HURRICANE CITY
UTAH

Mayor
Nanette Billings

City Manager
Kaden DeMille

City Council

Joseph Prete
Dave Sanders
Doug Heideman
David Hirschi
Kevin Thomas

Hurricane City Council Meeting
Agenda

February 17, 2022
3:00 PM
City Council Chambers 147 N 870 W, Hurricane

Notice is hereby given that the City Council will hold a Regular Meeting in the City Council Chambers 147 N 870 W, Hurricane, UT. Meeting Link on Webex Meeting number: 2630 456 5376 Meeting password: HCcouncil Join from a video or application Dial 26304565376@cityofhurricane.webex.com. You can also dial 173.243.2.68 and enter your meeting number. Join by phone +1-415-655-0001 US Toll Access code:26304565376.
A silent roll call will be taken, followed by the Pledge of Allegiance and prayer by invitation.
THOSE WISHING TO SPEAK DURING PUBLIC FORUM MUST SIGN IN WITH THE RECORDER BY 6:00 P.M.

3:00 PM PID Meeting

1. ULCT PID Presentation

5:00 p.m. Pre-meeting

6:00 p.m. - Call to Order

Prayer

Historical Thought

Pledge of Allegiance

Public Forum – Comments from Public

Please Note: In order to be considerate of everyone attending the meeting and to more closely follow the published agenda, public comments will be limited to 2 minutes per person per item. A spokesperson representing a group to summarize their concerns will be allowed 5 minutes to speak. Repetitious commentary will not be allowed. If you need additional time, please request agenda time with Cindy Beteag in writing before 5:00 p.m. the Wednesday one week before the Council meeting.

OLD BUSINESS

1. Consideration and possible approval of a **Franchise Agreement between Hurricane City and Infowest**
2. Consideration and possible approval of a **reduction in park and road impact fees for an apartment complex located at approximately 6129 W 100 South** H-4-2-4-3211 - Kyle Arbizu

3. Consideration and possible **approval of Modified Agreement between Hurricane City and Stratton Brothers Partnership**-Fay Reber
4. Consideration and possible approval of a **Resolution declaring parents are the primary stakeholders in their child's life**-Nanette Billings
5. Consideration and possible approval of an **updated preliminary plat for Peregrine Point West Phase 1-4 Amended**, located at 600 N and 3100 W. Perry Development Applicant, Greg Sant Agent.

NEW BUSINESS

1. **Public Hearing** to take comments on the following:
   a. A sensitive land application for Mountain View Estates, a 37 lot subdivision, located at 1300 W 650 S
   b. A sensitive land application for Mesa Cove, a 91 lot residential subdivision, located at 1117 W 600 N
2. Consideration and possible approval for a **preliminary plat and sensitive land application for Mountain View Estates Preliminary Plat, a 37 lot subdivision, located at 1300 W 650 S.** Craig Engel, RAC Inc Applicant. Marc Brown Agent.
3. Consideration and possible approval on a **preliminary plat and sensitive land application for Mesa Cove, a 91 lot residential subdivision, located at 1117 W 600 N**. GVS Holdings LLC Applicant. Dwain Schallenberger Agent
4. Discussion and possible approval of an **Equestrian Park grand opening celebration**-Rob Goulding
5. Consideration and possible approval of a **Certificate of Sale and Restrictive Covenant for purchase and acceptance of property from SITLA**.
6. Consideration and possible decision on the **flood modeling approach for Gould Wash**.
7. Consideration and possible approval of **a contract award for a slurry seal project.**
8. Consideration and possible approval of a **contract award for a chip seal project**.
9. Consideration and possible approval of a **grading permit for Dennett Construction south of Quail Creek Industrial**- Doug Dennett
10. Consideration and possible approval of **a grading permit for Scholzen Products-** Bruce Ballard
11. Discussion and possible approval of **event parking at Sand Hollow on the Washington County Water Conservancy District's propert**y - Dan Staheli
12. Consideration and possible approval of a **Zone Change Amendment request located north of 3000 S and west of 2100 W to amend the zoning boundary on 160 acres already approved as R1-10 PDO, planned development overlay, and M-1 zone, light industrial, from 26.7 acres of M-1 to 31.83 acres of M-1 with the remainder remaining R1-10 PDO**, Parcel number: H-3373-NP. Molly's View LLC Applicant. Richard Wedig Agent.

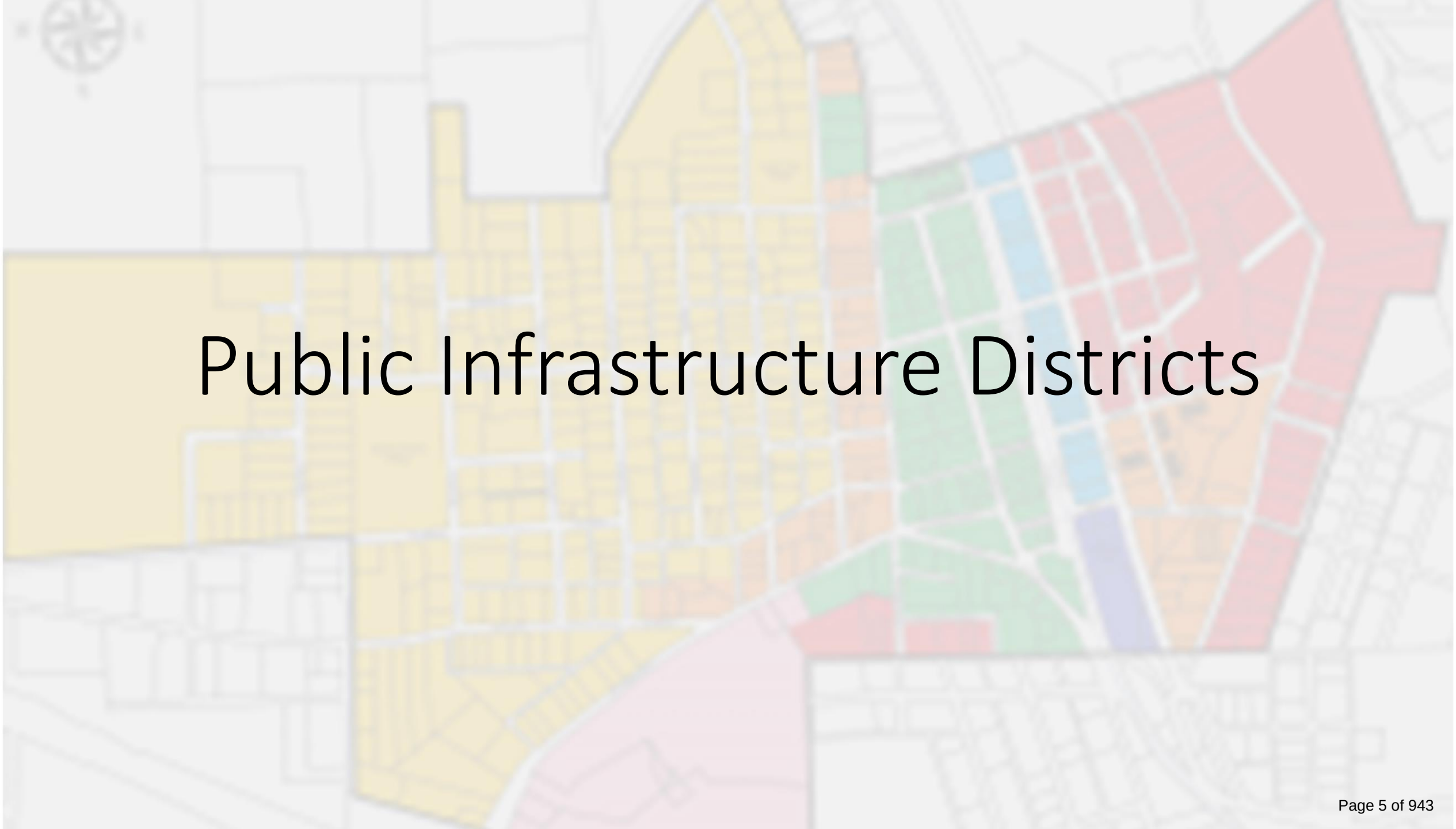
13. Consideration and possible approval for a **preliminary plat for Gateway at Sand Hollow Commercial, a 6 lot commercial subdivision**, located between SR-9 and Sand Hollow Road. Western MTG and Realty Co Applicant. Brent Moser Agent.
14. Consideration and possible approval of an **amended final plat for Pioneer Estates Lot 5** located at 252 S 1430 W. Pat Stone Applicant
15. Consideration and possible approval of a **preliminary plat for Sand Hollow Mancaves** located at the northeast corner of Sand Hollow Road and Abbey Road. Dixie Man Caves LLC Applicant. Jason Miller Agent
16. Consideration and possible approval for a **preliminary plat for Elim Estates**, a 135 lot subdivision located at approximately 1400 S 4300 W. Bright Ideas REI Applicant. Adam Allen Agent.
17. Discussion and possible decision on **renewing the contract with Granicus or hiring a new position for licensing and reviewing vacation rentals** - Nanette Billings
18. Discussion regarding a **water conservation ordinance**
19. Discussion and possible approval of a **part-time position to transcribe meeting minutes**-Nanette Billings
20. Discussion on **short term rental ordinance-**Nanette Billings
21. Discussion on the i**nfrastructure needed in Hurricane City**- Nanette Billings
22. Closed Session

Adjournment

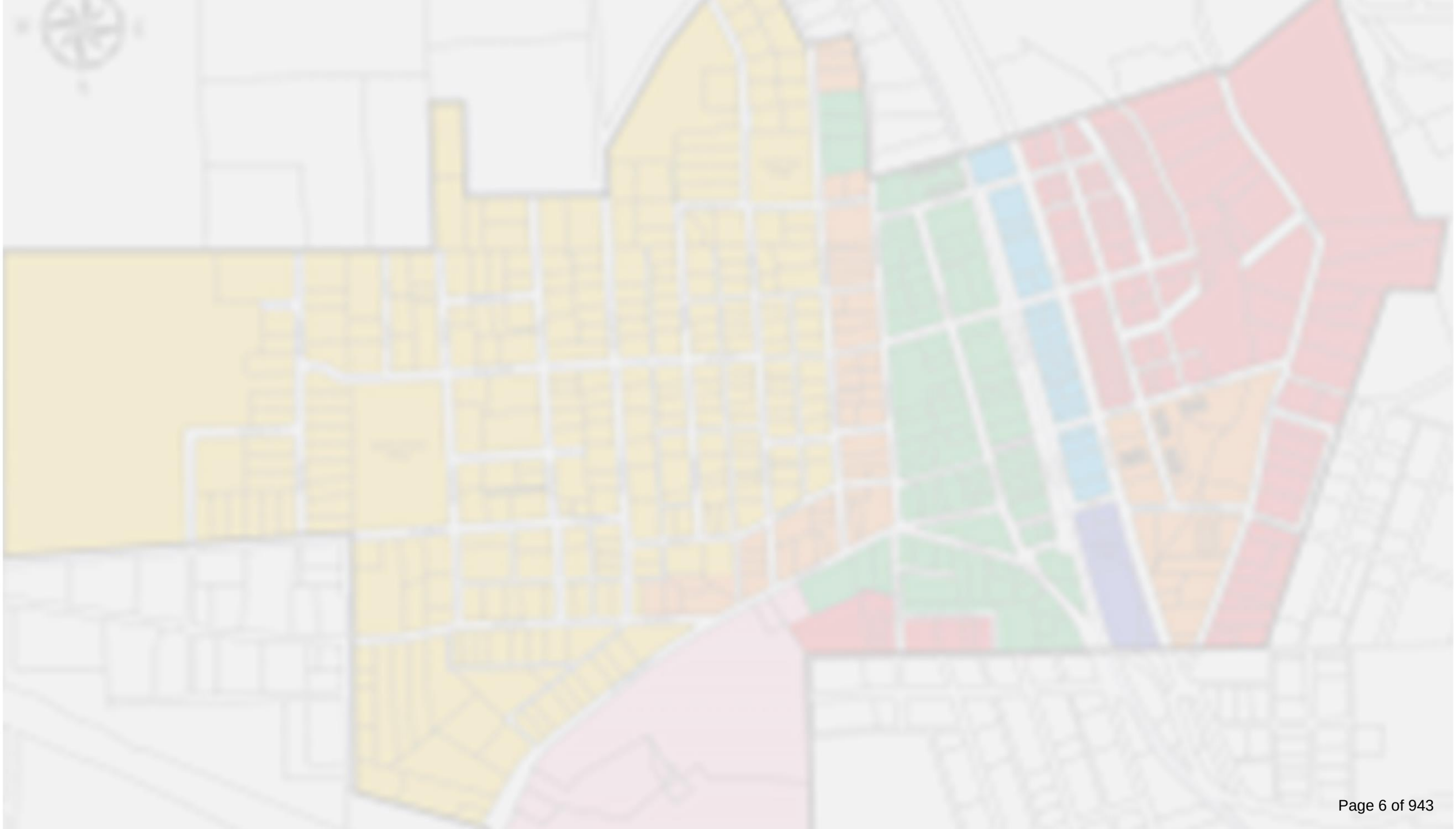
I hereby certify that the above notice was posted to the city website, (www.cityofhurricane.com) posted to the state public notice website, and at the following locations:
1. City office – 147 North 870 West, Hurricane, UT
2. The Post Office – 1075 West 100 North, Hurricane, UT
3. The library – 36 South 300 West, Hurricane, UT

_____ for the City Recorder





Public Infrastructure Districts



West Jordan's PID Considerations

- What is that property tax paying for?
- Why should I pay more in property taxes than the house across the street?
- What am I getting out of this?
- How come I didn't know about this?
- When was this disclosed?
- Is it fair to the future property owners?
- Is it fair to the rest of the community?


STOP
PROCEED WITH
CAUTION


WARNING
PROCEED WITH
CAUTION




LT Col Mark

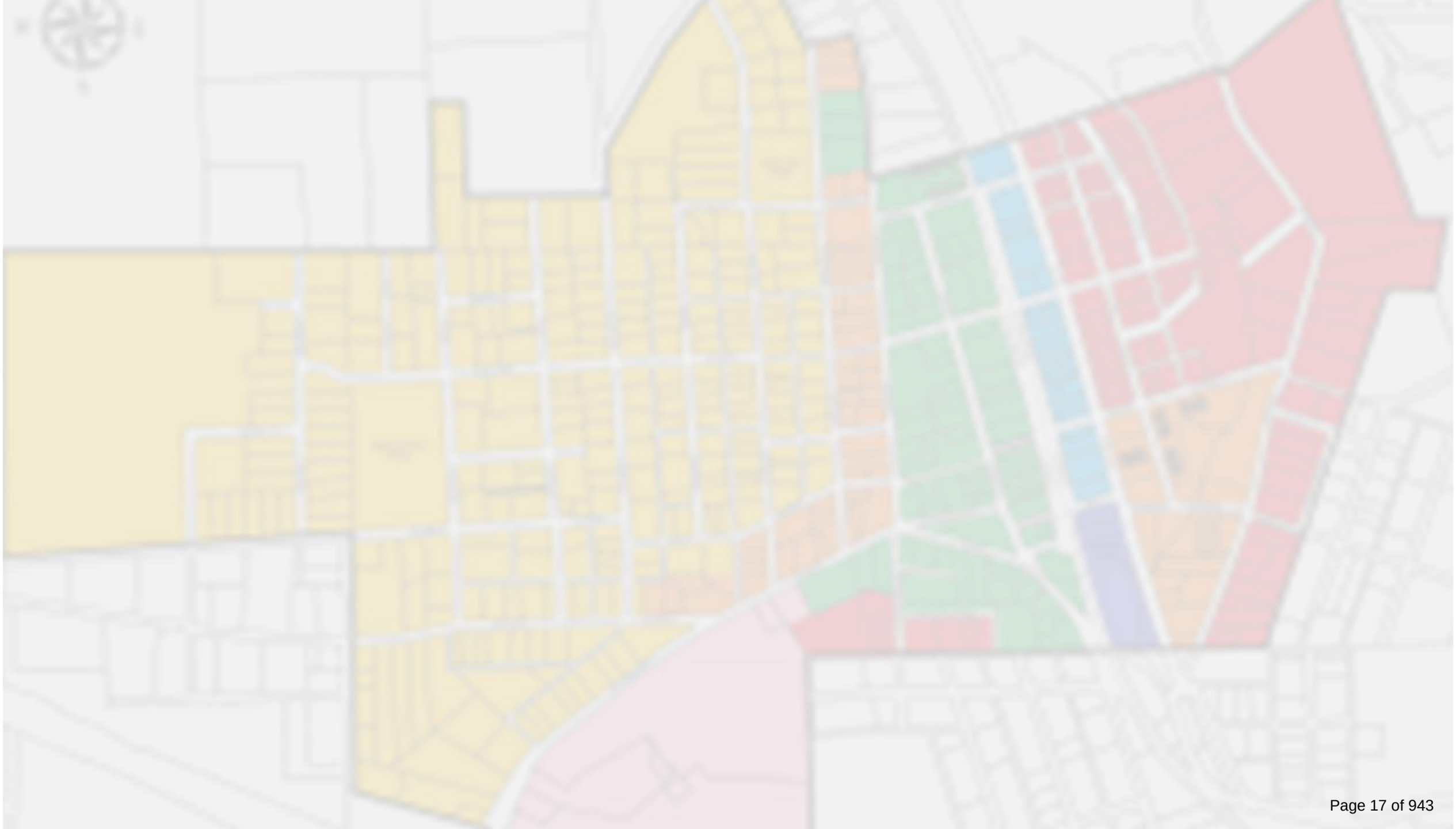












West Jordan's PID Policy

- Sole Discretion of the City to Approve
- Three parts to PID Policy
  - Process and Fees
  - City's Decision-Making Criteria
  - Governing Document Requirements

West Jordan's PID Policy

- Process and Fees
  - Letter of Intent from Applicant
    - Detailed plan of infrastructure, construction, maintenance, financing
    - Timeline
    - Summary of Unique Enhancements
  - LOI Reviewed by Advisory Committee
    - If LOI approved, applicant may begin drafting Governing Document
      - Governing Document paid for by applicant, will be sent to Council for approval
  - Fees
    - $2500 for LOI
    - $5,000 for Governing Doc
    - All additional expenses paid for by Applicant

West Jordan's PID Policy

- Conditions and Criteria
  - Public Benefit
  - Unique Enhancements Consistent with City's Goals

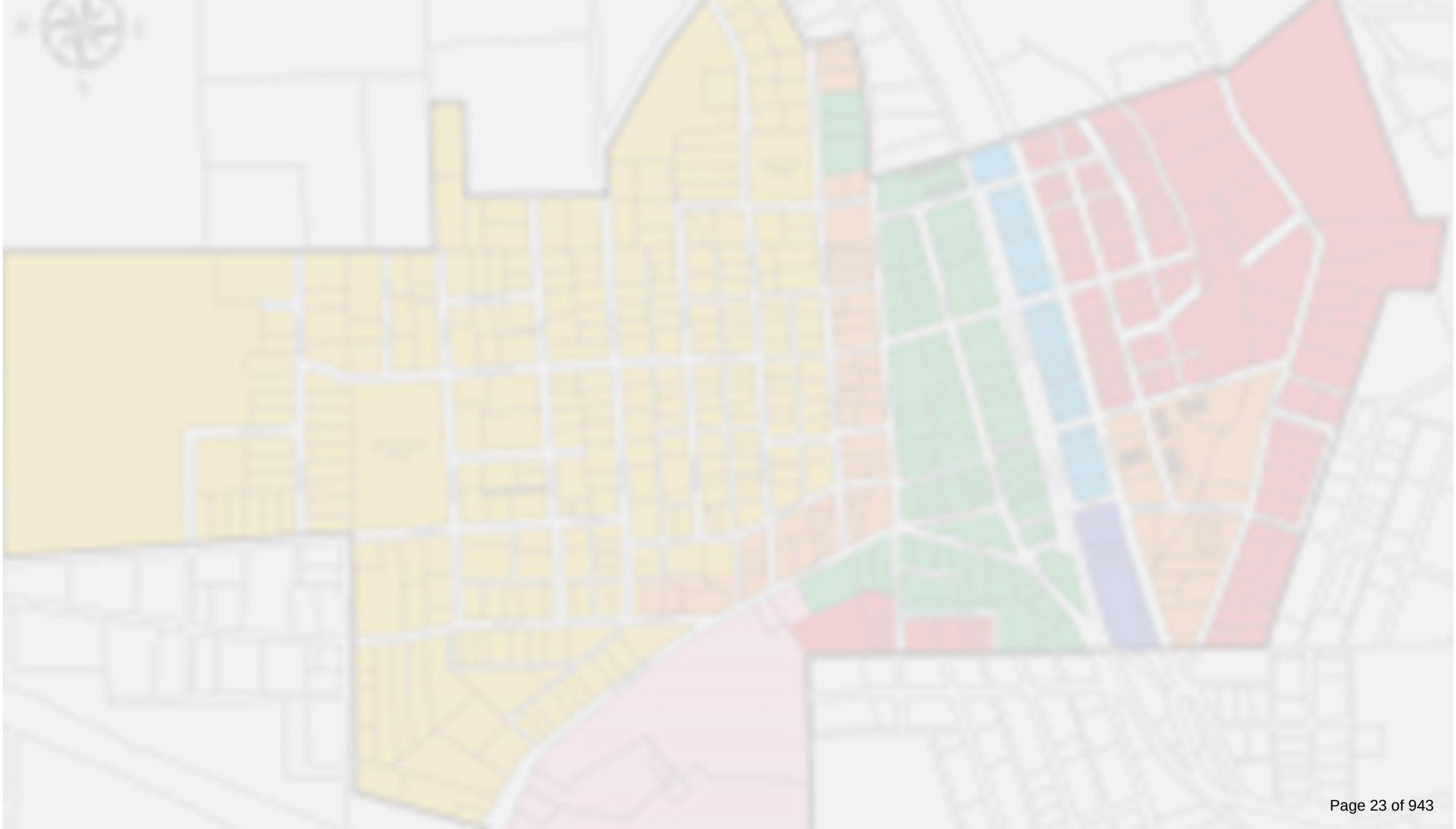
West Jordan's PID Policy

- Public Benefit / Unique Enhancements Defined

Public Infrastructure in excess of the project and system improvements the City would typically require for a development area. The value of this excess public benefit will serve as a limit on the net proceeds from the debt issuance allowed in the District.

PID and Upzoning

PID can’t be used to pay for infrastructure or enhancements that were offered to the City for an increase in entitlement








Picnic Shelter




CASCADE
ORTHOPEDICS
& SPORTS MEDICINE
CENTER P.C.
THE DALLES · HOOD RIVER · WHITE SALMON
velosolutions
velosolutions
©2018 ///.BERMSTYLE.COM
















P
OPEN


The BLOCK







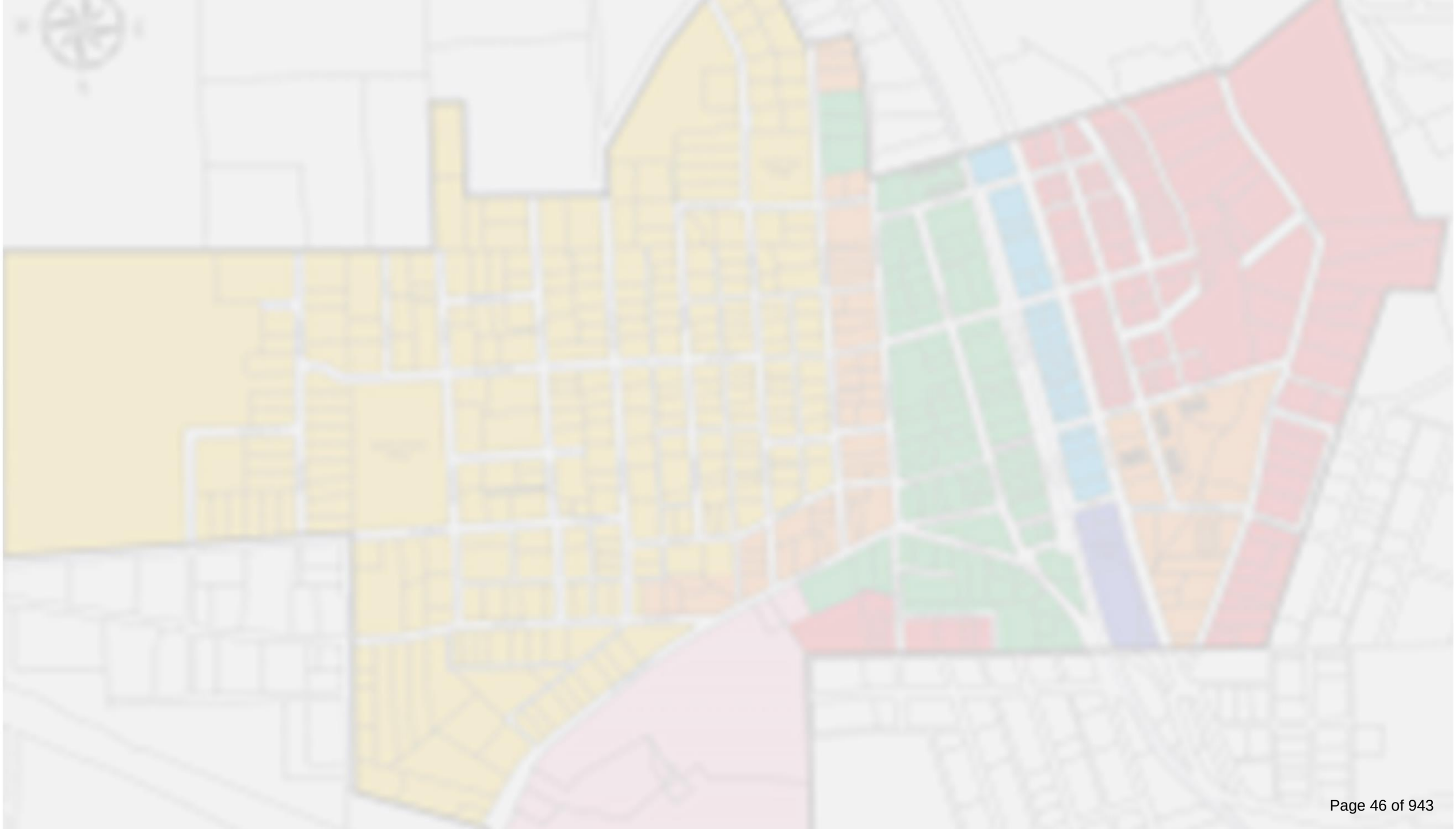







THE WIZARD OF OZ





West Jordan's PID Policy

- Conditions and Criteria
  - Public Benefit
  - Unique Enhancements Consistent with City's Goals
  - May not include land within another PID (rare exceptions)
  - Debt Service Limits
    - Cap on mill levy
    - Limits on Debt Service

West Jordan's PID Policy

- Consideration of the Applicant
  - Historical Performance
  - Development Plans in relation to City's Master Plan(s)
  - Regional Benefits
  - Credit Worthiness of Applicant

West Jordan's PID Policy

- Disclosure of PID to Future Property Owners
  - Shall Record Notice with County Recorder
    - Details of PID, disclosures of possible debt financing, limits, terms, etc.
  - Annual noticing to property owners within PID about the existence of the PID
    - Meeting Notice, Board of Directors Contact Info
  - PID info to City
    - Budget, Audit, Debt Terms, Interlocal Agreements, Contracts
  - Changes to Governing Documents Require City Approval

Questions?

Korban Lee
Chief Administrative Officer
City of West Jordan
801-569-5100
korban.lee@westjordan.utah.gov



TELECOMMUNICATIONS FRANCHISE AGREEMENT
BETWEEN THE CITY OF HURRICANE UTAH
AND INFOWEST, INC

THIS TELECOMMUNICATIONS FRANCHISE AGREEMENT (this "Agreement") is entered into this _____ day of _____, 2022 (the "Effective Date") by and between **Hurricane City**, a municipal corporation and political subdivision of the State of Utah, with principal offices at **147 N 870 W, Hurricane, Utah 84737** (the "City") and **InfoWest Inc**, a telecommunications corporation with its principle offices at **435 E Tabernacle St, St. George, Utah 84770** (the "Provider"). The CITY and the PROVIDER may sometimes be referred to herein collectively as the "Parties".

RECITALS

WHEREAS, the Provider desires to provide telecommunications services within the City and, in connection therewith, to establish a telecommunications network in, under, along, over and across present and future rights-of-way of the City which consists of telecommunication lines, cables, and all other necessary appurtenances (the "System"); and

WHEREAS, after extensive consideration, the City, in exercising its management of public rights-of-way, has determined that it is in the best interest of the public to provide the Provider a non-exclusive franchise agreement to operate a telecommunications network within the City; and

WHEREAS, the City and the Provider have negotiated an arrangement whereby the Provider may provide its services within the City pursuant to the terms and conditions outlined in the Agreement and all applicable City ordinances, and subject to the further reasonable regulation under the City's police and other regulatory power.

AGREEMENT

NOW, THEREFORE, in consideration of the mutual covenants and agreements of the Parties contained herein, and for other good and valuable consideration, the receipt and legal sufficiency of which is hereby acknowledged, the City and the Provider hereby agree as follows:

ARTICLE I
FRANCHISE AGREEMENT

1.1 Agreement. Upon approval by the City Council and execution by both Parties, this Agreement shall be deemed to constitute a binding contract by and between the City and the Provider.

1.2 Grant of Franchise. The City, through this Agreement, hereby grants to the Provider the non-exclusive right, privilege, and franchise to install, repair, maintain, remove and replace its telecommunications system on, in, under, over and across the present and future public rights-of-way in the City in order to provide services.

1.3 Licenses. The Provider hereby acknowledges that it has, or will, obtained any and all necessary approvals, licenses or permits required by federal, state and local law to provide telecommunication services consistent with the provisions of this Agreement.

1.4 Financial Capability. The Provider hereby warrants that it has the financial capability to construct, maintain, and operate a telecommunications network and to otherwise comply with the provisions of this Agreement.

1.5 Relationship of Parties. Nothing herein shall be deemed to create a joint venture or principal-agent relationship between the Parties, and neither Party is authorized to nor shall either Party act toward third persons or the public in a manner that would indicate any such relationship.

1.6 Pole Attachments. This franchise grants to the Provider the right to use City poles, conduit, or other facilities. Provider must work with the city for approval of such use.

ARTICLE II
FRANCHISE FEE

2.1 Franchise Fee.

a. This agreement is subject to the Utah Municipal Telecommunications License Tax Act Title 10, Chapter 1, Sections 401 through 410, Utah Code Annotated, 1953 as amended, enrolled at the time this agreement is signed or as may be amended. Provider shall pay the City's municipal telecommunications license tax at the rate of **3.5%** of the gross receipts from telecommunications service attributed to the municipality. Said tax shall be paid through the Utah State Tax Commission.

b. All payments shall be made to the Utah State Tax Commission, whose current address is as follows:

Utah State Tax Commission
210 North 1950 West
Salt Lake City, Utah 84134

c. Payments are due to the Utah State Tax Commission within forty-five (45) days after receipt by the Provider. Interest shall accrue on late payments at the rate of **1 ½%** per month until paid. Compliance by the Provider with the terms and provisions of the Municipal Telecommunications Tax Act, and any rules and regulations promulgated thereunder, shall satisfy all requirements of this Agreement with respect to the calculation and payment of the Franchise Fee.

d. The City and the Provider hereby agree to negotiate in good faith any amendments to this Agreement as shall be necessary to accommodate changes in the Franchise Fee including payment provisions; provided, however, such new or changed provisions shall substantially confirm with the provisions contained in any permits held by other similarly situated companies.

e. City shall have access to any and all of Provider's business records upon reasonable notice for the purpose of auditing compliance with the above tax provisions.

f. The Provider hereby represents to the City that one of the purposes for entering into this Agreement is to obtain authority to build a network within the City to provide telecommunication services to customers within the City.

2.2 Equal Treatment. The City hereby agrees that if any service forming part of the base for calculating the Franchise Fee under this Agreement is, or becomes, subject to competition from a third party, the City will either impose and collect from any such third party a fee or tax on gross revenues from such competing service in the same percentage identified herein, plus the percentage specified as a utility revenue tax or license fee in the then-current ordinances of the City, or to waive collection of the fee(s) provided for herein that are subject to such competition.

ARTICLE III
TERM AND RENEWAL

3.1 Term and Renewal. The franchise granted to the Provider herein shall be for a period of twenty (20) years commencing on the Effective Date first set forth above in this Agreement unless this Agreement is terminated sooner as provided herein. At the end of the initial twenty (20) year term of this Agreement, the franchise granted herein may be renewed by the City and the Provider upon the same terms and conditions as contained in this Agreement for an additional ten (10) year term, by the Provider providing to the City's representative designated herein written notice of the Provider' s intent to renew not less than ninety (90) calendar days before the expiration of the initial franchise term.

3.2 Rights of Provider upon Expiration or Revocation. Upon expiration of this Agreement, whether by lapse of time, by agreement between the Parties, or by revocation or forfeiture, the Provider shall have the right to remove from the City' s rights-of-way any and all of its system; however, in such an event, it shall be the duty of the Provider, immediately upon such removal, to restore the rights-of-way for which such system is removed to as good a condition as the same was before the removal was affected.

3.3 Rights of City upon Expiration or Revocation. Upon expiration of the term of this Agreement, forfeiture, or lawful revocation of this Agreement, and if no renewal or extension thereof is agreed upon, the Provider may, at the discretion of the City Council, be required, in part or entirely, to remove all its wires, poles, fixtures, and other facilities or equipment installed or used in the enjoyment of the franchise. Alternatively, the removal or sale of such facilities and equipment may be directed, limited, or conditioned by the City by agreement between the Parties or through means of other lawful municipal power or right. The City may continue to invoke any or all provisions of this franchise Agreement against the Provider or any successor entity enjoying de facto franchise privileges after expiration or revocation. The City and the Provider shall work together to take all other actions deemed by the City as necessary and proper to accommodate the transition to any successor as may be in the best interest of the City or its inhabitants and the Provider.

ARTICLE IV
USE AND RELOCATION OF FACILITIES IN THE PUBLIC RIGHTS-OF-WAY

4.1 Franchise Rights to Use the Public Rights-of-Way. The Provider shall have the right to use the public rights-of-way within the City to construct and maintain its network subject to the conditions set forth in this Agreement; provided, however, that the Provider shall not, pursuant to this Agreement, place any new poles, mains, cables, structures, pipes, conduits, or

wires on, in, under, along, over, across or within any right-of-way, City park, pleasure ground, or other recreational area currently existing or developed in the future without a permit from the City. Nothing contained herein shall preclude the City from granting a revocable permit for such purpose. In addition, the Provider shall have the right to utilize any easements across private property granted to the City for utility purposes; provided, however, that the Provider obtain the City' s prior written permission in each case and the documents granting any such easements to the City to authorize such use. The Provider specifically understands and acknowledges that certain City easements and rights-of-way may be prescriptive in nature, and that nothing in this Agreement extends permission to use the easement or right-of-way beyond the extent that the City may have acquired, and such easements and rights-of-way may be subject to third party prior or after-acquired interests. The Provider is cautioned to examine each individual easement and right-of-way and the legal arrangement between the City and adjacent property owners. The City assumes no duty or obligation to defend any interest in any easement or right of-way, and the Provider remains solely responsible to make any arrangements required as a result of other persons claiming an interest in the City easement or right-of-way.

4.2 Provider Duty to Relocate; Subordination to City Use. Whenever the City, for any lawful public purpose, shall require the relocation or reinstallation of any property of the Provider or the Provider' s successors in any of the streets, alleys, rights-of-way, or public property of the City, it shall be the obligation of the Provider, upon notice of such requirement and written demand made of the Provider, and within a reasonable time thereof, but not less than thirty (30) calendar days, to remove and relocate or reinstall such facilities as may be reasonably necessary to meet the requirements of the City. Such relocation, removal, or reinstallation by the Provider shall be at no cost to the City; provided, however, that the Provider and its successors and assigns may maintain and operate such facilities, with the necessary appurtenances, in the new location or locations without additional payment, if the new location is a public place. Notwithstanding the foregoing, the duty of the Provider to install or relocate its lines underground shall be subject to the provisions of Article IV, Paragraph 4.4 below. Any money and all rights to reimbursement from the State of Utah or the federal government to which the Provider may be entitled for work done by the Provider pursuant to this Paragraph shall be the property of the Provider. The City shall assign or otherwise transfer to the Provider all rights the City may have to recover costs for such work performed by the Provider and shall reasonably cooperate with the Provider' s efforts to obtain reimbursement. In the event the City has required the Provider to relocate its facilities to accommodate a private third party, the City shall use good faith to require such third party to pay the costs of any such relocation. Notwithstanding anything to the contrary herein, the Provider' s use of the right-of-way shall in all matters be subordinate to the City' s use of the right-of-way for any public purpose. The City and the Provider shall coordinate the placement of their respective facilities and improvements in a manner which minimizes adverse impact on each other. Where placement is not otherwise regulated, the

facilities shall be placed with adequate clearance from such public improvements so as not to impact or be impacted by such public improvements.

4.3 Duty to Obtain Approval to Move Provider Property; Emergencies. Except as otherwise provided herein, the City, without the prior written approval of the Provider, shall not intentionally alter, remove, relocate, or otherwise interfere with any Provider facilities. Approval by Provider will not be unreasonable withheld. However, if it becomes necessary (in the judgment of the Mayor, City Council, City Engineer, Fire Chief, Police Chief, or their designees) to cut, move, remove, or damage any of the cables, appliances, or other fixtures of the Provider because of a fire, emergency, disaster, or other imminent threat thereof, these acts may be done without prior written approval of the Provider, and the repairs thereby rendered necessary shall be made by the Provider, without charge to the City. Should the City take actions pursuant to this section, the Provider shall indemnify, defend, and hold the City harmless from and against any and all claims, demands, liens, or liability for (a) loss or damage to the Provider' s property; and/or (b) interruptions of telecommunications services provided by the use of or through the Provider' s property (including telecommunications services provided by the Provider to the Provider' s customers), whether such claims, demands, liens, or liability arise from or are brought by the Provider, its insurers, the Provider' s customers, or third parties. If, however, the City requests emergency funding reimbursement from federal, state or other governmental sources, the City shall include in its request the costs incurred by the Provider to repair facilities damaged by the City in responding to the emergency. Any funds received by the City on behalf of the Provider shall be paid to the Provider within thirty (30) business days.

4.4 Location to Minimize Interference. All lines, poles, towers, pipes, conduits, equipment, property, structures, and assets of the Provider shall be located so as to minimize interference with the use of streets, alleys, rights-of-way, and open property by others and shall reasonably avoid interference with the rights of owners of property that abuts any of said streets, alleys, rights-of-way, or public property.

4.5 Repair of Damage. If, during the course of work on its facilities, the Provider causes damage to or alters any street, alley, right-of-way, sidewalk, utility, public improvement, or other public property, the Provider, at its own cost and expense and in a manner approved by the City, shall promptly and completely restore such street, alley, right-of-way, sidewalk, utility, public improvement, or other public property to its previous condition in accordance with applicable City ordinances, policies and regulations relating to repair work of similar character to the reasonable satisfaction of the City. Except in cases of emergency, the Provider, prior to commencing work in the public way, street or public property, shall make application for a permit to perform such work from the City Engineer or other department or division designated by the City. Provider shall also be required to obtain a road break permit from the Public Works

Department. Such permit shall not be unreasonably withheld. The Provider shall abide by all reasonable regulations and requirements of the City for such work.

4.6 Guarantee of Repairs. For a period of eighteen (18) months following the completion of the repair work performed pursuant to Paragraph 4.5 above, the provider shall maintain, repair, and keep in good condition those portions of said streets, alleys, rights-of-way, or public property restored, repaired or replaced to the satisfaction of the City. Provider will comply with all applicable City Ordinances related to the posting of bonds and guarantee of repairs.

4.7 Safety Standards. It shall be the Provider' s responsibility to ensure that the Provider' s work, while in progress, be properly protected at all times with suitable barricades, flags, lights, flares, or other devices as are reasonably required by applicable safety regulations or standards imposed by law including, but not limited to, signage in conformance with the Federal and State of Utah manuals on Uniform Traffic Control Devices.

4.8 City Supervision. The Provider shall construct, operate, and maintain its network within the City in strict compliance with all laws, ordinances, rules, and regulations of the City and any other agency having jurisdiction over the operations of the Provider. The Provider' s network and all parts thereof within the City shall be subject to the right of periodic inspection by the City; provided, however, that such inspection shall be conducted at reasonable times and upon reasonable notice to the Provider.

4.9 Provider's Duty to Remove Network.

a. The Provider shall promptly remove, at its own cost and expense, from any public property within the City, all or any part of the network when one or more of the following conditions occur:

i. This franchise grant is terminated or revoked pursuant to notice as provided herein; or

ii. This franchise grant expires pursuant to the terms of this Agreement.

b. The removal of any or all of the network by the Provider that requires trenching or other opening of the City's streets shall be done only after the Provider complies with applicable City Ordinances related to opening City Streets.

c. The Provider shall receive notice in writing from the City setting forth one (1) or more of the occurrences specified in Subsection 4.9 (a) above and shall have ninety (90) calendar days from the date upon which said notice is received to remove or abandon such facilities.

4.10 Notice of Closure of Streets. Except in cases of emergency, the Provider shall notify the City not less than three (3) business days in advance of any construction, reconstruction, repair, or relocation of facilities which would require any street closure which reduces traffic flow to less than two (2) lanes of moving traffic. Except in the event of an emergency, as reasonably determined by the Provider, no such closure shall take place without prior authorization from the City. In addition, all work performed in the traveled way or which in any way impacts vehicular or pedestrian traffic shall be properly signed, barricaded, and otherwise protected as required by Paragraph 4.7 above, and the City shall receive no less than 48 hours' notice of said closure.

4.11 Agreement to Abide by Construction and Technical Requirements. In addition to the provisions of this Article 4, the Provider expressly agrees to comply with all other provisions of City governing the construction and technical requirements of the Provider' s network and system.

ARTICLE V
POLICE POWERS

5.1 Police Powers. The City hereby expressly reserves, and the Provider hereby expressly recognizes, the City's right and duty to adopt, from time to time, in addition to provisions herein contained, such ordinances and rules and regulations as the City may deem necessary in the exercise of its police power for the protection of the health, safety and welfare of its citizens and their properties.

ARTICLE VI
SEVERABILITY

6.1 Severability. If any section, sentence, paragraph, term or provision of this Agreement is for any reason determined to be or rendered illegal, invalid or superseded by other lawful authority, including any state or federal, legislative, regulatory or administrative authority having jurisdiction thereof, or is determined to be unconstitutional, illegal or invalid by any court of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision, and such determination shall have no effect on the validity of any other section, sentence, paragraph, term or provision, all of which shall remain in full force and effect for the term of this Agreement or any renewal or renewals thereof. Provided that if the invalidated portion is considered a material consideration for entering into this Agreement, the Parties shall negotiate, in good faith, an amendment to this Agreement. As used herein, "material consideration" for the City is its ability to collect the Franchise Fee during the term of this

Agreement and its ability to manage its rights-of-way in a manner similar to that provided in this Agreement and the City's excavation ordinance. For the Provider, "material consideration" is its ability to use the rights-of-way for telecommunication purposes in a manner similar to that provided in this Agreement and the City's excavation ordinance.

ARTICLE VII
EARLY TERMINATION; REVOCATION OF FRANCHISE; OTHER REMEDIES

7.1 Grounds for Termination. The City may terminate or revoke this Agreement and all rights and privileges herein provided for any of the following reasons:

a. The Provider fails to make timely payments of the Franchise Fee as required under Article II of this Agreement and does not correct such failure within sixty (60) calendar days after written notice by the City of such failure;

b. The Provider, by act or omission, materially violates a material duty herein set forth in any particular within the Provider' s control, and with respect to which redress is not otherwise herein provided. In such event, the City, acting by or through its City Council, may determine, after a hearing, that such failure is of a material nature, and thereupon, after written notice giving the Provider notice of such determination, the Provider, within sixty (60) calendar days of such notice, shall commence efforts to remedy the conditions identified in the notice and shall have ninety (90) calendar days from the date it receives notice to remedy the conditions. After the expiration of such ninety (90) day period and failure to correct such conditions, the City may declare the franchise forfeited and this Agreement terminated, and thereupon, the Provider shall have no further rights or authority hereunder; provided, however, that any such declaration of forfeiture and termination shall be subject to judicial review as provided by law, and provided further, that in the event such failure is of such nature that it cannot be reasonably corrected within the ninety (90) day time period provided above, the City shall provide additional time for the reasonable correction of such alleged failure if the reason for the non-compliance was not the intentional or negligent act or omission of the Provider;

c. The Provider becomes insolvent, unable or unwilling to pay its debts; is adjudged bankrupt; or all or part of its facilities should be should under an instrument to secure a debt and is not redeemed by the Provider within sixty (60) calendar days; or

d. In furtherance of the Provider' s policy or through acts or omissions done within the scope and course of employment, a director or officer of the Provider knowingly engages in conductor makes a material misrepresentation with or to the City that is fraudulent or in violation of a felony criminal statute of the State of Utah.

ARTICLE VIII
NOTICES

8.1 City Designee and Address. The Mayor of the City or his/her designee(s) shall serve as the City' s representative regarding administration of this Agreement. Unless otherwise specified herein, all notices from the Provider to the City pursuant to or concerning this Agreement shall be delivered to the City' s representative at **147 N 870 W, Hurricane, Utah 84737**, or other such officer and address as the City may designate by written notice to the Provider.

8.2 Provider Designee and Address. Unless otherwise specified herein, all notices from the City to the Provider pursuant to or concerning this Agreement shall be delivered to **435 E Tabernacle St, St. George Utah, 84770;** with a copy to General Counsel at the same address.

8.3 Failure of Designee. The failure or omission of the City' s or the Provider' s representative to act shall not constitute any waiver or estoppel by the City or the Provider.

ARTICLE IX
INSURANCE AND INDEMNIFICATION

9.1 No Liability. Except as otherwise specifically provided herein, the City shall in no way be liable or responsible for any loss or damage to property, including financial or business loss (whether direct, indirect, or consequential), or any injury to or death of any person(s) that may occur in the construction, operation, or maintenance by the Provider of any of its lines and appurtenances hereunder, except to the extent of the City' s own negligence or willful misconduct. Notwithstanding any other provision of this Agreement, in no event shall either Party be liable for any consequential, special, incidental, punitive, indirect or similar damages.

9.2 Provider Indemnification of City. The Provider shall indemnify and, at the City' s option, defend and hold the City, its elected and appointed officers, agents, and employees thereof, harmless from and against any and all claims, suits, actions, liability and judgments for damages or otherwise harmless from and against claims, demands, liens, and all liability or damage of whatsoever kind on account of or arising from the exercise by the Provider of the related rights, or from the operations of the Provider within the City, and shall pay the costs of defense plus reasonable attorneys' fees. Said indemnification shall include, but not be limited to, the Provider' s negligent acts or omissions pursuant to its use of the rights and privileges of this Agreement including construction, operation and maintenance of telecommunications lines and

appurtenances, whether or not any such use, act or omission complained of is authorized, allowed, or prohibited by this Agreement.

9.3 Notice of Indemnification. The Provider shall give prompt written notice to the City of any claim, demand or lien that may result in a lawsuit against the City. The City shall (i) give prompt written notice to the Provider of any claim, demand or lien with respect to which the City seeks indemnification hereunder; and (ii) unless, in the City' s sole judgment, a conflict of interest may exist between the City and the Provider with respect to such claim, demand or lien, permit the Provider to assume the defense of such claim, demand or lien with counsel satisfactory to the City. If such defense is not assumed by the Provider, the Provider shall not be subject to any liability for any settlement made without its consent. Notwithstanding any provision hereof to the contrary, the Provider shall not be obligated to indemnify, defend or hold the City harmless to the extent any claim, demand or lien arises out of or in connection with a breach by the City of any obligation under this Agreement or any negligent or otherwise tortious act or failure to act of the City or any of its elected or appointed officers, agents, or employees.

9.4 Insurance. The Provider shall file a Certificate of Insurance with the City prior to commencing any action pursuant to this Agreement, and shall at all times thereafter maintain in full force and effect, at its sole expense, an acceptably policy or policies which have one (1) of the three (3) highest or best rating from the Alfred M. Best Company of liability insurance, including comprehensive liability insurance. The policy(ies) shall name the City as an additional insured and in their capacity as such, also the City' s elected and appointed officers, agents, and employees. Policies of insurance shall be in the minimum single limit amount of three million dollars ($2,000,000) per occurrence. The insurer(s) shall be authorized to write the required insurance in the State of Utah. The policy(ies) of insurance shall be maintained by the Provider in full force and effect during the full term of this franchise Agreement. Each policy of insurance shall contain a statement on its face that the insurer(s) will not cancel the policy or fail to renew the policy, whether for nonpayment of premium or otherwise, and whether at the request of the Provider or for other reasons, except after thirty (30) calendar days' advance written notice mailed by the insurer(s) to the City, and that such notice shall be transmitted postage prepaid.

9.5 City's Right to Intervene. In any suit in which the City is named as a party and which seeks indemnification from the Provider, and in which the City, in its own reasonable discretion, believes that a conflict of interest with the Provider exists, the City shall have the right to provide its own defense in connection with the same. In such event, in addition to being reimbursed for any judgment that may be rendered against the City which is subject to indemnification hereunder, together with all court costs incurred therein, the Provider shall reimburse the City for all reasonable attorneys' fees including those employed by the City in such case (s), as well as all reasonable expenses incurred by the City by reason of undertaking the defense of such suit(s),

whether such suit(s) are successfully defended, settled, compromised, or fully adjudicated against the City.

9.6 No Creation of Private Cause of Action. The provisions set forth herein are not intended to create liability for the benefit of third parties, but is solely for the benefit of the Provider and the City. In the event any claim is made against the City that falls under these indemnity provisions and a court of competent jurisdiction should adjudge, by final decree, that the City is liable therefore, the Provider shall indemnify and hold the City harmless of and from any such judgment or liability, including any court costs, expenses, and attorneys' fees incurred by the City in defense thereof. Nothing herein shall be deemed to prevent the Parties indemnified and held harmless herein from participating in the defense of any litigation by their own counsel at their own expense. Such participation shall not, under any circumstances, relieve the Provider from its duty of defense against liability or paying any judgment entered against such party.

9.7 Performance Bonds and/or Cash Bonds and other Surety. To ensure completion of the Provider' s performance of its obligations hereunder, the Provider shall furnish to the City a performance bond and/or cash bond from an insurer or guarantor that is acceptable to the City prior to commencing any action pursuant to this Agreement. At the City's sole discretion, and based on the project, a performance bond and/or cash bond may be required.

ARTICLE X
REMEDIES

10.1 Duty to Perform. The Provider and the City hereby agree to take all reasonable and necessary actions to assure that the terms of this Agreement are performed.

10.2 Remedies at Law. In the event the Provider or the City fail to fulfill any of their respective obligations under this Agreement, the City or the Provider, whichever the case may be, shall have a breach of contract claim and remedy against the other in addition to any other remedy provided by law, provided that no remedy that would have the effect of amending the specific provisions of this Agreement shall become effective without such action that would be necessary to formally amend the Agreement.

10.3 Third Party Beneficiaries. The benefits and protections provided by this Agreement shall inure solely to the benefit of the City and the Provider. This Agreement shall not be deemed to create any right in any person who is not a Party hereto and shall not be construed in any respect to be a contract in whole or in part for the benefit of any third party (other than the permitted successors and assigns of a Party hereto.)

10.4 Reserved Rights. Nothing contained herein shall be deemed to preclude the Provider from pursuing any legal or equitable rights or remedies it may have to challenge the action of the City.

10.5 Force Majeure. The Provider shall not be held in default or non-compliance with the provisions of this Agreement, nor suffer any enforcement or penalty relating thereto, where such non-compliance or alleged defaults are caused by strikes, acts of God, power outages, or other events reasonably beyond the Provider' s ability to control; however, the Provider shall not be relieved of any of its obligations to comply promptly with any provision of this Agreement by reason of any failure of the City to enforce such prompt compliance.

10.6 No Waiver. Nothing herein shall be construed as to imply that the City waives any right, payment, or performance based on future legislation where said legislation impairs this Agreement in violation of the United States or Utah Constitutions.

ARTICLE XI
TRANSFER OF FRANCHISE

11.1 Written Approval Required to Transfer. The Provider shall not transfer or assign any rights under this Agreement or the franchise granted herein to another entity unless the City first gives its approval in writing, which approval shall not be unreasonably withheld or delayed; provided, however, that the Provider may fully assign the franchise contained herein to its corporate parent, a corporate affiliate or a subsidiary, and also that inclusion of the franchise as property subject to the liens of the Provider' s mortgages or other security interests shall not constitute a transfer or assignment. A lease of the Provider' s system to a third party shall not constitute a transfer or assignment of the franchise for purposes of this Agreement. Any attempted assignment or transfer without such prior written consent shall constitute a default of the franchise and this Agreement. In the event of such a default, the City shall proceed according to the procedures set forth in this Agreement and any applicable state, federal or local law.

11.2 Procedure for Obtaining Approval for Transfer. At least ninety (90) calendar days before a proposed assignment or transfer of the Provider' s franchise is scheduled to become effective, the Provider shall petition in writing for the City Councils written consent for such a proposed assignment or transfer. The City shall not unreasonably withhold its consent to such an assignment or transfer. However, in making such a determination, the City Council may consider the following:

a. Experience of the proposed assignee or transferee (including conducting an investigation of the proposed assignee or transferee' s service record in other communities);

b. Qualifications of the proposed assignee or transferee;

c. Legal integrity of the proposed assignee or transferee;

d. Financial ability and stability of the proposed assignee or transferee;

e. The corporate connection, if any, between the Provider and the proposed assignee or transferee; and

f. Any other aspect of the proposed assignee's or transferee's background which could affect the health, safety and welfare of the citizenry of the City as it relates to the operation of a telecommunication network.

11.3 Certification of Assignee. Before an assignment or transfer is approved by the City Council, the proposed assignee or transferee shall execute an affidavit acknowledging that it has read, understands, and intends to abide by this franchise Agreement.

11.4 Effect of Approval. In the event of any approved assignment or transfer, the assignee or transferee shall assume all obligations and liabilities of the Provider, except that an assignment or transfer shall not relieve the Provider of its liabilities under this franchise Agreement until the assignment actually takes place or unless specifically relieved by federal, state, or local law, or unless specifically relieved by the City Council at the time an assignment or transfer is approved.

11.5 Transfer upon Revocation by the City. The Provider and the City hereby agree that in the event of a lawful revocation of this franchise, at the Provider's request, which shall be made in the Provider's sole discretion, the Provider shall be given a reasonable opportunity to effectuate a transfer of its network to a qualified third party. The City further hereby agrees that during such a period of time, it shall authorize the Provider to operate pursuant to the terms of its prior franchise Agreement; however, in no event shall such authorization exceed a period greater than six (6) months from the effective date of such revocation. If, at the end of that six (6) month period, the Provider is unsuccessful in procuring a qualified transferee or assignee of its network which is reasonably acceptable to the City, the Provider and the City may avail themselves of any rights they may have pursuant to federal or state law; it being further agreed that the Provider's continued operation of its network during the six (6) month period shall not be deemed to be a waiver or extinguishment of any rights of either the City or the Provider. Notwithstanding anything to the contrary set forth herein, neither the City nor the Provider shall be required to violate federal or state law.

11.6 Abandonment of Facilities by the Provider. The Provider, with the consent of the City, may abandon any underground facilities in place, subject to the requirements of the City. In such an event, the abandoned network shall become the property of the City, and the Provider shall have no further responsibilities or obligations concerning those facilities.

ARTICLE XII
GENERAL PROVISIONS

12.1 Binding Agreement. The Parties hereby represent that (i) when executed by their respective parties, this Agreement shall constitute all the legal and binding obligations of the Parties pertaining to the subject matter contained herein; and (ii) that each Party has complied with all relevant statutes, ordinances, resolutions, by-laws, and other legal requirements applicable to their operation in entering into this Agreement. This Agreement shall be binding upon the heirs and successors, administrators and assigns of each of the Parties.

12.2 Governing Law. This Agreement shall be construed, interpreted and governed in accordance with the laws of the State of Utah. All disputes resulting in legal action shall be governed by the laws of the State of Utah. Jurisdiction shall be vested in the District Courts in and for the State of Utah. Venue is vested in the 5th Judicial District Court in and for Washington County, State of Utah or in any other successor district court of competent jurisdiction.

12.3 Interpretation of Agreement. The invalidity of any portion of this Agreement shall not prevent the remainder of this agreement from being carried into effect. Whenever the context of any provision shall require it, the singular number shall be held to include the plural number, and vice versa, and the use of any gender shall include any other and all genders. The paragraph and section headings in this Agreement are for convenience only and do not constitute a part of the provisions hereof.

12.4 Entire Agreement and Amendments. This Agreement and all attachments hereto constitute and represent the entire agreement and understanding between the Parties hereto and replaces any previous agreement, understanding or negotiation between the Parties with respect to the subject matter hereof, and may be modified or amended, supplemented, or changed only by the written agreement of the Parties, including the formal approval of the City Council. No oral modifications or amendments shall be effective.

IN WITNESS WHEREOF, the parties have hereunto set their hands the day and year set forth above.

HURRICANE CITY, UTAH

_____

John Bramall, MAYOR
Hurricane City Corporation

Date: _____

ATTEST:

_____

, CITY RECORDER

STATE OF UTAH)
: Ss.
COUNTY OF WASHINGTON)

This is to certify that on the ____ day of _____, 2022, before me, the undersigned, a Notary Public, in and for the State of Utah, duly commissioned and sworn as such, personally appeared John Bramall, known to me to be the Mayor of Hurricane City Corporation, and _____ _____known to me to be the City Recorder of Hurricane City Corporation, and acknowledged to me that he the said John Bramall and She the said _____executed the foregoing instrument as a free and voluntary act and deed of said corporation, for the uses and purposes therein, and on oath state that they were authorized to execute said instrument, and that the seal affixed is the corporate seal of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year hereinabove written.

_____

NOTARY PUBLIC

_____

By: _____

Titles: _____

Date: _____

STATE OF _____)
: Ss.
COUNTY OF _____)

On this ___ day of _____, 2022, _____ personally appeared before me _____, and duly acknowledged to me that he/she signed the above and foregoing document.

_____
NOTARY PUBLIC

Title 13 - FRANCHISES

CHAPTER 1. - VIDEO SERVICES FRANCHISE

Sec. 13-1-1. - Title.

This chapter shall be known as the Video Services Franchise Ordinance.

Sec. 13-1-2. - Definitions.

For purposes of this chapter, the following terms, phrases, words and their derivatives shall have the meanings set forth in this section, unless the context clearly indicates that another meaning is intended. Words used in the present tense include the future tense, words in the single number include the plural number, words in the plural number include the singular. The words "shall" and "will" are mandatory, and "may" is permissive. Words not defined shall have the same meanings as the terms used in title 7, chapters 8 and 11 of this Code, and if not defined there, their common and ordinary meaning.

Basic service means any service tier that includes the retransmission of local television broadcast signals.

Cable act means Title VI of the Communications Act of 1934, as amended, 47 USC section 151 et seq., and all other provisions of the Cable Communications Policy Act of 1984, codified at 47 USC section 521 et seq., and the Cable Television Consumer Protection and Competition Act of 1992 as codified at 47 USC section 543 et seq.

Cable service means:

A. The one-way transmission to subscribers of:
    1. Video programming; or
    2. Other programming service; and
B. Subscriber interaction, if any, which is required for the selection or use of such video programming or other programming service.

Franchise agreement means a contract entered into in accordance with the provisions of this chapter between the City and a franchisee that sets forth the terms and conditions under which a franchise to provide video services will be exercised.

Grantee means any person, firm or corporation granted a franchise by the City.

Gross revenues means:

A. All revenues derived by a grantee, or an affiliate of grantee in connection with its provision of video services in the City via a video service system including, but not limited to:
    1. Revenue from any video service which generates revenue of any type whatsoever and which is offered to the subscribers by means of a video services system, including, but not limited to, leased access fees and advertising revenues.
    2. Revenue from all charges for the installation, connection and reinstatement of equipment necessary for the utilization of the video services.
    3. Grantee's pro rata portion of any revenues derived from any other person or source and attributable to

grantee's provision of video services in the service area via a video services system, to which the City is authorized to apply a franchise fee under the cable act, state or local law as it may exist from time to time during the term of the franchise agreement.

B. For the purpose of calculating franchise fees, the following shall not be included in the definition of gross revenue:

1. State or local taxes, such as sales taxes, imposed upon an end user where the grantee acts as a collection agent for the state or local taxing authority.
2. Bad debt, to the extent it is not collected.
3. Affiliate revenues are not counted as gross revenues of the grantee where that would result in a double count of the same revenues for purpose of calculating the franchise fee owed.

Service area means the geographic area in which a grantee is authorized to provide video services.

Subscriber means any person or entity lawfully receiving video service from grantee or an affiliate of grantee.

Transfer means any transaction subject to review under section 13-1-17 of this chapter.

Video service system means a communications system that is designed to be used, or is used to provide video services.

Sec. 13-1-3. - Application for franchise agreement.

A. *Information required.* All initial franchise applications to construct, operate or maintain any communications system for the purpose of providing video services, or to provide video services via a communications system in this City shall be filed with the City Recorder-Clerk, and each such application shall set forth, contain or be accompanied by the following in addition to the information required by title 7, chapter 8 of this Code:

1. The name, address, and telephone number of the applicant.
2. A detailed statement of the corporate or other business entity organization of the applicant, including, but not limited to, the following:
   a. The names, residence addresses and business addresses of all officers, directors and partners or business associates of the applicant.
   b. The names, residence addresses and business addresses of all persons and entities having controlling, or being entitled to have or control five percent or more of the ownership of the applicant, and the respective ownership share of each such person or entity.
   c. The names and addresses of any parent of the applicant to the ultimate parent; and the names and addresses of each entity responsible in whole or in part for management or operation of the applicant or the video service system that will be used by applicant, along with a description of the nature of the responsibilities of such entity.
   d. A description of the previous experience of the applicant in providing video services and constructing systems used to provide video services; and an identification of all communities in the state where applicant, or any affiliate, provides video services.
   e. Information regarding the legal, financial, technical and character qualifications of the applicant.
   f. Whether grantee is filing the application as a cable operator of a cable system within the meaning of the cable act.
3. A detailed description of the proposed plan of operation of the applicant, which shall include, but not be

limited to, the following:

a. A map or maps of a scale not less than one inch equaling one hundred feet (1" = 100') showing the precise geographic area for which applicant seeks a franchise agreement.

b. Plans showing any existing location of the communications system that will be used to provide video services; and, unless the communications system is fully constructed except for drops to subscribers, a plan for system construction, containing at least the information required by subsection 13-1-6C of this chapter.

4. A copy of the form of any agreement, undertaking or other instrument proposed to be entered into between the applicant and any subscriber.

B. *Additional information.* The City may request such additional information as it deems necessary to determine whether or not the application should be granted. The failure to file a complete application, or to provide additional information requests, is grounds for rejecting an application.

C. *Time for review.* An initial application for a franchise shall be reviewed promptly by the City. The City may grant or deny the application, or grant it subject to conditions. To the extent that the federal communications commission requires the City to take a final action on a completed application by a date certain, a completed application for a franchise shall be deemed denied by final action of the City if the City has not adopted an ordinance granting a franchise to the applicant prior to the deadline, unless the applicable deadline has been lawfully extended.

D. *Time for denial.* Unless the FCC alters the deadlines, the date on which the application shall be deemed denied for purposes of subsection C of this section shall be:

1. Ninety days after the filing of a completed application by an entity for an initial cable franchise that already has a communications system in the rights of way;

2. One hundred eighty days after the filing of a completed application by any other entity.

3. Provided that, where an application is submitted in connection with a transfer, the deadlines in section 13-1-17 of this chapter shall apply.

E. *Renewals.* Franchise renewals shall be according to applicable state and federal law. The City and grantee by mutual consent, may enter into renewal negotiations at any time during the term of the franchise.

Sec. 13-1-4. - Grant and acceptance of franchise.

A. *Acceptance required.* No franchise agreement shall become effective for any purpose unless and until an ordinance is passed by the City approving the franchise agreement. No franchise shall be effective until accepted unconditionally by the grantee. Grantee shall be deemed to have unconditionally accepted a franchise by signing a franchise agreement countersigned by the City.

B. *Subject to general ordinance provisions.* Any franchise agreement granted is hereby made subject to the general ordinance provisions of this chapter and title 7, chapters 4 and 8 of this Code.

C. *Right of police power.* Grantee's rights are subject to the police powers of the City to adopt and enforce ordinances necessary to the health, safety and welfare of the public. Grantee shall comply with all laws and ordinances enacted by the City pursuant to that power. No franchise shall be interpreted in a manner that limits a grantee's obligations under this section.

Sec. 13-1-5. - Additional conditions of street occupancy.

A. *City use of pole and conduits in rights-of-way.* Subject to any applicable state or federal regulations or tariffs, the Cit after giving written notice, have the right, without cost, to make use of any poles or conduits controlled or maintain for use of the grantee, that are located in any public way. Such use by the City shall not interfere with current or fut by the grantee.

B. *Use by others of poles.* In cases where access to a grantee's poles are not regulated by the Public Service Commission or by the Federal Communications Commission:

1. If another public utility is denied the privilege of utilizing poles or wire holding structures constructed and installed by the grantee within streets; and
2. The City finds that such use would enhance the public convenience and would not unduly interfere with the grantee's operations.

The City may require the parties to enter into a mutually agreeable joint pole use agreement with respect to the then unused capacity until such time as the poles and wire holding structures are needed by the owner thereof, so as to avoid proliferation of poles and wire holding structures, and may set the terms and conditions for access if the parties cannot agree, in a manner consistent with the manner in which rates are set for poles under 47 USC section 224, or under state law.

Sec. 13-1-6. - Extension of service; duty to serve.

A. *Minimum service area.* Except as provided in this section, the City shall not approve any franchise that provides for a service area smaller than the City, as it existed as of the effective date of the franchise. The City may grant a franchise that permits a grantee to serve areas annexed after the effective date of the franchise. The foregoing does not apply:

1. To an open video system;
2. To a video service provider offering services via an infrastructure system, where infrastructure provider agrees to terms and conditions for system build out, or agrees to make payments to support build out of systems used by others to provide video services, that the City accepts in satisfaction of obligations of video service providers who use such infrastructure system; or
3. Where an applicant shows that the service area is economically infeasible; that granting a franchise for a smaller area will not adversely affect the development of competition throughout the City; and that the proposed service area is such that granting a franchise for that area will not unfairly disadvantage any franchised video service provider.

B. *Time to provide service.* A video service provider must complete construction of its system within a reasonable time, so that it passes by all dwelling units within its service area, which time shall be specified in the franchise and subject to the density requirements in subsection D of this section.

C. *Sequence of construction.* As a condition of receiving a franchise, each video service provider must submit a plan for the sequence of construction that ensures it does not discriminate against residents of the City based on income. The plan must show the timing of construction by geographic area and the schedule for completion of construction by geographic area. A schedule for completion of construction may be tied to the success of the applicant in the marketplace. In determining whether the plan is acceptable, the City may take into account:

1. The amount of time required to build out the video service system first franchised to serve the City; and
2. The amount of construction required to serve the service area; and

3. The time required to provide the applicant reasonable opportunities to recover its investment.

D. *Density requirements.* A grantee may, but is not required to serve any portion of its service area where the density is less than five dwelling units per linear quarter mile unless the potential subscriber agrees to pay extension charges as provided in this section. In extending service, the following requirements shall be met:

1. In any portion of the service area where the density is five dwelling units or more per linear quarter mile, a grantee shall provide video service to any person that requests it at its normal connection fee; provided, that grantee is able to reasonably obtain all easements or permissions, if any, which are necessary to extend service relating thereto. Provided that, where the distance from the curb to the demarcation point on the potential subscriber's premises is greater than 150 feet, a grantee may charge an additional fee to recover the costs of extending the system the additional distance.
2. In areas with less than five residential units per linear quarter mile, a grantee shall offer a cost sharing arrangement with residents desiring video service wherein each will bear their proportionate share of construction costs. For example, if there are four dwelling units per linear quarter mile grantee must extend service if the potential subscribers are willing to pay one-fifth of the cost of extending the system to pass by the dwelling units, and the grantee must bear four-fifths of the construction cost. Should additional residents actually subscribe to video service in areas where subscribers have already paid a proportionate share under the extension cost sharing formula, subscribers who have previously paid a proportionate share shall be reimbursed pro rata for their contribution or proportional share thereof. In such case, the pro rata shares shall be recalculated and each new subscriber shall pay the new pro rata share, and all subscribers who previously paid a proportionate share shall receive pro rata refunds. However, one year after completion of a project, subscribers who have paid a share of line extension costs shall no longer be eligible for refunds, and the amounts paid in construction costs thereafter shall be credited to the plant account of grantee.
3. The subscriber who must pay additional amounts for extended connections or for distribution cable construction, as provided in subsection D2 of this section, shall be given a written estimate of the additional amount payable by them prior to their subscription, and they shall in no event be required to pay more than five percent over this estimate.

Sec. 13-1-7. - Community access services.

A. *Requirement to provide access channels.*

1. For any franchise effective after the effective date hereof, each grantee shall at a minimum provide the greater of:
   a. Two activated channels for public, educational, or government use; or
   b. The greatest number of channels being provided under any video service franchise for the City.
2. For any franchise effective after the effective date hereof, the City may require activated additional channels for public, educational or government use as necessary to satisfy the needs and interests of the community as determined at the time an applicant seeks a renewal, extension or initial issuance of a franchise. Each franchise shall require the grantee to provide additional channels based on usage.
3. For any franchise granted prior to the effective date hereof, a grantee shall provide access channels and support for access channels as required by its franchise, and by this section as the same was in effect on January 1, 2009, until it ceases to operate under the terms and conditions of that franchise.
4. The City may designate itself or another entity to manage the channels, and may designate the purposes for

which the channels may be used, consistent with applicable law.

5. The City may establish rules and procedures for the use of the channels, or authorize its designee to establish rules and procedures for the use of the channels.

B. *Channel assignments.* Access channel assignments shall be made by a grantee in consultation with the City and shall be uniform on that grantee's system throughout the City. Unless it is technically infeasible to do so, a grantee shall place PEG channels at the same channel locations as are being used by a video service system in the City designated by the City. Each grantee's system shall, insofar as technically and economically feasible, be compatible with and able to tie into all other franchised video service systems providing video services within and adjacent to the City so as to enable each system to carry and cablecast the public, educational and governmental access programming of the other systems. The City may require a grantee to interconnect its system with other franchised video service providers.

C. *Minimum requirements for channels.* Access channels shall be carried on the basic service tier, and shall be available to every subscriber without any additional charges for equipment beyond the charges for equipment the subscriber pays to receive the commercial services to which the subscriber subscribes. Access channels shall be of the same quality, have the same features and functionality as the primary broadcast signals carried by the grantee. The channels shall be selectable from the same menus used to access other commercial programming, shall be as prominently featured as other channels, and if the information is provided to grantee, shall contain the same type of information as is carried with respect to commercial programming. Each grantee must pass through the full PEG signal to subscribers, including information equivalent to that carried in the vertical blanking interval.

D. *Extension of system.* Each grantee is responsible for extending its system to points from which it can pick up the access channels at no cost to the City or to the persons programming the channels, which extension may be direct, through an interconnection or by other reasonable technical means.

Sec. 13-1-8. - Rates.

A. The City expressly reserves the right to regulate the rates which a grantee charges its subscribers for basic service and for such other services and equipment as the City is now, or may hereafter be, permitted to regulate consistent with applicable law. A grantee shall not deny, delay, interrupt or terminate cable service or the use of cable television system facilities to subscribers because of an action by the City related to its regulation of the rates; provided, however, that nothing herein shall be construed to limit a grantee's right to seek judicial review of such action. The City may from time to time adopt rules and procedures for the regulation of rates.

B. Each video service provider shall provide notice of rate changes to the City and to subscribers as if it were a cable operator subject to the notice rules established by the Federal Communications Commission.

Sec. 13-1-9. - Customer service standards.

A. *Minimum standards.* Each grantee under this chapter shall satisfy the customer service standards established by the FCC pursuant to 47 USC section 552 as if it were a cable operator, and such additional or stricter customer service or consumer protection requirements as are included in this Code, or as the City may adopt from time to time by resolution, or as may apply under applicable law.

B. *Waiver of standards.* Customer service standards and reporting requirements may be waived by the City Manager where:

1. A grantee shows the standard as applied to it is too burdensome; and
2. The grantee proposes an alternative standard that the City Manager determines will reasonably protect subscribers in light of the customer service record of the grantee requesting the waiver.
3. The waiver shall expire in 90 days unless a longer period is approved by the City Council. The City Council may revoke a waiver at any time, upon 60 days' notice.

C. *Opportunity for comment.* After the effective date hereof, before adopting any additional video service specific customer service standards, the City shall provide grantees an opportunity to comment on the proposed standards before they are adopted.

D. *Billing practices.*

1. *Failure to pay.* The due date for a bill may be no earlier than 15 days after a bill is mailed. No penalty or late fee may be assessed until five days after the due date. A payment is made as of the earlier of the date it is received, or the date a payment by mail is postmarked.
2. *Return of deposits.* If the grantee collects a deposit or advance charge on any service or equipment requested by a subscriber, the grantee shall provide such service or equipment within 30 days of the collection of the deposit or charge or it shall refund such deposit or charge by mail postmarked within seven working days thereafter. Nothing in this section shall be construed to limit the grantee's liability for damages because of its failure to provide the service for which the deposit or charge was made.
3. *Pro rata refunds.* In the event that a subscriber terminates service prior to the end of a prepaid period, the pro rata portion of any prepaid subscriber fee which represents payment for services which are no longer to be rendered shall be refunded promptly, but in no case more than 30 days after receipt of the request of termination.
4. *Security deposits.* Security deposits may not be levied on a discriminatory basis. A grantee shall not charge an equipment security deposit greater than the equipment's actual cost to the grantee. Any equipment security deposit collected by the grantee shall be returned to the subscriber no later than the earlier of:
    a. Twelve months after its collection, if the deposit was collected from a person that is still a subscriber; or
    b. Within 30 days of return of such equipment undamaged, with allowance for reasonable wear and tear, and payment of any outstanding balance due and payable for lease of the equipment.

E. *Time for installation completion.*

1. Subject to subsection E2 of this section, standard subscriber installations shall be completed within seven business days (unless the subscriber requests a later date). A standard installation is an installation where distance from the curb to the demarcation point on the potential subscriber's premises is 150 feet or less. During normal operating conditions, this standard will be met 95 percent of the time, measured on a quarterly basis.
2. Upgrades or reconnections of service by a grantee shall be performed and completed within seven working days of a subscriber requesting such upgrade or reconnection. During normal operating conditions, this standard will be met 95 percent of the time, measured on a quarterly basis.
3. For nonstandard installations, or where a system extension is required, work must be completed promptly, and no later than 60 days after the extension request, unless the City grants an extension of the time. The City shall not unreasonably deny a request for an extension where proper engineering, planning and construction require more time.

F. *Missing appointments.* If the grantee fails to meet an appointment, the grantee shall in the case of an installation, reconnection or upgrade, at a minimum, waive all charges for installation, reconnection or upgrade applicable to th customer whose appointment was missed. If the grantee fails to meet a service or repair appointment, the grantee a minimum, waive all repair charges, if any are applicable to the customer whose appointment was missed, and cre account of the customer whose appointment was missed an amount of no less than $20.00, in addition to automati providing credits for the period during which service was lost.

G. *Credit for outage, interruption.* A grantee shall provide a subscriber with credit for a signal or service interruption exceeding four hours in duration. The credits provided herein need be given only upon request made by a subscriber. The request may be made at the time a subscriber calls to report a signal or service interruption, whether or not the four hours has elapsed at the time the call is made; and may be requested up to 60 days after the signal or service interruption occurs. A "signal or service interruption" refers to the loss of sound or picture on any channel, or the significant deterioration of the same on any channel.

H. *Records maintained.* Grantee shall maintain a record or "log" of signal or service interruptions; and customer complaints describing the date and nature of the interruption or complaint, and the date and nature of the action taken by grantee. These records shall be kept at grantee's local office for a period of three years. Each grantee shall collect information, and shall maintain records to show its performance with respect to all applicable customer service standards.

Sec. 13-1-10. - Disconnections; voluntary and involuntary.

A. *Involuntary disconnection.* Before an involuntary disconnection of a subscriber's service takes place, the following must occur:

1. The subscriber shall in fact be delinquent in payment at least 45 days after the posting of the bill before notice of disconnection may be given;
2. Notice shall be by separate written advice of impending disconnection that may be mailed or personally served upon the subscriber before disconnection;
3. If notice is given by personal service, at least five days must elapse before disconnection after the subscriber has either signed for or refused to accept personally served written notice of impending disconnection;
4. If notice is given by mail, at least ten days shall be elapsed after the date of mailing such notice before disconnection.

B. *Notice of disconnection.* The written notice of disconnection must expressly and clearly state the amount that is owed by the subscriber to the grantee, the minimum amount required to be paid to avoid disconnection, and the date and place where such payment must be made. Disconnection of service and retrieval of equipment must occur both on a normal service day and within normal business hours of grantee. Receipt of a "bad check" from a subscriber, in response to a written notice of disconnection, does not constitute payment, and the affected grantee need not give the subscriber further notice prior to disconnection of service. A grantee may add a reasonable collection charge to a subscriber's bill.

Sec. 13-1-11. - Resolution of complaints.

A. Each grantee shall maintain a comprehensive complaint resolution policy that is in writing, and such policy shall be provided to persons at the time of initial subscription and whenever amended; it shall be available, upon request, to any person.

B. A grantee may not disconnect a subscriber if the subscriber files a complaint with a grantee prior to the scheduled d disconnection, disputing charges owed, until the complaint is addressed in writing by the grantee.

C. The City may adopt procedures for complaint resolution if it determines that the grantee's complaint resolution process is unfair to subscribers, or if a grantee fails to comply with its obligations under this section.

Sec. 13-1-12. - Books and records.

A. *Right to access.* The City shall have the right to review and make copies of books and records relevant to its enforcement of a franchise agreement and applicable law. Books and records shall be produced at a convenient location in the City, or if books and records cannot be produced there, at a mutually agreeable location. To the extent the Utah Government Records and Management Act, Utah Code Annotated title 63G, chapter 2 (the "act"), and other applicable law permits, the City may agree in a franchise agreement that information contained within the books and records of grantee provided to the City shall be kept confidential by the City, and may agree to provide grantee reasonable notice of any request received by the City for disclosure of any books and records requested by grantee to remain confidential, so that the grantee may take appropriate action to protect confidential information from disclosure.

B. *Prompt response required.* Grantee shall promptly respond to requests for information from the City related to a franchise agreement or grantee's compliance with applicable law. Provided that, nothing herein shall require a grantee to disclose personally identifiable information it is prohibited from disclosing under privacy laws; and provided that, a grantee shall redact any such information if it is contained in information requested by the City.

C. *Audit.* In addition to its rights under subsection A of this section, for the purpose of verifying the correct amount of the franchise fee, the books and records of the provider pertaining thereto shall be open to inspection or audit by duly authorized representatives of the City at all reasonable times, upon giving reasonable notice of the intention to inspect or audit the books and records; provided, that the City shall not audit the books and records of the provider more often than annually. The provider shall agree to reimburse the City the reasonable costs of an audit if the audit discloses that the provider has paid 95 percent or less of the compensation due the City for the period of such audit. In the event the accounting rendered to the city by the provider herein is found to be incorrect, then payment shall be made on the corrected amount within 30 calendar days of written notice, it being agreed that the City may accept any amount offered by the provider, but the acceptance thereof by the City shall not be deemed a settlement of such item if the amount is in dispute or is later found to be incorrect.

Sec. 13-1-13. - Reporting requirements.

A. Each grantee shall prepare reports as the City may reasonably request to monitor compliance with the terms hereof and of the grantee's franchise.

B. By January 31 of each year, each grantee shall provide the City with a detailed statement of revenues derived in connection with the provision of video services in the City, sworn as accurate by an officer of the grantee, which statement shall identify:

1. The number of subscribers, by category of service;
2. Service revenues, by category of service;
3. Equipment revenues, by category of equipment;
4. Other revenues, identifying the source of the revenues;
5. The amount of any deduction from gross revenues, identifying the reason for the deduction, and the manner

in which it was calculated;

6. If revenues are allocated among the City and other entities (as may be the case with regional advertising revenues), the total revenues, and the manner in which the revenues were allocated.

C. The report shall be in a form the City prescribes, or if there is no form, in a form consistent with the manner in which grantee maintains its books and records.

Sec. 13-1-14. - Fines and penalties.

Subject to the provisions of section 7-8-8 of this Code, the City may impose a civil penalty on a grantee not to exceed the following amounts per day, or any part thereof, for the occurrence or continuation of any of the following violations:

A. $200.00 for any failure to complete system construction in accordance with a grantee's construction obligations contained in this chapter or grantee's franchise agreement.

B. $100.00 for any failure to provide data, documents, reports or information to the City.

C. $75.00 for any failure to comply with any of the provisions of this chapter for which penalty is not otherwise specifically provided, including customer service violations.

Each day that any of the above violations shall continue shall be considered a separate violation for which said penalties can be assessed.

Sec. 13-1-15. - Franchise fee.

A. *Specified; terms of payment.* Each grantee shall pay a franchise fee in connection with provision of video services in an amount equal to five percent per year of the grantee's annual gross revenue. Said fees shall be paid quarterly, not later than 60 days after the end of the preceding three-month period ending, respectively, June 30, September 30, December 31 and March 31. Not later than the date of each payment, each grantee shall file with the City a written statement signed under penalty of perjury by an officer of the grantee during a quarter for which payment is made. Acceptance of payment shall not be construed as an accord that the amount paid is correct nor shall it be construed to release any claim which the City may have for any further sums payable under this section. Any franchise fees which remain unpaid after the dates specified herein shall be delinquent and shall thereafter accrue interest at the maximum legal rate until paid.

B. *Increase.* If the FCC, congress or other governmental entity with authority over video service providers allow a franchising authority to increase the franchise fee beyond five percent, then the City may increase the franchise fee paid by grantees holding franchises to the maximum permitted amount, but no more than six percent of gross revenues prior to the scheduled expiration date of the franchise, or the date the franchise terminates, whichever is earlier; and the City may require any grantee issued a new or renewed franchise after such change to pay the maximum amount permitted by law as a condition of the grant of the franchise. Payment of a franchise fee pursuant to the provisions of this chapter shall be considered to be an addition to, and exclusive of, any and all authorized taxes, business license fees or other fees and assessments presently in effect or adopted subsequent hereto.

Sec. 13-1-16. - Term of franchise.

A franchise granted hereunder shall be for a term established in the franchise agreement. In no event shall any franchise term exceed 15 years.

Sec. 13-1-17. - Transfers.

A. *Consent of City required.* Unless specifically provided in the franchise agreement, a franchise or video service system shall not be sold, assigned, leased, subleased, mortgaged, transferred or conveyed in any manner whatsoever, either in whole or in part, voluntarily or involuntarily, nor shall any right, title or interest therein, either legal or equitable, pass to or vest in any person or entity other than the person or entity named as the grantee in the franchise agreement without the prior written consent of the City, obtained in accordance with the provisions of this section. Any attempt by the grantee to sell, assign, transfer or convey any interest in the franchise without obtaining the prior written consent of the City shall constitute a default in the franchise agreement.

B. *Changes of control included.* A "sale," "transfer" or "conveyance" of the franchise shall include any acquisition of the controlling interest of grantee, whether through purchase of stock, merger, consolidation or any other change of control. Without limiting the foregoing, a rebuttable presumption that a transfer of control has occurred shall arise upon the acquisition or accumulation by any person or group of persons of 20 percent of the voting interest or management control of the grantee.

C. *Considerations of City.* At least 120 days before a proposed sale, assignment, transfer or conveyance of a grantee's franchise is scheduled to become effective, such grantee shall petition in writing for the City's written consent to the proposed sale, assignment, transfer or conveyance. The City will not unreasonably withhold its consent, but without limitation, it may consider the technical ability, financial capability, legal qualifications and general character qualifications of the purchaser, assignee or transferee, including its experience and service record in other communities. A request for consent to the sale, assignment or transfer hereunder shall be made to the City in writing and the grantee and the proposed purchaser, assignee or transferee must cooperate with the City in its investigation of the transfer. A request for consent may be denied if the grantee or proposed purchaser, assignee or transferee fail to timely provide the City information the City requests in connection with its review of the transfer.

D. *Approval without response.* The City shall be deemed to have approved a proposed sale, transfer or assignment in the event that its response is not communicated in writing to the grantee within 120 days following receipt of the petition for consent to the proposed sale, transfer or assignment, unless the City and grantee agree to an extension of this period, subject to the following conditions:

1. Transferee shall assume all obligations and liability of the former grantee, known and unknown.
2. An approval without response is not a representation, express or implied, that the grantee is in compliance with the franchise.
3. A sale, assignment or transfer shall not relieve the former grantee of its liabilities under this chapter until the sale, assignment or transfer actually takes place unless otherwise specifically relieved by the City.

E. *Assignment for creditors.* Notwithstanding any other provision of this chapter or a franchise agreement:

1. A video services franchise shall automatically terminate by force of law 120 calendar days after an assignment for the benefit of creditors or the appointment of a receiver or trustee to take over the business of the grantee, whether in a receivership, reorganization, bankruptcy assignment for the benefit of creditors, or other action or proceeding.
2. However, the franchise may be reinstated if, within the 120-day period:
   a. The assignment, receivership or trusteeship is vacated; or
   b. The assignee, receiver, or trustee has fully complied with the terms and conditions of this chapter and the

video services franchise and has executed an agreement, approved by a court having jurisdiction, assuming and agreeing to be bound by the terms and conditions of the video services franchise and this chapter.

F. *Foreclosure or judicial sale.* Notwithstanding any other provision of this chapter:

1. In the event of foreclosure or other judicial sale of any of the grantee's video system or associated property, the City may revoke the video services franchise at a public hearing before the City Council, by serving notice upon the grantee and the successful bidder at the sale.
2. The video services franchise shall terminate 30 calendar days after serving such notice, unless:
   a. The City approves the transfer of the video services franchise to the successful bidder; and
   b. The successful bidder agrees with the City to assume and be bound by the terms and conditions of the video services franchise and applicable law.

G. *Transfer limitation.* The provisions of this section are not in lieu of transfer approvals that may be required, including approvals required under title 7, chapters 10 and 11 of this Code.

Sec. 13-1-18. - Continuity upon termination or transfer.

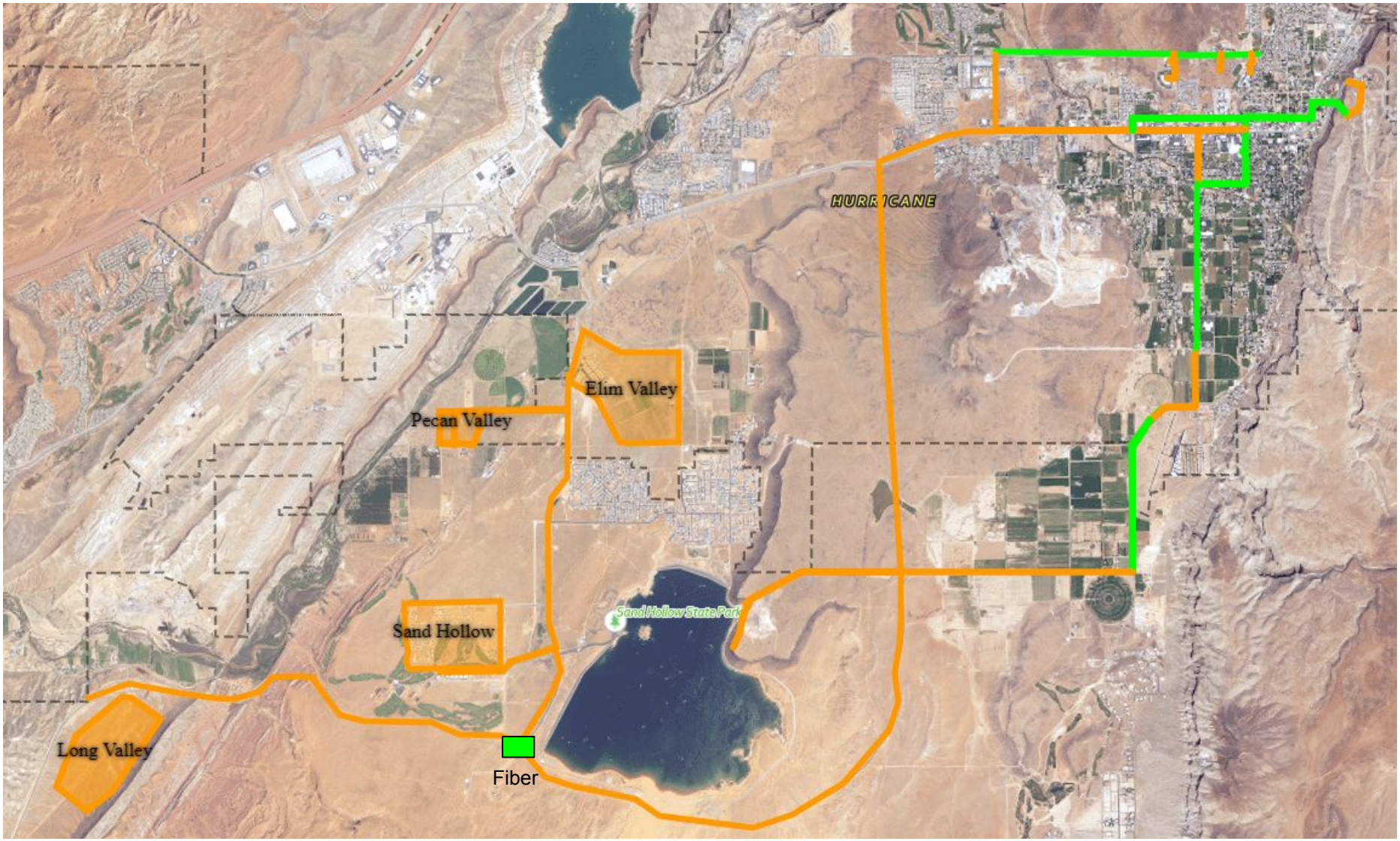
In the event of a termination, revocation, or transfer of grantee's franchise for whatever reason, grantee shall ensure that all subscribers receive continuous, uninterrupted service regardless of the circumstances. At the City's request, grantee shall cooperate with the City to operate grantee's video service system for a temporary period following termination or transfer of the franchise as necessary to maintain and to ensure an orderly transition from one operator to another to avoid disruption of public streets and public property, and to ensure continuity of service to subscribers. During such period, the video service system shall be operated as if the terms and conditions of this chapter and franchise agreement continue to apply.

Sec. 13-1-19. - Application to persons holding franchise.

The revisions to this chapter adopted by the ordinance codified herein do not relieve a cable services franchisee of any obligations that were included in its franchise by reference. To the extent that the revisions establish additional obligations for such franchisee, they shall be enforceable against it to the maximum extent permitted by law.

Sec. 13-1-20. - Relation to infrastructure provider franchise.

In lieu of requiring a video services franchise for a video services provider offering services via an infrastructure system the City may choose to enter into agreements with the infrastructure provider and the video service provider with respect to the provision of video services, so long as the benefits that could be obtained through a franchise are obtained and enforceable through those agreements.


HURRICANE
Elim Valley
Pecan Valley
Sand Hollow State Park
Sand Hollow
Long Valley
Fiber

InfoWest, Inc.

– Sec. 13-1-3 Application for Franchise Agreement

A.

1. InfoWest, Inc – 435 E Tabernacle, St. George, Utah 84770

2. Business Entity

a. List of Shareholders – InfoWest

InfoWest List of Shareholders

Shareholders	Address	Phone
Kelly Nyberg	207 Shadow Point Drive St. George, Utah 84770	435-229-2713 – Cell
Randy Cosby	290 S Marble Canyon Cir Cedar City, Utah 84720	435-862-4562 – Cell
Aaron Gifford	293 N. 2790 E. St. George, Utah 84790	435-229-2745 – Cell 435-215-1000 – Home
Eric Pedersen	646 E. 1100 S. St. George, Utah 84790	435-229-5444 – Cell
Gary Koeven	163 N. Main Washington, Utah 84780	435-680-7240 – Cell 435-628-7240 - Home
Cassidy Larson	947 S. White Sands Dr. Washington, Utah 84780	435-229-2717 – Cell
Mark Shumate	657 S Main Street Ivins, Utah 84738	435-229-2722 – Cell
Jackie Dearden	1164 Wesley Powell Dr. St. George, Utah 84790	435-313-2154 – Cell
Pete Larsen	586 W 300 S PO Box 480 Fountain Green, Utah 84632	435-590-6763 – Cell
Ryon Bowler	776 Diagonal #20 St. George, Utah 84770	435-862-1331 – Cell
Adam Hardy	3710 Skyline PO Box 113 Logandale, Nevada 89021	702-496-7736 – Cell
Jeff Knight	177 N. Roundabout Way Cedar City, Utah 84720	435-531-9533 - Cell

b. Refer to 2(a). as this is a complete list of all InfoWest Shareholders.

c. N/A

d. N/A – InfoWest is not a video provider.

e. InfoWest has been in the ISP business for 28 years. InfoWest was the very first Internet Provider in Southern Utah and has extensive knowledge of providing Internet Service. InfoWest is also a medium to large company with nearly 100 employees and over 20,000 customers on it's network. InfoWest has the expertise to provide state-of-the-art telecommunication services to the Hurricane Valley.

f. InfoWest/Grantee is NOT filing as a cable operator.

3. InfoWest currently has an extensive wireless network which covers 100% of the Hurricane Valley with thousands of customers located in the valley and in other parts of Southern Utah. InfoWest is currently expanding it's fiber infrastructure which currently runs past the Sand Hollow reservoir on SR7 connecting into SR9. InfoWest would like to extend it's fiber network down into the heart of Hurricane city and build a ring to create redundancy. The obvious benefits for the expansion of InfoWest's fiber network into Hurricane city are increased competition, better rates and faster speeds for the residents and businesses of Hurricane City. InfoWest is looking to invest millions of dollars into areas of Southern Utah and has targeted the Hurricane Valley as one of those areas.

HURRICANE CITY
UTAH

STAFF COMMENTS

Consideration and possible approval of a **reduction in park and road impact fees for an apartment complex located at approximately 6129 W 100 South** H-4-2-4-3211 - Kyle Arbizu

Discussion:
The applicant is requesting that the City adjust their impact fees for an 18 unit apartment complex. An impact fee is a fee charged with a building permit that is used to build master plan infrastructure. An impact fee is justified within Utah law as a tool to have developers contribute to their impact within the City. The City uses these fees to help build new roads, parks, water line, wells, and other needed improvements required by growth. The City must go through a rigorous process set by state law to adopt impact fees, including an impact fee analysis study and public hearings. Hurricane City has followed those steps and has adopted several impact fees that gets charge for every building permit for each new unit built within Hurricane City.

Hurricane City Code list standards that an applicant needs to meet in order for the City Council to approved adjusted impact fees:

Sec. 9-2-5. - Adjustments. (Impact Fee)
A.Request. In order to ensure that impact fees are imposed fairly, and in order to respond to unusual circumstances in specific cases, the City may adjust the standard impact fee at the time the fee is charged. Such adjustment shall be made only upon specific written request to the City by persons subject to payment of such fees and after consideration of the matter by the City at a regular meeting of the City Council.

B.Submission of application; decision. The City may adjust the amount of impact fees to be paid on any specific development based upon studies and data submitted by the developer evidencing that the impact fee imposed is unfair or not reasonably related to the impacts caused by such new development. The application to adjust fees, together with any supporting data and studies, shall be submitted to the City staff for review and recommendation to the City Council. Within 30 days, the City Council shall consider all pertinent information and make any adjustments deemed appropriate at a regular meeting of the City Council.

At the time of this report, staff has not done a full review of the request and does not have a recommendation at this time. Staff generally recommends that any application to adjust impact fees is held to the highest standard allowed by City code to ensure fairness with all those who develop within Hurricane City.

Findings:

The application is currently under review.

Recommendation:
Staff is reviewing the application and does not have a recommendation at this time.

Attachments:
1. impactfees
2. impact-fee-handbook
3. Huricane City Council Agenda
4. Shadow Brook Apartments Estimate-200 amp
5. Shadow Ridge Apartments
6. Anderson Apartments 3-5-2020 Arch Set
7. CURTIS ANDERSON-HURRICANCE APARTMENTS-C6.0 LANDSCAPING
8. Impact fee reduction
9. Impact Fees - Fays Summary

Impact Fees & Housing Affordability

A Guide for Practitioners







U.S. Department of Housing and Urban Development
Office of Policy Development and Research

Visit PD&R's Web Site

www.huduser.org

to find this report and others sponsored by HUD's Office of Policy Development and Research (PD&R).
Other services of HUD User, PD&R's Research Information Service, include listservs; special interest reports, bimonthly publications (best practices, significant studies from other sources); and access to public use databases.
Call the HUD User hotline at 1-800-245-2691, option 1, for help accessing the information you need.

IMPACT FEES AND HOUSING AFFORDABILITY

A Guidebook for Practitioners

Prepared for:
U.S. Department of Housing and Urban Development
Washington, DC

Prepared by:

Newport Partners, LLC
Davidsonville, MD
and
Virginia Polytechnic Institute and State University
Alexandria, VA

June 2008

About the Guidebook

This Guidebook was prepared by Liza K. Bowles of Newport Partners, LLC and Arthur C. Nelson of Virginia Polytechnic Institute and State University under contract to the Department of Housing and Urban Development. It draws heavily on various research papers prepared under subcontract to Newport Partners. These papers and their authors are listed here:

- *The Past, Present and Future of Impact Fees*, August 2005, prepared by James C. Nicholas, University of Florida;

- *State Impact Fee Enabling Acts and Housing Affordability*, February 2005, prepared by Arthur C. Nelson, Ph.D., Professor and Director of Graduate Studies in Urban Affairs and Planning, Virginia Polytechnic Institute and State University, and Clancy Mullen, Duncan Associates;

- *Proportionate Share Impact Fees and Housing Affordability,* January 2006, prepared by Arthur C. Nelson, Ph.D., Professor and Director of Graduate Studies in Urban Affairs and Planning, Virginia Polytechnic Institute and State University; and Liza K. Bowles and David J. Dacquisto, Newport Partners; and,

- *Infrastructure Financing Techniques: Impact Fees and Alternatives*, June 2005, prepared by Arthur C. Nelson, Ph.D., Professor and Director of Graduate Studies in Urban Affairs and Planning, Virginia Polytechnic Institute and State University.

- The case study material was developed by Bowles and Dacquisto of Newport Partners in conjunction with Nicholas, Nelson, Mullen and Juergensmeyer.

Full copies of the briefing papers as well as additional resource material prepared under this project are available at HUD's Regulatory Barriers Clearinghouse http://www.huduser.org/rbc/.

Acknowledgements

In addition to the authors listed here, we would like to acknowledge the help of Lorie Ebersberger for cover design, Kermit Baker for thoughtful review and input, Matthew Hawkins for preparation for publication and Ed Stromberg of HUD for his timely and constructive review and support throughout the project.

We would also like to thank the following impact fee experts for serving as a review group on the Guidebook and offering additional insights and information:

L. Carson Bise II, AICP
Vice President
TischlerBise
4701 Sangamore Road S240
Bethesda, MD 20816

Ray Burby
University of North Carolina
New East Building
Campus Box-3140
Chapel Hill, NC 27599-3140

Ken Szymanski, AICP
Executive Director
Charlotte Apartment Association &
Apartment Association of North Carolina
2101 Rexford #330E
Charlotte, NC 28211-3499

Robert P. Wallace, P.E., AICP
Vice President
Tindale-Oliver & Associates, Inc.
3660 Maguire Blvd. Suite 103
Orlando, FL 32803

Mark White
White & Smith, LLC
Planning and Law Group
1125 Grand Blvd. Suite 1500
Kansas City, MO 64106

Finally, we acknowledge the constructive review by David Crowe (who also provided data on the relationship between house size and occupants per unit by unit type) and Paul Emrath, both of the National Association of Home Builders.

NOTICE

This report was prepared as an account of work sponsored by the U.S. Department of Housing and Urban Development. Views and opinions expressed herein are the responsibility of the authors. References herein to any product, process or system do not constitute an endorsement, but are included solely because they are considered essential to the object of the report.

TABLE OF CONTENTS

Executive Summary i

Introduction 1

Chapter 1 - Impact Fees - Past, Present and Future 7

The Need for Infrastructure Financing Tools 7
The Proliferation of Impact Fees 12
General Trends in Impact Fees 14

Chapter 2 - Capital Facility and Infrastructure Financing Options 17

Principles of Efficient Facility Pricing 17
General Financing Options 20
Principal Revenue Methods 22
Policy-Making Criteria 28
Alternative Funding Decision Charts 32
Decision Chart 2.1 Public Safety Facilities 33
Decision Chart 2.2 Water-Based Utilities 34
Decision Chart 2.3 Public Amenity Facilities 35
Decision Chart 2.4 Transportation 36

Chapter 3 - The Role of the State 37

Review of State Enabling Acts 37
Impact Fee Statutes and Affordable Housing 40

Chapter 4 - Impact Fees and Housing Affordability 43

Review of Impact Fee Cost Variables 43
Description of Square Footage Valuations Using Impact Fees 48
Elements of Program Design 54
Decision Chart 4.1 Designing a Level of Service (LOS) Area 62
Decision Chart 4.2 Designing for Affordable Housing 63
Decision Chart 4.3 Including Situation Specific Reductions 64
Decision Chart 4.4 Assessing Appropriate Revenue Credits 65
Specific Housing Affordability Measures as Part of Impact Fee Policy 66
Decision Chart 4.5 Affordable Housing 70

Chapter 5 - Case Studies 71

Atlanta, Georgia 71
Albuquerque, New Mexico 78
Alachua County, Florida 87

Chapter 6 - Summary and Conclusions 93

APPENDICES 95

Appendix A. The Relationship between Impact Fees, Planning and Exactions 95
Appendix B. Special Assessment Districts 99
Appendix C. Land Purchase Option Contract Language Accounting for Impact Fees at the Purchase of Land 101
Appendix D. Proportionate Share Impact Fees and Housing Affordability 103

LIST OF TABLES

Page

TABLE 1-1. METROPOLITAN POPULATION, CITIES & POPULATION PER CITY 1980 - 2000 7
TABLE 1-2. AVERAGE IMPACT FEES BY TYPE 12
TABLE 1-3. AVERAGE TOTAL NON-UTILITY IMPACT FEE SINGLE FAMILY HOME 12
TABLE 1-4. CONSTANT SAMPLE IMPACT FEE 13
TABLE 1-5. PALM BEACH COUNTY SCHOOL IMPACT FEE 16
TABLE 1-6. CANTON PARK IMPACT FEES 16
TABLE 2-1. ANNUAL CAPITAL FACILITY AND SERVICE DELIVERY COSTS 1,000 HOUSING UNITS CONSTRUCTED AT DIFFERENT DENSITIES, LOUDOUN COUNTY, VIRGINIA 18
TABLE 2-2. ECONOMIC CHARACTERISTICS AND PREFERRED FUNDING FOR SELECTED MAJOR FACILITIES 21
TABLE 2-3. GOVERNMENT UNITS: 1972 - 2002 25
TABLE 2-4. SUMMARIZING THE POLICY-MAKING ISSUES OF ALTERNATIVE FINANCING MECHANISMS 31
TABLE 3-1. FACILITIES ELIGIBLE FOR IMPACT FEE ASSESSMENT BY STATE 39
TABLE 3-2. SELECTED IMPACT FEE PROVISIONS 40
TABLE 4-1 PERSONS PER 1,000 SQUARE FEET 44
TABLE 4-2. OCCUPANCY BY OCCUPIED UNIT SIZE BASED ON UNIT TYPE 46
TABLE 4-3. OCCUPANCY BY UNIT SIZE BASED ON UNIT TYPE FOR ALL UNITS 46
TABLE 4-4. IMPACT FEE ADJUSTMENTS BASED ON DISTANCE TO WATER SUPPLIER AND NEIGHBORING HOUSES 51
TABLE 4-5. VEHICLE TRIPS BY HOUSEHOLD SIZE 52
TABLE 4-6. BASIC FACTORS FOR SETTING HOUSE-LEVEL IMPACT FEES 54
TABLE 4-7. AVERAGE DAILY VEHICLE MILES TRAVELED PER HOUSEHOLD PERSON BY UNIT TYPE 57
TABLE 5-1. ATLANTA IMPACT FEE CALCULATIONS 74
TABLE 5-2. ATLANTA FEE SCHEDULES 75
TABLE 5-3. ALBUQUERQUE PUBLIC SAFETY LEVEL OF SERVICE, NET IMPACT COSTS, AND IMPACT FEES BY SERVICE AREA 82
TABLE 5-4. ALBUQUERQUE PARKS, RECREATION FACILITY, TRAIN AND OPEN SPACE LEVEL OF SERVICE, NET IMPACT COST, AND IMPACT FEES BY SERVICE AREA 83
TABLE 5-5. ALBUQUERQUE NET IMPACT COSTS, PROJECTED IMPERVIOUS ACRES, AND DRAINAGE IMPACT FEE PER ACRE BY SERVICE AREA 84

TABLE 5-6. ALBUQUERQUE LEVEL OF SERVICE, NET IMPACT COST, ROAD IMPACT FEES BY SERVICE AREA 84
TABLE 5-7. LAND USE ASSUMPTIONS 89

LIST OF FIGURES

Page

Figure 1-1. Rate of Inflation 1970 - 2004 8
Figure 1-2. Average Non-Utility Impact Fee 13
Figure 1-3. Impact Fees By Type 1988-2004 13
Figure 3-1. States With Impact Fee Acts 37
Figure 5-1. Atlanta Parks and Recreation Service Areas 72
Figure 5-2. Public Safety Service Area 80
Figure 5-3. Parks, Recreation Facilities and Open Space Service Areas 81
Figure 5-4. Drainage Facility Service Areas 81
Figure 5-5. Road Facility Service Areas 81

Executive Summary

Impact fees are one-time charges applied to new development. Impact fees are a form of land-use regulation designed to assure that communities maintain adequate levels of public facilities in the face of growth. The resulting revenue generated for the construction or expansion of new facilities is coincidental to their land-use regulatory (i.e. police power) purpose. Were it not for growth many communities would have adequate public facilities and often if growth is at a manageable pace adequate public facilities can be provided concurrent with the impacts of growth. To assure adequate public facilities, impact fees are assessed and dedicated principally for the provision of additional water and sewer systems, schools, libraries, parks and recreation facilities, and other infrastructure made necessary by the presence of new residents in the area. The funds collected cannot be used for operation and maintenance, repair, alteration, or replacement of capital facilities.

As will be noted, impact fees are not the best way in which to finance most public facilities from a variety of theoretical perspectives and instead taxes are. However, in the absence of the legal or political ability to raise taxes combined with a desire to maintain level-of-service quality in their communities, elected officials may see impact fees as a pragmatic solution.[1]

Impact fees have expanded and evolved substantially throughout the United States over recent decades, and currently appear in a wide variety of forms covering different types of infrastructure in varying amounts around the country. These changes have taken place through legislation, regulations and court cases. While the process is extraordinarily complex and there have been many debates over the specifics, in some ways the underlying fee principles are now better defined and more straightforward than in the past. Indeed, it may be one reason impact fees have grown substantially in many communities.

However, impact fees remain somewhat controversial. Different interests naturally have different perspectives on impact fees, as the table below notes.

Stakeholder	Perceptions and Concerns
HUD	Need to keep housing affordable, need to help communities struggling with infrastructure financing problems
States	Financing of infrastructure is important to economic growth, new taxes are not popular
Local government (planners, elected officials, active citizens)	Often want to manage growth, want to preserve housing values, don't want new taxes, may have little financial incentive to promote affordable housing
Developers	Want to maximize return, want a predictable system, cannot always pass fees on to builder or land owner
Builders	Want to maximize return, cannot justify building affordable homes if lot costs and fees are too high
Home buyers	Low and moderate income buyers cannot afford high fees, often there is no substitute choice of housing
General population	Impact fees keep general taxes lower, often do not understand the impact that fees have on housing prices and the need for affordable housing

[1] While local general funds are composed of many sources of revenue, for the most part they come from local taxes. The 2002 Census of Government Finances shows local government "general revenues" totaled $727 billion with taxes accounting for $535 billion or nearly 75%.

One of the central themes in structuring and implementing impact fees of all types is the concept of "proportionate share," which has been generally accepted and dates back to at least the 1970's. From a legal standpoint, impact fees are legally prohibited from charging developments more than a proportionate share of the cost of new facilities. This is closely related to the very definition of impact fees, which are distinguished from taxes or general charges and required to be based on actual or projected expenditures. Charging proportionate shares is also frequently supported from a policy and fairness standpoint. Ensuring that impact fees do not charge more than the proportionate share is fair and equitable and protects affordable housing from paying a disproportionate share.

Notwithstanding the broad underlying support for proportionate shares, it also leads directly to significant questions and complications. In reality while the courts have made it clear that lawful impact fees must reflect proportionate shares, they have also accepted very relaxed approaches including the common use of impact fees set at average levels and then applied to every case in the community. In other words, so long as the process achieved an overall, general correspondence between costs and fees, it could be legally accepted as an impact fee. Yet using flat fees to pay costs that do not vary with unit size has had serious drawbacks because it charges smaller homes and apartments disproportionately large shares of costs, and larger homes and apartments disproportionately smaller shares. Unlike real property taxes, flat fees tend to have a “regressive” effect; that is, they fall disproportionately on those with lower incomes than with higher ones.

Designing More Equitable Fees

The purpose of this guidebook is to help practitioners design fees that more equitably reflect actual proportionate share and therefore have less of a negative impact on housing affordability. It is not a primer on impact fees and assumes some general familiarity with public financing terminology. It is not a research report but a guideline, based on substantial research, for addressing issues of housing affordability and equity. Fortunately, modern information systems make it easier than ever before for communities to develop impact fees that correspond more accurately to actual costs associated with new homes. While there are different variables that might be used for this purpose, based on a comprehensive literature review and research conducted in the course of this project, the authors found that the simplest and most universal factor associated with actual costs is the square footage of the home. For certain impact fees, particularly those covering libraries, parks, open space and construction of schools, square footage of the homes may be sufficient for allocating costs. For other fees, such as those covering roads, public safety and water or drainage, additional significant variables should also be considered along with dwelling unit square footage in determining the appropriate costs and payments. Depending on the particular fee, these variables might include size of lots and the density of subdivisions or broader neighborhoods. But the key point is that basing all types of impact fees in whole or in part on house or apartment square footage rather than charging uniform rates is straightforward to implement and helps to avoid overcharging smaller units more than their true proportionate share.

This Guidebook takes this core research finding and applies it to the construction of impact fee programs. It includes information that is useful to local jurisdictions that are either in the process of implementing impact fees, or considering revisions to current impact fee programs. It includes information on the history of impact fees; discusses alternative financing models to ensure the most appropriate financing tools are at least considered; summarizes state legislation which can influence the design of local impact fee programs; and addresses how to design impact fees to be more progressive. Case studies of local government impact fee programs that should provide valuable insights to the reader on the development of innovative impact fee programs that are sensitive to affordable housing are also included.

Additional information is presented in this Guidebook in the form of a series of decision guides that include model questions and potential answers. Some of the questions and answers are potentially applicable to all local governments with infrastructure financing needs, with the balance geared toward increasing the level of understanding and providing guidance on questions of equity and revenue credits. These decision guides draw off the text in each chapter and will help the user make decisions based on their unique needs and circumstances. The issues are presented in two specific sets of decision guides which lead the reader through a series of questions and answers.

- The first set of decision guides is included in Chapter Two, Capital Facility and Infrastructure Financing Options, relates to categorizing the financing needs and providing for various financing options based on subject matter. This series of guides is meant to help the practitioner take the material presented in this chapter on infrastructure financing options and decide whether impact fees are the most appropriate financing tool. Infrastructure financing needs range from very simple and clear needs to complex situations. The simplest infrastructure needs for public facilities that will be constructed without any regard to user ability to pay (such as fire stations) are under one decision guide, while complex infrastructure needs dealing with the extent users are willing to pay for specifics are under another decision guide.
- The second set of decision guides is included in Chapter Four, Impact Fees and Housing Affordability. This set of decision guides delves more deeply into issues relating to specific impact fee program design to help practitioners take the material presented in this chapter relating to equity and apply the material through the question and answer format. The decision guides are intended to help practitioners determine whether their existing impact fee programs meet basic equity and fairness criteria; and, in the case of new programs, ensure a program design that is fair and equitable.

The appendices included in this Guidebook include core background and research information for reference purposes. We have included these pieces as they can contribute to a better understanding of impact fees and how the authors arrived at the recommendations contained in the Guidebook.

Additional Resources

Key to both designing fair and equitable impact fees, and ensuring that they withstand the scrutiny of the legal system, is incorporating good data. Fortunately, there is substantial data often available at the local level. In addition, the Department of Housing and Urban Development maintains a website where practitioners can find useful resources that form the underlying basis for this Guidebook. This website is: http://www.huduser.org/rbc/.

Introduction

On January 9, 2003, Lincoln, Nebraska's Mayor Don Wesely stood on a bumpy graveled portion of West Adams Street that leads to new homes in northwest Lincoln to drive home his attitude on the need for impact fees.

> "The washboard-like graveled West Adams Street is an example of how big the funding gap for extending arterial streets really is and why impact fees are needed," said Mayor Wesely. "The City has fallen so far behind that the City is not scheduled to pave this street for another six years. It's less safe than a paved road, it's dusty, and it's a daily problem for the residents.
>
> This is the wrong way to build our community. If impact fees had been in place, West Adams would have been paved much sooner because the street fees would have helped pay for the improvements.
>
> Critics have said impact fees will stop growth," said Mayor Wesely. "What stops growth is uncertainty and the inability to pay for new streets, water and sewer systems and parks. Impact fees are not the whole solution, but they are a fair way to share the costs between the new development and the taxpayer."[2]

Mayor Wesely's comments echo those of many city officials who want to find a way to pay for growth. Impact fees have now become a fact of life in an ever-increasing number of communities. Originally a phenomenon of fast-growing coastal communities in Florida and California, the use of such fees has now spread to mid-America. Increasingly impact fees are seen by local officials as the best option available. .

Impact fees, one-time charges on new development, provide revenue for new or expanded infrastructure to support new development. Impact fees take the form of a predetermined monetary payment -- a fee -- and are generally levied against developers to fund capital expansion of large-scale public facilities and services.[3] Increasingly, such fees play an integral part in giving local governments the ability to cope with the many burdens of rapid population growth such as the need for new parks, roads, schools, jails, public buildings, sewer and water treatment facilities, and public safety (fire, police, and Emergency Medical Service) facilities.[4]

Impact fees have become widely used especially in growing regions for a variety of reasons but three in particular: a) locally elected officials are increasingly loathe to ask voters and voters are generally unwilling to raise their taxes in part to help provide increasingly higher levels of new facilities demanded by new development, and b) state and local governments have municipal financing constraints including state constitutional limits on property tax rates, and c) there is little financing provided by state and federal governments for infrastructure to local governments. While in theory there are many better ways to finance infrastructure, in practice impact fees often become the path of least political and legal resistance.

---

2 News release accessed from http://www.lincoln.ne.gov/city/mayor/media/2003/011303a.htm.

3 See Susan M. Denbo, Development Exactions: A New Way to Fund State and Local Government Infrastructure Improvements and Affordable Housing?, 23 REAL EST. L.J. 7, 11 (1994).

4 Juergensmeyer & Roberts, supra note 1, at 421.

In one form or another, impact fees now exist in nearly all U.S. states and are a common technique used to generate revenue for capital funding necessitated by new development.[5] To date, approximately twenty-six states have enacted impact fee enabling legislation and in most other states impact fees are enacted pursuant to home rule powers or pursuant to individual local government enablement.

Historically, it has been a primary function of state and local governments to construct, operate, maintain, and improve the basic physical infrastructure of American communities. However, as a result of three significant events in American history, this traditional approach began to break down. The first of these events was the sharp rise in inflation in the 1970s[6] and the decimation of fixed-base taxes such as the motor fuels tax. The second factor leading to the breakdown of the traditional approach was the general hostility to the taxation of real property, thus forcing local jurisdictions to look elsewhere to fund the ever-increasing demands of constituents.[7] Third, was the failed expectation that the federal government would pay a significant portion of infrastructure costs. Although, historically, the federal government has paid little or no portion of such costs, many environmental mandates enacted in the '70's, especially regarding clean water, did initially include significant federal financial support. Many communities began to rely on these funds just at the time the federal government returned to a more traditional role of limited financial support for local infrastructure. Because these factors were occurring at a time when the pace of urban development was increasing, especially in the fast growing communities in Florida and California, both the demand for and the cost of investment in public infrastructure began to climb, while at the same time the available financial resources were falling. As a result, there arose an increasing need for investment concurrent with declining means.

Florida, especially, presented a financial "perfect storm". Population was growing rapidly, homebuyers were expecting higher levels of services, and the lessening of state and federal support resulted in ever-increasing demands of localities. An increasing share of the responsibility to pay for these and other public investments fell directly on local jurisdictions by default.[8] In order to assume control of providing these infrastructure needs, local governments were forced to pay the associated costs commonly by raising local property taxes. At the same time, they were hit by the "taxpayers' revolt." Increasingly, local elected officials faced a public demand to increase public services without increasing taxes. Impact fees arose from this environment as an acceptable political alternative to solve the need for financing. Because of their intrinsic attractiveness to local governments, their use for an ever-increasing number of facilities and services spread rapidly.

---

5 See J. Juergensmeyer & T. Roberts, Land Use Planning and Development Regulation Law 421 (Practitioner Treatise 2003), and J. Nicholas, A. Nelson, & J. Juergensmeyer, A Practitioner's Guide to Development Impact Fees 13 (1991) [hereinafter cited as Nicholas, Nelson & Juergensmeyer].

6 For most of the county's history inflation averaged two percent or less, with the periods of war being significant exceptions. Beginning in the 1960s and continuing through the 1980s, inflation existed at hitherto unprecedented rates, peaking at over 18 percent in the late 1970s. See U.S. DEPARTMENT OF LABOR, BUREAU OF LABOR STATISTICS website, available at www.bls.gov (last visited Oct. 2, 2003).

7 See generally Lawrence Susskind, Proposition 2 ½: Its Impact on Massachusetts (1983).

8 Both state governments and the federal government limited funding programs for public investments because of a sharp rise in cost. Furthermore, there was a greater burden on the local governments responsible for handling these matters because of required improvements to many infrastructure facilities, such as water pollution control facilities. See, e.g.,The Water Pollution Control (Clean Water) Act, 33 U.S.C. § § 1251 et seq. (1994).

However, impact fees are often criticized for having adverse effects on housing affordability either by raising prices, reducing supply or both. Some recent studies show that carefully tailored impact fees may not necessarily reduce the supply of housing that is affordable and in fact may increase it.[9] Nonetheless, Vicki Been observes that:

> "…impact fees also can be abused, either to exclude low-and moderate-income residents or people of color from communities, or to exploit new homebuyers, who have no vote in the community. They also can be unfair to those caught in the transition from other forms of infrastructure finance. By careful attention to the myriad of issues …*researchers can help local governments seize the potential impact fees offer for promoting* more efficient development patterns while minimizing any negative effects impact fees might have on *the affordability of housing and the distribution of housing opportunities to all residents (emphasis added).*[10]

Her concluding observation is the very purpose of this Guidebook: to educate practitioners on impact fees and present recommended approaches that can reduce potentially adverse effects of impact fees on housing affordability. Two approaches are recommended. The first is to calculate impact fees based on house size in square feet because, as noted by the National Association of Home Builders, as the size of the house increases so does the number of occupants at least up to a certain size (see Chapter 5). The second is to waiver or defer impact fees on affordable housing, as done in several communities around the nation (see Chapter 6).

Why is housing affordability an important impact fee local policy consideration? In many (and some would say most) growing metropolitan areas, school teachers, first responders, building maintenance, retail and service workers among many others are simply unable to afford to buy or rent housing in the very communities in which they work. Instead they either pay a disproportionate amount of their income for housing in or near communities where they work or, more often, live in other communities incurring substantial commuting costs.[11] As a result, many become detached from communities where they work – and in the case of public service workers such as teachers and first responders this undermines community cohesion. Indeed, first responders may not be able to respond timely to catastrophic events because they may live so far away. The extent to which impact fees may by themselves weaken housing affordability to people working in the community and what can be done to offset this outcome is the focus of this Guidebook.

The overall guidance presented in this document is based on considerable research conducted over the years and additional research conducted specifically for this project. The research findings clearly support

---

9 Gregory Burge and Keith Ihlanfeldt of the DeVoe Moore Center and the Department of Economics at Florida State University found that through a cause-and-effect analysis the supply of multi-family and higher-density single-family homes increased in suburban communities that had impact fee programs. Among the reasons are removing "NIMBY" concerns about such housing "paying its own way". In *Impact Fees and Single-Family Home Construction* they note "(i)mpact fees earmarked for public services other than water and sewer system improvements are found to increase the construction of small homes within inner suburban areas and of medium and large homes within all suburban areas" and in *The Effects of Impact Fees on Multifamily Housing* they state "(i)mpact fees earmarked for public services other than for offsite water and sewer system improvements are found to expand the stock of multifamily housing construction within inner suburban areas."

10 Vicki Been synthesizes these issues in "Impact Fees and Housing Affordability", *Cityscape: A Journal of Policy Development and Research,* 8(1): 139-185 (2005).

11 See *Paycheck to Paycheck*, National Housing Coalition (2004).

the intuitively obvious assumption that bigger houses place more demand on services. Thus, bigger homes should pay higher fees to be fair and equitable. The basic conclusion of the authors and the underlying premise of the guidance is that to be fair and equitable, impact fees need to be based on square footage as a starting point, followed, in some cases, by additional elements that further vary costs across households to reflect other underlying cost differences. The guidance offered here is meant to be a balanced and pragmatic approach to implementing equitable fees.

The Guidebook has six chapters, a series of questions presented as decision guides included within two of the chapters, and three appendices.

- Chapter 1 examines the use of impact fees historically and currently, and briefly looks at future patterns and the need to structure fees progressively to limit the impact on affordable housing.

- Chapter 2 provides an overview of various infrastructure financing options to help practitioners understand the basic financing options and ensure that a thoughtful approach is taken to considering various options. The simplest infrastructure financing needs, covered in Decision Guide 2-1, are public facilities or services that need to be provided without any regard to user ability to pay or extent of use; for example, fire services or police protection. The most complex infrastructure needs, covered in Decision Guide 2-4, tend to be infrastructure necessary but with a substantial ability to assess the users for specifics; for example, roads, which might be funded at least in part by tolls. Other programs fall somewhere between the simple and complex.

- Chapter 3 provides an overview of the role of the state in impact fee programs. It includes summary information about the states with enabling legislation and reports the types of facilities eligible for impact fee financing.

- Chapter 4 is designed to give clear guidance on how to set impact fees that are consistent with the concept of proportionate share. The chapter begins with a review of key elements associated with setting the amounts of particular impact fees. It explains the rationale for the use of impact fees based on square footage, and in some cases, additional elements. This chapter includes decision guides that serve as checklists of procedures that local governments can follow to assure that impact fee design does not unduly affect housing affordability. The focus here is on proactive measures to alleviate impact fee effects.

- Chapter 5 presents case studies documenting how impact fees incorporating these principles have been implemented in three jurisdictions around the U.S.: Atlanta, Georgia; Albuquerque, New Mexico; and, Alachua County, Florida.

- Chapter 6 concludes this Guidebook. It is an overall summary of the Guidebook contents.

Supplemental materials which local government planners may find useful in understanding the relationship between impact fees and the comprehensive plan; and the provision of infrastructure financing through special assessment districts are included as Appendix A and B. Appendix C is sample land purchase option contract language that the authors received from a developer showing how such contracts may be used to "internalize" impact fee payments to the seller of land – consistent with land economic theory. Appendix D is a briefing paper prepared while doing research for the Guidebook. This is a core piece of research that examines the variables that can create the greatest negative impact on housing affordability and inadvertent inequities that disproportionately affect the smallest and most affordable units. Conversely, it also details the variables that should be included to create impact fees that are fair and equitable. This briefing paper serves as a reference piece for the approach suggested in this Guidebook.

Chapter 1 - Impact Fees - Past, Present and Future

This chapter serves as a background on impact fees and how they have evolved over time. It also includes data on how impact fees are being assessed today with tables summarizing national data and several useful local examples illustrating specific impact fee structures. This chapter concludes by introducing the concept of equity as applied to impact fees and the impact on affordable housing.

The Need for Infrastructure Financing Tools

The financing of basic community infrastructure in the United States has become more complex and more expensive as each year passes. It has become more complex because we are continually expanding our urbanized areas and, thereby, requiring increased quantities of infrastructure. Table 1-1 shows some basic trends for the United States. The urbanization of the nation's population has continued and with continued urbanization come increasing numbers of people and households looking to government for services, including the provision of infrastructure. The population continues its shift to metropolitan areas,[12] although at a lower rate than in the past.[13] Both the number and the populations of all urban areas have continued to grow, with growth of the medium-sized cities being the greatest. In both the medium and largest cities the population per city declined, simply indicating that the cities added to that size grouping would be at the lower end of the size range, thus reducing the average size.

TABLE 1-1. METROPOLITAN POPULATION, CITIES & POPULATION PER CITY 1980 - 2000

	1980	1990	2000	% Increase 1980-2000
Population (000)				
Total	226,546	248,719	281,422	24.2%
Metropolitan	177,143	198,023	229,192	29.4%
Non-Metro	49,399	50,696	52,229	5.73%
% Urban	78.20%	79.60%	81.40%	
Cities 500K and Over				
Number	22	23	29	31.8%
Population	28,400.00	30,100.00	35,888.25	26.4%
Per City	1,290,909	1,308,696	1,237,526	-4.14%
Cities 100K – 500K				
Number	147	172	213	44.9%
Population	28,400.00	33,300.00	40,193.32	41.5%
Per City	193,197	193,605	187,819	-2.78%
Cities under 100K				
Number	18,513	19,067	19,214	3.79%
Population	83,800.00	89,700.00	98,800.00	17.9%
Per City	4,527	4,704	5,142	13.6%

Source: Statistical Abstract of the US, 2001, p. 1-67.

But increased numbers of people in cities alone understates the demand. As incomes have increased, the public's expectations of and demand for public facilities have grown. Schools are no longer aggregations of classrooms but have become multimedia learning and social/cultural centers. The transition has greatly

[12] There is a circularity here as new metropolitan areas continue to be created, thus adding to the metropolitan population by the simple act of creating more metropolitan areas.

[13] In 1920 the urban population first equalled the non-urban population in the U.S. Since then urbanization has grown to reach over 80 percent by the year 2000.

increased the cost of providing educational facilities. The same is true for park and recreational facilities. Gone are the days when a ballfield was simply an otherwise vacant area where ball was played. Now they are stadiums with all the accoutrements, including red dirt. A fire department no longer simply puts out fires; today it offers advanced life support. These evolutions are responses to public demands. Few would doubt that the quality of modern public services is greatly improved.[14] Few would doubt that the cost of these services has greatly increased.

The federal government has long since reached a peak in being a growth source of revenue to state and local governments. Since 1972, the federal portion of state and local revenues has remained constant at about 20%,[15] leaving state and local governments to rely on their own revenue-generating abilities to meet the demands of the public. Some suggest that the federal government is responsible for many of the increased costs being borne by local governments through the use of unfunded and partially mandates.[16]

As urbanization and public demands grew, inflation became an important political/economic fact of life. For most of the life of the nation, inflation was not an issue.[17] During the 1970s and 80s this was not the case. One of the more pernicious aspects of inflation is that it significantly weakens the revenue from fixed-base taxes, such as the motor fuel taxes. Inflation increases the cost that fixed-base revenue sources are to cover without increasing the means to pay those costs. Inflation increases the cost of road construction and maintenance but does nothing to the proceeds derived from a 6¢ or 8¢ per gallon levy. In the face of such a problem the logical thing to do is to raise the fixed-base tax. Property taxes, while not fixed-base, require action to be increased. The action required is an increase in the assessed or taxable value of the property.

Figure 1-1 shows annual rates of inflation from 1970 to 2004. During the time period the average was 4.95% per year, approximately twice the long-term rate of inflation. Annual inflation during 1980 was 13.5% and the year-over-year rate peaked during 1980 at over 17%. Such rates of price growth meant that the purchasing power of fixed-base taxes, such as the motor fuels tax, declined by 13.5% during 1980. One of the commodities most responsive to inflation is real estate, including development property. In fact, real property inflation tends to proceed

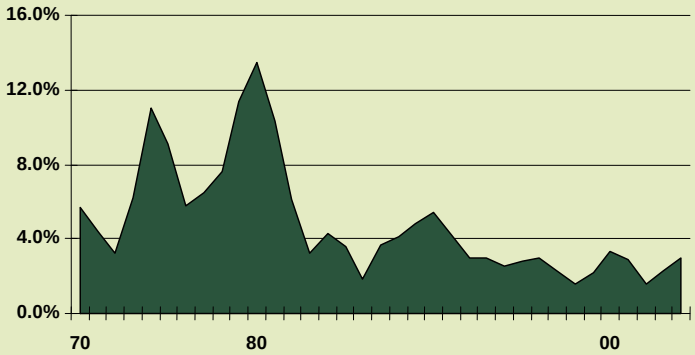


FIGURE 1-1. RATE OF INFLATION 1970-2004

[14] Nostalgia notwithstanding.

[15] *Stat. Abstract of the US*, 2001, page 262.

[16] The Clean Water Act required massive expenditures to be made largely by local governments. Of course, it could be argued that it was those local jurisdictions that dirtied the water so the burden of clearing that same water should be borne by them.

[17] From 1929 (the first year of consistent price indices) to date, the annual increase in prices has averaged 3.3%. If the two periods of rapid inflation are removed, the long-term rate of inflation drops to 2%.

faster than general inflation.[18] General inflation increased public facility operating and capital costs but it also increased the prices of both new and existing homes, thereby increasing the property taxes on those properties. It should not be surprising that California's Proposition 13 was enacted in 1978, during a period of unprecedented inflation. Proposition 13 rolled back property taxable values to 1975 and capped their rate of increase.[19]

Massachusetts soon followed in 1980 with Proposition 2½, which took its name from the limit on property taxes being no more than 2.5% of taxable value.[20] Since the referendum enactment of these two limits, all states have taken some action on limiting property taxes.[21] Thus, property taxes tend to act like fixed-base taxes because of the limitations imposed by legislation or constitutional amendment.

Local governments were faced with conflicting demands:

- Increase the supply of facilities, especially infrastructure, to larger populations;
- Increase the quality of public facilities, also to larger populations; and,
- Avoid tax increases in meeting these demands.

As these events unfolded, the philosophy of taxation moved more toward the use of the *Benefit Principle* and away from *Ability to Pay Principle*.[22] This shift, combined with continuing urbanization and inflation eroding the tax base, set the stage for "alternative" sources of revenues.

As a result of new federal environmental mandates local jurisdictions were also being directed to make massive investments in water pollution control facilities.[23] These investments originally were funded up to 85% by federal grants. They are now funded by federal loans amounting to 45%. The highway system that was to be primarily funded by federal sources has fallen into disrepair with increasing congestion because of the inadequacy of federal funding. States elected not to assume the primary role that the federal government was abandoning for precisely the same reason that the federal government was abandoning it: cost. The responsibility for highway maintenance and other major public investments have fallen to local jurisdictions by default. Where local governments attempted to assume these responsibilities they were met with the "taxpayers' revolt," a reaction to the increase in property taxes that resulted from increasing local absorption of these responsibilities as well as a more general unwillingness to pay the costs for homebuyers that did not yet live in their communities.. Clearly some other means of funding were needed. When the power to tax proved unsuccessful, local jurisdictions looked to their police powers as a means to address the problem.

American local jurisdictions have great discretion in the exercise of their power to protect the public's health, safety and welfare. By contrast, they have almost no independent discretion in the exercise of their power to tax without voter approval. It was natural then that the police powers would be turned to as an

---

18 Between 1980 and 2000, all prices rose at 3.8% percent per year while shelter costs rose at 4.4%. See *Stat. Abstract of the U.S.*, 2001, p. 454. The median sales price of a new single-family home grew by 4.9% per year. See *Ibid*. p. 598. The median price of existing home sales rose by 4.1% per year.

19 See John Kirlin. *The Political Economy of Fiscal Limits*. Lexington, MA: Lexington Books.

20 *Ibid.*

21 Therese J. McGuire, "Proposition 13 and Its Offspring: For Good or Evil?", 52 *National Tax Journal*, 1999, 129-138.

22 Musgrave, Richard A., and Peggy B. Musgrave. 1989. *Public Finance in Theory and Practice.* 5th ed. New York: McGraw-Hill.

23 The "Water Pollution Control Act," commonly known as the Clean Water Act, PL 92-500.

alternative. Local communities found that growth and development meant more traffic, wastewater, and school children that somehow had to be accommodated. Absent the funds to make physical improvements, congestion resulted and with congestion also came citizen outrage. Increasingly, local elected officials faced a public demand to reduce taxes and maintain or even increase services. In such an environment, growth and development came to be viewed as detrimental rather than beneficial.[24] The detrimental aspects of urban growth provided the basis to invoke the police powers and protect the public against the congestion and loss of "quality of life" that further growth and development would entail.

The impact fee arose not out of any great thought or plan, but simply from desperation resulting from conflicting demands placed on local officials. Citizens demanded quality public services and taxpayers insisted on lower taxes. Builders demanded that they be allowed to serve a clearly apparent market for their products and those that earned their livings from development fought for their jobs. Local governments were vested with the authority to impose on new development reasonable conditions that were consistent with the protection of the public's health, safety and welfare in all of its manifestations. The impact fee filled this role. As a result, the use of impact fees spread rapidly with Florida in the forefront.

To understand the evolution of the impact fee it may be helpful to understand the state of urban infra-structure through considering a representative example. The small community of Key West, Florida, originally a private enclave, that still maintains those traditions today, is an island jutting out into the Straits of Florida. The city had been dumping its untreated sewage into the Straits. In order for the City of Key West to fund an Environmental Protection Agency mandated sewage treatment system, it would have to raise the monthly bill for each home owner by $65 to fund the expansion with revenue bonds.[25] An increase of $65 per month was considered to be outrageous and the citizens turned it down, thus creating an environmental and funding crisis. This crisis ultimately became an issue in the further development of the City in that the City was barred from making new sewer connections and thus new construction could not proceed. A cost-sharing agreement was struck between the City and the development interests that included a monthly bill increase of $15 which, combined with an impact fee, funded the sewage treatment system and development was allowed to proceed. As a result, the City stopped pumping its raw sewage into the Gulf Stream.

Education presented another area in which impact fees have filled a funding gap. Like sanitary and road infrastructure, school construction tended to be financed from inelastic revenue sources, and, these too failed to keep pace with need in areas of rapid growth with many schools becoming increasingly over-crowded.

Large scale, fast paced growth is not nationwide or even state-wide. In rapidly growing Florida, the actual growth areas are confined to no more that 10% of the geographic area of the state. Significant state funding support could not be expected for that would mean taxing both the growing and the non-growing (and therefore poorer[26]) areas with the result being taxing the poor to subsidize the more affluent. The state's legislatures joined the federal government in the position that if the needs were great enough, the

---

[24] See William K. Reiley, *The Use of Land*, New York: Crowell, 1972.

[25] One of the authors (Nicholas) served as a consultant to the City of Key West during this period and these facts are from the author's on-site observations.

[26] In Florida, the per capita incomes of the non-growing portions of the state amount to approximately 50% of those of the growth areas. See *Florida Statistical Abstract*, 1995, pp. 199-204.

prosperous growth areas had the ability to fund the improvements needed to serve growth. What they lacked was the willingness to raise the funds.

Now, given this situation, what realistic alternatives were available to local governments? Although some communities did agree to raise local taxes, as a general rule, this approach did not get very far. Even in areas that increased taxes, they were generally insufficient to respond to the magnitude of the needs. Some communities sought to restrict growth to a level which could be accommodated by existing infrastructure. As could be expected, this "solution" has been has been hotly opposed by the building industry. Impact fees were the alternative to further congestion and a shut-down of building. Impact fees charged new construction and generated revenue that the community could use to expand the physical infrastructure needed to accommodate that growth.

However, impact fees have significant drawbacks. Capital improvements and infrastructure are needed "up front," but impact fees dribble in.[27] Roads, schools, parks and utilities are all needed ahead of development.[28] The problem is that funding is not available "up front" unless it is put up by the developer or borrowed by the host local government. Developers and local governments assiduously avoid both of these actions. Impact fees, while becoming an important component of local government finance, do not address the timing problem. Impact fees, as they are commonly implemented, charge new development when the construction is actually permitted. Thus the impact fee receipts "dribble in" as construction occurs. While jurisdictions prefer any revenues" to no revenues at all, they would prefer up-front revenues so that facilities can be constructed and be available as new development occurs.

Alpharetta, Georgia, received public support for a general obligation bond issue for road and fire facilities improvements. A large portion of this debt was for growth accommodating improvements that would be paid for by impact fees. The impact fees collected were used to pay debt service, thereby reducing the necessary tax rate. The key to this program was the public's willingness to support a general obligation bond. This support facilitated an impact fee funding program that provided road and fire protection improvements "up front" and did so at the lowest possible cost.

The key to resolving the "dribble in" problem is bonding, but bonding requires a secure source of revenue that can be pledged. Impact fees are not considered to be secure because their receipt will rise and fall with the level of construction in a community. The solution is to create some type of security, borrow against that security, and then use impact fees to make the required payments.

[27] Sometimes this is referred to as "trickle in."

[28] There is the question of where in the development process impact fees should be assessed. In particular, the earlier in the development process a given impact fees is collected, the longer the developer has to pay financing and other carrying costs and the more costly the home may become. The issue of timing is addressed in Chapter 4.

The Proliferation of Impact Fees

Table 1-2 shows the national average impact fees for 2003-2004 for single-family dwellings by type and it illustrates the wide range of fees with school impact fees being the most expensive and libraries the least. These norms are derived from a sample of 152 local governments including 44 in California, 51 in Florida and 57 in other states. These data are for jurisdictions that charge impact fees of various types. Not all of the 152 local governments charge each type listed in the table so the number per impact fees varies. The method of sampling is not scientific. Rather, the sampling was done by opportunity, meaning that when the opportunity presented itself, data were included in the sample.[29] Even with the caveats on sampling methodology, the table is useful in illustrating the types of fees and relative costs.

TABLE 1-2. AVERAGE IMPACT FEES BY TYPE

ROADS		SCHOOLS	
Maximum	$7373	Maximum	9,936
Minimum	130	Minimum	348
Average	1,761	Average	3,169
PARKS		PUBLIC SAFETY	
Maximum	8228	Maximum	8,031
Minimum	102	Minimum	79
Average	1344	Average	568
STORM DRAINAGE		LIBRARY	
Maximum	6,000	Maximum	1,843
Minimum	160	Minimum	54
Average	1,227	Average	415
WATER		SEWER	
Maximum	7,763	Maximum	6,998
Minimum	237	Minimum	265
Average	2,237	Average	2,061

As interesting as the cost of impact fees is the rate of growth in such fees. Table 1-3 shows the average non-utility (not including water and sewer) impact fee amount and annual growth rate from 1988 to 2004.

TABLE 1-3. AVERAGE TOTAL NON-UTILITY IMPACT FEE SINGLE FAMILY HOME
1988 – 2004

Year	Amount	Avg. Annual % increase
1988	$5,781	
1991	$7,649	10.8%
1995	$7,849	0.65%
1997	$8,006	0.99%
1999	$8,970	6.0%
2000	$9,767	8.9%
2002	$10,183	2.1%
2004	$11,012	4.1%
1988 - 2004		5.66%

The data shown in Table 1-3 are the results of the national survey conducted by Duncan Associates and are the averages for the jurisdictions included in this survey. (The 2005 survey can be found at http://www.huduser.org/rbc or obtained from Duncan Associates.) The average has grown at an annual rate of 4.07%. This may be contrasted with a rate of inflation (CPI) of 2.7% during the same period, and a construction cost index of about 2.9% (Engineering News Record, Annual Cost of Construction Index). It is apparent that the rate of increase has not been steady over the period. The trend line shown in Figure 1-2 is simply the annual rate of growth over the 16-year period rather than the year-to-year rate seen in Table 1-3.

[29] Impact fee data for inclusion in the sample was prepared by James C. Nicholas.

The data shown in Table 1-3 are the averages for all jurisdictions included in the sample. Over time many more jurisdictions have been included and some have dropped out. Given that the sample is not scientifically drawn, the conclusions drawn must be tempered. Table 1-4 presents a constant sample of impact fees.

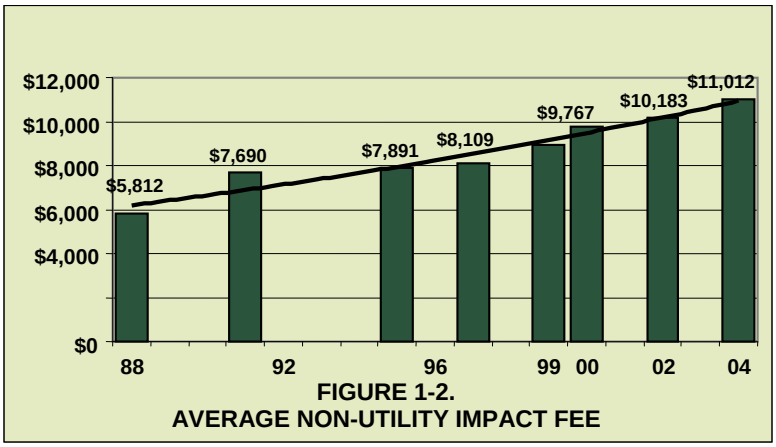


FIGURE 1-2.
AVERAGE NON-UTILITY IMPACT FEE

The amounts in Table 1-4 are substantially less that those of Tables 1-2 or 1-3 because not all fees were included in the constant sample. When the sample was begun in 1988 only a few types of impact fees were included. Those impact fees for the named jurisdictions have been followed over the 16 years and these results are shown in Table 1-4. It is interesting to note that the rate of increase of residential impact fees for the constant sample is in general accord with the variable sample; and that the data in Table 1-4 (depicted graphically in Figure 1-3) show the non-residential fees, especially industrial fees, have been growing more rapidly than residential fees. One explanation might be the lack of developer opposition in commercial versus residential.

TABLE 1-4. CONSTANT SAMPLE IMPACT FEE
1988 – 2004

	1988	2004	Avg. Annual % Increase
Residence	$2,782	$7,564	10.7%
Industrial	$481	$2,913	31.6%
Office	$1,316	$4,518	15.2%
Retail	$2,277	$3,978	4.7%

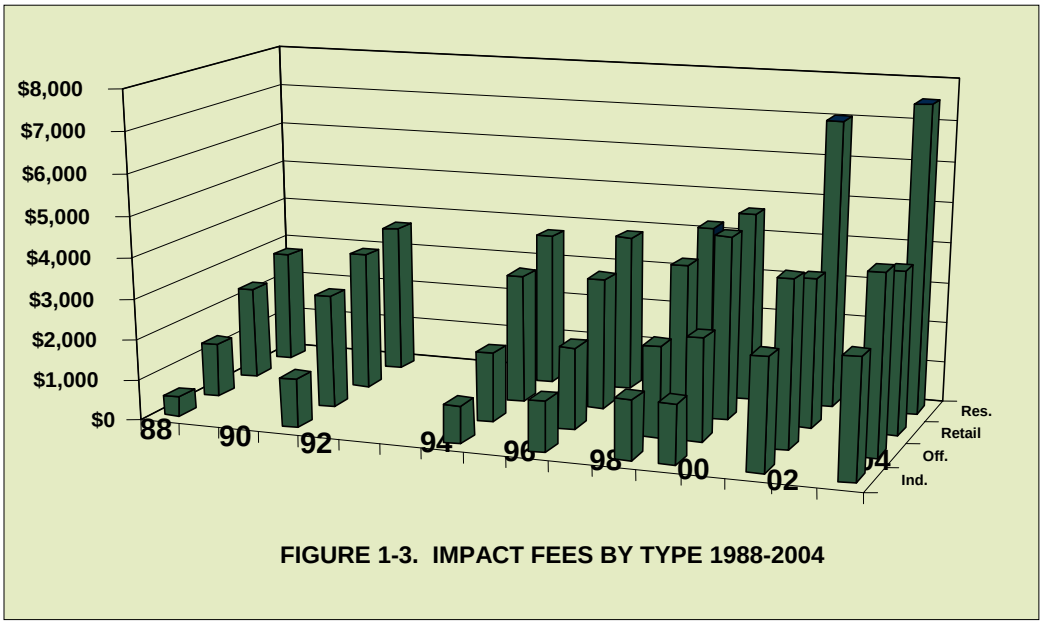


FIGURE 1-3. IMPACT FEES BY TYPE 1988-2004

General Trends in Impact Fees

Subsequent chapters of this Guide will provide detailed guidance as to how future impact fees can be shaped to be more equitable and more sensitive to housing affordability while also providing for sound fiscal decision-making. This section addresses the issue more generally providing historical perspectives, emerging practices, and lingering realities.

Impact fees began as minor supplements to traditional sources of capital improvement finance. The water and sewer impact fees that were at issue in the 1975 case of *Contractors and Builders Association of Pinellas County v. City of Dunedin*[30] were $325 for water and $475 for sewer.[31] These 1975 amounts are substantially below the $2,131 and $1,963 of today.[32] Similarly, the "transportation" fee litigated in *Broward County v. Janis Development Corp*.[33] was $100 which is very much less than the average road impact fee of $1,679, even after considering inflation.[34] The amounts of impact fees thus began small and became much larger. The role of impact fees began as supplemental and is now primary. But, the impact fee debate continues. That debate has evolved, however, from *whether* impact fees should be assessed at all to *how* they are assessed.

Local level debates concerning impact fees can address different types of equity. Intergenerational equity may be of concern because impact fees assessed on new homes may adversely affect the ability of the children of current residents of the community to buy homes where they grew up. Representational equity may be of concern because to the extent that impact fees are assessed on new homes bought by new residents of the community, these new residents had no say in the adoption of the policy. Equity in endowments may be of concern to the extent that impact fees are considered a form of "initiation" fee into a community much like country clubs charge high initiation fees affordable only to the affluent. While these concepts of equity are important, the focus of this Guidebook is how to address proportionate equity – that is, the extent to which the fee reflects the actual impact different housing units have on community facilities.

A critical aspect of proportionality is the extent to which impact fees are based on the impact of new development on facilities. Many impact fee programs assume that each residential unit had the same impact on facilities regardless of size, type, density, location, or other factors. Hence, the impact fee for a large single-family detached home is the same as for a small efficiency apartment despite the fact that census figures clearly show substantial differences in occupancy rates. These impact fees are described as "flat rate" fees, and are inherently unfair. The result is that flat rate impact fees have a "regressive" effect; that is, they fall disproportionately on those with lower incomes than with higher ones.

This Guidebook focuses on methodologies for calculating impact fees to ensure that the regressive effect is reduced if not eliminated. Through taking an approach that more correctly allocates the proportionate share, the resulting fees are far less regressive.[35] When done properly, impact fees as presently practiced

---

30 329 So. 2d 314.

31 *Ibid.* at 315. These fees are for a single-family detached unit.

32 The 1975 water fee of $325 would be $1,265 after adjustment for changes in the CPI, and the $475 sewer fee would amount to $1,603. These indicate that the relative amount of Dunedin's fees has remained about the same.

33 311 So.2d 371.

34 Adjusting the $200 from 1974 to 2002 by the CPI yields a 2002 value of $683.

35 In Dolan v. Tigard (512 U.S. 687 (1994)) the US Supreme Court established the "rough proportionality" standard for exactions such as impact fees. The court ruled that "the necessary connection required by the Fifth Amendment is 'rough proportionality.' No precise mathematical calculation is required but the (local government) must make some sort of . . .

in many if not most places would be reduced for smaller units on smaller lots, in locations where facilities currently exist including public transit, and in configurations that economize especially on vehicular trips.

For example, a study by James Duncan and Associates for Santa Fe, New Mexico found that trips per dwelling unit rose consistently with respect to unit size, from 6.7 trips per day for two-bedroom units averaging about 1,800 square feet and 2.07 persons up to 11.93 daily trips for five bedroom units averaging 4,985 square feet and 4.06 persons. [36] Further reductions are possible when transit is accessible. In metropolitan areas without rail transit about 93 percent of all trips are done by the automobile but in metropolitan areas with rail transit the figure drops to about 75 percent.[37]

Regressivity and the Impact on Affordable Housing

A common practice has been to charge residential impact fees based on the type of residence: single-family detached, single-family attached, multi-family, mobile home, etc. This method (although much preferable to flat impact fees with no variations) implicitly assumes that the only relevant distinction among dwellings is the type of unit and that there is at least some degree of homogeneity within unit types. Both of these implicit assumptions are simply incorrect. The net effect of the unit-type approach to levying impact fees has been to ignore all characteristics other than the type of dwelling unit. The result has been that while multifamily and mobile home units tend to have lower fees than detached units, a modest single-family detached unit of 1,200 square feet will pay the same amount as a mansion of 10,000 feet or more. The problems inherent with such an approach led some jurisdictions to look for other variables that when applied can result in more equitable fee structures. Recently, several jurisdictions have set impact fees that look to the size rather than the type of unit as the basis for assessing impact fees.[38] The premise of this approach is that it is the size of the dwelling, rather than its type, that is the better predictor of impact on the need for infrastructure. Three examples illustrate the benefit of this approach.

One of the first jurisdictions to address the regressivity problem was Palm Beach County, Florida. Palm Beach County had been using a unit type approach to residential impact fees and was dissatisfied with the relative burden on that approach between less expensive and more expensive dwellings. In response, the County incorporated unit size in calculating its residential impact fees. An example is its school impact fee, as shown in Table 1-5.

---

determination that the required (exaction) is related both in nature and extent to the proposed development's impact. Data such as that developed by the National Association of Home Builders reported in Chapter 5 showing the relationship between house size and occupancy (up to 3,000 or perhaps more square feet) nationally may help meet the rough proportionality test.

36 Duncan Associates, *Capital Improvements Plan for Water, Wastewater, Road, Park, Fire and Police Development Impact Fees for the City of Santa Fe*, March 2003 draft.

37 Authors' calculations based on the *Nationwide Household Transportation Survey for 2001*.

38 See J. Nicholas, "On The Progression of Impact Fees," *Journal of the American Planning Association*, Vol. 58, No.4, 1992.

TABLE 1-5. PALM BEACH COUNTY SCHOOL IMPACT FEE	
Unit Size:	Impact Fee
800 Square Feet and Under	$272.05
801 - 1,399	$557.62
1,400 - 1,999	$893.35
2,000 - 3,599	$1,259.95
3,600 and Over	$1,543.59

Had the traditional unit type approach been used, the single-family detached fee would have been $1,221. Smaller and presumably more affordable units receive a substantial reduction in the fee paid.

Miami-Dade County, Florida, also assesses its school impact fee on the basis of unit size. Rather than using size groupings, a simple formula calculates the fee based on a fixed $612 amount plus 91.8 cents per square foot of unit size:

$$\text{School Fee} = \$612 + \$0.918 * FT^2$$

Canton, Georgia recently adopted park and recreation impact fees that also use unit size as the basis for fees, as shown in Table 1-6.

TABLE 1-6. CANTON PARK IMPACT FEES	
Total Growth Cost	$42,054,887
Residential	26,094,512
Non-residential	4,349,086
Net Growth Cost*	$12,233,362
Residential	$10,485,738
New Residential FT²	19,905,404
Cost per FT²	$0.53
Non-residential	$2,250,246
New Non-residential FT²	12,972,159
Cost per FT²	$0.17
*After amount paid by taxes	

As shown in the table, the park impact fee in Canton is simply 53¢ per square foot of living area regardless of the type of dwelling. These and several other jurisdictions have been shifting away from unit type and towards assessment bases that reduce the regressivity of impact fees and properly assess fees based on impact. These attempts have been rather cautious and have tended to be incremental steps rather than giant leaps. Each jurisdiction has tended to build upon the experience of the previous one and to extend anti-regressive methodologies. Chapter Four, Impact Fees and Housing Affordability, includes a much more detailed discussion of these issues.

In summary, while impact fees appear to be here to stay, the role and scope of impact fees can continue to evolve. The task is to continue the expansion of new methodologies that satisfy the legal criteria for impact fees while accommodating both the interests of cities and counties looking to finance an ever-increasing share of capital costs and the legitimate concerns of the shelter industry for equity in the application of impact fees. This Guidebook deals with the regressivity problem and suggests methods of developing impact fees that are more equitable and, as a result, are more sensitive to the impact upon affordability.

Chapter 2 - Capital Facility and Infrastructure Financing Options

The purpose of this chapter is to discuss a range of infrastructure financing options, including impact fees, in order that the practitioner might have a more complete understanding of the options available and make informed choices. Impact fees, as well as other financing mechanisms, must be considered within the context of the local planning process. The relationship between impact fees, planning and exactions is described in Appendix A. This chapter also includes several decision guides which lay out various financing options in the form of questions, and present choices in the form of decision trees. The chapter opens with a general discussion of pricing as the underlying economic theory helps to determine the best options.

Included in this chapter is a discussion of developer exactions, special financing districts, and development taxes, as well as impact fees. Despite their differences, these alternative funding techniques all have a common theme: they shift the costs of new infrastructure from the general public to the new developments that create the need.

Principles of Efficient Facility Pricing

Economic theory supports the view that efficient pricing of public facilities alone will make land-use patterns more efficient, thereby saving resource lands for resource uses and facilitating efficient urban development. If public facilities were priced according to the costs of serving different locations, efficient development patterns would be encouraged. However, the choice of a local facility financing method affects the pattern of urban development. For example, residential density and distance from a water or sewer treatment plant influences the costs of sewer facilities and services. If the true costs of providing water or sewer service are subsidized and new development does not pay its full share of those costs, inefficient development will occur. It is "inefficient" in the sense that costs exceed benefits, which is seen in the form of infrastructure expansion and maintenance backlogs. It may also be inequitable in the sense that lower-cost development may subsidize higher-cost development.

In order to understand the efficiency and equity issues, the general nature of the costs of providing public facilities such as water and sewer services will be used to illustrate these concepts. These costs can be divided into three basic components:

The capital costs of producing the service. As a rule, these facilities, such as treatment plants, are subject to economies of scale and declining average cost. Being a function of the number of users and not necessarily distance from the facility, these costs usually are independent of residential distance away from the facilities or density of development.

The costs associated with the delivery of the service, such as sanitary sewer lines. Generally, these costs increase proportionally as distance increases. Increased residential density usually results in economies. For example, greater density allows for economies due to larger sewer pipe sizes run over shorter distances.

The short-run costs of actually producing the good; in other words, the maintenance and operation costs. These costs are incurred independent of density or distance, and are determined by actual use, such as the cost of actually processing the sewage once collected.

Average cost pricing occurs when the government charges everyone equally for the same service, regardless of the real cost to provide that service to a particular user. For example, sewer fees set on an average basis would charge connections to homes on half-acre lots five miles from the treatment plant the same as homes on 6,000 square foot lots one mile from the plant. As a result of average cost pricing, outlying developments are subsidized by other residents. Urban sprawl is encouraged when new development does not take account of the additional or marginal costs of providing service to it.

Table 2-1 illustrates this situation using actual figures from Loudoun County, Virginia, in 1984.[39] Notice that if all development is charged the same for service, some developments effectively subsidize other developments. If subsidized development is actually occupied by households that are more affluent than development being overcharged, there is also an inequity created. Unfortunately, Loudoun County is not at all an isolated example of this kind of inefficiency and inequity.

TABLE 2-1. ANNUAL CAPITAL FACILITY AND SERVICE DELIVERY COSTS 1,000 HOUSING UNITS CONSTRUCTED AT DIFFERENT DENSITIES, LOUDOUN COUNTY, VIRGINIA

[Prototypical communities of 1,000 units, 3,260 residents and 1,200 students.]

Facility Cost Category	Rural Low-Density *1 du/5 acres*	Rural Cluster *1 du/acre*	Moderate Density *2.67 du/acre*	High Density *4.5 du/acre*
Costs that vary with density	$4,052	$3,609	$2,621	$2,555
School operating costs	$3,046	$3,046	$2,256	$2,256
School transportation costs	$187	$153	$67	$33
Road maintenance costs	$110	$55	$38	$26
Water, sewer operating costs	$709	$355	$260	$240
Costs that do not vary with density	$908	$908	$908	$908
Public schools capital costs	$243	$243	$243	$243
Law enforcement	$165	$165	$165	$165
Fire/rescue services	$58	$58	$58	$58
Health/welfare services	$295	$295	$295	$295
General administration	$147	$147	$147	$147
Total Annual Costs	$4,960	$4,517	$3,529	$3,463

Source: Smythe and Laidlaw 1986. Figures not adjusted for inflation.

Public finance economists advocate marginal cost pricing, the cost of producing one more unit of output, in the form of a three-part tariff as an alternative to average cost pricing. One part of the tariff would be a charge for the costs of the capital facility used to produce the good, such as the cost of building a water or sewer treatment plant. This charge is a flat fee per connection since these costs do not vary by density or distance, although the charge may vary by size of connection to reflect approximate variation in treatment-plant capacity that must be reserved for that use.

The second part of the tariff is a charge for the costs of delivering the service, such as the cost of extending sewer lines to the house. It is a flat rate per house based on the average cost of extending a sewer line to

[39] Robert B Smythe and Charles D. Laidlaw, "Density-Related Public Costs," American Farmland Trust (Washington D.C.), 1986.

that and other homes in the same subdivision. The longer the sewer line and the lower the density, the higher the charge.

The third part of the tariff is a charge for actual use, based on the short-run costs of producing the service. It is a charge on the per-unit cost of providing potable water or processing sewage. A sewerage charge could be based on the volume of sewage passing out of the home and into the sewer line. More typically, it is based partly on the volume of water passing through a water meter into the home.

Planners argue that costs associated with lower-density development patterns may be reduced if facility-use was charged based on the three-part tariff. More-distant and less-dense development would only occur if its expected benefits to both developers and purchasers exceeded its additional or marginal costs to the public. Developers would not build and purchasers would not buy homes in inefficient developments since the charges would price such development out of the market. Under this theory, the primary task of planners is simply to determine the location of central facilities such as water and sewer plants and then price their use according to the three-part tariff. The market would then dictate appropriate land-use patterns. Although this discussion is simplistic, it does convey that marginal cost pricing can force developers to take account of all the fiscal costs and benefits of development before they try to have their plans approved.

The key question is, why is marginal cost pricing not being used, and why instead do communities look to rather inefficient growth controls? One reason is that the costs of developing and implementing a more accurate pricing system are high. It is a much more difficult technical task to determine marginal versus average-cost pricing systems. In a perfect situation, the marginal costs of serving each development and the extent of facility use by each household would be calibrated and assessed. In practice, this is beyond the technical capacities of most local governments. Even calculating marginal costs by area, such as for neighborhoods or sewage drainage basins, is difficult to understand and explain making adoption and implementation unlikely.

Another reason is that political costs are high. Communities may choose not to employ marginal cost pricing because they do not want to discriminate among members of the community, especially if the community is homogeneous in many respects. For example, if cost pricing is based on geographic service areas, then boundary lines must be drawn, and it is often difficult to convince people near the boundary that their cost of service is significantly higher than their neighbor's on the other side of the line. Many communities apply only a flat charge for residential water, regardless of the distance a home is from the supply or how much water is consumed. Such policy may seem fair; all residents have equal access to the facility and are free to consume what they need. To such communities, it does not matter that some may use more or less than others. It also is the situation that in most communities taxes on commercial and industrial enterprises subsidize residential public services. Marginal pricing would mean sharing this subsidy with new residents and thereby reducing the welfare of existing residents.

General Financing Options

There are five very broad ways to raise revenue for public facilities: general taxes, dedicated taxes, special assessments, user fees, and impact fees. There are certainly more categories that may be considered (such as federal and state grants and low-interest loans, charitable donations and lotteries), but this section focuses on the principal revenue sources available to most, albeit not all, local governments. Each is discussed below.

General Taxes. In the past general taxes, particularly property taxes, funded all infrastructure. Given the need of localities to now limit general taxes, such taxes today are most appropriate where there are exclusivity and free-rider issues, such as in parks and public safety, and where the general public well-being is enhanced, such as education and libraries.

Dedicated Taxes. A good example of a dedicated tax is the gasoline tax where revenues go exclusively for enhancing roads (including in some instances transit), normally under the argument that higher transit use preserves road capacity. There are examples of other dedicated taxes, such as California's per-square-foot tax on new buildings to help finance local schools, and Florida's real estate transfer tax where a share is dedicated to acquiring environmentally sensitive land by the state.

Special Assessments. In Texas, Municipal Utility Districts are often formed by private developers then turned over to local government to charge property within master-planned communities for the cost of installing and maintaining infrastructure within and, in some cases, outside the community. This is also the case with many developments-of-regional-impact in Florida. Indeed, the fastest growing segment of governance nationally is in the formation of special districts which usually serve the sole function of providing and maintaining infrastructure, as shown in Table 2-3. Special districts will be discussed in the next section.

User Fees. User fees are the most direct way in which to connect the benefit of the service to those who pay for it. Water and wastewater meter connections and subsequent charges by volume of use may be the best example of such a direct connection, because if one does not pay to connect to public water one does not receive it. Indeed, some of the earliest court cases surrounding impact fees related to that portion of the water and wastewater connection fee used to finance capital expansion.

Impact Fees. Impact fees are an attempt to generate revenue where general or dedicated taxes/assessments cannot cover all the capacity expansion costs. These are differentiated from user fees because they are, in effect, a reservation capacity fee – they provide the facility capacity whether or not those who paid actually use that capacity at any given point in time. Also, unlike user fees, they are directly tied to planning in that they are used to help finance a local capital improvement program that itself implements overall community planning objectives.

Public finance criteria indicate that for most facilities impact fees may be inappropriate for a variety of economic efficiency and social welfare reasons. Only water and wastewater facilities would seem to be appropriate facilities for which impact fees should be assessed. Other facilities, such as public safety, parks, libraries, and schools, are best financed through general funds and debt retired through general obligation bonds. Roads are financed best from user fees and dedicated taxes. Yet, impact fees are used to help finance all these and other facilities by an ever-increasing number of communities.

Table 2-2 summarizes the nature of facility financing in terms of the economic variables that should be considered in selecting financing: marginal cost, scale economy, exclusivity, and price elasticity of demand. The rightmost column identifies the most rational choice on pure economic grounds, without consideration for local conditions.

TABLE 2-2. ECONOMIC CHARACTERISTICS AND PREFERRED FUNDING FOR SELECTED MAJOR FACILITIES

Facility	Marginal Cost Characteristic	Scale Economy	Exclusivity	Demand Elasticity	Preferred Capital Expansion Financing
Water	Lumpy for central facilities	Large	Exclusive	Low	*Impact Fees*
Wastewater	Lumpy for central facilities	Large	Exclusive	Low	*Impact Fees*
Stormwater	Lumpy for central facilities	Large	Nonexclusive	Low	*Special assessment based on impervious surface*
Parks	Lumpy for major parks, relatively smooth for smaller parks	Small to moderate	Nonexclusive	Moderate	*General taxes*
Recreation Centers	Lumpy for most	Small to moderate	Can be exclusive	Moderate	*General taxes and user fees*
Library	Lumpy	Small to moderate	Nonexclusive	Moderate	*General taxes*
Fire	Lumpy for central facilities, moderate for stations, smooth for vehicles	Small	Nonexclusive	Low	*General taxes*
Police	Lumpy for central facilities, moderate for precincts, smooth for vehicles	Small	Nonexclusive	Low	*General taxes*
Emergency Medical	Lumpy for central facilities, moderate for stations, smooth for vehicles	Small	Nonexclusive	Low	*General taxes*
Highways	Lumpy for most, smooth for local streets	Large to moderate	Exclusive through tolls	High	*Dedicated taxes and tolls*
Schools	Lumpy	Small to moderate	Nonexclusive	Moderate	*General taxes*
Colleges	Lumpy	Large	Exclusive through tuition	Moderate	*User fees (tuition) and general taxes*
Transit	Lumpy	Large	Exclusive through fares	High	*User fees (fares) and general or dedicated taxes*

For the most part, impact fees do not appear to comport with public finance principles as they relate to capital financing. Yet, there is a growing use of impact fees to build new parks, libraries, public safety

facilities, schools, and roads – all facilities that are better-financed from other means. Why is this? The next section reviews the practicalities of employing some development or project-specific alternative financing mechanisms to see why impact fees are gaining popularity.

Principal Revenue Methods

Although there are numerous financing alternatives available, discussion in this section is limited to the following three broad categories:

Developer Exactions;
Special Assessment Districts; and,
Impact Assessments

The principal alternatives within each category are reviewed first and then assessed relative to policy-making criteria which will be introduced later.

Developer Exactions

Developer exactions are generally defined as the private provision of land or facilities to serve public infrastructure needs created by new development; they are made as a condition of development approval. In some states, private contributions must be “volunteered” (often not truly voluntary) by the developer and are referred to as "proffers." Note that impact fees are not considered a developer exaction per se but instead fall into the "impact assessment" category.

In most communities, developers are already required to construct at their own expense and dedicate to the local government all public improvements within a subdivision that are designed to serve only that subdivision. These internal improvements, which must be constructed to standards set by the local government, typically include local streets, sidewalks, water distribution lines, wastewater collection mains, and storm sewers.

Clearly, however, the improvements within a subdivision are only a part of the total public improvements that are needed or affected by a new subdivision. Off-site facilities such as schools and parks typically serve residents of a number of different subdivisions. Streets in new subdivisions will always connect to a network of collector and arterial roads outside the subdivision. Similarly, most subdivisions tie into larger networks of water, wastewater, and stormwater systems.

Typical exactions include the dedication of park land, school sites, and road rights-of-way. In addition to the dedication of land, developers may be required to construct public facilities, such as widening the portion of a substandard street on which the development has frontage, or installing a traffic signal at a nearby congested intersection. Finally, exactions may take the form of monetary contributions, such as fees in lieu of dedication, or developer participation in a pro rata share of the cost of installing a traffic signal.

Monetary exactions are superficially similar to impact fees. Indeed, fees in lieu of dedication are a direct precursor of impact fees. The distinction lies in the manner in which the fee is assessed and the purposes of the fee. In-lieu fees are usually based on land costs only and are ill-suited for public services not requiring extensive amounts of land. Impact fees, on the other hand, are designed to cover a proportionate

share of the capital facility costs and may be applied to a wider variety of services. Monetary or in-kind exactions other than land are typically site-specific and often negotiated on a case-by-case basis, whereas impact fees are based on a general formula that applies equally to all developments.

In general, exactions fall into two broad categories: mandatory land dedication requirements and negotiated exactions. A major limitation common to both types of exactions is that they tend to address only those public improvements that are either on-site or in close proximity to the development. Such needs as roadway systems to relieve congestion or treatment plants to relieve the overloaded are generally beyond the power of an individual developer to address through the exaction process.

Mandatory Dedication Requirements. Mandatory park or school dedication requirements with in-lieu fee provisions typically apply only to residential subdivisions and are based on the number of dwelling units proposed. Requirements based on a percentage of site area have been overturned by the courts, since they do not recognize the differing service demands created by low- and high-density developments. Land dedication usually is required at the subdivision stage of the development process.

Land-dedication exactions have the advantage of being closely related to on-site needs created by new development. They have a long history of use and are generally accepted as legitimate exercises of local police power. They treat all residential subdivisions similarly and are relatively simple to administer.

A major drawback, however, is that land dedication only covers the cost of land and makes no contribution toward the cost of new capital improvements required by new development. In addition, since they are generally administered through the subdivision ordinance, developments not requiring land subdivision, such as apartments or previously platted land, are often exempted from the requirements.

Negotiated Exactions. Monetary or in-kind exactions are generally the result of open-ended negotiations between the developer and the local government, rather than from the application of a previously defined methodology. They may be imposed at any stage of the development process, particularly during requests for regulatory approvals such as zoning, special permits, or planned unit developments, where the local governing body has broad discretionary authority. Such exactions typically involve public improvements in close proximity to the development.

While negotiated exactions are standard procedure in many communities, they are tightly regulated in some states. In North Carolina and Virginia, for example, the state governments have authorized two kinds of zoning districts: general-use districts and conditional-use districts. Local governments cannot require developer contributions as a condition of granting general-use zoning, and can accept proffers only when conditional-use zoning is requested. In Virginia, jurisdictions outside of Northern Virginia and the Eastern Shore that have not been expressly granted conditional zoning authority are severely limited by the types of proffers that may legally be accepted.

In comparison with land-dedication requirements, negotiated exactions may cover the capital cost of public facilities in addition to land costs. Since such exactions are based on the specifics of an individual development proposal, they can address public-facility improvement needs, such as driveway turning lanes, that are directly related to the development.

Another drawback of negotiated exactions is that they lack the attributes of predictability and equity that gained park dedications their early and wide acceptance. The amount of the exaction may depend on

accidents of geography, such as the amount of land owned by a developer that happens to coincide with right-of-way needs, or on the political or bargaining skill of the applicant. Small developments, although they may cumulatively result in the need for significant capital improvements, often escape such exaction requirements because individually they are not capable of making significant contributions. Negotiations are often time-consuming and expensive for both the developer and the local permitting authority. Roadway exactions, for example, may be based on a traffic impact study required for each major development project.

Development Agreements. A variant of both of these approaches is the development agreement that is negotiated between the developer and the local government. Unlike mandatory dedications and negotiated exactions, development agreements cover a broad range of facilities (and other issues), provide for timing, phasing, and financing schedules, establish obligations of both parties, and help to settle issues that may otherwise have emerged in the future. Once in place, development agreements provide certainty to both the developer and local government on what to expect as the project builds out. Development agreements are widely used throughout California and Florida, and are increasingly seen in other growing states (Porter and Marsh 1989).

Special Assessment Districts

While developer exactions may be gaining in popularity, they do have their limitations. Exactions are only one-time assessments usually dedicated to capital improvements. As such, developer exactions have little relationship to maintenance and operating expenses, and they do not aid in the process of getting existing development to contribute its proportionate share of capital improvements. Special assessment techniques reviewed here help solve this problem. Many local governments will use both developer exactions and special assessment programs.

Special assessment districts are the broad title that includes local improvement districts, municipal utility districts, and other sub-jurisdictional entities whose purpose is to finance and often maintain capital facilities to accommodate growth and development. They are commonly characterized as geographic areas within which fees or taxes are collected (in addition to jurisdiction-wide general taxes) to fund capital investments or special services that clearly benefit properties within the district. The distinctive feature of special assessment districts is the very close and visible tie between the facility constructed or maintained and those who benefit from and pay for it. Unlike other financing options that target new development to pay for a share of communitywide improvements, special assessment districts assess all properties in a defined area for the range of facilities being provided. Assessments can finance debt service needed to provide the initial capital facilities and subsequently finance operations and maintenance costs. It is perhaps for this reason that they are the largest growing segment of American government. Table 2-3 reports the change in government units by type for the period 1972 through 2002.

TABLE 2-3. GOVERNMENT UNITS: 1972 - 2002[40]

Type of Government	1972	1982	1992	2002	Change From 1972	Percent Change
Federal	1	1	1	1	0	0.00%
State	50	50	50	50	0	0.00%
County	3,044	3,041	3,043	3,043	(1)	-0.03%
City	18,517	19,076	19,296	19,431	914	4.94%
Township	16,991	16,734	16,666	16,506	(485)	-2.85%
School District	15,781	14,851	14,556	13,522	(2,259)	-14.31%
Special District	*23,885*	*28,078*	*33,131*	*35,356*	*11,471*	*48.03%*

Special assessment districts are attractive for several reasons. They shift the burden of infrastructure finance from the general public to properties receiving direct benefit, while avoiding the short-term time horizon of purely private infrastructure provision. Property owners are assured that their additional taxes or fees will be spent in a manner that will benefit them, with a more single-minded focus than is characteristic of general-purpose government activities. Most states permit the creation of local improvement districts with the approval of the majority of property owners within the district. In Florida, the developer can unilaterally impose a local improvement district on all development subject to approval by the governing body. In Texas, "municipal improvement districts" serve the same function and are often tied to eventual annexation to a nearby city if the development is outside the city limits. In most cases, once the district is created, participation is mandatory for all property owners. An exception is Colorado, which permits the creation of special districts with voluntary participation of property owners within the district.

Assessments within special assessment districts are based on attributes of property--such as property value, parcel size, street frontage or use--assumed to be directly proportional to benefits accruing to property owners. However, the basis and level of assessments may vary within the district. For water and wastewater, utility assessments can reflect use. For drainage, stormwater assessments can be based on impervious surface area. For roads, assessments are often based on road frontage. For all other facilities, assessments can be based on value.

Special assessment districts have the ability to assess both existing development and vacant land in the immediate vicinity of the capital improvement. Particularly in local improvement districts with a considerable amount of existing development, revenue streams are more predictable than those of impact fees, development taxes, and developer exactions, which are dependent on development cycles. One concrete advantage resulting from the greater predictability of the revenue stream is that bonds can be issued by pledging to levy assessments necessary to repay the bonds.

Once established to provide infrastructure services, special assessment districts often operate outside the public spotlight that is focused, in most communities, on elected general governments. The proliferation of special assessment districts can weaken the authority of general governments to deal effectively with growth and to govern in the comprehensive way that they should. Widespread use of such districts can create a confusing hodgepodge of overlapping, independent taxing and assessment jurisdictions that lack the visibility and accountability, as well as the ability to coordinate different activities that characterize

[40] Census Bureau, 2002 Census of Governments, CGO2-1(P), July 2002, accessed January 22, 2005 from http://ftp2.census.gov/govs/cog/2002COGprelim_report.pdf

general-purpose governmental entities. Appendix B reviews details of a typical special assessment district process from the State of Washington.

Tax Increment Financing. A variant of special assessment districts is tax increment financing (TIF) districts. They differ from other special financing districts in that no special fees are assessed in addition to jurisdiction-wide taxes. District revenues consist of a diversion of that portion of revenues attributable to new development within the district. District revenues are used to retire bonds that finance the initial improvements that stimulated the new development. It is this internal financing, or bootstrap redevelopment, approach that accounts for much of the popularity of the TIF technique.

TIF is particularly attractive to cities because other taxing authorities, such as counties and school districts, may be required to contribute to the redevelopment fund, and that fund is ordinarily under the control of the city or its redevelopment agency. In theory, the other jurisdictions do not lose revenue because there would be no growth in the TIF district's tax base without the stimulating public investment. Even if this were true, however, the development attracted to the TIF district might have otherwise occurred elsewhere in the region.

Impact Assessments

Impact assessments are scheduled charges made against new development for the purpose of financing public facilities. Impact fees are obviously included in this category, but so are impact taxes and dedicated real estate transfer taxes.

Impact Taxes. A development impact tax, also called an improvement tax, is a tax on new construction, usually assessed at the time of application for a building permit. Impact taxes are generally based on the value of new improvements, and tend to be more popular than other kinds of taxes because they are levied on new construction rather than existing development. However, re-roofing, remodeling, and alterations to existing structures are also subject to such a tax. Even in a high-growth community like San Jose, California, over one-third of total building permit valuation is for such remodeling activities.

Unlike impact fees, impact taxes need not be based on the cost of facilities needed to serve the development, and the special studies required to justify impact fees are not required. In addition, revenues from such taxes may be spent in any way the local jurisdiction sees fit, subject to the provisions of state enabling legislation.

Impact taxes are not widely used. One exception is California; since passage of Proposition 13 in 1978, which limited local government revenue substantially, many California communities have resorted to impact taxes as a way to finance public facilities. The legislature also enabled impact taxes for schools affecting all new development, not just residential. California is not alone. Oregon enables local governments to impose a transportation impact tax, and Tennessee enables an “adequate public facilities” tax, as needed, to match infrastructure to new development demands.

Real Estate Transfer Taxes. Real estate transfer taxes are levied on real estate transactions. While impact taxes are generally based only on the value of new improvements, real estate transfer taxes are assessed on sales price, which includes the value of both land and improvements. As with all taxes, real estate transfer taxes cannot be adopted by local governments without state enabling legislation. Real estate transfer taxes are not dependent on new development, but rather on an active real estate market.

Transfer tax revenues are more predictable than revenues from impact fees or exactions and hence more suitable for bond financing. However, to solve infrastructure problems, there must be an explicit dedication of such taxes for infrastructure. In addition, if the real estate transfer tax is applied to all transactions including resales of existing homes, it would have a markedly different incidence than a program of developer exactions or impact fees.

Impact Fees. Impact fees (also known as development impact fees, system development charges, and connection charges) are charges levied on new development to pay for the construction of off-site capital improvements that benefit the contributing development. Impact fees are typically assessed using a fee schedule that sets forth the charge per dwelling unit or per 1,000 square feet of nonresidential floor space. Impact fees are one-time, up-front charges, with the payment usually made at the time of building permit approval, although some jurisdictions allow extended payments over a period of years.

Impact fees are a political response to the notion that development should pay its own way. In some communities, impact fees are actually considered a pro-growth tool because of their ability to defuse rising no-growth sentiments, ensure facility adequacy, and facilitate development approval. In addition, because they are typically used as a replacement for negotiated exactions, impact fees add speed and predictability to the development process. Impact fees are also more equitable than informal systems of negotiated exactions and are likely to generate considerably more revenue.

Impact fees can be used to fund a wider variety of services and types of facilities than is possible with exactions or special districts. Unlike dedication requirements that cover only land costs, impact fees can be used to cover the full capital cost of new facilities. Impact fees can also be structured to require new development to buy into service delivery systems with existing excess capacity, thus recouping prior public investments made in anticipation of growth demands. Recoupment of prior investments is generally not possible with other types of exactions.

The requirement that impact fees be spent to benefit the fee-paying development is typically met by earmarking revenues for expenditure in the zone in which they are collected. The requirement that fee revenues be spent within a reasonable period of time following fee payment imposes an additional constraint. However, proper design of benefit zones, provisions for pooling revenues from adjacent zones, and supplementing impact fee revenues with funds from other sources can overcome obstacles to successful fee implementation.

Sometimes impact fee revenue is pledged to support bonded debt service incurred to provide facilities needed to accommodate growth. In these cases bond covenants may call for using impact fee revenue first for this purpose, but to assure timely and adequate payment of debt service the fiscal base of the community is also pledged to the extent needed.

The primary strengths of impact fees include applicability to a wide range of public services, ability to promote efficient development patterns, predictability for public and private sectors, acceptability due to a clear linkage with the needs of new development, and some ability to help with bonded debt service. Their limitations weaknesses include inability to fund operating costs, lack of expenditure flexibility, and dependence on construction cycles.

Policy-Making Criteria

Each alternative likely has its own limitations, so how does one know which is best from the perspective of local government's need to meet facility financing needs and society's interest in supporting housing affordability? The following sections identify certain policy-making criteria and apply them to a comparative assessment.[41]

Revenue Potential. Any financing scheme must generate sufficient revenue to meet needs. In this context, however, revenue potential means the ability to generate revenue roughly concurrent with the development as well as the ability to use the revenue as supplemental security for general obligation and revenue bonds and for certificates of participation that are used to finance large-scale improvements meeting present and future needs. Finally, revenue potential means the ability to have all development contribute revenues, not just certain development under certain conditions.

The chief limitation of *developer exactions* is that only development triggering these actions pays and payment is usually limited to what is negotiated. For example, *mandatory dedications* address only a limited range of facilities, usually school and park land, and affect only new subdivisions and, often, only those exceeding a certain size. Although in-lieu fees for land dedication are common, our research indicates in-lieu revenues are insufficient to provide land of suitable quality at other locations. *Negotiated exactions* and *development agreements* can address a broader range of facilities including funds for them. Developer exactions as a class are poorly to moderately able to generate the revenue needed.

Impact assessments may be better able to generate the revenue needed because the base includes all new development. Here, however, *development taxes* are not widely used and are usually limited to a small range of facilities. On a practical level, *real estate transfer taxes* will not solve infrastructure financing problems unless they are dedicated to that purpose, because otherwise they will quickly be spent on other needs and the infrastructure financing problems will remain. *Impact fees* are seen as having the broadest base of dedicated revenue for new facilities of the three alternatives, but even here state statutes can limit impact fees to a small range of facilities. New Mexico, for example, does not allow impact fees to be assessed for schools, libraries, and community centers, and Georgia does not allow impact fees for transit.

Local improvement districts have potentially the greatest power of all financing mechanisms to generate revenue to finance capital expansion needed to accommodate development, but they often cannot finance off-site facilities impacted by the development they serve.

Proportionality. This is the connection between the demand for facilities created by new development, the cost of meeting those demands, and the extent to which the alternative apportions those costs to new development. Proportionality can also mean geographic equity and housing affordability if costs vary appropriately, but these two issues are separately discussed below.

Proportionality relates to equity, but equity comes in two broad forms: horizontal and vertical. Horizontal equity means essentially that similarly situated people will be treated similarly. Impact fees have survived challenge on this charge because at their simplest they meet this equity principle. Vertical equity considers differences within the same class based on objective measures or criteria. The trouble is that impact fees can be horizontally equitable but vertically inequitable. For example, under horizontal equity all dwellings

[41] This scheme was initially devised by Dr. Arthur C. Nelson and James B. Duncan for application to Hickory, North Carolina and has since been adapted by Duncan & Associates for use in numerous other communities.

would be assessed the same impact fee for parks. If dwelling units differ by the number of people living in them based on type or size of dwelling then vertical equity is not achieved. Federal data show, for example, that in 2003 the average household size of units less than 500 square feet was nearly 2.0 while for units over 2,500 square feet it was more than 3.0. Charging each unit the same means that the smaller unit over-pays with respect to its occupancy level while the larger unit under-pays.

In reviewing the options that are available against the criterion of proportionality, *developer exactions* are poor methods by which to assure proportionality. There exists some potential to achieve this in *development agreements* and, to some extent, in *negotiated exactions,* but our collective experience is that proportionality is a secondary concern to primarily mitigating impacts of new development. Moreover, not all development is subject to developer exactions. Among the *impact assessment* mechanisms, *impact taxes* and *real estate transfer taxes* are not required by law to be proportionate, but this is the very underpinning of *impact fees*. *Local improvement districts* are probably proportionate since all costs are internalized and apportioned usually based on some formula, but since they do not usually address off-site impacts, proportionality overall is not likely achieved.

Geographic Equity. This issue results from the fact that some areas are more costly to serve than others. This is one area where marginal cost pricing can become an element of policy-making even where the political will to charge prices based on marginal cost may not otherwise be present. An element of geographic equity is infill and redevelopment, since we often find older areas have excess infrastructure capacity (such as under-utilized schools). Even where the infrastructure needs to be upgraded, the cost can be less per unit of development if infill and redevelopment is encouraged.

It is difficult to presume that any *developer exaction* alternative by its design attempts to achieve geographic equity. The same can be said for *local improvement districts*. Neither *impact taxes* nor *real estate transfer taxes* are sensitive to geographic equity. Only *impact fees* have this potential and, while not widely used to achieve this form of equity, they are becoming more common across the country.

Administrative Ease. This factor refers to whether an alternative can be administered efficiently, and whether compliance can be achieved at reasonable cost.

Developer exactions are costly on local governments in two respects: first because such exactions typically engage local government and attorneys on all cases involving exactions; second because revenue generated (or its in-kind value from dedications) comes only from affected development. Moreover, developer exactions normally do not generate adequate revenue to compensate for the cost of processing them.

Impact assessments and *local improvement districts* are quite efficient in achieving their purposes. *Impact taxes*, *real estate transfer taxes*, and *impact fees* are assessed and collected easily through standard government processes. *Local improvement districts* are like developer exactions in that they involve usually extensive negotiations between the parties, but the result is a stream of revenue some of which may be used to offset the local government cost, and the continuing revenue supports development-specific infrastructure.

Public Acceptance. Above all, the alternative policy must have the potential for receiving broad public acceptance. In our view, this means that current taxpayers/ratepayers will not face higher taxes or rates for the benefit of new development, both in the near and long terms.

Most of these alternatives enjoy broad public acceptance. The *real estate transfer tax* may not enjoy a broader base of support since anyone selling property has to pay it, and almost everyone sells some property in his or her life. *Developer exactions* may allow citizens a chance to extract concessions but only on the most visible proposals. *Impact taxes* and *impact fees* probably have broad public appeal, but because impact taxes are not as widely used (perhaps because of the word "tax"), impact fees by default are probably more widely accepted.

Housing Affordability. This criterion relates to the ability of any alternative to be created or calibrated to reflect differences in facility cost by size and type of housing unit (proportionality), as well as the ability to offset costs for certain housing based on ability to pay.

None of the *developer exaction* alternatives are explicitly sensitive to housing affordability. *Development agreements* may include housing affordability features, but only on a case-by-case basis. Except for assessing residential development based on type and size of unit, *local improvement districts* are not explicitly sensitive to housing affordability. *Impact taxes* are usually based on house size so they appear to address housing affordability indirectly; similarly, *real estate transfer taxes* based on property value only address affordability implicitly. *Impact fees* have the greatest potential for being designed to minimize effects on housing affordability and can include provisions to waive fees altogether, as most impact fee enabling statutes provide.

Table 2-4 summarizes these alternative financing mechanisms in terms of these criteria.

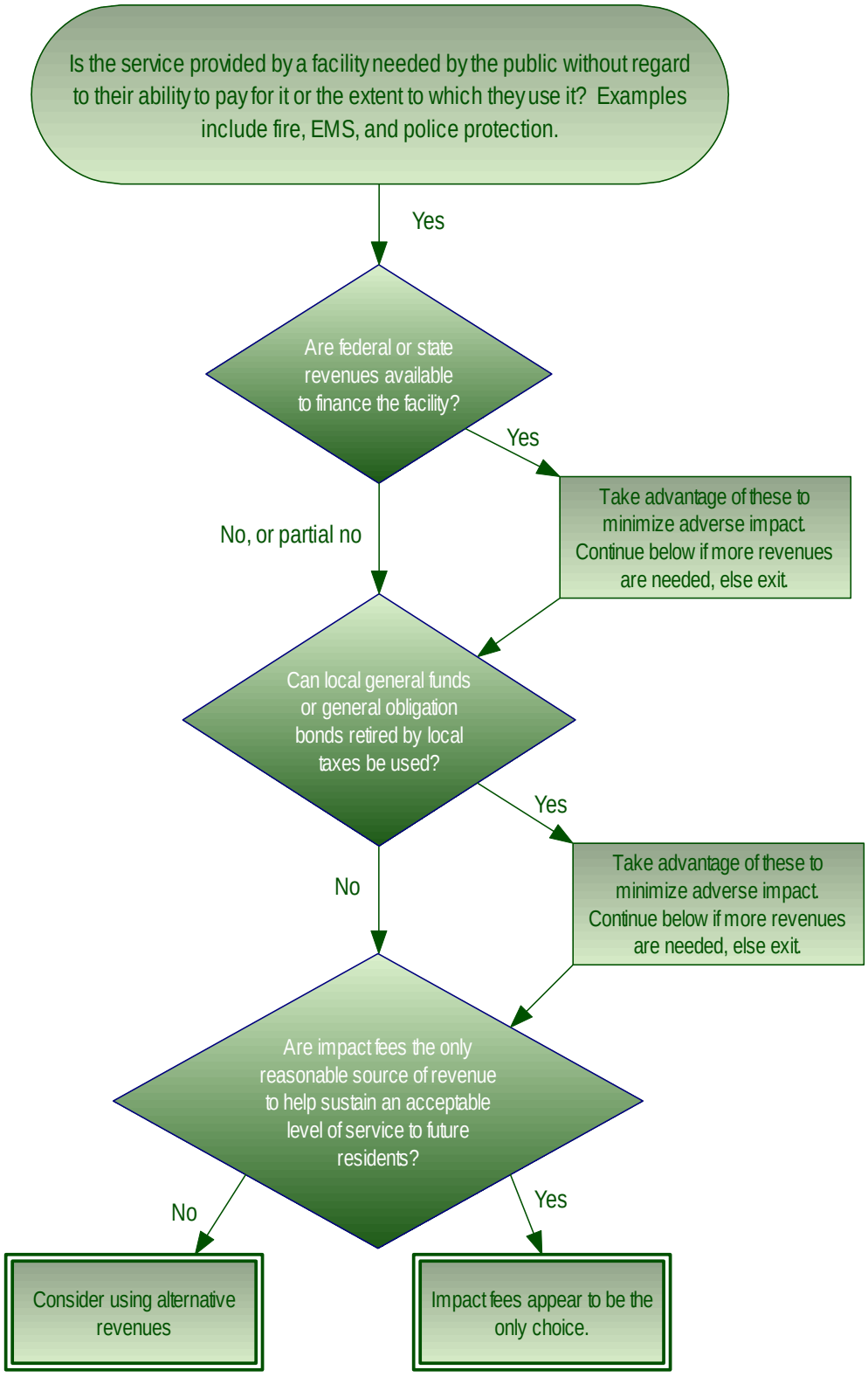
TABLE 2-4. SUMMARIZING THE POLICY-MAKING ISSUES OF ALTERNATIVE FINANCING MECHANISMS

Mechanism	Revenue Potential	Proportionality	Geographic Equity	Administrative Ease	Public Acceptance	Calibrated to Reflect House Impact Differences
Mandatory Dedications	Low – Usually applies to subdivisions.	Low – Often based on how much can be exacted in ad hoc negotiations.	Low – Exaction does not vary by geographic need.	Moderate – Features of actual dedications (such as location of park dedication land) can be disputed.	High – Affects only new development.	Low – Essentially a flat fee type of exaction.
Development Agreements	High – Can internalize project costs and fund off-site externalities.	Low – Often based on how much can be exacted in ad hoc negotiations.	High – Can take account of geographic variations.	Low – Often requires complex & expensive negotiations.	High – Affects only new development and can lead to more concessions than other exactions.	Low – Based only on an ad hoc negotiation that need not consider.
Impact Taxes	Moderate – Usually based on statutory limits.	Low – Based usually on statutory limits.	Low – Assessed without respect to geographic variations.	High – Usually based on simple assessment and collection procedures.	Moderate – Existing residents may pay when they buy a new home.	Low to Moderate – Usually based on value or a flat fee per unit.
Impact Fees	Moderate – Only based on difference between available revenue and revenue needed.	High – Legal standards require it.	High – Based on service area design which varies based on geographic differences.	High – Usually based on simple assessment and collection procedures.	Moderate – Existing residents may pay when they buy a new home.	Moderate to High – Can be designed to reflect differences in impact based on house occupancy characteristics.
Real Estate Transfer Taxes	Moderate – Limited to real estate sales and subject to statutory limits.	Low – Based on value but not on proportionality of impact.	Low – Assessed without respect to geographic variations.	High – Usually based on simple assessment and collection procedures.	Low to Moderate – Existing residents may pay when they buy and sale homes.	Moderate – Based on value which can reflect house impact differences.
Local Improvement Districts	Low – Limited usually to project and does not include development outside districts.	Moderate – Can be designed reflecting proportionate impacts and benefits but often not.	High – Can take account of geographic variations.	High – Usually based on simple assessment and collection procedures.	High – Affects only new development.	Low – Not usually designed to reflect differences in impact based on house occupancy characteristics.

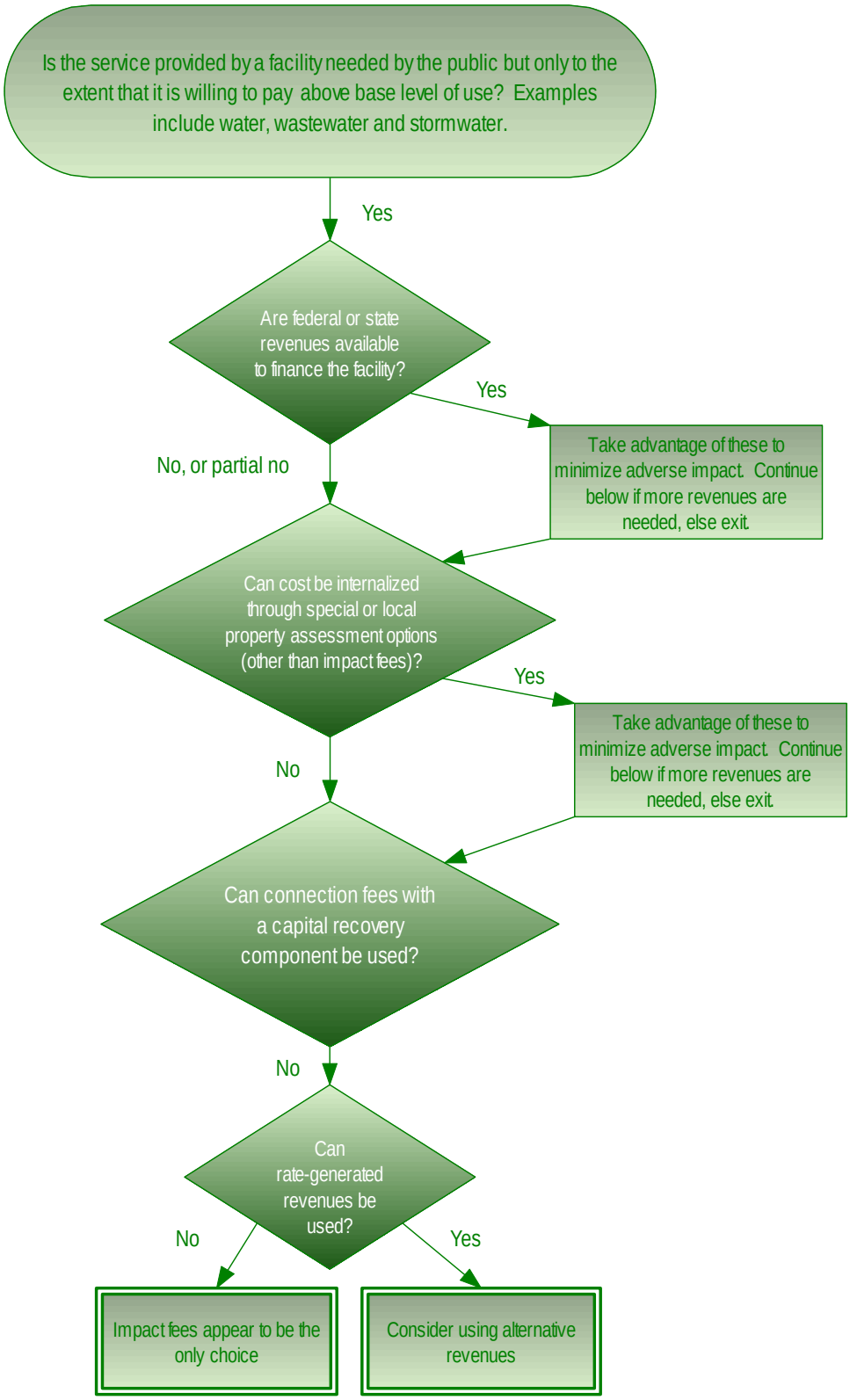
Alternative Funding Decision Charts

For a variety of political, legal, and pragmatic reasons impact fees are often seen as the most flexible option to address facility financing needs even though for the most part other funding alternatives may appear superior. Nonetheless, it is important to consider alternatives first to be sure that the impact fee choice is the best available option. The decision charts for specific facilities that follow are designed to help practitioners make rational decisions on potential funding mechanisms and consider if impact fees meet their needs. They should be used as a guide in the decision-making process.

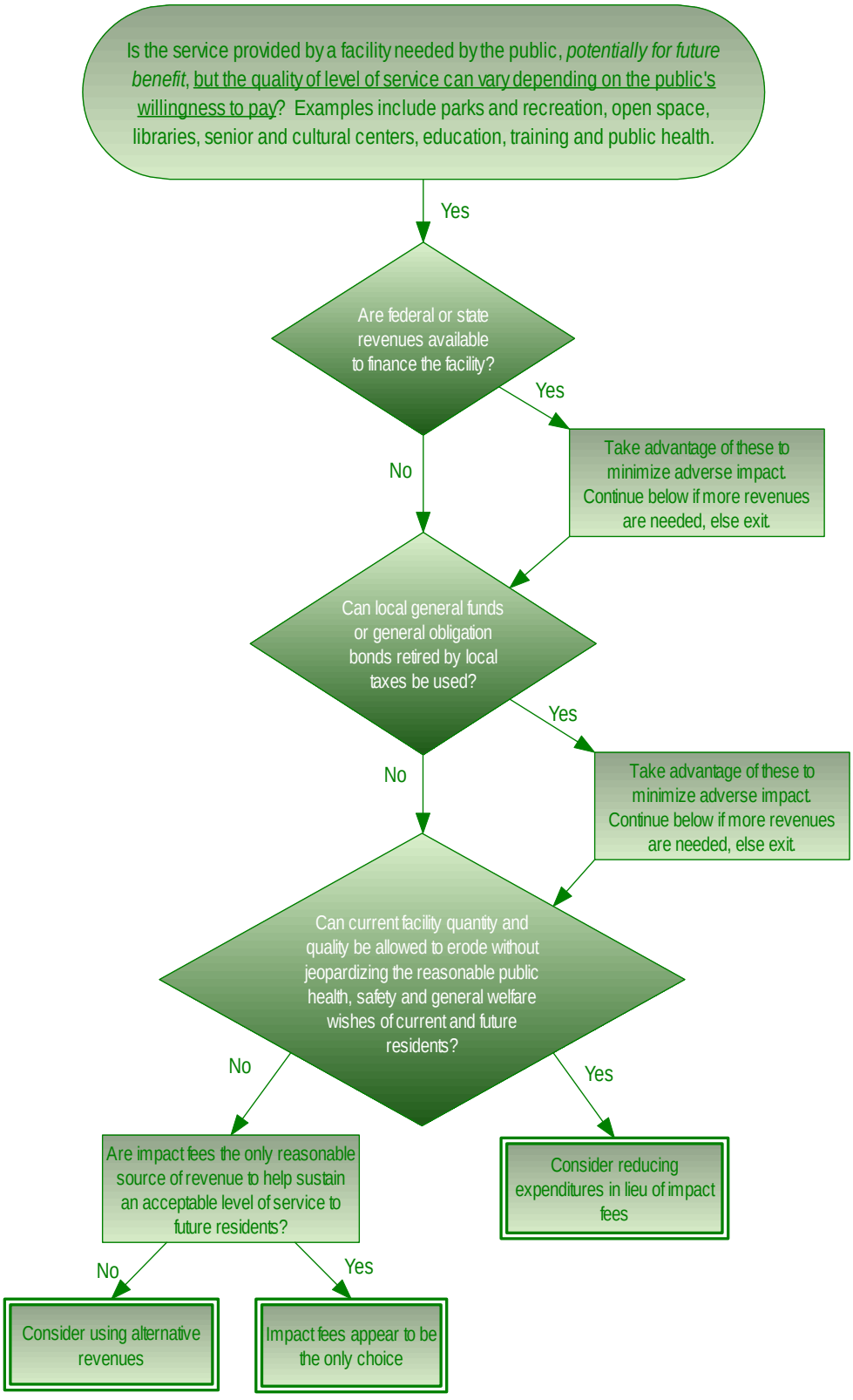
Decision Chart 2.1 Public Safety Facilities



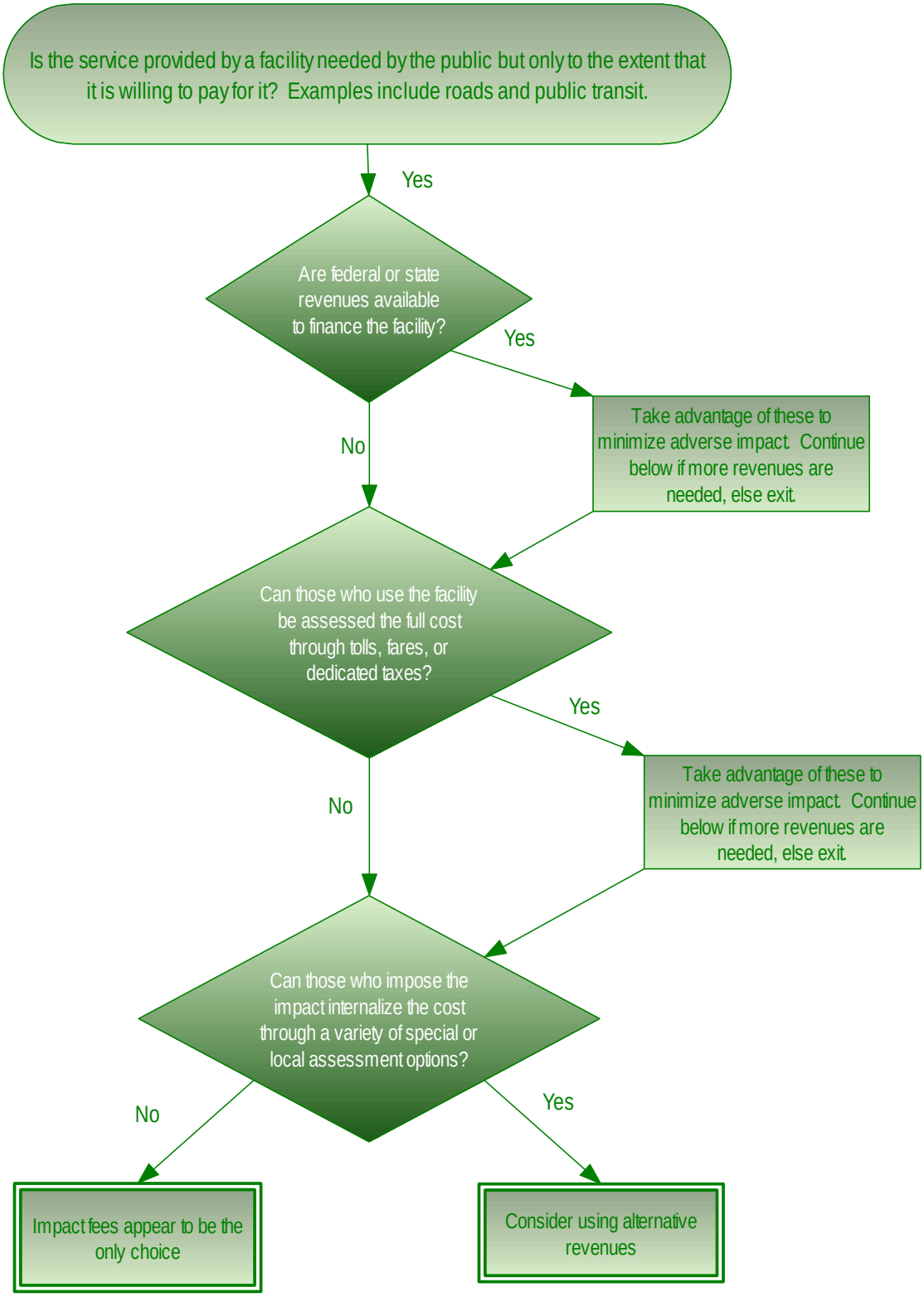
Decision Chart 2.2 Water-Based Utilities



Decision Chart 2.3 Public Amenity Facilities



Decision Chart 2.4 Transportation



Chapter 3 - The Role of the State

This chapter briefly summarizes states with impact fee enabling acts, and includes summary tables, and examples of evolving state statutes. It highlights those states that address affordable housing, reviewing how they enable facilitation of affordable housing in light of locally assessed impact fees. This information is useful to practitioners as the state statutes obviously affect the local impact fee design. For those states without enabling legislation, practitioners should look to case law.

Impact fees were originally developed by local governments in the absence of explicit state enabling legislation. Consequently, such fees were originally defended as an exercise of local government's broad "police power" to protect the health, safety and welfare of the community. The courts gradually developed guidelines for constitutionally valid impact fees, based on the relationship (in legal parlance "rational nexus") that must exist between the regulatory fee or exaction and the activity that is being regulated. Texas adopted the first general impact fee enabling act in 1987. To date, 26 states (illustrated in Figure 3-1) have adopted impact fee enabling legislation (for other than water and wastewater fees). These acts have tended to embody the constitutional standards that have been developed by the courts. Some states where impact fees are popular, such as Florida, currently do not have impact fee enabling legislation. In Florida, the authority of cities and counties to adopt impact fees is solidly established in case law. In some other states, such as Tennessee and North Carolina, impact fees and development taxes are generally authorized for individual jurisdictions through special acts of the legislature.

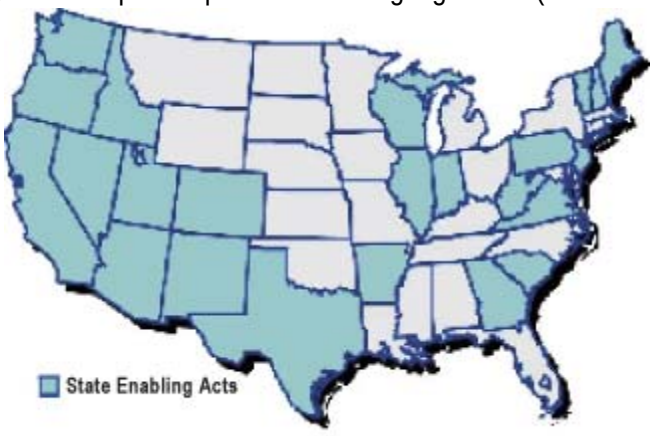


FIGURE 3-1. STATES WITH IMPACT FEE ACTS

Review of State Enabling Acts

Table 3-1 lists the states with enabling acts and reports the facilities eligible for impact fee financing. Some notable recent developments in impact fee legislation illustrate that states continue to wrestle with impact fee authority, parameters, and procedures. Several examples are highlighted here, and the full text of all the state statutes is posted at http://www.huduser.org/rbc/ and may be obtained from HUD or the authors.

The Texas legislature amended that state's impact fee enabling act, effective September 1, 2001. Credits against the impact fees for other taxes or fees that would be paid by new development and used for capital improvements of the same facility type as the impact fee are now required. As an alternative to performing a revenue credit calculation, cities[42] can simply reduce the impact fees by 50 percent. The maximum width of road impact fee service areas was increased from three to six miles, and the amount of time between mandatory updates was increased from three to five years. The recalculation requirement described above

[42] In Texas, counties have very limited authority to regulate development and do not have impact fee authority.

was eliminated. Finally, the number of public hearings required before impact fees could be updated was reduced from two to one (two are still required for initial adoption).

The Idaho legislature recently amended that state's impact fee enabling act in a way that favored a manufacturer in its dispute with the local highway district. Micron, a local manufacturer, had filed an independent assessment with the highway district for an expansion to its existing manufacturing facilities in Boise in which it claimed that it should get credit for all property taxes paid in the past or in the future by Micron to the district and available for capital improvements. The amendments to the act, which became effective July 1, 2002, seem to require local governments to calculate revenue credits in such a way that an existing business that expands its operations or builds a new facility gets credit for past and future tax payments by the business within the same service area, even though the gross fee before credits is based only on the net increase in traffic generated by the expansion or new construction. If interpreted as the act appears to intend, an existing business that expands or opens a new branch within the same service area would likely never pay a road impact fee, while a business that does not have existing operations within a service area would be required to pay. Such an inequitable outcome would be subject to challenge as contrary to the enabling act's more general "proportionate share" language. As a result, the amendments to the state act cast a cloud of uncertainty over how revenue credits should be calculated in Idaho.

Two brief examples of states' continuing efforts to refine impact fee authority are illustrated here:

- Arkansas adopted an impact fee enabling act on April 22, 2003. The act only applies to municipalities and water or wastewater providers, it does not authorize impact fees for counties. It clarified the authority of cities to enact impact fees, which had not been firmly established before this. Like most state acts, it does not allow school impact fees. It is relatively short and has few requirements. Its only unusual feature is that it requires that the amount of the impact fee paid be itemized separately on the closing statements when property is sold. The original version of the bill, drafted at the request of the state homebuilders association, had proposed that the fees for single-family homes actually be paid at time of closing by the buyer, but this requirement was dropped in conference committee.
- Colorado also adopted an impact fee enabling act. Senate Bill 15 was signed by the governor on November 16, 2001. Among other things, this bill created a new Section 104.5: Impact Fees, in Article 20 of Title 29, Colorado Revised Statutes, which specifically provides that:

  Pursuant to the authority granted in section 29-20-104 (1) (g) and as a condition of issuance of a development permit, a local government may impose an impact fee or other similar development charge to fund expenditures by such local government on capital facilities needed to serve new development.

  Home-rule cities in Colorado had long assessed impact fees, but the authority of counties and towns to assess impact fees was less clear. While clarifying the authority issue, the enabling act has created some confusion about whether local governments can assess impact fees at time of building permit, or whether they must assess them at some earlier stage in the development process.

In New Mexico, House Bill 334, which was signed by the governor and became law in 2001, specifically authorizes impact fee waivers for affordable housing projects.

The Nevada legislature passed Assembly Bill 458, which became effective July 1, 2001. The bill added traffic signals, parks, police stations and fire stations to the list of facilities that could be funded with impact fees.

TABLE 3-1. FACILITIES ELIGIBLE FOR IMPACT FEE ASSESSMENT BY STATE

State	Roads	Water	Sewer	Storm Water	Parks	Fire	Police	Library	Solid Waste	School
Arizona (cities)	●	●	●	●	●	●	●	●	●	
Arizona (counties)	●	●	●		●	●	●			
Arkansas	●	●	●	●	●	●	●	●		
California	●	●	●	●	●	●	●	●	●	●
Colorado	●	●	●	●	●	●	●	●	●	
Georgia	●	●	●	●	●	●	●	●		
Hawaii	●	●	●	●	●	●	●	●	●	●
Idaho	●	●	●	●	●	●	●			
Illinois	●									
Indiana	●	●	●	●	●					
Maine	●	●	●		●	●			●	
Montana	●	●	●	●	●	●	●	●	●	
Nevada	●	●	●	●	●	●	●			
New Hampshire	●	●	●	●	●	●	●	●	●	●
New Jersey	●	●	●	●						
New Mexico	●	●	●	●	●	●	●			
Oregon	●	●	●	●	●					
Pennsylvania	●									
Rhode Island	●	●	●	●	●	●	●	●	●	●
South Carolina	●	●	●	●	●	●	●			
Texas	●	●	●	●						
Utah	●	●	●	●	●	●	●			
Vermont	●	●	●	●	●	●	●	●	●	●
Virginia	●									
Washington	●				●	●				●
West Virginia	●	●	●	●	●	●	●			●
Wisconsin (cities)	●	●	●	●	●	●	●	●	●	
Wisconsin (counties)		●	●	●	●	●	●	●	●	

Selected provisions of state impact fee enabling acts are summarized in Table 3-2. The first column shows the maximum number of years that impact fees can be retained by a local government before being spent on eligible facilities or refunded back to the fee payer. The second column indicates the presence of a rather onerous recalculation requirement, which mandates that the local government recalculate the impact fees after completion of the capital improvements plan, then refund any excess collected if actual costs were less than projected costs. This provision was in the original Texas act and was copied virtually verbatim in several other acts. The third column indicates whether and for how long fee assessment locks in the amount of the fee. In the Texas act, the fee schedule in effect at time of platting is the maximum fee that may be charged to development within the subdivision, regardless of when development actually occurs. The final column indicates the frequency within which the fees must be updated.

TABLE 3-2. SELECTED IMPACT FEE PROVISIONS

State	Time Limit for Expenditures	Recalculation Requirement	Assessment Locks in Fee	Update Frequency
Arizona (cities)	None	no	No	none
Arizona (counties)	5 years	no	No	2 years
Arkansas	7 years	no	No	none
California	5 years	no	No	none
Colorado	none	no	No	none
Georgia	6 years	no	180 days	none
Hawaii	6 years	no	No	none
Idaho	10 years	no	1 year	5 years
Illinois	5 years	no	No	5 years
Indiana	6 years	no	3 years	5 years
Maine	none	yes	No	none
Montana	none	no	No	none
Nevada	10 years	yes	No	3 years
New Hampshire	6 years	no	No	none
New Jersey	none	no	No	none
New Mexico	7 years	yes	4 years	5 years
Oregon	none	no	No	none
Pennsylvania	none	yes	No	none
Rhode Island	8 years	no	No	none
South Carolina	5 years	no	Forever	none
Texas	10 years	no	Forever	5 years
Utah	6 years	no	No	none
Vermont	6 years	yes	No	none
Virginia	15 years	yes	Forever	2 years
Washington	6 years	no	No	none
West Virginia	6 years	no	No	none
Wisconsin (cities)	none	no	No	none
Wisconsin (counties)	none	no	No	none

Impact Fee Statutes and Affordable Housing

Of the 26 states that have explicit impact fee enabling statutes, 14 address affordable housing: California, Colorado, Georgia, Idaho, Indiana, New Jersey, New Mexico, Pennsylvania, South Carolina, Texas, Vermont, Washington, West Virginia, and Wisconsin. Only Idaho, New Mexico, Pennsylvania, and South Carolina define affordable housing and all use variations of HUD's 80 percent median income standards. The rest would presumably leave it to local governments to define the term for local application.

Fourteen states enable impact fees to be waived on qualifying affordable housing developments. Of those, five require waived fees to be financed or paid for from a source of revenue not related to impact fees: Georgia, Idaho, South Carolina, Utah, and Washington. Another nine states enable waivers without making up the lost revenue: Colorado, Indiana, New Jersey, New Mexico, Pennsylvania, Texas, Vermont, West Virginia and Wisconsin.

Other states address affordable housing in different ways. California exempts housing dedicated for elderly occupants and state-owned migrant farm labor housing from school impact fees. Texas requires that local governments failing to properly certify impact fees would be assessed a penalty of 10 percent of their collections with the funds deposited in a housing trust fund.

Two states require an affordable housing impact assessment of sorts. South Carolina requires that "Before imposing a development impact fee on residential units, a governmental entity shall prepare a report which

estimates the effect of recovering capital costs through impact fees on the availability of affordable housing within the political jurisdiction of the governmental entity" (6-1-930(A)(2)). Wisconsin has a similar provision requiring that local governments devising impact fees ". . . includ(e) an estimate of the effect of recovering these capital costs through impact fees on the availability of affordable housing within the political subdivision" (66.0617(4)(a)3.).

Chapter 4 - Impact Fees and Housing Affordability

This Guidebook encourages local governments to consider issues of fairness and equity which work in favor of affordable housing. This chapter reviews key elements associated with setting the amounts of particular impact fees in different jurisdictions. It explains the rationale for the use of impact fees based on square footage as a starting point, followed, in some cases, by additional elements that further vary costs across households to reflect other underlying cost differences.

The chapter begins by reviewing the general choice of impact fee cost variables and possible approaches to defining choices faced by many jurisdictions. Next, the chapter presents the recommended logical method of using household square footage to determine the impact fees of a wide variety of improvements, ranging from parks, to fire, to roads, to water and sewage. This section also describes methods in addition to residential square footage that can be used to set impact fees for facilities such as water supplies or roads. Next, simplified methods are further explained through the use of real-world examples of specific kinds of impact fee setups that have occurred in selected locations. Finally, underlying policy approaches commonly used to limit the effect of impact fees on particular types of affordable housing, with supplemental decision guides about affordability exemptions, exclusions, waivers and forgivable loans are included.

It is important to note that the guidance given in this chapter is based on years of research and consulting with local governments, and has come together in this Guidebook as the authors' best recommendation based on this experience base. Readers should also refer to Appendix C of the Guidebook for further understanding and discussion of the methodology suggested in this chapter.

Review of Impact Fee Cost Variables

Impact fees can be calculated in a range of different amounts and imposed using a wide variety of different structures that ultimately depend on the state, the local jurisdiction, and the preferences of citizens who influence the local government process. This is partly a reflection of legal distinctions and partly a reflection of policy matters. Over time, fees have evolved as the complexity of impact fee arrangements and amounts of money being collected have grown.

Early uses of impact fees were typically in simple forms using constant or flat fees across houses or apartments, often without regard to any notion of size or type of unit that was covered under the fee. This kind of fee structure charges impact fees to purchasers in a way that is simple to calculate and provides the necessary revenues for construction of infrastructure. Many jurisdictions still charge flat impact fees on all residential units regardless of type or size. However, underlying costs across units range widely based on size of the unit and number of occupants that tend to use more or less of particular services. While the fixed amounts are undoubtedly simple to understand and enforce, they are inherently unfair. Flat rate impact fees compromise affordability and are socially negative to the degree they systematically overcharge purchasers in smaller, less expensive houses or apartments and undercharge others in the most valuable houses.

If impact fees are to be varied based on differences between units, then what is the appropriate variable? Choices are essentially unit type (single-family detached, townhouse, condominium, apartment and

manufactured home are usual types), number of bedrooms, or size in square feet. Then the per capita multiplier would be characterized as persons per unit, based on unit type, number of bedrooms, or square footage of heated space. (In the case of schools the measure would be based on public school students.) All would be an improvement over assessing a flat fee on all residential units despite differences in occupancies between them.

Research done as background for this project indicates that assessing impact fees for residential development based on persons per 1,000 square feet may be the easiest and fairest way to make such assessments. It is fair because persons per dwelling unit rise as the size of the unit increases, to a point, so this relationship may be necessary to meet the proportionality criterion of impact fees. It is easier because the relationship can be calculated simply as the quotient of total residential square feet from assessor records and total population for the same year of the assessor records. From this at least a rough proportionality is derived that assures more equitable treatment than a flat fee. This simple yet equitable approach to calculating impact fees is based on several studies showing a general pattern that persons per 1,000 square feet do not vary much by type of unit within a jurisdiction. Table 4-1 summarizes results from five such studies. While variations exist in occupancy levels between types of units, they are considered *de minimus*. Exactions such as impact fees need only meet the principle of "rough" proportionality so focusing on precise differences in levels of occupancy between types of units should not be necessary. All that should be necessary is calculating the overall average figure of persons per 1,000 square feet for the jurisdiction for which impact fees may be assessed.

TABLE 4-1 PERSONS PER 1,000 SQUARE FEET

County	SF Detached	SF Attached	Apartment/Condo	Average
Brevard FL	1.5	1.4	1.4	1.4
Collier FL	1.2	1.1	1.2	1.2
DeKalb GA	1.4	1.3	1.3	1.3
Douglas CO	1.4	1.3	1.6	1.4
Stafford VA	1.4	1.6	1.4	1.4

Source: Compendium of studies conducted by the authors.

Mechanically, for any given jurisdiction the relevant impact fee (except for public school impact fees) should be proportional to the following expression:

*[Total Residents / Total Residential Heated Space] * 1,000*

where:

Total Residents is either based on the most recent census or a current estimate,

Total Residential Heated Space is the sum of residential space in square feet based on property assessor records for the same year as the residential estimate.[43]

** The multiplier 1,000 provides a figure for persons per 1,000 square feet of heated area.*

[43] If the 2000 census is used, then the denominator should be the sum of total residential heated space constructed 2000 or earlier based on assessor records.

Note that where the impact fees involve public school services, *Total Public School Students* should be substituted for *Total Residents* with the balance of the formula remaining the same. Technically, there may also be a floor (such as a minimum assessment for all units under 800 square feet) and a ceiling (such as a maximum assessment for units more than 3,500 square feet (see Table 4-3), unless local knowledge suggests otherwise.[44] This approach was pioneered by the metropolitan Atlanta chapter of the National Association of Home Builders and used widely throughout that metropolitan area. It is also becoming increasingly used in Florida and in numerous Mountain and Western states. To a very large extent, this approach to calculating impact fees may do more to lessen potentially adverse effects on housing affordability than any other – aside from waiving fees outright (see the case studies and related discussions below).

Research by the National Association of Home Builders based on the American Housing Survey data appears to support this approach with some refinement.[45] Table 4-2, reporting NAHB's analysis, shows the national average persons per unit for different categories of house base based in 500 square foot increments above 1,000 square feet. It is more precise than the more general calculation reported in Table 4-1. It confirms that between a range of house sizes – in this case 1,000 and 3,000 square feet – persons per unit increases as house size increases. The rate of increase between categories falls as size increases, however.

Using NAHB's data, one way in which to refine estimates of persons per unit based on house size is to establish a base number of persons for the first 1,000 square feet of a residential unit, then increase the number of persons per unit in 500-square foot categories up to 3,000 square feet. This would show that for all residential units the average occupancy is 2.03 persons for units at or less than 1,000 square feet and increases at an average of about 0.16 persons per unit for each increment of 500 square feet to 3,000 square feet, capped at 3.05 persons per unit thereafter. Detached units would have slightly higher base and cap figures at 2.35 to 3.07 respectively. For single-family attached (townhouse) units, the range to be 2.03 to 2.66 and for multifamily the range is 1.89 to 2.29.

The NAHB analysis does not consider smaller units (under 500 and between 500 and 1,000 square feet) or larger ones up to 3,500 square feet. The data also appear to considers only occupied ones – thus over-stating the impact by removing vacant units nonetheless intended for occupancy (such as those for-sale, for-rent, or vacant between moves). This would have the effect of increasing impact fees more than normally recommended in practice. Using the NAHB's reporting format for persons per unit by increments of 500 square feet, Table 4-3 reports a refined analysis. It extends the detached unit analysis for detached units because of the very sizeable number of homes in those categories but has fewer categories for all forms of attached units (townhouses, condominiums, cooperatives and apartments) because of reduced sample size.

---

[44] For example, in popular coastal areas, new homes within walking distance of the beach range from 4,000 square feet to more than 10,000 square feet because they are rented by multiple families during holidays. At the other end of the spectrum, a college town may have four or more persons per small apartment unit even though the national average is around half that.

[45] Memorandum July 7, 2006 from David A. Crowe, Senior Staff Vice President, to David Engel, Director, Affordable Housing Research and Technology Division, U.S. Department of Housing and Urban Development.

TABLE 4-2. OCCUPANCY BY OCCUPIED UNIT SIZE BASED ON UNIT TYPE

Unit Type	Square Foot Range	Persons Per Unit	Change in Persons Per 1,000 Square Feet	Percent Change in Persons Per 1,000 Square Feet
All	<1,000	2.03		
	1,000-1,500	2.49	0.46	22.7%
	1,500-2,000	2.67	0.18	7.2%
	2,000-2,500	2.83	0.16	6.0%
	2,500-3,000	2.95	0.12	4.2%
	3,000+	3.05	0.10	3.4%
Single Family Detached	<1,000	2.35		
	1,000-1,500	2.57	0.22	9.4%
	1,500-2,000	2.70	0.13	5.1%
	2,000-2,500	2.86	0.16	5.9%
	2,500-3,000	2.96	0.10	3.5%
	3,000+	3.07	0.11	3.7%
Single Family Attached	<1,000	2.03		
	1,000-1,500	2.33	0.30	14.8%
	1,500-2,000	2.42	0.09	3.9%
	2,000-2,500	2.50	0.08	3.3%
	2,500-3,000	2.62	0.12	4.8%
	3,000+	2.66	0.04	1.5%
Multi-Family	<1,000	1.89		
	1,000-1,500	2.27	0.38	20.1%
	1,500-2,000	2.42	0.15	6.6%
	2,000-2,500	2.30	-0.12	-5.0%
	2,500-3,000	2.43	0.13	5.7%
	3,000+	2.29	-0.14	-5.8%

Source: National Association of Home Builders based on analysis of *American Housing Survey for the United States in 2003*.

TABLE 4-3. OCCUPANCY BY UNIT SIZE BASED ON UNIT TYPE FOR ALL UNITS

Unit Type	Square Foot Range	Persons Per Unit	Change in Persons Per 1,000 Square Feet	Percent Change in Persons Per 1,000 Square Feet
Detached	<500	2.01		
	500-1,000	2.15	0.14	7.0%
	1,000-1,500	2.44	0.29	13.5%
	1,500-2,000	2.60	0.16	6.6%
	2,000-2,500	2.77	0.17	6.5%
	2,500-3,000	2.86	0.09	3.2%
	3,000-3,500	2.94	0.08	2.8%
	3,500+	3.02	0.08	2.7%
Attached	<500	1.36		
	500-1,000	1.61	0.25	18.4%
	1,000-1,500	1.95	0.34	21.1%
	1,500-2,000	2.20	0.25	12.8%
	2,000-2,500	2.21	0.01	0.5%
	2,500+	2.29	0.08	3.6%

Source: Weighted-unit analysis of *American Housing Survey for the United States in 2003*, based on number of non-seasonal occupants per unit by unit type and size, including vacant units.

This application of the NAHB approach results in the following formulas based on national data, which is a refinement to the approach illustrated in Table 4-1:

Detached Units

Occupancy = *2.02* persons per unit beginning at *500* square feet
plus *0.000333* persons per square foot (equivalent to about 0.333 persons per 1,000 square feet) up to *3,500* square feet then
3.02 persons at 3,500 square feet and larger

Attached Units

Occupancy = *1.36* persons per unit beginning at *500* square feet
plus *0.000465* persons per square foot (equivalent to 0.465 persons per 1,000 square feet) up to *2,500* square feet then up to 2,500 square feet then
2.29 persons at 2,500 square feet and large

The actual figures can be estimated for each of the more than 40 metropolitan areas included in the *American Housing Survey*, including the more than 200 sub areas. They may be more difficult to estimate for individual communities, however, because of data limitations. This is why the simple approach suggested in Table 4.1 and its associated discussion may be practical. Adjusting locally derived figures by national trends may help refine local analysis. [46]

In addition, the maximum or cap figures shown above for detached and attached units are more an artifact of sampling limitation than reality in many situations. While the occupancy level may flatten out above a certain size in some communities it may increase in others. Moreover, very large homes may provide living quarters for support staff. For example, in some affluent sections of all metropolitan areas families may employ nannies with one benefit being living quarters for them and their children. In resort areas, large homes may not be occupied by many people during the off-season but during peak season a large home may serve multiple families each renting sections of the home or pooling resources to rent the entire home. Finally, there is some concern that inevitably as population pressures increase along with rising energy prices and rising home mortgage interest rates larger homes may become available for formal (such as separate entrances and kitchens and such) to informal (such as one entrance and common use of certain rooms) thereby resulting in larger homes being occupied by more people than may have been assumed when the home is constructed. It may be reasonable local planning policy to include this contingency in long-range land-use and facility planning.

There are other considerations. Even with the characteristics determined, the actual analysis of impact fees based on societal costs is not entirely straightforward. For example, every home effectively has a set of unique occupants based on number of people, gender, ages and other characteristics, yet impact fees for the specific house do not vary in this level of detail. Checking each family each year to set fees is not only impractical but it would be a charge on each family rather than an impact fee on the house. Therefore,

[46] If local conditions are roughly proportionate to national experience it may be possible to use the formulas adjusted to reflect local conditions.

rather than basing individual household charges on actual family characteristics the fees should properly be based on amounts that would *typically* be charged on the property. These charges would reflect the fees from the average, projected occupants that tend to occupy the property being taxed and who pay the costs resulting from the fee. Setting typical fees generally avoids the need to review occupants of the house over time, while still charging fees based on the likely potential charges from such a house. Although the actual fees to owners could easily be more or less than costs they incur in any particular year, the idea is that over time the occupants will evolve, owners will change, and average differences between actual families in a home and typical families that might occupy the same home will tend to become smaller. As a result, to the extent that impact fees vary across houses the differences are based on characteristics of the home and its location, and while those characteristics will typically relate to specific occupants they may not do so in particular cases.

A final point is necessary. Measuring impact based on the occupancy of the original tenants will mask overall occupancy over the life of the structure. This will have the effect of over- or under-charging. For example, the authors are aware of homes constructed in resort coastal areas that are used principally as second homes so the apparent occupancy level is small when averaged over the year – and school impacts are negligible since the school children, if any, attend elsewhere. Yet, over a generation, that same home may become part of the regular stock of homes occupied by permanent residents and their children. Impact fees assessed based on the original occupancy characteristics in this case would be under-charged based on long-term impacts of the home on the community. At the other end of the spectrum, a new subdivision in a metropolitan area may be occupied initially by families with children and the public school student generation rate can appear quite large. Yet, over time, as the children move out of the house, the parents remain often becoming "empty nesters" before they sell perhaps to a new family with children. Impact fees based on the original occupancy in this case would be over-charged relative to long-term impacts of the home. It is for these reasons that long-term, average occupancy characteristics are the normally recommended basis for calculating impact fees.

Description of Square Footage Valuations Using Impact Fees

Experience has shown that impact fees can potentially be imposed for financing a wide range of public facilities and services. Of course, there are variations in the underlying laws as well as in the particular fees that communities want and need to put into place. This section presents basic descriptions of the logical procedures that can potentially be used to set different types of impact fees, assuming the community is legally authorized to do so and the residents have chosen to act this way. Note that in this section the discussion is designed to be general, so that it works across communities.

For this analysis, impact fees are organized into the following five types:

- Parks and libraries
- Police and fire
- Water, sewer and stormwater
- Roads
- Schools

There are some general principles used in these procedures that apply to all types of impact fees, and are perhaps the most important guidance in this document. This includes basing impact fees on the size or square footage, because setting any fee at a fixed amount regardless of house size tends to overcharge

small houses and undercharge large houses. Even though fees that are equal for all houses might be legal, that approach is unnecessarily simplified and will clearly compromise housing affordability. The recommendation is to use conditioned square footage as the best parameter capturing size of home. While the number of bedrooms or internal rooms might also work, they are discouraged here. The most important reason is that designation of rooms as bedrooms and division of internal rooms both are more subject to irrelevant manipulation than conditioned square footage. In the simplest case, basing impact fees entirely on house size may be sufficient.

General Principles. The preliminary steps in determining the amount of any particular impact fee are as follows.

1. Identify a specific target service and an affected geographic area,
2. Determine the size of the affected population (the number and square footage of houses projected and, for impact fees on schools, the number of schoolchildren),
3. Estimate the total capital cost required to provide the target service, and the amount of capital currently provided or expected to be provided by revenue sources other than impact fees, and
4. Calculate the balance of capital costs for the target services that need to be covered by impact fees because they are not currently provided or expected to be provided by other sources.

The other principles used to set impact fees typically differ from one type of fee to another. This happens when the underlying costs vary significantly based not only on house size, but also on house characteristics or neighborhood attributes other than size. Examples include distance from the home to a specific facility, or density around the home in a small neighborhood. The most basic variability factors related to each type of impact fee are discussed in the following sections. While actual impact fees may ultimately vary with other factors as well, so long as the variables laid out here correspond to most of the variation across homes, the need for using additional variables is relatively small and the added complexity may be large.

It is most common for the straightforward situation to arise when new facilities being analyzed are based on serving new development alone, since that simplifies identifying the amount of funding (and limit on that amount) that can be collected from new facilities. Once the amount of capital needed from impact fees is calculated and the number of homes expected to be built and covered by the fees is determined, then the fee amounts can be calculated. As noted above, in the simplest cases these data may be sufficient to set specific impact fees applicable throughout the relevant community. In other more complex cases the impact fees should vary based on additional factors related to the underlying project. If for some reason the impact fee amounts determined at this stage are unworkable or unacceptable, then this process must be repeated starting with the preliminary steps above until an acceptable case is identified.

The basic process for setting different types of impact fees is illustrated under each of the five types: parks and libraries; police and fire; water, sewer and stormwater; roads; and schools.

Parks and Libraries. The general principles can readily be used to cover the cost of building public parks and libraries. Unlike other impact fees these typically do not depend on factors such as distance from the home to the service, since users must pay their own travel costs. Similarly, given the number of users, the costs are independent of the sizes of lots where user homes are located, and the overall density of the neighborhoods where users live because such services are based not on density but delivery of the service consistent with level-of-service standards. The single factor with the greatest effect on costs is the size of houses in the service area, because larger homes will house larger families that will generally tend to use parks and libraries more than smaller families. As shown earlier, larger homes up to some threshold have

more occupants than smaller ones. It is simple and straightforward to vary impact fees between houses based on house area, with overall amounts of all the fees set to cover the underlying costs.

Example:
If a new library will serve 25,000 new residents and cost $1,000,000 to build, then the total library impact fee per new resident would be $40. Assuming all new residents live in detached homes and using the formula above, the impact fee for a 2,000 square foot home would be:

(2.02 x $40) + (0.000333 x (2,000 – 500) x $40) = $100.80.

Police and Fire. Another common type of impact fees is for police or fire services. These funds will cover items such as new or enlarged police stations or firehouses, or long-lived capital equipment used by these departments. Generally speaking, larger homes clearly present greater potential demands on these services because they contain more occupants and more property. As a result, fees could properly increase with house square footage. Furthermore, both police and fire departments will experience costs that vary with the square mileage of their jurisdictions because of the need to travel. This means that the impact fee can vary across properties based on the distance from the property to the government office.

Example:
If a new fire station will serve 25,000 residents and cost $20,000,000 to build, then the total fire station impact fee per new resident is $800. If a new detached home is 2,000 square feet, the fire department impact fee would be:

(2.02 x $800) + (0.000333 x (2,000 – 500) x $800) = $2,016.00.

To the extent the distance from the fire department to the new house affects the cost of providing protection, the fees should be higher or lower at varying distances. For example, in Missoula, MT, the impact fee for rural areas is on the order of 10 times that for urban areas because lower densities mean more fire stations per unit for the same response time than higher density areas.

Water, Sewer and Stormwater. Many communities provide homeowners with water from publicly owned facilities. Frequently they will also treat or dispose of household sewage, and manage stormwater from large or medium-sized subdivisions. While the day-to-day costs of operations are typically covered by tax receipts or marginal fees collected from all users, the capital expense needed to invest in construction or expansion of the required equipment and facilities may be raised from impact fees on new homes.

Example:
If a new water supply facility will serve 10,000 new residents and cost $10,000,000 to build, then the water supply impact fee on new houses averages $1,000 per resident. If a new detached home is 2,000 square feet the impact fee would be:

(2.02 x $1,000) + (0.000333 x (2,000 – 500) x $1,000) = $2,520.00

However, two additional factors affect the appropriate fee per house.

Distance from House to Water Supply Facility. First, to the extent the separation between houses and the water supply facility significantly increases the cost of the water system, the impact fees

should be higher at above-average distances from the water supply facility and lower at below-average distances. For example, if the water source serves an area extending 10 miles in each direction, then the cost experienced by the water supplier might rise and the fees imposed on purchasers should be increased over a range from, say, $500 per new resident at a distance of up to 2 miles to $2,000 per new resident at distances from 8 to 10 miles. The effect is to vary the fees imposed on purchasers to the extent costs vary with distances from their homes to the water supply.

Neighborhood Density. Second, to the extent the separation between nearby houses varies significantly across users, the cost of the pipe approaching the houses will also vary, even assuming the distances to the supply facility is the same. Other things equal, the result is for larger pipes that can serve multiple houses to be less expensive per house than smaller pipes dedicated to a single house. If the increase or decrease in cost associated with neighborhood density was 10 percent above or below the average, then this component of impact fees could logically vary by 10 percent across neighborhoods.

The combination of distance to water supply, neighborhood density, and house size would determine the actual fees on particular houses. Based on the particular values in this example, homes located at high (low) distances from the water supplier and from one another would face fees up to 30 percent higher (lower) than average, as listed in Table 4-4.

TABLE 4-4. IMPACT FEE ADJUSTMENTS BASED ON DISTANCE TO WATER SUPPLIER AND NEIGHBORING HOUSES

	Low distance to water supplier	Average distance to water supplier	High distance to water supplier
Low distance to neighboring houses	-30%	-10%	+10%
Average distance to neighboring houses	-20%	0%	+20%
High distance to neighboring houses	-10%	+10%	+30%

Roads. Roads may be the single facility most often covered by modern impact fees on new residential construction. This could properly include the entire cost of building new roads inside a newly built subdivision, as well as the incremental costs of expanding existing roads located close to the subdivision.

To date, few road impact fees have been adopted that vary by the size of the dwelling unit. This is largely because road impact fees are generally based on national trip generation rate data, and the ITE manual[47] does not provide rates by dwelling unit size. However, the fact that trip generation rates for residential uses vary by the size of the household is actually well documented in the transportation planning literature. As shown in Table 4-5 below, the average number of vehicle trips generated per day is almost directly proportional to the number of people living in the dwelling unit, which as discussed earlier, is strongly related to the size of the dwelling unit.

47 Institute of Transportation Engineers (ITE), *Trip Generation* 7th ed., 2003.

TABLE 4-5. VEHICLE TRIPS BY HOUSEHOLD SIZE

Household Size	Daily Trips	PM Peak Hr Trips	
		Single-Family	Multi-Family
One Person	3.5	0.369	0.323
Two Persons	6.7	0.707	0.618
Three Persons	8.8	0.928	0.812
Four Persons	10.6	1.118	0.978
Five Persons or More	12.5	1.319	1.154

Source: Daily trips from Transportation Research Board, NCHRP Report 365, "Travel Estimation Techniques for Urban Planning," Washington, D.C.: National Academy Press, Table 9 (for urban areas with populations of 500,000 to 1 million), 1998; PM peak hour trips based on 10.55% of daily trips in PM peak hour for single-family and 9.23% of daily trips in PM peak hour for apartment units from ITE, Trip Generation, 7th edition, 2003.

Other factors can also be considered. First, data from one source indicate that vehicle miles per driver drop by about 50 percent between low-density homes (one unit per 4 acres) and high-density homes (10 units per acre). Second, a further adjustment should be made to the extent it can be shown that new homes located in high-density urban areas generally lead to less traffic than equally sized new homes in rural areas, because more alternative forms of transportation are available for the urban homes and the distances separating them from important destinations are less. Note that this is a factor different from and broader than the density of the immediate neighborhood where the home is located.

Example:
If new roads to serve 5,000 new residents will cost $10,000,000 to build, then the road construction impact fee on new houses averages $2,000 per new resident. If a new house size is 2,000 square feet, the impact fee would be the:

(2.02 x $2,000) + (0.000333 x (2,000 – 500) x $2,000) = 5,040.00

However, it is also appropriate for the impact fees to be set higher in low-density, rural areas and lower than average in high-density ones. Note that these factors could be considered both in the subdivision or local neighborhood where the house lies, as well as the larger general neighborhood where the subdivision lies, since both can affect the cost of road construction or improvement in different ways.

As an example, in one location the amount of traffic per driver per year was found to drop by 50 percent as house density grows from a low of one unit per 4 acres to a high of 10 units per acre. This obviously affects the necessary road construction in which case the impact fee for road construction should change accordingly. If the distribution of house densities is symmetrical, this would correspond to a maximum 50% increase or 50% decrease from an impact fee of say $2,000 per resident based on density. This means that the road impact fees would range from a maximum of $1,000 to $4,000 per resident between high- and low-density areas.

Schools. Schools are one of the property types that are less commonly covered by modern impact fees, although fees on schools are certainly not rare (Table 3-1 lists 7 states out of 25, including California, that specifically provide for impact fees on schools). Those fees appear conceptually similar to impact fees that

finance parks and libraries in that they do not vary directly with individual lot size or overall housing density. One exception is the extent that the school district pays for student transportation and therefore experiences higher cost in low-density communities. However, note that the school bus operating costs are not capital costs and should not be covered by impact fees. The other substantial difference between schools and other public facilities is that overall school costs are clearly driven by *student* population, not *total* population. This suggests that school-related impact fees on different sizes of houses should be set based on the community's typical number of public school students in houses of those sizes, rather than the total number of occupants or adults in the houses. It makes a difference to the extent that the ratio of students to house size varies substantially across house types, since that was not considered to be an issue with other fees based on occupants per 1,000 square feet.

Example:
If new public schools to serve 3,000 new students will cost $30,000,000 to build, then the public school impact fee would be $10,000 per new student. If public school students are equivalent roughly to one-quarter of the household size this is equivalent to $2,500 per new resident. If the average new house size is 2,000 square feet, then the impact fee per new house should the following:

(2.02 x $2,500) + (0.000333 x (2,000 – 500) x $2,500) = 6,300.00.

Summary
Impact fees can be set once the amount of funds needed for particular projects in specified areas has been determined. While the idea is to set each impact fee based on underlying costs, the appropriate methods for calculating particular fees can vary across fee category. There is reason to believe that essentially all fees would justifiably vary based on square footage of houses in the service area, and for some types of fees including parks and libraries this may be the only variable needed. By contrast, for other fees there are additional factors that may affect costs to the point where they should be considered. For example,

- police and fire costs may also depend to some degree on the distance from a house to the police or fire station,
- costs of water, sewer and stormwater facilities can vary significantly with distance from the house to the central facility, as well as based on the overall density of homes near the target home,
- costs of roads per house will reflect the amount of roads built primarily for that house as well as the additional roads built to serve groups of homes in the same general area, and
- setting impact fees for schools involves analyzing whether the square footage used to support students is similar or different across housing types. If it is different then the impact fees should be adjusted for different housing types to be consistent with numbers of students per 1,000 square feet in each type.

Note that while examples given above listed impact fees at fixed amounts per square footage over a range of square footage, those amounts might in principle vary depending on structure size. This means they might, for example, add fewer fees to additional square footage in large houses than in smaller houses. For example, the fee might go up per 1,000 square feet by a fixed amount, up to 3,000 square feet, then by a lesser amount for each additional 1,000 square feet. The result would be for cost to increase in both sizes, but by less in the large house than in the small house.

The information presented in this section is summarized in the following table.

TABLE 4-6. BASIC FACTORS FOR SETTING HOUSE-LEVEL IMPACT FEES

Impact Fee Category	Factors for Setting House-Level Impact Fees
Parks and Libraries	Square footage of house
Police and Fire	Square footage of house Distance from house to police or fire service
Water, Sewer and Stormwater	Square footage of house Distance from house to water or drainage facility Density of neighborhood where house is located
Roads	Square footage of house Amount of roads built primarily to serve the specific house Amount of roads built to serve groups of houses including the specific house
Schools	Square footage of house Number of students per 1000 square feet by housing type

Elements of Program Design

The approach to setting impact fees as described in the previous section is only part of the issue to be considered. From a practical standpoint, communities must make many decisions ultimately leading up to the design and implementation of the impact fees, and the results will likely depend on those details. This section reviews each of the following impact fee design and service issues:

- Service area design
- Level of service standards
- Situation-specific reductions
- Revenue credits
- Broadest reasonable base
- Timing of payment

Designing Service Areas

Impact fee practice requires that fees collected in a "service area" are spent in that area. But this is really just a starting point. Users have some flexibility in setting the service area, and as a matter of practice the larger the service area the more flexibility there is in spending the revenue where (and when) needed most. Service areas that are too small and/or too numerous can result in insufficient revenue generated in many of them to spend on infrastructure improvements. Finally, many services – especially public safety – act as a system in serving the entire jurisdiction. Even though it is may be easiest to design and administer one service area for an entire jurisdiction, it is also important to consider refining service area design and fee structure in ways that preserve or promote housing affordability. There are several ways this can be approached, as discussed below.

Service Area Design Based on Extent of Existing Infrastructure. If the infrastructure needed to serve growth in one large part of the community is already in-place, but substantial new investment is needed in another, then service areas may be drawn reflecting this. In Albuquerque, for example, city staff and

consultants determined that the park system served seven different parts of the city. In "fully served" areas, park land was sufficient to serve projected development needs, while in "partially served" areas, substantial new investment was needed. As a result, in areas where parks were sufficient to meet future needs the park impact fees were zero. In this situation, impact fees would have no effect on housing affordability where infrastructure already exists to meet future needs.

Subject to applicable laws and customs, the kinds of facilities that lend themselves to this analysis include neighborhood and community parks, branch libraries, public safety, roads, community centers, and schools.

Service Area Design Based on Extent of Revenue Credit. Even where all parts of a community need new or expanded infrastructure to meet development needs, in some cases locally generated revenue may be sufficient to finance those needs while in others it is not. This was the case in Albuquerque as it designed its seven road service areas. In areas where road needs were the greatest to meet relatively rapid growth, impact fees were high. In other areas that needed some road enhancements, however, the fee became zero because the aggregate road-related revenue generated by all existing and projected development in those cases was sufficient to finance road needs.

Only those facilities that have a relatively predictable revenue stream dedicated to them (such as roads where there are dedicated gasoline taxes) may be appropriate for this kind of service area design.

Service Area Design Based on Response Time. In cases where a constant level of service is desired, the cost to provide the service can vary greatly based on density of development. For example, Missoula County, Montana, wished to maintain an eight-minute public safety response time throughout the county. This meant building more fire stations in remote and less densely settled areas than in closer areas developed at higher density. It settled on a three-tier service-area design that charges impact fees reflecting differential cost of maintaining the desired level of service where those costs varied considerably based on location and density.

Service Area Design Based on Alternative Funding. There are circumstances when parts of a jurisdiction already have the revenue stream needed to assure adequate public facilities. For example, in Texas, many Municipal Service Districts (MSDs) generate their own revenue to construct and maintain facilities. In Florida, many Developments of Regional Impact form local improvement districts for the same purpose. More specialized arrangements can have the same effect, such as tax increment financing districts and various forms of special assessment districts. Where these alternative financing mechanisms fund the same facilities that impact fees would, service areas may be drawn to exclude them or implementing ordinances drafted to exempt them from impact fee assessments – and expenditures of impact fees in those areas. Care must be taken, however, to assure this is done properly. For example, while Texas MSDs may finance their own infrastructure, they typically do not finance the regional roads and regional parks serving them.

Service Area Exclusions. Sometimes parts of a jurisdiction may be excluded from service areas even if the service area otherwise surrounds them. This could be the case in redevelopment areas where, although there is no taxing or special assessment district in place, adequate funding sources have been identified to meet infrastructure needs. For example, one part of Albuquerque, Mesa del Sol, is not in any service area principally because separate planning and financing mechanisms are being developed to facilitate growth

there. Through a development agreement with the city, all on-site and relevant off-site infrastructure will be financed through a variety of mechanisms uniquely available to it.

Level of Service Standards

Although it is usual practice to adopt the same level of service (LOS) standard across an entire jurisdiction – such as Level of Service D for roads, or 3.50 acres of park per 1,000 residents – this need not be the case. Variable LOS standards are suitable when past, present or future development patterns, constraints, or other factors combined with policy provide a rational basis for it. For example, some Florida counties have an LOS Standard of D for urban areas and C for suburban/rural areas. The rationale is that urban areas are understood to be more prone to congestion than areas farther away, and the cost to maintain the same level of service area could discourage development closer in. Another possibility is public safety response-time level of service differences. Although Missoula chose to have the same response time everywhere, it might have decided to vary response times within each of the tiers. Fees would have gone down but fire insurance premiums would likely have gone up in the non-urban tier. Note that variable LOS standards may not be suitable for libraries, schools, water or wastewater facilities. Decision chart 4.1 is designed to help guide decisions on the appropriate LOS standards.

It is important to note that, if a higher level-of-service is adopted in an area, infrastructure should be brought up to the new standard through revenue from sources other than impact fees.

Situation-Specific Reductions

Because there are always exceptions to any rule, impact fee ordinances usually have the option for the feepayer to conduct an independent fee calculation study to show that the impacts of a particular development may be less than assumed in the impact fee schedule. This assures due process but it can be cumbersome and does not allow for situations in which research has shown reasonably conclusively that impacts are reduced across-the-board in a class of situations. For example, in the early 1990s, Atlanta was the first city in the nation to reduce road impact fees for development near heavy-rail transit stations automatically – and to this date remains the only city to do so. A few jurisdictions reduce water, wastewater and stormwater impact fees based on density of development, with Scottsdale having perhaps the most detailed approach. Individual jurisdictions may make

Atlanta, Georgia: An Innovative Approach to Affordability

Key Atlanta officials were concerned about potentially adverse effects of impact fees on affordable housing. To address these concerns, Atlanta became the first jurisdiction in the nation to adopt the following features.

- 50% reduction if within 1,000 feet of a rail transit station.
- 100% reduction if located within an enterprise zone.
- 100% reduction if located within a federally-chartered empowerment zone.
- 100% reduction if part of a qualified historic preservation project
- 100% reduction if the unit rents for less than 60% of the regional median rent or sells for less than 1.5 times the regional new home sale price.
- 50% reduction if the unit rents for between 60% and 80% of the regional median rent or sells for between 1.5 and 2.5 times the regional new home sale price.
- Broadens the assessment base for parks and recreation by charging non-residential development.

Georgia law requires that revenues waived through these reductions must be offset from sources of revenue other than impact fees. This requirement does not apply to the 50% reduction for being within 1,000 feet of a rail station because studies show that traffic impact is reduced roughly proportionate with this relationship. More information is included in Chapter 5, Case Studies.

refinements to impact fee calculations affecting specific developments based on their particular situation.[48]

Situation-specific reductions may be mostly applicable to transportation and water-related utilities in the following ways:

Transportation. As density increases, vehicle miles traveled per person decreases, based on census data compiled in 2001 for the National Household Transportation Survey. Reductions increase further with the presence of public transit. Generally speaking, the reduction in miles per person from the lowest residential density category (fewer than 75 units per square mile) to the highest (more than 6,000 units per square mile) is about half.

TABLE 4-7. AVERAGE DAILY VEHICLE MILES TRAVELED PER HOUSEHOLD PERSON BY UNIT TYPE

Units Per Square Mile	Miles Per Person	Percent Change Between Categories
151 - 700	29.5	
701 - 2,000	27.1	8.4%
2,001 – 4,000	24.0	11.3%
4,001 – 6,000	20.3	15.6%
6,000+	14.2	30.0%

Source: Nationwide Household Transportation Study 2001, calculated by authors based on annual average vehicle miles per drive times drivers per household person by density category divided by 365.

Proximity of rail stations also reduces vehicle trips. Although the reduction varies by system, a sample of studies indicates the reduction ranges by a third to a half for projects located within about one-quarter mile of rail transit stations.

Water-Related Utilities. Unlike transportation, no national data exist to indicate the range of reductions in water, wastewater, and stormwater impacts associated with residential development features. Scottsdale evaluated costs associated with providing capital facilities throughout the city to several residential unit types and derived the following impact fee schedule based on residential unit density:

Transportation and water-related utilities have significant situation-specific reduction potential. Since they also tend to have among the highest impact fee levels, they merit reductions based on density to help assure that such fees do not impact adversely on housing affordability.

[48] There is a unique situation-specific reduction used in some jurisdictions that is important to note. Age-restricted residential developments such as retirement communities ostensibly do not generate school children, have fewer persons per unit and per 1,000 square feet, and in other respects impose fewer demands on many facilities than other communities. Some jurisdictions exempt such communities from school impact fees and lower impact fees for other facilities. The age-restriction is enforced via covenant that runs with the title that current and future owners must oblige. In some cases, however, covenants are not enforced resulting in owners and/or tenants raising children (theirs or others from their kin or kith) thus increasing school impacts. The school district, which never received the impact fees to expand schools to meet this unexpected demand must enforce the covenant through legal action or doing nothing. The latter option seems to be the norm. Some local governments choose not to recognize these and similar covenants because of their inability or unwillingness to enforce them, and thus impact fees are not reduced. This is purely a local policy decision.

Density	Impact Fee per Unit
1 unit per 2.5 acres	$5,492
1 unit per acre	$3,382
2-4 unclustered units per acre	$2,203
2-4 clustered units per acre	$1,802
5-8 units per acre	$1,585
9+ units per acre	$1,337

Source: Duncan Associates.

Similarly, Denver's water impact fee schedule is based on density, as shown in the following:

Density	Impact Fee per Unit
1 unit per acre	$17,767
2 units per acre	$9,709
3 units per acre	$7,022
4 units per acre	$5,679
5 units per acre	$4,873
6 units per acre	$4,336
7 units per acre	$3,952
Duplex	$3,100
Multi-Family 3+ units	$1,350

Source: Denver Water.

Revenue Credits

New development often brings with it new revenue that is in some ways help provide the same facilities for which impact fees are also assessed. For example, general obligation bonds used to finance new or expanded capital facilities that are retired by property taxes will result in new development paying part of those bonds. Dedicated gasoline taxes, school capital assessments on real property, special levies for parks, and so forth, are candidates for revenue credit calculation to reduce certain impact fees. The reason is that unless the impact fee is reduced by this "revenue credit" the effect may be that new development pays for the same facility twice.

For example, consider a recent court case out of Florida, *Florida Home Builders Association v. Osceola County School Board*. In this case, the county adopted an impact fee for schools essentially as follows (using rounded figures and simplifying the calculation for illustration purposes only):

$20,000	Cost per student
0.50	Students per single-family detached unit
0.25	Students per townhouse
0.20	Students per apartment, condominium unit
$10,000	Impact fee per single-family detached unit
$5,000	Impact fee per townhouse unit
$4,000	Impact fee per apartment, condominium unit

However, the fee did not consider the new taxes new development generates that flow in part to help finance the very class of facilities for which impact fees are assessed. Florida enables local school boards to charge up to 2 mills[49] ($200 per $100,000 assessed value) for school capital purposes. This assessment is on all development, not just residential development. In this case, the local school board was assessing the maximum and using about half the dedicated revenue stream to retire debt for new schools. (The other half is used for maintenance and repair.) Because all development is assessed – not just residential development – an appropriate estimate of the revenue credit would be based on calculating the average assessed value per student, then estimating the present (discounted) value of the stream of revenue new development would contribute to help finance school facilities (excluding maintenance and repair), and deducting that from the gross cost per student. If the average assessed value per student in this county was $512,000 and 1 mill was assessed to finance school capital facilities, then over 25 years (the typical bond period) assuming 4% government borrowing, new development would generate about $8,000 (rounded up) for school capital facilities. The revised calculation would be as follows:

$20,000	Gross impact cost per student
($8,000)	Revenue credit per student
$12,000	Net impact cost per student
0.50	Students per single-family detached unit
0.25	Students per townhouse
0.20	Students per apartment, condominium unit
$6,000	Impact fee per single-family detached unit
$3,000	Impact fee per townhouse unit
$2,400	Impact fee per apartment, condominium unit

The fees would thus be on the order of 40% lower when considering the revenue credit. (In fact, the court ordered the school district to calculate a revenue credit.)

Broadest Reasonable Base

Impact fees for parks and recreation, library and school facilities usually fall on only residential development. Residential impact fees are thus assessed on only a subset of the total base of development in the jurisdiction. One way to reduce potentially adverse effects of impact fees on housing affordability is to broaden the base of impact fee assessment to include all development. In some instances – notably for parks – local governments have been able to quantify the impact of non-residential development and thus justify assessing non-residential impact fees. Except for California, however, school facility impact fees are assessed on only residential development.

To expand the impact fee assessment base, two factors must be taken into account: what is the impact of non-residential development on these facilities, and how would they benefit from their provision?

The first factor is addressed simply as follows: There is a very high correlation between new jobs and new population and housing growth. In most American communities, job growth attracts new residents. Indeed, the relationship between job growth and overall community growth is so strong that input-output analysis – the mainstay of economic impact assessment – focuses only on jobs and not on residents or households.

[49] A mill is short for the word millage, a term used in property taxes. The easiest way to understand tax millages is to use a 1 mill tax as an example. A one mill property tax will produce $1.00 in taxes on each 1,000 dollars of "assessed value".

It is perhaps by definition that new jobs cause the impacts on facilities that need community amenities to be remedied in part by impact fees.

The second factor is also addressed easily. Richard Florida has chronicled the relationship among such services as parks and recreation, libraries, and education. He found that firms are attracted to areas that provide these facilities and without them in sufficient quality, firms will locate elsewhere. Firms thus benefit from the provision of such facilities.[50] Moreover, the Supreme Court in *Dolan v. City of Tigard, OR*, noted that "no precise mathematical calculation is required" to establish a relationship between the impact of development and exactions necessary to offset it. A reasonable case can be made that all impact fees should be assessed to all development because (a) in various ways all development impacts on all facilities; and (b) all development benefits from all facilities in various ways.

Timing of Payments

Where in the development process should impact fees be paid to lessen their potential burden on housing affordability? Numerous statues specify that impact fee assessments and collections occur at the building permit state. Others are silent and in states without impact fee enabling acts the timing of payment is mostly local option. There are two issues here: the point of assessment and the point of collection. Sometimes they are simultaneous such as being assessed and collected concurrent with the building permit – this is perhaps the most common approach as it is the most efficient administratively. It is also the earliest point in the development process where the expected impacts of new development are known best. Impact fees assessed and collected at that stage increase the chance that fees will flow into new or expanded infrastructure roughly concurrent with the impacts of new development.

This does not mean to exclude consideration of assessing and collecting impact fees at other stages of the development process. Perhaps the best stage theoretically is during the sale of law from the land owner to a developer because this increases the likelihood that the land market – through the seller of land – internalizes the impact fee, consistent with economic theory. In many situations this is not practical because final development plans may not be known for years. However, where a land transfer is part of a land sale option agreement that itself is based on securing necessary land-use decisions, including entitlements providing reasonable specificity in overall development, it may be possible to assess and collect the impact fee as part of the condition of land-use and development approval. Under these circumstances, developers purchasing land may include in their land purchase option contract a clause specifying how the price will be adjusted reflecting fees anticipated to be paid. (See Appendix C for sample language.) This may be a practice in only those cases where there is a transfer of land that also engages the land-use decision-making process.

Some local governments assess and collect impact fees at the end of the development process concurrent with the final inspection or issuance of the certificate of occupancy. This has the advantage of preventing the builder from incurring finance costs on the period between the impact fee payment at the building permit stage and sale of the home. Where a residential structure is to be held for rental it allows the builder/owner to finance the fee with lower-cost "take-out" financing, the long-term or permanent financing that replaces interim or construction financing. A variant on this approach is assessing impact fees at the building permit stage but collecting them at the final inspection or certificate of occupancy stage. This has

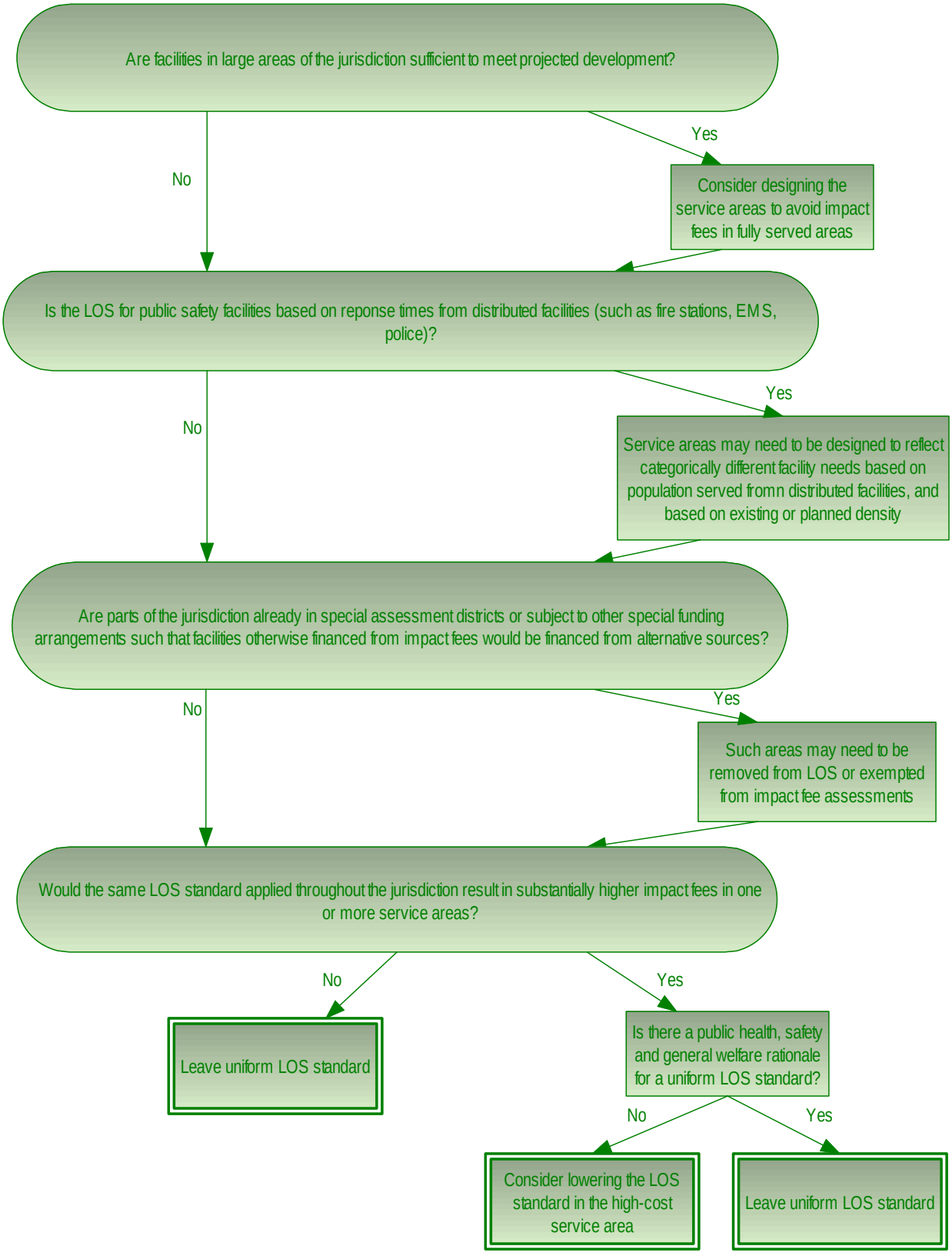
[50] Richard Florida, *The Flight of the Creative Class*, 2005, Collins (New York); *Cities and the Creative Class*, 2005, Routledge (London); *The Rise of the Creative Class*, 2004, Basic Books (New York).

the advantage of allowing local government to budget for the revenue before it is paid and provides the developer with increased certainty on the amount. This is the approach used by Alachua County, Florida in the case study to be reviewed later. Timing payments in this way may help reduce potentially adverse effects of impact fees on housing affordability.

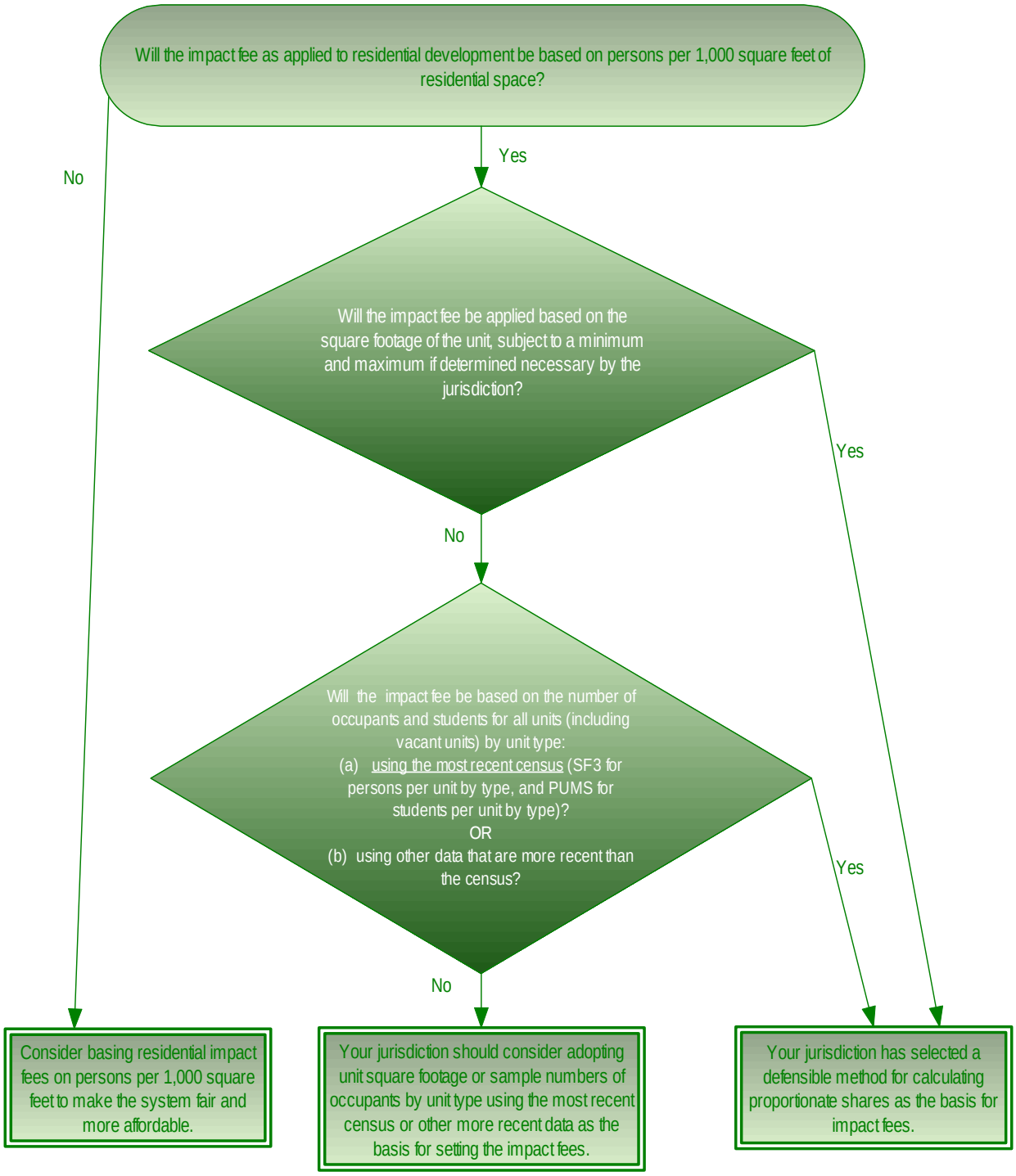
Impact Fee Decision Charts

The following section includes several additional decision charts designed to help practitioners apply the guidance included in this chapter.

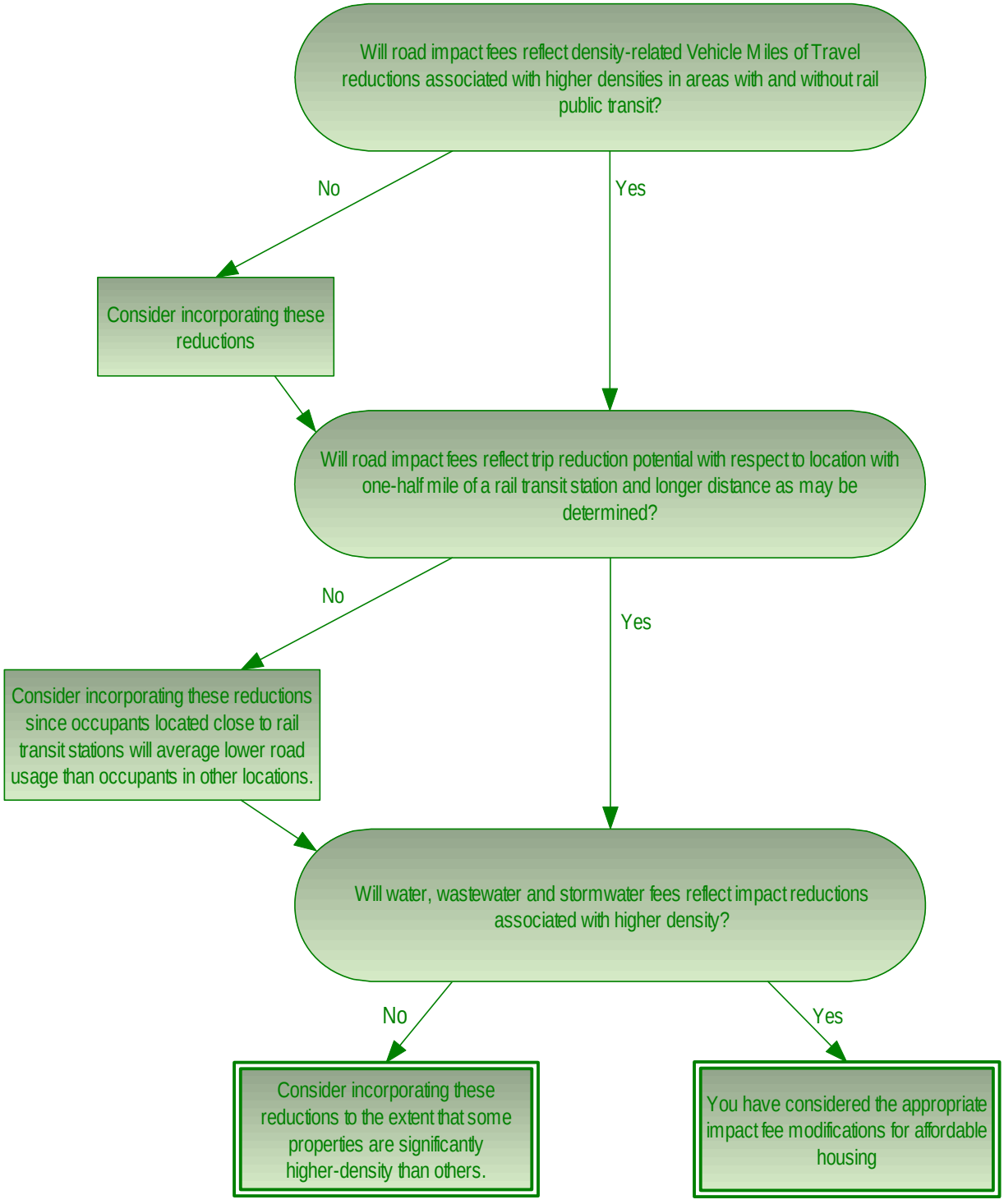
Decision Chart 4.1 Designing a Level of Service (LOS) Area



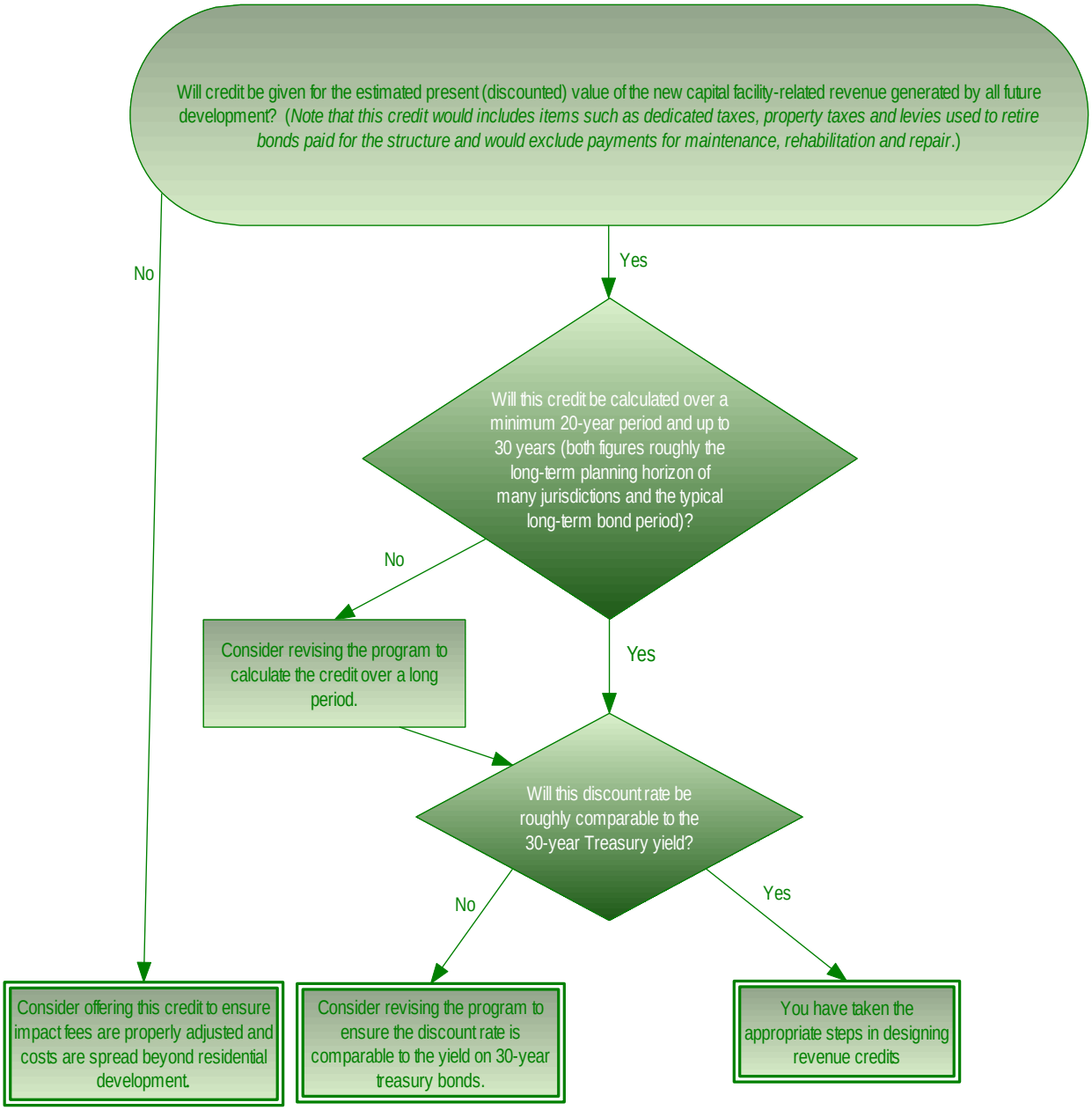
Decision Chart 4.2 Designing for Affordable Housing



Decision Chart 4.3 Including Situation Specific Reductions



Decision Chart 4.4 Assessing Appropriate Revenue Credits



Specific Housing Affordability Measures as Part of Impact Fee Policy

Impact fee design can go a considerable way towards reducing potentially adverse effects of impact fees on housing affordability, but there are other affordability measures that should also be considered. The most important possibility is that even where impact fees are generally charged in an equitable manner, qualifying affordable housing may still need to be *exempted* from fees. Particular relevant circumstances relating to exemptions are reviewed in this section, including exemptions, exclusions, waivers and forgivable downpayment loans.

Exemptions

Exemptions are given when new development does not create a new impact. For example, a home that is removed and rebuilt does not increase its impact on facilities – unless of course the home is made bigger and will over time presumably allow more people to occupy it.

Another potential form of exemption could be the remodeling of a structure formerly used for a non-residential purpose into a residential one. Converting abandoned warehouses into lofts has been popular for a generation and in recent years there has been the conversion of older high-rise office towers into residential units. Sometimes jurisdictions exempt these kinds of conversions on the assumption that they create no new impact relative to that occasioned by the tenants in a prior use. Other jurisdictions, however, impose impact fees on the estimated difference in impact when moving from one use to another, and the full impact fee if the conversion involves a structure that has been vacant for five or 10 years or so.

Reuse and rehabilitation of existing structures is an efficient urban development activity and the view posed here is that it should be encouraged. Moreover, converting a structure from a nonresidential use to a residential one may result in fewer impacts relative to the prior tenants. For example, a 200,000 square foot general office

Collier County: Impact Fee Assistance Program Designed to Promote Affordable Housing and Encourage Rehabilitation

The County has adopted three affordable/workforce housing programs which are funded by a combination of County resources. Two of the programs provide impact fee deferrals to qualified applicants for the lifetime of their ownership of the home. The home must be homesteaded and owner-occupied; however, there is no limit to the number of years an owner may participate in the program and the payment does not balloon at the end of the term of the agreement. The third deferral program is for affordable rental apartments, which provides a deferral from the payment of the impact fees for a term of six years and nine months. The County also provides for the waiver of impact fees (except for Water and Sewer and Educational Facilities Impact Fees) for publicly owned residential housing. – Excerpted from a letter to Alton Colvin, Executive Director Florida Legislative Committee on Intergovernmental Relations from James V. Mudd, Collier County Manager, November 9, 2005.

In addition, the Collier County Community Redevelopment Agency has created the Impact Fee Assistance Program to provide financial assistance to redevelopment projects in targeted areas as a way to encourage rehabilitation of degraded structures. The funding for this program comes in part from Tax Increment Financing.

For each project, the county may provide up to 50% of the total impact fees. There is a maximum amount of funding allocated each year for impact fee assistance, so the program is managed on a "first come, first served" basis as well as an eligibility point system.

building will generate about 1,100 one-way trips during a typical weekday.[51] If converted into 200 units averaging 1,000 square feet each, one-way weekday trips will fall about 70% to about 420.[52] Clearly, the community may gain from such a conversion especially if the building is already vacant or in other ways underutilized.

Many urban areas are ripe or becoming ripe for conversion to other land uses and in the process become revitalized. Exempting impact fees in situations where existing space is being rehabilitated but no new space added can help facilitate revitalization. Indeed, in the office building example above, even adding space to accommodate a doubling of units would still result in a net reduction in trips than were generated by the tenants of the office building.

Exclusions

Excluding certain new development from impact fees may be warranted when alternative revenues are available to finance the very infrastructure that would be financed from impact fees. For example, in Albuquerque, the city does not charge water or wastewater impact fees in areas where federal and state funds are being used to construct related infrastructure. Not only was the area an imminent health hazard but the existing and new homes being built there catered to low-income households. Likewise, DeKalb County, Georgia, will be excluding development in community improvement districts, business improvement districts, empowerment zones, and enterprise zones where alternative financing mechanisms are or will be used to finance the same facilities that would be financed from impact fees.

In these examples, excluded areas are identified clearly on maps, facilities constructed in those areas that may otherwise have been funded from impact fees are identified, and alternative sources of revenue are allocated for their construction.

Waivers

Sometimes it is desirable from a public policy perspective to simply waive all or a share of the impact fees on certain, qualifying residential development. In some states, however, outright waivers may not be allowed and a waiver can be accomplished only by identifying substitute revenue. These forms of waiver are reviewed, along with the concept of the *de minimus* waiver described below.

Outright Waiver. In states that have no impact fee enabling act (such as Florida, Nebraska and Ohio) waivers can be provided. Presumably they are targeted for residential units or their occupants meeting certain conditions and presumably consistent with public policy purposes. In New Mexico, however, the enabling act specifically provides for such an outright waiver.

Substitute Revenues. Most state impact fee enabling legislation requires that waived revenues be replaced with others that are identified. Sometimes this may be Community Development Block Grants and in others a local housing trust. The usual solution is not to waive, however.

---

51 Institute of Transportation Engineers, Trip Generation, (2003), for general office building, p. 1158. One-way is total multiplied by 50% to avoid double-counting the same trip.

52 Institute of Transportation Engineers, Trip Generation, (2003), for high-rise apartment building, p. 348. One-way is total multiplied by 50% to avoid double-counting the same trip.

Atlanta, Georgia, has devised a unique way to solve this problem. Because of its already high quality of infrastructure, the city established the level of service for parks and recreation, and public safety *below* the current level of service meaning that for planning purposes it had excess facility capacity. Impact fees thus "recouped" the value of this excess capacity. New residential development in targeted areas defined for housing affordability purposes became eligible for 50% to 100% waivers with the waived revenues replaced by recoupment revenues. Recoupment revenues not used for waivers are then reinvested in the facilities so that over time facility capacity has increased while impact fees were waived or reduced on qualifying affordable housing.

De Minimus. In states with and without impact fee legislation there is the concern that if a substantial amount of impact fee revenue is lost through waivers, then facilities that would have been financed from impact fees will not get built when planned and overall facility quality might erode. The term *de minimus* is used to indicate that it is a very minor amount or low risk.

Although hard statistical evidence is illusive in this regard, the general impression is that waived impact fees constitute a *de minimus* share of the total facility financing package. Even in Atlanta where officials admit freely that the waiver program was too generous, lost revenues have not affected its expansion of facilities to meet new development needs.

Unless experience shows otherwise, it may be reasonable for local governments to waive all or part the impact fees assessed on qualifying affordable housing and assume the impact on revenue needed to provide new or expanded facilities will be *de minimus*. In states with impact fee enabling legislation, local governments may consider inserting *de minimus* language into impact fees ordinances and codes, and noting on capital improvement programs that in the event impact fee revenues fall short of projections because of waivers, other revenue will be generated as needed from such sources as federal and state grants and loans, and allowable inter-fund transfers.

Forgivable Downpayment Loans

There are two concerns about waiving impact fees for qualifying housing. First, what if the short-term market-clearing price for a house is the same whether or not impact fees are charged? In a normally competitive housing market this would be the case. While some development interests would argue that impact fees are simply passed on to home buyers, in fact economic theory shows this not to be the case in the short term. Waived impact fees may not reduce the sales price of the housing resulting in no benefit to the low- and moderate-income buyer and may also deprive the local government of revenue it may need to construct facilities. In this scenario, the builder is the beneficiary of a "windfall" profit.

Second, what if the household for whom the waiver was granted moves and sells the home to a higher-income household – what long-term benefit did the waiver accomplish?

Recognizing these limitations on waiving impact fees directly, a small but growing number of jurisdictions are using a forgivable downpayment loan as an indirect way to waive the fees. Here's how it works:

- The developer pays the impact fee. However, to reduce the financing and administrative costs associated with paying the fee at the building permit stage, the fee is assessed there but collected

upon issuance of the certificate of occupancy (or final inspection – depending on the state), which can be timed to occur roughly coincidental with closing to a buyer.

- The local government collects the impact fee and uses it as it would for all impact fees.

- The local government uses other funds to lend the home buyer an amount equal to the impact fee to be used for the downpayment. The local government uses federal (CDBG), state (SHIP in the case of Florida), or local (housing trust) funds for this purpose.

- The loan to the homebuyer is forgiven over time; for example in Alachua County, Florida, the loan is forgiven at the rate of 20% per year for each year the household remains in the house for up to five years. If the home is sold before then, the remaining balance becomes due without interest.

Technically, these steps do not waive the impact fee. Rather, the impact fee is paid by the developer while the homebuyer is assisted in purchasing the home with a downpayment loan equal to the fee, and the fee is forgiven in five years if the home is not sold by the homebuyer.

Deferred Impact Fee Payment

Martin County, Florida, uses another approach. It allows developers of very low, low, and moderate income housing to have impact fee payments deferred for 10 to 15 years. Relevant features include[53]:

- Buyers of very low and low income housing may apply for a loan from the County for 100 percent of the impact fees assessed on very low and low income housing as defined in the Martin County Comprehensive Plan. Repayment is due upon sale or transfer of the affected property, or at the end of 15 years, whichever occurs first, unless the County chooses to allow refinancing of the loan if the affected housing continues to meet the County's definition of very low or low income housing.

- Buyers of moderate income housing may apply for a loan from the County for 50 percent of the impact fees assessed on moderate income housing as defined in the Martin County Comprehensive Plan. The interest on the loan shall be equivalent to the County's long term borrowing rate at the time of the loan. Repayment of the loan plus interest is due upon sale or transfer of the affected property, or at the end of ten years, whichever occurs first, unless the County chooses to allow refinancing of the loan if the affected housing continues to meet the County's definition of moderate income housing.

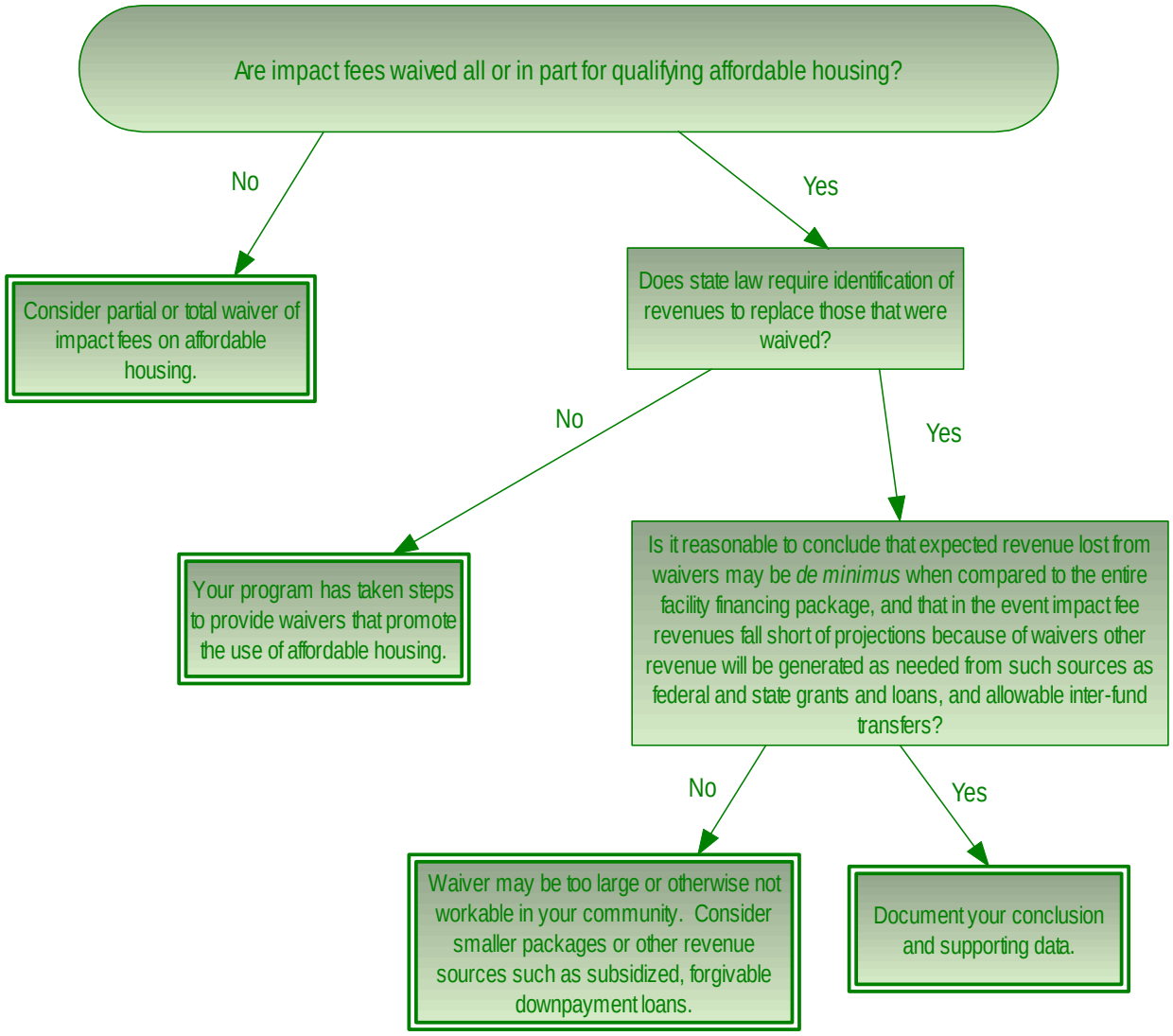
- To receive a deferral of impact fees the sales prices of the homes cannot exceed 90 percent of median area purchase price as established by the United States Department of the Treasury in accordance with section 3(b)2 of the United States Housing Act of 1937. In addition, house size is correlated to household size, so that the home to be constructed does not exceed HUD income guidelines.

[53] See Martin County Ordinance No. 562, pt. 1, § 6.11, 12-7-1999.

Housing Affordability Questions to Consider

The following decision guide poses questions on specific ways in which impact fees should be waived or exempted from certain new residential developments to help advance housing affordability.

Decision Chart 4.5 Affordable Housing



Chapter 5 - Case Studies

The impact fee systems of three jurisdictions are described in this section: Atlanta, Georgia; Albuquerque, New Mexico; and, Alachua County, Florida. These communities were chosen for their innovative approaches to devising progressive impact fees (meaning that the fees are structured to be higher for higher income houses that correspondingly use more services) and sheltering affordable housing from potentially adverse impacts of impact fees. This chapter should be highly useful to communities that are considering impact fees and concerned with affordability.

Atlanta, Georgia



In 1993, the City of Atlanta, Georgia, adopted the state's second development impact fee program and the first since passage of the Georgia Development Impact Fee Act in 1990. It was then and probably remains today a national leader in how it tailors the impact fee program to address affordable housing concerns. Lessons learned may be applicable broadly especially in jurisdictions that have significant prior investments in infrastructure and are growing but not stressed with growth.

The City of Atlanta, Georgia, is the state's largest city at over 435,000 residents. It also has about as many jobs bringing its "daytime" functional population to more than 800,000 as more people commute into work or school than out. The state constitution confers home rule authority to cities thereby providing Atlanta with a broad range of powers and flexibility with which to use them. At the time of the impact fee policy-making process, the city was governed by a mayor, an 18-member council elected by districts (13) and at-large (5), and an elected council president. It is a strong-mayor government in that the mayor proposes legislation including an annual city budget, and administers policies adopted by council. In 1990, the city was anticipating adding about 40,000 new residents and 180,000 new jobs by 2010, based on projections of the Atlanta Regional Commission. The city also had a history of not incurring large debt and thus paying for many new capital items on a pay-as-you-go basis. Since the city did not want to ask voters to authorize more bonds to finance new capital facilities in advance of growth, it saw impact fees as a way to help bridge the financing gap. Yet, it was also more sensitive than most jurisdictions about the effects of impact fees on affordable housing.

Enabling Legislation for Atlanta

Although arguably enabled through home rule authority, the Georgia legislature adopted the Development Impact Fee in 1990 to provide guidance to local governments in how impact fees would be crafted and implemented. The Act enables local governments to assess impact fees for fire and emergency medical, police, road, library, parks and recreation, stormwater, water and wastewater facilities. Initially, Atlanta wished to assess fees on all facilities except libraries since they are administered by counties. Although the city did adopt impact fees for water and wastewater systems, they were quickly dropped in large part because the language of the Act essentially waives the requirement to apply the Act to those facilities. A stormwater fee was considered but never implemented; the city instead is considering a city-wide special

district to manage these facilities. The impact fees adopted by the city generate revenues for parks and recreation, fire and EMS, police, and roads.

It is important to note that although setting impact fees based on the size of the unit is recommended in this Guidebook such was not done in Atlanta. The Atlanta program pre-dates many advances in impact fee practice such as this but the authors have been informed that when the city updates its program it will use the size-based approach. There are so many other pioneering features of the program affecting housing affordability however that Atlanta deserves review as an important case study. Practitioners would be advised to consider many of Atlanta's approaches in addition to considering varying impact fees by the size of the unit at least up to a certain size threshold based on local conditions.

The Act requires service areas for each facility. Recognizing that public safety activities function best as a system of facilities serving the entire city, only one service area was designed for those facilities. Parks and recreation services were considered more locally serving, so three service areas were crafted (see Figure 5-1) . Although two service areas were considered initially for roads (north and south), in the end the city was considered one large service area. This decision was made in part by recognizing that traffic patterns are decided north-south throughout the day and because at 32 square miles the city is not physically very large.

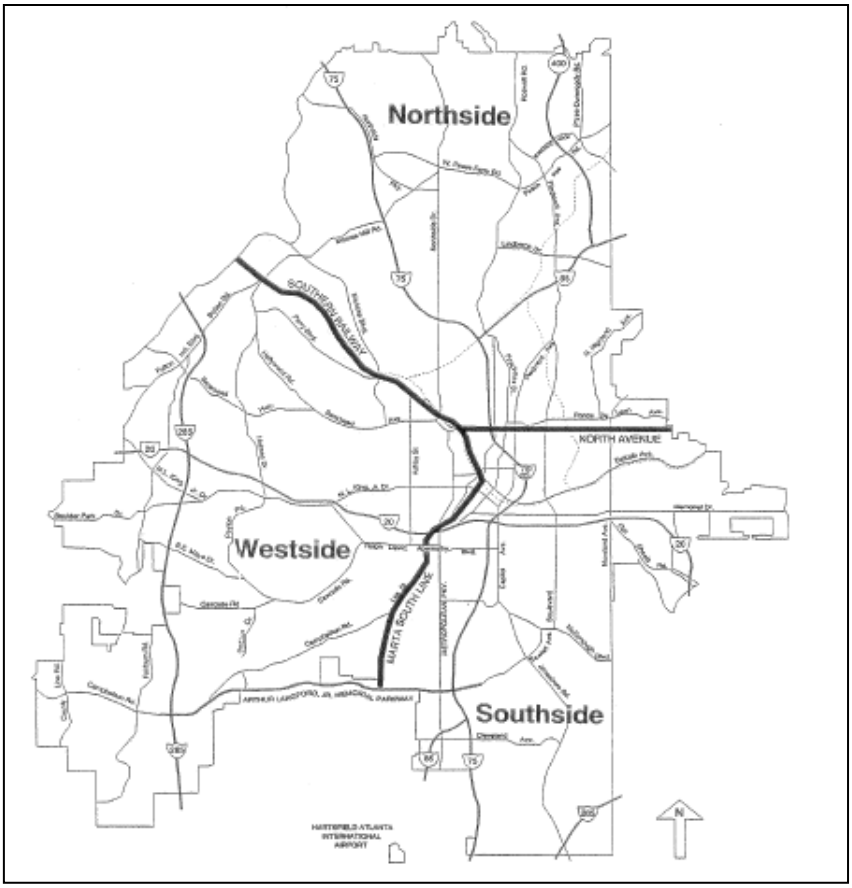


FIGURE 5-1. ATLANTA PARKS AND RECREATION SERVICE AREAS

The Act requires that level of service standards be adopted as a way to measure current capacity deficiencies or surpluses, and in part to help project future development needs. However, to measure development impacts across different land uses, such as residential, commercial, industrial, and institutional, a uniform measure was devised based on functional population. Conceptually, functional population estimates the full-time equivalent number of people any given facility needs to serve during work days ("daytime functional population") or around the clock ("24/7 functional population"). It adopted functional population levels of service for parks and recreation, and public safety facilities – being the first in the nation to do so.

The city inventoried its park and recreation facilities and found that on a city-wide basis it had nearly 7 acres of park per 1,000 functional residents. It adopted a level of service (LOS) standard of 5.75 acres per

1,000 functional residents meaning that it had sufficient excess capacity to accommodate growth to 2010. Impact fees collected for park and recreation facilities could thus be considered “recoupment” revenues under provisions of the Act, essentially recovering for the taxpayers the value of excess capacity it financed for the benefit of new development.

The consulting team also determined that the city had about 500 square feet of fire/EMS space and about 790 square feet of police space per 1,000 functional residents. The city adopted LOS standards of 470 and 660 square feet per 1,000 functional residents, respectively, which was the projected 2010 LOS, based on existing facilities and growth projections. This also created a “recoupment” situation for the city.

For roads, the city adopted an LOS standard calling for a volume-to-capacity ratio of 0.75 for all major roads, meaning that the road system should have 25 percent more capacity than used; the ratio translates roughly into a level “D” in transportation engineering terms. Because the city was then at a 0.71 ratio, this implied that excess capacity existed, but the city determined all the impact fee revenues generated from road impact fees should be used to expand capacity and thus recoupment was not an administrative feature.

The Act requires that costs be estimated based on historical and/or projected expenditures and rendered to a cost per unit of service based on the adopted LOS. That cost must be reduced to reflect any non-local revenue credits such as state or federal grants, and local revenue credits such as the present value of that share of debt service on bonds used to finance the same type of facilities for which impact fees are assessed generated by new development. The fees themselves were calculated as follows in Table 5-1 (below):

TABLE 5-1. ATLANTA IMPACT FEE CALCULATIONS

Parks and Recreation		
Cost Feature	North	South + West
Improvement Cost per Acre	$43,000	$43,000
Land Cost per Acre	$46,047	$10,442
Total Cost per Acre	$89,047	$53,442
Non-Local Revenue Credits	$ 0	$ 0
Local Revenue Credits	$ 0	$ 0
Net Impact Cost per Acre	$89,047	$53,442
Acres per Functional Resident	0.00575	0.00575
Impact Fee per Resident	$ 512	$ 351
Fire/Emergency Medical Service		
Cost Feature	Citywide	
Improvement Cost per Square Foot	$152.00	
Non-Local Revenue Credits	$ 0	
Local Revenue Credits	$ 0	
Total Impact Cost per Square Foot	$152.00	
Square Feet per Functional Resident	0.47	
Impact Fee per Resident	$ 71.44	
Police		
Cost Feature	Citywide	
Improvement Cost per Square Foot	$ 31.00	
Non-Local Revenue Credits	$ 0	
Local Revenue Credits	$ 0	
Total Impact Cost per Square Foot	$ 31.00	
Square Feet per Functional Resident	0.66	
Impact Fee per Resident	$ 20.46	
Transportation (Roads)		
Cost Feature	Citywide	
Cost Per Vehicle Mile Traveled at LOS	$1,869	
Non-Local Revenue Credits	($ 787)	
Net Cost per Mile	$1,082	
Local Revenue Credits	Variable	

Note: Road impact fees are reduced based on property values of different land uses.

The Act allows developers to offer improvements to those facilities that are scheduled for impact fee financing and thereby reduce the fees charged per unit. For example, if a road impact fee is $1 million but the $600,000 road improvement project in front of the development is scheduled to be improved using impact fees in part, the developer may make those improvements (probably at lower cost than the city and earlier than scheduled) and reduce the impact fee accordingly – in this case down to $400,000. The fee schedules for Atlanta appear in Table 5-2.

TABLE 5-2. ATLANTA FEE SCHEDULES

	Land Use Type	Number of Dwelling Units	Pop*/ Unit	Acres per 1,000 Pop*	Acres per Unit	Cost per Acre	Net Cost per Unit
PARKS & RECREATION – NORTHSIDE	Single-family	1	1.60	5.75	0.0092	$89,047	$819
	Multi-family	1	1.11	5.75	0.0064	$89,047	$570
PARKS & RECREATION – SOUTHSIDE & WESTSIDE	Single-family	1	1.60	5.75	0.0092	$53,442	$492
	Multi-family	1	1.11	5.75	0.0064	$53,442	$342

	Land Use Type	Number of Dwelling Units	Pop*/ Unit	Sq Footage/ 1,000 Pop*	Sq Ft per Unit	Cost per Sq Ft	Cost per Unit
FIRE/EMS	Single-family	1	1.60	470	0.7520	$152	$114
	Multi-family	1	1.11	470	0.5217	$152	$79
POLICE	Single-family	1	1.60	660	1.0560	$31	$33
	Multi-family	1	1.11	660	0.7326	$31	$23

	Land Use Type	Number of Dwelling Units	Peak Hr VMT/ Unit	Cost/ Peak Hr VMT	Cost per Unit	Property Tax Credit	Net Cost per Unit
TRANSPORTATION	Single-family	1	1.02	$1,154	$1,177	$190	$987
	Multi-family	1	0.5	$1,154	$577	$107	$470

* Pop refers to functional population. The population numbers adjusted for the daytime commuting population.

The unique ways in which Atlanta facilitates affordable housing production through its impact fee program are also important to understand. Key Atlanta officials, such as Leon Eplan and Fernando Costa, then Commissioner of Planning and Director of Planning, respectively, under the Maynard Jackson Administration, were concerned about the potentially adverse effects of impact fees on affordable housing. To address these concerns, Atlanta became the first jurisdiction in the nation to adopt the following features:

- 50% reduction if within 1,000 feet of a rail transit station.
- 100% reduction if located within an enterprise zone.
- 100% reduction if located within a federally chartered empowerment zone.
- 100% reduction if part of a qualified historic preservation project
- 100% reduction if the unit rents for less than 60% of the regional median rent or sells for less than 1.5 times the regional new home sale price.
- 50% reduction if the unit rents for between 60% and 80% of the regional median rent or sells for between 1.5 and 2.5 times the regional new home sale price.
- Broadens the assessment base for parks and recreation by charging non-residential development.

Georgia law requires that revenues not collected from impact fees must be offset from sources of revenue other than impact fees. This requirement to collect from other sources does not apply to the 50% reduction for being within 1,000 feet of a rail station because studies show that traffic impact is reduced roughly proportionate with this relationship. The analysis indicates that Atlanta remains the only jurisdiction that recognizes this relationship. In all other respects, however, the city is required by law to offset lost impact fee revenues through identified sources. This is where recoupment comes into play.

For parks and recreation, and public safety, impact fees essentially reimburse taxpayers for investments generating excess capacity for the benefit of new development. It is these "recoupment" revenues that are used to reduce the fees assessed on qualifying affordable housing. This approach is used in no other jurisdiction. In addition, although the city does not recoup road impact fees (all revenues are dedicated to capacity-expansion), it has nonetheless been able to offset road impact fees for qualifying affordable housing through bond arbitrage (interest from bond proceeds before bond revenue is spent), community development block grant, and even general fund sources.

Recoupment is based on adopting a level of service standard below the current service level so that at least for a while impact fees reimburse for the value of excess capacity. Yet, Atlanta has been even more creative in sheltering affordable housing from impact fee burdens while *expanding* parks and recreation, and public safety facilities in excess of adopted LOS standards. This is a unique win-win innovation. Here is how it works:

By setting the adopted impact fee level of service standard below current levels – which carries the risk that services over time will be degraded relative to the present – impact fee revenues can be used to offset assessments on affordable housing. Because not all revenues are used for this purpose – more likely about a quarter – the remaining revenue is in fact used to expand capacity and to leverage investment. For example, because parks and recreation impact fees generated new revenue in excess of covering affordable housing offsets, the new revenue could be used as match to leverage even more investment in parks. The effect is that affordable housing is sheltered from impact fee effects yet facility capacity is increased. Moreover, the combination of impact fees leveraging investment means that today Atlanta's current acreage of parks per 1,000 residents is *more* than in 1993. The same is true for public safety.

Atlanta was also the first jurisdiction that expands the base of impact fee assessments across all land uses for parks and recreation. The usual custom is to assess only residential development for parks and recreation facilities, and libraries. (This is also the case in those states where school facility impact fees are assessed, the exception being California where non-residential development is required by statute to also pay school impact fees.) Thus, the entire burden for financing these facilities falls on roughly half to two-thirds of the development base. However, because Atlanta kept park and recreation facility reservation records by type of reservation (company picnic, church league, etc.), the consultants were able to determine that a very high percentage of the formal use of these facilities was for the benefit of non-residential land uses. The city thus had a reasonable basis on which to assess all land uses thereby reducing the magnitude of impact fees assessed on residential property.

Research for this project indicates that no other jurisdiction assessing impact fees is as comprehensive as Atlanta in sheltering affordable housing from potentially adverse effects.

Lessons from Atlanta

More than a decade after implementing its pioneering program, Atlanta is reflecting on its pioneering approach. Several lessons became evident during the case study. First, using the regional median measures for housing affordability in Atlanta during the 1990s meant that because housing values and incomes were lower in the city than in much of the metropolitan area (the city used HUD's regional figures), many more housing units qualified for reductions than if only city-specific value were used. In effect, for Atlanta, the reductions may have been too generous.

Second, not all development in targeted areas needed to have the impact fee reduced. It turned out that several developers of properties in targeted areas had no knowledge of the impact fee reductions and came to pull building permits assuming the impact fee would be paid, only to learn from staff that fees would be waived. This finding suggests that impact fee reductions may need to be targeted to a smaller group or more specific situations.

Third, as the city updates its impact program, it may cut back on the number and nature of reductions. Its initial concern in the 1990s was whether impact fees may affect growth in the city. That concern has dissipated as the city is attracting more higher-income residents yet it is still able to provide affordable housing.

Fourth, Atlanta as elsewhere has learned that impact fees do not by themselves facilitate construction of new facilities but may stimulate leveraging. City officials informed us that parks and recreation impact fees have enabled the city to leverage foundation (like Ford, Rockefeller, etc.) and other investments that result in a higher effective level of service now than in 1992, despite an officially adopted level of service that is lower.

As Atlanta prepares for an update, it is likely to reduce the scope of affordable housing reductions such as those for targeted geographic areas, enterprise and empowerment zones in particular, but retain many key reductions relating to transportation and affordable housing per se. As former commissioners of planning Leon Eplan and Michael Dobbins observed, the broad scale of impact fee reductions did its job of encouraging housing construction in blighted or other targeted areas. Now that Atlanta's housing market is healthy, future reductions should be more targeted.

Legal Issues for Atlanta

Since the Act was adopted in 1990 there have only been two legal challenges in Georgia, both decided favorably to local government. In *Metro Atlanta Home Builders Association v. Cherokee County*, the state Court of Appeal ruled that a single county-wide service area including cities was consistent with the Act even though impact fees are not collected from building permits issued by the cities themselves.

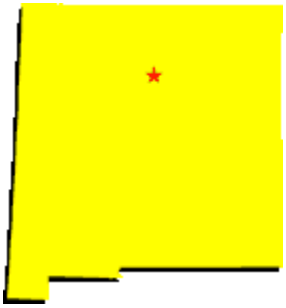
More recently, in *Southeast Legal Foundation v. City of Atlanta*, the federal District Court ruled that the plaintiff had no legal standing to challenge the city's use of only one service area instead of two for roads. In that case, the plaintiff alleged that while most impact fees for roads were collected in the northern part of the city in the areas of Midtown and Buckhead, those revenues were being spent mostly in the south for such purposes as sidewalks along streets. Had the case gone to trial, the City was prepared to show that more than 80% of the impact fees assessed were credited back to developers who constructed road improvements that would have been financed by impact fees instead. Of the remaining funds, much if not

most were used to improve sidewalks in the south so that workers living in the south could get to their jobs in the north – consistent with the city's strong city-wide north-south travel pattern.

Next Steps for Atlanta

Atlanta will undertake a major updating of its impact fee program in the near future. As it does, it will retain key affordable housing features and be more refined in impact fee calculations and assessments on housing. For example, road impact fees may be reduced for situations where development occurs along transit corridors (not just within 1,000 feet of a rail station), or in configurations that reduce vehicle use. The number and size of areas targeted for impact fee reductions will be reduced and fewer homes will likely be eligible for reduced impact fees but all homes meeting affordable housing criteria will remain eligible for reductions. The update will likely raise impact fees, which are currently a modest $1,400 per unit on average. This will provide the city with even more funds with which to leverage non-local and private funding for key facilities. As former commissioners of planning Eplan and Dobbins observed, the real benefit of impact fees to the city was their role in leveraging multiple sources of revenues especially for parks and recreation facilities, and roads.

Albuquerque, New Mexico



In 2005, the City of Albuquerque, New Mexico, adopted an impact fee program that is unique for 1) its attention to differences in facility costs between parts of the city, 2) its reductions in impact fees for attaining land-use efficiencies that by their nature reduce facility impacts, and 3) its outright waivers for affordable housing. Consequently, it is one of the most sophisticated impact fee programs yet adopted. Lessons learned may be applicable broadly especially in jurisdictions that are committed to minimizing potentially adverse effects of impact fees on affordable housing through direct (waiver) and indirect (cost-variation and impact-reduction) approaches.

The City of Albuquerque, New Mexico, is the state's largest city at over 510,000 residents and is projected to reach nearly 625,000 residents by 2025. The state constitution confers home rule authority to cities thereby providing Albuquerque with a broad range of powers and flexibility with which to use them. The city's governance structure can be characterized as a strong-mayor, the position of which serves as the chief administrator for city policy. The city council is composed of seven members elected by district, with a council president elected from among council members.

The City started its impact fee deliberations in the early 1990s then decided to embark on a large-scale, community-driven visioning approach to address issues of urban form, land use and facility efficiencies, equity, long-range capital facility financing, and related "big picture" issues. That process led to the Planned Growth Strategies (PGS) plan which was adopted in 2004. Chief among its many innovations was establishing tiers called "fully served," "partially served," and "unserved." The purpose of the tiers was to recognize that some areas of the city already had most or all the infrastructure needed to serve new development but other areas did not. Also, "fully served" areas were more likely than "partially served" ones to have infill and redevelopment opportunities. From the city's perspective, it would be a more efficient use of existing resources to encourage development in fully served areas – where facilities already exist – and also encourage more efficient development patterns in partially served areas through a pricing

structure in part based on impact fees. The rest of this section reviews how the impact fee structure emerged from this basic planning objective.

The fees went into effect on July 1, 2005.

Enabling Legislation for Albuquerque

The City of Albuquerque is authorized to impose development impact fees. The New Mexico Development Fees Act [5-8-1 to 5-8-42 NMSA 1978] authorizes all cities and counties to enact or impose impact fees on land within their respective corporate boundaries and to pay specified costs of constructing capital improvements or facility expansions with impact fees. Section 5-8-3.B "If it complies with the Development Fees Act, a municipality or county may enact or impose impact fees on land within its respective corporate boundaries." Section 5-8-2.I defines an impact fee as:

> *[A] charge or assessment imposed by a municipality or county on new development in order to generate revenue for funding or recouping the costs of capital improvements or facility expansions necessitated by and attributable to the new development. The term includes amortized charges, lump-sum charges, capital recovery fees, contributions in aid of construction, development fees and any other fee that functions as described by this definition. The term does not include hook-up fees, dedication of rights of way or easements or construction or dedication of on-site water distribution, wastewater collection or drainage facilities, or streets, sidewalks or curbs if the dedication or construction is required by a previously adopted valid ordinance or regulation and is necessitated by and attributable to the new development.*

The statute authorizes specific services to be funded with impact fees. Section 5-8-2. provides the list:

> *"[C]apital improvement" means any of the following facilities that have a life expectancy of ten or more years and are owned and operated by or on behalf of a municipality or county:*
> *(1) water supply, treatment and distribution facilities; wastewater collection and treatment facilities; and storm water, drainage and flood control facilities;*
> *(2) roadway facilities located within the service area, including roads, bridges, bike and pedestrian trails, bus bays, rights of way, traffic signals, landscaping and any local components of state and federal highways;*
> *(3) buildings for fire, police and rescue and essential equipment costing ten thousand dollars ($10,000) or more and having a life expectancy of ten years or more; and*
> *(4) parks, recreational areas, open space trails and related areas and facilities.*

The New Mexico enabling act adopts the proportionate share concept in Section 5-8-7: "[t]he fee shall not exceed the cost to pay for a proportionate share of the cost of system improvements, based upon service units, needed to serve new development."

In Section 5-8-2.G "facility expansion" is defined in the statute as the "expansion of the capacity of an existing facility that serves the same function as an otherwise necessary new capital improvement, in order that the existing facility may serve new development." Section 5-8-2.G further specifies that "facility expansion" does not include "the repair, maintenance, modernization or expansion of an existing facility to

better serve existing development..."

The Act specifies that no impact fees shall be spent to provide new or better facilities for existing development. Furthermore, fees collected for public safety capital improvements and facility expansion can only be spent for public safety capital facilities and facility expansions and not for any other type of improvements or facilities.

A capital improvement plan is required by the Act to be the basis of impact fee programs. Section 5-8-23 requires that "If the governing body adopts an ordinance, order or resolution approving the land use assumptions, the municipality or county shall provide for a capital improvements plan to be developed by qualified professionals using generally accepted engineering and planning practices…"

Therefore, the City of Albuquerque is authorized to adopt public safety impact fees provided that the fees do not exceed a proportionate share of the cost of providing capital improvements to new developments within service areas. Furthermore, those impact fees must be in accord with land use assumptions adopted by the City Council and be incorporated into Capital Improvement Plans. What follows are the calculations for public safety impact fees consistent with these requirements.

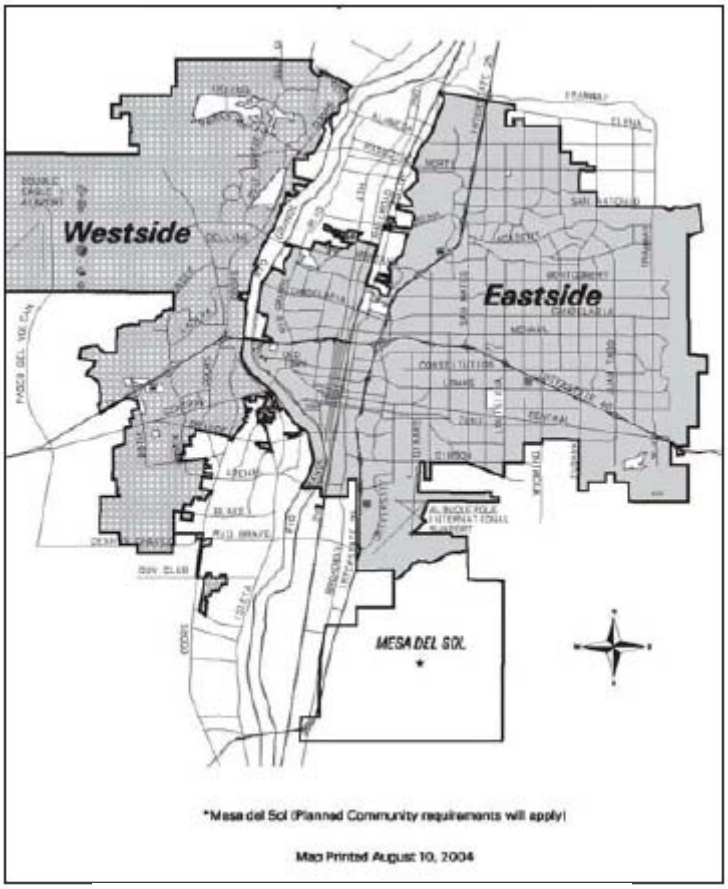


FIGURE 5-2. PUBLIC SAFETY SERVICE AREA

The Act also requires service areas for each facility. The Act also allows different levels of service for individual service areas – similar to other impact fee statutes – but rarely applied. In Albuquerque, the city decided that for public safety facilities not only were two service areas logical but different levels of service within each. The city reasons that although public safety activities function best as a system of facilities serving the entire city, the city is actually divided by the Rio Grande River into eastern and western parts so two service areas were devised (Figure 5-2). For parks and recreation, seven areas were created (Figure 5-3). To account for topographical features creating unique drainage sheds, five drainage facility service areas were created (Figure 5-4). Finally, in recognizing important differences in travel patterns and the extent to which road facilities were fully developed, seven service areas were drafted (Figure 5-5).

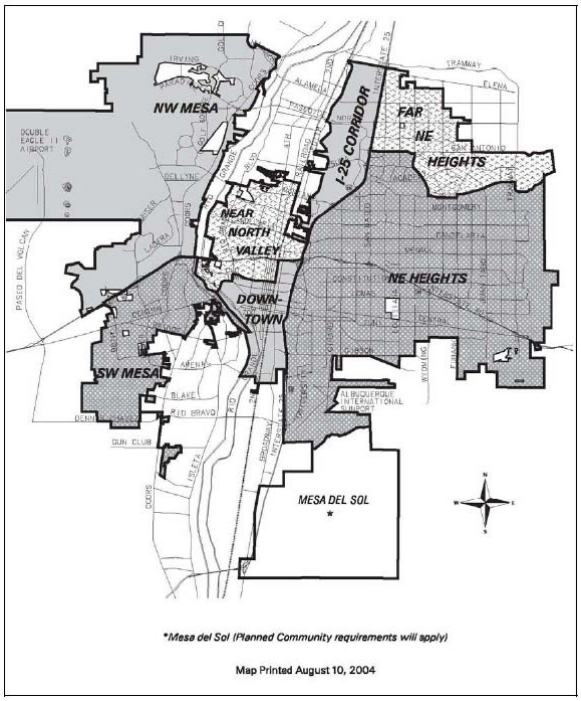


FIGURE 5-3. PARKS, RECREATION FACILITIES AND OPEN SPACE SERVICE AREAS

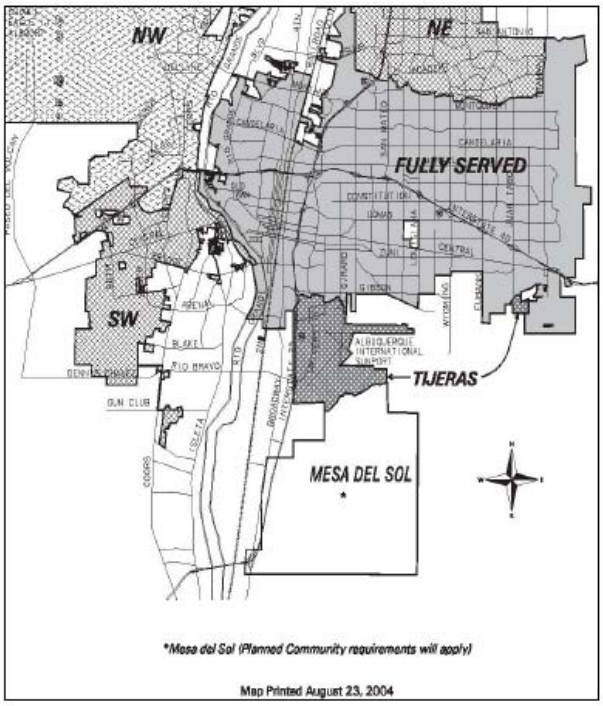


FIGURE 5-4. DRAINAGE FACILITY SERVICE AREAS

The Act requires that levels of service standards be adopted as a way to measure current capacity deficiencies or surpluses, and in part to help project future development needs. Capital improvement plans and costs need to be related to service areas, and impact fees calculated accordingly. Where revenue was known to be available to help finance needed facilities, costs were reduced to a "net" impact cost. For public safety facilities, the level of service standard was based on functional population while for parks, recreation facilities, trails and open space it was based on residents. For drainage it was based on impervious surface, and for roads it was based on travel behavior by land use. Tables 5-3 through 5-6 provide the impact fee calculations for residential structures.

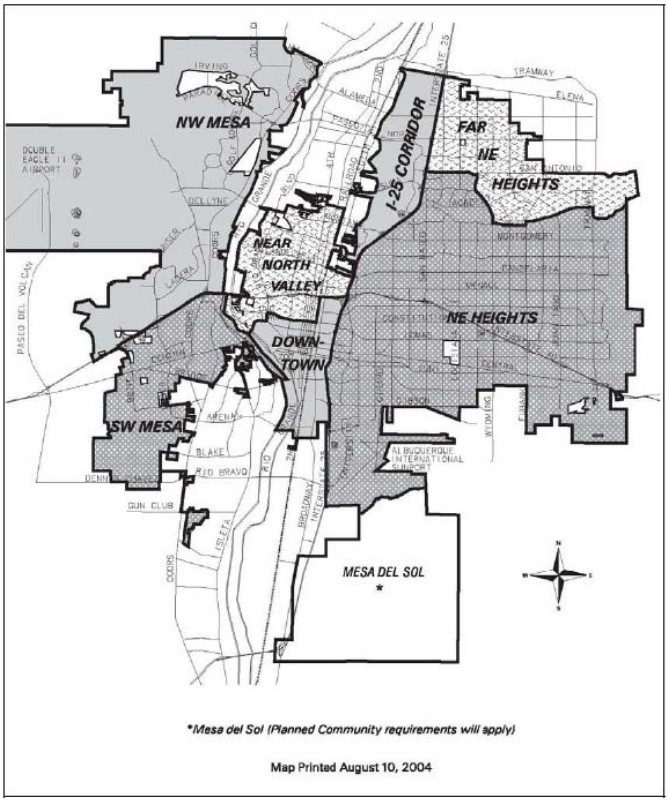


FIGURE 5-5. ROAD FACILITY SERVICE AREAS

TABLE 5-3. ALBUQUERQUE PUBLIC SAFETY LEVEL OF SERVICE, NET IMPACT COSTS, AND IMPACT FEES BY SERVICE AREA

Step		East Side	West Side
New Functional Population 2004 – 2025		47,991	63,779
Total Public Safety Cost per Capita		$371.47	$278.17
Fire and Emergency Protection Levels of Service			
Persons Served per Fire Station		22,886	20,782
New Stations Needed by 2025		3	2
Fire Improvement Costs		$11,395,311	$9,175,144
Fire Cost Per Capita		$237.45	$143.86
Police Levels of Service			
Citywide Facilities, Square Ft. per Capita		0.444	0.444
Citywide Cost per Capita		$94.77	$94.77
Service Area Facilities, Square Ft. per Capita		0.163	0.163
Service Area Costs per Capita		$39.25	$39.54
Police Cost per Capita		$134.02	$134.31
Development Type	Functional Occupants	Unit Costs per 1,000 Square Feet	
		East Side	West Side
Residential	0.743	$275.92	$206.62

TABLE 5-4. ALBUQUERQUE PARKS, RECREATION FACILITY, TRAIN AND OPEN SPACE LEVEL OF SERVICE, NET IMPACT COST, AND IMPACT FEES BY SERVICE AREA

SERVICE AREA	Academy/ NE	Central/ University	Foothills/ SE	North Albuquerque	North Valley/I-25	SW Mesa	NW Mesa/ Volcano
Local Parks (Neighborhood & Community)							
Level of Service per 1,000 People	2.600	2.600	2.600	2.600	2.600	2.600	2.600
Needed Additional Acres	2.13	0.00	8.88	20.07	16.71	71.29	110.44
Acres Available in Inventory	26.49	12.74	47.61	59.00	3.95	81.53	109.02
Acres to be Acquired	0.00	0.00	0.00	0.00	12.76	0.00	0.00
Acquisition Cost per Acre	$125,000	$110,000	$105,000	$125,000	$122,500	$72,000	$120,000
Acquisition Cost	$0	$0	$0	$0	$1,562,708	$0	0.00
Acres to be Developed	2.13	0.00	8.88	20.07	16.71	71.29	110.44
Existing Surplus	0.00	78.17	7.11	0.00	0.00	0.00	22.90
Net Acres to be Developed	2.13	0.00	1.77	20.07	16.71	71.29	87.54
Development Cost per Acre	$175,000	$175,000	$175,000	$175,000	$175,000	$175,000	$175,000
Development Cost	$373,555	$0	$309,225	$3,511,690	$2,923,830	$12,475,645	$15,319,465
Facilities Cost per Acre	$226,007	$226,007	$226,007	$226,007	$226,007	$226,007	$226,007
Facilities Cost	$482,434	$0	$399,354	$4,535,228	$3,776,027	$16,111,871	$19,784,567
Total Cost Local Parks	$855,989	$0	$708,579	$8,046,918	$8,262,565	$28,587,516	$35,274,864
Cost per Capita	$1,042.62	$0	$207.49	$1,042.62	$1,285.80	$1,042.62	$830.45
Less Grants	($70.41)	$0	($14.01)	($70.41)	($86.84)	($70.41)	($56.08)
Less Bond Credit	($208.52)	$0	($41.50)	($208.52)	($257.16)	($208.52)	($166.09)
Net Local Park Cost	*$763.69*	*$0*	*$151.98*	*$763.69*	*$941.80*	*$763.69*	*$608.28*
Trails							
Cost per Capita	$21.88	$21.88	$21.88	$21.88	$21.88	$21.88	$21.88
Less Grants	($1.48)	($1.48)	($1.48)	($1.48)	($1.48)	($1.48)	($1.48)
Less Bond Credit	($4.38)	($4.38)	($4.38)	($4.38)	($4.38)	($4.38)	($4.38)
Net Trails Cost	*$16.03*	*$16.03*	*$16.03*	*$16.03*	*$16.03*	*$16.03*	*$16.03*

TABLE 5-5. ALBUQUERQUE NET IMPACT COSTS, PROJECTED IMPERVIOUS ACRES, AND DRAINAGE IMPACT FEE PER ACRE BY SERVICE AREA

Service Area	Net Impact Costs	Total Area (Acres)	Projected Impervious Acres, 2000-2025	Cost Per Impervious Acre
NW	$ 55,015,528	15,490	3,915	$ 14,052
SW	$ 35,393,166	9,021	2,757	$ 12,836
Fully Served	$ 0	40,250	2,009	$ 0
Tijeras	$ 2,933,604	2,611	221	$ 13,290
Far NE	$ 15,044,434	11,753	1,474	$ 10,208

TABLE 5-6. ALBUQUERQUE LEVEL OF SERVICE, NET IMPACT COST, ROAD IMPACT FEES BY SERVICE AREA

Land Use	Trip Rate (PM Peak)	Trip Rate (Daily)	Assessable Trip Length	Total Trip Length	% New Trips	Total Impact Cost	Annual Gas Tax Proxy	Gas Tax Proxy Offset	Net Impact Cost	Downtown	NE Heights	Near North Valley	Far NE Heights	I-25 Corridor	NW Mesa	SW Mesa	Fee
Single Family Detached																	
Less than 1,500 sf	0.68	6.35	6.28	6.78	100%	$3,617	$17	$233	$3,384	$0	$0	$0	$1,069	R2,113	$2,626	$2,702	N/D
1,500 sf to 2,499 sf	1.02	9.57	6.28	6.78	100%	$5,425	$25	$351	$5,075	$0	$0	$0	$1,585	$3,160	$3,933	$4,046	$3,068
2,500 sf or Larger	1.14	10.74	6.28	6.78	100%	$6,063	$28	$394	$5,670	$0	$0	$0	$1,754	$3,521	$4,388	$4,516	N/D
Multi-Family	0.67	6.72	4.19	4.69	100%	$2,376	$12	$170	$2,206	$0	$0	$0	$512	$1,276	$1,651	$1,706	$1,902
Condominium/Townhouse	0.52	5.86	4.19	4.69	100%	$1,844	$11	$148	$1,695	$0	$0	$0	$218	$885	$1,212	$1,260	$1,657
Mobile Home Park	0.60	4.99	4.29	4.79	100%	$2,178	$9	$129	$2,049	$0	$0	$0	$765	$1,344	$1,629	$1,671	$1,687
Retirement Home	0.35	3.71	2.39	2.89	100%	$709	$4	$58	$651	$0	$0	$0	$74	$335	$462	$481	$828
Congregate Care Facility	0.20	2.02	3.09	3.59	71.6%	$375	$2	$28	$347	$0	$0	$0	$67	$193	$255	$264	N/D

By and large, these fee schedules are notable for their treatment of affordable housing in two significant respects. First, the service areas are carefully designed with respect to parks, recreation facilities, trails and open space, drainage, and road facilities. Generally, the more built-out and compact an area, the lower the fee – in several cases being zero. In effect, when existing facilities are sufficient to meet future demand no impact fee need be assessed. On the other hand, the lower the investment in facilities and the greater the projected growth, the higher the fees. The effect is to encourage infill and redevelopment in closer-in areas where excess capacity exists while charging substantial fees where new facilities are needed to accommodate growth. It is possible that some development may be lured away from lower-density areas where new facilities are needed and into higher-density ones where facilities that can accommodate development needs exist.

Second, the fees are based on the size of structures and in particular residential units. Census data show clearly that larger dwellings on average have more residents than smaller ones (such as shown in Tables 4-2 and 4-3 above). By apportioning impact fees based on dwelling unit size, the smaller and more affordable residential units pay a lower fee than larger ones.

By themselves, these two features are notable improvements in impact fee policy and "Smart Growth" friendly. The City is going further, as will be seen in the next section.

Special Affordable Housing Provisions for Albuquerque

The City of Albuquerque has taken two additional actions to reduce the potentially adverse effect of impact fees on affordable housing: waiving fees; and, encouraging designs and configurations of new development to reduce facilities impacts – thereby reducing fees potentially for all affected housing stock.

New Mexico's impact fee Act enables local governments to waive impact fees on affordable housing. At 5-8-3, the Act allows that a "municipality or county may waive impact fee requirements for affordable housing projects" while 5-8-1 defines affordable housing as "any housing development built to benefit those whose income is at or below eighty percent of the area median income; and who will pay no more than thirty percent of their gross monthly income towards such housing." The City is taking advantage of these statutory provisions to waive or reduce impact fees for qualified housing in the following respects:

- Impact fees for owner-occupied housing affordable to households earning 80% or less of the Metropolitan "area median income" (AMI) are waived completely.

- Impact fees for owner-occupied housing affordable to households earning 80% or less of AMI within "Planned Village Development Zones" – essentially areas targeted for compact suburban villages, and "Infill Development Zones" – essentially areas targeted for urban-scale infill and redevelopment, are waived completely.

- Impact fees for the affordable units in projects located within certain Centers and Corridors identified in the Comprehensive Plan are waived completely.

- Impact fees for affordable units within mixed-income projects located elsewhere are reduced by 60%. The City defines "mixed-income projects" as (a) for owner-occupied housing, not less than 20% or more than 50% of the total owner-occupied units in the development affordable to

households earning 80% or less of AMI and at least 40% of remaining units affordable at 120% or more of AMI, and (b) for rental housing, not less than 20% or more than 40% of the total rental units in the development affordable to households earning 60% or less of AMI and at least 30% of the total units serving families at 80% or more of AMI.

In addition, the City is finding through policy-making that certain developments by their nature in specific parts of the city can lead to efficiencies, such as reducing travel by providing employment or shopping services near existing residential areas. It thus reduces impact fees for nonresidential development from 30% (for retail) to 70% (for industrial) west of the Rio Grande River, an area that is devoid of substantial employment, shopping, or service opportunities. While not directly related to affordable housing, the policy recognizes that achieving the jobs-housing balance will nonetheless help advance housing affordability by reducing costs associated with commuting.

During 2005 and 2006, the City anticipates adjusting fees downward for many types of development, including housing, in a variety of targeted areas.

How will the City offset lost revenue and continue building new facilities? Where facilities already exist and where efficiencies can be attained where new facilities are needed, the lost revenue is *per se* not needed. The real revenue that is lost comes from waiving fees on certain housing where fees would be otherwise assessed. In other states that enable fee waivers, replacement revenues need to be identified but this is not the case in New Mexico. One theory is that in the scheme of things the lost revenue is *de minimus* and not sufficient to warrant concern at least from a legal perspective. Another is that the general fund will be used to fill in revenue gaps as needed to provide facilities when needed. The general fund includes tax revenue from existing and new development, including taxes paid by occupants of affordable housing, so it would be a matter of public policy that everyone in the community would offset revenues through impact fee waivers on affordable housing.

Legal Issues for Albuquerque

After adopting impact fees in late 2004 but having not implemented them until mid-2005, the New Mexico legislature considered amending the Act to undercut the City's program. It would have done so by disallowing "marginal cost" calculations of impact fees, a term used in the Planned Growth Strategies (PGS) to guide impact fee calculations. The bill would instead require "average cost" calculations. The bill passed the House but failed to be moved out of a Senate committee before adjournment. It is uncertain how the amendment would actually have changed the City's program since, technically, the fees were actually calculated based on long-term average cost principles (total future costs divided by total future development). Since the law would not have required that the same impact fee be assessed throughout a jurisdiction -- which was supportive of the principles of apportioning impacts based on differences in costs by service areas – experts were uncertain what practical down-side effects there would be.

Lessons from Albuquerque

It may be too early to learn many lessons from Albuquerque's unique approach, especially as it relates to affordable housing, but some may be apparent. First, the City has shown that multiple service areas reflecting substantially different levels of facility availability between them can result in much lower (and sometimes no) impact fees where sufficient facilities already exist. Care must be taken not to make service

areas too small, however, as this may reduce revenue to levels below those needed to actually make facility investments.

Second, the City is pioneering efforts to include impact fee reductions for certain developments that reduce facility impacts through an across-the-board adjustment. Normally, such adjustments are done on a case-by-case "independent fee calculation study" that could be expensive, time-consuming, and contentious. Time will tell whether actual impacts were reduced. Nonetheless, the logic would appear sound, and if overall facility impact reductions are somewhat less than assumed, they may still be more than would have occurred in the absence of such policy.

Third, the City may have one of the most aggressive approaches to reducing potentially adverse effects of impact fees on affordable housing. The extent to which this may lead to delay in constructing facilities or require significant contributions from the general fund will not be known perhaps for years. Even if these outcomes are realized, the City's approach may lead to more dispersion of affordable housing, improved jobs-housing and workforce-housing balance, more stable neighborhoods, greater housing choices, and other benefits that may offset the costs.

From the broader perspective, one must not lose sight that the whole impact fee approach pursued by Albuquerque is rooted in its PGS policy, a variation of a "Smart Growth" policy. At its heart, the PGS seeks to encourage infill and redevelopment, encourage development to go where facilities exist and away from areas where they don't, increase housing options, improve housing affordability, and result in more efficient land uses, among other things. Impact fees merely help implement these and related policies, not guide them.

Alachua County, Florida



Alachua County is a moderately fast growing county in north-central Florida, about 100 miles north of Orlando, and home to the University of Florida, the state's largest university and the County's largest employer. During the 1990s, it grew from about 183,000 to 218,000 residents, or a little less than 20%. (Florida grew by about 23% during the same period.) As in many growing jurisdictions throughout Florida, impact fees have long been considered one option to facilitate new development without raising taxes or imposing lower standards of service on existing development.

The County initially adopted a road impact fee in 1991 (a flat $686 per single-family unit) but repealed it in 1993 principally because of concerns about the effect of impact fees on housing affordability. As growth continued and along with it demand for new facilities increased yet revenues available for new facilities could not keep pace, interest in impact fees was renewed in the early 2000s. In 2004, a technical report was prepared covering public buildings, fire, rescue, parks, and roads, and in 2005 all the fees except those for rescue and public buildings were implemented. To address affordable housing concerns, the County also implemented a pioneering affordable housing impact fee set-aside program. The discussion leading to this program and how it works may be instructive to other communities.

Alachua County's population in 2005 was estimated at 230,000. The largest city is Gainesville which has a population of about 100,000. More than half the county population lives in unincorporated areas. In Florida, all counties have home rule powers which, when combined with police powers, provide local governments with considerable flexibility to address problems. The county commission is composed of five elected officials serving staggered four-year terms. The chairman is selected annually by the board.

In the early 2000s, county commissioners began to express their concern about the county's ability to expand facilities to meet development needs given its current funding levels. It was also concerned about affordable housing.[54] In 2003, the County commissioned a study into affordable housing needs. It found that production of affordable housing requires proactive measures through policies and financial incentives.

After that study was issued, the County engaged Dr. James C. Nicholas of the University of Florida in 2004 to prepare a technical report for impact fees to help finance public buildings, fire/rescue, parks, and roads.[55] Both studies led the County to adopt impact fees for three facilities (public buildings and rescue were deferred) but with an impact fee set-aside program for affordable housing, details of which will be discussed later.

Enabling Legislation for Alachua County

In Florida, impact fees are based on case law emanating from the 1970s and refined through the early 1990s, with little change in case law since then (see Nicholas, Nelson and Juergensmeyer 1991; Juergensmeyer and Roberts 2001). In addition, state planning law (Chapter 163 Part II, F.S.) requires local governments to project capital facility needs and identify revenues sufficient to fully fund them. Implementing state law is Rule 9J-5 of the Florida Administrative Code, which identifies impact fees as a potential source of revenue to help finance capital improvements.

Although Florida does not have an impact fee enabling statute, Florida case law requires that communities meet the "dual rational nexus test" (Nicholas, Nelson & Juergensmeyer 1991). This test has two major components:

(1) The facilities to be charged to new development as impact fees must be needed to serve that new development, and

(2) The funds collected as impact fees must be earmarked and spent for the purposes for which they were collected.

Implied in this test is that no impact fee can exceed a pro rata or proportionate share of the anticipated costs of providing new developments with capital facilities.

Today, impact fees in Florida are used to finance a wide range of activities including but not limited to schools, parks, beaches, trails, open space, public safety, public buildings, roads, drainage, water, wastewater, emergency shelters, boat docks, community centers, cemeteries, and golf courses.

---

[54] The online affordable housing needs study and the appendix can both be accessed via: http://growth-management.alachua.fl.us/housing/housing_study.php.

[55] The technical report by Dr. Nicholas can be found in the public hearing materials package at http://publicinformation.alachua.fl.us/documents/impact_fees/092804 Impact Fee Public Hearing.pdf.

Impact Fees in Alachua County

The method employed in the Alachua County impact fee program is the so-called "needs driven" approach, also known as the "standards approach." This method begins by identifying the level of service for a facility or service, such as 3 acres of parks per 1,000 residents. This would convert to 131 square feet of park area per capita. It would follow that a new home with 2.5 persons in residence would need 327 square feet of park area in order to maintain that standard. Using the historic or projected costs of the jurisdiction, the cost for providing an acre of parks is calculated and then applied to the needs of particular units or types of development. If park costs per acre are found to be $20,000, the cost per square foot would be $0.46, the cost per capita would be $60 and the cost per residence would be $150.

The alternate method is the so-called "improvements driven" approach. This approach begins by developing an improvement program for a service such as parks. The costs of the growth-serving park improvements are then spread over the units of growth expected during the life of the improvement program. If the level of service is 3 acres of parks per 1,000 residents and if parks cost $20,000 per acre in the future, the cost would be the same as that of the needs driven calculation. However, it is a rare occurrence when future costs for capital improvements, especially land acquisition, are equal to historic costs. The result is that improvements based impact fees tend to be higher than needs based.

The first set of data needed to calculate impact fees are the land use assumptions, shown in Table 5-7. These data are drawn from the census and other available data from the Alachua County Comprehensive Plan. Between 2002 and 2003, the unincorporated area of the County lost population. This was due to annexations by the City of Gainesville. All the fees except roads are assessed county-wide since those facilities serve county-wide needs.

TABLE 5-7. LAND USE ASSUMPTIONS

	2000	2004	2005	2009	2010
COUNTYWIDE					
Population	215,498	225,501	229,967	248,722	253,643
Dwelling Units	95,113	99,528	101,499	109,777	111,949
Households	87,509	91,571	93,384	101,001	102,999
Res. Floor Area	171,203,400	179,150,337	182,698,225	197,598,576	201,507,875
Office Floor Area	9,405,834	10,391,501	10,577,108	11,317,313	11,557,267
Ind. Floor Area	9,549,169	10,270,777	10,405,283	11,125,264	11,356,194
Retail Floor Area	8,034,555	8,617,640	8,735,609	9,181,358	9,355,909
Total Area	198,192,958	208,430,255	212,416,225	229,222,511	233,777,245
UNINCORPORATED					
Population	104,479	97,388	100,114	111,725	114,814
Dwelling Units	47,535	44,309	45,549	50,832	52,237
Households	43,350	40,408	41,539	46,357	47,638
Res. Floor Area	85,563,000	79,755,787	81,987,886	91,497,211	94,026,841
Office Floor Area	7,793,405	8,181,599	8,763,889	9,413,595	9,576,021
Ind. Floor Area	5,545,421	5,744,287	6,042,586	6,484,359	6,594,802
Retail Floor Area	5,515,470	5,707,971	5,996,722	6,337,375	6,422,538
Total Area	104,417,296	99,389,643	102,791,084	113,732,539	116,620,202

SOURCES: Bureau of the Census, 2000 Decennial Census; Alachua County, March 2004; Florida Statistical Abstract, various years; Bureau of the Census, Annual Estimates of Population for Counties of Florida: April 1,2000 to July 1,2003 (CO-EST2003-01-12); Bureau of Economic and Business Research, Florida Population Studies: Projections of Florida Population by County 2003-2030, Bulletin 138, February 2004; Bureau of Economic and Business Research, Florida Estimates of Population, January 2004. Fishkind & Associates, March 19, 2001, memo to Ken Zeichner, Alachua County Principal Planner. Note: The population reported is the total population less those institutionalized.

These assumptions were supplemented with other data on service standards, impact costs, non-local revenues, and new revenues new development may generate that may be used to help finance the same facilities for which impact fees are assessed. The impact fee technical report used these land use assumptions plus cost and revenue data to prepare impact fees for public buildings, fire, rescue, parks, and roads. Except for public buildings and rescue, all fees were adopted. The impact fee calculations for those facilities are summarized in the Appendix A.

Impact fees for all housing units are assessed on a per-square-foot basis for all residential units. Although the technical report recommended that impact fees top-out for homes larger than 3,900 square feet, the impact fee advisory committee recommended and the County Commission adopted a fee that tops-out at 2,600 square feet.[56] This is purely a policy decision. To further reduce potential effects on housing affordability, the County reduced the road impact fees (the largest of those implemented) to 65% of the potential amount that could be assessed. This was also purely a policy decision. In this case, the concern was that because road impact fees would be by far the largest of all fees, they may impact more on housing affordability. This approach was endorsed by a coalition of residential and commercial developers.

The County's assessment approach is very much in keeping with the guidance contained in this document. It means that larger homes will be charged more than smaller ones. Only a few jurisdictions apply impact fees in this way with most assessing fees based on type of dwelling (single-family detached, townhouse, apartment, manufactured home, etc.) and sometimes by type that is tiered reflecting different size categories. The Alachua County approach is thus designed to reduce potentially adverse effects of impact fees on lower-cost housing because, usually, smaller homes cost less than larger ones. The rationale is sound because larger homes on average have more occupants than smaller ones (see Table 4-2).

Mechanically, impact fees are assessed at the building permit stage but collected prior to the issuance of the Certificate of Occupancy (when the home is finished and ready for occupancy.) That is, the size of the house is determined when application for a building permit is made and the fee is assessed based on the total number of square feet up to 2,600.

Affordable Housing Impact Fee Relief Program for Alachua County

In response to information presented in the 2003 affordable housing study and local residential developers, Alachua County established an *Affordable Housing Impact Fee Relief Program*. In 2005, the County apportioned $100,000 into the fund. Here is how it works: Qualifying homebuyers must have gross annual incomes less than 80% of Area Median Income, adjusted for family size, as established annually by the United States Department of Housing and Urban Development. In 2004, the most recent year applicable, the median family income was $52,200[57] of which 80% would be $41,760.[58] It is difficult to tell how many households seeking to purchase new homes would benefit from this approach, however.

---

[56] These draft reports are not official but give some insight into deliberations.

[57] From http://www.web-mtg.com/Public/florida_news/florida_median_income_areas_cities_counties.htm#median_income_2004_florida_counties accessed September 9, 2005.

[58] Table 5-7 indicates that the average household size was 2.41 in 2004. Assuming 5% down, 30-year period, 6% interest, and $300 other monthly obligations, such a household could afford to purchase a home of about $93,000. Payments would be $675 per month.

The maximum purchase price of a qualifying single-family home cannot exceed the maximum allowable purchase price as established in the Alachua County State Housing Initiatives Partnership Program Local Housing Assistance Plan (2004). That plan, adopted in 2004, capped purchase prices at $131,603 for new construction and $103,000 for existing homes. The 2006-2008 SHIP Local Housing Assistance Plan, adopted in 2005, caps purchase prices at $140,000 for new construction and $103,000 for existing homes. (Note: an existing home would be subject to payment of impact fees in the case where a permit is issued to build additional living space.) The most recent federal income tax return is used to verify household income and family size.[59]

For qualifying sale of new homes to low-income households, the impact fees assessed at the building permit stage are turned into a "soft second"[60] mortgage at the certificate of occupancy stage with 0% interest as a deferred mortgage over five years. At the end of each year, 20% of the second mortgage is forgiven and at five years it is forgiven completely. The balance of the second mortgage is due on sale or refinance if homes are sold or refinanced within the five-year term, regardless of the buyer's or seller's current income. No income tests are necessary after the initial assistance is provided to the buyer as the soft second mortgage is not transferable.

The extent to which this program is effective cannot be immediately known. The County budgeted $100,000 in general revenue to fund the first year of the program, but as of October 1, 2005, no funds have been expended for this purpose. Nevertheless, it may be too early to assess the effectiveness of this program as impact fees have been assessed only on building permit applications submitted after March 28, 2005. Community outreach by county staff to realtors, builders, and manufactured housing dealerships is in the initial stage. Other potential beneficiaries include homeowners with room additions or accessory dwellings, where building permits are being issued. Local market rate home builders are simply not building homes meeting the affordable housing parameters in unincorporated Alachua County. Indeed, a recent Internet search of homes[61] that would fit the affordable price range for the average household at low income found only 13 new homes of 166 on the market meeting the price parameters, and all these were on one condominium project. However, affordable housing providers do produce new housing under $140,000 in Alachua County. The Alachua County Property Appraiser's sales records indicate that 22 new homes sold between September 2004 and January 2005 for a sales price between $85,000 and $138,100, for an average of $114,750.[62]

---

59 If no tax return is available, then eligibility is based on verification of current income and family size of the household intending to reside in the unit.

60 Also called a "silent second" in some applications. This term is used by the County to characterize its program.

61 www.realtor.com accessed September 9, 2005, for Gainesville and surrounding communities searching for homes built in 2005 (thus "new" homes) under $145,000.

62 Alachua County Property Appraiser website sales search at www.acpafl.org/saleresults.asp for homes built in 2004-2005 between September 2004 to September 2005 in unincorporated Alachua County (city code 0400).

Lessons from the Case Studies

The case studies presented here offer some real-world examples of the affordable housing guidance contained in this Guidebook. Currently, very few communities waive impact fees for affordable housing entirely. The Albuquerque case study shows this can be done where state enabling legislation allows waivers without identifying replacement or substitute revenues. The Atlanta case study reports waivers are financed through a unique "recoupment" system that may be the only one of its kind in the nation, despite being adopted more than a decade ago in 1993. These are two extremes that may not be possible in many states whether or not they have impact fee enabling legislation.

The Alachua County case study offers a third and perhaps more realistic approach to reducing, if not eliminating, impact fees for qualified affordable housing. A modest general fund allocation is provided to offset the cost of impact fees for qualifying affordable housing, and is provided as a soft-second no-interest deferred mortgage. If the subject dwelling remains occupied by the initial buyer for five years, the deferred loan is forgiven.

Chapter 6 - Summary and Conclusions

During the next 30 years, America will need to build about 2 million homes annually to keep pace with demand. It has produced this level of new homes for much of the past decade in large part because of favorable interest rates and reasonably ample land on which to build. Still, the past five years have seen some of the highest rates of housing price increases on record – and for a lot of reasons these are the "good times" in the residential real estate market.

Challenges are looming. Rising interest rates are already cooling new construction. Rising energy prices will erode personal disposable income. Foreign competition for such building materials as steel, concrete, lumber, and even gypsum (for wallboard) reduces domestic supply and increases construction prices. The next few years in new housing construction may see a reduction in supply that when coupled with growing demand and rising prices may reduce greatly the amount of housing that is considered "affordable."

Against this backdrop is increasing demand put on local governments to provide quality public services and facilities. Congress and most statehouses are devolving responsibility for local financing of local public facilities and service to local governments. States have also acted in numerous ways to restrict facility financing options.

Impact fees have evolved as an important means of bridging the gap between facility needs and the revenue available to pay for them. Impact fees have many detractors who argue correctly on public finance and social welfare grounds that impact fees are not the best solution to solving local facility financing problems. However, for reasons related to taxpayer resistance, legal constraints and pragmatism, impact fees are often viewed as the necessary evil to solve pressing needs.

The potential effect of impact fees on housing affordability is hotly debated, with evidence seemingly supporting all views. Impact fees are likely here to stay but that does not mean they are rigidly implemented instruments of public policy. To the contrary, the impact fees of the 1970s bear little resemblance to those of the 2000s. One significant area of evolution is in calculating the fees. As noted above, much can be achieved to soften the potentially adverse effect of impact fees on housing affordability. And if that is still not enough there exist other approaches in which potentially adverse effects can be softened further if not eliminated entirely.

It is hoped that HUD's Guidebook will elevate impact fee practice to the point where every reasonable design and calculation approach is used to protect or advance housing affordability, while fairly and accurately serving underlying societal needs.

APPENDICES

Appendix A. The Relationship between Impact Fees, Planning and Exactions

This appendix puts impact fees into the context of planning and broadly reviews their relationship to exactions.

Impact Fees and Planning

Impact fees come near the tail-end of a planning and implementation process.[63] The legal logic for impact fees came initially through the exercise of local police powers provided in home rule charters, subdivision regulation authority, zoning enabling legislation, and utility statutes. Since they must be tied to regulation, they are sometimes called regulatory impact fees. They must be based on the relationship between growth and its demand on facilities needed to serve it. Also, they must not exceed the "proportionate share" of the impact of growth on facilities. This is the foundation of the "dual rational nexus test" (see section on proportionate-share impact fees).

The Georgia Department of Community Affairs, provides useful guidance on how this is established. First, long-range projections of population, housing unit demand, and employment growth are made and adopted officially. This is typically over a 10- to 20-year planning horizon.

Second, community planning goals are established that are designed to guide growth consistent with them. One or more goals may relate to housing affordability – a topic addressed elsewhere in this Guidebook.

Third, a comprehensive, long-range (typically 10- to 20-year) land use plan is prepared to help guide development to achieve planning goals.

Fourth, the projections are converted into facility demand. Suppose a community will double in population, adding 100,000 new residents over the planning horizon. Suppose also that it already has 500 acres of park land or 5 acres per 1,000 residents. Its current "level of service" is thus 5 acres per 1,000 residents. If the community is satisfied with the current level of service, it may adopt it as the official level of service standard. The next 500 acres of park are thus included generally in a long-range capital improvement element (CIE).

The Capital Improvement Element is implemented by a capital improvement program (CIP) which in Georgia is typically five to 10 years. This is the fifth step. In the case of parks, it shows the park land and acquisition improvement projects needed over that period to accommodate new development. Costs are estimated and sources of revenue available to cover those costs are identified. These revenue sources may include federal, state, and local funds, gifts from foundations, civic groups or individuals, and

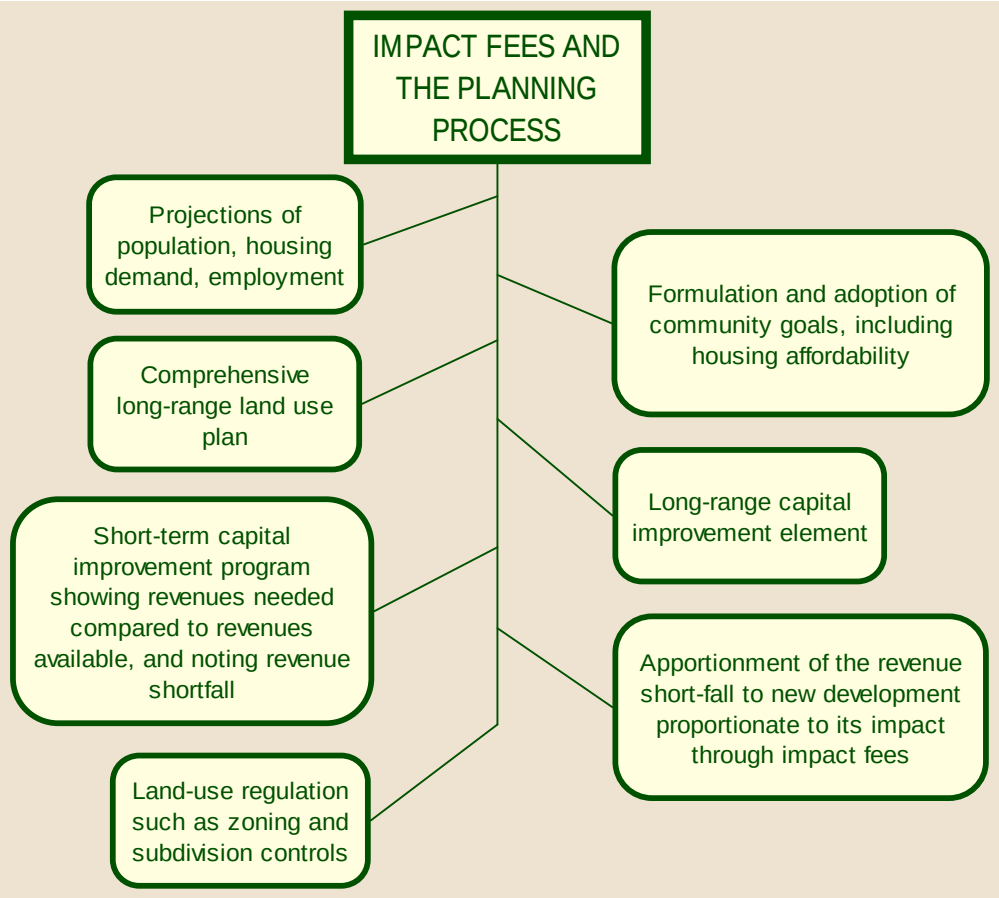
---

63 For a review of the planning and impact fee process, see Edward J. Kaiser and Raymond J. Burby "Exactions in Managing Growth: The Land Use Perspective" in *Private Supply of Public Services* edited by Rachelle Alterman New York University Press (1988). See also James C. Nicholas, Arthur C. Nelson, and Julian C. Juergensmeyer, *A Practitioners' Guide to Development Impact Fees*, American Planning Association (1991). For a general review of the land-use and facility planning process, see Edward Kaiser, David Godschalk, Philip Berke and F. Stuart Chapin, *Urban Land Use Planning*, fourth edition, University of Illinois Press (2006).

dedicated sources of revenue such as a dedicated property tax used to expand park inventory. If there is a short-fall in revenue needed to fully-fund the park CIP, impact fees are used to make up the gap.

Impact fees are themselves the sixth step of the planning and implementation process. Once the CIP gap has been identified a process is undertaken to apportion the shortfall in revenues to benefiting development. An impact fee schedule is developed and applied to land development permits, building permits, and/or certificates of occupancy as determined locally.

The last step in the process is designing and implementing land development regulations. Zoning and subdivision controls regulate the actual timing, shape, density and other features of development especially including residential development. Once a development has been deemed consistent with zoning and subdivision regulations – and others as locally required, it is then assessed impact fees proportionate to its impact on facilities as determined from the first five steps in the planning and implementation process.



Impact Fees and Exactions

The land-use regulatory step itself may include other forms of exactions. Suppose for example that land needs to be rezoned and then subdivided to meet a developer's objectives presumably consistent with the goals and framework of the comprehensive land-use plan. The rezoning process may identify unique or unanticipated impacts of it on the community. These may include environmental, habitat, localized facility, and other impacts. Comprehensive plans, CIE's, CIP's and impact fees cannot anticipate all potential

forms of development impacts so it is the rezoning and subdivision stage that does so. Drainage, stream setback, buffers, access improvements, utility extensions and so forth may be needed to assure the development mitigates impacts not covered by impact fees or other community-based investments shown in the CIP. Subdivision regulations also assure that on-site improvements are made at no or relatively little cost to the community – although those improvements are usually dedicated to the community for long-term maintenance after they are installed and accepted.

Rezoning and subdivision exactions are negotiated as part of the development approval process. After the rezoning (if needed) and subdivision final orders have been adopted, the developer then pays impact fees to mitigate the off-site facility impacts the final orders do not cover. The distinction here is that there is a two-stage development approval process, one that addresses unique and development-specific impacts and the other that addresses community-wide development impacts on facilities.

Two qualifications are in order. About half the states have impact fee enabling statutes but nearly all of them limit the use of impact fees to a list of facilities (see Chapter 3). Thus, if a development impacts facilities for which impact fees are not or cannot be assessed, it may be required to mitigate its impact on those facilities through additional exactions. In addition, if a development exaction includes money or improvements to mitigate off-site improvements that would otherwise have been paid through impact fees, the development receives a credit against those impact fees to avoid double-charging.

There is another set of "near impact fee" exactions that are used commonly. For example, many communities require a share of land within developments to be dedicated to the public for such uses as parks, school sites, and other facilities. Where a community park impact fee pays only for community- and regional-scale parks but not local ones, mandatory land dedications for local parks may not be subject to an impact fee credit. In states where school impact fees are not enabled or communities that choose not to have them, mandatory land dedications for school sites – or fees in-lieu based on the land value – do not result in an impact fee credit.

There is probably room for improvement in how exactions other than impact fees are implemented. In many communities, impact fees are a relatively minor part of the total package of development exactions. On-site infrastructure exactions such as for subdivision improvements are usually far larger in total cost than impact fees. Thus, from the perspective of housing affordability, understanding the nature of how other exactions are negotiated or calculated is recommended. Often, exactions provide benefits to future development that are not recovered by the exacted development. In part this is simple expediency on behalf of local government and even the developer. To craft a non-impact system to recoup the value of infrastructure for the benefit of the exacted development can be complex, and can obligate local government to more burdens. Nonetheless, this Guidebook recommends that some effort be made to do so.

For example, so-called "latecomer" assessments should be allowed more liberally than they are perhaps at present. A latecomer assessment is a public-to-private agreement that new development benefiting from improvements installed by previous developments for its benefit is assessed its proportionate share of the benefit value. The funds are collected by the local government – based on a formula akin to impact fees – and then rebated to the developer creating the benefits. Latecomer fees are allowed in many states but should be enabled by all and used more liberally in those that already have the authority. This is just another way in which to soften the effect of exactions on housing affordability.

Appendix B. Special Assessment Districts

This appendix draws heavily from local improvement district concepts and procedures in Washington State, particularly Chapters 35.43 through 35.56 RCW. The procedures reviewed here are common among local improvement districts, special assessment districts, municipal utility districts, and other mechanisms by which a project's infrastructure – including off-site infrastructure – can be financed through long-term debt retired by new development, thereby avoiding impact fees. A distinct advantage over impact fees is also that special assessment districts can finance operating expenses, rehabilitation, and renewal of infrastructure.

Once approved locally, special assessment district processes ultimately lead to the sale of bonds to investors and the retirement of those bonds via annual assessments on the property owners within a district. Goals of the special assessment district process are twofold:

- ✓ to present a bond portfolio to investors that will entice them to invest at as low a rate of return as possible; and

- ✓ to assess property owners as fairly as possible in relation to special benefits received.

Washington State statutes specify that the assessment per parcel must not exceed the special benefit of the improvement to that parcel, which is defined as the difference between the fair market value of the property before and after the local improvement project. This helps improve equity as higher value properties will be assessed higher amounts. In addition, Washington State statutes require that the assessments must be proportionate to one another.

Washington statutes provide for two specific methods of assessing benefited properties, but also allow the local government to choose any other method which meets the basic criteria. The two main assessment methods are:

- ✓ The "mathematical" method, which is relatively inexpensive to create and easy to explain to property owners. It can be composed of front-foot assessments for roads (per lineal foot of property street frontage), area (per square foot of property), zones or sectors, and units (per lot or parcel). It is possible to use several different types of mathematical assessment within one district.

- ✓ The "special benefit analysis," which furthers proportionality but is more costly to implement. It involves using a certified appraiser to calculate the value of each parcel with and without the infrastructure improvement project, calculate the difference between those two values (the special benefit), apportion project costs assignable to the special assessment district to all special benefits, and use the ratio to determine the assessment for each parcel.

One important feature of Washington's special assessment district statute is that off-site infrastructure improvements can be provided. Thus, instead of charging development within the special assessment district impact fees for off-site infrastructure, the special assessment district itself can theoretically generate the equivalent in fees through either in-kind construction or revenue produced through the sale of special assessment district bonds.

In Washington, special assessment districts have been found to be very well-suited for filling in gaps in a city's existing infrastructure such as in older plats where the full complement of today's required improvements do not exist. Special assessment districts can also provide a means for whole neighborhoods to improve their quality of life, using long-term financing at relatively lower interest rates.

Typically, because special assessment districts are governmental entities complete with their own budget, the local governing body becomes the governing body for them. Although the typical special assessment district dissolves once the bonds have been retired, expanded versions of special assessment districts can allow for the local governing body to establish a budget, provide staff or contract out as needed, make and collect assessments, and provide for operations, rehabilitation, and replacement over the long term.

Appendix C. Land Purchase Option Contract Language Accounting for Impact Fees at the Purchase of Land

The following is sample language included in the land purchase option contract provided to the authors by a developer/builder in Florida. It provides in part that the final price of land to be purchased will be reduced by the anticipated impact fees to be paid.

Section [___]. Purchase Price Adjustment. To the extent the purchaser is required to pay, either before Closing or within one (1) year after the Closing, to the City of [_____], and/or to the County of [_____], and/or to the State of [_____] or any other governmental or quasi-governmental authority or entity any development "impact" fees or other surcharges (hereinafter referred to as "Charges") associated with the development of the Property (other than fees or charges for customary permits such as zoning, site disturbance and building permits), the Purchase Price shall be reduced by the sum equal to the amount actually assessed and paid by the Purchaser for such Charges. In the event such Charges are assessed against the Purchaser or the Property prior to Closing, the Purchase Price shall be reduced by such amount, in addition to any other adjustments, credits or prorations otherwise provided in this Agreement. The Purchaser shall provide the Seller with such documentation as the Seller shall reasonably require with respect to the assessment of such Charges. In the event such Charges are assessed against the Purchaser or the Property after Closing, the Purchaser shall promptly deliver to the Seller notice of such assessment, whereupon the Seller shall have ten (10) days after the receipt of notice of such assessment within which to remit to the Purchaser a portion of the Purchase Price representing the amount of such Charges. Nothing set forth in this Section [___] shall vest, or be deemed to vest, in favor of the Seller any right to appeal, contest or otherwise challenge the validity or amount of any Charges assessed against the Purchaser or the Property, and the Seller hereby expressly covenants and agrees not to contest the validity or amount of any such Charges. The provisions of this Section [___] shall survive Closing and the delivery of all instruments of conveyance set forth herein.

Appendix D. Proportionate Share Impact Fees and Housing Affordability

Introduction and Overview

An examination of impact fees nationwide and in individual markets shows a remarkable range in the approach and methodologies by which impact fees are assessed. Given the large number of localities that have implemented impact fees and the range in purposes, this range is not surprising. What is increasingly clear is that there are considerable inequities in the ways impact fees are often assessed. Variations in housing type, unit size, density, and other factors have an effect on costs but are often not accounted for in impact fee studies. Impact fees, if not carefully constructed, can be regressive as applied and a fundamental violation of equity. The purpose of this briefing paper is to highlight the variables that can create the greatest negative impact on housing affordability and inadvertent inequities that disproportionately affect the smallest and most affordable units. The approach is to provide an overview of the concerns and a series of examples with appropriate data to validate the issues.

An article in *Units*, the trade magazine for the National Apartment Association, offers important insights into differences in impact between different types of dwellings.[64] The example is of Volusia County, Florida, which charges impact fees of $1,927 for each new dwelling unit to help cover its cost of providing fire protection, parks, and public schools to apartment residents – regardless of type. Because impact fees for residential units are based on occupancy or number of persons per unit, the County perhaps reckoned that with an average of 2.02 persons (based on the 2000 Census), the impact of the typical dwelling on these facilities amounts to $953 per person, or $1,925 per unit.

A closer look at Census figures, however, reveals that the average persons per occupied unit for single-family detached homes is 2.39, but for apartments it is 1.17, less than half. To be equitable, these impact fees should be $2,277 for single-family homes and $1,115 for apartments. Instead, single-family homes pay $350 less than they should while apartments pay $812 more. In Volusia County, impact fees are not proportionately assessed on apartments considering average apartment occupancy rates. Unfortunately, this is not an isolated example.

This briefing paper begins with a review of equity principles, explores different conceptual applications, reviews actual applications in selected communities, and offers insights to advance professional impact fee practice.

Equity Basics

Impact fees are one-time charges assessed on new development to help pay for the new or expanded infrastructure it needs. After a generation of rapidly growing national acceptance, the impact fee debate continues. That debate has evolved, however, from *whether* impact fees should be assessed at all to *how* they are assessed.

Impact fees elicit concerns about equity. Intergenerational equity may be of concern because impact fees assessed on new homes may adversely affect the ability of the children of current residents of the

[64] Arthur C. Nelson, National Apartment Association, *Units,* (2004).

community to buy homes where they grew up. Representational equity may be of concern because to the extent that impact fees are assessed on new homes bought by new residents of the community, these new residents had no say in the adoption of the policy. Equity in endowments may be of concern to the extent that impact fees are considered a form of "initiation" fee into a community much like country clubs charge high initiation fees affordable only to the affluent. While these concepts of equity are important, the focus of this briefing paper is on proportionate equity – that is, the extent to which the fee reflects the actual impact different housing units have on community facilities. The legal principle of proportionality is reviewed in another briefing paper so the focus here is on applying the principle through calculations.

A critical aspect of proportionality is the extent to which impact fees are based on the *impact* of new development on facilities. Consider new residential development. In the Volusia County example above, the county merely assumed that each residential unit had the same impact on facilities regardless of size, type, density, location, or other factors. Hence, the impact fee for a large single-family detached home is the same as for a small efficiency apartment despite the fact that census figures clearly show substantial differences in occupancy rates. The following discussion reviews differences in proportionate impacts based on dwelling unit type, size, density, location, and configuration.

Dwelling Unit Type: The Volusia County example illustrates that different residential unit types have proportionately different levels of occupancy that in turn impact facilities differently. The example of school impact fees, which tend to be among the highest of all impact fees, is reviewed here. Based on data from the 2000 Census, the average student generation rate in Volusia County is 0.41 per single-family home but only 0.13 for apartments with an overall county average of 0.31 students.[65] In other words, charging the same school impact fees for apartments as for single-family detached homes means that apartments are charged proportionately about 2.5 times more than their average impact while single-family detached homes are charged about a quarter less. The effect is that apartments are subsidizing detached homes.

Size: Size also matters. Remember that impact fees are one-time charges on new development to help pay for the public facilities needed to serve it. Conceptually, if new single family detached homes built in the community averages 2.5 persons per unit, the construction of an average new single family detached home adds 2.5 people to the community. If the community wishes to maintain the current "level of service" that is, say, 5 acres of improved park land per 1,000 residents, this would be 0.005 acres per new resident which, multiplied by 2.5 persons per unit, means the new home will require 0.0125 acres of new park land to maintain the desired level of service. If the cost of an improved acre of park land is $100,000, the impact fee per unit would be $500 per new resident or $1,250 per new home. In some communities, this is precisely how impact fees are calculated and assessed for all new homes constructed regardless of size. Yet, census data show that the smaller the dwelling unit (regardless of type) the fewer the number of people who live in it on average. Detached homes of 1,000 square feet for example average about 2.19 persons per unit while homes of 3,500 square feet average about 3.02 persons (see Table 4-3). Thus, to be proportionate to differences in impact, impact fees should really range from $1,093 for the smaller home to $1,510 for the larger home.

[65] Figures from 2000 US Census 5% Public Use Micro Sample (PUMS) data; figures shown are public school students attending pre-school through 12th grade per total unit—students per occupied unit are 0.44 for single-family detached and 0.19 for apartments with 5 or more units and 0.35 for all units.

This leads to a related issue of proportionality – vertical equity. Conceptually, higher-income households are better able to afford things than lower-income households. Although impact fees are not based on income, there is an important albeit subtle relationship between house size, income, and the burden impact fees have on households based on house value and income. This distinction is raised here because one of the concerns about impact fees is their effect on housing affordability related to household income. A fixed fee will thus be higher proportionately on the smaller home with a lower value (and on average fewer people) than on the larger home with a higher value (and on average more people). Table 1 shows the relationship between house value and house size. Clearly, as house size increases so does its value.

Table 1. Relationship Between House Value and House Size (in Sq. Ft.)

House Value	Size	House Value	Size
Less than $10,000	900	$80,000 to $99,999	1,614
$10,000 to $19,999	1,044	$100,000 to $119,999	1,716
$20,000 to $29,999	1,188	$120,000 to $149,999	1,834
$30,000 to $39,999	1,314	$150,000 to $199,999	1,999
$40,000 to $49,999	1,378	$200,000 to $249,999	2,183
$50,000 to $59,999	1,451	$250,000 to $299,999	2,332
$60,000 to $69,999	1,478	$300,000+	2,500+
$70,000 to $79,999	1,513		

Source: Adapted from *American Housing Survey 2001.*

Table 2 goes one step further by showing the relationship between house size, household income, persons per unit, and lot size. Clearly, as house size increases so does household income, persons per unit, and lot size. The implications of this table on housing affordability should be clear. If calibrating impact fees to be sensitive to affordable housing concerns is desired, scaling them based on house size is necessary because as house size increases so do average occupancy levels and hence impact on facilities. Unfortunately, these simple relationships are usually not considered in impact fee methodologies with the result that impact fees are normally regressive as applied – that is, they fall disproportionately on smaller homes with lower values and fewer occupants with lower incomes than on larger homes. This is a fundamental violation of equity.

Table 2. Relationship Between House Size, Household Income, Persons Per Unit, and Lot Size

House Size	Income	Persons	Lot Size
Less than 500 square feet	$21,982	2.21	0.22
500 to 999 square feet	$27,370	2.27	0.25
1,000 to 1,499 square feet	$37,187	2.51	0.33
1,500 to 1,999 square feet	$52,134	2.69	0.37
2,000 to 2,499 square feet	$63,649	2.89	0.43
2,500+ square feet	$76,526	3.02	0.52

Source: Adapted from *American Housing Survey 2001.*

To address housing affordability concerns, DeKalb County, Georgia, is considering one of the nation's first comprehensive proportionate share impact fee, methodologies that recognizes differences in impact based on house size. Its methodology for parks and recreation, libraries, public safety facilities, and transportation results in impact fees totaling $1.66 per square foot. Not only was the county able to generate data and

craft a methodology that converts facility impacts for a wide range of facilities – including transportation which heretofore has rarely been done – but it has also done so in a manner that is consistent with the logical extension of proportionality. This is a breakthrough for national impact fee practice. As currently under consideration, Table 3 shows that for homes of 900 square feet (about the median size of a Habitat for Humanity house in metropolitan Atlanta) which average about 1.9 persons per home, the impact fee is $1,330 or 1.7% of the house value and 3.4% of the average annual income of the household. In contrast, for homes of 3,500 square feet that average 3.3 persons per unit, impact fees are $5,818 or 2.2% of the house value and 6.3% of the average household income.

Table 3. DeKalb County, Georgia, Progressive Impact Fee System

Size	Value	Persons	Fee	Percent of Home Value	Income	Percent of Income
900	$79,819	1.9	$1,330	1.7%	$39,127	3.4%
1,300	$115,295	2.2	$2,161	1.9%	$51,652	4.2%
1,800	$143,142	2.3	$2,992	2.1%	$63,346	4.7%
2,300	$189,197	2.7	$3,990	2.1%	$81,362	4.9%
3,500	$269,573	3.3	$5,818	2.2%	$92,143	6.3%

Source: Calculated from the *American Housing Survey* 1996 for Metropolitan Atlanta, GA, interpolated and adjusted to 2004 values.

It is important to note that the "progressive" nature of impact fee assessments contemplated by DeKalb is coincidental – the impact fees are based proportionately on different levels of impact generated by housing units of different sizes, not on incomes or values.

Density: It goes almost without saying that apartments are of higher density than single-family homes and for this reason there is the normal perception that they contribute more to highway congestion than lower-density, single-family detached homes. Yet, as will be seen below, higher-density areas result in fewer automobile trips at shorter distances per trip. Spreading out development requiring more and longer trips may exacerbate congestion. This is an important consideration because while impact fee programs give a break to apartments based on data from the Institute of Transportation Engineers (ITE) *Trip Generation* (now in its 7th edition) that show fewer trips per apartment unit than per single-family detached unit (including Volusia County), they do not consider lower trip distances between apartment and single-family detached units based on other federal travel data. Thus, while Volusia County's road impact fees for apartments are 30 percent less than for single-family homes based only on trips, there is no further adjustment for vehicle miles traveled (VMT). Why is this important? The higher the VMT the more road capacity is required to accommodate the traffic impacts. Volusia County's road impact fees may thus over-charge for residential development in higher-density areas for this reason.

Location: Location also matters. Thus far only one impact fee program has been identified that reduces impact fees based on proximity to rail transit stations and none with respect to bus lines. Atlanta recognizes the reduced impact on roads because of close proximity to public rail transit. The city reduces impact fees by 50 percent for all multifamily communities within one-quarter mile of rail transit stations and 25 percent for developments between one-quarter and one-half miles. This was instituted in 1993, but it is possible that Atlanta remains the lone pioneer. DeKalb County, Georgia, is considering reductions in road impact fees for new development located along bus corridors; the reductions may range from 10 percent to 30 percent.

Configuration: Mixed-use developments also reduce road impacts. For example, some studies of mixed-use projects show up to a 40 percent reduction in road impacts. When living-working-shopping-services are all nearby, fewer car trips are needed and certainly the distance traveled is reduced. New urbanism, new towns, new communities, planned unit developments and the like probably all reduce their impact on facilities. Numerous examples exist but have not been codified into impact fee studies.

Impact Variations by Housing Type

This section presents information showing how impacts between different residential types and sizes vary in terms of type, size, location, density, and configuration. To help with this assessment, four housing prototypes are devised and compared with an average dwelling as shown in Table 4. Figures for house size (in heated/cooled square feet), lot size (or its equivalent in terms of attached units), density, occupants, and public school students are roughly comparable to national averages for each prototype although there will be regional variations. Note that we highlight "Average Dwelling" using figures that are intended to be reasonably typical of the average of all dwelling units.

Table 4. Five Housing Prototypes

Unit Type	Living Area in Square Feet	Lot Size in Square Feet	Acres Per Unit	Units Per Acre	Occupants Per Unit	Public School Students Per Unit
Detached Large Lot	3,000	20,000	0.500	2.0	2.75	0.65
Average Dwelling	***2,000***	***10,000***	***0.250***	***4.0***	***2.50***	***0.50***
Detached Cluster	1,500	5,000	0.125	8.0	2.25	0.25
Townhouse/Low-Rise Apartment	1,200	3,000	0.075	13.3	2.15	0.22
Apartment/Condo	900	1,000	0.025	40.0	2.00	0.20

Source: Adapted by authors from the *American Housing Survey 2001.*

Because many local governments charge impact fees for all residential units based on a single average, a comparison can be made between impact fees assessed for the average dwelling in relation to larger and smaller units, and attached and detached units. For instance, Table 5 shows results from a recent national survey, indicating that more than one-third of jurisdictions assessing impact fees charge a flat fee for all units without respect to type, size, or other characteristics for at least one facility. The survey also showed that an average of 17 percent of all jurisdictions surveyed have a flat rate for all residential development and 34 percent do so for at least one facility.

Table 5. Distribution of Jurisdictions Charging Flat Fee For Residential Development

Facility	Percent Charging One Fee
Roads	5.8 %
Water	11.4%
Wastewater	11.6%
Stormwater	8.5%
Parks	22.6%
Library	20.0%
Fire	21.6%
Police	29.2%
General Government	33.3%

Schools	9.3%
Average	17.3%
Any Facility	33.9%

Source: Duncan Associates, national survey, February 2005.

Table 6 shows the facilities for which impact fees are considered along with level of service standards and net impact costs.[66] The impact costs per unit of impact are rounded averages based on national surveys.

Table 6. Impact Fee-Financed Facilities, Net Impact Cost, Level of Service

Facility	*Impact Unit*	*Net Impact Cost Per Impact Unit*	*Level of Service*
Libraries	Persons	$100.00	2 books per capita @ $50 net cost per book including land and capital costs.
Parks	Persons	$250.00	5 acres of park per 1,000 residents @ $50,000 net cost per acre including land and capital costs.
Fire/EMS*	Dwelling	$60.00	$1,000,000 net cost to serve the average density including land and capital costs.
Police	Dwelling	$30.00	$500,000 net cost to serve the average density including land and capital costs.
Schools	Student	$3,000.00	Net cost per student station including land and capital costs.
Roads	Miles	$50.00	Net cost per average daily trip mile and 20 net daily miles per person including land and capital costs.
Drainage	Sq. Feet	$0.75	Net cost per impervious square foot including collection and storage network.
Water	Gallon	$5.00	Net cost per gallon of treatment and storage but not network costs; 100 gallons per person, average daily demand during peak month.
		$250,000	Net cost per mile of water main.
Wastewater	Gallon	$5.00	Net cost per gallon of treatment but not network costs; 80 gallons per person, average daily demand during peak month.
		$250,000	Net cost per mile of wastewater main.

Source: Adapted by authors from national survey of impact fee use by Duncan & Associates, February 2005. Net costs mean those after accounting for other revenues available to finance the same facilities for which impact fees are to be assessed. Fire/EMS and Police assumes 5-minute response time in an area serving a uniform density of 0.25 acres per unit, total of 17,920 units.

These costs are in line with typical communities based on level of service standards observed nationally.[67] Costs can vary based on level of service policies, land, local construction, and labor conditions.[68] Considered separately now are how costs vary based on type and size of unit, density, location, and configuration.

Variation Based on House Size and Type

[66] "Net" impact costs mean capital facility impact costs per unit of development less new tax, fee, and other revenues generated by new development that help finance the same facilities, such as that portion of a dedicated school facility property tax that is used to pay debt service for new schools.

[67] See the briefing paper on extent and variation of impact fees.

[68] For water and wastewater, we assume 100 gallons demand per capita per day for the average annual day and 115 gpcpd for peak month average daily demand. For wastewater we assume 90 gpcpd for both.

Table 7 shows the variation in impact fees between the four prototypes based only on house size and type of unit. Communities that charge impact fees based on only the average unit will typically under-charge larger units on larger lots and over-charge smaller, often detached units on smaller lots or at higher density. In this example, the net impact cost to serve a large home on a large lot is $13,470 but the impact fees would be $10,350 or 23 percent less when based on average house size. On the other hand, smaller homes, townhouses, and apartments at higher densities cost less than the average yet would pay impact fees ranging from $1,710 to $3,945 or 20 percent to 62 percent more than their net impact cost.[69]

Table 7. Variation in Impact Fees Based on House Size and Type

Facility	***Average Dwelling***	***Detached Large Lot***	***Detached Cluster***	***Townhouse/ Low-Rise Apartment***	***Apartment/ Condominium***
Impact Measure	***Development Impacts By Unit Type***				
Persons Per Unit	***2.5***	3.00	2.25	2.15	2.00
Students Per Unit	***0.5***	0.650	0.250	0.220	0.200
1-Way Miles	***50***	60	45	43	40
Impervious Land Per Unit	***4,000***	6,000	3,500	2,250	1,500
Gallons Water	***250***	300	225	215	200
Gallons Wastewater	***200***	240	180	172	160
Facility	***Net Facility Impact Costs By Unit Type***				
Libraries	***$250***	$300	$225	$215	$200
Parks	***$625***	$750	$563	$538	$500
Fire	***$150***	$180	$135	$129	$120
Police	***$75***	$90	$68	$65	$60
Schools	***$1,500***	$1,950	$750	$660	$600
Roads	***$2,500***	$3,000	$2,250	$2,150	$2,000
Drainage	***$3,000***	$4,500	$2,625	$1,688	$1,125
Water	***$1,250***	$1,500	$1,125	$1,075	$1,000
Wastewater	***$1,000***	$1,200	$900	$860	$800
Total Net Impact Cost	***$10,350***	$13,470	$8,640	$7,379	$6,405
Over (Under) Charge Amount		***($3,120)***	***$1,710***	***$2,972***	***$3,945***
Over (Under) Charge Percent		***-23.2%***	***19.8%***	***40.3%***	***61.6%***

Source: Calculations by authors.

This example, based on reasonable estimates of national averages, shows that charging impact fees on the basis of only the average size of the dwelling unit results in larger homes at lower densities being subsidized by smaller, usually more affordable homes at higher density.

Impact Variation Based on Density

For some facilities, density probably is not a determinative factor in calculating impact fees. Libraries, government administration, and schools come to mind (aside from school bus costs that will vary by density). Other facilities range from being mildly to greatly influenced by density such as utilities, transportation, and public safety facilities – principally fire and emergency medical response.

[69] Water and wastewater charges based on average daily demand.

Numerous studies have shown that density is a substantial influencing factor in extending wastewater and stormwater systems. Burchell's synthesis of literature suggests that higher-density development (more than 6 units per acre) is about 20% to 30% less costly to serve with wastewater and stormwater services than lower density.[70] Because the cost effects relating to stormwater facilities are incorporated in the figures above, they are not considered here.

Density of the geographic area within which development occurs (as opposed to density of the development itself – see below for "configuration" of individual development projects) has a strong influence on mode choice to destinations and distance to destinations. Higher-density areas may lend themselves to more walking and bicycling to some destinations than lower-density ones, and higher-density areas may have public transit options that lower-density ones do not. Also, higher-density areas may make the trips between destinations shorter. All this suggests that from the perspective of road impact fees – usually the highest of all impact fees assessed – density matters.

The effect of density on public safety, water and wastewater, and road facility impact is considered here. Public safety facilities need to be located to respond to emergencies usually within 5 to 10 minutes after a call. The more densely developed an area is usually the lower the capital cost (land, buildings, and equipment) per home. For a given number of homes, the size and associated cost of water and wastewater networks decline per home as density increases. Likewise, higher density is usually associated with fewer and shorter road trips. To begin this analysis, five density ranges are created that for convenience are based on the availability of travel data by density range, with an assumed average density within each range.

Table 8. Density-Range Categories and Average Density by Category

Residential Units Per Square Mile, Range	***Average Residential Units Per Square Mile***
26 – 700	500
701 - 2,000	1,200
2,001 - 4,000	3,000
4,001 - 6,000	5,000
>6,000	7,000

Source: Calculation by authors. Density ranges based on categories of residential unit development at the level of census tracts used by the National Household Travel Survey, 2001.

Consider first density and the cost of public safety facilities. Assume a 5-minute response time as the level of service for fire/EMS and police facilities. In a low-density area, one fire station may be able to serve 10 square miles of development around it but at higher densities perhaps only 4 square miles may be served. Table 9 illustrates the differences in costs associated with different densities per person. Note that costs per person are reduced by about half when density increases from 500 to 1,200 units per square mile, and by another half when density increases to 3,000 units per square mile.

[70] Robert Burchell, et al., *The Costs of Sprawl Revisited*, National Academy of Sciences (2000).

Table 9. Density-Based Public Safety Facility Net Impact Costs

Residential Units Per Square Mile, Range	*Residential Units Per Square Mile, Average*	*Residents at Constant Occupancy*	*Square Miles Served by Station and Precinct*	*Persons Served Per Station and Precinct*	*Fire/EMS Cost Per Person*	*Police Cost Per Person*	*Total Cost Per Person*
26 - 700	500	1,250	10	12,500	$80	$40	$120
701 - 2,000	1,200	3,000	8	24,000	$42	$21	$63
2,001 - 4,000	3,000	7,500	6	45,000	$22	$11	$33
4,001 - 6,000	5,000	12,500	5	62,500	$16	$8	$24
>6,000	7,000	17,500	4	70,000	$14	$7	$21

Source: Calculation by authors. Cost per person based on units per square mile times average unit density from Table 4 which is divided into cost per fire/EMS station and police precinct in Table 6.

It is observed that impact fees are typically assessed throughout a jurisdiction without respect to variations in density. The argument is normally made that because public safety facilities serve the entire jurisdiction and each facility backs others, there would be no variation by service area since there would be just one. However, if planning shows clearly different densities between sub-areas of the jurisdiction, density-based impact fees may be considered reflecting the differences in cost illustrated in Table 9.

Consider now variations in water and wastewater capital costs based on density. Two separate issues are considered. First, as density decreases the cost of providing the network of mains and other improvements outside subdivisions increases. Second, the costs of central water and wastewater facilities are roughly constant for average daily personal use but for water vary by time of year reflecting principally lawn irrigation and other outdoor water use.

For the network cost, consider a very simplistic set of assumptions: a) the same size of water and wastewater main can serve the same number of people whether they are concentrated in one square mile of development or 10 (that is, as land area increases density decreases proportionately); b) the main traverses through the center of a square mile and residential developments tap onto it and internalize costs of extending the network within them (that is, each connecting development serves an area a half mile wide); c) the terrain is unproblematic; and d) the cost to install a mile of water and wastewater mains is $250,000 each or $500,000 together. These simplistic assumptions allow us to calculate the variation in water and wastewater network costs by density which is done in Table 10.

Table 10. Water and Wastewater Network Costs Per Unit By Density

Residential Units Per Square Mile, Range	***Residential Units Per Square Mile, Average***	***Cost Per Unit***
26 – 700	500	$1,000
701 - 2,000	1,200	$417
2,001 - 4,000	3,000	$167
4,001 - 6,000	5,000	$100
>6,000	7,000	$71

Source: Calculated by authors. Network costs based on $250,000 per mile for water and wastewater mains from Table 6.

Central facility demand for normal daily use is roughly the same per person but variation in water demand in certain months occurs as density declines reflecting outdoor use such as for irrigation, swimming pools, and washing cars. For this part of the analysis, we keep persons per unit constant to assure consistent assessment of how costs vary only by density. Table 11 calculates the cost of central treatment demand for both normal average daily use and peak seasonal use.

Table 11. Central Water and Wastewater Treatment Costs Per Unit By Density with Constant Occupancy

	Units Per Square Mile				
Residential Units Per Square Mile, Range	***26 - 700***	***701 - 2,000***	***2,001 - 4,000***	***4,001 - 6,000***	***>6,000***
Units Per Acre	2.0	4.0	8.0	13.3	40.0
Persons Per Unit, Constant Occupancy	2.50	2.50	2.50	2.50	2.50
Average Daily Water Demand, Gallons	250	250	250	250	250
Average Daily Water Cost	$1,250	$1,250	$1,250	$1,250	$1,250
Average Daily Wastewater Demand, Gallons	200	200	200	200	200
Average Daily Wastewater Cost	$1,000	$1,000	$1,000	$1,000	$1,000
Equivalent Land Area, Square Feet	20,000	10,000	5,000	3,000	1,000
Additional Average Daily Water Demand During Peak, Gallons	4,000	2,000	800	500	300
Additional Peak Season Average Daily Demand, Gallons	$20,000	$10,000	$4,000	$2,500	$1,500
Total Cost Per Unit	$22,250	$12,250	$6,250	$4,750	$3,750

Source: Calculated by authors.

Table 12 combines information from Tables 10 and 11 to illustrate water and wastewater fees by density and assuming average household sizes by density as provided in Table 11. The variation is substantial. Costs to serve units at the lowest density (corresponding roughly to large-lot homes) are nearly twice those of the next density category (corresponding roughly to the average-size lots) and nearly four times the

middle density category (corresponding roughly to small and cluster lots). The difference is mostly associated with peak seasonal use which can be reduced through pricing or policy or both. In the absence of such policies, varying central treatment costs by density would appear to improve proportionality in impact fee assessments.

Table 12. Total Water and Wastewater Costs Per Unit By Density With Constant Occupancy

Residential Units Per Square Mile, Range	***Network Costs Per Unit***	***Central Treatment Costs Per Unit, Constant Occupancy***	***Total Costs***	***Total Costs Per Person***
26 - 700	$1,000	$22,250	$23,250	$9,300
701 - 2,000	$417	$12,250	$12,667	$5,067
2,001 - 4,000	$167	$6,250	$6,417	$2,567
4,001 - 6,000	$100	$4,750	$4,850	$1,940
>6,000	$71	$3,750	$3,821	$1,529

Source: Calculated by authors.

This section concludes with consideration of variation in road costs based on density. The principal concern here is whether road demand varies by density. Generally, higher density results in fewer trips and shorter distances traveled between land uses. Table 13 reports average vehicle miles traveled per driver for all residential units and by unit type for 2001 based on density at the census tract level.

Table 13. Average Daily Vehicle Miles Traveled Per Household Person by Unit Type, 2001

Units Per Square Mile	*Miles Per Person*	*Percent Change Between Categories*
151 - 700	29.5	
701 - 2,000	27.1	8.4%
2,001 – 4,000	24.0	11.3%
4,001 – 6,000	20.3	15.6%
6,000+	14.2	30.0%

Source: Nationwide Household Transportation Study 2001, calculated by authors based on annual average vehicle miles per drive times drivers per household person by density category divided by 365.

Vehicle miles traveled per person fall with respect to residential density. Between the lowest density (about one unit per four acres) and the highest density (about 10 units per acre – roughly townhouse density), vehicle miles traveled per driver fall by about half. Indeed, the rate of change in reduction in miles traveled per person increases among the two highest density categories, as noted on the table.

It is also suspected that as density increases so does the opportunity to use transit, bicycle, or walk to work. Table 14 shows mode choice for all trips with respect to density (measured at the level of census tracts). Expected patterns emerge. Although the private motorized vehicle mode (car, van, sport utility vehicle, pick-up truck, large truck) dominates in all categories, it falls considerably between the 4,000-6,000 and >6,000 unit-per-square-mile categories (essentially cluster home to townhouse density). Trips via bus nearly double between the same density categories, while rail trips increase nearly six-fold. Walking to work increases at about the same rate between the three most dense categories.

Table 14. Trip Distribution by Density, 2001

Housing Units Per Square Mile	Private Motor Vehicle	Bus	Rail	Bicycle	Walk	All Other Modes
26 – 750	97.0%	0.5%	0.3%	0.1%	1.7%	0.5%
751 - 2,000	95.4%	1.1%	1.2%	0.3%	1.4%	0.6%
2,001 - 4,000	92.4%	2.8%	1.6%	0.4%	2.4%	0.4%
4,001 - 6,000	82.4%	7.4%	3.2%	1.4%	5.0%	0.7%
6,000+	56.6%	13.7%	18.7%	1.4%	8.6%	0.9%
All	90.9%	2.90	2.5%	0.5%	2.8%	0.5%

Source: Nationwide Household Transportation Study 2001, calculated by authors based on mode journey to work by workers using only complete responses and grouping detailed mode categories into the ones reported here.

All these considerations are combined for road impact fee purposes in Table 15. Average daily vehicle miles traveled per person for each density category are reduced by 50% to assign trips half to the origin (the home) and half to the destination to avoid double counting. The adjusted figure is multiplied by the cost per mile of a one-way trip. Although there is little difference between the lowest and second lowest density categories, substantial differences are seen in others. The greatest rate of reduction in miles traveled is between the density categories of 751-2,000 and 2,001-4,000 units per square mile. At the higher density, regularly scheduled bus and light rail service becomes feasible, and land uses are sufficiently close that more non-vehicle trips are needed.

Table 15. Road Impact Fees Per Person by Density Category

Housing Units Per Square Mile	***Average Daily Vehicle Miles Per Person***	***One-Way Miles Per Person***	***Net Impact Cost @ $50 Per Mile***	***Percent Change from Lower Density***
26 - 750	26.3	13.1	$656	
751 - 2,000	24.9	12.4	$622	-5.3%
2,001 - 4,000	21.7	10.9	$543	-12.7%
4,001 - 6,000	19.9	9.9	$497	-8.5%
6,000+	18.6	9.3	$464	-6.5%

Source: Nationwide Household Transportation Study 2001, calculated by authors. Average daily vehicle miles per person calculated as annual person miles traveled divided by total household members divided by average vehicle occupancy. Cost per mile from Table 6.

Clearly, density matters, especially for facilities such as wastewater, public safety, and highways. Table 16 summarizes impact fees for all facilities except drainage. Density-related facilities include public safety, water and wastewater, and roads while non-density related facilities include libraries, park and recreation, and schools. (Of course these facilities are affected by density but not as much as others.) Seen here is that impact fees per person vary remarkably between the different density categories. Fees per person for the lowest density exceed $13,000 while for the middle-density category, where transit service becomes feasible, fees per person are less than half.

Table 16. Non-Density Related + Density-Related Net Impact Costs Per Person

	Residential Units Per Square Mile, Range				
Residential Units Per Square Mile, Range	***26 - 700***	***701 – 2,000***	***2,001 – 4,000***	***4,001 - 6,000***	***>6,000***
Public Safety Cost Per Person	$120	$63	$33	$24	$21
Water and Wastewater Cost Per Person	$9,300	$5,067	$2,567	$1,940	$1,529
Road Cost Per Person	$656	$622	$543	$497	$464
Libraries	$100	$100	$100	$100	$100
Parks and Recreation	$250	$250	$250	$250	$250
Schools	$3,000	$3,000	$3,000	$3,000	$3,000
Total Cost Per Person	$13,426	$9,101	$6,493	$5,811	$5,364
Percent Change from Lower Density		-32.2%	-28.7%	-10.5%	-7.7%

Source: Calculated by authors. Stormwater is excluded for brevity.

Table 17 applies these per-person figures to the residential prototypes by density category. (Stormwater is excluded to highlight differences without further complication) Some information presented is probably not realistic such as detached large lots in the highest density category and 40-unit per acre apartments in the lowest density category. However, it is reasonable to compare impact fee levels between the three lowest-density categories since they can apply to county-level situations where all five residential types and all three density categories may be present. Also, to be consistent between residential types, we will only consider the effect of density on each of them. For each residential type, fees are in the order of one-third less in the category of 751 to 2,000 units per mile than in the lowest density category, and they are about half in the category of 2,001 to 4,000 units per square mile. Interestingly, the rate of change beyond about 4,000 units per square mile is not as pronounced. Clearly, to assure proportionality and therefore equity in impact fee assessments, house type, size, and density need to be considered.

Table 17. Impact Fees By Unit Type by Density

	Residential Units Per Square Mile, Range				
Unit Type	***26 - 700***	***751 - 2,000***	***2,001 - 4,000***	***4,001 – 6,000***	***>6,000***
Detached Large Lot	$40,279	$27,302	$19,479	$17,432	$16,093
Average Dwelling	***$33,566***	***$22,752***	***$16,232***	***$14,526***	***$13,411***
Detached Cluster	$30,210	$20,477	$14,609	$13,074	$12,070
Townhouse/Low-Rise Apartment	$28,867	$19,567	$13,960	$12,493	$11,533
Apartment/Condominium	$26,853	$18,202	$12,986	$11,621	$10,728

Source: Calculated by authors. Stormwater is excluded for brevity.

Variation in Location

Location is considered in two respects: specific area and distance from service. Specific area means that in some portions of a jurisdiction it is simply more expensive to install infrastructure than in others; for example, a mesa composed of rock versus a talus slope within the same jurisdiction – as seen in Albuquerque, New Mexico. These are idiosyncratic and need to be addressed on a case-by-case basis. Needless to say, impact fees that blend high-cost and low-cost areas together into an average cost applied everywhere would have the effect of charging low-cost areas more and high-cost areas less than their proportionate share of many facility impacts.

Distance from service means that the farther away development is from a specific service, the less likely the service will be used or accessible in a timely manner. Two types of facilities are especially sensitive to this: public safety and public transit. Public safety facilities, such as fire, police, and emergency medical, are often designed to provide service within five minutes of a call. New development that results in service beyond this threshold may require new facilities. However, if no new facilities are provided, there is little penalty other than delay – except for fire service. Fire insurance rates are based in part on response times and if new development extends average response times for the jurisdiction beyond certain thresholds, the fire insurance rating for all property goes up – meaning that fire insurance premiums increase. In terms of impact fees, if more fire stations are needed to serve the same population but across a larger area, fire impact fees will need to be higher. If fees are the same across the jurisdiction – as most are – development in higher-density areas will be paying more than its proportionate share and development in lower-density areas will be paying less. Clearly, density could be a factor in calculating impact fees for fire protection and perhaps other public safety facilities. This is an area worthy of future research.

Accessibility to public transit has a measurable impact on road demand. For example, in Arlington County, Virginia, 47 percent of the workforce commutes via transit and 73 percent of them walk to transit stations – yet its density is only half that of Los Angeles (where transit ridership is less than that of Arlington's). National studies have shown that dwelling units within one-half mile of transit stations have about 60 percent fewer automobiles than their metropolitan area averages. Finally, numerous studies have shown that rail transit ridership ranges from 25 to 50 percent of workers living within ¼ mile of stations and half that between ¼ and ½ mile, and others indicate that use of bus transit ranges from 15 to 30% for workers living within ¼ mile of the bus line and about half that between ¼ and ½ mile. The reductions applicable to a given situation will need to be estimated based on local conditions; this need not be difficult, however, as data allowing for such analysis are provided in the Census Transportation Planning Package for all metropolitan areas.

One example application of this type of analysis is a road impact fee recently adopted by the City of Tucson, Arizona, which reduced residential road impact fees in the downtown core area of the city. The 2000 Census data on average travel time to work for workers over sixteen years of age using other modes than public transportation is summarized in Table 18. The data revealed a modest difference between the Central Core area (19.1 minutes) and the rest of the city (21.6 minutes). Additional analysis revealed little differences between other sections of the city. Not only do Central Core residents travel somewhat quicker (and presumably shorter) routes to work when they use automobiles and other private forms of transportation, they are also more likely to use alternative modes of travel. Only 78.8 percent of Central Core residents take private motor vehicles to work compared to 90.8 percent of other city residents. Taking into account both the reduced tendency to use private motor vehicles and shorter trip lengths, residential

development in the Central Core can be expected to generate only about 77 percent of the vehicular travel demand generated by residential development in other parts of the city, as shown in Table 18.

Table 18. Road Reduction Factor for Core Residential Development

	Central Core	Rest of City	Ratio
Percent Driving Private Motor Vehicle to Work	78.8%	90.8%	0.87
Travel Time, Non-Public Transportation (minutes)	19.1	21.6	0.88
Reduction in Road Impact for Residential in Central Core			0.77

Source: Duncan Associates, *Road and Park Impact Fee Study for the City of Tucson*, June 2004, based on 2000 U.S. Census, SF-3 sample data (1 in 6 sample) of workers 16 years or older; Central Core area approximated by Pima County census tracts 1-19, 22, 24-25.01, 26-29.01, 38.01, 45.04-45.05.

Also, consider the potential effect of transit availability on road demand. Using data from the 2001 National Household Transportation Survey, we constructed comparisons shown in Table 19. Metropolitan areas over one million residents with a transit system that included rail have decidedly lower rates of private vehicle use than those without – about 20 percent less overall.

Table 19. Private Vehicle Trips in Metropolitan Areas 1+ Million Population With and Without Transit Systems That Include Rail

	Units Per Square Mile					
With Rail Transit	***26 - 700***	***701 - 2,000***	***2,001 - 4,000***	***4,001 - 6,000***	***>6,000***	***All***
Private Vehicle	95.6%	91.8%	87.0%	75.0%	49.4%	75.3%
Transit	2.3%	6.8%	9.0%	18.1%	40.1%	19.0%
Bicycle	0.1%	0.1%	0.4%	1.5%	0.9%	0.6%
Walk	2.1%	1.1%	3.1%	5.3%	8.7%	4.7%
Other	0.0%	0.2%	0.4%	0.1%	0.9%	0.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Without Rail Transit						
Private Vehicle	96.8%	95.9%	93.1%	87.2%	75.9%	92.8%
Transit	1.4%	2.2%	4.4%	7.8%	13.6%	4.3%
Bicycle	0.1%	0.3%	0.3%	0.9%	2.7%	0.4%
Walk	1.5%	1.2%	2.0%	3.9%	7.6%	2.2%
Other	0.2%	0.5%	0.2%	0.2%	0.3%	0.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Nationwide Household Transportation Study 2001, calculated by authors.

Variation in Configuration

Urban form and design heavily impact transportation demand. Mixed uses and, better still, master-planned mixed-use developments, can reduce automobile use substantially. For example, in a typical single-use office/business park, walking trips may account for 3 to 8 percent of all mid-day trips. That figure rises to 20 to 30 percent when other uses are accessible such as shopping, and personal and financial services.

Even greater gains are made when new community design combines compact development (even in the suburbs), mixed uses, connectivity, and networks of pedestrian and bicycle pathways. Modern neo-traditional or new urbanism designs reduce trip lengths and induce non-vehicular use for short trips, especially if also served by mass transit. Studies in California have shown that when compared to

conventional suburban subdivisions with single or few uses, curvilinear streets, and cul-de-sacs, modern new community design can reduce VMT by 50 percent. These adjustments would need to be made on a case-by-case basis.

On this point, it is useful to note that most road impact fee ordinances allow a developer to prepare an "individual fee calculation study" to demonstrate that their project will have less impact on the road system than indicated by the fee schedule. The developer of a mixed-use project could use this option to quantify the reduction in external trips that should be expected due to the nature of the project. For example, the current edition of ITE's *Trip Generation* shows an across-the-board reduction of about 10 percent in trips generated within planned unit developments. Loveland, Colorado, has a provision allowing for the road impact fees to be reduced 25 percent for mixed-use projects that meet certain criteria. As is shown in the Albuquerque case study, variations can range from about 10 to 50 percent depending on the configuration of new development.

Applications of Proportionate Share Impact Fee Variations in Practice

Impact fee enabling statutes and relevant case law require that impact fees be based proportionate to the impact new development has on facilities. Where residential impact varies by occupancy, unit size, density, location, and configuration, these considerations should be taken into account. When done properly, impact fees as presently practiced in many if not most places would be reduced for smaller units on smaller lots in locations where facilities currently exist including public transit and in configurations that economize especially on vehicular trips. In this section, we report the applications of many, albeit not all, of the concepts presented above.

While most impact fees do acknowledge the difference between housing types, such as single-family and multi-family units, few of them vary by unit size. This is beginning to change. For example, one-third of the 18 Florida counties that assessed school impact fees in 2002 based the fees on some measure of dwelling unit size. Three of the counties (Lake, Broward, and Hillsborough) base fees on the number of bedrooms in combination with housing type. Two counties (Martin and Palm Beach) have translated bedrooms into four or five size categories (e.g., a one-bedroom unit is on average less than 800 square feet, etc.). Finally, one county (Miami/Dade) charges school fees on a per square foot basis.

Table 20. Assessment Basis for Florida School Impact Fees

Assessment Basis	Counties
Flat Rate per Dwelling	Volusia
Housing Type	Citrus , Collier, Hernando, Lee, Manatee, Orange, Osceola, Pasco, St. Lucie, St. Johns, Seminole
Housing Type & Bedrooms	Broward, Hillsborough, Lake
Size Categories	Martin, Palm Beach
Square Footage	Miami/Dade

Source: Survey by Duncan Associates, July 2002.

There are several reasons for the continuing predominance of impact fees that do not vary by unit size. One obvious reason is that a flat fee per dwelling unit is easier to calculate and has fewer data requirements. While this is still the case, the data requirements are not insurmountable, and greater resources are now available. The other principal reason for the predominance of one-size-fits-all residential impact fees was legal in nature. In the early days of the development of impact fees in the late

1970s and early 1980s, there were no state impact fee enabling acts, and impact fees were based on the "police power" of local governments to regulate development in order to advance the health and welfare of the community. Great care had to be taken to ensure that impact fees would not be struck down as an illegal tax by the courts. Even today, there is a residual feel by some attorneys that a fee per square foot for residential development may appear more like a tax than a regulatory fee. However, this should no longer be a major concern. Impact fees are explicitly authorized by enabling legislation in 25 states, and are based on well-established case law in most others. In addition, impact fees for nonresidential uses have always been assessed on a square footage basis.

Data on which to base variable rate impact fees are now widely available, much of it on the internet. Data on the relationship between the size of the unit (measured in bedrooms or rooms) and the number of people or public school students living in the unit are available from U.S. census sample data for areas with a population of 100,000 or more. Data on the relationship between the number of bedrooms in a unit and the square footage of the unit are available from real estate and property appraiser data in most communities. These readily available data are sufficient to develop variable-rate impact fees for those types of facilities that are typically charged only on residential uses on a per capita or per student basis, such as park, school, and library impact fees.

To date, few road impact fees have been adopted that vary by the size of the dwelling unit. This is largely because road impact fees are generally based on national trip generation rate data, and the ITE manual[71] does not provide rates by dwelling unit size. However, the fact that trip generation rates for residential uses vary by the size (and even the income) of the household is actually well documented in the transportation planning literature. As shown in Table 21 below, the average number of vehicle trips generated per day is almost directly proportional to the number of people living in the dwelling unit, which as discussed earlier, is strongly related to the size of the dwelling unit.

Table 21. Vehicle Trips by Household Size

Household Size	Daily Trips	PM Peak Hr Trips	
		Single-Family	Multi-Family
One Person	3.5	0.369	0.323
Two Persons	6.7	0.707	0.618
Three Persons	8.8	0.928	0.812
Four Persons	10.6	1.118	0.978
Five Persons or More	12.5	1.319	1.154

Source: Daily trips from Transportation Research Board, NCHRP Report 365, "Travel Estimation Techniques for Urban Planning," Washington, D.C.: National Academy Press, Table 9 (for urban areas with populations of 500,000 to 1 million), 1998; PM peak hour trips based on 10.55% of daily trips in PM peak hour for single-family and 9.23% of daily trips in PM peak hour for apartment units from ITE, *Trip Generation*, 7th edition, 2003.

In order to develop trip rates by the size of the unit in square feet, one must first find the relationship between average household size and size characteristics reported by the Census Bureau. The most recent and reliable data on average household size by number of bedrooms or rooms are the five percent sample

[71] Institute of Transportation Engineers (ITE), *Trip Generation* 7th ed., 2003.

data from 2000 U.S. Census. The five percent sample data for the City of Tucson are combined with sample data for some other cities and unincorporated portions of Pima County. However, the City of Tucson makes up 73 percent of the total population sampled. The results obtained should therefore be representative of the City of Tucson. The average household size for all single-family units from the two samples is identical, and for multi-family is almost identical. Because of the nature of the data sources for unit size in square feet, the average household size was varied by rooms for single-family units and by bedrooms for multi-family, as shown in Table 22.

Table 22. Average Household Size by Rooms and Bedrooms

Housing Type	Sample Households	Weighted Population	Weighted Households	Avg. HH Size
Single-Family, 4 Rooms or Fewer	1,245	58,662	24,141	2.43
Single-Family, 5 Rooms	1,744	91,937	34,494	2.67
Single-Family, 6 Rooms	1,674	93,632	33,617	2.79
Single-Family, 7 Rooms	1,010	60,023	20,513	2.93
Single-Family, 8 Rooms or More	657	44646	13585	3.29
All Single-Family Detached Units	6,330	348,900	126,350	2.76
Multi-Family, Efficiency	433	15,132	10,140	1.49
Multi-Family, One Bedroom	1,409	53,483	32,345	1.65
Multi-Family, Two Bedrooms	1,533	78,925	34,582	2.28
Multi-Family, Three Bedrooms	353	23,902	7,885	3.03
Multi-Family, Four Bedrooms or More	72	6,014	1,533	3.92
All Multi-Family Units	3,800	177,456	86,485	2.05

Source: U.S. Census Bureau, 2000 Public Use Microdata Sample (PUMS), 5 percent weighted sample data for portions of Pima County including the City of Tucson (PUMAs 201, 202, 204, 206 and 207) for households occupying single-family detached and multi-family units.

The above information on household size by room/bedrooms is combined with the trip rate data by household size presented earlier to derive peak hour trip rates by the size of the unit, represented by rooms and bedrooms, as shown in Table 23.

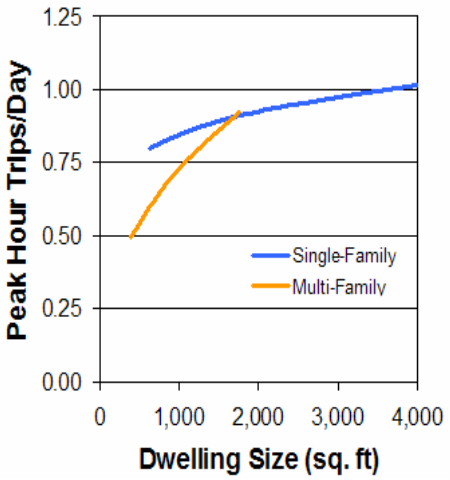
Table 23. Peak Hour Trips by Rooms and Bedrooms

Housing Type	Avg. HH Size	Peak Hr Trips
Single-Family, 4 Rooms or Fewer	2.43	0.806
Single-Family, 5 Rooms	2.67	0.860
Single-Family, 6 Rooms	2.79	0.884
Single-Family, 7 Rooms	2.93	0.917
Single-Family, 8 Rooms or More	3.29	0.983
All Single-Family Detached Units	2.76	0.872
Multi-Family, Efficiency	1.49	0.488
Multi-Family, One Bedroom	1.65	0.546
Multi-Family, Two Bedrooms	2.28	0.683
Multi-Family, Three Bedrooms	3.03	0.822
Multi-Family, Four Bedrooms or More	3.92	0.983
All Multi-Family Units	2.04	0.628

Source: Average household sizes from Table 22; peak hour trips derived from Table 21 using linear interpolation.

To determine a relationship between the unit square footage and peak hour trip rates, a data set was compiled with information on the square footage of dwelling units from single-family detached and multi-family units derived from two different data sources. For single-family detached units, the Pima County Tax Assessor data for the 2004 tax year was analyzed. Tax Assessor data give total living space in square feet and the total number of rooms for the majority of single-family homes in the City of Tucson. Data from the Arizona Multi-Family Housing Association provides information on all apartment complexes in the City of Tucson consisting of 20 or more units. This information includes the number of dwelling units by floor plan, and the floor plan information includes number of bedrooms and square footage. From these two data sources, a stratified random sample was taken that was distributed in the same proportion by housing type and size (rooms for single-family and bedrooms for multi-family) as households from the 2000 Census.

Figure 1. Relationship of Trips to Size



The combined data base consisted of information on 10,000 single-family detached and multi-family dwelling units. To this data base, a variable for peak hour trips was added, based on housing type and number of bedrooms or rooms shown in the preceding table. Regression analysis was then performed to determine the relationship between unit size in square feet and persons residing in the unit. Housing type turned out to be significant, with single-family and multi-family units displaying much different relationships.

Both linear and logarithmic regressions were performed for single-family detached and multi-family data sets. In both cases, logarithmic equations were determined to provide the best explanation of the data.[72] The curves described by the equations are shown in Figure 1.

While the equations for single-family detached and apartment units are very different, there is actually relatively little overlap and at 1,125 square feet, the midpoint of the 1,000 to 1,250 square feet category, the two equations produce the identical result. Only 2.2 percent of the apartment units in the sample are larger than 1,250 square feet, and while 21.6 percent of the single-family units in the sample are less than 1,000 square feet, it is unlikely that very many homes that size are being built in Tucson today. Consequently, the progressive residential rates were based on the multi-family equation for up to 1,000 square feet, and on the single-family equation for the larger size categories.

Using the regression equations, peak hour trip rates were derived for 12 square footage size categories. The two curves intersect in the 1,250 to 1,500 square foot range. Since the multi-family equation yields the lower trip rate estimates, and since relatively few single-family units are being built in the lower size range, the multi-family equation is used for unit sizes less than 1,500 square feet, and the single-family equation for larger units. The results are shown in Table 24.

---

72 The equation for single-family detached units is Ln(y) = 0.1271 * Ln(x) - 1.0433, where y is peak hour trips per day and x is the floor area of the unit in square feet; the R^2 is 0.600 and the t-statistics are 94 for the x-coefficient and -108 for the y-intercept. The equation for multi-family units is Ln(y) = 0.4182 * Ln(x) - 3.2062; the R^2 is 0.763 and the t-statistics are 114 for the x-coefficient and -135 for the y-intercept.

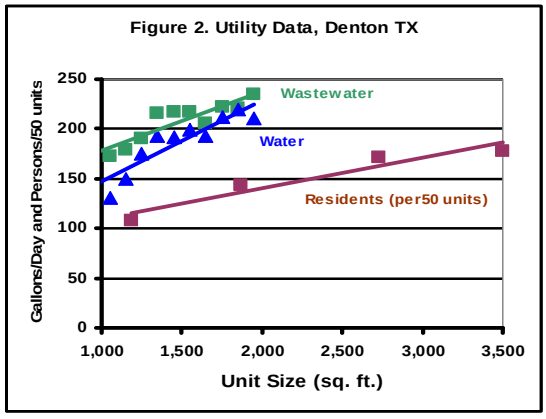
Table 24. Residential Road Impact Fees by Size Category

Housing Type/Size Category	Midpoint	Peak Hour Trips	Road Fee
Less than 500 sq. ft.	375	0.48	$2,186
500 - 749 sq. ft.	625	0.60	$2,743
750 - 999 sq. ft.	875	0.69	$3,198
1,000 - 1,249 sq. ft.	1,125	0.76	$3,462
1,250 - 1,499 sq. ft.	1,375	0.83	$3,829
1,500 - 1,999 sq. ft.	1,750	0.91	$4,196
2,000 - 2,999 sq. ft.	2,500	0.95	$4,386
3,000 - 3,999 sq. ft.	3,500	0.99	$4,562
4,000 sq. ft. or more	4,500	1.03	$4,738

Source: Duncan Associates and Dr. James C. Nicholas, *Road and Park Impact Fee Study for the City of Tucson*, June 2004.

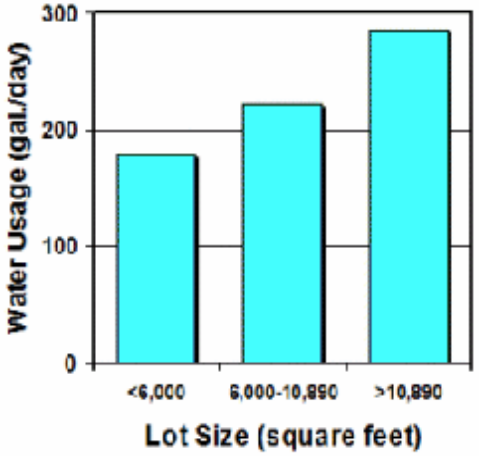
Like road impact fees, water and wastewater impact fees are seldom varied by unit size. In the vast majority of cases, fees are charged based on the size of the water meter, although a sizable minority are charged residential fees on a per dwelling unit basis. In a few communities, residential fees are charged on the basis of the number of water fixtures.

While the authors are unaware of any national statistics on the relationship between water consumption and wastewater generation by dwelling unit size, that there is a relationship certainly makes intuitive sense. Larger units tend to house more people, and water and wastewater demand forecasts are mostly a function of the projected increase in population. One would expect larger households, who tend to occupy larger homes, to have greater demand for water and wastewater services than smaller households. In fact, there is some limited data from Denton, Texas, which tends to support this conclusion.



The Denton Municipal Water Utility provided data on water and wastewater demand for single-family units between 1,000 and 2,000 square feet in 100-square-foot blocks for the years 1998 and 1999. Census data information was available for Denton County on the average household size for two-bedroom, three-bedroom, four-bedroom and five-bedroom or more single-family units for 1990. Finally, the average square footage of single-family units was determined for each bedroom category from realtor listings for January, 2003. All of these data are plotted in Figure 2.

Figure 3. Water Use by Lot Size, Santa Fe, NM

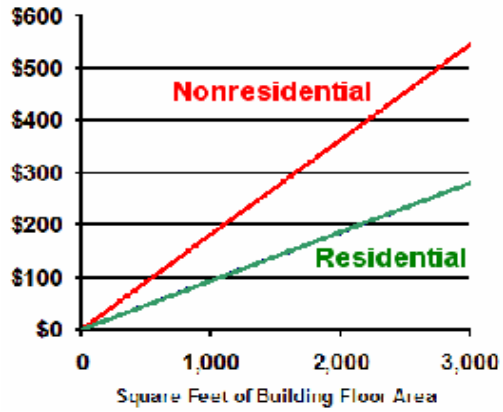


While the utility demand data are only available for smaller units (the average apartment in Denton used 203 gallons per day during this same period), they indicate that utility demand increases with dwelling size even more strongly than household size increases with dwelling size. These data support the reasonableness of using average household size as an indicator of water and wastewater demand. Several communities have used this relationship to base

utility fees on the square footage of the residential dwelling unit, including Orange County, North Carolina; and Collier County, Florida.

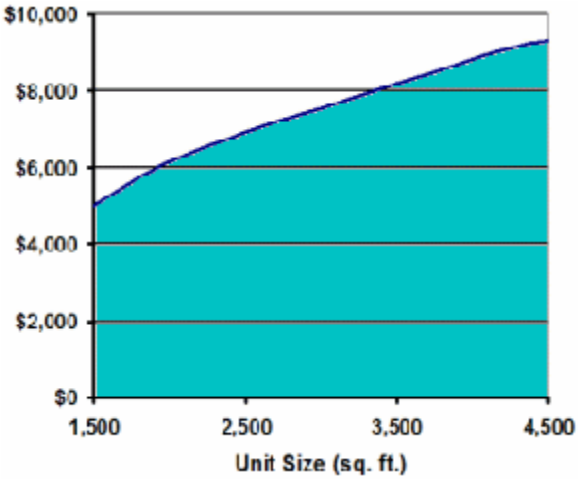
Some water impact fees are based, not on the size of the dwelling unit, but on the size of the lot, due to the fact that larger lots require more water for landscaping, which is the biggest use of water during the peak summer months. Santa Fe, New Mexico, recently adopted water impact fees that vary by lot size, based on a study of water use records that found water usage is strongly related to lot size, as shown in Figure 3. Other communities with water fees that vary by lot size include Basalt, Colorado; Fort Collins, Colorado; and Scottsdale, Arizona.

Figure 4. Calculated Fire Fees, Santa Fe, NM



Most fire and police impact fees are based on calls-for-service data. Unfortunately, emergency call data are seldom available by the size of the dwelling unit. Another drawback is that calls for individual land uses can fluctuate significantly from one year to the next. An alternative approach is to use call data only to determine a cost allocation between residential and nonresidential development. Based on the reasonable assumption that the cost to serve development will increase proportionately to the square footage of new development, the residential cost per square foot can be determined by dividing the cost to serve residential development by the amount of residential square footage (the same can be done for nonresidential). This was the approach used in developing fire impact fees for Santa Fe, shown in Figure 4.

Figure 5. Sum of Fees in Santa Fe, NM



While many communities have adopted variable-rate impact fees for individual facilities, few have implemented variable fees by dwelling unit size for a broad array of facilities. One community that has adopted such a set of impact fees is Santa Fe, New Mexico. The sum of that city's water, wastewater, road, park, police, and fire impact fees is illustrated in Figure 5.

Conclusion: Moving Toward Truly Proportionate Impact Fees

As seen in other briefing papers the concept of calculating impact fees based on “proportionate share” principles has long been established but the details have been lacking. The example of Volusia County, Florida was given because like many other communities the idea of proportionate share is reduced simply to facility needs per residential unit without respect to type, size, location, density or configuration. Strictly speaking, this may meet the minimum legal test justifying impact fees – after all in Dolan v. Tigard the US Supreme Court asserted that while a relationship needs to be established between the impact of development and the mitigation needed there is no need for a precise calculation – but this begs the question. If housing affordability is a concern, impact fee calculations need to truly embrace proportionate share principles. This briefing paper outlines how to address many of the details.

As seen in the examples reviewed in this briefing paper, impacts vary by residential unit type, size, density, location, and configuration. The differences in impact between large detached homes on large lots in low-density settings far away from commercial centers and the same-sized home on a small lot in higher-density settings closer-in may be considerable. Peak water demand may be more than double, road impacts can be higher and public safety costs three or four times more in lower-density settings than in higher-density ones. As shown above, total impacts per person between the lowest- and highest-density categories are about 2.5 times and are nearly double between the second-least and second-most dense categories across all unit types (see Table 16). These differences are attributable to density and indirectly by location. When considering variation on occupancy by type and size of unit, the differences become even more stark being about four times between large homes in the lowest-density settings and apartments in the highest-density settings and about 2.5 times between the second-least and second-most densely settled areas (see Table 17).

These examples of refined use of proportionate share impact fees can aid in lowering fees assessed on low- and moderate-income housing below the average cost, thereby aiding in the production of such housing. Census data, transportation data, utility data, and public safety response data show clearly that impact fees calculated on the basis of unit size, perhaps including consideration of unit type, are more proportionate than averaging costs across all dwelling units or even by type of unit. Case law so far does not require apportioning impact fees by unit type or size but given the weight of the statistical evidence this may only be a matter of time. Communities that calculate impact fees based on dwelling unit type, size, density, and location, and allow for fees to be tailored to account for configuration, will likely ensure that by themselves impact fees are not necessarily an impediment to the production of affordable housing.

There is a final consideration relating to courts and impact fee enabling statutes. At the moment, neither courts nor state enabling statutes have addressed impact variations based on these factors. It may be a matter of time before either one or both occur. However, waiting for this to happen is not necessary. The basic calculation methods and data are already available, as shown in this paper, to refine impact fees to substantially reduce any potentially adverse effect that they have on housing affordability. It may also be the case that generally available data could be used to challenge impact fee schedules not considered truly proportionate with respect to type, size, density, location, and perhaps, to configuration.







IMPACT FEE HANDBOOK



Prepared for the National Association of Home Builders
1201 15th Street NW
Washington, DC 20005

By DPFG
3302 East Indian School Road
Phoenix, AZ 85018









DPFG
DEVELOPMENT PLANNING & FINANCING GROUP, INC.

NAHB

Published in 2008

Updated in 2016

Impact Fee Handbook

National Association of Home Builders

This publication is designed as a resource to provide accurate and authoritative information in regard to the subject matter covered with the understanding that its authors are not engaged in rendering legal, accounting, and other professional service. If legal advice or other expert assistance is required, the services of a competent professional person should be sought.

Impact Fee Handbook
© 2016 by the National Association of Home Builders of the United States of America

This handbook is also available online as a downloadable pdf at:
www.nahb.org

For further information, please contact:

Land Use and Design
Nicholas Julian
Program Manager, Land Use

Survey and Housing Policy Research
Paul Emrath
Vice President

This report was produced alongside NAHB staff Debbie Bassert and Claire Worshtil

Natalia Siniavskaia
Assistant Vice President

Office of Legal Affairs
Devala Janardan
Staff Counsel, Legal Advocacy

National Association of Home Builders
1201 15th Street, NW
Washington, DC 20005-2800
(800) 368-5242

Acknowledgements

The National Association of Home Builders wishes to acknowledge and the following persons who wrote and updated the current version of the handbook:

Contributors from the Development Planning & Financing Group, Inc. (DPFG) include Carter T. Froelich and Lucy Gallo.

Contributors from NAHB include Debbie Bassert, Claire Worshtil, Paul Emrath, Natalia Siniavskaia and Devala Janardan.

Contents

Chapter 1 Introduction 5
What are Impact Fees? 6
Why do we have Impact Fees? 7
Local Government Fiscal Stress and the Rise of Impact Fees 8

Chapter 2 Legal Concepts of Impact Fees 15
Authority to Impose Impact Fees 15
Impact Fees as Unlawful Taxes 17
Federal and State Constitutional Issues 18

Chapter 3 Economic Implications of Impact Fees 24
Who Ultimately Pays an Impact Fee 25
Implications of Higher House Prices 29
Are Impact Fees Really Necessary 31

Chapter 4 A Closer Look at Impact Fee Technical Studies 49
Methodology 50
Population and Land Use Assumptions 53
Levels of Service 54
Construction and Land Costs 55
Offsets 55
Credits 56
Service Areas 57
Transportation-Related Issues 58
Legitimacy of Growth-Related Costs 60
Proportionate Share Impact Fees 61
Discount Impact Fees 64
Commonly Found Errors 64
Revising State Statutes to Address Jurisdictional Overreach 68

Chapter 5 Administrative Issues 71
Definition of Capital Costs 71
Use of Impact Fees to Pay Interest Costs 72
The Comprehensive Plan and Capital Improvement Plan 72
Independent Fee Calculation Study 73
When Fees are Due 74
Accounting 75
Refunds 75
Advisory Panels 76
Appeals 76
Credits and Reimbursements 76
Exemption 77
Grandfathering 78

Chapter 6 Alternatives to Impact Fees 79
Infrastructure Financing Objectives 79
Methods of Financing Infrastructure 81
Taxes 83
General Obligation Bonds 84
Revenue Bonds 85
User Fees 86
Special Taxing Districts 87
Local Improvement Districts 89
Special Service Districts 90
Tax Increment Financing 91
Private Exactions 94

Chapter 7 Public Affairs Strategies 98
Arguments and Strategies to be Utilized to Defeat Fee Proposals 99
What to do if an Impact Fee Seems Inevitable 103
Groups Likely to Support the HBA Position 105
Groups Likely to Oppose the HBA Position 105

Appendices 107
Appendix A: Case Studies 108
Appendix B: State Impact Fee Summary Chart 120
Appendix C: General Impact Fee Statute Considerations 121
Appendix D: Arizona, Montana and Texas Impact Fee Statutes 126
Appendix E: Resources 164

CHAPTER 1

Introduction

- ***What Are Impact Fees?***
- ***Why Do We Have Impact Fees?***
- ***Local Government Fiscal Stress and the Rise of Impact Fees***

The United States is experiencing a public infrastructure financing deficit that is the result of increasing demand for new and upgraded infrastructure systems coupled with diminished fiscal resources. Communities have turned to impact fees as a politically expedient means by which to construct public infrastructure systems. However, the use of impact fees may shift much of the financial burden away from all public infrastructure users (the general public) to a narrow segment of the public—homebuilders and new homebuyers. Aside from basic issues of fairness and equity, the use of impact fees raises legal, economic, technical, administrative, policy, and financial concerns for interested parties.

This Handbook was developed to provide homebuilders and other parties interested in impact fees a resource for exploring these issues and to provide strategies for achieving balanced infrastructure financing solutions.

The Impact Fee Handbook includes the following sections:

- Legal Aspects of Impact Fees
- Economic Aspects of Impacts Fees
- A Closer Look at Impact Fee Technical Studies
- Administrative Issues
- Alternatives to Impact Fees
- Political and Public Relations Strategies
- Appendices:
  A Case Studies
  B State Impact Fee Enabling Legislation Summary Chart
  C General Impact Fee Statute Considerations
  D Arizona, Montana, and Texas Impact Fee Statutes
  E Resources

While each section of the Handbook was designed to stand on its own, the Handbook's value lies in connecting each section so as to present the reader with a comprehensive picture of impact fees. It is recommended that the reader familiarize him or herself with the contents of the entire Handbook and then read in depth the sections most relevant to your situation. If there are areas that should be covered based on real world success and

failures in working with impact fees, readers are encouraged to let the staff at NAHB know so they can be addressed in future Handbook updates.

What Are Impact Fees?



Generally, impact fees are charges levied against new development in order to generate revenue for the purpose of funding capital improvements necessitated by that development. *Impact fees should not be confused with subdivision exactions that require developers either to "dedicate" land for public use or contribute cash in lieu of land for the purchase of land or facilities perceived to be necessary by local governments.* As a fundamental tool, impact fees are broader and more flexible than subdivision exactions. Impact fees can be levied on various types of development, including subdivision, condominium, commercial, and industrial projects. Unlike subdivision exactions, impact fees can be used to fund the construction of offsite facilities.

Typically, impact fees are:

- levied on an "up-front" or "front-end" basis, usually at the time of building permit issuance or subdivision approval;
- dedicated to a specific public use, such as a transportation facilities, sewer facilities, water facilities, or parks and recreation facilities, etc.;
- calculated on the basis of the number of residents or bedrooms in a dwelling, the square footage of a building, the linear footage of the front property line, or as a flat fee per unit or building lot, or some other formulation; and,
- prescribed by ordinance, although the dollar amount may or may not be specified.

Government has long imposed narrower charges for a variety of onsite capital improvements, including sewer and water hookups, storm water management facilities, and street and sidewalk construction. More recently, though, communities have levied impact fees on developers for a number of offsite improvements such as the development of community-wide recreational facilities, the construction of highway segments, or the expansion of centralized wastewater treatment plants. Often the need for these services and facilities is only indirectly attributed to a specific subdivision or project, giving rise to developer objections to funding such general improvements.

Impact fees range from several hundred to hundreds of thousands of dollars per home or building. They raise such fundamental social questions as:

- Who *really* pays?
- How is the fee calculated?
- Where does the money go?
- How and where is the money spent?
- Who *really* benefits from the new or expanded public facilities? What is the impact on housing costs?

- How is economic development affected? What are a community's financing alternatives?
- How does an impact fee policy mesh with a community's and region's affordable housing policy?
- Is new development being required to pay its *fair* share or something more?

Why Do We Have Impact Fees?

Impact fees were initiated in the 1970s in Florida and California—areas facing high growth and restrictive tax systems. Coupled with cutbacks in federal aid, local governments began searching for a new funding source: impact fees. In reality, many of these "fees" are a hidden charge placed upon a discrete segment of the general public—those citizens moving into new houses and apartments. In many, if not most, cases, consumers paying these charges already live in the community. They are first-time or move-up home buyers, and new families or individuals leaving their parent's home. .

The use of impact fees has spread rampantly as a result of several factors. Local governments are often pressed to extend public services to urban expansion areas because of a strong market preference for suburban housing products coupled with an expanding population base and rapid rate of new household formation. In particular, governments in high-growth areas struggle to keep pace with the demand for new public services while simultaneously maintaining and repairing existing public facilities. The cost of constructing new public infrastructure has increased substantially over the past decade as local governments compete in a globalized marketplace for raw materials, while at the same time, spending more to meet stringent federal and state mandated design standards. Nonetheless, citizens expect local governments to maintain existing levels of service despite diminishing fiscal resources.

Traditionally, local government has financed public services through (i) general fund revenues and (ii) the issuance of general obligation bonds that are repaid by future property tax collections, or (iii) revenue bonds that are paid through the net revenues of the utility constructing the improvements. General obligation bonds are defined as a debt liability backed by the full faith and credit of the issuing community. Revenue Bonds are backed by the full faith and credit of the community's utilities. Any of these approaches tends to be politically unpopular with existing residents.

Communities argue that the use of these financing mechanisms may require property tax increases, utility rate increases, or reductions in existing services. In addition, many states have adopted constitutional or statutory limitations on a local government's ability to issue debt, commonly including a requirement to attain approval by a majority or supermajority of voters.

In addition, voters across the nation have passed tax-cutting measures, including California's Proposition 13 and Massachusetts' Proposition $2^1/_2$, to limit the ability of local governments to raise taxes and to reduce the scope of government and government-supported services.

One consequence of the popularly termed "taxpayer revolt" is the emergence of local government policy that deems residential development acceptable only if it can "pay its own way." In many communities, public officials maintain that new development exacts public costs that exceed expected benefits. Decision makers, therefore, are frequently reluctant to approve development proposals that would require significant and politically unpopular outlays for service expansion. If they do approve development, local policy makers often condition permission to build on the payment of impact fees, effectively shifting some of the responsibility for service and facility provision from the public to the private sector.

Usually, however, decision makers fail to recognize the broad range of benefits associated with new development. They look only to the short term costs rather than to the full range of benefits a new development project generates at the time of project completion such as increased property tax revenues and other economic contributions by new households.

Impact fees generally do not require voter approval nor do they result in property tax or utility rate increases, at least directly, paid by current residents.

Local Government Fiscal Stress and the Rise of Impact Fees

During the past 30 years, many local governments have experienced some degree of fiscal stress resulting from rising service demands and from constraints on their ability to raise revenues. Fiscal stress, broadly defined, is when public service demands grow because of increasing population, inflation, rising real incomes, or other reasons, while the local revenue base—taxes, grants, and user fees and charges—does not grow fast enough to meet the increased public service demands. The difference in the growth rates of service demands and revenues necessitates either increases in tax rates or decreases in the level of services, or some combination of the two.

Another source of fiscal stress may have come from decreasing aid from the federal government, in part resulting from the changing focus of the federal government away from domestic issues to foreign policy, national defense, and homeland security.[1]

For an aggregation of all local governments, there is no definitive measure of effective tax rates. A crude measure of effective tax rates is local general revenues from their own sources (that is, total revenues less revenues from locally owned public utilities, transit systems, local employee retirement systems, and federal and state aid), as a percentage of Gross Domestic Product (GDP). This ratio provides an estimate of effective local government revenue-raising efforts since it measures their own-source general revenues (OSGR) relative to aggregate output (GDP).

During the 30-year period from 1966 to 1996, the period that includes the "tax revolts" in California and Massachusetts, local governments lessened their reliance on property taxes. In 1966 revenues from property taxes comprised nearly half of the total local

revenues, however, 30 years later, in 1996, the property taxes only comprised 28 percent. [2] Since 1966, local governments confronting rising service demands from mandates from higher levels of government and their own constituents and constrained from increasing property taxes, raised revenues from other sources.

Rising Service Demands

Population growth visibly increases public service demands. Roads, schools, and other public facilities become more congested. In order to keep a constant level of public services, the local public capital stock must expand to reduce congestion (assuming there was no excess capacity prior to growth). Inflation also increases the cost of providing public services, as local governments must pay more for their purchases of goods and services, including employee compensation.

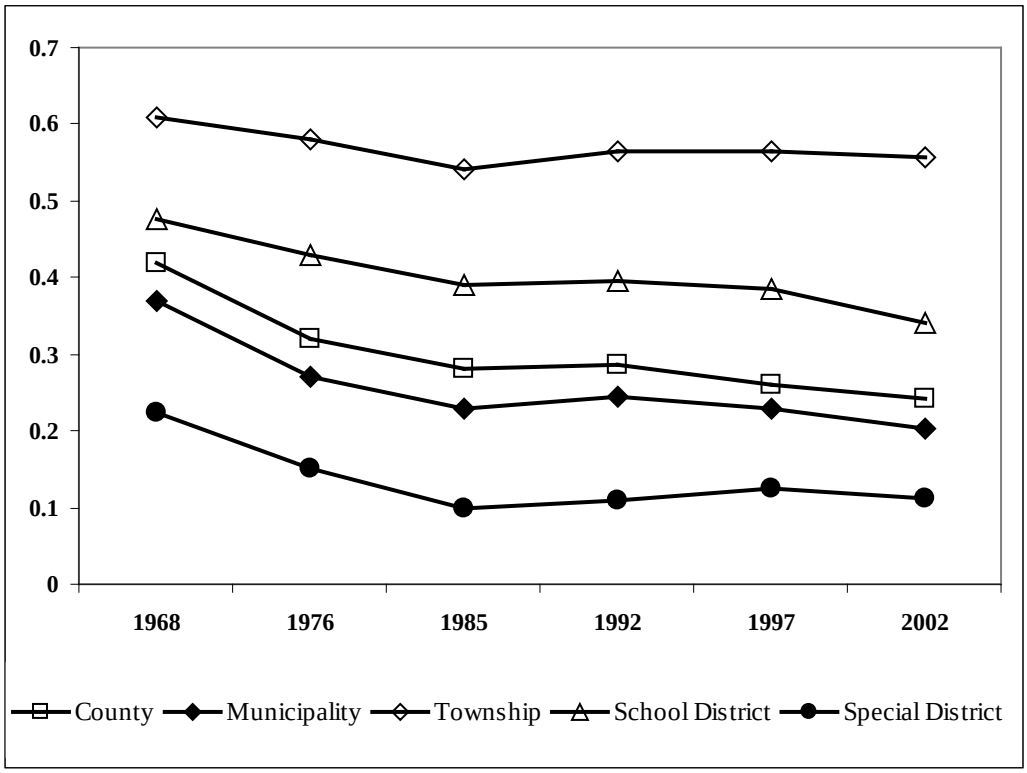
Another source of pressure on local governments for increased public services comes from higher levels of government. Since the mid-1960s, both federal and state governments have increasingly turned to mandates on local government to provide for increased levels of environmental protection, increased quality of public education, and upgraded jail facilities, to name a few. For local government officials, these mandates from higher levels of government are particularly burdensome because they are often completely unfunded. Local officials must devote portions of their fiscal resources to satisfying the requirements of federal and state governments rather than addressing local priorities.

Revenue Constraints

Two other sources of fiscal stress on local government are constraints on their ability to raise local revenues and decreased state and federal aid. According to Altshuler and Gomez-Ibanez (1993, p. 23), voter discontent with taxes of all sorts grew during the 1970s, when real incomes were flat or declining but effective tax rates were rising.[3] The most visible manifestations of voter dissatisfaction with property taxes came in 1978 with the passage of Proposition 13 in California and Proposition $2^1/_2$ in Massachusetts.[4] These pieces of legislation required their respective state governments to stabilize effective property tax rates at the levels that prevailed in the mid-1970s. Fee and miscellaneous revenues have increased substantially compared to property taxes as a result of property tax limitations placed on local governments. By 1999, 23 states generated more local revenue from fees and miscellaneous income than property taxes, an increase from only three states in 1972. The increased dependence of local governments on sources of revenue other than property taxes has led to a decrease in local property taxes as a share of general revenue. Overall, the proportion of property taxes as a part of general revenue has decreased from an average of 40.3 percent in 1972 to 29.1 percent in 1999.[5]

The chart on the following page highlights local property tax revenue as a proportion of general revenue from 1968 to 2002.[6]

Figure 1.1: Local Property Taxes as a Proportion of General Revenue (1968 – 2002)



Source: 1968-1997 data from chart in "State and Local Finances under Pressure", edited by David L. Sjoquist, 2003. 2002 data obtained from the U.S. Census Bureau. Census of the Governments. www.census.gov/govs/www/

Opposition to property taxation also came from groups concerned about the inequality of per-pupil expenditures for elementary and secondary education among school districts within their states. Reliance on local property taxes to finance public schools allowed school districts with high levels of property wealth per pupil to fund high-quality programs with relatively low effective tax rates, while school districts with low levels of property wealth per pupil were forced to levy relatively high effective tax rates to fund lower-quality programs. These groups argued that state aid did not sufficiently reduce inequalities in per-pupil spending across the state, and that the remaining inequalities violated the state constitutional provisions of adequate education spending for all pupils. Successful court cases in California, New Jersey, Iowa, Texas, and other states required states to reallocate state aid and, in some instances, to reduce reliance on property taxation for financing public education. The Michigan legislature has acted to require the state to assume full responsibility for school funding in place of local property taxes.

Declining Federal and State Aid

Further exacerbating local government fiscal stress has been the relative decline in aid from higher levels of government for the past 30 years. The changing composition of federal and state aid since the late 1970s has adversely affected the ability of state and local governments to finance infrastructure. A stark decline in aid from the federal level of

government has contributed to the growing problem. To compensate for the declining fiscal assistance from the federal government, local governments have pursued other revenue sources.

Economic factors have also played a role in decreasing government aid. For example, poor economic conditions during the 2001 recession created additional fiscal pressure on local governments. State and federal government tax collections decreased, which meant less funding was appropriated to local governments. As a result, local governments tapped reserves, raised existing fees and charges, and adopted measures to create diverse revenue sources to fill the revenue gap.[7]

Local Government Response to Fiscal Stress

The fiscal stress confronting local governments and, to a lesser extent, state governments, forced many state and local government officials to find ways to reduce expenditures. Reducing current service levels is politically difficult because diminished service levels are readily visible to constituents and are often as contentious as tax increases. One method of limiting expenditure growth is to reduce spending for infrastructure maintenance. This expedient choice allows local officials to keep other services at current levels, and the effects of deferring maintenance spending are not readily or immediately apparent.

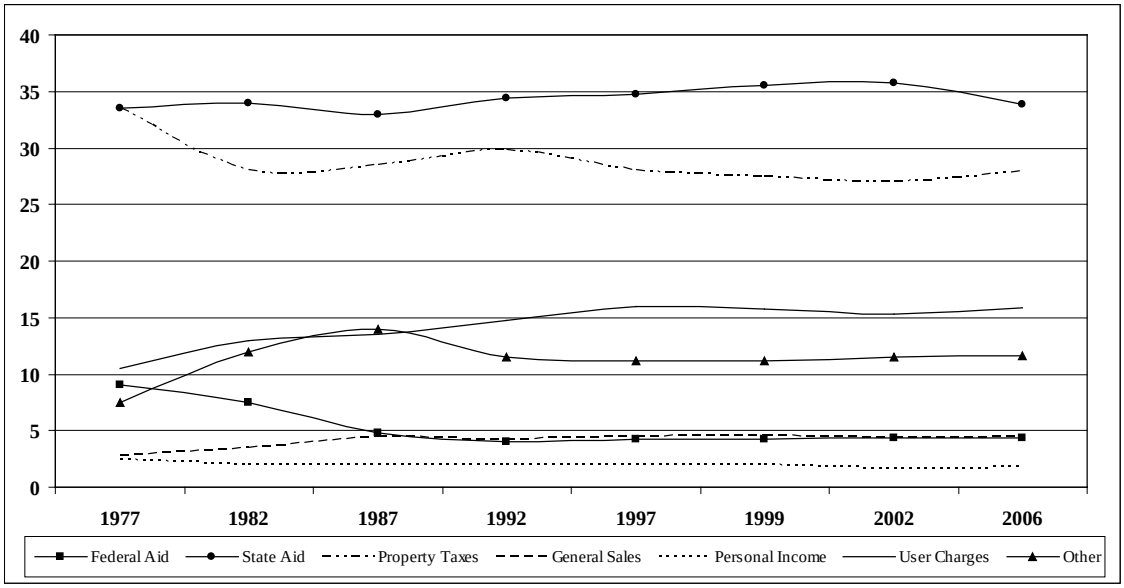
The deadly collapse of the I-35W Bridge in Minneapolis in 2007, and the catastrophic failure in 2005 of the levees in New Orleans following Hurricane Katrina punctuate the nation's current infrastructure maintenance crisis. These failures are a symptom of the nation's systemic neglect of infrastructure which, according to a 2007 Urban Land Institute report, has resulted in a $1.6 trillion deficit in needed repair and maintenance spending through 2010.[8]

Revenue Diversification

Local governments diversified their sources of general revenues in response to opposition to property taxes. During the 1970s, property taxes accounted for approximately 34 percent of locally raised general revenues. Between 1977 and 1999, the proportion of local own source general revenues from property taxes fell from 34 percent to 27 percent (see graph below). Sales taxes, which had provided approximately 3.5 percent local own-source general revenues in the 1970s, accounted for approximately 4.5 percent of local government OSGR by 1999. Approximately 16 percent of all local OSGR came from user charges and miscellaneous revenues by 1999.[9]

The graph on the following page highlights the share of funding sources contributing to local general revenues from 1977 to 2006.

Figure 1.2: Share of Funding Sources Contributing to Local General Revenues (1977 – 2006)

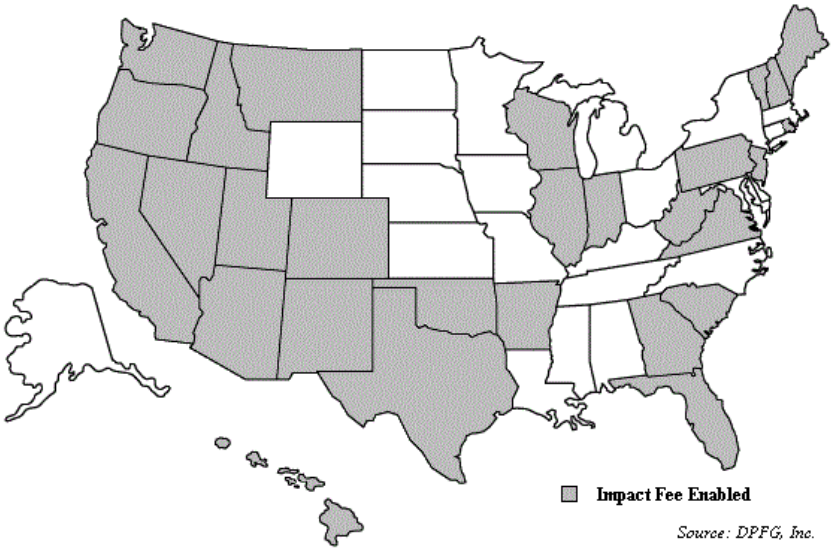


Source: Robert Tannenwald, Are State and Local Revenue Systems becoming Obsolete?, National Tax Journal, Sept. 2002.
U.S. Census Bureau. Census of the Governments: 1977, 1982, 1987, 1992, 1997, 1999. www.census.gov/govs/www/. 2002, 2006 data updated utilizing the same source.
Footnote: "Other" category consists of: selective sales, corporate income, motor vehicle license tax, other taxes, and miscellaneous general revenue.

Impact Fee Usage

The use of impact fees has spread widely throughout the United States, especially in regions affected by rates of growth and development including southern and western states. It is less common for communities in Midwestern or northeastern states to utilize impact fees. As of 2015, twenty-nine (29) states had impact fee enabling statutes. In addition to states with impact fee enabling statutes, communities in "home-rule" states may also use impact fees even if a state enabling statute has not been enacted.

Figure 1.3: States with Impact Fee Enabling Acts (2015)



According to statistics publicized by the Government Accountability Office (GAO), 39 percent of counties and 59 percent of communities with populations greater than 25,000 imposed some type of impact fee to finance infrastructure.[10]

Where impact fees are utilized, the dollar amount per home has grown substantially over the years. For example, Snyder and Stegman (1986, p. 76), citing a California Building Industry Association study, found that the average impact fee, measured in 1983 dollars, on a single-family detached house, with 3 bedrooms, rose from $1,087 in 1975 to $6,847 in 1983, or 511 percent.[11] Based on more recent surveys conducted by Duncan Associates, a similar new home in California would require impact fee payments of approximately $22,154 in 2012 and $23,455 in 2015, representing a 6% increase in over the four year period.[12]

Conclusion

In light of the economic pressures on local governments, it is easy to understand why local governments are increasingly turning to impact fees for the provision of public services. *For growing communities, impact fees represent a vast store of potential revenue that can be tapped at less political cost than other sources. This does not mean, however, that impact fees are always the best or wisest solution for the financing of public infrastructure when taking into account social equity considerations and the need to maintain long-term community support for capital spending programs.*

Endnotes

1. Terri A. Sexton, National Tax Journal, Washington, June 2004. Vol. 57, Iss.2.
2. Gordon Shuford and Richard D. Young, *A report on Local Government Funding: An Overview of National Issues and Trends*, Institute of Public Affairs – Center for Governance University of South Carolina, 2000.
3. Alan A. Altshuler and Jose A. Gomez-Ibanez, *Regulation for Revenue: The Political Economy of Land Use Exactions* (Washington, DC: The Brookings Institution, 1993).
4. During this period, the federal government and many state governments began to either partially or fully index their individual income tax codes to moderate the adverse effects of inflation on family income tax burdens.
5. *State and Local Finances Under Pressure*, Edited by David L. Sjoquist, Studies in fiscal federalism and state-local finance, 2003.
6. *State and Local Finances Under Pressure*, Edited by David L. Sjoquist, Studies in fiscal federalism and state-local finance, 2003.
7. Bruce A. Wallin, *Budgeting for Basics: The Changing Landscape of City Finances* (Washington, DC: The Brookings Institution Metropolitan Policy Program, 2005).
8. ULI–the Urban Land Institute and Ernst & Young. *Infrastructure 2007: A Global Perspective.*
9. Robert Tannenwald, *Are State and Local Revenue Systems becoming Obsolete?*, National Tax Journal, Sept. 2002.
10. General Accountability Office, *Local Growth Issues—Federal Opportunities and Challenges*, GAO/RCED-00-178 (September 2000).
11. Thomas P. Snyder and Michael A. Stegman, *Paying for Growth: Using Development Impact Fees to Finance Infrastructure* (Chapel Hill, NC: Urban Land Institute, 1986).
12. Clancy Mullen, *National Impact Fee Survey: 2012 & 2015*, Duncan Associates.

CHAPTER 2

Legal Concepts of Impact Fees

- ***Authority to Impose Impact Fees***
- ***Impact Fees as Unlawful Taxes***
- ***Federal and State Constitutional Issues***

This chapter discusses general legal principles that apply to typical impact fees. Because these principles vary from state to state, it is important to consult with counsel when faced with an impact fee ordinance.

There are three key legal concepts that have a direct bearing on whether the fee has been validly enacted and applied. First, a municipality must have authority to enact the impact fee—either from a state enabling statute or implied by other legal authority. Second, the impact fee must not be imposed in a manner that makes it an unlawful "tax in disguise." Third, an impact fee must be constitutional. Additionally, organizations and individuals who are considering a challenge to an impact fee must be able to show that an injury has occurred as a result of the impact fee.

Authority to Impose Impact Fees

Without the proper legal authority, municipalities are unable to enact an impact fee. This authority is express—granted by a state legislation—or implied by a municipality's inherent powers.

Enabling Legislation

Many states have enabling legislation which specifically authorizes impact fees. These statutes usually are beneficial for builders as they help to establish certainty and transparency in the development process. Impact fee statutes usually require municipalities to follow prescribed procedures when implementing local impact fee programs.

Georgia's enabling statute, for example, allows municipalities and counties to charge development impact fees if they first enact a comprehensive plan with a capital improvements section. The statute establishes legislative intent, outlines definitions, procedures and the appeals process to be used in the implementation of any impact fee. Ga. Code Ann. §§ 36-71-1 *et seq.* (2006). Most notably, Georgia's statute requires municipalities to form an advisory committee, which includes representatives from the development industry, to assist with the creation of an ordinance. Ga. Code Ann. § 36-

71-5 (2006). If the municipality fails to properly form this committee, the impact fee is invalid.

When municipalities fail to follow the procedures or parameters outlined in a state enabling statute, the resulting impact fee ordinance may not have been properly enacted. In some states, municipalities must strictly follow the planning and zoning procedures outlined in the enabling statute. For example, an impact fee ordinance in Idaho was invalidated because the city was located within a county containing less than 200,000 people, the minimum imposed by the state law for empowering cities to impose development impact fees. *Idaho Building Contractors Ass'n v. City of Coeur D'Alene*, 890 P.2d 326 (Idaho 1995).

On the other hand, some state courts have upheld impact fees even when a municipality has not strictly followed all of the procedures in the state's enabling statute. For example, in *Charleston Trident Home Builders, Inc. v. Town Council of Summerville*, 632 S.E.2d 864 (S.C. 2006), a court found that a municipality "substantially compli[ed]" with an enabling statute even though its capital improvements plan did not incorporate every element required by the statute.

Usually, impact fee enabling statutes classify what type of infrastructure may be improved through the use of impact fees. For example, Virginia's statute authorizes municipalities to use impact fees for road improvements, but additionally allows for public facilities impact fees only on properties that are currently zoned agricultural and are being subdivided for by-right residential development. Va. Code Ann. § 15.2-2317 – 2329. If a municipality attempts to impose an impact fee for infrastructure not authorized under the enabling statute, there is a strong likelihood that it is invalid. An impact fee for school improvements was invalidated in Nevada because the enabling statute did not specifically authorize school impact fees. *Douglas County Contractor's Ass'n v. Douglas County*, 929 P.2d 253, 259-261 (Nev. 1996).

Implied Authority

In the absence of a state enabling statute, municipalities must have some other source of authority from the state before they may impose an impact fee. Municipalities are commonly described as operating under either home rule or Dillon's Rule. This important distinction has a direct bearing on a municipality's ability to enact impact fees and other growth control measures.

Municipalities which operate under Dillon's Rule are limited to those powers which have been expressly granted by the state.[1] Therefore, a Dillon's Rule municipality must be able to rely on a state enabling statute before it has authority to impose an impact fee. In a classic Dillon's rule case, the Supreme Court of New Hampshire invalidated an impact fee because the municipality had not been expressly granted this power under the statute authorizing municipalities to charge administrative fees. *Bd. of Water Comm'rs v. Mooney*, 660 A.2d 1121 (N.H. 1995).

Some Dillon's Rule municipalities have argued that their ability to enact impact fees stems from their general planning and zoning authority—which usually includes the ability to impose fees. This argument, however, may be on the decline because courts have proven unwilling to equate the authority to impose administrative fees with the authority to enact an impact fee.[2]

On the other hand, home rule municipalities have a greater degree of independence over their regulation of land use. Generally, home rule municipalities have broad discretion in the exercise of their planning and zoning powers, so long as their regulation does not conflict with state law.

Home rule municipalities often rely on this authority to justify their ability to enact impact fees.[3] For example, a Nebraska court upheld an impact fee under a city's home rule charter—finding that the city's home rule authority was sufficiently broad that it included the authority to impose taxes on development. *Home Builders Ass'n v. City of Lincoln,* 711 N.W.2d 871 (Neb. 2006).

In contrast, other courts have imposed greater limits on the ability of home rule municipalities to enact impact fees.[4] The Supreme Court of Mississippi, for example, held that the state's home rule statute did not allow the municipality to assess impact fees without express enabling authority. *Mayor of Ocean Springs v. Homebuilders Ass'n,* 932 So.2d 44 (Miss. 2006). The court distinguished the municipality's ability to impose fees with its ability to enact taxes. The court noted that, under Mississippi's constitution, general municipal services must be funded by traditional tax revenue, and the state had to explicitly authorize an alternative method, such as impact fees.

Impact Fees As Unlawful Taxes

As the Mississippi case shows, it is important to determine whether an impact fee actually amounts to an unlawful tax—even when a municipality might otherwise have authority to impose the impact fee. The central distinction here is that the power to tax is separate from the state's police power. As put by the Arizona Supreme Court, in *Casa Grande v. Tucker,* 817 P.2d 947, 950 (Ariz. 1991):

> *A tax is imposed upon the party paying it by mandate of the public authorities, without his being consulted in regard to its necessity, or having any option as to its payment. The amount is not determined by any reference to the service which he receives from the government, but by his ability to pay, based on property or income. On the other hand, a fee is always voluntary, in the sense that the party who pays it originally has, of his own volition, asked a public officer to perform certain services for him, which presumably bestow upon him a benefit not shared by other members of society.*

Whether an impact fee results in an unlawful tax depends on the facts of a specific case and specific tests created by state courts. Frequently, courts examine where the impact

fee funds are going in any tax vs. fee analysis. If an impact fee is used to raise revenue for general public infrastructure, instead of defraying the impact of development on a specific type of infrastructure, the impact fee takes on characteristics of a tax. *Courts also look at whether those who pay the impact fee are, in fact, causing the infrastructure problem and whether the proceeds being applied to infrastructure will benefit those who pay (development) and not just the public as a whole.*[5]

Federal and State Constitutional Issues

Even when a municipality has properly enacted an impact fee ordinance, it must still meet certain constitutional requirements before it can be considered valid. Impact fees may be challenged on three grounds under the U.S. Constitution: (1) the ordinance violates a developer's due process rights; (2) it results in a violation under the Equal Protection Clause; and (3) the fee is an unconstitutional exaction under the Fifth Amendment. Regarding due process and equal protection, the status of the law mostly well-settled. Unfortunately, the legal atmosphere is less settled concerning claims that impact fees are unconstitutional exactions.

In addition, note that state constitutions and state statutes often provide similar protection to the U.S. Constitution and can often be brought as separate claims under a single lawsuit.

Violations of the 14th Amendment—Due Process & Equal Protection

The Due Process Clause of the Fourteenth Amendment to the U.S. Constitution prohibits states from depriving any person of their property without due process of law. When the government has acted arbitrarily and/or irrationally, the developer can bring a due process claim and may be entitled to damages under 42 U.S.C. §1983, and/or injunctive relief. Similarly, when the government has discriminated against the developer, the developer can bring an equal protection claim under 42 U.S.C. §1983.

Due Process

An impact fee ordinance may be challenged under the due process clause even though the municipality has acted within its police powers to protect the public. Due process claims focus on whether the impact fee in question is a *reasonable* exercise of the state's police power. To raise a successful due process claim, the developer must show that the municipality's interference with his property rights was arbitrary, irrational and capricious.

Substantive Due Process

In substantive due process cases, most courts use a three pronged test. *First, is the exaction rationally related to a legitimate public purpose? Second, are the means adopted to achieve this purpose reasonably necessary? Third, is the regulation unduly*

oppressive on the property owner? If the ordinance fails any of the three prongs of the test, it will be invalidated. The third prong is generally the most disputed.

Although the third prong requires the application of a "balancing test" between the rights and needs of the public versus the rights of the individual property owner, there are several factors used to determine whether the ordinance is unduly oppressive: (1) the nature of the harm sought to be avoided; (2) the availability and effectiveness of less drastic means of achieving the goal of the ordinance; and (3) the economic loss suffered by the property owner.

It is difficult to overcome the test used in substantive due process challenges. Therefore, such challenges are not often successful.

Procedural Due Process

In procedural due process cases, an ordinance imposing exactions on developers may be challenged if it was not enacted under the proper procedures set forth in the state enabling legislation. *Whether a municipality has violated a developer's right to procedural due process often depends upon local law. The procedural due process afforded to an individual will vary according to each state's own laws but generally, the developer will be entitled to fair notice and a hearing on the issue at hand.*

Raising a claim of procedural due process is not an effective way to prevent the imposition of an exaction. In effect, a procedural due process violation serves merely as a delaying tactic. Following a judgment in favor of a developer claiming a violation of procedural due process, the municipality will often reenact the exaction legislation with the necessary corrections to ensure the protection of procedural due process rights.

Equal Protection

In some cases an exaction may also be challenged on the theory that it violates the right to equal protection. The Equal Protection Clause of the Fourteenth Amendment ensures all people equal protection under the law, meaning that states cannot unreasonably discriminate between persons who are similarly situated.

The use of a classification of development, resulting in different treatment for each group, does not necessarily result in a violation of the equal protection clause of the United States Constitution. Equal protection does not require that all persons be dealt with identically, but it does require that a distinction made have some relevance to the purpose for which the classification is made. Unless a case involves a "suspect classification," which includes treating groups of people differently based on race, national origin, religion, or alienage, the law merely requires that classifications be rationally related to legitimate governmental purposes.

When an ordinance does not expressly use classifications for the purposes for imposing exactions on developers, the ordinance may still be subject to an equal protection challenge if the ordinance is discriminatory in its application.

In most cases, it is difficult to successfully challenge a zoning ordinance on equal protection grounds because the ordinance only needs to be rationally related to legitimate government purpose and the challenger must rebut a presumption that the ordinance (a legislative act) is constitutional and valid.

Violations of the 5th Amendment—Impact Fees as Unconstitutional Exactions

The Fifth Amendment to the U.S. Constitution requires that private property shall not be taken for public use without just compensation. Traditionally, a taking occurs when the government physically invades private property or requires the dedication of a piece of property to the state. Second, a government *regulation*, as opposed to a physical intrusion, can also be a basis for a takings lawsuit. Finally, the U.S. Supreme Court has also recognized that the Fifth Amendment is implicated when the government places conditions on a development applicant in return for a development permit (i.e. exactions). Unfortunately, the Supreme Court's jurisprudence is limited to cases where the government has conditioned a development approval on a case-by-case (also called *ad hoc)* basis, and it is an open question as to whether legislatively-imposed impact fees are subject to the same analysis. Nevertheless, NAHB consistently argues that legislatively-imposed exactions and *ad hoc* exactions must both meet the same constitutional requirements. Specifically, NAHB argues that the Court's decisions in *Nollan v. California Coastal Commission*, 483 U.S. 825 (1987) and *Dolan v. City of Tigard*, 512 U.S. 374 (1994) instruct municipalities regarding the appropriate level of and purposes for the exaction.

In *Nollan*, the Court explained that *there must be an "essential nexus" between the development condition and the anticipated impacts of the development. Without this connection, the condition could result in a violation of the Fifth Amendment.*

In *Dolan*, the Court discussed what constitutes a reasonable level of a development condition. The Court held that *development conditions must bear a "rough proportionality" to the development's impact on existing infrastructure.* In order to meet this proportionality requirement, municipalities must make an individualized determination that the impact of proposed development warrants the exaction. "No precise mathematical calculation is required, but the city must make some sort of individualized determination that the required dedication is related both in nature and extent to the impact of the proposed development." *Dolan* at 391.

Where a condition of development approval is not in proportion with the development's anticipated impact, the *Dolan* rough proportionality test is not met and the government has violated the Fifth Amendment. This violation occurs regardless of whether the imposition by the government is for a dedication of land or for a monetary payment. *Koontz v. St. Johns River Water Management District,* 133 S.Ct. 2586 (2013).

Several courts have directly applied the heightened scrutiny standard in *Nollan* and *Dolan* to impact fees.[6] The California Supreme Court, for example, stated that a municipality must account for the actual impact of a proposed development, as well as any relative benefit the project will contribute, before imposing a fee. *Ehrlich v. City of Culver City*, 911 P.2d 429 (Cal. 1996).

Other courts have refused to extend this standard to monetary conditions like impact fees.[7] Courts in this camp frequently distinguish *Nollan* and *Dolan* from legislatively-imposed conditions. These courts usually explain that "the two-pronged heightened scrutiny that the Court adopted in *Dolan* was animated by the Court's particular concern with the sort of governmental leveraging that can arise in case-by case . . . imposition of development conditions." *Rogers Machinery, Inc. v. Washington County*, 45 P.3d 966 (Or. Ct. App. 2002). In other words, because impact fees apply generally to all developers, the heightened scrutiny test does not apply.

States with express enabling authority for impact fees usually include the standards for nexus and proportionality within the text of the statute itself.[8] *Otherwise, three general tests have emerged among the state courts to determine the constitutionality of impact fees (1) the reasonable relationship test, (2) the dual rational nexus test, and the (3) specifically and uniquely attributable test. These state tests stem from either state enabling statues or case law.*

The first test is the least restrictive, and only requires a reasonable relationship between the fee and the new development's impact on public facilities.[9] This test is the most favorable to government, as it is fairly easily satisfied.

The dual rational nexus test has two components, which both must be satisfied in order for an impact fee to be constitutional. First, the impact fee must be reasonably attributable to new development's impact on the municipality's infrastructure. Second, the funds from the fee must be used to benefit the new development itself.[10]

In *Upton v. Town of Hopkinton,* 945 A.2d 670 (N.H. 2008), the Supreme Court of New Hampshire recently explained the dual rational nexus test this way:

> *[A]n impact fee must be a proportional share of municipal capital improvement costs which is reasonably related to the capital needs created by the development, and to the benefits accruing to the development from the capital improvements financed by the fee.*

Resolution of the dual rational nexus test is dependent on the facts of each individual case. A court will analyze the methodology used to calculate a development's impact and whether capital improvements actually benefit the development that is required to pay the fee. If this methodology is sound, a court is likely to find the impact fee to be constitutional.[11]

The most restrictive test, and therefore the most favorable to development, is the specifically and uniquely attributable test. 'Specifically and uniquely attributable' means that a new development creates the need, or an identifiable portion of the need, for additional capacity to be provided by the required improvement or facility. Illinois is the author and primary user of the specifically and uniquely attributable test although a few states have applied it as well. *Pioneer Trust & Sav. Bank v. Village of Mt. Prospect,* 176 N.E.2d 799 (Ill. 1961). The principal challenge developers can bring against impact fees in these states is whether the new development is the sole cause of the allegedly needed capital facilities.

Standing

The party challenging an impact fee ordinance must have "standing" before bringing a claim in court. Essentially, this means that the party must have suffered a tangible injury as a result of the impact fee. For a builder or developer, this standing is based on payment of the fee. However, for an organization, such as a homebuilder's association, standing tends to occur more often.

Generally, an organization can have standing on behalf of its members if it meets the following requirements: "(1) [it] has suffered an 'injury in fact' that is (a) concrete and particularized and (b) actual or imminent, not conjectural or hypothetical; (2) the injury is fairly traceable to the challenged action of the defendant; and (3) it is likely, as opposed to merely speculative, that the injury will be redressed by a favorable decision." When the plaintiff is not the object of the government action, standing is not precluded, but it is "substantially more difficult" to establish. *Lujan v. Defenders of Wildlife,* 504 U.S. 555, 560-62, 112 S.Ct. 2130, 119 L.Ed.2d 351 (1992).

In the context of impact fees, courts will likely find that an organization has standing when one of its members has had to pay the fee. For example, in *Charleston Trident Home Builders, Inc. v. Town Council,* 632 S.E.2d 864 (S.C. 2006), the Supreme Court of South Carolina held that the home builders association had standing because there was evidence that its president had paid more than $100,000 worth of impact fees since the ordinance was enacted. *While it may be possible for an organization to establish standing for the future payment of impact fees, it will be difficult to establish that an injury is imminent and not speculative.*[12]

Organizations generally claim declaratory or injunctive relief, rather than monetary damages, because courts are unlikely to find that all members have suffered identical damages.

Endnotes

1. Dillon's rule is named for John Forrest Dillon, a 19th Century judge who determined that, under the 10th Amendment to the U.S. Constitution, local governments are mere political subdivisions of the state when exercising their powers.
2. *Durham Land Owners Ass'n v. County of Durham*, 630 S.E.2d 200 (N.C. Ct. App. 2006).
3. *See, e.g. McCarthy v. City of Leawood, 894* P.2d 836 (Kan. 1995); *HBA of Dayton & Miami Valley v. City of Beavercreek*, 729 N.E.2d 349 (Ohio 2000).
4. *See, e.g. Twin City Fire Ins. Co. v. City of Madison*, 309 F.3d 901 (5th Cir. 2002).
5. *Eastern Diversified Properties, Inc. v. Montgomery County*, 570 A.2d 850 (Md. 1990); *Home Builders Ass'n of Greater Des Moines v. City of West Des-Moines*, 644 N.W.2d 339 (Iowa 2002).
6. *N. Ill. Home Builders Ass'n v. County of Dupage*, 649 N.E.2d 384 (Ill. 1995); *Town of Flower Mound v. Stafford Estates Ltd. P'ship*, 135 S.W.3d 620 (Tex. 2004); *Benchmark Land Co. v. City of Battle Ground*, 14 P.3d 172 (Wash. Ct. App. 2000).
7. *San Remo Hotel L.P. v. S.F. City & County*, 364 F.3d 1088 (9th Cir. 2004); *Clajon Prod. Corp. v. Petera*, 70 F.3d 1566 (10th Cir. 1995); *Home Builders Ass'n of Cent. Ariz. v. City of Scottsdale*, 930 P.2d 993 (Ariz. 1997); *Krupp v. Breckenridge Sanitation Dist.*, 19 P.3d 687 (Colo. 2001); *McCarthy v. City of Leawood*, 894 P.2d 836 (Kan. 1995); *Waters Landing Ltd.P'ship v. Montgomery County*, 650 A.2d 712 (Md. 1994).
8. *See, e.g.* Ariz. Rev. Stat. § 9-463.05; Ark. Code Ann. § 14-56-103; Me. Rev. Stat. Ann. tit 30-A § 4354; Mont. Code Ann. § 7-6-1601 – 1604.
9. Cal. Gov't Code § 66001 (B) (2007).
10. *Banberry Dev. Corp. v. South Jordan City*, 631 P.2d 899 (Utah 1981);
11. *HBA of Dayton & Miami Valley v. City of Beavercreek*, 729 N.E.2d 349 (Ohio 2000).
12. *Newton County Home Builders Ass'n v. Newton County*, 648 S.E.2d 420 (Ga. Ct. App. 2007).

CHAPTER 3

Economic Implications of Impact Fees

- ***Introduction***
- ***Who Ultimately Pays an Impact Fee?***
- ***Implications of Higher House Prices***
- ***Are Impact Fees Really Necessary?***
- ***Conclusion***

Impact fees on new residential development are a form of market intervention. In the absence of an intervention, the economic forces of supply and demand will bring about an unconstrained outcome to the interactions among consumers and producers of housing, and the suppliers of inputs (such as land, labor, building materials, and the entrepreneurial skill to consummate the process) utilized to build the housing. Impact fees unquestionably change the outcome. The questions remain: In what ways do impact fees affect the economic forces of supply and demand and by how much.

Part of the unconstrained outcome of supply and demand within a local housing market is a set of pricing components for new housing units and each of the inputs that comprise the building of a home. Such pricing components may include, but not be limited to: land, labor, building materials and profit. In this framework, profit is considered a price paid to developers to induce them to risk capital and apply entrepreneurial skill to residential development projects. The imposition of an impact fee influences at least one of these prices. If the pricing components for a project remain unchanged, and an impact fee is imposed, the price of housing increases. In short, someone has to pay the fee. Chapter 3 explains why, in the typical case, pricing components are unlikely to decrease, meaning the home buyer is ultimately the party who pays the impact fee.

Chapter 3 also demonstrates that the imposition of impact fees may cause home prices to increase by more than the amount of the impact fee. Such a scenario occurs primarily because development costs, such as financing charges and broker commissions, are often calculated as a percentage of other costs. To illustrate the effect that impact fees passed on to home buyers may have on housing affordability, the number of households "priced out" of the market as a result of the impact fee is described and estimated. For purposes of the chapter, priced out is defined as households able to qualify for a mortgage on a median-priced home prior to the imposition of the impact fee, but not afterward.

This leads naturally to the question of whether or not impact fees are really necessary. Chapter 3 demonstrates that, given existing fees and taxes within a typical metropolitan area, the economic activity generated and supported by home building may, after some

time, result in enough additional local government revenue to cover current expenses plus the cost of providing infrastructure. In this sense, new housing can be said to pay for itself.

Who Ultimately Pays an Impact Fee?

From the perspective that developers and home builders are the ones that provide the cash outlay for impact fees, it may be said that they pay the impact fees. However, similar to any tax or other costs imposed on businesses, the ultimate burden of payment will, to varying degrees, be passed to new home buyers in the form of higher house prices[1] (or, equivalently, smaller houses with fewer amenities), or come from suppliers of products and services utilized to build and deliver the home in the form of lower prices paid for those products and services.

To put this argument in perspective, Figure 3.1 identifies the components that comprise the price of a typical single family home.

Figure 3.1 Sale Price Breakdown
For an Average Single-Family Home in 2013

Average Lot Size: 14,359 sq. ft.
Average Finished Area: 2,607 sq. ft.

Description	Average	Share of Price
Finished Lot Cost (including financing cost)	$74,509	18.60%
Total Construction Cost	$246,453	61.70%
Financing Cost	$5,479	1.40%
Overhead and General Expenses	$17,340	4.30%
Marketing Cost	$4,260	1.10%
Sales Commission	$14,235	3.60%
Profit	$37,255	9.30%
Total Sales Price	$399,532	100%

The cost of an impact fee is fully passed on to the home buyer, unless any of the seven line items in Figure 3.1 are reduced. Theoretically, it is possible that the ultimate effect of impact fees is to reduce demand for these inputs and drive down the price of the items. The question is how likely this is to happen in practice for a particular item.

Impact fees, building permit fees, and water and sewer fees fall within the total construction cost figure. In most cases, permit and other fees imposed by local governments on new construction, will most likely not decrease over time as reason for imposing a fee on the construction of a home is to raise revenue, it makes little sense for the local jurisdiction to simultaneously relinquish that revenue through a concomitant reduction in fees on the same home.

In order for a reduction in the cost of labor per home to occur, wage rates for local construction workers must decline. For a significant wage decline to occur in response to an impact fee on new residential construction, new residential construction within the jurisdiction must account for a large proportion of the demand for local construction labor and construction workers building the homes must have relatively few opportunities for work on new residential construction in neighboring jurisdictions, on non-residential new construction, or on remodeling.

If a residential impact fee is imposed across all jurisdictions in a market area, including potential development sites on the fringes, it, by definition, removes the option for local workers to construct new homes that are not subject to the impact fee. On the other hand, to the extent that such a broadly imposed fee inhibits new construction, it could be discerned that the replacement of existing structures would be delayed, which may result in an increase in the demand for remodeling work.

A similar argument applies to overhead and general expenses. New home construction typically represents a minor part of a local economy that a change in impact fees would not change demand enough to generate noticeable declines in prices paid for general overhead expenses. In the short run, if impact fees inhibit new construction, the effect may be to increase overhead costs per unit, as overhead would then need to be allocated across fewer units of production.

It seems even more obvious that conditions in a single local market will have no significant impact on the cost of building materials. Markets for building materials are regional, if not national and may even be international, in scope. The effect of one local market on demand for building materials is typically negligible and imposing a fee on construction in one jurisdiction will not generally result in the builders paying less for lumber, wall board, or other building products.

Credit markets are also national or international in scope, making it difficult for local action to have an effect on financing costs. Locally imposed impact fees will not reduce the interest rates or improve the terms builders and developers can obtain on acquisition, development, and construction loans.

At first, it may seem reasonable to assume that, because the builders and developers write the checks, the impact fee is deducted from the profit. Such a scenario would not be true in a competitive market, however, as profits to home building must remain competitive with home building in nearby areas and returns available in other, similar industries with a corresponding level of risk. Otherwise, builders would be better off constructing homes elsewhere, pursuing a different business, or investing resources in alternative investment options. In short, a competitive rate of return is required in order to keep local builders in business in the long run.

Home building is widely recognized as a competitive industry. According to a 2003 monograph by the American Real Estate and Urban Economics Association, “In the United States, as in most countries, the market for housing services per se can be

approximated by a competitive market… Few landlords or developers are large enough to exert significant market power."[2]

A competitive housing market is defined as large numbers of consumers and producers acting independently to make market decisions. The firms in the market are competing against one another, and there are no barriers to entry: whenever firms are earning excess profits, these are competed away by other firms who enter the industry, increase supply, and compete away the excess.

The most complicated item to analyze is the raw land cost. It is conceivable that an impact fee imposed on local construction to some extent inhibits demand for raw land and places downward pressure on the price. The extent to which this happens depends on local housing market conditions, other local land use policies—including policies of other local governments in the surrounding area—and the time frame being considered.

If impact fees are imposed in one jurisdiction but land is readily available in a surrounding market area that does not impose impact fees, builders may choose not to purchase land in the jurisdiction that imposes the fee unless owners of land within the jurisdiction are willing to take a reduction in price that fully compensates for the fee.

However, there are realistic scenarios under which land in surrounding jurisdictions may not be readily available. One scenario may be that surrounding jurisdictions are unwilling to change zoning or accelerate approval of residential building permits to accommodate construction activity that would otherwise spill over into their areas from the jurisdiction imposing the impact fee.

Even if home building is largely confined to the area over which the fee is imposed or land is already owned by builders, the willingness of land owners to sell at a lower price depends upon economic conditions and other land use policies within that jurisdiction. If other profitable uses for the land are available, and local jurisdictions readily change zoning to allow land to be utilized for those purposes, the owner of the land has no reason to accept a lower price for a residential use. Notwithstanding current zoning restrictions, the owner may be unwilling to sell land at a price that offsets the impact fee, if he or she reasonably expects zoning restrictions to change in the future.

Given the local nature of land use decisions, the types of restrictions often imposed, and the role of expectations, a reasonable working assumption is that nationwide residential developers will have difficulty passing impact fees to land owners in the form of lower land prices, and will therefore tend to pass them on instead to home buyers in the form of higher house prices.

From the perspective of new home buyers, the price of the home to the buyer may increase by more than the impact fee amount. One may ask, how can this scenario be possible? Payment of an impact fee typically occurs during development. An impact fee paid early in the production process has associated carrying costs and can substantially increase the costs builders and developers pay. In a typical case, NAHB

estimates that total developer and builder costs will increase by 137 percent of the impact fee.

NAHB research shows that, on average, regulations imposed by government at all level account for 25 percent of the final price of a new single family home built for sale[1]. Every time a local or regional government raises construction costs by, for example, increasing the price of construction permits or impact fees, the cost of building a house rises. In fact, the final price of the home to the buyers will usually go up by more than the increase in the government fee. This is because each time construction costs increase other costs such as commissions and financing charges automatically rise as well. As a result, most cost increases are passed on to the buyers with additional charges. The size of these charges depends both on the type of fee/cost increase and when it is imposed in the development/construction process. NAHB estimates that the add-on charges range from 0 percent if a fee is imposed directly on buyers to 39 percent if cost is incurred when applying for site development approval (see Figure 3.2). So that for every $1 increase in fees incurred, for example, when acquiring a building permit, the final price of a new home to its final customer rises by $1.20. Alternatively, every $833 increase in fees imposed at the time of the building permit results in a $1,000 increase in house prices.

Figure 3.2 Impact Fee Effect on Sale Price

Description	Time (months)
Length of time:	
Permit to Start	0.8
Start to Construction Completion	6.2
Construction Completion to Home Sale	4.8
Total	**11.8**

Building Costs/Fees	Add-on Charges
Imposed directly on buyer	0%
During construction	16%
At start of construction	18%
When building permit acquired	20%
During development	37%
When applying for site development approval	39%

The bottom line is that a $1,000 impact fee imposed at the time of development approval will typically increase the costs to builders and developers to at least $1,390. Most if not all of the price increase is likely to be passed on to home buyers. In some cases, depending on particular local conditions, the price increase may be partially

[1] See P. Emrath "How Government Regulation Affects the Price of a New Home", Housing Economics Online, July 2011

offset by falling land prices. In rare circumstances, depending on local conditions, the price increase may be partially offset by declining wages for construction workers.

Impact fees on rental housing units would have similar effects on prospective tenants. Impact fees would tend to increase rents in new units to cover higher development costs.

Implications of Higher House Prices [5]

When an impact fee is passed to the buyer, what are the implications? Obviously, one is an adverse effect on housing affordability. One way to illustrate the potential extent of the adverse effect is to apply national mortgage underwriting standards to estimate the households that qualified for a mortgage before a house price increase, but no longer qualify for a mortgage afterwards. Households that no longer qualify for a mortgage following the price increase are referred to as being "priced out" of the market for the home.

Applying this approach to the U.S. as a whole reveals that in 2014—utilizing typical assumptions about the mortgage, down payment, property taxes and property insurance, a $1,000 impact fee which increases the price of a median-priced new home by $1,370, prices out about 282,588 households as illustrated below in Figure 3.3.

Figure 3.3 US Households Priced Out of the Market by Impact Fees, 2014

Description	Mortgage Rate	House Price	Monthly Mortgage Payment	Taxes and Insurance	Minimum Income Needed	Households That Can Afford House
Without Fee	4.50%	$275,000	$1,321	$391	$73,382	41,959,112
With Fee	4.50%	$276,370	$1,328	$393	$73,748	41,676,524
Difference		**$ 1,37**	**$ 7**	**$ 2**	**$ 366**	**- 282,588**

* Calculations assume a 10% down payment and a 45 basis point fee for private mortgage insurance. A Household Qualifies for a Mortgage if Mortgage Payments, Taxes, and Insurance are 28% of Income.

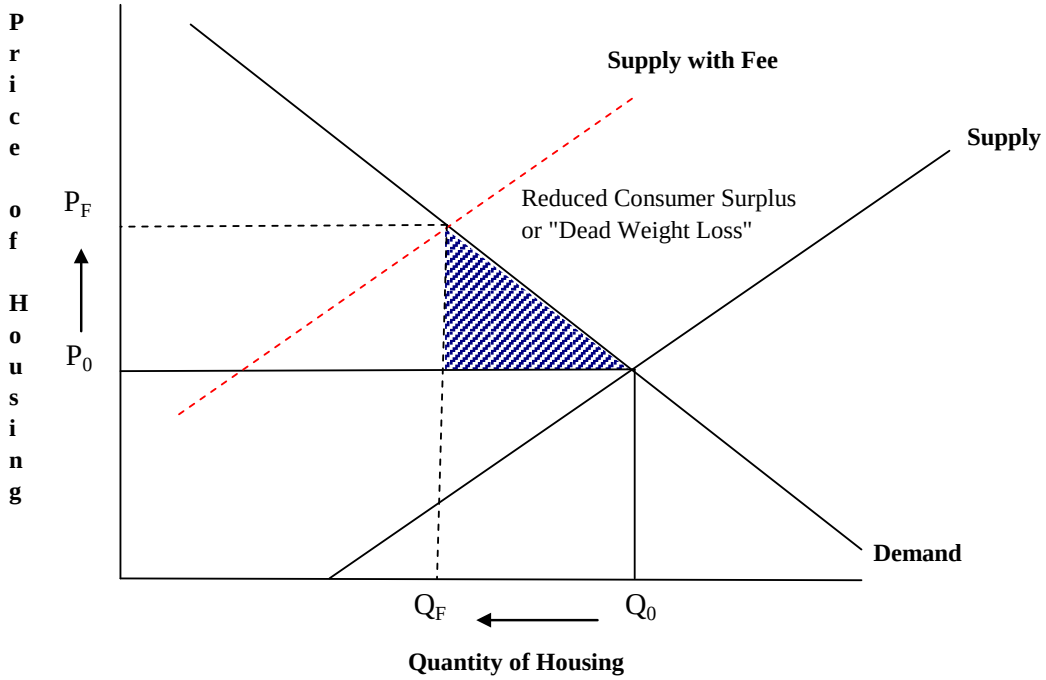
The priced-out calculation requires an income distribution as illustrated in Figure 3.3, and assumptions about mortgages, property taxes and property insurance. The income distribution, taxes and insurance rates are based largely on data from the Census Bureau's American Community Survey (ACS). Given appropriate information about housing prices, income distributions, taxes and insurance rates, it's possible to apply the priced-out analysis to local housing markets.

NAHB estimated new house prices for 357 Metropolitan Statistical Areas (MSAs).[6] Household income distributions, as well as information about real estate taxes and insurance, are available for MSAs from the ACS.[7] The priced-out analysis based on these data for 357 MSAs are illustrated in Exhibit A located at the end of this chapter.

The number of households priced out of the market by a $1,000 impact fee (resulting in a $1,370 price increase) ranges from a low of 19 in the Napa, CA, MSA and 30 in the Carson City, NV, MSA, to a high of 5,742 in the New York, Northern New Jersey, Long Island NY-NJ MSA. The MSA with second largest number of priced-out households is the Chicago, Joliet, Naperville IL-IN-WI MSA, with 5,325 households priced out as the result of the imposition of an impact fee.

The priced-out results do not provide a specific answer to the extent of the impact on new construction (that would require a complicated economic model that includes estimates of the willingness of households to buy smaller houses, older houses, or houses with fewer amenities; interrelationships between different segments of the local housing market; and adjustments made by home builders and surrounding local governments). It is possible, however, to indicate the general effects impact fees have on new construction on a graph of supply and demand in a local housing market as illustrated in Figure 3.4 below.

Figure 3.4 Supply and Demand in a Local Housing Market



The imposition of an impact fee translates into an increase in the cost to produce a home. On Figure 3.4, the imposition of an impact fee is equivalent to shifting the supply curve up and to the left. The effect of the impact fee on consumers of new homes is thus some combination of a price increase and reduction in quantity of housing produced.

The area below the demand curve but above the market price is called a “consumer surplus,” because all consumers pay the same, market-clearing price for housing although many of them may be willing to pay more. When the imposition of an impact fee shifts the supply curve, the consumer surplus is reduced. Consumers are made worse off because they are both consuming less housing and paying a higher price for housing. The lost surplus is called a “dead weight loss” and is illustrated as the area of the shaded triangle in Figure 3.4.

Note that, although local builders maintain a normal profit margin in this scenario, total profits are reduced, as the same per unit profit margin is earned on fewer units of production.

Existing homes in the area will also be affected by this scenario, because they are substitutes for new housing. As impact fees raise the prices of new homes and prospective buyers view existing homes as an alternative, upward pressure is placed on the prices of existing homes. Empirical research supports the argument that impact fees raise the price of existing homes as well as new homes.[8] This research finds that existing homes are relatively close substitutes for new homes in particular impact-fee-imposing jurisdictions.

Similarly, prospective renters are likely to consider existing rental units as substitutes for new rental units, placing upward pressure on rental rates for existing housing. The combination of rising prices for existing homes and rental rates in existing rental units results in "windfall" gains to current owners of housing units. The opposite is true for current tenants in existing rental units as they are doubly squeezed by impact fees. The ability of current tenants to purchase a home or move to a newer rental unit is hampered by higher housing prices and tenants may be forced to pay higher rents for their current residence.

To the extent that impact fees raise the price of all homes in a given community, the affordability of housing in that area is reduced. A reduction in housing affordability will have a negative effect on attracting and retaining workers and will have a direct impact on local governments as police officers, firefighters, teachers, and other public sector workers are heavily impacted when home prices rise. In addition, the shortage of affordable housing will make it difficult for the community to retain its own sons and daughters as they leave their parents' homes and look for affordable first homes of their own.

Are Impact Fees Really Necessary?

The premise underlying the use of impact fees is that development, especially residential development, does not pay for its fair share of the burden imposed upon the local government as new development requires the expansion of public infrastructure as well as the hiring of additional public sector workers.

NAHB has developed a model to estimate the costs to local governments for the additional public infrastructure and public sector workers that are attributable to new growth. Detail on the methodology is available in the report *The Local Impact of Home Building in a Typical Metropolitan Area: Comparing Costs to Revenues for Local Governments*: http://www.nahb.org/fileUpload_details.aspx?contentTypeID=3&contentID=35601&subContentID=119792.

The general approach of the model is to assume local jurisdictions supply residents of new homes with the same levels of services that they currently provide, on average, to occupants of existing structures. The amount spent by jurisdictions to provide public services is available to the public from the Census of Governments, where all units of government in the U.S. report line item expenses, revenues, and intergovernmental transfers once every five years to the Governments Division of the U.S. Census Bureau. The Census of Governments accounts can be aggregated for every local government in a typical metropolitan area and then used to estimate total annual expenses per 100 single family and 100 multifamily housing units.

Local taxes and government spending patterns vary considerably by jurisdiction across the U.S., so defining averages for a typical metropolitan area is not completely straightforward. The figures presented in Figure 3.5 were calculated by aggregating data from the majority of the roughly 88,000 local governments in the U.S. and scaling them to the number of housing units. Areas in which revenues collected by local jurisdictions exceed 15 percent of personal income were excluded in order to exclude extreme values from cases where significant local government activity exists without substantial housing markets (for example, mining communities).

Figure 3.5 Current Expenses for Local Governments per 100 Housing Units

Description	Single Family	Multifamily
Education	$ 142,000	$ 82,000
Police Protection	45,000	33,000
Fire Protection	20,000	15,000
Corrections	14,000	11,000
Streets and Highways	6,000	4,000
Water Supply	15,000	8,000
Sewerage	8,000	4,000
Health	19,000	14,000
Recreation and Culture	21,000	16,000
Other General Government	69,000	51,000
Electric Utilities	15,000	11,000
Gas Utilities	2,000	1,000
Public Transit	1,000	1,000
Other Government Functions	1,000	-
Total	**$ 378,000**	**$ 251,000**

Source: NAHB calculations based on data from the Census of Governments, U.S. Census Bureau.

In addition to current expenses, providing services to residents requires local governments to make capital expenditures for items such as schools and other buildings, equipment, roads, and other structures.

Estimating capital expenditures for schools, roads and other structures is more complicated than estimating current expenses. The process is to estimate a traditional economic model, where expenditures are a function of labor and capital, with state level data, for which information about the capital stock can be derived.[9] The results are then applied to the typical metropolitan area, where capital required per housing unit can be computed as a residual. The results for 100 single family and 100 multifamily housing units are illustrated in Figure 3.6.

Figure 3.6 Capital Needed by Local Governments to Support 100 Housing Units (in $ Thousand)

Description	Single Family	Multifamily
Schools	$ 759,000	$ 442,000
Hospitals	83,000	61,000
Other buildings	241,000	179,000
Highways & streets	150,000	104,000
Conservation & development	5,000	4,000
Sewer systems	189,000	99,000
Water supply	249,000	130,000
Other structures	241,000	179,000
Total	**$ 1,917,000**	**$ 1,198,000**

Source: results from NAHB "local impact of home building" model that estimates capital owned and maintained by local governments: http://www.nahb.org/fileUpload_details.aspx?contentTypeID=3&contentID=35601&subContentID=10018

If, in the estimation of local policy makers, the increase in property tax revenues generated by development would not be sufficient to cover the increases in debt service and other costs of providing public services, local governments may decide to impose impact fees on new growth in order to maintain property tax rates at the current level. Often omitted from policy makers' estimates are the long-term economic and fiscal benefits of growth.

NAHB has also developed a model to estimate the total economic benefits of home building. The model captures the effect of the construction activity itself (Phase I), the ripple impact that occurs when income earned from construction activity is spent and recycled in the local economy (Phase II) and the ongoing impact from new homes occupied by residents who pay taxes and purchase locally produced goods and services (Phase III). In order to accurately capture the positive impact residential construction has on a community, it’s important to include the ripple effects and the ongoing benefits.

In each phase, the expanded economic activity results in additional revenue for local governments in the area. In Phase I, even without impact fees, local government

revenue is generated by local sales taxes on materials, and a variety of other taxes and fees paid by the local businesses that participate in the process of building, marketing, and selling the home. In Phase II, as the income earned in Phase I is spent, local government revenue is generated by sales taxes, other taxes and fees paid by local consumers and businesses resulting from the expanded economic activity, and revenue for government-owned utilities and other local government enterprises. In Phase III, the residents of the new homes spend money locally and generate taxes, fees, and revenue for local government much as in Phase II—with the exception that the revenue is recurring, and also includes the increase in local property taxes that normally results from the development of residential properties.

Results of the revenue generated in each phase for a typical metropolitan area can be found in the report *The Local Impact of Home Building in a Typical Metropolitan Area: Income, Jobs, and Taxes Generated*: http://www.nahb.org/fileUpload_details.aspx?contentTypeID=3&contentID=35601&subContentID=28002.[10] Results in the report assume an average impact fee (broadly defined to include permits, hook-up charges, etc.) of $7,008 per single family and $2,762 per multifamily housing unit.

In order to judge whether or not impact fees are necessary, the results are recalculated under the alternative assumption that home builders and developers pay **no impact or other fees of any kind to local governments.** These results are summarized in Figure 3.7.

Figure 3.7 Revenue Generated for Local Governments per 100 Housing Units

	One-Time Effect				Ongoing, Annual	
	Phase I		Phase II		Phase III	
Description	**Single Family**	**Multi- Family**	**Single Family**	**Multi- Family**	**Single Family**	**Multi- Family**
Business Property Taxes	$ 163,000	$ 54,000	$ 140,000	$ 61,000	$ 90,000	$ 100,000
Residential Property Taxes	-	-	-	-	270,000	107,000
General Sales Taxes	125,000	46,000	45,000	20,000	29,000	32,000
Specific Excise Taxes	22,000	7,000	19,000	8,000	12,000	14,000
Income Taxes	23,000	10,000	12,000	5,000	8,000	8,000
Licenses Taxes	1,000	1,000	1,000	-	1,000	1,000
Other Taxes	21,000	7,000	18,000	8,000	11,000	13,000
Residential Permit/Impact Fees	-	-	-	-	-	-
Utilities & Other Govt. Enterprises	88,000	38,000	106,000	46,000	134,000	97,000
Hospital Charges	45,000	20,000	20,000	9,000	42,000	40,000
Transportation Charges	19,000	8,000	9,000	4,000	6,000	6,000
Education Charges	20,000	9,000	9,000	4,000	6,000	6,000
Other Fees and Charges	86,000	32,000	57,000	25,000	39,000	37,000
Total	**$ 613,000**	**$ 232,000**	**$ 436,000**	**$ 190,000**	**$ 648,000**	**$ 461,000**

Source: results from NAHB "local impact of home building" model that estimates the economic benefits of new construction. Technical documentation available from the NAHB Housing Policy Department.

The next issue to address is whether the generated revenues are sufficient to cover all costs listed in Figures 3.5 and 3.6, employing several conservative assumptions to avoid understating costs. For example, it is assumed that demand for public capital facilities generated by the new housing units cannot be met through current excess capacity. Instead, local governments invest in new structures and equipment at the start of the first year, prior to the construction of any homes. To the extent that neither assumption

is true, interest costs would be somewhat lower than reported in the following discussion.

To compare the streams of revenues and expenditures over time, it is assumed that half of the current expenses and half of the ongoing, annual revenues are realized in the first year. This would be the case if construction and occupancy took place at an even rate throughout the year.

The difference between revenues and current expenses in a given year is an operating surplus. At the beginning of the first year, capital investment is financed through debt by borrowing at the current municipal bond interest rate, with the interest accruing throughout the year. Each year following the first year, the operating surplus is first utilized to pay the interest on the debt, then to pay off the debt at the end of the year. Results are illustrated for the 100 single family homes in Figure 3.8 and 100 multifamily units in Figure 3.9.

Figure 3.8 Costs and Revenue for Local Governments Generated by 100 Single Family Units in a Typical Metropolitan Area With No Impact Fees

Year	Current Expenses	Revenue	Operating Surplus	Capital Investment Start of Year	Debt Outstanding End of Year	Interest on Debt	Net Income
1	$ 189,000	$ 1,372,681	$ 1,183,681	$ 1,917,000	$ 820,824	$ 87,505	$ (820,824)
2	378,000	647,748	269,748	-	588,545	37,468	232,280
3	378,000	647,748	269,748	-	345,662	26,865	242,883
4	378,000	647,748	269,748	-	91,692	15,778	253,970
5	378,000	647,748	269,748	-	-	4,185	265,563
6	378,000	647,748	269,748	-	-	-	269,748
7	378,000	647,748	269,748	-	-	-	269,748
8	378,000	647,748	269,748	-	-	-	269,748
9	378,000	647,748	269,748	-	-	-	269,748
10	378,000	647,748	269,748	-	-	-	269,748
11	378,000	647,748	269,748	19,000	-	-	250,748
12	378,000	647,748	269,748	-	-	-	269,748
13	378,000	647,748	269,748	-	-	-	269,748
14	378,000	647,748	269,748	-	-	-	269,748
15	378,000	647,748	269,748	-	-	-	269,748

Source: results from NAHB "local impact of home building" models.

Figure 3.9 Costs and Revenue for Local Governments Generated by 100 Multifamily Housing Units in a Typical Metropolitan Area With No Impact Fees

Year	Current Expenses	Revenue	Operating Surplus	Capital Investment Start of Year	Debt Outstanding End of Year	Interest on Debt	Net Income
1	$ 125,500	$ 652,645	$ 527,145	$ 1,198,000	$ 725,540	$ 54,685	$ (725,540)
2	251,000	460,846	209,846	-	548,813	33,119	176,728
3	251,000	460,846	209,846	-	364,018	25,052	184,795
4	251,000	460,846	209,846	-	170,788	16,616	193,230
5	251,000	460,846	209,846	-	-	7,796	202,050
6	251,000	460,846	209,846	-	-	-	209,846
7	251,000	460,846	209,846	-	-	-	209,846
8	251,000	460,846	209,846	-	-	-	209,846
9	251,000	460,846	209,846	-	-	-	209,846
10	251,000	460,846	209,846	-	-	-	209,846
11	251,000	460,846	209,846	14,000	-	-	195,846
12	251,000	460,846	209,846	-	-	-	209,846
13	251,000	460,846	209,846	-	-	-	209,846
14	251,000	460,846	209,846	-	-	-	209,846
15	251,000	460,846	209,846	-	-	-	209,846

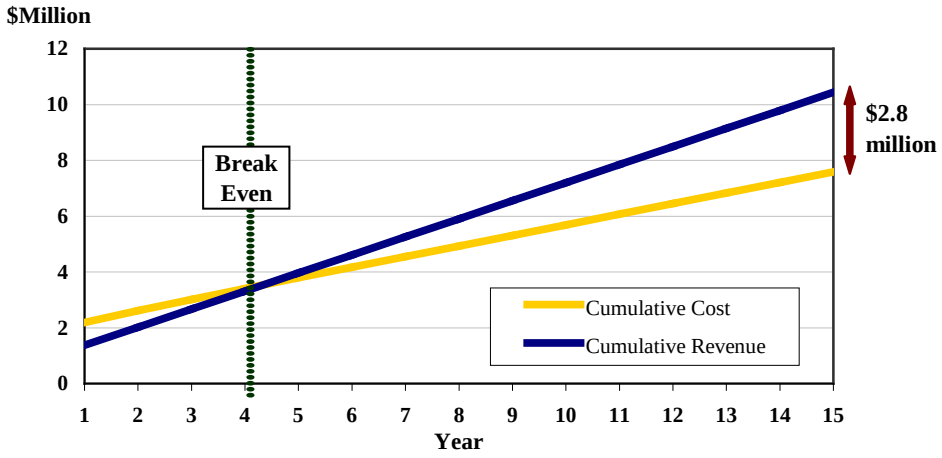
Source: results from NAHB "local impact of home building" models.

As Figure 3.8 illustrates, in the first year without the imposition of impact fees, 100 average single family homes constructed in the typical metropolitan area, generate an estimated $1.4 million in tax and other revenue for local governments. 100 average single-family homes also generate $189,000 in current expenditures to the local government for providing public services to the net new households at current levels, and $1.9 million in capital investment for new infrastructure and equipment necessary to serve the needs of new residents. The analysis assumes that local governments finance the capital investment by borrowing at the current municipal bond rate.

In a typical year after the first, the 100 single-family homes result in $648,000 in recurring tax and other revenue for local governments, and $378,000 in local government expenditures needed to continue providing services at current levels.

After 15 years, the homes will generate a cumulative $10.4 million in revenue for local governments compared to only $7.6 million in expenditures, including annual current expenses, capital investment, and interest on debt as illustrated in Figure 3.10.

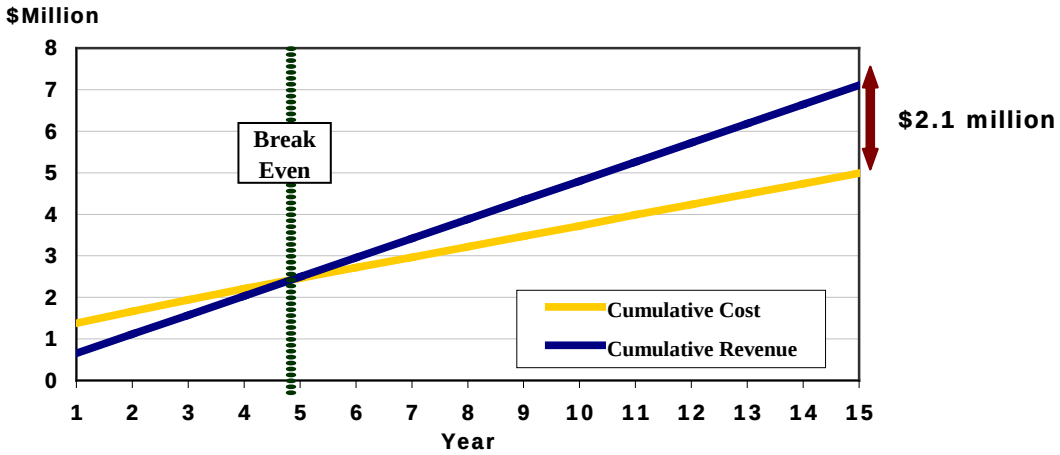
Figure 3.10. Costs Compared to Revenue: 100 Single Family Homes with No Impact Fees



Similarly, in the first year without the use of impact fees, 100 average multifamily housing units constructed in a typical metropolitan area, generate an estimated $653,000 in taxes and other revenue for local governments while requiring approximately $126,000 in current expenditures for local governments to provide public services at current levels to the net new households, and $1.2 million in capital investment for new structures and equipment necessary to serve the needs of new residents. Again, it was assumed that local governments finance the capital investment by borrowing at the current municipal bond rate.

In a typical year after the first, the 100 multifamily housing units result in an additional $461,000 in tax and other revenue for local governments, and $251,000 in local government expenditures needed to continue providing services at current levels. After 15 years, the homes will generate a cumulative $7.1 million in revenue compared to $5.0 million in costs (Figure 3.11).

Figure 3.11 Costs Compared to Revenue: 100 Multifamily Units with No Impact Fees



In *The Local Impact of Home Building in a Typical Metropolitan Area: Income, Jobs, and Taxes Generated*, NAHB showed that, in an average revenue structure (including average impact fees), an average single family house will pay for itself (from the standpoint of local governments in the area) in four years, and an average multifamily housing unit will pay for itself in approximately five years.

Figures 3.10 and 3.11 illustrate that, impact and other construction-related fees are eliminated, the revenues attributable to new growth that remain from Figure 3.7 are sufficient enough for the average single-family and multifamily housing units to pay for themselves within a five-year timeframe. After a breakeven point at approximately five (5) years, the average single-family and multifamily unit begins generating excess revenue that local governments may use to reduce taxes or finance other projects, including the expansion of services to other residents in the area.

Many revenue items in Figure 3.7 result from general expansion of the local economy of a metropolitan area and cannot be assigned with certainty to a particular jurisdiction. This creates fiscal challenges, as many costs (such as those associated with primary and secondary education) are borne entirely by the jurisdiction in which a home is constructed. However, if each jurisdiction ignores the economics of the broader housing and labor market in which it is situated, and considers only revenues that can be documented with certainty when making decisions regarding impact fee policies or other measures with the potential to restrict the supply of housing, the result will be a general shortage of housing that will stifle business growth and create housing affordability problems. The purpose of this chapter was not to trivialize the significant fiscal challenges many local jurisdictions face, but to document the net economic benefits jurisdictions in a market area may realize if they allow an adequate supply of housing to be constructed.

Conclusion

The information presented in this chapter has illustrated how a $1,000 impact fee will typically be passed to the ultimate buyer of the home; how the buyer often ends up paying more than $1,000 extra for the home; and how the increase in the price of the home will create housing affordability issues by reducing consumption of housing in addition to increasing prices for the housing buyers do consume.

Moreover, given the tax and fee structures that prevail throughout the United States, the expanded economic activity resulting from residential construction generates considerable revenue for local governments in the area. In the typical case, after the initial five (5) year period following construction, revenues from various sources, excluding impact fees (or permit, or hook-up, or other construction-related), are adequate to extend existing level of public services the new residences.

Endnotes

1. Higher prices include the case of a house that may sell for the same price but is smaller, on smaller lot, or includes fewer amenities. In this case the buyer may be paying the same price but getting less housing in return, an effective price increase. For simplicity, this chapter describes primarily the case where the characteristics of the house remain constant while the price changes.
2. Richard Greene and Stephen Malpezzi. A Primer on U.S. Housing Markets and Housing Policy. AREUEA Monograph Series No. 3, The Urban Institute Press, Washington (2003). Richard Greene is currently Associate Dean for Graduate Programs and Oliver T. Carr, Jr. Chair of Real Estate Finance at George Washington University. Stephen Malpezzi is Professor, and Lorin and Marjorie Tiefenthaler Distinguished Chair in Real Estate at the University of Wisconsin-Madison.
3. U.S Census Bureau. Houses Sold and for Sale by Stage of Construction and Median Number of Months on Sales Market: http://www.census.gov/const/stageann.pdf, and Length of Time for New Residential Construction: http://www.census.gov/const/www/lengthoftimeindex.html.
4. NAHB, 2006 Cost of Doing Business Study.
5. A substantial portion of the material in this section is adapted from "Metro Area House Prices and Affordability" by Elliot Eisenberg in Housing Economics, July 2007. http://www.nahb.org/generic.aspx?sectionID=734&genericContentID=79606&channelID=311
6. "New Home Prices by State and Metro Areas" by Paul Emrath and Helen Fei Liu in Housing Economics, June 2007: http://www.nahb.org/generic.aspx?sectionID=734&genericContentID=78655&channelID=311
7. "Residential Real Estate Tax Rates in the American Community Survey" by Natalia Siniavskaia in Housing Economics, May 2007: http://www.nahb.org/generic.aspx?sectionID=734&genericContentID=76984&channelID=311
8. See for example "An Empirical Examination of the Effect of Impact Fees on the Housing Market," by Larry D. Singell and Jane H. Lilleydahl in Land Economics, February 1990; "Pricing Implications of Development Exactions on the Existing Housing Stock," by Charles Delaney and Marc Smith in Growth and Change, Fall 1989; or "Do Impact Fees Raise the Price of Existing Housing" by Shishir Mathur in Housing Policy Debate, 2007 (Issue 4).
9. The procedure is explained in detail in the technical appendix to The Local Impact of Home Building in a Typical Metropolitan Area: Comparing Costs to Revenues for Local Governments.
10. Details of the model used to estimate the results are available in NAHB's Local Impact of Home Building Model: Technical Appendix. The document is too large to be downloaded over the internet but can be obtained by contacting NAHB's Housing Policy Department.

Exhibit A

NATIONAL ASSOCIATION OF HOME BUILDERS
Households Priced Out of the Market by a $1,000 Price Increase, 2014

Metropolitan Statistical Area	Median New Home Price	Income Needed to Qualify	Households		
			All	Percent that Can Afford	Priced Out
Abilene, TX MSA	240,384	71,059	62,311	25%	144
Akron, OH MSA	269,153	75,822	293,691	29%	407
Albany, GA MSA	140,973	38,181	56,249	45%	160
Albany-Schenectady-Troy, NY MSA	401,105	117,214	336,867	19%	369
Albuquerque, NM MSA	225,407	57,214	344,294	43%	659
Alexandria, LA MSA	207,636	51,993	69,543	37%	178
Allentown-Bethlehem-Easton, PA-NJ MSA	307,829	87,794	318,081	29%	513
Altoona, PA MSA	349,984	92,322	48,629	17%	44
Amarillo, TX MSA	272,883	83,203	94,499	29%	142
Ames, IA MSA	284,375	78,675	37,083	30%	53
Anchorage, AK MSA	373,186	98,659	131,380	35%	192
Anderson, IN MSA	259,819	70,209	47,967	24%	105
Anderson, SC MSA	230,499	56,789	71,988	39%	110
Ann Arbor, MI MSA	270,400	78,181	143,994	41%	233
Anniston-Oxford, AL MSA	171,771	43,116	48,622	50%	117
Appleton, WI MSA	251,328	72,245	87,202	38%	212
Asheville, NC MSA	240,017	58,015	173,969	40%	333
Athens-Clarke County, GA MSA	228,491	58,608	70,685	35%	128
Atlanta-Sandy Springs-Marietta, GA MSA	221,742	56,955	1,980,222	48%	4,135
Atlantic City-Hammonton, NJ MSA	299,539	90,537	100,674	28%	136
Auburn-Opelika, AL MSA	314,741	78,066	54,042	25%	74
Augusta-Richmond County, GA-SC MSA	208,798	52,477	198,133	44%	407
Austin-Round Rock-San Marcos, TX MSA	232,454	69,043	667,355	45%	1,285
Bakersfield-Delano, CA MSA	241,976	62,459	258,396	40%	479
Baltimore-Towson, MD MSA	228,013	57,989	1,060,179	56%	2,014
Barnstable Town, MA MSA	616,381	151,432	80,879	11%	24
Baton Rouge, LA MSA	226,874	56,548	306,517	48%	530
Battle Creek, MI MSA	241,340	72,350	56,027	26%	114
Bay City, MI MSA	240,615	70,478	45,788	28%	79
Beaumont-Port Arthur, TX MSA	183,574	55,775	142,970	39%	349
Bellingham, WA MSA	293,969	72,746	77,203	35%	145
Bend, OR MSA	326,459	81,842	68,995	31%	101
Billings, MT MSA	247,752	63,972	67,882	35%	153
Binghamton, NY MSA	255,988	82,431	103,527	26%	164
Birmingham-Hoover, AL MSA	263,064	64,348	447,016	38%	681
Blacksburg-Christiansburg-Radford, VA MS	210,790	52,204	67,158	52%	141
Bloomington, IN MSA	205,783	51,066	77,320	42%	147
Bloomington-Normal, IL MSA	207,654	62,994	71,053	51%	172
Boise City-Nampa, ID MSA	269,591	66,056	239,837	33%	474
Boston-Cambridge-Quincy, MA-NH MSA	430,296	111,855	1,749,426	32%	1,829
Boulder, CO MSA	310,031	74,378	128,370	47%	191
Bowling Green, KY MSA	202,515	52,107	53,579	40%	93
Bremerton-Silverdale, WA MSA	293,074	74,090	90,100	41%	167
Bridgeport-Stamford-Norwalk, CT MSA	878,625	240,996	339,772	1%	186
Brownsville-Harlingen, TX MSA	116,704	35,831	126,119	47%	478
Brunswick, GA MSA	289,183	73,721	40,866	29%	59
Buffalo-Niagara Falls, NY MSA	395,105	128,302	469,199	10%	266

NATIONAL ASSOCIATION OF HOME BUILDERS
Households Priced Out of the Market by a $1,000 Price Increase, 2014

Metropolitan Statistical Area	Median New Home Price	Income Needed to Qualify	Households		
			All	Percent that Can Afford	Priced Out
Burlington, NC MSA	155,202	38,966	56,995	54%	154
Canton-Massillon, OH MSA	220,267	60,406	165,387	35%	326
Cape Coral-Fort Myers, FL MSA	292,932	80,100	259,094	26%	279
Carson City, NV MSA	343,367	84,201	22,243	34%	30
Cedar Rapids, IA MSA	146,885	41,106	99,047	64%	218
Champaign-Urbana, IL MSA	254,760	76,429	93,065	29%	141
Charleston-North Charleston-Summerville, S	288,677	72,424	269,643	34%	491
Charlotte-Gastonia-Rock Hill, NC-SC MSA	243,499	62,366	683,782	43%	1,181
Charlottesville, VA MSA	262,901	63,558	78,144	51%	128
Chattanooga, TN-GA MSA	182,679	46,376	210,567	46%	510
Chicago-Joliet-Naperville, IL-IN-WI MSA	308,424	92,108	3,473,022	31%	5,325
Chico, CA MSA	274,636	67,806	89,007	31%	128
Cincinnati-Middletown, OH-KY-IN MSA	244,344	66,318	865,663	41%	1,623
Clarksville, TN-KY MSA	140,513	35,802	103,093	64%	306
Cleveland, TN MSA	159,148	39,165	49,234	56%	138
Cleveland-Elyria-Mentor, OH MSA	272,149	79,010	830,043	28%	1,103
Coeur d'Alene, ID MSA	250,758	60,527	55,100	37%	100
College Station-Bryan, TX MSA	192,998	56,025	88,453	36%	198
Columbia, MO MSA	214,130	54,865	76,589	42%	128
Columbia, SC MSA	213,026	52,771	291,253	44%	670
Columbus, GA-AL MSA	188,924	47,549	114,070	43%	247
Columbus, IN MSA	270,724	69,587	30,780	41%	66
Columbus, OH MSA	254,712	72,249	725,749	38%	1,452
Corpus Christi, TX MSA	192,237	59,548	163,365	38%	405
Dallas-Fort Worth-Arlington, TX MSA	289,824	89,627	2,412,714	31%	3,676
Dalton, GA MSA	168,738	42,291	48,593	40%	122
Danville, IL MSA	130,985	39,651	32,323	54%	106
Danville, VA MSA	167,278	41,519	49,204	42%	168
Davenport-Moline-Rock Island, IA-IL MSA	220,693	64,422	158,920	38%	363
Dayton, OH MSA	291,432	84,249	333,881	24%	411
Decatur, AL MSA	179,407	45,017	61,915	50%	106
Decatur, IL MSA	225,354	69,191	52,324	37%	109
Deltona-Daytona Beach-Ormond Beach, FL	357,650	96,058	213,555	15%	214
Denver-Aurora-Broomfield, CO MSA	306,315	74,688	1,049,652	42%	1,791
Des Moines-West Des Moines, IA MSA	269,083	76,308	245,972	40%	507
Detroit-Warren-Livonia, MI MSA	294,783	91,235	1,666,009	26%	2,434
Dothan, AL MSA	238,111	58,693	53,913	34%	93
Dover, DE MSA	158,002	37,589	65,290	67%	148
Duluth, MN-WI MSA	214,426	56,782	117,200	44%	287
Durham-Chapel Hill, NC MSA	252,354	65,845	216,839	40%	353
Eau Claire, WI MSA	223,405	63,094	64,452	39%	158
El Centro, CA MSA	234,495	59,418	42,914	32%	68
El Paso, TX MSA	171,999	51,310	267,497	39%	694
Elizabethtown, KY MSA	178,046	45,538	48,608	53%	175
Elkhart-Goshen, IN MSA	218,863	57,199	70,981	44%	161
Erie, PA MSA	300,781	88,158	111,662	17%	188
Eugene-Springfield, OR MSA	286,284	73,007	147,425	28%	227

Households Priced Out of the Market by a $1,000 Price Increase, 2014

Metropolitan Statistical Area	Median New Home Price	Income Needed to Qualify	Households		
			All	Percent that Can Afford	Priced Out
Evansville, IN-KY MSA	183,817	47,332	149,798	49%	256
Fairbanks, AK MSA	228,035	61,929	33,892	47%	98
Fargo, ND-MN MSA	223,606	62,807	91,187	41%	195
Farmington, NM MSA	254,662	62,485	35,965	47%	90
Fayetteville, NC MSA	203,097	53,953	147,433	42%	393
Fayetteville-Springdale-Rogers, AR-MO MS	271,763	67,378	182,509	35%	276
Flagstaff, AZ MSA	229,039	54,724	49,607	43%	94
Flint, MI MSA	225,094	71,795	171,869	26%	342
Florence-Muscle Shoals, AL MSA	138,411	34,354	54,083	56%	175
Fond du Lac, WI MSA	244,900	71,637	41,020	38%	105
Fort Collins-Loveland, CO MSA	289,367	70,156	128,382	39%	199
Fort Smith, AR-OK MSA	190,863	48,139	124,807	39%	289
Fort Wayne, IN MSA	238,403	62,176	167,061	38%	338
Fresno, CA MSA	293,061	73,897	304,713	30%	456
Gadsden, AL MSA	170,888	43,165	36,353	43%	62
Gainesville, FL MSA	202,516	53,567	94,526	43%	184
Gainesville, GA MSA	207,524	51,934	61,424	47%	152
Glens Falls, NY MSA	269,828	77,148	51,033	30%	75
Goldsboro, NC MSA	188,687	49,767	45,559	40%	106
Grand Junction, CO MSA	258,995	60,551	56,846	43%	88
Grand Rapids-Wyoming, MI MSA	253,115	71,378	297,890	34%	641
Greeley, CO MSA	269,681	64,966	96,568	40%	189
Green Bay, WI MSA	231,028	65,732	124,309	40%	224
Greensboro-High Point, NC MSA	288,492	74,552	295,059	28%	445
Greenville, NC MSA	184,839	48,872	90,674	44%	204
Greenville-Mauldin-Easley, SC MSA	277,468	67,903	254,703	34%	380
Gulfport-Biloxi, MS MSA	162,576	44,342	108,125	48%	270
Hagerstown-Martinsburg, MD-WV MSA	206,117	51,465	106,312	55%	238
Hanford-Corcoran, CA MSA	189,803	47,603	39,541	55%	114
Harrisburg-Carlisle, PA MSA	323,166	87,531	219,380	30%	310
Harrisonburg, VA MSA	175,588	41,958	47,538	54%	122
Hartford-West Hartford-East Hartford, CT M	319,298	91,708	477,064	37%	723
Hattiesburg, MS MSA	243,791	64,017	52,169	34%	88
Hickory-Lenoir-Morganton, NC MSA	252,219	62,967	150,672	27%	276
Holland-Grand Haven, MI MSA	247,807	67,911	97,057	42%	222
Honolulu, HI MSA	393,669	87,662	307,228	40%	420
Hot Springs, AR MSA	262,134	65,875	46,326	27%	66
Houma-Bayou Cane-Thibodaux, LA MSA	271,420	69,031	72,220	35%	115
Houston-Sugar Land-Baytown, TX MSA	195,144	60,997	2,167,245	47%	4,234
Huntsville, AL MSA	165,823	40,142	171,081	62%	384
Idaho Falls, ID MSA	161,729	40,306	41,575	60%	108
Indianapolis-Carmel, IN MSA	260,699	67,557	697,114	38%	1,312
Iowa City, IA MSA	271,832	76,239	67,287	36%	132
Ithaca, NY MSA	280,564	89,282	36,575	30%	40
Jackson, MI MSA	188,708	52,506	63,934	44%	190

NATIONAL ASSOCIATION OF HOME BUILDERS
Households Priced Out of the Market by a $1,000 Price Increase, 2014

Metropolitan Statistical Area	Median New Home Price	Income Needed to Qualify	Households		
			All	Percent that Can Afford	Priced Out
Jackson, MS MSA	244,997	63,545	192,760	38%	370
Jackson, TN MSA	193,808	49,633	47,158	37%	84
Jacksonville, FL MSA	280,185	73,490	508,999	34%	856
Jacksonville, NC MSA	148,170	37,704	66,124	66%	233
Janesville, WI MSA	213,437	64,369	62,636	38%	152
Jefferson City, MO MSA	224,583	57,677	59,464	46%	126
Johnson City, TN MSA	163,973	40,268	83,177	50%	239
Johnstown, PA MSA	301,932	84,153	60,029	19%	66
Joplin, MO MSA	144,861	37,416	72,896	55%	245
Kalamazoo-Portage, MI MSA	254,025	72,309	135,068	29%	243
Kankakee-Bradley, IL MSA	191,793	58,765	41,504	35%	111
Kansas City, MO-KS MSA	292,243	80,318	814,964	33%	1,194
Kennewick-Pasco-Richland, WA MSA	328,527	85,647	92,841	32%	129
Killeen-Temple-Fort Hood, TX MSA	169,434	50,058	146,822	51%	367
Kingsport-Bristol-Bristol, TN-VA MSA	179,999	45,171	122,105	43%	323
Kingston, NY MSA	377,249	114,249	72,871	19%	74
Knoxville, TN MSA	213,424	52,723	294,901	44%	537
Kokomo, IN MSA	215,884	54,403	39,545	41%	70
La Crosse, WI-MN MSA	219,155	62,946	57,652	37%	92
Lafayette, IN MSA	231,863	58,658	80,628	39%	156
Lafayette, LA MSA	187,491	47,716	110,350	52%	217
Lake Charles, LA MSA	234,773	60,482	81,131	36%	147
Lakeland-Winter Haven, FL MSA	236,300	64,659	235,702	30%	358
Lancaster, PA MSA	269,950	74,049	196,147	35%	413
Lansing-East Lansing, MI MSA	254,683	75,840	184,760	30%	390
Laredo, TX MSA	164,186	50,884	72,117	36%	196
Las Cruces, NM MSA	231,803	57,551	71,069	34%	130
Las Vegas-Paradise, NV MSA	182,564	46,013	755,412	55%	2,044
Lebanon, PA MSA	262,028	71,597	53,811	35%	115
Lewiston, ID-WA MSA	255,924	65,790	26,662	31%	59
Lexington-Fayette, KY MSA	175,954	44,491	194,617	55%	509
Lima, OH MSA	213,974	58,512	40,561	38%	100
Lincoln, NE MSA	229,995	66,939	123,808	38%	266
Little Rock-North Little Rock-Conway, AR M	207,826	52,753	283,816	46%	636
Logan, UT-ID MSA	223,458	53,659	42,138	46%	82
Longview, TX MSA	155,971	44,591	72,341	50%	218
Longview, WA MSA	246,663	65,225	35,426	32%	77
Los Angeles-Long Beach-Santa Ana, CA M	445,105	107,294	4,292,536	22%	3,813
Louisville/Jefferson County, KY-IN MSA	229,997	59,226	533,456	44%	1,140
Lubbock, TX MSA	250,013	76,069	111,958	29%	173
Lynchburg, VA MSA	223,782	54,240	102,347	43%	196
Macon, GA MSA	198,624	52,472	84,446	39%	169
Madera-Chowchilla, CA MSA	271,959	67,513	41,538	36%	73
Madison, WI MSA	293,258	83,743	244,625	35%	381
Manchester-Nashua, NH MSA	323,009	95,042	159,493	28%	230
Mansfield, OH MSA	222,557	61,861	48,355	33%	103
McAllen-Edinburg-Mission, TX MSA	137,758	42,748	237,476	40%	656
Medford, OR MSA	272,536	69,332	74,464	26%	156
Memphis, TN-MS-AR MSA	194,193	52,811	493,575	45%	1,183

NATIONAL ASSOCIATION OF HOME BUILDERS
Households Priced Out of the Market by a $1,000 Price Increase, 2014

Metropolitan Statistical Area	Median New Home Price	Income Needed to Qualify	Households		
			All	Percent that Can Afford	Priced Out
Medford, OR MSA	272,536	69,332	74,464	26%	156
Memphis, TN-MS-AR MSA	194,193	52,811	493,575	45%	1,183
Merced, CA MSA	351,321	88,213	79,793	16%	92
Miami-Fort Lauderdale-Pompano Beach, FL	342,099	97,050	2,058,718	17%	1,953
Midland, TX MSA	240,632	69,973	51,972	45%	111
Milwaukee-Waukesha-West Allis, WI MSA	346,831	100,111	641,192	22%	943
Minneapolis-St. Paul-Bloomington, MN-WI	336,496	89,372	1,327,842	36%	2,009
Mobile, AL MSA	163,596	42,440	154,719	50%	327
Modesto, CA MSA	255,320	64,669	166,773	37%	281
Monroe, LA MSA	196,501	50,170	70,146	37%	106
Monroe, MI MSA	227,025	62,366	57,536	42%	106
Montgomery, AL MSA	199,530	48,515	150,721	49%	276
Morgantown, WV MSA	208,761	51,142	51,113	42%	107
Morristown, TN MSA	203,473	50,167	50,289	38%	100
Mount Vernon-Anacortes, WA MSA	245,286	62,316	42,494	45%	77
Muncie, IN MSA	208,458	55,525	48,842	33%	103
Muskegon-Norton Shores, MI MSA	205,803	60,633	65,952	32%	129
Myrtle Beach-North Myrtle Beach-Conway,	203,843	50,379	137,484	41%	283
Napa, CA MSA	580,197	142,369	44,979	13%	19
Naples-Marco Island, FL MSA	413,389	105,952	123,245	22%	75
Nashville-Davidson--Murfreesboro--Frankli	261,290	65,354	622,873	40%	1,096
New Haven-Milford, CT MSA	318,180	93,482	337,231	29%	514
New Orleans-Metairie-Kenner, LA MSA	248,612	65,357	476,731	36%	750
New York-Northern New Jersey-Long Islanc	407,805	113,408	7,040,717	19%	5,742
Niles-Benton Harbor, MI MSA	355,099	96,306	67,997	17%	80
North Port-Bradenton-Sarasota, FL MSA	290,155	78,160	294,796	27%	371
Ocala, FL MSA	226,250	60,413	134,869	28%	333
Ocean City, NJ MSA	448,406	118,716	39,273	18%	35
Odessa, TX MSA	216,022	62,359	48,352	41%	108
Ogden-Clearfield, UT MSA	285,382	69,601	182,900	45%	391
Oklahoma City, OK MSA	230,816	63,382	487,440	38%	935
Olympia, WA MSA	290,425	74,854	103,069	42%	207
Omaha-Council Bluffs, NE-IA MSA	219,334	65,366	356,329	44%	731
Orlando-Kissimmee-Sanford, FL MSA	323,141	85,927	805,830	23%	955
Oshkosh-Neenah, WI MSA	249,872	72,679	66,752	34%	154
Oxnard-Thousand Oaks-Ventura, CA MSA	391,706	94,599	272,711	41%	343
Palm Bay-Melbourne-Titusville, FL MSA	359,862	98,315	221,973	19%	257
Panama City-Lynn Haven-Panama City Beac	187,641	48,955	66,256	51%	123
Pascagoula, MS MSA	162,073	44,932	55,327	49%	161
Pensacola-Ferry Pass-Brent, FL MSA	171,995	45,705	187,473	53%	489
Peoria, IL MSA	279,063	83,796	154,710	26%	283
Philadelphia-Camden-Wilmington, PA-NJ-D	270,854	75,346	2,240,167	41%	3,914
Phoenix-Mesa-Glendale, AZ MSA	299,444	74,110	1,594,811	34%	2,670

NATIONAL ASSOCIATION OF HOME BUILDERS
Households Priced Out of the Market by a $1,000 Price Increase, 2014

Metropolitan Statistical Area	Median New Home Price	Income Needed to Qualify	Households		
			All	Percent that Can Afford	Priced Out
Pittsburgh, PA MSA	383,844	110,558	1,012,323	16%	934
Port St. Lucie, FL MSA	346,618	99,486	183,423	21%	199
Portland-South Portland-Biddeford, ME MS	321,500	84,074	218,046	34%	281
Portland-Vancouver-Hillsboro, OR-WA MS	324,988	83,386	873,789	33%	1,190
Poughkeepsie-Newburgh-Middletown, NY	315,346	93,615	231,194	35%	383
Prescott, AZ MSA	271,476	65,766	98,451	33%	184
Providence-New Bedford-Fall River, RI-MA	314,448	84,389	623,169	32%	805
Provo-Orem, UT MSA	289,202	68,850	149,368	41%	309
Pueblo, CO MSA	212,056	54,060	62,804	42%	182
Punta Gorda, FL MSA	255,458	72,257	79,495	25%	189
Racine, WI MSA	283,360	83,396	75,451	32%	110
Raleigh-Cary, NC MSA	239,300	60,054	477,113	51%	986
Reading, PA MSA	255,169	74,361	143,350	35%	309
Redding, CA MSA	242,398	60,089	66,329	36%	109
Reno-Sparks, NV MSA	302,827	75,485	173,013	32%	295
Richmond, VA MSA	220,984	54,604	481,937	54%	1,003
Riverside-San Bernardino-Ontario, CA MSA	294,917	74,642	1,269,021	36%	2,050
Roanoke, VA MSA	247,589	61,709	138,319	40%	310
Rochester, MN MSA	289,029	76,208	74,890	46%	139
Rochester, NY MSA	363,279	119,792	421,843	15%	418
Rockford, IL MSA	161,275	52,310	132,629	45%	402
Rocky Mount, NC MSA	197,825	52,868	52,983	38%	107
Rome, GA MSA	233,496	60,762	33,306	34%	73
Sacramento--Arden-Arcade--Roseville, CA	368,853	92,854	796,644	29%	1,004
Saginaw-Saginaw Township North, MI MSA	220,475	64,958	81,456	31%	155
Salem, OR MSA	278,962	72,881	149,861	29%	271
Salinas, CA MSA	336,843	81,481	125,003	32%	156
Salisbury, MD MSA	172,707	43,739	44,757	51%	78
Salt Lake City, UT MSA	286,243	69,358	389,439	42%	777
San Antonio-New Braunfels, TX MSA	227,539	68,643	774,537	36%	1,712
San Diego-Carlsbad-San Marcos, CA MSA	443,256	106,876	1,117,831	27%	912
San Francisco-Oakland-Fremont, CA MSA	441,837	106,571	1,665,167	39%	1,597
San Jose-Sunnyvale-Santa Clara, CA MSA	447,432	107,821	647,818	42%	729
San Luis Obispo-Paso Robles, CA MSA	419,878	100,466	103,348	29%	137
Sandusky, OH MSA	243,727	66,843	32,955	32%	68
Santa Barbara-Santa Maria-Goleta, CA MSA	427,335	101,612	143,151	28%	120
Santa Cruz-Watsonville, CA MSA	287,744	68,260	90,282	47%	151
Santa Fe, NM MSA	180,544	42,743	65,157	62%	119
Santa Rosa-Petaluma, CA MSA	325,692	79,106	191,860	43%	262
Savannah, GA MSA	205,157	53,207	139,421	44%	311
Scranton--Wilkes-Barre, PA MSA	345,255	96,513	222,523	18%	274
Seattle-Tacoma-Bellevue, WA MSA	368,710	94,273	1,397,266	38%	1,775
Sebastian-Vero Beach, FL MSA	433,676	117,492	61,928	11%	37

NATIONAL ASSOCIATION OF HOME BUILDERS
Households Priced Out of the Market by a $1,000 Price Increase, 2014

Metropolitan Statistical Area	Median New Home Price	Income Needed to Qualify	Households		
			All	Percent that Can Afford	Priced Out
Sheboygan, WI MSA	295,862	85,947	48,035	23%	79
Shreveport-Bossier City, LA MSA	199,792	51,275	151,106	48%	284
Sioux City, IA-NE-SD MSA	269,059	78,691	50,974	26%	72
Sioux Falls, SD MSA	180,932	49,784	89,630	56%	283
South Bend-Mishawaka, IN-MI MSA	275,678	72,826	119,914	27%	222
Spartanburg, SC MSA	169,499	42,354	115,152	52%	317
Spokane, WA MSA	358,134	93,874	192,335	21%	244
Springfield, IL MSA	248,178	74,317	87,129	35%	142
Springfield, MA MSA	357,528	97,210	259,426	23%	343
Springfield, MO MSA	210,300	53,752	184,137	39%	450
Springfield, OH MSA	245,947	68,424	53,722	27%	95
St. Cloud, MN MSA	238,803	62,543	71,849	44%	136
St. George, UT MSA	218,646	52,782	52,381	43%	121
St. Joseph, MO-KS MSA	212,137	55,439	50,925	39%	103
St. Louis, MO-IL MSA	263,137	72,040	1,115,669	36%	2,071
State College, PA MSA	261,048	69,018	53,699	44%	88
Stockton, CA MSA	311,589	78,983	219,842	32%	252
Sumter, SC MSA	131,871	33,549	38,919	65%	124
Syracuse, NY MSA	299,007	95,900	268,267	23%	387
Tallahassee, FL MSA	220,666	56,798	137,300	42%	279
Tampa-St. Petersburg-Clearwater, FL MSA	376,565	103,652	1,177,086	17%	842
Terre Haute, IN MSA	203,506	54,299	73,531	42%	173
Toledo, OH MSA	255,682	73,852	260,186	26%	362
Topeka, KS MSA	216,320	62,215	91,646	40%	221
Trenton-Ewing, NJ MSA	446,961	136,243	134,536	23%	88
Tucson, AZ MSA	287,021	73,702	399,026	29%	660
Tulsa, OK MSA	223,880	60,536	375,628	40%	867
Tuscaloosa, AL MSA	248,394	59,158	79,981	37%	120
Tyler, TX MSA	232,175	65,966	74,360	33%	129
Utica-Rome, NY MSA	298,972	94,627	118,949	17%	169
Valdosta, GA MSA	137,268	35,630	54,958	49%	196
Vallejo-Fairfield, CA MSA	255,570	64,307	143,461	53%	259
Vineland-Millville-Bridgeton, NJ MSA	177,370	55,125	50,779	44%	104
Virginia Beach-Norfolk-Newport News, VA-	234,587	59,056	648,268	50%	1,370
Visalia-Porterville, CA MSA	253,824	63,209	134,074	33%	272
Waco, TX MSA	201,313	60,613	87,319	33%	163
Warner Robins, GA MSA	232,089	60,349	53,293	43%	116
Waterloo-Cedar Falls, IA MSA	232,706	64,308	65,726	37%	166
Wausau, WI MSA	243,269	70,353	49,835	39%	111
Wenatchee-East Wenatchee, WA MSA	239,422	60,552	42,564	42%	94
Wichita Falls, TX MSA	223,899	70,763	64,542	30%	159
Wichita, KS MSA	226,945	64,818	245,039	41%	586
Williamsport, PA MSA	289,987	79,994	43,826	22%	70
Wilmington, NC MSA	266,712	66,865	152,944	35%	282
Winchester, VA-WV MSA	233,050	56,203	51,402	41%	62
Winston-Salem, NC MSA	189,420	48,459	201,425	46%	445
Worcester, MA MSA	296,995	79,168	307,142	40%	428
Yakima, WA MSA	276,602	72,065	75,369	26%	135
York-Hanover, PA MSA	265,832	74,801	170,288	37%	352
Youngstown-Warren-Boardman, OH-PA M	232,467	65,474	224,983	30%	405
Yuba City, CA MSA	246,352	63,666	57,492	35%	115
Yuma, AZ MSA	178,173	46,100	69,720	45%	187

NATIONAL ASSOCIATION OF HOME BUILDERS
Households Priced Out of the Market by a $1,000 Price Increase, 2014

Metropolitan Statistical Area	Median New Home Price	Income Needed to Qualify	Households		
			All	Percent that Can Afford	Priced Out
Yakima, WA MSA	276,602	72,065	75,369	26%	135
York-Hanover, PA MSA	265,832	74,801	170,288	37%	352
Youngstown-Warren-Boardman, OH-PA M	232,467	65,474	224,983	30%	405
Yuba City, CA MSA	246,352	63,666	57,492	35%	115
Yuma, AZ MSA	178,173	46,100	69,720	45%	187

CHAPTER 4

A Closer Look at Impact Fee Technical Studies

- ***Methodology***
- ***Population and Land Use Assumptions***
- ***Levels of Service***
- ***Credits***
- ***Construction and Land Costs***
- ***Offsets***
- ***Credits***
- ***Service Areas***
- ***Transportation-Related Issues***
- ***Legitimacy of Growth-Related Costs***
- ***Proportionate-Share Impact Fees***
- ***Discount Impact Fee Schedules***
- ***Commonly Found Errors***
- ***Revising State Statutes to Address Jurisdictional Overreach***
- ***Conclusion***

When local governments decide to implement impact fees, they will commonly direct either their staff or a consultant to prepare a document that, among other things, analyzes the public costs of constructing capital facilities, calculates the share that is needed to serve new development, and determines the portion of that share which will not be paid from other fees and taxes on new development. This study is called a technical memorandum, fee calculation study, public facility needs assessment, nexus report, or some such similar name (herein termed "technical study").

The technical study is important because it is needed to demonstrate that the impact fees are logically related to a need created by new development and that the amount charged is proportional to the cost of providing public facilities. The technical study is not part of the impact fee ordinance itself but it provides the necessary background and is the source for the schedule of impact fees contained in the ordinance.

In order to determine the fairness and legality of any impact fee charge, it is necessary to illustrate how the impact fees were calculated. The local government should always make the technical study available prior to a public hearing on an impact fee ordinance or at any time after adoption. In rare cases, the technical study is not available or was

never prepared. In these instances, the local government is susceptible to legal challenges on the basis that the impact fee schedule was established arbitrarily. It should be emphasized that impact fee calculation is a complex and subtle matter and even experienced impact fee consultants make errors that can potentially result in overcharges (see Chapter 2, pp. 15-18).

Some state impact fee laws specifically require a technical study and mention particular aspects of the study which must be present. *Technical studies prepared by or for local governments should always be checked against applicable state statutes in order to verify that all requirements of the applicable state statutes have been addressed.* Even in the absence of pertinent state laws, a sound impact fee technical study is essential to establish the validity of impact fees (see Chapter 2, pp. 15-18). This chapter will discuss various technical issues that should be addressed in impact fee studies and point out some common errors made in impact fee methodologies and calculations.

Methodology

The preparation of an impact fee technical study has much in common with the preparation of a fiscal impact study except that the former considers only capital costs, not operating costs. The fiscal consequences of new development must be accounted for because, unless it can be shown that the public cost of providing capital facilities for new development exceeds the amount of revenue generated by new development for capital construction purposes, then impact fees cannot be justified.

Just as there are several different approaches to fiscal impact analysis, there are several different methodologies that may be used to estimate impact fees. The different approaches can produce different results and it can be argued that some are more accurate than others. These methods are referred to by various names, but there are three essential types: the *incremental expansion approach*, the *buy-in approach*, and the *plan-based approach.* All three approaches are commonly employed in the United States.

Incremental Expansion Approach

The key operating assumption in impact fee technical studies that use the incremental expansion approach is that future development will require the same types of capital facilities at existing levels of service and current replacement costs as those capital facilities currently being utilized by existing development.

The incremental expansion approach documents the current level of service using either quantitative or qualitative measures. The incremental expansion approach examines the replacement cost of existing capital facilities within a proposed impact fee category and divides this cost by the population served to produce a figure that is the average cost per capita for a particular type of facility. It is assumed that future costs per capita will maintain existing levels of service and will approximate the current replacement

costs of providing these facilities. Figure 4.1 provides an example of how a fire impact fee may be established utilizing the incremental expansion approach.

Figure 4.1: Sample Impact Fee Calculation Utilizing the Incremental Expansion Approach

Description	Calculation	Amount
Replacement Cost of Fire Station	A	$ 2,000,000
Population Served by Existing Station	B	10,000
Average Replacement Cost per Person	(A / B) = C	$ 200
Persons per Household	D	2.2
Impact Fee per Household	**C * D = E**	**$ 440**

Assuming the cost of maintaining existing levels of service follows current patterns, the incremental expansion approach may give a reasonable approximation of the costs necessary to serve new development. This approach also requires minimal planning on the part of the local community, and is easiest to execute in a technical study.

However, the incremental expansion approach has a serious flaw. It assumes that the cost to provide facilities throughout the community is the same in any particular part of the community. But costs in a particular location depend on local conditions. Using the fire facility fee as an example, the cost of providing fire facilities for a property within the response radius of an existing station will differ substantially from the cost of providing new facilities for properties beyond the reach of existing stations. Properties that can be served by existing fire facilities will not require the expenditure of additional capital funds. The incremental expansion approach makes no distinction between properties that require additional capital spending and properties that don't.

Buy-In Approach

A variation on the incremental expansion approach has been devised which is sometimes referred to as a buy-in approach. The buy-in approach seeks to recoup from new development the cost of the excess capacity present in existing facilities which is available to serve new development. The buy-in approach utilizes the actual cost of the facility when it was constructed. Rather than dividing by the population presently served by the facility, the denominator includes present population plus projected future population of the service area which can be served by the facility in question without additional capital improvements. In this way the government recovers from new development an amount determined to be its fair share of the cost of previously constructed facilities. The rationale for the buy-in approach is that new development will pay its fair share of the remaining capacity of completed facilities.

Plan-Based Approach

The key operating assumption of the plan-based approach is that future development will follow adopted community plans, and future capital facilities needs and costs will vary based on location and types of new development.

The plan-based approach differs from the incremental expansion approach and buy-in approach as it does not rely on replacement costs or the actual costs, respectively, averaged over the entire community's population but rather the plan-based approach relies on specific planned facilities and the populations projected to be served by them. Again using fire facilities as an example, the plan-based approach would begin with the community's comprehensive plan or capital facilities plan to find how many new fire stations were planned for future populations to provide a specified level of service (e.g., minimum response time). The service area of each station would be examined to determine planned densities, land uses, and populations. The cost of providing service in each service area would be obtained from the same kind of engineering cost estimates used to prepare the capital budget (or from the capital budget itself [1]). Presumably, there would be differences in the costs from station-to-station, reflecting differences in equipment needed to address different fire risks associated with the specific mix of land uses in each station's service area. The impact fee calculation would involve dividing the capital cost for each station by the number of units served (dwellings, increments of nonresidential space) and/or projected to occupy each service area.

The technical study may use different unit types for determining impact fees depending upon the infrastructure system in question, such as gallons of demand for water systems or trips generated for roadway systems. The plan-based approach is more time consuming (therefore more expensive) but is thought to be more realistic as it examines individual service areas and their public facility requirements in detail. It should be noted, however, that this approach may drastically over or underestimate service demands for plans with long planning horizons (i.e. a 20-year plan). As such, the plan-based approach is best utilized with a three- to five-year planning horizon.

Special attention must be paid to ensuring that the capital facilities plan maintains a level of service that is consistent with the community's existing levels of service. If higher levels of service are being implemented the technical study must allocate a portion of the costs associated with the higher level of service to existing development and indicate what alternative funding sources will be used by the community (excluding impact fees) to upgrade existing facilities to meet the new proposed increased levels of service (see Level of Service section below).

If a jurisdiction is attempting to implement levels of service that are higher than their current service standards, the jurisdiction must fund the costs associated with increasing the existing level of service with funding sources other than impact fees before it can begin to levy and collect impact fees at the higher level of service. In such situations, the jurisdiction will often designate a funding source for increasing the existing level of service. *In such a situation, care should be taken in subsequent technical study reviews to verify that the jurisdiction did provide the designated funding to finance the higher levels of service.* Past experience has shown that often times the jurisdiction never provided the designated funding to increase the levels of service although they imposed impact fees based upon the higher level of service.

Hybrid or Ad-hoc Approaches

Some communities utilize a hybrid or ad-hoc methodology that combines elements of all of the impact fee approaches. The most important consideration when evaluating a hybrid or ad-hoc approach is whether the state statute is followed. Further, it is important to consider the strengths and weaknesses of the approach utilized compared to other more conventional approaches.

Population and Land Use Assumptions

Many state impact fees enabling laws require the community to specify the population and land use assumptions upon which the impact fee calculation will be based. This is important because the plan-based approach and buy-in methods rely on projections of future population and land use. However, the incremental expansion approach is not typically reliant on these assumptions. Normally, the community's comprehensive plan would be the source for these assumptions and projections. If the community has no comprehensive plan, or is out of date, a separate study may be used. Communities unwilling or unable to commission a comprehensive plan or special study sometimes ignore the issue of growth assumptions by using the incremental expansion approach.

The population and land use assumptions are worth examining in detail because the amount of the impact fee will depend on the number of persons, dwellings, and nonresidential land uses that will share responsibility for capital costs. *A common error in impact fee studies is inadequate consideration of household size trends or failure to consider and evaluate household size and trends at all.* Household size is important because a small change in the average household size can create substantial changes in overall population or in demand for housing. Many studies only consider the community's household size as reported in the most recent census and assume that future families will share the same characteristics as existing families. There is no valid reason to make this assumption. Census data show that household size has been decreasing over time for the U.S. as a whole. NAHB studies indicate that this trend is reflected in many local areas as well. The census data also show that families which have recently moved (the source of most local population growth) have a smaller household size than the national average. This trend has the following implications for impact fee calculations: fewer persons in each household means that the marginal impact of each additional dwelling unit is less; furthermore, a greater number of dwelling units will be needed to house an equivalent population, thus sharing costs over a greater number of units and reducing the per-unit impact fee amount. This is especially true given current demographic trends associated with aging baby boomers who are downsizing and/or Millennials who tend to remain single much longer than previous generations.

Land use assumptions also need to take account of demand from nonresidential land uses in order to avoid over-counting the demands and costs related to population and housing. For example, police and fire capital facilities will be sized to serve both

residential and nonresidential development, so costs should be spread over both types in proportion to the demand generated by each.

Levels of Service

Level of service is a concept for defining the quantity of public facilities that must be provided in order to adequately satisfy citizens' demands for capital facilities. For example, the number of public park acres per capita is a measure of the level of service for park facilities and the average response time is a measure of the level of fire, emergency medical, and police services. When calculating the amount of public facilities that will be required to serve new growth, one must select a specific level of service in order to quantify the required investment. For example, if the selected level of service for park facilities is 0.03 acres per capita and the projected population increase is 10,000 persons, then the required investment is 300 (10,000 x 0.03) additional acres. *Many communities assume, wrongly, that they are free to select the level of service of public facilities for new development.*

A community may not require new development to fund a higher level of service that it did not require for existing development. The only level of service that may be used to quantify the public facility requirements of new development is the level of service currently provided in the community. There is one exception, however: a community may require higher levels of service for new development if it is concurrently implementing a plan to raise the level of service for existing development and is funding the plan with revenues other than impact fees on new development.

If a community plans to increase its levels of service and has indicated in the technical study the source from which the funding will be derived to accomplish this, it is important to periodically verify that the community has in fact utilized those funding sources rather than impact fees to meet this end.

All technical memoranda should address the issue of levels of service explicitly. Many address levels of service implicitly, inappropriately, or not at all. Additionally, many state statutes require that levels of service be disclosed and to the extent that a technical study does not address the levels of service, such a technical study may not be compliant with state statutes leaving the community open to potential legal challenges.

Construction and Land Costs

Replacement costs as utilized in the incremental expansion or plan-based approaches should be based on estimates prepared by qualified state license engineers, actual bids, or data provided by a costing service such as Marshall & Swifts or RS Means. Land values should be supported by recent comparable land sales occurring within the immediate area over the last 6-month period. More times than not, replacement cost estimates lack the supporting documentation necessary to determine the reasonableness of the cost. To the extent that replacement costs are inflated, new growth will fund facility costs in excess of existing levels of service.

If the buy in approach is utilized to estimate impact fees, the actual costs of the facilities should be used as opposed to their current replacement costs. In the *Boa v. Seattle* (Washington 1965)[2] case, the court held that the "value" of facilities must be based on the historical cost rather than the inflated replacement cost of the facility, thereby rejecting a buy-in fee based on the purported replacement cost of the facilities rather than the much lower historical costs. If for whatever reason the replacement cost is utilized in the buy-in approach, allowance for depreciation should be taken to reduce the costs to more closely align with historic costs.

Offsets

Certain state enabling acts, such as Utah and Arizona, require impact fees to be reduced based upon future cash flows generated from new development, including but not limited to: property taxes, construction sales taxes, gas taxes, state shared revenue and other revenue sources that will be utilized to pay for capital facilities (offsets). *The impact fee amount is established to cover the cost of capital facilities less these other revenue collections.*

An equitable impact fee methodology will take offsets into account when estimating impact fee amounts. Technical studies that include offsets recognize that new development provides financial contributions other than impact fees to fund capital facilities. In essence, offsets protect home builders and homebuyers from double-paying for the same capital facilities. Potential offsets include:

- Grants;
- Gasoline taxes;
- Sales taxes;
- User fees;
- Bond repayments (i.e. through property taxes);
- Property taxes dedicated to fund capital facilities;
- Transfer taxes; and,
- State shared revenues.

Credits

An impact fee payer is entitled to a reduction in the amount of the impact fee (a credit) to compensate for contributions he or she has made or will make toward the cost of capital facilities. It is essential that the technical study and/or impact fee ordinance provide developers and builders with a mechanism to receive credits if they are due. *Many technical studies ignore the methodologies of how impact fee credits are to be calculated thus leading to inconsistent impact fee credit calculations.*

There are three key types of credits:

1) *In-Lieu of Impact Fee Credits:* credits provided to developers or home builders in exchange for the construction and/or dedication of infrastructure items that would otherwise be funded through impact fees. For example, a developer should receive credit equal to the cost of constructing and dedicating a sewer treatment plant if a portion of the local community's sewer impact fee is normally utilized to pay for sewer treatment facilities.

2) *Excess Capacity Impact Fee Credits:* credits for dedication of public facilities that provide excess capacity beyond what is required by a particular project that would otherwise by funded by impact fees. For example, a local community may request that a developer build and dedicate a new sewer treatment plant with enough capacity to serve the project in question but also other neighboring projects that will be completed in the future. In this case, the developer is not only given impact fee credits for the developer's immediate project; the developer is also given impact fee credits for the costs of the excess capacity. These excess capacity impact fee credits are the personal property of the developer and may be applied to the developer's future projects or sold to other developers with development projects located within the service area.

3) *Land Use Credits:* credit for a change in land use that results in less impact than the previous land use. Credits are generally addressed in the impact fee ordinance itself. For example, when a large portion of the community's general plan is amended from residential to industrial uses, adjustments to the impact fee ordinance are required.

Consideration should also be given to the interaction between impact fee credits and alternative infrastructure financing tools such as special taxing districts. Special taxing districts in most cases are separate political subdivisions established for the purpose of issuing tax exempt bonds to fund public infrastructure. Special taxing districts vary from state-to-state and are called: Community Facilities Districts (California, Hawaii and Arizona), Municipal Utility Districts (Texas), Community Development Districts (Florida), Public Improvement Districts (Texas, New Mexico) and Special Improvement Districts and General Improvements Districts (Nevada). (See Chapter 6 for more information on this topic). Because special taxing districts are used to finance public infrastructure, to the extent that a special taxing district is financing capital improvements that would otherwise be funded through impact fees, impact fee credits must be given for the cost of the capital improvements funded through the special taxing district.

As a side note, the use of special taxing districts by developers and communities is a very effective way of having growth pay for growth. The use of special taxing districts may dramatically reduce the amount of impact fees required by a community. For more information on the use of special taxing districts as an alternative to impact fees see Chapter 6. Additionally, the NAHB has published a handbook specifically dedicated to

special purpose taxing districts entitled, An Overview of Special Purpose Taxing Districts. The publication may be found on the NAHB website at http://www.nahb.org/en/research/nahb-priorities/land-development/special-purpose-taxing-districts.aspx.

If an ordinance/technical study does not adequately address the issue of impact fee credits, developers and/or home builders may wish to include impact fee credit provisions in their development agreement(s) with the applicable community documenting the understanding of the parties in relation to how impact fee credits will be calculated and administered.

Service Areas

Generally defined, a service area is a geographic area that is served by a public facility. For example, the service area of a neighborhood park is the residential community near the park where the users of the park live. Service areas are generally defined by proximity and accessibility (i.e., areas within the service area are closer to the facility and/or have easier access to the facility than areas outside the service area). The concept of service area does not mean that the facility is reserved exclusively for service area residents or that the facility never provides services to those outside the service area. It means, rather, that the facility was designed and intended primarily to serve a given area.

From the standpoint of fairness and equity, the use of service areas are preferred if a community is implementing or updating an impact fee program. *Service areas allow impact fees to be more closely linked to the actual cost of providing capital facilities in a given service area.*

Service areas are important for a number of reasons. The capacity of existing public facilities is usually inconsistent across a community. Some service areas will have capacity to serve additional development, others will not. Land use, density, topography, and access will vary from one service area to another and this will cause the expense of providing needed capital facilities for new development to vary from one area to another.

Because many states require that impact fees be roughly proportional to capital costs imposed by development, each service area should be examined to determine the capital cost implications of development in that specific area. The capital cost calculations should also take into account the existing levels of service provided in individual service areas. In the administration of the impact fee ordinance, it will be easier to show that impact fees collected from a property are spent to benefit that property if impact fees collected in a service area are placed in an account dedicated exclusively to spending for capital facilities in that service area.

Many communities designate the entire community as a single service area on the theory that individual capital facilities are part of a system, such as the park system, road system, or school system. According to this view, impact fees collected in one area

may be spent on any other part of the system because improvements anywhere in the system benefit the entire system. Communities prefer this method as it also provides them with greater flexibility in spending impact fees. Also, fewer service areas reduce the administrative burden of tracking impact fee revenue and expenditures.

There are several problems caused by communities using just one service area. In general, the benefits of a public facility diminish with distance from it. Therefore, if impact fees collected in one local area are spent to construct a facility in a different area, the area where the fees were paid will not be the principal beneficiary of that capital spending. For example, it is difficult to see the rational nexus between park impact fees collected on the west side of town and a new neighborhood park constructed with those fees on the east side of town. *Courts and State legislatures in some states have determined that new development, though it need not be the sole beneficiary of impact fee spending, must benefit more than other property from spending of the impact fees it has paid.* Unless impact fees are accounted for and spent within the local service area where they are collected, it is difficult to demonstrate the legally required rational nexus (see Chapter 2, pp. 15-16).

If a "systems approach" to impact fee spending is taken, then a new method of impact fee calculation is required. Since new facilities constructed with impact fee revenues are assumed to improve the "system" for the benefit of all system users, impact fee calculations must account for the fact that the majority of system users are existing residents. In other words, new development must not be asked to pay more than its pro rata fair share for system improvements. Given that in any year the amount of new development is a small fraction of the amount of existing development, new development therefore must pay only a fraction of the cost of new capital facilities.

Transportation-Related Issues

There are a number of technical issues related to the calculation of traffic or road impact fees that do not apply to other types of impact fees. These have to do with peak versus average daily traffic volumes, trip diversion, trip substitution, and sources of trip generation data.

Peak Traffic versus Average Daily Traffic

Different land uses generate traffic at different rates. Road impact fee formulas should take this into account by making use of local trip generation studies or data from national sources such as the Institute of Transportation Engineers (ITE). The results of trip generation studies are reported as the number of trip ends generated by an increment of land use (dwelling unit, 1,000 square feet of retail space, number of hospital beds, etc.) expressed as the average number of trips in a 24-hour period and/or the average number of trips during the peak hour(s). Some communities base impact fee calculations on average daily traffic (ADT) and others on peak hour trips. For example, a number of Florida cities and counties use ADT, whereas a number of California and Illinois communities use peak hour traffic as the basis for calculations.

Whether ADT or peak hour traffic should be the basis for road impact fee calculations can be debated. A case can be made, however, that not every trip generated by new development creates a need for additional roadway capacity. Trips added to adjacent roads during off-peak hours in most cases will not add significantly to congestion on those roads. For example, a nightclub that opens at 9:00 p.m. and closes at 2:00 a.m. will add trips to the adjacent roads at a time when roads have more than enough available capacity to absorb these trips. It would be difficult to justify road impact fees for this nightclub use because it does not create a need for additional lane capacity. Road impact fees are justified, however, when trips are added during times when the road is already operating at or near capacity (i.e., peak hours) such that the level of service will be decreased unless additional capacity is added. Most land uses generate traffic throughout the day, but it is the traffic they generate during peak hours, when adjacent roads are least able to accommodate additional trips, that is critical to determining the demand for additional road capacity created by new development for which an impact fee will be charged. Trips generated during off-peak hours, when capacity is ample, have little impact, create no need for additional capital improvements, and should not enter the calculation of road impact fees.

It should be noted that the concepts related to peak versus average daily demand also apply to water and wastewater impact fees.

Trip Diversions

A common but not universal practice is to apply a trip diversion factor in the calculation of road impact fees. This factor accounts for the fact that some trips to a land use are not separate, single-purpose trips but, instead, are diverted from the stream of traffic passing by. For example, the trip diversion factor for a convenience store is high because visits to the store frequently occur while the driver is pursuing another trip purpose, such as returning from work. If the work trip and the store trip were counted separately, over counting would occur. The diversion factor for doctors' offices is low because such trips are usually planned in advance rather than impulsively combined with another trip purpose. The diversion factor is applied as a percentage by which the trips generated by a land use are reduced.

Trip Substitution

Not all trips generated by new development are net new trips. Some trips to a new land use replace existing trips. For example, when a neighborhood convenience store opens, some longer trips to a highway shopping center are replaced by shorter trips to the convenience store. The net result is actually a lower impact on the road system because the new trips are shorter. In general, when new retail uses are added to a saturated market, there is not a proportionate increase in shopping trips. Instead, trip destinations shift from one area to another.

Because of trip diversion and trip substitution effects, at least one locality, Los Angeles, exempts certain land uses from road impact fees. The exempt land uses are generators of local short-distance trips including car washes, gasoline stations, automotive repair shops, walk-in or drive-through banks, convenience stores, free-standing supermarkets, storage facilities, convalescent hospitals, and restaurants. These land uses are not thought to substantially affect the region's transportation infrastructure.[3]

Sources of Trip Generation Data

The best data source for trip generation is a properly conducted study carried out in the community that imposes the impact fees. Such studies can be expensive, so many communities use data derived from studies in other communities such as the Institute of Transportation Engineers (ITE) manual, *Trip Generation.* Use of data from the ITE manual is legitimate, provided the limitations of the data are well understood. The ITE manual compiles trip generation data on a wide variety of different land uses based on local studies conducted throughout the United States. For some land uses, the data is derived from a large number of studies covering a broad range of the independent variables (e.g., number of employees, leasable area, etc.). More confidence can be placed in this data than in the data for other land uses which may be derived from only two or three local studies. Indeed *Trip Generation* contains caveats and warnings about data limitations. While the ITE is certainly a reputable organization, it would be a mistake to uncritically accept their published data. Impact fee payers would be well advised to carefully consider the source and reliability of the trip generation rates on which impact fee schedules are based. In some cases, the commissioning of an independent fee calculation study may result in considerable impact fee savings.

Legitimacy of Growth-Related Costs

An essential part of impact fee calculations is the determination of the cost of capital facilities that new development will require. In an ideal world, the capital facility needs of new growth are set out in a well-considered and duly-approved long-range comprehensive plan. Every year the five-year capital improvement plan that identifies the cost and source of funds for capital projects is updated and adopted. In the real world, however, impact fee ordinances are frequently adopted in the absence of either comprehensive planning or capital improvement planning. In these cases, capital facility cost data may be found in the appendices of impact fee technical memoranda, in separate engineering cost estimates, in consultant reports, or elsewhere. *Like every other aspect of impact fee calculation, cost data should be examined critically.*

Each item that is proposed to be funded with impact fees should be examined to determine if it meets the definition of capital costs for which impact fees may be charged. If state statutes apply, there will be a specific description of legitimate capital costs in the law. The local ordinance itself should contain a definition of "capital cost" or "capital facility." For example, the definition may include buildings, but not furniture, books, computers, or nondurable items with a useful life of three years or less. Generally, some "soft costs" such as legal and engineering costs may be permitted, but

these may be limited.[4] Other noncapital costs such as "contingencies," "administrative costs," and "interest" are questionable. Operating costs, maintenance, repairs, salaries, and other recurring costs should not be included.

Next, it should be determined if the facilities are intended to serve new development, if they will correct an existing deficiency, or if they will principally benefit existing development. A simple test is to assume that there will be no new growth and determine if the facility will still be needed. If the facility is still needed, then it is obviously intended to benefit existing residents and may not be funded with impact fees paid by new development. The capital improvement plan or other documents may provide details that indicate who the principal beneficiaries will be. For example, the budget documents may state that the purpose is to correct a deficiency, or they may indicate that the facility will be located in a developed part of the community, or that it improves or replaces an existing facility. In cases where the principal beneficiary of the facility is existing development, its cost should not be included in impact fee calculations.

Having determined that a capital facility is a type that qualifies for impact fee funding under state and local law and that the principal beneficiary will be new development, the next question concerns whether the amount of spending proposed is commensurate with needs and conforms to existing levels of service in the community. For example, if existing neighborhood parks are less than 10 acres in size, a proposal for a new 35-acre neighborhood park should be questioned. Likewise, a proposal to purchase a ladder truck for a fire station that serves low-density residential land use should raise a red flag.

Unlike general obligation bond issues, which must be approved by taxpayers at referendum, the political threshold for impact fee spending is very low. As a result, there is not as much pressure on the community to contain costs. Under this relaxed spending discipline, municipal departments have a tendency to "gold-plate" their capital requests. This danger is magnified when there is no comprehensive planning or capital budgeting process that requires department managers to justify their capital requests to the legislative body in a public hearing.

Proportionate-Share Impact Fees

At times a jurisdiction may use proportionate-share impact fees. The rationale behind proportionate-share impact fees is that impact fees for new residential units are “proportionate” to unit size. The idea being that larger units have more people with higher incomes who generate greater impacts on public facilities. Accordingly, larger units should pay higher impact fees than smaller units. However, the argument for impact fees graduated by unit size is not convincing and in fact is counterproductive to housing affordability.[5] The more straightforward and cost-effective way to promote affordable housing is to charge one flat impact fee for all housing units and to apply waivers selectively for affordable housing units.

Practitioners who believe impact fees should vary by unit size attempt to calculate impact fees precisely. But impact fees, as opposed to taxes, tend to be regressive. Methodologies designed to establish progressive impact fee structures may undermine their legitimacy as fees; such calculations are not legally mandated. The courts have rarely commented on methodology unless the resulting fee differences were extreme.

In fact, Dolan simply requires "rough proportionality" in setting impact fees that reflect the public facility costs of new residential development. Rough proportionality can be satisfied with the calculation of one impact fee for all residential units. This position is supported by the finding that the difference in persons per household is less than one person in comparing units of less than 1,000 square feet with units of up to 3,000 square feet.[5] Local jurisdictions that develop more complicated methods in an attempt to calculate proportionate-share impact fees will find the resulting fee schedules more difficult to defend and more costly to calculate, and more time consuming to administer, as well as exceeding the "rough proportionality" requirements of Dolan.

If proportionate-share impact fees are used, they should employ the most relevant demand generator to estimate facility impacts, but population (including school-aged children) is the best indicator only in limited applications. Furthermore, the drivers of demand used in public facility planning and capital improvements programming should correspond to the demand generators employed in impact fee calculations. Since impact fees based on unit size reflect needs generated by population (or number of children) but are calculated on the basis of housing characteristics, local jurisdictions would have to reconcile these relationships.

When graduated impact fees for residential units are considered instead of one flat impact fee, one should verify that the best unit characteristic is being utilized. The choices are typically unit type, unit size, or number of bedrooms. Of these factors, unit type is by far the most widely used. Data on single family, multifamily/apartments, and other unit types are publicly available for most local jurisdictions, and practitioners usually can generate defensible impact fees that are specific to housing unit type. Practitioners who prefer unit size to type are more likely to use data on number of bedrooms, because these data are more readily available and accessible than data on unit size. If unit size data is also available, practitioners should select the factor that predicts occupancy most consistently.

One often hears the argument that one level impact fee is inferior to impact fees graduated by unit size. Static impact fees are assumed to be regressive, whereas impact fees graduated by unit size are progressive. Thus, graduated fees are assumed to mitigate the negative impacts of impact fees on affordable housing. This argument ignores four advantages of level impact fees, the most important of

which is that they are inherently progressive. As such, when making a case against proportionate-share impact fees one may want to employ the following arguments.

Household Size – Homes in any size/cost range that pay the same impact fees are occupied by households of different sizes. Smaller households would tend to be more affluent than larger households purchasing houses in the same size cohort. Thus, with the same impact fee charged for these housing units, higher-income households with fewer occupants would overpay whereas lower-income households with more occupants would underpay relative to facility impacts.

Housing Affordability - Although the claim is made that graduated impact fees improve housing affordability, this approach is very crude. Affluent households that opt to purchase smaller units would receive the same benefit as lower-income households occupying units in the same size range.

Impact Fee Sensitivity - Static or flat impact fees are less sensitive to the vagaries of the market than variable fees. Revenues from graduated fees will be more difficult to predict than revenues from flat fees.

Ease of Calculation - Static impact fees require less detailed calculations of revenue credits than graduated impact fees. When unit size is the attribute used to estimate proportionate demand for graduated impact fees, practitioners are obligated to calculate multiple revenue credit streams that relate unit size to revenue generation. With variable fees, ad valorem-based revenue credits must correspond to residential segments of the tax base that pay the taxes. Similarly, sales tax-related credits must be proportionate to taxable spending driven primarily by household income.

Even if there was a flawless logic to justify impact fee calculations based on unit size, the feasibility of the approach has to be evaluated in every case. We have assessed the tasks and questions local practitioners would need to resolve to impose defensible impact fees based on unit size. We found that the amount of data need to do such a calculation properly is voluminous and will be more expensive to implement than a static impact fee calculation.

Additionally, when reviewing proportionate-share impact fee technical studies, one must keep in mind Dolan's rough proportionality test and not ignore the proportionate treatment of revenue credits to ensure that fundamentals of cost accounting as well as the logic of fiscal impact analysis are taken into account. When impact fees are used to raise revenues needed for public facilities, flat residential impact fees can minimize the potentially negative influences on housing affordability. Compared with impact fees graduated by unit size, flat fees are straightforward to estimate, easy to administer, and actually more progressive when revenue credits are taken into account.

For more detailed information related to proportionate-share impact fees see the NAHB's publication Proportionate-Share Impact Fees on the NAHB's website at www.nahb.org.

Discounted Impact Fee Schedules

After calculating the impact fee amount according to a formula that will vary for each type of impact fee, many communities discount this nominal fee amount by a certain percentage. The nominal impact fee amount represents the highest amount that can be legally charged. There are technical, administrative, and political reasons for discounting this fee amount. Impact fee calculation is a complex technical exercise that often requires expert judgment. As a result, technical and judgmental errors are common. To protect a community from liability in the event of a legal challenge to its ordinance, the fee amounts are sometimes discounted to account for the possibility of overcharges due to technical errors. Impact fee ordinances are easier to administer if fee payers accept a simple flat fee rather than insisting on their right to individual fee determinations. Fee schedules will therefore be discounted as an incentive to avoid time-consuming individual fee calculations. For political reasons, such as keeping fees in line with those charged by other communities, a community may decide to charge less than the calculated fee.

Commonly Found Errors

Figure 4.2 on the following page illustrates some of the most common errors found in technical studies relating to the calculation of impact fees.

Figure 4.2: Common Errors with Impact Fee Technical Studies

	Error	Explanation	Example
1	**Construction Cost Estimate and Adopted Capital Improvements Plan Inconsistencies**	Cost estimates utilized in the technical study do not agree to the costs identified in the community budget, capital improvement plan or recently completed projects. In order to verify the reasonableness of costs utilized in the technical study, such costs should be compared to costs from the community budget, capital improvement plan or recently completed projects.	In one community, there was a discrepancy of 24% between school construction costs identified in the technical study and costs identified in the capital improvement plan.
2	**Current Levels of Service Not Properly Documented and/or Applied**	Some communities fail to assess the current levels of service enjoyed by existing residents and do not use the current levels of service as a standard to which new development must be held. As a result, development fee studies may tend to require new development to pay for and operate at higher levels of service than existing residents.	A recent review of impact fees in a community in Virginia revealed that new development was being required to provide a higher level of service for parks than was currently being enjoyed by existing residents. The level of service established as the guideline from which to calculate the park impact fees was 13.8 acres of park land for every 1,000 residents of the county. In reality, the current level of service for park land for the county was found to be 8.8 acres of parkland for every 1,000 county residents.
3	**Funding Offsets Ignored or Improperly Applied**	Technical studies may ignore additional funding sources attributable to new development. Additional funding sources that would offset impact fees must be considered and may include: i) gasoline taxes; ii)sales taxes; iii) user fees; iv) bond repayments (i.e. through property taxes); v) property taxes dedicated to fund capital facilities; and vi) transfer taxes.	A community in Oregon applied a credit for future debt payments that was discounted to arrive at the offset utilized to reduce the fees. The community chose to discount future debt repayments, however, did not discount the cost of infrastructure to be installed in the future. Discounting the future debt repayments and not discounting the infrastructure costs resulted in a decrease in the offsets being applied and consequently an inaccurate increase in the system development charge (impact fee).
4	**Inflated Land and Building Cost Estimates**	Cost estimates for buildings and land utilized in technical studies often do not correspond with construction or land cost indices. Communities may inflate construction and land costs by using cost estimates derived during periods of dramatic growth and increased demand for construction materials and land.	During the boom, Arizona experienced a period of dramatic growth and escalation in land prices. A comparison of land costs in technical studies adopted by an Arizona community revealed an unrealistic increase in the land cost per acre from $76,800 to $370,424 in a four year period and the technical study provided no support for the increase.

	Error	Explanation	Example
5	**Math Errors**	Technical studies often include numerous math errors which affect the final assessed impact fee amount.	One community in Arizona inadvertently doubled the construction cost of a roadway improvement from $25 million to $50 million, resulting in a substantial increase in the impact fees required by the community.
6	**Correcting Existing Deficiencies**	Impact fees must only be established to finance the public infrastructure required to service new development, not to repair or improve the public facilities that provide service to existing residents.	A review of a technical study in one community found that $108 million in sidewalk improvements were to be financed with impact fees in developed areas of the community to make the city compliant with the American with Disabilities Act. This was a clear violation of using impact fees to correct existing deficiencies.
7	**Impact Fee Alternatives Not Considered**	Community officials may be unaware of alternatives that exist to finance public infrastructure. Special taxing districts represent one alternative to the use of impact fees and allow growth to pay for growth. In some states, special taxing districts may be allowed to finance a broader array of eligible infrastructure than the eligible infrastructure that can be financed through development impact fees.	A California community formed a special taxing district, known as a community facilities district (CFD), in response to a public safety funding crisis resulting from rapid growth in residential construction and lagging retail sales. It was determined there would be revenue shortfall in providing police and fire services to accommodate the community's need for the services. Through the use of a CFD, the community was able to ensure the necessary services were provided to its residents while at the same time allowing growth to pay for growth.
8	**State Statute Compliance**	Oftentimes, communities fail to fully conform to the guidelines stipulated in the state enabling impact fee statutes. A review of the requirements of the state statute is important to ensure that they are being met.	An impact fee review for a Montana community found that of the approximately 23 items required by the state statute to be addressed in a technical study, the community failed to fully comply with 6 items.

	Error	Explanation	Example
9	**Misappropriation of Impact Fees**	Impact fees are collected for specific public infrastructure items (e.g. water resources, water transmission lines) and the impact fees can only be spent on the facilities for which the impact fee are collected. Audits of impact fee accounts indicate that jurisdictions often comingle funds and do not spend the impact fees on the infrastructure for which they were collected.	A 2016 audit of a community's impact fee accounts revealed that while the City's impact fee study indicated that the City was supposed to be utilizing 49% of its sewer impact fee collections for water reclamation facilities and 51% for sewer collection lines; the City had expended 91% of its sewer impact fee collections for the water reclamation facilities and only 9% for the collection system.

Revising State Statutes to Address Jurisdictional Overreach

Background

Reviewing impact fee technical studies leads to many questions and concerns related to the assumptions utilized in the technical study. In practice, it is common to meet with the jurisdiction's staff to discuss and hopefully resolve concerns related to the technical study. Often, however, it is not unusual for a jurisdiction to ignore the home building industry's concerns related to a technical study, especially if the changes result in a decrease of impact fees. In such a situation, the builders and/or the local home building association either need to let the issue go unresolved, litigate the issue, or alternatively, revise the state's impact fee enabling legislation.

For example, after years of conflict with Arizona municipalities in relation to the calculation of impact fees, in May 2011, the home builders of Arizona, working through their respective home builders associations (collectively, the HBA), were successful in passing Senate Bill 1525 (SB1525) that made sweeping changes to the way Arizona municipalities must calculate and collect impact fees.

SB1525 was an outgrowth of the HBA attempting to work with Arizona jurisdictions over a number of years to modify their aggressive tactics when estimating impact fees. Some of the challenges that the HBA found when reviewing the jurisdictional impact fee technical studies encompassed all of the challenges outlined in Figure 4.2. More specifically, the HBA was concerned with:

1. Growth paying for non-growth related public improvements (e.g. performing arts centers, town lakes)
2. Construction cost estimates provided by unqualified municipal staff (e.g. a fire chief preparing cost estimates for a fire station).
3. The non-use of service areas to determine levels of service and to estimate infrastructure costs and the impact fees necessary to provide services to new growth at existing service levels.
4. Funding levels of service that are in excess of existing service levels.
5. Challenges with the proportionality of the impact fees versus benefits received.
6. Lack of transparency in the impact fee process.

Key provisions of SB1525

To address the aforementioned challenges with jurisdictional technical studies, SB1525 included the following key provisions:

1. Provided jurisdictions with the ability to continue to collect current impact fee schedules to pay debt service on existing bonds for public improvements either constructed or underway, even if the impact fee would no longer be allowed after the effective date of the Bill, which was January 1, 2012.

2. Introduced the phrase "necessary public services." This is a new definition that narrowed the use of impact fees to address home builder concerns about the improper use of impact fees for general government purposes and certain public facilities, such as public parks over 30 acres or libraries over 10,000 square feet.

3. Limited impact fees to the proportional share of the cost of new infrastructure that is attributable to new development only, and prohibited increasing the level of service that is provided to existing residents.

4. Clarified that offsets against impact fees need only be provided for taxes that are applied to capital costs of infrastructure.

5. Made clear that credits against impact fees are only due when a developer pays for, or is required to provide, infrastructure in an infrastructure-improvements plan (IIP) for which impact fees were assessed.

6. Created new public notice and hearing procedures for assessing, adopting, and amending development fees. Existing fee studies and plans were to be replaced using the new system outlined under SB1525 no later than August 1, 2014, or the municipality would be prohibited from collecting impact fees.

7. Required IIPs to: (i) identify all capital projects that are the subject of impact fees; (ii) disclose existing facilities; (iii) disclose costs to existing facilities not associated with new development; (iv) identify offsets to public infrastructure costs financed by impact fees; and, (v) require construction costs estimates be prepared by Arizona state licensed professionals.

8. Mandated a refund to current property owners of certain impact fees if the infrastructure that is the subject of a impact fee is not built within 10 years or the time identified in the IIP, or 15 years for water and wastewater projects.

9. Required creation of either an advisory committee to provide input on adoption and administration of impact fees or a biennial audit of a municipality's impact fee program.

For more details on SB1525 and to find the complete version of Arizona’s impact fee statute, refer to Appendix D.

Other states with favorable impact fee statutes include Montana and Texas. Montana’s impact fee statute is fairly succinct yet it requires jurisdictions to adhere to common impact fee practices that lead to fair and equitable impact fees. Texas’ statute, while more in depth that Montana’s is fairly comprehensive in its scope. Both the Montana and Texas statutes have been included as part of Appendix D.

Conclusion

Local governments are attracted to impact fees because of their potential to generate revenue at a lower political cost than some other measures such as jurisdictional general obligation bond elections. There is a cost to be paid, however, which is related to the greater complexity and difficulty of setting a truly fair and legal impact fee amount. Unlike taxes which may be set at arbitrary levels, impact fees must be proportional to the actual cost of providing capital facilities. Making these calculations, as the above discussion points out, is neither simple nor straightforward. It is also easy to make mistakes. As a result, the community imposing the fee pays a price in the form of higher administrative costs, consultant fees, and legal fees when the methodology is challenged.

Endnotes

1. For this reason, some state impact fee laws require that the community adopt a capital budget before implementing impact fee legislation.
2. Boe v. Seattle, 66 Wa.2d 152 (Wash. 1965)
3. As reported in *Waukesha County Impact Fee Study* by Barton-Aschman Associates, Inc., Vandewalle & Associates, Whyte Hirschboeck Dudek S.C., Siemon, Larsen & Marsh.
4. The Wisconsin law limits such costs to 10 percent.
5. Emil Malizia and Lucy Gallo, *Proportionate-Share Impact Fees*, (National Association of Home Builders, October 2009)

CHAPTER 5

Administrative Issues

- ***Definition of Capital Costs***
- ***The Use of Impact Fees to Pay Interest Costs***
- ***The Comprehensive Plan and Capital Improvement Plan***
- ***Independent Fee Calculation Study***
- ***When Fees Are Due***
- ***Accounting***
- ***Refunds***
- ***Advisory Panels***
- ***Appeals***
- ***Credits and Reimbursements***
- ***Exemptions***
- ***Grandfathering***
- ***Conclusion***

The local impact fee ordinance is the legal document that establishes a community or county's impact fee program. It should also establish the administrative procedures by which the program will be implemented and cover such issues as when impact fees are paid, how they will be accounted for and spent, independent fee calculation procedures, refunds of fees collected but not spent, administrative appeals, etc. Together with technically correct impact fee calculations, proper administration of the impact fee program is necessary to establish the constitutionality and legality of the impact fee program.

In states where the legislature has enacted impact fee enabling laws, local impact fee ordinances must comply with specific administrative requirements. Whether there are state enabling statutes or not, court decisions may establish requirements that local ordinances must address and adhere to. This chapter will cover administrative aspects of impact fee programs with emphasis on areas where many local ordinances could be improved. Unlike taxes and other revenue sources, local governments do not have as much discretion in the handling of impact fee revenues. Particular care and attention are required in the administration of impact fees to assure fairness and legal sufficiency.

Definition of Capital Costs

The local ordinance should contain a precise definition of the kinds of capital costs that qualify for impact fee funding. If state impact fee laws apply, the local ordinance may

be more restrictive but may not include a broader range of cost items than the state law permits. Generally acceptable cost items include land, buildings, durable equipment and machinery, grading, paving, landscaping, and associated engineering costs. Items that would generally not be considered as capital costs include recurring expenses such as those for consumable supplies, salaries, training, maintenance, repairs, administrative costs, program operating costs, nondurable equipment (less than three years useful life), and the like.

?

Are the allowed uses of impact fees defined in the state enabling statute?

Some items of moderate durability such as vehicles, books, computers, and furniture are questionable as capital expenses. The problem with these items is that they are not fixed in location and are hard to track. For example, computers purchased with impact fee funds and placed in a school serving new development one year may end up in a different school the next year. The portability of these items makes it difficult to assure, or even sometimes to tell, that impact fees are being used to benefit the development that paid the fees.

The Use of Impact Fees to Pay Interest Costs

The use of impact fees to pay the interest portion of debt service for capital facilities is controversial. Unlike taxpayers who pay for capital facilities on the installment plan through bond financing, the impact fee payer pays for his share of needed infrastructure all at once in a lump sum. Many times this payment is made years before the facilities are provided, particularly because the impact fee payer has no control over when facilities are constructed. The impact fee payer starts off with a capital facility principal account balance of zero. In these cases, the impact fee payer is in essence double paying for the infrastructure—first through impact fees, and again through other taxes, i.e. property taxes, which are used to retire debt on the same infrastructure. It is difficult to understand, therefore, how interest on debt can be justified as a capital cost for which impact fees may be expended when the fee payer has paid his share of the principal in full before receiving a building permit. In those situations where a local government has issued ad valorem debt to fund the construction of capital improvements, it is necessary to review the impact fee calculation to determine that a reduction in the impact fee has been made for interest on debt service to avoid the potential of double charging.

The Comprehensive Plan and Capital Improvement Plan

?

Has a comp plan or capital improvement plan been prepared?

In examining an impact fee ordinance, a fundamental question arises as to the source of the assessment of public facility needs which is the basis for the impact fees. The public facility needs assessment should not be a "wish list." The capital facility requirements should be based on a thorough analysis of future growth and appropriate levels of service for each type of facility that establishes a clear and logical connection (rational nexus) between anticipated growth and the type and amount of capital spending that growth will require. It should be emphasized that demonstration of a rational nexus is not merely desirable but is essential to establishing the legality of the ordinance. In some states a report providing the rational nexus is also a statutory requirement (see Chapter 2, pp. 15-18).

The comprehensive plan is the benchmark by which nexus is measured. This plan should include population and land use projections, establish appropriate levels of service for public facilities, examine existing service levels and deficiencies, and identify the capital facilities that will be needed because of new growth.

The capital improvement plan (CIP) or capital budget will attach a cost to the facilities identified in the comprehensive plan and match the facility to an appropriate funding source. The CIP usually covers a five-year period and is updated and approved every year. Other documents may be relied on to provide a public facility needs assessment, but the comprehensive plan and CIP have the advantage and added weight of being officially adopted by the legislative body after a public hearing process.

Some communities have no comprehensive plan (or none that is up-to-date), CIP, or formal capital budgeting process. This has not deterred them from imposing impact fees. Such communities run the risk of having their ordinances overturned because they are not able to document that the fees they charge are rationally related and proportional to the capital costs occasioned by new development.

The impact fee study, capital improvement program, and comprehensive plan must account for differences between the levels-of-service currently provided to existing residents and the levels-of-service proposed for facilities to be financed with impact fees. If current levels-of-service are deemed deficient, then funding sources (other than impact fees) to correct these deficiencies must be identified and detailed to prevent new development from bearing the financial burden of improving service levels for the benefit of existing residents. Annual monitoring is crucial to assure that upgraded levels-of-service enjoyed by existing residents is not financed by impact fee payers, but by other means that assign costs to those who benefit from the improvements.

Independent Fee Calculation Study

?

Does the impact fee ordinance specify how the independent fee study must be conducted?

The impact fee ordinance should outline the process for developers and builders to obtain variances that would reduce or eliminate their need to pay impact fees so as to allow flexibility in cases involving special circumstances. A community should also offer a variance process when the applicant believes that the schedule of fees in the ordinance does not reflect the actual monetary impact of a particular project (many already do this). This is usually accomplished through an independent fee calculation study. Under these procedures the applicant commissions and pays for a study which may entitle the applicant to a reduction in impact fees if it convincingly shows that the project will require less public capital expense than assumed in the impact fee study. For example, a road impact fee may be based on trip generation figures from the Institute of Traffic Engineer (ITE) Trip Generation Handbook. An applicant for a convenience store may question the ITE trip rates for this use because they are based on only a few studies and the range of rates varies widely. An independent study of trip generation specifically targeting the

particular market in question may find lower trip generation rates and justify reduced impact fees.

Some ordinances specify exactly how an independent fee study must be conducted and some even require that the government hire a consultant to conduct an independent impact fee study, although the applicant must pay the consultant's fees. In fairness to the applicant, there should be few restrictions on the methods used to conduct the study. The applicant should be free to present their case in his or her own way. In the end the independent fee study must stand or fall on its own merits. A rigorously logical and competent study based on a defensible methodology should be acceptable to any reasonable person. The applicant should also be free to hire the consultant of his choice. Only the applicant has an incentive to control the cost of the study, and the interposition of the government between the applicant and the consultant would make cost control impossible.

When Fees Are Due

The most convenient way to administer an impact fee program is to withhold some permit or approval needed for development or occupancy until the impact fee is paid. Impact fee payment can therefore be made a condition of plat approval, of issuance of a building permit, or of a certificate of occupancy. Probably the most common practice is to make impact fees due at the time the building permit is issued. *From the building industry's point of view, it is preferable for the impact fee amount to be determined at the earliest possible time (i.e. development agreement or plat map recordation) but to fall due and payable at the latest possible time (i.e., certificate of occupancy).*.

The earlier a developer or builder knows what his project's impact fee liability will be, the easier it will be to make adjustments. If this information is known too late, it may be impossible to adjust the product or the price to compete in the marketplace. If the ordinance relies on a schedule of standard impact fee charges, then the information can be obtained at any time. If, however, impact fees are determined on a case-by-case basis, or if calculations of credits are involved, then these calculations should be performed well in advance of the time that the fee amounts are actually due, say, at the time of plat approval.

Because development does not actually cause impacts until a land use commences or a building is occupied, the fees should not be payable until as close to the time that a use or occupancy begins. A more practical reason is that a builder must carry the financial burden of the impact fee from the time of payment until closing, incurring finance charges during this period which are passed on in the form of higher home prices. If impact fees were paid at time of issuance of the certificate of occupancy (if applicable) or at settlement, carrying costs would ordinarily be minimized.

Accounting

Unlike tax revenues, which are deposited in a general fund to be spent with broad discretion, impact fees must be separately accounted for and expended for the specific purposes for which they were collected. Impact fees must not be freely transferred to other accounts to be spent for other purposes. For example, a park impact fee should be credited to a park capital improvement account in a subaccount for the particular park service area where it was collected. Interest earned on impact fee funds should be credited to the proper accounts. In general, impact fees must be spent for the intended purpose within a definite period of time or else be refunded to the fee payer. Therefore, records must be kept of the amounts paid, the identity of the fee payers, the dates the fees are paid into the accounts, and the dates the fees are spent. A frequently established rule is that fees are spent in the same order that they were deposited in the account.

The government has little discretion in disposing of the funds in impact fee accounts. The funds must be spent for the particular capital facilities listed in the capital improvement plan which formed the basis for the fee calculations, or they must be refunded to the fee payers. Over the years, accounting for impact fees and their expenditure has become an essential topic, with the payers of impact fees wanting assurances that impact fees are being expended for their intended purpose. The state of Arizona has even gone so far as to require a biennial audit of the impact fee accounts to ensure that impact fees are being properly utilized.

Refunds

?

Does the state enabling statute require impact fees to be refunded with interest if not used within a reasonable timeframe?

When the government collects an impact fee for a specific purpose but does not spend it for that purpose, it has no choice but to refund the fee because it may not be used for any other purpose. Therefore, all impact fee ordinances should contain refund provisions. Most ordinances permit impact fees to be held for five to ten years before they are eligible to be refunded. We would argue that, since most capital improvement plans cover a five-year period, any impact fees not spent in one five-year capital budget cycle should be refunded. It hardly needs to be mentioned that impact fees should be refunded with interest. The interest rate should be the same as that which the government receives on its long-term deposits.

The fact that a refund is due indicates that the government erred in collecting the impact fee. Therefore, the government has an affirmative obligation to identify the impact fee payers who are due a refund and to make the refunds promptly. Unfortunately, most impact fee ordinances put the burden on the impact fee payers to prove to the government that they are owed refunds. Few ordinances address the issue of unclaimed or undeliverable refunds. These should probably remain in the original impact fee account for the class of infrastructure to which they were originally dedicated rather than be transferred to the general fund.

Some ordinances impose an administrative fee that is deducted from refunds. Given that the government erred in collecting the fee or in failing to spend funds in a timely manner, the fee payer should not be charged for the government's errors. In addition, expending impact fee dollars on administration violates the principle that impact fees must not be used for operating expenses but only for the capital facilities for which they were collected.

Advisory Panels

To ensure fairness in the administration of the impact fee program, oversight should be provided by an independent, objective citizen advisory panel. This is needed because government has a vested interest in the revenue produced by the program and therefore cannot provide objective and unbiased oversight. This panel should be composed of citizens appointed by the legislative body, and at least 40 percent of its members should represent those most affected by the program, including builders, developers, real estate agents, architects, engineers, etc. No elected or hired official of the local government should sit on the panel.

The panel should conduct an annual audit of impact fee accounts, review the administration of the program, and assess impact fee calculations and fee schedules annually. The panel should advise the legislative body on the operation of the impact fee program by publishing an annual report. The advisory panel can also play a role in the appeals process by hearing appeals in the first instance and issuing a nonbinding, advisory opinion.

Participation in an advisory panel provides an important opportunity to voice issues and concerns related to the planning and/or implementation of impact fees.

Appeals

An impact fee payer who believes he or she has been unfairly treated should have access to an appeals process. The ordinance should provide the impact fee payer the opportunity to seek relief by submitting alternative fee calculation studies or other evidence to the agency administering the fee program. The administrative agency's decision could be appealed to the citizen advisory panel or (if established) a hearing examiner or board of administrative appeals. From this point, further appeals could be taken to the local legislative body or, if still unresolved, to the courts. Alternatively, some states are exploring whether disputes over impact fees should be resolved by an arbitration panel that is independent of the courts. The reasoning behind this strategy is that an arbitration panel provides the opportunity to resolve conflict much more quickly and with fewer legal costs than the court system.

Credits and Reimbursements

In most cases the impact fee amount due can be determined from schedules in the ordinance. In some instances, however, adjustments will need to be made on an

individual basis. For example, a developer may agree to provide land or to construct facilities of the type for which impact fees would be charged. In such cases the developer is entitled to receive a credit or reimbursement equal to the market value of the land or facilities provided which is subtracted from his impact fee bill. In cases where the value of land or facilities exceeds the amount of impact fees due, the developer might receive the difference in cash or in the form of transferable credit against future impact fee liabilities. The latter could be limited to apply only to the specific category of fees for which credit was originally granted.

However, many ordinances do not address credits or reimbursements. In all cases, developers and builders should attempt to include language in their development agreements with the community's charging impact fees that provide for credits and/or reimbursements as a safeguard.

Credits should also apply when there is a change in existing land use. For example, if a land use is changed from residential to commercial, there will be an impact due to increased traffic. But the impact fees should not be based on the total number of trips generated by the commercial use but on the *net increase in* trips. The residential trips that were taken off the roads by the change of land use are the basis for the credit.

Sometimes land use changes from a more intense use to a less intense use. The reduction of impact on public infrastructure is thus a benefit to the community. A case can be made that, if developers whose actions increase the impact on infrastructure must pay a fee for that impact, then developers whose actions reduce impacts should receive something (a reverse impact fee) from the government. Government may resist making cash payments in such cases but transferable impact fee credits are certainly appropriate.

Exemptions

For reasons of public policy, government may wish to make some uses exempt from the payment of impact fees. One example of exempt land use might be affordable housing for low- and moderate-income households. It would not be fair, however, to burden new development with increased fees because some categories are exempt. Capital facilities for exempt land uses should be funded from a source of revenue other than impact fees on new development.

Exemptions can raise constitutional concerns about equal protection because some properties are charged impact fees and some are not. A valid public purpose can justify unequal treatment but some communities take the extra step of establishing administrative procedures whereby impact fees are paid on behalf of exempt categories by general revenues passed through a nonprofit organization (see Chapter 2, pp. 15-18).

Grandfathering

When first implementing an impact fee program the question arises about which properties, if any, should be grandfathered, i.e., deemed to have established a prior right to proceed with development without paying impact fees. For example, on the effective date of the impact fee ordinance there may be projects in the approval pipeline which were accepted for processing or for which development agreements have been reached before an impact fee program was either contemplated or announced and whose feasibility relies on financial assumptions that did not include payment of impact fees. Depending on the fee levels, these projects may fail if required to pay impact fees. In fairness, projects accepted for processing before announcement of an impact fee requirement should be grandfathered. Some states such as Texas have strong vesting statutes. Verify state and local laws regarding vesting when addressing grandfathering issues.

Conclusion

Just as an impact fee is difficult to correctly calculate, impact fee programs are difficult to design and administer so that all legal criteria are met. Unlike the administration of programs funded by general revenues, administration of impact fee programs is complicated by the fact that impact fee revenue accounts have many strings attached. Bureaucrats accustomed to exercising broad discretion over general funds may not fully appreciate that they have practically no discretion over the disposition of impact fee revenues. For this reason, it is important that impact fee ordinances be very carefully drafted to provide strict control of impact fee accounts.

CHAPTER 6

Alternatives to Impact Fees

- ***Infrastructure Financing Objectives***
- ***Methods of Financing Infrastructure***
- ***Alternatives to Impact Fees***

The United States is presently confronting an infrastructure crisis of historic proportions. While the problems related to infrastructure finance have grown, the creative application of appropriate financing vehicles has not. Impact fees are viewed by many local communities as an inevitable solution to finance infrastructure due to the declining availability of state, federal, and local general fund revenues. In truth, the United States' use of impact fees is relatively young—and cannot be viewed as a "one size fits all" solution. There are viable alternatives to impact fees that may, in some cases, offer a more fair, equitable, expedient or politically viable mechanism to address a community's infrastructure deficits.

This section outlines the different methods of public and private financing of new infrastructure, describes the equity and efficiency attributes of each, and poses possible alternatives to impact fees.

Infrastructure Financing Objectives

The fundamental purpose of any infrastructure financing vehicle is to enable local governments to deliver infrastructure that is needed to serve new demand. However, every infrastructure financing vehicle presents some tradeoffs as there are multiple and sometimes conflicting objectives that must be weighed as well.

Comparisons of different methods of financing new infrastructure inevitably involve discussions of achieving expediency, equity, economic efficiency, ease of administration, and political acceptability. There is no ideal method for all possible scenarios because each method involves trade-offs between these objectives.[1]

Expediency

Since the basic purpose of infrastructure improvements is to meet the demand of existing and new users, infrastructure improvements should be constructed prior to or concurrent with new development. Achieving this important objective ensures that existing infrastructure systems are not overwhelmed by new demand. Further, this is one objective that all major stakeholders (local governments, residents and homebuilders) can agree is important.

Economic Efficiency

An infrastructure financing vehicle is "economically efficient" when the capacity of public facilities is expanded up to the point where the cost of increasing the capacity to produce one more unit of service (marginal cost) is equal to the cost to the user for using an additional unit of service (price of the service). Efficiency criteria also imply that the method(s) employed to finance new infrastructure promote efficiency in housing production and consumption, and orderly development. It is generally assumed that residential housing is competitively produced and, therefore, infrastructure financing should not unduly distort the decisions of housing consumers regarding the size and type of house desired nor unduly interfere with home builders' methods of production. New development should be located near already developed land to minimize the cost of providing additional public services if near-in locations offer residents similar benefits in terms of comparable housing and other amenities. If new residents have strong preferences for locations away from existing development, are willing to pay the additional cost of being provided with public services, and are charged the additional cost, remote development can be considered orderly and economically efficient.

Equity

Equity considerations in public service provision revolve around two principles: the benefits principle and the ability-to-pay principle (or vertical equity principle). The benefits principle requires that those who benefit from a public service should be the ones who pay for the service. In this regard, the benefits principle is analogous to the efficiency criterion of public service provision. This principle can be best applied to cases where it is important to conserve resources (e.g., water), access to the service is not considered a basic need (e.g., a municipal golf course, performing arts center, equestrian center, town lake, etc.), and it is administratively feasible to charge users directly.

In cases where it is not feasible to charge users directly (e.g., local streets) or the service is considered a basic need (e.g., police and fire protection), the cost of providing for these services has generally been allocated to the members of the community according to their ability to pay. That is, higher-income or wealthier individuals, the most commonly used measures of ability-to-pay, pay more toward the cost of providing public services than do poorer individuals.[2] The decision to finance public services according to ability-to-pay or benefits received is difficult when it is possible to charge users of the service directly but the service is considered to be so important that access to the service cannot be based on ability to pay. Public elementary and secondary education are examples of services that are provided through the tax system (ability-to-pay principle) but could hypothetically be financed by charging registration fees or tuition to families with children in the public school system.

Ease of Administration

All public infrastructure financing solutions require some form of public administration. Potentially, the administration of a financing vehicle that fully meets all of the other objectives might be so administratively burdensome to the local community that it would be impractical. Alternatively, it is conceivable that an infrastructure financing vehicle would be structured to facilitate ease of administration at the cost of expediency, equity, and efficiency.

Political Acceptability

Local communities usually must weigh conflicting public interests when making policy decisions related to infrastructure finance. Sometimes existing residents view their interests and needs as at odds with those of new residents. Policymakers should look to find solutions that offer broad political acceptability, while providing equal protection to minority members of the community such as new entrants.

Methods of Financing Infrastructure

Methods of financing new infrastructure may be classified *as* either public or private. The more traditional or public method consists of the local (or state) government issuing bonds to finance the construction and installation of the infrastructure and then using a portion of the locality's revenues to service the debt (i.e., pay interest to bondholders and amortize the principal). Another method, although not always feasible or desirable, is to charge the users of the infrastructure directly through tolls, user fees, or other charges. In some instances, the fees can be set high enough to cover the debt service and current operating and maintenance costs. Under public financing methods, the entire community pays something toward the use of new capital facilities. Under private financing methods, the cost of providing new capital facilities is borne by those individuals and businesses that benefit directly, or are considered the underlying cause of the need for new capital. Impact fees are one form of private financing of new infrastructure, although in some aspects they are similar to property taxes.[3]

The following provides a description of infrastructure financing methods that may be used as alternatives to impact fees. These descriptions are general in nature. The tools summarized in this chapter may vary widely from state-to-state in terms of their applicability and even the terminology used to describe them.

Table 6.1: Summary of Alternatives to Impact Fees

	Expediency	Efficiency	Equity	Administration	Political Acceptability
Taxes	❍	❍	●	●	❍
General Obligation Bonds	●	❍	●	●	❍
Revenue Bonds	●	❍	●	●	❍
User Fees	●	●	-	❍	-
Special Taxing Districts	●	●	●	-	●
Local Improvement Districts	●	●	●	-	-
Special Service Districts	-	-	-	❍	-
Tax Increment Financing	-	●	●	❍	❍
Private Exactions (Including Impact Fees)	-	-	-	-	-

Key:
❍ Inferior to Impact Fees
- Neutral/Varies
● Superior to Impact Fees

Taxes

Property taxes, general sales taxes, and personal income taxes are traditionally the major sources of revenues for local governments to directly finance additions to infrastructure, or to service general obligation bonds.

Expediency

Property taxes, general sales taxes, and personal income taxes are typically collected in annually recurring increments. These revenue sources are usually dependent on having development in place to provide a tax base. Therefore, these revenue sources do not provide an extremely expedient funding source for infrastructure in advance of new development; however, if sufficient tax revenue sources are available, they can be a more expedient method of constructing public infrastructure than that of impact fees.

Efficiency

Because these tax revenues are derived from the public at large, there is no direct link or sometimes even no link at all, between those who pay for the infrastructure and those who use it. [4]

Although they are considered two distinct forms of revenues, there are instances in which taxes can behave like user fees. For example, special excise taxes such as motor fuels taxes, hotel/motel room occupancy taxes, motor vehicle registration fees, and other specific taxes are similar to user fees if they are dedicated to restricted uses rather than placed in the community's general fund. For example, gasoline taxes and motor vehicle registration fees dedicated to funding transit and road construction and improvements act like user fees insofar as they attempt to charge only the users of certain publicly provided services.

Equity

There are cases where it is not feasible to charge individual users directly for their use of the public service (e.g., police and fire protection, local streets), thus tax financing is the only feasible method of providing these services. In contrast, services such as public schools, libraries, and parks can be financed by charging the users directly for their use of the services, but it is considered poor social policy to deny anyone access to these services because of their inability to pay. For these types of services, equity considerations usually outweigh efficiency considerations, and thus the services and their underlying infrastructure are generally tax-financed.

Administration

Virtually all local and state communities already have the administrative capacity to manage taxes.

Political Acceptability

The use of taxes to fund infrastructure offers important advantages to local communities and homebuilders, when compared to impact fees. Because taxes are generally collected from a broad-base of the citizenry, they are an appropriate source of funding for infrastructure that provides a broad benefit. However, the public is often resistant to new taxes and there are often statutory limitations that cripple a local community's ability to use them to advance major capital programs.

General Obligation Bonds

Another traditional method of financing new public infrastructure is for the local government to issue general obligation (GO) bonds and to service the debt from local general revenue sources. GO bonds are backed by the "full faith and credit" of the issuing locality and serviced by local general revenues, usually tax revenues and sometimes from grants from higher levels of government. GO bondholders are guaranteed that the locality will use any general revenue source available to pay the interest due and to repay principal on maturing bonds. These bonds usually carry the lowest rate of interest because of these guarantees.

Expediency

GO bonds allow a local community to spend money on infrastructure by borrowing against future revenues of the community. This provides communities with an expedient mechanism to implement new infrastructure that will attract new development and thereby increase the overall tax base available to repay bonds in the future.

Efficiency

The efficiency of GO bonds depends on infrastructure being paid for with the bonds providing an equal benefit to everybody paying taxes into the community that issues them. For example, if a city issued GO bonds that were only used to pay for a neighborhood park benefiting a small area, it would not be considered efficient, because residents outside of the area would not be equally responsible for paying debt service but would not receive benefits. Alternatively, if the GO bonds were used to make improvements to a regional or community park that provided an equal benefit to all residents, then their use would be considered efficient.

Equity

In contrast to impact fees, new development is not singled out to pay for infrastructure and, therefore, GO bonds would be considered more equitable if they provide a broad community-wide benefit.

Administration

GO bonds are different from impact fees in that their use is not subject to the same constitutional and statutory protections given to homebuilders. It is not necessary for a community to establish rational nexus or fulfill many of the administrative or technical burdens of impact fees (i.e. an impact fee technical study would not be required). However, most states have adopted limitations on the amount of bonded indebtedness that may be created, and on the types of infrastructure that GO bond debt may be used for.

Political Acceptability

In order for GO bonds to be backed by the "full faith and credit" of the issuing locality, the locality must have sufficient taxing authority to service the debt. To ensure that localities can indeed back their GO bonds, most states restrict the issuance of GO bonds. A frequent restriction imposed by states is limiting the bonded indebtedness of any locality to a set proportion of the locality's assessed property value.

There is great variation among the states concerning which types of local governments must obtain voter approval (e.g., cities, counties, townships, school districts) and the majority needed to obtain approval (i.e., a simple majority or a super majority).

GO bonds can be difficult to implement as they must typically be voted on by the qualified electors of a community. *Since they are backed by the full faith and credit of that community, GO bonds must provide a direct and tangible benefit to existing residents if they are to pass the election.*

GO bonds carry lower interest rates than revenue bonds and are, therefore, the least costly to the locality. Governments are bound by constitutional and statutory imposed limits on the maximum GO bond amounts allowed to be issued. These limits are often expressed as a percentage of the value of the property within the community.[5]

Revenue Bonds

Revenue bonds are an infrastructure financing vehicle that has also traditionally been used by local communities. *Revenue bonds are public indebtedness that is serviced from specific revenue streams such as a certain percentage of the revenues from property taxes, sales taxes, income taxes, or through user fees.* Because the dedicated revenue streams are not as constant or predictable as the total stream of general revenues, they usually carry a higher rate of interest than GO bonds to compensate the bondholders for the higher risk.

Revenue bonds carry fewer restrictions regarding the volume of indebtedness a locality may incur because they are not backed by the "full faith and credit" of the issuing locality. These instruments are more flexible than GO bonds in financing public infrastructure because they can be used to publicly finance capital expenditures when they

are backed by tax revenues and to privately finance capital expenditures when they are backed by user charges, special assessments, tax increments, and, in some instances, impact fees.

Revenue bonds offer similar advantages and disadvantages as GO bonds when compared to impact fees (see above).

User Fees

User fees are direct charges to infrastructure users related to the amount of services used. They can be used for a type of infrastructure that can be metered such as water, sewer, gas, electricity, and telecommunications systems. The most common forms of general user charges for local governments are hospital room charges, school lunch sales, parking fees, and sewer fees.[6]

Expediency

User fees are commonly used in combination with revenue bonds, providing an expedient source of revenues that can be used for infrastructure improvements.

Efficiency

Properly structured, user charges are an efficient method of servicing revenue bonds and paying for the operating and maintenance costs of certain public services. Because users of public services are faced with the cost of using the service, user fees promote more efficient use of the public capital stock than do taxes.[7]

Equity

User charges may violate some people's concept of equity because access to public services is limited by an individual's ability to pay. Despite the possibility of inequitable treatment of some individuals, user charges are appropriate where the cost of administering the system is low relative to total revenues and where conservation of resources and alleviation of congestion is of paramount importance. The use of user charges to service revenue bonds for toll roads, municipal golf courses, water treatment plants, and sewer systems is usually considered appropriate.

Administration

Depending on the service, user fees can be more difficult and costly to administer than impact fees as the local community or other infrastructure operators must regularly meter infrastructure use and collect revenues.

Political Acceptability

The political acceptability of implementing user fees generally depends on the infrastructure type that fees are being proposed. Most citizens will balance questions of efficiency and equity in determining whether to support user fees. As mentioned earlier, primary and secondary school education is seen as too important for children to be subject to user fees when some families may not be able to afford to pay them. Alternatively, most households inherently recognize the appropriateness of paying only for the water or electricity used – giving them the flexibility to use more if they can afford it and protecting them from their neighbors' excessive use.

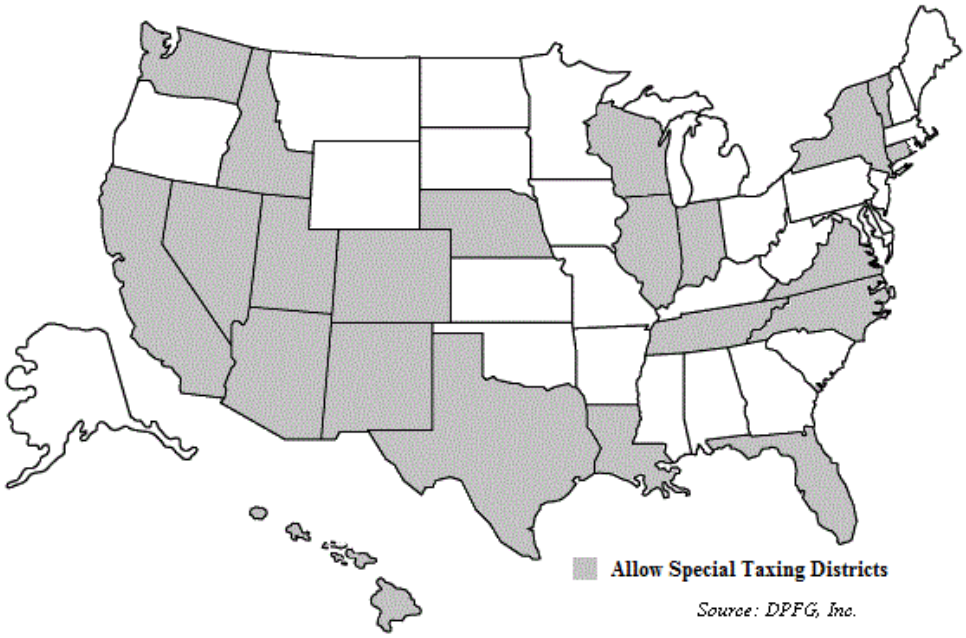
Special Taxing Districts

A special taxing district is typically a separate political subdivision separate and distinct from the county or community that established it. *The sole purpose of special taxing districts is to finance, construct and/or acquire public improvements through the use of tax-exempt bonds, user fees, and property tax levies, special tax levies, etc.* Depending on the state statute, these districts may utilize tax-exempt special assessment bonds, GO bonds, or revenue bonds. Bonds are typically repaid over a 20 to 30 year period by property owners, residing within the boundaries of the special taxing district, making special assessment or ad valorem property tax payments—rather than as upfront impact fees paid by the homebuilder.

Special taxing districts are established over areas which benefit from the public improvements constructed, and usually require a vote or petition of land owners and/or resident electors. Currently, 21 states allow special taxing districts.[8] Examples of special taxing districts include:

- Community Development Districts (Florida)
- Community Facilities Districts (Arizona, California, Hawaii)
- Community Infrastructure Districts (Idaho)
- General Improvement Districts (Nevada)
- Metropolitan Districts (Colorado)
- Municipal Utility Districts (Texas)
- Public Infrastructure Districts (New Mexico, Texas)
- Special Improvement Districts (Nevada)
- Special Service Districts (Utah)

Figure 6.1: States that Allow Special Taxing Districts



Special taxing districts typically require that the developer and local community agree on a General Plan and District Development Agreement. This provides both the developer and local community more flexibility and control over how infrastructure funds are spent – and can help ensure that infrastructure funds result in a direct benefit to development within the district.

Expediency

Special taxing districts provide for more expedient delivery of public infrastructure than impact fees as bonds are issued early in the development process to fund the construction of public improvements in advance of growth. With special taxing districts, the timing of bond issuances is typically coordinated with project development milestones. This feature of special taxing districts reduces the risks of funding excess infrastructure system capacity far in advance of new development.

Efficiency

Special taxing districts are more economically efficient than impact fees because only those public improvements that specifically benefit the residents residing within the boundaries of the special taxing districts can be financed. Additionally, public infrastructure constructed by a special taxing district is funded utilizing tax-exempt bonds that carry a lower cost of financing than that of private debt and/or equity as is typically the case with impact fees, thereby potentially resulting in lower home prices and/or carrying costs for homeowners.

Equity

The use of special taxing districts is considered very equitable as the public improvements being demanded by the residents residing within the boundaries of the special taxing district are being funded and paid for by these residents. Often, impact fees may be utilized to find public improvements for which residents receive little or no perceived benefit.

Administration

Special taxing districts create some administrative challenges because a new political subdivision of the state must be established and organized in order to use this financing vehicle. However, property tax levies or special assessments are typically collected via the county treasurer which poses few administrative challenges. In addition, most states allow special taxing districts to collect a special administrative tax levy to compensate for these costs, thus, special taxing districts become fully self-sustaining.

Special taxing districts are not necessarily more complicated to administer compared to impact fees. For example, it is not necessary to establish level-of-service standards or complete a defensible impact study in order to use this financing vehicle.

Political Acceptability

Special taxing districts are frequently used because they are more acceptable to both the developer and the public at large. *Obligations of a special taxing district are non-contingent liabilities to the local community. Therefore, the local community may be more willing to establish a special taxing district than other mechanisms that may require the community to pledge its full faith and credit.*

In addition, only new and future residents in a special taxing district must pay for the infrastructure constructed or acquired by the district; therefore existing residents would not have to pay higher taxes as a result of new development.

For more information on special purpose taxing districts, go to the NAHB's website and download NAHB's publication at http://www.nahb.org/en/research/nahb-priorities/land-development/special-purpose-taxing-districts.aspx.

Local Improvement Districts

Local Improvement Districts (LIDs) are special purpose districts created by communities and/or counties to allow for the imposition of special assessments or property tax levies in a specific area. These funds may be used to pay for infrastructure that provides a direct benefit to the area or as debt payment for special assessment or GO bonds. Depending on the state, the debt of a LID may be secured by the underlying land within the district or by the full faith and credit of the local community that formed it.

LIDs have many applications. *They are commonly used to complete infrastructure improvements in an area that has fragmented property ownership.* For example, a LID could be formed in a rural community to pave a gravel road that would provide service to several individual farm owners. Alternatively, LIDs have been used to construct streetcar improvements benefiting dozens of individual property owners in an urban community.

Typically, LIDs require a petition or election of property owners within the district before the governing body of the local community can establish them.

They key distinction between a LID and a special taxing district is that LIDs are typically formed and controlled by the community or county in which they are formed, while the establishment of special taxing districts is initiated by property owners and are usually overseen by a governing board.

LIDs generally offer similar advantages and disadvantages when compared to impact fees as special taxing districts. The only key differentiation is in states where the debt of a LID is a contingent liability of the local community, in which case it may be more difficult to attain political acceptance.

Special Service Districts

Another method of financing infrastructure and providing public services is the creation of special service districts. These are autonomous units of government, created by local governments, with the permission of state governments to provide a single or very narrow range of related public services. *The key distinction between special service districts and special taxing districts is that special service districts have an ongoing role in maintaining and operating infrastructure facilities, while special taxing districts typically finance, construct and/or acquire the public improvements and then dedicate the public improvements to other public entities for ongoing operations and maintenance.* Within the limits set by the state enabling provisions, these units of local government can issue debt and levy taxes, or impose user charges to service the debt and to finance current operations without the interference of other local governments. The most common form of independent district is the school district. Other special service districts include mass transit, roads, water supply and treatment, and other public utilities. Special service districts have also been created to provide police and/or fire protection, health care, and housing. In 2007 there were 13,051 independent school districts and 37,381 other special service districts.[9]

The boundaries of special service districts may coincide with the boundaries of the local government that created them, or, in the case of areas with many small local governments, the special district boundaries may include a number of small local units of general governments.

Special service districts may utilize impact fees to raise revenues for new infrastructure construction.

There are vast differences in the types and organizational structures of special service districts. Therefore, it is difficult to make general comparisons between this method of infrastructure financing and impact fees.

Equity

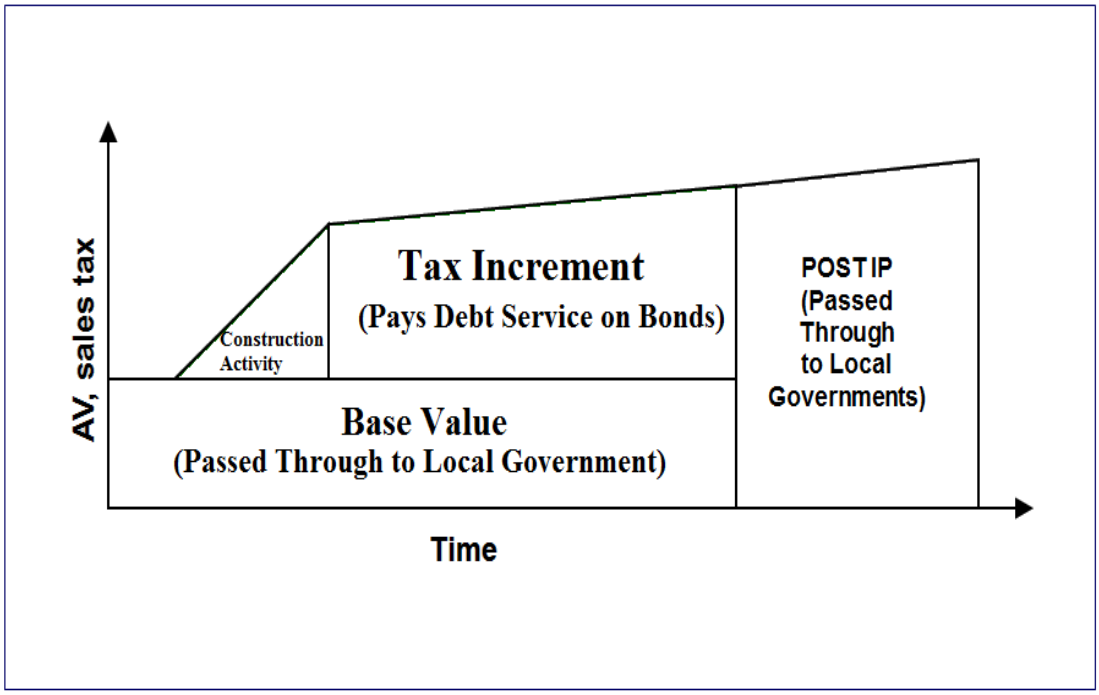
It should be noted, however, that one of the benefits of large special districts is that the financial and other costs associated with rapid population growth and commercial and industrial development are spread over a large population base and geographic area, rather than concentrated in small areas where the burdens of growth can be overwhelming.

Administration

Local governments may, at times, be reluctant to create special service districts because of potential administrative difficulties. The major disadvantage is that creation of too many special service districts fragments decision making and coordination among local governments.

Tax Increment Financing

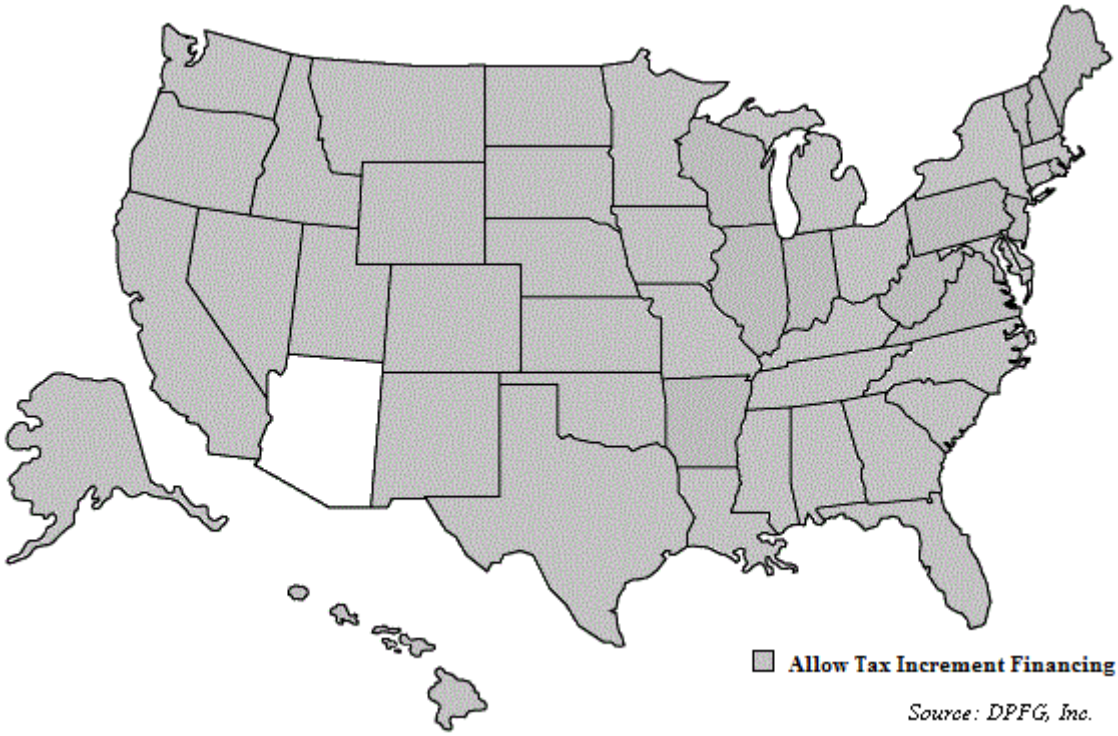
Tax Increment Financing Districts (TIF) capture the tax increment resulting from the increase in the assessed valuation as the result of new development activities or property appreciation for the purpose of making local public infrastructure improvements. The tax increment is the difference between total tax revenues after development and an established "baseline" level of tax revenues prior to development. The tax increment, or a portion of the increment, is diverted from general fund revenues to service revenue bonds issued by the parent community to finance new capital investment and/or provide increased services within the district.[10] Once the tax increment period (IP) has expired, all revenues are returned to the appropriate agencies. A diagram of a typical TIF is shown below:



Most often, TIF is utilized in conjunction with redevelopment and as such boundaries of TIF districts mirror those of redevelopment areas designated by the community. One exception to this rule is New Mexico, which allows the creation of a Tax Increment Development District (TIDD) to be used to capture the incremental sales tax and property tax revenues within a TIDD to finance the construction and/or acquisition of public improvements related to Greenfield development provided the TIDD will create jobs and utilize sustainable development techniques.

Forty-nine states and the District of Columbia allow the use of tax increment financing as a vehicle to finance public infrastructure. Only Arizona does not allow tax increment financing.[11]

Figure 6.2: States that Allow Tax Increment Financing



Expediency

As TIF financing is reliant upon an increase in property tax revenues from new development, TIF financing is on par with that of impact fees related to expediency.

Efficiency

TIF tends to be more efficient than impact fees because those who are bearing the cost of the infrastructure investment, new and current owners in the financing district, have a voice in determining the service levels they want and therefore the amount of new capital needed.

Equity

The use of TIF supports the objective of inter- generational equity. Because tax bases and rates are uniform throughout the community, new entrants and established residents are treated identically.[12] If impact fees are set on a uniform basis, or if impact fees or special assessments are based on physical characteristics of the properties, then TIF would also be superior to those financing mechanisms according to the ability-to-pay principle. However, impact fee financing, may be superior to TIF according to the benefit principle. With impact fee financing, there is a linkage, however tenuous, between the cost to an individual and the benefits received.

Administration

TIF tends to be fairly complicated from an administrative standpoint, because the local government has to complete complex technical studies when establishing a TIF district. Additionally, the local government has to participate in the on-going administration of a district.

Political Acceptability

While TIF is currently allowed in the majority of states, the use of this financing mechanism has increasingly come under political fire. For many, TIF is inexorably linked to the unpopular use of eminent domain—though it need not be. TIF may also spur battles among local units of government, who may object to the establishment of a TIF district because of the fiscal stress caused by reduced tax revenues captured by the district combined with increased service demands. However, this issue has been resolved in some states which require that a fiscal impact analysis is completed in tandem with the TIF financial study. The fiscal impact analysis is completed to identify what mitigation measures would be necessary to ensure that public services will be fully funded in the future.

Private Exactions

The most direct forms of private infrastructure finance are locally imposed exactions on builders and developers, either to directly construct and install infrastructure, or to dedicate land for the construction of infrastructure. Impact fees are a form of exaction in which the developer pays a fee to the locality and the locality uses the proceeds to construct and install the infrastructure. The builder or developer must borrow to finance land development, construction, and new capital facilities. The developers or builders will, to the extent possible, pass all costs forward to the ultimate buyer or backward to landowners. As a result of the added costs of developer-financed infrastructure, the ultimate purchaser must put up more cash for closing and borrow more to purchase the property (see Chapter 3).

Expediency

Private exactions may or may not be expedient depending on how they are implemented. A local community will often require an exaction to be complete in advance of new development in order to ensure that adequate facilities are available. Alternatively, impact fees are technically a form of exaction and are not expedient given that they are collected in arrears.

Efficiency

Private financing of infrastructure is more costly than public financing because private borrowers almost invariably bear higher interest rates than public borrowers, especially if the public authority issues debt with interest that is exempt from federal

(and possibly state) income taxes. Because mortgage interest payments are deductible from federal, and possibly state, income taxes, the difference in *effective* interest rates paid by private borrowers and public borrowers is not as great as the difference in nominal interest rates. However, not all private borrowers can take full advantage of the mortgage interest deduction; itemized deductions for mortgage interest are of full value only if other tax deductions, including real estate property taxes, are at least equal to the standard deduction ($12,600 for married couples filing joint returns and $6,300 for single individuals in 2016).[13]

Despite the higher cost of private borrowing versus public borrowing, it may be argued that exactions on developers and builders are efficient. Downing and McCaleb (1987, p. 53) argue that sophisticated exactions (including impact fees) *do* possess the attributes of efficient prices because those who are considered to be the proximate cause of the need for new infrastructure, or are the primary beneficiaries, pay the cost of the facilities.[14] Conversely, Snyder and Stegman (1986, p. 31) argue that development fees and other forms of private financing of public capital facilities, where exclusion is possible, promote inefficiency in the use of public facilities by reducing user fees and charges to cover only short-run costs rather than long-run costs. Furthermore, Snyder and Stegman argue that development fees *do not* promote efficiency because the ultimate payers do not determine what they pay for, or the size and amount of infrastructure that is to be built.[15] In addition, if impact fees are set on a uniform basis and therefore do not reflect the actual cost to the locality for providing public services, the fees may encourage inefficient development if new development occurs at locations that are not near existing development.[16] Impact fees that are based on the number of bedrooms, acreage, or front-footage are another source of inefficiency in that they force builders, in their attempt to minimize fees, to produce housing units that are not the ones most desired by home buyers.[17]

Equity

A key issue with exactions is that they are often implemented by local communities on an ad-hoc basis. Further, exactions may violate the ability-to-pay concept of equity. Lower-income households pay more, relative to their income, than do higher-income households for the same capital facilities. Exactions are particularly burdensome to buyers of low-income households if they are used to finance infrastructure for roads, police and fire protection, schools, libraries, parks, or other public services from which it is either difficult or impossible to exclude anyone, or which are deemed so socially important that no one should be excluded on the basis of the ability-to-pay.

Private financing of new infrastructure and public financing of replacement infrastructure, often based on ability to pay, involve a double standard in the treatment of new entrants compared to the treatment of established residents. Although current residents may believe it is fair to force new entrants to privately finance new infrastructure and to publicly finance replacement infrastructure, there may be a downside for current residents if new entrants can thwart moves to publicly finance

replacement infrastructure (e.g., refurbishing and modernizing older schools) that primarily benefit established residents.[18]

Administration

The use of exactions, including impact fees, can be challenging for local communities to administer. Specifically, all development projects have different impacts on public infrastructure systems. Administering a fair and balanced exaction or impact fee program is difficult when there are so many nuances in various development projects. Chapter 5 of this handbook includes a detailed description of the challenges related to impact fee programs, which can be broadly understood to relate to exactions in general.

Political Acceptability

While the use of exactions and impact fees may be more politically acceptable than other forms of infrastructure financing to existing residents—it does pose some complicated political questions for local communities regarding their fairness to new residents. Chapter 7 of this Handbook includes a detailed discussion of political issues associated with impact fees, which can be understood to broadly address all forms of exactions.

Endnotes

1. A complete presentation of equity, efficiency, administrative, and political criteria for infrastructure finance can be found in Snyder and Stegman, *Paying for Growth,* pp. 27-38.
2. Wealth is usually measured by the amount of assessed real property owned by an individual.
3. Paul P. Downing and Thomas S. McCaleb, "The Economics of Development Exactions," in Nelson, ed., *Development Exactions,* 1988, p. 53, *op. cit.*
4. T.R. Lakshmanan, P. Nijkamp, E.T. Verhoef and P. Rietveld, *Benefits and Costs of Transport, Classification, Methodologies and Policies,* 2001.
5. David R. Berman, *Local Government and the States: Autonomy, Politics, and Policy*, 2003.
6. U.S. Bureau of the Census, *Total State and Local Government Finances in 1992-93,* pp. 1, 2.
7. Thomas P. Snyder and Michael A Stegman, 1986, p. 31.
8. National Association of Home Builders, *Infrastructure Series: Part II: Infrastructure Finance, Does your state encourage innovation?*
9. U.S. Bureau of the Census, *Statistical Abstract of the United States 2007*.
10. Opponents of tax increment financing argue that these programs may require cost subsidization from taxpayers outside of the tax increment district. David B. Lawrence and Susan C. Stephenson, "The Economics and Politics of Tax Increment Financing," *Growth and Change* (Winter 1995), p. 106.
11. National Association of Home Builders, *Infrastructure Series: Part II: Infrastructure Finance, Does your state encourage innovation?*
12. National League of Cities, *Financing Infrastructure: Innovations at the Local Level* (Washington, DC, 1987).

13. Commerce Clearing House, 1996 *U.S. Master Tax Guide,* p. 85. For a discussion of the interaction between the standard deduction and the mortgage interest deduction, see Paul Emrath, "Cost of Finance and Taxes for New and Old Homes," *Housing Economics* (September 1993), pp. 5-8. Internal Revenue Service for 2016 Standard Deduction Amounts.
14. Paul P. Downing and Thomas S. McCaleb, "The Economics of Development Exactions," in Nelson, ed., *Development Exactions,* 1987.
15. Thomas P. Snyder and Michael A. Stegman, *op. cit.*
16. Ibid.
17. Ibid.
18. Thomas P. Snyder and Michael A. Stegman, *op. cit.,* p. 30.

CHAPTER 7

Public Affairs Strategies

- ***Arguments and Strategies to be Utilized to Defeat Fee Proposals***
- ***What to do if an Impact Fee Seems Inevitable***
- ***Groups Likely to Support the Home Builders Association Position***
- ***Groups Likely to Oppose the Home Builders Association Position***

A sound public affairs strategy which is carried out in a successful manner will benefit the home builders association by influencing legislation and public actions. As the implementation of impact fees and impact fee increases are typically the result of political rather than economic motivations, home builder associations may successfully address these issues through a solid public affairs strategy.

HBAs must adopt a strategy to influence impact fee public policy. If impact fees are not currently being discussed in your community, it may only be a matter of time before they are considered as a method to finance new or expand existing infrastructure. Impact fee use has steadily increased across the country since originating in Florida and California decades ago and impact fee enabling legislation has now been adopted in 28 states.

Chapter 7 focuses on identifying key policy issues that should be considered by governments when creating or increasing impact fees. The chapter outlines arguments and strategies that rely on these policy issues and have been successful in defeating or modifying impact fees.

Additionally, a list of provisions HBAs should urge governments to consider for inclusion in impact fee legislation and ordinances is included in this chapter. The protections and provisions found within impact fee ordinances play an important role in ensuring that the money collected for a purpose is actually spent on that project or service. Certain provisions, if included in the impact fee legislation or ordinance, not only protect the home builder but also the home buyer, local government and existing tax payers. Examples of what issues should be considered in an impact fee have stature has been included as Appendix C. Arizona's impact fee statute has been included as Appendix D. The Arizona Statute was updated in 2011 to address the continued challenges that the Arizona HBAs were experiencing with jurisdictional technical studies and the public sector's reluctance to address the HBA's concerns. The resulting legislation is one of the most comprehensive impact fee statutes in the country and one that other HBAs may want to consider utilizing in whole or in part to prevent jurisdictional overreach. The Montana and Texas impact fee statutes have also been included as additional impact fee statutes that provide many of the checks noted within this publication to prevent jurisdictional abuses.

As HBAs work to defeat or negotiate an impact fee, it is always best to form a coalition which supports the HBA's position. A sound strategy may include building a coalition with mutual interest groups, e.g., business, labor, civil rights, and housing organizations. Prepare materials that may be provided to the media and other key decision makers that detail the economic and social costs of impact fees. Be sure to meet with the media throughout the process to advance their understanding of this financing mechanism.

Arguments and Strategies to Utilize to Defeat Fee Proposals

Impact fees are proposed in a community for many reasons. A HBA's public affairs strategy should be dynamic enough to address the varied reasons for using the impact fee as a tool to finance infrastructure and public services.

Cost of Infrastructure

Many communities simply lack the funds or think they lack the funds to finance infrastructure improvements and expand services. Often, the lack of financing is caused by either a cap imposed upon property taxes or voter resistance to increased taxes. In these cases, it is essential to identify the economic sensitivity of impact fees as an infrastructure finance mechanism. And HBAs should always examine their community's budget to check the validity of the budget shortfall or limitations. Many local jurisdictions try to make up for seriously deferred maintenance of existing infrastructure by charging fees to new growth. HBA's should be prepared to challenge this practice when encountered as discussed in earlier chapters.

The cyclical nature of housing construction makes impact fees an unreliable revenue source. The amount of revenue generated through assessment and collection of impact fees may fluctuate dramatically during times of high and low growth, making fiscal planning based on impact fee revenues unpredictable and difficult. Additionally, the goal of raising additional revenue through impact fees may be attained only in the short term in a growing community. The use of impact fees may result in stifled economic development and limited growth.

If growth is limited by impact fees, the direct and indirect benefits of growth—such as a larger property tax base, increased employment opportunities, increased disposable income, increased sales and other tax revenues—will also be limited. And in regions where communities are competing for growth, impact fees can push to the growth to other areas if the fees are high enough and the market is sensitive.

In communities that are suffering from declining new home construction, impact fees are a naïve way to address the community's infrastructure needs. To the extent that the community is financing the construction of infrastructure through bonds supported by impact fees, the community will not likely receive the funds necessary to retire the bonds as impact fee financing depends on a reliable source of revenue.

If the cost to construct public infrastructure or provide public services is a challenge faced in a community then the following arguments may be useful:

- Ensure the community has explored all of the alternative financing mechanisms available such as its statutory bonding capacity, special taxing districts, tax increment financing, public/private partnerships, grants, etc. Information relating to infrastructure finance solutions may be found in the NAHB's three part series available at www.nahb.org/infrastructurefinance. These publications are:

    - *Building for Tomorrow: Innovative Infrastructure Solutions* (2003): This is a 32-page report that explains more than 20 innovative financing and delivery mechanisms and presents case studies on how those tools have been applied successfully.
    - *Infrastructure Solutions—Best Practices from Results-Oriented States* (2007), features research from the NCSL regarding the best state enabling legislation for some of 11 infrastructure finance alternatives. NCSL looked at statutory language from all the states authorizing the use of these finance tools and highlighted the best-written laws – those that showed the most promise for helping local governments make effective use of those tools.
    - *Infrastructure Finance: Does Your State Encourage Innovation?* (Updated 2012) features a matrix of all 50 states, showing which states authorize the use of the 12 most commonly used infrastructure finance tools discussed in *Building for Tomorrow*. It highlights a more in-depth research report written by the National Conference of State Legislatures (NCSL) that summarizes state enabling authority for these tools and includes links to the relevant statutes.
    - *An Overview of Special Purpose Taxing Districts (2014)* features an in-depth study of the benefits of special purpose taxing districts and how the districts may be used to finance public infrastructure in advance of growth.

- Identify the economic sensitivity of impact fees as an infrastructure financing mechanism.

- Describe the long term impacts on housing affordability and economic development (more detail under "slow growth or no growth").

Slow Growth or No Growth

Oftentimes communities propose impact fees aiming to discourage or prevent growth. Housing affordability is not considered an issue when no-growth is the goal as the policy makers intend to create barriers to housing construction.

If the slow growth or no growth argument is at the forefront of impact fee issues, or even masquerading behind them, then an HBA should consider making the following points:

- **Create a constituency for affordable housing.** Note that impact fees are included within the sale price of new homes and thus are amortized over the life of the mortgage. Amortizing impact fees significantly adds to the cost of the home, which decreases the ability of many people to purchase a home. For example, as a point of reference, a $6,000 impact fee on a $275,000 home, with a 4.50 percent 30-year mortgage, increases the total closing and financing costs of the home by $8,220. If fewer people can afford to buy new homes, then fewer new homes will be built; if housing is limited, so too will be the property tax base—and as such impact fee revenues. Please refer back to Chapter 3 for more information on NAHB's priced-out model.

- **Impact fees place a disproportionate burden on lower-income households.** For example, suppose a household with an annual income of $48,000 is buying a $200,000 house with a $180,000 mortgage at 5.0 percent. A $5,000 increase in house price due to an impact fee would require an increase of 2.5 percent in down payment and $325 more annually in house payments, which is 0.7 percent of the family's income. In a household with an income of $69,000 buying a $300,000 house with the same mortgage terms, the same rise in price would cause the same increase in annual payments, an increase equaling only 0.5 percent of that family's income.

- **Argue the equity issue.** Costs for the construction of infrastructure has traditionally been paid from general revenues of the community. When a local government is benefiting from a budget surplus, there is little justification for turning to new revenue sources such as impact fees. Why should a builder or home buyer pay for the basic needs of a community when the community itself can afford them?

- **Check the motives of the impact fee proponents.** Ensure impact fees are being assessed as a means of raising needed revenue and not for exclusionary purposes.

- **Identify the negative effect impact fees will have on a community.** If your community is competing for new or expanded businesses with neighboring communities that have no such fees, the economic development and growth will simply move next door.

- ***Impact fees not only lead to an increase in the price of new homes but also an increase in the prices of existing homes, as both new and existing homes are close substitutes.*** If the cost for new homes is more expensive than existing homes, demand for existing homes will increase, resulting in an increase in existing home prices. The increase in home values will make housing less

affordable for existing homes at the expense of buyers of both new and existing homes.

- **Advocate paying the impact fee at the latest point in the construction process.** The later the impact fee is paid, the lower the impact on the housing price. One suggestion is to pay the impact fee upon the receipt of the certificate of occupancy. Alternatively, in some communities, impact fees have been financed as an annual special assessment amortized over a twenty year period.

Political Expediency/No New Taxes

Elected community officials may utilize impact fees as a method to address infrastructure issues without raising taxes. Due to the long build-out schedule for constructing public infrastructure, it is incumbent upon successors to manage the tax decisions made by current elected community officials if impact fee revenues fail to meet growth projections. Residents of new construction are a constituency of the future and are often only represented by the HBA.

For communities utilizing impact fees as a way to hide the real costs of infrastructure, you may want to influence community officials with the following arguments:

- **Provide alternative mechanisms for the financing of public infrastructure.** This is outlined in more detail in Chapter 6.

- ***Verify that impact fees represent only the actual costs of providing public services to the new home buyer.*** *It is also important to make sure that the community is capable of maintaining the facility (or service) after the facility is constructed.* In the future, a fiscal crisis may occur and the community may find that revenue funds are insufficient to operate and maintain the facilities.

- **Argue that a majority of new homes are purchased by the existing residents who have already been financing infrastructure through property taxes, etc.** These new home owners are already living in the community and create no new burden on the public infrastructure of the community.

Equity Issue/Growth Pays for Itself

In many communities, elected community officials and residents believe that it is fair for new growth to pay for itself. If a community believes that growth should always pay its own way, the following arguments for opposing impact fees may be helpful:

- **Impact fees imposed for public infrastructure services that benefit and serve both new and existing residents are discriminatory if they are levied only on new homeowners.** Alternative sources of funding, such as gasoline taxes to pay for roads, are available and more fairly distribute the cost of services among those who use them.

- **When impact fees are designated to pay for the construction of future planned facilities, the buyer is paying not just for available facilities, but also for projected infrastructure**. Impact fees are often collected from a constituency that may not enjoy the benefits for which the impact fee paid. The average turnover in home ownership is six years. Many times it takes longer than six years to build infrastructure and develop services.

- **Make sure that impact fees earmarked for building certain infrastructure are used for that purpose and in the community or service area they were intended to support.** Impact fee monies should not be commingled with the funds in the general fund, and to the extent that impact fees are not expended for their intended use over a reasonable time period, they should be returned to the homeowners.

- ***Impact fees may result in "double taxation" of buyers of new housing as new residents may be charged twice for a portion of the public infrastructure; once through the payment of an impact fee and second through the repayment of bonds.***

What to do if an Impact Fee Seems Inevitable

If it is apparent that an impact fee proposal will be approved, there are several options that may minimize the effect of the fees and ensure they are being spent for the purpose they were collected:

- Work to establish specific procedures for enacting local fee ordinances, including requirements for public hearings and legal notice.

- Suggest alternative mechanisms for the financing of public infrastructure (Chapter 6).

- Review the impact fee study to ensure that: (i) the impact fee study is compliant with the requirements of the impact fee statute; (ii) the impact fee study is mathematically accurate; (iii) the impact fee study is in agreement with supporting documents and studies (e.g. CIP); (iv) the impact fee study allocated costs to multiple service areas; (v) the impact fee study is supported by reasonable growth estimates; (vi) construction costs are provided by licensed professionals; (vii) impact fees are reduced by funding offsets; and (viii) the impact fee study is based on existing levels of service..

- Provide economic data to demonstrate the influence that impact fees have on housing affordability in an effort to lower the impact fee and/or transfer the timing of the payment of the impact fee further in the development and building process.

- *Conduct a detailed legal and technical review of the ordinance or statute especially the portion that applies to the rational nexus test. Ensure the assessment of the impact fees conforms to the requirements of the ordinance or statute.* NAHB's Land Use & Design Department provides technical and policy assistance through its ordinance reviews. NAHB's Legal Services can provide assistance and advice on legal issues with the ordinance or statute.

- In the case where a state does not currently regulate impact fees, make sure the community has established administrative guidelines. Many communities fail to comply with the administrative requirements and accounting that must occur when utilizing impact fees as a method of financing public infrastructure.

- HBAs in states with adopted impact fee statutes must be knowledgeable of the provisions contained therein. Most state statutes have specific requirements for communities to follow when adopting impact fees. Make sure the local ordinance is in compliance with the requirements of the impact fee statute. In communities where no state statute has been adopted, confirm the impact fee is in line with established criteria as outlined in other chapters of this handbook.

- Certify that the community commits to conducting an annual capital project update. Doing so will help eliminate completed projects from the impact fee schedule, add new projects if needed and document expenditures for constructed facilities. The purpose of the annual capital project update is to ensure the home buyer receives the infrastructure and services for which the impact fees were paid and that the community is both planning ahead and being accountable.

- *Ensure the ordinance requires the community to perform a periodic update of the impact fee program. Provisions in many state statutes have a schedule for periodic impact fee program updates. The goal of these updates is to make sure that the plans and fees for new infrastructure and services are realistic and accurately represent the burden imposed by new development.*

- As an integral component of the fee program update, communities must also include a timeframe to update development projections. A sound ordinance should require the community to regularly update the base year and planning horizon as well as provide a new analysis of facility standards and needs (since these can change over time) and, most importantly, provide updated and realistic facility costs. Material cost fluctuations may greatly impact the construction costs of capital facilities.

- Ensure that credits and reimbursements are part of a consistent documentation process. HBAs can add significant value to the building and development community in this field. It is prudent to ensure the community is required to adequately track fee payments and projects so that in the event impact fee funds are not spent, refunds can be made. Credits should also be given in the case of changes in land use that reduce demands on infrastructure.

- Communities assessing impact fees must properly account for the fees received from new development. Ensure the community ordinance requires funds for fee programs to be deposited into separate interest-bearing accounts. The accounts typically should also use multiple categories for fees and projects. And a public accounting of how the funds were spent needs to be a requirement for the local jurisdiction.

- Push to have impact fees paid as late in the homebuilding process as possible, such as the receipt of the certificate of occupancy

- Suggest a gradual phasing of the bill's fee requirements. Phasing in the assessment of impact fees results in a less abrupt change in the functioning of builders, developers, and consumers.

Groups Likely to Support the Home Builders Association Position

As stated earlier, HBAs have a stronger ability to influence impact fee legislation when part of a broader coalition. As such, it is important to garner support through communication with other organizations early on regarding the provisions of the impact fee proposal. It may also be advantageous to proactively communicate with business clubs, labor, housing, civil rights, and property owner groups. Local commercial and residential homebuilders and developers may also be a source of support.

Enlisting the support of recent and potential new home buyers will likely play an important role in challenging impact fee proposals. Home buyers elect the officials of the governing body and may represent a powerful source of support as decreasing the affordability of housing will likely be important to home buyers.

Maintain an open line of communication with support groups and ensure that efforts to challenge impact fee proposals are coordinated. Effectively challenging impact fee proposals requires a consistent coordination of efforts between supportive groups.

Groups Likely to Oppose the Home Builders Association Position

While some groups will support the position of HBAs, there will also be groups in support of the impact fee proposals. Communicating with groups that may not share the same perspective on impact fees can be an effective way to learn how to formulate a strategy and arguments that would be tenable to all parties and for the HBA to be viewed as an effective advocate for rational development.

As impact fees represent an additional revenue source to communities, the imposition or increase of impact fees will likely be supported by community officials. It becomes increasingly difficult to effectively influence the implementation of impact fees as the capital budgeting and planning processes progress. Whenever possible, early

involvement in the budgeting and capital planning processes of the community will provide the best opportunity for HBAs to influence the impact fees being proposed.

It is likely that in an effort to discourage or limit community growth, antidevelopment organizations and groups may strongly oppose the efforts of HBAs. It is prudent to stay abreast of the current events of these groups and communicate periodically with the leaders of antidevelopment groups.

Conclusion

Developing a political and public relations strategy to affect an impact fee proposal is essential to building broad-based support in the community that will give additional weight to the building industry's position. Garnering the support of community organizations, professional groups and potential home buyers early in the capital budgeting and planning process will provide a better opportunity to effectively influence the implementation of the proposed impact fees. Following public hearings and the adoption of the fee ordinance, successfully challenging the impact fees without litigation becomes increasingly difficult.

APPENDICES

A Case Studies

B State Impact Fee Enabling Legislation Summary Chart

C General Impact Fee Statute Considerations

D Arizona, Montana, and Texas Impact Fee Statutes

E Resources

APPENDIX A

Case Studies

Home Builders Associations (HBAs) throughout the United States continue to experience challenges related to jurisdictions' implementation of development impact fees. In order to show case the actions a number of HBAs have taken in relation to such challenges, case studies have been included that include dealing with issues of: (i) changing impact fee consultants; (ii) statutory authority to implement Fees; (iii) the timed payment of Fees; (iv) the misappropriation of Fees; and (v) levels of service. Although some of the case studies may be dated, the logic and approach of the actions taken by the HBAs is still relevant today.

I. CHANGING IMPACT FEE CONSULTANTS AND UNINTENDED CONSEQUENCES

(Note: For political sensitivity, the names of the county and the consultants in question have been omitted.)

BACKGROUND

ABC County's (County) Impact Fee Ordinance (Ordinance) requires impact fees to be used only for capital facility costs for which the impact fees are levied and that add capacity needed to serve new development. Furthermore, the Ordinance requires the County to encumber the impact fees six years from the date the impact fees are paid and spend the impact fee within nine years from the date the fees are paid. Otherwise, the fee payer is entitled to a refund.

The County's impact fees have been updated on a biennial basis since 1994. Consultant A prepared the 2012 update and for many years prior, and Consultant B prepared the 2014 update. Consultant A and Consultant B are credentialed impact fee consulting firms. Both firms calculated the fees using the consumption-based methodology.

Although the overall methodology did not change, the 2014 update recommended a $15,888 (or 384 percent) increase in impact fees for a single-family detached, 2,000 square foot home. This case study explores how underlying approaches used by impact fee consultants can affect the fee calculations.

2012 and 2014 Impact Fee Comparison

Single Family (Detached) 2,000 sq ft	2012	2014	$ Increase	% Increase
Schools	$ 1,964	$ 15,305	$ 13,341	679%
Parks & Recreation	905	2,418	1,513	167%
Public Libraries	309	289	(20)	-6%
Fire & Rescue	-	324	324	N/A
Law Enforcement	135	192	57	42%
Public Buildings	826	1,499	673	81%
Total	$ 4,139	$ 20,027	$ 15,888	384%

Schools

As described in the 2012 update, the School District has been implementing an aggressive capital improvement program resulting in marginal additions to existing schools rather than constructing new schools to meet enrollment demand. No capacity-adding projects were included in the School District's current Five-Year Work Plan.

The capital cost per student station of $11,170 in the 2012 update was based on the marginal cost of expanding capacity in existing schools. In the 2014 update, the capital cost per student station of $39,846 was assumed, which reflects the cost of building new schools.

Differences in the application of the consumption-based (e.g. incremental expansion) methodology and interpretation of the County's Ordinance in determining the capital cost per student station were key factors in the $13,341 increase in school impact fees.

Parks and Recreation

In the 2012 Study, the cost of park land was excluded from the Parks and Recreation impact fee calculation because at that time and for the foreseeable future, the County had no plans to increase its inventory of park land. Instead, the County will be developing park land that is already in inventory.

The 2014 Study included calculations demonstrating how the County's achieved level of service for park land exceeded the adopted level of service, consistent with findings in the 2012 Study. The County still has no plans to acquire additional park land. However, the 2014 Study included the cost of park land, at achieved levels of service, in the cost component of the impact fee calculation. Park land accounts for 52 percent of the 2014 impact fee cost component, with park land improvements and facilities accounting for the remainder.

Differences in the application of the consumption-based methodology and interpretation of the County's Ordinance in determining the capital cost for parks and recreation were key factors in the $1,513 increase in parks and recreation impact fees.

Fire and Rescue

The 2012 Study recommended the Fire and Rescue Fee be set at zero as the County's Capital Improvement Plan (CIP) did not propose any capacity-adding improvements. However, the 2014 Study noted three new stations have been included in the current CIP, so a Fire and Rescue impact fee was recommended for adoption.

Initially, the 2014 Study included a $14.6 million Training and Administrative Facility in the land and buildings inventory used in calculating the cost component of the fee. However at the County's request, the cost of this facility was later removed, as there is no need for a similar facility in the future.

Law Enforcement

The 2012 Study allocated capital costs on a per call basis[2] and used the existing inventory of vehicles and equipment in determining the cost component of the law enforcement impact fee. The 2014 Study allocated costs on a functional population basis and used a flat capital cost per officer based on information obtained from other jurisdictions. The level of service in the 2014 Study was based on the number of officers per 1,000 functional residents.

A comparison of the two approaches, calculated on a per capita basis, highlights certain anomalies between the two approaches. For example, the overall capital cost was $10.8 million less in 2014 compared to 2012, and the service area population increased by 86,318 persons (or 12 percent) from 2012 to 2014. In total, the per capita cost declined by $25.50 per person over the biennial period.

2012 and 2014 Law Enforcement Capital Cost Comparison

Description		Figure
2014 Law Enforcement Impact Fee Study		
Service Area Functional Population		699,882
Cost per Functional Resident	$	106.50
Total Equipment and Vehicle Value	$	74,537,433
Service Area Peak Population		818,439
Per Capita Cost	$	91.07
2012 Law Enforcement Impact Fee Study		
Total Equipment and Vehicle Value	$	85,341,771
Unincorporated Peak Population Served		732,121
Per Capita Cost	$	116.57

In spite of the decreases noted above, the 2014 Law Enforcement impact fee increased significantly across all land uses, as illustrated below.

- Office (50,000 sq. ft. and less) increased 1,325 percent
- Retail (50,000 sq. ft. and less) increased 335 percent
- Fast Food Restaurant increased 1,480 percent

Persons per housing unit increased slightly in 2014, which affected the residential land use fees, but different approaches in calculating functional population in the 2012 and 2014 studies accounts for the majority of the nonresidential land use increases.

For example, the peak population in the 2014 study was 1,443,996; however, the peak population in the 2012 study was 1,640,084—a decrease of 196,088. The primary difference appears to be in the transient population assumption, which affects the Parks & Recreation, Fire and Rescue, Law Enforcement and Public Building impact fee calculations.

[1] The 2012 Study also included the Law Enforcement impact fee calculated on a per capita basis.

Furthermore, the functional population coefficient for many nonresidential land uses differed in the 2014 Study compared to the 2012 Study due to methodologies developed and applied by the two consulting firms.

2012 and 2014 Functional Population Coefficient Comparison

Land Use	Functional Population Coefficient Per 1,000 Sq Ft	
Drive-in Bank	1.815	2.280
Quality Restaurant	2.231	6.820
High Turnover Sit-Down Restaurant	2.375	6.780
Office (<= 50,000 sq ft)	0.801	1.410
Retail (<= 50,000 sq ft)	2.050	2.450
Fast Food Restaurant	3.699	8.900

Public Buildings

A significant amount of debt associated with existing public buildings was paid off between 2012 and 2014, which decreased the credit component in the 2014 Study. However, the increase in Public Building impact fees was also affected by the differences in functional population and functional population coefficients described above.

OUTCOME

Because impact fees are not subject to a regulatory body that establishes standardization in practice, a wide variety of approaches are used even when applying the primary methodologies: plan-based (or improvements-driven) and standards-based (or incremental expansion or consumption-based). It is important for local governments to fully understand the assumptions and methodologies included in the impact fee study and to take the steps necessary to limit inequitable (and unintended) inconsistencies that may arise with a change in the impact fee preparer.

For more information contact:
Development Planning & Financing Group, Inc.
Lucy Gallo
Managing Principal – Southeast Region
Lucy.gallo@dpfg.com
(919) 949-1838

II. STATUTORY AUTHORITY LAWSUIT

Bozeman, Montana

BACKGROUND

In December of 1995, the City of Bozeman (City) voted to adopt fees for streets, fire, water and wastewater, without permission through state enabling legislation. The fees voted upon became effective March 23, 1996. At this time, the City only had "general governing powers" not "self-governing powers" and as such, would need state legislation to pass ordinances. Self-governing power, which is the power to enact any measure not expressly forbidden by state laws, was granted to the City in July 2001.

In 1998, following the narrow approval of Initiative 19 by voters, the City sought to substantially increase the existing amounts being assessed for fees. The fee schedule increase was enough for members of the Southwest Montana Building Industry Association (SWMBIA) to begin questioning the authority of the City to collect fees. The local building industry (Building Industry) and the SWMBIA formed a coalition to fight the implementation of the increased fees. In 1999, the City and the SWMBIA entered a lawsuit relating to the City's fee ordinance on the grounds that the City did not have statutory authority to impose fees. The lawsuit was later certified as a class action lawsuit in 2000. The SWMBIA and its members were highly involved in all aspects of the lawsuit and formed a committee of builders to administer and oversee the lawsuit and to keep the SWMBIA informed of the status and progress, including fundraising, identifying necessary plaintiffs, and overall supervision as the lawsuit progressed.

Prior to and at the time of the fee issue, the state of Montana had not enacted state-enabling legislation for the implementation of fee programs. As state-enabling legislation had not been given, the SWMBIA believed the City had no authority to impose fees, to say nothing of the authority to collect or arbitrarily increase the unfounded fees without industry input or the preparation of a technical fee study. A highly important factor that contributed to the substantiality of the SWMBIA's case was not straying from the central argument that the city lacked the statutory authority to impose the fees. Years later in 2005, the passing of State Bill 185 allowed jurisdictions to implement fee programs on the legal basis of Montana Code 7-6-1601 et. seq.

City officials and other supporters for higher fees consistently used media channels to purport that any and all infrastructure problems or deficiencies were the result of the Building Industry's pursuing litigation over fees. Accordingly, the SWMBIA routinely used the local media to combat the misinformation and mischaracterization of the Building Industry and focused the public relations effort on educating the public about the SWMBIA's position and the importance of challenging the City's existing fee study. Allies of the SWMBIA included numerous members of the local and state building associations as well as state and local realtors. Efforts were focused on educating allies of the need for litigation and formally requesting their financial support to challenge the fees. By maintaining open lines of communication with allies throughout the process, the SWMBIA was able to receive additional funding when necessary.

OUTCOME

In February 2001, the lawsuit was settled and the City agreed to:

- Return a total of $5.1 million to approximately 1,000 fee payers resulting in a refund of approximately $5,000 per residential dwelling.

Bozeman Fee Refund

Fee Category	Amount Refunded
Street and Fire	$ 2,231,410
Water	1,293,369
Sewer	1,606,555
Total	$ 5,131,334
Residential Dwellings [(1)]	1,000
Refund per Residential Dwelling	$ 5,131

Footnote:

(1) Figure is approximate.

- Reduce the existing fee schedule by 10 percent until a new study could be completed.
- Allow local builders reasonable participation in the preparation of the new fee study.

After settlement was reached, the SWMBIA continued its public relations approach by providing the public with detailed information about the settlement and the parties eligible to receive fee refunds. The SWMBIA and the class were very pleased with the outcome of the lawsuit, however, the reasonable participation in the preparation of the new fee studies never really materialized.

For more information contact:
Southwest Montana Building Industry Association
Linda Revenaugh
Executive Officer
linda@swmbia.org
(406) 585-8181

III. TIME PAYMENT OF FEES

Hillsborough County, Florida

BACKGROUND

The water and sewer systems for Hillsborough County, Florida (County) had substantial excess capacity within certain service areas caused by a combination of overly optimistic population projections, housing market down turns, down planning, and reluctance on the part of the County to approve rezonings involving higher residential densities.

The County was having difficulty meeting its bond payment obligations, and bond rating agencies threatened to downgrade the County to "junk bond" status. The reclassification would make it difficult for the County to successfully finance any future capital improvements through the issuance of bonds.

The water and sewer development impact fees (fees) in the County were structured to meet the needs of providing necessary capital infrastructure and were some of the highest utility fees in Florida. At the time of receiving certificate of occupancy, homebuilders paid fees of $3,665 per single family residence for water and sewer.

As a means of generating revenue, the County sought to implement a "stand-by" charge, which the Tampa Bay Builders Association (TBBA) felt was arbitrarily chosen and did not meet the provisions of rational nexus tests. As such, the TBBA threatened legal action.

The TBBA participated in a task force offering suggestions on how to increase revenues and cut expenses and suggested allowing the County to adopt the stand-by charge as a way to raise revenue and to allow the stand-by charge and fees to be financed by home buyers over a period of time. As a result of the concept of allowing the homebuilder to finance both the stand-by charge as well as the Fees through the use of special assessment bonds was created. The goal of the time payment of fees program was to accelerate the collection of funds by the County and to shift the burden of fees from the home builder to the home buyer and to protect the County's bonding ability and rating.

To accomplish the implementation of a time payment system, the County proposed a new fee, called the Accrued Guarantee Revenue Fee (AGRF), to reimburse the cost of the unused water and wastewater capacity in the utility system. Following extensive discussion, it was agreed that the County would adopt an AGRF of $445 for water and $645 for wastewater for a total AGRF of $1,090. Fees now due for water and wastewater were increased from the average of $3,665 per single family residence to a total of $4,755. The fee increase is illustrated in the table on the following page.

County Water and Wastewater Fees

Description of Fee	Amount
AGRF [(1)]	$ 1,090
Average Fee	3,665
Total Fee	$ 4,755

Footnote:

(1) The acronym represents the Accrued Guarantee Revenue Fee.

By participating in the time payment program, the home builder paid $2,500 known as the Builder Payment. The time payment fee is paid prior to the issuance of a certificate of occupancy while the home buyer, as part of their property tax bill, pays the remaining $2,255 over 20 years, amounting to approximately $230 per year.

Time Payment of Fees Example

Fee Breakdown	Amount	When Paid
Homebuilder	$ 2,500	Certificate of Occupancy
Homebuyer	2,255	Amortized over 20 years.
Total	$ 4,755	

Participation in the time payment system is voluntary and home builders have the option to participate in the time payment program or to pay the fees themselves and include them in the cost of the home. Home buyers who purchase homes participating in the time payment system have the option to pay the annual assessments or to prepay the fees at any time without penalty.

OUTCOME

The time payment program of water and sewer fees has been in effect since 1997 and has been beneficial to the county government as well as the building industry. Following the adoption of the initial program, the County performed a rate/services study that concluded additional funds would be necessary to support the time payment system. The County agreed to maintain the builder fee at $2,500 but increase the AGRF to $5,865, with the home buyer paying $3,365 over 20 years.

Since the adoption of the time payment system, several rate adjustments have been made based on the results of annual studies conducted by the County. In 2002, the home builder payment was **reduced** to $2,170, and the total fees for a single family residence were $5,495, with home buyers financing $3,325 over 20 years. Without the implementation of the time payment program, home builders in the County would pay a total of $5,495 in water and sewer Fees. The time payment system reduces the Fees paid by the home builder by $3,325 per single family residence and allows the home buyer to finance the balance through a tax assessment, potentially at lower interest rates than conventional home mortgages.

The development of the time payment system offers the following benefits:
* Reduces home builder's direct costs.
* Passes some fees to the home buyer and potentially at lower interest rates.
* Provides an alternative to conventional fees.

For more information contact:
Tampa Bay Builders Association
Jennifer Doerfel, Executive Vice President
Jennifer@tbba.net
(813) 434-5027

IV. LEVELS OF SERVICE

Yuba City, California

BACKGROUND

In October 2006, the North State Building Industry Association (BIA), working with an outside consulting firm, began reviewing the proposed development impact fees (fees) prepared by consultants on behalf of the City of Yuba City, California (City). As the City offered a variety of public services, the fees and nexus studies covered the following categories:

1) Community Services (police, fire, corporation yard and city hall)
2) Roads
3) Parks & Recreation
4) Library
5) Levee
6) Sewer
7) Water
8) Storm Drainage

The initial fees circulated by the City had increased the single-family rate from $24,270 to $64,193.

Fees within the State of California are controlled by Government Code 66000-6605 (Mitigation Fee Act) which was adopted in 1987 as AB 1600. The power to collect fees is contained in the city's police powers to protect the public health, safety and welfare of the citizens. Section 66001(a) of the Government Code requires any imposition of a Fee as part condition of development must show the following nexus:

- Identify the purpose of the fee;
- Identify how the fee is to be used;
- Determine how a reasonable relationship exists between the fee's use and the type of development project on which the fee is imposed;
- Determine how a reasonable relationship exists between the need for the public facility and the type of development project on which the Fee is imposed.

The nexus findings are typically made in a fee program's corresponding fee study (Nexus Study) or must be made in the ordinance that establishes the fee program. Additionally, AB 2751 created Section 66001(g) in 2007, which clearly states new development is not responsible for curing any existing deficiency in the current fee program. Understanding AB 1600 and the nexus requirements are critical in negotiating with any jurisdiction regarding fees.

As such, the BIA and their outside consultant focused on the following key assumptions: population build-out, interest rates, existing deficiencies, level of service standards, residential equivalency rates

and construction cost contingencies. For example, the City had originally estimated design, engineering and construction contingency as 65 percent of the hard construction costs. This is 30 to 40 higher than most jurisdictions typically estimate in any fee program. Additionally, the City utilized the fee program to increase the de-facto level of standard from 4.06 acres per 1,000 residents to 10.0 acres per 1,000 residents. Adjustments made to these two assumptions reduced the proposed fees by more than $15,000 per residential unit.

The goal was to ensure that development paid its fair share of future infrastructure needs, recognizing the temporal economic conditions currently facing business interest in the City. In addition to negotiating with key the City staff members, an Ad Hoc committee was created which included two members of the City council to provide input on key level of service standards, existing deficiencies and interest rate assumptions associated with financing infrastructure improvements. Through this process the BIA and their outside consulting group were able to significantly reduce the fees to be paid by new development.

OUTCOME

In September 2007, the City council adopted revised fees that were substantially reduced from the originally proposed fees proposed in October 2006. The revised fees reflect a position that provides for development paying its fair share of future infrastructure cost and ensures that the proposed fees are justifiable under state guidelines while meeting the City's desired level of service standards. The table below illustrates the results realized by the BIA working with their outside consultants upon the completion of the fee review and subsequent adoption by the City:

Yuba City Fee Update

				Numerical Variance			Percentage Variance		
Fee Category	Existing Fee	Oct 2006 Proposed Fee	September 2007 Adopted Fee	Existing - Proposed	Proposed - Adopted	Existing - Adopted	Existing - Proposed	Proposed - Adopted	Existing - Adopted
Police	$ 593	$ 1,876	$ 1,196	$ 1,283	$ (680)	$ 603	216%	-36%	102%
Fire	749	1,587	1,361	838	(226)	612	112%	-14%	82%
Roads	3,583	14,117	9,094	10,534	(5,023)	5,511	294%	-36%	154%
Corporation Yard	-	934	814	934	(120)	814	0%	-13%	0%
Parks & Recreation	2,692	9,320	6,160	6,628	(3,160)	3,468	246%	-34%	129%
Library	954	1,082	912	128	(170)	(42)	13%	-16%	-4%
Levee	-	5,366	2,874	5,366	(2,492)	2,874	0%	-46%	0%
City Hall	-	667	516	667	(151)	516	0%	-23%	0%
Sewer	4,990	7,826	5,261	2,836	(2,565)	271	57%	-33%	5%
Drainage	-	6,575	3,061	6,575	(3,514)	3,061	0%	-53%	0%
Water	7,209	10,644	5,796	3,435	(4,848)	(1,413)	48%	-46%	-20%
Administration	-	699	496	699	(203)	496	0%	-29%	0%
Affordable Housing	3,500	3,500	1,750	-	(1,750)	(1,750)	0%	-50%	-50%
Total	$ 24,270	$ 64,193	$ 39,291	$ 39,923	$ (24,902)	$ 15,021			

When there are substantial increases in fees, there is a good chance that a jurisdiction may be attempting to increase its levels of service standards or to remedy existing deficiencies with Fee revenues generated by new growth. Special attention needs to be placed on construction cost estimates, as these costs are often times significantly higher than those currently being experienced in the market place. Lastly, consideration should be given to bringing in outside fee consultants who work solely for the private sector to augment the BIA review team.

V. SIZE-BASED RESIDENTIAL FEE ASSESSMENTS

BACKGROUND

It is common among jurisdictions to assess fees for residential dwellings based upon unit type. For example, a flat fee is charged for all single family residences, without taking into consideration the size of the residence. In recent years, the notion of assessing residential fees based upon the size of the unit (square footage or the number of bedrooms) has become popular throughout jurisdictions in the United States. Several communities, such as Missoula, Montana; Baton Rouge, Louisiana; Palo Alto, California; Burlington, Vermont; and Hillsborough and Manatee County, Florida, have adopted size-based residential fee programs.

For example, the Manatee County, Florida impact fee schedule for single-family detached homes is presented below.[2] Except for public education, the fees are based on unit size. The square footage ranges for most categories are minor (300 to 500 square feet); however, the methodology assumes demand for public facilities, other than schools, is homogenous for all homes greater than 2,200 square feet.

			Multi-Modal Transportation						
Single-Family Detached	Law Enforcement	Libraries	NE District	NW District	SE District	SW District	Parks & Natural Resources	Public Safety	Public Education	Admin Surcharge
1,000 sq ft or less	$ 178	$ 95	$ 2,290	$ 2,185	$ 1,686	$ 1,335	$ 430	$ 96	$ 3,238	$ 44
1001 - 1300 sq ft	$ 276	$ 148	$ 3,564	$ 3,400	$ 2,623	$ 2,078	$ 669	$ 149	$ 3,238	$ 69
1301 - 1700 sq ft	$ 378	$ 202	$ 4,874	$ 4,650	$ 3,588	$ 2,833	$ 915	$ 204	$ 3,238	$ 94
1701- 2200 sq ft	$ 477	$ 255	$ 6,126	$ 5,843	$ 4,509	$ 3,560	$ 1,154	$ 257	$ 3,238	$ 119
2201 or more sq ft	$ 595	$ 319	$ 7,633	$ 7,282	$ 5,619	$ 4,434	$ 1,441	$ 321	$ 3,238	$ 149

Total Single-Family Fee	NE District	NW District	SE District	SW District
1,000 sq ft or less	$ 6,371	$ 6,266	$ 5,767	$ 5,416
1001 - 1300 sq ft	$ 8,113	$ 7,949	$ 7,172	$ 6,627
1301 - 1700 sq ft	$ 9,905	$ 9,681	$ 8,619	$ 7,864
1701- 2200 sq ft	$ 11,626	$ 11,343	$ 10,009	$ 9,060
2201 or more sq ft	$ 13,696	$ 13,345	$ 11,682	$ 10,497

An impetus to the emergence of this approach to assessing fees is the argument revolving around the regressive nature of impact fees. Fees that are regressive increase as a percentage of residential dwelling size as the residential dwelling size decreases. Therefore, the fee remains the same without regard to the size of the unit.

The purpose of this discussion is to emphasize the primary arguments of proponents and opponents to this method of calculating residential fees.

PROPONENTS

Proponents of square foot and number of bedroom based residential fee assessments argue that assessing fees based on unit size provides a more equitable assessment of fees as smaller residences are not paying a proportionately higher share of fees compared to larger residences. Basing the

assessment of fees on the size of a residential dwelling or the number of bedrooms in that dwelling makes the fee less regressive than assessing fees based upon unit type.[1]

The central premise of the argument is that, in general, larger residences house more people, and with a greater number of people, there results a greater demand for public services. On the other hand, small residences house fewer people and as such would require fewer public services. It is argued that the dwelling does not have an impact on the demand for public services, but it is the people residing in the dwelling that have the impact, and assessing fees based upon housing size proportionately places the burden of paying the fees on those who create the greatest demand for public infrastructure and services.

OPPONENTS

Opponents to the assessment of residential fees based upon square footage and number of bedrooms argue that it is not feasible to transform fees from something regressive to something that is not regressive.

The difficulty in assessing residential fees based upon unit size is that the assumption that larger residences house a greater number of people does not always follow the aspects of the argument set forth by proponents of this approach. As a simple example, some households nearing retirement or with fewer dependents may purchase housing that is much larger than is necessary to provide space for visiting relatives or entertaining guests. Additionally, the definition of what constitutes a "bedroom" varies from source to source. A room may be defined as a "den" to one person, while the very same room may be considered a "bedroom" by another.

It is important that home builder associations stay abreast of the developments in this approach as it is likely that this method of calculating residential fees will become more common in the future.[3]

For further information on recent fee trends and ways to deal with fee proposals, it may be helpful to work with the NAHB to ascertain how HBAs in other parts of the United States manage impact fees.

Endnote

1. Nicholas, James C. 1992. "On the Progression of Impact Fees," *Journal of the American Planning Association* 58: 517–525
2. This schedule reflects impact fees in effect for the period April 18, 2016 to April 17, 2017.
3. National Association of Home Builders, *Proportionate-Share Impact Fees*

APPENDIX B

State Impact Fee Summary Chart

		Fees May Be Imposed For											Requirements					
State	Legislative Reference	Roads	Water	Sewer	Storm Water	Parks	Fire	Police	Library	Solid Waste	School	Utilities	Improvements Plan	Interest Bearing Account	Spend Within "X" Years	Waiver for Affordable Housing	Advisory Committee	Stage for Payment (1)
Alabama																		
Alaska																		Anytime
Arizona (Cities)	AZ Rev. Stat. Ann., § 9-463.05	X	X	X	X	X	X	X	X				X	X	10		X	BP/CO
Arizona (Counties)	AZ Rev. Stat. Ann., § 11-1102 et seq.	X	X	X	X	X	X	X					X	X	10		X	BP/CO
Arkansas	AK Code, § 14-56-103 (cities only)	X	X	X	X	X	X	X	X				X	X	7			CO
California	CA Gov't Code, § 66000 et seq. (mitigation fee act); § 66477 (Quimby Act for park dedication/fee-in-lieu); § 17620 et. seq. (school fees)	X	X	X	X	X	X	X	X	X	X	X	Yes		6			Certificate of occupancy
Colorado	CO Rev. Stat., § 29-20-104.5; § 29-1-801804 (earmarking requirements); § 22-54-102 (school fee prohibition)	X	X	X	X	X	X	X	X	X		X		X		X		
Connecticut																		
Delaware																		
Florida	FL. Stat., § 163.31801	X	X	X	X	X	X	X	X	X	X							Anytime
Georgia	GA Code Ann., § 36-71-1 et seq.	X	X	X	X	X	X	X	X				X	X	6	X	X	BP
Hawaii	HI Rev. Stat., § 46-141 et seq.; § 264-121 et seq.	X	X	X	X	X	X	X	X	X	X	Yes	X	X	6			BP
Idaho	ID Code, § 67-8201 et seq.	X	X	X	X	X	X	X					X	X	8 (2)	X	X	BP
Illinois	605 Ill. Comp. Stat. Ann., § 5/5-901 et seq.	X											X	X	5		X	BP/CO
Indiana	ID Code Ann., § 36-7-4-1300 et seq.	X	X	X	X	X							X	X	6	X	X	BP
Iowa																		
Kansas																		
Kentucky																		
Louisiana																		
Maine	ME. Rev. State. Ann., Title 30-A, § 4354	X	X	X		X	X			X			X					
Maryland	MD Code, Art. 25B, § 13D	X	X	X	X	X	X	X	X	X	X							
Massachusetts																		
Michigan																		
Minnesota																		
Mississippi																		
Missouri																		
Montana	MT Code Annotated, Title 7, Chapter 6, Part 16	X	X	X	X	X	X	X	X	X	X	X	X	X			X	BP
Nebraska																		
Nevada	NV. Rev. Stat., § 278B	X	X	X	X	X	X	X					X	X	10		X	BP/CO
New Hampshire	NH Rev. Stat. Ann., § 674:21	X	X	X	X	X	X	X	X	X	X		X		6			CO
New Jersey	NJ Perm. Stat., § 27:1C-1 et seq.; § 40:55D-42	X	X	X	X								Yes					BP
New Mexico	NM. Stat. Ann., § 5-8-1 et seq.	X	X	X	X	X	X	X					X	X	7	X	X	BP
New York																		
North Carolina																		
North Dakota																		
Ohio																		
Oklahoma	OK Statutes, § 62-895	X	X	X	X	X	X	X		X								
Oregon	OR Rev. State, § 223.297 et seq.	X	X	X	X	X							X					
Pennsylvania	PA Stat. Ann., Title 53, § 10502-A et seq.	X											Yes			Yes		BP
Rhode Island	General Laws of RI, §45-22.4	X	X	X	X	X	X	X	X	X	X			X	8			CO
South Carolina	Code of Laws of SC, § 6-1-910 et seq.	X	X	X	X	X	X	X					X	X	3	X		BP
South Dakota																		
Tennessee																		
Texas	TX Local Gov't Code Ann., Title 12, § 395.001 et seq.	X	X	X	X								X	X	10	X	X	BP/CO
Utah	UT Code, § 11-36-101 et. seq.	X	X	X	X	X	X	X				X	X (3)	X	6	X		
Vermont	VT Stat. Ann., Title 24, § 5200 et seq.	X	X	X	X	X	X	X	X	X	X	X	X		6	X		
Virginia	VA Code Ann., § 15.2-2317 et seq.	X											X	X	15		X	CO
Washington	WA Rev. Code Ann., § 82.02.050 et seq.	X				X	X				X		X	X	6	X		
West Virginia	WV Code, § 7-20-1 et seq.	X	X	X	X	X	X	X			X		X	X	6	X		
Wisconsin	WI Stats., § 66.0617	X	X	X	X	X	X	X	X	X			X	X	7	X		BP/CO
Wyoming																		

Source: National Impact Fee Survey, 2015

Footnotes:

(1) BP = Building Permit; CO = Certificate of Occupancy.

(2) Idaho - 20 years for wastewater and drainage.

(3) Political Subdivisions serving populations under 5,000 as of the last federal census need not comply with the capital facilities plan requirements.

APPENDIX C

General Impact Fee Statute Considerations

The following document aims to serve as a reference for homebuilders to review common issues discussed in impact fee statutes. While all state impact fee statutes are unique, the majority of impact fee statutes share the following common characteristics.

- Definitions
- Minimum Standards for Development Impact Fee Ordinances
- Advisory Committee
- Service Areas
- Imposition of Development Impact Fees
- Proportionate Share of Improvement Costs Determination
- Capital Improvements Plan
- Credits
- Accounting for Collected Development Impact Fees
- Refunds
- Collection

A thorough discussion about the characteristics outlined above can be found in its respective section below.

DEFINITIONS

- The definitions section should include a detailed list of the public facilities for which impact fees are assessed.
- Examples of public facilities may include: Water supply production, treatment, storage and distribution facilities, wastewater collection, treatment and disposal facilities roads, streets and bridges, including rights-of-way, traffic signals, storm water collection, retention, detention, treatment and disposal facilities, flood control facilities, parks, open space and recreation areas, public safety facilities, including law enforcement, fire, emergency medical and rescue and street lighting facilities.

MINIMUM STANDARDS FOR DEVELOPMENT IMPACT FEES ORDINANCES

Minimum standard requirements for development impact fee ordinances may include:

- Should be based upon the proportionate share of the cost of system improvements. Development impact fees shall be based on actual system improvement costs or reasonable estimates of such costs.

- Should be calculated on the basis of levels of service for public facilities in the development impact fee applicable to existing development as well as new growth and development. The construction, improvement, expansion or enlargement of new or existing public facilities for which a development impact fee is imposed must be attributable to the capacity demands generated by the new development.
- Should specify the time in the development process at which the development impact fee is to be collected. Times for the collection of the development impact fee may include: (i) the commencement of construction of the development, (ii) the issuance of a building permit or (iii) as may be agreed by the developer and the governmental entity.
- Should include a provision for credits in accordance with the requirements of the "Credits" section.
- Should include a provision prohibiting the expenditure of development impact fees except in accordance with the requirements of the "Earmarking and Expenditure of Collected Development Impact Fees" section.
- Should make a determination as to whether one service area or more than one service area is necessary to establish a correlation between impact fees and benefits.
- May exempt all or part of a particular development project from development impact fees provided that such project is determined to create affordable housing.
- Should provide that development impact fees shall only be spent for the category of system improvements for which the fees were collected and either within or for the benefit of the service area in which the project is located.
- Should provide for a refund of development impact fees in accordance with the requirements of the "Refunds" section.
- Should provide for appeals regarding development impact fees in accordance with the requirements of the "Appeals" section.
- Should provide a detailed description of the methodology by which costs per service unit are determined.
- Should include a schedule of development impact fees for various land uses per unit of development.
- Should not subject any development to double payment of impact fees. (i.e. Homebuilder should not be responsible to pay impact fees and also pay to retire the debt to pay for the infrastructure)
- May exempt from development impact fees for the following activities:
    (i) Rebuilding the same amount of floor space of a structure, which was destroyed by fire or other catastrophe, providing the structure is rebuilt and ready for occupancy within two (2) years of its destruction;
    (ii) Remodeling or repairing a structure which does not increase the number of service units;
- Should include a description of acceptable levels of service for system improvements.

DEVELOPMENT IMPACT FEE ADVISORY COMMITTEE

- The governmental entity should establish a development impact fee advisory committee.
- The composition of the advisory committee should have representatives from the home building community. It would be wise to have no less than 40% of the committee members

selected from the building community. An example composition may include a total of five (5) members appointed by the governing authority of the governmental entity, where two (2) or more members are active in development, building or real estate and are not employees of the governmental entity.

- The advisory committee should:
  (i) Monitor and evaluate implementation of the capital improvements plan;
  (ii) Recommend to the governmental entity that the capital improvements plan and development impact fees be updated or revised periodically.

SERVICE AREAS

- Service areas are defined as geographic areas identified by a governmental entity or by intergovernmental agreement in which specific public facilities provide service to development within the area. An important note on service areas is that impact fees collected for the intent to be spent on public facilities located within a specific service area should be separately accounted for to ensure that the impact fees are appropriately spent on public facilities located within the service area.

IMPOSITION OF DEVELOPMENT IMPACT FEES

- The advisory committee should be consulted on the development of the capital improvements plan.
- The public should be notified, through a public hearing, of any changes to be made to the capital improvements plan. Notification should be made by circulation in a recognized county newspaper.
- The public should be notified, through a public hearing, of the governmental entity's intent to consider adoption of an ordinance for the imposition of development impact fees.

PROPORTIONATE SHARE OF IMPROVEMENT COSTS DETERMINATION

- The impact fees should be based on a reasonable and fair formula or method, so that the impact fees do not exceed a proportionate share of the costs of the improvements to serve the new development.
- The following should be considered in the determination of proportionate share and accounted for in the calculation of the impact fee:
  (i) Any offsets, credits, contribution of money, dedication of land, or construction of system improvements;
  (ii) Payments anticipated to be made in the form of user fees and debt service payments;
  (iii) The portion of general taxes or other revenues allocated to system improvements;
  (iv) The cost of existing system improvements within the service area or areas;
  (v) The extent to which new development will contribute to the cost of system improvements through taxation, assessment, or developer or landowner contributions, or has previously contributed to the cost of system improvements through developer or landowner contributions.
  (vi) The extent to which the new development is required to contribute to the cost of existing system improvements in the future.

(vii) The extent to which the new development should be credited for providing system improvements, without charge to other properties within the service area or areas;
(viii) The availability of other sources of funding system improvements. (user charges, general tax levies, intergovernmental transfers, and special taxation)

CAPITAL IMPROVEMENTS PLAN

It is recommended that a capital improvements plan be prepared and that it be included as an element of the comprehensive plan. The capital improvements plan may contain the following:

(i) A general description of all existing public facility deficiencies within the service area or areas and a reasonable estimate of all costs and a plan to develop the funding resources related to curing the existing deficiencies.
(ii) Means by which the governmental entity will use revenue sources other than impact fees to cure existing system deficiencies.
(iii) An analysis of the total capacity, the level of current usage, and commitments for usage of capacity of existing capital improvements to ascertain the current level of service.
(iv) The capital improvements plan should provide a table establishing the specific level or quantity of use of a service unit for each category of system improvements as well as an equivalency ratio of a service unit to various types of land uses, including residential, commercial, agricultural and industrial.
(v) A description of all system improvements and their costs necessitated by new development in the service area, to provide a level of service not to exceed the level of service adopted in the development impact fee ordinance.
(vi) The total number of service units necessitated by and attributable to new development within the service area.
(vii) The projected demand for system improvements required by new service units projected over a reasonable period of time. (The longer the timeframe, the less accurate the projected demand)
(viii) Identification of all sources available to the governmental entity for the financing of the system improvements.
(ix) A schedule setting forth estimated dates for commencing and completing construction of all improvements identified in the capital improvements plan.

- There should be a provision that the capital improvements plan will be periodically updated.

CREDITS

Provisions for impact fee credits may include:

- A credit or reimbursement for the present value of any construction of system improvements or contribution or dedication of land or money.
- Amount of Credit or the amount, time and form of reimbursement.
- A credit on future impact fees or reimbursement at the developer's choice for excess construction, funding or contribution from development impact fees.
- A credit on future impact fees for the amount in excess of the development’s proportionate share.

ACCOUNTING/EXPENDITURE OF COLLECTED DEVELOPMENT IMPACT FEES

Suggestions for the allocation and expenditure of collected impact fees can be found below:

- Impact fees should be maintained in interest-bearing accounts. This could be further delineated by category of system improvements and the service area in which the fees are collected.
- Interest earned should be considered funds of the account, and should be subject to all restrictions placed on the use of development impact fees.
- Expenditures of development impact fees should be made only for the category of system improvements of the service area shown in the capital improvements plan.
- Annual reports should be produced that describe the amount of all development impact fees collected, or spent during the preceding year delineated by category of public facility and service area.
- A timeframe for the expenditure of development impact fees that have been collected should be specified. If the funds are not expended within the prescribed timeframe they should be refunded.

REFUNDS

Suggestions for impact fee refund language:

- Development impact fees that have been paid should be refunded if:
    (i) The governmental entity, has failed to appropriate and expend the collected development impact fees.
    (ii) The impact fees are paid under protest and a review of the fee paid determines that it exceeded the proportionate share.
- Refunds should be sent to the owner of record within a specified timeframe after it is determined that a refund is due.
- Interest accrued from the date on which the fee was originally paid should also be refunded.

COLLECTION

The collection of development impact fees primarily occurs at one of the following two stages in the construction process:

(i) The issuance of a building permit; or
(ii) The issuance of a certificate of occupancy.

For an example of how many of the aforementioned concepts were implemented into law by the home builders of Arizona, See Arizona’s Impact Fee Statute included as Appendix D.

APPENDIX D

Arizona, Montana, and Texas Impact Fee Statutes

ARIZONA

Arizona's Response to Development Impact Fee Abuses

In 2011, after years of being on the receiving end of abusive development impact fee ordinances imposed by some of the rapidly growing cities in Arizona, the home building industry in Arizona, led by the Home Builders Association of Central Arizona, drafted Senate Bill 1525 (SB1525). This bill not only addressed these abuses but enacted comprehensive requirements for municipalities in Arizona that charge impact fees.

Background

During the housing boom years some of the fastest growing communities in Arizona began enacting development impact fee ordinances based on development impact fee studies that were lacking in many respects. Some of the more common challenges with these impact fees studies included:

- Inclusion of non-essential public improvements (e.g. cultural centers) in eligible costs;
- No delineation of service areas;
- Incomplete analysis of existing levels of service;
- Use of inconsistent levels of service;
- Using development fees to address existing infrastructure deficiencies;
- No consideration of funding offsets, or credits;
- Inaccurate cost estimates, and
- Logic and mathematical errors.

The result of these errors was to force new growth to fund more than its proportionate share of the public infrastructure burden.

SB 1525

As a result, the building industry drafted, lobbied for, and passed SB1525 in 2011. Among other things, this bill:

- Immediately required municipalities to remove "unnecessary public services" from their impact fee programs;
- Required existing municipal impact fee programs to be replaced with impact fees estimated pursuant to the tenets of SB 1525;

- Established strict deadlines for the adoption of impact fees which, if not met, required municipalities to stop collecting impact fees;
- Adopted constitutional "proportionality" requirements based on standardized service units;
- Required use of service areas in which there is a "substantial nexus" between public services and demand;
- Necessitated the preparation of infrastructure improvement plans by Arizona licensed engineers pursuant to approved land use assumptions;
- Required a detailed existing level of service analysis;
- Defined "necessary public services" and the facilities that would be eligible for funding through development impact fees;
- Required an offset to public service costs for other fees and taxes paid by new growth which will be used by the jurisdiction to fund public infrastructure costs, including but not limited to construction sales taxes, state shared revenues, existing municipal general obligation bonds, grants, etc.;
- Increased the amount of time and frequency of public hearings and industry input into the impact fee process; and
- Required a bi-annual audit of the impact fee program if the jurisdictions did not work with an impact fee advisory panel during the preparation of the impact fee program.

Result

As result of the enactment of SB1525, many jurisdictions' impact fees were reduced by as much as 20 percent as they were forced to remove "unnecessary public services" from their impact fee calculations. Other jurisdictions decided to abandon their impact fee programs altogether given the amount of time and cost involved in revising the fees to be compliant with SB1525. Still other municipalities followed the tenets of SB1525, which led to a much more transparent and reasonable allocation of public service costs to new growth. In all, SB1525 was a huge success in reining in the jurisdictional abuses related to impact fee calculations and serves as a good model for other state impact fee statutes. Arizona's full impact fee statute follows.

9-463.05. Development fees; imposition by cities and towns; infrastructure improvements plan; annual report; advisory committee; limitation on actions; definitions

A. A municipality may assess development fees to offset costs to the municipality associated with providing necessary public services to a development, including the costs of infrastructure, improvements, real property, engineering and architectural services, financing and professional services required for the preparation or revision of a development fee pursuant to this section, including the relevant portion of the infrastructure improvements plan.

B. Development fees assessed by a municipality under this section are subject to the following requirements:

    1. Development fees shall result in a beneficial use to the development.

    2. The municipality shall calculate the development fee based on the infrastructure improvements plan adopted pursuant to this section.

3. The development fee shall not exceed a proportionate share of the cost of necessary public services, based on service units, needed to provide necessary public services to the development.

4. Costs for necessary public services made necessary by new development shall be based on the same level of service provided to existing development in the service area.

5. Development fees may not be used for any of the following:

    a) Construction, acquisition or expansion of public facilities or assets other than necessary public services or facility expansions identified in the infrastructure improvements plan.
    b) Repair, operation or maintenance of existing or new necessary public services or facility expansions.
    c) Upgrading, updating, expanding, correcting or replacing existing necessary public services to serve existing development in order to meet stricter safety, efficiency, environmental or regulatory standards.
    d) Upgrading, updating, expanding, correcting or replacing existing necessary public services to provide a higher level of service to existing development.
    e) Administrative, maintenance or operating costs of the municipality.

6. Any development for which a development fee has been paid is entitled to the use and benefit of the services for which the fee was imposed and is entitled to receive immediate service from any existing facility with available capacity to serve the new service units if the available capacity has not been reserved or pledged in connection with the construction or financing of the facility.

7. Development fees may be collected if any of the following occurs:

    a) The collection is made to pay for a necessary public service or facility expansion that is identified in the infrastructure improvements plan and the municipality plans to complete construction and to have the service available within the time period established in the infrastructure improvement plan, but in no event longer than the time period provided in subsection H, paragraph 3 of this section.

    b) The municipality reserves in the infrastructure improvements plan adopted pursuant to this section or otherwise agrees to reserve capacity to serve future development.

    c) The municipality requires or agrees to allow the owner of a development to construct or finance the necessary public service or facility expansion and any of the following apply:

        i. The costs incurred or money advanced are credited against or reimbursed from the development fees otherwise due from a development.

ii. The municipality reimburses the owner for those costs from the development fees paid from all developments that will use those necessary public services or facility expansions.
iii. For those costs incurred the municipality allows the owner to assign the credits or reimbursement rights from the development fees otherwise due from a development to other developments for the same category of necessary public services in the same service area.

8. Projected interest charges and other finance costs may be included in determining the amount of development fees only if the monies are used for the payment of principal and interest on the portion of the bonds, notes or other obligations issued to finance construction of necessary public services or facility expansions identified in the infrastructure improvements plan.

9. Monies received from development fees assessed pursuant to this section shall be placed in a separate fund and accounted for separately and may only be used for the purposes authorized by this section. Monies received from a development fee identified in an infrastructure improvements plan adopted or updated pursuant to subsection D of this section shall be used to provide the same category of necessary public services or facility expansions for which the development fee was assessed and for the benefit of the same service area, as defined in the infrastructure improvements plan, in which the development fee was assessed. Interest earned on monies in the separate fund shall be credited to the fund.

10. The schedule for payment of fees shall be provided by the municipality. Based on the cost identified in the infrastructure improvements plan, the municipality shall provide a credit toward the payment of a development fee for the required or agreed to dedication of public sites, improvements and other necessary public services or facility expansions included in the infrastructure improvements plan and for which a development fee is assessed, to the extent the public sites, improvements and necessary public services or facility expansions are provided by the developer. The developer of residential dwelling units shall be required to pay development fees when construction permits for the dwelling units are issued, or at a later time if specified in a development agreement pursuant to section 9-500.05. If a development agreement provides for fees to be paid at a time later than the issuance of construction permits, the deferred fees shall be paid no later than fifteen days after the issuance of a certificate of occupancy. The development agreement shall provide for the value of any deferred fees to be supported by appropriate security, including a surety bond, letter of credit or cash bond.

11. If a municipality requires as a condition of development approval the construction or improvement of, contributions to or dedication of any facilities that were not included in a previously adopted infrastructure improvements plan, the municipality shall cause the infrastructure improvements plan to be amended to include the facilities and shall provide a credit toward the payment of a development fee for the construction, improvement, contribution or dedication of the facilities to the extent that the facilities

will substitute for or otherwise reduce the need for other similar facilities in the infrastructure improvements plan for which development fees were assessed.

12. The municipality shall forecast the contribution to be made in the future in cash or by taxes, fees, assessments or other sources of revenue derived from the property owner towards the capital costs of the necessary public service covered by the development fee and shall include these contributions in determining the extent of the burden imposed by the development. Beginning August 1, 2014, for purposes of calculating the required offset to development fees pursuant to this subsection, if a municipality imposes a construction contracting or similar excise tax rate in excess of the percentage amount of the transaction privilege tax rate imposed on the majority of other transaction privilege tax classifications, the entire excess portion of the construction contracting or similar excise tax shall be treated as a contribution to the capital costs of necessary public services provided to development for which development fees are assessed, unless the excess portion was already taken into account for such purpose pursuant to this subsection.

13. If development fees are assessed by a municipality, the fees shall be assessed against commercial, residential and industrial development, except that the municipality may distinguish between different categories of residential, commercial and industrial development in assessing the costs to the municipality of providing necessary public services to new development and in determining the amount of the development fee applicable to the category of development. If a municipality agrees to waive any of the development fees assessed on a development, the municipality shall reimburse the appropriate development fee accounts for the amount that was waived. The municipality shall provide notice of any such waiver to the advisory committee established pursuant to subsection G of this section within thirty days.

14. In determining and assessing a development fee applying to land in a community facilities district established under title 48, chapter 4, article 6, the municipality shall take into account all public infrastructure provided by the district and capital costs paid by the district for necessary public services and shall not assess a portion of the development fee based on the infrastructure or costs.

C. A municipality shall give at least thirty days' advance notice of intention to assess a development fee and shall release to the public and post on its website or the website of an association of cities and towns if a municipality does not have a website a written report of the land use assumptions and infrastructure improvements plan adopted pursuant to subsection D of this section. The municipality shall conduct a public hearing on the proposed development fee at any time after the expiration of the thirty day notice of intention to assess a development fee and at least thirty days before the scheduled date of adoption of the fee by the governing body. Within sixty days after the date of the public hearing on the proposed development fee, a municipality shall approve or disapprove the imposition of the development fee. A municipality shall not adopt an ordinance, order or resolution approving a development fee as an emergency measure. A development fee assessed pursuant to this section shall not be effective until seventy-five days after its formal

adoption by the governing body of the municipality. Nothing in this subsection shall affect any development fee adopted before July 24, 1982.

D. Before the adoption or amendment of a development fee, the governing body of the municipality shall adopt or update the land use assumptions and infrastructure improvements plan for the designated service area. The municipality shall conduct a public hearing on the land use assumptions and infrastructure improvements plan at least thirty days before the adoption or update of the plan. The municipality shall release the plan to the public, post the plan on its website or the website of an association of cities and towns if the municipality does not have a website, including in the posting its land use assumptions, the time period of the projections, a description of the necessary public services included in the infrastructure improvements plan and a map of the service area to which the land use assumptions apply, make available to the public the documents used to prepare the assumptions and plan and provide public notice at least sixty days before the public hearing, subject to the following:

1. The land use assumptions and infrastructure improvements plan shall be approved or disapproved within sixty days after the public hearing on the land use assumptions and infrastructure improvements plan and at least thirty days before the public hearing on the report required by subsection C of this section. A municipality shall not adopt an ordinance, order or resolution approving the land use assumptions or infrastructure improvements plan as an emergency measure.

2. An infrastructure improvements plan shall be developed by qualified professionals using generally accepted engineering and planning practices pursuant to subsection E of this section.

3. A municipality shall update the land use assumptions and infrastructure improvements plan at least every five years. The initial five year period begins on the day the infrastructure improvements plan is adopted. The municipality shall review and evaluate its current land use assumptions and shall cause an update of the infrastructure improvements plan to be prepared pursuant to this section.

4. Within sixty days after completion of the updated land use assumptions and infrastructure improvements plan, the municipality shall schedule and provide notice of a public hearing to discuss and review the update and shall determine whether to amend the assumptions and plan.

5. A municipality shall hold a public hearing to discuss the proposed amendments to the land use assumptions, the infrastructure improvements plan or the development fee. The land use assumptions and the infrastructure improvements plan, including the amount of any proposed changes to the development fee per service unit, shall be made available to the public on or before the date of the first publication of the notice of the hearing on the amendments.

6. The notice and hearing procedures prescribed in paragraph 1 of this subsection apply to a hearing on the amendment of land use assumptions, an infrastructure improvements

plan or a development fee. Within sixty days after the date of the public hearing on the amendments, a municipality shall approve or disapprove the amendments to the land use assumptions, infrastructure improvements plan or development fee. A municipality shall not adopt an ordinance, order or resolution approving the amended land use assumptions, infrastructure improvements plan or development fee as an emergency measure.

7. The advisory committee established under subsection G of this section shall file its written comments on any proposed or updated land use assumptions, infrastructure improvements plan and development fees before the fifth business day before the date of the public hearing on the proposed or updated assumptions, plan and fees.

8. If, at the time an update as prescribed in paragraph 3 of this subsection is required, the municipality determines that no changes to the land use assumptions, infrastructure improvements plan or development fees are needed, the municipality may as an alternative to the updating requirements of this subsection publish notice of its determination on its website and include the following:

    a) A statement that the municipality has determined that no change to the land use assumptions, infrastructure improvements plan or development fee is necessary.
    b) A description and map of the service area in which an update has been determined to be unnecessary.
    c) A statement that by a specified date, which shall be at least sixty days after the date of publication of the first notice, a person may make a written request to the municipality requesting that the land use assumptions, infrastructure improvements plan or development fee be updated.
    d) A statement identifying the person or entity to whom the written request for an update should be sent.

9. If, by the date specified pursuant to paragraph 8 of this subsection, a person requests in writing that the land use assumptions, infrastructure improvements plan or development fee be updated, the municipality shall cause, accept or reject an update of the assumptions and plan to be prepared pursuant to this subsection.

10. Notwithstanding the notice and hearing requirements for adoption of an infrastructure improvements plan, a municipality may amend an infrastructure improvements plan adopted pursuant to this section without a public hearing if the amendment addresses only elements of necessary public services in the existing infrastructure improvements plan and the changes to the plan will not, individually or cumulatively with other amendments adopted pursuant to this subsection, increase the level of service in the service area or cause a development fee increase of greater than five per cent when a new or modified development fee is assessed pursuant to this section. The municipality shall provide notice of any such amendment at least thirty days before adoption, shall post the amendment on its website or on the website of an association of cities and towns if the municipality does not have a website and shall provide notice to the

advisory committee established pursuant to subsection G of this section that the amendment complies with this subsection.

E. For each necessary public service that is the subject of a development fee, the infrastructure improvements plan shall include:

1. A description of the existing necessary public services in the service area and the costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable.

2. An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable.

3. A description of all or the parts of the necessary public services or facility expansions and their costs necessitated by and attributable to development in the service area based on the approved land use assumptions, including a forecast of the costs of infrastructure, improvements, real property, financing, engineering and architectural services, which shall be prepared by qualified professionals licensed in this state, as applicable.

4. A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial and industrial.

5. The total number of projected service units necessitated by and attributable to new development in the service area based on the approved land use assumptions and calculated pursuant to generally accepted engineering and planning criteria.

6. The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years.

7. A forecast of revenues generated by new service units other than development fees, which shall include estimated state-shared revenue, highway users revenue, federal revenue, ad valorem property taxes, construction contracting or similar excise taxes and the capital recovery portion of utility fees attributable to development based on the approved land use assumptions, and a plan to include these contributions in determining the extent of the burden imposed by the development as required in subsection B, paragraph 12 of this section.

F. A municipality's development fee ordinance shall provide that a new development fee or an increased portion of a modified development fee shall not be assessed against a development for twenty-four months after the date that the municipality issues the final approval for a commercial, industrial or multifamily development or the date that the first building permit is issued for a

residential development pursuant to an approved site plan or subdivision plat, provided that no subsequent changes are made to the approved site plan or subdivision plat that would increase the number of service units. If the number of service units increases, the new or increased portion of a modified development fee shall be limited to the amount attributable to the additional service units. The twenty-four month period shall not be extended by a renewal or amendment of the site plan or the final subdivision plat that was the subject of the final approval. The municipality shall issue, on request, a written statement of the development fee schedule applicable to the development. If, after the date of the municipality's final approval of a development, the municipality reduces the development fee assessed on development, the reduced fee shall apply to the development.

G. A municipality shall do one of the following:

1. Before the adoption of proposed or updated land use assumptions, infrastructure improvements plan and development fees as prescribed in subsection D of this section, the municipality shall appoint an infrastructure improvements advisory committee, subject to the following requirements:

a) The advisory committee shall be composed of at least five members who are appointed by the governing body of the municipality. At least fifty per cent of the members of the advisory committee must be representatives of the real estate, development or building industries, of which at least one member of the committee must be from the home building industry. Members shall not be employees or officials of the municipality.

b) The advisory committee shall serve in an advisory capacity and shall:

i. Advise the municipality in adopting land use assumptions and in determining whether the assumptions are in conformance with the general plan of the municipality.
ii. Review the infrastructure improvements plan and file written comments.
iii. Monitor and evaluate implementation of the infrastructure improvements plan.
iv. Every year file reports with respect to the progress of the infrastructure improvements plan and the collection and expenditures of development fees and report to the municipality any perceived inequities in implementing the plan or imposing the development fee.
v. Advise the municipality of the need to update or revise the land use assumptions, infrastructure improvements plan and development fee.

c) The municipality shall make available to the advisory committee any professional reports with respect to developing and implementing the infrastructure improvements plan.

d) The municipality shall adopt procedural rules for the advisory committee to follow in carrying out the committee's duties.

2. In lieu of creating an advisory committee pursuant to paragraph 1 of this subsection, provide for a biennial certified audit of the municipality's land use assumptions, infrastructure improvements plan and development fees. An audit pursuant to this paragraph shall be conducted by one or more qualified professionals who are not employees or officials of the municipality and who did not prepare the infrastructure improvements plan. The audit shall review the progress of the infrastructure improvements plan, including the collection and expenditures of development fees for each project in the plan, and evaluate any inequities in implementing the plan or imposing the development fee. The municipality shall post the findings of the audit on the municipality's website or the website of an association of cities and towns if the municipality does not have a website and shall conduct a public hearing on the audit within sixty days of the release of the audit to the public.

H. On written request, an owner of real property for which a development fee has been paid after July 31, 2014 is entitled to a refund of a development fee or any part of a development fee if:

1. Pursuant to subsection B, paragraph 6 of this section, existing facilities are available and service is not provided.

2. The municipality has, after collecting the fee to construct a facility when service is not available, failed to complete construction within the time period identified in the infrastructure improvements plan, but in no event later than the time period specified in paragraph 3 of this subsection.

3. For a development fee other than a development fee for water or wastewater facilities, any part of the development fee is not spent as authorized by this section within ten years after the fee has been paid or, for a development fee for water or wastewater facilities, any part of the development fee is not spent as authorized by this section within fifteen years after the fee has been paid.

I. If the development fee was collected for the construction of all or a portion of a specific item of infrastructure, and on completion of the infrastructure the municipality determines that the actual cost of construction was less than the forecasted cost of construction on which the development fee was based and the difference between the actual and estimated cost is greater than ten per cent, the current owner may receive a refund of the portion of the development fee equal to the difference between the development fee paid and the development fee that would have been due if the development fee had been calculated at the actual construction cost.

J. A refund shall include any interest earned by the municipality from the date of collection to the date of refund on the amount of the refunded fee. All refunds shall be made to the record owner of the property at the time the refund is paid. If the development fee is paid by a governmental entity, the refund shall be paid to the governmental entity.

K. A development fee that was adopted before January 1, 2012 may continue to be assessed only to the extent that it will be used to provide a necessary public service for which development fees can

be assessed pursuant to this section and shall be replaced by a development fee imposed under this section on or before August 1, 2014. Any municipality having a development fee that has not been replaced under this section on or before August 1, 2014 shall not collect development fees until the development fee has been replaced with a fee that complies with this section. Any development fee monies collected before January 1, 2012 remaining in a development fee account:

1. Shall be used towards the same category of necessary public services as authorized by this section.

2. If development fees were collected for a purpose not authorized by this section, shall be used for the purpose for which they were collected on or before January 1, 2020, and after which, if not spent, shall be distributed equally among the categories of necessary public services authorized by this section.

L. A moratorium shall not be placed on development for the sole purpose of awaiting completion of all or any part of the process necessary to develop, adopt or update development fees.

M. In any judicial action interpreting this section, all powers conferred on municipal governments in this section shall be narrowly construed to ensure that development fees are not used to impose on new residents a burden all taxpayers of a municipality should bear equally.

N. Each municipality that assesses development fees shall submit an annual report accounting for the collection and use of the fees for each service area. The annual report shall include the following:

1. The amount assessed by the municipality for each type of development fee.

2. The balance of each fund maintained for each type of development fee assessed as of the beginning and end of the fiscal year.

3. The amount of interest or other earnings on the monies in each fund as of the end of the fiscal year.

4. The amount of development fee monies used to repay:

    a) Bonds issued by the municipality to pay the cost of a capital improvement project that is the subject of a development fee assessment, including the amount needed to repay the debt service obligations on each facility for which development fees have been identified as the source of funding and the time frames in which the debt service will be repaid.
    b) Monies advanced by the municipality from funds other than the funds established for development fees in order to pay the cost of a capital improvement project that is the subject of a development fee assessment, the total amount advanced by the municipality for each facility, the source of the monies advanced and the terms under which the monies will be repaid to the municipality.

5. The amount of development fee monies spent on each capital improvement project that is the subject of a development fee assessment and the physical location of each capital improvement project.

6. The amount of development fee monies spent for each purpose other than a capital improvement project that is the subject of a development fee assessment.

O. Within ninety days following the end of each fiscal year, each municipality shall submit a copy of the annual report to the city clerk and post the report on the municipality's website or the website of an association of cities and towns if the municipality does not have a website. Copies shall be made available to the public on request. The annual report may contain financial information that has not been audited.

P. A municipality that fails to file the report and post the report on the municipality's website or the website of an association of cities and towns if the municipality does not have a website as required by this section shall not collect development fees until the report is filed and posted.

Q. Any action to collect a development fee shall be commenced within two years after the obligation to pay the fee accrues.

R. A municipality may continue to assess a development fee adopted before January 1, 2012 for any facility that was financed before June 1, 2011 if:

1. Development fees were pledged to repay debt service obligations related to the construction of the facility.

2. After August 1, 2014, any development fees collected under this subsection are used solely for the payment of principal and interest on the portion of the bonds, notes or other debt service obligations issued before June 1, 2011 to finance construction of the facility.

S. Through August 1, 2014, a development fee adopted before January 1, 2012 may be used to finance construction of a facility and may be pledged to repay debt service obligations if:

1. The facility that is being financed is a facility that is described under subsection T, paragraph 7, subdivisions (a) through (g) of this section.

2. The facility was included in an infrastructure improvements plan adopted before June 1, 2011.

3. The development fees are used for the payment of principal and interest on the portion of the bonds, notes or other debt service obligations issued to finance construction of the necessary public services or facility expansions identified in the infrastructure improvement plan.

T. For the purposes of this section:

1. "Dedication" means the actual conveyance date or the date an improvement, facility or real or personal property is placed into service, whichever occurs first.

2. "Development" means:
    a) The subdivision of land.
    b) The construction, reconstruction, conversion, structural alteration, relocation or enlargement of any structure that adds or increases the number of service units.
    c) Any use or extension of the use of land that increases the number of service units.

3. "Facility expansion" means the expansion of the capacity of an existing facility that serves the same function as an otherwise new necessary public service in order that the existing facility may serve new development. Facility expansion does not include the repair, maintenance, modernization or expansion of an existing facility to better serve existing development.

4. "Final approval" means:

    a) For a nonresidential or multifamily development, the approval of a site plan or, if no site plan is submitted for the development, the approval of a final subdivision plat.
    b) For a single family residential development, the approval of a final subdivision plat.

5. "Infrastructure improvements plan" means a written plan that identifies each necessary public service or facility expansion that is proposed to be the subject of a development fee and otherwise complies with the requirements of this section, and may be the municipality's capital improvements plan.

6. "Land use assumptions" means projections of changes in land uses, densities, intensities and population for a specified service area over a period of at least ten years and pursuant to the general plan of the municipality.

7. "Necessary public service" means any of the following facilities that have a life expectancy of three or more years and that are owned and operated by or on behalf of the municipality:

    a) Water facilities, including the supply, transportation, treatment, purification and distribution of water, and any appurtenances for those facilities.
    b) Wastewater facilities, including collection, interception, transportation, treatment and disposal of wastewater, and any appurtenances for those facilities.
    c) Storm water, drainage and flood control facilities, including any appurtenances for those facilities.
    d) Library facilities of up to ten thousand square feet that provide a direct benefit to development, not including equipment, vehicles or appurtenances.
    e) Street facilities located in the service area, including arterial or collector streets or roads that have been designated on an officially adopted plan of the municipality, traffic signals and rights-of-way and improvements thereon.
    f) Fire and police facilities, including all appurtenances, equipment and vehicles. Fire and police facilities do not include a facility or portion of a facility that is used to replace services that were once provided elsewhere in the municipality, vehicles and equipment used to provide administrative services, helicopters or airplanes or a facility that is used for training firefighters or officers from more than one station or substation.

g) Neighborhood parks and recreational facilities on real property up to thirty acres in area, or parks and recreational facilities larger than thirty acres if the facilities provide a direct benefit to the development. Park and recreational facilities do not include vehicles, equipment or that portion of any facility that is used for amusement parks, aquariums, aquatic centers, auditoriums, arenas, arts and cultural facilities, bandstand and orchestra facilities, bathhouses, boathouses, clubhouses, community centers greater than three thousand square feet in floor area, environmental education centers, equestrian facilities, golf course facilities, greenhouses, lakes, museums, theme parks, water reclamation or riparian areas, wetlands, zoo facilities or similar recreational facilities, but may include swimming pools.

h) Any facility that was financed and that meets all of the requirements prescribed in subsection R of this section.

8. "Qualified professional" means a professional engineer, surveyor, financial analyst or planner providing services within the scope of the person's license, education or experience.

9. "Service area" means any specified area within the boundaries of a municipality in which development will be served by necessary public services or facility expansions and within which a substantial nexus exists between the necessary public services or facility expansions and the development being served as prescribed in the infrastructure improvements plan.

10. "Service unit" means a standardized measure of consumption, use, generation or discharge attributable to an individual unit of development calculated pursuant to generally accepted engineering or planning standards for a particular category of necessary public services or facility expansions.

Montana Impact Fee Statute

7-6-1601. Definitions. As used in this part, the following definitions apply:

(1) (a) "Capital improvements" means improvements, land, and equipment with a useful life of 10 years or more that increase or improve the service capacity of a public facility.

(b) The term does not include consumable supplies.

(2) "Connection charge" means the actual cost of connecting a property to a public utility system and is limited to the labor, materials, and overhead involved in making connections and installing meters.

(3) "Development" means construction, renovation, or installation of a building or structure, a change in use of a building or structure, or a change in the use of land when the construction, installation, or other action creates additional demand for public facilities.

(4) "Governmental entity" means a county, city, town, or consolidated government.

(5) (a) "Impact fee" means any charge imposed upon development by a governmental entity as part of the development approval process to fund the additional service capacity required by the development from which it is collected. An impact fee may include a fee for the administration of the impact fee not to exceed 5% of the total impact fee collected.

(b) The term does not include:

(i) a charge or fee to pay for administration, plan review, or inspection costs associated with a permit required for development;
(ii) a connection charge;
(iii) any other fee authorized by law, including but not limited to user fees, special improvement district assessments, fees authorized under Title 7 for county, municipal, and consolidated government sewer and water districts and systems, and costs of ongoing maintenance; or
(iv) onsite or offsite improvements necessary for new development to meet the safety, level of service, and other minimum development standards that have been adopted by the governmental entity.

(6) "Proportionate share" means that portion of the cost of capital system improvements that reasonably relates to the service demands and needs of the project. A proportionate share must take into account the limitations provided in 7-6-1602.

(7) "Public facilities" means:

(a) a water supply production, treatment, storage, or distribution facility;

(b) a wastewater collection, treatment, or disposal facility;

(c) a transportation facility, including roads, streets, bridges, rights-of-way, traffic signals, and landscaping;

(d) a storm water collection, retention, detention, treatment, or disposal facility or a flood control facility;

(e) a police, emergency medical rescue, or fire protection facility; and

(f) other facilities for which documentation is prepared as provided in 7-6-1602 that have been approved as part of an impact fee ordinance or resolution by:

(i) a two-thirds majority of the governing body of an incorporated city, town, or consolidated local government; or
(ii) a unanimous vote of the board of county commissioners of a county government

7-6-1602. Calculation of impact fees -- documentation required -- ordinance or resolution -- requirements for impact fees.

(1) For each public facility for which an impact fee is imposed, the governmental entity shall prepare and approve a service area report.

(2) The service area report is a written analysis that must:

(a) describe existing conditions of the facility;

(b) establish level-of-service standards;

(c) forecast future additional needs for service for a defined period of time;

(d) identify capital improvements necessary to meet future needs for service;

(e) identify those capital improvements needed for continued operation and maintenance of the facility;

(f) make a determination as to whether one service area or more than one service area is necessary to establish a correlation between impact fees and benefits;

(g) make a determination as to whether one service area or more than one service area for transportation facilities is needed to establish a correlation between impact fees and benefits;

(h) establish the methodology and time period over which the governmental entity will assign the proportionate share of capital costs for expansion of the facility to provide service to new development within each service area;

(i) establish the methodology that the governmental entity will use to exclude operations and maintenance costs and correction of existing deficiencies from the impact fee;

(j) establish the amount of the impact fee that will be imposed for each unit of increased service demand; and

(k) have a component of the budget of the governmental entity that:

(i) schedules construction of public facility capital improvements to serve projected growth;
(ii) projects costs of the capital improvements;
(iii) allocates collected impact fees for construction of the capital improvements; and
(iv) covers at least a 5-year period and is reviewed and updated at least every 5 years.

(3) The service area report is a written analysis that must contain documentation of sources and methodology used for purposes of subsection (2) and must document how each impact fee meets the requirements of subsection (7).

(4) The service area report that supports adoption and calculation of an impact fee must be available to the public upon request.

(5) The amount of each impact fee imposed must be based upon the actual cost of public facility expansion or improvements or reasonable estimates of the cost to be incurred by the governmental entity as a result of new development. The calculation of each impact fee must be in accordance with generally accepted accounting principles.

(6) The ordinance or resolution adopting the impact fee must include a time schedule for periodically updating the documentation required under subsection (2).

(7) An impact fee must meet the following requirements:

(a) The amount of the impact fee must be reasonably related to and reasonably attributable to the development's share of the cost of infrastructure improvements made necessary by the new development.

(b) The impact fees imposed may not exceed a proportionate share of the costs incurred or to be incurred by the governmental entity in accommodating the development. The following factors must be considered in determining a proportionate share of public facilities capital improvements costs:

(i) the need for public facilities capital improvements required to serve new development; and
(ii) consideration of payments for system improvements reasonably anticipated to be made by or as a result of the development in the form of user fees, debt service payments, taxes, and other available sources of funding the system improvements.

(c) Costs for correction of existing deficiencies in a public facility may not be included in the impact fee.

(d) New development may not be held to a higher level of service than existing users unless there is a mechanism in place for the existing users to make improvements to the existing system to match the higher level of service.

(e) Impact fees may not include expenses for operations and maintenance of the facility.

7-6-1603. Collection and expenditure of impact fees -- refunds or credits -- mechanism for appeal required.

(1) The collection and expenditure of impact fees must comply with this part. The collection and expenditure of impact fees must be reasonably related to the benefits accruing to the development paying the impact fees. The ordinance or resolution adopted by the governmental entity must include the following requirements:

(a) Upon collection, impact fees must be deposited in a special proprietary fund, which must be invested with all interest accruing to the fund.

(b) A governmental entity may impose impact fees on behalf of local districts.

(c) If the impact fees are not collected or spent in accordance with the impact fee ordinance or resolution or in accordance with 7-6-1602, any impact fees that were collected must be refunded to the person who owned the property at the time that the refund was due.

(2) All impact fees imposed pursuant to the authority granted in this part must be paid no earlier than the date of issuance of a building permit if a building permit is required for the development or no earlier than the time of wastewater or water service connection or well or septic permitting.

(3) A governmental entity may recoup costs of excess capacity in existing capital facilities, when the excess capacity has been provided in anticipation of the needs of new development, by requiring impact fees for that portion of the facilities constructed for future users. The need to recoup costs for excess capacity must have been documented pursuant to 7-6-1602 in a manner that demonstrates the need for the excess capacity. This part does not prevent a governmental entity from continuing to assess an impact fee that recoups costs for excess capacity in an existing facility. The impact fees imposed to recoup the costs to provide the excess capacity must be based on the governmental entity's actual cost of acquiring, constructing, or upgrading the facility and must be no more than a proportionate share of the costs to provide the excess capacity.

(4) Governmental entities may accept the dedication of land or the construction of public facilities in lieu of payment of impact fees if:

(a) the need for the dedication or construction is clearly documented pursuant to 7-6-1602;

(b) the land proposed for dedication for the public facilities to be constructed is determined to be appropriate for the proposed use by the governmental entity;

(c) formulas or procedures for determining the worth of proposed dedications or constructions are established as part of the impact fee ordinance or resolution; and

(d) a means to establish credits against future impact fee revenue has been created as part of the adopting ordinance or resolution if the dedication of land or construction of public facilities is of worth in excess of the impact fee due from an individual development.

(5) Impact fees may not be imposed for remodeling, rehabilitation, or other improvements to an existing structure or for rebuilding a damaged structure unless there is an increase in units that increase service demand as described in 7-6-1602(2)(j). If impact fees are imposed for remodeling, rehabilitation, or other improvements to an existing structure or use, only the net increase between the old and new demand may be imposed.

(6) This part does not prevent a governmental entity from granting refunds or credits:

(a) that it considers appropriate and that are consistent with the provisions of 7-6-1602 and this chapter; or

(b) in accordance with a voluntary agreement, consistent with the provisions of 7-6-1602 and this chapter, between the governmental entity and the individual or entity being assessed the impact fees.

(7) An impact fee represents a fee for service payable by all users creating additional demand on the facility.

(8) An impact fee ordinance or resolution must include a mechanism whereby a person charged an impact fee may appeal the charge if the person believes an error has been made.

7-6-1604. Impact fee advisory committee.

(1) A governmental entity that intends to propose an impact fee ordinance or resolution shall establish an impact fee advisory committee.

(2) An impact fee advisory committee must include at least one representative of the development community. The committee shall review and monitor the process of calculating, assessing, and spending impact fees.

(3) The impact fee advisory committee shall serve in an advisory capacity to the governing body of the governmental entity.

Texas Impact Fee Statute

Sec. 395.001. DEFINITIONS.

In this chapter:

(1) "Capital improvement" means any of the following facilities that have a life expectancy of three or more years and are owned and operated by or on behalf of a political subdivision:

(A) water supply, treatment, and distribution facilities; wastewater collection and treatment facilities; and storm water, drainage, and flood control facilities; whether or not they are located within the service area; and

(B) roadway facilities.

(2) "Capital improvements plan" means a plan required by this chapter that identifies capital improvements or facility expansions for which impact fees may be assessed.

(3) "Facility expansion" means the expansion of the capacity of an existing facility that serves the same function as an otherwise necessary new capital improvement, in order that the existing facility may serve new development. The term does not include the repair, maintenance, modernization, or expansion of an existing facility to better serve existing development.

(4) "Impact fee" means a charge or assessment imposed by a political subdivision against new development in order to generate revenue for funding or recouping the costs of capital improvements or facility expansions necessitated by and attributable to the new development. The term includes amortized charges, lump-sum charges, capital recovery fees, contributions in aid of construction, and any other fee that functions as described by this definition. The term does not include:

(A) dedication of land for public parks or payment in lieu of the dedication to serve park needs;

(B) dedication of rights-of-way or easements or construction or dedication of on-site or off-site water distribution, wastewater collection or drainage facilities, or streets, sidewalks, or curbs if the dedication or construction is required by a valid ordinance and is necessitated by and attributable to the new development;

(C) lot or acreage fees to be placed in trust funds for the purpose of reimbursing developers for oversizing or constructing water or sewer mains or lines; or

(D) other pro rata fees for reimbursement of water or sewer mains or lines extended by the political subdivision.

However, an item included in the capital improvements plan may not be required to be constructed except in accordance with Section 395.019(2), and an owner may not be required to construct or dedicate facilities and to pay impact fees for those facilities.

(5) "Land use assumptions" includes a description of the service area and projections of changes in land uses, densities, intensities, and population in the service area over at least a 10-year period.

(6) "New development" means the subdivision of land; the construction, reconstruction, redevelopment, conversion, structural alteration, relocation, or enlargement of any structure; or any use or extension of the use of land; any of which increases the number of service units.

(7) "Political subdivision" means a municipality, a district or authority created under Article III, Section 52, or Article XVI, Section 59, of the Texas Constitution, or, for the purposes set forth by Section 395.079, certain counties described by that section.

(8) "Roadway facilities" means arterial or collector streets or roads that have been designated on an officially adopted roadway plan of the political subdivision, together with all necessary appurtenances. The term includes the political subdivision's share of costs for roadways and associated improvements designated on the federal or Texas highway system, including local matching funds and costs related to utility line relocation and the establishment of curbs, gutters, sidewalks, drainage appurtenances, and rights-of-way.

(9) "Service area" means the area within the corporate boundaries or extraterritorial jurisdiction, as determined under Chapter 42, of the political subdivision to be served by the capital improvements or facilities expansions specified in the capital improvements plan, except roadway facilities and storm water, drainage, and flood control facilities. The service area, for the purposes of this chapter, may include all or part of the land within the political subdivision or its extraterritorial jurisdiction, except for roadway facilities and storm water, drainage, and flood control facilities. For roadway facilities, the service area is limited to an area within the corporate boundaries of the political subdivision and shall not exceed six miles. For storm water, drainage, and flood control facilities, the service area may include all or part of the land within the political subdivision or its extraterritorial jurisdiction, but shall not exceed the area actually served by the storm water, drainage, and flood control facilities designated in the capital improvements plan and shall not extend across watershed boundaries.

(10) "Service unit" means a standardized measure of consumption, use, generation, or discharge attributable to an individual unit of development calculated in accordance with generally accepted engineering or planning standards and based on historical data and trends applicable to the political subdivision in which the individual unit of development is located during the previous 10 years.

SUBCHAPTER B. AUTHORIZATION OF IMPACT FEE

Sec. 395.011. AUTHORIZATION OF FEE.

(a) Unless otherwise specifically authorized by state law or this chapter, a governmental entity or political subdivision may not enact or impose an impact fee.

(b) Political subdivisions may enact or impose impact fees on land within their corporate boundaries or extraterritorial jurisdictions only by complying with this chapter, except that impact fees may not be enacted or imposed in the extraterritorial jurisdiction for roadway facilities.

(c) A municipality may contract to provide capital improvements, except roadway facilities, to an area outside its corporate boundaries and extraterritorial jurisdiction and may charge an impact fee under the contract, but if an impact fee is charged in that area, the municipality must comply with this chapter.

Sec. 395.012. ITEMS PAYABLE BY FEE.

(a) An impact fee may be imposed only to pay the costs of constructing capital improvements or facility expansions, including and limited to the:

(1) construction contract price;
(2) surveying and engineering fees;
(3) land acquisition costs, including land purchases, court awards and costs, attorney ’s fees, and expert witness fees; and
(4) fees actually paid or contracted to be paid to an independent qualified engineer or financial consultant preparing or updating the capital improvements plan who is not an employee of the political subdivision.

(b) Projected interest charges and other finance costs may be included in determining the amount of impact fees only if the impact fees are used for the payment of principal and interest on bonds, notes, or other obligations issued by or on behalf of the political subdivision to finance the capital improvements or facility expansions identified in the capital improvements plan and are not used to reimburse bond funds expended for facilities that are not identified in the capital improvements plan.

(c) Notwithstanding any other provision of this chapter, the Edwards Underground Water District or a river authority that is authorized elsewhere by state law to charge fees that function as impact fees may use impact fees to pay a staff engineer who prepares or updates a capital improvements plan under this chapter.

(d) A municipality may pledge an impact fee as security for the payment of debt service on a bond, note, or other obligation issued to finance a capital improvement or public facility expansion if:

(1) the improvement or expansion is identified in a capital improvements plan; and

(2) at the time of the pledge, the governing body of the municipality certifies in a written order, ordinance, or resolution that none of the impact fee will be used or expended for an improvement or expansion not identified in the plan.

(e) A certification under Subsection (d)(2) is sufficient evidence that an impact fee pledged will not be used or expended for an improvement or expansion that is not identified in the capital improvements plan.

Sec. 395.013. ITEMS NOT PAYABLE BY FEE.

Impact fees may not be adopted or used to pay for:

(1) construction, acquisition, or expansion of public facilities or assets other than capital improvements or facility expansions identified in the capital improvements plan;

(2) repair, operation, or maintenance of existing or new capital improvements or facility expansions;

(3) upgrading, updating, expanding, or replacing existing capital improvements to serve existing development in order to meet stricter safety, efficiency, environmental, or regulatory standards;

(4) upgrading, updating, expanding, or replacing existing capital improvements to provide better service to existing development;

(5) administrative and operating costs of the political subdivision, except the Edwards Underground Water District or a river authority that is authorized elsewhere by state law to charge fees that function as impact fees may use impact fees to pay its administrative and operating costs;

(6) principal payments and interest or other finance charges on bonds or other indebtedness, except as allowed by Section 395.012.

Sec. 395.014. CAPITAL IMPROVEMENTS PLAN.

(a) The political subdivision shall use qualified professionals to prepare the capital improvements plan and to calculate the impact fee. The capital improvements plan must contain specific enumeration of the following items:

(1) a description of the existing capital improvements within the service area and the costs to upgrade, update, improve, expand, or replace the improvements to meet existing needs and usage and stricter safety, efficiency, environmental, or regulatory standards, which shall be prepared by a qualified professional engineer licensed to perform the professional engineering services in this state;

(2) an analysis of the total capacity, the level of current usage, and commitments for usage of capacity of the existing capital improvements, which shall be prepared by a qualified professional engineer licensed to perform the professional engineering services in this state;

(3) a description of all or the parts of the capital improvements or facility expansions and their costs necessitated by and attributable to new development in the service area based on the approved land use assumptions, which shall be prepared by a qualified professional engineer licensed to perform the professional engineering services in this state;

(4) a definitive table establishing the specific level or quantity of use, consumption, generation, or discharge of a service unit for each category of capital improvements or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial, and industrial;

(5) the total number of projected service units necessitated by and attributable to new development within the service area based on the approved land use assumptions and calculated in accordance with generally accepted engineering or planning criteria;

(6) the projected demand for capital improvements or facility expansions required by new service units projected over a reasonable period of time, not to exceed 10 years; and

(7) a plan for awarding:

(A) a credit for the portion of ad valorem tax and utility service revenues generated by new service units during the program period that is used for the payment of improvements, including the payment of debt, that are included in the capital improvements plan; or

(B) in the alternative, a credit equal to 50 percent of the total projected cost of implementing the capital improvements plan.

(b) The analysis required by Subsection (a)(3) may be prepared on a system-wide basis within the service area for each major category of capital improvement or facility expansion for the designated service area.

(c) The governing body of the political subdivision is responsible for supervising the implementation of the capital improvements plan in a timely manner.

Sec. 395.015. MAXIMUM FEE PER SERVICE UNIT.

(a) The impact fee per service unit may not exceed the amount determined by subtracting the amount in Section 395.014(a)(7) from the costs of the capital improvements described by Section 395.014(a)(3) and dividing that amount by the total number of projected service units described by Section 395.014(a)(5).

(b) If the number of new service units projected over a reasonable period of time is less than the total number of new service units shown by the approved land use assumptions at full development of the service area, the maximum impact fee per service unit shall be calculated by dividing the costs of the part of the capital improvements necessitated by and attributable to projected new service units described by Section 395.014(a)(6) by the projected new service units described in that section.

Sec. 395.016. TIME FOR ASSESSMENT AND COLLECTION OF FEE.

(a) This subsection applies only to impact fees adopted and land platted before June 20, 1987. For land that has been platted in accordance with Subchapter A, Chapter 212, or the subdivision or platting procedures of a political subdivision before June 20, 1987, or land on which new development occurs or is proposed without platting, the political subdivision may assess the impact fees at any time during the development approval and building process. Except as provided by Section 395.019, the political subdivision may collect the fees at either the time of recordation of the subdivision plat or connection

to the political subdivision ’s water or sewer system or at the time the political subdivision issues either the building permit or the certificate of occupancy.

(b) This subsection applies only to impact fees adopted before June 20, 1987, and land platted after that date. For new development which is platted in accordance with Subchapter A, Chapter 212, or the subdivision or platting procedures of a political subdivision after June 20, 1987, the political subdivision may assess the impact fees before or at the time of recordation. Except as provided by Section 395.019, the political subdivision may collect the fees at either the time of recordation of the subdivision plat or connection to the political subdivision ’s water or sewer system or at the time the political subdivision issues either the building permit or the certificate of occupancy.

(c) This subsection applies only to impact fees adopted after June 20, 1987. For new development which is platted in accordance with Subchapter A, Chapter 212, or the subdivision or platting procedures of a political subdivision before the adoption of an impact fee, an impact fee may not be collected on any service unit for which a valid building permit is issued within one year after the date of adoption of the impact fee.

(d) This subsection applies only to land platted in accordance with Subchapter A, Chapter 212, or the subdivision or platting procedures of a political subdivision after adoption of an impact fee adopted after June 20, 1987. The political subdivision shall assess the impact fees before or at the time of recordation of a subdivision plat or other plat under Subchapter A, Chapter 212, or the subdivision or platting ordinance or procedures of any political subdivision in the official records of the county clerk of the county in which the tract is located. Except as provided by Section 395.019, if the political subdivision has water and wastewater capacity available:

(1) the political subdivision shall collect the fees at the time the political subdivision issues a building permit;

(2) for land platted outside the corporate boundaries of a municipality, the municipality shall collect the fees at the time an application for an individual meter connection to the municipality ’s water or wastewater system is filed; or

(3) a political subdivision that lacks authority to issue building permits in the area where the impact fee applies shall collect the fees at the time an application is filed for an individual meter connection to the political subdivision ’s water or wastewater system.

(e) For land on which new development occurs or is proposed to occur without platting, the political subdivision may assess the impact fees at any time during the development and building process and may collect the fees at either the time of recordation of the subdivision plat or connection to the political subdivision’s water or sewer system or at the time the political subdivision issues either the building permit or the certificate of occupancy.

(f) An "assessment" means a determination of the amount of the impact fee in effect on the date or occurrence provided in this section and is the maximum amount that can be charged per service unit of such development. No specific act by the political subdivision is required.

(g) Notwithstanding Subsections (a)-(e) and Section 395.017, the political subdivision may reduce or waive an impact fee for any service unit that would qualify as affordable housing under 42 U.S.C. Section 12745, as amended, once the service unit is constructed. If affordable housing as defined by 42 U.S.C. Section 12745, as amended, is not constructed, the political subdivision may reverse its decision to waive or reduce the impact fee, and the political subdivision may assess an impact fee at any time during the development approval or building process or after the building process if an impact fee was not already assessed.

Sec. 395.017. ADDITIONAL FEE PROHIBITED; EXCEPTION.

After assessment of the impact fees attributable to the new development or execution of an agreement for payment of impact fees, additional impact fees or increases in fees may not be assessed against the tract for any reason unless the number of service units to be developed on the tract increases. In the event of the increase in the number of service units, the impact fees to be imposed are limited to the amount attributable to the additional service units.

Sec. 395.018. AGREEMENT WITH OWNER REGARDING PAYMENT.

A political subdivision is authorized to enter into an agreement with the owner of a tract of land for which the plat has been recorded providing for the time and method of payment of the impact fees.

Sec. 395.019. COLLECTION OF FEES IF SERVICES NOT AVAILABLE.

Except for roadway facilities, impact fees may be assessed but may not be collected in areas where services are not currently available, unless:

(1) the collection is made to pay for a capital improvement or facility expansion that has been identified in the capital improvements plan and the political subdivision commits to commence construction within two years, under duly awarded and executed contracts or commitments of staff time covering substantially all of the work required to provide service, and to have the service available within a reasonable period of time considering the type of capital improvement or facility expansion to be constructed, but in no event longer than five years;

(2) the political subdivision agrees that the owner of a new development may construct or finance the capital improvements or facility expansions and agrees that the costs incurred or funds advanced will be credited against the impact fees otherwise due from the new development or agrees to reimburse the owner for such costs from impact fees paid from other new developments that will use such capital improvements or facility expansions, which fees shall be collected and reimbursed to the owner at the time the other new development records its plat; or

(3) an owner voluntarily requests the political subdivision to reserve capacity to serve future development, and the political subdivision and owner enter into a valid written agreement.

Sec. 395.020. ENTITLEMENT TO SERVICES.

Any new development for which an impact fee has been paid is entitled to the permanent use and benefit of the services for which the fee was exacted and is entitled to receive immediate service from any existing facilities with actual capacity to serve the new service units, subject to compliance with other valid regulations.

Sec. 395.021. AUTHORITY OF POLITICAL SUBDIVISIONS TO SPEND FUNDS TO REDUCE FEES.

Political subdivisions may spend funds from any lawful source to pay for all or a part of the capital improvements or facility expansions to reduce the amount of impact fees.

Sec. 395.022. AUTHORITY OF POLITICAL SUBDIVISION TO PAY FEES.

Political subdivisions and other governmental entities may pay impact fees imposed under this chapter.

Sec. 395.023. CREDITS AGAINST ROADWAY FACILITIES FEES.

Any construction of, contributions to, or dedications of off-site roadway facilities agreed to or required by a political subdivision as a condition of development approval shall be credited against roadway facilities impact fees otherwise due from the development.

Sec. 395.024. ACCOUNTING FOR FEES AND INTEREST.

(a) The order, ordinance, or resolution levying an impact fee must provide that all funds collected through the adoption of an impact fee shall be deposited in interest-bearing accounts clearly identifying the category of capital improvements or facility expansions within the service area for which the fee was adopted.

(b) Interest earned on impact fees is considered funds of the account on which it is earned and is subject to all restrictions placed on use of impact fees under this chapter.

(c) Impact fee funds may be spent only for the purposes for which the impact fee was imposed as shown by the capital improvements plan and as authorized by this chapter.

(d) The records of the accounts into which impact fees are deposited shall be open for public inspection and copying during ordinary business hours.

Sec. 395.025. REFUNDS.

(a) On the request of an owner of the property on which an impact fee has been paid, the political subdivision shall refund the impact fee if existing facilities are available and service is denied or the political subdivision has, after collecting the fee when service was not available, failed to commence construction within two years or service is not available within a reasonable period considering the

type of capital improvement or facility expansion to be constructed, but in no event later than five years from the date of payment under Section 395.019(1).

(b) Repealed by Acts 2001, 77th Leg., ch. 345, Sec. 9, eff. Sept. 1, 2001.

(c) The political subdivision shall refund any impact fee or part of it that is not spent as authorized by this chapter within 10 years after the date of payment.

(d) Any refund shall bear interest calculated from the date of collection to the date of refund at the statutory rate as set forth in Section 302.002, Finance Code, or its successor statute.

(e) All refunds shall be made to the record owner of the property at the time the refund is paid. However, if the impact fees were paid by another political subdivision or governmental entity, payment shall be made to the political subdivision or governmental entity.

(f) The owner of the property on which an impact fee has been paid or another political subdivision or governmental entity that paid the impact fee has standing to sue for a refund under this section.

SUBCHAPTER C. PROCEDURES FOR ADOPTION OF IMPACT FEE

Sec. 395.041. COMPLIANCE WITH PROCEDURES REQUIRED.

Except as otherwise provided by this chapter, a political subdivision must comply with this subchapter to levy an impact fee.

Sec. 395.0411. CAPITAL IMPROVEMENTS PLAN.

The political subdivision shall provide for a capital improvements plan to be developed by qualified professionals using generally accepted engineering and planning practices in accordance with Section 395.014.

Sec. 395.042. HEARING ON LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN.

To impose an impact fee, a political subdivision must adopt an order, ordinance, or resolution establishing a public hearing date to consider the land use assumptions and capital improvements plan for the designated service area.

Sec. 395.043. INFORMATION ABOUT LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN AVAILABLE TO PUBLIC.

On or before the date of the first publication of the notice of the hearing on the land use assumptions and capital improvements plan, the political subdivision shall make available to the public its land use assumptions, the time period of the projections, and a description of the capital improvement facilities that may be proposed.

Sec. 395.044. NOTICE OF HEARING ON LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN.

(a) Before the 30th day before the date of the hearing on the land use assumptions and capital improvements plan, the political subdivision shall send a notice of the hearing by certified mail to any person who has given written notice by certified or registered mail to the municipal secretary or other designated official of the political subdivision requesting notice of the hearing within two years preceding the date of adoption of the order, ordinance, or resolution setting the public hearing.

(b) The political subdivision shall publish notice of the hearing before the 30th day before the date set for the hearing, in one or more newspapers of general circulation in each county in which the political subdivision lies. However, a river authority that is authorized elsewhere by state law to charge fees that function as impact fees may publish the required newspaper notice only in each county in which the service area lies.

(c) The notice must contain:

(1) a headline to read as follows:
"NOTICE OF PUBLIC HEARING ON LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN RELATING TO POSSIBLE ADOPTION OF IMPACT FEES"

(2) the time, date, and location of the hearing;

(3) a statement that the purpose of the hearing is to consider the land use assumptions and capital improvements plan under which an impact fee may be imposed; and

(4) a statement that any member of the public has the right to appear at the hearing and present evidence for or against the land use assumptions and capital improvements plan.

Sec. 395.045. APPROVAL OF LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN REQUIRED.

(a) After the public hearing on the land use assumptions and capital improvements plan, the political subdivision shall determine whether to adopt or reject an ordinance, order, or resolution approving the land use assumptions and capital improvements plan.

(b) The political subdivision, within 30 days after the date of the public hearing, shall approve or disapprove the land use assumptions and capital improvements plan.

(c) An ordinance, order, or resolution approving the land use assumptions and capital improvements plan may not be adopted as an emergency measure.

Sec. 395.0455. SYSTEMWIDE LAND USE ASSUMPTIONS.

(a) In lieu of adopting land use assumptions for each service area, a political subdivision may, except for storm water, drainage, flood control, and roadway facilities, adopt system-wide land use

assumptions, which cover all of the area subject to the jurisdiction of the political subdivision for the purpose of imposing impact fees under this chapter.

(b) Prior to adopting system-wide land use assumptions, a political subdivision shall follow the public notice, hearing, and other requirements for adopting land use assumptions.

(c) After adoption of system-wide land use assumptions, a political subdivision is not required to adopt additional land use assumptions for a service area for water supply, treatment, and distribution facilities or wastewater collection and treatment facilities as a prerequisite to the adoption of a capital improvements plan or impact fee, provided the capital improvements plan and impact fee are consistent with the system-wide land use assumptions.

Sec. 395.047. HEARING ON IMPACT FEE.

On adoption of the land use assumptions and capital improvements plan, the governing body shall adopt an order or resolution setting a public hearing to discuss the imposition of the impact fee. The public hearing must be held by the governing body of the political subdivision to discuss the proposed ordinance, order, or resolution imposing an impact fee.

Sec. 395.049. NOTICE OF HEARING ON IMPACT FEE.

(a) Before the 30th day before the date of the hearing on the imposition of an impact fee, the political subdivision shall send a notice of the hearing by certified mail to any person who has given written notice by certified or registered mail to the municipal secretary or other designated official of the political subdivision requesting notice of the hearing within two years preceding the date of adoption of the order or resolution setting the public hearing.

(b) The political subdivision shall publish notice of the hearing before the 30th day before the date set for the hearing, in one or more newspapers of general circulation in each county in which the political subdivision lies. However, a river authority that is authorized elsewhere by state law to charge fees that function as impact fees may publish the required newspaper notice only in each county in which the service area lies.

(c) The notice must contain the following:

(1) a headline to read as follows:
"NOTICE OF PUBLIC HEARING ON ADOPTION OF IMPACT FEES"

(2) the time, date, and location of the hearing;

(3) a statement that the purpose of the hearing is to consider the adoption of an impact fee;

(4) the amount of the proposed impact fee per service unit; and

(5) a statement that any member of the public has the right to appear at the hearing and present evidence for or against the plan and proposed fee.

Sec. 395.050. ADVISORY COMMITTEE COMMENTS ON IMPACT FEES.

The advisory committee created under Section 395.058 shall file its written comments on the proposed impact fees before the fifth business day before the date of the public hearing on the imposition of the fees.

Sec. 395.051. APPROVAL OF IMPACT FEE REQUIRED.

(a) The political subdivision, within 30 days after the date of the public hearing on the imposition of an impact fee, shall approve or disapprove the imposition of an impact fee.

(b) An ordinance, order, or resolution approving the imposition of an impact fee may not be adopted as an emergency measure.

Sec. 395.052. PERIODIC UPDATE OF LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN REQUIRED.

(a) A political subdivision imposing an impact fee shall update the land use assumptions and capital improvements plan at least every five years. The initial five-year period begins on the day the capital improvements plan is adopted.

(b) The political subdivision shall review and evaluate its current land use assumptions and shall cause an update of the capital improvements plan to be prepared in accordance with Subchapter B.

Sec. 395.053. HEARING ON UPDATED LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN.

The governing body of the political subdivision shall, within 60 days after the date it receives the update of the land use assumptions and the capital improvements plan, adopt an order setting a public hearing to discuss and review the update and shall determine whether to amend the plan.

Sec. 395.054. HEARING ON AMENDMENTS TO LAND USE ASSUMPTIONS, CAPITAL IMPROVEMENTS PLAN, OR IMPACT FEE.

A public hearing must be held by the governing body of the political subdivision to discuss the proposed ordinance, order, or resolution amending land use assumptions, the capital improvements plan, or the impact fee. On or before the date of the first publication of the notice of the hearing on the amendments, the land use assumptions and the capital improvements plan, including the amount of any proposed amended impact fee per service unit, shall be made available to the public.

Sec. 395.055. NOTICE OF HEARING ON AMENDMENTS TO LAND USE ASSUMPTIONS, CAPITAL IMPROVEMENTS PLAN, OR IMPACT FEE.

(a) The notice and hearing procedures prescribed by Sections 395.044(a) and

(b) apply to a hearing on the amendment of land use assumptions, a capital improvements plan, or an impact fee.

(c) The notice of a hearing under this section must contain the following:

(1) a headline to read as follows:
"NOTICE OF PUBLIC HEARING ON AMENDMENT OF IMPACT FEES"

(2) the time, date, and location of the hearing;

(3) a statement that the purpose of the hearing is to consider the amendment of land use assumptions and a capital improvements plan and the imposition of an impact fee; and

(4) a statement that any member of the public has the right to appear at the hearing and present evidence for or against the update.

Sec. 395.056. ADVISORY COMMITTEE COMMENTS ON AMENDMENTS.

The advisory committee created under Section 395.058 shall file its written comments on the proposed amendments to the land use assumptions, capital improvements plan, and impact fee before the fifth business day before the date of the public hearing on the amendments.

Sec. 395.057. APPROVAL OF AMENDMENTS REQUIRED.

(a) The political subdivision, within 30 days after the date of the public hearing on the amendments, shall approve or disapprove the amendments of the land use assumptions and the capital improvements plan and modification of an impact fee.

(b) An ordinance, order, or resolution approving the amendments to the land use assumptions, the capital improvements plan, and imposition of an impact fee may not be adopted as an emergency measure.

Sec. 395.0575. DETERMINATION THAT NO UPDATE OF LAND USE ASSUMPTIONS, CAPITAL IMPROVEMENTS PLAN OR IMPACT FEES IS NEEDED.

(a) If, at the time an update under Section 395.052 is required, the governing body determines that no change to the land use assumptions, capital improvements plan, or impact fee is needed, it may, as an alternative to the updating requirements of Sections 395.052-395.057, do the following:

(1) The governing body of the political subdivision shall, upon determining that an update is unnecessary and 60 days before publishing the final notice under this section, send notice of its determination not to update the land use assumptions, capital improvements plan, and impact fee by certified mail to any person who has, within two years preceding the date that the final notice of this matter is to be published, give written notice by certified or registered mail to the municipal secretary or other designated official of the political subdivision requesting notice

of hearings related to impact fees. The notice must contain the information in Subsections (b)(2)-(5).

(2) The political subdivision shall publish notice of its determination once a week for three consecutive weeks in one or more newspapers with general circulation in each county in which the political subdivision lies. However, a river authority that is authorized elsewhere by state law to charge fees that function as impact fees may publish the required newspaper notice only in each county in which the service area lies. The notice of public hearing may not be in the part of the paper in which legal notices and classified ads appear and may not be smaller than one-quarter page of a standard-size or tabloid-size newspaper, and the headline on the notice must be in 18-point or larger type.

(b) The notice must contain the following:

(1) a headline to read as follows: "NOTICE OF DETERMINATION NOT TO UPDATE LAND USE ASSUMPTIONS, CAPITAL IMPROVEMENTS PLAN, OR IMPACT FEES";

(2) a statement that the governing body of the political subdivision has determined that no change to the land use assumptions, capital improvements plan, or impact fee is necessary;

(3) an easily understandable description and a map of the service area in which the updating has been determined to be unnecessary;

(4) a statement that if, within a specified date, which date shall be at least 60 days after publication of the first notice, a person makes a written request to the designated official of the political subdivision requesting that the land use assumptions, capital improvements plan, or impact fee be updated, the governing body must comply with the request by following the requirements of Sections 395.052-395.057; and

(5) a statement identifying the name and mailing address of the official of the political subdivision to whom a request for an update should be sent.

(c) The advisory committee shall file its written comments on the need for updating the land use assumptions, capital improvements plans, and impact fee before the fifth business day before the earliest notice of the government’s decision that no update is necessary is mailed or published.

(d) If, by the date specified in Subsection (b)(4), a person requests in writing that the land use assumptions, capital improvements plan, or impact fee be updated, the governing body shall cause an update of the land use assumptions and capital improvements plan to be prepared in accordance with Sections 395.052-395.057.

(e) An ordinance, order, or resolution determining the need for updating land use assumptions, a capital improvements plan, or an impact fee may not be adopted as an emergency measure.

Sec. 395.058. ADVISORY COMMITTEE.

(a) On or before the date on which the order, ordinance, or resolution is adopted under Section 395.042, the political subdivision shall appoint a capital improvements advisory committee.

(b) The advisory committee is composed of not less than five members who shall be appointed by a majority vote of the governing body of the political subdivision. Not less than 40 percent of the membership of the advisory committee must be representatives of the real estate, development, or building industries who are not employees or officials of a political subdivision or governmental entity. If the political subdivision has a planning and zoning commission, the commission may act as the advisory committee if the commission includes at least one representative of the real estate, development, or building industry who is not an employee or official of a political subdivision or governmental entity. If no such representative is a member of the planning and zoning commission, the commission may still act as the advisory committee if at least one such representative is appointed by the political subdivision as an ad hoc voting member of the planning and zoning commission when it acts as the advisory committee. If the impact fee is to be applied in the extraterritorial jurisdiction of the political subdivision, the membership must include a representative from that area.

(c) The advisory committee serves in an advisory capacity and is established to:

(1) advise and assist the political subdivision in adopting land use assumptions;

(2) review the capital improvements plan and file written comments;

(3) monitor and evaluate implementation of the capital improvements plan;

(4) file semiannual reports with respect to the progress of the capital improvements plan and report to the political subdivision any perceived inequities in implementing the plan or imposing the impact fee; and

(5) advise the political subdivision of the need to update or revise the land use assumptions, capital improvements plan, and impact fee.

(d) The political subdivision shall make available to the advisory committee any professional reports with respect to developing and implementing the capital improvements plan.

(e) The governing body of the political subdivision shall adopt procedural rules for the advisory committee to follow in carrying out its duties.

SUBCHAPTER D. OTHER PROVISIONS

Sec. 395.071. DUTIES TO BE PERFORMED WITHIN TIME LIMITS.

If the governing body of the political subdivision does not perform a duty imposed under this chapter within the prescribed period, a person who has paid an impact fee or an owner of land on which an impact fee has been paid has the right to present a written request to the governing body of the

political subdivision stating the nature of the unperformed duty and requesting that it be performed within 60 days after the date of the request. If the governing body of the political subdivision finds that the duty is required under this chapter and is late in being performed, it shall cause the duty to commence within 60 days after the date of the request and continue until completion.

Sec. 395.072. RECORDS OF HEARINGS.

A record must be made of any public hearing provided for by this chapter. The record shall be maintained and be made available for public inspection by the political subdivision for at least 10 years after the date of the hearing.

Sec. 395.073. CUMULATIVE EFFECT OF STATE AND LOCAL RESTRICTIONS.

Any state or local restrictions that apply to the imposition of an impact fee in a political subdivision where an impact fee is proposed are cumulative with the restrictions in this chapter.

Sec. 395.074. PRIOR IMPACT FEES REPLACED BY FEES UNDER THIS CHAPTER.

An impact fee that is in place on June 20, 1987, must be replaced by an impact fee made under this chapter on or before June 20, 1990. However, any political subdivision having an impact fee that has not been replaced under this chapter on or before June 20, 1988, is liable to any party who, after June 20, 1988, pays an impact fee that exceeds the maximum permitted under Subchapter B by more than 10 percent for an amount equal to two times the difference between the maximum impact fee allowed and the actual impact fee imposed, plus reasonable attorney's fees and court costs.

Sec. 395.075. NO EFFECT ON TAXES OR OTHER CHARGES.

This chapter does not prohibit, affect, or regulate any tax, fee, charge, or assessment specifically authorized by state law.

Sec. 395.076. MORATORIUM ON DEVELOPMENT PROHIBITED.

A moratorium may not be placed on new development for the purpose of awaiting the completion of all or any part of the process necessary to develop, adopt, or update land use assumptions, a capital improvements plan, or an impact fee.

Sec. 395.077. APPEALS.

(a) A person who has exhausted all administrative remedies within the political subdivision and who is aggrieved by a final decision is entitled to trial de novo under this chapter.

(b) A suit to contest an impact fee must be filed within 90 days after the date of adoption of the ordinance, order, or resolution establishing the impact fee.

(c) Except for roadway facilities, a person who has paid an impact fee or an owner of property on which an impact fee has been paid is entitled to specific performance of the services by the political subdivision for which the fee was paid.

(d) This section does not require construction of a specific facility to provide the services.

(e) Any suit must be filed in the county in which the major part of the land area of the political subdivision is located. A successful litigant shall be entitled to recover reasonable attorney's fees and court costs.

Sec. 395.078. SUBSTANTIAL COMPLIANCE WITH NOTICE REQUIREMENTS.

An impact fee may not be held invalid because the public notice requirements were not complied with if compliance was substantial and in good faith.

Sec. 395.079. IMPACT FEE FOR STORM WATER, DRAINAGE, AND FLOOD CONTROL IN POPULOUS COUNTY.

(a) Any county that has a population of 3.3 million or more or that borders a county with a population of 3.3 million or more, and any district or authority created under Article XVI, Section 59, of the Texas Constitution within any such county that is authorized to provide storm water, drainage, and flood control facilities, is authorized to impose impact fees to provide storm water, drainage, and flood control improvements necessary to accommodate new development.

(b) The imposition of impact fees authorized by Subsection (a) is exempt from the requirements of Sections 395.025, 395.052-395.057, and 395.074 unless the political subdivision proposes to increase the impact fee.

(c) Any political subdivision described by Subsection (a) is authorized to pledge or otherwise contractually obligate all or part of the impact fees to the payment of principal and interest on bonds, notes, or other obligations issued or incurred by or on behalf of the political subdivision and to the payment of any other contractual obligations.
(d) An impact fee adopted by a political subdivision under Subsection (a) may not be reduced if:

(1) the political subdivision has pledged or otherwise contractually obligated all or part of the impact fees to the payment of principal and interest on bonds, notes, or other obligations issued by or on behalf of the political subdivision; and

(2) the political subdivision agrees in the pledge or contract not to reduce the impact fees during the term of the bonds, notes, or other contractual obligations.

Sec. 395.080. CHAPTER NOT APPLICABLE TO CERTAIN WATER-RELATED SPECIAL DISTRICTS.

(a) This chapter does not apply to impact fees, charges, fees, assessments, or contributions:

(1) paid by or charged to a district created under Article XVI, Section 59, of the Texas Constitution to another district created under that constitutional provision if both districts are required by law to obtain approval of their bonds by the Texas Natural Resource Conservation Commission; or

(2) charged by an entity if the impact fees, charges, fees, assessments, or contributions are approved by the Texas Natural Resource Conservation Commission.

(b) Any district created under Article XVI, Section 59, or Article III, Section 52, of the Texas Constitution may petition the Texas Natural Resource Conservation Commission for approval of any proposed impact fees, charges, fees, assessments, or contributions. The commission shall adopt rules for reviewing the petition and may charge the petitioner fees adequate to cover the cost of processing and considering the petition. The rules shall require notice substantially the same as that required by this chapter for the adoption of impact fees and shall afford opportunity for all affected parties to participate.

Sec. 395.081. FEES FOR ADJOINING LANDOWNERS IN CERTAIN MUNICIPALITIES.

(a) This section applies only to a municipality with a population of 105,000 or less that constitutes more than three-fourths of the population of the county in which the majority of the area of the municipality is located.

(b) A municipality that has not adopted an impact fee under this chapter that is constructing a capital improvement, including sewer or waterline or drainage or roadway facilities, from the municipality to a development located within or outside the municipality ’s boundaries, in its discretion, may allow a landowner whose land adjoins the capital improvement or is within a specified distance from the capital improvement, as determined by the governing body of the municipality, to connect to the capital improvement if:

(1) the governing body of the municipality has adopted a finding under Subsection (c); and

(2) the landowner agrees to pay a proportional share of the cost of the capital improvement as determined by the governing body of the municipality and agreed to by the landowner.

(c) Before a municipality may allow a landowner to connect to a capital improvement under Subsection (b), the municipality shall adopt a finding that the municipality will benefit from allowing the landowner to connect to the capital improvement. The finding shall describe the benefit to be received by the municipality.

(d) A determination of the governing body of a municipality, or its officers or employees, under this section is a discretionary function of the municipality and the municipality and its officers or employees are not liable for a determination made under this section.

Sec. 395.082. CERTIFICATION OF COMPLIANCE REQUIRED.

(a) A political subdivision that imposes an impact fee shall submit a written certification verifying compliance with this chapter to the attorney general each year not later than the last day of the political subdivision's fiscal year.

(b) The certification must be signed by the presiding officer of the governing body of a political subdivision and include a statement that reads substantially similar to the following: "This statement certifies compliance with Chapter 395, Local Government Code."

(c) A political subdivision that fails to submit a certification as required by this section is liable to the state for a civil penalty in an amount equal to 10 percent of the amount of the impact fees erroneously charged. The attorney general shall collect the civil penalty and deposit the amount collected to the credit of the housing trust fund.

APPENDIX E

Resources

Web Resources

Impact Fees
NAHB www.nahb.org/infrastructurefinance
Impact Fees.com (Duncan and Associates) www.impactfees.com
National Impact Fee Roundtable www.impactfees.org
National Association of REALTORS http://www.realtor.org/library/library/fg805
American Planning Association http://www.planning.org/policyguides/impactfees.html
HUD http://www.huduser.org/publications/affhsg/impactfees.html

School Impact Fees
National Clearinghouse for Educational Facilities www.edfacilities.org/rl/impact_fees.cfm

Infrastructure Finance Alternatives
Council of Development Finance Agencies www.cdfa.net
National Conference of State Legislatures www.ncsl.org

NAHB PUBLISHED RESOURCES

An Overview of Special Purpose Taxing Districts Proportionate-Share Impact Fees
Building for Tomorrow: Innovative Infrastructure Solutions
Infrastructure Finance: Does Your State Encourage Innovation
Infrastructure Solutions – Best Practices from Solution Oriented States

AGENDA FORM

Date of City Council meeting: February 3rd

Name of Person Making Presentation: Kyle Arbizu

Address: PO BOX 727
Santa Clara, Utah 84765

Contact #:

Phone: 435-632-1493

e-mail: karbizu@pprmco.com

Approximate length of discussion: 10 Minutes may depend on council's questions

Description of item to be discussed: See explanation at the bottom of the page

If this is a complaint issue:

Have you tried to resolve the issue with staff? __ yes x no

If yes, with whom? _____

If you have a power point presentation, we would encourage you to keep it under 10 minutes. All other items discussed will be done as quickly and as efficiently as possible.

We appreciate the time and consideration of the Hurricane City Council considering this request. Between construction costs, inflation, and higher interest rates, it's become challenging to bring medium to high-density projects to fruition. We feel that these types of projects fill a necessary gap in the housing market. Not all person(s) moving to Southern Utah are looking to buy a home. It also provides additional housing to those person(s) just starting out, relocating, or experiencing changes in their living circumstances.

We're constructing 18 apartments on parcel H-4-2-4-3211. Our project contains only four two-bedrooms, six one-bedrooms, and eight studio apartments. This project site requires little to no additional work from the City for roads, and any new parking and roads for this project are being paid for, maintained, and installed by the developer. The estimate for our project that was provided by the City is $41,292. We're seeking a reduction of 60% or $24,775.20 so the project would still be paying $16,516.80.

Lastly, we believe that City parks and trails are an essential part of the feel of Southern Utah. That being said, due to our unit sizing and the fact that the apartments will house fewer citizens than most homes and townhomes. Our estimate that was provided has Park and Recreation for the project at $55,962. We're seeking a 50% reduction or $27,981. This still leaves this single project contributing over $27,981 to parks and trails or $1,554.50 per residence.

Thank you for your time and consideration.

Estimate Fees

↳ **Multi-Family**

First, complete the information below. Then, click the "Estimate" button on the bottom of the page.

Fee Based Occupancies

:: use numbers only

ICC R-2 Residential Multiple Family 5B Garage Area (remove)
Square Feet: 2430
Declared Value: $30,000.00
Calculated Value: $60,750.00 selected

ICC R-2 Residential Multiple Family 5B Living Area (remove)
Square Feet: 11920
Declared Value: $500,000.00
Calculated Value: $679,440.00 selected

Fee Based Information

:: use numbers only

☑	Number of Units	18 *

Project Fees

:: use numbers only

☐		**GROUP > 120/240 - Single Phase**		
☐		Clean Up Deposit Commercial	1 @	$1,500.00 +
☑		Habitat Fee - Multifamily	1 @	(0.2% x selected occupancy types) *
☑		Multi-Family Permit Fee	1 @	(Table 1-A based on selected occupancy types) *
☑		Multi-Family State Tax Fee	1 @	(1% x Multi-Family Permit Fee) *
☑	ⓘ	Park & Rec	1 @	($3,109.00 per Number of Units)
☐		Parks-MultiFamily Adjusted	1 @	$3109.00
☑	ⓘ	Plan Review	1 @	$2846.00
☐		Plan Review Deposit	1 @	$1,000.00
☐		Plan Review-Multi Family	1 @	$1000.00
☑		Power Conn-Multi Family-Adjusted	1 @	$4503.00
☐		Power Conn. - Residential Underground (New)	1 @	$237.00
☐	ⓘ	Power Impact - Residential 200 AMP	1 @	($1,946.00 per Number of Units)
☑		Power Impact 200 amp-Multi Family-Adjusted	1 @	$36974.00

Your Fee Estimate

Based On Your Selection

FEES	> $173,030.67
Habitat Fee - Multifamily	$1,480.38
Multi-Family Permit Fee	$4,378.50
Multi-Family State Tax Fee	$43.79
Park & Rec	$55,962.00
Plan Review	$2,846.00
Power Conn-Multi Family-Adjusted	$4,503.00
Power Impact 200 amp-Multi Family-Adjusted	$36,974.00
Public Safety-Multi Family	$4,626.00
Streets Impact - Residential	$41,292.00
Water Connection 2"	$5,483.00
Water Impact Fee 2"	$15,442.00

Questions

For questions, use this contact information.

Tami Jones
Building
(435) 635-2811 x122 Ph.
(435) 635-2184 Fax
tami@cityofhurricane.com
www.cityofhurricane.com

Mailing Address
147 N 870 W
Hurricane, UT 84737

Physical Address
147 N 870 W
Hurricane, UT 84737
(view map)

☐	Power Impact-Residential 125 amp	1 @	$0
☐	Public Safety Impact - Residential	1 @	($421.00 per Number of Units)
☑	Public Safety-Multi Family	1 @	($257.00 per Number of Units)
☐	Public Safety-Multi Family-Adjusted	1 @	$257.00
☑	Streets Impact - Residential	1 @	($2,294.00 per Number of Units)
☐	Streets-MultiFamily Adjusted	1 @	$2294.00
☐	Water Connection 1"	1 @	$1,315.00
☐	Water Connection 1.5"	1 @	$2,924.00
☑	Water Connection 2"	1 @	$5,483.00
☐	Water Connection 3/4"	1 @	$731.00
☐	Water Connection 5/8"	1 @	($550.00 per Number of Units)
☐	Water Impact 1"-New	1 @	$3,860.00
☐	Water Impact 5/8"	1 @	($884.00 per Number of Units)
☐	Water Impact 5/8"-New	1 @	$1,508.00
☐	Water Impact Fee 1.5"	1 @	$5,092.00
☑	Water Impact Fee 2"	1 @	$15,442.00
☐	Water Impact Fee 3/4"	1 @	$1,273.00

Disclaimer

This information is to give you a general idea of permit fees and is subject to change.

CURTIS ANDERSON
SHADOW RIDGE APARTMENTS

LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M

GENERAL NOTES:

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CITY OF HURRICANE AND ASH CREEK SPECIAL SERVICE DISTRICT "STANDARD SPECIFICATIONS FOR DESIGN AND CONSTRUCTION".

2. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE. ANY AND ALL IMPROVEMENTS OR STRUCTURES WHICH ARE DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR RECONSTRUCTED SATISFACTORY TO THE CITY OF HURRICANE AND THE OWNER AT THE EXPENSE OF THE CONTRACTOR.

3. THE CONTRACTOR SHALL NOT BACKFILL ANY UTILITY OR DRAINAGE TRENCHES UNTIL THEY HAVE BEEN INSPECTED AND APPROVED BY THE CITY OF HURRICANE AND ASH CREEK SPECIAL SERVICE DISTRICT. THE CITY AND ASH CREEK SPECIAL SERVICE DISTRICT SHALL BE NOTIFIED AT LEAST 1 WORKING DAY IN ADVANCE OF ALL CONSTRUCTION.

4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY ALTERATIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE ENGINEER AND THE CITY OF HURRICANE.

5. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL OVERHEAD INTERFERENCE WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD OR UNDERGROUND POWER, TELEPHONE, GAS AND OTHER UTILITIES FOR THE SAFETY OF ALL PERSONNEL AND EQUIPMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS AND LIABILITY IN CONNECTION THEREWITH.

6. AN ENCROACHMENT PERMIT IS REQUIRED FOR WORK IN THE PUBLIC RIGHT OF WAY, THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.

7. HANDICAP RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION AS PER THE CITY STANDARD DRAWINGS (SEE ADOPTED DETAIL ON DETAIL SHEET). EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY ENGINEER.

8. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO SAID CONSTRUCTION. THE EXTENT OF TRANSITIONS TO BE AS SHOWN ON PLANS.

9. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AT THE EXPENSE OF THE CONTRACTOR BY A REGISTERED LAND SURVEYOR.

10. BEFORE ANY WORK IS STARTED IN THE RIGHT OF WAY, THE CONTRACTOR SHALL INSTALL CONSTRUCTION ZONE SIGNING AS REQUIRED BY THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES-LATEST EDITION".

11. ALL CONSTRUCTION SIGNING, BARRICADING AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES-LATEST EDITION".

12. FINAL SURVEY MONUMENTS TO BE INSTALLED AS PER HURRICANE CITY ADOPTED DRAWING AND LOCATION TO BE AS PER THE FINAL PLAT.

13. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL BEST MANAGEMENT PRACTICES TO LIMIT ON SITE EROSION AND SEDIMENT FROM LEAVING THE SITE. ALL BEST MANAGEMENT PRACTICES WILL BE APPROVED BY THE ENGINEER AND THE CITY OF HURRICANE

14. ALL WORK SHALL BE CONTAINED ON SITE.

15. A TEMPORARY TRASH ENCLOSURE SHALL BE PROVIDED.

16. DUST CONTROL SHALL BE MAINTAINED; CONTRACTOR SHALL USE A WATER TRUCK DURING ALL EARTH MOVING ACTIVITIES.

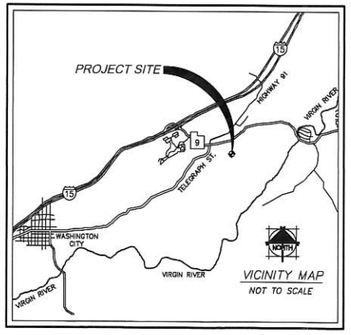
17. PROJECTS SHALL INSTALL AN INFORMATIONAL SIGN ON SITE BEFORE CONSTRUCTION BEGINS. THIS SIGN WILL HAVE A MINIMUM SIZE, PLACEMENT LOCATION AND CONTENT INFORMATION WITH THE COMPANY NAME, PHONE CONTACT & GRADING PERMIT NUMBER.

18. PROJECTS SHALL SUBMIT A DUST CONTROL PLAN WITH DETAILS ON EQUIPMENT, SCHEDULING AND REPORTING OF DUST CONTROL ACTIVITIES.

19. A MANDATORY PRE-CONSTRUCTION MEETING WILL BE REQUIRED ON ALL PROJECTS PRIOR TO ANY GRUBBING, GRADING, OR CONSTRUCTION ACTIVITIES. THE PERMIT HOLDER WILL BE REQUIRED TO NOTIFY ALL DEVELOPMENT SERVICES INSPECTORS

20. ALL LANDSCAPING TO BE MAINTAINED BY PROPERTY OWNER (CITY WILL NOT MAINTAIN)

21. A SPECIAL INSPECTOR FOR PAVING WILL BE REQUIRED.(COST BORNE BY DEVELOPER)



SHEET INDEX

C0.00	TITLE SHEET
C1.00	SITE PLAN
C2.00	UTILITY PLAN
C3.00	GRADING & DRAINAGE PLAN
C4.00	LIFE SAFETY PLAN
C5.00	EROSION PLAN
C6.00	LANDSCAPE PLAN
C10.00	DETAIL SHEET

APPROVAL

ASH CREEK SEWER DISTRICT	DATE:
DOMINION ENERGY	DATE:
TDS COMMUNICATIONS	DATE:
CENTURYLINK	DATE:
WASHINGTON COUNTY WATER CONSERVANCY DISTRICT	DATE:
HURRICANE POWER DEPARTMENT	DATE:
HURRICANE PARKS DEPARTMENT	DATE:
HURRICANE VALLEY FIRE DISTRICT	DATE:
HURRICANE WATER DEPARTMENT	DATE:
HURRICANE STREETS DEPARTMENT	DATE:
HURRICANE PLANNING DEPARTMENT	DATE:
HURRICANE CITY ENGINEER	DATE:
HURRICANE PUBLIC WORKS DEPARTMENT	DATE:
HURRICANE CITY GIS	DATE:

CALL BEFORE YOU DIG

Call before you DIG 1-800-662-4111

1. UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING ANY CONSTRUCTION.
3. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON.
4. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS

NO.	DATE	BY	APP'VD	REVISION DESCRIPTION

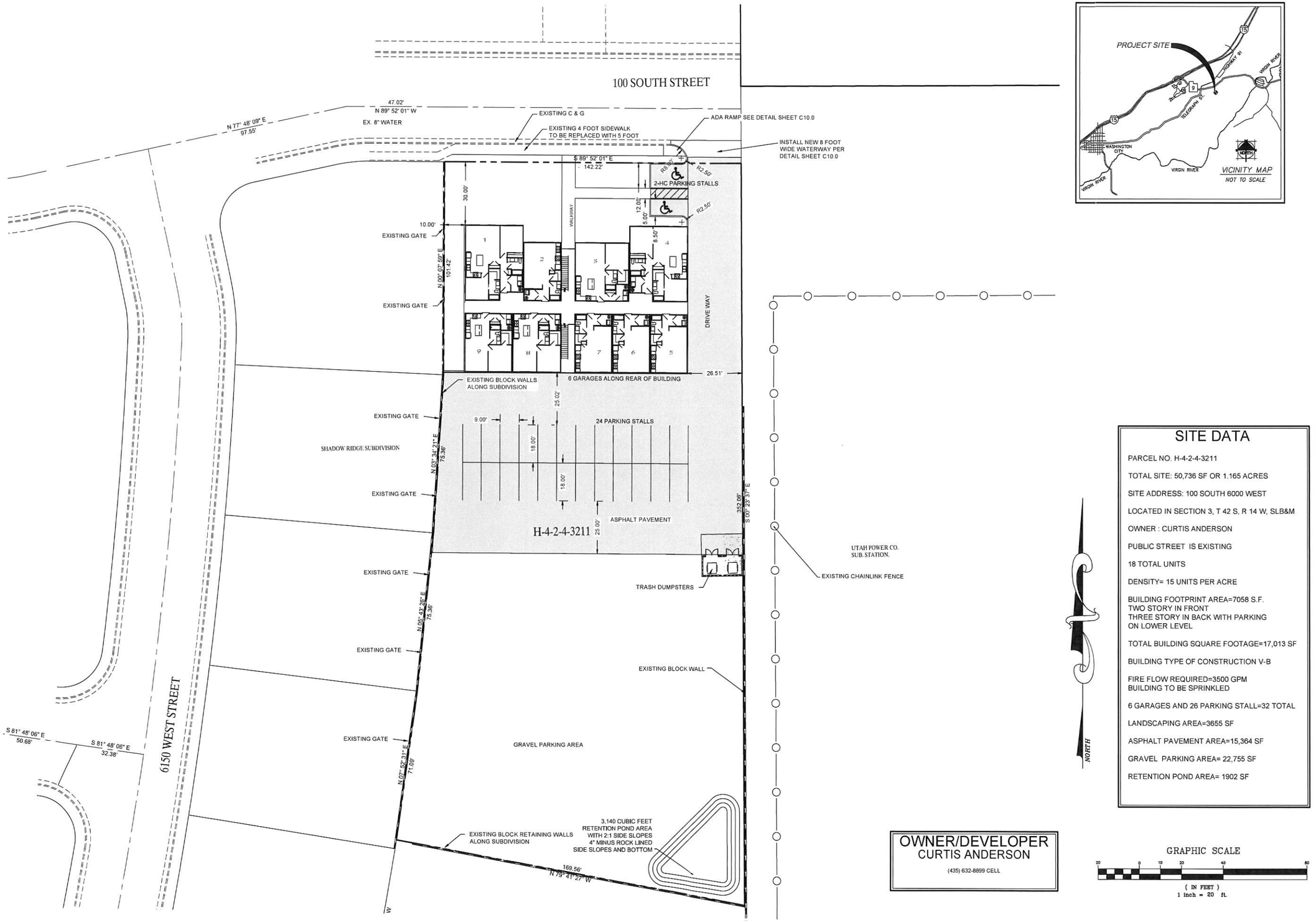
STATE OF UTAH — 155869 — LLOYD RIED POPE — 10-26-20 — REGISTERED PROFESSIONAL ENGINEER

L.R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS, CIVIL ENGINEERS & SURVEYORS
1245 EAST 180 SOUTH SUITE 1-9
ST. GEORGE, UTAH 84790
(PHONE) 435-628-1676
(FAX) 435-628-7199
(EMAIL) lrpope@infowest.com

CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
TITLE SHEET
LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M

DESIGN BY LRP
DATE 10-26-20
FILE NAME CURTIS ANDERSON

24" x 36" SCALE 1" = 1"
12" x 18" SCALE 1" = 1"
SHEET NUMBER C0.00



SITE DATA

PARCEL NO. H-4-2-4-3211

TOTAL SITE: 50,736 SF OR 1.165 ACRES

SITE ADDRESS: 100 SOUTH 6000 WEST

LOCATED IN SECTION 3, T 42 S, R 14 W, SLB&M

OWNER : CURTIS ANDERSON

PUBLIC STREET IS EXISTING

18 TOTAL UNITS

DENSITY= 15 UNITS PER ACRE

BUILDING FOOTPRINT AREA=7058 S.F.
TWO STORY IN FRONT
THREE STORY IN BACK WITH PARKING
ON LOWER LEVEL

TOTAL BUILDING SQUARE FOOTAGE=17,013 SF

BUILDING TYPE OF CONSTRUCTION V-B

FIRE FLOW REQUIRED=3500 GPM
BUILDING TO BE SPRINKLED

6 GARAGES AND 26 PARKING STALL=32 TOTAL

LANDSCAPING AREA=3655 SF

ASPHALT PAVEMENT AREA=15,364 SF

GRAVEL PARKING AREA= 22,755 SF

RETENTION POND AREA= 1902 SF

OWNER/DEVELOPER
CURTIS ANDERSON
(435) 632-8899 CELL

GRAPHIC SCALE
20 0 10 20 40 60
(IN FEET)
1 inch = 20 ft.

NO.	DATE	BY	APP'D	REVISION DESCRIPTION

STATE OF UTAH
153699
LLOYD R. POPE
10-26-20
REGISTERED PROFESSIONAL ENGINEER

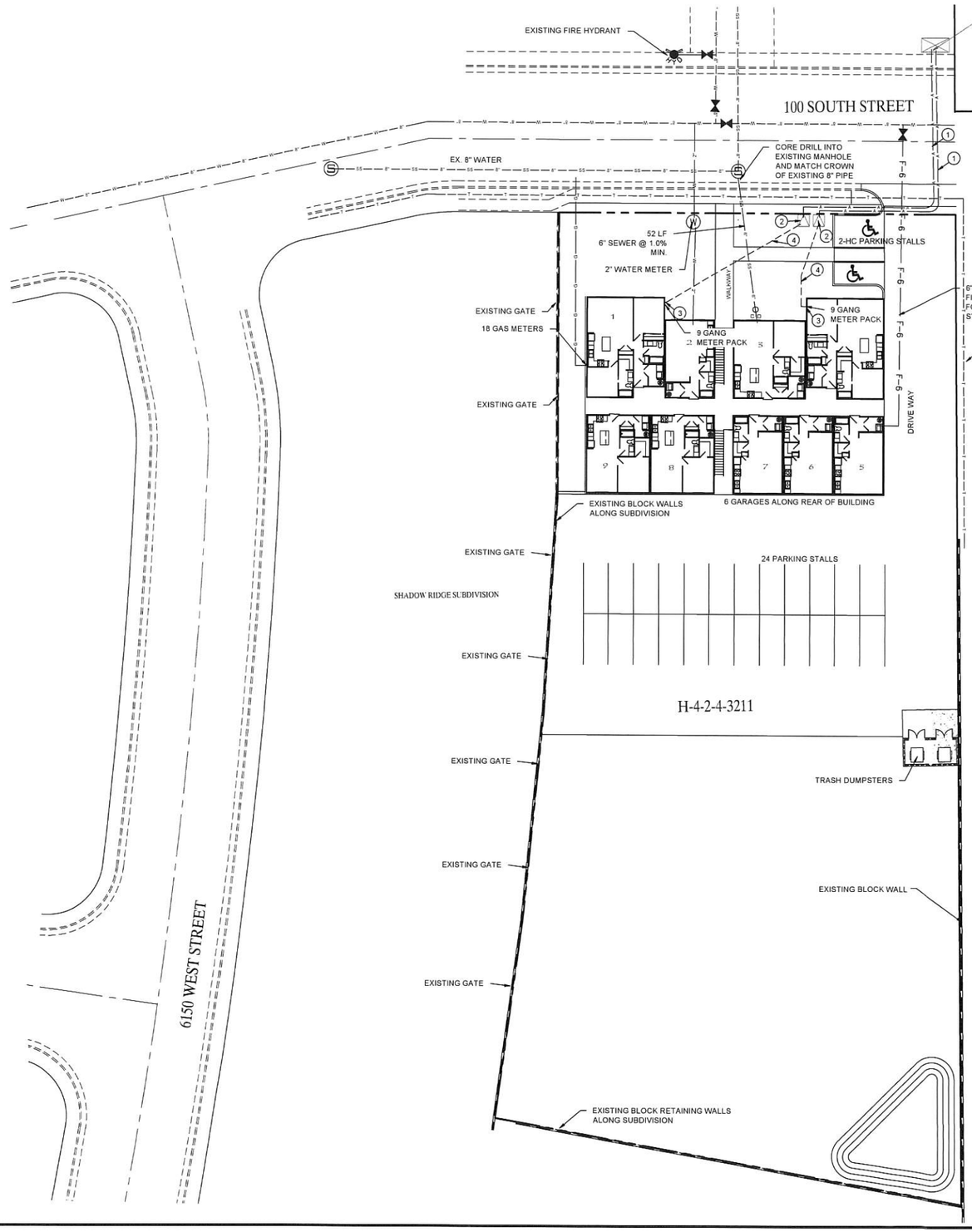
L. R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS, CIVIL ENGINEERS & SURVEYORS
1246 EAST 180 SOUTH SUITE 1-S2
ST. GEORGE, UTAH 84790
(PHONE) 435-628-1976
(FAX) 435-628-1768
(EMAIL) lrpope@infowest.com

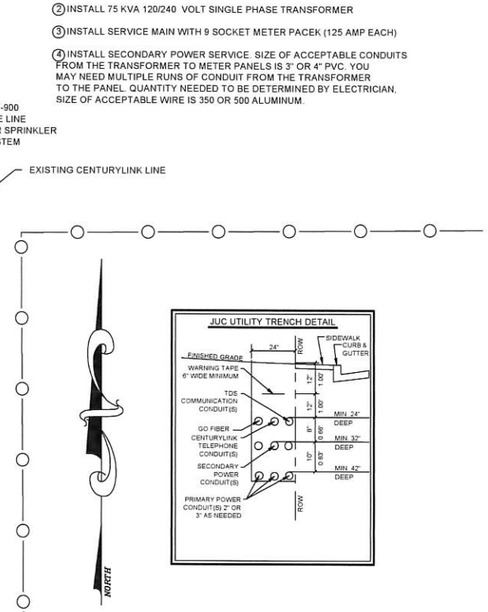
THESE PLANS ARE THE PROPERTY OF L. R. POPE ENGINEERING INC. AND ARE NOT TO BE USED IN WHOLE OR IN PART FOR ANY OTHER PROJECT WITHOUT THE WRITTEN PERMISSION OF L. R. POPE ENGINEERING INC. ANY REUSE OF THESE PLANS WITHOUT WRITTEN PERMISSION AND ADAPTATION BY L. R. POPE ENGINEERING INC. FOR THE SPECIFIC PURPOSE INTENDED WILL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY OR LEGAL EXPOSURE TO L. R. POPE ENGINEERING INC. ALL RIGHTS RESERVED.

CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
SITE PLAN
LOCATED IN SECTION 4, TOWNSHIP 41 SOUTH, RANGE 14 WEST, SLB&M

DESIGN BY LRP
DATE 10-26-20
FILE NAME CURTIS ANDERSON

24" x 36" SCALE 1" = 20'
12" x 18" SCALE 1" = 40'
SHEET NUMBER C1.00





UTAH POWER CO.
SUB. STATION.

CENTURYLINK INTERNET FIBER OPTIC NOTES: (RESIDENTIAL)
1. DEVELOPER TO PROVIDE ALL TRENCH, BACKFILL AND ROAD CROSSINGS. CENTRYLINK SUB CONTRACTOR (NEILS FUGAL) WILL PLACE CONDUIT IN TRENCH. CALL 435-632-6553 15 DAYS PRIOR TO REQUIRING CONDUIT TO SCHEDULE DELIVERY.
2. ANY BREAKS/BLOCKAGES IN CONDUIT RESULTING FROM IMPROPER BACKFILL OR OTHER CONSTRUCTION UTILITY PLACEMENT ARE THE DEVEOPER RESPONSIBILITY TO REPAIR AND MAY RESULT IN DELAY OF SERVICE.
3. CONTACT CENTURYLINK ENGINEER AT 435-673-9639 WITH ANY QUESTIONS OR CHANGES TO JUC PLANS.
4. ANY CENTURYLINK FACILITY RELOCATIONS ASSOCIATED WITH PROJECT WILL BE BILLABLE 100% TO OWNER/DEVELOPER AND MUST BE SCHEDULED A MINIMUM OF 45 DAYS IN ADVANCE.

WATER SERVICE METER CONNECTION TO MEET THE FOLLOWING ITEMS PER WCWCD.

1. TAPPING SADDLE TO CONNECT SERVICE LINES ON PVC LINES.
2. 2" MALE X MALE CORPORATION STOP VALVE.
3. FEMALE X COMPRESSION FITTING
4. 2" COPPER SERVICE LINE FROM MAIN LINE TO METER SETTER.
5. METER SETTER MUST HAVE LOCKABLE SHUTOFF AND DUAL CHECK VALVE. FORD OR APPROVED EQUAL MFG.
6. 3' X 2" COPPER LINE FROM METER SETTER FOR FUTURE CONNECTION.
7. ROUND HDPE METER BARREL WITH METAL RING AND COVER.
8. DISTANCE FROM METER TO TOP OF BARREL SHOULD BE 9" TO 12".
9. 14 GAUGE LOCATE WIRE FROM MAIN CONNECTION TO METER BARREL W/ MINIMUM OF 24" BROUGHT UP IN METER BARREL

NOTE:
NO COMPONENT SHALL BE INSTALLED FOR WATER DELIVERY WITHIN THE SUBDIVISION THAT HAS NOT BEEN APPROVED AND INSPECTED BY THE WCWCD. PLEASE CALL DAVE JESSOP, OPERATIONS MANAGER, AT 435-668-7416 OR 435-673-3617 TO ARRANGE FOR INSPECTIONS.

POWER KEY

(1) INSTALL 2 1/2" PVC WITH 1/0 15 KV SINGLE PHASE

(2) INSTALL 75 KVA 120/240 VOLT SINGLE PHASE TRANSFORMER

(3) INSTALL SERVICE MAIN WITH 9 SOCKET METER PACEK (125 AMP EACH)

(4) INSTALL SECONDARY POWER SERVICE. SIZE OF ACCEPTABLE CONDUITS FROM THE TRANSFORMER TO METER PANELS IS 3" OR 4" PVC. YOU MAY NEED MULTIPLE RUNS OF CONDUIT FROM THE TRANSFORMER TO THE PANEL. QUANTITY NEEDED TO BE DETERMINED BY ELECTRICIAN. SIZE OF ACCEPTABLE WIRE IS 350 OR 500 ALUMINUM.

POWER NOTES:

1. ONLY A PRE-APPROVED CONTRACTOR TO WORK ON AND INSTALL ANY PART OF THE ELECTRIC SYSTEM.
2. LINES ARE FOR SCHEMATIC PURPOSES ONLY. ALL EQUIPMENT AND PLACEMENT OF TO BE TO HURRICANE POWER SPECS.
3 EXISTING PRIMARY POWER LINE WILL NEED TO BE RELOCATED AS SHOWN ON PLAN
4. PRE-APPROVED CONTRACTOR TO GO OVER PRINTS WITH HURRICANE POWER BEFORE BEGINNING WORK. CONTACT HURRICANE POWER FOR AN APPOINTMENT 435-635-5536 EXT 4
5. ANY CHANGES TO THE SIGNED SET OF PLANS MUST BE APPROVED BY HURRICANE POWER.
6. THE ENTIRE JUC TRENCH MUST BE BACKFILLED WITH 1" MINUS FROM THE BOTTOM TO THE TOP OF THE TRENCH. ALSO AROUND ELECTRICAL BOXES AND EQUIPMENT.
7. IMPACT FEES FOR ADDITIONAL POWER SERVICE WILL BE COLLECTED BY BUILDING DEPARTMENT. IMPACT FEES TO BE CHARGED BY THE MAIN PANEL SIZE. CONTACT HURRICANE POWER
8. METERS SHALL NOT BE LOCATED IN FENCED AREA. METERS SHALL BE KEPT ACCESSIBLE AT ALL TIMES.
9. DEVELOPER WILL CHARGE FOR OUR LINEMAN TO TERMINATE ALL PRIMARY ELBOW TERMINATIONS. CHARGE WILL BE $99 PER ELBOW.
10. DEPENDING ON TRANSFORMER LOCATION TRANSFORMER MAY NEED BOLLARDS TO PROTECT IT FROM TRAFFIC. CONTACT HURRICANE POWER REGARDING QUESTIONS ON THIS.

TDS TELECOM NOTES:
1. THE DEVELOPER WILL PROVIDE ALL REQUIRED TRENCH WITHIN THE PROJECT. ANY MODIFICATIONS ALONG THE PERIPHERY TO FEED THIS PROJECT WILL BE BILLED TO THE DEVELOPER.
2. TDS WILL PROVIDE CONDUITS. PLEASE CONTACT DAVID AT 435-703-8932 AT LEAST 3 WEEKS PRIOR TO OPENING TRENCH TO SCHEDULE WORK.
3. ANY QUESTIONS REGARDING CONSTRUCTION OF SERVICE SHOULD BE DIRECTED TO DAVID TRAUNTVEIN WITH TDS AT 435-703-8932
4. RELOCATION OF NEW OR EXISTING TDS FACILITIES WILL BE BILLABLE TO THE DEVELOPER/CONTRACTOR
5. ANY MODIFICATIONS AFTER CONDUIT/CABLE PLACEMENT WILL BE BILLABLE TO THE DEVELOPER CONTRACTOR AS WELL DAMAGES CAUSED BY OTHER CONTRACTORS WORKING FOR THE DEVELOPER ON THIS PROJECT.

OWNER/DEVELOPER
CURTIS ANDERSON
(435) 632-8899 CELL

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

CALL BEFORE YOU DIG
Call before you DIG 1-800-662-4111
1 UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY
2 IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING ANY CONSTRUCTION
3 NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON
4 THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS

LEGEND

SEWER
- NEW SEWER LINES (SIZE AS NOTED)
- EXISTING SEWER LINES (SIZE AS NOTED)
- SERVICE LATERALS (SIZE AS NOTED)
- SEWER MANHOLES (SIZE AS NOTED)

WATER
- NEW WATER LINE (SIZE AS NOTED)
- EXISTING WATER LINES (SIZE AS NOTED)
- SERVICE LINE (SIZE AS NOTED)
- FIRE LINE (SIZE AS NOTED)
- EXISTING FIRE LINE (SIZE AS NOTED)
- NEW FIRE HYDRANT W/ GATE VALVE
- EXISTING FIRE HYDRANT W/ GATE VALVE
- NEW WATER GATE VALVE
- EXISTING WATER GATE VALVE
- SINGLE WATER METER (SIZE AS NOTED) (DETECTOR LINE TO BE INSTALLED TO MAIN)

POWER
- PRIMARY THREE PHASE POWER LINE
- SECONDARY THREE PHASE POWER LINE
- PRIMARY POWER LINE (PHASE NOTED)
- SECONDARY POWER LINE (PHASE NOTED)
- PMH SWITCH (SIZE AS NOTED)
- TRANSFORMER (SIZE AND PHASE NOTED)
- 4-WAY VAULT
- SECONDARY POWER BOX
- POWER POLE

GAS
- NEW GAS LINE

NO.	DATE	BY	APPVD	REVISION DESCRIPTION

STATE OF UTAH — LICENSED PROFESSIONAL ENGINEER — 170069 — LLOYD RIED POPE — 10-26-20 — PROFESSIONAL SEAL

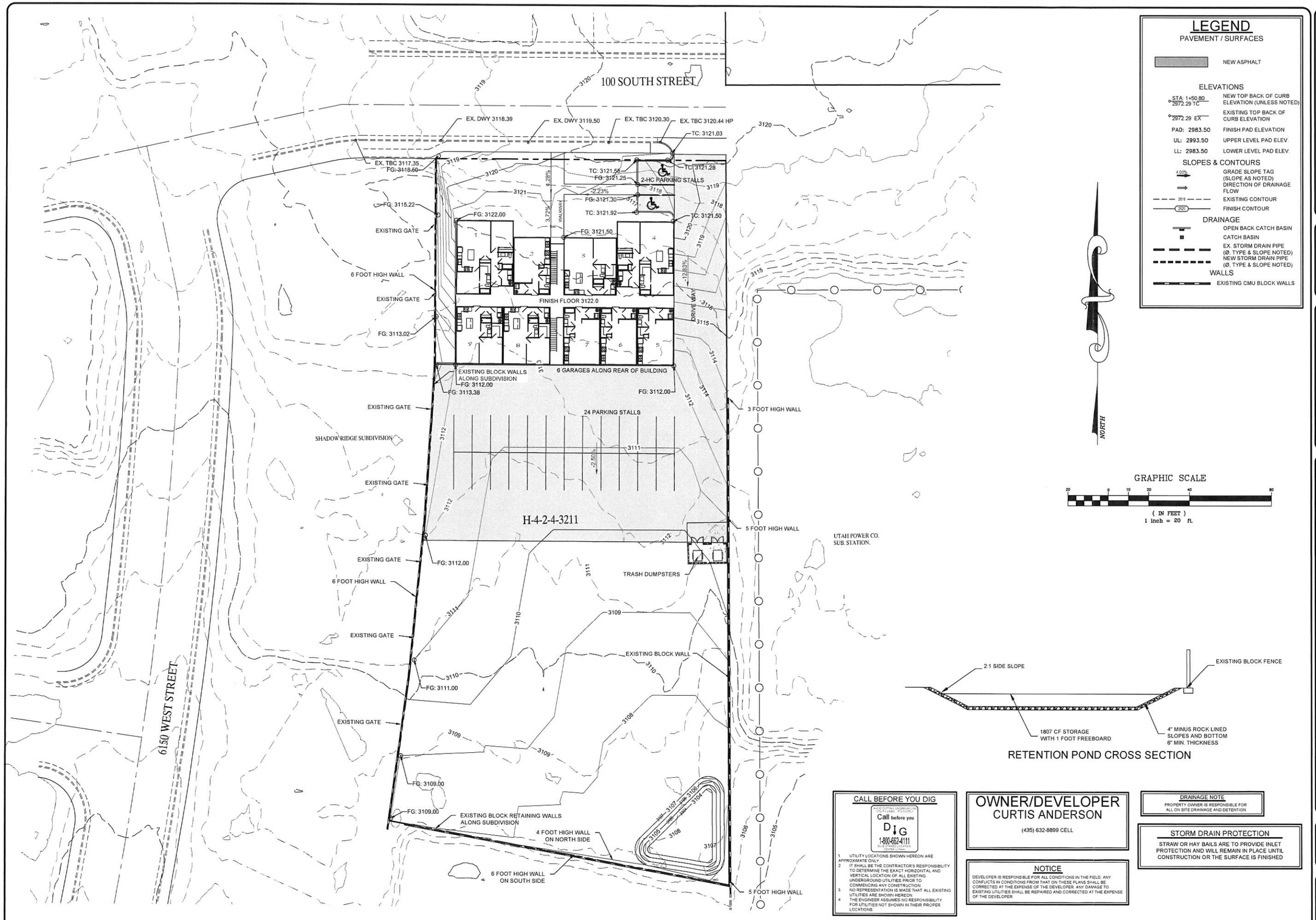
L. R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS, CIVIL ENGINEERS & SURVEYORS
124 EAST 100 SOUTH SUITE 1&8
ST. GEORGE, UTAH
(PHONE) 435-628-1870
(FAX) 435-628-1871
(EMAIL) lrpope@lrpope.com

THESE PLANS ARE THE PROPERTY OF L. R. POPE ENGINEERING INC. AND ARE NOT TO BE USED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF L. R. POPE ENGINEERING INC.

CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
SITE UTILITY PLAN
LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M

DESIGN BY LRP
DATE 10-26-20
FILE NAME CURTIS ANDERSON

24" x 36" SCALE 1" = 20'
12" x 18" SCALE 1" = 40'
SHEET NUMBER C2.00



LEGEND

PAVEMENT / SURFACES

NEW ASPHALT

ELEVATIONS

STA: 1+50.80 / 2972.29 TC — NEW TOP BACK OF CURB ELEVATION (UNLESS NOTED)

2972.29 EX — EXISTING TOP BACK OF CURB ELEVATION

PAD: 2983.50 — FINISH PAD ELEVATION

UL: 2983.50 — UPPER LEVEL PAD ELEV.

LL: 2983.50 — LOWER LEVEL PAD ELEV.

SLOPES & CONTOURS

4.00% — GRADE SLOPE TAG (SLOPE AS NOTED)

DIRECTION OF DRAINAGE FLOW

2618 — EXISTING CONTOUR

2620 — FINISH CONTOUR

DRAINAGE

OPEN BACK CATCH BASIN

CATCH BASIN

EX. STORM DRAIN PIPE (Ø, TYPE & SLOPE NOTED)

NEW STORM DRAIN PIPE (Ø, TYPE & SLOPE NOTED)

WALLS

EXISTING CMU BLOCK WALLS

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

RETENTION POND CROSS SECTION

CALL BEFORE YOU DIG

Call before you DIG 1-800-662-4111

1. UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING ANY CONSTRUCTION.
3. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON.
4. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS.

OWNER/DEVELOPER

CURTIS ANDERSON

(435) 632-8899 CELL

NOTICE

DEVELOPER IS RESPONSIBLE FOR ALL CONDITIONS IN THE FIELD. ANY CONFLICTS IN CONDITIONS FROM THAT ON THESE PLANS SHALL BE CORRECTED AT THE EXPENSE OF THE DEVELOPER. ANY DAMAGE TO EXISTING UTILITIES SHALL BE REPAIRED AND CORRECTED AT THE EXPENSE OF THE DEVELOPER

DRAINAGE NOTE

PROPERTY OWNER IS RESPONSIBLE FOR ALL ON SITE DRAINAGE AND DETENTION

STORM DRAIN PROTECTION

STRAW OR HAY BAILS ARE TO PROVIDE INLET PROTECTION AND WILL REMAIN IN PLACE UNTIL CONSTRUCTION OR THE SURFACE IS FINISHED

NO.	DATE	BY	APPVD	REVISION DESCRIPTION

STATE OF UTAH — 155069 — LLOYD RIED POPE — 10-26-20 — REGISTERED PROFESSIONAL ENGINEER

L.R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS, CIVIL ENGINEERS & SURVEYORS

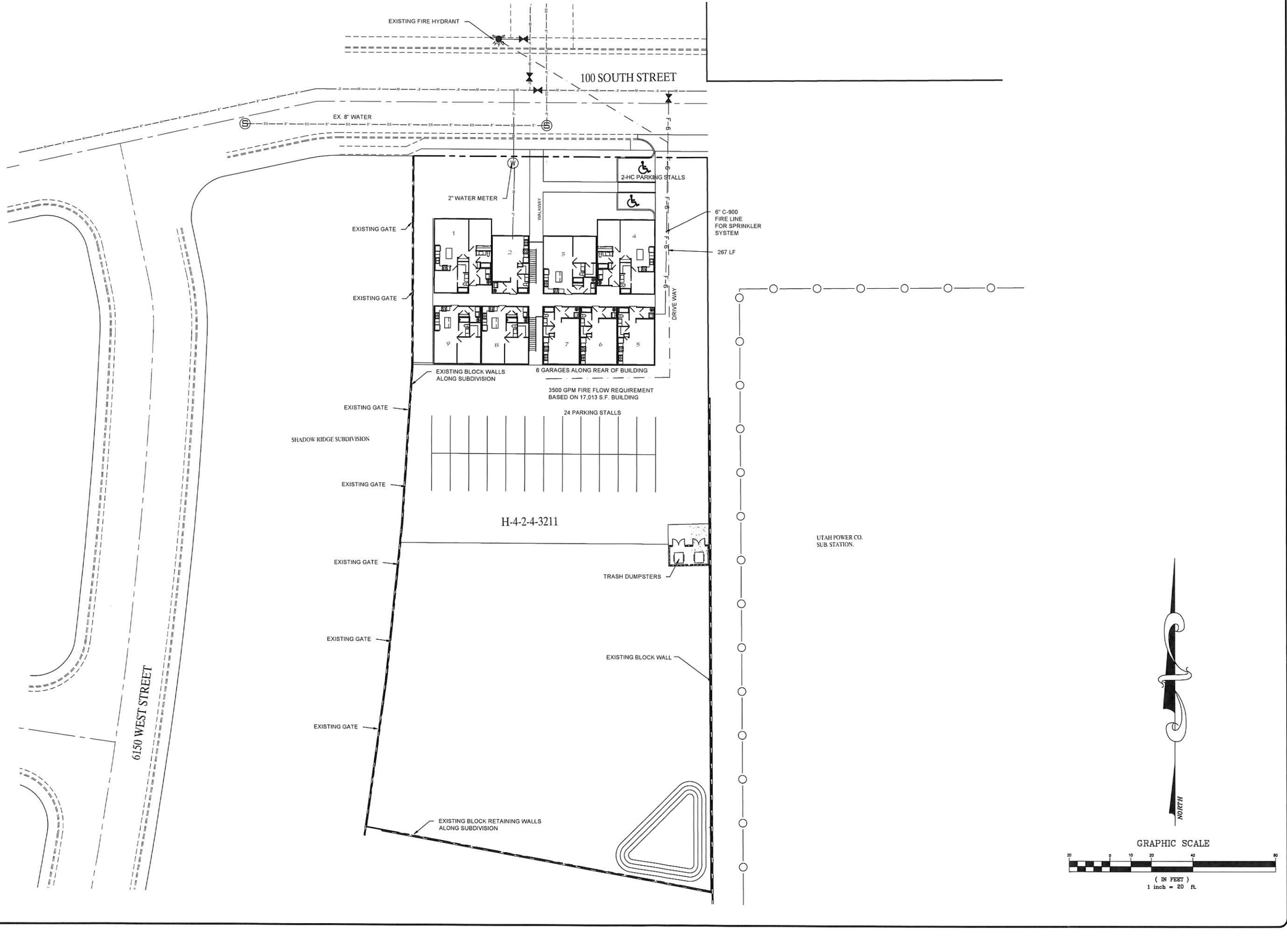
CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M

GRADING AND DRAINAGE PLAN

DESIGN BY LRP
DATE 10-26-20
FILE NAME CURTIS ANDERSON

24" x 36" SCALE 1" = 20'
12" x 18" SCALE 1" = 40'

SHEET NUMBER C3.00



NO	DATE	BY	APP'D	REVISION DESCRIPTION

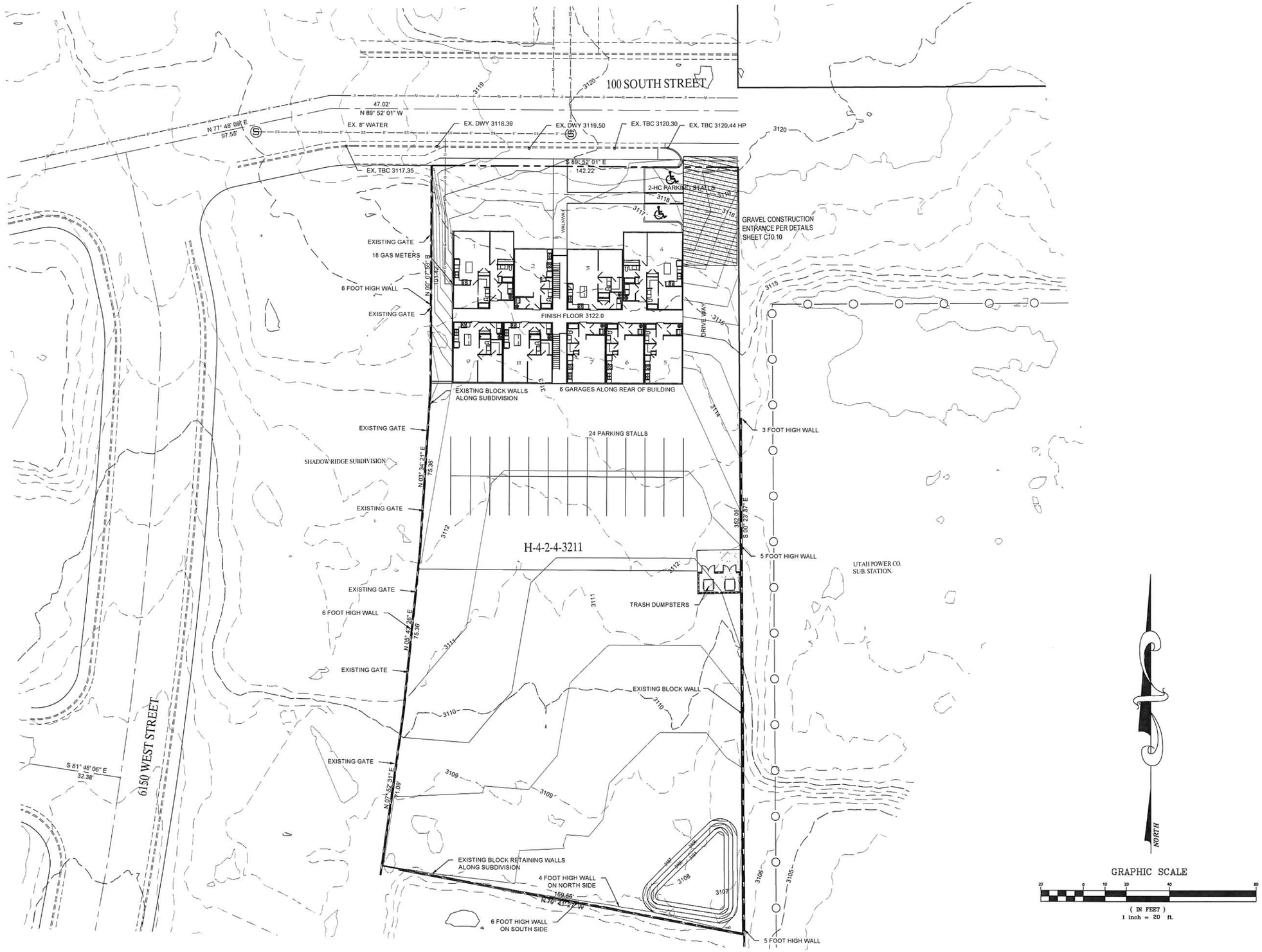
STATE OF UTAH
TS369
LLOYD RIED
POPE
10-26-20
REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR

L. R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS, CIVIL ENGINEERS & SURVEYORS
1245 EAST 100 SOUTH SUITE 143
ST. GEORGE, UTAH 84770
(PHONE) 435-628-1974
(FAX) 435-628-7189
(EMAIL) lrpope@yahoo.com

THESE PLANS ARE THE PROPERTY OF L. R. POPE ENGINEERING INC. AND ARE NOT TO BE USED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF L. R. POPE ENGINEERING INC. ALL RIGHTS RESERVED.

CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
LIFE SAVINGS PLAN
LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M

DESIGN BY	LRP
DATE	10-26-20
FILE NAME	CURTIS ANDERSON
24" x 36"	SCALE 1" = 20'
12" x 18"	SCALE 1" = 40'
SHEET NUMBER	C4.00



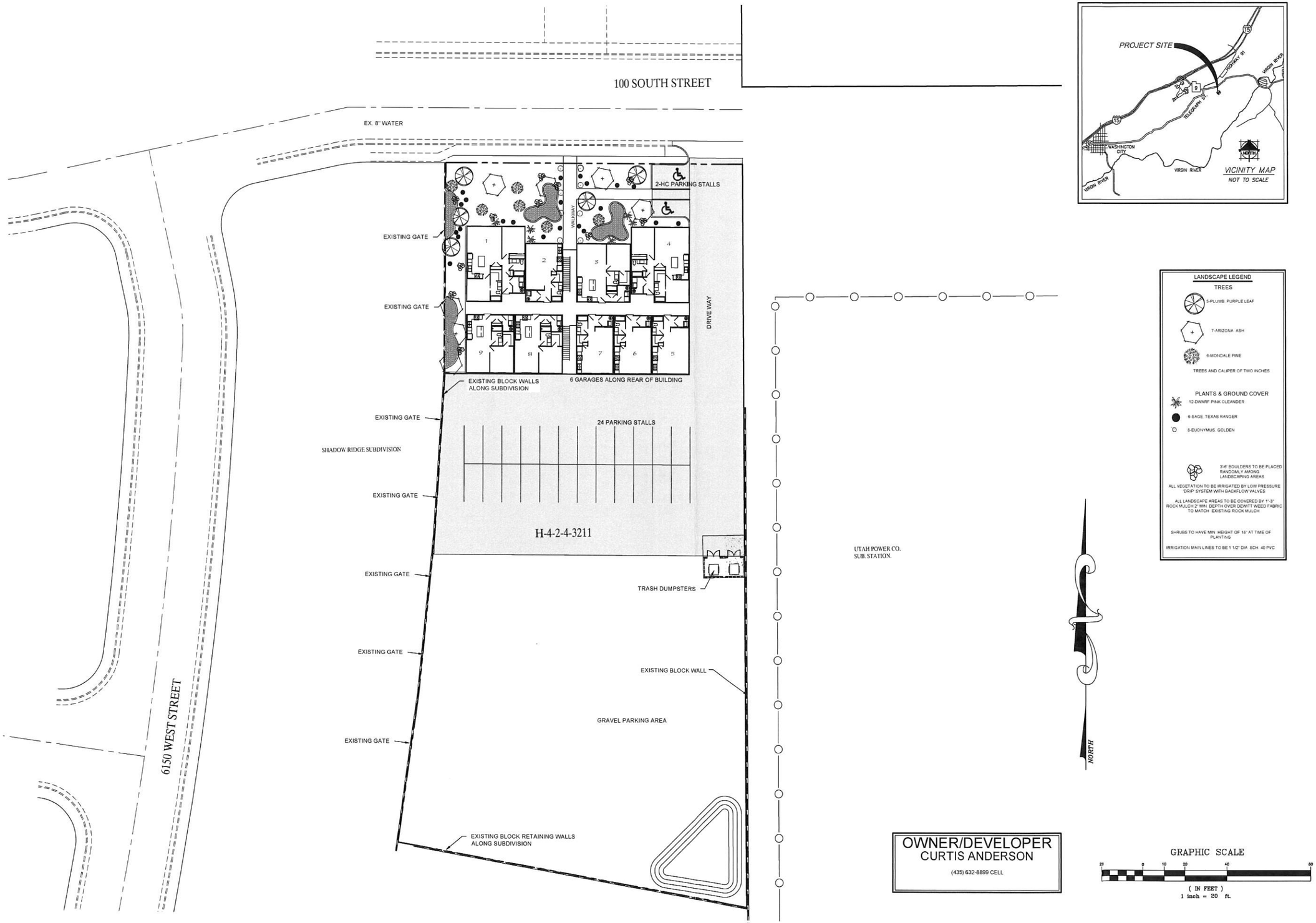
NO	DATE	BY	APPVD	REVISION DESCRIPTION

153069
LLOYD RIED
POPE
10-26-20

L. R. POPE ENGINEERING INC.
DIRECTIONAL DRILLING • CIVIL ENGINEERING & SURVEYING
124 EAST 100 SOUTH SUITE 1&B
ST. GEORGE, UTAH
(PHONE) 435-628-7726
(FAX) 435-634-2759
(EMAIL) lrpope@ltpope.com

CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
EROSION PLAN
LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M

DESIGN BY	LRP
DATE	10-26-20
FILE NAME	CURTIS ANDERSON
24" x 36"	SCALE 1" = 20'
12" x 18"	SCALE 1" = 40'
SHEET NUMBER	C5.00



LANDSCAPE LEGEND

TREES

5-PLUMB. PURPLE LEAF

7-ARIZONA ASH

6-MONDALE PINE

TREES AND CALIPER OF TWO INCHES

PLANTS & GROUND COVER

12-DWARF PINK OLEANDER

6-SAGE, TEXAS RANGER

8-EUONYMUS, GOLDEN

3'-6' BOULDERS TO BE PLACED RANDOMLY AMONG LANDSCAPING AREAS

ALL VEGETATION TO BE IRRIGATED BY LOW PRESSURE DRIP SYSTEM WITH BACKFLOW VALVES

ALL LANDSCAPE AREAS TO BE COVERED BY 1"-3" ROCK MULCH 2" MIN. DEPTH OVER DEWITT WEED FABRIC TO MATCH EXISTING ROCK MULCH

SHRUBS TO HAVE MIN. HEIGHT OF 18" AT TIME OF PLANTING

IRRIGATION MAIN LINES TO BE 1 1/2" DIA. SCH. 40 PVC

OWNER/DEVELOPER
CURTIS ANDERSON
(435) 632-8899 CELL

GRAPHIC SCALE
25 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

NO.	DATE	BY	APPVD	REVISION DESCRIPTION

STATE OF UTAH
153969
LLOYD R. POPE
10-26-20
REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR

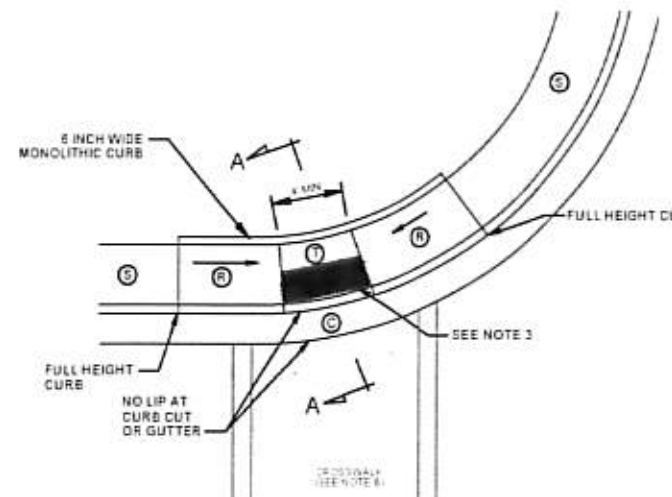
L.R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS, CIVIL ENGINEERS & SURVEYORS
136 EAST 100 SOUTH SUITE 1-A5
ST. GEORGE, UTAH
PHONE) 435-634-1971
FAX) 435-634-1972
EMAIL) lrpope@inpope.com

THESE PLANS ARE THE PROPERTY OF L.R. POPE ENGINEERING INC. AND ARE NOT TO BE USED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF L.R. POPE ENGINEERING INC. ALL RIGHTS RESERVED.

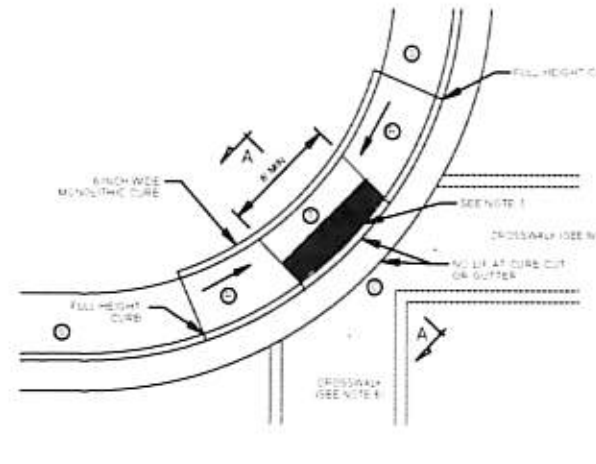
CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
LANDSCAPE PLAN
LOCATED IN SECTION 4, TOWNSHIP 41 SOUTH, RANGE 14 WEST, SLB&M

DESIGN BY LRP
DATE 10-26-20
FILE NAME CURTIS ANDERSON

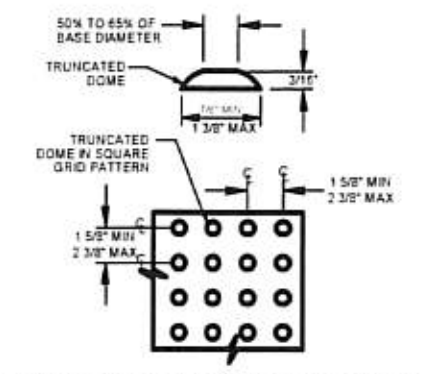
24" x 36" SCALE 1" = 20'
12" x 18" SCALE 1" = 40'
SHEET NUMBER C6.00



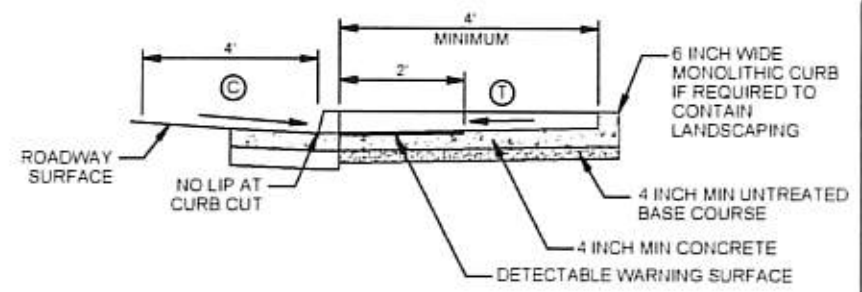
CORNER PEDESTRIAN RAMP
SINGLE CROSSING



CORNER PEDESTRIAN RAMP
DUAL CROSSING



DETECTABLE WARNING SURFACE



SECTION A-A

SLOPE TABLE			
	ITEM	MAX. RUNNING SLOPE *	MAX. CROSS SLOPE *
Ⓣ	TURNING SPACE	2%	2% (c)
Ⓡ	RAMP	8.33% (a)	2% (c)
Ⓒ	CLEAR SPACE	5% (b)	2% (c)
Ⓢ	SIDEWALK	STREET GRADE	2%

* RUNNING SLOPE IS IN THE DIRECTION OF PEDESTRIAN TRAVEL. CROSS SLOPE IS PERPENDICULAR TO PEDESTRIAN TRAVEL.

(a) LENGTH OF RUNNING SLOPE FOR PARALLEL RAMPS IS NOT REQUIRED TO EXCEED 15 FT.

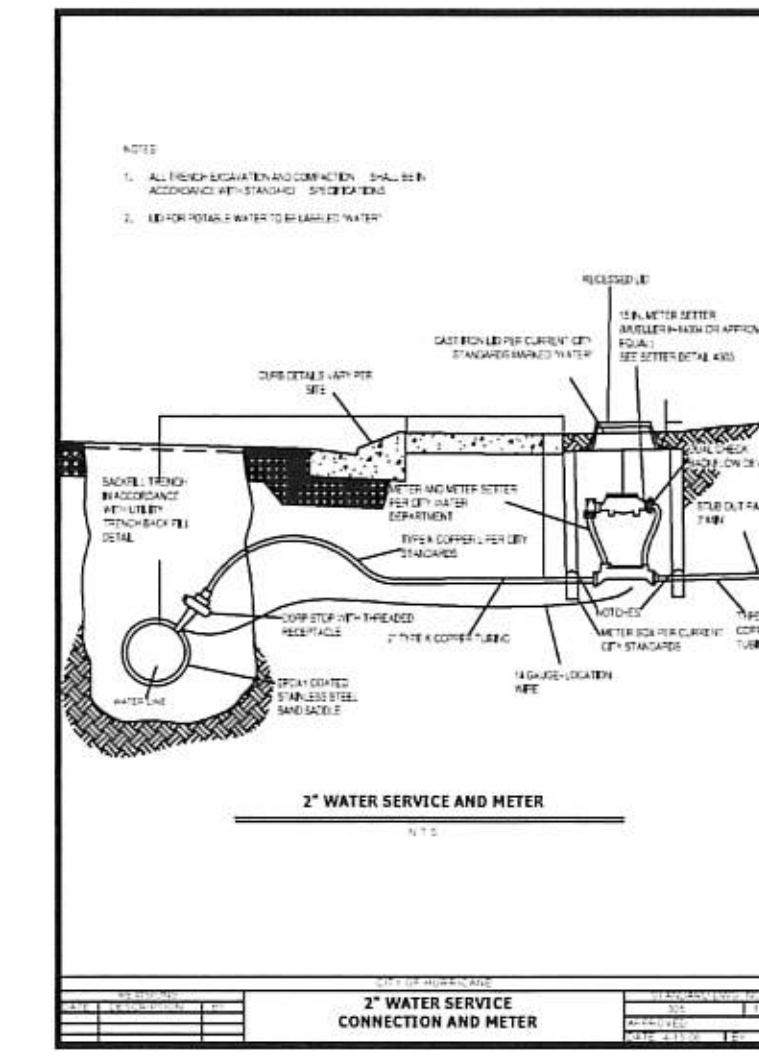
(b) MAINTAIN CONSISTENCY OF CLEAR SPACE RUNNING SLOPE ACROSS ENTIRE CURB CUT. WARP GUTTER PAN TO MEET REQUIRED CLEAR SPACE SLOPE AT CURB CUT.

(c) DO NOT EXCEED THE ROADWAY PROFILE GRADE FOR THE CROSS SLOPE AT CROSSWALKS WITHOUT STOP OR YIELD CONTROL AND AT MID-BLOCK CROSWALKS.

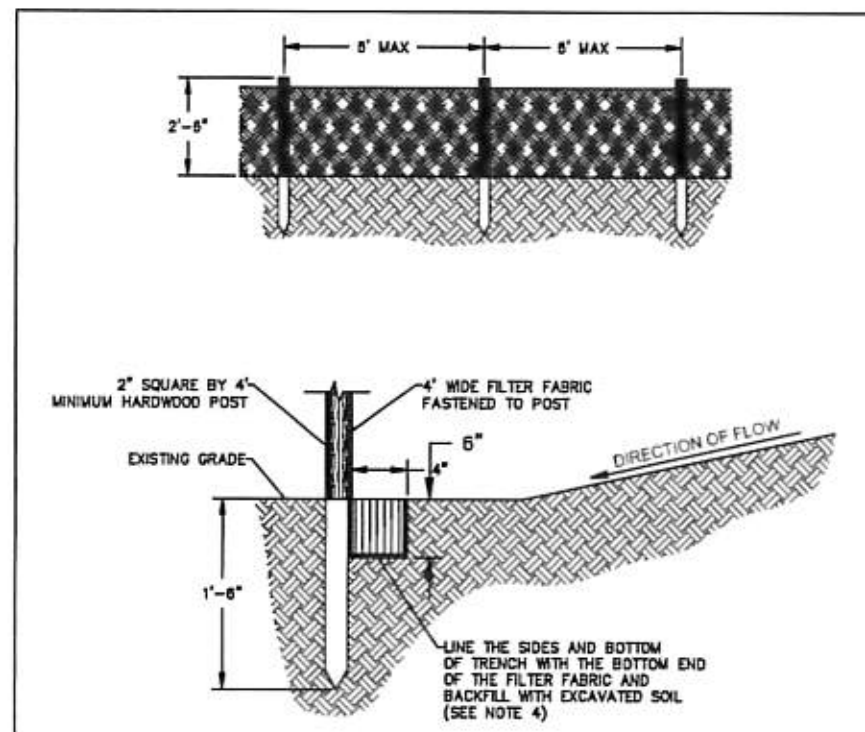
NOTES:

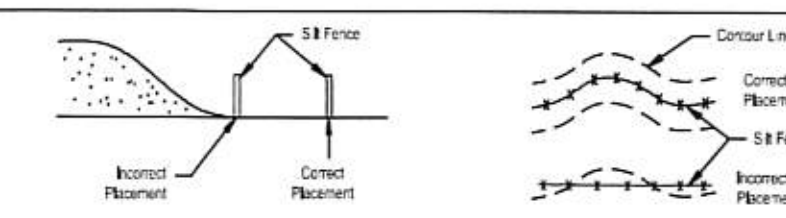
1. DIMENSIONS SHOWN IN THE SLOPE TABLE ON ARE NOT SUBJECT TO CONVENTIONAL INDUSTRY TOLERANCES. CONSTRUCT SIDEWALKS AND RAMPS SUCH THAT THE MAXIMUM OR MINIMUM VALUES ARE NOT EXCEEDED. WORK THAT EXCEEDS THOSE VALUES WILL NOT BE ACCEPTED.
2. PROVIDE DETECTABLE WARNING SURFACE FOR FULL WIDTH OF CURB CUT.
3. LOCATE DETECTABLE WARNING SURFACE SO THE CORNERS NEAREST THE STREET ARE WITHIN 1 INCH OF THE BACK OF CURB.
4. RAMP GRADE BREAK MUST BE PERPENDICULAR TO THE RUNNING SLOPE.
5. CLEAR SPACE AND TURNING SPACE SIZE: 4 FT MIN. X 4 FT MIN.
6. CROSSWALK DELINEATION IF REQUIRED ON PROJECT STRIPING PLAN.

NOT TO SCALE



NOT TO SCALE





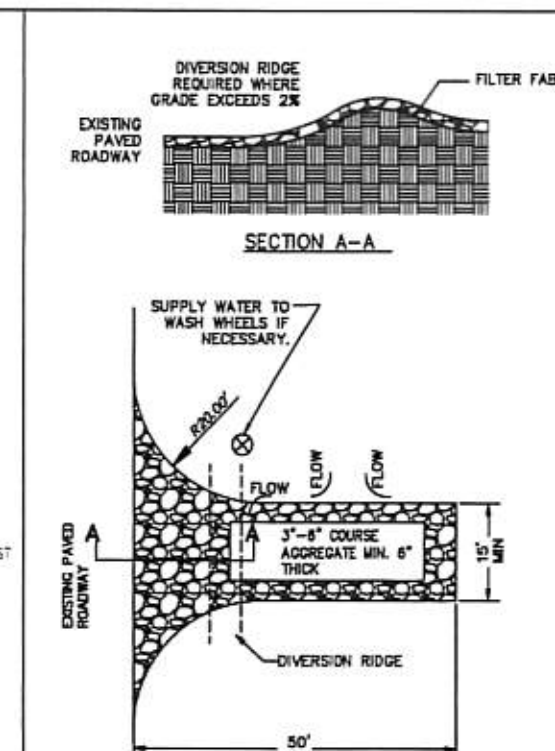
SEE NOTE 1   SEE NOTE 2

NOTES:

1. WHERE POSSIBLE, LAYOUT THE SILT FENCE 5' TO 10' BEYOND THE TOE OF SLOPE.
2. ALIGN THE FENCE ALONG THE CONTOUR AS CLOSE AS POSSIBLE.
3. WHEN EXCAVATING THE TRENCH, USE MACHINERY THAT WILL PROVIDE NO MORE THAN THE DESIRED DIMENSIONS.
4. EXTEND THE BOTTOM 1'-4" OF THE FABRIC TO LINE ALL THREE SIDES OF THE TRENCH.
5. TO AVOID EXCESSIVE PONDING OF WATER AT LOW POINTS ALONG THE FENCE, PROVIDE AN OPENING IN THE SILT FENCE AND INSTALL A CHECK DAM.
6. AVOID USING JOINTS ALONG THE FENCE AS MUCH AS POSSIBLE. IF A JOINT IS NECESSARY, SPLICE THE FILTER FABRIC AT A POST WITH 6" OVERLAPS AND SECURELY FASTEN BOTH ENDS TO THE POST.
7. MAINTAIN A PROPERLY FUNCTIONING SILT FENCE THROUGHOUT THE DURATION OF THE PROJECT OR UNTIL DISTURBED AREAS HAVE BEEN VEGETATED.
8. REMOVE SEDIMENT AS IT ACCUMULATES AND PLACE IT IN A STABLE AREA APPROVED BY THE ENGINEER.

SPECIFICATIONS FOR SILT FENCE DETAIL

NOT TO SCALE



NOTES

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT

CONSTRUCTION SPECIFICATIONS

THE AGGREGATE SIZE FOR CONSTRUCTION OF THE PAD SHALL BE 3 TO 6 INCH STONE. PLACE GRAVEL TO THE SPECIFIC GRADE AND DIMENSIONS SHOWN ON THE PLANS, AND SMOOTH IT. USE GEOTEXTILE FABRICS, IF NECESSARY, TO IMPROVE STABILITY OF THE FOUNDATION IN LOCATIONS SUBJECT TO SEEPAGE OR HIGH WATER TABLE. THE WIDTH OF THE PAD SHALL NOT BE LESS THAN THE FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS AND IN ANY CASE SHALL NOT BE LESS THEN 12 FEET WIDE. THE LENGTH OF THE PAD SHALL BE REQUIRED, BUT NOT LESS THAN 50.

LOCATE CONSTRUCTION ENTRANCES AND EXITS TO LIMIT SEDIMENT LEAVING THE SITE AND TO PROVIDE FOR MAXIMUM UTILITY BY ALL CONSTRUCTION VEHICLES. AVOID ENTRANCES WHICH HAVE STEEP GRADES AND ENTRANCES AT CURVES IN PUBLIC ROADS. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT OF WAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHT-OF-WAY SHALL BE REMOVED IMMEDIATELY. PROVIDE DRAINAGE TO CARRY WATER TO A SEDIMENT TRAP OR OTHER SUITABLE OUTLET. WHEN NECESSARY, WHEELS SHALE BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE THROUGH USE OF SAND BAGS, GRAVEL, STRAW BALES, OR OTHER APPROVED METHODS.

MAINTENANCE:
MAINTAIN THE GRAVEL PAD IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. REPLACE GRAVEL MATERIAL WHEN SURFACE VOIDS ARE VISIBLE. AFTER EACH RAINFALL, INSPECT ANY STRUCTURE USED TO TRAP SEDIMENT AND CLEAN IT OUT AS NECESSARY. IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED, OR TRACKED ONTO PUBLIC ROADWAYS. REMOVE ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS WITHIN 24 HOURS.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE / EXIT

NOT TO SCALE

EROSION CONTROL NOTES:

1. PROVIDE SEDIMENT BASINS AT THE BOTTOM OF EVERY DRAINAGE AREA PRODUCING SEDIMENT RUNOFF. THE BASINS SHALL BE MAINTAINED AND CLEANED AFTER EVERY STORM EVENT. THE BASINS MAY BE REMOVED AFTER SOIL STABILIZATION AND VEGETATION IS ESTABLISHED ON ERODABLE SLOPES

2.PROVIDE SEDIMENT CONTROL AROUND EVERY STORM DRAIN INLET TO PREVENT SEDIMENT FROM ENTERING THE STORM DRAIN SYSTEM

3.ALL EROSION CONTROL BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE INSPECTED AND MAINTAINED REGULARLY AND AFTER EVERY STORM EVENT.

4.ANY ALTERNATIVE CONTROL MEASURES MUST BE APPROVED IN ADVANCE BY THE ENGINEER AND THE CITY OF HURRICANE.

5.THE CONTRACTOR SHOULD FOLLOW A WORK SCHEDULE THAT COORDINATES THE TIMING OF LAND-DISTURBING ACTIVITIES.

6.LIMIT LAND CLEARING AND RESTORE ALL GRADING AS SOON AS POSSIBLE

7.PRACTICE STAGED SEEDING TO RE-VEGETATE CUT AND FILL SLOPES AS THE WORK IS IN PROGRESS

8.AT ALL TIMES DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING AND CONTROLLING EROSION DUE TO WIND AND OTHER EROSION. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING ALL EROSION CONTROL BMP'S

9.ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED BY THE ENGINEER OR THE CITY OF HURRICANE.

10.THE CONTRACTOR IS RESPONSIBLE FOR KEEPING THE STREETS CLEAN AND FREE FROM DEBRIS.

11.CONTRACTOR SHALL USE VEHICLE TRACKING CONTROL AT ALL ENTRANCES AND EXITS.

12.ALL WASH WATER (CONCRETE TRUCKS, VEHICLE CLEANING, ETC.) SHALL BE DISPOSED AS TO NOT ENTER THE STORM WATER SYSTEM.

13.CONTRACTOR SHALL PROVIDE DUST CONTROL AT ALL TIMES DURING CONSTRUCTION.

14.THE LIMITS OF DISTURBANCE SHALL BE STAKED BEFORE CONSTRUCTION BEGINS

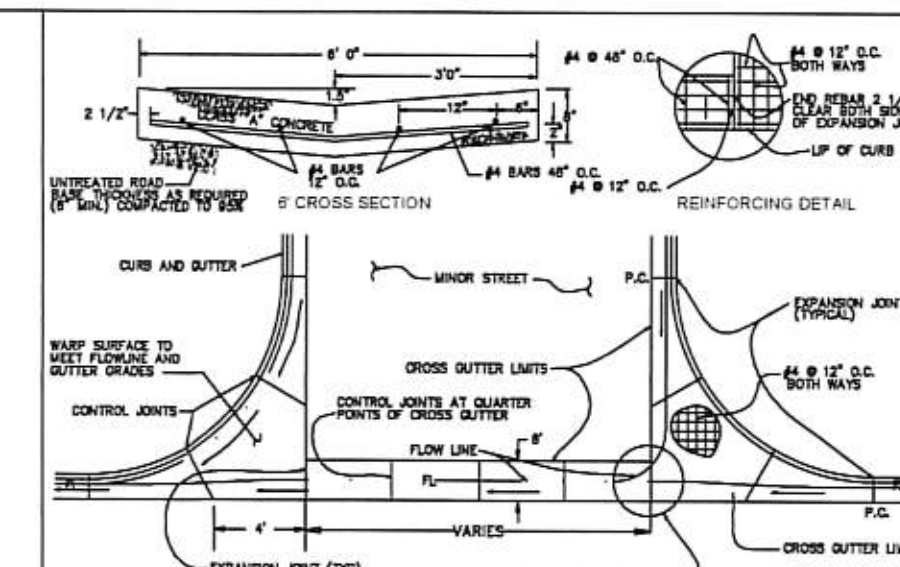
15.COMPLY WITH ANY AND ALL REQUIREMENTS FROM THE CITY OF ST.GEORGE AND THE UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY.

16.A COPY OF THIS STORM WATER POLLUTION PREVENTION PLAN SHALL BE KEPT ON SITE DURING ALL CONSTRUCTION ACTIVITY.
LONG TERM MAINTENANCE (POST CONSTRUCTION)

1. EROSION CONTROL STRUCTURES MAY BE REMOVED ONCE FINAL LANDSCAPING IS IN PLACE. EROSION CONTROL STRUCTURES BELOW SEEDED AREAS MUST REMAIN IN PLACE UNTIL THE ENTIRE AREA HAS BEEN ESTABLISHED. EROSION CONTROL IN PROPOSED PAVEMENT AREAS SHALL REMAIN IN PLACE UNTIL PAVEMENT IS COMPLETE

2. THE PROPERTY OWNER IS RESPONSIBLE TO COMPLY WITH ALL APPLICABLE STORM WATER REGULATIONS AT ALL TIMES. ALL BMP'S SHALL BE MAINTAINED TO EFFECTIVELY PREVENT THE IMPACTS OF THIS PROJECTS CONSTRUCTION AND USE ON STORM WATER QUALITY.

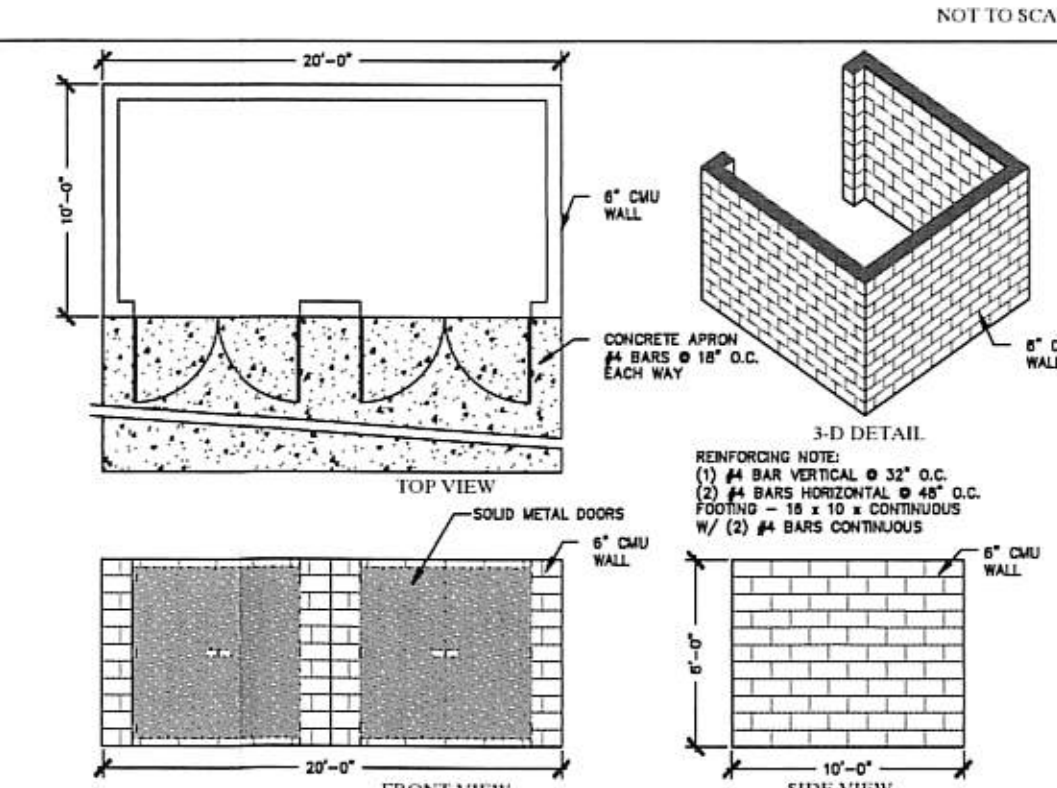
3. THE FOLLOWING PRECAUTIONS SHALL BE PERFORMED
   a. PERIODIC INSPECTION OF CATCH BASIN SEDIMENT TRAPS AND CLEANING WHEN THE BASIN IS MORE THAN ½ FULL. INSPECTIONS SHALL BE DONE AFTER EVERY MAJOR RAINFALL AND EVERY 6 MONTHS AS A MINIMUM. DISPOSAL OF ANY GREASE OR OIL MUST BE DONE IN ACCORDANCE WITH CURRENT ENVIRONMENTAL REGULATIONS.
   b. LITTER, DEBRIS, AND CHEMICALS MUST BE PICKED UP AND KEPT IN A LOCATION TO PREVENT POLLUTION OF STORM WATER DISCHARGE.
   c. PARKING AREAS SHALL BE KEPT FREE FROM AUTOMOBILE FLUIDS AS TO NOT WASH INTO THE STORM DRAIN SYSTEM.



NOTES:
1- FOR USE ON RESIDENTIAL STREETS ONLY.
2- CROSS GUTTERS ARE USED AT INTERSECTIONS ONLY UNLESS OTHERWISE APPROVED.
3- CROSS GUTTER SHALL CROSS THE MINOR STREET.
4- ALL REINFORCING STEEL SHALL HAVE 2-INCH MINIMUM CLEAR COVER. SUPPORT CHAIRS, BLOCKS OR OTHER APPROVED EQUAL SHALL BE USED TO RAISE STEEL OFF GROUND.
5- REINFORCING TO EXTEND TO LIMITS OF CROSS GUTTER.
6- ALL REINFORCING STEEL SHALL BE GRADE 60 ASTM A 615.

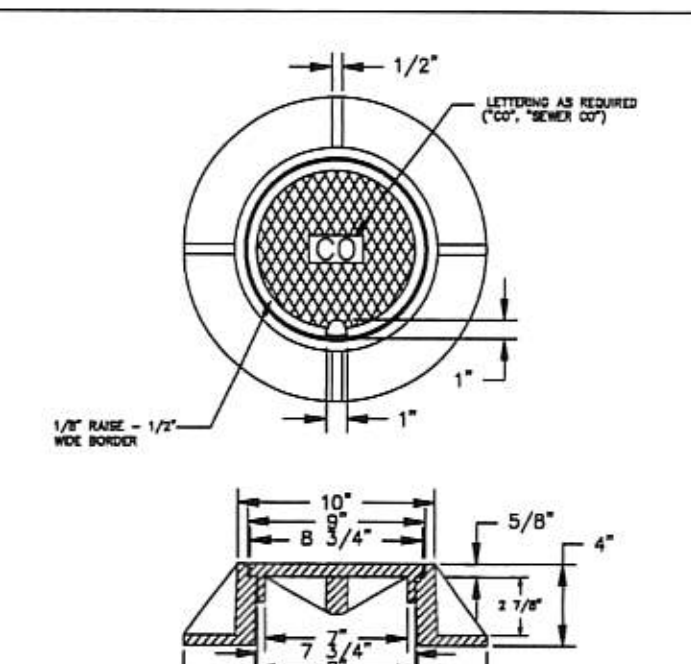
STANDARD 8' CROSS GUTTER

NOT TO SCALE



TRASH ENCLOSURE DETAILS

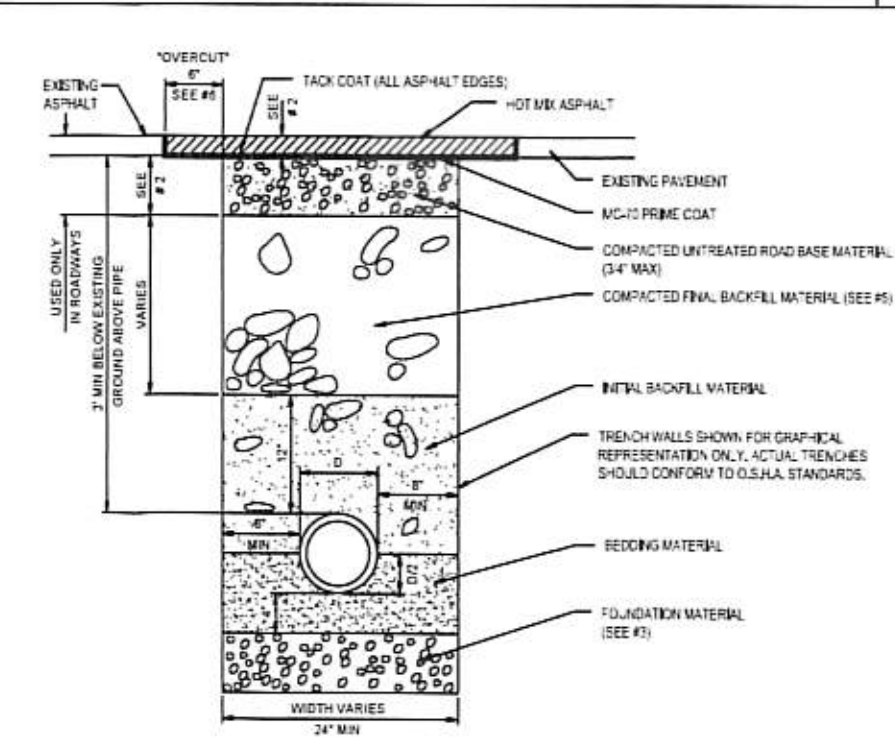
NOT TO SCALE



NOTES:
1– MATERIAL SHALL BE CAST IRON ASTM A48, CL30

SEWER CLEANOUT COVER

NOT TO SCALE

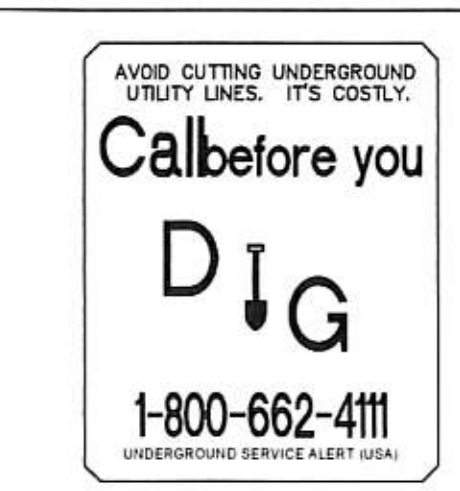


NOTES:

1. ALL EXCAVATIONS WITHIN PUBLIC RIGHT-OF-WAY REQUIRE AN ENCROACHMENT PERMIT FROM THE CITY ENCROACHMENT OFFICER.
2. MINIMUM THICKNESS OF ASPHALT AND BASE SHALL BE AS OUTLINED IN THE ROADWAY STRUCTURAL REQUIREMENTS. IN NO CASE SHALL THE THICKNESS BE LESS THAN THE EXISTING.
3. FOUNDATION MATERIAL SHALL BE USED WHEN TRENCH BOTTOM IS UNSTABLE.
4. ALL STATE HIGHWAY CROSSING SHALL BE APPROVED BY THE U.D.O.T. DISTRICT ENGINEER (U.D.O.T. PERMIT REQUIRED)
5. MINIMUM COMPACTING SHALL BE 95% WHEN APPROVED FLOW ABLE FILL OR SLURRY IS USED COMPACTING TEST WILL NOT BE REQUIRED.
6. WHEN MATERIAL UNDER THE 6" OVER CUT SLUFFS OFF OR IS REMOVED, BASE SHALL BE COMPACTED, TO THE BOTTOM LEVEL OF EXISTING ASPHALT. AN ADDITIONAL 6" IN WIDTH OF ASPHALT SHALL BE CUT, REMOVED AND REPLACED AS OF THE OVERALL PATCH.
7. WHERE ROAD SECTION HAS A DESIGNED GRANULAR SUB-BASE, IT SHALL BE REPLACED IN KIND OR WITH ROAD BASE GRAVEL.
8. IN GENERAL, STREET SURFACE LESS THAN 24 MONTHS OLD WILL NOT BE CUT! IF A CUT MUST BE MADE, ADDITIONAL STRICTER REQUIREMENTS MAY BE INVOKED. SEE ENCROACHMENT OFFICER.
9. 24 HOUR NOTES REQUIRED ON ALL INSPECTIONS.
10. ALL TRENCH BACK FILL SHALL MEET MIN. COMPACTING REQUIREMENTS.
11. EXCLUDING EMERGENCY CLOSURES ALL ROAD CLOSURES AND DETOURS REQUIRE 48 HOURS PRIOR NOTICE.

TRENCH BACKFILL

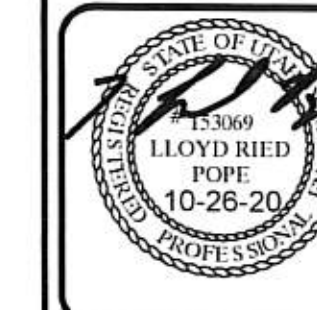
NOT TO SCALE



UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING ANY CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS.

DISCLAIMER

NO.	DATE	BY	APPVD	REVISION DESCRIPTION



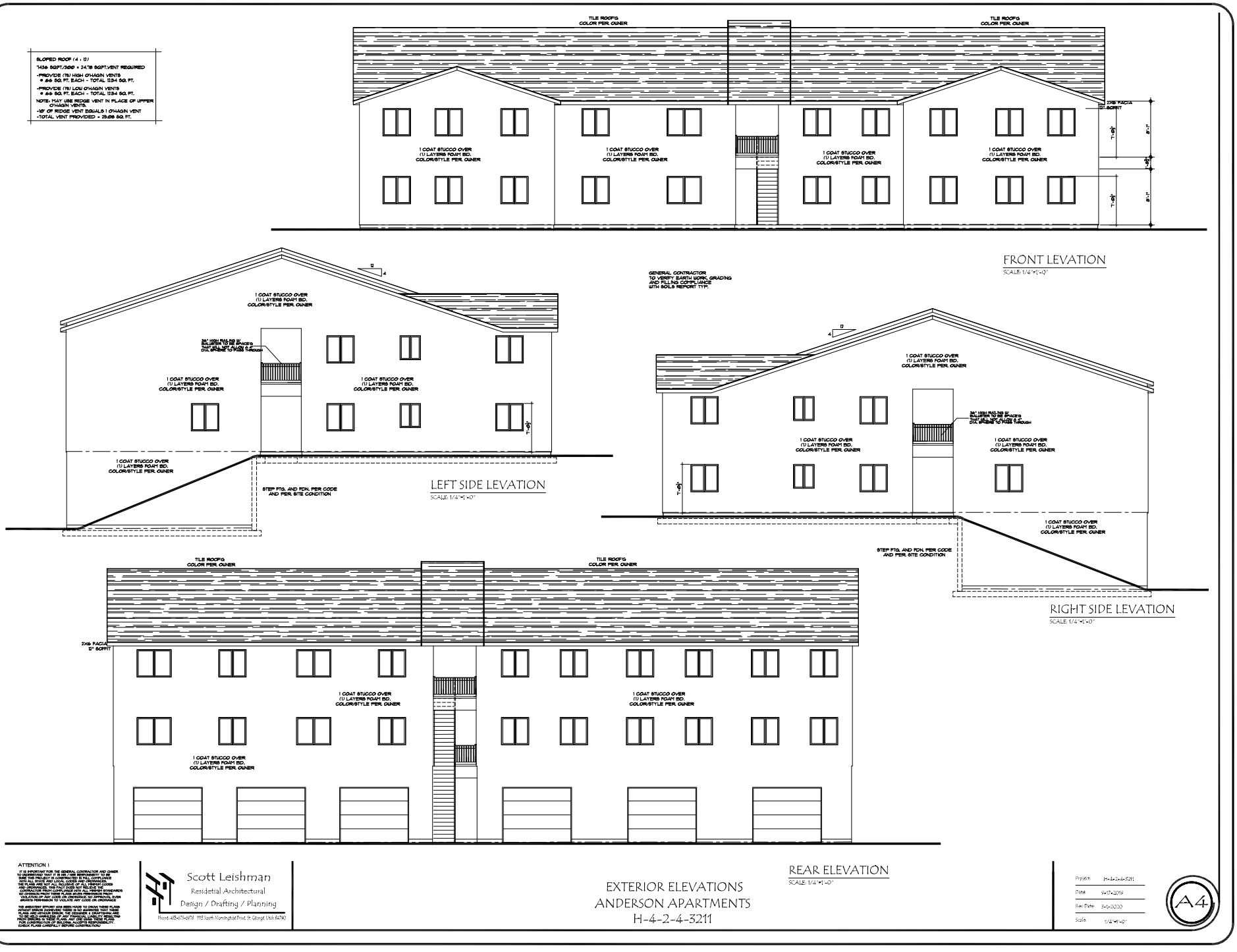
1240 EAST 100 SOUTH SUITE 15-B
ST. GEORGE, UTAH
(PHONE) 435-628-1676
(FAX) 435-628-1788
(EMAIL) lrpope@lrpope.com
L. R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS, CIVIL ENGINEERS & SURVEYORS

CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
DETAILS
LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M

DESIGN BY
LRP
DATE
10-26-20
FILE NAME
CURTIS ANDERSON

24" x 36"
SCALE 1" = 1"
12" x 18"
SCALE 1" = 1"
SHEET NUMBER
C10.00

PDF created with pdfFactory Pro trial version www.pdffactory.com



ATTENTION !

IT IS IMPORTANT FOR THE GENERAL CONTRACTOR AND OWNER TO UNDERSTAND THAT IT IS HIS / HER RESPONSIBILITY TO SEE THAT THE PROJECT IS CONSTRUCTED IN FULL COMPLIANCE WITH ALL LOCAL CODES AND ORDINANCES. THESE PLANS ARE NOT ALL INCLUSIVE OF ALL TRADES' CODES AND ORDINANCES. THIS FACT DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO MEET ALL APPLICABLE STANDARDS. NO CHANGES FROM THESE PLANS SHALL BE MADE WITHOUT PRIOR APPROVAL FROM THE DESIGNER. VIOLATION OF ANY CODE OR ORDINANCE, NO APPROVAL EVER GRANTED PERMISSION TO VIOLATE ANY CODE OR ORDINANCE

THIS ARCHITECTS REPORT HAS BEEN MADE TO DRAW THESE PLANS FROM INFORMATION SUPPLIED BY THE OWNER AND/OR AGENTS. THESE PLANS ARE NOT A SURVEY OR ENGINEERING. THE DESIGNER IS NOT BE A CONSTRUCTION AND TO BE HELD HARMLESS OF ANY FINANCIAL LIABILITY RESULTING FROM THE USE OF THESE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR CORRECTION OF ANY BUILDING ACCEPTS RESPONSIBILITY. (UNSURE PLANS CAREFULLY BEFORE CONSTRUCTION)

Scott Leishman
Residetial Architectural
Design / Drafting / Planning
Phone: 435-673-0978 1115 South Morningside Drive, St. George, Utah 84790

EXTERIOR ELEVATIONS
ANDERSON APARTMENTS
H-4-2-4-3211

Project:	H-4-2-4-3211
Date:	9-17-2019
Rev Date:	5-5-2020
Scale:	1/4"=1'-0"

A4

100 SOUTH STREET

EX. 8" WATER

2-HC PARKING STALLS

WALKWAY

EXISTING GATE

EXISTING GATE

DRIVE WAY

6 GARAGES ALONG REAR OF BUILDING

EXISTING BLOCK WALLS ALONG SUBDIVISION

OUTSIDE LIGHTING ON BUILDING

EXISTING GATE

24 PARKING STALLS

SHADOW RIDGE SUBDIVISION

EXISTING GATE

H-4-2-4-3211

EXISTING GATE

COLORED GRAVEL

OVERHEAD POWER LIGHT WITH DOWN LIGHTLY

TRASH DUMPSTERS

EXISTING GATE

EXISTING BLOCK WALL

GRAVEL PARKING AREA

EXISTING GATE

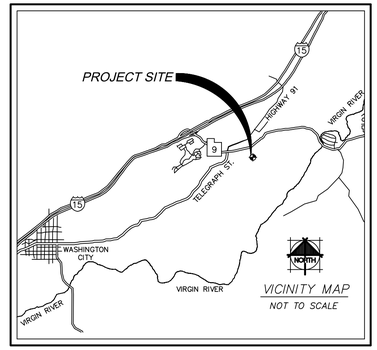
GRAVEL PARKING AREA

3,140 CUBIC FEET RETENTION POND AREA WITH 2:1 SIDE SLOPES 4" MINUS ROCK LINED SIDE SLOPES AND BOTTOM

EXISTING BLOCK RETAINING WALLS ALONG SUBDIVISION

6150 WEST STREET

UTAH POWER CO. SUB. STATION.



VICINITY MAP
NOT TO SCALE

LANDSCAPE LEGEND

TREES

5-PLUMB, PURPLE LEAF

7-ARIZONA ASH

6-MONDALE PINE

TREES AND CALIPER OF TWO INCHES

PLANTS & GROUND COVER

12-DWARF PINK OLEANDER

6-SAGE, TEXAS RANGER

8-EUONYMUS, GOLDEN

3'-6' BOULDERS TO BE PLACED RANDOMLY AMONG LANDSCAPING AREAS.

ALL VEGETATION TO BE IRRIGATED BY LOW PRESSURE "DRIP" SYSTEM WITH BACKFLOW VALVES

ALL LANDSCAPE AREAS TO BE COVERED BY 1"-3" ROCK MULCH 2" MIN. DEPTH OVER DEWITT WEED FABRIC TO MATCH EXISTING ROCK MULCH.

SHRUBS TO HAVE MIN. HEIGHT OF 18" AT TIME OF PLANTING

IRRIGATION MAIN LINES TO BE 1 1/2" DIA. SCH. 40 PVC

NORTH

OWNER/DEVELOPER
CURTIS ANDERSON

(435) 632-8899 CELL

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NO.	DATE	BY	APP'D	REVISION DESCRIPTION

L.R. POPE ENGINEERING INC.
STRUCTURAL ENGINEERS, CIVIL ENGINEERS & SURVEYORS
1104 EAST 100 SOUTH SUITE 1-B
ST. GEORGE, UTAH
(PHONE) 435-625-1676
(FAX) 435-628-1935
(EMAIL) lrpope@infowest.com

ALL DRAWINGS, DESIGNS, PLANS, SPECIFICATIONS, AND COPIES THEREOF FURNISHED BY L.R. POPE ENGINEERING INC. ARE AND SHALL REMAIN THE PROPERTY OF L.R. POPE ENGINEERING INC. THEY ARE NOT TO BE USED IN WHOLE OR IN PART FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF L.R. POPE ENGINEERING INC. ALL DRAWINGS, DESIGNS, PLANS, SPECIFICATIONS, AND COPIES THEREOF SHALL BE RETURNED OR DESTROYED UPON REQUEST OF L.R. POPE ENGINEERING INC. ALL RIGHTS ARE RESERVED.

STATE OF UTAH
153069
LANCE R. POPE
1-14-21
REGISTERED PROFESSIONAL ENGINEER

CURTIS ANDERSON
SHADOW RIDGE APARTMENTS
LANDSCAPE PLAN
LOCATED IN SECTION 4, TOWNSHIP 41 SOUTH, RANGE 14 WEST, SLB&M

DESIGN BY LRP

DATE 10-26-20

FILE NAME CURTIS ANDERSON

24" x 36" SCALE 1" = 20'

12" x 18" SCALE 1" = 40'

SHEET NUMBER C6.00

From: Kyle Arbizu
To: Cindy Beteag
Cc: Landon A
Subject: Re: agenda form
Date: Wednesday, January 26, 2022 11:08:12 AM
Attachments: impactfees.pdf
impact-fee-handbook.pdf

Cindy,

I've attached two studies on impact fees, one by HUD and one by The National Association of Home Builders. I'd put in our narrative that the location of this project requires little to no spending for street and parking infrastructure. We believe these costs should be reduced, so they commiserate with costs the City would incur. The other request was the reduction in Park fees which the proposed reduction we believe is still a large sum and pays for a good portion of a new park or would cover a long extension of walking or biking paths.

Kyle Arbizu
ARM®, HCCP©, CPM® Candidate
Managing Partner
Parkplace Residential, AMO®
560 South Valley View Drive #3
Saint George, Utah 84770
Office: (435) 656-0770
Mobile: (435) 632-1493
Fax: (844) 672-5753

Mailing
PO BOX 727
Santa Clara, Utah 84765
https://www.pprmco.com



NOTICE: This email message, including any attachments, may contain information that is confidential and/or proprietary. If you are not an intended recipient, please be advised that any review, use, reproduction or distribution of this message is prohibited. If you have received this message in error, please completely destroy all electronic and hard copies, and contact the sender.

From: Cindy Beteag <cindy@cityofhurricane.com>
Date: Wednesday, January 26, 2022 at 10:21 AM
To: Kyle Arbizu <karbizu@pprmco.com>

Cc: Landon A <andersonlandon06@gmail.com>
Subject: RE: agenda form

Kyle,

You have been added to the agenda. This is how our code reads for adjustment requests:

- **Sec. 9-2-5. - Adjustments.**

A. *Request.* In order to ensure that impact fees are imposed fairly, and in order to respond to unusual circumstances in specific cases, the City may adjust the standard impact fee at the time the fee is charged. Such adjustment shall be made only upon specific written request to the City by persons subject to payment of such fees and after consideration of the matter by the City at a regular meeting of the City Council.
B. *Submission of application; decision.* The City may adjust the amount of impact fees to be paid on any specific development based upon studies and data submitted by the developer evidencing that the impact fee imposed is unfair or not reasonably related to the impacts caused by such new development. The application to adjust fees, together with any supporting data and studies, shall be submitted to the City staff for review and recommendation to the City Council. Within 30 days, the City Council shall consider all pertinent information and make any adjustments deemed appropriate at a regular meeting of the City Council.
Do you have any other supporting documents or studies that you want to include with your request?

Thank you,

Cindy Beteag

Cindy Beteag
City Recorder
Hurricane City
Office 435-635-2811 x 106

From: Kyle Arbizu <karbizu@pprmco.com>
Sent: Tuesday, January 25, 2022 10:25 AM
To: Cindy Beteag <cindy@cityofhurricane.com>
Cc: Landon A <andersonlandon06@gmail.com>
Subject: Re: agenda form

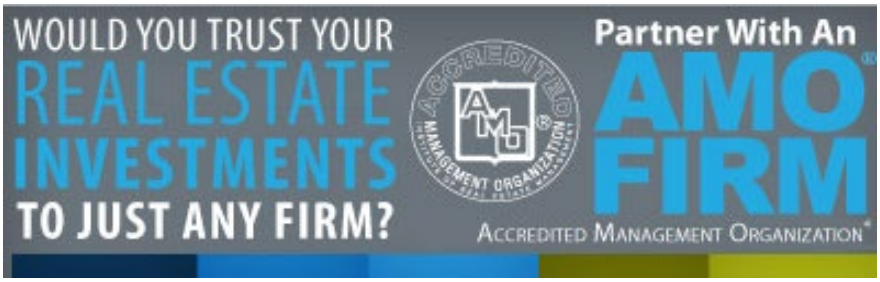
Cindy,

See completed form that has been attached. Please let us know if we can make it for the February 3rd agenda.

Thanks,

Kyle Arbizu
ARM®, HCCP©, CPM® Candidate
Managing Partner
Parkplace Residential, AMO®
560 South Valley View Drive #3
Saint George, Utah 84770
Office: (435) 656-0770
Mobile: (435) 632-1493
Fax: (844) 672-5753

Mailing
PO BOX 727
Santa Clara, Utah 84765
https://www.pprmco.com



NOTICE: This email message, including any attachments, may contain information that is confidential and/or proprietary. If you are not an intended recipient, please be advised that any review, use, reproduction or distribution of this message is prohibited. If you have received this message in error, please completely destroy all electronic and hard copies, and contact the sender.

From: Cindy Beteag <cindy@cityofhurricane.com>
Date: Tuesday, January 25, 2022 at 9:46 AM
To: Kyle Arbizu <karbizu@pprmco.com>
Subject: agenda form

Cindy Beteag

Cindy Beteag
City Recorder
Hurricane City
Office 435-635-2811 x 106

Impact Fees

• An impact fee is a one-time charge imposed by local political subdivision (a municipality, county, special service district, etc) to mitigate the impact on local infrastructure caused by new development.

• Growth in the form of new homes and businesses requires expansion or enlargement of public facilities to maintain the same level and quality of public services for all residents of a community. Impact fees help fund expansion of public facilities necessary to accommodate new growth.

• Impact fees are governed by the Utah Impact Fees Act, found in Utah Code §11-36a-101 et. seq. A local political subdivision may charge impact fees by following the terms of the Impact Fees Act which requires approval and adoption of:
(a) a capital facilities plan, and
(b) an ordinance (Hurricane's impact fee ordinance is found in §9-2-1 et. seq of the Hurricane City Code.)

• A capital facilities plan is a complex analysis of a local government's existing level of public services, future needs due to anticipated growth and new development, and the anticipated cost to maintain the existing level of service. Adoption of a capital facilities plan requires notice and public hearing and is required if a governmental entity wishes to adopt an impact fee Ordinance.

• Impact fees may be used for permanent buildings and other physical facilities owned by the local government which have a life expectancy of more than 10 years. A local government may charge impact fees to fund the following public facilities:
(a) water systems and water rights
(b) roads
(c) wastewater systems
(d) stormwater control systems
(e) parks
(f) municipal power facilities
(g) public safety facilities (*i.e.,* police and fire facilities)

• Impact fees are intended to help fund expansion of public facilities, including acquisition of property or water rights, materials, and construction. Impact fees may <u>not</u> be used for routine maintenance of existing facilities, or for employee salaries.

• Impact fees may <u>not</u> be used to cure deficiencies in a public facility serving existing development or to raise the established level of service of a public facility serving existing development.

• In addition to containing a schedule of impact fees, an impact fee ordinance must contain provisions that:
(a) allows the local political subdivision to adjust the standard impact fee at the time the fee is charged to respond to unusual circumstances in specific cases and ensure that impact fees are fairly imposed,

(b) governs calculation of the amount of the impact fee on a particular development in a way that permits adjustment of the impact fee based upon studies and data submitted by the developer, and
(c) permits impact fee credit for dedication by the developer of a system improvement.

• An impact fee ordinance may not take effect until 90 days after the day on which the impact fee ordinance is approved.

• Low income housing, development activity attributable to the state, or other development activity with a broad public purpose may be exempt from impact fees if:
(a) the impact fee ordinance allows such exemption, and
(b) the ordinance establishes one or more sources of funds other than impact fees for that development activity.

• A local political subdivision may expend impact fees only for a system improvement identified in the capital facilities plan and for the specific public facility type for which the fee was collected. For example, a road impact fee must be spent on road construction, and a park impact fee must be spent on parks, etc.

• A local political subdivision must expend an impact fee within six (6) years after the impact fee is collected, except that impact fees may be held longer than six (6) years if the local political subdivision identifies in writing an extraordinary and compelling reason why the fees should be held longer than six (6) years and an absolute date by which the fees shall be expended.

• Impact fees must be kept in separate interest bearing accounts. At the end of each fiscal year, a report must be made which shows:
(a) the amount and source for all money collected during the year
(b) each expenditure from each account
(c) the funds in each account by showing the year in which they were collected, the project for which they were collected, and the projected schedule for expenditure

• Impact fees are "exactions" within the meaning of exaction law. In order for such exaction to be valid:
(a) there must be an essential link or "nexus" between a legitimate government interest and the impact fee, and
(b) the amount of the impact fee must be "roughly proportionate" both in *nature* and *extent* to the impact of the proposed development.

MODIFIED AGREEMENT

THIS MODIFIED AGREEMENT (hereinafter "Modification") is made and entered into on this _____ day of _____, 2022, by and between the CITY OF HURRICANE, UTAH, a municipal corporation of the State of Utah, hereinafter referred to as "City", and Stratton Brothers Partnership, a Utah General Partnership by Donald Stratton, Tracey Stratton and Craig Stratton, managing members of NJ Stratton, LLC, a Utah limited liability company, DC Stratton, LLC., a Utah limited liability company and GE Stratton, LLC., a Utah limited liability company, as general partners, hereinafter collectively referred to as "Strattons."

RECITALS:

A. City and Stratton Brothers Partnership, a Utah General Partnership, have previously entered into an Agreement dated the 17th day of August 1979, a copy of which is attached hereto as Exhibit A and incorporated herein as if fully set for and an agreement dated the 6th day of June 1996 (hereinafter "Agreements").

B. Stratton Brothers Partnership is a general partnership established under the laws of the state of Utah. The original general partners were Glenn E. Stratton, Ltd., a Utah limited partnership, Neil J. Stratton, Ltd., a Utah limited partnership, and Winston G. Stratton, Ltd., a Utah limited partnership.

C. On or about May 7, 2008, the General Partners as defined in the General Partnership Agreement, Glenn E. Stratton, Ltd., a Utah limited partnership, Neil J. Stratton, Ltd., a Utah limited partnership, and Winston G. Stratton, Ltd., a Utah limited partnership, were removed and replaced with the following General Partners, GE Stratton, LLC, a Utah limited liability company, NJ Stratton, LLC., a Utah limited liability company and DC Stratton, LLC, a Utah limited liability company.

D. Donald Stratton, Tracey Stratton and Craig Stratton are the managing members of NJ Stratton, LLC, a Utah limited liability company, DC Stratton, LLC., a Utah limited liability company and GE Stratton, LLC, a Utah limited liability company, respectively.

E. Since the execution of the Agreements, the Strattons have discovered two water rights which they believe should have been added to the Agreement and are referred to as 81-1108 representing 21.72-acre feet and 81-1202 which represents 1.06-acre feet of water.

NOW, THEREFORE, IN CONSIDERATION of the mutual covenants and obligations contained herein, the parties hereto agree as follows:

1. City is duly organized and validly existing under the laws of the State of Utah, and has full governmental powers to execute, deliver and perform its obligations under the terms of this Modification.
2. The Strattons represent, covenant and warrant that they are the sole holders/owners of record, free and clear of any liens, claims or encumbrances of the following described water right:
   (a) Water right # 81-1202 with a diversion limit of 1.064-acre feet, as filed at the office of the State Water Engineer in Cedar City, Utah of the State Water and
   (b) Water right # 81-1108 with a diversion limit of 21.72-acre feet, as filed at the office of the State Water Engineer in Cedar City, Utah.
3. The Strattons hereby agree to sell, transfer and convey to City all of their right, title and interest in and to the above described water right and, immediately upon execution of this Modification, to execute and deliver to City all deeds, certificates or other documents as may be deemed necessary for the transfer and conveyance to City of said water rights.
4. The Strattons, their successors and assigns shall be entitled to receive an additional 24 fully pre-paid residential water connections, in accordance with the following:

(a) For purposes of this paragraph, the term "fully prepaid" shall include all fees or charges commonly referred to or included within the term "water impact fee", including water acquisition fees, etc., excepting only the cost of the water meter and the cost of the installation thereof.

(b) The cost of said residential connections may also be used or applied towards the cost of a commercial connection, provided that the value of any residential connection or commercial connection shall be determined at the time of connection to the water system.

(c) Said water connections may be used at any time during the term hereof at any location within the corporate limits of City, subject to all other applicable rules, regulations, or ordinances of City.

(d) City shall be responsible for maintaining adequate books and records for the purpose of keeping a running account of all transactions involving said residential water connections and shall provide Strattons, upon written request, an annual review and accounting showing the status of water connections unused by Strattons.

5. The term of this Modification to the Agreements shall be for a period of (50) years.
6. In the event of a breach of any term or condition of hereof, the party in breach shall be liable to the other party for all damages, fees, costs and expenses incurred as a result of said breach, including all costs of court and a reasonable attorney's fee incurred as a result of the commencement or maintenance of any legal action to enforce the terms and conditions hereof.

7. This agreement constitutes the entire understanding and agreement of the parties, all prior negotiations and discussions having been merged herein, and shall not be altered or modified except in writing signed by the parties hereto.
8. This agreement shall be construed under the laws of the State of Utah.
9. This agreement is binding on the parties heirs and assigns.

_____
DONALD STRATTON, MANAGING MEMBER
DJ STRATTON, LLC

STATE OF UTAH)
: ss
COUNTY OF WASHINGTON)

On the ____ day of _____ 2022 personally appeared before me, DONALD STRATTON, MANAGING MEMBER OF NJ STRATTON, LLC, A UTAH LIMITED LIABILITY COMPANY, the signer of the within instrument who duly acknowledged to me that he executed the same.

_____
NOTARY PUBLIC

_____
TRACEY STRATTON, MANAGING MEMBER
DC STRATTON, LLC

STATE OF UTAH)
: ss
COUNTY OF WASHINGTON)

On the ____ day of _____ 2022 personally appeared before me, TRACEY STRATTON, MANAGING MEMBER OF DC STRATTON, LLC, A UTAH LIMITED LIABILITY COMPANY, the signer of the within instrument who duly acknowledged to me that he executed the same.

_____
NOTARY PUBLIC

_____
CRAIG STRATTON, MANAGING MEMBER
GE STRATTON, LLC.

STATE OF UTAH)
: ss
COUNTY OF WASHINGTON)

On the ____ day of _____ 2022 personally appeared before me, CRAIG STRATTON, MANAGING MEMBER OF GE STRATTON, LLC, A UTAH LIMITED LIABILITY COMPANY, the signer of the within instrument who duly acknowledged to me that he executed the same.

_____
NOTARY PUBLIC

CITY OF HURRICANE

_____
NANETTE BILLINGS, MAYOR

ATTEST:

_____
CINDY BETEAG, CITY RECORDER

Resolution No. 2022-10

A RESOLUTION OF THE HURRICANE CITY COUNCIL OF HURRICANE, UTAH, RECOGNIZING PARENTS' RIGHTS, STAKEHOLDER AUTHORITY, AND POLITICAL PARTICIPATION.

WHEREAS, on October 22nd, 2021, the National School Board Association (NSBA) apologized exclusively to its policy of this state that a parent retains the fundamental right and duty to exercise primary control over the care, 30-5a-103 6 and 62A-4a-201, it is the public supervision, upbringing, and education of the parent's children," and association members, and

WHEREAS, on November 16th, 2021, a FBI whistleblower disclosed evidence of Federal Counter-Terrorism tools being used to target parents, based upon U.S. AG Garland's October 4th directive to FBI detachments, and directly contradicting U.S. AG's October 21st Congressional testimony that (1) the NSBA letter inspired his directive and (2) counter-terrorism tools were not being used against parents, and

WHEREAS, on November 16th, 2021, a FBI SWAT team broke into a home with children present, in Grand Junction, Colorado to arrest a parent whose political activities included attending school board meetings, supporting school board candidates, and organizing parents, and

WHEREAS, as of December 8th, 2021, twenty-seven (27) States have repudiated the repercussions of the NSBA letter and eighteen (18) States have rescinded their membership with NSBA, and

WHEREAS, as of January 28, 2022, the Utah School Directors Association has (1) not repudiated the NSBA's September 29th, 2021 'domestic terrorism' letter or (2) withdrawn its NSBA membership from NSBA, and

WHEREAS, the Utah State Legislature is the primary stakeholder in the establishment, maintenance, and success of the State's entire Education system, including, but not limited to public, charter, private, and home-based education sub-systems, and

WHEREAS, "The Utah State recognizes that: The State's role is secondary and supportive to the primary role of a parent," and

WHEREAS, The Utah State has legally stated, "A fundamentally fair process must be provided to parents if The State moves to challenge or interfere with parental rights. Utah State supports any actions or allegations made in opposition to the rights and desires of a parent regarding the parent's children by sufficient evidence to satisfy a parent's constitutional entitlement to heightened protection against government interference with the parent's fundamental rights and liberty interests and, concomitantly, the right of the child to be reared by the child's natural parent."

WHEREAS, Parents are the primary stakeholders in their children's upbringing, and

WHEREAS, as stakeholders, Parents are responsible for what and how their children are taught, and

WHEREAS being responsible, Parents have the unalienable right to participate in the political process on behalf of their children, and

WHEREAS, both Parents, the Utah State Legislature, and the Utah Board of Education, as Primary Stakeholders in their respective areas of education, should seek joint partnership in ensuring the success of Utah State's children and the entire Education System, therefore

BE IT RESOLVED that based on Utah State code Hurricane City Council and Mayor affirms that parents are the PRIMARY stakeholders in their children's upbringing and PRIMARY political participants on behalf of their children.

BE IT FURTHER RESOLVED that Hurricane City Council and Mayor agree by the clearly define law that terrorism and domestic terrorism in Utah State code and distinguish it from criminal activity to ensure due process for all Utahans.

BE IT FINALLY RESOLVED that this resolution will be forwarded to The Washington County School District, Washington County School Board, Utah State School Board, and Utah State Board of Education showing support from The Hurricane City Council and Mayor, who recognizing parents' rights, stakeholder authority, and political participation.

DATED this 3rd day of February 2022.

_____
Nanette Billings, Mayor

Attest:

_____
Cindy Beteag, City Recorder

Resolution No. 2022-10

A RESOLUTION OF THE CITY COUNCIL OF HURRICANE, UTAH, AFFIRMING FUNDAMENTAL RIGHTS AND FREEDOMS GUARANTEED UNDER THE UNITED STATES CONSTITUTION.

WHEREAS, when sworn in as public servants, the Mayor and each member of the Hurricane City Council pledged to uphold and defend the United States Constitution and to discharge their duties with fidelity; and

WHEREAS, the United States Constitution and, more specifically, the Due Process Clause of the Fourteenth Amendment, protects the fundamental right of parents to direct the care, upbringing, and education of their children; and

WHEREAS, in recent months there have been reports of government overreach that include the misapplication of domestic terrorism laws to wrongfully silence parents from voicing legitimate concerns at school board meetings regarding the education of their children; and

WHEREAS, the Mayor and undersigned City Council members feel duty bound to raise an unequivocal voice against those things or actions that directly or indirectly attack or erode our constitutional rights and freedoms,

NOW, THEREFORE, BE IT HEREBY RESOLVED by the City Council of Hurricane, Utah that the City of Hurricane and its elected officials reaffirm their commitment to maintain and defend rights and freedoms guaranteed to all Americans under the United States Constitution, including freedom of speech and the right to peacefully voice legitimate concerns at school board meetings and at other public forums, and the fundamental right of parents to direct the care, upbringing, and education of their children.

DATED this _____ day of February 2022.

CITY OF HURRICANE

_____
Nanette Billings, Mayor

Council Member	Aye	Nay
Kevin Thomas	____	____
David Sanders	____	____
Joseph Prete	____	____
David Hirschi	____	____
Doug Heideman	____	____

Attest:

_____
Cindy Beteag, City Recorder

PLANNING & ZONING
HURRICANE CITY
UTAH

Amended Final Plat Application

Date: 01/03/2022 Permit #: 77

Applicant / Owner

Applicant Name:	Greg Sant - Perry Development LLC
Address:	2250 N Coral Canyon Blvd Ste 215
City, State, Zip:	Washington
Phone:	4352519090
Email:	greg.perryhomesutah@gmail.com

Owner Name:	Perry Development LLC
Address:	2250 N Coral Canyon Blvd Ste 215
City, State, Zip:	Washington
Phone:	4352519090
Email:	greg.perryhomesutah@gmail.com

Property / Agent

Property Address:	
City, State, Zip:	,
Tax ID:	H-3-1-130-320
Number of Lots:	80
Subdivision:	
Phase:	Phases 3 and 4

Agent Name:	Greg Sant
Address:	2250 N Coral Canyon Blvd Ste 215
City, State, Zip:	Washington
Phone:	4352519090
Email:	greg.perryhomesutah@gmail.com

I do hereby certify that the information contained herein is true and correct.

Greg Sant	2022-01-03
Name	Date

PLANNING & ZONING
HURRICANE CITY
UTAH

STAFF COMMENTS

Agenda Date:	**01/20/22**
Application Number:	2022-PP-02
Type of Application:	Preliminary Plat Application
Action Type:	Administrative
Applicant:	Greg Sant- Perry Development LLC
Agent:	
Request:	Preliminary Plat Application
Location:	600 N and 3100 W
Zoning:	R1-6
General Plan Map:	Single Family Residential

Planning Commission Recommendation
The Planning Commission gave a positive recommendation on the preliminary plat with the following conditions:

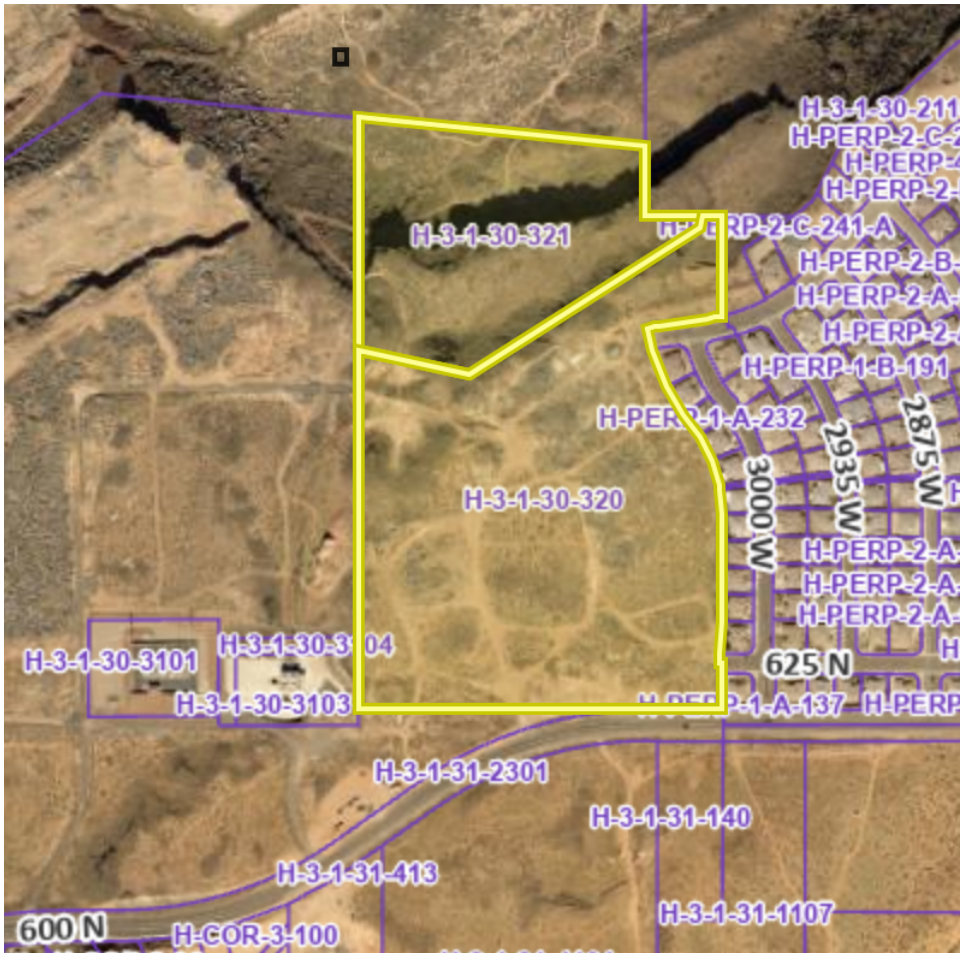
- The plat complies with Staff comments including for transportation connection and active transportation.
- That the City and the applicant is able to reach an agreement about access to the power lines that run along the south of the property.

Discussion: The applicant is seeking a preliminary plat for an 18.24 acre 80 lot preliminary plat located just west of Peregrine Point. The applicant has received preliminary approval for the majority of the development and has begun construction. The applicant is seeking an update to allow for the following changes:

1. Adding a roadway and connection with an additional six lots on the southwest corner of the project.
2. Changing the hammerhead in the north to a cul-de-sac.
3. The phase lines have been changed, from four phases to three.

JUC Comments
Construction Drawings have been approved and construction has begun on the project. However, the JUC had the following comments on the updated layout:

1. **Power:** Overhead power in the area along the southern boundary. Not okay with Phase 3 cul-de-sac (now shown as a roadway stubbed to the south.
2. **Water:** Make sure looping is fine
3. **Streets:** Want to see it connect through Interstate Rock's property to the south
4. **Sewer:** No concerns
5. **Engineering:** Access to overhead power lines along the southern boundary is vital. There needs to be additional access to 600 N and through to the south.
6. **Fire:** No fire hydrants in the bulbs of cul-de-sacs. Needs to be on the flats
7. **Water Conservancy:** Line runs along the southern boundary. Lot 61 is placed on their box and thus cannot have structures there.



Staff Comments:

1. The minimum lot size in an R1-6 zone is 4,800 sq. ft. with an average of 6,000 sq. ft. The development meets these standards.
2. The applicant has shown the typical cross-sections for the roads on the plat except for a 58' section for Cliff Hanger Drive. On Cliff Hanger Drive, instead of providing a sidewalk on both sides of the roadway, is providing a 12' sidewalk (trail) on the south side of the road. This is to match Hurricane's Active Transportation Plan and will connect to other trails in the area.

3. The applicant has provided a tentative plan or method by which the subdivider proposes to handle the stormwater drainage for the subdivision.
4. **Roadway Connections:** The applicant is providing a direct connection to the development to the east. These roadway connections are sufficient for the development. One of the main reasons that the project left the southwest section off the original drawings was that the City recommended that the applicant work with Interstate Rock to the south to bend the road and align an intersection with Sky Valley Townhomes on 600 N. Staff would still make that recommendation with this application. The applicant updated the plat last week and presented that update to the Planning Commission including the section to the south. The updated plat addresses staff concerns, but staff is reviewing the alignment.
5. The project is in a tortoise take area. Therefore, the applicant will need to fill out an applicant with the Red Rock Reserve (attached for reference) and clear the property of any desert tortoises before any construction may begin. This has taken place.
6. The plat does not note a list of preliminary Geologic Hazard reports as required. However, the applicant has submitted a full geologic study that has been reviewed and approved by City staff.
7. **Power:** There is a major and historic power line that runs along the south of the boundary. Power has expressed concerns about long-term access to this line without a proper easement and access corridor. During the original review of the plat and construction drawings for this development, an easement was not required. However, since construction has begun, concerns have been raised by the power department. Power is currently performing a title search to see if there are any old easements and setbacks that have been recorded, but at the time of this report, none are known. Power and city staff recommend that the City and applicant come to an agreement about securing access to these lines as part of this amended preliminary plat. The powerline and the approved lot layout is shown below.



8. **Three Rivers Trail:** The City has planned a 12’ wide trail in the area. Below is a picture of the main alignment and the alternative alignment (the alternative alignment approximate and exact layout has not been approved). Both trails are on the new Active Transportation Master Plan



Recommendation: Staff recommends the City Council review this application based on standards with Hurricane City Code. Staff would recommend approval with the following conditions:

- That the updated Active Transportation Master Plan is followed
- That the applicant provides a roadway stub south to align with Sky Valley Townhomes
- That the applicant complies with other JUC and staff comments.
- That the City and the applicant resolve the concerns about access to the power line the runs along the south of the property.

PEREGRINE POINT WEST: PHASES 1 - 3
PRELIMINARY PLAT

LOCATED IN SECTION 30, TOWNSHIP 41 SOUTH, RANGE 13 WEST
OF THE SALT LAKE BASE AND MERIDIAN
IN THE CITY OF HURRICANE, WASHINGTON COUNTY, UTAH.
DEVELOPED BY: PERRY HOMES UTAH, INC.

SKY MOUNTAIN GOLF COURSE

PROJECT LOCATION
THE PROJECT IS LOCATED AT (APPROXIMATELY): 3000 WEST 600 NORTH HURRICANE, UTAH

SCALE: NONE
VICINITY MAP
HURRICANE, UTAH

EXISTING PEREGRINE POINT EAST

PHASE 1
PHASE 2
PHASE 3

EXISTING 55 MH (DIA: 60") STA: 6+06.07 OFF: 867.28' R RIM: 3067.88 INV IN: 3059.42 8" PVC INV OUT: 3059.22 8" PVC INV OUT: 3059.22 8" PVC

EXISTING 55 MH (DIA: 60") STA: 1+44.95 OFF: -16.80' L RIM: 3043.16 INV IN: 3039.46 18" INV OUT: 3035.26 18"

EXISTING 55 MH (DIA: 60") STA: 4+71.60 OFF: 10.41' R RIM: 3042.94 INV IN: 3034.94 18" INV OUT: 3033.94 18"

EXISTING 55 MH (DIA: 60") STA: 2+69.74 OFF: 13.05' R RIM: 3040.94 INV IN: 3032.14 18" INV OUT: 3031.94 18"

EXISTING 55 MH (DIA: 60") STA: -0+18.22 OFF: 0.57' R RIM: 3022.20 INV IN: 3016.40 18" INV OUT: 3016.20 18"

103' of EXISTING 8" PVC @ 0.50%

EXISTING 36" CULVERT -2.00%

LEGEND

- 2' CONTOUR - EX
- 10' CONTOUR - EX
- 2' CONTOUR - PRO
- 10' CONTOUR - PRO
- TOP BACK CURB - EX
- FLOWLINE CURB - EX
- TOP BACK CURB - PRO
- FLOWLINE CURB - PRO
- WATER LINE - EX
- SEWER LINE - EX
- WATER LINE - PRO
- SEWER LINE - PRO
- OVERHEAD POWER LINE - EX
- OVERHEAD POWER LINE - PRO
- FLOWLINE/DRAINAGE SWALE - EX
- FLOWLINE/DRAINAGE SWALE - PRO
- PROPERTY LINE - EX
- PROPERTY LINE - PRO
- FIRE HYDRANT - EX
- FIRE HYDRANT - PRO
- SEWER MANHOLE - EX
- SEWER MANHOLE - PRO
- WATER VALVE -EX
- WATER VALVE -PRO
- STORM DRAIN CURB INLET - EX
- STORM DRAIN CURB INLET - PRO
- ASPHALT PAVEMENT - EX
- ASPHALT PAVEMENT - PRO
- CONCRETE PAD - EX
- CONCRETE PAD - PRO
- SURFACE FLOW DIRECTION - EX
- SURFACE FLOW DIRECTION - PRO
- CLASS II MONUMENT - EX
- POWER POLE - EX
- POWER POLE - PRO

SCALE: 1"=60'

ZONE R1-6

AVERAGE LOT AREA:	6,000 SQ.FT.
MIN. LOT AREA:	4,800 SQ.FT.
MIN. FRONTAGE:	60'

RESIDENTIAL SETBACKS

FRONT:	25'
REAR:	10'
SIDE:	8'
STREETSIDE:	20'

SITE INFORMATION:

CURRENT ZONE: R1-6 (PHASES 1-3)

TOTAL AREA: 18.20 AC (188,980 SQ.FT.)
RESIDENTIAL UNITS: 74

TOTAL RESIDENTIAL UNITS (74) AREA: 12.30 AC (532,041 SQ.FT.) = 67.58%
TOTAL OPEN SPACE AREA: 0.80 AC (34,774 SQ.FT.) = 4.40%
TOTAL PUBLIC STREET (R.O.W.) AREA: 5.10 AC (222,154 SQ.FT.) = 28.02%

AVERAGE RESIDENTIAL LOT SIZE: 532,041/74 = 7,190 SQ.FT.
DENSITY: UNITS/ACRES = 74/18.20 = 4.07 UNITS PER ACRE

OWNER/DEVELOPER/CONTACT

THE DEVELOPER FOR THIS PROJECT IS
PERRY HOMES UTAH, INC.
CONTACT: GREG SANT
2250 NORTH CORAL CANYON BOULEVARD, SUITE 215
WASHINGTON, UTAH 84780 (435) 251-4040 (OFFICE)

PROJECT ENGINEER

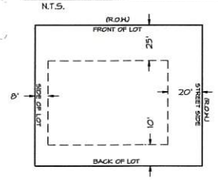
THE ENGINEER FOR THIS PROJECT IS:
ROSENBERG ASSOCIATES
CONTACT: ROB REID
352 EAST RIVERSIDE DRIVE, SUITE A2
ST. GEORGE, UTAH 84790 (435) 673-8586

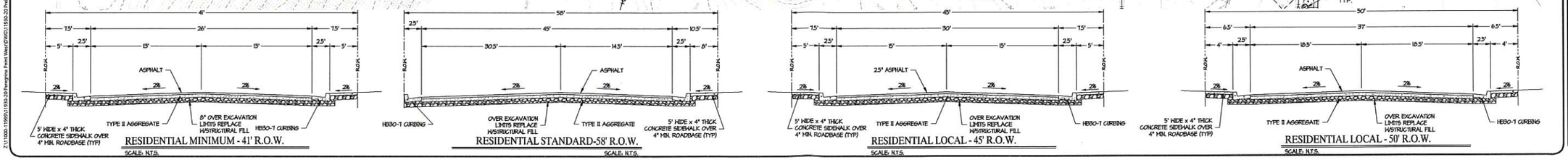
GEOTECHNICAL ENGINEER

THE GEOTECHNICAL ENGINEER FOR THIS PROJECT IS:
LANDMARK TESTING & ENGINEERING
745 EAST FACTORY DRIVE
ST. GEORGE, UT 84790 (435) 986-0566

TYPICAL LOT SETBACKS:

N.T.S.





ROSENBERG ASSOCIATES
CIVIL ENGINEERS • LAND SURVEYORS
352 East Riverside Drive
Suite A-2
St. George, Utah 84790
Ph (435) 673-8586 Fx (435) 673-8397
www.rosenbergassociates.com

DATE: 02/26/2021
JOB NO.: 1930-20
DESIGNED BY: DSH
CHECKED BY: RAR
DWG: Preliminary Plat

DATE | REVISIONS

PRELIMINARY PLAT
FOR
PEREGRINE POINT WEST: PHASES 1-3
3000 WEST 600 NORTH
HURRICANE, UTAH

STATE OF UTAH — ROBERT A. REID — No. 189104 — LICENSED PROFESSIONAL ENGINEER

SHEET
C1.0
1 OF 1 SHEETS

Z:\1930-19\PP01\1930-20 Peregrine Point West\DWG\1930-20 Preliminary Plat.dwg, Preliminary Plat, 2/26/2021 12:29:49 PM, dell

PEREGRINE POINT WEST: PHASES 1 - 4
PRELIMINARY PLAT - AMENDED

LOCATED IN SECTION 30, TOWNSHIP 41 SOUTH, RANGE 13 WEST
OF THE SALT LAKE BASE AND MERIDIAN
IN THE CITY OF HURRICANE, WASHINGTON COUNTY, UTAH.
DEVELOPED BY: PERRY HOMES UTAH, INC.

SKY MOUNTAIN GOLF COURSE

PROJECT LOCATION
THE PROJECT IS LOCATED AT (APPROXIMATELY):
3000 WEST 600 NORTH
HURRICANE, UTAH

VICINITY MAP
NOT TO SCALE
HURRICANE, UTAH

ZONE R1-6

AVERAGE LOT AREA:	6,000 SQ.FT.
MIN. LOT AREA:	4,800 SQ.FT.
MIN. FRONTAGE:	60'

RESIDENTIAL SETBACKS

FRONT:	25'
REAR:	10'
SIDE:	5'
STREETSIDE:	20'

SITE INFORMATION:

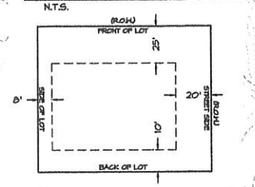
CURRENT ZONE: R1-6 (PHASES 1-4)

TOTAL AREA: 30.84 AC (1,343,551 SQ.FT.)
RESIDENTIAL UNITS: 80

TOTAL RESIDENTIAL UNITS (80) AREA: 13.94 AC
(606,962 SQ.FT.) = 45.13%
TOTAL OPEN SPACE AREA: 4.33 AC
(188,465 SQ.FT.) = 14.02%
TOTAL PUBLIC STREET (R.O.W.) AREA: 5.53 AC
(240,864 SQ.FT.) = 17.92%
TOTAL ZONED M AREA: 9.30 AC
(250,744 SQ.FT.) = 17.16%

AVERAGE RESIDENTIAL LOT SIZE: 606,962/80 = 7,587 SQ.FT.
DENSITY: UNITS/ACRES = 80/13.94 = 5.74 UNITS PER ACRE

TYPICAL LOT SETBACKS:
N.T.S.



EXISTING SECTION CORNER (ALUMINUM CAP)

EXISTING MONUMENT

EXISTING SD CURB INLET

EXISTING SS MH (DIA: 60") STA: 9+15.23 OFF: -3.50' L RIM (EX): 3044.82 RIM (PRO): 3044.82 INV IN: 3035.42 24" INV IN: 3032.42 8" PVC INV OUT: 3035.22 24" PVC

EXISTING SS MH (DIA: 60") STA: 7+93.53 OFF: -12.50' L RIM (EX): 3043.12 RIM (PRO): 777 INV IN: 3035.42 24" PVC INV OUT: 3035.22 24" PVC

EXISTING SS MH (DIA: 60") STA: 4+76.04 OFF: 14.75' R RIM (EX): 3042.55 RIM (PRO): 777 INV IN: 3034.15 24" PVC INV OUT: 3033.95 24" PVC

EXISTING SS MH (DIA: 60") STA: 2+85.84 OFF: 17.35' R RIM (EX): 3040.26 RIM (PRO): 777 INV IN: 3031.46 24" PVC INV IN: 3032.69 8" PVC INV OUT: 3031.26 24" PVC

EXISTING SS MH (DIA: 60") STA: 4+17.19 OFF: 4.57' R RIM (EX): 3015.54 RIM (PRO): " INV IN: 3009.74 24" PVC INV OUT: 3009.54 24" PVC

EXISTING 36" CULVERT

EXISTING WATER VAULT

EXISTING WATER MANHOLE, TYP.

EXISTING FENCE, TYP.

EXISTING PEREGRINE POINT EAST

PHASE 1

PHASE 2

PHASE 3

PHASE 4

CLIFFHANGER DRIVE

PEREGRINE POINT DRIVE

N 3000 W

N 3075 W

N 3025 W

600 NORTH

50' PUBLIC STREET

52' PUBLIC STREET

60' R.O.W.

EASEMENT

CONSTRUCTION SLOPE EASEMENT

REMNANT PROPERTY

EACH LOWER LOT TO BE EQUIPPED WITH INDIVIDUAL SG GRINDER PUMPS, TYP.

PROPOSED SD CURB INLET

PRESSURIZED SEWER LINE FROM LOWER LOTS, TYP.

ZONED R1-6

ZONED M-1

300' BUFFER

OPEN SPACE

SCALE: 1"=60'

LEGEND

- 2' CONTOUR - EX
- 10' CONTOUR - EX
- 2' CONTOUR - PRO
- 10' CONTOUR - PRO
- TOP BACK CURB - EX
- FLOWLINE CURB - EX
- TOP BACK CURB - PRO
- FLOWLINE CURB - PRO
- WATER LINE - EX
- SEWER LINE - EX
- WATER LINE - PRO
- SEWER LINE - PRO
- OVERHEAD POWER LINE - EX
- OVERHEAD POWER LINE - PRO
- FLOWLINE/DRAINAGE SWALE - EX
- FLOWLINE/DRAINAGE SWALE - PRO
- PROPERTY LINE - EX
- PROPERTY LINE - PRO
- FIRE HYDRANT - EX
- FIRE HYDRANT - PRO
- SEWER MANHOLE - EX
- SEWER MANHOLE - PRO
- WATER VALVE -EX
- WATER VALVE -PRO
- STORM DRAIN CURB INLET - EX
- STORM DRAIN CURB INLET - PRO
- ASPHALT PAVEMENT - EX
- ASPHALT PAVEMENT - PRO
- CONCRETE PAD - EX
- CONCRETE PAD - PRO
- -2.00% SURFACE FLOW DIRECTION - EX
- SURFACE FLOW DIRECTION - PRO
- CLASS II MONUMENT - EX
- POWER POLE - EX
- POWER POLE - PRO

OWNER/DEVELOPER/CONTACT

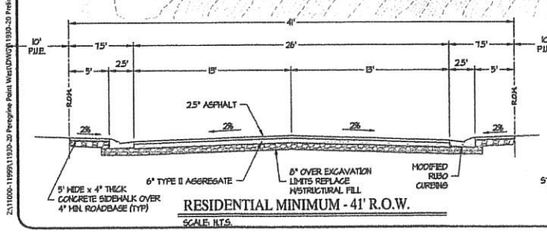
THE DEVELOPER FOR THIS PROJECT IS
PERRY HOMES UTAH, INC.
CONTACT: GREG SANT
2250 NORTH CORAL CANYON BOULEVARD, SUITE 215
WASHINGTON, UTAH 84780 (435) 251-9090 (OFFICE)

PROJECT ENGINEER

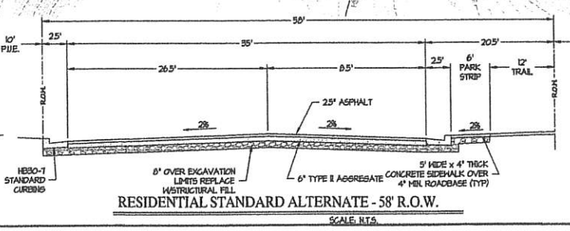
THE ENGINEER FOR THIS PROJECT IS:
ROSENBERG ASSOCIATES
CONTACT: ROB REID
352 EAST RIVERSIDE DRIVE, SUITE A2
ST. GEORGE, UTAH 84790 (435) 673-8586

GEOTECHNICAL ENGINEER

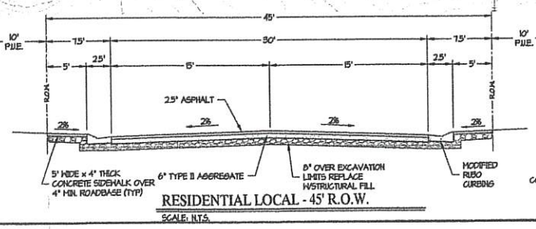
THE GEOTECHNICAL ENGINEER FOR THIS PROJECT IS:
LANDMARK TESTING & ENGINEERING
745 EAST FACTORY DRIVE
ST. GEORGE, UT 84790 (435) 986-0566



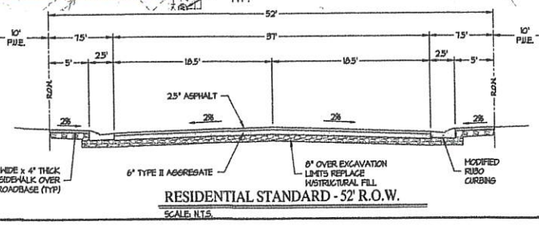
RESIDENTIAL MINIMUM - 41' R.O.W.
SCALE: N.T.S.



RESIDENTIAL STANDARD ALTERNATE - 58' R.O.W.
SCALE: N.T.S.



RESIDENTIAL LOCAL - 45' R.O.W.
SCALE: N.T.S.



RESIDENTIAL STANDARD - 52' R.O.W.
SCALE: N.T.S.

DATE:	01/12/2022
JOB NO.:	11430-20
DESIGNED BY:	DSW
CHECKED BY:	RAR
DWG:	Preliminary Plat

REVISIONS
DATE

ROSENBERG ASSOCIATES
CIVIL ENGINEERS • LAND SURVEYORS
352 East Riverside Drive
Suite A-2
St. George, Utah 84790
Ph (435) 673-8586 Fx (435) 673-8397
www.rasut.com

PRELIMINARY PLAT - AMENDED
FOR
PEREGRINE POINT WEST: PHASES 1-4
3000 WEST 600 NORTH
HURRICANE, UTAH

STATE OF UTAH LICENSED PROFESSIONAL ENGINEER
No. 189106
ROBERT A. REID

SHEET
1.0
1 OF 1 SHEETS

Z:\11000-11999\11430-20 Peregrine Point West\DWG\11430-20 Preliminary Plat - Amended.dwg, Profile-Plat, 1/12/2022 1:19:56 PM, dd, 6W0 To PDF.pc3

PEREGRINE POINT WEST: PHASES 1 - 4
PRELIMINARY PLAT - AMENDED

LOCATED IN SECTION 30, TOWNSHIP 41 SOUTH, RANGE 13 WEST
OF THE SALT LAKE BASE AND MERIDIAN
IN THE CITY OF HURRICANE, WASHINGTON COUNTY, UTAH.
DEVELOPED BY: PERRY HOMES UTAH, INC.

SKY MOUNTAIN GOLF COURSE

PROJECT LOCATION
THE PROJECT IS LOCATED AT (APPROXIMATELY):
3000 WEST 600 NORTH
HURRICANE, UTAH

SCALE: NONE
VICINITY MAP
HURRICANE, UTAH

EXISTING PEREGRINE POINT EAST

EXISTING MONUMENT

N 3000 W — 50' PUBLIC STREET

600 NORTH — 80' PUBLIC STREET — 80.00' R.O.W.

SCALE: 1"=60'

LEGEND

- 2' CONTOUR - EX
- 10' CONTOUR - EX
- 2' CONTOUR - PRO
- 10' CONTOUR - PRO
- TOP BACK CURB - EX
- FLOWLINE CURB - EX
- TOP BACK CURB - PRO
- FLOWLINE CURB - PRO
- WATER LINE - EX
- SEWER LINE - EX
- WATER LINE - PRO
- SEWER LINE - PRO
- OVERHEAD POWER LINE - EX
- OVERHEAD POWER LINE - PRO
- FLOWLINE/DRAINAGE SWALE - EX
- FLOWLINE/DRAINAGE SWALE - PRO
- PROPERTY LINE - EX
- PROPERTY LINE - PRO
- FIRE HYDRANT - EX
- FIRE HYDRANT - PRO
- SEWER MANHOLE - EX
- SEWER MANHOLE - PRO
- WATER VALVE -EX
- WATER VALVE -PRO
- STORM DRAIN CURB INLET - EX
- STORM DRAIN CURB INLET - PRO
- ASPHALT PAVEMENT - EX
- ASPHALT PAVEMENT - PRO
- CONCRETE PAD - EX
- CONCRETE PAD - PRO
- -2.00% SURFACE FLOW DIRECTION - EX
- SURFACE FLOW DIRECTION - PRO
- CLASS II MONUMENT - EX
- POWER POLE - EX
- POWER POLE - PRO

EXISTING SS MH (DIA: 60") STA: 9+15.23 OFF: -3.50' L RIM (EX): 3044.82 RIM (PRO): 3044.82 INV IN: 3036.42 24" PVC INV OUT: 3036.22 24" PVC

EXISTING SD CURB INLET

EXISTING SS MH (DIA: 60') STA: 7+93.53 OFF: -12.80' L RIM (EX): 3043.12 RIM (PRO): ??? INV IN: 3035.42 24" PVC INV OUT: 3035.22 24" PVC

EXISTING SECTION CORNER (ALUMINUM CAP)

ZONED R1-6

CLIFFHANGER DRIVE @ 0.48% — 24" ø EXISTING 24" PVC @ 0.48% — 50' PUBLIC STREET

EXISTING MONUMENT

N 3000 W — 50' PUBLIC STREET

PARCEL A — 929 sq ft — 0.02 acres

PARCEL B — 1898 sq ft — 0.04 acres

PARCEL C — 3780 sq ft — 0.09 acres

PARCEL D — 3305 sq ft — 0.08 acres

PARCEL E — 1572 sq ft — 0.04 acres

EXISTING 36" CULVERT

EXISTING WATER VAULT

EXISTING WATER MANHOLE, TYP.

N 3025 W — 45' PUBLIC STREET

W 600 N — 45' PUBLIC STREET

N 3075 W — 52' PUBLIC STREET

N 3085 W — 52' PUBLIC STREET

600 NORTH — 80' PUBLIC STREET

PHASE 1

PHASE 2

PHASE 3

PHASE 4

ZONE R1-6

AVERAGE LOT AREA:	6,000 SQ.FT.
MIN. LOT AREA:	4,800 SQ.FT.
MIN. FRONTAGE:	60'

RESIDENTIAL SETBACKS

FRONT:	25'
REAR:	10'
SIDE:	8'
STREETSIDE:	20'

SITE INFORMATION:

CURRENT ZONE: R1-6 (PHASES 1-4)

TOTAL AREA: 30.84 AC (1,345,357 SQ.FT.)
RESIDENTIAL UNITS: 80

TOTAL RESIDENTIAL UNITS (80) AREA: 13.94 AC
(606,962 SQ.FT.) = 45.19%
TOTAL OPEN SPACE AREA: 4.33 AC
(188,465 SQ.FT.) = 14.02%
TOTAL PUBLIC STREET (R.O.W.) AREA: 5.53 AC
(240,864 SQ.FT.) = 17.90%
TOTAL ZONED M1 AREA: 5.30 AC
(230,144 SQ.FT.) = 17.16%

AVERAGE RESIDENTIAL LOT SIZE: 606,962/80 = 7,587 SQ.FT.
DENSITY: UNITS/ACRES = 80/13.94 = 5.74 UNITS PER ACRE

REMNANT PROPERTY
187536 sq ft
4.31 acres

EACH LOWER LOT TO BE EQUIPPED WITH INDIVIDUAL SS GRINDER PUMPS, TYP.

PROPOSED SD CURB INLET

PEREGRINE COURT — 50' PUBLIC STREET — 600 NORTH R.O.W.

ZONED M-1
60996 sq ft
1.61 acres

30.00' BUFFER

PRESSURIZED SEWER LINE FROM LOWER LOTS, TYP.

EXISTING SS MH (DIA: 60") STA: 2+85.84 OFF: 17.35' R RIM (EX): 3040.26 RIM (PRO): ??? INV IN: 3031.46 24" PVC INV OUT: 3031.26 24" PVC

EXISTING SS MH (DIA: 60') STA: -0+17.19 OFF: 4.57' R RIM (EX): 3015.54 RIM (PRO): * INV IN: 3009.74 24" PVC INV OUT: 3009.54 24" PVC

EXISTING FENCE, TYP.

CONSTRUCTION SLOPE EASEMENT
39128 sq ft
0.88 acres

EXISTING SS MH (DIA: 60') STA: 4+76.04 OFF: 14.75' R RIM (EX): 3042.55 RIM (PRO): ??? INV IN: 3034.15 24" PVC INV OUT: 3033.95 24" PVC

OWNER/DEVELOPER/CONTACT

THE DEVELOPER FOR THIS PROJECT IS
PERRY HOMES UTAH, INC.
CONTACT: GREG SANT
2250 NORTH CORAL CANYON BOULEVARD, SUITE 215
WASHINGTON, UTAH 84780 (435) 251-9090 (OFFICE)

PROJECT ENGINEER

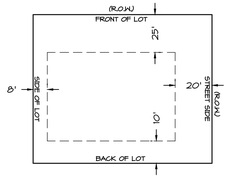
THE ENGINEER FOR THIS PROJECT IS:
ROSENBERG ASSOCIATES
CONTACT: ROB REID
352 EAST RIVERSIDE DRIVE, SUITE A2
ST. GEORGE, UTAH 84790 (435) 673-8586

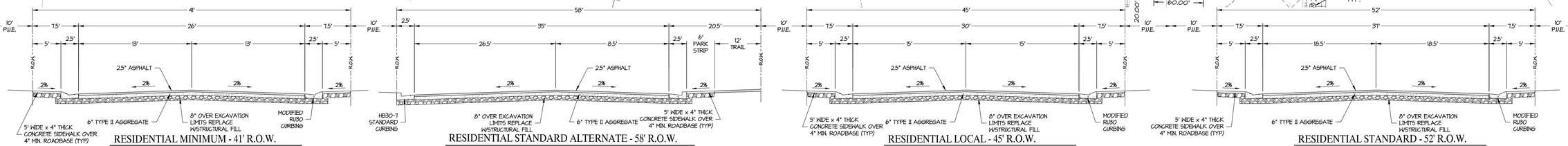
GEOTECHNICAL ENGINEER

THE GEOTECHNICAL ENGINEER FOR THIS PROJECT IS:
LANDMARK TESTING & ENGINEERING
795 EAST FACTORY DRIVE
ST. GEORGE, UT 84790 (435) 986-0566

TYPICAL LOT SETBACKS:

N.T.S.





DATE:	02/16/2022
JOB NO.:	11930-20
DESIGNED BY:	DSH
CHECKED BY:	RAR
DWG:	Preliminary Plat

REVISIONS / DATE

ROSENBERG ASSOCIATES
CIVIL ENGINEERS • LAND SURVEYORS
352 East Riverside Drive
Suite A-2
St. George, Utah 84790
Ph (435) 673-8586 Fx (435) 673-8397
www.racivil.com

STATE OF UTAH — LICENSED PROFESSIONAL ENGINEER — No. 189106 — ROBERT A. REID

PRELIMINARY PLAT - AMENDED
FOR
PEREGRINE POINT WEST: PHASES 1-4
3000 WEST 600 NORTH
HURRICANE, UTAH

SHEET 1.0
1 OF 1 SHEETS

Z:\11930-11999\11930-20 Peregrine Point West\DWG\11930-20 Preliminary Plat - Amended.dwg, Prelim Plat, 2/16/2022 10:54:58 AM, dsh, DWG To PDF.pc3

PRELIMINARY PLAT APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $150.00

For Office Use Only:
File No. 2022-PP-02
Receipt No. _____

Name: TAMMY ENGEL Craig Engel, RAC INC **Telephone:** 435-229-7360

Address: 1267 No. 1390 W St. George **Fax No.** _____

Email: racinc19@gmail.com **Agent Email:** marc@browncivil.com

Agent (If Applicable): MARC BROWN BCE **Telephone:** 435-628-4700

Address/Location of Subject Property: 1300 W, 650 South

Tax ID of Subject Property: H-3-2-4-124 **Zone District:** R-1-10

Proposed Use: (Describe, use extra sheet if necessary. Include total number of lots) _____

37 Lot, 10,000 s.f. min residential sub.

Submittal Requirements: The preliminary plat application shall provide the following:

✓ 1. Description: In a title block located in the lower right-hand corner of the sheet the following is required:
- ✓ a. The proposed name of the subdivision.
- ✓ b. The location of the subdivision, including the address and section, township and range.
- ✓ c. The names and addresses of the owner or subdivider, if other than the owner.
- ✓ d. Date of preparation, and north point.
- ✓ e. Scale shall be of sufficient size to adequately describe in legible form, all required conditions of Chapter 39, City Subdivision regulations.

✓ 2. Existing Conditions: The preliminary plat shall show:
- ✓ a. The location of the nearest monument.
- ✓ b. The boundary of the proposed subdivision and the acreage included.
- ✓ c. All property under the control of the subdivider, even though only a portion is being subdivided. (Where the plat submitted covers only a part of the subdivider's tract, a sketch of the prospective street system of the unplatted parts of the subdivider's land shall be submitted, and the street system of the part submitted shall be considered in light of existing Master Street Plan or other Commission studies.)
- ✓ d. The location, width and names/numbers of all existing streets within two hundred (200) feet of the subdivision and of all prior streets or other public ways, utility rights of way, parks and other public open spaces, within and adjacent to the tract.
- ✓ e. The location of all wells and springs or seeps, proposed, active and abandoned, and of all reservoirs or ponds within the tract and at a distance of at least one hundred feet (100') beyond the tract boundaries.
- ✓ f. Existing sewers, water mains, culverts or other underground facilities within the tract, indicating the pipe sizes, grades, manholes and the exact locations.

1-4-22

1 of 4

✓ g. Existing Hurricane Canal Company facilities; other ditches, canals, natural drainage channels and open waterways and any proposed realignments.

✓ h. Contours at vertical intervals not greater than five (5) feet.

✓ i. Identification of potential geotechnical constraints on the project site (such as expansive rock and soil, collapsible soil, shallow bedrock and caliche, gypsiferous rock and soil, potentially unstable rock or soil units including fault lines, shallow groundwater, and windblown sand) and recommendations for their mitigation.

N/A j. Information on whether property is located in desert tortoise take area

✓ 3. Proposed Plan: The subdivision plans shall show:

✓ a. The layout of streets, showing location, widths, and other dimensions of proposed streets, crosswalks, alleys and easements.

✓ b. The layout, numbers and typical dimensions of lots.

✓ c. Parcels of land intended to be dedicated or temporarily reserved for public use or set aside for use of property owners in the subdivision.

✓ d. Easements for water, sewers, drainage, utilities, lines and other purposes.

✓ e. Typical street cross sections and street grades where required by the Planning Commission. (All street grades over 5% should be noted on the preliminary plat)

✓ f. A tentative plan or method by which the subdivider proposes to handle the storm water drainage for the subdivision.

✓ g. Approximate radius of all center line curves on highways or streets.

✓ h. Each lot shall abut a street shown on the subdivision plat or on an existing publicly-dedicated street. (Double frontage or flag lots shall be prohibited except where conditions make other design undesirable)

✓ i. In general, all remnants of lots below minimum size left over after subdividing of a larger tract must be added to adjacent lots, rather than allow to remain as unusable parcels.

N/A j. Where necessary, copies of any agreements with adjacent property owners relevant to the proposed subdivision shall be presented to the Planning Commission.

✓ k. A letter from both the local sanitary sewer provider and culinary water provider indicating availability of service.

N/A l. Will this subdivision be phased? If yes show possible phasing lines.

✓ m. A tentative plan or method for providing non-discriminatory access to the subdivision for purposes of placement of communications infrastructure, and for purposes of placement of utility infrastructure.

_____ 4. Required copies of plans:

____ a. Three copies of all full scale drawings

____ b. One copy of each drawing on a 11 x 17 inch sheets. (8 ½ x 11 is acceptable if the project is small and the plans are readable at that size).

5. Warranty deed or preliminary title report or other document (see attached Affidavit) showing evidence that the applicant has control of the property

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. A deadline missed due to an incomplete application, could result in a month's delay. Planning Commission meetings are held on the second Thursday and fourth Wednesday of each month at 6:00 p.m. The deadline to submit an application to be placed on an agenda is no later than <u>12:00 noon</u> 10 full business days before the Planning Commission meeting at which you plan for your application to be heard.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete:_____ Completion determination made by: _____

2/4

PURPOSE
The preliminary plat application is the first step in land development process in those instances where land is divided for eventual sale. The process is established to insure that all proposed divisions of land conform to the City General Plan and to adopted development standards of the Land Use Ordinance.

WHEN REQUIRED
The preliminary plat is required any time land is to be divided, re-subdivided or proposed to be divided into two (2) or more lots, parcels, sites, units, plots or other division of land for the purpose, whether immediate or future, for offer, sale, lease or development either on installment plan or upon any and all other plans, terms and conditions. It is not required on agricultural divisions where the agricultural parcel is divided to be combined with another agricultural parcel, nor is it required when two un-subdivided properties are merged, or where the boundary between two un-subdivided properties are adjusted.

The preliminary plat must be approved before a final plat can be processed and recorded.

Subdivision approval process:

- Determine current zoning for property.
- If zoning fits desired subdivision, meet with Planning staff to discussed the proposed project.
- Obtain a preliminary plat application form and complete the application and have a plat prepared by an engineer to meet the requirements on the preliminary plat application.
- Submit completed application, preliminary plat, and required $150 fee to Planning Department before noon on the Wednesday two weeks before desired Planning Commission meeting. (see submittal dates sheet)
- Appear at the scheduled Planning Commission meeting to discuss preliminary plat, hear comments, answer questions, and receive recommendation of approval or disapproval from Planning Commission.
- Appear at the next scheduled City Council meeting that occurs after the Planning Commission meeting at which a recommendation was received. Hear City Council comments, answer questions, and receive City Council decision. City Council can approve the plat with conditions, recommend changes and send it back to the Planning Commission, or deny the plat.

If the preliminary plat is approved, have construction drawings for utilities and streets prepared by an engineer according to Hurricane City standards. Construction drawings must be approved by both the Hurricane Joint Utilities Committee and the Ash Creek Special Service District. Approval means changes are made and all required signatures are obtained.

Once the preliminary plat is approved by the City Council, the applicant has one year after receiving approval of the preliminary plat to submit the final plat to the Planning Commission for action. The Planning Commission may authorize a one-year time extension, provided the extension request is made before the one year time limit is reached. The Planning Commission will review and make recommendation to the City Council on the final plat when submitted. The City Council will typically review the Planning Commission recommendation within 1-2 weeks after the Commission action on the final plat.

APPEALS
The Planning Commission makes a recommendation to the City Council, so there is no appeal. The City Council's action on a preliminary plat is final unless appealed to the appropriate court.

3/4

AFFIDAVIT
PROPERTY OWNER

STATE OF UTAH)
:ss
COUNTY OF Washington)

I (we), Tammy Eirgel, being duly sworn, depose and say that I (we) am (are) the owner(s) of the property identified in the attached application and that the statements herein contained and the information provided identified in the attached plans and other exhibits are in all respects true and correct to the best of my (our) knowledge. I (we) also acknowledge that I have received written instructions regarding the process for which I am applying and the Hurricane City Planning staff have indicated they are available to assist me in making this application.

Tammy Engel
(Property Owner)

N/A
(Property Owner)

WENDY THOMAS
Notary Public - State of Utah
Comm. No. 702623
My Commission Expires on
Oct 1, 2022

Subscribed and sworn to me this 4 day of January 2022.

Wendy Thomas
(Notary Public)

Residing in: Washington County.

My Commission Expires: 10.01.2022

Agent Authorization

I (we), Tammy Eirgel, the owner(s) of the real property described in the attached application, do authorize as my (our) agent(s) Marc Brown to represent me (us) regarding the attached application and to appear on my (our) behalf before any administrative or legislative body in the City considering this application and to act in all respects as our agent in matters pertaining to the attached application.

Brown consulting

Tammy Engel
(Property Owner)

N/A
(Property Owner)

Subscribed and sworn to me this 4 day of January 2022

Wendy Thomas
(Notary Public)

Residing in: Washington County

My Commission Expires: 10.01.2022

WENDY THOMAS
Notary Public - State of Utah
Comm. No. 702623
My Commission Expires on
Oct 1, 2022

SENSITIVE LANDS APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $

For Office Use Only:
File No. 2022-HIL-01
Receipt No. _____

Name: RAC INC Craig Engel **Telephone:** 1-435-229-7360

Address: 1267 No 1390 W St. George **Fax No.** _____

MARC BROWN
Agent (If Applicable): BROWN CONSULTING **Telephone:** 435-628-4700

Email: racinc19@gmail.com **Agent Email:** marc@browncivil.com

Address/Location of Subject Property: 1300 W. 650 So.

Tax ID of Subject Property: H-3-2-4-124 **Zone District:** R-1-10

Proposed Use: (Describe, use extra sheet if necessary) 3Z-10,000 sf. min.
Residential subdivision

Other companion application submitted with the Development Plan:

- ✓ **Preliminary Plat**
- _____ **Site Plan Review**
- _____ **Conditional Use Permit**
- _____ **Rezone**
- _____ **Other**

Submittal Requirements:
Please review the attached Supplemental Information to determine additional information that must be submitted with this application.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete: _____ Completion determination made by: _____

DEVELOPMENT PLAN SUBMITTAL REQUIREMENTS

Development Plan Submittal: The following information shall be submitted with the application for Development Plan approval, and may be in addition to information required for a companion application being processed concurrently with the Development Plan:

_____1. Development plan: The development plan shall clearly show:

✓ a. Two (2) foot contours. The contour map shall be prepared and certified by a licensed professional civil engineer or surveyor drawn at a scale no smaller than one (1) inch equals one hundred (100) feet. Contour maps based on interpolation of maps with larger contour intervals are not acceptable.

✓ b. Field surveys may be required of the applicant by the City to verify the accuracy of the contour lines shown on the contour map.)

✓ c. Slopes having grades of 10-29 percent and natural slopes of thirty (30) percent or greater shall be color shaded clearly showing the difference between the two categories. This contour information shall either be computer based, or based on profile lines drawn perpendicular to contours at intervals no less than one hundred fifty (150') feet apart, nor greater than seventy-five (75') feet from an existing or proposed property line. Grades shall then be determined by calculating the slope along one hundred (100) foot segments of the profile. (See Appendix Diagram-A of the Land Use Ordinance)

✓ d. To determine required minimum lot size (Section 10-24-6B of the Sensitive Land Ordinance), the average natural grade on each proposed parcel shall be calculated and indicated on the development plan. The average grade is determined by calculating the grade of the natural slope between two opposing property lines, based on profiles taken perpendicular to the contours, no less than one hundred fifty (150) apart, nor greater than seventy-five (75) feet from an existing or proposed property line.

✓ e. The proposed development layout of lots, roads, proposed road grades, open space, area of disturbances, and existing native vegetation.

_____2. Soils Investigation Report: A soils investigation report which contains the following information:

✓ a. Nature, distribution and classification (Unified Soil Classification) of existing soils to the appropriate depth of influence by the proposed development, but not less than ten (10) feet deeper than the proposed excavations or to bedrock.

✓ b. Strength of existing soils, bearing capacity of supporting soils, settlement estimates, collapse and shrink-swell characteristics, lateral pressures and trench excavation limitations.

✓ c. Ground water levels that may affect development and estimated elevation of high ground water levels.

✓ d. Appropriate laboratory testing for classification, consistency, strength and consolidation conditions.

✓ e. Slope stability.

✓ f. A written statement by the persons or firm preparing the soils report describing the general suitability of the site for the owner=s intended use.

✓ 3. Geotechnical Report: A geotechnical and geological report shall be prepared by a geologist licensed to practice in the State of Utah, whenever a proposed building permit or development project:

a. Is located within one thousand (1,000) feet of an identified fault; or
b. Is located on slopes estimated to be twenty (20) percent or greater; or
c. Is determined to have potential hazards by the City Engineer, County Geologist or State Geologist.

The geotechnical and geological report when required above shall include:

✓ a. A geologic map showing topography, surface and subsurface geologic features and any geologic limitations to the proposed use;

✓ b. Depth to bedrock;

✓ c. Subsurface investigative logs and reports;

✓ d. Identification of all geologic hazards; and

✓ e. Measures to mitigate or eliminate geologic hazards and problems.

4. Grading and Drainage Plan: A grading and drainage plan report which includes storm water management, erosion, and grading plans describing the methods by which surface water, natural drainages, flooding (including identification of 100 year flood where applicable), erosion and sedimentation loss, and hydrologic hazards will be controlled during and after construction. The plan shall include the following information:

✓ a. The grading plan shall show present topography, including the location and depth of all proposed fills and cuts of finished earth surfaces, and/or use of retaining walls including height, using a contour interval of two (2) foot when grades are 0-29% and five (5) foot contours when grades 30% and over.

✓ b. The proposed area to be graded shall be clearly delineated on the plan.

c. Preliminary street grades shall be identified on the plan.

✓ d. All calculations and proposed details used for design and construction of debris basins, impoundments, diversions, dikes, waterways, drains, culverts and other water management or soil erosion control measures shall be shown. Drainage calculations shall determine runoff volume and peak discharge using the "Rational Method," "SCS Curve Number Method," or appropriate equivalent. Data provided should include:

(1) Rainfall depth, duration and distribution;
(2) Watershed slope and drainage area delineation;
(3) Land condition of watershed surface;
(4) Topography of drainage area; and
(5) Soil Descriptions in Watershed. Erosion calculations shall employ predictions of soil loss sheet erosion using the Universal Soil Loss Equation or equivalent. Data to be provided should include factors of:
    (a) Rainfall intensity and duration;
    (b) Soil erodability;
    (c) Land slope and length of slope or topography;
    (d) Condition the soil surface and land management practices in use; and
    (e) Surface cover, grass, pavements, etc.

5. License Required: All required reports shall be prepared by persons licensed to practice their specialty or expertise in the State of Utah, if such license for practice is required.

6. Expert Advice: In reviewing technical reports, calculations, and plans which may be required, the City staff or City Engineer may find it necessary to obtain the advice of other experts regarding the adequacy of the reports submitted, and the validity of the conclusions and recommendations reached in the reports. In such cases the City staff or City Engineer may consult with such experts, with the reasonable costs of these consultations to be borne by the developer prior to any public hearing. The Planning Commission or City Council may require payment by the developer of the costs of such consultations as a condition of preliminary or final plat approval.

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. A deadline missed due to an incomplete application could result in a month's delay. Call the Planning Department to determine the submittal deadline.

PROJECTS SUBJECT TO SENSITIVE LANDS REQUIREMENTS

The following projects are subject to Sensitive Land requirements:

1. All preliminary plats, planned developments, site plan reviews, conditional use permits and any other land use development permits authorized by City Codes when they are:
    (a) Located on lands defined in Section 10-24-2 of the Land Use Code or identified as sensitive lands on the General Plan Sensitive Lands Map;
    (b) Located within one thousand (1000) feet of a fault identified on a published geologic map.
    (c) Located within one hundred (100) feet, measured perpendicularly from a fault identified as a result of on-site investigation by a registered geologist.
    (d) Hillside and ridge and bluff areas (as set forth in section 10-24-5A of the Land Use Ordinance.).
2. Any grading on sensitive land not associated with an approved project of the types listed in subsection 1 above, when such grading will:
    a. Disturb ten thousand (10,000) square feet or more of land area;
    b. Create a cut or fill over three (3) feet in height; or
    c. Create trenching over two hundred (200) feet in length.

    (A development plan is not required, however sufficient information must be submitted to determine compliance with Chapter 24, Sensitive Lands)
3. All building permits, including grading on vacant lots or parcels not previously processed in accordance with the provisions of this Chapter 24 of the Land Use Ordinance. (A development plan is not required, however sufficient information must be submitted to determine compliance with Chapter 24, Sensitive Lands)

PROJECT REVIEW PROCEDURE

When a preliminary plat, site plan, planned development or conditional use permit or other application is located on sensitive lands, the Development Plan application is submitted as a companion application and processed concurrently. The Planning Commission will review the application(s) and on conditional use permits and site plan reviews they will approve, approve with conditions or deny the Development Plan application. On preliminary plats, or zone changes, the Planning Commission will forward a recommendation to the City Council. Following receipt of a recommendation from the Planning Commission, or on appeal, the City Council will hold a public hearing on the application and approve, approve with conditions, or deny the proposed Development Plan.

NOTE: To fully understand the requirements for projects on sensitive lands, you should request a copy of Chapter 24 of the Land Use Ordinance from the City of Hurricane Planning Department.

PLANNING & ZONING
HURRICANE CITY
UTAH

STAFF COMMENTS

Agenda Date:	**02/17/2022**
Application Number:	2022-PP-02 2022-HIL-01
Type of Application:	Preliminary Plat and Hillside Application
Action Type:	Administrative
Applicant:	Marc Brown
Agent:	Marc Brown
Request:	Approval of a Preliminary Plat and Sensitive Lands
Location:	1380 W 825 S
Zoning:	R1-10
General Plan Map:	Single-Family

Planning Commission Recommendation
The Planning Commission gave a positive recommendation subject to JUC and staff comments and granting the exception based on sound engineering principles as listed within the staff report.

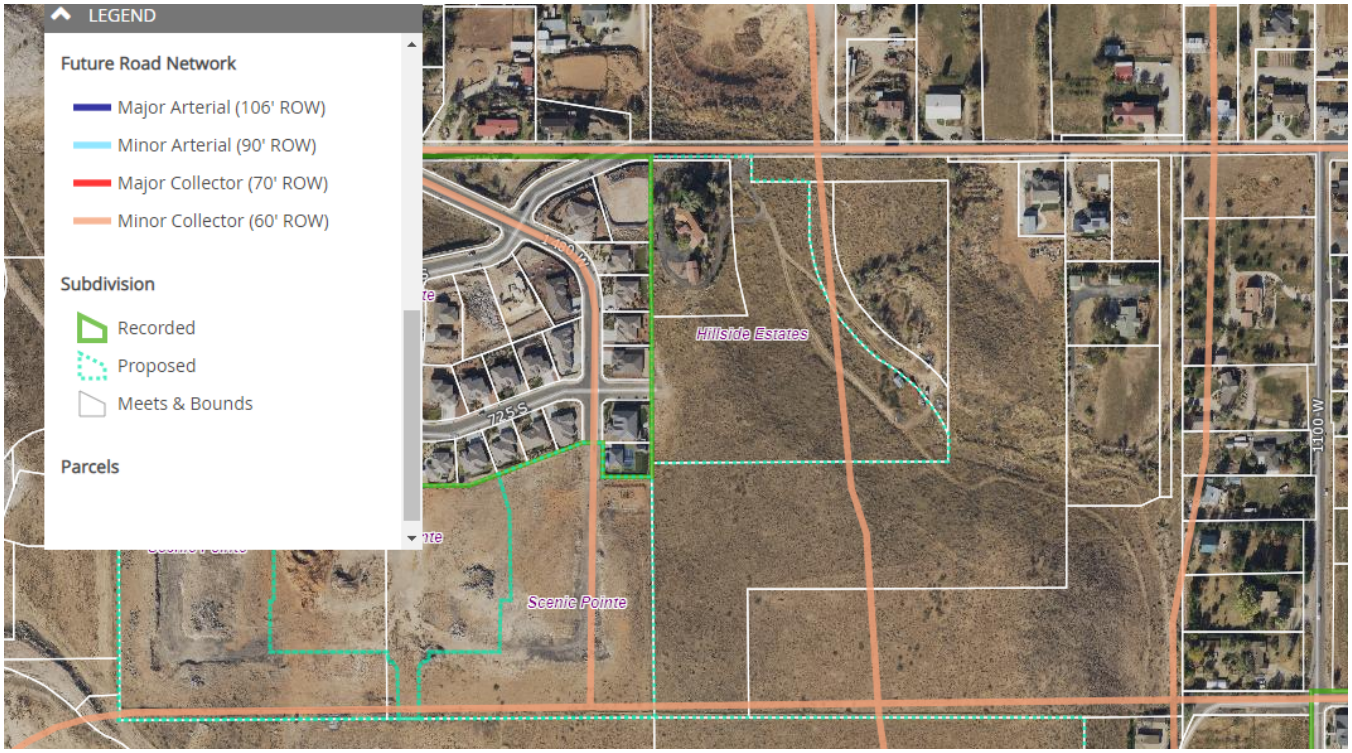
Discussion:
The applicant has submitted a preliminary plat application for 14.19 acres preliminary subdivision plat containing 37 lots. This application was approved by the Planning Commission last year but the applicant decided to resubmit as they found a way to reconfigure the layout in order to get five more lots. This application requires extensive connections with neighboring properties such as Hillside Estates and Collina Tinta. The subdivision is located on hillsides of slopes greater than 10% and has submitted an updated Sensitive Lands/Hillside Application.

JUC Comments
1. **Power:** Power has reviewed construction drawings. Power will be off 650 S. Power can serve the property
2. **Sewer:** A will serve letter has been sent
3. **Streets:** Need to comply with the master plan roadways
4. **Water:** Water is on 650 S. Will need to loop through Hillside Estates and Scenic Pointe to make the water loop work.
5. **Fire:** Make sure there are two access points for over 30 units. Roads that are over 10% grade will need to sprinkle the homes that access off that road. Off-site turnaround will require an agreement with the neighboring property owner
6. **Gas:** Good, two inch line in 650 S, just need it looped.

7. **Water Conservancy:** No comments

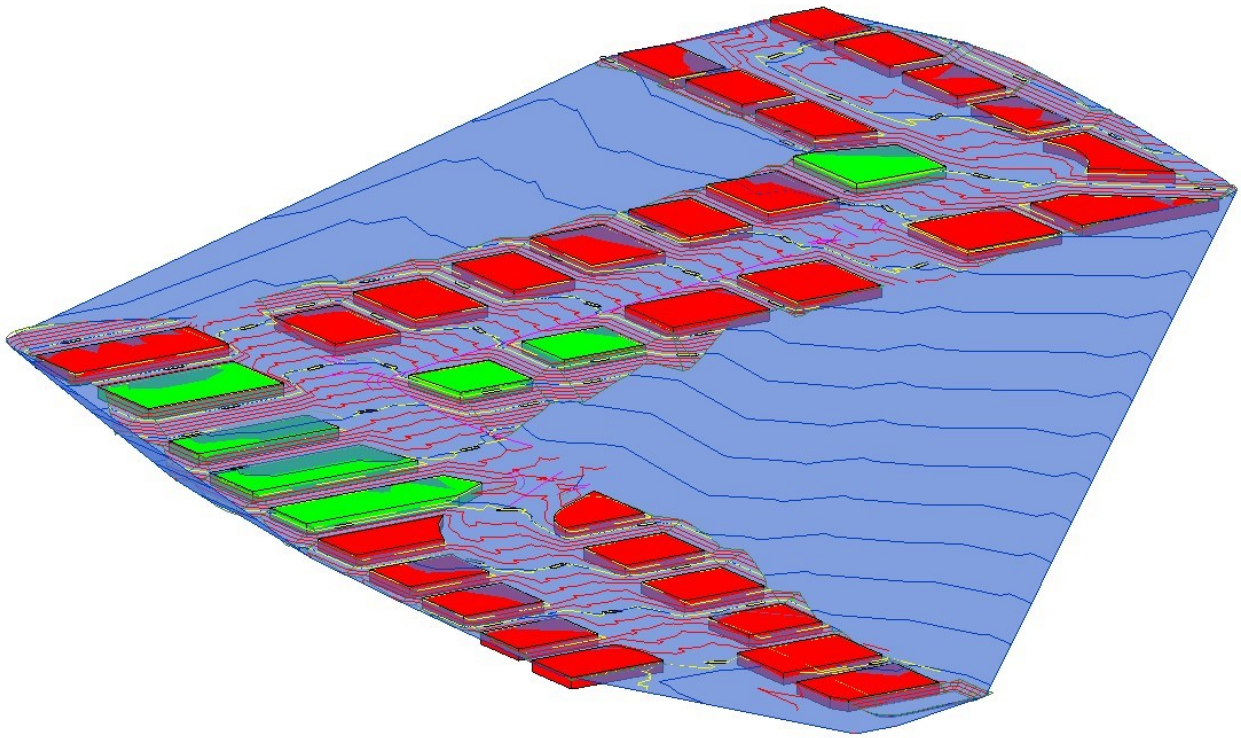
Staff Comments: Preliminary Plat

1. Zoning is R1-10, and the lots comply with the underlying zone. Several of the lots along proposed 825 W do not meet city standards for sensitive lands and will require an exception. These issues are address in the following section.
2. Staff believes a canal goes through the property as shown on the Hillside Estates Preliminary Plat (recently approved to the north). The applicant will need to investigate the location of this water line and ensure proper steps are taken.
3. There is a 60' master plan roadway that goes north and south that the applicant is providing, if at a slightly different alignment.
4. There is a master plan roadway that runs along the southern property boundary. The property owner to the south has indicated that they are planning on realigning the roadway based on their plan for their own project. This plan has not been seen or approved by the City. Any approval of the current layout of this property needs to be subject to a change of the 900 S Master Planned Roadway.



5. The City has not received a letter from the local culinary water provider indicating service availability, but they have indicated services are in the area.
6. A geotechnical and drainage report were submitted for the first submittal on this project. Staff will not require another one at this stage
7. Plat shows the east to west street to be "825 West" this should be "825 South"
8. The applicant is proposing a fire turnaround within property of the Collina Tinta development; an agreement will have to be made with the developers for that turnaround to be valid.
9. The applicant has noted that the property isn't located in a desert tortoise take area.

10. The plat is planned to be developed in a single phase.



Sensitive Lands

1. Update: The applicant is wishing to create five additional lots by splitting the lots shown above in green. The initial application was approved on Nov 29, 2021 by the City Council. The new lots are 28-32 and 7-10. As will be mention below, these lots do not comply with the sensitive lands table minimum lot size for the slop. Staff has talked to the applicant's engineer and has received a letter to address the above exception. See HCC 10-24-6. - Hillsides and ridge areas; general development standards.
2. The Sensitive Land Application is complete. The applicant has provided an updated sloping map and has shown the slope of each lot . The applicant also provided a geotechnical report, drainage Plan, and grading plan with the previous application.

10-24-5: HILLSIDES AND RIDGE AREAS:

A. Applicability: The following procedures, submittal requirements and standards shall apply to those projects located on lands identified as having at least one of the following characteristics:

1. Slopes over ten percent (10%) which are:

a. Identified through computer generated programs capable of calculating slopes on topographic maps prepared with two foot (2') contour interval accuracy; or

b. Established by profile lines drawn perpendicular to contour lines at intervals no greater than one hundred fifty feet (150') apart, when the slope, measured along any one hundred foot (100') segment of the profile line is ten percent (10%) or greater. (See section 10-24-9, appendix diagram A, of this chapter.)

c. A slope shall be subject to this chapter only when a contiguous identified area of ten percent (10%) or greater exceeds two (2) acres, or if the site is less than one acre and the entire site is ten percent (10%) or greater.

2. Soils Investigation Report: A soils investigation report which contains the following information:

a. Nature, distribution and classification (unified soil classification) of existing soils to the appropriate depth of influence by the proposed development, but not less than ten feet (10') deeper than the proposed excavations or to bedrock.

b. Strength of existing soils, bearing capacity of supporting soils, settlement estimates, collapse and shrink-swell characteristics, lateral pressures and trench excavation limitations.

c. Groundwater levels that may affect development and estimated elevation of high groundwater levels.

d. Appropriate laboratory testing for classification, consistency, strength and consolidation conditions.

e. Slope stability.

f. A written statement by the geotechnical engineer, civil engineer, or geologist preparing the soils report describing the general suitability of the site for the owner's intended use. The report shall identify soil constraints to development and shall state the professional opinion of the author as to whether the proposed development plan will mitigate and/or eliminate said constraints in a manner as to prevent hazard to life, hazard to property, and adverse effects. If the soil report prepared for a subdivision shows the presence of critically expansive soils, high water table, organic soils, liquefiable soils, collapsible soils, or other soil problems which, if not corrected, would lead to structural defects of the proposed buildings, damage to the building from the water, or premature deterioration of the public improvements, a soil investigation of each lot in the subdivision shall be required by the city.

3. Geotechnical Report: A geotechnical and geological report subject to the standards and requirements provided therein.

4. Grading And Drainage Plan: A grading and drainage plan report which includes stormwater management, erosion, and grading plans describing the methods by which surface water, natural drainage, erosion and sedimentation loss, and hydrologic hazards that will be controlled during and after construction. The plan shall include the following information:

a. The grading plan shall show present topography, including the location and depth of all proposed fills and cuts of finished earth surfaces, and/or use of retaining walls including height, using a contour interval of two feet (2') when grades are zero to twenty nine percent (0 - 29%) and five foot (5') contours when grades thirty percent (30%) and over.

b. The proposed area to be graded shall be clearly delineated on the plan.

c. All calculations and proposed details used for design and construction of debris basins, impoundments, diversions, dikes, waterways, drains, culverts and other water management or soil erosion control measures shall be shown. Drainage calculations shall determine runoff volume and peak discharge using the "rational method", "SCS curve number method", or appropriate equivalent. Data provided should include:

(1) Rainfall depth, duration and distribution;
(2) Watershed slope and drainage area delineation;
(3) Land condition of watershed surface;
(4) Topography of drainage area; and
(5) Soil descriptions in watershed. Erosion calculations shall employ predictions of soil loss sheet erosion using the universal soil loss equation or equivalent. Data to be provided should include factors of:
(A) Rainfall intensity and duration;
(B) Soil erodibility;
(C) Land slope and length of slope or topography;
(D) Condition of the soil surface and land management practices in use; and
(E) Surface cover, grass, pavements, etc.

3. Staff has reviewed each lot and the slopes. Each of the newly created lots, 28-32 and 7-10 will require a size exception. These lots were made smaller to accommodate more lots

10-24-5 (C)(1) d. To determine required minimum lot size (subsection 10-24-6B of this chapter) the average natural grade of each proposed parcel shall be calculated, and indicated on the development plan. The average grade shall be determined by calculating the grade of the natural slope between two (2) opposing property lines, based on profiles taken perpendicular to the contours, no less than one hundred fifty feet (150') apart, nor greater than seventy five feet (75') from an existing or proposed property line. Small washes or rock outcrops which have slopes distinctly different from surrounding property may be excluded from slope determination, if the exclusion of such small areas from slope determination will not be contrary to the overall purpose of this chapter, as reasonably determined by the zoning administrator.

The Planning Commission can approve an exception to the lot sizes based on the criteria listed below:

10-24-3: DETERMINATION OF APPLICABILITY:

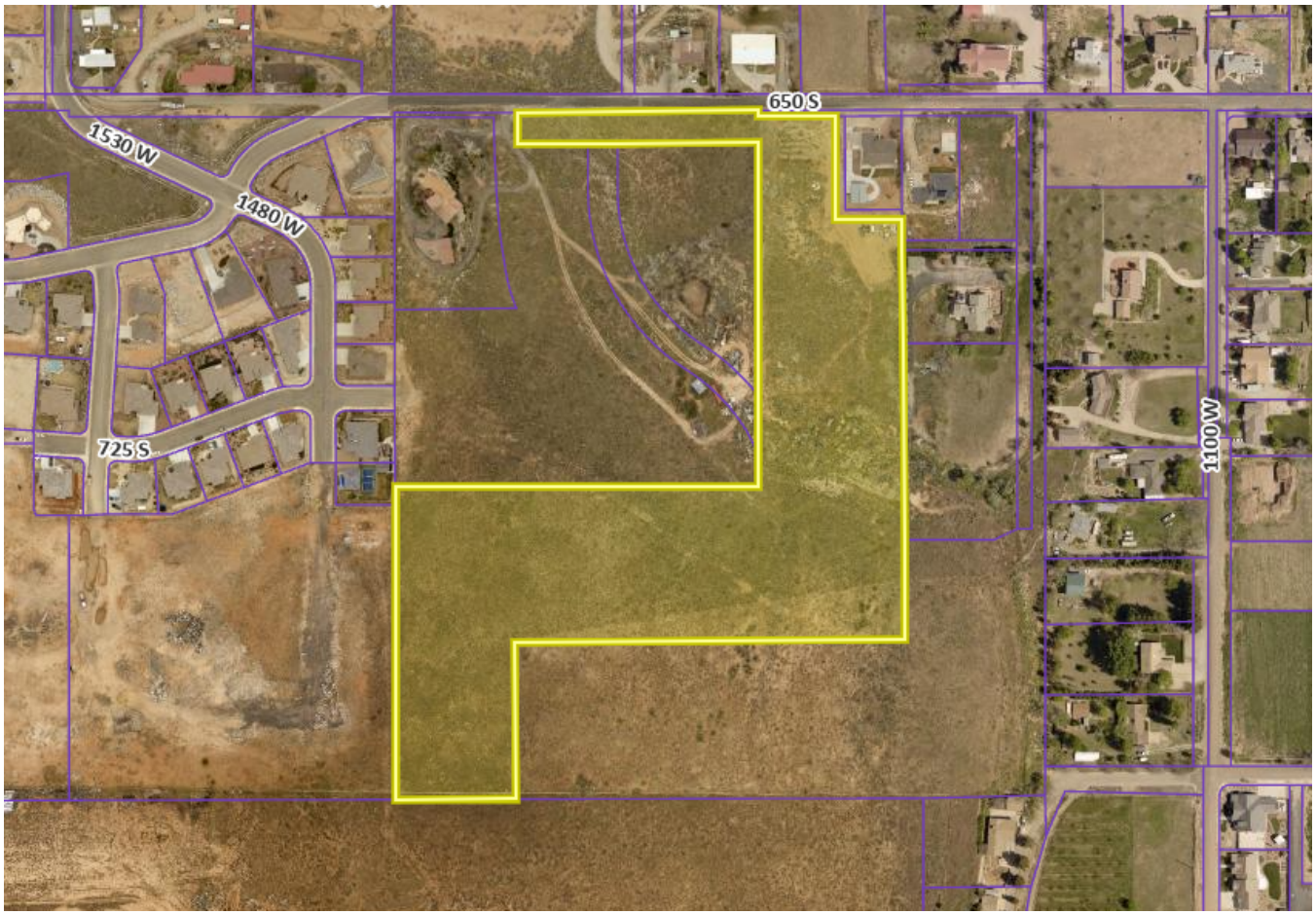
G. Exceptions: Exceptions to the provisions of this chapter may be granted by the city council upon recommendation from the planning commission when:

1. An alternative solution is proposed for the protection of the sensitive land, based on sound and generally accepted engineering and land development principles, and said alternative will result in equal or better protection than development under the standards of this chapter; and is consistent with the purposes of this chapter. The alternative shall also be consistent with the general plan policies affecting sensitive lands;

2. The size of the parcel existing before the effective date of the adoption of this chapter is determined by the planning commission to be too small to effectively apply the provisions of this chapter, and conditions can be added to the project to minimize safety and general welfare concerns.

3. The parcel is zoned for a nonresidential use and the planning commission determines the site requires grading inconsistent with the provisions of this chapter, and conditions can be added to the project to minimize safety and general welfare concerns. (Ord. 2014-6, 5-1-2014)

Staff has talked to the applicant's engineer and requested a letter to address the above exception. Each lot asking for an exception is under 20% slope. The City has typically allowed exceptions for lots under 20% based on a sound grading plan. 10%-20% slope is considered moderate slop for home construction.



4. The applicant has submitted a grading plan. Grading Plan generally complies with Hurricane Standards with the following notes:

- Slops maximums need to be 2:1. Lot 7 east side and Lot 12 southwest side does not seem to comply.
- Any walls must be under 16 ft within a run of 50' area.
- No walls should be placed in PUE. None are shown on the preliminary grading plan.
- The full grading plan will be reviewed with construction drawings by JUC.
- Grading Plan Notes 1 appears to be incomplete.

Recommendation: Staff recommends the City Council review this application based on standards with Hurricane City Code. Staff would recommend approval based on findings or changes listed within this report, that the City approves the realignment of 900 S and based on the letter received by the engineer.

1267 N. 1390 W. St. George Ut. 84770
435-229-7360
racinc19@gmail.com

RAC Development would like to request an increase of 5 additional lots for a total of 37 lots on the Mountain View Estates application from the previously approved 32 preliminary plat.

This alternate layout is in harmony with the protection of the sensitive lands. It is based on sound and generally accepted standards. The proposed revised plan provides equal or better protection for the development and is consistent with the general plan policy affecting sensitive lands.

The changes, slope, and grade issues, are as follows.

1 Lot was added on the south east boundary. 1 Lot added on the north boundary. 2 lots added on the lower west boundary. 1 lot added on the west and east upper boundary.

The larger lots were impractical with very tall 20’ walls. To reduce the wall height we terraced the walls. When we terraced the lots. We added to the usable layout.

The cut and fill was off and the additional lots balanced the grading.

Adding the lots helped with keeping the road under 10% grade.

The lots are all similar in size and are conducive to similar building structures. The larger lots were very out of place.

All lot slopes are under 15% and conform to accepted standards.

The terracing will reduce the slope of the roadways and increase stability of retaining walls, balance the grading, and make the lots of a consistent size. Improving the project viability.

Craig Engel President RAC
Craig Engel

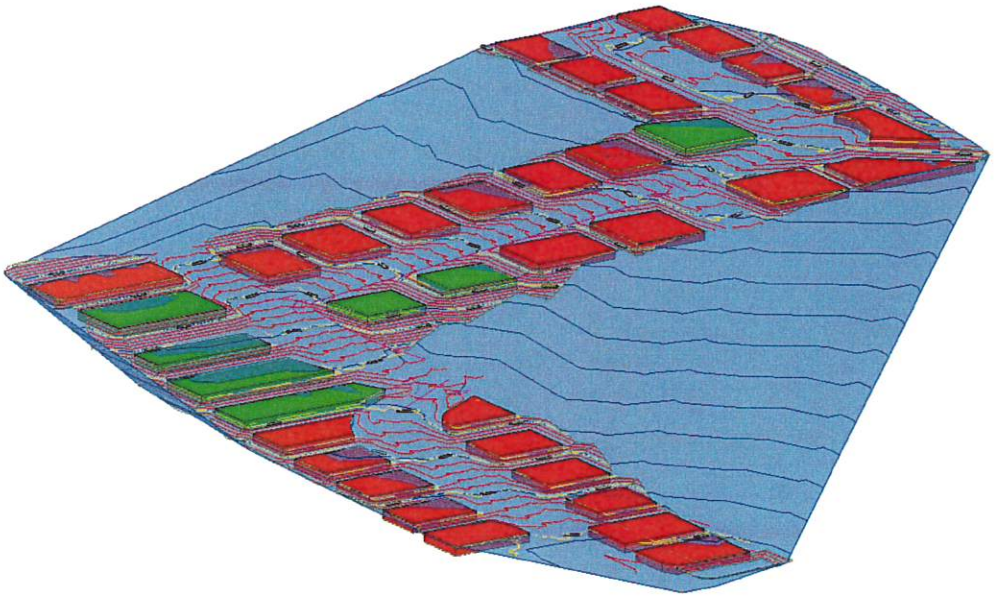
Marc Brown BCE Engineering.
Marc Brown

Stephen Nelson

From: RAC INC. <racinc19@gmail.com>
Sent: Wednesday, January 12, 2022 7:51 AM
To: Stephen Nelson
Cc: Marc Brown
Subject: Please add to RAC submittal

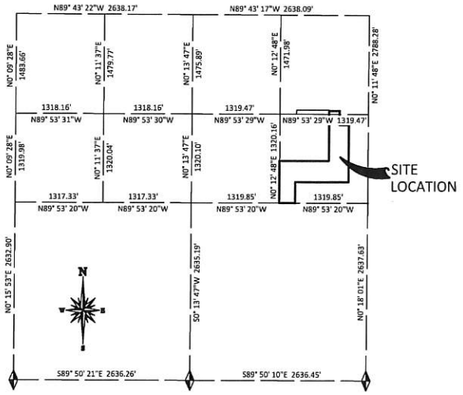
Hello Stephen,

Can you add the attached drawing to the RAC application for the meeting 1/13/21?



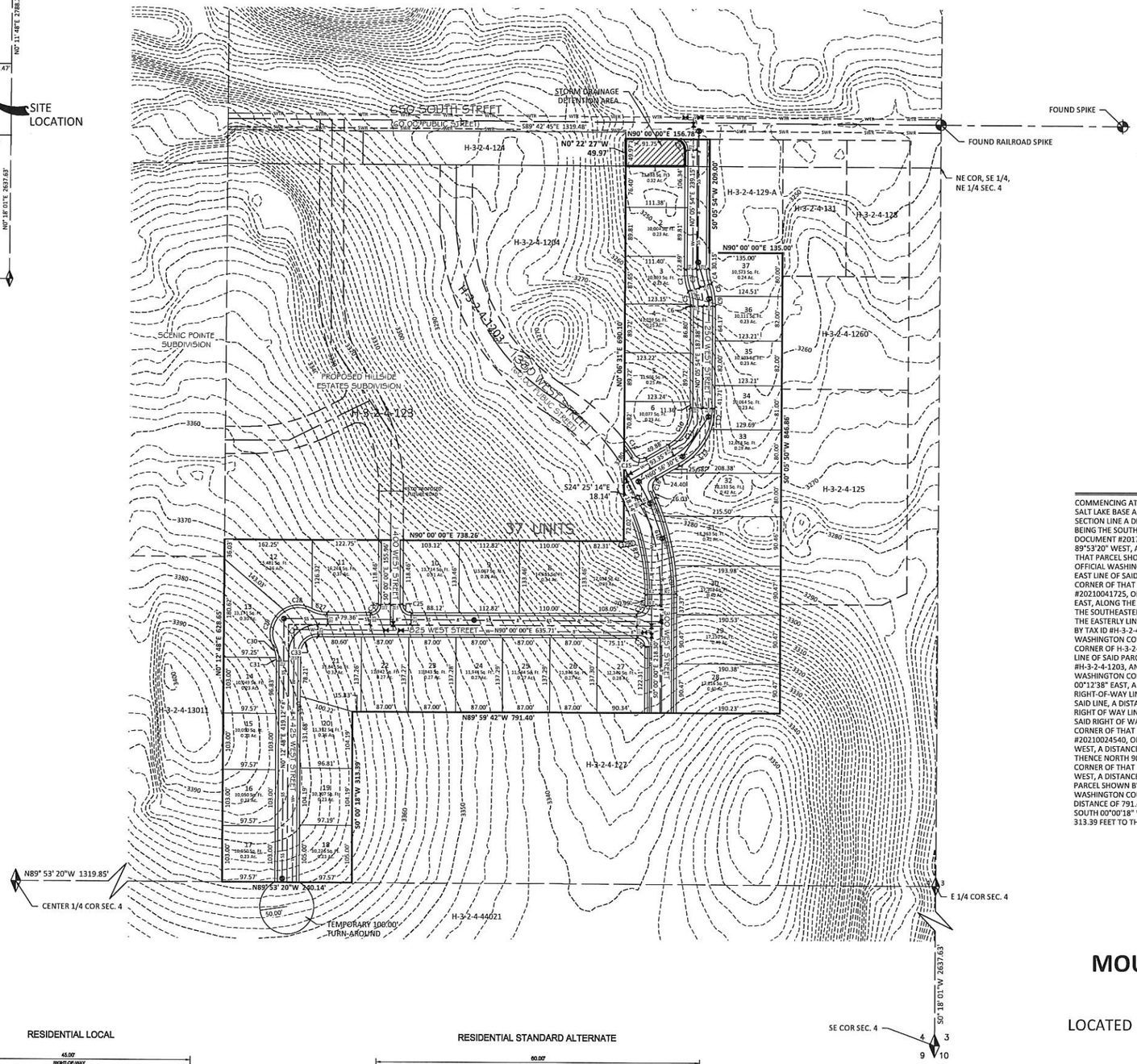
Thank you

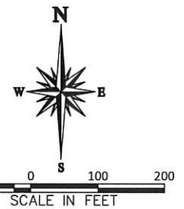
--
Craig Engel
RAC Inc.
1267 N 1390 W.
St. George UT 84770
435-229-7360



PROJECT LOCATION
SEC. 4 T42S R13W, SLB&M
NOT TO SCALE

CURVE TABLE				
CURVE	RADIUS	LENGTH	DELTA	TANGENT
C1	20.00'	31.45'	90°05'54"	20.03'
C2	122.50'	42.27'	19°46'21"	21.35'
C3	100.00'	34.51'	19°46'21"	17.43'
C4	77.50'	26.74'	19°46'21"	13.51'
C5	77.50'	23.74'	17°33'15"	11.97'
C6	77.50'	3.00'	2°13'06"	1.50'
C7	100.00'	34.51'	19°46'21"	17.43'
C8	122.50'	24.39'	11°24'21"	12.23'
C9	122.50'	17.89'	8°22'00"	8.96'
C10	77.50'	82.30'	60°50'36"	45.51'
C11	100.00'	106.19'	60°50'36"	58.72'
C12	122.50'	40.01'	18°42'53"	20.19'
C13	122.50'	90.07'	42°07'43"	47.18'
C14	430.00'	34.20'	4°33'23"	17.11'
C15	15.00'	22.32'	85°14'31"	13.80'
C16	15.00'	22.35'	85°21'44"	13.83'
C17	400.00'	57.04'	8°10'12"	28.57'
C18	370.00'	157.70'	24°25'14"	80.07'
C19	400.00'	170.49'	24°25'14"	86.56'
C20	430.00'	36.93'	4°55'16"	18.48'
C21	430.00'	93.11'	12°24'25"	46.74'
C22	430.00'	53.23'	7°05'32"	26.65'
C23	15.00'	23.56'	90°00'00"	15.00'
C24	15.00'	23.56'	90°00'00"	15.00'
C25	15.00'	23.56'	90°00'00"	15.00'
C26	15.00'	23.56'	90°00'00"	15.00'
C27	60.00'	29.57'	28°14'29"	15.09'
C28	52.50'	55.74'	60°50'02"	30.82'
C29	52.50'	76.90'	83°55'11"	47.20'
C30	60.00'	21.80'	20°49'13"	11.02'
C31	60.00'	6.18'	5°54'19"	3.09'
C32	54.00'	84.62'	89°47'12"	53.80'
C33	31.50'	49.36'	89°47'11"	31.38'





LEGEND

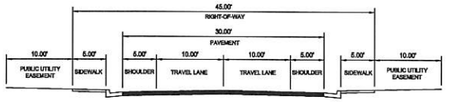
- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 1896 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- SWR SWR EXISTING SEWER LINE
- WTR WTR EXISTING WATER LINE
- SWR SWR PROPOSED SEWER LINE
- WTR WTR PROPOSED WATER LINE

PROJECT DATA	
SINGLE FAMILY HOMES	PARCEL = 14.18 ACRES
PARCEL ID	H-3-2-4-124
PROJECT ADDRESS	1250 W 650 SOUTH
PROJECT	37 SINGLE FAMILY HOMES
ZONE	R-1-10

LEGAL DESCRIPTION

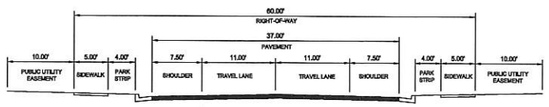
COMMENCING AT THE EAST 1/4 SECTION 4, TOWNSHIP 42 SOUTH, RANGE 13 WEST, SALT LAKE BASE AND MERIDIAN; THENCE NORTH 89°53'20" WEST, ALONG THE CENTER SECTION LINE A DISTANCE OF 1079.71 FEET TO THE POINT OF BEGINNING, SAID POINT BEING THE SOUTHWEST CORNER OF THAT PARCEL SHOWN BY TAX ID # H-3-2-4-127 AND DOCUMENT #20170002484, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 89°53'20" WEST, A DISTANCE OF 240.14 FEET, TO THE SOUTHEASTERLY CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-13011 AND DOCUMENT #20150044906, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 00°12'48" EAST, ALONG THE EAST LINE OF SAID PARCEL, A DISTANCE OF 628.65 FEET, TO THE SOUTHWESTERLY CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-123 AND DOCUMENT #20210041725, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 90°00'00" EAST, ALONG THE SOUTHERLY LINE OF SAID PARCEL, A DISTANCE OF 738.26 FEET, TO THE SOUTHEASTERLY CORNER OF SAID PARCEL; THENCE NORTH 00°06'31" EAST, ALONG THE EASTERLY LINE OF SAID PARCEL AND THE EASTERLY LINE OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-1204, H-3-2-4-1203, AND DOCUMENT #20170014334, OFFICIAL WASHINGTON COUNTY RECORDS, A DISTANCE OF 690.10 FEET, TO THE NORTHEASTERLY CORNER OF H-3-2-4-1204 PARCEL; THENCE NORTH 89°53'29" WEST, ALONG THE NORTH LINE OF SAID PARCEL AND THE NORTH LINE OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-1203, AND H-3-2-4-123 AND DOCUMENT #20210041725, OFFICIAL WASHINGTON COUNTY RECORDS, A DISTANCE OF 486.99 FEET; THENCE NORTH 00°12'38" EAST, A DISTANCE OF 61.64 FEET, TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY LINE OF 650 SOUTH STREET; THENCE SOUTH 89°59'16" EAST, ALONG SAID LINE, A DISTANCE OF 486.43 FEET; THENCE SOUTH 00°00'00" EAST, ALONG THE RIGHT OF WAY LINE, A DISTANCE OF 12.50 FEET; THENCE NORTH 90°00'00" EAST, ALONG SAID RIGHT OF WAY LINE, A DISTANCE OF 156.78 FEET, TO THE NORTHWESTERLY CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-129 AND DOCUMENT #20210024540, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE SOUTH 00°05'54" WEST, A DISTANCE OF 209.00 FEET, TO THE SOUTHWEST CORNER OF SAID PARCEL; THENCE NORTH 90°00'00" EAST, A DISTANCE OF 135.00 FEET, TO THE SOUTHEAST CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-129; THENCE SOUTH 00°05'50" WEST, A DISTANCE OF 846.86 FEET, TO A POINT ON THE BOUNDARY LINE OF THAT PARCEL SHOWN BY SAID TAX ID #H-3-2-4-127 AND DOCUMENT #20170002484, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 89°59'42" WEST, ALONG SAID LINE, A DISTANCE OF 791.40 FEET, TO THE NORTHWESTERLY CORNER OF SAID PARCEL; THENCE SOUTH 00°00'18" WEST, ALONG THE WESTERLY LINE OF SAID PARCEL, A DISTANCE OF 313.39 FEET TO THE POINT OF BEGINNING.

RESIDENTIAL LOCAL



45' STREET CROSS SECTION
1"=10'

RESIDENTIAL STANDARD ALTERNATE



60' STREET CROSS SECTION
1"=10'

PRELIMINARY PLAT FOR

MOUNTAIN VIEW ESTATES SUBDIVISION

LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 13 WEST, SLB&M

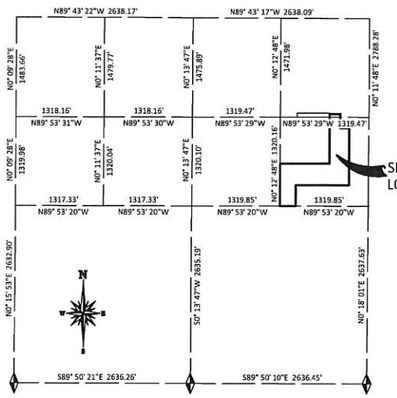
DEVELOPER/OWNER INFORMATION
RAC INC. / CRAIG ENGEL 1267 N 1390 W ST. GEORGE, UT 84770 435-229-7360 CRAIG_ENGEL@MSN.COM

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
163 WEST 1600 SOUTH, UNIT 5
ST. GEORGE, UTAH 84770
(435) 628-4700 FAX (435) 628-4725

PRELIMINARY PLAT
MOUNTAIN VIEW ESTATES
FOR
RAC INC.
LOCATED IN THE NE 1/4, SEC 4, T42NS R13W S.L.B.&M.
HURRICANE CITY, UTAH

CHECKED BY : MB
DRAWN BY : TF
DATE : JANUARY 2022
JOB NO. : 21-138
SCALE : 1"=100'
SHEET NO. : P-1



PROJECT LOCATION
SEC. 4 T42S R13W, SLB&M
NOT TO SCALE

GRADING PLAN NOTES:

1. ALL EXCAVATIONS AND GRADING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF HURRICANE, SPECIFICALLY THE "UTAH UNIFORM STANDARD ACT RULES", APPENDIX "K", AND THE SPECIFICATIONS AND REQUIREMENTS INCLUDED IN THE GEOTECHNICAL INVESTIGATION PREPARED BY ???

2. THE CONTRACTOR SHALL PROVIDE SUITABLE EQUIPMENT TO CONTROL DUST AND AIR POLLUTION CAUSED BY CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL ALSO PROVIDE SUITABLE MUD AND DIRT CONTAINMENT TO MAINTAIN THE WORK SITE, ACCESS ROADWAYS AND ADJACENT PROPERTIES IN A CLEAN CONDITION.

3. A DRAINAGE CONTROL PLAN AND REPORT HAS BEEN PREPARED FOR THIS DEVELOPMENT BY BROWN CONSULTING ENGINEERS.

4. THE OWNER SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE DRAINAGE CHANNEL AND THE ONSITE DETENTION BASINS.

5. NO GRADING BEYOND PROPERTY LINE.

6. CONTRACTOR SHALL VERIFY ELEVATION IN THE FIELD.

CONSTRUCTION NOTES

1. GRADE SITE TO ELEVATIONS AND CONTOURS SHOWN ON PLAN.
2. NEW STORM DRAIN CATCH BASIN
3. NEW 12"Ø HDPE STORM DRAIN PIPE
4. STANDARD 8' CROSS GUTTER PER HURRICANE STD DETAIL #CG100
5. PROPOSED STORM WATER DETENTION AREA.
10. NEW 2 1/2" ASPHALT OVER 6" TYPE II AGGREGATE BASE
11. CONSTRUCT NEW 5' SIDEWALK PER HURRICANE CITY STD. DWG #120

EARTHWORK

ESTIMATED EARTHWORK VOLUMES
PHASE 1 BUILDING SITE:
CUT = 40,951 c.y.
FILL = 40,985 c.y.
NET = 34 c.y. (FILL)

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING ALL EARTH WORK VOLUMES. VOLUMES SHOWN ARE FOR ESTIMATING PURPOSES ONLY. THEY REPRESENT ESTIMATED VOLUMES BETWEEN EXISTING AND FINISHED SURFACES.

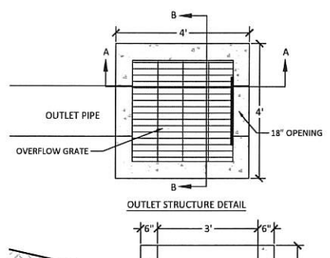
ALL GRADING ACTIVITY SHALL COMPLY WITH APPENDIX "K" SECTION 33 GUIDELINES.

NOTICE OF INTENT (N.O.I.) TO BE SUBMITTED PRIOR TO OBTAINING BUILDING PERMIT.

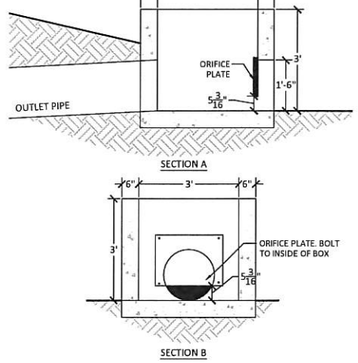
LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 1896 EXISTING CONTOUR, MAJOR
- EXISTING CONTOUR, MINOR
- 3350 PROPOSED CONTOUR, MAJOR
- PROPOSED CONTOUR, MINOR
- PROPOSED PAD
- TBC: 3278.38 STA: 4456.53 PROPOSED TBC STATION 7 ELEVATION
- PROPOSED WALL

N
W E
S
60 0 60 120
SCALE IN FEET



OUTLET STRUCTURE DETAIL



OUTLET STRUCTURE DETAIL
N.T.S.



CONTACT INFORMATION

CRAIG ENGEL
1267 NORTH 1390 WEST
ST. GEORGE, UT 84770
PHONE (435)229-7360

811 Know what's below. Call before you dig.

NOTICE!

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION, PROTECTION, AND RESTORATION OF ALL BURIED OR ABOVE GROUND UTILITIES, SHOWN OR NOT SHOWN ON THE PLANS.

NOTE: ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH HURRICANE CITY STANDARDS

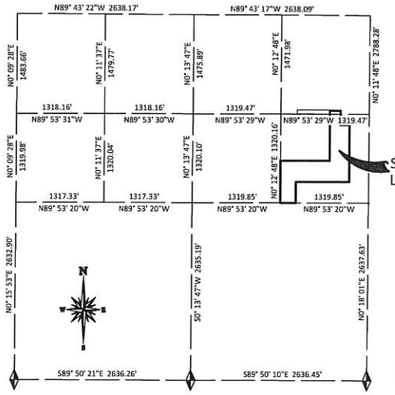
REVISIONS			
NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING • LAND SURVEYING • LAND PLANNING
180 WEST 1600 SOUTH, SUITE 5
ST. GEORGE, UTAH 84770
(435) 628-4700 FAX (435) 628-4725

GRADING PLAN
MOUNTAIN VIEW ESTATES
FOR
RAC INC.
LOCATED IN THE NE 1/4, SEC 4, T42NS R13W S.L.B.&M.
HURRICANE CITY, UTAH

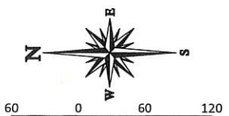
PROFESSIONAL STRUCTURAL ENGINEER — MARC BROWN — 10225 — 01-03-22 — STATE OF UTAH

CHECKED BY : MB
DRAWN BY : TF
DATE : JANUARY 2022
JOB NO. : 21-138
SCALE : 1"=60'
SHEET NO. : C-G2



SITE LOCATION

PROJECT LOCATION
SEC. 4 T42S R13W, SLB&M
NOT TO SCALE



60 0 60 120
SCALE IN FEET

LEGEND

PROPERTY LINE
ADJACENT PROPERTY LINE
1896 EXISTING CONTOUR MAJOR
EXISTING CONTOUR MINOR

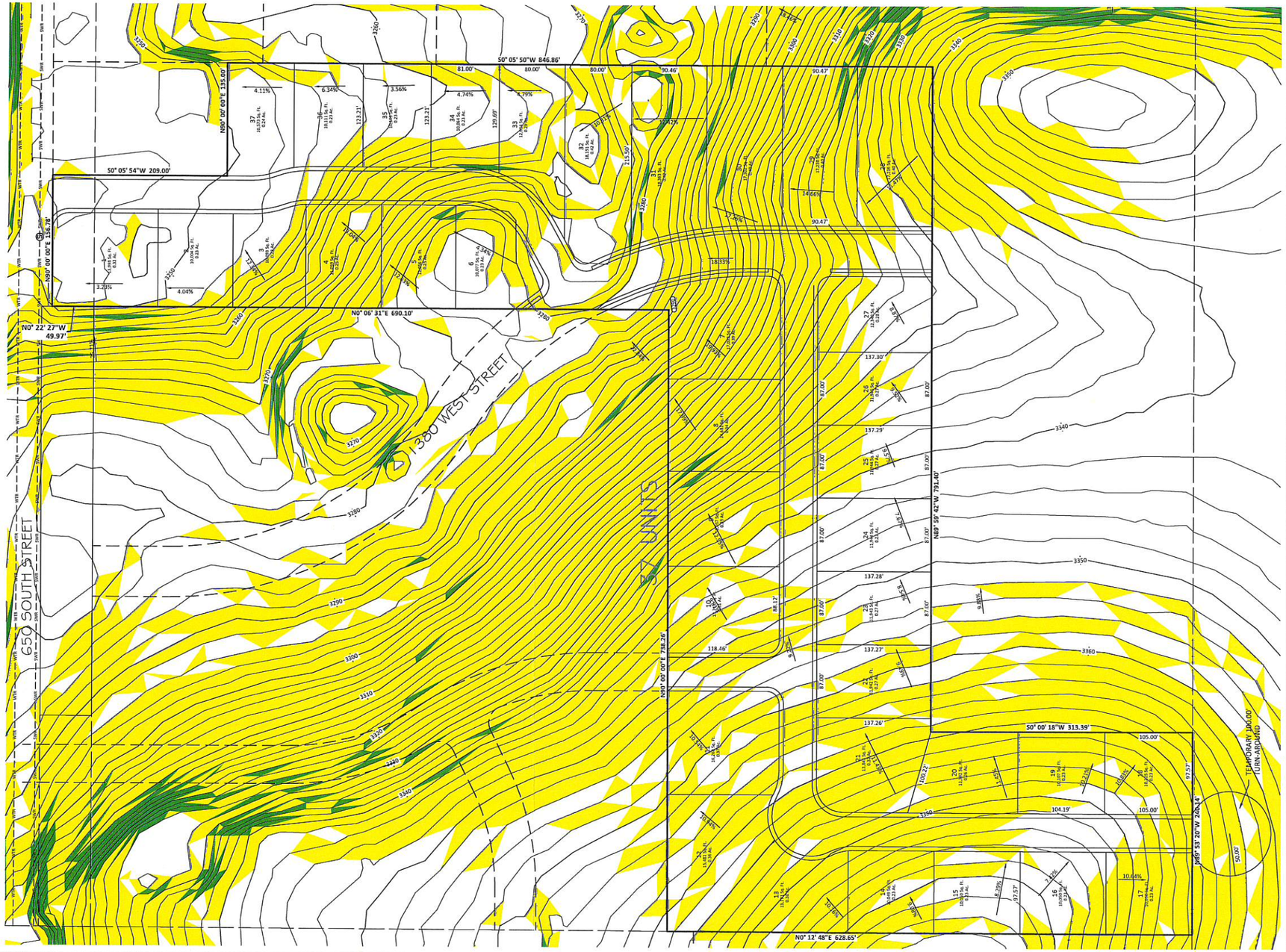
Slopes Table			
Number	Minimum Slope	Maximum Slope	Color
1	0.00%	10.00%	
2	10.00%	30.00%	
3	30.00%	Vertical	

811 Know what's below. Call before you dig.

NOTICE!

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION, PROTECTION, AND RESTORATION OF ALL BURIED OR ABOVE GROUND UTILITIES, SHOWN OR NOT SHOWN ON THE PLANS.

NOTE: ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT HURRICANE CITY STANDARDS



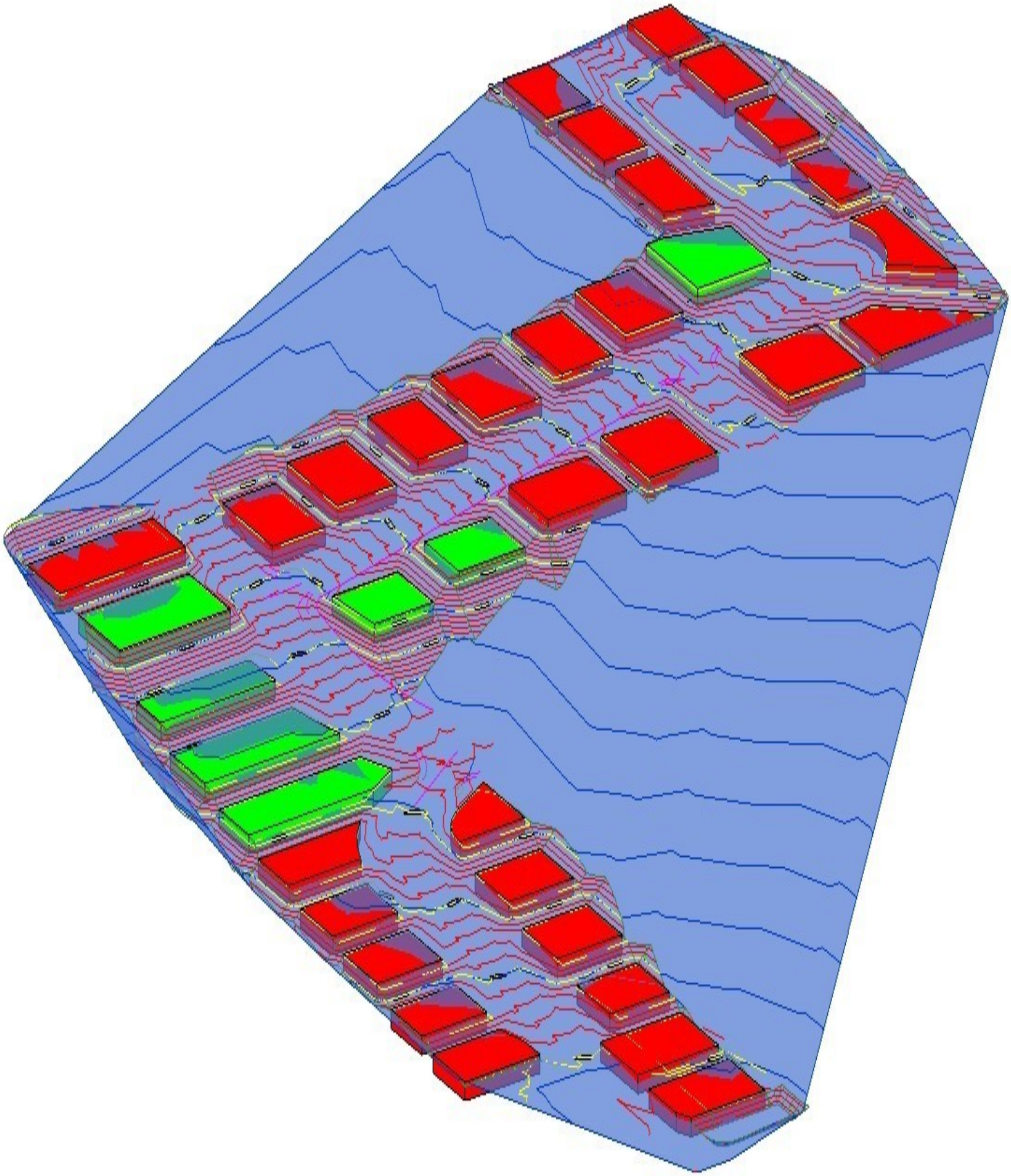
REVISIONS			
NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
80 WEST 1400 SOUTH, UNIT 5
ST. GEORGE, UTAH 84770
(435) 628-4700 FAX (435) 628-4725

SLOPE DISPLAY MAP
MOUNTAIN VIEW ESTATES
FOR
RAC INC.
LOCATED IN THE NE 1/4, SEC 4, T42NS R13W S.L.B.&M.
HURRICANE CITY, UTAH

PROFESSIONAL STRUCTURAL ENGINEER
MARC L BROWN
10223
01-03-22
STATE OF UTAH

CHECKED BY : MB
DRAWN BY : TF
DATE : JANUARY 2022
JOB NO. : 21-138
SCALE : 1"=60'
SHEET NO. : C-G1



HURRICANE CITY
UTAH

Water Department
Ken Richins, Superintendent

November 3, 2021

To Whom It May Concern:

A will serve letter has been requested for Mountain View Estates located at approximately 1300 W 650 S in Hurricane, Utah.

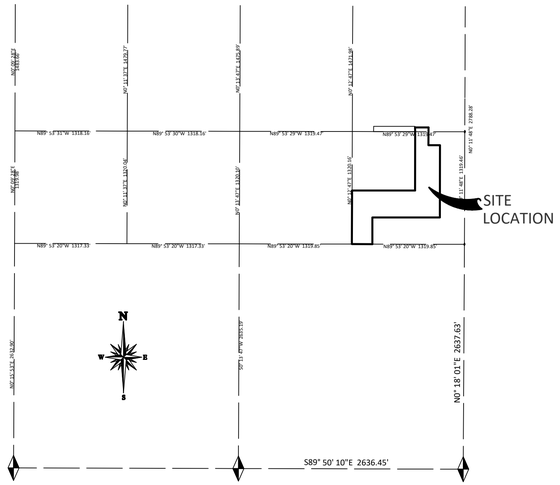
Yes, we do have culinary water in the area of 1300 W 650 S in Hurricane, Utah.

A hydraulic water study may be required to ensure the waterline will deliver the required fire flows. A looped water system may be required

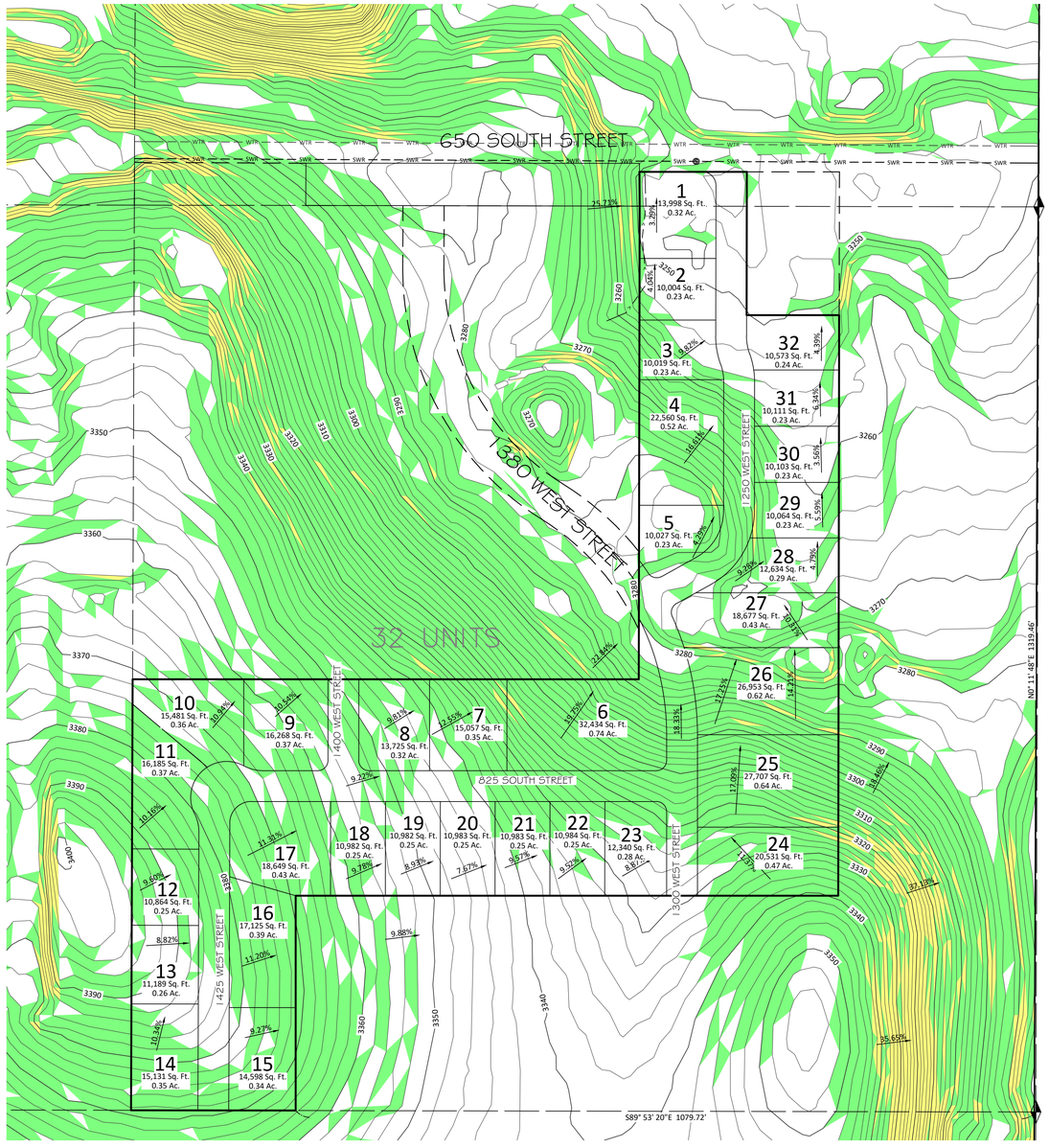
Sincerely,

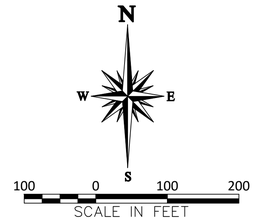
Hurricane City Water – Dallan Wadsworth

646 West 600 North • Hurricane, UT • 84737
Phone: (435) 635-9442 • Fax: (435) 635-2616
WEB: www.cityofhurricane.com



PROJECT LOCATION
SEC. 4 T42S R13W,
SLB&M
NOT TO SCALE





LEGEND

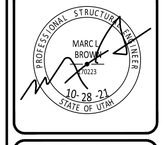
- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 1896 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR

Slopes Table			
Number	Minimum Slope	Maximum Slope	Color
1	0.00%	10.00%	
2	10.00%	30.00%	
3	30.00%	Vertical	

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
163 WEST 1600 SOUTH, UNIT 5
ST. GEORGE, UTAH 84770
(435) 628-4700 FAX (435) 628-4725

SLOPE DISPLAY MAP
MOUNTAIN VIEW ESTATES
FOR
RAC INC.
LOCATED IN THE NE 1/4, SEC 4, T42NS R13W S.L.B.&M.
HURRICANE CITY, UTAH



CHECKED BY : MB
DRAWN BY : SWB
DATE : SEPTEMBER 2021
JOB NO. : 20-54

SCALE :
1"=100'

SHEET NO. :
C-G1

BROWN CONSULTING ENGINEERS
CIVIL ENGINEERING•LAND SURVEYING•LAND PLANNING
163 WEST 1600 SOUTH UNIT #5•ST. GEORGE UTAH, 84770
PHONE 435-628-4700•FAX 435-628-4725•WWW.BROWNCIVIL.COM

October 27, 2021

City of Hurricane
147 N 570 W
Hurricane, UT 84737
ATTN: Arthur LeBaron

RE: Mountain View Estates Drainage Study

Brown Consulting Engineers has completed a drainage study analysis for the Mountain View Estates Subdivision using the HEC-HMS software in order to determine the existing and developed flows created by this development.

Existing Conditions

The existing site consists of an undeveloped parcel on 650 South St. The site generally slopes from west to east with an average slope of 10%. The ground cover consists of sage brush and desert shrub and a hydrologic soil group of B has been assumed for this site.

Proposed Construction

The developed site will be landscaped with homes, driveway, and sidewalk areas The building pads will be graded such that all runoff will be directed away from any structures via surface sheet flow and curb and gutter into a detention basin. The total disturbed area for the site will be 14.19 acres.

Runoff Computations & Methods

Rainfall was simulated using a the 10-yr 3-hr and the 100-yr 3-hr modified type II distribution with point rainfall depths of 1.10 inches and 1.89 inches respectively as specified in the City of Hurricane drainage manual. The SCS curve number method was used for all infiltration calculations and the SCS TR-55 lag method was used for all time of concentration calculations. The SCS unit hydrograph method was used for all runoff calculations.

Table 1 – Sub basin Summary

	Area (ac)	CN	Tc (hrs)
Pre-Development	14.19	72	0.237
Post-Development	14.19	77	0.236

Onsite Drainage Results

The Soil Conservation Service (SCS) method and the computer program HEC-HMS was used to model the storm water runoff.

$$Q_P = C\frac{A}{T_P}$$

Where:
Q_P = Peak runoff
C = Conversion constant (2.08 SI and 484 in foot-pound system)
A = Watershed area
T_P = Time of peak, calculated as follows:

$$T_P = \frac{\Delta t}{2} + t_{lag}$$

Where:
T_p = time of peak discharge
Δt = the excess precipitation duration (which is also the computational interval in the simulation)
t_{lag} = the basin lag time, defined as the difference between the center of mass of rainfall excess and the peak of the unit hydrograph.

As the site develops the post-development flows will increase as shown in Table 2 below.

Table 2 – Peak Runoff Summary

	$Q_{10\text{-yr }3\text{-hr}}$ (cfs)	$Q_{100\text{-yr }3\text{-hr}}$ (cfs)
Pre-Development	0.43	7.02
Post-Development	1.61	11.99

Detention Basin Design

Since the developed flows exceed existing flows a detention basin is required to reduce the peak runoff from the site. Flows from the site shall not exceed 0.20 cfs per acre, and the developed site area is 14.19 acres, therefore the detention basin outflow was calculated as 2.13 cfs and a detention basin volume of 14,201 cu. ft. is required. An outlet structure with an orifice plate will be constructed within the detention basin to reduce the flows to 0.20 cfs per acre. The table below summarizes the detention basin results.

Table 3 – Detention Basin Results

	$Q_{100\text{-yr }3\text{-hr}}$ inlet (cfs)	$Q_{100\text{-yr }3\text{-hr}}$ outlet (cfs)	Volume (cu. ft.)	Water height (ft)
Detention Basin #1	11.99	2.13	14,201	1.5

Details of the grading and the detention basin are presented in the construction drawings for Mountain View Estates.

Sincerely,

Steve Kamlowsky, PE
Brown Consulting Engineers



DETENTION BASIN CALCULATIONS

PROJECT: MOCCASIN FLATS LOT 8 **Date:** 3/8/2021

BASIN NAME: DET-1 **By:** SK

Stage-Discharge Calculations

$Q = CA\sqrt{2gH}$

C = 0.62

g = 32.2

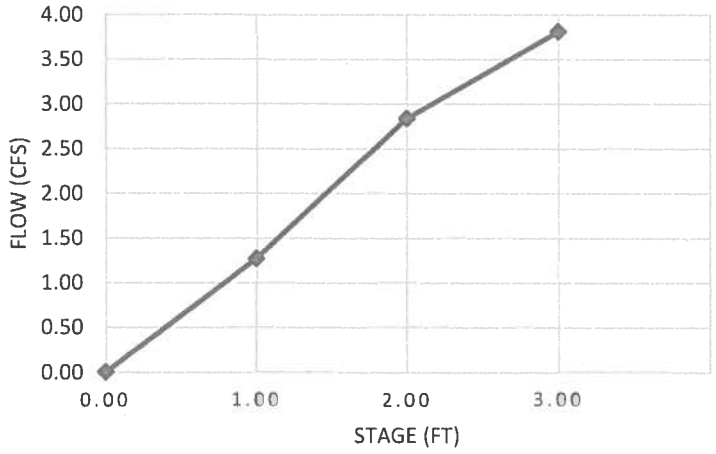
Dia. Pipe = 18 in

% restricted 71.1%

Stage-Discharge Table

Stage (Z)	Depth to center (H)	Area (A)	Flow (Q)
0.00	0.00	0.000	0.00
1.00	0.25	0.510	1.27
2.00	1.25	0.510	2.84
3.00	2.25	0.510	3.81

STAGE-DISCHARGE CURVE



Orifice Plate Calculations

$$h = R\left(1 - \cos\frac{\theta}{2}\right) \qquad A = \frac{R^2}{2}(\theta - \sin\theta)$$

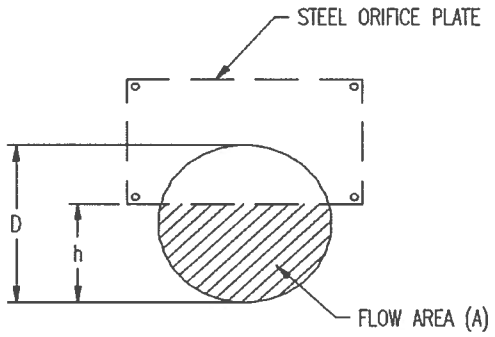
$$\theta = 2\cos^{-1}\left(1 - \frac{h}{R}\right)$$

D = 18 in

A = 0.510 ft^2

Θ = 2.451 rad. = 140.41 deg.

h = 0.496 ft



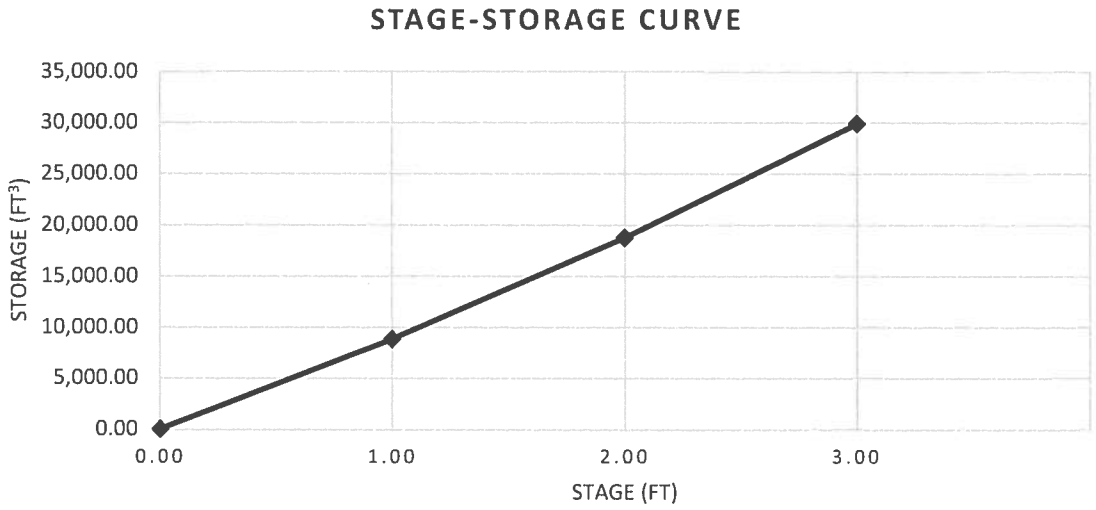
DETENTION BASIN CALCULATIONS

Stage-Storage Calculations

$$V = \sum L \frac{A_1 + A_2}{2}$$

Stage-Storage Table

Stage (ft)	Contour Area (ft^2)	Contour Area (ac)	Incr. Volume (ft^3)	Total Volume (ft^3)	Total Volume (ac-ft)
0.00	8241.50	0.18920	0.00	0.00	0.000
1.00	9351.46	0.21468	8,796.48	8,796.48	0.202
2.00	10533.62	0.24182	9,942.54	18,739.02	0.430
3.00	11781.98	0.27048	11,157.80	29,896.82	0.686



PRELIMINARY PLAT APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $150.00

For Office Use Only:
File No. _____
Receipt No. _____

Name: Virginia M Ashton Trust **Telephone:** 435-635-4425

Address: 2654 Red Cliffs Drive #148 ST G, UT 84790 **Fax No.** _____

Email: _____ **Agent Email:** RACINC19@gmail.com

Agent (If Applicable): Craig Engel RAC, INC. **Telephone:** 435-229-7360

Address/Location of Subject Property: 1300 West, 650 South

Tax ID of Subject Property: H-3-2-4-124 **Zone District:** R-1-10

Proposed Use: (Describe, use extra sheet if necessary. Include total number of lots)

35 LOTS - 10,000 s.f. Min. Residential Subdivision

Submittal Requirements: The preliminary plat application shall provide the following:

✓ 1. Description: In a title block located in the lower right-hand corner of the sheet the following is required:
- ✓ a. The proposed name of the subdivision.
- ✓ b. The location of the subdivision, including the address and section, township and range.
- ✓ c. The names and addresses of the owner or subdivider, if other than the owner.
- ✓ d. Date of preparation, and north point.
- ✓ e. Scale shall be of sufficient size to adequately describe in legible form, all required conditions of Chapter 39, City Subdivision regulations.

_____ 2. Existing Conditions: The preliminary plat shall show:
- ✓ a. The location of the nearest monument.
- ✓ b. The boundary of the proposed subdivision and the acreage included.
- ✓ c. All property under the control of the subdivider, even though only a portion is being subdivided. (Where the plat submitted covers only a part of the subdivider's tract, a sketch of the prospective street system of the unplatted parts of the subdivider's land shall be submitted, and the street system of the part submitted shall be considered in light of existing Master Street Plan or other Commission studies.)
- ✓ d. The location, width and names/numbers of all existing streets within two hundred (200) feet of the subdivision and of all prior streets or other public ways, utility rights of way, parks and other public open spaces, within and adjacent to the tract.
- ✓ e. The location of all wells and springs or seeps, proposed, active and abandoned, and of all reservoirs or ponds within the tract and at a distance of at least one hundred feet (100') beyond the tract boundaries.
- ✓ f. Existing sewers, water mains, culverts or other underground facilities within the tract, indicating the pipe sizes, grades, manholes and the exact locations.

✓ g. Existing Hurricane Canal Company facilities; other ditches, canals, natural drainage channels and open waterways and any proposed realignments.

✓ h. Contours at vertical intervals not greater than five (5) feet.

✓ i. Identification of potential geotechnical constraints on the project site (such as expansive rock and soil, collapsible soil, shallow bedrock and caliche, gypsiferous rock and soil, potentially unstable rock or soil units including fault lines, shallow groundwater, and windblown sand) and recommendations for their mitigation.

N/A j. Information on whether property is located in desert tortoise take area

✓ 3. Proposed Plan: The subdivision plans shall show:

✓ a. The layout of streets, showing location, widths, and other dimensions of proposed streets, crosswalks, alleys and easements.

✓ b. The layout, numbers and typical dimensions of lots.

✓ c. Parcels of land intended to be dedicated or temporarily reserved for public use or set aside for use of property owners in the subdivision.

✓ d. Easements for water, sewers, drainage, utilities, lines and other purposes.

✓ e. Typical street cross sections and street grades where required by the Planning Commission. (All street grades over 5% should be noted on the preliminary plat)

✓ f. A tentative plan or method by which the subdivider proposes to handle the storm water drainage for the subdivision.

✓ g. Approximate radius of all center line curves on highways or streets.

✓ h. Each lot shall abut a street shown on the subdivision plat or on an existing publicly-dedicated street. (Double frontage or flag lots shall be prohibited except where conditions make other design undesirable)

✓ i. In general, all remnants of lots below minimum size left over after subdividing of a larger tract must be added to adjacent lots, rather than allow to remain as unusable parcels.

N/A j. Where necessary, copies of any agreements with adjacent property owners relevant to the proposed subdivision shall be presented to the Planning Commission.

N/A k. A letter from both the local sanitary sewer provider and culinary water provider indicating availability of service.

N/A l. Will this subdivision be phased? If yes show possible phasing lines.

✓ m. A tentative plan or method for providing non-discriminatory access to the subdivision for purposes of placement of communications infrastructure, and for purposes of placement of utility infrastructure.

✓ 4. Required copies of plans:

____ a. Three copies of all full scale drawings

____ b. One copy of each drawing on a 11 x 17 inch sheets. (8 ½ x 11 is acceptable if the project is small and the plans are readable at that size).

5. Warranty deed or preliminary title report or other document (see attached Affidavit) showing evidence that the applicant has control of the property

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. A deadline missed due to an incomplete application, could result in a month's delay. Planning Commission meetings are held on the second Thursday and fourth Wednesday of each month at 6:00 p.m. The deadline to submit an application to be placed on an agenda is no later than 12:00 noon 10 full business days before the Planning Commission meeting at which you plan for your application to be heard.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete: _____ Completion determination made by: _____

2014

PURPOSE

The preliminary plat application is the first step in land development process in those instances where land is divided for eventual sale. The process is established to insure that all proposed divisions of land conform to the City General Plan and to adopted development standards of the Land Use Ordinance.

WHEN REQUIRED

The preliminary plat is required any time land is to be divided, re-subdivided or proposed to be divided into two (2) or more lots, parcels, sites, units, plots or other division of land for the purpose, whether immediate or future, for offer, sale, lease or development either on installment plan or upon any and all other plans, terms and conditions. It is not required on agricultural divisions where the agricultural parcel is divided to be combined with another agricultural parcel, nor is it required when two un-subdivided properties are merged, or where the boundary between two un-subdivided properties are adjusted.

The preliminary plat must be approved before a final plat can be processed and recorded.

Subdivision approval process:

- Determine current zoning for property.
- If zoning fits desired subdivision, meet with Planning staff to discussed the proposed project.
- Obtain a preliminary plat application form and complete the application and have a plat prepared by an engineer to meet the requirements on the preliminary plat application.
- Submit completed application, preliminary plat, and required $150 fee to Planning Department before noon on the Wednesday two weeks before desired Planning Commission meeting. (see submittal dates sheet)
- Appear at the scheduled Planning Commission meeting to discuss preliminary plat, hear comments, answer questions, and receive recommendation of approval or disapproval from Planning Commission.
- Appear at the next scheduled City Council meeting that occurs after the Planning Commission meeting at which a recommendation was received. Hear City Council comments, answer questions, and receive City Council decision. City Council can approve the plat with conditions, recommend changes and send it back to the Planning Commission, or deny the plat.

If the preliminary plat is approved, have construction drawings for utilities and streets prepared by an engineer according to Hurricane City standards. Construction drawings must be approved by both the Hurricane Joint Utilities Committee and the Ash Creek Special Service District. Approval means changes are made and all required signatures are obtained.

Once the preliminary plat is approved by the City Council, the applicant has one year after receiving approval of the preliminary plat to submit the final plat to the Planning Commission for action. The Planning Commission may authorize a one-year time extension, provided the extension request is made before the one year time limit is reached. The Planning Commission will review and make recommendation to the City Council on the final plat when submitted. The City Council will typically review the Planning Commission recommendation within 1-2 weeks after the Commission action on the final plat.

APPEALS

The Planning Commission makes a recommendation to the City Council, so there is no appeal. The City Council's action on a preliminary plat is final unless appealed to the appropriate court.

AFFIDAVIT
PROPERTY OWNER

STATE OF UTAH)
:ss
COUNTY OF Washington

I (we), Virginia M Ashton Trust, being duly sworn, depose and say that I (we) am (are) the owner(s) of the property identified in the attached application and that the statements herein contained and the information provided identified in the attached plans and other exhibits are in all respects true and correct to the best of my (our) knowledge. I (we) also acknowledge that I have received written instructions regarding the process for which I am applying and the Hurricane City Planning staff have indicated they are available to assist me in making this application.

Virginia M Ashton Trust
(Property Owner)

Virginia M. Ashton
(Property Owner)

Subscribed and sworn to me this 4th day of October 2021.

(Notary Public)

ANGEL ANTUNEZ
Notary Public - State of Utah
Comm. No. 718397
My Commission Expires on
May 25, 2025

Residing in: MACU

My Commission Expires: 5/25/2025

Agent Authorization

I (we), Virginia M Ashton Trust, the owner(s) of the real property described in the attached application, do authorize as my (our) agent(s) ** ** to represent me (us) regarding the attached application and to appear on my (our) behalf before any administrative or legislative body in the City considering this application and to act in all respects as our agent in matters pertaining to the attached application. ** CRAIG ENGEL, BROWN CONSULTING ENG

Virginia M Ashton Trust
(Property Owner)

Virginia M. Ashton
(Property Owner)

Subscribed and sworn to me this 4th day of October 2021.

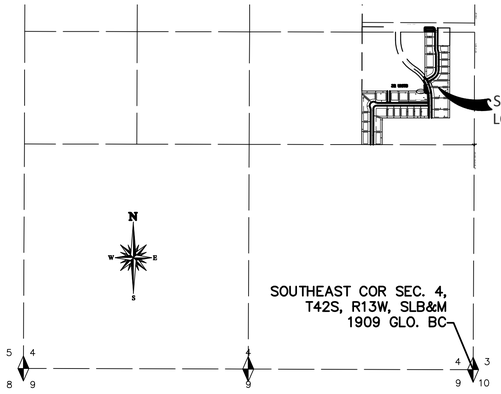
(Notary Public)

ANGEL ANTUNEZ
Notary Public - State of Utah
Comm. No. 718397
My Commission Expires on
May 25, 2025

Residing in: MACU

My Commission Expires: 5/25/2025

4054



PROJECT LOCATION
SEC. 4 T42S R13W,
SLB&M

NOT TO SCALE

CONSTRUCTION NOTES

1. GRADE SITE TO ELEVATIONS AND CONTOURS SHOWN ON PLAN.
2. NEW STORM DRAIN CATCH BASIN
3. NEW 12"Ø HDPE STORM DRAIN PIPE
4. STANDARD 8' CROSS GUTTER-PER HURRICANE STD DETAIL #CG100
5. PROPOSED STORM WATER DETENTION AREA.
6. CURB OUTLET STRUCTURE
10. NEW 2 1/2" ASPHALT OVER 6" TYPE II AGGREGATE BASE
11. CONSTRUCT NEW 5' SIDEWALK PER HURRICANE CITY STD. DWG #120

GRADING PLAN NOTES:

1. ALL EXCAVATIONS AND GRADING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF HURRICANE, SPECIFICALLY THE "UTAH UNIFORM STANDARD ACT RULES", APPENDIX "K", AND THE SPECIFICATIONS AND REQUIREMENTS INCLUDED IN THE GEOTECHNICAL INVESTIGATION PREPARED BY ???

2. THE CONTRACTOR SHALL PROVIDE SUITABLE EQUIPMENT TO CONTROL DUST AND AIR POLLUTION CAUSED BY CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL ALSO PROVIDE SUITABLE MUD AND DIRT CONTAINMENT TO MAINTAIN THE WORK SITE, ACCESS ROADWAYS AND ADJACENT PROPERTIES IN A CLEAN CONDITION.

3. A DRAINAGE CONTROL PLAN AND REPORT HAS BEEN PREPARED FOR THIS DEVELOPMENT BY BROWN CONSULTING ENGINEERS.

4. THE OWNER SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE DRAINAGE CHANNEL AND THE ONSITE DETENTION BASINS.

5. NO GRADING BEYOND PROPERTY LINE.

6. CONTRACTOR SHALL VERIFY ELEVATION IN THE FIELD.

7. ADD 3100.00 TO ALL ABBREVIATED ELEVATIONS.

CONTACT INFORMATION

CRAIG ENGEL
1267 NORTH 1390 WEST
ST. GEORGE, UT 84770
PHONE (435)229-7360

811 Know what's below. Call before you dig.

NOTICE!

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION, PROTECTION, AND RESTORATION OF ALL BURIED OR ABOVE GROUND UTILITIES, SHOWN OR NOT SHOWN ON THE PLANS.

NOTE: ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT HURRICANE CITY STANDARDS

EARTHWORK

ESTIMATED EARTHWORK VOLUMES
PHASE 1 BUILDING SITE:
CUT = 30,466 c.y.
FILL = 76,302 c.y.
NET = 45,836 c.y. (FILL)

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING ALL EARTH WORK VOLUMES. VOLUMES SHOWN ARE FOR ESTIMATING PURPOSES ONLY. THEY REPRESENT ESTIMATED VOLUMES BETWEEN EXISTING AND FINISHED SURFACES.

ALL GRADING ACTIVITY SHALL COMPLY WITH APPENDIX "K" SECTION 33 GUIDELINES.

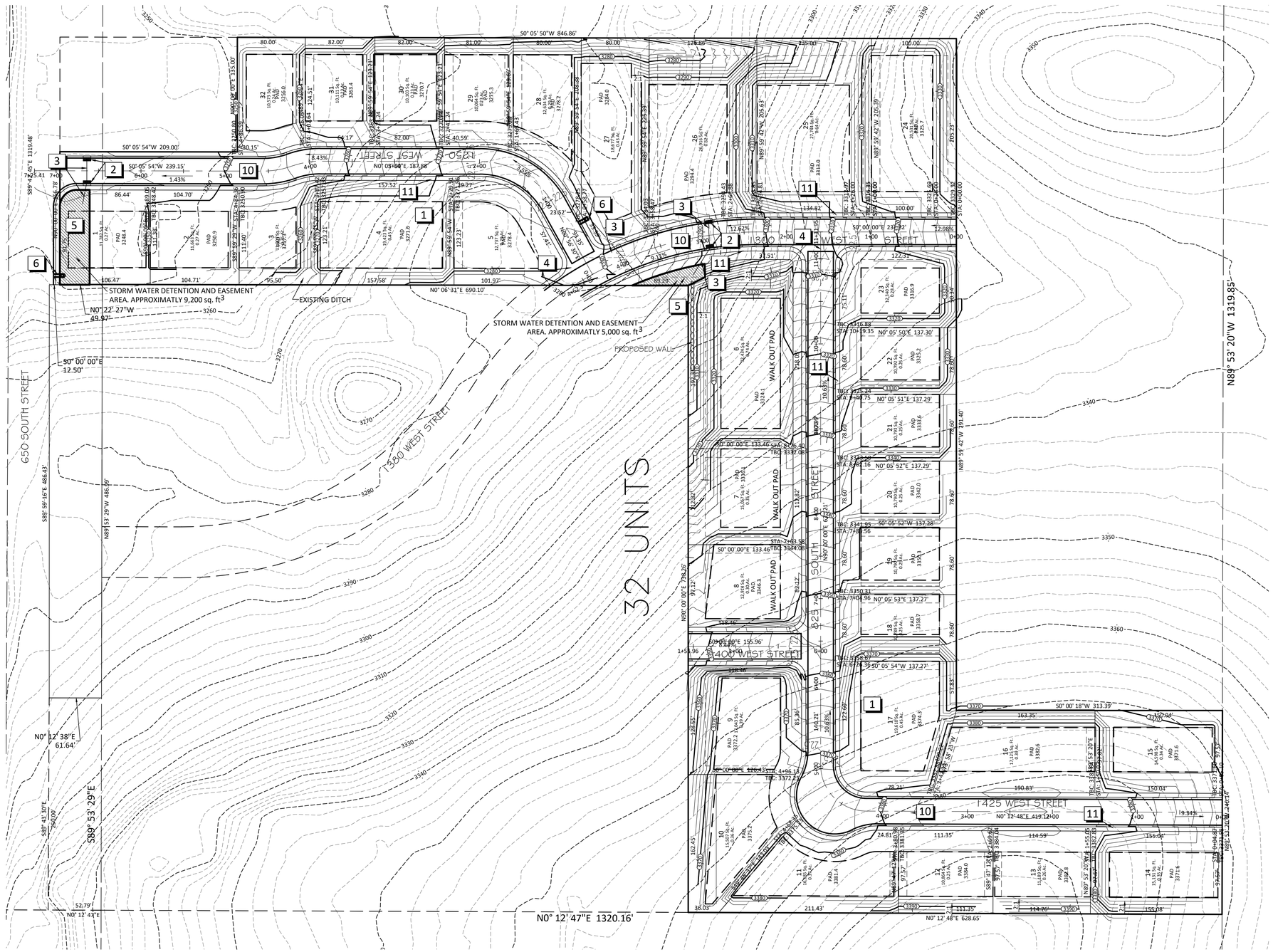
NOTICE OF INTENT (N.O.I.) TO BE SUBMITTED PRIOR TO OBTAINING BUILDING PERMIT.

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 1896 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 3350 PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- PROPOSED PAD
- TBC: 3278.38 STA: 4+56.53 PROPOSED TBC STATION 7 ELEVATION
- PROPOSED WALL

N E S W

60 0 60 120
SCALE IN FEET



BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
163 WEST 1600 SOUTH, UNIT 5
ST. GEORGE, UTAH 84770
(435) 628-4700 FAX (435) 628-4725

REVISIONS

NO.	DESCRIPTION	DATE	BY

GRADING PLAN
MOUNTAIN VIEW ESTATES
FOR
RAC INC.
LOCATED IN THE NE 1/4 SEC 4, T42NS R13W S.L.B.&M.
HURRICANE CITY, UTAH

PROFESSIONAL STRUCTURAL ENGINEER
MARC L. BROWN
9223
11-2-21
STATE OF UTAH

CHECKED BY : MB
DRAWN BY : SWB
DATE : SEPTEMBER 2021
JOB NO. : 21-138
SCALE : 1"=60'
SHEET NO. : C-G2

From: RAC INC. <racinc19@gmail.com>
Sent: Tuesday, November 30, 2021 6:51 PM
To: Stephen Nelson
Cc: Marc Brown
Subject: Permit # 56 JUC comments and preliminary Plat

Hello Stephen,

I hope your holiday was restful.

In response to planning and JUC comments. We are addressing all and revising the plat. The document will not be ready for the December 2 City Council review. The items we will address in the amended plat are.

All Master-planned roadways will be 65' in width
No transportation grades will exceed 10%
Water and Gas will be looped into hillside estates. I have confirmed with Chris Wyler.
Hillside Estates will provide the secondary needed fire access to exceed 30 Lots.
Chris is suggesting he will be starting his project in January. I hope to start mine in February. We are using the same excavation company.
A drainage report was submitted with the application.

The master-planned road to the south was brought up by planning. I have attempted to contact the owner with no success. Not sure how to address this. Fire asked for a turnaround on the south end. I was hoping to put in a temp on the adjacent property. this is the same contact for the road. I will keep trying.

I need to work our the 60' strip on 650. The piece adjacent to Chris's property I will negotiate with Chris. The piece adjacent to the city can either be sold to the city or the city can sell me their piece for development.

Please let me know of any other concerns.

Craig Engel
RAC Inc.
1267 N 1390 W.
St. George UT 84770
435-229-7360

GEOTECHNICAL INVESTIGATION REPORT

Prepared for:

RAC Inc.
Attn.: Craig Engel
1627 North 1390 West
St. George, Utah 84770

November 2, 2020

Parcel H-3-2-4-124



Prepared by:

795 East Factory Drive
St. George, UT 84790

Landmark Project No: 210848

November 2, 2021

RAC Inc.
Attn.: Craig Engel
1627 North 1390 West
St. George, Utah 84770

Subject: Geotechnical Investigation Report
Parcel H-3-2-4-124
Hurricane, Utah
Landmark Project No.: 210848

Craig Engel,

As requested, we have completed our Geotechnical Investigation for the above noted project. Our geotechnical recommendations, along with our field and laboratory data are presented in this report.

Our field investigation consisted of excavating twelve (12) test pits to depths between 1.0 and 8.0 feet below the existing ground surface (bgs) throughout the area of the proposed development. Site grading recommendations are detailed in Section 5.0 of this report. Foundation recommendations are found in Section 6.0 of this report.

Landmark has great interest in providing materials testing and special inspection services during the construction phase of this project. If you advise us of the appropriate time to discuss these engineering services, we will be pleased to meet with you at your convenience.

Please feel free to contact our office at (435) 986-0566 if you have any questions.

Sincerely,
LANDMARK TESTING AND ENGINEERING

Steven Wells, P.E.
Geotechnical Manager

TABLE OF CONTENTS

GEOTECHNICAL INVESTIGATION REPORT
PARCEL H-3-2-4-124
HURRICANE, UTAH

1.0 INTRODUCTION 1
2.0 PROPOSED CONSTRUCTION 1
3.0 SITE SETTING 1
3.1 SURFACE CONDITIONS 1
3.2 GEOLOGIC SETTING 1
3.3 SEISMICITY 2
3.4 GEOLOGIC HAZARDS 2
4.0 INVESTIGATION 3
4.1 FIELD INVESTIGATION 3
4.2 LABORATORY TESTING 4
4.3 CONCLUSIONS 4
5.0 SITE GRADING AND EARTHWORK 4
5.1 GENERAL GRADING 4
5.2 ROADWAY AND UTILITY EXCAVATION 5
5.3 FILL PLACEMENT AND COMPACTION 5
5.4 LIGHTLY LOADED ELEMENTS 6
5.5 CUT AND FILL SLOPES 7
6.0 FOUNDATION & CONSTRUCTION CONSIDERATIONS 7
7.0 FLOOR SLABS 7
8.0 LATERAL EARTH PRESSURES 8
9.0 MOISTURE CONTROL 9
10.0 PAVEMENT DESIGN RECOMMENDATIONS 10
11.0 SOIL CORROSIVITY 10
12.0 FOUNDATION REVIEW AND TESTING 10
13.0 LIMITATIONS 11

TABLE OF FIGURES AND APPENDICES

GEOTECHNICAL INVESTIGATION REPORT
PARCEL H-3-2-4-124
HURRICANE, UTAH

FIGURE 1: **VICINITY MAP**

FIGURE 2: **SITE MAP**

FIGURES 3 - 8: **TEST PIT LOGS**

FIGURE 9: **UNIFIED SOIL CLASSIFICATION SYSTEM**

1.0 INTRODUCTION

This report presents the results of Landmark Testing & Engineering's geotechnical investigation for a single-family residential development on Parcel H-3-2-4-124 in Hurricane, Utah. Figure 1 is a Vicinity Map showing the project location relative to surrounding features. Figure 2 is a Site Map showing the site and the approximate locations of the test pits completed for this investigation.

This investigation was completed to assist in developing opinions and recommendations concerning site earthwork and foundation design.

2.0 PROPOSED CONSTRUCTION

We understand that construction will consist of a single-family residential development with 35 lots. We anticipate residences will be wood-framed, slab-on-grade construction supported on conventional spread footings. We understand that the residences will be both one- and two stories with anticipated loads between 1,200 and 2,500 pounds per lineal foot. We anticipated a new public street with asphalt pavement, and concrete curb, gutter and sidewalk are also planned for the residential development.

A traffic index of 5.5 is assumed for the residential street. Any significant changes to the anticipated development should be reviewed by Landmark to evaluate the continued applicability of the recommendations contained in this report.

3.0 SITE SETTING

3.1 SURFACE CONDITIONS

The project site is 14.19-acre parcel located south of 650 South Street. The site generally slopes up to the south, southwest towards a lava basalt Ridge. The project site spans to the top of the basalt lava ridge near the southwest corner of the parcel. The site is covered with basalt cobbles and boulders with a moderate to dense amount of vegetation consisting of tall field grasses. There are single family residences located near the northwest corner and southwest end of the parcel. The other surrounding parcels are vacant.

3.2 GEOLOGIC SETTING

According to the Utah Geological Survey, the site is mapped as being located on the Ivans Knoll lava flow (lower Pleistocene, Qbi) consisting of "Medium-gray, fine- to medium-grained basalt (Qbi) with small olivine phenocrysts." The age of the basalt lava flow is estimated to be around a million years old.[1] The material encountered during our site investigation was consistent with the geologic maps for the project area.

1 Interactive Geologic Map Portal, Retrieved October 29, 2021, from Utah Geological Survey, https://geology.utah.gov/apps/intgeomap.

3.3 SEISMICITY

Seismicity at the site was determined using the Structural Engineers Association (SEA), OSHPD Seismic Design Maps website. The following values are presented to assist with seismic design:

- Latitude = 37.165047 North, Longitude = 113.31196 West
- Site Class = C (Very Dense Soil Soft Rock) based on ASCE 7-16 (Table 20.3.1) as referenced in 2018 IBC 1613.3.2
- Risk Category II

Period (sec)	Sa (g)	Site Class
0.2	0.617 = S_S	B / C
1.0	0.203 = S_1	B / C
0.2	0.515 = S_{DS}	C
1.0	0.203 = SD_1	C

(2016 ASCE-7-16, SEA, Structural Engineers Association, https://seismicmaps.org/)

As per section 20.1 of ASCE 7-16, "The soil shall be classified in accordance with Table 20.3-1 and section 20.3 based on the upper 100 feet of the site profile." However, section 20.1 continues, "Where site specific data are not available to a depth of 100 feet, appropriate soil properties are permitted to be estimated by the registered design professional preparing the soil investigation report based on known geologic conditions." Based on the mapped geology, experience this area, and our findings during our field investigation, it is the opinion of Landmark Testing and Engineering that the soils on site classify as Site Class C.

3.4 GEOLOGIC HAZARDS

Fault Rupture

The Utah Geologic Survey maps the Volcano Mountain Fault running through the proposed development from north to south as shown on Figure 2. According to the UGS, the Volcano Mountain Fault is a Class A fault and is estimated to be less than 750,000 years old. [2] Faults less 10,000 years old (Quaternary period) are considered to be active. Due to the fault having an unknown actively level and because the exact location of the fault is unknown, the Surface-Fault-Rupture-Hazard Map for the St. George-Hurricane Metropolitan Area classifies the area as a Surface-fault-rupture hazard special-study area.[3] A fault study has been completed on similar faults approximately 3.0 miles south of the project, which did show to be older than 10,000 years old and therefore deemed not active. Additionally, a fault study is currently being conducted on a fault approximately 9.5 miles north of the site. The OSL testing is expected to be completed shorty to determine the age of the fault. Though the Volcano Mountain faults are similar to the faults

2 Interactive quaternary Fault and Fold Map, Retrieved January 7, 2020, from Utah Geological Survey, https://geology.utah.gov/apps/intgeomap.

3 Lund, W., Knudsen, T., Vice, G., Shaw, L., 2008, Surface-Fault Rupture Hazard Map for the St. George-Hurricane Metropolitan Area, Utah Geologic Survey Special Study 127, Plate 1

located to the north and south, we cannot be certain of the activity level or the exact location of the fault without further investigation.

Based on the current site plan, it appears that a sewer line will be placed across the mapped location of the fault. We request the opportunity to observe the sewer excavation in order to possibly locate the fault at that time and get an idea of the age of the fault.

Additionally, the Hurricane fault is located approximately 1.5 miles east of the site. This fault displaces late Quaternary sediments and is considered active.[4] Strong ground motion associated with movement along the Hurricane fault is possible however, the potential for surface fault rupture from this fault is considered low.

Landslide

The Utah Geologic Survey maps the northeast end of the property as an existing landslide. The mapped landslide is outlined in orange on Figure 2. Basalt bedrock, boulders and caliche were encountered between depths of 1 and 6 feet below the existing ground surface (bgs) within the location of the mapped landslide, indicating that the landslide to be shallow. Additionally, the landslide has a shallow slope of approximately 10 percent. Based on the shallow slope and shallow basalt and caliche encountered, we believe that the landslide susceptibility to be low.[5]

Liquefaction

Liquefaction is the sudden loss of shear strength in the soil due to the build-up of excess pore water pressure.[6] This can occur when the soil is subjected to intense shaking such as during a seismic event. The soils that are most susceptible to liquefaction are loose, saturated sandy soils with a low fines content (material passing the #200 sieve).

Due shallow bedrock encountered throughout the site and lack of groundwater we believe the liquefaction potential at the project site is low. A liquefaction study is beyond the scope of this report.

4.0 INVESTIGATION

4.1 FIELD INVESTIGATION

To investigate the subsurface soil conditions, twelve (12) test pits, designated as TP-1 through TP-12, were excavated throughout the project site as shown on Figure 2, Site Map. The test pits were excavated to depths between 1.0 and 8.0 feet bgs with a Kobelco SK45SRX mini excavator. All test pits encountered refusal on caliche or basalt.

4 Interactive quaternary Fault and Fold Map, Retrieved January 7, 2020, from Utah Geological Survey, https://geology.utah.gov/apps/intgeomap.

5 Lund, R. William, Knudsen, R. Tyler, Vice, S. Garrett, and Shaw, M. Lucas. Landslide-Hazard Map for the St. George-Hurricane Metropolitan Area, Utah Geologic Survey, 2008.

6 Coduto, Donald P. (1999), Geotechnical Engineering: Principles and Practices, Prentice Hall, Upper Saddle River, NJ

The soils encountered in our test pits consisted of silty sand with gravel and various amounts cobbles and boulders. Generally, the upper 1.0 to 2.0 feet of soil was loose and increased in density with depth. The silty sand was underlain by strongly cemented caliche and basalt. Majority of the test pits encountered refusal on the strongly cemented caliche or basalt between depths of 1 and 3 feet bgs. Caliche and basalt were encountered at deeper depths between 4.0 and 8.0 bgs in test pit TP-3 and in test pits TP-6 through TP-8. Groundwater was not encountered in our test pits at the time of our investigation.

A detailed description of the subsurface soils encountered in the test pits is included in the test pit logs on Figures 3 through 8. A key to the symbols and soil classifications used on the logs is presented on Figure 9.

4.2 LABORATORY TESTING

Soil samples from the test pits were taken to our St. George laboratory for testing. Tests performed on the samples included mechanical sieve analyses. Laboratory results are shown on the test pit logs on Figures 3 through 8.

Sieve analyses classified the on-site soils as silty sand. The moisture contents of the soils tested ranged from 1.4 to 3.9 percent.

4.3 CONCLUSIONS

The material encountered in our test pits during our investigation generally consisted of loose to medium dense silty sand underlain by strongly cemented caliche and basalt bedrock. Groundwater was not encountered in our test pits at the time of our investigation. Refusal was encountered on the caliche and basalt between depths of 1.0 and 8.0 feet bgs. The use of heavy equipment, a hoe ram or possibly blasting may be required in order to install utilities and make cuts for building pads and roads. Loose surficial soils should be removed from within all building pad locations.

General grading recommendations are provided in Section 5.0 and foundation recommendations are provided in Section 6.0.

5.0 SITE GRADING AND EARTHWORK

5.1 GENERAL GRADING

Prior to general site grading, the project site should be cleared and grubbed of all vegetation and other deleterious materials. We anticipate clearing and grubbing to extend approximately 6 inches below the existing grade.

Following clearing and grubbing, we recommend the on-site soils are over-excavated down to strongly cemented caliche or basalt bedrock. In areas were strongly cemented caliche or basalt bedrock is not encountered in the upper 3 feet, we recommend that the soils within the building pad area are over excavated a minimum of 2 feet below the existing grade or 1 foot below the bottom of footings, whichever is greater. Based on our investigation, strongly cemented caliche

and basalt bedrock was encountered at depths greater than 3 feet in areas were test pit TP-3 and test pits TP-6 through TP-8 were excavated.

Following over-excavation, we recommend that the caliche be proof rolled to a firm and unyielding surface. If soil is encountered in the bottom the excavation, we recommend the upper 8 inches of soil in the bottom of the excavation is scarified, moisture conditioned to with within 2 percent of the optimum moisture content and compacted to a minimum of 90 percent of the maximum dry density.

A geotechnical engineer should observe the bottom of the excavations to confirm the depth of excavation and suitability of the material for construction.

The on-site soils are suitable for use as structure fill, provided all vegetation, material greater than 6 inches and other deleterious materials are removed and is placed to structural fill standards as subsequently outlined.

5.2 ROADWAY AND UTILITY EXCAVATION

The test pits for this investigation were excavated with a Kobelco SK45SRX mini excavator. Refusal was encountered on strongly cemented caliche and basalt bedrock between depths of 1.0 to 8.0 feet bgs throughout the project site. The use of a hoe ram, larger equipment, blasting or a combination of these will be required where basalt is encountered at shallower depths where removal of bedrock is required.

The upper 8-inches of native soil within the proposed roadways should be scarified and recompacted to structural fill standards prior to the placement of any road base. All excavations and backfilling procedures for roadways and utility trenches should conform to the City of Hurricane Standards for Design and Construction. Imported soil may be required for pipe bedding.

5.3 FILL PLACEMENT AND COMPACTION

All fill to be placed for support of footings and slabs-on-grade, whether it is on-site or imported, should be considered structural fill. On-site soils are suitable for use as structural fill provided all deleterious materials and oversized material greater than 6-inches in size are removed prior to placement of structural fill. We recommend that the footings and floor slabs be established directly on bedrock, caliche, or a minimum of 1 foot of structurally placed, granular fill with a maximum particle size of 6-inches, overlying properly compacted native material. Foundations should not transition from bedrock or caliche to structural fill.

Imported, granular fill should be well-graded, non-expansive, and free of organics and all deleterious materials. Soils used for granular, imported, structural fill should meet the following specifications and preferably would classify as gravel.

GRADATION	PERCENT PASSING
6- inch	100
3-inch	80-100
No. 200 sieve	10-25
ATTERBERG LIMITS	
Liquid Limit	30 or less
Plasticity Index	9 or less

Material not meeting the above requirements may be suitable for use as structural fill at the discretion of the geotechnical engineer. Samples of structural fill should be submitted for testing prior to being transported to the site.

Any on-site soils used as structural fill or imported structural fill should be compacted to the following specifications.

FILL PLACEMENT AND COMPACTION	
Maximum lift thickness	8-inch (loose)
Minimum compaction	95% ASTM D-1557
Compacted Moisture Content	within 2% of optimum

Compaction of structural fill should be completed with equipment suitable for the conditions encountered in the field such that compaction requirements are met, including those areas that may be inaccessible to large rolling compactors. All structural fill should be evenly spread on a horizontal plane in eight-inch loose lifts. Each eight-inch lift of structural fill material placed at the site should be tested for compliance with the required relative compaction and moisture content prior to proceeding with additional lifts.

5.4 LIGHTLY LOADED ELEMENTS

Exterior concrete slabs on grade (sidewalks, curbs, gutters, and misc.) should be established on a minimum of 6-inches of structurally placed, granular soils overlying 8-inches of scarified and recompacted on-site soils. Sidewalks and curbs and gutters will need to be underlain by approved road base as per Hurricane City Standards.

Structural fill, including road base, should be compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM D-1557.

5.5 CUT AND FILL SLOPES

It is recommended that permanent cut or fill slopes in on-site or imported soils be maintained at a slope of one vertical to two horizontal (1V:2H) or flatter unless structurally retained. Basalt bedrock may be slopes to a 3 vertical to 1 horizontal (3V:1H).

Grading of both cut and fill slopes should be such that surface water is directed away from the slopes and not concentrated on slopes or in unprotected channels. Construction procedures should ensure adequate compaction of slope faces. All excavations should conform to OSHA standards.

6.0 FOUNDATION & CONSTRUCTION CONSIDERATIONS

The following recommendations apply to conventional strip and spot footings. Footings should be established on bedrock, caliche or a minimum of 1-foot of structurally placed granular fill as indicated in Section 5.0. Foundations should not transition from bedrock or caliche to fill. Foundation excavations should be visually observed and tested by qualified personnel prior to placement of reinforcing steel or concrete. Additional foundation recommendations are subsequently presented.

DESCRIPTION	VALUE
Foundation Type	Continuous or spread footings
Bearing Material	Bedrock, Caliche or 1 foot of structurally placed fill
Allowable Bearing Capacity	1,800 psf on structural fill. 3,500 psf on basalt bedrock
Minimum embedment depth below finished grade	12 inches (for frost and confinement)
Minimum footing width	12 inches (continuous) for single-story 18-inches for two stories 24-inches (isolated spread)
Total estimated settlement	1-inch
Total differential settlement	less than 3/4 inch

The allowable bearing capacity is based upon dead load plus long-term live load. A one-third increase in allowable bearing capacity for short duration loads such as wind or seismic loads is permitted with the alternative load combinations given in Section 1605.3.2 of the IBC.

7.0 FLOOR SLABS

It is recommended that concrete floor slabs be constructed on a pad that has been prepared as previously indicated. A minimum of 4-inches of relatively free-draining material should be used

beneath the slab in order to help distribute floor loads, break the rise of capillary water, and aid in the concrete curing process. Alternatively, 6 inches of road base may be used in place of the free draining-material.

Concrete slabs should be designed using rebar reinforcement and frequent crack control joints to help control normal shrinkage and stress cracking. Concrete placement and curing should meet ACI[7] requirements including following hot or cold weather placement recommendations, when appropriate. If a moisture-sensitive floor covering will be installed, we recommend that a vapor barrier be installed beneath the concrete slab. The moisture sensitivity of floor finishes, anticipated project conditions, and the potential effects of slab curling and cracking should be considered in determining if the barrier should be placed directly beneath the slab or beneath the free-draining gravel (see ACI 302.IR-96 for more information regarding vapor barrier location). If the vapor barrier is installed directly beneath the slab, measures should be taken to minimize excessive slab curl such as reduced joint spacing and use of a low shrinkage (low water-cement ratio) mix.

8.0 LATERAL EARTH PRESSURES

Lateral loads imposed on footings may be resisted by the development of passive earth pressures against the sides of footings and friction between the base of the footing and the supporting soils. Lateral earth pressure values are presented in the following table.

Case Evaluated	Soil Type	Value
Active	On-site Soils	34 psf/ft
		54 psf/ft (with seismic)
At-Rest	On-site Soils	53 psf/ft
Passive	On-site Soils	424 psf/ft
		364 psf/ft (with seismic)
Coefficient of friction tan(φ*0.6) where φ = 34°	On-site Soils	0.35

The lateral earth pressures presented do not include any safety factors except where the friction angle (φ) used to determine the coefficient of friction has been multiplied by 0.6 to account for smooth contact conditions. The pressures also assume horizontal backfill and that the backfill is in a drained condition with no build-up of hydrostatic pressure. The additional effects of sloping backfill, surcharge, structural loads and groundwater conditions should be included in calculating lateral earth pressures. Backfill should be placed in accordance with the requirements of structural fill except that backfill in landscape and areas that will not be subject to structural loadings may be reduced to 90% of the maximum dry density as determined by ASTM D-1557.

[7] American Concrete Institute

9.0 MOISTURE CONTROL

This soils report provides recommendations for site preparation and foundation design. Inadequate surface drainage or failure to control moisture will likely result in excessive differential movement and structural damage. The following moisture control measures are highly recommended:

1. The ground surface should be graded to drain surface water away from the building in all directions. A minimum grade of 5% in the first 10 feet is recommended. Impervious surfaces such as concrete walkways or asphalt pavement adjacent to the structure are effective in reducing the potential for water migration beneath foundations and slabs and should be considered in design. Impervious surfaces such as concrete within 10 feet of the building foundation should be sloped a minimum of 2% away from the building.

2. Roof runoff should be collected, and downspouts should be designed to discharge collected water a minimum of 10 feet beyond the building footprint.

3. Grass should not be placed within 10 feet of the foundation. Large areas of grass are discouraged. Grass, if planted, should have a minimum slope of 5% away from the foundation.

4. Xeriscape (landscaping that eliminates the need for supplemental irrigation of plants) is recommended within 10 feet of the building foundation. Bubblers, although more efficient than sprinkler irrigation, still have a significant potential of introducing excessive water into the ground and saturating foundation soils. Bubblers are not recommended in the 10 feet buffer zone area. As an alternative, sealed bottom planter boxes may be used.

5. Inadequate compaction of utility trench backfill provides a conduit for water migration. All utility trenches within the building footprint and extending 5 feet beyond the footprint should be backfilled with structural fill similar to that approved for the foundations. Backfill adjacent to structures should be compacted to at least 90 percent of the maximum dry density as determined by ASTM D-1557 and the minimum slope requirements should be followed. Backfill beneath structures and the garage slab should be compacted to at least 95% of the maximum dry density.

6. Grading should be such that surface water is directed away from all cut and fill slopes and collected only in channels protected against erosion. Water should not be allowed to pond on-site.

It should be emphasized that final grading and landscaping generally occurs after construction of the structures and observation of these features is outside of normal geotechnical inspection and observation. The owner/contractor is responsible to ensure that these surface drainage and moisture control recommendations are followed throughout the life of the structures.

10.0 PAVEMENT DESIGN RECOMMENDATIONS

Design of the pavement section is based on the procedures outlined in the 1993 Guidelines for Design of Pavement Structures by the American Association of State Highway and Transportation Officials (AASHTO). A traffic index of 5.5 was used for design for the residential streets based of City of Hurricane Standards for Design and Construction. Any roadway removed along 650 South during construction of the proposed development should be replaced to match the existing pavement thickness. Based on the soils encountered during our investigation a CBR value of 10 was used for design.

For pavement design, the following design parameters have been assumed:

< Pavement Design Life - 20 years
< Structural Layer Coefficients
- Asphalt = 0.42
- Type II = 0.12

Based on design parameters, the following pavement section is provided for the minor residential road.

Location	Asphalt Thickness (in.)	Base Course (in.)	Scarified and Compacted Subgrade (in.)
Residential Streets (T.I = 5.5)	2.5	6.0	8.0

Recompacted on-site soils should be compacted to a minimum of 95% of the maximum dry density as determined by ASTM D-1557 and base course soils should be compacted to a minimum of 95% of the maximum dry density (ASTM D-1557). Asphalt should be compacted to at least 96% of the Marshall maximum density. Asphaltic concrete and base should be approved prior to site delivery and tested during placement for conformance with project specifications.

11.0 SOIL CORROSIVITY

Soils in the area have shown to be moderately corrosive. Therefore, we recommend that all concrete in contact with or within 6 inches of native soils be designed in accordance with ACI 318, Section Table 19.3.2.2 for Exposure Category S1. Buried pipes should be plastic (PVC or HDPE) instead of metal, where possible.

12.0 FOUNDATION REVIEW AND TESTING

This report has been prepared to assist in project design and construction. Variations from the conditions portrayed in the exploratory investigations may occur which are sometimes sufficient to require modifications to the design. In order to incorporate recommendations provided into

actual field conditions and to confirm that the project specifications are implemented, we recommend that observation and testing be performed during construction to monitor over-excavation, grading, and preparation of soils upon which foundations elements or structural loads may be established.

13.0 LIMITATIONS

The exploratory data presented in this report were collected to provide geotechnical design recommendations for this project and subsurface site descriptions represent conditions observed at the time and at the locations explored. The investigation may not be indicative of subsurface conditions beyond the investigation locations and conditions may change with passage of time. If subsurface conditions are encountered that are significantly different than those reported herein, Landmark should be contacted immediately for the continued applicability of the recommendations. In the event changes to the project are made that differ from those presented in this report, Landmark should be made aware of the changes. Landmark will provide written verification that the recommendations and conclusions remain valid or that modifications are required.

This report has been prepared to assist in project design and construction. We respectfully request the opportunity to review the final design drawings and specifications in order to determine whether the assumptions and recommendations presented herein are applicable to the anticipated designs.

This report is not intended to be used as a bid document. Any information concerning the environmental conditions of the site is beyond the scope of this geotechnical study. This geotechnical report has been prepared to meet the specific needs of our client and may not be appropriate to satisfy the needs of other users.

Site conditions and standards of practice change, therefore, we should be notified to review and update the report and its recommendations if construction is not commenced within 3 years of the date it was issued.

LANDMARK TESTING & ENGINEERING

Reviewed by:

Chad Coffey, P.E.
Project Engineer

PROFESSIONAL ENGINEER
11 - 2 - 2021
No. 12440204
CHAD
COFFEY
STATE OF UTAH

John Anderson, P.E.
Project Engineer

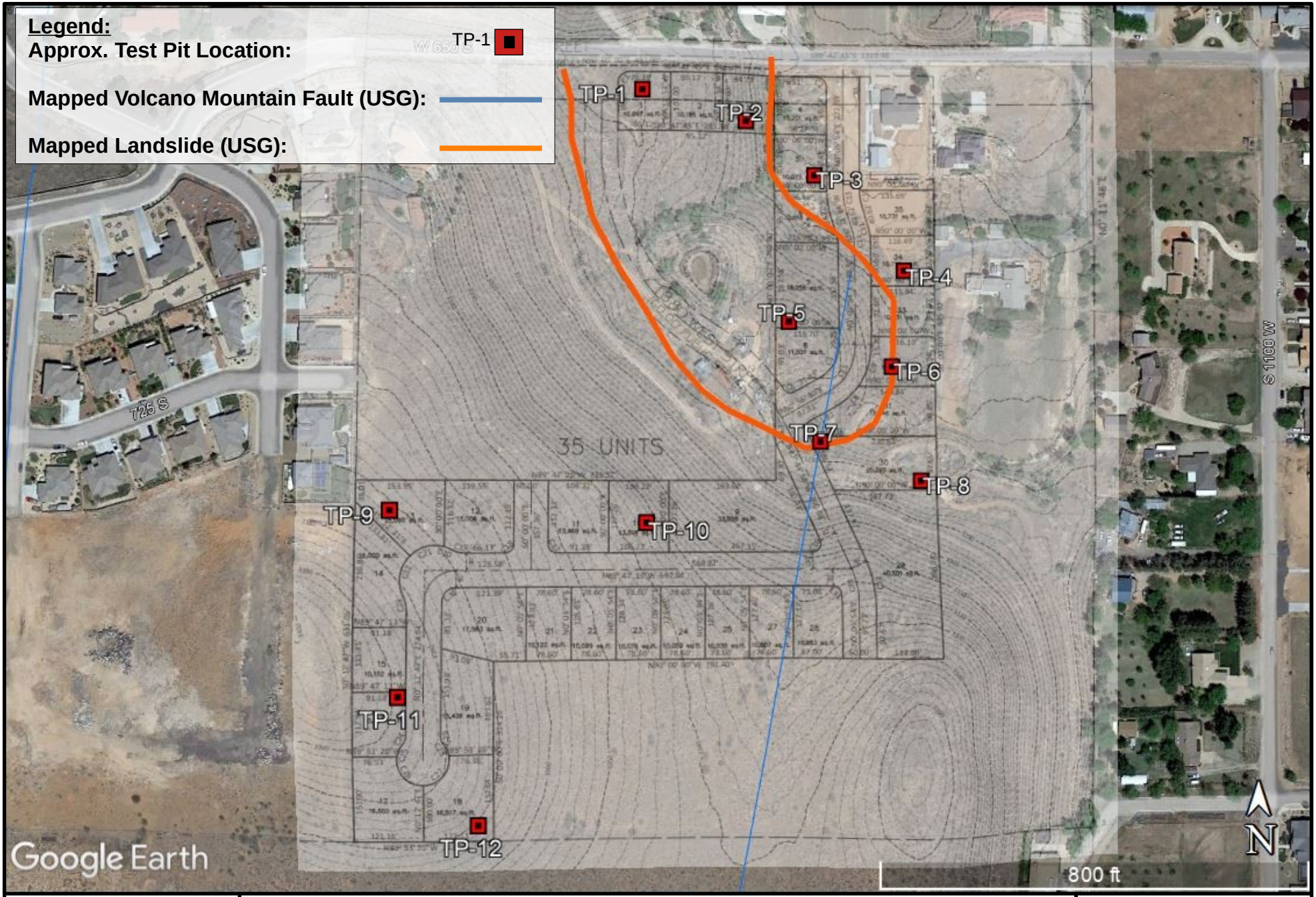


LANDMARK TESTING & ENGINEERING

Vicinity Map

Landmark Project No. 210848

Figure 1



LANDMARK TESTING & ENGINEERING

Site Map

Landmark Project No. 210848

Figure 2

TEST PIT NUMBER TP-1

DATE STARTED 10/4/21 **COMPLETED** 10/4/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0		1	SILTY SAND (SM), loose, dry, fine to coarse grained, abundant fine roots to 5", common <1mm pinholes to 1.25', weak caliche cementation, brown.		3.9			5	56	39	
		2	POORLY GRADED GRAVEL (GP), medium dense, dry, caliche cementation.								
			CALICHE, dense, dry, white.								
			Refusal at 2 feet on caliche. Bottom of test pit at 2.0 feet.								

TEST PIT NUMBER TP-2

DATE STARTED 10/4/21 **COMPLETED** 10/4/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0		1	SILTY SAND (SM), loose, dry, fine to coarse grained, common subangular to subround vesicular basalt boulders, abundant fine roots to 3", scattered <2mm pinholes to 1', brown.								
			Refusal at 1.0 foot on basalt boulders. Bottom of test pit at 1.0 feet.								

LANDMARK TESTING & ENGINEERING
Landmark Testing and Engineering
795 Factory Drive
84790
Telephone: 435-986-0566
Fax: 435-986-0568

PROJECT NAME Parcel H-3-2-4-124
CLIENT RAC Inc.
PROJECT NUMBER 210848
PROJECT LOCATION Hurricane, UT

Figure No. 3

LANDMARK 2 TEST PITS - LANDMARK NEW.GDT - 11/2/21 13:36 - P:\PROJECTS\21 PROJECTS\210848\GEOTECH\PARCEL H-3-2-4-124.GPJ

TEST PIT NUMBER TP-3

DATE STARTED 10/4/21 **COMPLETED** 10/4/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0			SILTY SAND (SM), loose to medium dense, dry, fine to coarse grained, rare fine roots to 6", brown.								
5		1									
		2									

Refusal at 6.0 feet on caliche.
Bottom of test pit at 6.0 feet.

TEST PIT NUMBER TP-4

DATE STARTED 10/4/21 **COMPLETED** 10/4/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0		1	SILTY SAND (SM), loose to medium dense, dry, fine grained, abundant fine roots to .5", brown.								
			Caliche cementation, light brown.								
		2	Dense.								

Refusal at 3.0 feet on caliche.
Bottom of test pit at 3.0 feet.

LANDMARK TESTING & ENGINEERING

Landmark Testing and Engineering
795 Factory Drive
84790
Telephone: 435-986-0566
Fax: 435-986-0568

PROJECT NAME Parcel H-3-2-4-124
CLIENT RAC Inc.
PROJECT NUMBER 210848
PROJECT LOCATION Hurricane, UT

Figure No. 4

LANDMARK 2 TEST PITS - LANDMARK NEW.GDT - 11/2/21 13:36 - P:\PROJECTS\21 PROJECTS\210848\GEOTECH\PARCEL H-3-2-4-124.GPJ

TEST PIT NUMBER TP-5

DATE STARTED 10/4/21 **COMPLETED** 10/4/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0											
		1	SILTY SAND (SM), loose, dry, fine grained, <1mm roots to 6", scattered 1mm pinholes to 0.75', brown.								
			Abundant subround basalt boulders, weak caliche cementation.								

Refusal at 1.5 feet on basalt.
Bottom of test pit at 1.5 feet.

TEST PIT NUMBER TP-6

DATE STARTED 10/4/21 **COMPLETED** 10/4/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0											
		1	SILTY SAND (SM), loose, dry, fine to coarse grained, fine roots to 18", reddish brown.								
		2	SILTY SAND (SM), medium dense, dry, fine grained, scattered <1" subangular gravel, rare 1mm pinholes to 2.5', reddish brown.								
		3	SILTY SAND (SM), dense, dry, fine grained, caliche cementation, brown.								

Refusal at 4.0 feet on caliche.
Bottom of test pit at 4.0 feet.

LANDMARK TESTING & ENGINEERING
Landmark Testing and Engineering
795 Factory Drive
84790
Telephone: 435-986-0566
Fax: 435-986-0568

PROJECT NAME Parcel H-3-2-4-124
CLIENT RAC Inc.
PROJECT NUMBER 210848
PROJECT LOCATION Hurricane, UT

Figure No. 5

LANDMARK 2 TEST PITS - LANDMARK NEW.GDT - 11/2/21 13:36 - P:\PROJECTS\21 PROJECTS\210848\GEOTECH\PARCEL H-3-2-4-124.GPJ

TEST PIT NUMBER TP-7

DATE STARTED 10/4/21 **COMPLETED** 10/4/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0		1	SILTY SAND (SM), loose, dry, fine to coarse grained, abundant fine roots to 3", brown. POORLY GRADED GRAVEL (GP), medium dense to dense, dry, <3" subangular, common subangular cobble and boulders, caliche cementation, light brown. No caliche, reddish brown.								

Refusal at 4.5 feet on basalt.
Bottom of test pit at 4.5 feet.

TEST PIT NUMBER TP-8

DATE STARTED 10/5/21 **COMPLETED** 10/5/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0		1	SILTY SAND (SM), loose to medium dense, dry, fine to coarse grained, scattered subround cobble, fine roots to 4', scattered 1mm pinholes to 7', reddish brown.								
		2									
5			Abundant subround basalt boulders.								

Refusal at 8 feet on Basalt.
Bottom of test pit at 8.0 feet.

LANDMARK TESTING & ENGINEERING
Landmark Testing and Engineering
795 Factory Drive
84790
Telephone: 435-986-0566
Fax: 435-986-0568

PROJECT NAME Parcel H-3-2-4-124
CLIENT RAC Inc.
PROJECT NUMBER 210848
PROJECT LOCATION Hurricane, UT

Figure No. 6

LANDMARK 2 TEST PITS - LANDMARK NEW.GDT - 11/2/21 13:36 - P:\PROJECTS\21 PROJECTS\210848\GEOTECH\PARCEL H-3-2-4-124.GPJ

TEST PIT NUMBER TP-9

DATE STARTED 10/5/21 **COMPLETED** 10/5/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0		1	SILTY SAND (SM), loose, fine to coarse grained, granular, fine roots to 1.5', brown.								
			Medium dense, rare 1mm pinholes.								
			Caliche cementation.								
			Refusal at 1.5 feet on basalt.								
			Bottom of test pit at 1.5 feet.								

TEST PIT NUMBER TP-10

DATE STARTED 10/5/21 **COMPLETED** 10/5/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0		1	SILTY SAND (SM), loose to medium dense, dry, fine to coarse grained, granular, fine to 1mm roots to 1', 1mm pinholes to 1', brown.								
			Caliche cementation, angular to subangular basalt gravel and cobble, white.								
			Refusal at 1.5 feet on basalt.								
			Bottom of test pit at 1.5 feet.								

LANDMARK TESTING & ENGINEERING
Landmark Testing and Engineering
795 Factory Drive
84790
Telephone: 435-986-0566
Fax: 435-986-0568

PROJECT NAME Parcel H-3-2-4-124
CLIENT RAC Inc.
PROJECT NUMBER 210848
PROJECT LOCATION Hurricane, UT

Figure No. 7

LANDMARK 2 TEST PITS - LANDMARK NEW.GDT - 11/2/21 13:36 - P:\PROJECTS\21 PROJECTS\210848\GEOTECH\PARCEL H-3-2-4-124.GPJ

TEST PIT NUMBER TP-11

DATE STARTED 10/5/21 **COMPLETED** 10/5/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0											
		1	SILTY SAND (SM), loose, dry, fine to course grained, fine to 2mm thick roots to 2', brown.		1.4			4	55	41	
			Caliche cementation.								

Refusal at 2.0 feet on caliche.
Bottom of test pit at 2.0 feet.

TEST PIT NUMBER TP-12

DATE STARTED 10/5/21 **COMPLETED** 10/5/21 **EXCAVATION COMPANY** Joe Martinez **ELEVATION**

LOGGED BY Dave Baldazzi **CHECKED BY** Chad Coffey **EXCAVATION METHOD** Kobelco SK45SRX

NOTES **AT TIME OF EXCAVATION** ---

DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE NUMBER	MATERIAL DESCRIPTION	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MECHANICAL GRADATION: GRAVEL (%)	MECHANICAL GRADATION: SAND (%)	MECHANICAL GRADATION: FINES (%)	Other Tests
0											
		1	SILTY SAND (SM), loose, dry, fine to coarse grained, abundant subangular to subround cobble and boulders, fine roots to 6", <1mm pinholes to 1', brown.								

Refusal at 1.0 foot on basalt.
Bottom of test pit at 1.0 feet.

LANDMARK TESTING & ENGINEERING
Landmark Testing and Engineering
795 Factory Drive
84790
Telephone: 435-986-0566
Fax: 435-986-0568

PROJECT NAME Parcel H-3-2-4-124
CLIENT RAC Inc.
PROJECT NUMBER 210848
PROJECT LOCATION Hurricane, UT

Figure No. 8

LANDMARK 2 TEST PITS - LANDMARK NEW.GDT - 11/2/21 13:36 - P:\PROJECTS\21 PROJECTS\210848\GEOTECH\PARCEL H-3-2-4-124.GPJ

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		SYMBOLS	TYPICAL NAMES
COARSE-GRAINED SOILS (More than 50% of soil Retained on No. 200 sieve size)	GRAVELS More than 1/2 of coarse fraction > No.4 sieve size	GW	Well graded gravels or gravel-sand mixtures little or no fines.
		GP	Poorly graded gravels or gravel-sand mixtures little or no fines.
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS More than 1/2 of coarse fraction < No.4 sieve size	SW	Well graded sands or gravelly sand mixtures little or no fines.
		SP	Poorly graded sands or gravelly sand mixtures little or no fines.
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (Less than 50% of soil Retained on No. 200 sieve size)	SILTS & CLAYS Liquid Limit < 50	ML	Inorganic silts and very fine sands, rock flour, silty fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		OL	Organic silts and organic silty clays of low plasticity
	SILTS & CLAYS Liquid Limit > 50	MH	Inorganic silts, micaceous of diatomaceous fine sand or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

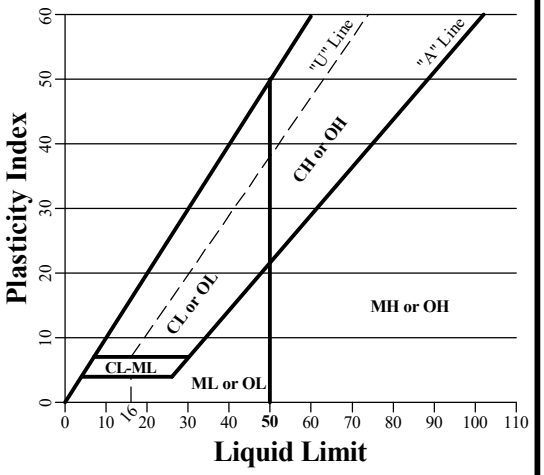
GRAIN SIZE CHART

CLASSIFICATION	Range of Grain Size: U.S. Standard Sieve Size	Range of Grain Size: Grain Size in Millimeters
BOULDERS	**Above 12"**	**Above 305**
COBBLES	**12" to 3"**	**305 to 76.2**
GRAVEL	**3" to No. 4**	**76.2 to 4.76**
Coarse	3" to 3/4"	76.2 to 19.1
Fine	3/4" to No. 4	19.1 to 4.76
SAND	**No. 4 to No. 200**	**4.76 to 0.074**
Coarse	No. 4 to No. 10	4.76 to 2.00
Medium	No. 10 to No. 40	2.00 to 0.42
Fine	No. 40 to No. 200	0.420 to 0.074
SILT & CLAY	Below No. 200	Below 0.074

SAMPLES

- Relatively Undisturbed Sample
- Block Sample
- Bag Sample
- Auger Cuttings
- B — Bucket Sample
- Core
- No Recovery

PLASTICITY CURVE



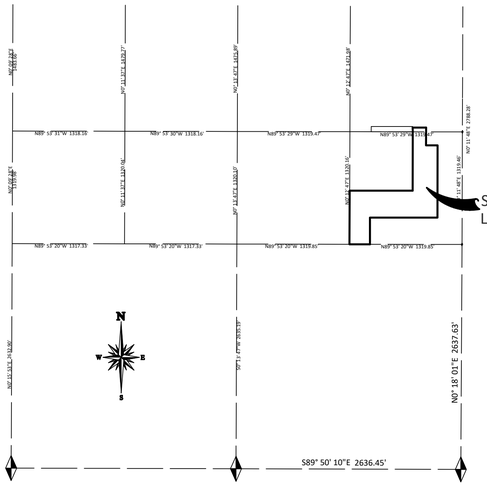
LANDMARK TESTING & ENGINEERING

Landmark Testing and Engineering
795 Factory Drive
84790
Telephone: 435-986-0566
Fax: 435-986-0568

PROJECT NAME Parcel H-3-2-4-124
CLIENT RAC Inc.
PROJECT NUMBER 210848
PROJECT LOCATION Hurricane, UT

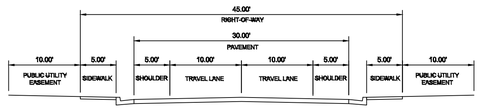
Figure No. 9

USCS SUMMARY - LANDMARK NEW.GDT - 10/29/21 12:02 - P:\PROJECTS\21 PROJECTS\210848\GEOTECH\PARCEL H-3-2-4-124.GPJ



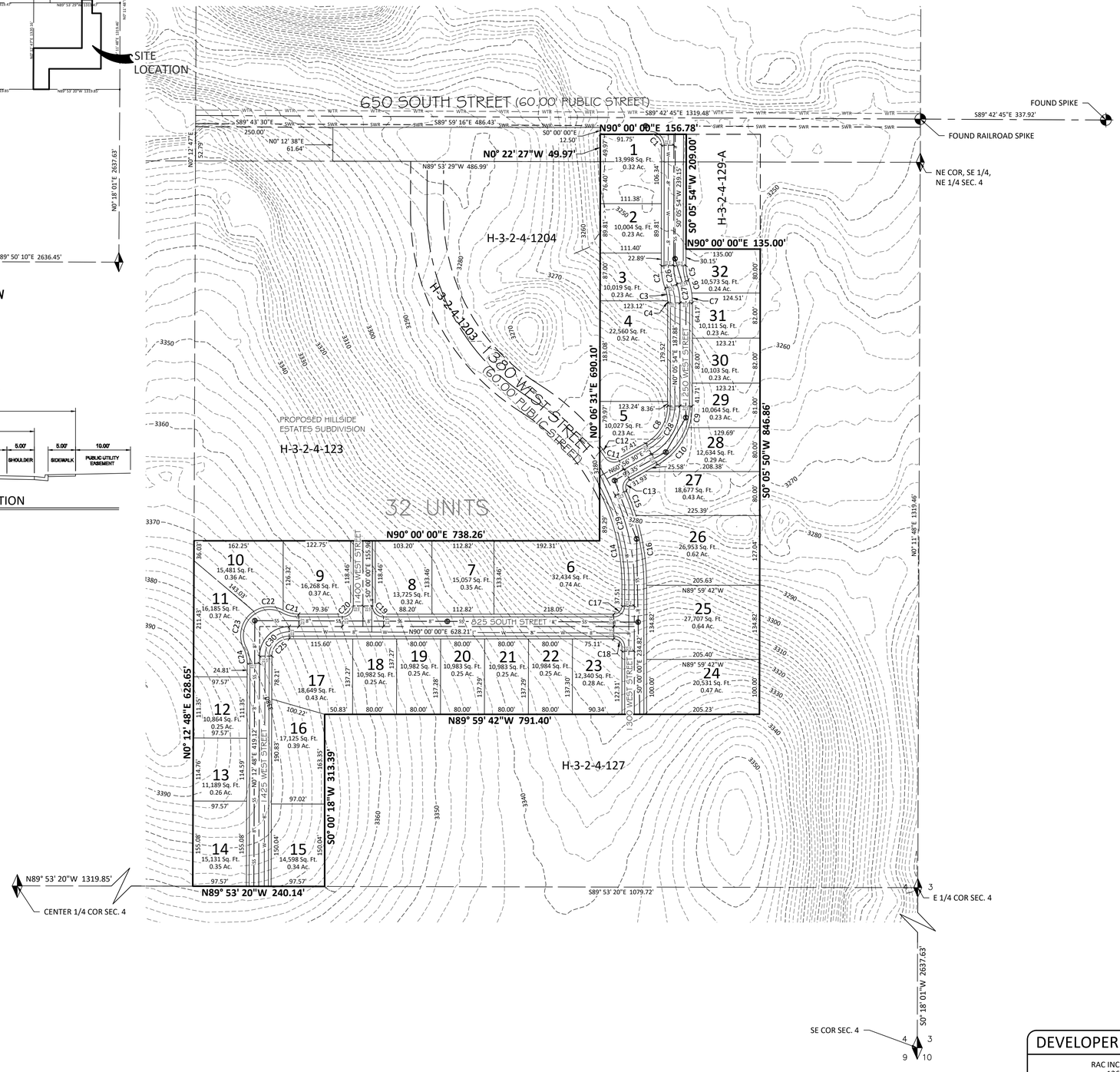
PROJECT LOCATION
SEC. 4 T42S R13W,
SLB&M
NOT TO SCALE

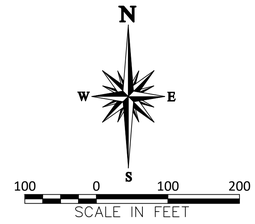
RESIDENTIAL LOCAL



45' STREET CROSS SECTION

CURVE TABLE				
CURVE	RADIUS	LENGTH	DELTA	TANGENT
C1	20.00'	31.45'	90°05'54"	20.03'
C2	122.50'	42.27'	19°46'21"	21.35'
C3	77.50'	23.18'	17°08'04"	11.68'
C5	77.50'	26.74'	19°46'21"	13.51'
C6	122.50'	24.39'	11°24'21"	12.23'
C7	122.50'	17.89'	8°22'00"	8.96'
C8	77.50'	82.30'	60°50'36"	45.51'
C9	122.50'	40.01'	18°42'53"	20.19'
C10	122.50'	90.07'	42°07'43"	47.18'
C11	15.00'	22.32'	85°14'21"	13.80'
C12	430.00'	23.46'	3°07'35"	11.73'
C13	15.00'	22.25'	85°00'21"	13.75'
C14	377.50'	176.62'	26°48'24"	89.96'
C15	422.50'	48.44'	6°34'08"	24.25'
C16	422.50'	129.01'	17°29'42"	65.01'
C17	15.00'	23.56'	90°00'00"	15.00'
C18	15.00'	23.56'	90°00'00"	15.00'
C19	15.00'	23.56'	90°00'00"	15.00'
C20	15.00'	23.56'	90°00'00"	15.00'
C21	60.00'	29.57'	28°14'29"	15.09'
C22	52.50'	55.74'	60°50'02"	30.82'
C23	52.50'	76.90'	83°55'11"	47.20'
C24	60.00'	27.99'	26°43'33"	14.25'
C25	31.50'	49.36'	89°47'12"	31.38'
C26	100.00'	34.51'	19°46'21"	17.43'
C27	100.00'	34.51'	19°46'21"	17.43'
C28	100.00'	106.19'	60°50'36"	58.72'
C29	400.00'	227.52'	32°35'26"	116.93'
C30	54.00'	84.62'	89°47'12"	53.80'





LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 1896 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- SWR SWR EXISTING SEWER LINE
- WTR WTR EXISTING WATER LINE
- SWR SWR PROPOSED SEWER LINE
- WTR WTR PROPOSED WATER LINE

PROJECT DATA	
SINGLE FAMILY HOMES	PARCEL = 14.19 ACRES
PARCEL ID	H-3-2-4-124
PROJECT ADDRESS	650 SOUTH
PROJECT	32 SINGLE FAMILY HOMES
ZONE	R-1-10

LEGAL DESCRIPTION

COMMENCING AT THE EAST 1/4 SECTION 4, TOWNSHIP 42 SOUTH, RANGE 13 WEST, SALT LAKE BASE AND MERIDIAN; THENCE NORTH 89°53'20" WEST, ALONG THE CENTER SECTION LINE A DISTANCE OF 1079.71 FEET TO THE POINT OF BEGINNING, SAID POINT BEING THE SOUTHWEST CORNER OF THAT PARCEL SHOWN BY TAX ID # H-3-2-4-127 AND DOCUMENT #20170002484, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 89°53'20" WEST, A DISTANCE OF 240.14 FEET, TO THE SOUTHEASTERLY CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-13011 AND DOCUMENT #20150044906, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 00°12'48" EAST, ALONG THE EAST LINE OF SAID PARCEL, A DISTANCE OF 628.65 FEET, TO THE SOUTHWESTERLY CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-123 AND DOCUMENT #20210041725, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 90°00'00" EAST, ALONG THE SOUTHERLY LINE OF SAID PARCEL, A DISTANCE OF 738.26 FEET, TO THE SOUTHEASTERLY CORNER OF SAID PARCEL; THENCE NORTH 00°06'31" EAST, ALONG THE EASTERLY LINE OF SAID PARCEL AND THE EASTERLY LINE OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-1204, H-3-2-4-1203, AND DOCUMENT #20170014334, OFFICIAL WASHINGTON COUNTY RECORDS, A DISTANCE OF 690.10 FEET, TO THE NORTHEASTERLY CORNER OF H-3-2-4-1204 PARCEL; THENCE NORTH 89°53'29" WEST, ALONG THE NORTH LINE OF SAID PARCEL AND THE NORTH LINE OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-1203, AND H-3-2-4-123 AND DOCUMENT #20210041725, OFFICIAL WASHINGTON COUNTY RECORDS, A DISTANCE OF 486.99 FEET; THENCE NORTH 00°12'38" EAST, A DISTANCE OF 61.64 FEET, TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY LINE OF 650 SOUTH STREET; THENCE SOUTH 89°59'16" EAST, ALONG SAID LINE, A DISTANCE OF 486.43 FEET; THENCE SOUTH 00°00'00" EAST, ALONG THE RIGHT OF WAY LINE, A DISTANCE OF 12.50 FEET; THENCE NORTH 90°00'00" EAST, ALONG SAID RIGHT OF WAY LINE, A DISTANCE OF 156.78 FEET, TO THE NORTHWESTERLY CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-129 AND DOCUMENT #20210024540, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE SOUTH 00°05'54" WEST, A DISTANCE OF 209.00 FEET, TO THE SOUTHWEST CORNER OF SAID PARCEL; THENCE NORTH 90°00'00" EAST, A DISTANCE OF 135.00 FEET, TO THE SOUTHEAST CORNER OF THAT PARCEL SHOWN BY TAX ID #H-3-2-4-129; THENCE SOUTH 00°05'50" WEST, A DISTANCE OF 846.86 FEET, TO A POINT ON THE BOUNDARY LINE OF THAT PARCEL SHOWN BY SAID TAX ID #H-3-2-4-127 AND DOCUMENT #20170002484, OFFICIAL WASHINGTON COUNTY RECORDS; THENCE NORTH 89°59'42" WEST, ALONG SAID LINE, A DISTANCE OF 791.40 FEET, TO THE NORTHWESTERLY CORNER OF SAID PARCEL; THENCE SOUTH 00°00'18" WEST, ALONG THE WESTERLY LINE OF SAID PARCEL, A DISTANCE OF 313.39 FEET TO THE POINT OF BEGINNING.

PRELIMINARY PLAT FOR

MOUNTAIN VIEW ESTATES SUBDIVISION

LOCATED IN SECTION 4, TOWNSHIP 42 SOUTH, RANGE 13 WEST, SLB&M

DEVELOPER INFORMATION

RAC INC. / CRAIG ENGEL
1267 N 1390 W
ST. GEORGE, UT 84770
435-229-7360
CRAIG_ENGEL@MSN.COM

OWNER INFORMATION

W.V. ASHTON FAMILY TRUST, DATED JUNE 6, 2007
C/O RORY & WENDY BRINGHURST
6202 MYRTLE HILL RD
VALLEY CITY, OH 44280

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BROWN CONSULTING ENGINEERS, P.C.
CIVIL ENGINEERING-LAND SURVEYING-LAND PLANNING
163 WEST 1600 SOUTH, UNIT 5
ST. GEORGE, UTAH 84770
(435) 628-4700 FAX (435) 628-4725

PRELIMINARY PLAT
MOUNTAIN VIEW ESTATES
FOR
RAC INC.
LOCATED IN THE NE 1/4, SEC 4, T42S R13W S.L.B.&M.
HURRICANE CITY, UTAH

CHECKED BY : MB
DRAWN BY : SWB
DATE : SEPTEMBER 2021
JOB NO. : 21-138

SCALE : 1"=100'

SHEET NO. : P-1

SENSITIVE LANDS APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $ _____

For Office Use Only:
File No. _____
Receipt No. _____

Name: RAC INC Craig Engel **Telephone:** 1-435-229-7360

Address: 1267 No 1390 W St. George **Fax No.** _____

MARC BROWN
Agent (If Applicable): BROWN CONSULTING **Telephone:** 435-628-4700

Email: racinc19@gmail.com **Agent Email:** marc@browncivil.com

Address/Location of Subject Property: 1300 W. 650 So.

Tax ID of Subject Property: H-3-2-4-124 **Zone District:** R-1-10

Proposed Use: (Describe, use extra sheet if necessary) 32-10,000 sf. min.
Residential subdivision

Other companion application submitted with the Development Plan:

- ✓ **Preliminary Plat**
- _____ **Site Plan Review**
- _____ **Conditional Use Permit**
- _____ **Rezone**
- _____ **Other**

Submittal Requirements:
Please review the attached Supplemental Information to determine additional information that must be submitted with this application.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete: _____ Completion determination made by: _____

DEVELOPMENT PLAN SUBMITTAL REQUIREMENTS

Development Plan Submittal: The following information shall be submitted with the application for Development Plan approval, and may be in addition to information required for a companion application being processed concurrently with the Development Plan:

_____ 1. Development plan: The development plan shall clearly show:

✓ a. Two (2) foot contours. The contour map shall be prepared and certified by a licensed professional civil engineer or surveyor drawn at a scale no smaller than one (1) inch equals one hundred (100) feet. Contour maps based on interpolation of maps with larger contour intervals are not acceptable.

✓ b. Field surveys may be required of the applicant by the City to verify the accuracy of the contour lines shown on the contour map.)

✓ c. Slopes having grades of 10-29 percent and natural slopes of thirty (30) percent or greater shall be color shaded clearly showing the difference between the two categories. This contour information shall either be computer based, or based on profile lines drawn perpendicular to contours at intervals no less than one hundred fifty (150') feet apart, nor greater than seventy-five (75') feet from an existing or proposed property line. Grades shall then be determined by calculating the slope along one hundred (100) foot segments of the profile. (See Appendix Diagram-A of the Land Use Ordinance)

✓ d. To determine required minimum lot size (Section 10-24-6B of the Sensitive Land Ordinance), the average natural grade on each proposed parcel shall be calculated and indicated on the development plan. The average grade is determined by calculating the grade of the natural slope between two opposing property lines, based on profiles taken perpendicular to the contours, no less than one hundred fifty (150) apart, nor greater than seventy-five (75) feet from an existing or proposed property line.

✓ e. The proposed development layout of lots, roads, proposed road grades, open space, area of disturbances, and existing native vegetation.

_____ 2. Soils Investigation Report: A soils investigation report which contains the following information:

✓ a. Nature, distribution and classification (Unified Soil Classification) of existing soils to the appropriate depth of influence by the proposed development, but not less than ten (10) feet deeper than the proposed excavations or to bedrock.

✓ b. Strength of existing soils, bearing capacity of supporting soils, settlement estimates, collapse and shrink-swell characteristics, lateral pressures and trench excavation limitations.

✓ c. Ground water levels that may affect development and estimated elevation of high ground water levels.

✓ d. Appropriate laboratory testing for classification, consistency, strength and consolidation conditions.

✓ e. Slope stability.

✓ f. A written statement by the persons or firm preparing the soils report describing the general suitability of the site for the owner=s intended use.

✓ 3. Geotechnical Report: A geotechnical and geological report shall be prepared by a geologist licensed to practice in the State of Utah, whenever a proposed building permit or development project:

a. Is located within one thousand (1,000) feet of an identified fault; or
b. Is located on slopes estimated to be twenty (20) percent or greater; or
c. Is determined to have potential hazards by the City Engineer, County Geologist or State Geologist.

The geotechnical and geological report when required above shall include:

✓ a. A geologic map showing topography, surface and subsurface geologic features and any geologic limitations to the proposed use;

✓ b. Depth to bedrock;

✓ c. Subsurface investigative logs and reports;

✓ d. Identification of all geologic hazards; and

✓ e. Measures to mitigate or eliminate geologic hazards and problems.

_____ 4. Grading and Drainage Plan: A grading and drainage plan report which includes storm water management, erosion, and grading plans describing the methods by which surface water, natural drainages, flooding (including identification of 100 year flood where applicable), erosion and sedimentation loss, and hydrologic hazards will be controlled during and after construction. The plan shall include the following information:

✓ a. The grading plan shall show present topography, including the location and depth of all proposed fills and cuts of finished earth surfaces, and/or use of retaining walls including height, using a contour interval of two (2) foot when grades are 0-29% and five (5) foot contours when grades 30% and over.

✓ b. The proposed area to be graded shall be clearly delineated on the plan.

c. Preliminary street grades shall be identified on the plan.

✓ d. All calculations and proposed details used for design and construction of debris basins, impoundments, diversions, dikes, waterways, drains, culverts and other water management or soil erosion control measures shall be shown. Drainage calculations shall determine runoff volume and peak discharge using the "Rational Method," "SCS Curve Number Method," or appropriate equivalent. Data provided should include:

(1) Rainfall depth, duration and distribution;
(2) Watershed slope and drainage area delineation;
(3) Land condition of watershed surface;
(4) Topography of drainage area; and
(5) Soil Descriptions in Watershed. Erosion calculations shall employ predictions of soil loss sheet erosion using the Universal Soil Loss Equation or equivalent. Data to be provided should include factors of:
    (a) Rainfall intensity and duration;
    (b) Soil erodability;
    (c) Land slope and length of slope or topography;
    (d) Condition the soil surface and land management practices in use; and
    (e) Surface cover, grass, pavements, etc.

5. License Required: All required reports shall be prepared by persons licensed to practice their specialty or expertise in the State of Utah, if such license for practice is required.

6. Expert Advice: In reviewing technical reports, calculations, and plans which may be required, the City staff or City Engineer may find it necessary to obtain the advice of other experts regarding the adequacy of the reports submitted, and the validity of the conclusions and recommendations reached in the reports. In such cases the City staff or City Engineer may consult with such experts, with the reasonable costs of these consultations to be borne by the developer prior to any public hearing. The Planning Commission or City Council may require payment by the developer of the costs of such consultations as a condition of preliminary or final plat approval.

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. A deadline missed due to an incomplete application could result in a month's delay. Call the Planning Department to determine the submittal deadline.

PROJECTS SUBJECT TO SENSITIVE LANDS REQUIREMENTS

The following projects are subject to Sensitive Land requirements:

1. All preliminary plats, planned developments, site plan reviews, conditional use permits and any other land use development permits authorized by City Codes when they are:
    - (a) Located on lands defined in Section 10-24-2 of the Land Use Code or identified as sensitive lands on the General Plan Sensitive Lands Map;
    - (b) Located within one thousand (1000) feet of a fault identified on a published geologic map.
    - (c) Located within one hundred (100) feet, measured perpendicularly from a fault identified as a result of on-site investigation by a registered geologist.
    - (d) Hillside and ridge and bluff areas (as set forth in section 10-24-5A of the Land Use Ordinance.).
2. Any grading on sensitive land not associated with an approved project of the types listed in subsection 1 above, when such grading will:
    a. Disturb ten thousand (10,000) square feet or more of land area;
    b. Create a cut or fill over three (3) feet in height; or
    c. Create trenching over two hundred (200) feet in length.

    (A development plan is not required, however sufficient information must be submitted to determine compliance with Chapter 24, Sensitive Lands)
3. All building permits, including grading on vacant lots or parcels not previously processed in accordance with the provisions of this Chapter 24 of the Land Use Ordinance. (A development plan is not required, however sufficient information must be submitted to determine compliance with Chapter 24, Sensitive Lands)

PROJECT REVIEW PROCEDURE

When a preliminary plat, site plan, planned development or conditional use permit or other application is located on sensitive lands, the Development Plan application is submitted as a companion application and processed concurrently. The Planning Commission will review the application(s) and on conditional use permits and site plan reviews they will approve, approve with conditions or deny the Development Plan application. On preliminary plats, or zone changes, the Planning Commission will forward a recommendation to the City Council. Following receipt of a recommendation from the Planning Commission, or on appeal, the City Council will hold a public hearing on the application and approve, approve with conditions, or deny the proposed Development Plan.

NOTE: To fully understand the requirements for projects on sensitive lands, you should request a copy of Chapter 24 of the Land Use Ordinance from the City of Hurricane Planning Department.

DISSENTING RECOMMENDATION OF THE HURRICANE CITY PLANNING COMMISSION TO THE HURRICANE CITY COUNCIL

RE: **Mountain View Estates;**
Application No. 2022-PP-01 and 2022-HIL-01;
Preliminary plat application and request for an exception to the City's Hillside Ordinance;
Location: 1300 South 650 South.

DATE: **January 26, 2022**

DISSENTING RECOMMENDATION

The Planning Commission recommended approval of the application on a 6 to 1 vote. This dissenting recommendation recommends that the City Council DENY the requested exception to the City's Hillside/Sensitive Lands Ordinance.

The City's Hillside Ordinance requires that lots with slopes in excess of 10% be larger than the standard lot size permitted by the underlying zone. *See* HCC § 10-24-6. The purposes of the Hillside Ordinance include maintaining open space, minimizing site grading, minimizing scars from cuts and fills, stabilizing steep hillsides, retaining moisture, preventing erosion, and preserving the beauty of unique landscapes. *See* HCC 10-24-1.

A prior preliminary plat for this property was approved on December 2, 2021, for a total of 32 lots. However, the applicant has submitted a new, proposed preliminary plat with a total of 37 lots for the purpose of creating five additional lots. Eight of the proposed lots (7-10, 28-32) do not comply with the Hillside Ordinance because they have slopes in excess of 10% but do not meet the corresponding minimum lot size set out in the Hillside Ordinance.

The City Council may grant an exception to the Hillside Ordinance when:

> "An alternative solution is proposed for the protection of the sensitive land, based on sound and generally accepted engineering and land development principles, and said alternative will result in equal or better protection than the development under the standards of this chapter; and is consistent with the purposes of this chapter."

The applicant is requesting an exception to the Hillside Ordinance and has submitted a letter in support of the requested exception. The applicant's position is, in essence, that additional lots will result in additional retaining walls, so the height of the additional retaining walls will not be as tall. The applicant also suggests that additional lots will reduce the slope of the roadways.

The applicant's reasons for adding more lots does not justify an exception to the Hillside Ordinance. Additional terracing, as well as reasonably sloped roadways, can be accomplished without increasing the density of the development. For example, one lot can incorporate a terracing wall without dividing the lot into two lots. Instead of placing a home on every terrace—lots with steep slopes could incorporate a side yard or a back yard with a terraced landscaped area or open space. This approach would be "consistent with the purposes" of the

Hillside Ordinance because it would promote open space on hillsides, reduce the inherent risks when homes are terraced on steep slopes in close proximately to each other, and minimize the visual impact of structures on highly visible slopes. The applicant's proposal does not provide "equal or better" protection than the generally applicable Hillside standards, nor is the proposal "consistent with the purposes" of the Hillside Ordinance, so an exception to the Hillside Ordinance is not warranted and should not be granted.

It is recommended that the application for a preliminary plat be denied on the grounds that it does not satisfy the standards of the Hillside Ordinance and that an exception to the Ordinance is not warranted.

APPROVAL

This Dissenting Recommendation is made by Commissioner Dayton Hall.

PRELIMINARY PLAT APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $150.00

For Office Use Only:
File No. 2022-PP-05
Receipt No. 8.154961

Name: GVS Holdings LLC **Telephone:** 435-313-6700

Address: 748 W. Morby St., Washington, UT 84780 **Fax No.** --

Email: Dwain@redrockrealestate.com **Agent Email:** Dwain@redrockrealestate.com

Agent (If Applicable): Dwain Schallenberger **Telephone:** 435-313-6700

Address/Location of Subject Property: 1117 W. 600 N.

Tax ID of Subject Property: H-3-1-34-4400 **Zone District:** PUD (RM-2 & R1-10)

Proposed Use: (Describe, use extra sheet if necessary. Include total number of lots)

PD Overlay with RM-2 at the north end, R1-10 at the south end, and open space between.

Submittal Requirements: The preliminary plat application shall provide the following:

X 1. Description: In a title block located in the lower right-hand corner of the sheet the following is required:
- X a. The proposed name of the subdivision.
- X b. The location of the subdivision, including the address and section, township and range.
- X c. The names and addresses of the owner or subdivider, if other than the owner.
- X d. Date of preparation, and north point.
- X e. Scale shall be of sufficient size to adequately describe in legible form, all required conditions of Chapter 39, City Subdivision regulations.

X 2. Existing Conditions: The preliminary plat shall show:
- X a. The location of the nearest monument.
- X b. The boundary of the proposed subdivision and the acreage included.
- N/A c. All property under the control of the subdivider, even though only a portion is being subdivided. (Where the plat submitted covers only a part of the subdivider's tract, a sketch of the prospective street system of the unplatted parts of the subdivider's land shall be submitted, and the street system of the part submitted shall be considered in light of existing Master Street Plan or other Commission studies.)
- X d. The location, width and names/numbers of all existing streets within two hundred (200) feet of the subdivision and of all prior streets or other public ways, utility rights of way, parks and other public open spaces, within and adjacent to the tract.
- X e. The location of all wells and springs or seeps, proposed, active and abandoned, and of all reservoirs or ponds within the tract and at a distance of at least one hundred feet (100') beyond the tract boundaries.
- N/A f. Existing sewers, water mains, culverts or other underground facilities within the tract, indicating the pipe sizes, grades, manholes and the exact locations.

X g. Existing Hurricane Canal Company facilities; other ditches, canals, natural drainage channels and open waterways and any proposed realignments.

X h. Contours at vertical intervals not greater than five (5) feet.

X i. Identification of potential geotechnical constraints on the project site (such as expansive rock and soil, collapsible soil, shallow bedrock and caliche, gypsiferous rock and soil, potentially unstable rock or soil units including fault lines, shallow groundwater, and windblown sand) and recommendations for their mitigation.

X j. Information on whether property is located in desert tortoise take area

X 3. Proposed Plan: The subdivision plans shall show:

X a. The layout of streets, showing location, widths, and other dimensions of proposed streets, crosswalks, alleys and easements.

X b. The layout, numbers and typical dimensions of lots.

X c. Parcels of land intended to be dedicated or temporarily reserved for public use or set aside for use of property owners in the subdivision.

X d. Easements for water, sewers, drainage, utilities, lines and other purposes.

X e. Typical street cross sections and street grades where required by the Planning Commission. (All street grades over 5% should be noted on the preliminary plat)

X f. A tentative plan or method by which the subdivider proposes to handle the storm water drainage for the subdivision.

X g. Approximate radius of all center line curves on highways or streets.

X h. Each lot shall abut a street shown on the subdivision plat or on an existing publicly-dedicated street. (Double frontage or flag lots shall be prohibited except where conditions make other design undesirable)

N/A i. In general, all remnants of lots below minimum size left over after subdividing of a larger tract must be added to adjacent lots, rather than allow to remain as unusable parcels.

N/A j. Where necessary, copies of any agreements with adjacent property owners relevant to the proposed subdivision shall be presented to the Planning Commission.

X k. A letter from both the local sanitary sewer provider and culinary water provider indicating availability of service.

N/A l. Will this subdivision be phased? If yes show possible phasing lines.

X m. A tentative plan or method for providing non-discriminatory access to the subdivision for purposes of placement of communications infrastructure, and for purposes of placement of utility infrastructure.

X 4. Required copies of plans:

X a. Three copies of all full scale drawings

X b. One copy of each drawing on a 11 x 17 inch sheets. (8 ½ x 11 is acceptable if the project is small and the plans are readable at that size).

X 5. Warranty deed or preliminary title report or other document (see attached Affidavit) showing evidence that the applicant has control of the property

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. A deadline missed due to an incomplete application, could result in a month's delay. Planning Commission meetings are held on the second Thursday and fourth Wednesday of each month at 6:00 p.m. The deadline to submit an application to be placed on an agenda is no later than <u>12:00 noon</u> 10 full business days before the Planning Commission meeting at which you plan for your application to be heard.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete: _____ Completion determination made by: _____

Ash Creek Special Service District

1350 S. Sand Hollow Road
Hurricane, UT 84737
Office: (435) 635-2348 Fax: (435) 635-8550
ashcreek@infowest.com

January 3, 2022

Hurricane City
Stephen Nelson
127 N. 870 W.
Hurricane, UT 84737

RE: GVS - Parcel H-3-1-34-4400

Stephen,

There is sewer capacity for this project. The developers understand and agree that they will need to get plan approval for the sewer system.

After approval they agree to pay all costs associated with construction and impact fees. Please let us know if you have any questions.

Sincerely,

Amber Gillette, PE
Engineering Tech
Ash Creek Special Service District

HURRICANE CITY
UTAH

Water Department
Ken Richins, Superintendent

December 30, 2021

To Whom It May Concern:

A will serve letter has been requested for residential subdivision on Parcel H-3-4-34-4400 located at approximately 600 N at 1117 W in Hurricane, Utah.

Yes, we do have culinary water in the area of 600 N 1117 W in Hurricane, Utah.

A hydraulic water study may be required to ensure the waterline will deliver the required fire flows. A looped water system may be required

Sincerely,

Hurricane City Water – Dallan Wadsworth

646 West 600 North • Hurricane, UT • 84737
Phone: (435) 635-9442 • Fax: (435) 635-2616
WEB: www.cityofhurricane.com

AFFIDAVIT
PROPERTY OWNER

STATE OF UTAH)
:ss
COUNTY OF Utah)

I (we) Sterling Nelson Randi C. Nelson-Frausto, being duly sworn, depose and say that I (we) am (are) the owner(s) of the property identified in the attached application and that the statements herein contained and the information provided identified in the attached plans and other exhibits are in all respects true and correct to the best of my (our) knowledge. I (we) also acknowledge that I have received written instructions regarding the process for which I am applying and the Hurricane City Planning staff have indicated they are available to assist me in making this application.

Sterling D Nelson
(Property Owner)

Randi C. Nelson-Frausto
(Property Owner)

Subscribed and sworn to me this 3 day of November 2021.

C. Ashdown
(Notary Public)

Residing in: Pleasant Grove, UT

My Commission Expires: 7-25-2023

CELIA ASHDOWN
NOTARY PUBLIC • STATE OF UTAH
COMMISSION# 707412
COMM. EXP. 07-25-2023

Agent Authorization

I (we), Sterling Nelson Randi C. Nelson-Frausto the owner(s) of the real property described in the attached application, do authorize as my (our) agent(s) TAYLOR RICKI / GUS HOLDING to represent me (us) regarding the attached application and to appear on my (our) behalf before any administrative or legislative body in the City considering this application and to act in all respects as our agent in matters pertaining to the attached application.

Sterling D Nelson
(Property Owner)

Randi C. Nelson-Frausto
(Property Owner)

Subscribed and sworn to me this 3 day of November 2021.

C. Ashdown
(Notary Public)

Residing in: Pleasant Grove, UT

My Commission Expires: 7-25-2023

CELIA ASHDOWN
NOTARY PUBLIC • STATE OF UTAH
COMMISSION# 707412
COMM. EXP. 07-25-2023

Account 0075856

Location

Account Number 0075856

Parcel Number H-3-1-34-4400

Tax District 03 - Hurricane City

Acres 19.16

Situs 0, 0

Legal S: 34 T: 41S R: 13W W1/2 NW1/4 NW1/4 SEC 34 T41S R13W SLM. LESS: BEG ON NE COR LOT 6 BLK 16 HFS, TH N89*52'13 W ALG N LN LOTS 5 & 6 660.36 FT TO W LN SEC 34 T41S R13W, TH N0*03'04 E ALG SEC/L 16.5 FT; TH N89*53'06 E ALG EXST F/L 660.35 FT; TH S0*02'22 W 19.25 FT TO POB. LESS: ALL N 37.50 FT OF W1/2 NW1/4 NW1/4 SEC 34 T41S R13W DESC AS FOL: BEG NW COR SEC 34 T41S R13W, SD PT BEING ON CTR LN OF SD PROJ ENG STA 67+53.91, TH ALG SD CTR LN & N LN OF SD SEC N89*51'47" E 660.29 FT; TH S00*14'22" E 37.50 FT TO PT ON LN 37.50 FT DIST & PRL TO SD CTR LN; TH ALG SD PRL LN S89*51'47" W 660.31 FT TO PT ON W LN OF SD SEC; TH ALG SD W LN N00*12'38" W 37.50 FT TO PT ON SD CTR LN SD NW COR & POB.

Parent Accounts

Parent Parcels

Child Accounts

Child Parcels

Sibling Accounts

Sibling Parcels

Owner

Name NELSON STERLING D & RANDI C

9447 MECKAILEE CV
SANDY, UT 84094-3682

Value

Market (2021) $871,800

Taxable $871,800

Tax Area: 03 **Tax Rate:** 0.009782

Type	Actual	Assessed	Acres
Non Primary Land	$871,800	$871,800	19.160

Transfers

Entry Number	Recording Date	
00262686	06/14/1984 02:52:00 AM	B: 351 P: 748
20090017916	05/08/2009 03:03:49 PM	
20090048182	12/22/2009 03:58:25 PM	
20100006647	03/01/2010 04:23:46 PM	
20100006648	03/01/2010 04:23:46 PM	
20100043974	12/30/2010 10:52:48 AM	
20110000235	01/04/2011 09:18:39 AM	

"Tax"

Tax Year	Taxes
2021	$8,527.95
2020	$6,315.63

Images

- GIS

Send - this notice - to

Randi C. Nelson and Sterling D. Nelson
557 West Pinewood Drive
Cedar City, Utah 84720
801-586-6200

Durham Morris
Attorney For Estate
172 North Main Street
Cedar City, Utah 84720
Telephone: 586-8391

262686

IN THE FIFTH JUDICIAL DISTRICT COURT OF WASHINGTON COUNTY, STATE OF UTAH

In the Matter of the Estate of	DECREE OF FINAL DISTRIBUTION
DAWN GRAFF SETZER, Deceased.	Probate No. 2528

This matter came on for hearing before this Court at St. George, Utah, on the 11th day of June, 1984, upon the Petition of Emil J. Graff, Personal Representative of the estate of Dawn G. Setzer, deceased, heretofore filed herein praying for a Decree of Final Distribution of all property and assets now belonging to the estate of said deceased; and it appearing to the Court that due and legal notice has been given of the time and place of the hearing of said Petition, and that no protests or objections have been filed or made to the granting of said Petition, and that the time for filing protests or objections has expired; and it appearing to the Court that due and legal notice to the creditors of said deceased has been given in the manner and for the length of time required by law, and that a Decree establishing that due and legal notice to such creditors has been given, has been made and filed herein; and it appearing further to the Court that all of the expenses of the last illness and funeral and burial of said deceased, and all of the costs and expenses of administration of the estate of said deceased, and all of the Estate Taxes which were due from the estate of said deceased to the United States Government have been fully paid; that said estate is not subject to the payment of any inheritance

Unofficial Copy

taxesto the State of Utah; and it appearing further that all of the taxes which have been levidd and assessad against the property belonging to said estate have been fully paid; and it further appearing to the Court that the names of the heirs at law of said deceased, and of the beneficiaries named in the Last Will and Testament of said deceased, together with their respective addresses and relationships to said deceased are as follows:

Name:	Relationship to said Deceased:	Address:
Jane S. Nelson	Major Daughter and Beneficiary named in Will	557 West Pinewood Drive Cedar City, Utah 84720
Richard W. Nelson	Major Son-in-law and Beneficiary named in Will	557 West Pinewood Drive Cedar City, Utah 84720
Randi Carroll Nelson	Major Granddaughter, 19 years of age, and Beneficiary named in Will	557 West Pinewood Drive Cedar City, Utah 84720
Sterling D. Nelson	Major Grandson, 18 years of age and Beneficiary named in Will	557 West Pinewood Drive Cedar City, Utah 84720

It further appearing to the Court that said Personal Representative of said estate has made and caused to be filed herein a First and Final Account and Report of his administration of said estate, which said First and Final Account and Report has been allowed and approved by this Court; and it further appearing that the property and cash now belonging to the estate of said deceased on hand for distribution is the property and cash designated in paragraph No. 6 of the said Petition For Final Distribution on file herein as being on hand for distribution and hereinafter described and distributed; and it further appearing to the Court that said deceased left a Last Will and Testament, which has heretofore been admitted to probate in this Court; that by the terms of which said Last Will and Testament said deceased did give and bequeath

Unofficial Copy

unto her beloved daughter, Jane S. Nelson, the sum of $5,000.00 in cash, and did give and bequeath unto her beloved son-in-law, Richard W. Nelson, the sum of $1,000.00 in cash, and that she did give, devise and bequeath unto her two beloved grandchildren, Randi Carroll Nelson and Sterling D. Nelson, all of the rest, residue and remainder of her property and assets which she owned at the time of her death, and to which she shall be entitled at the time of her death, and which remains after the said bequests to her beloved daughter, Jane S. Nelson, and to her beloved son-in-law, Richard W. Nelson, have been fulfilled, and after all of her just debts and funeral expenses, and all other financial obligations of her estate have been paid, they to take share and share alike. The Court finds that all property, cash and assets which now remain in said estate for distribution should be distributed in accordance with the terms and provisions of said Last Will and Testament, and as hereinafter set forth and provided for, and that said estate is now in a condition to be closed.

NOW THEREFORE, IT IS HEREBY ORDERED, ADJUDGED AND DECREED that all of the property, assets and cash now belonging to the estate of said Dawn G. Setzer, deceased, BE AND THE SAME IS HEREBY DISTRIBUTED to the said beneficiaries named in the said Last Will and Testament of said deceased as follows:

TO JANE S. NELSON the sum of $5,000.00 in cash.

TO RICHARD W. NELSON the sum of $1,000.00 in cash.

TO RANDI CARROLL NELSON, the sum of $5,144.57 in cash.

TO STERLING D. NELSON, the sum of $5,144.57 in cash.

TO RANDI CARROLL NELSON AND TO STERLING D. NELSON, as tenants in common, the following described real property situated in Washington County, Utah:

Unofficial Copy

Parcel 1: Commencing at the Northwest corner of Lot 80, LaVerkin Townsite & Field Survey; thence N 89°46'00" E along the North line of said Lot 80, a distance of 57.68 feet; thence S 18°08'25" E 253.91 feet; thence S 17°37'43" E 115.60 feet to Point of Beginning; thence N 89°50'25" E 57.06 feet; thence S 46°27'00" E 27.60 feet; thence S 18°03'30" E 77.41 feet to the North right-of-way line of Utah Highway SR-15; thence S 89°50'25" W 5.88 feet along said right-of-way; thence S 0°09'35" E 10.00 feet along said right-of-way; thence S 89°50'25" W 67.64 feet along said right-of-way; thence N 17°37'43" W 114.94 feet to the Point of Beginning, containing 0.184 acres, more or less.

Parcel 2: The Northwest quarter of the Southeast quarter of Section 26, Township 41 South, Range 13 West, Salt Lake Meridian, containing 40 acres, more or less.

Parcel 3: The West half of the Northwest quarter of the Northwest quarter of Section 34, Township 41 South, Range 13 West, Salt Lake Meridian, containing 20 acres, more or less.

Parcel 4: Beginning at a point 21 rods West of the Southeast corner of the Southeast quarter of the Northwest quarter of Section 34, Township 41 South, Range 13 West, Salt Lake Meridian, and running thence North 28 rods; thence 20° North of West 31 rods 7 feet; thence 15° West of South 47 rods 7 feet; thence East 47 rods 10 feet to the place of beginning, containing 8.4 acres, more or less.

Parcel 5: The South half of the Southeast quarter of Section 20, Township 42 South, Range 11 West, Salt Lake Meridian, containing 80 acres, more or less.

Parcel 6: The Northwest quarter of Section 21, Township 42 South, Range 13 West, Salt Lake Meridian, containing 160 acres, more or less.

Parcel 7: The Northeast quarter of Section 29, Township 42 South, Range 11 West, Salt Lake Meridian, containing 160 acres, more or less.

TO RANDI CARROLL NELSON AND TO STERLING D. NELSON, as tenants in common, the following described personal property:

All amounts now remaining unpaid on principal, the same being $124,164.05, and all amounts which will hereafter become due on interest on that certain Escrow Agreement, dated November 14, 1975, made and entered into by and between Dawn Setzer, Seller, and Marvin Prince and Dorothy Prince, and Clyde G. Hunt and Delora P. Hunt, Buyers, for the original principal purchase price of $140,000.00, which said Escrow Agreement is being held in Escrow in Zions First National Bank, Hurricane, Utah.

Also all amounts now remaining unpaid on principal, the same being $24,164.04, and all amounts which will hereafter become due on interest on that certain Escrow Agreement, dated November 14, 1975, made and entered into by and between Dawn Setzer, Seller, and Marvin Prince and Dorothy Prince, and Clyde G. Hunt and Delora P. Hunt,

Buyers, for the original principal purchase price of $40,000.00 which said Escrow Agreement is now being held in Escrow in Zions First National Bank, Hurricane, Utah.

Also All amounts which will hereafter become due on principal and interest on that certain Savings Certificate #356923847 issued by Zions First National Bank to Dawn G. Setzer, dated 9-14-82, payable 3-14-85, for the original principal amount of $48,413.44, and upon which Savings Certificate there is now a balance of principal and accrued interest totaling $51,598.02 now remaining unpaid.

Also one 1975 Chevrolet 2-door automobile, Identification No. IN47V5J181288.

Dated this 9th day of June, 1984.

/s/ J. Harlan Burns
District Judge

351
1400
748-7821
Randi C. & Sterling D. Nelson

1984 JUN 14 PM 2:52
262686

Unofficial Copy

SENSITIVE LANDS APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $

For Office Use Only:
File No. 2022-HIL-02
Receipt No. 8154961

Name: GVS Holdings LLC **Telephone:** 435-313-6700

Address: 748 W. Morby St., Washington, UT 84780 **Fax No.** --

Agent (If Applicable): Dwain Schallenberger **Telephone:** 435-313-6700

Email: Dwain@redrockrealestate.com **Agent Email:** Dwain@redrockrealestate.com

Address/Location of Subject Property: 1117 W. 600 N.

Tax ID of Subject Property: H-3-1-34-4400 **Zone District:** PUD (RM-2 & R1-10)

Proposed Use: (Describe, use extra sheet if necessary)

PD Overlay with RM-2 at the north end, R1-10 at the south end, and open space between.

Other companion application submitted with the Development Plan:

- [X] **Preliminary Plat**
- [ ] **Site Plan Review**
- [ ] **Conditional Use Permit**
- [ ] **Rezone**
- [ ] **Other**

Submittal Requirements:
Please review the attached Supplemental Information to determine additional information that must be submitted with this application.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete: _____ Completion determination made by: _____

DEVELOPMENT PLAN SUBMITTAL REQUIREMENTS

Development Plan Submittal: The following information shall be submitted with the application for Development Plan approval, and may be in addition to information required for a companion application being processed concurrently with the Development Plan:

X 1. Development plan: The development plan shall clearly show:

X a. Two (2) foot contours. The contour map shall be prepared and certified by a licensed professional civil engineer or surveyor drawn at a scale no smaller than one (1) inch equals one hundred (100) feet. Contour maps based on interpolation of maps with larger contour intervals are not acceptable.

X b. Field surveys may be required of the applicant by the City to verify the accuracy of the contour lines shown on the contour map.)

X c. Slopes having grades of 10-29 percent and natural slopes of thirty (30) percent or greater shall be color shaded clearly showing the difference between the two categories. This contour information shall either be computer based, or based on profile lines drawn perpendicular to contours at intervals no less than one hundred fifty (150') feet apart, nor greater than seventy-five (75') feet from an existing or proposed property line. Grades shall then be determined by calculating the slope along one hundred (100) foot segments of the profile. (See Appendix Diagram-A of the Land Use Ordinance)

X d. To determine required minimum lot size (Section 10-24-6B of the Sensitive Land Ordinance), the average natural grade on each proposed parcel shall be calculated and indicated on the development plan. The average grade is determined by calculating the grade of the natural slope between two opposing property lines, based on profiles taken perpendicular to the contours, no less than one hundred fifty (150) apart, nor greater than seventy-five (75) feet from an existing or proposed property line.

X e. The proposed development layout of lots, roads, proposed road grades, open space, area of disturbances, and existing native vegetation.

_____ 2. Soils Investigation Report: A soils investigation report which contains the following information:

_____ a. Nature, distribution and classification (Unified Soil Classification) of existing soils to the appropriate depth of influence by the proposed development, but not less than ten (10) feet deeper than the proposed excavations or to bedrock.

_____ b. Strength of existing soils, bearing capacity of supporting soils, settlement estimates, collapse and shrink-swell characteristics, lateral pressures and trench excavation limitations.

_____ c. Ground water levels that may affect development and estimated elevation of high ground water levels.

_____ d. Appropriate laboratory testing for classification, consistency, strength and consolidation conditions.

_____ e. Slope stability.

_____ f. A written statement by the persons or firm preparing the soils report describing the general suitability of the site for the owner=s intended use.

_____ 3. Geotechnical Report: A geotechnical and geological report shall be prepared by a geologist licensed to practice in the State of Utah, whenever a proposed building permit or development project:

a. Is located within one thousand (1,000) feet of an identified fault; or
b. Is located on slopes estimated to be twenty (20) percent or greater; or
c. Is determined to have potential hazards by the City Engineer, County Geologist or State Geologist.

The geotechnical and geological report when required above shall include:

_____a. A geologic map showing topography, surface and subsurface geologic features and any geologic limitations to the proposed use;

_____b. Depth to bedrock;

_____c. Subsurface investigative logs and reports;

_____d. Identification of all geologic hazards; and

_____e. Measures to mitigate or eliminate geologic hazards and problems.

X 4. Grading and Drainage Plan: A grading and drainage plan report which includes storm water management, erosion, and grading plans describing the methods by which surface water, natural drainages, flooding (including identification of 100 year flood where applicable), erosion and sedimentation loss, and hydrologic hazards will be controlled during and after construction. The plan shall include the following information:

X a. The grading plan shall show present topography, including the location and depth of all proposed fills and cuts of finished earth surfaces, and/or use of retaining walls including height, using a contour interval of two (2) foot when grades are 0-29% and five (5) foot contours when grades 30% and over.

X b. The proposed area to be graded shall be clearly delineated on the plan.

X c. Preliminary street grades shall be identified on the plan.

X d. All calculations and proposed details used for design and construction of debris basins, impoundments, diversions, dikes, waterways, drains, culverts and other water management or soil erosion control measures shall be shown. Drainage calculations shall determine runoff volume and peak discharge using the "Rational Method," "SCS Curve Number Method," or appropriate equivalent. Data provided should include:

(1) Rainfall depth, duration and distribution;
(2) Watershed slope and drainage area delineation;
(3) Land condition of watershed surface;
(4) Topography of drainage area; and
(5) Soil Descriptions in Watershed. Erosion calculations shall employ predictions of soil loss sheet erosion using the Universal Soil Loss Equation or equivalent. Data to be provided should include factors of:
(a) Rainfall intensity and duration;
(b) Soil erodability;
(c) Land slope and length of slope or topography;
(d) Condition the soil surface and land management practices in use; and
(e) Surface cover, grass, pavements, etc.

5. License Required: All required reports shall be prepared by persons licensed to practice their specialty or expertise in the State of Utah, if such license for practice is required.

6. Expert Advice: In reviewing technical reports, calculations, and plans which may be required, the City staff or City Engineer may find it necessary to obtain the advice of other experts regarding the adequacy of the reports submitted, and the validity of the conclusions and recommendations reached in the reports. In such cases the City staff or City Engineer may consult with such experts, with the reasonable costs of these consultations to be borne by the developer prior to any public hearing. The Planning Commission or City Council may require payment by the developer of the costs of such consultations as a condition of preliminary or final plat approval.

AGEC
Applied GeoTech

January 18, 2022

Attention: Dave Nasal
Email: davenasal@gmail.com

Subject: Geotechnical Consultation
Mesa Cove Subdivision
Hurricane, Utah
AGEC Project No. 2212879

Applied Geotechnical Engineering Consultants, Inc., (AGEC) was requested to conduct a geotechnical investigation for the proposed Mesa Cove Subdivision located in Hurricane, Utah as shown on Figure 1. The study is currently in progress. We have scheduled to excavate 12 exploratory test pits across the 19-acre development. A final report will be provided upon completion of the study. The report summarizes the work to date and the conditions of the site along with conclusions to the suitability of the property for the proposed development.

Site Conditions

The property is located south of 600 North and east of 1150 East in Hurricane, Utah. The property consists of undeveloped property with residential developments to the south and southwest. There is vacant property to the east and an elementary school further to the east. The north is bounded by 600 North Street.

The property slopes down to the south with approximately 120 feet of elevation change. There is a moderately steep slope through the center of the site. The property is primarily Basalt rock surface infilled with wind blown sand and silt. The site sparsely to moderate vegetated with desert grasses and brush. There is an overhead power line along the western portion of the property.

Several photos of the site are attached.

Geology

AGEC has reviewed the available literature for the property including the following:

Literature Document No. 1: Geologic Map of the Hurricane 7.5′ Quadrangle, Washington County, Utah, Map M-187, 2003, Robert F. Biek.

Literature Document No. 2: Geologic Hazards and adverse Construction Conditions, St. George-hurricane Metropolitan Area, Washington County, Utah, SS-127, 2008, Lund etal.

Based on the literature review the following conclusions are made:

1. The site geology consists of two basalt flows, the Cinder Pits Lava Flow (lower bench) and the Radio Tower Lava Flow (upper bench). The thickness of these basalt flows vary from tens of feet up to 180 feet.
2. There is minor amounts of wind blown or aeolian type deposits overlying the basalt with greater amounts along the south end of the site.
3. There are not faults on or near the property. The nearest fault, the Hurricane Fault is on the order of 1½ miles to the east.
4. The geologic hazard of Hard Rock is designated on the site that will make construction and grading difficult.

The geologic map for the site is shown on Figure 3.

Subsurface Conditions

AGEC has scheduled the excavation of 12 test pits (explorations) as shown on Figure 2. AGEC has also reviewed previous geotechnical studies in the area including:

Geotechnical Study No. 1: Geotechnical Investigation, "Valley Academy", Prepared by AGEC, Project no. 2111038, dated January 9, 2012. Located east of property and south of 600 North.

Geotechnical Study No. 2: Geotechnical Investigation, "Hurricane Elementary School", Prepared by AGEC, Project No. 2051890, dated October 16, 2008. Located east of the property north of 325 North and east of 1040 West.

Geotechnical Study No. 3: Geotechnical Investigation, "Hurricane Preschool", Prepared by AGEC, Project No. 2190861, dated June 6, 2019. Located on east side of Elementary School (Ref No. 2).

In addition, several other residential developments in the area were investigated by AGEC.

Based on our experience and review of the property, the basalt caprock visible throughout the site will be the dominant soil/rock type on the property. Based on previous borings to the east, the rock extends at least 22 to 23 feet below the surface. Typical excavator refusal has been encountered at depths varying from approximately 1 to 13 feet below the surface.

Groundwater was not encountered, nor anticipated throughout the property.

Proposed Construction

The property consists of approximately 19 acres and is to be developed with two types of residential product. The lower portion will have 27 single family lots approximately ¼ acre in size and the upper bench or portion will have 65 townhomes based on the Preliminary Plat map provided by Mainline Engineering. (See Figure 2a). We also understand that 1150 West will be constructed along the west side of the property. The roadway will be a 60 foot right of way (ROW). This roadway will require significant grading, cutting and filling with approximately 120 feet of elevation change from north to south. There are also several other public roads (52-foot ROW) throughout the development. We also anticipate that 600 North will require widening. There will be other public improvements through the property.

Conclusions

Based on the review of the various items noted above, the following conclusions are noted:

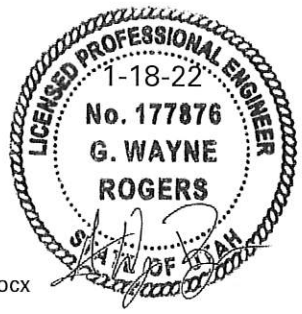
1. The site is suitable for the proposed development. No geologic hazards other than hard rock for excavation purposes are noted on the property.
2. The site will require significant cuts and fills, primarily for the construction of 1150 West Street. We anticipate the cuts will be in basalt caprock. Fills will require processing (screening and/or crushing) of the rock to use as fill. The on-site rock may be used as rockery wall rock for retaining purposes.

Limitations

AGEC will be providing a final report upon completion of the field exploration and the necessary laboratory testing. The information within this report may be used for review and preliminary design details.

Sincerely,

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.



G. Wayne Rogers, P.E.

P:\2021 PROJECT FILES\2212800\2212879 - MESA COVE (HURRICANE 19 ACRES)\GEOTECHNICAL CONSULTATION LETTER.DOCX

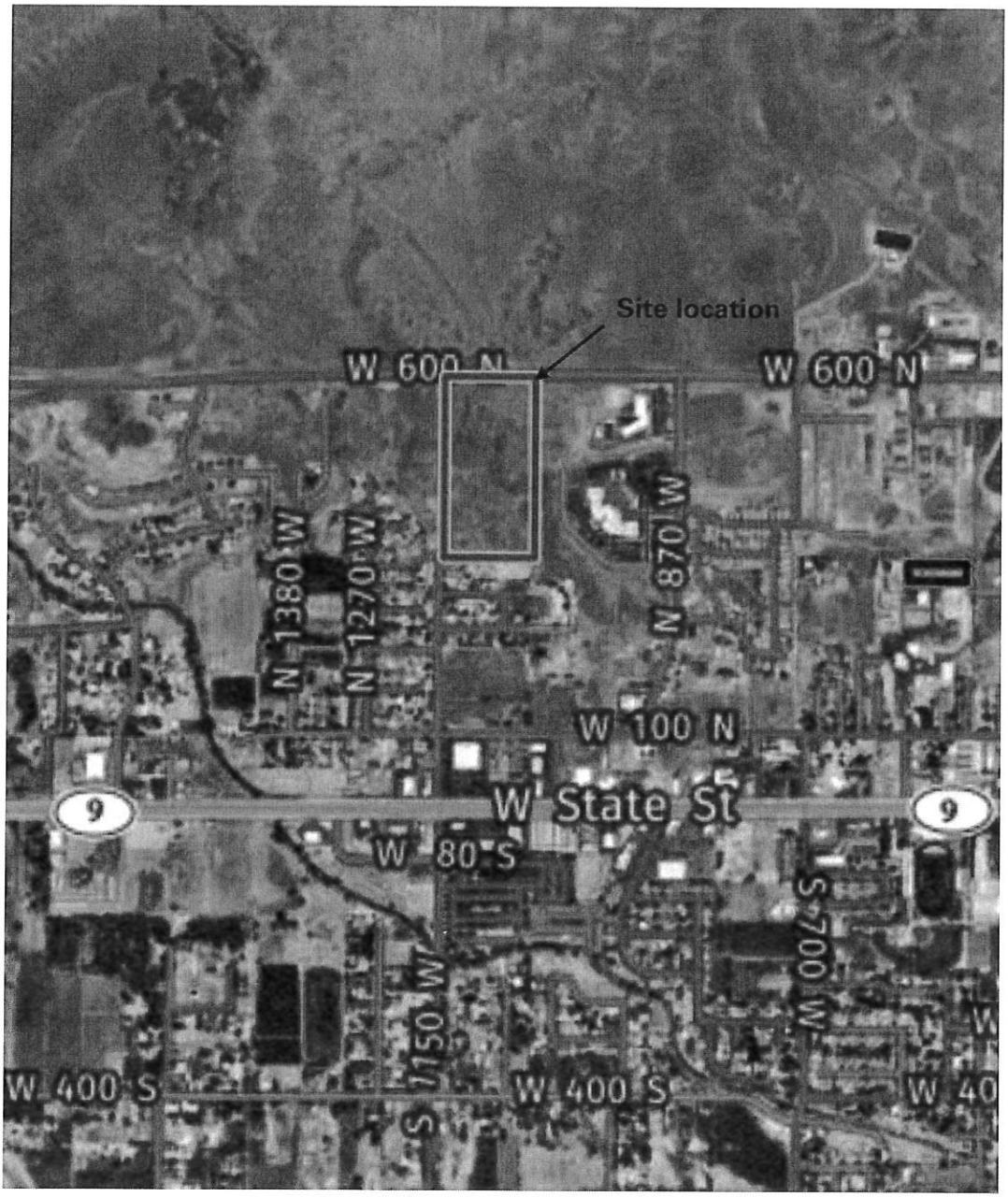


Figure 1, Site location Map

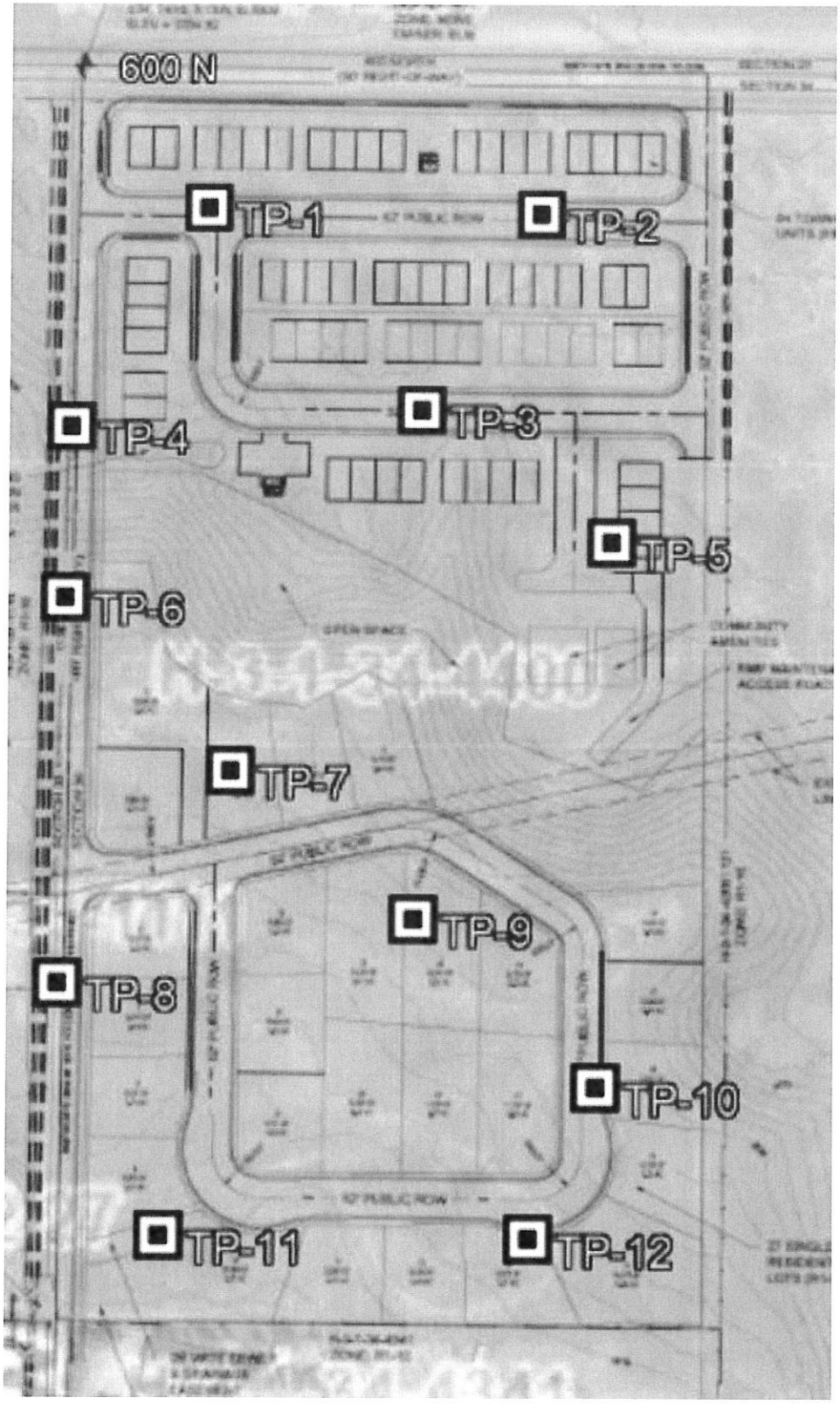


Figure 2, Proposed Exploration Map

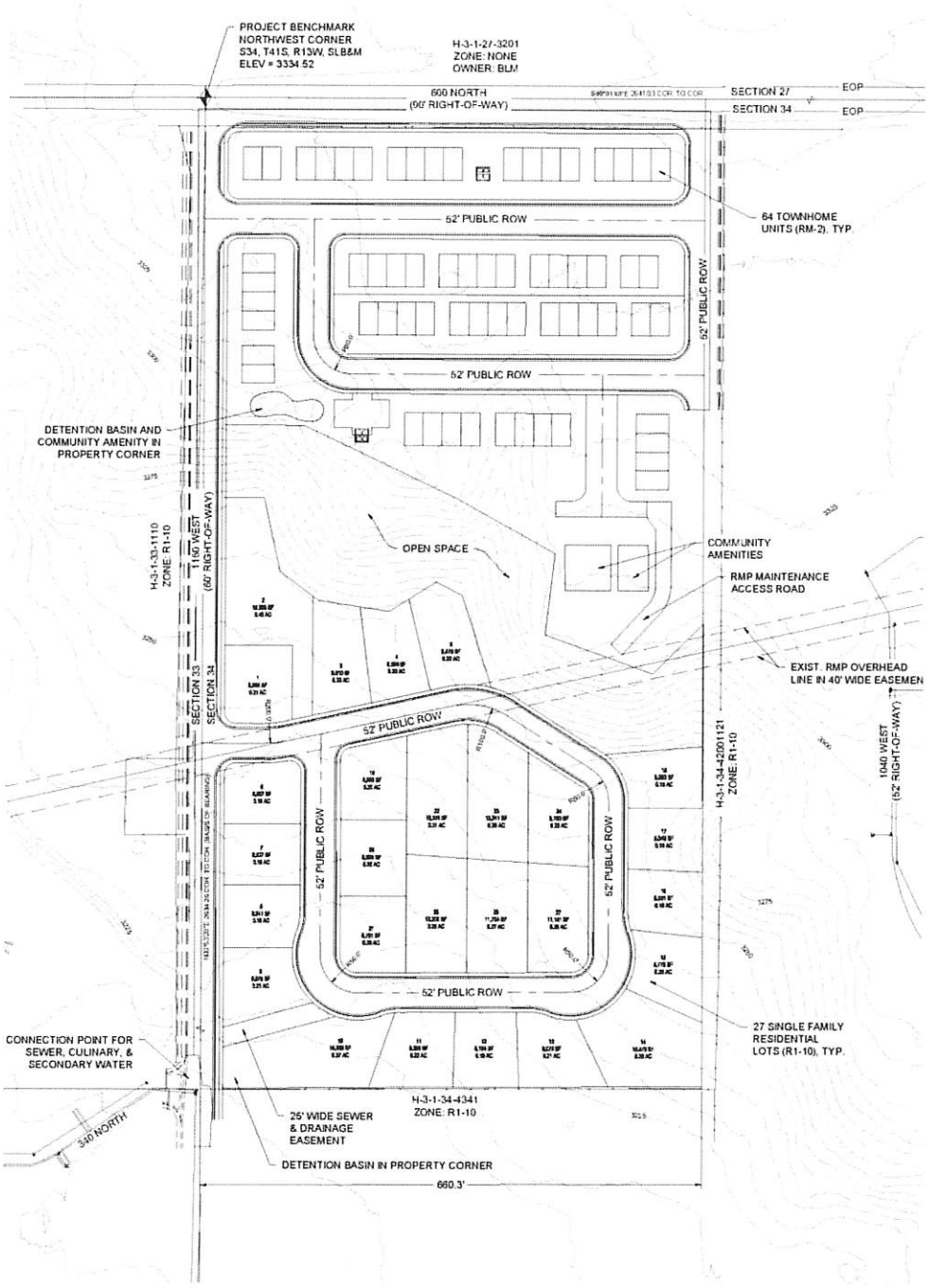


Figure 2a, Preliminary Plat Map with topography

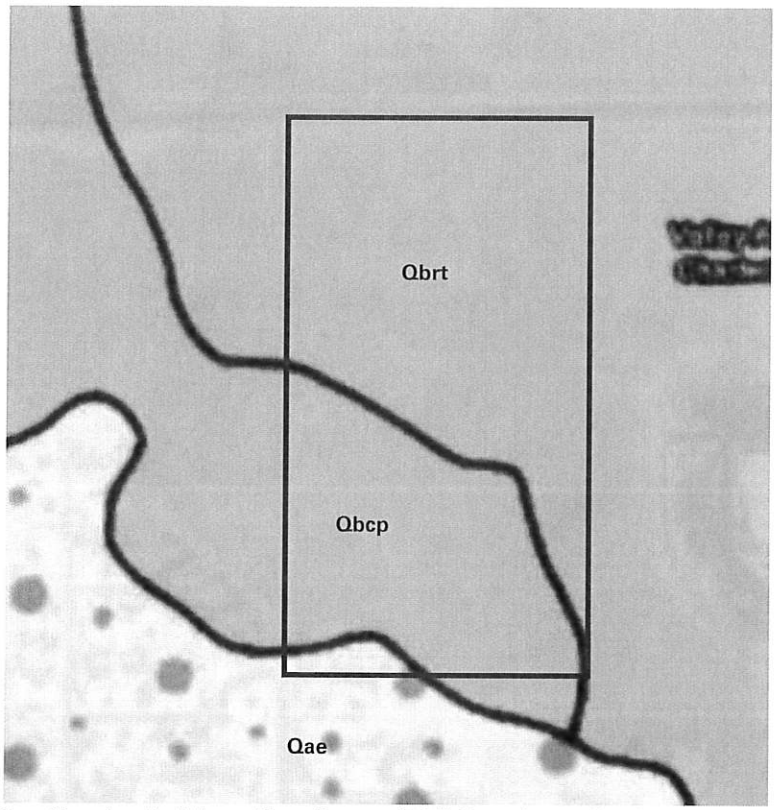


Figure 3 – Geologic Map, Hurricane 7.5' Quadrangle, M-187, Biek 2003

Key to Map:

Qbcp: **Cinder pits lava flow (middle Pleistocene),** Medium- to dark-gray, fine grained basalt (Qbcp) with small olivine phenocrysts; yielded an 40Ar/39Ar age of 0.24 +_ 0.02 Ma (Biek, 2003b); erupted from vents at two overlapping cinder cones (Qbcpc) northwest of Hurricane; lava flow is as much as several tens of feet thick.

Qbrt: **Radio tower lava flow (middle Pleistocene),** Medium- to dark-gray, fine-grained basalt to Basanite (Qbrt) with small olivine penocrysts; erupted from vents at four overlapping cinder cones (Qbrtc) west of Hurricane; yielded an 40Ar/39Ar plateau age of 0.14+_ 0.06 Ma (0.13+_ 0.07 Ma isochron), (Biek 2003b); lava flow is as much as 180 feet (55m) thick where it fill the ancestral Virgin River Channel.

Qae: **Alluvial and eaolian deposits (Holocene to upper Pleistocene),** Moderately sorted gravel, sand and silt deposited in small channels and on alluvial flats, and well-sorted, fine-to medium-grained, reddish-brown eaolian sand locally reworked by alluvial processes; younger deposits (Qaeo) typically form incised, inactive surfaces; as much as about 20 feet (6 m) thick.

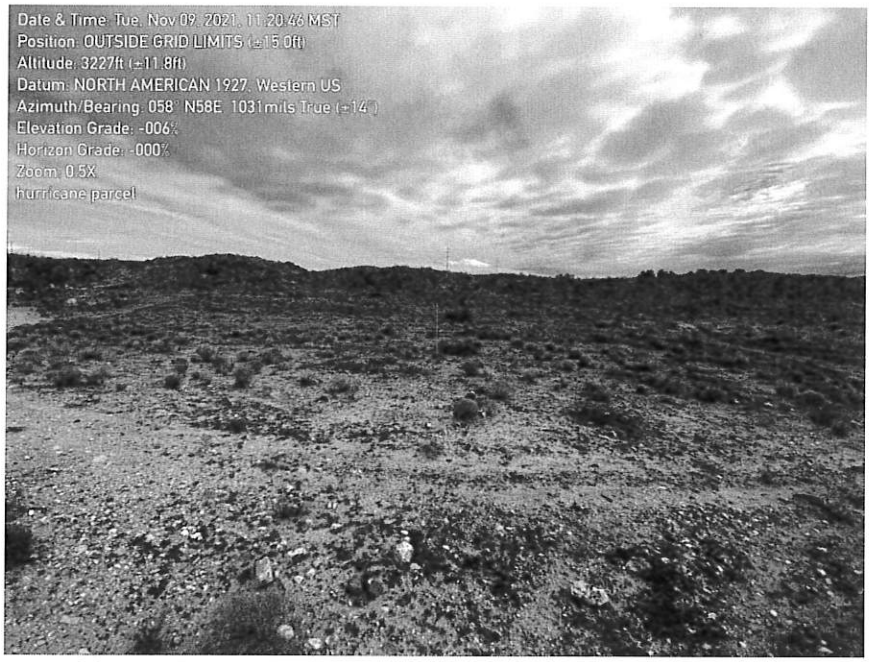


Photo No. 1, View of property looking NE from SWC

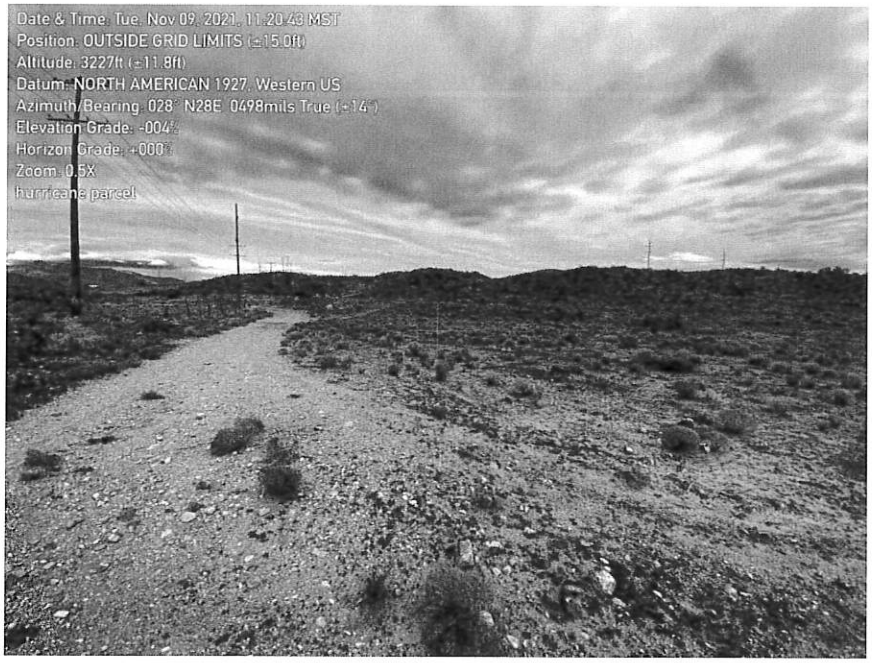


Photo No. 2, View of property looking north from SWC

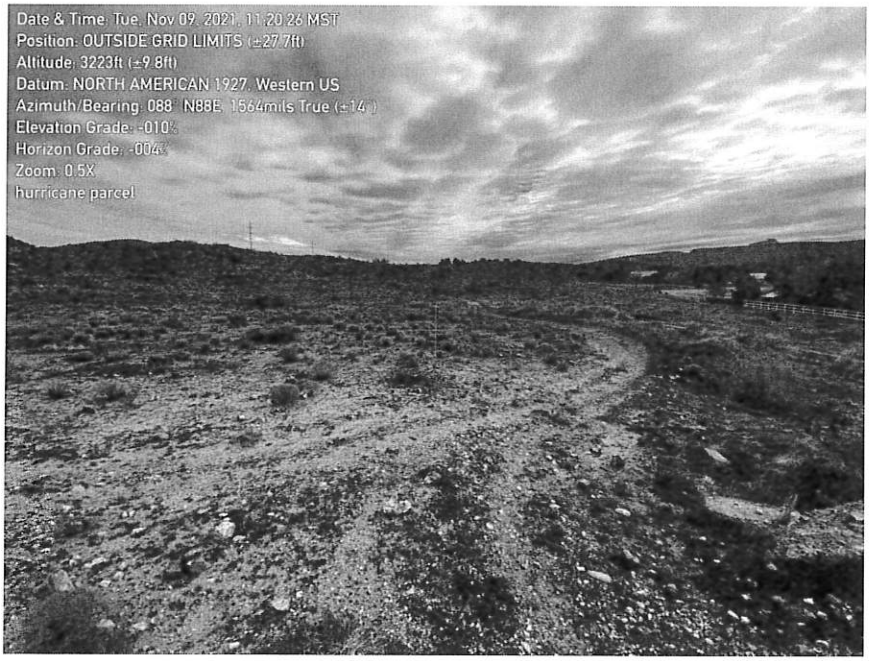


Photo No. 3, View of property looking east from SWC

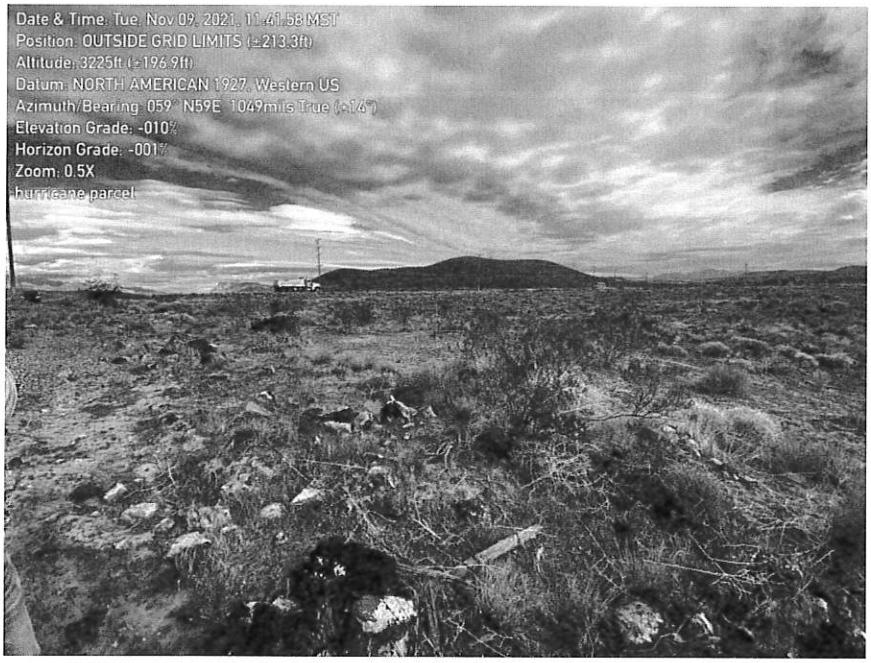


Photo No. 4, View of property looking NE from near West to NWC.

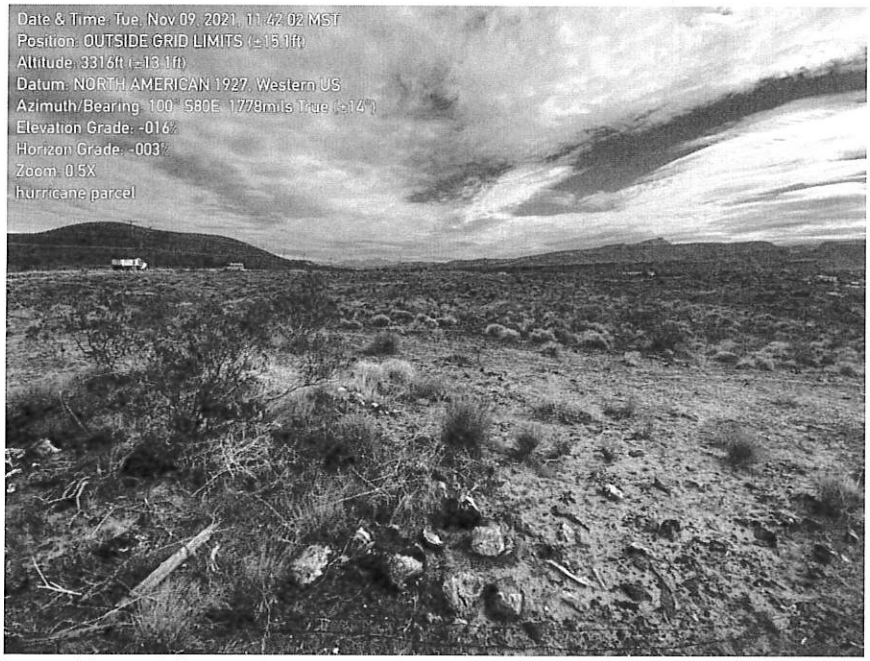


Photo No. 5, View of property looking east from near west center.

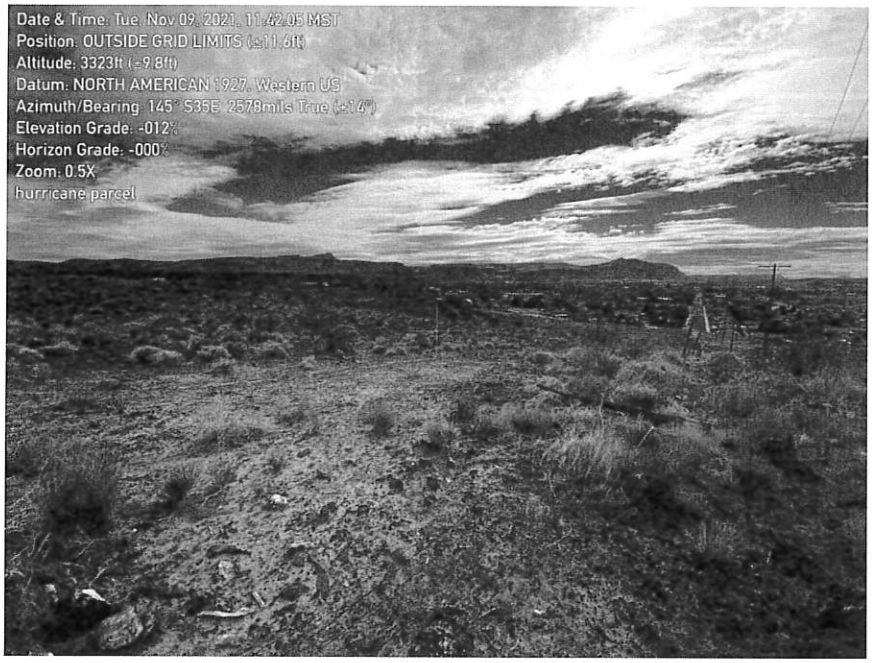


Photo No. 6, View of property looking south along west property boundary.

Preliminary
Drainage Study Report

Mesa Cove Subdivision

Owner:
GVS Holdings LLC

Prepared by:
Mainline Engineering LLC
Taylor Ricks, PE
321 N. Mall Drive, Ste. T101
St. George, UT 84790
435-669-2261

Prepared January, 2022

Table of Contents

Section 1: Introduction 4

1.1 Background 4

1.2 Purpose and Need 4

1.3 Reference Materials 4

Section 2: Property Description 4

2.1 Existing Property Description 4

2.2 Proposed Property Improvements 5

Section 3: Off-Site Drainage Description 5

Section 4: On-Site Drainage Description 5

Section 5: FEMA Floodplain Requirements 6

Section 6: Other Drainage Studies Affecting the Property 6

Section 7: Description of Proposed Drainage Facilities 6

7.1 Grading 6

7.2 Roadway Improvements 6

7.3 Conveyance Improvements 6

Section 8: Compliance with Local and FEMA Requirements 7

Section 9: Design Runoff Computations 7

9.1 Selection of Hydrologic Model 7

9.2 Model Input Parameters 7

9.3 Curve Number 7

9.4 Watershed Area 8

9.5 SCS Lag Time 8

9.6 Rainfall Depth 8

9.7 Time Distribution of Rainfall 8

9.8 Model Output 9

Section 10: Drainage Facility Design Calculations 9

10.1 Storm Improvements 9

10.2 Roadway Improvements 9

10.3 Detention Requirements 9

Section 11: Required Drainage Easement and Rights-of-Way 10

Section 12: FEMA Floodway and Floodplain Calculations 10

Section 13: Conclusions and Statement of Compliance 10

13.1 Conclusions 10
Appendix A – Figures, References & Calculations 12
Figure A1 Preliminary Plat (Location and Layout) 12
Figure A2 Existing Drainage Conditions 12
Figure A3 Developed Drainage Conditions 12
Figure A4 Floodplain Boundary Map (FIRM) 12
Figure A5 Soils Map 12
Figure A6 NOAA Atlas 14 Site-Specific Precipitation Frequency 12
Figure A7 Unimproved Site Conditions 12
Figure A8 Improved Site Conditions 12
Figure A9 Modified Type II Storm 3-Hour Rainfall Data (Farmer Fletcher Distribution) 12
Figure A10 SCS Rainfall Data & Detention Routing 12
Figure A11 Orifice Sizing / Discharge Pipe Size Calculator (not included with draft) 12
Figure A12 Detention Outfall – Storm Drain Pipe Sizing (not included with draft) 12
Figure A13 Detention Basin and Discharge Layout (not included with draft) 12

Section 1: Introduction

1.1 Background

The following Drainage Control Plan and Report is submitted in support of the proposed Mesa Cove Subdivision, located in Hurricane, Utah in the west half of the northwest ¼ of the northwest ¼ of Section 34, Township 41 South, Range 13 West, Salt Lake Base and Meridian.

1.2 Purpose and Need

This report has been prepared to evaluate the drainage needs affecting the proposed construction of the project site. The 20-acre subdivision with a PD-Overlay will consist of two densities including RM-2 at the north (64 townhomes units) and R1-10 to the south (27 residential lots) and associated streets. The purpose of this study is to:

- determine the drainage patterns of the stormwater within the proposed site improvements, both prior to, and following, project construction;
- estimate peak runoff amounts and subsequent storage capacity for stormwater detention; and
- design hydraulic improvements as required by Hurricane City Standards.

1.3 Reference Materials

This study references and demonstrates compliance with the following published documents:

- Hurricane City General Plan dated December 2011
- Hurricane City Drainage Manual dated June 2008
- Hurricane City Storm Drain Master Plan dated June 2008

Additional reference materials prepared as part of this report can be found in the following appendices:

- Appendix A, Figures, Maps, and Calculations

Section 2: Property Description

2.1 Existing Property Description

The undeveloped site is covered in native vegetation with varying slopes draining from northeast to southwest. There is a steep slope that bisects the site side west to east, is approximately 60-70 feet tall, and runs at a 2:1 slope. The site consists primarily of gravelly and rocky soils with shallow bedrock. The site discharges to the existing 1150 West street. See Appendix A, Figure 2 for existing watershed boundary and topographic information. The site is relatively steep with slopes ranging from 5% to 50%.

Bordering properties including 1150 West street to the west, 600 North street to the north, Valley Charter school to the east, residential (R1-10) to the south.

The subject site is part of the Gould Wash North (GN) as defined in the Hurricane City Storm Drain Master Plan. The Gould Wash Basin encompasses most of the northeast downtown area.

There are no existing irrigation facilities that flow through or directly adjacent to the subject site that would be impacted by development. Similarly, there are no facilities downstream of the subject site that would be impacted by proposed local drainage improvements.

2.2 Proposed Property Improvements

The proposed Mesa Cove Subdivision has a PD Overlay with RM-2 zoning on the north half consisting of 64 townhome units and R1-10 zoning on the south half consisting of 27 residential lots. The improvements total approximately 20 acres with 7.78 acres in the north basin and 16.30 acres in the south basin. These lot sizes and the planned roadways comply with Hurricane City's current General Plan. There are no existing irrigation facilities on the site and no downstream irrigation facilities that will be negatively impacted by modification of the drainage patterns within the local site.

Roadways within the proposed development and adjacent to the proposed development include the following:

- 1150 West is a collector roadway (60' ROW) running north/south along the west boundary of the proposed subdivision. It will be widened along the proposed project frontage.
- 600 North is an arterial roadway (90' ROW) running west/east along the north boundary of the proposed subdivision. It will be widened along the proposed project frontage.
- All proposed roadways within the subdivision will be 50' ROW local public roadways.

Existing private property borders the project to the east and south. Neither of these properties will be improved with this project. The proposed site grading plan will convey water through the subdivision by a combination of lot grading and street improvements to two detention facilities located at the low point of the subdivision basins at the southwest corner of each sub basin. All streets will have a minimum running slope of 0.5% and a cross slope of 2%. Detention will be used to limit offsite discharges which will outfall to the existing surface drainage in 1150 West.

Refer to Appendix A, Figure A3 for developed conditions.

Section 3: Off-Site Drainage Description

Due to the existing topography, there are no offsite sheet flow or point discharges onto the proposed subdivision from the north. There is a small pie-shaped piece to the east that flows to and across the existing property. All drainage leaves the project to the south and west. There are no other storm drain systems, washes, or conveyance that need to be considered with the project.

Section 4: On-Site Drainage Description

The undeveloped site drains to the south and west boundaries. There is no existing storm infrastructure adjacent to the project site and all storm water from the project site surface flows down 1150 West street to the south.

The proposed site grading plan will continue to convey water to the south and west through the subdivision by a combination of lot grading, street improvements, and surface swales. Both the existing site and the developed site were modeled as two separate sub basins (upper/north and lower/south) given the two distinct elevation differences between the two. A composite curve number was used to represent each of the sub basins within the site.

Section 5: FEMA Floodplain Requirements

According to the FEMA Flood Insurance Rate Map number 49053C0845G, dated April 2, 2009 the site is located in Zone X. Zone X is defined as "Area of Minimal Flood Hazard" or "Areas Determined to be Outside the 0.2% Annual Chance Floodplain". The web-based dynamic FIRM is located in Appendix A as Figure A4. This site is not located in any floodplain or floodways as designated by FEMA.

Section 6: Other Drainage Studies Affecting the Property

With the exception of regional studies including the Hurricane City Storm Drain Master Plan, there are no other drainage studies that are specific to the subject site that would need to be considered as part of the evaluation herein.

Section 7: Description of Proposed Drainage Facilities

The proposed project drainage improvements will include site grading and roadway improvements. All proposed interior drainage improvements were designed in accordance with the Hurricane City Drainage Manual using the 10-year, 24-hour storm event runoff values for the minimum initial system (storm drain) and the 100-year, 24-hour storm even runoff values for the major system (roadways). Detention was designed for the 24-hour event. An emergency spillway will be provided to discharge twice the 100-year undetained peak flow. Refer to Appendix A for output tables and worksheets.

The proposed improvements comply with the Storm Water Master Plan Report which shows improvements to the Gould's Wash North (GN-2) south and west of the subject site (Figure 6-1-A in the Master Plan). The Master Plan does not show any uncompleted project improvements within the proposed subdivision or directly adjacent to the proposed subdivision.

7.1 Grading

The proposed grading plans include the establishment of proposed building pads to be above the street flow lines in accordance with Hurricane City requirements.

7.2 Roadway Improvements

There are currently no roadways within the proposed site. Planned roads will be built to convey the 100-year, 3-hour storm event inside the right-of-way.

7.3 Conveyance Improvements

No significant conveyance improvements will be constructed with this project.

Section 8: Compliance with Local and FEMA Requirements

The hydrologic calculations, hydraulic design, and construction recommendations summarized in this report were performed in accordance with standard and accepted engineering practice. Other calculations, design methods, and assumptions utilized in this report not specifically addressed in the Hydrology Manual or by FEMA were based on civil engineering practices acceptable to the industry, with specific references cited in the report. No part of this project is located within, or adjacent to, a floodplain designated by FEMA.

The only deviation from the Hurricane City Drainage Manual was to use site-specific rainfall data from the NOAA Atlas 14 rather than a generic city-wide rainfall event. No other deviations from the processes approved in the Drainage Manual were made during the analysis of the subject site or preparation of this report.

Section 9: Design Runoff Computations

9.1 Selection of Hydrologic Model

Storm run-off (or discharge) resulting from a precipitation event is the portion of the rainfall that remains after losses from reservoir storage, interception by vegetation, and infiltration into the soil. The amount of rainfall that is lost depends on soil type and moisture content, vegetation type and cover density, rainfall rate and duration, and amount and location of impervious surfaces. Several methods have been developed for estimating the run-off rate and volume from a watershed in response to rainfall when statistical information is not available. The NRCS WinTR-55 software was used for the evaluation in this study.

9.2 Model Input Parameters

The input parameters selected for computing discharge were derived in accordance with procedures developed by the City of Hurricane. The model uses the following input parameters to compute peak flow runoff values for each sub-area evaluated:

- SCS Curve number, used to estimate loss rates and resulting storm water run-off excess, based on soil type, land use and vegetation type and cover density.
- Watershed area
- SCS Lag Time, the time required for a particle of water to flow hydraulically from the most distant point in the watershed to the outlet or design point.
- Rainfall depth for a given storm duration.
- Time distribution of rainfall, describes how the total rainfall depth is distributed over the storm duration.

9.3 Curve Number

Table 9-1 lists the estimated SCS run-off curve number for the pre- and post-developed site, which is based upon soil type, land use, vegetation type, and vegetation cover density. Site soil type was identified as Soil Group D using the NRCS Soils Hydrologic Soil Group (HSG) county map. The post-developed site consists of residential development of both townhomes and single family residential lots.

9.4 Watershed Area

The watershed boundary was delineated for both the existing site and the proposed developed site, and is illustrated in Appendix A, Figures A2 and A3, and summarized in Table 9-2.

9.5 SCS Lag Time

Watershed lag time (t_p) is the time from the center of mass of rainfall excess to the peak of the storm runoff hydrograph. This was determined using the SCS lag equation and are summarized in Table 9-2. Watershed calculations can be found in Appendix A. For this model, the kinematic wave method was used to simulate rainfall runoff routing. This method simulates the travel time for overland flow, gutter flow and collector pipe flow. Utilizing this method in WinTR-55 will attenuate and translate basin rainfall to runoff.

9.6 Rainfall Depth

A 100-year, 3-hour cloudburst design storm was used to determine peak flows at the site. 10-year and 100-year, 24-hour design storms were calculated to evaluate storm runoff detention volumes. The NOAA Atlas 14 was used to obtain site-specific precipitation for the 3-hour, 100-year rainfall depth of 1.89 inches, the 24-hour, 10-year rainfall depth of 1.86 inches, and the 24-hour, 100-year rainfall depth of 2.76 inches.

9.7 Time Distribution of Rainfall

The Farmer-Fletcher distribution was used for the 3-hour 10-year and 100-year events. The SCS Type II distribution was used for the 24-hour, 100-year event. Table 9-2 summarizes additional model input data that was used to calculate the storm data.

TABLE 9-1 - CURVE NUMBER DEVELOPMENT

		Basin							
		Pre Development				Post Development			
		Upper Basin		Lower Basin		Upper Basin		Lower Basin	
Cover Type	CN	Area (SF)	% Area	Area (SF)	% Area	Area (SF)	% Area	Area (SF)	% Area
Undeveloped (Desert, fair)	86	338,810	100%	710,070	100%	0	0%	319,154	45%
Natural Desert Landscaping	88					76,536	23%	114,369	16%
Lawn	80					51,024	15%	114,369	16%
Impervious Area	98					211,250	62%	162,179	23%
Total (SF)		**338,810**		**710,070**		**338,810**		**710,070**	
Total (Ac)		**7.78**		**16.30**		**7.78**		**16.30**	
Weighted CN			**86**		**86**		**93**		**88**

TABLE 9-2 - SUB-BASIN CHARACTERISTICS AND MODEL INPUT						
Basin Name	Area		Avg Slope	SCS Curve #	Longest Length	t_c
	(ac)	(sq mi)	%		L_0 (Feet)	(min)
Upper Pre-Dev	7.78	0.012	10.25%	86	747	11.8
Lower Pre-Dev	16.30	0.025	8.74%	86	1,472	12.4
Upper Post-Dev	7.78	0.012	6.93%	93	1,933	12.6
Lower Post-Dev	16.30	0.025	8.43%	88	1,211	6.7

9.8 Model Output

Table 9-3 provides detail for the model output including maximum discharge rates, piped flow rates, and detention discharge rates. The routing of 24-hour flows (10 year & 100 year) was performed in Microsoft Excel using time-data output from the WinTR-55 model for post-developed flows and is shown in the appendices.

TABLE 9-3 - PEAK FLOWS				
	UPPER BASIN		LOWER BASIN	
STORM EVENT	PRE-DEV PEAK FLOW (CFS)	POST-DEV ENTERING DETENTION BASIN (CFS)	PRE-DEV PEAK FLOW (CFS)	POST-DEV ENTERING DETENTION BASIN (CFS)
10-YR, 24-HR	7.7	12.0	15.9	21.0
100-YR, 3-HR	18.0	28.6	37.8	43.5
100-YR, 24-HR	15.2	20.1	31.3	39.5

Section 10: Drainage Facility Design Calculations

10.1 Storm Improvements

Onsite runoff from the 10-year, 24-hour storm event will be contained within the streets without overtopping the curb and will be captured by a sidewalk pass-through and conveyed via a new swale to the onsite detention basins.

Storm drain improvements will be maintained by access through 20' minimum width maintenance access easements.

10.2 Roadway Improvements

Runoff from the 100-year, 24-hour storm event will be contained in the interior streets without overtopping the curb.

10.3 Detention Requirements

The 10-year, 24-hour storm event will be discharged from the detention basin using appropriately sized orifices. The 100-year, 24-hour storm event requires 2,387 cubic feet of detention for the upper basin and 1,808 cubic feet of detention for the lower basin. This detention will be accommodated by two

onsite detention basins located at the southwest corner of each subbasin within the subdivision. To control the discharge from the detention basin area, an outlet structure will be constructed including accommodations for initial discharge, overflow discharge, and emergency overflow. A circular 18-inch pipe outlet will accommodate discharge flows from each detention basin. Calculation sheets are included in the appendix.

Access to the detention basin for maintenance of the facilities will be from 1150 West which borders the proposed basins on the west side.

Section 11: Required Drainage Easement and Rights-of-Way

The following easements will be required to accommodate drainage:

- A 25' wide no-build drainage easement between Lots 9 and 10 (centered on the property line) to accommodate the sewer and storm water outfall from the R1-10 development.
- An 20' unobstructed easement through the common space located at the southwest corner of the townhome development.

No additional easements or rights-of-way will be required beyond the use of public street rights-of-way for storm drainage collection and conveyance.

Section 12: FEMA Floodway and Floodplain Calculations

This site is not located in or next to any floodplain or floodways as designated by FEMA. Refer to Sections 5 and 8 for a detailed description.

Section 13: Conclusions and Statement of Compliance

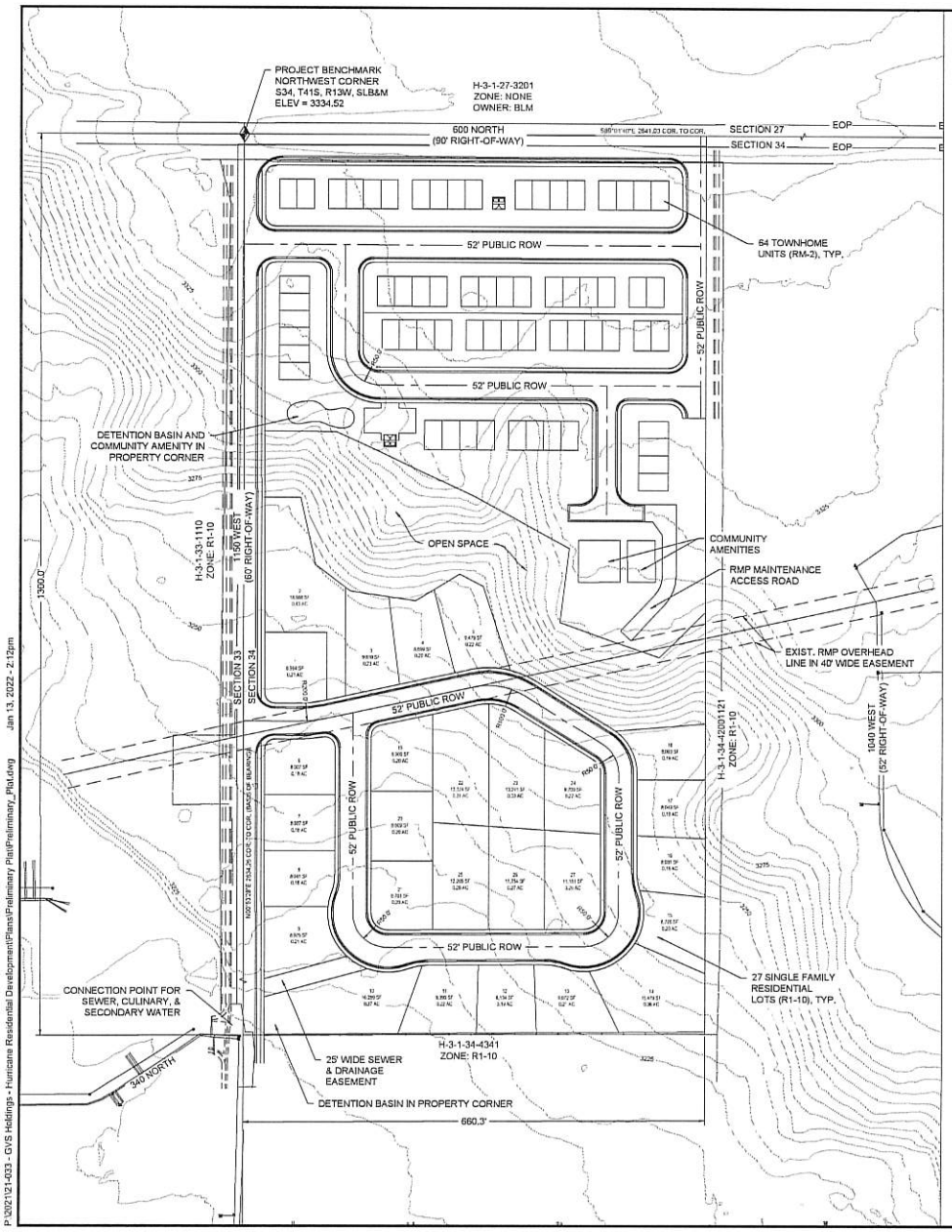
13.1 Conclusions

The following conclusions summarize the recommendations proposed for this development:

A. Offsite Drainage: A small area to the east of the project is considered as part of the drainage basin associated with this project.
B. Onsite Drainage: Storm water will be collected in interior streets. Runoff from the subdivided lots will run southwesterly through the public rights-of-way to the southwest corner of each sub basin (upper/north and lower/south) where it will be collected at the low point in the roadway and discharged into the onsite detention basin via a surface swale. Detention basins will be discharged at pre-development rates to the 1150 West right-of-way.
C. Detention Requirements: Total volume for the upper/north basin was calculated as 2,387 cubic feet and the lower/south basin was calculated as 1,808 cubic feet. Additional capacity will be provided for freeboard and an emergency spillway.
D. FEMA Floodplain: This site is not located inside any floodplains designated by FEMA.

Appendix A – Figures, References & Calculations

Figure A1 Preliminary Plat (Location and Layout)
Figure A2 Existing Drainage Conditions
Figure A3 Developed Drainage Conditions
Figure A4 Floodplain Boundary Map (FIRM)
Figure A5 Soils Map
Figure A6 NOAA Atlas 14 Site-Specific Precipitation Frequency
Figure A7 Unimproved Site Conditions
Figure A8 Improved Site Conditions
Figure A9 Modified Type II Storm 3-Hour Rainfall Data (Farmer Fletcher Distribution)
Figure A10 SCS Rainfall Data & Detention Routing
Figure A11 NRCS Soil Data and Properties
Figure A12 RUSLE Erosion Analysis
Figure A13 Orifice Sizing / Discharge Pipe Size Calculator (not included with draft)
Figure A14 Detention Outfall – Storm Drain Pipe Sizing (not included with draft)
Figure A15 Detention Basin and Discharge Layout (not included with draft)



PRELIMINARY PLAT OF

MESA COVE

SUBDIVISION

JANUARY, 2022

PLAT DATA

LOCATION & BOUNDARY: THE WEST HALF OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13 WEST, SALT LAKE BASE AND MERIDIAN LESS THE FOLLOWING:
ALL OF THE NORTH 37.50 FEET OF THE WEST ONE-HALF OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13 WEST OF THE SALT LAKE BASE AND MERIDIAN BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT THE NORTHWEST CORNER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13WEST OF THE SALT LAKE BASE AND MERIDIAN AND RUNNING THENCE ALONG THE NORTH LINE OF SAID SECTION NORTH 89°51'47" EAST 660.29 FEET; THENCE SOUTH 00°14'22" EAST 37.50 FEET TO A POINT ON A LINE 37.50 FEET DISTANT AND PARALLEL TO SAID NORTH SECTION LINE; THENCE ALONG SAID PARALLEL LINE SOUTH 89°51'47" WEST 660.31 FEET TO A POINT ON THE WEST LINE OF SAID SECTION; THENCE ALONG SAID WEST LINE NORTH 00°12'38" WEST 37.50 FEET TO THE POINT OF BEGINNING.

PARCEL IDS: H-3-1-34-4402

ZONING: PUD WITH RM-2 (NORTH) AND R1-10 (SOUTH)

PARCEL AREA: 19.16 ACRES

PLATTED AREA: 19.16 ACRES

TOTAL LOTS: RM-2 (NORTH): 64 UNITS
R1-10 (SOUTH): 27 LOTS
TOTAL: 91 UNITS/LOTS

BENCHMARK: NORTHWEST CORNER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13 WEST, SLB&M, AN EXISTING STONE AT ELEVATION 3334.52.

CURRENT OWNERSHIP: NELSON STERLING D & RANDI C
9447 MECKAILEE CV
SANDY, UT 84094-3682

TORTOISE: THE ENTIRE PARCEL LIES WITHIN DESERT TORTOISE TAKE AREA 7 OF THE RED CLIFFS DESERT RESERVE.

GEOTECH: ACCORDING TO HURRICANE CITY GIS MAPPING, THE SUBJECT PARCEL HAS A SIGNIFICANT AMOUNT OF SHALLOW BEDROCK AND CALICHE. THERE ARE NO OTHER ANTICIPATED GEOTECHNICAL CHALLENGES. A FULL GEOTECHNICAL INVESTIGATION WILL BE COMPLETED AND ALL RECOMMENDED MITIGATION WILL BE INCORPORATED IN TO THE CONSTRUCTION DRAWINGS.

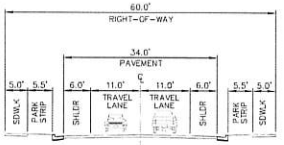
DRAINAGE: ALL STORM WATER FOR THE RM-2 SECTION WILL DRAIN TO A DETENTION BASIN IN THE SOUTHWEST CORNER OF THE TOWNHOMES AND STORM WATER IN THE R1-10 SECTION WILL DRAIN TO A DETENTION BASIN IN THE SOUTHWEST CORNER OF THE PROPERTY.

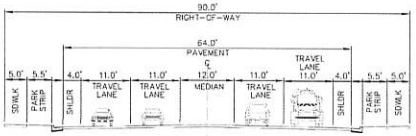
EASEMENTS: A 10' PUBLIC UTILITY EASEMENT WILL BE ASSIGNED ALONG ALL STREET-SIDE PROPERTY LINES. THIS EASEMENT WILL BE RESERVED FOR BOTH PUBLIC UTILITY AND COMMUNICATIONS INFRASTRUCTURE. A PUBLIC SEWER AND STORM DRAIN EASEMENT WILL BE RECORDED BETWEEN LOTS 9 & 10.

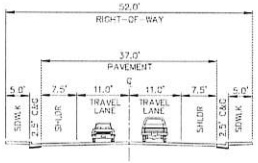
ROAD GRADES: 1150 WEST WILL HAVE A MAXIMUM GRADE OF 16%, AS COORDINATED WITH HURRICANE VALLEY FIRE, ALL INTERNAL ROADS FRONTING HOMES WILL HAVE A MAXIMUM GRADE OF 10% OR LESS FOR EMERGENCY SERVICE ACCESS.

HURRICANE CANAL COMPANY: THERE ARE NO HURRICANE CANAL FACILITIES WITHIN THE LIMITS OF THE PROJECT. THERE ARE NO KNOWN WELLS OR SEEPS ON THE PROPERTY.

WATER AND SEWER SERVICE: THE PROPERTY CAN BE SERVED BY HURRICANE CITY FOR WATER AND ASH CREEK SPECIAL SERVICE DISTRICT FOR SEWER BASED ON THE INITIAL JUC COMMENTS RECEIVED IN CONJUNCTION WITH THE ZONE CHANGE IN EARLY DECEMBER, 2021.

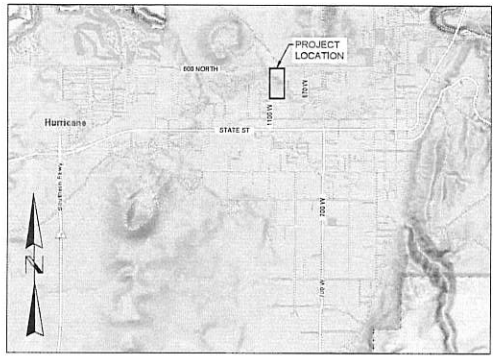








GRAPHIC SCALE
80 0 80 160
(IN FEET)



VICINITY MAP

MAINLINE ENGINEERING
MAINLINE ENGINEERING
2302 HILLCREST DRIVE
SUITE 110
ST. GEORGE, UT 84790

GVS HOLDINGS LLC
DAVID SCHWARZENBERGER
748 N. MORBY ST.
WASHINGTON, UT 84780

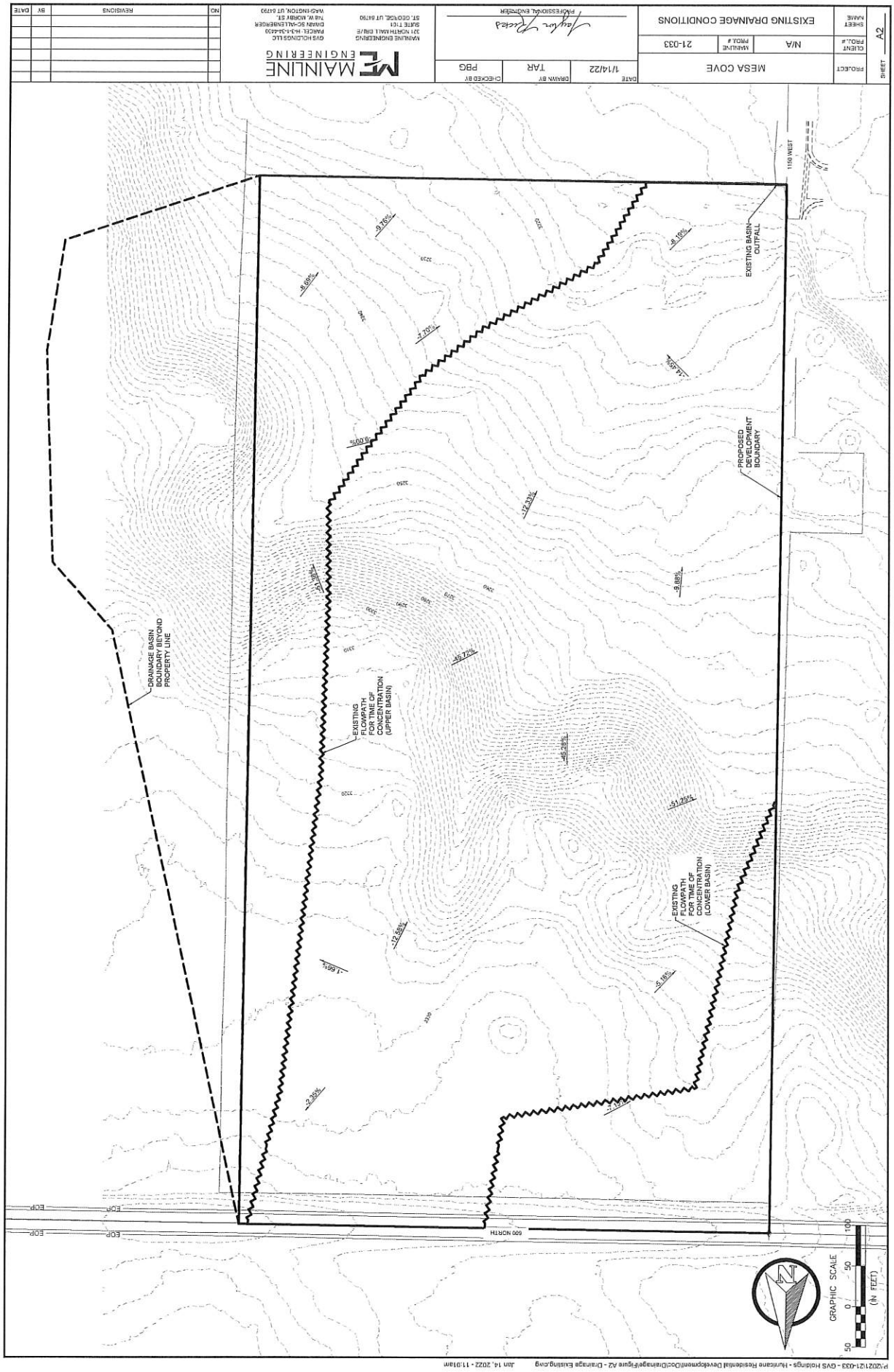
NO.	REVISIONS	BY	DATE

DATE 1/13/22
DRAWN BY TAR
CHECKED BY PBG

PROFESSIONAL ENGINEER

PROJECT MESA COVE
CLIENT PROJ.# N/A
MAINLINE PROJ.# 21-033
SHEET NAME PRELIMINARY PLAT
SHEET PRELIM

P:\2021\21-033 - GVS Holdings - Hurricane Residential Development\Plans\Preliminary Plat\Preliminary_Plat.dwg Jan 13, 2022 - 2:12pm



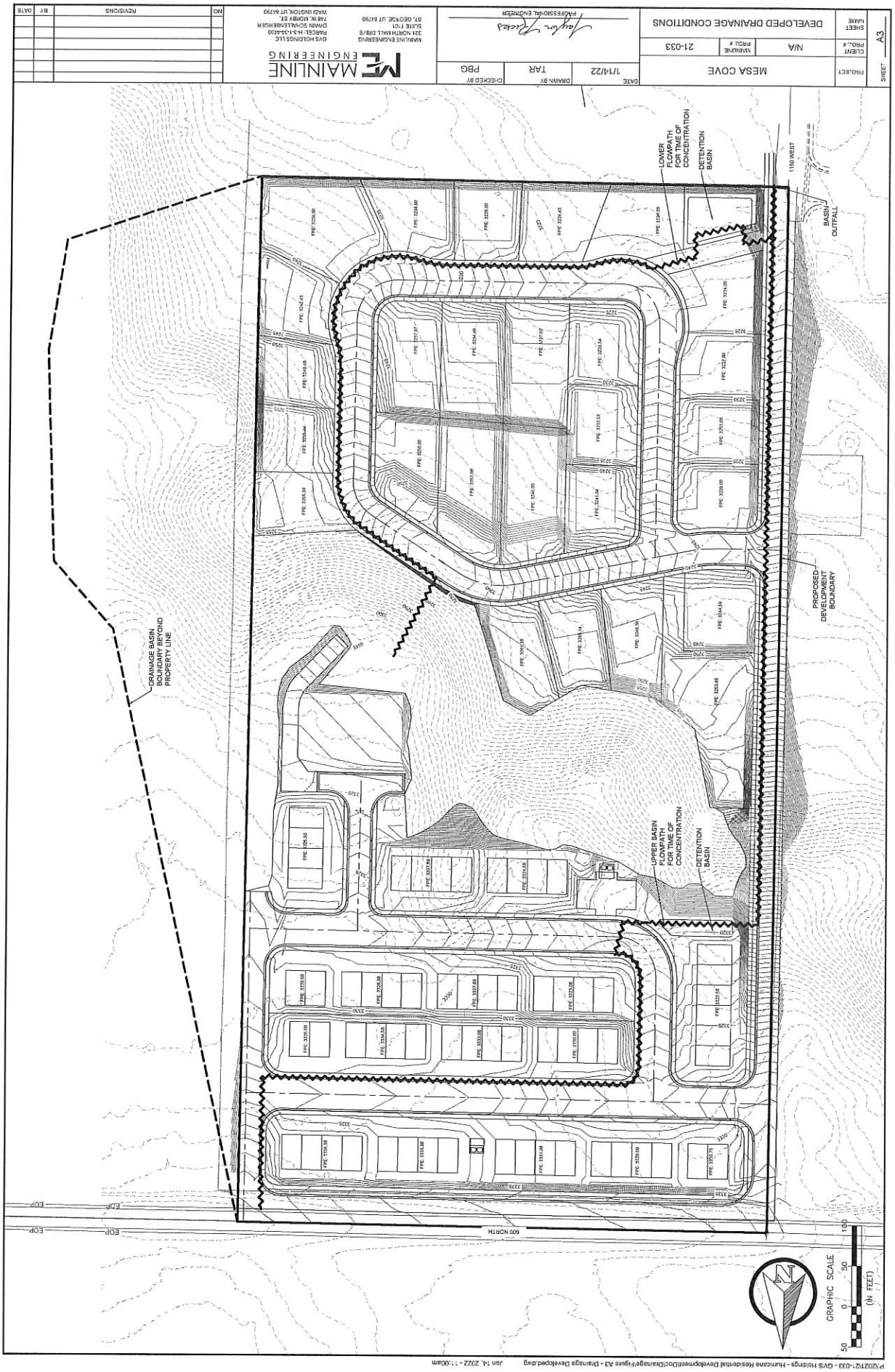
PROJECT	MESA COVE			DATE	1/14/22
CLIENT PROJ.#	N/A	MAINLINE PROJ.#	21-033	DRAWN BY	TAR
SHEET NAME	EXISTING DRAINAGE CONDITIONS			CHECKED BY	PBG
SHEET	A2			PROFESSIONAL ENGINEER	

MAINLINE ENGINEERING
321 NORTH MALL DR.#E
SUITE 101
ST. GEORGE, UT 84790

GVS HOLDINGS LLC
MARCEL HALVORSEN
DAWN SCALLENBERGER
748 W. MOMBY ST.
WASHINGTON, UT 84780

NO	REVISIONS	BY	DATE

P:\2021\21-033 - GVS Holdings - Hurricane Residential Development\Civil\Drainage\Figure A2 - Drainage Existing.dwg Jan 14, 2022 - 11:01am


LOWER FLOWPATH FOR TIME OF CONCENTRATION
DETENTION BASIN
1150 WEST
BASIN OUTFALL
PROPOSED DEVELOPMENT BOUNDARY
DRAINAGE BASIN BOUNDARY BEYOND PROPERTY LINE
UPPER BASIN FLOWPATH FOR TIME OF CONCENTRATION
DETENTION BASIN
600 NORTH
EOP
GRAPHIC SCALE
(IN FEET)
50
0
50
100
N
MESA COVE
DEVELOPED DRAINAGE CONDITIONS
PROJECT
CLIENT PROJ.#
N/A
MAINLINE PROJ.#
21-033
SHEET NAME
SHEET
A3
DATE
1/14/22
DRAWN BY
TAR
CHECKED BY
PBG
PROFESSIONAL ENGINEER
ME MAINLINE ENGINEERING
MAINLINE ENGINEERING
331 NORTH MALL DRIVE
SUITE F101
ST. GEORGE, UT 84790
GVS HOLDINGS LLC
PARCEL: H-3-1-34-4330
DAWN SCHULENBERGER
748 W. MOMBY ST.
WASHINGTON, UT 84790
NO.
REVISIONS
BY
DATE
P:\2021\21-033 - GVS Holdings - Hurricane Residential Development\Docs\Drainage\Figure A3 - Drainage Developed.dwg Jan 14, 2022 - 11:00am

National Flood Hazard Layer FIRMette

FEMA

113°18'50"W 37°11'10"N



113°18'13"W 37°10'41"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

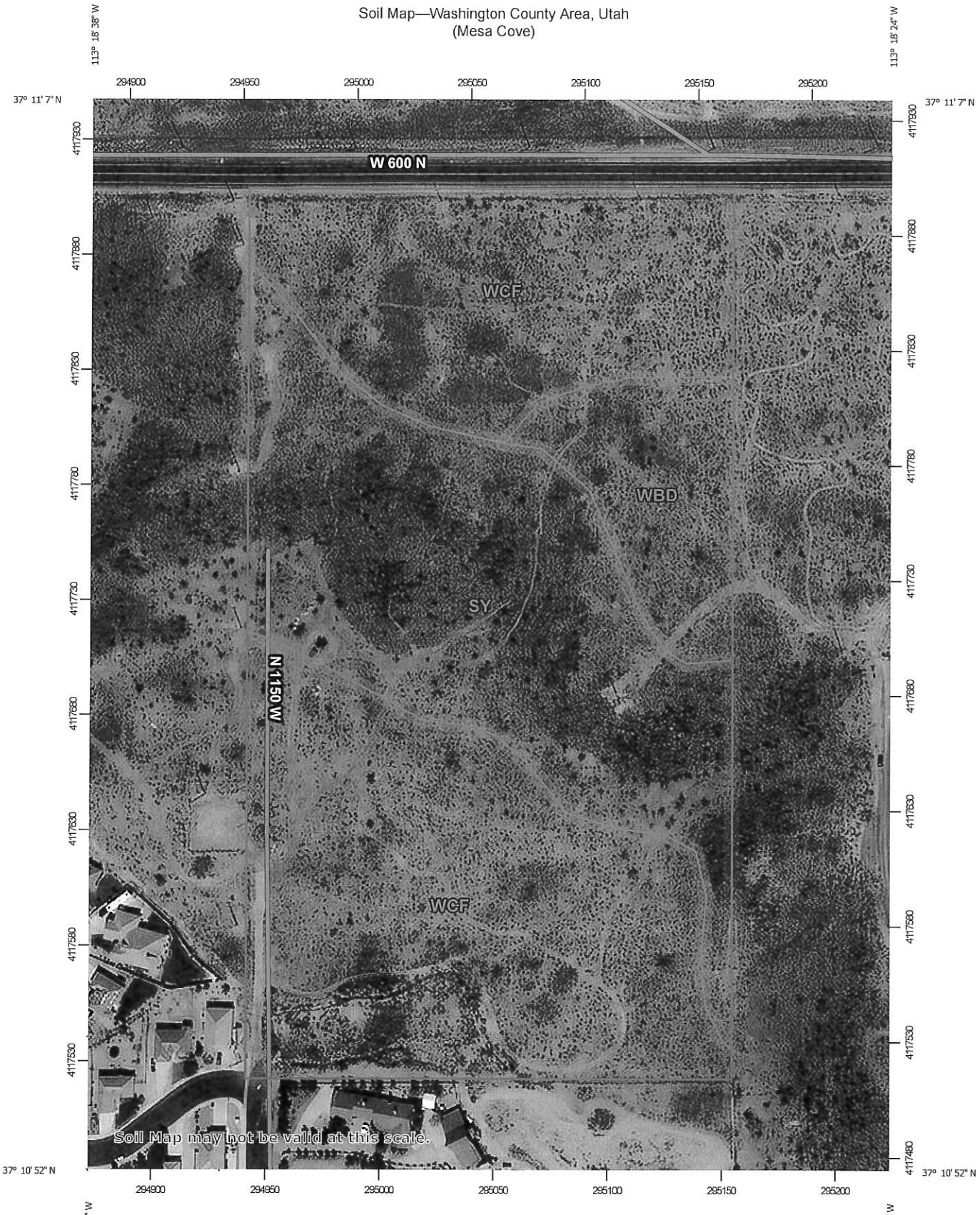
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/13/2022 at 5:12 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Soil Map—Washington County Area, Utah
(Mesa Cove)



Map Scale: 1:2,270 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 30 60 120 180

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washington County Area, Utah
Survey Area Data: Version 15, Sep 7, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 7, 2015—Oct 22, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
SY	Stony colluvial land	6.8	33.4%
WBD	Winkel gravelly fine sandy loam, 1 to 8 percent slopes	1.8	9.0%
WCF	Winkel-Rock outcrop complex, 8 to 30 percent slopes	11.8	57.7%
Totals for Area of Interest		**20.4**	**100.0%**

NOAA Atlas 14, Volume 1, Version 5
Location name: Hurricane, Utah, USA*
Latitude: 37.1835°, Longitude: -113.3089°
Elevation: 3277.55 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.134 (0.114-0.159)	0.173 (0.148-0.205)	0.236 (0.201-0.281)	0.293 (0.247-0.349)	0.380 (0.315-0.452)	0.456 (0.373-0.542)	0.544 (0.435-0.650)	0.644 (0.501-0.775)	0.799 (0.597-0.977)	0.936 (0.677-1.15)
10-min	0.204 (0.174-0.242)	0.263 (0.226-0.312)	0.360 (0.306-0.427)	0.446 (0.376-0.531)	0.579 (0.480-0.687)	0.695 (0.567-0.825)	0.828 (0.662-0.989)	0.981 (0.762-1.18)	1.22 (0.909-1.49)	1.42 (1.03-1.76)
15-min	0.253 (0.216-0.299)	0.326 (0.280-0.387)	0.446 (0.380-0.530)	0.553 (0.466-0.658)	0.718 (0.595-0.852)	0.861 (0.703-1.02)	1.03 (0.820-1.23)	1.22 (0.944-1.46)	1.51 (1.13-1.84)	1.77 (1.28-2.18)
30-min	0.341 (0.291-0.403)	0.439 (0.377-0.522)	0.600 (0.512-0.714)	0.745 (0.628-0.886)	0.967 (0.802-1.15)	1.16 (0.947-1.38)	1.38 (1.10-1.65)	1.64 (1.27-1.97)	2.03 (1.52-2.48)	2.38 (1.72-2.93)
60-min	0.422 (0.361-0.499)	0.543 (0.466-0.646)	0.743 (0.633-0.883)	0.921 (0.777-1.10)	1.20 (0.992-1.42)	1.43 (1.17-1.70)	1.71 (1.37-2.04)	2.03 (1.57-2.44)	2.51 (1.88-3.07)	2.94 (2.13-3.63)
2-hr	0.510 (0.446-0.592)	0.646 (0.562-0.749)	0.855 (0.742-0.990)	1.04 (0.896-1.21)	1.32 (1.12-1.53)	1.57 (1.31-1.82)	1.85 (1.51-2.16)	2.17 (1.73-2.55)	2.66 (2.04-3.18)	3.09 (2.30-3.73)
3-hr	0.572 (0.507-0.654)	0.719 (0.637-0.823)	0.934 (0.825-1.07)	1.12 (0.980-1.27)	1.39 (1.20-1.59)	1.62 (1.38-1.86)	1.89 (1.58-2.18)	2.20 (1.80-2.56)	2.68 (2.12-3.21)	3.10 (2.40-3.77)
6-hr	0.713 (0.637-0.808)	0.893 (0.800-1.01)	1.14 (1.02-1.29)	1.34 (1.19-1.53)	1.64 (1.44-1.86)	1.88 (1.63-2.14)	2.14 (1.83-2.46)	2.45 (2.06-2.83)	2.94 (2.40-3.45)	3.36 (2.69-3.99)
12-hr	0.875 (0.787-0.979)	1.10 (0.983-1.23)	1.38 (1.23-1.55)	1.61 (1.44-1.81)	1.93 (1.70-2.16)	2.17 (1.90-2.44)	2.42 (2.10-2.75)	2.70 (2.31-3.07)	3.09 (2.59-3.56)	3.48 (2.87-4.05)
24-hr	1.03 (0.957-1.12)	1.29 (1.20-1.40)	1.61 (1.49-1.74)	1.86 (1.73-2.02)	2.21 (2.04-2.39)	2.48 (2.28-2.68)	2.76 (2.52-2.99)	3.05 (2.76-3.30)	3.43 (3.07-3.72)	3.72 (3.31-4.06)
2-day	1.17 (1.09-1.26)	1.46 (1.35-1.58)	1.81 (1.68-1.96)	2.10 (1.94-2.26)	2.48 (2.30-2.68)	2.79 (2.57-3.01)	3.10 (2.84-3.35)	3.42 (3.11-3.69)	3.84 (3.46-4.17)	4.17 (3.74-4.54)
3-day	1.25 (1.17-1.36)	1.57 (1.46-1.69)	1.95 (1.81-2.10)	2.25 (2.10-2.42)	2.67 (2.48-2.87)	3.00 (2.77-3.22)	3.33 (3.06-3.58)	3.66 (3.34-3.96)	4.12 (3.72-4.47)	4.47 (4.01-4.86)
4-day	1.34 (1.25-1.45)	1.68 (1.57-1.81)	2.09 (1.95-2.24)	2.41 (2.25-2.59)	2.86 (2.65-3.06)	3.20 (2.96-3.43)	3.56 (3.27-3.82)	3.91 (3.58-4.22)	4.40 (3.98-4.76)	4.77 (4.29-5.18)
7-day	1.59 (1.47-1.72)	1.99 (1.84-2.15)	2.47 (2.29-2.67)	2.85 (2.63-3.07)	3.36 (3.09-3.61)	3.75 (3.44-4.03)	4.14 (3.78-4.46)	4.53 (4.12-4.90)	5.05 (4.56-5.49)	5.44 (4.88-5.93)
10-day	1.76 (1.63-1.91)	2.21 (2.04-2.40)	2.76 (2.55-2.98)	3.18 (2.94-3.44)	3.75 (3.45-4.05)	4.18 (3.84-4.52)	4.61 (4.21-5.00)	5.04 (4.59-5.48)	5.61 (5.06-6.12)	6.04 (5.42-6.62)
20-day	2.27 (2.10-2.45)	2.85 (2.63-3.08)	3.51 (3.24-3.79)	4.00 (3.69-4.32)	4.62 (4.26-4.98)	5.07 (4.67-5.47)	5.51 (5.06-5.94)	5.92 (5.41-6.41)	6.43 (5.85-6.98)	6.79 (6.16-7.39)
30-day	2.74 (2.52-2.98)	3.44 (3.16-3.73)	4.26 (3.91-4.62)	4.86 (4.46-5.27)	5.63 (5.15-6.10)	6.19 (5.66-6.71)	6.74 (6.14-7.31)	7.25 (6.58-7.89)	7.90 (7.13-8.62)	8.37 (7.52-9.17)
45-day	3.27 (2.99-3.57)	4.10 (3.75-4.48)	5.10 (4.67-5.57)	5.86 (5.35-6.38)	6.82 (6.22-7.43)	7.52 (6.85-8.19)	8.20 (7.46-8.96)	8.86 (8.02-9.70)	9.68 (8.72-10.6)	10.3 (9.22-11.3)
60-day	3.79 (3.45-4.15)	4.76 (4.34-5.22)	5.93 (5.39-6.50)	6.79 (6.18-7.44)	7.90 (7.17-8.65)	8.70 (7.88-9.54)	9.48 (8.56-10.4)	10.2 (9.19-11.2)	11.2 (9.98-12.3)	11.8 (10.5-13.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

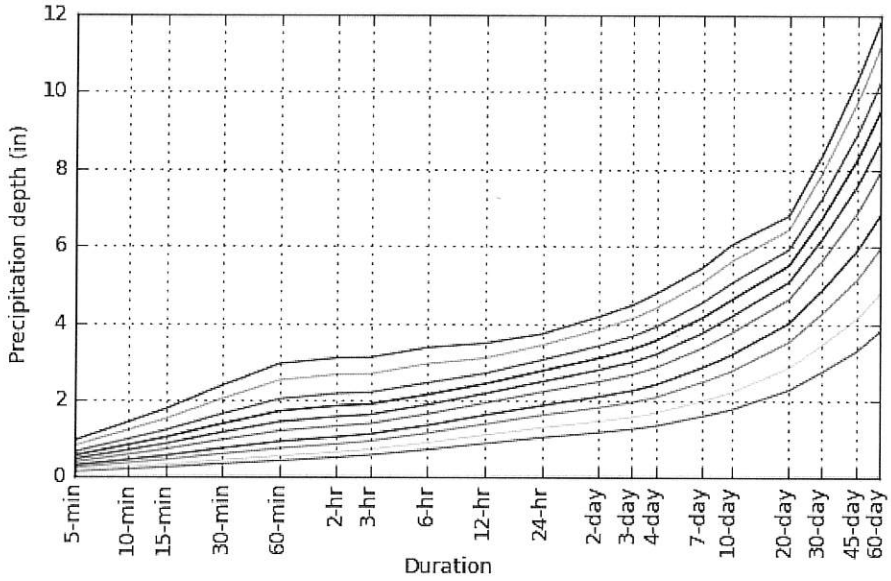
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

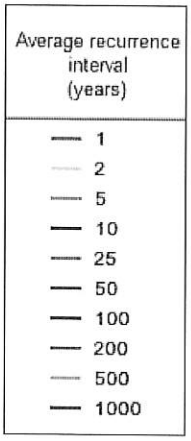
Please refer to NOAA Atlas 14 document for more information.

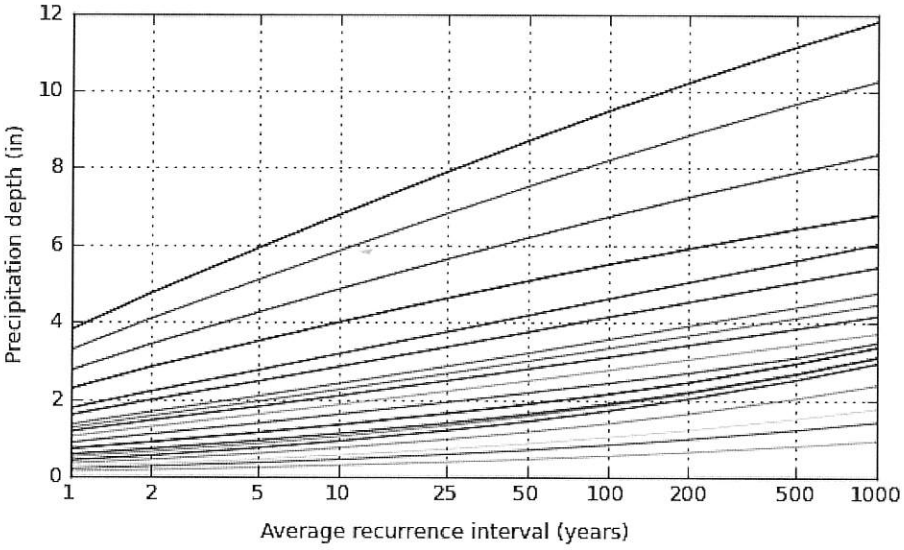
Back to Top

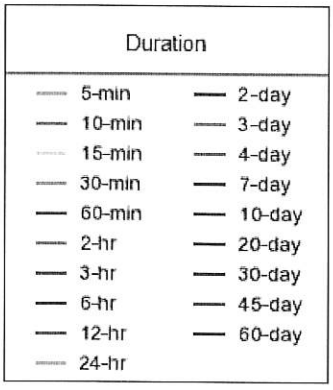
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 37.1835°, Longitude: -113.3089°









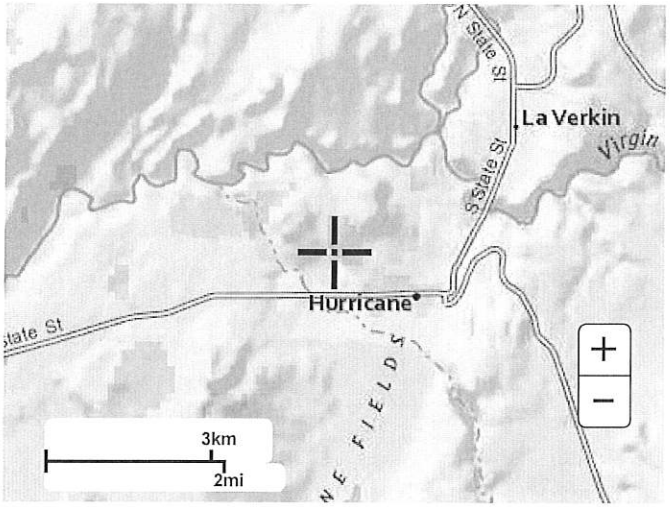
NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Thu Jan 13 22:09:57 2022

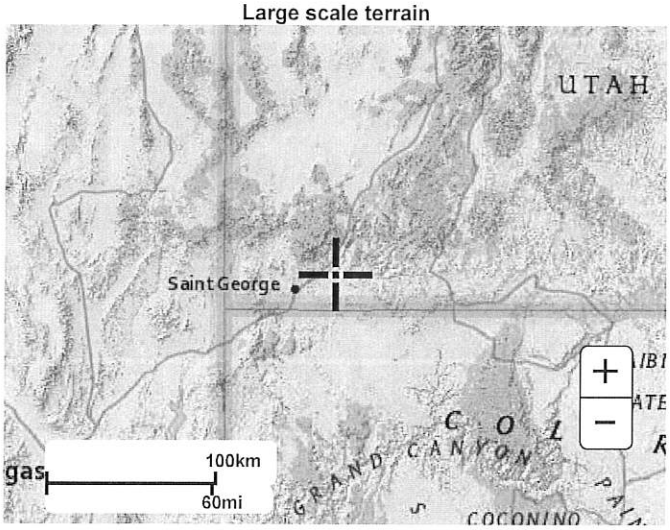
Back to Top

Maps & aerials

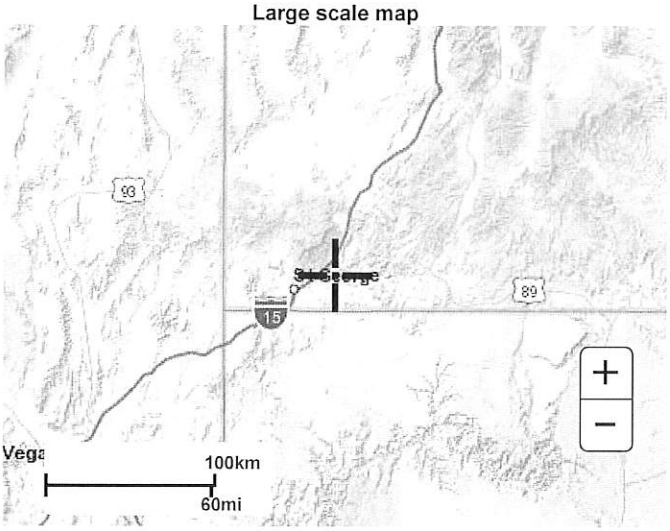
Small scale terrain



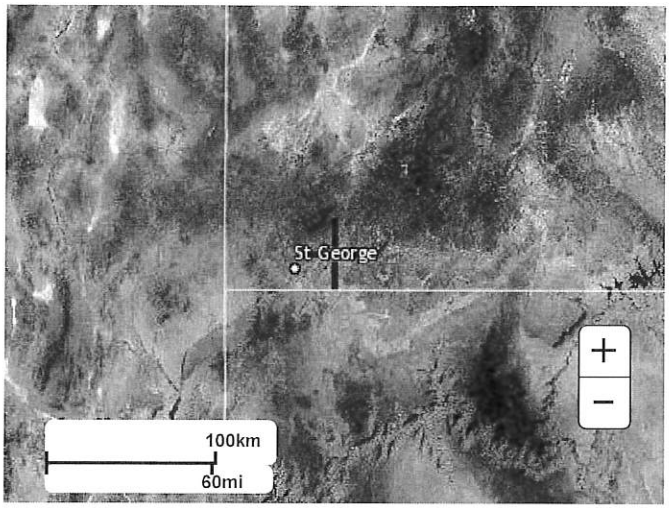
Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

NOAA Atlas 14, Volume 1, Version 5
Location name: Hurricane, Utah, USA*
Latitude: 37.1835°, Longitude: -113.3089°
Elevation: 3277.55 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.61 (1.37-1.91)	2.08 (1.78-2.46)	2.83 (2.41-3.37)	3.52 (2.96-4.19)	4.56 (3.78-5.42)	5.47 (4.48-6.50)	6.53 (5.22-7.80)	7.73 (6.01-9.30)	9.59 (7.16-11.7)	11.2 (8.12-13.8)
10-min	1.22 (1.04-1.45)	1.58 (1.36-1.87)	2.16 (1.84-2.56)	2.68 (2.26-3.19)	3.47 (2.88-4.12)	4.17 (3.40-4.95)	4.97 (3.97-5.93)	5.89 (4.57-7.07)	7.30 (5.45-8.92)	8.54 (6.19-10.5)
15-min	1.01 (0.864-1.20)	1.30 (1.12-1.55)	1.78 (1.52-2.12)	2.21 (1.86-2.63)	2.87 (2.38-3.41)	3.44 (2.81-4.09)	4.10 (3.28-4.91)	4.86 (3.78-5.85)	6.04 (4.51-7.37)	7.06 (5.11-8.71)
30-min	0.682 (0.582-0.806)	0.878 (0.754-1.04)	1.20 (1.02-1.43)	1.49 (1.26-1.77)	1.93 (1.60-2.29)	2.32 (1.89-2.75)	2.76 (2.21-3.30)	3.27 (2.54-3.94)	4.06 (3.04-4.96)	4.75 (3.44-5.87)
60-min	0.422 (0.361-0.499)	0.543 (0.466-0.646)	0.743 (0.633-0.883)	0.921 (0.777-1.10)	1.20 (0.992-1.42)	1.43 (1.17-1.70)	1.71 (1.37-2.04)	2.03 (1.57-2.44)	2.51 (1.88-3.07)	2.94 (2.13-3.63)
2-hr	0.255 (0.223-0.296)	0.323 (0.281-0.374)	0.428 (0.371-0.495)	0.520 (0.448-0.602)	0.662 (0.561-0.766)	0.784 (0.654-0.908)	0.924 (0.754-1.08)	1.08 (0.862-1.28)	1.33 (1.02-1.59)	1.55 (1.15-1.87)
3-hr	0.190 (0.169-0.218)	0.239 (0.212-0.274)	0.311 (0.275-0.355)	0.372 (0.326-0.424)	0.463 (0.400-0.528)	0.540 (0.460-0.619)	0.630 (0.527-0.727)	0.732 (0.599-0.851)	0.891 (0.707-1.07)	1.03 (0.799-1.26)
6-hr	0.119 (0.106-0.135)	0.149 (0.134-0.169)	0.191 (0.170-0.216)	0.224 (0.199-0.255)	0.273 (0.240-0.311)	0.314 (0.272-0.358)	0.358 (0.306-0.410)	0.409 (0.343-0.473)	0.491 (0.401-0.575)	0.561 (0.449-0.666)
12-hr	0.073 (0.065-0.081)	0.091 (0.082-0.102)	0.115 (0.102-0.129)	0.134 (0.119-0.150)	0.160 (0.141-0.179)	0.180 (0.158-0.203)	0.201 (0.174-0.228)	0.224 (0.191-0.255)	0.257 (0.215-0.296)	0.289 (0.238-0.336)
24-hr	0.043 (0.040-0.047)	0.054 (0.050-0.058)	0.067 (0.062-0.073)	0.078 (0.072-0.084)	0.092 (0.085-0.100)	0.103 (0.095-0.112)	0.115 (0.105-0.124)	0.127 (0.115-0.138)	0.143 (0.128-0.155)	0.155 (0.138-0.169)
2-day	0.024 (0.023-0.026)	0.030 (0.028-0.033)	0.038 (0.035-0.041)	0.044 (0.040-0.047)	0.052 (0.048-0.056)	0.058 (0.053-0.063)	0.065 (0.059-0.070)	0.071 (0.065-0.077)	0.080 (0.072-0.087)	0.087 (0.078-0.095)
3-day	0.017 (0.016-0.019)	0.022 (0.020-0.024)	0.027 (0.025-0.029)	0.031 (0.029-0.034)	0.037 (0.034-0.040)	0.042 (0.038-0.045)	0.046 (0.042-0.050)	0.051 (0.046-0.055)	0.057 (0.052-0.062)	0.062 (0.056-0.068)
4-day	0.014 (0.013-0.015)	0.017 (0.016-0.019)	0.022 (0.020-0.023)	0.025 (0.023-0.027)	0.030 (0.028-0.032)	0.033 (0.031-0.036)	0.037 (0.034-0.040)	0.041 (0.037-0.044)	0.046 (0.041-0.050)	0.050 (0.045-0.054)
7-day	0.009 (0.009-0.010)	0.012 (0.011-0.013)	0.015 (0.014-0.016)	0.017 (0.016-0.018)	0.020 (0.018-0.021)	0.022 (0.020-0.024)	0.025 (0.023-0.027)	0.027 (0.024-0.029)	0.030 (0.027-0.033)	0.032 (0.029-0.035)
10-day	0.007 (0.007-0.008)	0.009 (0.009-0.010)	0.011 (0.011-0.012)	0.013 (0.012-0.014)	0.016 (0.014-0.017)	0.017 (0.016-0.019)	0.019 (0.018-0.021)	0.021 (0.019-0.023)	0.023 (0.021-0.025)	0.025 (0.023-0.028)
20-day	0.005 (0.004-0.005)	0.006 (0.005-0.006)	0.007 (0.007-0.008)	0.008 (0.008-0.009)	0.010 (0.009-0.010)	0.011 (0.010-0.011)	0.011 (0.011-0.012)	0.012 (0.011-0.013)	0.013 (0.012-0.015)	0.014 (0.013-0.015)
30-day	0.004 (0.003-0.004)	0.005 (0.004-0.005)	0.006 (0.005-0.006)	0.007 (0.006-0.007)	0.008 (0.007-0.008)	0.009 (0.008-0.009)	0.009 (0.009-0.010)	0.010 (0.009-0.011)	0.011 (0.010-0.012)	0.012 (0.010-0.013)
45-day	0.003 (0.003-0.003)	0.004 (0.003-0.004)	0.005 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.006-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.009 (0.009-0.010)
60-day	0.003 (0.002-0.003)	0.003 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.005-0.007)	0.007 (0.006-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.008 (0.007-0.009)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

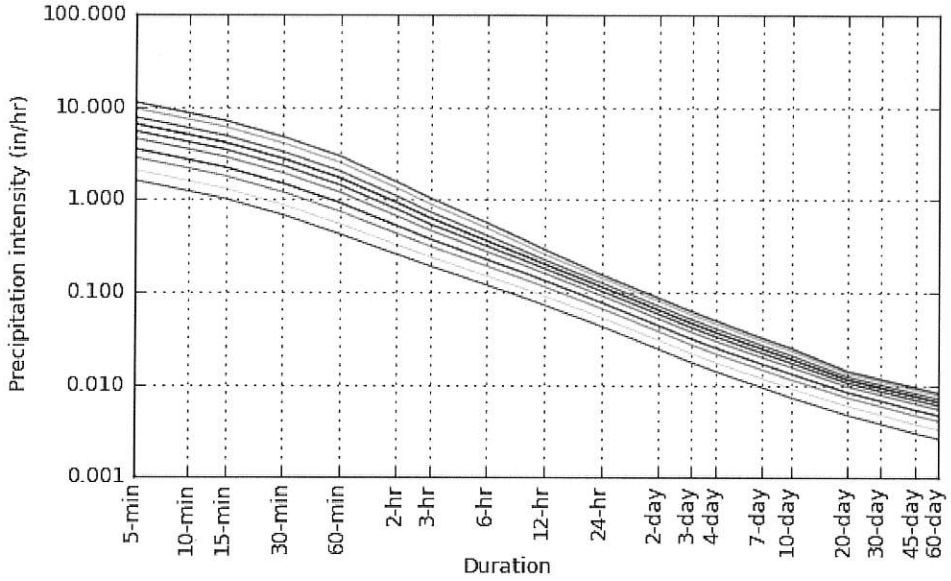
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

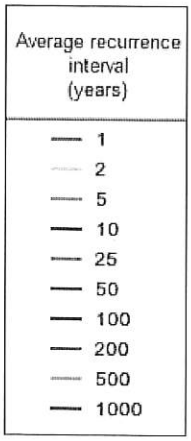
Please refer to NOAA Atlas 14 document for more information.

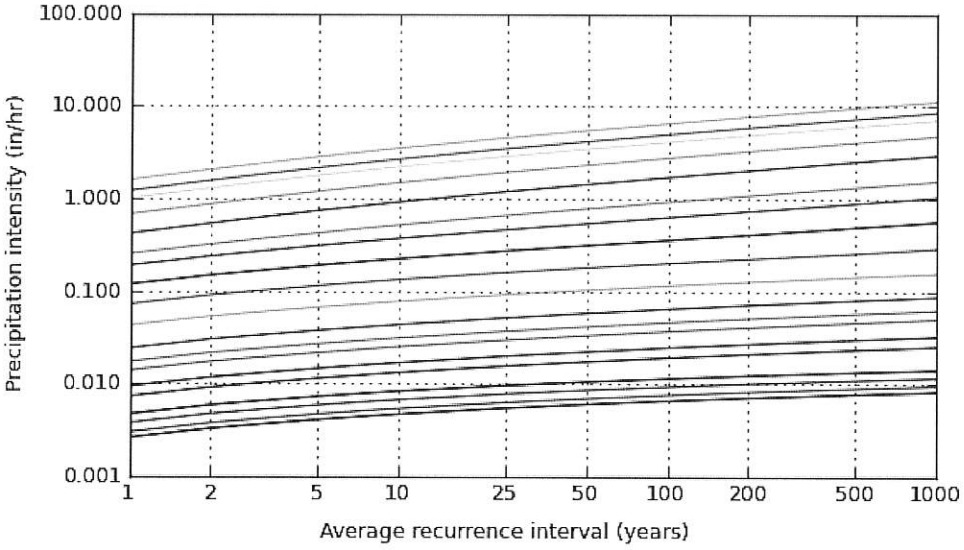
Back to Top

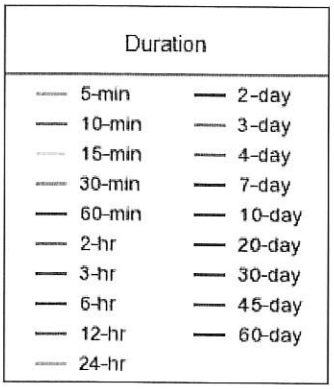
PF graphical

PDS-based intensity-duration-frequency (IDF) curves
Latitude: 37.1835°, Longitude: -113.3089°









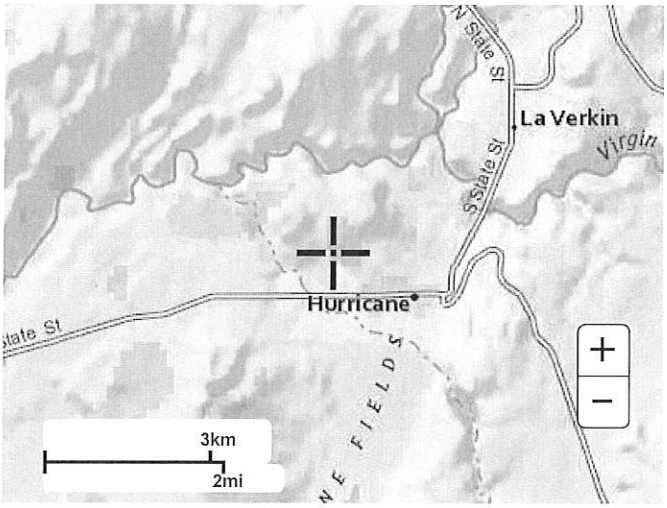
NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Thu Jan 13 22:10:32 2022

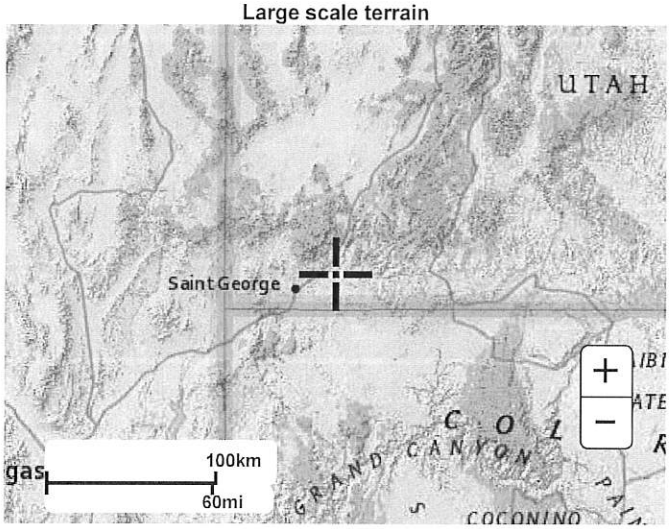
Back to Top

Maps & aerials

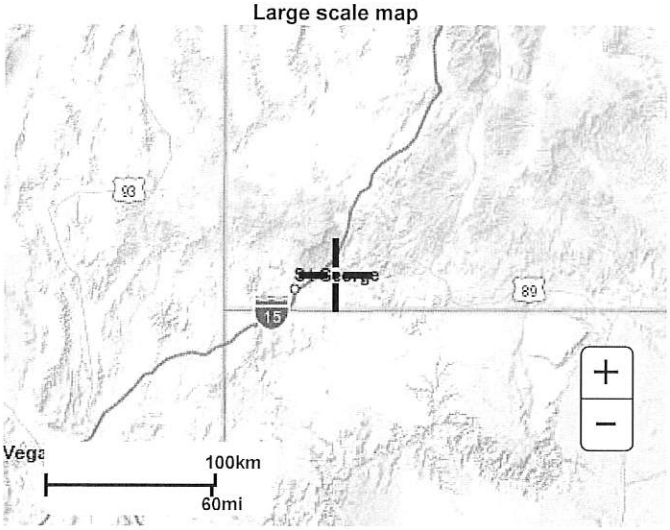
Small scale terrain



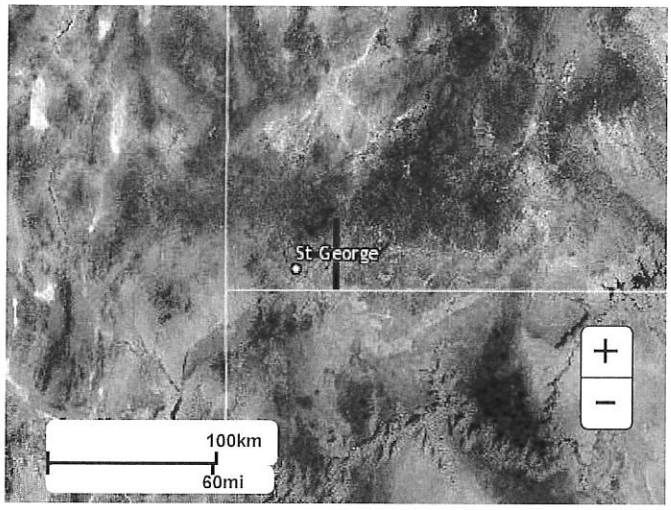
Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

UNIMPROVED ANALYSIS FOR

Mesa Cove

Upper Basin

UNIMPROVED CONDITION (TR-55)

Description of Area	*Area (SF)*	*Area (Ac)*	*Curve No.*	*% of Area*
Undeveloped (Desert, fair)	338,810	7.78	86	100.0%
Natural Desert Landscaping			88	0.0%
Lawn			80	0.0%
Impervious Area			98	0.0%
Total Area (SF) & Composite CN	**338,810**	**7.78**	**86**	**100.0%**

Max Retention (S)	1.63	inches
Initial Abstraction	0.33	inches
Time of Concentration	11.8	min

Storm --->	**10y 24hr**	**100y 24hr**	**10y 3hr**	**100y 3hr**
Runoff Depth (in)	0.74	1.46	0.26	0.77
Runoff Vol (CF)	21,021	41,190	7,356	21,646
Runoff Vol (Gal)	157,238	308,100	55,023	161,911
Ia/P	0.20	0.10		
Unit Discharge	753.3	806.1		
Theoretical Peak Discharge (cfs)	6.8	14.3		
Calc'd Peak Discharge (cfs)	7.7	15.17	6.1	18.0

Time of Conc. Calc	**Lenth (ft)**	**Slope**	**Manning n**
Sheet	100	4.70%	0.13
Shallow Concentrated	647	11.11%	Unpaved

UNIMPROVED ANALYSIS FOR

Mesa Cove

Lower Basin

UNIMPROVED CONDITION (TR-55)

Description of Area	*Area (SF)*	*Area (Ac)*	*Curve No.*	% of Area
Undeveloped (Desert, fair)	710,070	16.30	86	100.0%
Natural Desert Landscaping			88	0.0%
Lawn			80	0.0%
Impervious Area			98	0.0%
Total Area (SF) & Composite CN	**710,070**	**16.30**	**86**	**100.0%**

Max Retention (S)	1.63	inches
Initial Abstraction	0.33	inches
Time of Concentration	12.4	min

Storm --->	**10y 24hr**	**100y 24hr**	**10y 3hr**	**100y 3hr**
Runoff Depth (in)	0.74	1.46	0.26	0.77
Runoff Vol (CF)	44,056	86,325	15,417	45,365
Runoff Vol (Gal)	329,536	645,710	115,316	339,328
Ia/P	0.20	0.10		
Unit Discharge	753.3	806.1		
Theoretical Peak Discharge (cfs)	14.3	30.0		
Calc'd Peak Discharge (cfs)	15.88	31.34	12.8	37.8

Time of Conc. Calc	**Lenth (ft)**	**Slope**	**Manning n**
Sheet	100	8.80%	0.13
Shallow Concentrated	1372	8.74%	Unpaved

IMPROVED ANALYSIS FOR

Mesa Cove

Upper Basin

DEVELOPED CONDITION (TR-55)

Description of Area	*Area (SF)*	*Area (Ac)*	*Curve No.*	*% of Area*
Undeveloped (Desert, fair)			86	0.0%
Natural Desert Landscaping	76,536	1.757	88	22.6%
Lawn	51,024	1.171	80	15.1%
Impervious Area	211,250	4.850	98	62.4%
Total Area (SF) & Composite CN	**338,810**	**7.778**	**93**	**100.0%**

Max Retention (S)	0.75	inches
Initial Abstraction	0.15	inches
Time of Concentration	12.6	min

Storm --->	**10y 24hr**	**100y 24hr**	**10y 3hr**	**100y 3hr**
Runoff Depth (in)	1.19	2.03	0.55	1.22
Runoff Vol (CF)	33,576	57,260	15,456	34,345
Runoff Vol (Gal)	251,149	428,308	115,611	256,903
Ia/P	0.10	0.05		
Unit Discharge	784.9	807.2		
Theoretical Peak Discharge (cfs)	11.3	19.9		
Calc'd Peak Discharge (cfs)	11.99	20.07	12.9	28.6

Time of Conc. Calc Upper Basin	**Lenth (ft)**	**Slope**	**Manning n**	
Sheet	44	2.05%	0.13	
Shallow Concentrated 1	830	2.61%	Paved	
Shallow Concentrated 2				
Channel 1	140	11.50%	0.015	
Channel Addt'l	Area	0.49	WP	1.807
Channel 2	919	10.37%	0.015	
Channel Addt'l	Area	0.492	WP	1.811
Total/Avg	1933	6.93%		

Volumetric Summary

Description	*Required*	*Provided*	*Units*
Total Detention	2,387		CF

IMPROVED ANALYSIS FOR

Mesa Cove

Lower Basin

DEVELOPED CONDITION (TR-55)

Description of Area	*Area (SF)*	*Area (Ac)*	*Curve No.*	*% of Area*
Undeveloped (Desert, fair)	319,154	7.327	86	44.9%
Natural Desert Landscaping	114,369	2.626	88	16.1%
Lawn	114,369	2.626	80	16.1%
Impervious Area	162,179	3.723	98	22.8%
Total Area (SF) & Composite CN	**710,070**	**16.301**	**88**	**100.0%**

Max Retention (S)	1.35	inches
Initial Abstraction	0.27	inches
Time of Concentration	6.7	min

Storm --->	**10y 24hr**	**100y 24hr**	**10y 3hr**	**100y 3hr**
Runoff Depth (in)	0.86	1.61	0.33	0.88
Runoff Vol (CF)	50,851	95,499	19,414	52,255
Runoff Vol (Gal)	380,363	714,330	145,213	390,867
Ia/P	0.15	0.10		
Unit Discharge	757.8	784.9		
Theoretical Peak Discharge (cfs)	16.6	32.3		
Calc'd Peak Discharge (cfs)	20.95	39.52	16.2	43.5

Time of Conc. Calc Upper Basin	**Lenth (ft)**	**Slope**	**Manning n**	
Sheet	110	44.55%	0.15	
Shallow Concentrated 1	325	5.48%	Paved	
Shallow Concentrated 2				
Channel 1	508	3.92%	0.015	
Channel Addt'l	Area	1.242	WP	2.852
Channel 2	268	5.75%	0.015	
Channel Addt'l	Area	1.068	WP	2.604
Total/Avg	1211	8.43%		

Volumetric Summary

Description	*Required*	*Provided*	*Units*
Total Detention	1,808		CF

Site-Specific Modified Type II Storm 3-Hour Rainfall Data
Farmer Fletcher Distribution - Upper Basin

						Qmax							
								6.13	18.04			12.88	28.62
		Precip.				Runoff Pre-dev (delay timestep by Tc)				Runoff Post-dev (delay timestep by Tc)			
		Cumulative		Incremental		Cumulative		Incremental		Cumulative		Incremental	
Minutes	Distribution (%)	10y3h	100y3h	10y3h	100y3h	10y3h (CF)	100y3h (CF)	10y3h (CF)	100y3h (CF)	10y3h (CF)	100y3h (CF)	10y3h (CF)	100y3h (CF)
5	0	0.000	0.000	0.000	0.000	0	0	0	0	0	0	0	0
10	0	0.000	0.000	0.000	0.000	0	0	0	0	0	0	0	0
15	1	0.011	0.019	0.011	0.019	74	216	74	216	155	343	155	343
20	1	0.011	0.019	0.000	0.000	74	216	0	0	155	343	0	0
25	2	0.022	0.038	0.011	0.019	147	433	74	216	309	687	155	343
30	2	0.022	0.038	0.000	0.000	147	433	0	0	309	687	0	0
35	3	0.034	0.057	0.011	0.019	221	649	74	216	464	1,030	155	343
40	28	0.314	0.529	0.280	0.473	2,060	6,061	1,839	5,411	4,328	9,617	3,864	8,586
45	48	0.538	0.907	0.224	0.378	3,531	10,390	1,471	4,329	7,419	16,486	3,091	6,869
50	62	0.694	1.172	0.157	0.265	4,561	13,420	1,030	3,030	9,583	21,294	2,164	4,808
55	71	0.795	1.342	0.101	0.170	5,223	15,369	662	1,948	10,974	24,385	1,391	3,091
60	77	0.862	1.455	0.067	0.113	5,664	16,667	441	1,299	11,901	26,446	927	2,061
65	81	0.907	1.531	0.045	0.076	5,958	17,533	294	866	12,519	27,820	618	1,374
70	84	0.941	1.588	0.034	0.057	6,179	18,182	221	649	12,983	28,850	464	1,030
75	86	0.963	1.625	0.022	0.038	6,326	18,615	147	433	13,292	29,537	309	687
80	88	0.986	1.663	0.022	0.038	6,473	19,048	147	433	13,601	30,224	309	687
85	90	1.008	1.701	0.022	0.038	6,620	19,481	147	433	13,910	30,911	309	687
90	91	1.019	1.720	0.011	0.019	6,694	19,698	74	216	14,065	31,254	155	343
95	92	1.030	1.739	0.011	0.019	6,768	19,914	74	216	14,220	31,598	155	343
100	93	1.042	1.758	0.011	0.019	6,841	20,131	74	216	14,374	31,941	155	343
105	93	1.042	1.758	0.000	0.000	6,841	20,131	0	0	14,374	31,941	0	0
110	94	1.053	1.777	0.011	0.019	6,915	20,347	74	216	14,529	32,285	155	343
115	94	1.053	1.777	0.000	0.000	6,915	20,347	0	0	14,529	32,285	0	0
120	94	1.053	1.777	0.000	0.000	6,915	20,347	0	0	14,529	32,285	0	0
125	95	1.064	1.796	0.011	0.019	6,988	20,564	74	216	14,683	32,628	155	343
130	95	1.064	1.796	0.000	0.000	6,988	20,564	0	0	14,683	32,628	0	0
135	96	1.075	1.814	0.011	0.019	7,062	20,780	74	216	14,838	32,972	155	343
140	96	1.075	1.814	0.000	0.000	7,062	20,780	0	0	14,838	32,972	0	0
145	97	1.086	1.833	0.011	0.019	7,135	20,996	74	216	14,992	33,315	155	343
150	97	1.086	1.833	0.000	0.000	7,135	20,996	0	0	14,992	33,315	0	0
155	97	1.086	1.833	0.000	0.000	7,135	20,996	0	0	14,992	33,315	0	0
160	98	1.098	1.852	0.011	0.019	7,209	21,213	74	216	15,147	33,658	155	343
165	98	1.098	1.852	0.000	0.000	7,209	21,213	0	0	15,147	33,658	0	0
170	99	1.109	1.871	0.011	0.019	7,282	21,429	74	216	15,302	34,002	155	343
175	99	1.109	1.871	0.000	0.000	7,282	21,429	0	0	15,302	34,002	0	0
180	100	1.120	1.890	0.011	0.019	7,356	21,646	74	216	15,456	34,345	155	343
185	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
190	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
195	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
200	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
205	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
210	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
215	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
220	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
225	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
230	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
235	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
240	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
245	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
250	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
255	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
260	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
265	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
270	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
275	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
280	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
285	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
290	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
295	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
300	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
305	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
310	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
315	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
320	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
325	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
330	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
335	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
340	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
345	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
350	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
355	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0
360	100	1.120	1.890	0.000	0.000	7,356	21,646	0	0	15,456	34,345	0	0

Site-Specific Modified Type II Storm 3-Hour Rainfall Data
Farmer Fletcher Distribution - Lower Basin

						Qmax							
								12.85	37.80			16.18	43.55
		Precip.				Runoff Pre-dev (delay timestep by Tc)				Runoff Post-dev (delay timestep by Tc)			
		Cumulative		Incremental		Cumulative		Incremental		Cumulative		Incremental	
Minutes	Distribution (%)	10y3h	100y3h	10y3h	100y3h	10y3h (CF)	100y3h (CF)	10y3h (CF)	100y3h (CF)	10y3h (CF)	100y3h (CF)	10y3h (CF)	100y3h (CF)
5	0	0.000	0.000	0.000	0.000	0	0	0	0	0	0	0	0
10	0	0.000	0.000	0.000	0.000	0	0	0	0	0	0	0	0
15	1	0.011	0.019	0.011	0.019	154	454	154	454	194	523	194	523
20	1	0.011	0.019	0.000	0.000	154	454	0	0	194	523	0	0
25	2	0.022	0.038	0.011	0.019	308	907	154	454	388	1,045	194	523
30	2	0.022	0.038	0.000	0.000	308	907	0	0	388	1,045	0	0
35	3	0.034	0.057	0.011	0.019	462	1,361	154	454	582	1,568	194	523
40	28	0.314	0.529	0.280	0.473	4,317	12,702	3,854	11,341	5,436	14,631	4,853	13,064
45	48	0.538	0.907	0.224	0.378	7,400	21,775	3,083	9,073	9,319	25,082	3,883	10,451
50	62	0.694	1.172	0.157	0.265	9,558	28,126	2,158	6,351	12,036	32,398	2,718	7,316
55	71	0.795	1.342	0.101	0.170	10,946	32,209	1,387	4,083	13,784	37,101	1,747	4,703
60	77	0.862	1.455	0.067	0.113	11,871	34,931	925	2,722	14,948	40,236	1,165	3,135
65	81	0.907	1.531	0.045	0.076	12,487	36,745	617	1,815	15,725	42,327	777	2,090
70	84	0.941	1.588	0.034	0.057	12,950	38,106	462	1,361	16,307	43,894	582	1,568
75	86	0.963	1.625	0.022	0.038	13,258	39,014	308	907	16,696	44,939	388	1,045
80	88	0.986	1.663	0.022	0.038	13,567	39,921	308	907	17,084	45,984	388	1,045
85	90	1.008	1.701	0.022	0.038	13,875	40,828	308	907	17,472	47,029	388	1,045
90	91	1.019	1.720	0.011	0.019	14,029	41,282	154	454	17,666	47,552	194	523
95	92	1.030	1.739	0.011	0.019	14,183	41,736	154	454	17,860	48,075	194	523
100	93	1.042	1.758	0.011	0.019	14,337	42,189	154	454	18,055	48,597	194	523
105	93	1.042	1.758	0.000	0.000	14,337	42,189	0	0	18,055	48,597	0	0
110	94	1.053	1.777	0.011	0.019	14,492	42,643	154	454	18,249	49,120	194	523
115	94	1.053	1.777	0.000	0.000	14,492	42,643	0	0	18,249	49,120	0	0
120	94	1.053	1.777	0.000	0.000	14,492	42,643	0	0	18,249	49,120	0	0
125	95	1.064	1.796	0.011	0.019	14,646	43,097	154	454	18,443	49,642	194	523
130	95	1.064	1.796	0.000	0.000	14,646	43,097	0	0	18,443	49,642	0	0
135	96	1.075	1.814	0.011	0.019	14,800	43,550	154	454	18,637	50,165	194	523
140	96	1.075	1.814	0.000	0.000	14,800	43,550	0	0	18,637	50,165	0	0
145	97	1.086	1.833	0.011	0.019	14,954	44,004	154	454	18,831	50,687	194	523
150	97	1.086	1.833	0.000	0.000	14,954	44,004	0	0	18,831	50,687	0	0
155	97	1.086	1.833	0.000	0.000	14,954	44,004	0	0	18,831	50,687	0	0
160	98	1.098	1.852	0.011	0.019	15,108	44,457	154	454	19,025	51,210	194	523
165	98	1.098	1.852	0.000	0.000	15,108	44,457	0	0	19,025	51,210	0	0
170	99	1.109	1.871	0.011	0.019	15,262	44,911	154	454	19,219	51,732	194	523
175	99	1.109	1.871	0.000	0.000	15,262	44,911	0	0	19,219	51,732	0	0
180	100	1.120	1.890	0.011	0.019	15,417	45,365	154	454	19,414	52,255	194	523
185	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
190	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
195	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
200	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
205	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
210	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
215	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
220	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
225	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
230	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
235	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
240	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
245	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
250	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
255	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
260	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
265	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
270	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
275	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
280	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
285	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
290	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
295	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
300	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
305	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
310	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
315	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
320	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
325	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
330	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
335	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
340	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
345	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
350	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
355	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0
360	100	1.120	1.890	0.000	0.000	15,417	45,365	0	0	19,414	52,255	0	0

Site-Specific SCS Type II Storm - Upper Basin

Allowable Rate Discharge 15.17 cfs Allowable Vol. Discharge 5461.2 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
0	0.00%	0.000	0.000	0.000	0.000	0	0	0	0
0.1	0.10%	0.002	0.003	0.002	0.003	58	58	0	0
0.2	0.20%	0.004	0.006	0.002	0.003	116	58	0	0
0.3	0.31%	0.006	0.008	0.002	0.003	175	59	0	0
0.4	0.41%	0.008	0.011	0.002	0.003	234	59	0	0
0.5	0.51%	0.010	0.014	0.002	0.003	294	60	0	0
0.6	0.62%	0.011	0.017	0.002	0.003	354	60	0	0
0.7	0.73%	0.013	0.020	0.002	0.003	415	61	0	0
0.8	0.83%	0.015	0.023	0.002	0.003	476	61	0	0
0.9	0.94%	0.018	0.026	0.002	0.003	539	62	0	0
1	1.05%	0.020	0.029	0.002	0.003	601	62	0	0
1.1	1.16%	0.022	0.032	0.002	0.003	665	64	0	0
1.2	1.27%	0.024	0.035	0.002	0.003	728	64	0	0
1.3	1.39%	0.026	0.038	0.002	0.003	793	65	0	0
1.4	1.50%	0.028	0.041	0.002	0.003	858	65	0	0
1.5	1.61%	0.030	0.045	0.002	0.003	924	66	0	0
1.6	1.73%	0.032	0.048	0.002	0.003	989	66	0	0
1.7	1.85%	0.034	0.051	0.002	0.003	1,056	67	0	0
1.8	1.96%	0.036	0.054	0.002	0.003	1,123	67	0	0
1.9	2.08%	0.039	0.057	0.002	0.003	1,192	68	0	0
2	2.20%	0.041	0.061	0.002	0.003	1,260	68	0	0
2.1	2.32%	0.043	0.064	0.002	0.003	1,329	69	0	0
2.2	2.44%	0.045	0.067	0.002	0.003	1,398	69	0	0
2.3	2.57%	0.048	0.071	0.002	0.003	1,469	70	0	0
2.4	2.69%	0.050	0.074	0.002	0.003	1,539	70	0	0
2.5	2.81%	0.052	0.078	0.002	0.003	1,611	72	0	0
2.6	2.94%	0.055	0.081	0.002	0.003	1,682	72	0	0
2.7	3.07%	0.057	0.085	0.002	0.004	1,755	73	0	0
2.8	3.19%	0.059	0.088	0.002	0.004	1,828	73	0	0
2.9	3.32%	0.062	0.092	0.002	0.004	1,902	74	0	0
3	3.45%	0.064	0.095	0.002	0.004	1,975	74	0	0
3.1	3.58%	0.067	0.099	0.002	0.004	2,050	75	0	0
3.2	3.71%	0.069	0.102	0.002	0.004	2,126	75	0	0
3.3	3.85%	0.072	0.106	0.002	0.004	2,202	76	0	0
3.4	3.98%	0.074	0.110	0.002	0.004	2,278	76	0	0
3.5	4.11%	0.077	0.114	0.003	0.004	2,355	77	0	0
3.6	4.25%	0.079	0.117	0.003	0.004	2,432	77	0	0
3.7	4.39%	0.082	0.121	0.003	0.004	2,511	78	0	0
3.8	4.52%	0.084	0.125	0.003	0.004	2,589	78	0	0
3.9	4.66%	0.087	0.129	0.003	0.004	2,669	80	0	0
4	4.80%	0.089	0.132	0.003	0.004	2,749	80	0	0
4.1	4.94%	0.092	0.136	0.003	0.004	2,829	81	0	0

Site-Specific SCS Type II Storm - Upper Basin

Allowable Rate Discharge 15.17 cfs Allowable Vol. Discharge 5461.2 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
4.2	5.08%	0.095	0.140	0.003	0.004	2,911	82	0	0
4.3	5.23%	0.097	0.144	0.003	0.004	2,994	83	0	0
4.4	5.38%	0.100	0.148	0.003	0.004	3,078	84	0	0
4.5	5.53%	0.103	0.152	0.003	0.004	3,164	85	0	0
4.6	5.68%	0.106	0.157	0.003	0.004	3,250	86	0	0
4.7	5.83%	0.108	0.161	0.003	0.004	3,338	88	0	0
4.8	5.98%	0.111	0.165	0.003	0.004	3,426	89	0	0
4.9	6.14%	0.114	0.169	0.003	0.004	3,516	90	0	0
5	6.30%	0.117	0.174	0.003	0.004	3,607	91	0	0
5.1	6.46%	0.120	0.178	0.003	0.004	3,700	92	0	0
5.2	6.62%	0.123	0.183	0.003	0.004	3,793	93	0	0
5.3	6.79%	0.126	0.187	0.003	0.005	3,887	94	0	0
5.4	6.96%	0.129	0.192	0.003	0.005	3,983	96	0	0
5.5	7.13%	0.133	0.197	0.003	0.005	4,080	97	0	0
5.6	7.30%	0.136	0.201	0.003	0.005	4,178	98	0	0
5.7	7.47%	0.139	0.206	0.003	0.005	4,277	99	0	0
5.8	7.64%	0.142	0.211	0.003	0.005	4,377	100	0	0
5.9	7.82%	0.145	0.216	0.003	0.005	4,478	101	0	0
6	8.00%	0.149	0.221	0.003	0.005	4,581	102	0	0
6.1	8.18%	0.152	0.226	0.003	0.005	4,684	104	0	0
6.2	8.36%	0.156	0.231	0.003	0.005	4,789	105	0	0
6.3	8.55%	0.159	0.236	0.003	0.005	4,895	106	0	0
6.4	8.74%	0.162	0.241	0.003	0.005	5,002	107	0	0
6.5	8.93%	0.166	0.246	0.004	0.005	5,110	108	0	0
6.6	9.12%	0.170	0.252	0.004	0.005	5,220	109	0	0
6.7	9.31%	0.173	0.257	0.004	0.005	5,330	111	0	0
6.8	9.50%	0.177	0.262	0.004	0.005	5,442	112	0	0
6.9	9.70%	0.180	0.268	0.004	0.005	5,555	113	0	0
7	9.90%	0.184	0.273	0.004	0.005	5,669	114	0	0
7.1	10.10%	0.188	0.279	0.004	0.006	5,784	115	0	0
7.2	10.30%	0.192	0.284	0.004	0.006	5,900	116	0	0
7.3	10.51%	0.195	0.290	0.004	0.006	6,017	117	0	0
7.4	10.72%	0.199	0.296	0.004	0.006	6,136	119	0	0
7.5	10.93%	0.203	0.302	0.004	0.006	6,256	120	0	0
7.6	11.14%	0.207	0.307	0.004	0.006	6,377	121	0	0
7.7	11.35%	0.211	0.313	0.004	0.006	6,498	122	0	0
7.8	11.56%	0.215	0.319	0.004	0.006	6,622	123	0	0
7.9	11.78%	0.219	0.325	0.004	0.006	6,746	124	0	0
8	12.00%	0.223	0.331	0.004	0.006	6,871	125	0	0
8.1	12.23%	0.227	0.337	0.004	0.006	7,000	129	0	0
8.2	12.46%	0.232	0.344	0.004	0.006	7,135	135	0	0
8.3	12.71%	0.236	0.351	0.005	0.007	7,275	140	0	0

Site-Specific SCS Type II Storm - Upper Basin

Allowable Rate Discharge 15.17 cfs Allowable Vol. Discharge 5461.2 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in) 10y24h	Cumulative (in) 100y24h	Incremental (in) 10y24h	Incremental (in) 100y24h	100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
8.4	12.96%	0.241	0.358	0.005	0.007	7,421	146	0	0
8.5	13.23%	0.246	0.365	0.005	0.007	7,573	152	0	0
8.6	13.50%	0.251	0.373	0.005	0.008	7,730	157	0	0
8.7	13.79%	0.256	0.380	0.005	0.008	7,893	163	0	0
8.8	14.08%	0.262	0.389	0.005	0.008	8,062	169	0	0
8.9	14.39%	0.268	0.397	0.006	0.008	8,237	175	0	0
9	14.70%	0.273	0.406	0.006	0.009	8,417	180	0	0
9.1	15.02%	0.279	0.415	0.006	0.009	8,601	183	0	0
9.2	15.34%	0.285	0.423	0.006	0.009	8,784	183	0	0
9.3	15.66%	0.291	0.432	0.006	0.009	8,967	183	0	0
9.4	15.98%	0.297	0.441	0.006	0.009	9,150	183	0	0
9.5	16.30%	0.303	0.450	0.006	0.009	9,333	183	0	0
9.6	16.63%	0.309	0.459	0.006	0.009	9,521	188	0	0
9.7	16.97%	0.316	0.468	0.006	0.009	9,718	197	0	0
9.8	17.33%	0.322	0.478	0.007	0.010	9,924	206	0	0
9.9	17.71%	0.329	0.489	0.007	0.010	10,140	215	0	0
10	18.10%	0.337	0.500	0.007	0.011	10,364	224	0	0
10.1	18.51%	0.344	0.511	0.008	0.011	10,600	236	0	0
10.2	18.95%	0.352	0.523	0.008	0.012	10,850	250	0	0
10.3	19.41%	0.361	0.536	0.009	0.013	11,113	263	0	0
10.4	19.89%	0.370	0.549	0.009	0.013	11,390	277	0	0
10.5	20.40%	0.379	0.563	0.009	0.014	11,681	291	0	0
10.6	20.94%	0.389	0.578	0.010	0.015	11,990	309	0	0
10.7	21.52%	0.400	0.594	0.011	0.016	12,322	332	0	0
10.8	22.14%	0.412	0.611	0.012	0.017	12,677	355	0	0
10.9	22.80%	0.424	0.629	0.012	0.018	13,055	378	0	0
11	23.50%	0.437	0.649	0.013	0.019	13,456	401	0	0
11.1	24.27%	0.451	0.670	0.014	0.021	13,896	440	0	0
11.2	25.13%	0.467	0.694	0.016	0.024	14,391	495	0	0
11.3	26.09%	0.485	0.720	0.018	0.026	14,940	550	0	0
11.4	27.15%	0.505	0.749	0.020	0.029	15,545	605	0	0
11.5	28.30%	0.526	0.781	0.021	0.032	16,205	660	0	0
11.6	30.68%	0.571	0.847	0.044	0.066	17,570	1,365	0	0
11.7	35.44%	0.659	0.978	0.088	0.131	20,291	2,721	0	0
11.8	43.08%	0.801	1.189	0.142	0.211	24,667	4,376	0	0
11.9	56.79%	1.056	1.567	0.255	0.378	32,516	7,849	2,387	2,387
12	66.30%	1.233	1.830	0.177	0.263	37,964	5,448	0	2,387
12.1	68.20%	1.268	1.882	0.035	0.052	39,049	1,086	0	2,387
12.2	69.86%	1.299	1.928	0.031	0.046	40,004	955	0	2,387
12.3	71.30%	1.326	1.968	0.027	0.040	40,829	825	0	2,387
12.4	72.52%	1.349	2.001	0.023	0.033	41,523	694	0	2,387
12.5	73.50%	1.367	2.029	0.018	0.027	42,086	563	0	2,387

Site-Specific SCS Type II Storm - Upper Basin

Allowable Rate Discharge 15.17 cfs Allowable Vol. Discharge 5461.2 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in) 10y24h	Cumulative (in) 100y24h	Incremental (in) 10y24h	Incremental (in) 100y24h	100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
12.6	74.34%	1.383	2.052	0.016	0.023	42,570	483	0	2,387
12.7	75.14%	1.398	2.074	0.015	0.022	43,023	454	0	2,387
12.8	75.88%	1.411	2.094	0.014	0.020	43,447	424	0	2,387
12.9	76.56%	1.424	2.113	0.013	0.019	43,841	394	0	2,387
13	77.20%	1.436	2.131	0.012	0.018	44,205	364	0	2,387
13.1	77.80%	1.447	2.147	0.011	0.016	44,546	341	0	2,387
13.2	78.36%	1.458	2.163	0.011	0.016	44,872	325	0	2,387
13.3	78.90%	1.468	2.178	0.010	0.015	45,181	309	0	2,387
13.4	79.42%	1.477	2.192	0.010	0.014	45,474	293	0	2,387
13.5	79.90%	1.486	2.205	0.009	0.013	45,751	277	0	2,387
13.6	80.36%	1.495	2.218	0.009	0.013	46,014	263	0	2,387
13.7	80.80%	1.503	2.230	0.008	0.012	46,266	252	0	2,387
13.8	81.22%	1.511	2.242	0.008	0.012	46,507	240	0	2,387
13.9	81.62%	1.518	2.253	0.007	0.011	46,736	229	0	2,387
14	82.00%	1.525	2.263	0.007	0.010	46,954	218	0	2,387
14.1	82.37%	1.532	2.273	0.007	0.010	47,164	210	0	2,387
14.2	82.73%	1.539	2.283	0.007	0.010	47,369	206	0	2,387
14.3	83.08%	1.545	2.293	0.007	0.010	47,571	202	0	2,387
14.4	83.42%	1.552	2.303	0.006	0.010	47,769	198	0	2,387
14.5	83.76%	1.558	2.312	0.006	0.009	47,963	194	0	2,387
14.6	84.09%	1.564	2.321	0.006	0.009	48,153	190	0	2,387
14.7	84.42%	1.570	2.330	0.006	0.009	48,339	186	0	2,387
14.8	84.74%	1.576	2.339	0.006	0.009	48,520	182	0	2,387
14.9	85.05%	1.582	2.347	0.006	0.009	48,698	178	0	2,387
15	85.35%	1.588	2.356	0.006	0.008	48,872	173	0	2,387
15.1	85.65%	1.593	2.364	0.006	0.008	49,042	170	0	2,387
15.2	85.94%	1.598	2.372	0.005	0.008	49,207	165	0	2,387
15.3	86.22%	1.604	2.380	0.005	0.008	49,369	162	0	2,387
15.4	86.49%	1.609	2.387	0.005	0.008	49,527	157	0	2,387
15.5	86.76%	1.614	2.395	0.005	0.007	49,681	154	0	2,387
15.6	87.02%	1.619	2.402	0.005	0.007	49,830	149	0	2,387
15.7	87.28%	1.623	2.409	0.005	0.007	49,976	146	0	2,387
15.8	87.53%	1.628	2.416	0.005	0.007	50,118	141	0	2,387
15.9	87.77%	1.632	2.422	0.004	0.007	50,256	138	0	2,387
16	88.00%	1.637	2.429	0.004	0.006	50,389	133	0	2,387
16.1	88.23%	1.641	2.435	0.004	0.006	50,520	131	0	2,387
16.2	88.46%	1.645	2.441	0.004	0.006	50,650	129	0	2,387
16.3	88.68%	1.649	2.448	0.004	0.006	50,778	128	0	2,387
16.4	88.90%	1.654	2.454	0.004	0.006	50,905	127	0	2,387
16.5	89.12%	1.658	2.460	0.004	0.006	51,030	125	0	2,387
16.6	89.34%	1.662	2.466	0.004	0.006	51,154	124	0	2,387
16.7	89.55%	1.666	2.472	0.004	0.006	51,276	123	0	2,387

Site-Specific SCS Type II Storm - Upper Basin

Allowable Rate Discharge: 15.17 cfs Allowable Vol. Discharge: 5461.2 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
16.8	89.76%	1.670	2.477	0.004	0.006	51,397	121	0	2,387
16.9	89.97%	1.673	2.483	0.004	0.006	51,517	120	0	2,387
17	90.18%	1.677	2.489	0.004	0.006	51,635	118	0	2,387
17.1	90.38%	1.681	2.494	0.004	0.006	51,751	117	0	2,387
17.2	90.58%	1.685	2.500	0.004	0.006	51,866	115	0	2,387
17.3	90.78%	1.688	2.506	0.004	0.005	51,980	114	0	2,387
17.4	90.98%	1.692	2.511	0.004	0.005	52,093	112	0	2,387
17.5	91.17%	1.696	2.516	0.004	0.005	52,204	111	0	2,387
17.6	91.36%	1.699	2.522	0.004	0.005	52,313	109	0	2,387
17.7	91.55%	1.703	2.527	0.004	0.005	52,421	108	0	2,387
17.8	91.74%	1.706	2.532	0.003	0.005	52,528	107	0	2,387
17.9	91.92%	1.710	2.537	0.003	0.005	52,633	105	0	2,387
18	92.10%	1.713	2.542	0.003	0.005	52,737	104	0	2,387
18.1	92.28%	1.716	2.547	0.003	0.005	52,839	102	0	2,387
18.2	92.46%	1.720	2.552	0.003	0.005	52,940	101	0	2,387
18.3	92.63%	1.723	2.557	0.003	0.005	53,040	100	0	2,387
18.4	92.80%	1.726	2.561	0.003	0.005	53,138	98	0	2,387
18.5	92.97%	1.729	2.566	0.003	0.005	53,234	97	0	2,387
18.6	93.14%	1.732	2.571	0.003	0.005	53,330	95	0	2,387
18.7	93.30%	1.735	2.575	0.003	0.005	53,423	94	0	2,387
18.8	93.46%	1.738	2.579	0.003	0.004	53,516	92	0	2,387
18.9	93.62%	1.741	2.584	0.003	0.004	53,607	91	0	2,387
19	93.78%	1.744	2.588	0.003	0.004	53,696	89	0	2,387
19.1	93.93%	1.747	2.592	0.003	0.004	53,784	88	0	2,387
19.2	94.08%	1.750	2.597	0.003	0.004	53,871	86	0	2,387
19.3	94.23%	1.753	2.601	0.003	0.004	53,956	85	0	2,387
19.4	94.38%	1.755	2.605	0.003	0.004	54,040	84	0	2,387
19.5	94.52%	1.758	2.609	0.003	0.004	54,122	82	0	2,387
19.6	94.66%	1.761	2.613	0.003	0.004	54,203	81	0	2,387
19.7	94.80%	1.763	2.616	0.003	0.004	54,282	80	0	2,387
19.8	94.94%	1.766	2.620	0.003	0.004	54,360	78	0	2,387
19.9	95.07%	1.768	2.624	0.002	0.004	54,437	77	0	2,387
20	95.20%	1.771	2.628	0.002	0.004	54,512	75	0	2,387
20.1	95.33%	1.773	2.631	0.002	0.004	54,586	74	0	2,387
20.2	95.46%	1.776	2.635	0.002	0.004	54,660	74	0	2,387
20.3	95.59%	1.778	2.638	0.002	0.004	54,734	74	0	2,387
20.4	95.72%	1.780	2.642	0.002	0.004	54,807	73	0	2,387
20.5	95.84%	1.783	2.645	0.002	0.004	54,881	73	0	2,387
20.6	95.97%	1.785	2.649	0.002	0.004	54,953	73	0	2,387
20.7	96.10%	1.787	2.652	0.002	0.004	55,026	73	0	2,387
20.8	96.22%	1.790	2.656	0.002	0.003	55,098	72	0	2,387
20.9	96.35%	1.792	2.659	0.002	0.003	55,170	72	0	2,387

Site-Specific SCS Type II Storm - Upper Basin

Allowable Rate Discharge 15.17 cfs Allowable Vol. Discharge 5461.2 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in) 10y24h	Cumulative (in) 100y24h	Incremental (in) 10y24h	Incremental (in) 100y24h	100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
21	96.48%	1.794	2.663	0.002	0.003	55,242	72	0	2,387
21.1	96.60%	1.797	2.666	0.002	0.003	55,314	72	0	2,387
21.2	96.72%	1.799	2.670	0.002	0.003	55,385	71	0	2,387
21.3	96.85%	1.801	2.673	0.002	0.003	55,456	71	0	2,387
21.4	96.97%	1.804	2.676	0.002	0.003	55,526	70	0	2,387
21.5	97.09%	1.806	2.680	0.002	0.003	55,596	70	0	2,387
21.6	97.22%	1.808	2.683	0.002	0.003	55,666	70	0	2,387
21.7	97.34%	1.810	2.687	0.002	0.003	55,736	70	0	2,387
21.8	97.46%	1.813	2.690	0.002	0.003	55,805	69	0	2,387
21.9	97.58%	1.815	2.693	0.002	0.003	55,875	69	0	2,387
22	97.70%	1.817	2.697	0.002	0.003	55,943	69	0	2,387
22.1	97.82%	1.819	2.700	0.002	0.003	56,012	69	0	2,387
22.2	97.94%	1.822	2.703	0.002	0.003	56,080	68	0	2,387
22.3	98.06%	1.824	2.706	0.002	0.003	56,148	68	0	2,387
22.4	98.18%	1.826	2.710	0.002	0.003	56,216	68	0	2,387
22.5	98.29%	1.828	2.713	0.002	0.003	56,284	68	0	2,387
22.6	98.41%	1.830	2.716	0.002	0.003	56,351	67	0	2,387
22.7	98.53%	1.833	2.719	0.002	0.003	56,418	67	0	2,387
22.8	98.64%	1.835	2.723	0.002	0.003	56,484	66	0	2,387
22.9	98.76%	1.837	2.726	0.002	0.003	56,550	66	0	2,387
23	98.88%	1.839	2.729	0.002	0.003	56,616	66	0	2,387
23.1	98.99%	1.841	2.732	0.002	0.003	56,682	66	0	2,387
23.2	99.10%	1.843	2.735	0.002	0.003	56,747	65	0	2,387
23.3	99.22%	1.845	2.738	0.002	0.003	56,813	65	0	2,387
23.4	99.33%	1.848	2.742	0.002	0.003	56,877	65	0	2,387
23.5	99.44%	1.850	2.745	0.002	0.003	56,942	65	0	2,387
23.6	99.56%	1.852	2.748	0.002	0.003	57,006	64	0	2,387
23.7	99.67%	1.854	2.751	0.002	0.003	57,070	64	0	2,387
23.8	99.78%	1.856	2.754	0.002	0.003	57,134	64	0	2,387
23.9	99.89%	1.858	2.757	0.002	0.003	57,197	64	0	2,387
24	100.00%	1.860	2.760	0.002	0.003	57,260	63	0	2,387

Site-Specific SCS Type II Storm - Lower Basin

Allowable Rate Discharge 31.34 cfs Allowable Vol. Discharge 11282.4 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
0	0.00%	0.000	0.000	0.000	0.000	0	0	0	0
0.1	0.10%	0.002	0.003	0.002	0.003	96	96	0	0
0.2	0.20%	0.004	0.006	0.002	0.003	193	96	0	0
0.3	0.31%	0.006	0.008	0.002	0.003	291	98	0	0
0.4	0.41%	0.008	0.011	0.002	0.003	390	98	0	0
0.5	0.51%	0.010	0.014	0.002	0.003	490	100	0	0
0.6	0.62%	0.011	0.017	0.002	0.003	590	100	0	0
0.7	0.73%	0.013	0.020	0.002	0.003	692	102	0	0
0.8	0.83%	0.015	0.023	0.002	0.003	795	102	0	0
0.9	0.94%	0.018	0.026	0.002	0.003	899	104	0	0
1	1.05%	0.020	0.029	0.002	0.003	1,003	104	0	0
1.1	1.16%	0.022	0.032	0.002	0.003	1,109	106	0	0
1.2	1.27%	0.024	0.035	0.002	0.003	1,215	106	0	0
1.3	1.39%	0.026	0.038	0.002	0.003	1,323	108	0	0
1.4	1.50%	0.028	0.041	0.002	0.003	1,431	108	0	0
1.5	1.61%	0.030	0.045	0.002	0.003	1,540	110	0	0
1.6	1.73%	0.032	0.048	0.002	0.003	1,650	110	0	0
1.7	1.85%	0.034	0.051	0.002	0.003	1,762	112	0	0
1.8	1.96%	0.036	0.054	0.002	0.003	1,874	112	0	0
1.9	2.08%	0.039	0.057	0.002	0.003	1,987	114	0	0
2	2.20%	0.041	0.061	0.002	0.003	2,101	114	0	0
2.1	2.32%	0.043	0.064	0.002	0.003	2,217	116	0	0
2.2	2.44%	0.045	0.067	0.002	0.003	2,332	116	0	0
2.3	2.57%	0.048	0.071	0.002	0.003	2,450	117	0	0
2.4	2.69%	0.050	0.074	0.002	0.003	2,567	117	0	0
2.5	2.81%	0.052	0.078	0.002	0.003	2,686	119	0	0
2.6	2.94%	0.055	0.081	0.002	0.003	2,806	119	0	0
2.7	3.07%	0.057	0.085	0.002	0.004	2,927	121	0	0
2.8	3.19%	0.059	0.088	0.002	0.004	3,048	121	0	0
2.9	3.32%	0.062	0.092	0.002	0.004	3,172	123	0	0
3	3.45%	0.064	0.095	0.002	0.004	3,295	123	0	0
3.1	3.58%	0.067	0.099	0.002	0.004	3,420	125	0	0
3.2	3.71%	0.069	0.102	0.002	0.004	3,545	125	0	0
3.3	3.85%	0.072	0.106	0.002	0.004	3,672	127	0	0
3.4	3.98%	0.074	0.110	0.002	0.004	3,799	127	0	0
3.5	4.11%	0.077	0.114	0.003	0.004	3,928	129	0	0
3.6	4.25%	0.079	0.117	0.003	0.004	4,057	129	0	0
3.7	4.39%	0.082	0.121	0.003	0.004	4,188	131	0	0
3.8	4.52%	0.084	0.125	0.003	0.004	4,318	131	0	0
3.9	4.66%	0.087	0.129	0.003	0.004	4,451	133	0	0
4	4.80%	0.089	0.132	0.003	0.004	4,584	133	0	0
4.1	4.94%	0.092	0.136	0.003	0.004	4,719	135	0	0

Site-Specific SCS Type II Storm - Lower Basin

Allowable Rate Discharge 31.34 cfs Allowable Vol. Discharge 11282.4 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
4.2	5.08%	0.095	0.140	0.003	0.004	4,855	137	0	0
4.3	5.23%	0.097	0.144	0.003	0.004	4,994	138	0	0
4.4	5.38%	0.100	0.148	0.003	0.004	5,134	140	0	0
4.5	5.53%	0.103	0.152	0.003	0.004	5,276	142	0	0
4.6	5.68%	0.106	0.157	0.003	0.004	5,421	144	0	0
4.7	5.83%	0.108	0.161	0.003	0.004	5,567	146	0	0
4.8	5.98%	0.111	0.165	0.003	0.004	5,715	148	0	0
4.9	6.14%	0.114	0.169	0.003	0.004	5,865	150	0	0
5	6.30%	0.117	0.174	0.003	0.004	6,016	152	0	0
5.1	6.46%	0.120	0.178	0.003	0.004	6,170	154	0	0
5.2	6.62%	0.123	0.183	0.003	0.004	6,326	156	0	0
5.3	6.79%	0.126	0.187	0.003	0.005	6,483	158	0	0
5.4	6.96%	0.129	0.192	0.003	0.005	6,643	159	0	0
5.5	7.13%	0.133	0.197	0.003	0.005	6,804	161	0	0
5.6	7.30%	0.136	0.201	0.003	0.005	6,968	163	0	0
5.7	7.47%	0.139	0.206	0.003	0.005	7,133	165	0	0
5.8	7.64%	0.142	0.211	0.003	0.005	7,300	167	0	0
5.9	7.82%	0.145	0.216	0.003	0.005	7,469	169	0	0
6	8.00%	0.149	0.221	0.003	0.005	7,640	171	0	0
6.1	8.18%	0.152	0.226	0.003	0.005	7,813	173	0	0
6.2	8.36%	0.156	0.231	0.003	0.005	7,988	175	0	0
6.3	8.55%	0.159	0.236	0.003	0.005	8,164	177	0	0
6.4	8.74%	0.162	0.241	0.003	0.005	8,343	179	0	0
6.5	8.93%	0.166	0.246	0.004	0.005	8,523	180	0	0
6.6	9.12%	0.170	0.252	0.004	0.005	8,706	182	0	0
6.7	9.31%	0.173	0.257	0.004	0.005	8,890	184	0	0
6.8	9.50%	0.177	0.262	0.004	0.005	9,076	186	0	0
6.9	9.70%	0.180	0.268	0.004	0.005	9,264	188	0	0
7	9.90%	0.184	0.273	0.004	0.005	9,454	190	0	0
7.1	10.10%	0.188	0.279	0.004	0.006	9,646	192	0	0
7.2	10.30%	0.192	0.284	0.004	0.006	9,840	194	0	0
7.3	10.51%	0.195	0.290	0.004	0.006	10,036	196	0	0
7.4	10.72%	0.199	0.296	0.004	0.006	10,234	198	0	0
7.5	10.93%	0.203	0.302	0.004	0.006	10,433	200	0	0
7.6	11.14%	0.207	0.307	0.004	0.006	10,635	202	0	0
7.7	11.35%	0.211	0.313	0.004	0.006	10,838	203	0	0
7.8	11.56%	0.215	0.319	0.004	0.006	11,043	205	0	0
7.9	11.78%	0.219	0.325	0.004	0.006	11,251	207	0	0
8	12.00%	0.223	0.331	0.004	0.006	11,460	209	0	0
8.1	12.23%	0.227	0.337	0.004	0.006	11,675	215	0	0
8.2	12.46%	0.232	0.344	0.004	0.006	11,899	224	0	0
8.3	12.71%	0.236	0.351	0.005	0.007	12,133	234	0	0

Site-Specific SCS Type II Storm - Lower Basin

Allowable Rate Discharge 31.34 cfs Allowable Vol. Discharge 11282.4 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
8.4	12.96%	0.241	0.358	0.005	0.007	12,377	244	0	0
8.5	13.23%	0.246	0.365	0.005	0.007	12,630	253	0	0
8.6	13.50%	0.251	0.373	0.005	0.008	12,892	263	0	0
8.7	13.79%	0.256	0.380	0.005	0.008	13,164	272	0	0
8.8	14.08%	0.262	0.389	0.005	0.008	13,446	282	0	0
8.9	14.39%	0.268	0.397	0.006	0.008	13,737	291	0	0
9	14.70%	0.273	0.406	0.006	0.009	14,038	301	0	0
9.1	15.02%	0.279	0.415	0.006	0.009	14,344	306	0	0
9.2	15.34%	0.285	0.423	0.006	0.009	14,649	306	0	0
9.3	15.66%	0.291	0.432	0.006	0.009	14,955	306	0	0
9.4	15.98%	0.297	0.441	0.006	0.009	15,261	306	0	0
9.5	16.30%	0.303	0.450	0.006	0.009	15,566	306	0	0
9.6	16.63%	0.309	0.459	0.006	0.009	15,880	313	0	0
9.7	16.97%	0.316	0.468	0.006	0.009	16,208	329	0	0
9.8	17.33%	0.322	0.478	0.007	0.010	16,552	344	0	0
9.9	17.71%	0.329	0.489	0.007	0.010	16,911	359	0	0
10	18.10%	0.337	0.500	0.007	0.011	17,285	374	0	0
10.1	18.51%	0.344	0.511	0.008	0.011	17,679	393	0	0
10.2	18.95%	0.352	0.523	0.008	0.012	18,095	416	0	0
10.3	19.41%	0.361	0.536	0.009	0.013	18,534	439	0	0
10.4	19.89%	0.370	0.549	0.009	0.013	18,997	462	0	0
10.5	20.40%	0.379	0.563	0.009	0.014	19,482	485	0	0
10.6	20.94%	0.389	0.578	0.010	0.015	19,997	516	0	0
10.7	21.52%	0.400	0.594	0.011	0.016	20,551	554	0	0
10.8	22.14%	0.412	0.611	0.012	0.017	21,143	592	0	0
10.9	22.80%	0.424	0.629	0.012	0.018	21,774	630	0	0
11	23.50%	0.437	0.649	0.013	0.019	22,442	668	0	0
11.1	24.27%	0.451	0.670	0.014	0.021	23,176	733	0	0
11.2	25.13%	0.467	0.694	0.016	0.024	24,001	825	0	0
11.3	26.09%	0.485	0.720	0.018	0.026	24,918	917	0	0
11.4	27.15%	0.505	0.749	0.020	0.029	25,926	1,008	0	0
11.5	28.30%	0.526	0.781	0.021	0.032	27,026	1,100	0	0
11.6	30.68%	0.571	0.847	0.044	0.066	29,303	2,277	0	0
11.7	35.44%	0.659	0.978	0.088	0.131	33,841	4,538	0	0
11.8	43.08%	0.801	1.189	0.142	0.211	41,140	7,299	0	0
11.9	56.79%	1.056	1.567	0.255	0.378	54,230	13,090	1,808	1,808
12	66.30%	1.233	1.830	0.177	0.263	63,316	9,086	0	1,808
12.1	68.20%	1.268	1.882	0.035	0.052	65,126	1,811	0	1,808
12.2	69.86%	1.299	1.928	0.031	0.046	66,719	1,593	0	1,808
12.3	71.30%	1.326	1.968	0.027	0.040	68,094	1,375	0	1,808
12.4	72.52%	1.349	2.001	0.023	0.033	69,252	1,157	0	1,808
12.5	73.50%	1.367	2.029	0.018	0.027	70,192	940	0	1,808

Site-Specific SCS Type II Storm - Lower Basin

Allowable Rate Discharge 31.34 cfs Allowable Vol. Discharge 11282.4 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
12.6	74.34%	1.383	2.052	0.016	0.023	70,998	806	0	1,808
12.7	75.14%	1.398	2.074	0.015	0.022	71,754	756	0	1,808
12.8	75.88%	1.411	2.094	0.014	0.020	72,461	707	0	1,808
12.9	76.56%	1.424	2.113	0.013	0.019	73,118	657	0	1,808
13	77.20%	1.436	2.131	0.012	0.018	73,725	607	0	1,808
13.1	77.80%	1.447	2.147	0.011	0.016	74,294	569	0	1,808
13.2	78.36%	1.458	2.163	0.011	0.016	74,837	542	0	1,808
13.3	78.90%	1.468	2.178	0.010	0.015	75,352	516	0	1,808
13.4	79.42%	1.477	2.192	0.010	0.014	75,841	489	0	1,808
13.5	79.90%	1.486	2.205	0.009	0.013	76,303	462	0	1,808
13.6	80.36%	1.495	2.218	0.009	0.013	76,743	439	0	1,808
13.7	80.80%	1.503	2.230	0.008	0.012	77,163	420	0	1,808
13.8	81.22%	1.511	2.242	0.008	0.012	77,564	401	0	1,808
13.9	81.62%	1.518	2.253	0.007	0.011	77,946	382	0	1,808
14	82.00%	1.525	2.263	0.007	0.010	78,309	363	0	1,808
14.1	82.37%	1.532	2.273	0.007	0.010	78,659	350	0	1,808
14.2	82.73%	1.539	2.283	0.007	0.010	79,002	343	0	1,808
14.3	83.08%	1.545	2.293	0.007	0.010	79,339	337	0	1,808
14.4	83.42%	1.552	2.303	0.006	0.010	79,669	329	0	1,808
14.5	83.76%	1.558	2.312	0.006	0.009	79,993	324	0	1,808
14.6	84.09%	1.564	2.321	0.006	0.009	80,309	316	0	1,808
14.7	84.42%	1.570	2.330	0.006	0.009	80,619	310	0	1,808
14.8	84.74%	1.576	2.339	0.006	0.009	80,922	303	0	1,808
14.9	85.05%	1.582	2.347	0.006	0.009	81,219	297	0	1,808
15	85.35%	1.588	2.356	0.006	0.008	81,508	289	0	1,808
15.1	85.65%	1.593	2.364	0.006	0.008	81,792	284	0	1,808
15.2	85.94%	1.598	2.372	0.005	0.008	82,068	276	0	1,808
15.3	86.22%	1.604	2.380	0.005	0.008	82,338	270	0	1,808
15.4	86.49%	1.609	2.387	0.005	0.008	82,601	263	0	1,808
15.5	86.76%	1.614	2.395	0.005	0.007	82,857	257	0	1,808
15.6	87.02%	1.619	2.402	0.005	0.007	83,107	249	0	1,808
15.7	87.28%	1.623	2.409	0.005	0.007	83,350	244	0	1,808
15.8	87.53%	1.628	2.416	0.005	0.007	83,586	236	0	1,808
15.9	87.77%	1.632	2.422	0.004	0.007	83,816	230	0	1,808
16	88.00%	1.637	2.429	0.004	0.006	84,039	223	0	1,808
16.1	88.23%	1.641	2.435	0.004	0.006	84,258	219	0	1,808
16.2	88.46%	1.645	2.441	0.004	0.006	84,473	216	0	1,808
16.3	88.68%	1.649	2.448	0.004	0.006	84,687	214	0	1,808
16.4	88.90%	1.654	2.454	0.004	0.006	84,898	211	0	1,808
16.5	89.12%	1.658	2.460	0.004	0.006	85,107	209	0	1,808
16.6	89.34%	1.662	2.466	0.004	0.006	85,314	206	0	1,808
16.7	89.55%	1.666	2.472	0.004	0.006	85,518	204	0	1,808

Site-Specific SCS Type II Storm - Lower Basin

Allowable Rate Discharge 31.34 cfs Allowable Vol. Discharge 11282.4 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
16.8	89.76%	1.670	2.477	0.004	0.006	85,720	202	0	1,808
16.9	89.97%	1.673	2.483	0.004	0.006	85,919	200	0	1,808
17	90.18%	1.677	2.489	0.004	0.006	86,116	197	0	1,808
17.1	90.38%	1.681	2.494	0.004	0.006	86,311	195	0	1,808
17.2	90.58%	1.685	2.500	0.004	0.006	86,503	192	0	1,808
17.3	90.78%	1.688	2.506	0.004	0.005	86,693	190	0	1,808
17.4	90.98%	1.692	2.511	0.004	0.005	86,880	187	0	1,808
17.5	91.17%	1.696	2.516	0.004	0.005	87,065	185	0	1,808
17.6	91.36%	1.699	2.522	0.004	0.005	87,248	182	0	1,808
17.7	91.55%	1.703	2.527	0.004	0.005	87,428	180	0	1,808
17.8	91.74%	1.706	2.532	0.003	0.005	87,606	178	0	1,808
17.9	91.92%	1.710	2.537	0.003	0.005	87,781	176	0	1,808
18	92.10%	1.713	2.542	0.003	0.005	87,954	173	0	1,808
18.1	92.28%	1.716	2.547	0.003	0.005	88,125	171	0	1,808
18.2	92.46%	1.720	2.552	0.003	0.005	88,293	168	0	1,808
18.3	92.63%	1.723	2.557	0.003	0.005	88,459	166	0	1,808
18.4	92.80%	1.726	2.561	0.003	0.005	88,623	163	0	1,808
18.5	92.97%	1.729	2.566	0.003	0.005	88,784	161	0	1,808
18.6	93.14%	1.732	2.571	0.003	0.005	88,943	159	0	1,808
18.7	93.30%	1.735	2.575	0.003	0.005	89,099	157	0	1,808
18.8	93.46%	1.738	2.579	0.003	0.004	89,253	154	0	1,808
18.9	93.62%	1.741	2.584	0.003	0.004	89,405	152	0	1,808
19	93.78%	1.744	2.588	0.003	0.004	89,554	149	0	1,808
19.1	93.93%	1.747	2.592	0.003	0.004	89,701	147	0	1,808
19.2	94.08%	1.750	2.597	0.003	0.004	89,845	144	0	1,808
19.3	94.23%	1.753	2.601	0.003	0.004	89,987	142	0	1,808
19.4	94.38%	1.755	2.605	0.003	0.004	90,127	139	0	1,808
19.5	94.52%	1.758	2.609	0.003	0.004	90,264	138	0	1,808
19.6	94.66%	1.761	2.613	0.003	0.004	90,399	135	0	1,808
19.7	94.80%	1.763	2.616	0.003	0.004	90,532	133	0	1,808
19.8	94.94%	1.766	2.620	0.003	0.004	90,662	130	0	1,808
19.9	95.07%	1.768	2.624	0.002	0.004	90,790	128	0	1,808
20	95.20%	1.771	2.628	0.002	0.004	90,915	125	0	1,808
20.1	95.33%	1.773	2.631	0.002	0.004	91,039	124	0	1,808
20.2	95.46%	1.776	2.635	0.002	0.004	91,162	123	0	1,808
20.3	95.59%	1.778	2.638	0.002	0.004	91,285	123	0	1,808
20.4	95.72%	1.780	2.642	0.002	0.004	91,407	122	0	1,808
20.5	95.84%	1.783	2.645	0.002	0.004	91,530	122	0	1,808
20.6	95.97%	1.785	2.649	0.002	0.004	91,651	121	0	1,808
20.7	96.10%	1.787	2.652	0.002	0.004	91,772	121	0	1,808
20.8	96.22%	1.790	2.656	0.002	0.003	91,893	120	0	1,808
20.9	96.35%	1.792	2.659	0.002	0.003	92,013	120	0	1,808

Site-Specific SCS Type II Storm - Lower Basin

Allowable Rate Discharge 31.34 cfs Allowable Vol. Discharge 11282.4 cf in 0.1 hrs

Time (hours)	Distribution (%)	Cumulative (in)		Incremental (in)		100y24h Cum. Inflow (CF)	100y24h Incremental Inflow (CF)	Detained in Period (CF)	Cum Detained (CF)
		10y24h	100y24h	10y24h	100y24h				
21	96.48%	1.794	2.663	0.002	0.003	92,132	119	0	1,808
21.1	96.60%	1.797	2.666	0.002	0.003	92,252	119	0	1,808
21.2	96.72%	1.799	2.670	0.002	0.003	92,370	118	0	1,808
21.3	96.85%	1.801	2.673	0.002	0.003	92,489	118	0	1,808
21.4	96.97%	1.804	2.676	0.002	0.003	92,606	117	0	1,808
21.5	97.09%	1.806	2.680	0.002	0.003	92,723	117	0	1,808
21.6	97.22%	1.808	2.683	0.002	0.003	92,840	117	0	1,808
21.7	97.34%	1.810	2.687	0.002	0.003	92,956	117	0	1,808
21.8	97.46%	1.813	2.690	0.002	0.003	93,072	116	0	1,808
21.9	97.58%	1.815	2.693	0.002	0.003	93,188	116	0	1,808
22	97.70%	1.817	2.697	0.002	0.003	93,302	115	0	1,808
22.1	97.82%	1.819	2.700	0.002	0.003	93,417	115	0	1,808
22.2	97.94%	1.822	2.703	0.002	0.003	93,530	114	0	1,808
22.3	98.06%	1.824	2.706	0.002	0.003	93,644	114	0	1,808
22.4	98.18%	1.826	2.710	0.002	0.003	93,757	113	0	1,808
22.5	98.29%	1.828	2.713	0.002	0.003	93,869	113	0	1,808
22.6	98.41%	1.830	2.716	0.002	0.003	93,981	112	0	1,808
22.7	98.53%	1.833	2.719	0.002	0.003	94,093	112	0	1,808
22.8	98.64%	1.835	2.723	0.002	0.003	94,204	111	0	1,808
22.9	98.76%	1.837	2.726	0.002	0.003	94,314	111	0	1,808
23	98.88%	1.839	2.729	0.002	0.003	94,424	110	0	1,808
23.1	98.99%	1.841	2.732	0.002	0.003	94,534	110	0	1,808
23.2	99.10%	1.843	2.735	0.002	0.003	94,643	109	0	1,808
23.3	99.22%	1.845	2.738	0.002	0.003	94,752	109	0	1,808
23.4	99.33%	1.848	2.742	0.002	0.003	94,860	108	0	1,808
23.5	99.44%	1.850	2.745	0.002	0.003	94,968	108	0	1,808
23.6	99.56%	1.852	2.748	0.002	0.003	95,075	107	0	1,808
23.7	99.67%	1.854	2.751	0.002	0.003	95,182	107	0	1,808
23.8	99.78%	1.856	2.754	0.002	0.003	95,288	106	0	1,808
23.9	99.89%	1.858	2.757	0.002	0.003	95,394	106	0	1,808
24	100.00%	1.860	2.760	0.002	0.003	95,499	105	0	1,808

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Percentage of rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties–Washington County Area, Utah

Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
WBD—Winkel gravelly fine sandy loam, 1 to 8 percent slopes														
Winkel	85	D	0-1	Gravelly fine sandy loam	SM	A-4, A-2-4	0- 0- 0	0- 5- 10	75-80-85	70-75-80	50-55-60	30-35-40	15-20-25	NP-3 -5
			1-6	Gravelly fine sandy loam	SM	A-4, A-2-4	0- 0- 0	0- 5- 10	75-80-85	70-75-80	50-55-60	30-35-40	15-20-25	NP-3 -5
			6-12	Very gravelly fine sandy loam	GM	A-1-b	0- 0- 0	10-15-20	40-45-50	35-40-45	25-30-35	15-20-25	15-20-25	NP-3 -5
			12-16	Extremely cobbly fine sandy loam	GC-GM, GM	A-2, A-1-b	0- 0- 0	50-55-60	40-45-50	35-40-45	30-35-40	15-23-30	15-20-25	NP-3 -5
			16-20	Indurated	—	—	—	—	—	—	—	—	—	—
			20-24	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Washington County Area, Utah														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
WCF—Winkel-Rock outcrop complex, 8 to 30 percent slopes														
Winkel	65	D	0-1	Gravelly fine sandy loam	SM	A-2-4, A-4	0- 0- 0	0- 5- 10	75-80-85	70-75-80	50-55-60	30-35-40	15-20 -25	NP-3 -5
			1-6	Gravelly fine sandy loam	SM	A-4, A-2-4	0- 0- 0	0- 5- 10	75-80-85	70-75-80	50-55-60	30-35-40	15-20 -25	NP-3 -5
			6-12	Very gravelly fine sandy loam	GM	A-1-b	0- 0- 0	10-15-20	40-45-50	35-40-45	25-30-35	15-20-25	15-20 -25	NP-3 -5
			12-16	Extremely cobbly fine sandy loam	GC-GM, GM	A-2, A-1-b	0- 0- 0	50-55-60	40-45-50	35-40-45	30-35-40	15-23-30	15-20 -25	NP-3 -5
			16-20	Indurated	—	—	—	—	—	—	—	—	—	—
			20-24	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—

Data Source Information

Soil Survey Area: Washington County Area, Utah
Survey Area Data: Version 15, Sep 7, 2021

Hydrologic Soil Group and Surface Runoff

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

Report—Hydrologic Soil Group and Surface Runoff

Absence of an entry indicates that the data were not estimated. The dash indicates no documented presence.

Hydrologic Soil Group and Surface Runoff–Washington County Area, Utah			
Map symbol and soil name	**Pct. of map unit**	**Surface Runoff**	**Hydrologic Soil Group**
SY—Stony colluvial land			
Stony colluvial land	100	—	—

Hydrologic Soil Group and Surface Runoff–Washington County Area, Utah			
Map symbol and soil name	Pct. of map unit	Surface Runoff	Hydrologic Soil Group
WBD—Winkel gravelly fine sandy loam, 1 to 8 percent slopes			
Winkel	85	Medium	D
WCF—Winkel-Rock outcrop complex, 8 to 30 percent slopes			
Winkel	65	Medium	D
Rock outcrop	25	—	—

Data Source Information

Soil Survey Area: Washington County Area, Utah
Survey Area Data: Version 15, Sep 7, 2021

Physical Soil Properties

This table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates in the table are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity (Ksat) is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and Ksat. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Reference:
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. (http://soils.usda.gov)

Report—Physical Soil Properties

Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Physical Soil Properties–Washington County Area, Utah														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
SY—Stony colluvial land														
Stony colluvial land	—	—	—	—	—	—	—	—	—					
WBD—Winkel gravelly fine sandy loam, 1 to 8 percent slopes														
Winkel	0-1	-70-	-22-	3- 8- 12	1.35-1.43 -1.50	14.11-28.23-42. 34	0.07-0.08-0. 09	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.20	.32	1	5	56
	1-6	-70-	-22-	3- 8- 12	1.35-1.43 -1.50	14.11-28.23-42. 34	0.07-0.08-0. 09	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.24	.37			
	6-12	-70-	-22-	3- 8- 12	1.35-1.43 -1.50	14.11-28.23-42. 34	0.05-0.06-0. 07	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.15	.37			
	12-16	-70-	-22-	3- 8- 12	1.40-1.48 -1.55	14.11-28.23-42. 34	0.04-0.05-0. 06	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.10	.37			
	16-20	—	—	—	—	0.00-2.12-4.23	—	—	—					
	20-24	—	—	—	—	0.07-70.61-141. 14	—	—	—					

Physical Soil Properties–Washington County Area, Utah														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
WCF—Winkel-Rock outcrop complex, 8 to 30 percent slopes														
Winkel	0-1	-70-	-22-	3- 8- 12	1.35-1.43 -1.50	14.11-28.23-42. 34	0.07-0.08-0. 09	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.20	.32	1	5	56
	1-6	-70-	-22-	3- 8- 12	1.35-1.43 -1.50	14.11-28.23-42. 34	0.07-0.08-0. 09	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.24	.37			
	6-12	-70-	-22-	3- 8- 12	1.35-1.43 -1.50	14.11-28.23-42. 34	0.05-0.06-0. 07	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.15	.37			
	12-16	-70-	-22-	3- 8- 12	1.40-1.48 -1.55	14.11-28.23-42. 34	0.04-0.05-0. 06	0.0- 1.5- 2.9	0.0- 0.5- 1.0	.10	.37			
	16-20	—	—	—	—	0.00-2.12-4.23	—	—	—					
	20-24	—	—	—	—	0.07-70.61-141. 14	—	—	—					
Rock outcrop	—	—	—	—	—	—	—	—	—					

Data Source Information

Soil Survey Area: Washington County Area, Utah
Survey Area Data: Version 15, Sep 7, 2021

RUSLE2 Related Attributes

This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. The report includes the map unit symbol, the component name, and the percent of the component in the map unit. Soil property data for each map unit component include the hydrologic soil group, erosion factor Kf for the surface horizon, erosion factor T, and the representative percentage of sand, silt, and clay in the mineral surface horizon. Missing surface data may indicate the presence of an organic layer.

Report—RUSLE2 Related Attributes

Soil properties and interpretations for erosion runoff calculations. The surface mineral horizon properties are displayed or the first mineral horizon below an organic surface horizon. Organic horizons are not displayed.

RUSLE2 Related Attributes–Washington County Area, Utah

Map symbol and soil name	Pct. of map unit	Slope length (ft)	Hydrologic group	Kf	T factor	Representative value		
						% Sand	% Silt	% Clay
WBD—Winkel gravelly fine sandy loam, 1 to 8 percent slopes								
Winkel	85	—	D	.32	1	70.4	22.1	7.5
WCF—Winkel-Rock outcrop complex, 8 to 30 percent slopes								
Winkel	65	—	D	.32	1	70.4	22.1	7.5

Data Source Information

Soil Survey Area: Washington County Area, Utah
Survey Area Data: Version 15, Sep 7, 2021

Modified Universal Soil Loss Equation (MUSLE)

Project Name	Mesa Cove Subdivision
Project Location	Hurricane City, Utah
Date	Jan-22
Project Manger	Dave Nasal
Project Engineer	Taylor Ricks
Begin Construction	May 2022
End Construction	December 2022

INPUT	UPPER BASIN	LOWER BASIN	
V = volume of runoff (10 yr, 24 hr)	21,021	44,056	cubic feet
V = volume of runoff (10 yr, 24 hr)	0.48	1.01	acre-feet
Qp = peak flow per storm event	7.7	15.88	cfs
K = soil erodibility factor	0.32	0.32	
LS = Hill slope length and steepness	6	5.5	
C = cover-management factor	1.0	1.0	
P = land management practices	0.6	0.6	

OUTPUT

Total Soil Loss	228	475	tons
Conversion Factor (Table 3.4)	0.7	0.7	Sandy Loam
Total Soil Volume	160	333	Cu Yd
Total Soil Volume in Basin	4,320	8,991	Cu Ft
Total Soil Volume in Project	13,311		Cu Ft

Storage

Sediment Storage	# of Devices	Total Storage (ft^3)
Check Dams @ 26 ft^3/device	TBD	TBD
Silt Fence @ 0.25 ft^3/ft	TBD	TBD

Total Storage Required	13,311	cu ft
Total Storage Provided	0	cu ft

PLANNING & ZONING
HURRICANE CITY
UTAH

STAFF COMMENTS

Agenda Date:	**02/17/2022**
Application Number:	2022-PP-05 and 2022-HIL-02
Type of Application:	Preliminary Plat and Sensitive Lands Application
Action Type:	Administrative
Applicant:	GVS Holdings LLC
Agent:	Dwain Schallenberger
Request:	Approval of a Preliminary Plat and Sensitive Lands Application
Location:	1117 W 600 N
Zoning:	R1-10 and RM-2 PDO
General Plan Map:	Planned Community

Discussion:
The applicant has filed a preliminary plat for the Mesa Cove subdivision. A zone change was passed for this property in November 2021 under the name of the property's owners "GVS Holdings". They are proposing 91 total lots on 19.3 acres with the northern half being townhomes and the southern half being single-family homes. As part of the zone change, the city council approved it at R1-10 instead of the proposed R1-6. Plat includes some community amenities and vital connection points for traffic flow through the city.

JUC Comments
The Joint Utility Committee had the following comments:

1. **Power:** There is a transmission line on the east property line that the power department is looking to redo. Rocky Mountain Power has a powerline easement that needs to be maintained
2. **Sewer:** Line on 1150 W will be difficult for drainage, might need to loop around to 870 W.
3. **Street:** Access on 600 N will need to be reviewed.
4. **Water:** 600 N line needs to be extended to 870 W. The line will be 12" ductile iron. Secondary irrigation in the area. Each townhome will need its own meter. Need a second access for water looping
5. **Engineering:** The 52' right of way on the local streets within the development can be lowered to 45'. Will need turn lanes on 600 N. Will need to review slope of 1150 W, should be fine since there are other accesses. The City and the developer need to review drainage and both participate in the construction. Lot 2 will be allowed to access 1150 W

6. **Fire:** Will need to review construction drawings. Will need a fire hydrant near Lot 2
7. **Cable:** No concerns.
8. **Phone:** No comments
9. **WCWCD:** No comments



Staff Comments: Preliminary Plat

1. Plat has 27 lots in the R1-10 section and 64 townhouses in the RM-2 section. Both of these match the underlying zoning.
2. Plat indicates the zoning is *"PUD with RM-2 (North) and R1-10 (South)";* it is actually PDO not PUD
3. There is a large cliff in the open space portion of the property. It appears most buildings will be avoiding the cliff face. Will need a 25' setback from any drop-offs.
4. The detention basin in the southwest corner should be dedicated to the city not on private property.



5. Proposed 1150 W will have a grade of 18%. This is steeper than usually permissible, however, the Planning Commission and City Council can grant an exception. After review with the City Engineer, they have found it acceptable because emergency access and access in inclement weather can be rerouted down 870 W.
    a. 1150 W is also a Master Planned Roadway with plans to connect the road from 600 N all the way to the south end of town
6. Sightlines at the proposed corner of 1150 W and 600 N are poor, as shown in the picture below; this will have to be resolved in construction drawings by moving the intersection slightly or rerouting traffic to the eastern boundary. The intersection will need to be approved by JUC during construction drawings.



7. Lot 2 was a flag lot. By code, flag lots are generally to be avoided. City design standards allow for driveway access on 60’ right of ways like 1150 W, so the flag lot was eliminated; otherwise, the design standards for flag lots would apply. Flag Lot standards can be found at the end of this report. After review, staff and JUC felt either option could be acceptable.
8. Details on the community amenities would be appreciated
9. A will serve letter has been provided by Hurricane City Water and Ash Creek Sewer District
10. A sensitive lands application has been provided. Lots 17 and 16 both have unbuildable areas that need to be clearly labeled on the preliminary plat.

Sensitive Lands

1. The Sensitive Land Application requires the following items

10-24-5: HILLSIDES AND RIDGE AREAS:

A. Applicability: The following procedures, submittal requirements and standards shall apply to those projects located on lands identified as having at least one of the following characteristics:

1. Slopes over ten percent (10%) which are:

a. Identified through computer generated programs capable of calculating slopes on topographic maps prepared with two foot (2') contour interval accuracy; or

b. Established by profile lines drawn perpendicular to contour lines at intervals no greater than one hundred fifty feet (150') apart, when the slope, measured along any one hundred foot (100') segment of the profile line is ten percent (10%) or greater. (See section 10-24-9, appendix diagram A, of this chapter.)

c. A slope shall be subject to this chapter only when a contiguous identified area of ten percent (10%) or greater exceeds two (2) acres, or if the site is less than one acre and the entire site is ten percent (10%) or greater.

2. Soils Investigation Report: A soils investigation report which contains the following information:

a. Nature, distribution and classification (unified soil classification) of existing soils to the appropriate depth of influence by the proposed development, but not less than ten feet (10') deeper than the proposed excavations or to bedrock.

b. Strength of existing soils, bearing capacity of supporting soils, settlement estimates, collapse and shrink-swell characteristics, lateral pressures and trench excavation limitations.

c. Groundwater levels that may affect development and estimated elevation of high groundwater levels.

d. Appropriate laboratory testing for classification, consistency, strength and consolidation conditions.

e. Slope stability.

f. A written statement by the geotechnical engineer, civil engineer, or geologist preparing the soils report describing the general suitability of the site for the owner's intended use. The report shall identify soil constraints to development and shall state the professional opinion of the author as to whether the proposed development plan will mitigate and/or eliminate said constraints in a manner as to prevent hazard to life, hazard to property, and adverse effects. If the soil report prepared for a subdivision shows the presence of critically expansive soils, high water table, organic soils, liquefiable soils, collapsible soils, or other soil problems which, if not corrected, would lead to structural defects of the proposed buildings, damage to the building from the water, or premature deterioration of the public improvements, a soil investigation of each lot in the subdivision shall be required by the city.

3. Geotechnical Report: A geotechnical and geological report subject to the standards and requirements provided therein.

4. Grading And Drainage Plan: A grading and drainage plan report which includes stormwater management, erosion, and grading plans describing the methods by which surface water, natural drainage, erosion and sedimentation loss, and hydrologic hazards that will be controlled during and after construction. The plan shall include the following information:

a. The grading plan shall show present topography, including the location and depth of all proposed fills and cuts of finished earth surfaces, and/or use of retaining walls including height, using a contour interval of two feet (2') when grades are zero to twenty nine percent (0 - 29%) and five foot (5') contours when grades thirty percent (30%) and over.

b. The proposed area to be graded shall be clearly delineated on the plan.

c. All calculations and proposed details used for design and construction of debris basins, impoundments, diversions, dikes, waterways, drains, culverts and other water management or soil erosion control measures shall be shown. Drainage calculations shall determine runoff volume and peak discharge using the "rational method", "SCS curve number method", or appropriate equivalent. Data provided should include:

(1) Rainfall depth, duration and distribution;
(2) Watershed slope and drainage area delineation;
(3) Land condition of watershed surface;
(4) Topography of drainage area; and
(5) Soil descriptions in watershed. Erosion calculations shall employ predictions of soil loss sheet erosion using the universal soil loss equation or equivalent. Data to be provided should include factors of:
(A) Rainfall intensity and duration;
(B) Soil erodibility;
(C) Land slope and length of slope or topography;
(D) Condition of the soil surface and land management practices in use; and
(E) Surface cover, grass, pavements, etc.

2. City staff has received a topographic map, a slope map, a grading plan, soil map, and drainage plan
3. Generally, the steep slopes have remained in open space, and the housing is on relatively flat areas.
4. The setback from any cliffside will need to be a minimum of 25'. The townhomes and amenity structure will need to ensure they meet this setback.
5. A grading plan has been provided. Retaining walls are staying under the minimum of 16' tall and the grading appears to be workable.
6. Lots 17 and 16 both have unbuildable areas that need to be clearly labeled on the preliminary plat.
7. Public Utility Easement along the front will need to be accessible and no retaining walls are allowed.
8. Retaining walls are shown on the plan. They are labeled as 3'-10' in height. This meets our code for size. More details on each of these walls will need to be shown on the construction drawings.
9. A slope map has been provided. Several of the lots in the lower section require exceptions for lower size.

10-24-3: DETERMINATION OF APPLICABILITY:

G. Exceptions: Exceptions to the provisions of this chapter may be granted by the city council upon recommendation from the planning commission when:

1. An alternative solution is proposed for the protection of the sensitive land, based on sound and generally accepted engineering and land development principles, and said alternative will result in equal or better protection than development under the standards of this chapter; and is consistent with the purposes of this chapter. The alternative shall also be consistent with the general plan policies affecting sensitive lands;

2. The size of the parcel existing before the effective date of the adoption of this chapter is determined by the planning commission to be too small to effectively apply the provisions of this chapter, and conditions can be added to the project to minimize safety and general welfare concerns.

3. The parcel is zoned for a nonresidential use and the planning commission determines the site requires grading inconsistent with the provisions of this chapter, and conditions can be added to the project to minimize safety and general welfare concerns. (Ord. 2014-6, 5-1-2014)

Staff has reached out to the applicant's engineer and requested a letter to address the above exception. Each lot asking for an exception is under 20% slope except for lot 17 at 24.5%. The City has typically allowed exceptions for lots under 20% based on a sound grading plan. 10%-20% slope is considered moderate slope for home construction. Slopes over 20% are more severe and deserve a high level of scrutiny for any exception based on the grading report. Lots 23 and 24 are. Lot 19 is just over 19% slope, and the grading along the east side is very steep.

Lots 7, 14, 19, 22, 23, and 24	These lots are under 15% slope and staff do not have any concern about the grading as shown
Lot 19	Just over 19% slope, and the grading along the east side is very steep. There is a retaining wall, but the grade of the slope should be labeled on the map of the sensitive lands to ensure it will not exceed 2:1.
Lots 17 and 16	Lot 17 is at 24.58% and Lot 16 is at 19.52%. Each lot has an area that is over 30% slope and should be labeled as a non-buildable area. Staff believes the site engineer needs to address each lot beyond what the grading plan has shown before the City may grant any type of exception. Based on city code, slopes over 30% do not count toward the slope of the lot since these areas are to remain undisturbed unless height and size of the slope is minimal.

Recommendation: Staff recommends the City Council review this application based on standards with Hurricane City Code. Staff would like more information for lots 16, 17, and 19 before approval should be granted.

Sec. 10-37-10. Flag lots.

A flag lot for one single-family dwelling may be allowed to accommodate the development of property that otherwise could not reasonably be developed under the regulations contained in this title or other titles adopted by the City. The primary purpose of this section is not to make development of property easier and more profitable. Rather, it is to serve as a "last resort" for property which may not otherwise be reasonably developed.

A. Factors. When property is subdivided, flag lots shall not be approved by right but may be allowed after considering the following:

1. More than two flag lots with contiguous staffs should be avoided;

2. Whether development of the property in question under normal City land use and subdivision regulations is reasonable and practical; and

3. Creation of a flag lot should not foreclose the possibility of future development of other large interior parcels that are not developable unless a street is extended to them across other adjacent properties.

B. Development standards. When flag lots are permitted, they shall be subject to the following conditions:

1. A flag lot shall be comprised of a staff (narrow) portion that is contiguous with a flag (wide) portion.

2. The staff portion of the lot shall front on and be contiguous to a public street. The minimum width of the staff portion at any point shall be 26 feet. However, a greater staff width for lots within the sensitive lands overlay zone may be required. The maximum length of a staff shall be 500 feet. The maximum grade of a staff shall not exceed 12 percent.

3. The size of the flag portion of a lot shall conform to the minimum lot size requirement of the zone in which the lot is located. Sufficient turnaround space per the fire code shall be provided.

4. No building or structure shall be located within the staff portion of a flag lot.

5. The front yard of a flag lot shall be on the side of the flag portion which connects to the staff. Yard setbacks shall conform to the setback requirements of the zone in which the flag lot is located.

6. A main building shall be located no more than 250 feet from a fire hydrant, measured along a public or private right-of-way or along the staff portion of a flag lot. An easement for any fire hydrant located on private property shall be provided to the City for access to and maintenance of the hydrant.

7. Upon review the City may require installation of curb, gutter and other drainage control measures in the staff portion of a flag lot to prevent runoff from entering neighboring properties.

8. Clear address signage shall be installed and maintained at the street by the owner, including notice that the driveway is a private right-of-way.

9. The new residential structure to be constructed on a flag lot shall be no higher than the average height of all residential structures within a 300-foot radius of the proposed structure.

10. Before a flag lot is approved the joint utility committee must approve the design and location of all facilities needed to accommodate a single-family dwelling. Construction of the approved facilities must be complete before a building permit will be issued for the lot.

HURRICANE
ELEMENTARY

52' PUBLIC ROADWAY
EXTENSION

H-3-1-34-42001121
ZONE: R1-10

OPEN SPACE

H-3-1-27-3201
ZONE: NONE
OWNER: BLM

600 NORTH

H-3-1-34-4341
ZONE: R1-10

H-3-1-33-1110
ZONE: R1-10

RM-2 (TOWNHOME UNITS)

R1-10 SINGLE
FAMILY LOTS

1150 WEST

340 NORTH

EOP

LEGEND

SLOPES 10% - 29%

SLOPES > 30%

AVERAGE GRADE ACROSS ENTIRE PARCEL NORTH TO SOUTH = 9.54%

AVERAGE GRADE ACROSS NORTH SECTION (RM-2) NORTH TO SOUTH = 2.54%

AVERAGE GRADE ACROSS SOUTH SECTION (R1-10) NORTH TO SOUTH = 9.19%

MINIMUM LOTS SIZE BASED ON SLOPES < 10% IS UNDERLYING ZONE PER 10-24-6B OF THE SENSITIVE LAND ORDINANCE.

Know what's below.
Call before you dig.

GRAPHIC SCALE
100 0 100 200
(IN FEET)

NO.	REVISIONS	BY	DATE

MAINLINE ENGINEERING

MAINLINE ENGINEERING
321 NORTH MALL DRIVE
SUITE T101
ST. GEORGE, UT 84790

GVS HOLDINGS LLC
PARCEL: H-3-1-34-4400
DWAIN SCHALLENBERGER
748 W. MORBY ST
WASHINGTON, UT 84790

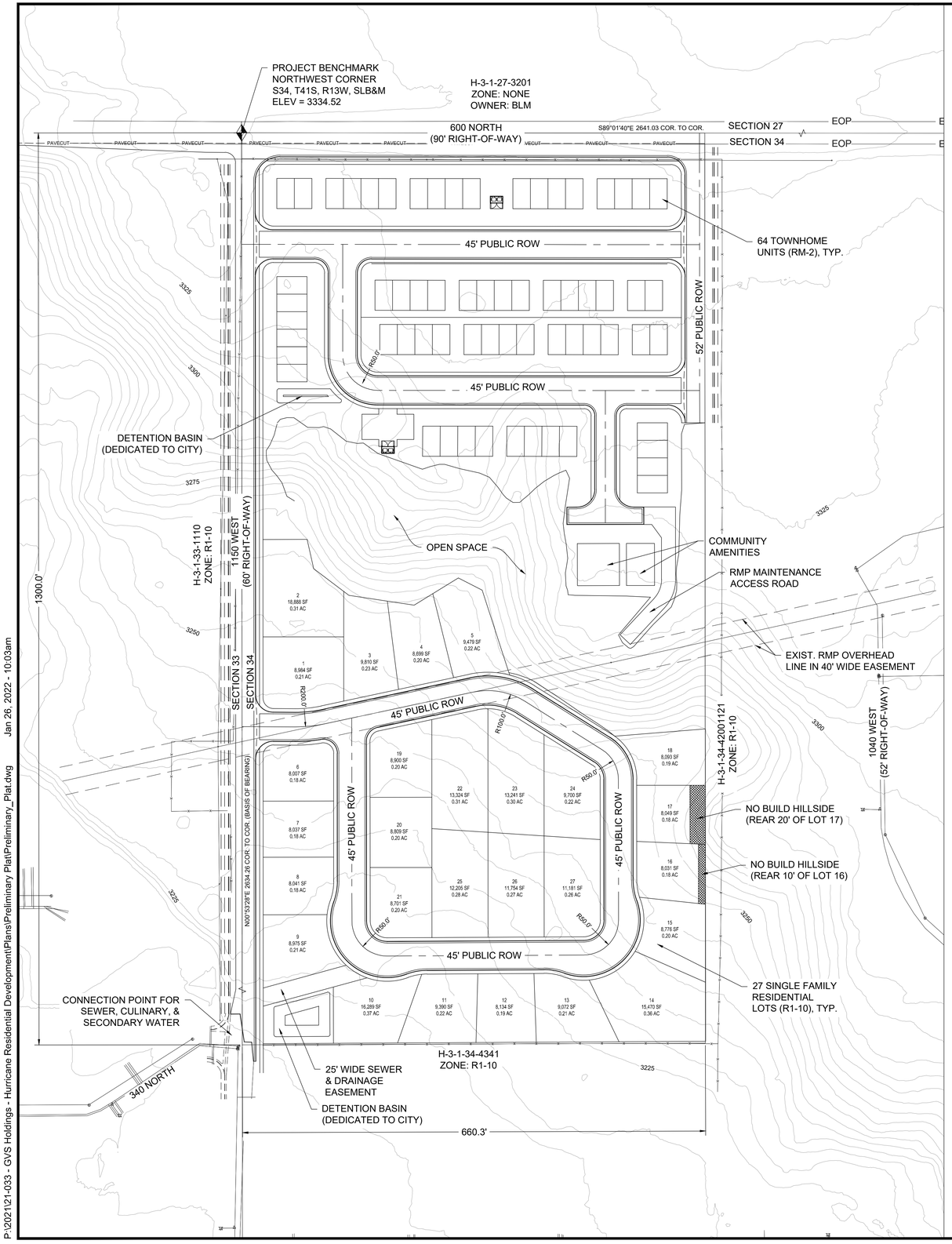
CHECKED BY: PBG
DRAWN BY: TAR
DATE: 1/26/22

PROFESSIONAL ENGINEER

PROJECT: MESA COVE
CLIENT PROJ. #: N/A
MAINLINE PROJ. #: 21-033
SHEET NAME: SENSITIVE LANDS SLOPE EXHIBIT

SHEET EXHIBIT

P:\2021\21-033 - GVS Holdings - Hurricane Residential Development\Exhibits\Mesa Cove Sensitive Lands Slope Exhibit.dwg Jan 26, 2022 - 10:12am



PRELIMINARY PLAT OF

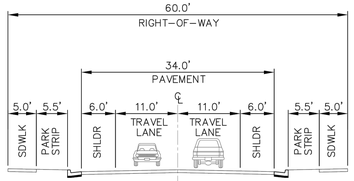
MESA COVE

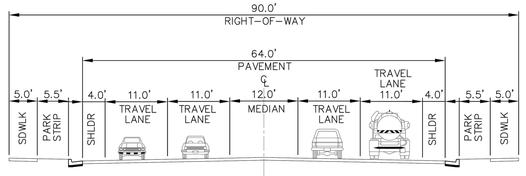
SUBDIVISION

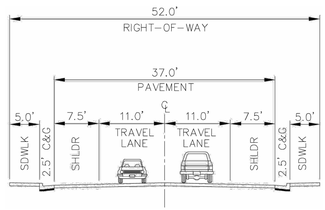
JANUARY, 2022

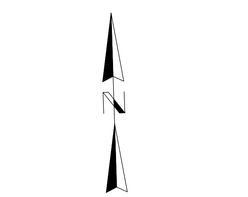
PLAT DATA

LOCATION & BOUNDARY:	THE WEST HALF OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13 WEST, SALT LAKE BASE AND MERIDIAN LESS THE FOLLOWING: ALL OF THE NORTH 37.50 FEET OF THE WEST ONE-HALF OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13 WEST OF THE SALT LAKE BASE AND MERIDIAN BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS: BEGINNING AT THE NORTHWEST CORNER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13WEST OF THE SALT LAKE BASE AND MERIDIAN AND RUNNING THENCE ALONG THE NORTH LINE OF SAID SECTION NORTH 89°51'47" EAST 660.29 FEET; THENCE SOUTH 00°14'22" EAST 37.50 FEET TO A POINT ON A LINE 37.50 FEET DISTANT AND PARALLEL TO SAID NORTH SECTION LINE; THENCE ALONG SAID PARALLEL LINE SOUTH 89°51'47" WEST 660.31 FEET TO A POINT ON THE WEST LINE OF SAID SECTION; THENCE ALONG SAID WEST LINE NORTH 00°12'38" WEST 37.50 FEET TO THE POINT OF BEGINNING.
PARCEL IDS:	H-3-1-34-4400
ZONING:	PDO WITH RM-2 (NORTH) AND R1-10 (SOUTH)
PARCEL AREA:	19.16 ACRES
PLATTED AREA:	19.16 ACRES
TOTAL LOTS:	RM-2 (NORTH): 64 UNITS R1-10 (SOUTH): 27 LOTS TOTAL: 91 UNITS/LOTS
BENCHMARK:	NORTHWEST CORNER OF SECTION 34, TOWNSHIP 41 SOUTH, RANGE 13 WEST, SLB&M, AN EXISTING STONE AT ELEVATION 3334.52.
CURRENT OWNERSHIP:	NELSON STERLING D & RANDI C 9447 MECKAILEE CV SANDY, UT 84094-3682
TORTOISE:	THE ENTIRE PARCEL LIES WITHIN DESERT TORTOISE TAKE AREA 7 OF THE RED CLIFFS DESERT RESERVE.
GEOTECH:	ACCORDING TO HURRICANE CITY GIS MAPPING, THE SUBJECT PARCEL HAS A SIGNIFICANT AMOUNT OF SHALLOW BEDROCK AND CALICHE. THERE ARE NO OTHER ANTICIPATED GEOTECHNICAL CHALLENGES. A FULL GEOTECHNICAL INVESTIGATION WILL BE COMPLETED AND ALL RECOMMENDED MITIGATION WILL BE INCORPORATED IN TO THE CONSTRUCTION DRAWINGS.
DRAINAGE:	ALL STORM WATER FOR THE RM-2 SECTION WILL DRAIN TO A DETENTION BASIN IN THE SOUTHWEST CORNER OF THE TOWNHOMES AND STORM WATER IN THE R1-10 SECTION WILL DRAIN TO A DETENTION BASIN IN THE SOUTHWEST CORNER OF THE PROPERTY.
EASEMENTS:	A 10' PUBLIC UTILITY EASEMENT WILL BE ASSIGNED ALONG ALL STREET-SIDE PROPERTY LINES. THIS EASEMENT WILL BE RESERVED FOR BOTH PUBLIC UTILITY AND COMMUNICATIONS INFRASTRUCTURE. A PUBLIC SEWER AND STORM DRAIN EASEMENT WILL BE RECORDED BETWEEN LOTS 9 & 10.
ROAD GRADES:	1150 WEST WILL HAVE A MAXIMUM GRADE OF 18% AS COORDINATED WITH HURRICANE VALLEY FIRE. ALL INTERNAL ROADS FRONTING HOMES WILL HAVE A MAXIMUM GRADE OF 10% OR LESS FOR EMERGENCY SERVICE ACCESS.
HURRICANE CANAL COMPANY:	THERE ARE NO HURRICANE CANAL FACILITIES WITHIN THE LIMITS OF THE PROJECT. THERE ARE NO KNOWN WELLS OR SEEPS ON THE PROPERTY.
WATER AND SEWER SERVICE:	THE PROPERTY CAN BE SERVED BY HURRICANE CITY FOR WATER AND ASH CREEK SPECIAL SERVICE DISTRICT FOR SEWER BASED ON THE INITIAL JUC COMMENTS RECEIVED IN CONJUNCTION WITH THE ZONE CHANGE IN EARLY DECEMBER, 2021.











VICINITY MAP

REVISIONS	NO. / BY / DATE

MAINLINE ENGINEERING
321 NORTH MALL DRIVE
SUITE T101
ST. GEORGE, UT 84790

GVS HOLDINGS LLC
PARCEL: H-3-1-34-4400
DWAIN SCHALLENBERGER
748 W. MORBY ST
WASHINGTON, UT 84790

CHECKED BY	PBG
DRAWN BY	TAR
DATE	1/26/22

PROFESSIONAL ENGINEER

PROJECT	MESA COVE	MAINLINE PROJ. #	21-033
CLIENT PROJ. #	N/A	SHEET NAME	PRELIMINARY PLAT
SHEET	PRELIM		

P:\2021\21-033 - GVS Holdings - Hurricane Residential Development\Plans\Preliminary Plat\Preliminary_Plat.dwg Jan 26, 2022 - 10:03am

MAINLINE ENGINEERING

January 26, 2022

Stephen Nelson
Planning Director
Hurricane City
147 N 870 W
Hurricane, UT 84737

RE: Mesa Cove Preliminary Plat and Sensitive Lands Updates and Exception Request

Dear Stephen,

This letter is written in support of the Mesa Cove Preliminary Plat and Sensitive Lands applications submitted January 18, 2022, for presentation to Planning Commission January 26, 2022. Based on comments received from staff and a follow-up phone call between us the morning of January 26, 2022, this letter and supporting materials are being sent to address the following items:

1. Preliminary Plat updates based on Staff findings including the following:
    a. Reduced public rights-of-way for internal circulation roads from 52' to 45'.
    b. Updated current zoning from PUD to PDO.
    c. Indicated that detention basins will be dedicated to the City.
    d. Modified Lot 1 and 2 layouts to have Lot 2 front 1150 West instead of being a flag lot.
    e. Labeled no-build zones on Lots 16 and 17 due to the existing hillside.
2. Slope & Grading Exhibit updated to better show existing slopes and impacts.
3. Request for exception to Ordinance 10-24-3 for slope violations on Lots 5, 16, and 17. For information, Lot 19 was referenced in Staff comments instead of Lot 5 but, upon further review, the comment was intended for Lot 5 and not Lot 19.

Request for Exception to Ordinance 10-24-3

Per Chapter 10-24-3 of the Hurricane City ordinances, an exception to the provisions contained in the Chapter can be sought if:

> *"An alternative solution is proposed for the protection of the sensitive land, based on sound and generally accepted engineering and land development principles, and said alternative will result in equal or better protection than development under the standards of this chapter; and is consistent with the purposes of this chapter. The alternative shall also be consistent with the general plan policies affecting sensitive lands;"*

An exception is being sought for Lots 5, 16, and 17 of the Mesa Cove subdivision as shown on the preliminary plat dated January 26, 2022. Each Lot exception is described in detail below.

Lot 5 Exception: The average slope across the width of the lot is 19.19% but the average slope from the back to the front of the lot is only 9.80% as shown on the updated exhibit. An existing 2:1 slope borders the east and north sides of the lot. Lot lines directly adjacent to the hillside will match the existing topography and the remainder of the lot will be lifted (into a fill condition) in order to avoid any cut into the existing 2:1 hillside. The lot will also be graded to slope toward the roadway at the front of the lot at approximately 2% to promote drainage away from the hillside. Using this approach, there will not be any cut into the existing hillside and no vegetation will be removed on the hillside to reduce the likelihood of erosion from the hillside.

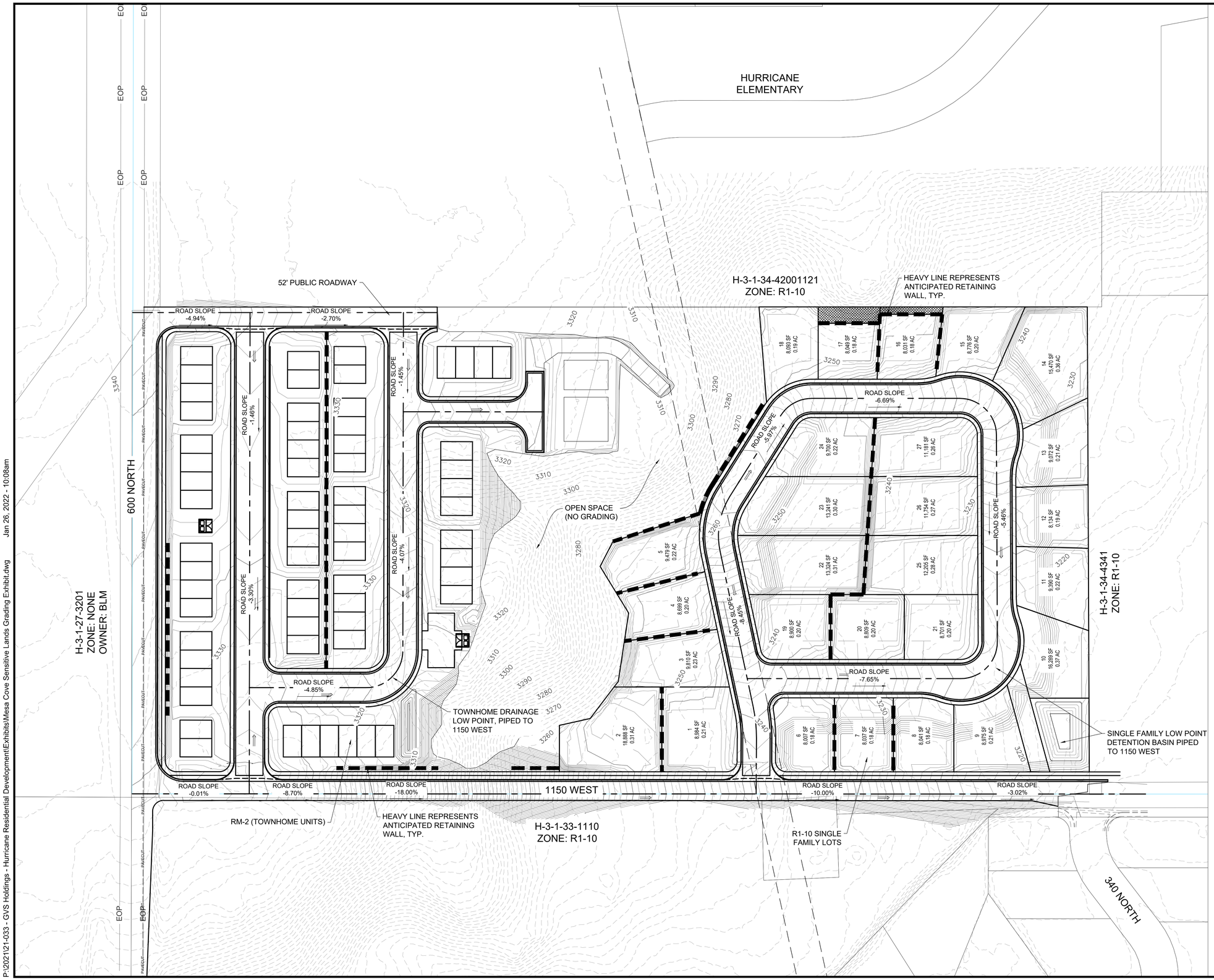
Lot 16 & Lot 17 Exceptions: The average slopes shown on the original slope exhibit for Lots 16 and 17 were 24.58% and 19.52% respectively. These slopes were artificially inflated due to a narrow band of very steep slope at the back of these lots. This steep portion has since been labeled as a no-build zone on the preliminary plat and the average slope has been adjusted to reflect the buildable portion only. The average slope is now 18.22% for Lot 16 and 14.32% for Lot 17. In order to create a usable building bad for these lots, the roadway profile and front setbacks were elevated to lift the lot pad several feet above the existing ground. Additionally, a retaining wall varying from 2' to 6' tall will be installed at the back of the two lots' buildable areas in order to maximize the buildable area. No additional vegetation will be removed from the steep hillside in order to reduce erosion.

Proposed grading on each of the three lots described will not exceed 2% without the use of retaining walls and no cut scars or excessive fills are anticipated during grading of these lots. Thank you for your consideration and please respond with any additional concerns.

Sincerely,



tricks@mainline-eng.com



LEGEND

ANTICIPATED RETAINING WALL (HEIGHT VARIES 3'-10')

MINIMUM ROAD GRADE	0.50%
MAXIMUM ROAD GRADE (1150 WEST)	18.00%
MAXIMUM ROAD GRADE FOR EMERGENCY VEHICLE ACCESS	10.00%

Know what's **below.** **Call** before you dig.

GRAPHIC SCALE
100 0 100 200
(IN FEET)

NO.	REVISIONS	BY	DATE

MAINLINE ENGINEERING
MAINLINE ENGINEERING
321 NORTH MALL DRIVE
SUITE T101
ST. GEORGE, UT 84790

GVS HOLDINGS LLC
PARCEL: H-3-1-34-4400
DWAIN SCHALLENBERGER
748 W. MOREY ST
WASHINGTON, UT 84790

DATE 1/26/22
DRAWN BY TAR
CHECKED BY PBG

PROFESSIONAL ENGINEER

PROJECT: MESA COVE
CLIENT PROJ. #: N/A
MAINLINE PROJ. #: 21-033
SHEET NAME: SENSITIVE LANDS GRADING EXHIBIT

SHEET EXHIBIT

P:\2021\21-033 - GVS Holdings - Hurricane Residential Development\Exhibits\Mesa Cove Sensitive Lands Grading Exhibit.dwg Jan 26, 2022 - 10:08am

HURRICANE CITY
UTAH

STAFF COMMENTS

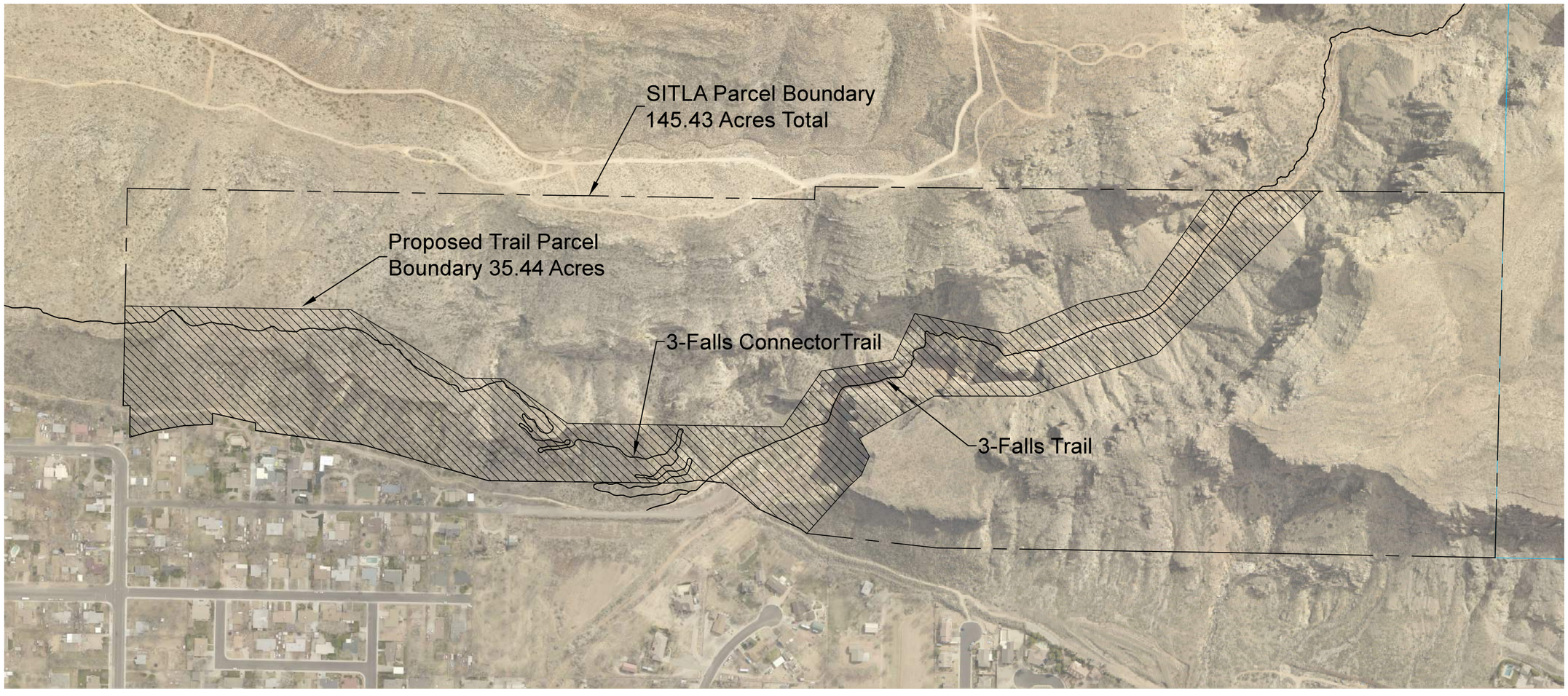
Consideration and possible approval of a **Certificate of Sale and Restrictive Covenant for purchase and acceptance of property from SITLA**.

Discussion:
The Water Department and Engineering Department have been working with SITLA to obtain a well site near the 3-Falls trailhead along with cliffside property for parks and trails use. The well site and associated access easement are to be purchased and the trails and parks property is proposed to be gifted to the city by dedication. SITLA is requiring that the city agree to a certificate of sale for the land purchase, as well as a restrictive covenant that would protect archeological resources in the area, such as the old Hurricane Canal alignment.

Findings:

Recommendation:
Staff is recommending approval of these documents.

Attachments:
1. 3-Falls Trail Exhibit
2. C26990 Hurricane City Wellsite 10.26.21 Purchaser Review
3. Hurricane Restrictive Covenant 10.6.21 Purchaser Review
4. Goulds Wash Well Site Legal Descriptions and Exhibit 9-24-2021



GRAPHIC SCALE

200 0 100 200 400

(IN FEET)
1 inch = 200 ft.

No	Date	By	Revision

HURRICANE CITY ENGINEERING
DEPARTMENT
Hurricane, Utah 84737
Phone (435) 635-2811 / Fax (435) 635-4284

DATE: 5/15/2020
DRAWN: AOL
APPROVED: APPROVED
SCALE: 1" = 200'
JOB NO. JOB NO.

3-FALLS TRAIL EXHIBIT

FOR

SITLA,
HURRICANE, UT

SHEET 1 OF 1

THE STATE OF UTAH
SCHOOL AND INSTITUTIONAL TRUST LANDS ADMINISTRATION
CERTIFICATE OF SALE

Certificate No. 26990
Fund: School

This Certificate of Sale ("**Certificate**"), dated _____ ____, ~~2021~~2022 (the "**Effective Date**"), is between the State of Utah, through the School and Institutional Trust Lands Administration ("**SITLA**") and Hurricane City, a Utah municipality, with its office located at 147 North 870 West, Hurricane, Utah 84737 ("**Purchaser**").

RECITALS

WHEREAS, SITLA manages lands held in trust by the State of Utah for the benefit of certain named beneficiaries ("**Trust Lands**"), pursuant to Sections 6, 8, and 12 of the Utah Enabling Act, Article XX, Section 2 of the Utah State Constitution, and Title 53C of the Utah Code, and

WHEREAS, SITLA holds certain Trust Lands located in Section 2, Township 42 South, Range 13 West, Washington County, State of Utah, and

WHEREAS, SITLA has agreed to sell, and Purchaser has agreed to purchase, those certain Trust Lands described on Exhibit A (the "**Well Site**") and Exhibit B (the "**Trail**", and collectively with the Well Site, the "**Property**").

AGREEMENT

NOW THEREFORE, for and in consideration of the covenants and obligations contained herein, the parties agree as follows:

1. **PURCHASE AND SALE**. Subject to the terms and conditions of this Certificate, SITLA does hereby agree to sell, and the Purchaser does hereby agree to buy, in a manner provided by law and as set forth herein, the Property.

    a. Patent; Plat; Exceptions and Reservations. At Closing, defined below, SITLA shall issue a patent for the Well Site and a dedication plat for the Trail, each subject to the following:

        i. an exception and reservation of all coal, oil and gas and other mineral deposits, along with the right for SITLA or other authorized persons or entities to prospect for, mine, and remove such deposits;
        ii. any valid, existing rights of way of and easements of any kind, including, without limitation, Easement 1886 with Hurricane City, Right of Entry No. 6918, and Right of Entry No. 6931;

iii. any right, interest, reservation or exception appearing of record, including, without limitation, the restrictive covenant described below;
iv. any exceptions and reservations contained in federal patents and clear lists;
v. all rights of way for ditches, tunnels, and telephone and transmission lines that have been or may be constructed by the United States as provided by statute;
vi. an exception and reservation of all water rights and shares of any kind; and
vii. an exception and reservation of all sub-surface void and pore spaces in the Property whether naturally existing or created upon the removal of coal, oil and gas and other mineral deposits, and the right to reasonably access and use the Property and to use those sub-surface void and pore spaces for any purpose.

b. Purchase Price and Fees.

i. At Closing, Purchaser shall pay SITLA Three Thousand Six Hundred Eighty Dollars and No Cents ($3,680.00) (the "**Purchase Price**").

2. **CLOSING**.

a. **Closing.** The closing of the transaction contemplated by this Certificate, including the payment of the Purchase Price, and issuance of a patent and dedication plat (the "**Closing**") will occur on or before _____ ___, ~~2021~~2022, or upon such other date prior thereto as the parties agree in writing (the "**Closing Date**"). Purchaser and SITLA agree that Closing on or before the Closing Date is a material inducement to SITLA entering into this Certificate. If the transaction contemplated in this Certificate does not close on or before the Closing Date, this Certificate will automatically terminate at 11:59 p.m. on the Closing Date, unless SITLA elects in writing, in its reasonable discretion, to extend the Closing Date.

b. **SITLA's Obligations**. At Closing, subject to Purchaser performing all of its obligations under this Certificate, including payment in full of the Purchase Price, SITLA shall issue to Purchaser a patent for the Well Site and a dedication plat for the Trail, which patent and plat will contain the reservations and exceptions in this Certificate. The patent will be in the form attached hereto as Exhibit C.

c. **Purchaser's Obligations**. At Closing, subject to SITLA performing all of its obligations under this Certificate, Purchaser shall pay to SITLA in cash or by wire transfer of ready funds, the Purchase Price along with other amounts due as set forth in this Certificate.

d. **Possession**. SITLA shall deliver possession of the Property to Purchaser upon Closing. All risk of loss, destruction and expenses of the Property will be borne by

SITLA until the date of possession at which time all risk and expenses will be borne by the Purchaser.

3. **TAXES**. Purchaser hereby acknowledges and agrees that the Property has not been subject to taxes during the period it was held by the State, but that such Property may be subject to general and special real estate and other ad valorem taxes and assessments, including Farmland Assessment (Greenbelt) rollback taxes, and charges for utilities, if any, and other charges, all of which charges, when applicable, are the sole responsibility of Purchaser.

4. **INSPECTION; NO WARRANTIES**. Purchaser acknowledges that Purchaser is acquiring the Property subject to all existing laws, ordinances, rules and regulations and that Purchaser has had the opportunity to inspect the Property to determine the condition and suitability of the Property for Purchaser's intended purposes, and for the presence or absence of any hazardous material or condition. Purchaser agrees that Purchaser is acquiring the Property in an "As-Is" condition with all faults and defects, including latent and patent defects, and neither SITLA's agents, representatives or employees have made any representations or warranty as to title, zoning, legal or physical access, location or availability of utilities, soil conditions, floodplains and watercourses, the presence or absence of any hazardous material or condition, or other physical or legal attributes of the Property or Purchaser's ability to obtain approvals for Purchaser's development of the Property, or the physical conditions of the Property. **SITLA HEREBY DISCLAIMS ANY AND ALL WARRANTIES WITH RESPECT TO THE PROPERTY IT IS CONVEYING, AND PURCHASER ASSUMES THE RISK THAT ADVERSE PAST, PRESENT OR FUTURE PHYSICAL CHARACTERISTICS AND CONDITIONS OF THE PROPERTY WHICH PURCHASER IS ACQUIRING UNDER THIS CERTIFICATE MAY NOT HAVE BEEN REVEALED BY INSPECTION OR INVESTIGATION.**

5. **ENVIRONMENTAL RELEASE**. Purchaser expressly assumes the risk that any Hazardous Substance (defined below) is or hereafter may be located on the Property, excepting use by the State or its lessees of void spaces reserved herein. **PURCHASER HEREBY FOREVER RELEASES AND DISCHARGES THE STATE, SITLA AND ANY SUBSIDIARY OR AFFILIATE OF THE STATE, AND THEIR RESPECTIVE DIRECTORS, OFFICERS (APPOINTED AND ELECTED), EMPLOYEES, BOARD OF TRUSTEES, BENEFICIARIES, REPRESENTATIVES AND AGENTS, FROM AND AGAINST ANY AND ALL JUDGMENTS, CLAIMS, EXPENSES (INCLUDING ATTORNEYS' AND OTHER CONSULTANTS' REASONABLE FEES AND COSTS), CAUSES OF ACTION, DAMAGES, LOSSES, LIABILITIES, INCLUDING WITHOUT LIMITATION, (A) ALL FORESEEABLE AND ALL UNFORESEEABLE CONSEQUENTIAL DAMAGES, DIRECTLY OR INDIRECTLY ARISING OUT OF THE USE, GENERATION, STORAGE, DISPOSAL, RELEASE OR THREATENED RELEASE OF HAZARDOUS MATERIALS ON THE PROPERTY AND (B) THE COST OF ANY REASONABLY NECESSARY INVESTIGATION, REPAIR, CLEANUP, REMEDIATION OR DETOXIFICATION OF THE PROPERTY AND OTHER AFFECTED PROPERTY AND THE PREPARATION OF ANY CORRECTIVE ACTION, CLOSURE OR OTHER REQUIRED PLANS OR REPORTS TO THE FULL EXTENT THAT SUCH ACTIONS ARE ALLEGED TO BE ATTRIBUTABLE, DIRECTLY OR INDIRECTLY, TO THE PRESENCE OR USE, GENERATION, STORAGE, RELEASE, THREATENED**

RELEASE, OR DISPOSAL OF HAZARDOUS MATERIALS BY ANY PERSON AND RELATE TO OR INVOLVE THE PROPERTY.

a. "Hazardous Substance" as used herein means: (a) any substance, material, or waste that is included within the definitions of "hazardous substances," "hazardous materials," "hazardous waste," "toxic substances," "toxic materials," "toxic waste," or words of similar import in any Environmental Law; (b) those substances listed as hazardous substances by the United States Department of Transportation (or any successor agency) (49 C.F.R. 172.101 and amendments thereto) or by the Environmental Protection Agency (or any successor agency) (40 C.F.R. Part 302 and amendments thereto); and (c) any substance, material, or waste that contains petroleum or is petroleum, petroleum-related, or a petroleum by-product, asbestos or asbestos-containing material, polychlorinated biphenyls, flammable, explosive, radioactive, freon gas, radon, or a pesticide, herbicide, or any other agricultural chemical, except as otherwise provided by law.

6. **CULTURAL, ARCHAEOLOGICAL, PALEONTOLOGICAL AND ANTIQUITIES RESOURCES**. Conveyance of the Property will be subject to that certain restrictive covenant dated _____ ___, ~~2021~~2022 recorded on _____ ___, ~~2021~~2022 at instrument number _____ of the Washington County Recorder's Office. Pursuant to all applicable laws regarding cultural, archaeological, paleontological, and antiquities resources, and pursuant to Utah Administrative Code R850-60-900, upon discovery of a site, historic property, remains, antiquities, or critical paleontological resources, whether before or after Closing, Purchaser shall immediately cease all activities on the Property until such time as the discovery has been evaluated and treated to the Director of SITLA's satisfaction. Any and all discoveries remain the property of the State of Utah. These obligations will survive the Closing and issuance of a patent. Definitions in this clause:

"Antiquities" UCA 76-6-901(1)
"Critical Paleontological Resources" UCA 79-3-102(4)
"Cultural Resources" R850-1-200(8)
"Historic Properties" UCA 9-8-302(5)
"Remains" UCA 9-9-402(11)
"Site":
Archaeology UCA 9-8-302(17), R850-1-200(31)
Paleontological UCA 79-3-102(14), R850-1-200(20)
"Specimen":
Archaeology UCA 9-8-302(18), R850-1-200(33)
Paleontological UCA 79-3-102(15)

7. **PURCHASER'S REPRESENTATIONS AND WARRANTIES**. Purchaser represents and warrants to SITLA as of the Effective Date and the date of Closing, that:

a. Purchaser is an entity in good standing and licensed to do business in the State of Utah;

b. Purchaser has full power and authority to execute and deliver this Certificate and to perform its obligations hereunder and has obtained all necessary company authorizations to do so;

c. The Purchaser's signatory to this Certificate has all power and authority to execute this Certificate on behalf of Purchaser;

d. The execution, delivery, and performance by Purchaser of this Certificate does not and will not violate, nor be in conflict with, any agreement or instrument to which Purchaser is a part or is bound, or any judgment, decree, order, statute, rule or regulation applicable to Purchaser;

e. To Purchaser's knowledge, there are no claims, actions, suits, or other legal proceedings by any governmental department or agency, or any other entity or person, including any threatened claims or demands in writing, pertaining to the transactions contemplated by this Certificate;

f. Purchaser has no liability or obligation to pay fees or commissions to any broker, finder, or agent with respect to its acquisition of the Property; and

g. Purchaser shall pay all taxes, assessments and fees assessed against the Property.

8. **DEFAULT**. If either party defaults in the performance of any of its obligations under this Certificate and upon failure to cure the default within thirty (30) days after written notice of default is given to the defaulting party, then the non-defaulting party may terminate this agreement and pursue any other remedies afforded it by law or in equity, including specific performance.

9. **INDEMNIFICATION BY PURCHASER**. In addition to any other indemnity obligations of Purchaser under this Certificate, Purchaser further agrees to protect, indemnify and hold harmless the State, including SITLA, and their respective directors, officers (appointed and elected), employees, board of trustees, beneficiaries, representatives and agents from and against all judgments, claims, demands, expenses, damages, losses, liabilities and causes of action of every kind or character on account of bodily injuries, death, or damage to property arising because of, for, out of, or in any way connected with Purchaser's performance of this Certificate, including, without limitation, a breach of any of Purchaser's representations or warranties. The Purchaser shall defend all suits brought upon such claims and pay all costs and expenses incidental thereto, but the State, SITLA, and the other indemnified parties have the right, at its option, to participate in the defense of any such suit without relieving the Purchaser of any obligation hereunder. Such duty of indemnification includes, but is not limited to, damage, liability, or loss pursuant to all federal and state environmental laws, strict liability and common law. These obligations will survive the Closing and issuance of a patent.

10. **NOTICES**. All notices, requests, demands, and other communications under this Certificate must be in writing and must be given by (a) established express delivery service which maintains delivery records, (b) hand delivery, or (c) certified or registered mail, postage prepaid, return receipt requested, to the applicable party at the following address, or at such other address as a party may designate by written notice in the above manner:

To SITLA:

State of Utah School and Institutional Trust Lands Administration

675 East 500 South, Suite 500
Salt Lake City, Utah 84102
Attention: Planning and Development

To Purchaser:

Hurricane City
147 North 870 West
Hurricane, Utah 84737

Communications may also be given by fax or electronic mail, provided the communication is concurrently given by one of the above methods. Notices are effective upon receipt, or upon attempted delivery if delivery is refused or if delivery is impossible because of the recipient's failure to provide a reasonable means for accomplishing delivery.

11. **MISCELLANEOUS**.

a. **Binding Terms**. It is understood that the terms of this Certificate are to apply to and bind the heirs, executors, administrators, successors, and assigns of the respective parties hereto.

b. **Time of the Essence**. Time is of the essence of this Certificate and each and all of its terms, covenants, or conditions in which performance are a factor.

c. **Assignment**. This Certificate may be assigned pursuant to statute and rule, but the assignment does not relieve the assignor from responsibility under the original contract.

d. **No Merger**. The assurances, obligations, and covenants of the Purchaser will not merge with but will survive the delivery of the patent to the Purchaser.

e. **Entire Agreement**. This Certificate and the exhibits and schedules attached hereto constitute the entire agreement between the parties hereto with respect to the subject matter hereof, incorporates all prior agreements, and may only be modified by a subsequent writing duly executed by the parties.

f. **Waivers**. No waiver of any of the provisions of this Certificate constitutes a waiver of any other provision, whether or not similar, nor is any waiver a continuing waiver. Except as expressly provided in this Certificate, no waiver is binding unless executed in writing by the party making the waiver.

g. **Governing Law**. This Certificate is to be construed and enforced in accordance with, and governed by, the law of the State of Utah without regard to its choice or conflicts of laws provisions that may refer the interpretation hereof to the laws of another state. Any action, legal or equitable, arising from or in connection with this Certificate, must be conducted exclusively in the Third District Court for the State of Utah, and each party hereby submits to the exclusive jurisdiction of such court, subject to the prior exhaustion of administrative remedies.

h. **Captions**. The captions in this Certificate are for convenience only and do not constitute a part of the provisions hereof.

i. **Applicability**. If any term or provision of this Certificate or the application of it to any person, entity or circumstance, to any extent, be invalid and unenforceable, the remainder of this Certificate or the application of such term or provision to persons or circumstances other than those as to which it is invalid or unenforceable will not be affected thereby, and each term and provision of this Certificate will be valid and enforced to the extent permitted by law.

j. **Numbering of Days**. If the last day of any time period stated herein falls on a Saturday, Sunday or federal legal holiday, then such time period is extended to the next succeeding day which is not a Saturday, Sunday or a federal legal holiday.

k. **Allocation of Professional Fees**. Regardless of whether the transaction contemplated by this Certificate is consummated, each respective party is responsible for its own legal, accounting, and other professional fees incurred in relation to this Agreement or the transaction contemplated by this Agreement.

l. **No Waiver of Governmental Immunity**. Notwithstanding anything in this Certificate to the contrary, by entering into this Certificate, neither the State of Utah nor SITLA has waived, limited or modified any governmental immunity from suit.

m. **Counterparts**. This Certificate may be executed in one or more counterparts, including by electronic portable document signature, each of which will be deemed an original, and together constitute the same Certificate whether or not all parties execute each counterpart.

[Remainder of Page Intentionally Left Blank. Signature Page to Follow.]

IN WITNESS WHEREOF, the parties hereto have caused this Certificate to be executed the day and year first above written.

STATE OF UTAH
SCHOOL AND INSTITUTIONAL TRUST LANDS ADMINISTRATION

By: _____
Name: David Ure
Title: Director

APPROVED AS TO FORM:

By: _____
Special Assistant Attorney General

HURRICANE CITY:

_____
John Bramall, Mayor

(Date) (County)

EXHIBIT A

WELL SITE

Commencing at the Northwest corner of Section 2, Township 42 South, Range 13 West, Salt Lake Base and Meridian; thence South 89°00'26" East 1563.19 feet along the section line; thence South 2225.23 feet to the point of beginning, and running thence South 32°48'47" East 200.00 feet; thence South 57°11'13" West 200.00 feet; thence North 32°48'47" West 200.00 feet; thence North 57°11'13" East 200.00 feet to the point of beginning.

Contains 40,000 square feet or 0.92 acres, more or less.

EXHIBIT B

TRAIL DESCRIPTION

[Insert Description]

EXHIBIT C

Form of Patent

STATE OF UTAH PATENT NO. _____

WHEREAS, Hurricane City a Utah municipality, heretofore purchased from the State of Utah School and Institutional Trust Lands Administration, the lands hereinafter described, pursuant to the laws of said State; and

WHEREAS, Hurricane City has paid for said lands, pursuant to the conditions of said sale, the sum of _____ Dollars and _____ Cents ($_____), and all legal interest thereon accrued, as fully appears by the certificate of sale.

NOW THEREFORE I, SPENCER J. COX, Governor, by virtue of the power and authority vested in me by the laws of the State of Utah, do issue this PATENT, in the name of the State of Utah, hereby quitclaiming, without warranty of any kind, unto the said Hurricane City, the tract or parcel of land situated in the County of Washington, State of Utah, more particularly described in **Exhibit A** attached hereto and incorporated by reference.

TO HAVE AND TO HOLD the above described and granted premises unto Hurricane City, and to its successors and assigns forever.

[Insert exceptions and reservations as provided in the Certificate of Sale]

[Insert restrictive covenant and information]

[Signature blocks omitted in exhibit.]

END

Restrictive Covenant

This restrictive covenant ("**Restrictive Covenant**") is entered into as of the ___ day of _____, 2022 by the State of Utah School and Institutional Trust Lands Administration ("**SITLA**").

WHEREAS, SITLA is the owner of that certain tract of land located in Section 2, Township 42 South, Range 13 West, in Washington County, Utah more particularly described on Exhibit A (the "**Property**");

WHEREAS, Hurricane City desires to purchase the Property from SITLA for use as a hiking trail and water well site; and

WHEREAS, SITLA desires to record this Restrictive Covenant against the Property prior to sale so that a certain prehistoric archaeological sites known as the Hurricane Canal is protected from and by all future owners.

NOW THEREFORE, SITLA hereby causes this Restrictive Covenant to be entered into and recorded against the Property.

1. Restrictive Covenant. SITLA hereby subjects the Property and all future owners to the restrictions and covenants set forth on Exhibit B attached hereto and made a part hereof. The map set forth on Exhibit C attached hereto and made a part hereof shows the general location of the Site, as defined in Exhibit B.

In witness whereof, the SITLA has caused this restrictive covenant to be entered into the day and year first written above.

State of Utah
School and Institutional Trust Lands Administration

By: _____
Name: _____
Title: _____

STATE OF UTAH)
:ss.
COUNTY OF SALT LAKE)

On this ____ day of _____, 2022, personally appeared before me _____, the _____ of the State of Utah School and Institutional Trust Lands Administration, who acknowledged that he, being duly authorized, did execute the foregoing instrument on behalf of the State of Utah School and Institutional Trust Lands Administration.

Given under my hand and seal this _____ day of _____, 2022.

_____
Notary Public

EXHIBIT A

The Property

[INSERT LEGALS]

END

EXHIBIT B

Restrictive Covenant

EXHIBIT C

Location of the Site

ALPHA ENGINEERING
43 South 100 East, Suite 100
St George, Utah 84770
T 435.628.6500
F 435.628.6553
alphaengineering.com

EXHIBIT "A"

WELL SITE, DEED RESTRICTION AREA, AND EASEMENT
3437-TR-HV
(September 23, 2021)

WELL SITE

Commencing at the Northwest corner of Section 2, Township 42 South, Range 13 West, Salt Lake Base and Meridian; thence South 89°00'26" East 1563.19 feet along the section line; thence South 2225.23 feet to the point of beginning, and running thence South 32°48'47" East 200.00 feet; thence South 57°11'13" West 200.00 feet; thence North 32°48'47" West 200.00 feet; thence North 57°11'13" East 200.00 feet to the point of beginning.

Contains 40,000 square feet or 0.92 acres, more or less.

DEED RESTRICTION AREA

Commencing at the Northwest corner of Section 2, Township 42 South, Range 13 West, Salt Lake Base and Meridian; thence South 89°00'26" East 1563.19 feet along the section line; thence South 2225.23 feet to the point of beginning, and running thence South 32°48'47" East 200.00 feet; thence South 57°11'13" West 50.00 feet; thence North 32°48'47" West 200.00 feet; thence North 57°11'13" East 50.00 feet to the point of beginning.

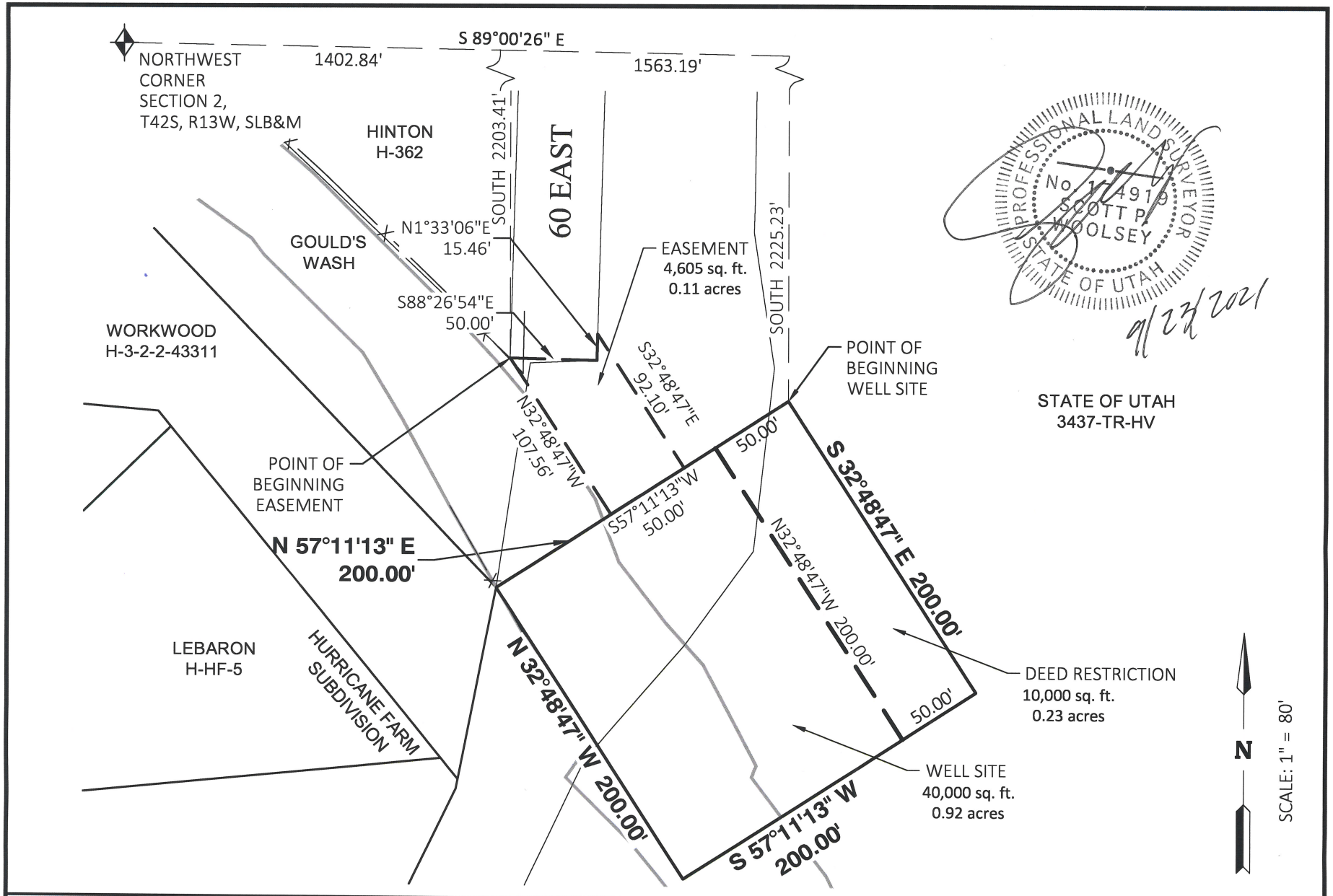
Contains 10,000 square feet or 0.23 acres, more or less.

50.0' WIDE EASEMENT

Commencing at the Northwest corner of Section 2, Township 42 South, Range 13 West, Salt Lake Base and Meridian; thence South 89°00'26" East 1402.84 feet along the section line; thence South 2203.41 feet to the point of beginning, said point being the southeast corner of Lot 16, Hurricane Local Survey, and running thence South 88°26'54" East 50.00 feet; thence North 01°33'06" East 15.46 feet; thence South 32°48'47" East 92.10 feet; thence South 57°11'13" West 50.00 feet; thence North 32°48'47" West 107.56 feet to the point of beginning.

Contains 4,605 square feet or 0.11 acres, more or less.

PROFESSIONAL LAND SURVEYOR
No. 7840191
SCOTT P. WOOLSEY
STATE OF UTAH
9/23/2021



WELL SITE, DEED RESTRICTION AREA, AND ACCESS EASEMENT EXHIBIT "B"

046-185	RS 9/23/2021

ALPHA ENGINEERING
43 South 100 East, Suite 100 • St George, Utah 84770
T: 435.628.6500 • F: 435.628.6553 • alphaengineering.com

HURRICANE CITY
UTAH

STAFF COMMENTS

Consideration and possible decision on the **flood modeling approach for Gould Wash**.

Discussion:
The Utah Division of Emergency Management is partnering with FEMA and local communities to update floodplain mapping in Washington County. In their analysis, the project team has identified flood risk that is currently underrepresented on the effective flood maps. In order to proceed with the modeling effort, the Division needs the city to choose between the Regulatory Floodway Option and the Administrative Floodway Option. This request from the Division requires some homework on the city's end in order to understand the risk, what the options mean, and how this decision will affect the citizens. This item has come before the Council previously and several questions were asked, and the answers to those questions are addressed in a few emails and attachments from Jamie Huff from the Division.

Findings:
The current effective mapping is based on a hydraulic analysis that acknowledges that certain reaches of Gould Wash in Hurricane proper will not contain the 100-year flood. Although this acknowledgement exists, the flood risk is not identified on the maps. The recent modeling also identifies the capacity of the wash being exceeded and flood waters exiting the channel and flowing through town and then entering back into the wash further downstream. Responsible floodplain management dictates that known flood risks should be managed through proper floodplain management practices.

Recommendation:
It is my recommendation as the city's Floodplain Administrator that the city choose the Regulatory Floodway Option for the same reasons that have been stated by the Utah Division of Emergency Management.

Attachments:
1. 11-04-2021 Email from Jamie Huff
2. 12-13-2021 Email from Jamie Huff
3. Gould Wash Community Presentation 8-26-2021
4. Hurricane Admin Floodway Inquiry Response_v3
5. Hurricane City_Gould Wash_Meeting_Notes_8-26-2021
6. Hydraulics Analysis Report

Arthur Lebaron

From: Jamie Huff <jhuff@utah.gov>
Sent: Thursday, November 4, 2021 5:44 PM
To: Arthur Lebaron
Cc: Angela Crowther; Hurwitch, Brie
Subject: Re: Hurricane Flood Plain Modeling
Attachments: Hurricane Admin Floodway Inquiry Response_v3.pdf

Arthur,

I apologize for the delay in reply. Because there are no other Administrative Floodway's in Utah we wanted to seek some additional guidance from FEMA. Please keep in mind Administrative Floodways would be a new mapping process for us. There does not appear to be any clear guidance developed, so we may learn more as a model is produced and questions arise. The attached information is in no way an exhaustive list of issues, but we hope this helps aid in the initial decisions being made.

Based on your questions attached are some initial responses, but again, may not be an exhaustive list of issues.

Please let me know if you would like to discuss further or have any further questions.

Regards,

Jamie Huff, CFM
Risk MAP Program Manager
Utah Division of Emergency Management
Taylorsville State Office Building
4315 S 2700 W., 2nd Fl., Suite 2200
Taylorsville, UT 84129-2128
Phone: 385-549-0746
Email: jhuff@utah.gov

(Please note address and phone number changes)

On Tue, Oct 19, 2021 at 6:27 AM Arthur Lebaron <arthur@cityofhurricane.com> wrote:

> Jamie,
>
> After the last discussion, the City Council asked me to advise them on which option we should choose: Regulatory, or Administrative (Planning).
>
> Based on what I know now, I would advise them to choose the regulatory floodway option but I had a few follow-up questions for you:

1. What is your preferred option, and what would your reason be?
2. Which option encumbers more land with the requirement to do a hydraulic analysis?

Thanks,

Arthur LeBaron, PE, PLS, CFM

City Engineer

147 North 870 West

Hurricane, UT 84737

435-635-2811 x113

arthur@cityofhurricane.com

Arthur Lebaron

From: Jamie Huff <jhuff@utah.gov>
Sent: Monday, December 13, 2021 11:26 AM
To: Arthur Lebaron; John Bramall; Kaden DeMille; Mike Vercimak; David Sanders; Nanette Billings; kdtervort@gmail.com; Council
Cc: Hurwitch, Brie; Tom Wright; Newton, Brady; Angela Crowther; Chaney, Matt
Subject: Re: Gould Wash Meeting Notes 8/26/2021
Attachments: Hydraulics Analysis Report.pdf; Gould Wash Community Presentation 8-26-2021.pdf; Hurricane City_Gould Wash_Meeting_Notes_8-26-2021.pdf; Hurricane Admin Floodway Inquiry Response_v3.pdf

Greetings Hurricane City,

This is a follow up to the City Council working meeting held on October 7, 2021 regarding flood modeling approaches for Gould Wash. We are requesting feedback from the city on which modeling option you want to choose in order to take the next step in this study. The choices are: 1) a Regulatory Floodway Option or 2) an Administrative Floodway Option.

As discussed at the meeting, this study--requested by the city--has revealed that flood risk is greatly underrepresented on the effective flood maps. This underrepresentation stems from the methods used in the older study (detailed in the 2006 Hydraulic Report for Gould Wash (Citation from the 2006 Effective Hydraulic Report - Gould Wash model discussion begins on page 21: Section 2.4.6)). Additionally a recent Hydraulic Analysis performed by Bowen Collins and Associates for an NRCS project is in agreement with our current analysis. Please see the 2006 Effective Hydraulic Report attached for your review. In addition to the report, I have attached information provided to the Hurricane City Engineer including more detail on the reasons why our team recommends the Regulatory Floodway option vs. the Administrative Floodway Option.

We understand either model option is likely to result in a significant change to the identified flood risk in Hurricane. We are aware of ongoing discussions to mitigate the increased risk, but the outcome of the NRCS project is not yet certain. The project has not yet been approved for construction, nor is construction occurring which will take several years to complete. In the meantime, this increased flood risk exists today, so our flood study needs to continue.

We have appreciated the city's support during this study effort and welcome continued conversation as the study progresses. Please let us know if there is any additional information we can provide in order for you to make an informed decision about the study model that best meets the city's needs.

Regards,

Jamie Huff, CFM
Risk MAP Program Manager
Utah Division of Emergency Management
Phone: 385-549-0746
Email: jhuff@utah.gov

On Fri, Sep 24, 2021 at 11:45 AM Jamie Huff <jhuff@utah.gov> wrote:
> Hi Arthur,

I am checking in to see if any questions have come up in your discussions or if you need any support. I believe you might have already had your council meeting on this subject and I am a little curious how it went.

Regards,

Jamie Huff, CFM
Risk MAP Program Manager
Utah Division of Emergency Management
Taylorsville State Office Building
4315 S 2700 W., 2nd Fl., Suite 2200
Taylorsville, UT 84129-2128
Phone: 385-549-0746
Email: jhuff@utah.gov

(Please note address and phone number changes)

On Fri, Sep 3, 2021 at 9:27 AM Arthur Lebaron <arthur@cityofhurricane.com> wrote:

> Thanks Jamie. We will review and respond.
>
> ---
>
> **From:** Jamie Huff <jhuff@utah.gov>
> **Sent:** Thursday, September 2, 2021 4:20 PM
> **To:** Arthur Lebaron <arthur@cityofhurricane.com>; John Bramall <jbramall@cityofhurricane.com>; Kaden DeMille <kaden@cityofhurricane.com>; Mike Vercimak <mike@cityofhurricane.com>; David Sanders <sanders@cityofhurricane.com>; clark@cityofhurricane.com
> **Cc:** Bob Carey <bcarey@utah.gov>; Hurwitch, Brie <brie.hurwitch@aecom.com>; Tom Wright <tom.c.wright@aecom.com>; Newton, Brady <brady.newton@aecom.com>; Angela Crowther <acrowther@utah.gov>; Chaney, Matt <matt.chaney@aecom.com>
> **Subject:** Gould Wash Meeting Notes 8/26/2021
>
> Greetings Hurricane City,
>
> We wanted to thank you for meeting with us virtually on August 26, 2021 to discuss the ongoing floodplain study on Gould Wash. As a follow-up to our meeting, I wanted to provide you with the list of attendees, detailed notes, and the slide presentation for your reference. I have also included links at the end of the notes to identify guidance documents we referenced during the discussion.
>
> As a summary we are seeking your decision on how to model and revise the floodway on Gould Wash. As the city is aware, Utah DEM is currently performing a study within Washington County on 110 stream miles. Gould Wash is included in this study, as requested by the city in 2018. During our initial analysis of the flood risk on Gould Wash, we have determined the current effective flood model does not meet current FEMAs mapping standards and it will need to be updated. We are seeking your decision on how to model the revised Floodway. We have two options to consider: 1. a Regulatory Floodway – preferred option and 2. an Administrative (Planning) Floodway – less preferred

option. Both have advantages and disadvantages and both have a strong possibility to supersede the current effective floodway and any associated effective LOMRs the city is currently regulating to.

We ask that you please review the attached information, feel free to discuss internally and provide your response by September 30, 2021. If additional meetings or coordination is necessary to provide additional clarification, please do not hesitate to contact me.

Regards,

Jamie Huff, CFM

Risk MAP Program Manager

Utah Division of Emergency Management

Taylorsville State Office Building

4315 S 2700 W., 2nd Fl., Suite 2200

Taylorsville, UT 84129-2128

Phone: 385-549-0746

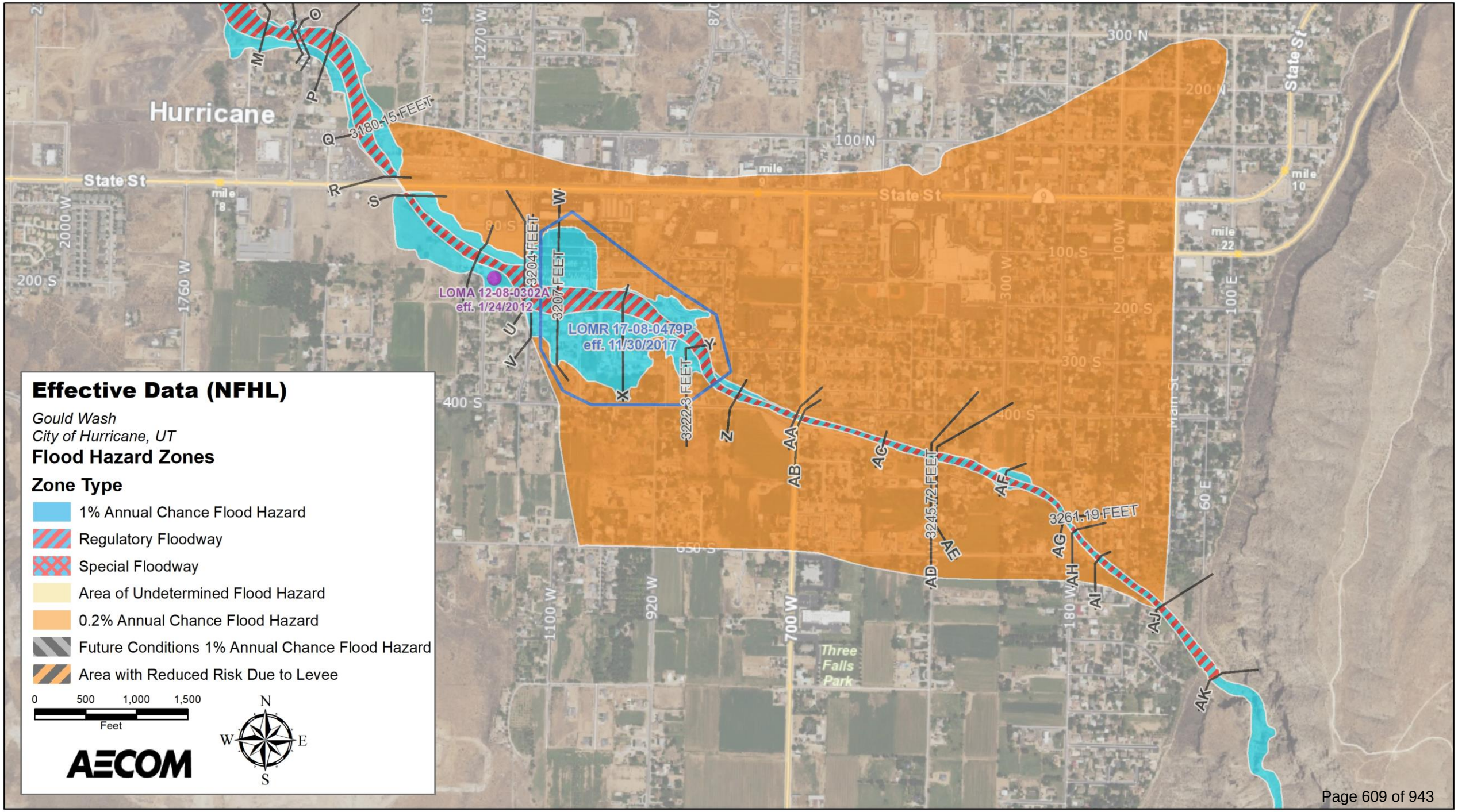
Email: jhuff@utah.gov

(Please note address and phone number changes)

Washington County Study Timeline

Hurricane Gould Wash Timeline	
	Date
Current Effective Flood Insurance Rate Maps (FIRMs) for Washington County	4/2/09
Current Effective LOMR	11/30/17
BLE (Phase 1) funded by FEMA	9/1/17
DEM Risk MAP (BLE) Study Kickoff Meeting (virtual)	4/11/2018
BLE maps provided (via email) to Hurricane (to prep for Discovery Meeting)	4/13/18
DEM Risk MAP Discovery Meeting (Gould Wash Requested to be restudied by Hurricane City Floodplain Administrator):	5/17/18
Phase 2-3 Study awarded by FEMA	7/1/18
DEM hosted BLE training in Santa Clara	7/15/19
DEM Risk MAP (Detailed) Flood Study Kickoff Meeting	7/16/19
Washington County Study Kickoff Meeting follow-up (email)	7/31/19
Engineering Modeling letter sent to communities (email)	8/15/19
Washington County Hydrology Meeting and Erosion Hazard analysis (virtual)	1/30/20
Washington County Hydrology Webinar Follow-up email to all communities (email)	3/20/20

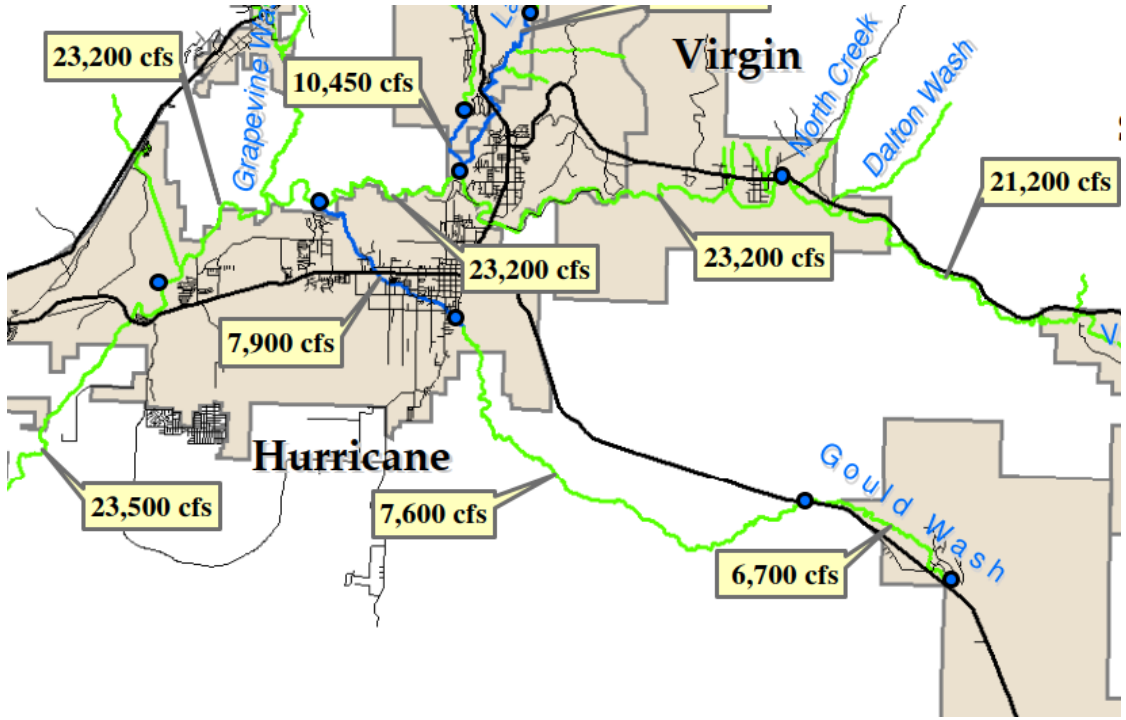
- Since the Hydrology Meeting, we have been developing models for the 110 streams being studied.


Hurricane
State St
300 N
100 N
200 S
400 S
650 S
1270 W
2000 W
1760 W
1100 W
920 W
700 W
180 W
100 E
60 E
mile 8
mile 9
mile 10
mile 22
3180.15 FEET
3204 FEET
3207 FEET
3222.3 FEET
3245.72 FEET
3261.19 FEET
LOMA 12-08-0302A
eff. 1/24/2012
LOMR 17-08-0479P
eff. 11/30/2017
Three Falls Park
Effective Data (NFHL)
Gould Wash
City of Hurricane, UT
Flood Hazard Zones
Zone Type
1% Annual Chance Flood Hazard
Regulatory Floodway
Special Floodway
Area of Undetermined Flood Hazard
0.2% Annual Chance Flood Hazard
Future Conditions 1% Annual Chance Flood Hazard
Area with Reduced Risk Due to Levee
0 500 1,000 1,500
Feet
N
W
E
S
AECOM

2006 Hydrology Report

Table 7
Summary of 100-year Discharge Values For
Detailed and Limited Detailed Study Reaches – (CONTINUED)

Flooding Source and Location	Area (mi^2)	100-year Discharge (cfs)					
		New Hydrology	City Storm Drain Master Plan	Effective FIS /LOMR	USGS Analysis	UDOT Regression Equations	NFF Regression Equations
Cottonwood Wash Tributary (Washington City)							
From State Street to confluence with unnamed wash east of Telegraph Road	1.6	--	**320**	--	--	--	--
From confluence with unnamed wash east of Telegraph Road to confluence with Cottonwood Wash	2.3	--	**800**	--	--	--	--
Coyote Wash							
From foothill to confluence with two unnamed washes (2.25 miles upstream from Santa Clara River)	0.7	**240**	--	--	--	--	--
From confluence with two unnamed washes to confluence with Santa Clara River	2.4	**470**	--	--	--	--	--
Fort Pierce Wash							
From Utah State line to confluence with Virgin River	1,680	--	--	25,000	28,500	17,000	**22,000**[3]
Gould Wash							
From canyon mouth to confluence with Virgin River	74.1	--	--	--	--	**7,900**	9,600



2006 Hydraulics Report

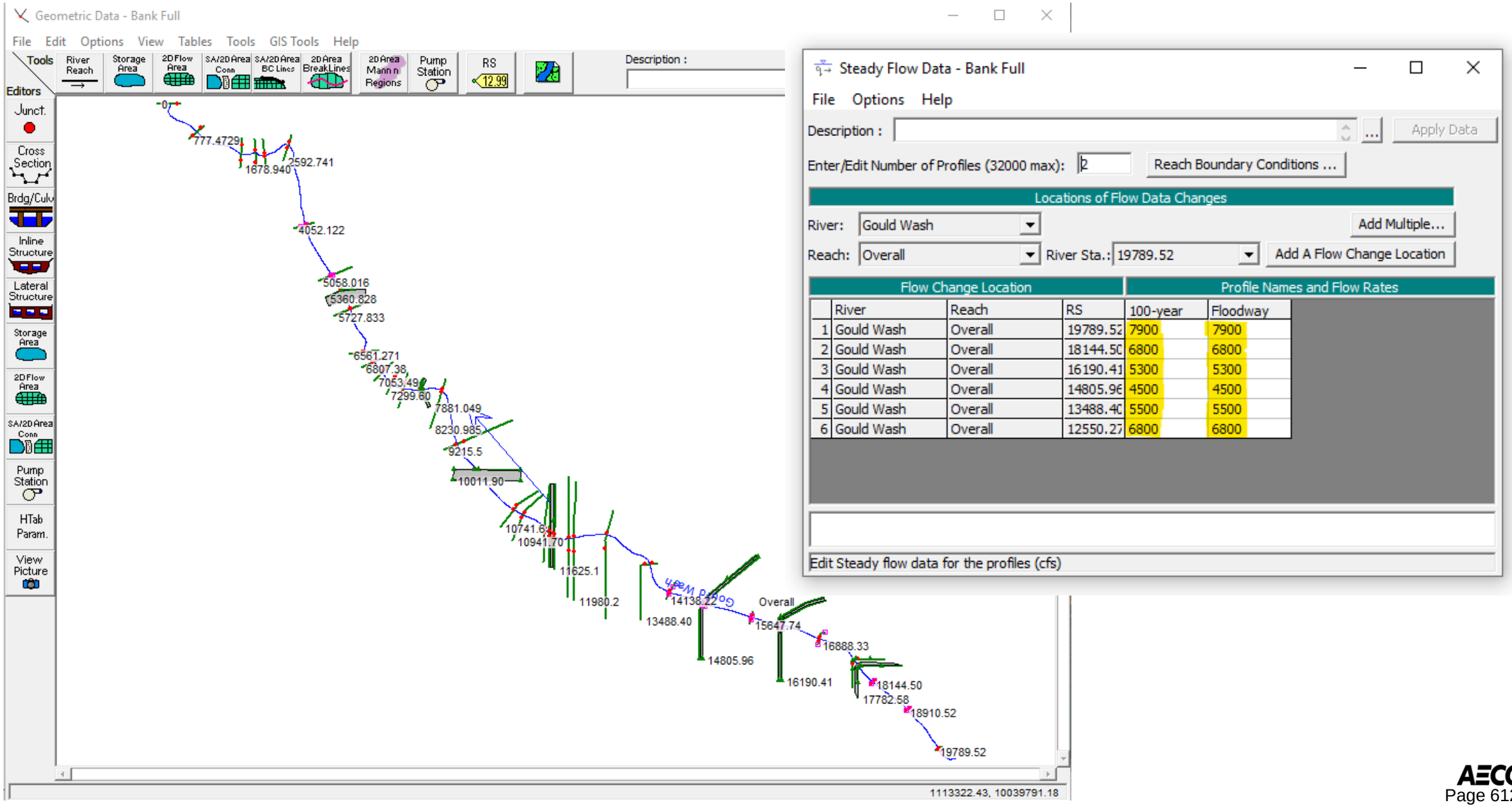
Special Conditions and Notes to Reviewer. The channel capacity for the Gould Wash study reach is significantly less than the estimated 100-year discharge of 7,900 cfs for this reach. Upstream of 700 West Street, the topography adjacent to the channel is such that once water overtops the bank it will either flow away from the channel or flow hydraulically disconnected from the channel. Downstream of 700 West Street water that is not contained in the channel will remain hydraulically connected to the channel. No special modeling considerations were required for the lower study reach. However, special consideration for modeling the upper upper study reach was required, as described below.

Channel Floodplain Mapping. The base-flood elevations for the upper study reach were established by estimating the bank-full capacity of the channel. It was assumed that since the channel does not have capacity to convey the entire base flood, water will overtop the channel banks and flow onto the overbanks. In an effort to estimate the depth of water overtopping the banks, the levee option was used in the HEC-RAS model. In general, artificial one-foot-high levees were established in the model at the top of the channel banks and utilized to estimate the bank-full capacity and the channel base flood elevations. The one-foot limit was utilized because it is believed that it is unlikely that the depth of water overtopping the banks in a linear fashion would be more than one foot deep. The base-flood elevations for the channel that resulted from this analysis are conservative from a regulatory perspective because the water surface elevations can be a foot higher than the bank elevation.

To estimate the bank-full capacity of the channel in determining flood flows routed down the channel versus overbank flow routed out of the channel, the hydraulic structures were temporarily removed from the model and no additional channel flow reductions were made

- From the canyon mouth to 120 West Street: 7,900 cfs (100-year discharge documented in the hydrology report)
- From 120 West Street to 400 West Street: 6,800 cfs (estimated bank-full capacity). It is estimated that 700 cfs will flow into the right overbank, and 400 cfs will flow into the left overbank due to water overtopping the banks, reducing the channel flow by 1,100 cfs.
- From 400 West Street to 700 West Street: 5,200 cfs (estimated bank-full capacity). It is estimated that due to the channel constriction at 400 West Street, 1,000 cfs will flow into the right overbank and 600 cfs will flow into the left overbank, reducing the channel flow by 1,600 cfs
- From 700 West Street to 850 West Street: 4,500 cfs (estimated bank-full capacity). It is estimated that due to the channel constriction at 700 West Street, 400 cfs will flow into the right overbank and 300 cfs will flow into the left overbank, reducing the channel flow by 700 cfs.
- From 850 West Street to about 1000 West: 5,500 cfs (estimated bank-full capacity). At this point water from the left overbank will become hydraulically connected with the channel again.
- From about 1000 West to the confluence with the Virgin River: 6,800 cfs (estimated bank-full capacity). At this point water from both overbanks will become hydraulically connected with the channel again. It is estimated that the 1,100 cfs lost at 180 West Street will attenuate such that even though the water eventually returns to the channel, it will not be until after the peak has past.

2006 Effective Model



Steady Flow Data - Bank Full

File Options Help

Description : ... Apply Data

Enter/Edit Number of Profiles (32000 max): 2 Reach Boundary Conditions ...

Locations of Flow Data Changes

River: Gould Wash Add Multiple...

Reach: Overall River Sta.: 19789.52 Add A Flow Change Location

Flow Change Location				Profile Names and Flow Rates	
	River	Reach	RS	100-year	Floodway
1	Gould Wash	Overall	19789.52	7900	7900
2	Gould Wash	Overall	18144.50	6800	6800
3	Gould Wash	Overall	16190.41	5300	5300
4	Gould Wash	Overall	14805.96	4500	4500
5	Gould Wash	Overall	13488.40	5500	5500
6	Gould Wash	Overall	12550.27	6800	6800

Edit Steady flow data for the profiles (cfs)

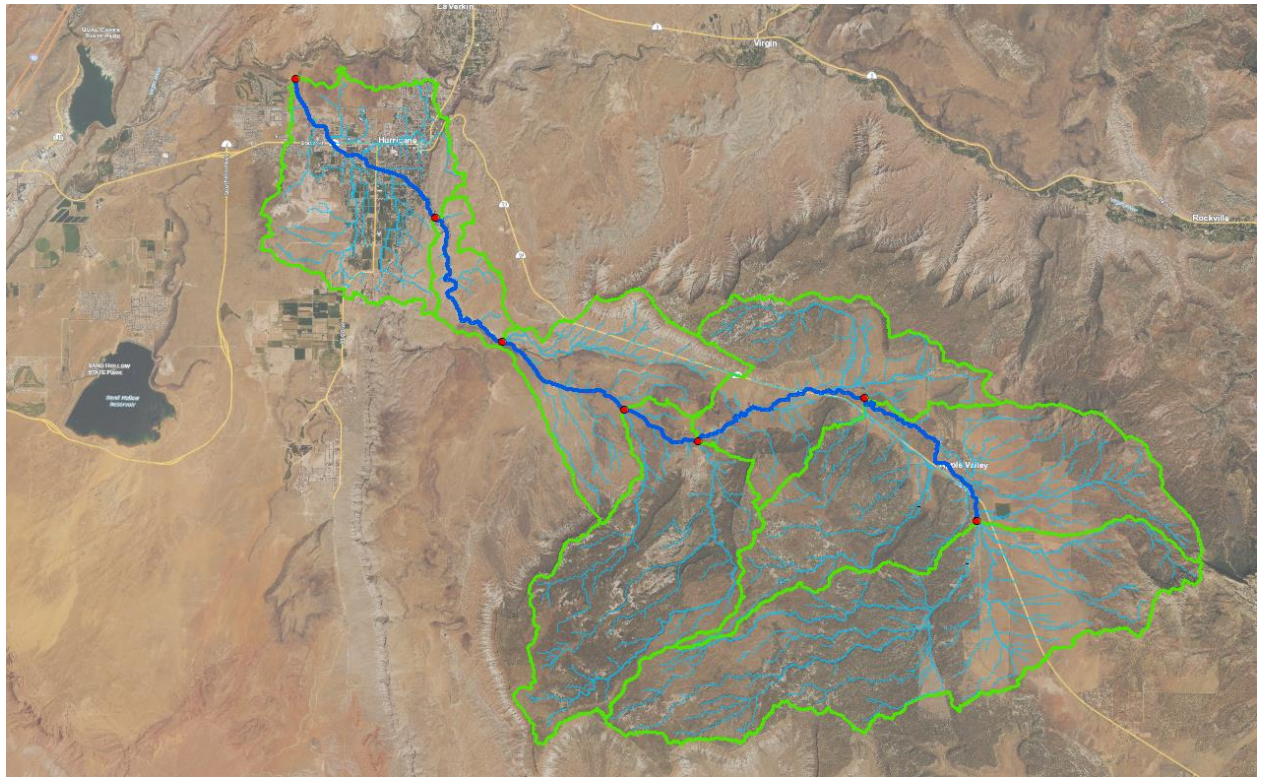
Floodway Definition

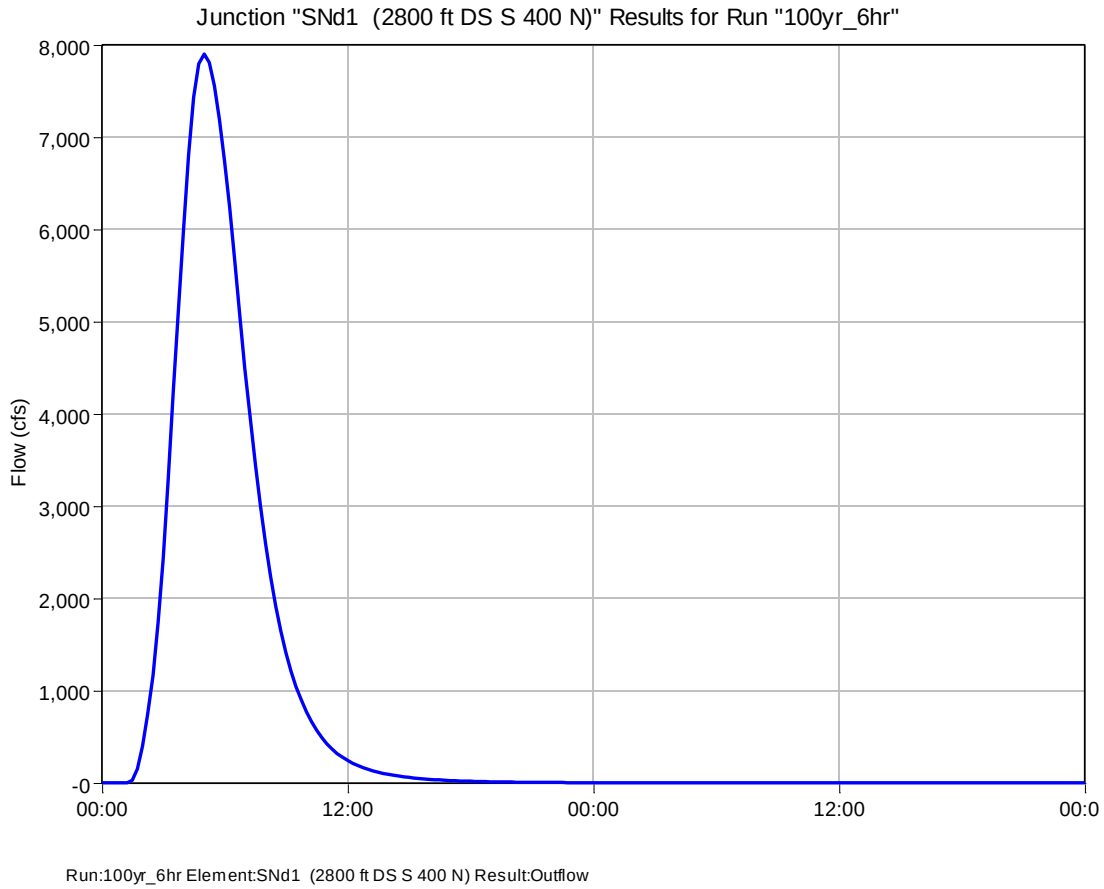
– From 44 CFR 59.1:

> *Regulatory floodway* means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

– This floodway is not discharging the base flood, just the “bank full” flood

Detailed Hydrology Approach



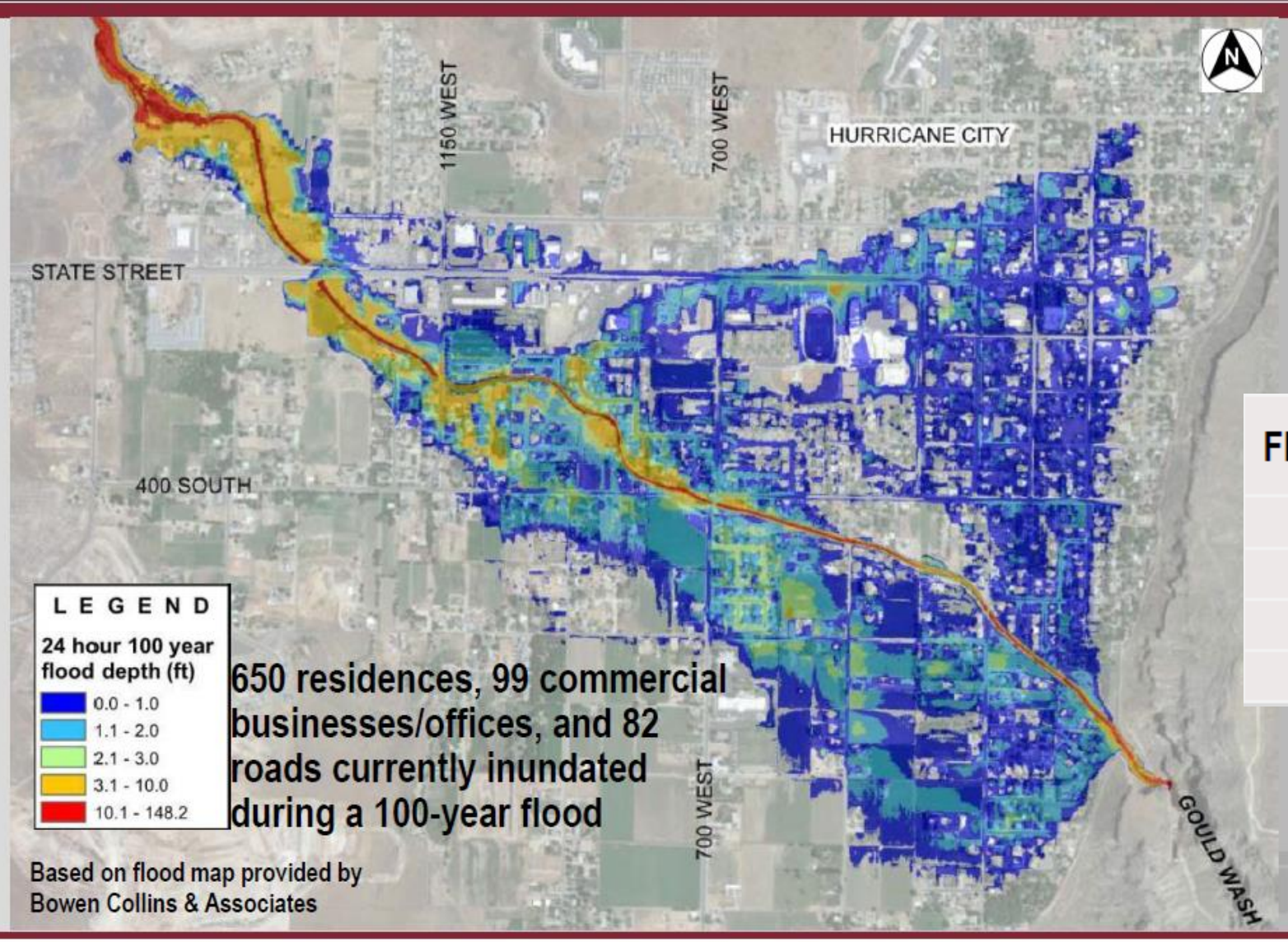


Detailed Hydrology Results

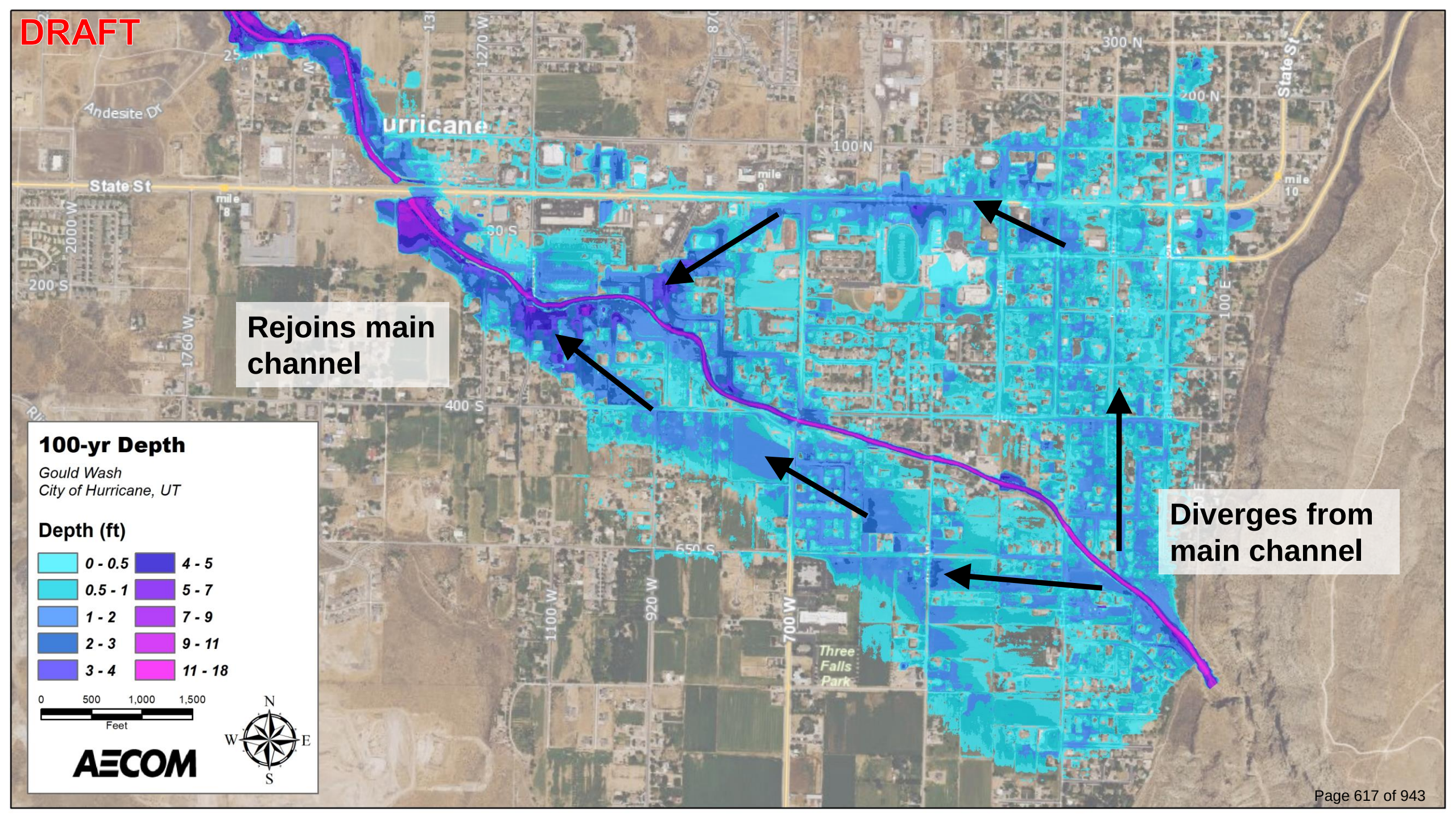
Flooding Source and Location	Drainage Area (Sq. Mi.)	Peak Discharges					
		10-yr	25-yr	50-yr	100-yr	100-yr Plus	500-yr
GOULD WASH							
2800 ft downstream from W 600 N	73.5	2,435	4,185	5,865	7,900	12,960	15,110

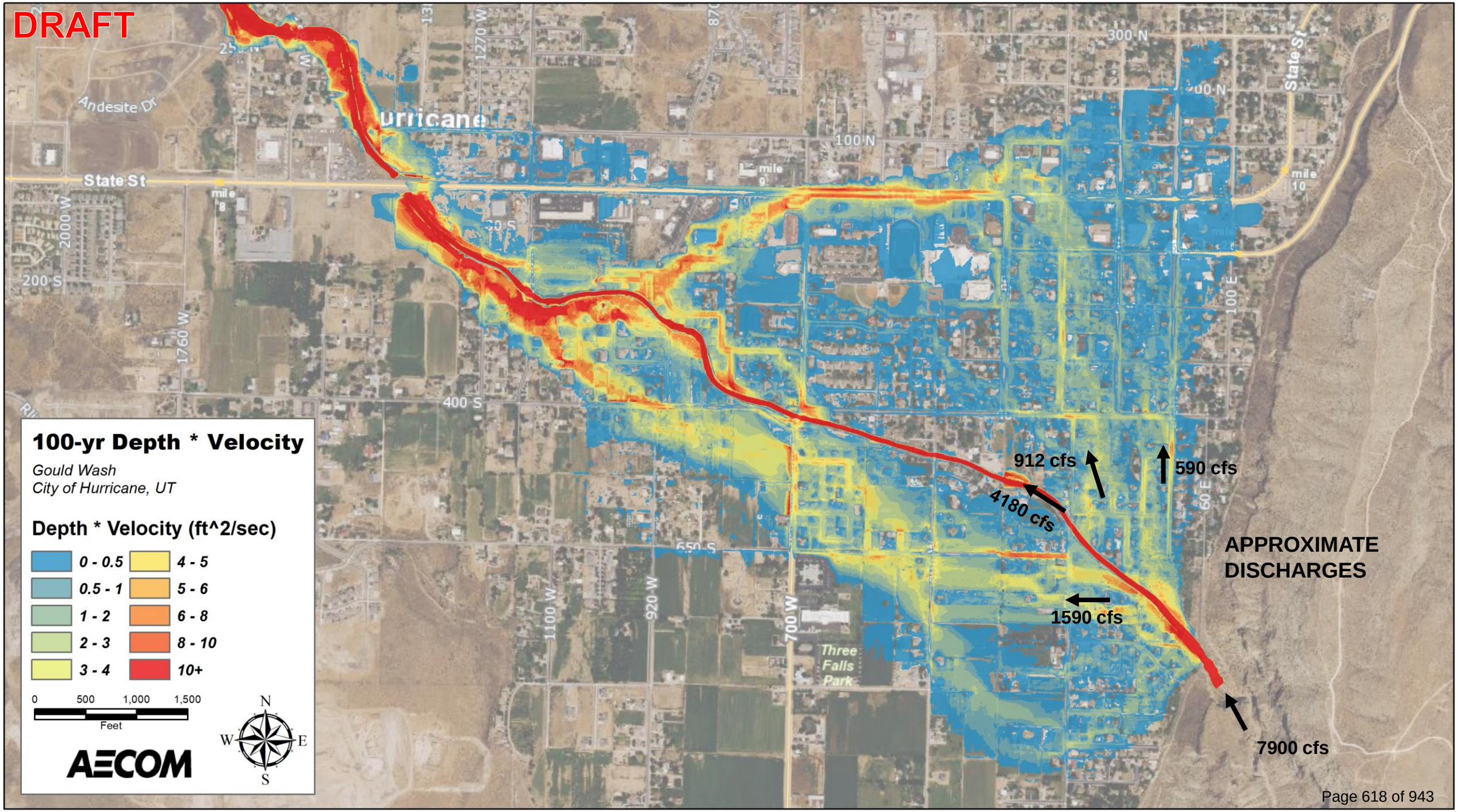
– 100-yr flow same as effective

Project Overview
Existing Condition 100-Year Flood



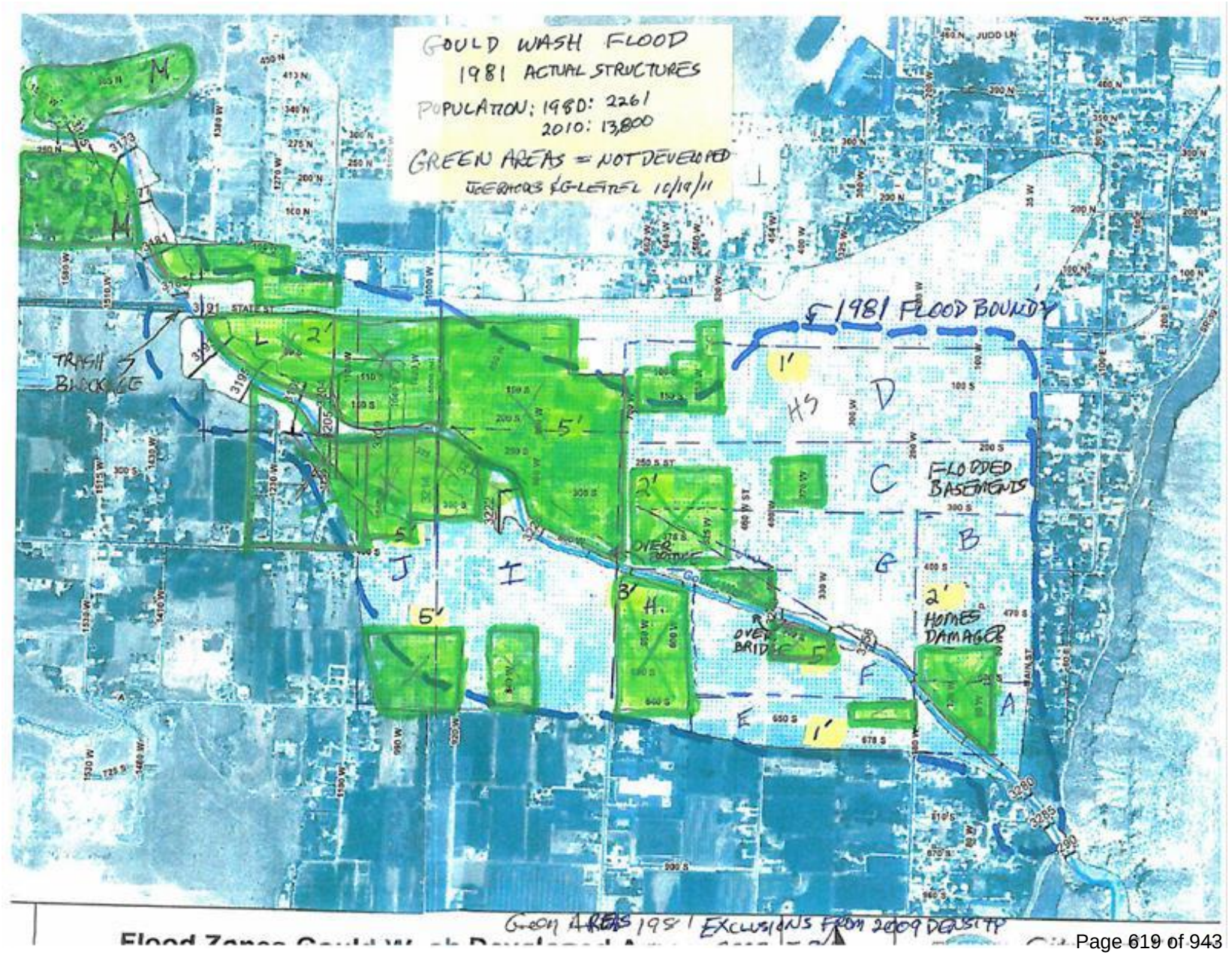
Flood Event	Discharge at Hurricane Cliffs (cfs)
2-Year	760
10-Year	2,810
50-Year	6,580
100-Year	8,820


DRAFT
Rejoins main channel
Diverges from main channel
100-yr Depth
Gould Wash
City of Hurricane, UT
Depth (ft)
0 - 0.5
0.5 - 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 7
7 - 9
9 - 11
11 - 18
0
500
1,000
1,500
Feet
AECOM
N
W
E
S
State St
300 N
200 N
100 N
100 S
200 S
400 S
650 S
2000 W
1760 W
1270 W
1100 W
920 W
700 W
100 E
State St
mile 8
mile 9
mile 10
Andesite Dr
Three Falls Park


DRAFT
100-yr Depth * Velocity
Gould Wash
City of Hurricane, UT
Depth * Velocity (ft^2/sec)
0 - 0.5
0.5 - 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
6 - 8
8 - 10
10+
0
500
1,000
1,500
Feet
AECOM
N
W
E
S
912 cfs
590 cfs
4180 cfs
1590 cfs
7900 cfs
APPROXIMATE DISCHARGES
Hurricane
State St
Andesite Dr
100 N
300 N
200 S
400 S
650 S
1760 W
2000 W
1270 W
1100 W
920 W
700 W
100 E
60 E
Three Falls Park
mile 8
mile 9
mile 10

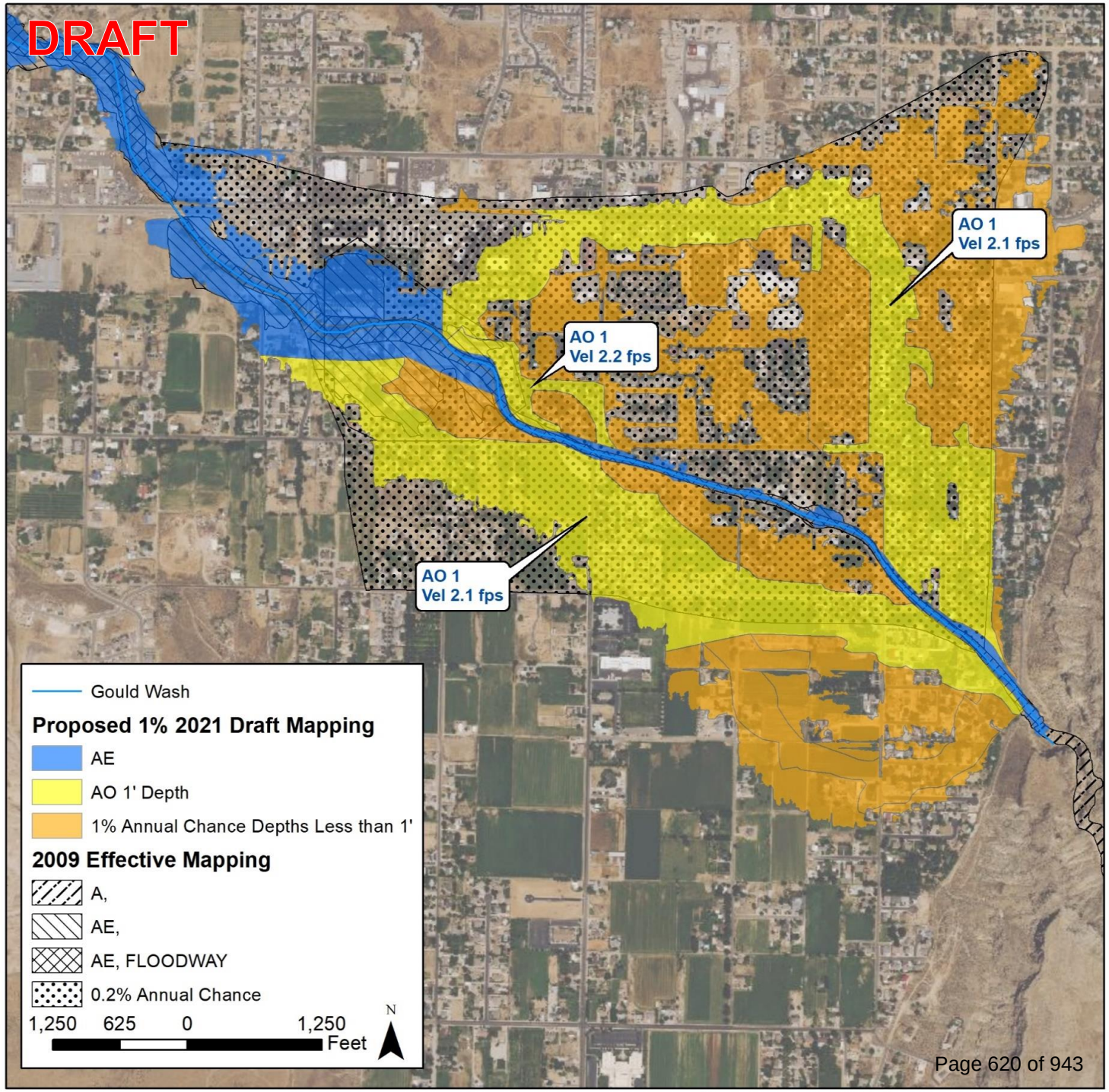
Historical Flooding

– 1956
  - Took all 3 bridges out
– 1981
  - Estimated flood flow 12,400 cfs
– 2011



Proposed Mapping Approach

– Shallow flooding flow paths follow D*V



Gould Wash Currently has a Floodway

– Cannot downgrade study level

– Challenge: including a floodway that meets FEMA mapping guidelines

– 2 Proposed Approaches:
  - Regulatory Floodway Option
  - Administrative Floodway Option



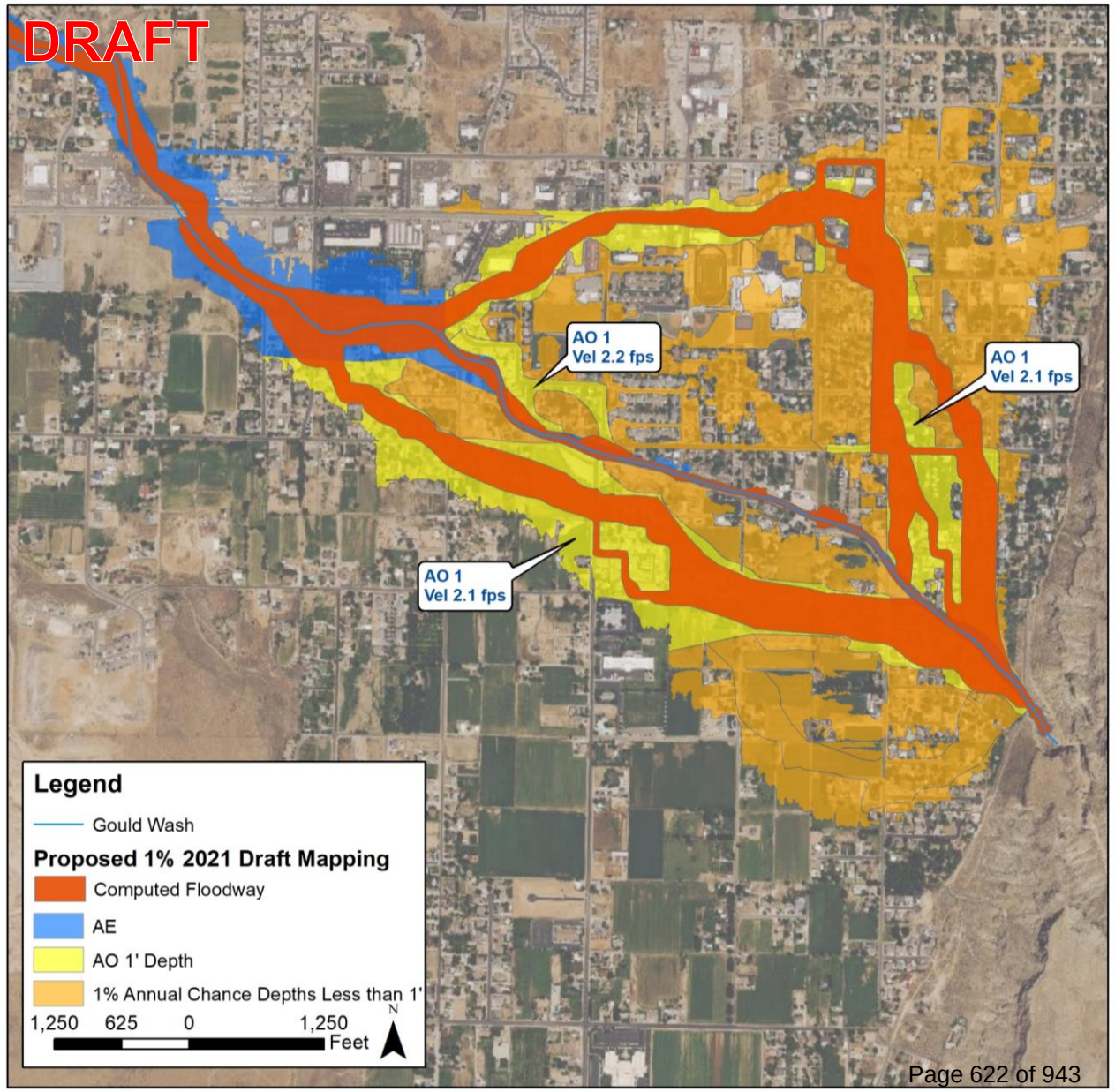
Looking upstream from 180 W

Regulatory Floodway Option

(Preferred Option)

– Advantages
  - Clear understanding of regulatory expectations & development requirements
  - *"…considerably reduces the administrative burden of regulating floodplain development since hydraulic studies do not have to be undertaken for individual development proposals."* (Floodway Guidance Section 5.1)
  - Follows floodway guidance

– Challenges
  - Establishes floodway through an area that is almost completely developed

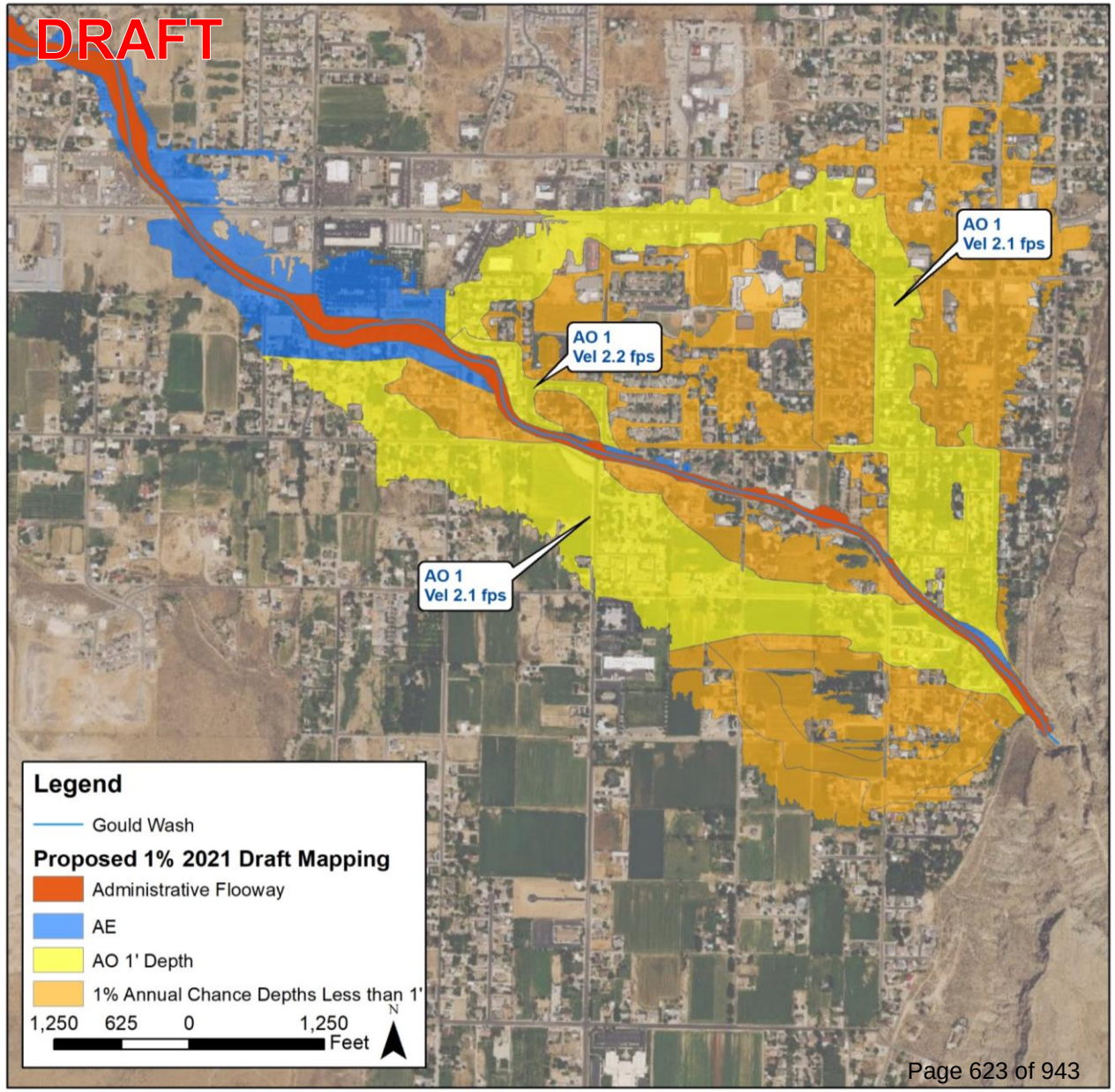


Administrative (Planning) Floodway Option

(Less Preferred Option)

– Advantages
  - Administrative Floodway appears similar to current effective Floodway

– Challenges
  - Not a regulatory floodway
  - Resource intensive and challenging to manage [60.3 (c)(10)]
    - Every new development proposal would require a hydraulic analysis
    - Not necessarily less restrictive than the Regulatory Floodway Option
  - Could be confused with the requirements for a regulatory floodway
  - Mapping Appeals
    - May impact availability of MT-1 (LOMAs)
    - CLOMR/LOMRs may not be available, but unclear



Summary

- Hurricane City requested re-study in 2018
- Using current Hydrology, flooding exits the main channel
- Current Floodway does not meet FEMA Guides & Specs (bank full)
- Using 1D/2D approach, new flood risk is being modeled
- FEMA studies cannot be downgraded, floodway cannot be removed
- Floodway options
  - Regulatory Floodway – Preferred option
  - Administrative (Planning) Floodway – less preferred option
  - Both have advantages and disadvantages
- Request community decision for Floodway approach

12.0 Encroachment Requirements for Rivers and Streams without Floodways

FEMA may also issue a FIRM that include rivers or streams where FEMA has conducted a detailed study and established base flood elevations, but not designated a floodway. Generally, these Studies are conducted in less densely populated areas where it is difficult to justify the expense of conducting an engineering study that would include a floodway. These areas are subject to the requirements at 44 CFR 60.3(c)(10) which requires a hydraulic analysis to ensure that each development in the floodplain does not increase base flood levels by more than one foot at any point in the community. The requirement at 44 CFR 60.3(c)(10) essentially applies the same standard to these areas as would apply if a floodway were designated (the maximum one foot rise in flood stage). The main difference is that the hydraulic analyses are conducted on a case-by-case basis for each proposed development in the floodplain. Most communities pass on the cost of performing this analysis to the permit applicant. The advantage of having a floodway designated is that is that the community can review and permit development outside of the floodway without requiring a hydraulic analysis and without passing the costs of that analysis on to the permit applicant.

The requirement in 63.3(c)(10) only applies along rivers, streams, and other watercourses where FEMA has provided base flood elevations. The requirement does not apply along lakes, bays and estuaries, and the ocean coast. Generally, this type of data is provided as interim data and the intent is to eventually re-map these areas to add floodways when funding becomes available and the amount of development warrants the added cost to develop floodways.

Sometimes a decision is made not to designate a floodway on a stream because hydraulic conditions on the river or stream do not lend themselves to modeling a floodway using standard methodologies. Generally, FEMA, the state, and the community agree to an alternative management scheme for the stream that achieves the same purpose as designating a floodway or performing an encroachment analyses under 60.3(c)(10).

---

44 CFR 60.3(c)(10): *Require until a regulatory floodway is designated, that no new construction, substantial improvements, or other development (including fill) shall be permitted within zones A1-30 and AE on the community's FIRM, unless it is demonstrated that the cumulative effect of the proposed development when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.*

Source: FEMA Floodway Analysis and Mapping Guidance Document (Dec. 2020)

12.1 Ways to Meet the 60.3(c)(10) Requirement

Section 60.3(c)(10) of NFIP regulations requires a hydraulic analysis to ensure that each development in the floodplain does not increase base flood levels by more than one foot at any point in the community. One of the concerns that have been expressed about implementing the requirement has been the cost of performing a hydraulic analyses for a small development such as a single home. The costs of this analysis must be considered as part of the cost of developing in the floodplain. The potential adverse impacts of development in the floodplain on upstream and adjacent property owners can be significant and must be evaluated before the development is allowed to occur. However, there are several ways a community can avoid or minimize these costs:

- **Stay out of the floodplain entirely.** Usually limited detail studies without floodways are provided in rural areas or less densely populated areas where parcels are large and there is a choice of building sites. In these cases, it is often in everyone's best interest to design the development so that the building sites are located outside of the floodplain. The floodplain is preserved, and the permit applicant avoids the added costs of performing the hydraulic analysis and of developing in the floodplain.

Very few backwater areas along Gould Wash

- **Limit development to backwater areas.** It may also be possible to limit the development to backwater areas that are not effective flow areas. Most floodplains have irregular boundaries and include backwater areas that provide storage of floodwaters but play little or no role in the conveyance of floodwaters. The velocity of floodwaters in these areas may be zero or close to zero. There may also be floodplain areas that are separated from the river or stream by a railroad or road embankment or a substantial levee that is at or near the base flood elevation that parallels the river or stream. Areas behind these obstructions also may not convey flood flows. These areas are not taken into account as flow areas when the hydraulic model is developed of the floodplain. Development of these areas will not increase flood stages. A qualified engineer can apply basic hydraulic principles to identify these areas. The remainder of the floodplain is sometimes referred to as a natural floodway.

- **Establish setbacks:** Finally, it may be possible to develop a standard setback or an algorithm for establishing setbacks along smaller streams in your community that would serve the same purpose as 44 CFR 60.3(c)(10). You may already have adopted a setback to preserve a natural stream buffer to protect water quality. Back-up your setback or algorithm with engineering calculations to show that development will cause no more than a one foot rise in flood stage. Be conservative. Test the setback or algorithm on a reasonable number of cross-sections given the variety of stream conditions in your community. If you choose this alternative, check with your state or FEMA Regional Office first.

If you adopt either the second or third alternative and feel that permit applicants may challenge your setbacks or other requirements, you can always allow the applicant the option of hiring an engineer and submitting a (c)(10) analysis if they disagree. Most permit applicants are likely to comply with your requirement as long as it is reasonable rather than to go to the expense of paying for a hydraulic analysis.

This type of analysis would be required for every development application in the floodplain

12.2 Performing a 60.3(c)(10) Analysis

In those floodplains where FEMA has provided the community with base flood elevations, but no floodway, the community must prohibit development unless it is demonstrated that the cumulative effect of the proposed development when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

When evaluating the proposed encroachment into the floodway, you must assume that other like situated property owners will want to develop their properties in the same manner as the permit applicant and that eventually their properties will be developed. You must take their rights to develop into account when evaluating a proposed encroachment to determine if it will cause rise in flood stage for the base flood. For example, if the permit applicant wants to build a house on fill that extends 100 feet into the floodway, you must assume that the property owners across the stream encroach into the floodway an equal amount. You must also make the same assumption for upstream and downstream property owners on both sides of the river or stream. You need to extend your hydraulic analysis far enough upstream and downstream to capture the cumulative impacts of all of this development.

11/4/2021

Repose to Hurricane, UT questions regarding Administrative Floodway Option vs Regulatory Floodway

Based on the city's questions, below are some initial responses, but may not be an exhaustive list.

1. **What is your preferred option, and what would your reason be?**
    a. Our preferred approach continues to be the Regulatory Floodway.
    b. The revised regulatory model would show the true risk of flooding because it models the full flows through Gould Wash, which lacks the channel capacity to convey the 1%-annual-chance flood event causing water to overtop. Since the current effective model only uses the "bank full" (reduced) flows, it is showing a much lower flood risk than what actually exists. This is also confirmed by the Bowen Collins "Existing Condition 100-Year Flood" map (February 4, 2020 EIS scoping meeting presentation) in support of the NRCS project that proposes a detention facility in the upper Gould Wash watershed to reduce peak flows through Hurricane City.
    c. There are clear requirements for development in regulatory floodways adopted in your floodplain ordinance.
    d. Development of the regulatory floodway provides the community the modeling backup needed to ensure any new development will not increase the flood risk to any other properties. The model simulates that all properties in the floodway have been fully developed; this reduces the administrative burden for the city to determine if any proposed development would increase the flood risk.
    e. While there may be more properties identified in the regulatory floodway, if much of the area is already developed this may only impact permitting when new development or substantial improvements outside of the original foundation footprint is proposed.
    f. The increased depicted risk could be beneficial for the NRCS detention basin application by creating a more favorable Benefit Cost Ratio.
    g. FEMA Letters of Map Change (LOMCs), such as LOMRs and CLOMRs would be allowed.
    h. The model would meet current FEMA Floodway Mapping guidance.
2. The City did not ask this, but we want to ensure we provide a more detailed response as to why we would not recommend the "Administrative Floodway".
    a. The "Administrative Floodway" will not meet current FEMA Mapping Standards. Due to the city's flat topography, a 1D/2D model was developed per FEMA guidance to more accurately model and map areas of shallow flooding (AO zones) in the overbanks adjacent to the regulatory floodway delineation. Per FEMA Shallow Flooding Analyses and Mapping guidance, communities can choose to have administrative floodways for such areas.
    b. An "Administrative Floodway" is not considered a "Regulatory Floodway" and the current model does not reflect today's risk, nor does it meet FEMA Floodway Mapping Standards.
    c. When the final model is produced, an "Administrative Floodway" might appear to be smaller in size than the proposed Regulatory Floodway option. However, with this option, we would not be performing a revised floodway analysis. The current and inaccurate floodway model would be refined using more recent high-resolution topography data but would still only show "bank full" (reduced) flows.

d. Because this is not a Regulatory Floodway, any FEMA CLOMRs, LOMRs, and possibly some LOMAs (on the Administrative Floodway boundary) would not be allowed as there is no "regulatory" model-backed data for FEMA to compare it to. Therefore, the mapping that becomes effective on the revised FIRM will not be changed through the FEMA Letter of Map Change (LOMC) process until a new regulatory model is developed.
e. What if there is proposed development in this area?
    i. Many questions may be received as to what this area means.
    ii. The city would need to develop a process to track all development in this area to ensure that all development is not causing more than one foot of rise per 44 CFR 60.3(c)(10) in the Zone AE areas without a regulatory floodway. All proposed development in Zone AE would need an engineering analysis to determine if one development increases BFEs by one foot. When the one foot elevation is reached, all future development in the entire Administrative Floodway would have to meet the no-rise requirements. This places a heavy burden on the city to review and approve H&H engineering analyses on their own and track all BFE increases on Gould Wash. See additional information below in 3a.
    iii. In other states that have an Administrative Floodway designation, communities have required a no-rise for all development in any AE zone to reduce the administrative burden of tracking BFE increases. Some communities identify the area as a "no-build zone".
f. This area may be misinterpreted as a Regulatory Floodway and developers may want to seek a FEMA map change. Explaining the limitation could pose to be a difficult conversation.

3. Which option encumbers more land with the requirement to do a hydraulic analysis?

a. Both floodway options will require some level of hydraulic analysis depending on which zone the proposed development falls in. Below is a description of when a hydraulic analysis would be required under different scenarios.
    i. **Regulatory Floodway Option** – 44 CFR 60.3(d) applies:
        1. Since a regulatory floodway is established, all projects that fall outside the floodway boundary can be permitted without any hydraulic analysis but would still need a floodplain development permit.
        2. All new developments or substantial improvements that fall within the floodway require a “no-rise” certification where an engineer performs a hydraulic analysis to compare pre-project and post-project conditions and certify that the project causes no increases in flood heights [44 CFR 60.3(d)(3)].
            a. This is typically a more localized analysis that only looks in the vicinity of the proposed project.
            b. There are also exceptions for “minor projects” that can be permitted without an engineering analysis, such as signposts, telephone poles, re-paving at-grade (e.g. no fill), and small additions or accessory buildings that are placed in the

conveyance shadow of an existing structure (see FEMA 480, February 2005, pages 5-23 to 5-24).

ii. **Administrative Floodway Option** – 44 CFR 60.3(c) applies:

1. All new developments or substantial improvements that fall within the administrative floodway require a "no-rise" certification in the same manner as the regulatory floodway.
2. All new developments or substantial improvements that fall within zone AE will require a hydraulic analysis to demonstrate that "the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community." [44 CFR 60.3(c)(10)]
    a. A separate individual analysis is required for each proposed development or substantial improvement.
    b. This hydraulic analysis must evaluate the entire community every time.
3. While an H&H analysis may not be required to demonstrative the cumulative impact, all new developments or substantial improvements that fall within zone AH or AO will require an analysis to show that adequate drainage paths are provided to guide floodwaters around and away from proposed structures [44 CFR 60.3(c)(11)].

b. After speaking with FEMA, the 44 CFR 60.3(c)(10) requirements only apply to areas where no floodway has been determined (Zone AE without floodway or Administrative Floodway). The final mapping determination for what area this includes has not yet been developed. If much of the area is already developed this may only impact permitting when new development or substantial improvement outside of the original foundation footprint are proposed. The City should determine which properties are currently undeveloped to help inform this decision.

Project Meeting:	*Hurricane City Meeting – Gould Wash (Virtual)* *Washington County, Utah Phase 2 Risk MAP Study*
Date and Time:	*August 26, 2021, 3:00 PM - 4:00 PM*
Place:	*Webinar*

Meeting Summary

Introduction

Jamie Huff, Utah Division of Emergency Management (DEM), opened the meeting by welcoming the group. Introductions were made for the study team and community representatives.

Attendees:

Jamie Huff, DEM State Risk MAP Program Manager

Angelia Crowther, DEM NFIP Coordinator

Brie Hurwitch, AECOM

Tom Wright, AECOM

Matt Chaney, AECOM

Arthur LeBaron, City Engineer

Clark Fawcett, Hurricane City Manager

Mayor John Bremmell, Hurricane City Mayor

Dave Sanders, Hurricane City Councilman

Mike Vercimak, Hurricane City Public Works Director

Presentation

See attached presentation for details.

In 2018, Hurricane City requested a new floodplain study for Gould Wash as part of a larger Washington County FEMA flood study. Study timline provided on Slide 1. The new Gould Wash study cannot be modeled and mapped similar to the current effective study (2009) because the methodology used then does not meet current FEMA guidelines and standards. The revised study performed by AECOM (and a concurrent independent study by Bowen Collins and Associates) shows the community is at considerable risk of flooding from the 1%-annual-chance ("100-year") flood event. There are two options for mapping the floodway which produce very different results. Hurricane City will need to decide which option is best for their community in order for the study to move forward.

Questions / Discussion

AECOM provided an overview of the flood study pointing out the hydrologic flow rate for the 1%-annual-chance storm event is 7,900 cfs, the same as the previous mapped floodplain (current effective 2009 study). (Illustration on slide 2 and 3)

AECOM explained that we would not be permitted by FEMA requirements to model the wash in the same manner as the current effective data, with a narrow floodplain and floodway contained along the banks of the wash, and a wide shallow flooding 0.2%-annual-chance ("500-year") event spreading across the city. This is because the current floodway is only modeling the "bank full" flood, not the entire base flood, going against the standards required in 44 CFR 59.1. (Illustration on slides 4-8)

A comparison was made to the NRCS study, which used 8,820 cfs, showing very comparable modeling results with the 1%-annual-chance flood escaping the channel to both the north and south of the wash in the developed areas of the city. (Illustration on slide 9)

Arthur indicated that the NRCS project is years out but they are hoping the project will help with mitigating the flood risk.

AECOM showed the draft results and discussed that, due to the capacity limitations of the channel at various locations through the city, flow diverges from the channel in several locations. This is in contrast with the effective mapping, and clearly shows many more structures in the 100-year floodplain, where an insurance requirement would be implemented for these structures. (illustration on slide 10-11)

Historical flooding events were discussed; particularly the flood events of 1956, 1981, and 2011 where significant damage occurred. (Illustration on slide 12)

The proposed mapping approach includes shallow flooding with a combination of AE and AO zones. (Illustration on slide 13)

Arthur asked for explanation on AO flood zones. Jamie explained that these zones are mapped with depths instead of elevations. Any structure within an AO zone with a depth of 1 foot would need to elevate to a depth of one foot above the identify base flood elevation (or AO depth), and basements would not be permitted. Arthur asked whether a variance could be allowed to avoid any development restrictions associated with substantial improvements made on a structure, and the answer is no. Variances should be rare and need to meet specific criteria identified 44CFR 60.6, these requirements are also located in the Hurricane City Code.

AECOM then presented two options for modeling the floodway, which include a Regulatory Floodway (preferred option) and an Administrative (Planning) Floodway (less preferred option). Both have advantages and disadvantages; with the Administrative Floodway being resource intensive and challenging for the community to manage (illustration on slides 14-16).

The city expressed concerns about flood risk along the wash, indicating that a private entity hired Rosenberg Associates to remap the floodplain and floodway via a LOMR (effective October 25, 2021) and build two large homes right next to Gould Wash in the current effective floodway. However, the LOMR is revising the current effective model, which does not meet current FEMA guidance.

Jamie noted the new 2021 LOMR (as well as the 2017 LOMR) would likely be superseded by the new study and could potentially put properties/structures back in the mapped floodplain or floodway. Since the results are still draft, it is not known what the exact impacts will be.

The city noted that property owners are pulling a development permit between now and September 17, 2021 and need to be told about the upcoming changes. Jamie indicated the the LOMR will not become effective until October 2021 and the current floodway designation is still in effecti until the date the LOMR becomes effective.

Angelia mentioned that variances are "red flags" for FEMA and catch their attention if they are granted.

Arthur indicated that the city's priority is protecting life and property regardless of the flood insurance burden on homeowners. One point of clarification on insurance. Jamie made a comment that flood insurance is a "last resport" for property owners, however, this point was meant that flood insurance is the "last line of defense" for property owners to protect their property and recover from flooding.

Arthur noted that City Council will need to review the information, including the CFRs, and vote on the floodway options being presented.

The study team with send the presentation in pdf format that can be taken to City Council.

There were no further questions.

Meeting Adjourned at 4:25 PM

These notes are an interpretation of discussions held. Please provide any additions or corrections to **Jamie Huff, Utah DEM,** within 5 days of the date below; otherwise they will be assumed correct as written.

Prepared by: ___Utah DEM and AECOM____

Date completed:_____9/2/2021_____

Post Meeting Guidance for Consideration

- 44CFR 59.1: Floodplain Management Defination
- 44 CFR Part 60: Requirements for Flood Plain Management Regulations https://www.govregs.com/regulations/title44_chapterI_part60_subpartA
- 44 CFR Part 65. IDENTIFICATION AND MAPPING OF SPECIAL HAZARD AREAS: https://www.govregs.com/regulations/title44_chapterI_part65
- Variance Guidance: https://www.fema.gov/sites/default/files/2020-08/FEMA_P-993_FPM-Bulletin_Variance.pdf
- FEMA POLICY: GUIDANCE ON THE USE OF AVAILABLE FLOOD HAZARD INFORMATION FEMA Policy #104-008-2 https://www.fema.gov/sites/default/files/2020 04/Available_Flood_Hazard_Information_Policy_104-008-2.pdf-
- Guidance for Flood Risk Analysis and Mapping: Floodway Analysis and Mapping (reference slides 18-21) https://www.fema.gov/sites/default/files/documents/fema_floodway-analysis-and-mapping.pdf

Washington County Map Modernization
DFIRM and FIS Update Project

HYDRAULICS ANALYSIS REPORT

Prepared for:

State of Utah Division of Emergency Services and FEMA Region VIII

Prepared by:

Bowen Collins & Associates, Inc.
756 East 12200 South
Draper, Utah 84020

In association with

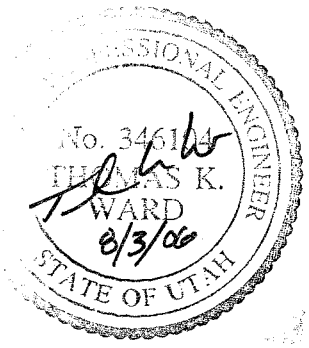
August 2006

Washington County Map Modernization
DFIRM and FIS Update Project

HYDRAULIC ANALYSES REPORT

Prepared for:

State of Utah Division of Emergency Services
and FEMA Region VIII



Prepared by:

Bowen, Collins & Associates, Inc.
in association with
AMEC Earth & Environmental, Inc.

August 2006

STANDARD ACRONYMS/ABBREVIATIONS

BC&A	Bowen, Collins & Associates
BFE	Base Flood Elevations
CTP	Cooperating Technical Partner
D	Detailed Flood Study
DEMs	Digital Elevation Models
DES	Division of Emergency Services (a.k.a. Office of Emergency Services)
DFIRM	Digital Flood Insurance Rate Map
FEMA	Federal Emergency Management Agency
FIRMs	Flood Insurance Rate Maps
FIS	Flood Insurance Study
G&S	*Guidelines & Specifications for Cooperating Technical Partners, May 2005*
HMTAP	Hazard Mitigation Technical Assistance Project
LD	Limited Detail Flood Study
LIDAR	Light Detection and Ranging
MAS	Mapping Activity Statement
NAIP	National Agricultural Imagery Program
NAVD 88	North American Vertical Datum of 1988
NGVD 29	National Geodetic Vertical Datum of 1929
OES	Office of Emergency Services (State of Utah)
TDSN	Technical Data Support Notebook
TIN	Triangular Irregular Network

Washington County DFIRM
Hydraulics and Floodplain Development Report

TABLE OF CONTENTS

Section **Page No.**

STANDARD ACRONYMS / ABBREVIATIONS **A1**

1.0 INTRODUCTION **1**
1.1. General Description 1
1.2. Purpose of Study 3

2.0 HYDRAULIC ANALYSES **4**
2.1 Overview 4
2.2 Data Development 4
2.2.1. Basic Information 4
2.2.2. Boundary Conditions and Backwater Effects 4
2.2.3. Topographic Data 4
2.2.4. Flood Discharge Data 5
2.2.5. Manning's "n" Values and Expansion/Contraction Coefficients 5
2.2.6. Stream Layout and Cross-section Locations 6
2.2.7. Cross-section Geometry 7
2.2.8. Bridges and Culverts 7
2.2.9. Floodways 7
2.2.10. Blocked Obstructions and Ineffective Flow Areas 7
2.2.11. Sediment Transport and Transient Channel Conditions 7
2.2.12. Channel Modifications Post-Model Development 7
2.2.13. Model Calibration 8
2.2.14. Special Conditions and Notes to Reviewer 8
2.3 General Hydraulic Modeling Results 9
2.3.1. Floodways 9
2.3.2. Floodplains 9
2.3.3. Profiles 10
2.3.4. Base Flood Elevations 10
2.3.5. Internal QA/QC 10
2.4 Hydraulic Model Development and Floodplain Delineation 11
2.4.1 Ash Creek, Toquerville 11
2.4.2. Cottonwood Wash, Enterprise 12
2.4.3. Cottonwood Wash, Washington City 14
2.4.3.1. Cottonwood Wash Tributary, Washington City 16
2.4.4. Coyote Gulch, Ivins City 18
2.4.5. Fort Pierce Wash, St. George City 20
2.4.6. Gould Wash, Hurricane City 21
2.4.7. Grapevine Pass Wash, Washington City 24
2.4.8. Kayenta Wash, Ivins City 26

Table of Contents
(continued)

Section **Page No.**

2.4.9. Lava Flow Wash, Ivins, and Santa Clara 27
2.4.10. LaVerkin Creek, LaVerkin City 29
2.4.11. Middleton Wash, St. George City 30
2.4.12 Mill Creek, Washington City 32
2.4.13. North Fork Virgin River, Springdale City 33
2.4.14. Rimrock Wash, St. George City 35
2.4.15. Sand Hollow Wash, St. George City 35
2.4.16. Santa Clara River, Santa Clara City, and St. George 37
2.4.17. Shoal Creek, Enterprise City 38
2.4.18. Spring Creek, Enterprise City 40
2.4.19. Tuacahn Wash, Ivins, Santa Clara City, and St. George 43
2.4.20. Virgin River, St. George, and Washington City 44

LIST OF TABLES

Table No. **Title** **Page No.**

1 Detailed Study Flood Sources 2
2 Manning's "n" Channel Roughness Coefficients 6

LIST OF FIGURES

Figure No. **Title** **Following Page No.**

1 Flooding Sources Studied 5
2 Recommended 100-year Discharge Values for Washington County 5
3 Recommended 100-year Discharge Values for St. George and Surrounding Area 5
4 Cross-section Locations for Calculations 24

APPENDICES – HYDRAULIC MODEL AND FLOODPLAIN DEVELOPMENT DATA

- FEMA QA/QC CHECKLIST
- DIGITAL FILES (HEC-RAS, CHECK RAS)
- HEC-RAS INPUT, OUTPUT, AND PROFILES
- CHECK RAS INPUT/OUTPUT
- FLOODPLAIN WORKMAPS

1.0 INTRODUCTION

1.1 General Description

This report summarizes the data, methodology, and results of the hydraulic analyses and associated floodplain map generation activities required for the Washington County, Utah Map Modernization project. This document has been prepared in accordance with the Technical Data Support Notebook (TSDN) format under Federal Emergency Management Agency's (FEMA) *Guidelines & Specifications for Cooperating Technical Partners*, May 2005 (G&S).

This work was authorized in accordance with the Cooperating Technical Partner (CTP) Partnership Agreement and Mapping Activity Statement (MAS) No. 1, dated December 1, 2004, between Utah State Department of Public Safety Division of Emergency Services (DES) and the FEMA. The Utah DES contracted with Bowen, Collins & Associates, Inc. (BC&A) in collaboration with AMEC Earth & Environmental, Inc. to produce the Digital Flood Insurance Rate Map (DFIRM) and Flood Insurance Study (FIS) report products described in the MAS.

The work described herein was performed in accordance with Activity 8, *Hydraulic Analyses*, and Activity 10, *Floodplain Mapping* of the MAS for submittal and review in accordance with MAS *Independent QA/QC Review* Activities 9 and 11.

This report is organized with a general description of the data, methodology, and results in Sections 1 through 2.3. Section 2.4, *Individual Flood Source Hydraulic Model and Floodplain Development*, provides narrative details of special conditions and concerns regarding the hydraulic model development and analyses for each individual flood source.

Hydraulic analyses were performed on 23.2 miles of flooding sources using detailed study methods and 59.7 miles of flooding sources using limited-detailed study methods (100-year flood only) as identified in the MAS and subsequent amendments approved by the DES and FEMA. Table 1 provides a list of all Washington County flood sources studied utilizing detailed methods. Approximate flood study reaches are documented separately in the TSDN.

Hydraulic modeling of the detailed flooding sources included the 10-, 2-, 1-, and 0.2-percent-annual-chance (10-, 50-, 100-, and 500-year recurrence interval) events utilizing peak discharges developed under Activity 6. Floodway development was included for both detailed and limited detailed study streams (61.3 miles). Modeling of the limited detailed flooding sources included only the 1-percent-annual-chance event.

A federally-declared flood disaster occurred on the Santa Clara River, Virgin River, and Shoal Creek in January 2005. This resulted in several impacts and issues which were considered during the course of the project. The flood event highlighted the dynamic nature of these streams that experienced lateral migration and stream geomorphic changes during the event. Considerable maintenance, restoration and mitigation projects have been ongoing since the event. These issues, and how they were addressed during the hydraulic model and floodplain development phases of the project, are described in the respective flood source narratives in Section 2.4.

Table 1
Detailed Study Flood Sources

FLOODING SOURCE	COMMUNITY	STUDY TYPE	REACH LIMITS	STUDY LENGTH (MILES)
Ash Creek	Toquerville	LD	From Virgin River confluence upstream 1.3 miles.	1.3
Ash Creek	Toquerville	LD	From a point 2.9 miles upstream of Virgin River confluence upstream 1.5 miles.	1.5
Atkinville Wash	St. George	LD[1]	From its confluence with the Virgin River to the Utah State line.	3.9
Cottonwood Wash	Enterprise	LD	From Confluence with Shoal Creek to a point just upstream of Highway 18 bridge	0.8
Cottonwood Wash	Washington City	LD	From confluence with Grapevine Pass Wash to SR9.	3.8
Cottonwood Wash Tributary	Washington City	LD	From confluence with Cottonwood Wash to SR9.	1.5
Coyote Gulch (previously unnamed)	Ivins	LD	From foothill to confluence with Santa Clara River.	3
Fort Pierce Wash	St. George	D[1]	From confluence with Virgin River to River Road Bridge.	3.4
Fort Pierce Wash	St. George	LD	From River Road Bridge to Utah State line.	7.6
Gould Wash	Hurricane	LD	From downstream of 600 North to the Hurricane Canal crossing (100 East).	3.1
Grapevine Pass Wash	Washington City	LD	From confluence with Virgin River to a point about 0.3 miles north of I-15.	2.8
Halfway Wash	St. George	LD[1]	From a point 0.2 miles downstream of confluence with Buckskin Hollow Wash downstream to the confluence with Sand Hollow.	3.1
Kayenta Wash	Ivins	LD	From canyon mouth to confluence with Santa Clara River, 3.8 miles.	3.8
Lava Flow Wash	Santa Clara	LD	From confluence with Tuacahn Wash upstream to Santa Clara City west boundary	1.2
LaVerkin Creek	La Verkin, Toquerville	LD	From confluence of Virgin River upstream 3.2 miles	3.2
Lizard Wash	St. George	LD[1]	From its confluence with Atkinville Wash to the Utah State line	1.7
Middleton Wash	St. George	LD	From confluence with Virgin River upstream to a point about 2 miles upstream of I-15	4.2
Mill Creek	Washington City	LD	From confluence with Virgin River to a point including 2 forks of Mill Creek approximately 1.5 miles north of I-15	3.9
Mokaac Wash	St. George	LD[1]	From its confluence with Atkinville Wash to the Utah State line	1.3

Table 1
Detailed Study Flood Sources
(continued)

FLOODING SOURCE	COMMUNITY	STUDY TYPE	REACH LIMITS	STUDY LENGTH (MILES)
North Fork Virgin River	Springdale	LD	From Virgin River confluence upstream 3.8 miles	3.8
Rimrock Wash	St. George	LD	Upstream from I-15 approximately 1 mile	1
Sand Hollow Wash	St. George	LD	From a point located 3 miles upstream of the Santa Clara Road Crossing to the Confluence with the Santa Clara River	3.8
Santa Clara River	Santa Clara, St. George	D	From a point 0.7 miles upstream of bend in Santa Clara Road to the Confluence with the Virgin River	8
Shoal Creek	Enterprise	LD	From a point 100 feet upstream of Cottonwood Wash Confluence to Spring Creek Confluence	1
Spring Creek	Enterprise	LD	From Confluence with Shoal Creek upstream 1 mile.	1
Tuacahn Wash	Ivins	LD	From canyon mouth to confluence with western most unnamed wash	3.7
Tuacahn Wash	Santa Clara	LD	From the confluence with the western most unnamed wash near Ivins to the Santa Clara Reservoir	2.9
Virgin River	St. George	D/LD	From a point located 0.6 miles downstream of Atkinville Wash upstream 18.3 miles to a point 1.4 miles downstream of Highway 9 crossing	18.3
			DETAILED STUDY SUBTOTAL	**23.2**
			LIMITED DETAIL STUDY SUBTOTAL (100-year or 1% chance only)	**64**
			APPROXIMATE STUDY SUBTOTAL	**200.4**
			DIGITIZE SUBTOTAL [(1)]	**17.7**
			TOTAL STUDY	**305.3**

LD – Limited Detail Flood Study (100-year floodplain and floodway only)
D – Detailed Flood Study
[(1)] Existing Effective Study digitized per scoping document.

1.2 Purpose of Study

The primary purpose of the hydraulic analyses is to establish floodplain boundaries, elevations and regulatory floodways for the identified flooding sources in Washington County, Utah. It should be noted that many other streams in the county may pose some level of flood hazard. The scope of this report is limited to flood sources which were either defined on existing Flood Insurance Rate Maps (FIRMs), supplemented by additional areas that are currently experiencing development pressure as identified by the Cities and County in conjunction with DES and FEMA during the project scoping phase.

The final objective and deliverables of this Map Modernization Project is to develop a DFIRM and FIS report for Washington County, Utah, and Incorporated Areas. The DFIRM and FIS report is to be produced in the FEMA Countywide Format.

2.0 HYDRAULIC ANALYSES

2.1 Overview

The hydraulic models and floodplain maps for the Project were developed utilizing topographic and survey data provided, for the most part, by local communities and their respective contractors. The U.S. Army Corps of Engineers' HEC-RAS version 3.1.3 computer program was used to perform the hydraulic modeling for all streams studied using detailed methods. The HEC-GeoRAS extension within ArcGIS version 9.0 and 9.1 was utilized to create a HEC-RAS geometry file and to map the floodplain once the hydraulic modeling was completed. Computer model results for each flood source were critically reviewed for accuracy and reasonableness, and manually "smoothed" to represent the projected extents of the respective flood zone.

There are a few exceptions where manual methods rather than HEC-RAS were used to estimate the limits of overland shallow sheet flow. These exceptions are noted in the individual flooding source section of this report.

2.2 Data Development

The following sections outline the general methodology and approach used in developing data needed to complete the hydraulic modeling and floodplain mapping tasks for this project. Any exceptions to this approach are described in the individual flooding source section of this report.

2.2.1 Basic Information. Data acquisition and hydraulic model development tasks were completed by BC&A and AMEC in accordance with FEMA G&S. Data or model development issues or anomalies were discussed as appropriate with the NSP to verify G&S requirements and specification compliance.

2.2.2 Boundary Conditions and Backwater Effects. The normal depth option was used to set the downstream water surface boundary condition in the hydraulic models. Slopes for the normal depth calculation were estimated from the lower reaches of the studied streams. Concurrence of floodplain boundaries at confluences with other studied streams was established at the point where the downstream base flood elevation matched the water surface of the upstream flood source.

2.2.3 Topographic Data. In general, a combination of channel cross section and aerial survey data were used to develop the channel geometry needed for the hydraulic models. The ground survey data were limited to channel cross sections and structures impacting flooding sources in Detailed and Limited Detailed study reaches. Where available, this data was used to define the channel cross-section geometry.

The aerial mapping was used to define the overbank cross-section geometry and, in some cases, the channel cross-section geometry. Three types of aerial survey data were obtained for this study: Light Detection and Ranging (LIDAR) mass point files; two-foot contour data; and USGS 10-meter Digital Elevation Models (DEMs). The LIDAR data developed from the May 17, 2005 aerial mapping flight was utilized wherever possible to define the stream geometry. Local communities provided two-foot contour data for Detailed or Limited Detailed study areas where the LIDAR coverage was insufficient. In addition, the USGS 10-meter DEMs were used in approximate study areas where neither LIDAR mass point files nor two-foot contour data were available.

Below is a list of the two-foot contour mapping data used in this study. This map data was approved by FEMA for use on the study and represents the best available map information at the time of the study. The aerial extent of the topographic data utilized for the Detailed and Limited Detail scope of work is presented in Figure 1.

- Enterprise (flown October 6, 1998)
- Hurricane (flown October 6, 2005)
- Ivins (flown January 22, 2006)
- Santa Clara City (flown January 6, 2006)
- Springdale (flown November 16, 2005)
- St George (updated 1999; 2-foot contours interpolated from 5-foot contour map data)
- Washington City (flown March 7, 2004)

2.2.4 Flood Discharge Data. A Hydrology report has been separately published to summarize the 100-year discharge values for all the studied streams in Washington County, Utah. Flow discharge values and flow change locations from this report were incorporated into the hydraulic models. Figures 2 and 3, copied from the Hydrology Report, show the respective 100-year flood discharge values and flow change locations used in the hydraulic analyses.

2.2.5 Manning's "n" Values and Expansion/Contraction Coefficients. Values for channel overbank roughness coefficients, or Manning's "n" values, were estimated based on field observations and aerial photography. In some locations multiple Manning's "n" values were selected for a single cross section in order to more accurately simulate varying conditions. In addition, modifications to the Manning's "n" values were made in some locations to account for channel roughness variations between cross sections. In some areas the Manning's "n" values were increased in an effort to raise the computed water surface depth such that it would be deeper than critical depth, or in a subcriticial flow regime. Table 2 provides the range of Manning's "n" values used in model development for each flood source studied. Specific values are included in the model input/output files and discussed as appropriate in the respective narrative for each stream study reach.

N

0 12,500 25,000
Feet

Legend

Study Method
- Approximate
- Detailed
- Limited Detail
- Digitized

Topography Utilized
- Springdale
- Hurricane
- Washington City
- St George
- Santa Clara
- Enterprise
- Ivins
- LIDAR

Figure 1
Flooding Sources Studied

Washington County FIS, Hydraulic Report

State of Utah

Bowen Collins & Associates, Inc. Consulting Engineers

Printing Date: June 5, 2006
File: T:\Washington_Utah_FIS\Hydraulics\Report\GIS\Figure1.mxd

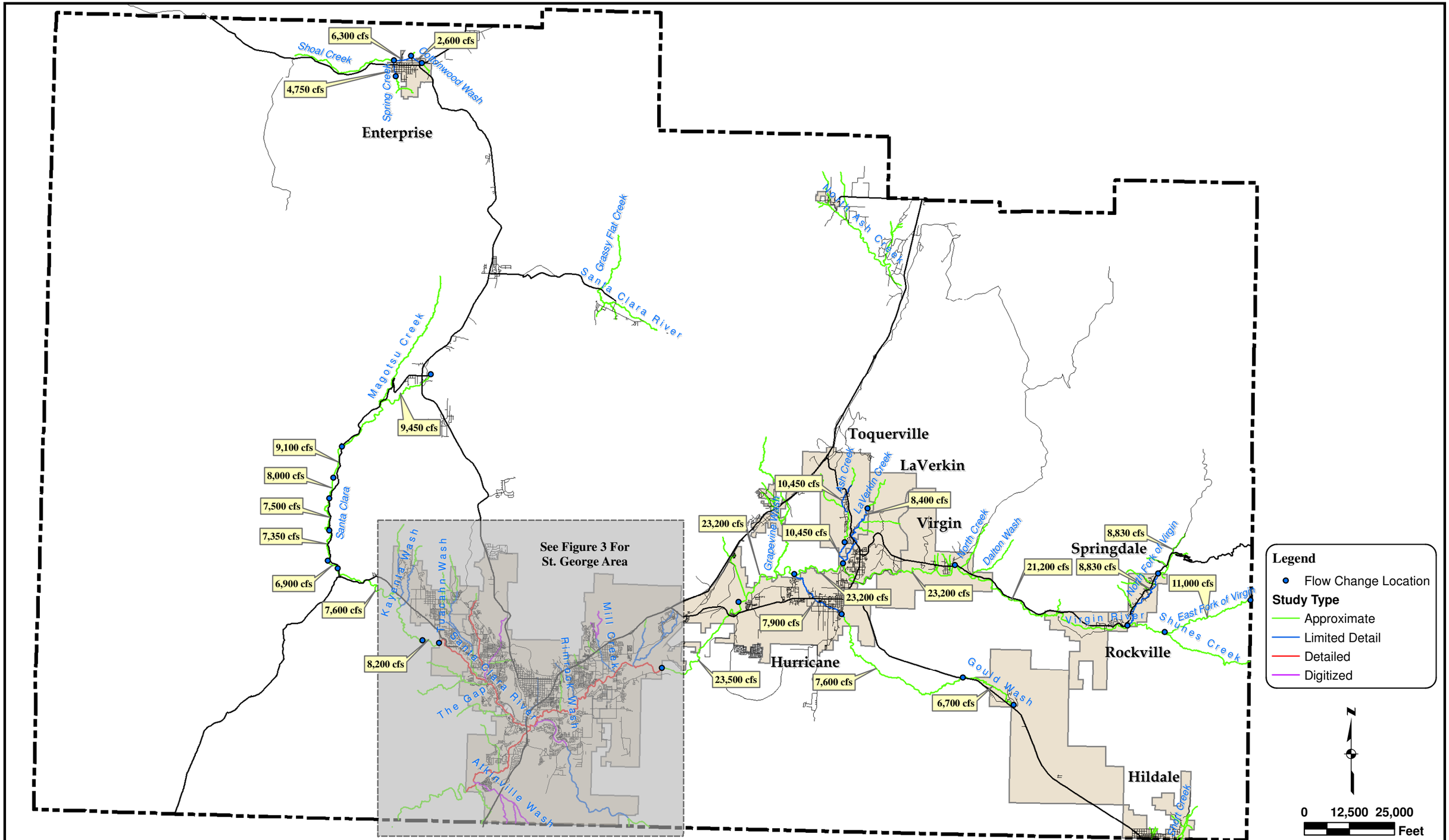


Figure 2
Recommended 100-year Discharge Values For Washington County
Washington County FIS Hydrology Report
State of Utah

amec

Bowen Collins & Associates, Inc. Consulting Engineers

Printing Date: June 14, 2006
File: T:\Washington_Utah_FIS\Hydrology\Report\GIS\Q_Fig_Overall.mxd

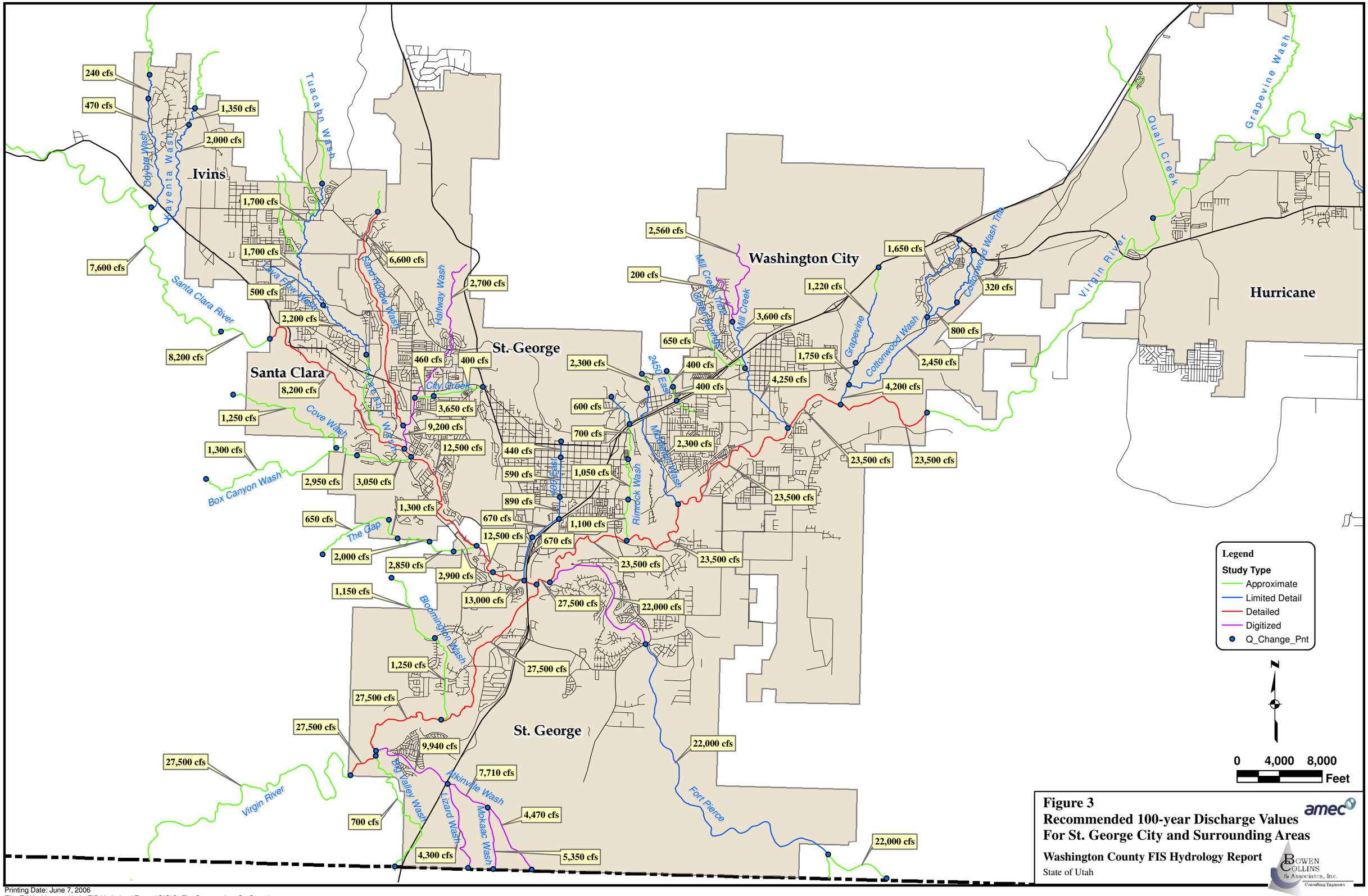


Figure 3
Recommended 100-year Discharge Values For St. George City and Surrounding Areas

Washington County FIS Hydrology Report
State of Utah

amec

Bowen Collins & Associates, Inc. Consulting Engineers

Printing Date: June 7, 2006
File: T:\Washington_Utah_FIS\Hydrology\Report\GIS\Q_Fig_Surrounging_St_G.mxd

Table 2
Manning's n Channel Roughness Coefficients

		MANNING'S N ROUGHNESS COEFFICIENT		
FLOOD SOURCE	**COMMUNITY**	**CHANNEL**	**FLOODPLAIN**	**OVERBANK**
Ash Creek	Toquerville	0.04 - 0.05	0.06 - 0.08	0.05
Cottonwood Wash	Enterprise	0.07	0.07	0.075*(erosion berms)
Cottonwood Wash	Washington City	0.04 - 0.05	0.04 - 0.05	0.055
Cottonwood Wash Trib.	Washington City	0.04	0.04	0.055
Coyote Gulch (previously unnamed)	Ivins	0.04 - 0.06	0.04 - 0.06	0.055
Fort Pierce Wash	St. George	0.035 - 0.05	0.05 - 0.08	0.05 - 0.08
Gould Wash	Hurricane	0.040 - 0.052	0.055 - 0.070	0.055 - 0.070
Grapevine Pass Wash	Washington City	0.05 - 0.07	0.05 - 0.07	0.055
Kayenta Wash	Ivins	0.045 - 0.07	0.045 - 0.07	0.055
Lava Flow Wash	Santa Clara	0.035 - 0.045	0.035 - 0.13	0.05
LaVerkin Creek	La Verkin, Toquerville	0.045 - 0.055	0.06 - 0.085	0.05
Middleton Wash	St. George	0.035 - 0.06	0.05 - 0.17	0.04 - 0.15
Mill Creek	Washington City	0.045 - 0.08	0.045 - 0.08	0.055
North Fork Virgin River	Springdale	0.045 - 0.06	0.055 - 0.07	0.05
Rimrock Wash	St. George	0.045 - 0.055	0.045 - 0.055	0.045 - 0.055
Sand Hollow Wash	St. George	0.02 - 0.048	0.055 - 0.17	0.055
Santa Clara River	Santa Clara, St. George	0.04	0.05 - 0.09	0.06 - 0.075* (erosion berms)
Shoal Creek	Enterprise	0.033	0.050	0.075*(erosion berms)
Spring Creek	Enterprise	0.035	0.055	0.075*(erosion berms)
Tuacahn Wash	Ivins	0.035 - 0.04	0.05 - 0.13	0.05 - 0.55
Tuacahn Wash	Santa Clara	0.035 - 0.04	0.05 - 0.13	0.05 - 0.55
Virgin River	St. George	0.035 - 0.035	0.07 - 2.17	0.05 - 0.55

* The NRCS constructed several flood erosion control structures, or "erosion berms" along several flood sources following the January 2005 national flood disaster. These were constructed as porous structures primarily built with large diameter rip-rap designed to contain the floodway, but not the floodplain, under high flow conditions.

The expansion and contraction coefficients for all cross sections are 0.1 and 0.3, respectively, except at the cross sections that are immediately upstream or downstream of a bridge or hydraulic structure, in which case they are 0.3 and 0.5, respectively.

2.2.6 Stream Layout and Cross-section Locations. Stream centerline locations were digitized within ArcGIS using the 2004 National Agriculture Imagery Program (NAIP) orthophotographic base maps and the digital terrain models for each stream. Cross sections were located to provide, in general, seven cross-sections per mile for detail study reaches and four cross-sections per mile for limited detail study reaches. These cross sections coincide with field survey data, where available.

2.2.7 Cross-section Geometry. The HEC-GeoRAS computer program was utilized to create a HEC-RAS geometry file based on digital terrain models. The digital terrain models were created from the LIDAR mass point files and/or two-foot contour mapping. Modifications were made to the cross sections in HEC-RAS to reflect the ground survey points, where available.

2.2.8 Bridges and Culverts. A field survey of each hydraulic structure in the detailed and limited detailed study reaches was completed, including a channel cross-section survey upstream and downstream of each structure. Four digital photographs were taken of each structure in accordance with the G&S. These photos are included in the TSDN.

2.2.9 Floodways. Floodways were developed for all detailed studied streams. The floodway is defined as the channel of a stream, plus any adjacent flood plain areas that must be kept free of encroachment so that the 100-year flood may be conveyed without increasing the base flood (100-year flood) elevation more than 1.0 foot. BC&A modeled the floodway on the basis of equal-conveyance reduction from each side of the flood plain. Surcharge values are between zero and the maximum allowable value of 1.0 feet. Due to steep slopes and associated high velocity of the studied flood sources, encroachment stations have been computed so that the allowable rise in water-surface elevation may match the target water surface without exceeding a target maximum energy grade line increase of 1.0 foot. Floodway widths were determined at each cross section. Between cross sections, the boundaries were interpolated.

2.2.10 Blocked Obstructions and Ineffective Flow Areas. The block obstruction and ineffective flow area options were used in HEC-RAS in cross sections immediately upstream and downstream of hydraulic structures in accordance with recommended modeling guidelines. In addition, the blocked obstruction option was used where the model cross section crossed a topographical low point that was below the computed water surface level, but was not hydraulically connected to the channel.

2.2.11 Sediment Transport and Transient Channel Conditions. Stream channels in this region are generally comprised of highly mobile sands, which can result in significant erosion and deposition during flood events. This situation is compounded by fast growing vegetation within the channels and floodplains in the project area, which restrict conveyance capacity and provide a potential source of debris during flood events. Several flood sources in the project area are subject to regular maintenance by the local community jurisdiction to remove sediment and debris after large streamflow events and to manage the aggressive regrowth of invasive trees and shrubs within the floodway channel. All of the above issues were considered in development of the hydraulic models. In general, channel reaches historically choked with thick vegetation were modeled with appropriate manning roughness coefficients in anticipation of future regrowth. This was based upon engineering judgment as well as consultation and direction from local communities who understand this provides contingency well within the range of possible channel conditions.

2.2.12 Channel Modifications Post-Model Development. Channel mitigation and maintenance activities have been ongoing since the January 2005 flood events, particularly along reaches of the Santa Clara and Virgin Rivers. Channel dredging and construction of erosion

control barriers (rock berms) were completed by the NRCS after the May 17, 2005 LIDAR flight which was used to develop topographic mapping for the hydraulic model and floodplain mapping. Based on coordination and discussion with the NRCS, local communities, FEMA and the State of Utah, the NRCS erosion control barriers were hydraulically modeled as uncertified levees. As such, base flood elevations for reaches with these berms were estimated through hydraulic analysis under two criteria in accordance with FEMA G&S. First, the Base Flood Elevations (BFE) were estimated by modeling the channel as if all the water were contained by the berms. Then the BFE's outside the berms were estimated assuming the berms were ineffective, allowing water to freely flow outside the berms.

2.2.13 Model Calibration. The availability of recent flood flow data coupled with aerial photography from the January 2005 flood event created the opportunity to calibrate the Virgin River model. Due to stakeholder concern over the model accuracy and respective floodplain management impacts, the HEC-RAS model for the Virgin River was calibrated to the discharges published by the USGS for the January 2005 flood event. The computed floodplains using the established flood flows were compared to aerial photography taken January 13, 2005, during the later stages of the flood. Additional details of the calibration effort are provided in the Virgin River narrative in Section 2.4.

2.2.14 Special Conditions and Notes to Reviewer. Below are a few of the unique items that were considered during map development and internal QA/QC review. These issues and respective approaches were established in coordination with local stakeholders, FEMA, the State of Utah and the NSP. These unique circumstances are documented for future reference.

- Bathymetry – Both the Virgin and Santa Clara river models and floodplain mapping utilize the May 17, 2005 LIDAR data. Appropriate corrections to the models were made to account for the bathymetric surface below the water level reflected on the LIDAR aerial mapping. These are discussed in the respective flood source narratives in Section 2.4.

- NRCS and local flood project developments – channel mitigation and maintenance activities have been ongoing since the January 2005 floods. Dredging and construction of erosion control barriers (porous berms) were completed following the May 17, 2005 LIDAR flight used for development of hydraulic models and floodplain mapping. This methodology was discussed and approved in the coordination meeting, but will require special attention to identify and manage any effects of the projects upon the final DFIRMs and to Floodplain management community.

Top Widths. The floodplain and floodway were mapped based on the intersection of the computed water surface elevation from HEC-RAS with the existing topography. To verify that the flood boundaries were mapped correctly, the HEC-RAS computed floodplain and floodway top widths were compared to the mapped top widths. Some special cases exist where the mapped floodplain and floodway top widths do not match the computed top widths. Below is a description of these special cases.

- **Backwater Computation Exceptions** – HEC-RAS uses a backwater computation method (moving upstream) to compute a water surface profile for subcritical flow conditions, yet flooding occurs in a downstream direction. This can lead to unrealistic results. For example, if there is insufficient capacity in the channel at a given cross section HEC-RAS will compute flooding in the overbanks. If the channel capacity is sufficient at the next downstream cross section, HEC-RAS will compute the flow as being contained in the channel. However, it is unlikely that the actual flooding would make such an abrupt transition. Therefore, at some locations engineering judgment was used to override the HEC-RAS computations and the floodplain was mapped wider than the HEC-RAS computed width.

- **Islands** – The computed top width is based on the width of the computed water surface in the model cross sections. This measurement excludes land features that are located within the area of inundation that extend above the computed water surface. For example, these "islands" occur where there is flooding on both sides of an uncertified levee and where small topographic rises occur in areas of shallow flooding. In these areas, the islands were ignored and the floodplain/floodway was mapped as a continuous surface. The width of the "islands" should be added to the HEC-RAS computed top width to match the mapped floodplain.

- **Ineffective Flow Areas** – The HEC-RAS top width includes water contained in ineffective flow areas. These ineffective flow areas were not mapped and should be subtracted from the HEC-RAS results to match the mapped floodplain.

2.3 General Hydraulic Modeling Results

The results of the HEC-RAS steady flow modeling are discussed in the following sections, with detailed results information provided in the flood source narratives in Section 2.4 and the appendices.

2.3.1 Floodways. Floodways were developed for the detailed and limited detail study reaches scoped for revision and update for the project. Details of the resultant floodways are discussed in the respective stream study narratives in Section 2.4.

2.3.2 Floodplains. After the hydraulic models were developed, the final HEC-RAS water surface profiles were imported into ArcView using HEC-GeoRAS. Based on the water surface profile elevations at each section, a Triangular Irregular Network (TIN) of the water surface was created. The water surface TIN is based upon an interpolation of calculated flood levels at each cross section in the hydraulic model. This water surface TIN was overlaid on the ground digital terrain model to compute and delineate a raster floodplain based upon finite flood depth calculations. The raster floodplain was converted to vector data and "smoothed" to remove the jagged appearance resulting from the finite raster image. Manual modifications were then made to the floodplain based on engineering judgment. Isolated areas of flooding were refined and shallow flooding areas were added where appropriate.

2.3.3 Profiles. HEC-RAS flood profiles are included in Appendix A. The studies for limited detail studied streams modeled only the 1 percent annual chance profile while the detailed streams also include the 10 percent, 2 percent, and 0.2 percent annual chance flood profiles and floodways. Final FIS and DFIRM profiles will be provided with the TSDN submittal, after the Hydraulics Report is approved.

2.3.4 Base Flood Elevations. The BFEs will be shown on DFIRM panels based on the water surface TIN created within ArcGIS. Final BFE locations will be created after the Hydraulic Report is approved.

2.3.5 Internal QA/QC. Consistent with the MAS intent and requirements, BC&A and AMEC firm policies include internal QA/QC review for technical and regulatory adequacy, completeness of required information, and supporting data and documentation to ensure that the submitted work product meets FEMA G&S. This review is conducted by an engineer or technical specialist with appropriate experience and expertise, who was not involved with the work production in order to provide a "fresh" set of eyes and perspective on the work. Below is a partial list of internal Hydraulic Analysis QA/QC review activities completed for each flood source. Additional QA/QC activities and/or issues specific to a certain flood source are addressed in the "Results" section for that flood source.

- Review cross-section geometry for proper spacing, location and orientation on the work map and agreement with the hydraulic model;
- Review the regulatory floodway widths shown on the work maps for agreement with the results of the hydraulic model and data to be used for the Floodway Data Table;
- Review the floodplain boundaries shown on the work maps or agreement with the flood elevations shown in the Floodway Data Table and the contour lines and other topographic information shown on the work maps;
- Review the floodplain widths at cross sections as shown on the work maps to ensure they match the Floodway Data Table;
- Review the floodplain boundaries as shown on the work maps to ensure they match the Flood Profiles;
- Review the flood insurance risk zones as shown on the work maps to ensure they are labeled properly;
- Manning's "n" values and expansion/contraction coefficients;
- Bridge and culvert modeling;
- Flood discharges and hydrologic profiles;
- Regulatory floodway computation methods; and

- Tie-ins to upstream and downstream non-revised Flood Profiles.

A QA/QC checklist provided by FEMA Region VIII was referenced and used by BC&A and AMEC as part of the internal quality control process. In addition to the checklist items, the results of the hydraulic models were reviewed and checked using FEMA's CHECK-RAS software. CHECK-RAS reports were reviewed and modifications to the HEC-RAS models were made where appropriate. Where changes to the HEC-RAS model were not appropriate, a note of explanation has been added to the CHECK-RAS reports. The results of the CHECK-RAS program runs are located with the digital files in Appendix B.

2.4 Hydraulic Model Development and Floodplain Delineation

The sections below provide narrative descriptions of the individual flood source hydraulic model development and floodplain delineation activities. Unless noted otherwise, the specific flood source complies with the general data sources and methodology presented in Section 2.3.

As discussed previously, this report has been prepared in a partial format where individual flood source data is to be summarized and submitted in three packages to facilitate workload and schedule considerations for the contract provider, CTP and NSP reviewer. The flood source subsections are organized alphabetically for all project detailed and limited detail study flood sources in accordance with the TSDN format. Flood sources with no narrative in the current report submittal will be completed and addressed in future submittals. The final version of this report will include all flood sources, and will be submitted and incorporated into the TSDN for project documentation.

2.4.1 Ash Creek, Toquerville.

Basic Information. Ash Creek is a perennial stream located in Toquerville, Utah. The Ash Creek drainage area has a mean basin elevation of 5,990 feet above sea level (NAVD 88). The total drainage area north and upstream of the confluence with the Virgin River is 216.1 square miles. The study limits extend from the confluence with the Virgin River and La Verkin Creek upstream 5 miles to a point above the State Highway existing development.

Topographic Data. The LIDAR data was used to develop the hydraulic model and map the floodplain for the entire reach of Ash Creek. Two-foot contours shown on the workmap were generated from the LIDAR mapping in ArcGIS.

Five hydraulic structures were field surveyed using a surveyor's level and referencing temporary bench marks established on the project control datum. There were no surveyed cross sections on Ash Creek.

Manning's "n" Values. Manning's n values are included in Table 2. Below are representative photographs of the studied reaches of Ash Creek.



Ash Creek – View Upstream of Private Bridge



Ash Creek – View Downstream of Center Street

Special Conditions and Notes to Reviewer. Several unique hydraulic modeling and floodplain mapping issues for this flood source are described below for reference.

- Due to the undersized bridge opening on the Old Church Bridge, backwater effects result in 7,450 cfs flowing around the bridge on the west side of the bridge. The capacity of the Old Church Bridge was calculated to be approximately 3,000 cfs. The remainder of the flow will flow to the West around the bridge.

- A split flow analysis was performed from the cross sections 22066 to 20969. Flow rates discussed above were used in calculations of the floodplain.

- A floodway calculation was performed for both the main channel and the area to the west of the Old Church Bridge where the majority of the water will flow.

- Critical depth is computed at the cross sections just downstream each of the five structures.

- The top width at cross section 8501 differs from the model to the workmap due to a point of higher elevations in the channel. This area was inundated to show the overall area of the floodplain.

Flooding. The majority of Ash Creek is contained in the natural channel. The only significant area of flooding would be the area around the Old Church Street Bridge where the undersized bridge has caused water to flow onto the floodplain as noted.

2.4.2 Cottonwood Wash, Enterprise.

Basic Information. Cottonwood Wash is an ephemeral stream located in Enterprise, Utah. The Cottonwood Wash drainage area is 5.9 square miles and has a mean basin elevation of 6,073 feet above sea level (NAVD 88). The stream flows in a northerly direction and is a tributary to Shoal Creek, which is also being studied as part of this project.

This flooding source was studied using limited detailed study methods (100-year flood only) from the Cottonwood Wash confluence with Shoal Creek upstream to Main Street.

Topographic Data. Two-foot contours provided by Enterprise City were used to create the ground digital terrain model. In addition, eight channel cross sections were field-surveyed. Survey control points (temporary benchmarks) were also established at each of the five hydraulic structures (four culverts and one drop-structure) in the study reach. The survey control was used to survey the channel geometry and culvert features needed to develop the hydraulic model.

Manning's "n" Values. The Manning's "n" roughness coefficients used for the channel and overbanks is 0.070 based on an excavated or dredged channel with a clean bottom and uncut brush on the sides (Chow, 1959). A slightly higher value of 0.075 was used where the NRCS installed erosion barriers. Manning's "n" values for all flood sources are summarized in Table 2. Below are representative photographs of the studied reach.



Cottonwood Wash Looking Downstream at Drop-structure (600 East)



Cottonwood Wash Looking Downstream from Brown Avenue

Special Conditions and Notes to Reviewer. The channel capacity for the Cottonwood Wash study reach is significantly less than the 100-year discharge. Earthen berms and riprap erosion barriers line the river banks through most of the study reach. Since these features were not constructed to meet FEMA levee criteria, they were treated as uncertified levees. The channel and the floodplain were analyzed in two separate analyses in accordance with FEMA criteria for modeling uncertified levees.

With Levee Scenario. In the "with levee scenario" the base-flood elevations in the main channel were established by estimating the bank-full capacity of the channel. It was assumed

that since the channel does not have capacity to convey the base flood, water will overtop the channel banks and flow onto the overbanks. In an effort to conservatively estimate the depth of water overtopping the banks, the levee option was used in the HEC-RAS model. In general, artificial one-foot-high levees were established in the model at the top of the channel banks and utilized to estimate the bank-full capacity and the channel base flood elevations. This was done because the typical riverine confined floodplain does not exist adjacent to Cottonwood Wash. Water that overtops the channel banks will flow away from the main channel. The one-foot limit was utilized because it is believed that it is unlikely that the depth of water overtopping the banks in a linear fashion would be more than one-foot deep.

It should be noted that in estimating the bank-full capacity no additional reductions were made based on the inadequate capacities of the hydraulic structures.

Three different discharge values were used in modeling this flooding source as described below:

- Upstream of Main Street: 2,600 cfs (100-year discharge documented in the hydrology report)
- From Main Street to 100 North Street: 1,100 cfs (estimated bank-full capacity)
- From 100 North Street to Cottonwood Confluence with Shoal Creek: 600 cfs (estimated bank-full capacity).

Without Levee Scenario. The "without levee" scenario was run to estimate the base-flood elevations in the overbanks. Main Street is raised above the surrounding ground where it crosses over Cottonwood Wash and significantly impacts the overbank flow in this area. Based on the results from the HEC-RAS model, it is estimated that 635 cfs will overtop Main Street and flow to the Northwest in the left overbank. It is estimated that 1,305 will flow to the north in the right overbank.

The width of the left and right overbank flow was estimated using a combination of HEC-RAS model output, two-foot contour data, the Flow Master computer program, and engineering judgment. The depth of flow in the overbanks downstream of Main Street was estimated using Flow Master (calculations attached). These results show the shallow sheet flow to be less than one-foot deep. Therefore, the flood flooding hazard outside the main channel are designated as Shaded Zone X.

2.4.3 Cottonwood Wash, Washington City.

Basic Information. Cottonwood Wash is an ephemeral stream located in Washington City, Utah. The Cottonwood Wash drainage area is 7.2 square miles, not including the eastern tributary which was also studied and mapped as described in Section 2.4.3.2. The limited detail study limits extend from the Grapevine Pass Wash confluence to SR 9 (State Street).

Topographic Data. LIDAR data available for the area between the Grapevine Pass Wash confluence and cross section 17901.19 (17,901.19 feet) was used for floodplain mapping in this

area. The remaining area between cross sections 17901.19 and 23072.1 (5,170.91 feet) was mapped using Washington City two-foot contours.

Manning's "n" Values. Channel roughness coefficients for Cottonwood Wash range from 0.04 to 0.05 within the channel, 0.055 for overbank areas and 0.04 to 0.05 in the floodplain. Manning's n values for all project study areas are summarized in Table 2. Below are representative photographs of the studied reaches of Cottonwood Wash.



Cottonwood Wash Looking Upstream at Canyon Crest Bridge



Cottonwood Wash Looking Upstream to Telegraph Road

Special Conditions and Notes to Reviewer. Several unique hydraulic modeling and floodplain mapping issues for this flood source are described below for reference.

- Some Manning's "n" values used in the hydraulic model are higher than would be expected for the observed channel terrain. A higher Manning's "n" value was used from that which would be anticipated for the actual surface of the channel in order to reach subcritical flow.

- The area of the floodway for the study reach was determined to be the same as the floodplain. This is due to the confinement of the flow within the channel for the entire reach.

- The floodplain limits across Canyon Crest and Territory Canyon Roads have been manually adjusted to reflect the contours of the area along with the HEC-RAS model. This increased the top widths of the cross section immediately downstream from the culvert outlet (cross sections 20325.25 and 18165.4, respectively) from what is shown in the HEC-RAS model.

- The top widths for cross sections 11528.84 and 11858.99 on the workmap do not reflect the same top widths in the HEC-RAS model because the contours do not show the floodwall that runs along the right bank from Telegraph Road to the confluence

with Cottonwood Wash Tributary. The top width in the HEC-RAS model is wider than that on the workmap for this reason.

- The HEC-RAS profile displays a water surface elevation drop towards the outlet for the culverts along Territory Canyon and Coral Canyon Blvd. The culverts are outlet controlled and should be shown at capacity; therefore the bridges will be overtopped. The HEC-RAS profile does not reflect that the culverts are at full flow but the calculations say otherwise. For the given slope and flow, the profile should resemble full culverts for these two bridges.

- Critical depth is computed at cross sections 22493.82, 19905.29, 19461.33, 3681.78, 3019.21, 1872.06, 1342.37 and 20.75 due to steep slopes. Critical depth also occurs at cross sections 20325.25, 18165.40, 16363.60 and 11410.82 due to being immediately downstream from culvert outlets.

Flooding. The circular culvert in Cottonwood Wash, just upstream of Canyon Crest Road, overtops during the 100-year flood event. The flood waters returns to the channel below the bridge.

The circular culvert in Cottonwood Wash, just upstream of Territory Canyon Road, overtops during the 100-year flood event. The flood waters returns to the channel below the bridge.

The two circular culverts in Cottonwood Wash, just upstream of Coral Canyon Blvd, overtop during the 100-year flood event. The flood waters returns to the channel below the bridge.

2.4.3.1 Cottonwood Wash Tributary, Washington City.

Basic Information. Cottonwood Wash Tributary is an ephemeral stream located in eastern Washington City, Utah. The total drainage area northeast and upstream of the confluence with the Cottonwood Wash is 2.3 square miles.

Topographic Data. May 2005 LIDAR data was available for the area between the confluence with Cottonwood Wash and cross section 7245.25 (7,245.25 feet), and was used to map the floodplain in this area. Two-foot contour data provided by the City of Washington was used to map the Floodplain upstream of the LIDAR limits.

Manning's "n" Values. Manning's n values are included in Table 2. Below are representative photographs of the studied reaches of Cottonwood Wash Tributary.



Cottonwood Wash Tributary – View Downstream from Golf Course.



Cottonwood Wash Tributary – View Upstream from Confluence with Cottonwood Wash

Special Conditions and Notes to Reviewer. Several unique hydraulic modeling and floodplain mapping issues for this flood source are described below for reference.

- A divide in flow occurs immediately downstream from cross section 2287.16 with the water surface elevation at this cross section being one-foot from the top of bank. Approximately 20 to 40 feet downstream from this cross section the channel is found to be at capacity. It is anticipated that the left bank at this location will erode away, allowing flow to exit the main channel and flow across the green of the golf course located just south of the main channel. The assumption that the left bank will be overtopped results in an average flow depth of 2 feet crossing the green, labeled ZONE AO-2 as shown on the workmap. To analyze this condition in HEC-RAS, two hydraulic model plans were developed to estimate the maximum depth of flow in the main channel and over the green. One model plan is labeled 'without levees' and the other is labeled 'with levees'. The model without levees was developed to allow flow to leave the channel and cross the green, reconnecting with the main channel just upstream of cross section 633.12. The model labeled with levees had levees placed along the left bank of cross sections 633.12 through 2129.68. All the flow remained in the channel under this approach. These combined maximum floodplains for the two scenarios is shown on the final floodplain workmap.

- With the exception of the split in flow noted above, the area of the floodway for the study reach was determined to be the same as that of the floodplain due to the confinement of the flow within the channel of the entire reach.

- The flooding source across the green has been manually adjusted to reflect the contours of the area along with the magnitude of flow that will be leaving the main channel. This increased the top widths of the channel and split flow for cross sections 633.12 through 2287.16 from what is shown in the HEC-RAS model.

- Critical depth is computed at cross sections 7853.52 and 7987.04 due to steep slopes. Critical depth also occurs at cross sections 2287.16 and 9472.04 due to steep declines and natural rock drop structures.

2.4.4 Coyote Gulch, Ivins City.

Basic Information. Coyote Gulch is an ephemeral stream located in western Ivins City, Utah. The Coyote Gulch drainage area is 2.4 square miles. The limited detail study limits extend from the Santa Clara River confluence upstream 1.7 miles to the upstream side of Keleva Drive Bridge (cross section 8826.42).

Topographic Data. LIDAR data available for the area between the Santa Clara confluence and Highway 91 (923.26 feet) was used for floodplain mapping in this area. The remaining area between Highway 91 and cross section 15011.78 (14,088.52 feet) was mapped using Ivins City two-foot contours. In addition, channel cross sections were field surveyed at ten locations along Coyote Gulch. Six hydraulic structures were field surveyed using a surveyor's level and referencing temporary bench marks established on the project control datum.

Manning's "n" Values. Channel roughness coefficients for Coyote Gulch range from 0.04 to 0.06 within the channel, 0.055 for overbank areas and 0.04 to 0.06 in the floodplain. Manning's n values for all project study areas are summarized in Table 2. Below are representative photographs of the studied reaches of Coyote Gulch



Coyote Gulch Looking Upstream at Highway 91 Bridge



Coyote Gulch Looking Downstream from Kwasava Drive Bridge

Special Conditions and Notes to Reviewer. Several unique hydraulic modeling and floodplain mapping issues for this flood source are described below for reference.

- Some Manning's "n" values used in the hydraulic model are higher than would be expected for the observed channel terrain. A higher Manning's "n" value was used from that which would be anticipated for the actual surface of the channel in order to reach subcritical flow.

- The floodplain limits across Kwasava Drive (south), Kayenta Parkway , unnamed road (2,482.36 feet upstream from Santa Clara confluence) and Highway 91 have been manually adjusted to reflect the contours of the area along with the HEC-RAS model. This increased the top width of the cross section immediately downstream from the culvert outlet (cross sections7036.74, 6447.81, 2482.36 and 923.26, respectively) from what is shown in the HEC-RAS model.

- The HEC-RAS profile displays a water surface elevation drop towards the outlet for the culverts along Kayenta Parkway. The culverts are outlet controlled and should be shown at capacity; therefore, the bridges will be overtopped. The HEC-RAS profile does not reflect that the culverts are at full flow but the calculations say otherwise. For the given slope and flow, the profile should resemble full culverts for this bridge.

- The limited detail study ends at cross section 8826.42, just above the Keleva Drive Bridge. An approximate study was completed from this cross section upstream to the study limits at cross section 15011.79. Due to the confinement of the flow within the defined channel and not having a BFE within noted area.

- Critical depth is computed at cross sections 15011.79, 14614.35, 13782.44, 13434.42, 12778.28, 8953.94, and 6654.00 due to steep slope. Critical depth also occurs at cross sections 13618.47, 8759.41, 7036.74, 2482.36, and 923.26 due to being immediately downstream from culvert outlets.

Flooding. The two circular culverts in Coyote Gulch, just upstream of Keleva Drive, overtop during the 100-year flood event. The flood waters returns to the channel below the bridge.

The two circular culverts in Coyote Gulch, just upstream of Kwasava Drive, overtop during the 100-year flood event. The flood waters returns to the channel below the bridge.

The two circular culverts in Coyote Gulch, just upstream of Kayenta Parkway, overtop during the 100-year flood event. The flood waters returns to the channel below the bridge.

The circular culvert in Coyote Gulch, just upstream of unnamed road (2,482.36 feet upstream from the Santa Clara River confluence), overtops during the 100-year flood event. The flood waters returns to the channel below the bridge.

The circular culvert in Coyote Gulch, just upstream of Highway 91, overtops during the 100-year flood event. The flood waters returns to the channel below the bridge.

2.4.5 Fort Pierce Wash, St. George City.

Basic Information. Fort Pierce Wash is a significant ephermal stream which flows through Saint George, Utah to its confluence with the Virgin River. The Fort Pierce drainage area has a mean basin elevation of 5,080 feet above sea level (NAVD 88). The total drainage area north and upstream of the confluence with the Virgin River is 1,680 square miles. The limited detail study limits extended from near the Utah/Arizona State line in the southeast area of St. George and Washington County, downstream to River Road Bridge. The reach from River Road Bridge to the Virgin River confluence was scoped for digitizing of the effective floodplain.

Topographic Data. The 1999 City Contour data was used to map the floodplain for most of the study reach. The City Contour data did not extend to the upper 4900 feet of the reach to the state line. Although this upper reach was originally scoped for limited detail study, the 10 meter DEM data used to map the floodplain in this area was deemed of insufficient resolution and accuracy for limited detail flood mapping. This upper reach was mapped as an approximate floodplain.

Channel cross sections were field surveyed by the City of St. George in the summer of 2006 at 27 locations on the middle reach in the limited detail study area, and six locations on the upper reach in the approximate study area. Two hydraulic structures were field surveyed using a surveyor's level and referencing temporary bench marks established on the project control datum. Both of these structures lie in the digitized study area. The upper most bridge was used in the model to effectively tie in the lower digitized area.

Manning's "n" Values. Manning's n values are included in Table 2. Below is a representative photograph of the studied reaches of Fort Pierce Wash.



Fort Pierce – View upstream from River Road Bridge

Special Conditions and Notes to Reviewer. Several unique hydraulic modeling and floodplain mapping issues for this flood source are described below for reference.

- Gravel pits have been dug since the contours were developed in 1995 and updated in 1999 (Sunroc, etc.). These areas are not reflected in the model as flooded due to the dated surface topo mapping. However, these are areas of known material excavation lowering elevations, development pressure is occurring at rapid rates, and the potential of flooding is very likely. Based upon consultation and direction from St. George City officials and the fact that these areas are adjacent to and in some cases presently lower than the river channel, these areas have been noted on the flood map as areas of high potential for flooding.

- The City Contour data did not extend to the upper 4900 feet of the reach to the state line. Although this upper reach was originally scoped for limited detail study, the 10 meter DEM data used to map the floodplain in this area was deemed of insufficient resolution and accuracy for limited detail flood mapping. These surveyed cross sections do not contain the 100 year flow; therefore the extents of the water surface at these points were mapped as an approximate floodplain.

- The mapped water surface and computed water surface at the following cross sections do not match due to small islands in the floodplain analysis: 54032, 50474, 42739, 39661, 27097, 25192, 22165, 20738, 16092, 15972 and 15662.

- The computed water surface at cross section 15662 ties into the lower digitized reach within 0.43 feet

Flooding. No major flooding is observed other than the areas that have been altered from the gravel excavation operations as noted.

2.4.6 Gould Wash, Hurricane City.

Basic Information. Gould Wash is an ephemeral stream located in Hurricane, Utah. The Gould Wash drainage area is 74.1 square miles at the confluence with the Virgin River and has a mean basin elevation of 4,837 feet above sea level (NAVD 88). The stream flows in a northwesterly direction through Hurricane City.

This flooding source was studied using limited detailed study methods (100-year flood only) from the Mouth of the Canyon on the southeast side of Hurricane City to the confluence with the Virgin River.

Topographic Data. Two-foot contours provided by Hurricane City were used to create the ground digital terrain model. In addition, eight channel cross sections were field-surveyed. Survey control points (temporary benchmarks) were also established at each of the seven hydraulic structures in the study reach. The survey control was used to survey the channel geometry and culvert features needed to develop the hydraulic model.

Manning's "n" Values. The Manning's "n" roughness coefficients used for this flooding source are: 0.040 – 0.052 within the channel and 0.055 – 0.070 for the overbank. Manning's "n" values for all flood sources are summarized in Table 2. Below are representative photographs of the studied reach.



Gould Wash Looking Downstream from State Street (July)



Gould Wash Looking Upstream from 700 West (April)

Special Conditions and Notes to Reviewer. The channel capacity for the Gould Wash study reach is significantly less than the estimated 100-year discharge of 7,900 cfs for this reach. Upstream of 700 West Street, the topography adjacent to the channel is such that once water overtops the bank it will either flow away from the channel or flow hydraulically disconnected from the channel. Downstream of 700 West Street water that is not contained in the channel will remain hydraulically connected to the channel. No special modeling considerations were required for the lower study reach. However, special consideration for modeling the upper upper study reach was required, as described below.

Channel Floodplain Mapping. The base-flood elevations for the upper study reach were established by estimating the bank-full capacity of the channel. It was assumed that since the channel does not have capacity to convey the entire base flood, water will overtop the channel banks and flow onto the overbanks. In an effort to estimate the depth of water overtopping the banks, the levee option was used in the HEC-RAS model. In general, artificial one-foot-high levees were established in the model at the top of the channel banks and utilized to estimate the bank-full capacity and the channel base flood elevations. The one-foot limit was utilized because it is believed that it is unlikely that the depth of water overtopping the banks in a linear fashion would be more than one foot deep. The base-flood elevations for the channel that resulted from this analysis are conservative from a regulatory perspective because the water surface elevations can be a foot higher than the bank elevation.

To estimate the bank-full capacity of the channel in determining flood flows routed down the channel versus overbank flow routed out of the channel, the hydraulic structures were temporarily removed from the model and no additional channel flow reductions were made

based on the hydraulic limitations of the existing hydraulic structures. The final model included the structures to appropriately model back-water effects from the structures.

Four different discharge values were used in modeling this flooding source as described below:

- From the canyon mouth to 120 West Street: 7,900 cfs (100-year discharge documented in the hydrology report)

- From 120 West Street to 400 West Street: 6,800 cfs (estimated bank-full capacity). It is estimated that 700 cfs will flow into the right overbank, and 400 cfs will flow into the left overbank due to water overtopping the banks, reducing the channel flow by 1,100 cfs.

- From 400 West Street to 700 West Street: 5,200 cfs (estimated bank-full capacity). It is estimated that due to the channel constriction at 400 West Street, 1,000 cfs will flow into the right overbank and 600 cfs will flow into the left overbank, reducing the channel flow by 1,600 cfs

- From 700 West Street to 850 West Street: 4,500 cfs (estimated bank-full capacity). It is estimated that due to the channel constriction at 700 West Street, 400 cfs will flow into the right overbank and 300 cfs will flow into the left overbank, reducing the channel flow by 700 cfs.

- From 850 West Street to about 1000 West: 5,500 cfs (estimated bank-full capacity). At this point water from the left overbank will become hydraulically connected with the channel again.

- From about 1000 West to the confluence with the Virgin River: 6,800 cfs (estimated bank-full capacity). At this point water from both overbanks will become hydraulically connected with the channel again. It is estimated that the 1,100 cfs lost at 180 West Street will attenuate such that even though the water eventually returns to the channel, it will not be until after the peak has past.

Overbank Floodplain Mapping. In addition to mapping the base-flood elevations for the channel, special consideration was required for mapping the shallow flooding areas in the overbanks, especially in the upper study reach where the flood water is not hydraulically connected to the channel. As mentioned above, it was assumed that the water will not be more than one-foot deep when it overtops the banks and flows into the overbanks. It is a reasonable assumption, based on the topography that once the flood water has overtopped the bank, it will fan out further.

Attached are calculations for the left and right overbanks where it is estimated water will leave the channel. For each location it was calculated how wide the flow path must be, based on the flow and slope, in order for the depth of flow to be one foot deep. This width was then compared to how wide the flow path could be based on the topography. In every case, it is estimated that

the flow path based on the topography will be wider than the flow path based on the water being one foot deep. Therefore, this area is mapped as Shaded Zone X.

Below is a figure showing where the cross sections were cut for the calculations.

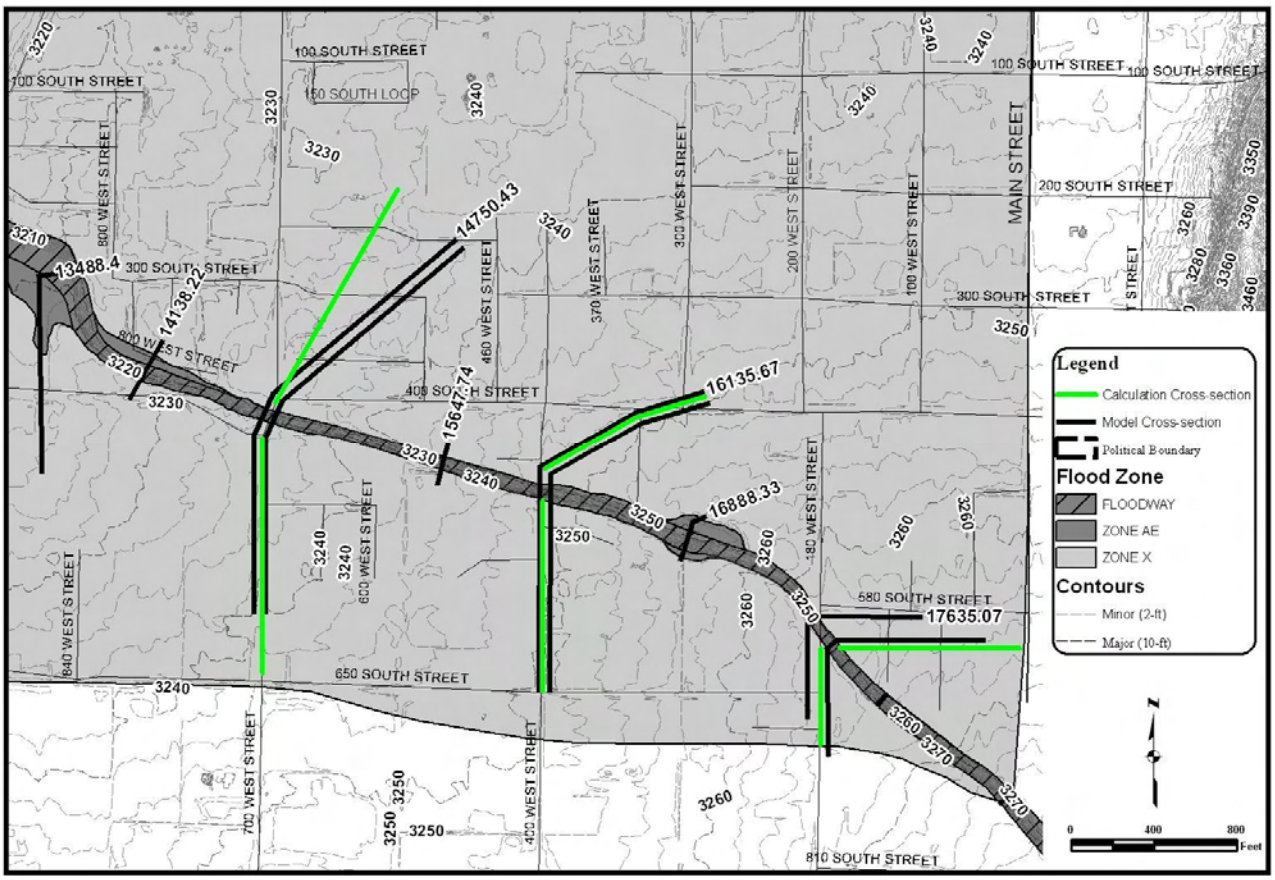


Figure 4 – Cross-section Locations for Calculations

2.4.7 Grapevine Pass Wash, Washington City.

Basic Information. Grapevine Pass Wash is an ephemeral stream located in eastern Washington City, Utah. The total drainage area north and upstream of the confluence with the Virgin River is 13.3 square miles. The limited detail study limits extend from the Virgin River confluence upstream 2.8 miles to a point approximately 0.3 miles north of I-15.

Topographic Data. LIDAR data available for the area between the confluence with the Virgin River and cross section 11781.01 (11,781.01 feet) was used for floodplain mapping in this area.

Manning's "n" Values. Manning's n values are included in Table 2. Below are representative photographs of the studied reaches of Grapevine Pass Wash.



Grapevine Pass Wash – View Upstream from Telegraph Road Culvert



Grapevine Pass Wash – View Downstream from Telegraph Road Culvert

Special Conditions and Notes to Reviewer. Several unique hydraulic modeling and floodplain mapping issues for this flood source are described below for reference.

- Some Manning's "n" values used in the hydraulic model are higher than would be expected for the observed channel terrain. A higher Manning's "n" value was used from that which would be anticipated for the actual surface of the channel in order to reach subcritical flow.

- Due to a lack of field survey data for two manmade dams located at the upstream limits of the study area, the limited detail study ends at cross section 9379.09, just below a manmade drop structure. An approximate study was completed from this cross section upstream to the study limits at cross section 11811.17.

- The area of the floodway for the study reach was determined to be the same as that of the floodplain. This is due to the confinement of the flow within the channel for the entire reach.

- The floodplain limits across Telegraph Road has been manually adjusted to reflect the contours of the area along with the HEC-RAS model. This increased the top width of the cross section immediately downstream from the culvert outlet (cross section 4077.06) from what is shown in the HEC-RAS model.

- Critical depth is computed at cross sections 2000, 2500, 2779.85, 4077.06, and 8895.75 due to steep slopes. Critical depth also occurs at cross sections 9420.84, 9518.22, and 11781.01 due to steep declines and manmade drop structures.

Flooding. The box culvert in Grapevine Pass Wash, just upstream of Telegraph Road, overtops during the 100-year flood event. The flood waters returns to the channel below the bridge.

2.4.8 Kayenta Wash, Ivins City.

Basic Information. Kayenta Wash is an ephemeral stream located in western Ivins City, Utah. The Kayenta Wash drainage area is 7.0 square miles.

Topographic Data. LIDAR data available for the area between the Santa Clara confluence and Highway 91 (1,726.98 feet) was used for floodplain mapping in this area. The remaining area between Highway 91 and cross section 15205.40 (13,478.42 feet) was mapped using Ivins City two-foot contours. In addition, channel cross sections were field surveyed at none locations along Kayenta Wash. Three hydraulic structures were field surveyed using a surveyor's level and referencing temporary bench marks established on the project control datum.

Manning's "n" Values. Channel roughness coefficients for Kayenta Wash range from 0.045 to 0.07 within the channel, 0.055 for overbank areas and 0.045 to 0.07 in the floodplain. Manning's n values for all project study areas are summarized in Table 2. Below are representative photographs of the studied reaches of Kayenta Wash.



Kayenta Wash Looking Upstream at Highway 91 Bridge



Kayenta Wash Looking Downstream from Kayenta Parkway Bridge

Special Conditions and Notes to Reviewer. Several unique hydraulic modeling and floodplain mapping issues for this flood source are described below for reference.

- Some Manning's "n" values used in the hydraulic model are higher than would be expected for the observed channel terrain. A higher Manning's "n" value was used from that which would be anticipated for the actual surface of the channel in order to reach subcritical flow.

- The floodplain limits across Taviawk Drive has been manually adjusted to reflect the contours of the area along with the HEC-RAS model. This increased the top width of the cross section immediately downstream from the culvert outlet (cross section 14985.53, respectively) from what is shown in the HEC-RAS model.

- Critical depth is computed at cross sections 14034.18, 13467.74, 12236.8, 1836.78, and 1773.20 due to steep slope. Critical depth also occurs at cross sections 7708.92 and 1726.98 due to being immediately downstream from culvert outlets.

Flooding. The three circular culverts in Kayenta Wash, just upstream of Taviawk Drive, overtop during the 100-year flood event. The flood waters returns to the channel below the bridge.

The circular culvert in Kayenta Wash, just upstream of an unnamed road (7,708.92 feet upstream from Santa Clara confluence), overtops during the 100-year flood event. The flood waters returns to the channel below the bridge.

The circular culvert in Kayenta Wash, just upstream of Highway 91 Road, overtops during the 100-year flood event. The flood waters returns to the channel below the bridge.

2.4.9 Lava Flow Wash, Ivins, and Santa Clara City.

Basic Information. Lava Flow Wash is an ephemeral stream whose watershed originates on the red sandstone bluffs north of the City of Ivins, Utah. Lava Flow flows south through urban Ivins City and crosses into the northwestern corner of the City of Santa Clara, where it flows into Tuacahn Wash. The total drainage area north and upstream of the confluence with Tuacahn Wash is approximately three square miles. The preexisting effective FEMA flood maps extend from the Ivins/Santa Clara City limits downstream to the confluence with Tuacahn Wash. Based upon direction from the City of Santa Clara, the updated flood map study area limits extend to the ball field and parkway located at cross section 4500.06 just west of Rachel Drive. Above the park area, the cities of Santa Clara and Ivins manage Lava Flow Wash as a local flooding hazard within their respective storm drain management and development permit programs.

Topographic Data. LIDAR data from May 2005 was used to develop hydraulic model cross-section data for Lava Flow Wash. The City of Santa Clara provided two foot contour data flown on January 6, 2006, and requested that it be used to map the floodplain.

Two hydraulic structures were field surveyed using a surveyor's level and referencing temporary bench marks established on the project control datum. There were no surveyed cross sections on Lava Flow Wash.

Manning's "n" Values. Manning's n values are included in Table 2. Below is a representative photograph of the studied reaches of Lava Flow Wash.



Lava Flow – View Upstream of Rachael Drive Crossing

Special Conditions and Notes to Reviewer. Several unique hydraulic modeling and floodplain mapping issues for this flood source are described below for reference.

- Lava Flow Wash was originally scoped to be mapped up to 400 East at the city limits between Santa Clara and Ivins. The previous effective FIS flood mapping extended to this point. However, development in the area immediately upstream and downstream of this location since the effective map date has changed the nature of the upstream watershed and wash area from an open, overland flow wash to an urban residential area which is no longer drained by a distinct wash but through the Ivins City streets, alley swales, and storm drain system. In addition, the City of Santa Clara is incorporating the reach of Lava Flow Wash from 400 East to Rachael Drive into its urban storm drainage system with development of the land anticipated for completion in 2006. At the direction of the City of Santa Clara, the limited detail flood map study area was limited to 1,000 feet Northwest of Rachael Drive (HEC-RAS cross section 4500.06).

- There is a minor discrepancy between the Effective FIS and the floodplain on the workmap. Pioneer Parkway (cross sections 1455.59 and 1341.75) was constructed with considerable cut into the preexisting topography after the effective maps were adopted. Shallow sheet flooding will result in this area.

- Critical depth is computed at cross section 501.78 due to a steep slope of four percent. Also there are two other points of critical depth. These points lie immediately downstream of the two structures along the wash (Rachel Drive and Pioneer Parkway).

- Top width for both the floodplain and the floodway don't match the model due to overland flow at cross section 1455.59. At this cross section the top widths were manually adjusted on the workmap to represent the 100-year flood event.

- See below for discussion of the Zone X flood map area.

Flooding. Both of the bridge structures/culverts in the study reach overtop during the 100-year flood event.

The flow over Rachel Drive does not result in significant flooding, as the water enters the wash a short distance below the road.

An estimated 65 cfs overtops Pioneer Parkway Road. Some of the flow returns to Lava Flow Wash, but the majority of the 65 cfs enters Tuacahn Wash at a downstream location. The mapping and concurrence of these flood sources will be determined upon completion of the Tuacahn Wash draft floodplain workmap (to be submitted at a later date) and incorporated into the final DFIRM product. This shaded Zone X area will encompass most of Pioneer Parkway and run southeast until the flow joins Tuacahn Wash. Flowmaster software was used to determine the depth and width of the sheet flow from Lava Flow Wash.

2.4.10 LaVerkin Creek, LaVerkin City.

Basic Information. LaVerkin Creek is a perennial stream located in LaVerkin, Utah. The LaVerkin Creek drainage area has a mean basin elevation of 6,035 feet above sea level (NAVD 88). The total drainage area north and upstream of the confluence with the Virgin River is 94.7 square miles

Topographic Data. The LIDAR data was used to develop the hydraulic model and map the floodplain for the entire reach of the LaVerkin Creek. Two-foot contours shown on the workmap were generated in ArcGIS.

Two hydraulic structures were field surveyed using a surveyor's level and referencing temporary bench marks established on the project control datum. There were no surveyed cross sections on LaVerkin Creek.

Manning's "n" Values. Manning's n values are included in Table 2. Below are representative photographs of the studied reaches of LaVerkin Creek.



LaVerkin Creek – View Upstream of State Street



LaVerkin Creek – View Downstream of Gas Line

Special Conditions and Notes to Reviewer. Several unique hydraulic modeling and floodplain mapping issues for this flood source are described below for reference.

- The bridge crossing near the cross section 9950.43 was washed out prior to the field data collection and hydraulic model development. The local community indicated this bridge would not be replaced and that the remainder of the bridge would be removed from the channel. Therefore, this bridge structure was not included in the hydraulic model.

- Critical depth is computed at cross section 10469.89 due to a drop structure.

Flooding. The gas line below the State Street bridge is overtopped during the 100-year flood event, which results in flooding of the nearby residential area. This confirms initial field observations which indicated likelihood for flooding this small, low-lying residential area.

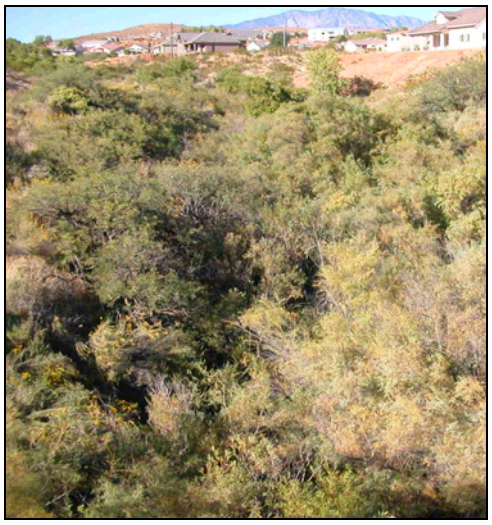
2.4.11. Middleton Wash, St. George City

Basic Information. Middleton Wash is an ephemeral stream located in Saint George, Utah. The Middleton Wash drainage area has a mean basin elevation of 3,754 feet above sea level (NAVD 88). The total drainage area north and upstream of the confluence with the Virgin River is 9.7 square miles

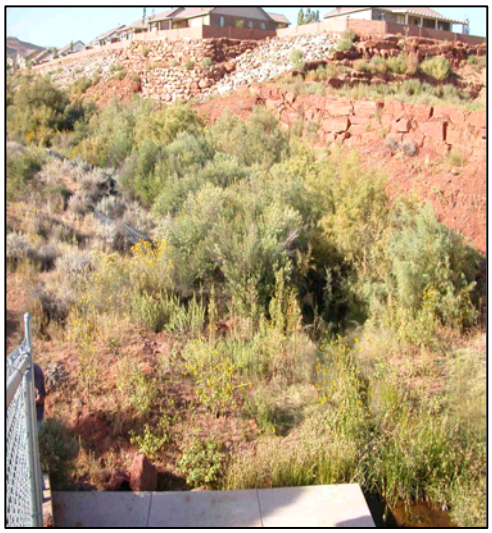
Topographic Data. The LIDAR data was used for the area between the Virgin River and I-15 (9,900 feet). Two-foot contour data provided by the City of St. George was used upstream of the LIDAR limits. Survey cross-section data and grading plans for the development located along the upper 1,500 feet of the Middleton Wash study limits were used to map the floodplain for this reach as the City contour data did not extend to the full study boundary.

In addition, channel cross sections were field surveyed at eight locations. Eight hydraulic structures were field surveyed using a surveyor's level and referencing temporary bench marks established on the project control datum.

Manning's "n" Values. Manning's n values are included in Table 2. Below are representative photographs of the studied reaches of Middleton Wash.



Middleton Wash – View Upstream of Middleton Drive



Middleton Wash View Downstream of 110 South Bridge

Special Conditions and Notes to Reviewer. Several unique hydraulic modeling and floodplain mapping issues for this flood source are described below for reference.

- As referenced in the topographic data section above, the upper 1,500 feet of the Middleton Wash floodplain study limits was mapped using interpolation, therefore this area has been labeled as approximate. The top width of the surveyed cross section in this upper area was found and maintained to the surveyed cross section in the area where contour data was provided.

- Due to dense shrub and tree vegetation (tamarisk, willow) in various study reaches, some cross sections cut from the LIDAR surface were altered to more accurately represent the site visit observations. The modified cross sections are: 9363.27, 10061.03, 12167.41, and 13533.82.

- Inlet control prevails at the culvert under Interstate 15, resulting in a surcharged water depth of approximately 37 feet, at which point the culvert is able to convey the 100-year discharge. This creates backwater effects that extend to the upper portions of the golf course.

- Critical depth is computed at cross section 11144.01 due to a steep spillway incline.

- There is a discrepancy in the FIRM floodplain to this model at the I-15 bridge. This is the case due to inlet control conditions and backwater effects.

Flooding. The box culverts in Middleton Wash, just upstream of the 344 South culverts, will overtop during the 100-year flood event. The flood waters will return to the channel below the bridge.

The culverts under the bike path near the Virgin River are undersized and overtopping occurs. Some water will flow down the path in both directions, but eventually flows into the Virgin River.

2.4.12 Mill Creek, Washington City.

Basic Information. Mill Creek is an ephemeral stream located in Washington City, Utah. The Cottonwood Wash drainage area is 23.1 square miles.

Topographic Data. LIDAR data available for the area between the Virgin River confluence and cross section 8163.92 (8,163.92 feet) was used for floodplain mapping in this area. The remaining area between cross sections 9163.92 and 13473.51 (5,309.59 feet) was mapped using Washington City two-foot contours.

Manning's "n" Values. Channel roughness coefficients for Mill Creek range from 0.045 to 0.08 within the channel, 0.055 for overbank areas and 0.045 to 0.08 in the floodplain. Manning's n values for all project study areas are summarized in Table 2. Below are representative photographs of the studied reaches of Mill Creek.



Mill Creek Looking Upstream at Buena Vista Bridge



Mill Creek Looking Downstream from I-15 Bridge

Special Conditions and Notes to Reviewer. Several unique hydraulic modeling and floodplain mapping issues for this flood source are described below for reference.

- Some Manning's "n" values used in the hydraulic model are higher than would be expected for the observed channel terrain. A higher Manning's "n" value was used from that which would be anticipated for the actual surface of the channel in order to reach subcritical flow.

- The floodplain and floodway limits across cross section 8968.08 have been manually adjusted to reflect the contours and the top widths of the water surface elevations of the cross sections immediately up and downstream in within the drop structure (cross sections 8969.082 and 8956.03, respectively).

- The floodway limits across cross section 3184.48 has overlapped the floodplain on the left bank and by doing so the floodplain width across this cross section appears wider than cited in the CHECK-RAS XS Check Report.

- The floodplain limits across Buena Vista and 200 South Roads have been manually adjusted to reflect the contours of the area along with the HEC-RAS model. This increased the top widths of the cross section immediately downstream from the culvert outlet (cross sections 9736.70 and 6573.22, respectively) from what is shown in the HEC-RAS model.

- The two box culverts under I-15 have inlets that are 12' by 14' and transition to 12' by 6' culverts over a length of 220 feet. Because of this contraction, HEC-RAS is unable to model these two culverts. The culverts are modeled as 14' by 12' culverts in HEC-RAS. Calculations say that the culverts will be inlet controlled at the upstream face and then become outlet controlled through the contraction 12' by 6' length of the culverts. The water elevation at the outlet will be at critical depth.

- Critical depth is computed at cross sections 8974.10, 8969.08 and 8968.08 due to a drop structure. Critical depth also occurs at cross sections 9736.70, 9018.99, 7507.74, and 2702.90 due to being immediately downstream from culvert outlets. Critical depth occurs at cross section 3985.50 due to steep slope.

Flooding. The two box culverts in Mill Creek, just upstream of Buena Vista Road, overtop during the 100-year flood event. The flood waters returns to the channel below the bridge.

The two box culverts in Mill Creek, just upstream of 200 South Road, overtop during the 100-year flood event. The flood waters returns to the channel below the bridge.

The three circular culverts in Mill Creek, just upstream of 100 East Road, overtop during the 100-year flood event. The flood waters returns to the channel below the bridge.

2.4.13. North Fork Virgin River, Springdale City.

Basic Information. The North Fork study area of the Virgin River is an ephemeral stream located in Springdale, Utah. Zion National Park is located at the upper limits of the study area. The total drainage area north and upstream of the confluence with the Virgin River is 361 square miles.

Topographic Data. LIDAR data was available and used to map the floodplain for the lower reach of the study area from the confluence with the East Fork of the Virgin River to

cross section number 9025.59. Above this location, two-foot contour data obtained in 2006 by the City of Springdale was used to map the floodplain.

Channel cross sections were field surveyed at twenty two locations for development of the hydraulic model. Six hydraulic structures were field surveyed using a surveyor's level and referencing bench marks established by the City's engineering contractor on the project control datum.

Manning's "n" Values. Manning's n values are included in Table 2. Below are representative photographs of the studied reaches of the North Fork of the Virgin River.



North Fork Virgin–Upstream of Springdale River Park



North Fork Virgin – Downstream of Canyon Springs Bridge

Special Conditions and Notes to Reviewer.

Unique hydraulic analyses and floodplain mapping issues addressed for this flood source are described below.

- The HEC-RAS split flow analysis routine was used for the hydraulic analysis at two locations; 500 feet upstream of Springdale River Park, and the private drive bridge above Apple Orchard. This approach was used to determine the amount of water leaving the main channel. In both cases, the structures are essentially "perched" bridges with the approach road being at a lower elevation within the floodplain. The floodwater flows over the road at both locations and returns to the main stream just downstream of each bridge.

Flooding. Four of the six bridges are overtopped or have water flowing around them during the 100 year storm event. There are other locations along the river edge where the flood maps show buildings will be flooded under the 100-year event.

2.4.14. Rimrock Wash, St. George City.

Basic Information. Rimrock Wash is an ephemeral stream located in east Saint George. The City requested the reach north of I-15 be mapped with limited detail study methods. The reach below I-15 was restudied using approximate methods. The Rimrock drainage area has an area of 1.3 square miles at I-15. Rimrock flows to the south out of the northern hills and tortoise habitat conservation area. The limited detail study reach does not have a single flow path, but crosses a large parking lot at the northern end and enters into several swales and gutters in and around the structures in this area until it reaches I-15, at which point the water flows under I-15 at the historical channel alignment of enters the City and UDOT storm drain systems to the southwest of the study area. Due to the development of the area in and around the Rimrock Wash flow path, must of the subject area will be subject to shallow sheet flow during the 100 year effective flood.

Topographic Data. For the entire area of Rimrock Wash, two foot contours provided by the city were used to map the flood zone area.

Special Conditions and Notes to Reviewer. Using Flowmaster software, calculations were performed and noted to have an average depth less than one foot, therefore the area inundated by the flood water is represented as a Shaded Zone X.

2.4.15. Sand Hollow Wash, St. George City.

Basic Information. Sand Hollow Wash is an ephemeral stream located on the west side of St. George City, Utah. Sand Hollow flows southerly through St. George to its confluence with Halfway Wash. From the Halfway Wash confluence, Sand Hollow continues to flow southerly to the Santa Clara River. The Sand Hollow drainage area has an area of 56.1 square miles and a mean basin elevation of 5,064 feet above sea level (NAVD 88).

Sand Hollow Wash was studied using detailed study methods from the confluence with Halfway Wash upstream to the City of St. George corporate limits, a distance of approximately 4.3 miles.

Topographic Data. LIDAR data was used from the confluence of Halfway Wash to just upstream of Sunset Boulevard. North of Sunset Boulevard, two-foot contours provided by St. George City were used to create the ground digital terrain model. In addition, channel cross sections were GPS-surveyed approximately every 750-feet along the wash upstream of Sunset Boulevard. Survey control was provided at each hydraulic structure, which was used by the engineer developing the hydraulic model to survey the channel geometry and bridge features at each structure.

Manning's "n" Values. Manning's n values are included in Table 2. Below are representative photographs of the studied reach of Sand Hollow.



Sand Hollow Wash Looking Downstream Pioneer Drive (2000 North)



Sand Hollow Wash Looking Upstream of Snow Canyon Parkway

Special Conditions and Notes to Reviewer. An item associated with technical review is method for mapping the floodplains at the hydraulic structures. Since the HEC-RAS software utilizes a backwater calculation method to compute a water surface profile for subcritical flow conditions, water-surface elevations are calculated from downstream to upstream. Flooding usually occurs from water moving from upstream to downstream. Due to the calculation method used by the software, all of the flow may be computed to be contained in the channel at the downstream face of the bridge, but the computation for the upstream face may show that significant flow is outside the main channel, with a much wider top width. The floodplain in these situations was mapped from upstream to downstream, using the contour information to delineate the boundaries of the flood hazard. This means that actual mapped top widths at some cross section may not match the calculated top width from the HEC-RAS software.

Sunset Boulevard Road. Two parallel 14.5 x 8.5 foot box culverts have been installed beneath Sunset Boulevard Road. These two culverts do not have capacity to convey the 100-year flood discharge of 6,600 cfs without overtopping the road. The low point on Sunset Boulevard is just east of the box culvert location. As flood water starts to backup, it will flow to the east where it will overtop the road and then flow back into Sand Hollow Wash. Due to the backwater calculation methods employed by the HEC-RAS software, the cross section just downstream of Sunset Boulevard contains the entire 100-year flood within its banks. The floodway and Zone AE have been extended to the east on the downstream side of the road to account for the floodwater overtopping the road. The area in the left bank downstream of Sunset Boulevard has been mapped as a Zone AO-1. The approximate ground slope of this area is 3.33 percent. It is estimated that approximately 2,130 cfs of floodwater will be contained in the left bank overtopping the culvert. With the estimated ground slope the flood depth will be approximately 1-foot.

Effective Approximate Study Upstream of 2000 North. On the effective FIRM Panel Number 490177 0003 there is an approximate flood hazard boundary north of 2000 North street that begins at Sand Hollow Wash and sheet flows to the southeast away from the channel. Inspection of the new topography of the area indicates that flood water will not leave the channel or flow to

the southeast. The area in question is near the location of cross section 18361 on the new work map. This approximate flood hazard has been removed on the new DFIRMs.

2.4.16. Santa Clara River, Santa Clara City and St. George.

Basic Information. The Santa Clara River is located in the western portion of Washington County and flows through the corporate limits of Santa Clara City and St. George City. The Santa Clara drainage area is 540 square miles at the confluence with the Virgin River.

This flooding source was studied using detailed study methods from the west corporate limits of Santa Clara City to the confluence with the Virgin River.

Topographic Data. The LIDAR topographic data (May 2005) was used for most of the reach studied for the Santa Clara River. Santa Clara City also provided updated two-foot contour data (January 2006) that was used in the hydraulic models from the western Santa Clara City limit downstream approximately one mile. This area, locally referred to as the Swiss Village, experienced significant flooding during the January 1005 flood event and the terrain was modified after the May 2005 flight date. Additional surveys were performed at each of the five bridges included in the model, including cross-sections upstream and downstream of each bridge. The crest of the drop structure located just above the confluence with the Virgin River was also surveyed.

Manning's "n" Values. The Manning's "n" roughness coefficients used for this flooding source are: 0.040 within the channel, 0.050 – 0.090 for the overbank and 0.060 – 0.075 for the erosion control barriers. Manning's "n" values for all flood sources are summarized in Table 2. Below are representative photographs of the studied reach.



Santa Clara River Looking Downstream from Dixie Drive Bridge



Santa Clara River Looking Downstream from Hilton Drive/Santa Clara Drive Bridge

Special Conditions and Notes to Reviewer.

- **Bathymetric Channel.** As mentioned in section 2.2, the Virgin River hydraulic model utilizes the May 17, 2005 LIDAR data. The LIDAR data did not reflect the bathymetric surface below the water level. However, data from the St. George USGS gaging station shows that the peak flow the day of the flight was relatively low at 149 cfs. The survey cross-sections were compared to the LIDAR data. It appears there is less than a six inch difference between the two sources. This difference was deemed insignificant and no adjustments were made to correct the bathymetric contours.

- **NRCS Projects.** The January 2005 flood caused extensive lateral erosion along the Santa Clara River. Since that time the NRCS has been constructing erosion control barriers (porous berms) along the river. The improvements along the Santa Clara River had not been completed in time for incorporation into the DFIRM project contract schedule. Only those projects that are reflected in the LIDAR have been included in the hydraulic model for the Santa Clara River. This issue and approach to mapping the floodplain has been discussed and approved in coordination meetings with the local communities, State of Utah, FEMA and the NSP.

  The NRCS design shows fill placed behind the erosion control barriers. However, as of May 2005 (when the LIDAR was flown), many of these areas had not been filled in. The area in back of the barriers is ineffective for flow and was modeled accordingly. If this area has been filled in since May 2005, or if it will be filled in at some future time, it is not anticipated to have much affect on the hydraulic model because it is already considered ineffective.

2.4.17. Shoal Creek, Enterprise City.

Basic Information. Shoal Creek is an ephemeral stream located in Enterprise, Utah. The Shoal Creek drainage area is 191.1 square miles with a mean basin elevation of 6070 feet above sea level (NAVD 88). Spring Creek and Cottonwood Wash are tributaries to Shoal Creek and are also being studied in conjunction with this report.

This flooding source was studied using limited detailed study methods (100-year flood only) from the Shoal Creek confluence with Cottonwood Wash at the downstream study limit to its confluence with Spring Creek at the upstream study limit.

Topographic Data. Two-foot contours provided by Enterprise City were used to create the ground digital terrain model. In addition, eight channel cross sections were field-surveyed.

Manning's "n" Values. The Manning's "n" roughness coefficients used for this flooding source are: 0.033 within the channel, 0.075 for the erosion barriers, and 0.050 for the floodplain. Manning's "n" values for all flood sources are summarized in Table 2. Below are representative photographs of the studied reach.



Shoal Creek Looking Downstream from Center Street



Shoal Creek Looking Downstream at Confluence with Spring Creek

Special Conditions and Notes to Reviewer. Earthen berms and riprap erosion barriers line the river banks through most of the study reach. These features were treated as uncertified levees in developing the hydraulic model. The channel and the floodplain were analyzed in two separate analyses in accordance with FEMA criteria for modeling uncertified levees.

With Levee Scenario. In the "with levee scenario" the entire 100-year discharge was routed in the channel assuming the uncertified levees would contain the flow. The base flood elevations for this scenario are based on the resulting computed water surface elevations.

Without Levee Scenario. In the "without levee scenario" the geometry of the uncertified levees was left in the model, but flow was allowed in the overbanks as well as the channel. The base flood elevations in the overbanks are based on the computed water surface elevations.

It appears that flood flows in the left overbank downstream of Center Street will shallow sheet flow away from the stream. The average depth of flow in this area based on the HEC-RAS results is less than a foot deep. Therefore, it is mapped as Shaded Zone X.

Top Widths. The floodplain and floodway were mapped based on the intersection of the computed water surface elevation from HEC-RAS with the existing topography. To verify that the flood boundaries were mapped correctly, the HEC-RAS computed floodplain and floodway top widths were compared to the mapped top widths. Some special cases exist where the mapped floodplain and floodway top widths do not match the computed top widths. Below is a description of these special cases.

- **Backwater Computation Exceptions** – HEC-RAS uses a backwater computation method (moving upstream) to compute a water surface profile for subcritical flow conditions, yet flooding occurs in a downstream direction. This can lead to unrealistic results. For example, if there is insufficient capacity in the channel at a given cross section HEC-RAS will compute flooding in the overbanks. If the channel capacity is sufficient at the next downstream cross section, HEC-RAS will compute the flow as being contained in the channel. However, it is unlikely that the actual flooding would make such an abrupt transition. Therefore, at some locations

engineering judgment was used to override the HEC-RAS computations and the floodplain was mapped wider than the HEC-RAS computed width.

- **Islands** – The computed top width is based on the width of the computed water surface in the model cross sections. This measurement excludes land features that are located within the area of inundation that extend above the computed water surface. For example, these "islands" occur where there is flooding on both sides of an uncertified levee and where small topographic rises occur in areas of shallow flooding. In these areas, the islands were ignored and the floodplain/floodway was mapped as a continuous surface. The width of the "islands" should be added to the HEC-RAS computed top width to match the mapped floodplain.

- **Ineffective Flow Areas** – The HEC-RAS top width includes water contained in ineffective flow areas. These ineffective flow areas were not mapped and should be subtracted from the HEC-RAS results to match the mapped floodplain.

2.4.18. Spring Creek, Enterprise City.

Basic Information. Spring Creek is an ephemeral stream located in Enterprise, Utah. The Spring Creek drainage area has a mean basin elevation of 6108 feet above sea level (NAVD 88). The total drainage area, located south of Shoal Creek, is 30.1 square miles.

This flooding source was studied using limited detailed study methods (100-year flood only) from the Spring Creek confluence with Shoal Creek upstream approximately 4,100 feet. The original limited detail project scope included an additional 800 feet upstream. However, the aerial extents of the two-foot contour mapping were insufficient to map the floodplain in this reach. The area above the limited detail study reach is included in the enhanced approximate hydraulic analysis and floodplain mapping.

Topographic Data. Two-foot contours provided by Enterprise City were used to create the ground digital terrain model. In addition, seven channel cross sections were field-surveyed. A survey control point (temporary benchmark) was established at the Main Street structure. The survey control was used to survey the channel geometry and culvert features needed to develop the hydraulic model.

Manning's "n" Values. The Manning's "n" roughness coefficients used for this flooding source are: 0.035 within the channel, 0.075 for the erosion barriers, and 0.055 for the floodplain. Manning's "n" values for all flood sources are summarized in Table 2. Below are representative photographs of the studied reach.



Spring Creek Looking Upstream from Main Street



Spring Creek Looking Upstream from Approximately 330 South

Special Conditions and Notes to Reviewer. The channel capacity for the portion of Spring Creek studied in the report is significantly less than the 100-year discharge. Earthen berms and riprap erosion barriers line the majority of the study reach. Since these features were not constructed to meet FEMA levee criteria, they were treated as uncertified levees. The channel and the floodplain were analyzed in two separate scenarios in accordance with FEMA criteria for modeling uncertified levees.

With Levee Scenario. In the "with levee scenario" the base-flood elevations in the main channel were established by estimating the bank-full capacity of the channel. It was assumed that since the channel does not have capacity to convey the base flood, water will overtop the channel banks and flow onto the overbanks. In an effort to conservatively estimate the depth of water overtopping the banks, the levee option was used in the HEC-RAS model. In general, artificial one-foot-high levees were established in the model at the top of the channel banks and utilized to estimate the bank-full capacity and the channel base flood elevations. This was done because the typical riverine confined floodplain does not exist adjacent to Spring Creek. Water that overtops the channel banks will flow away from the main channel. The one-foot limit was utilized because it is believed that it is unlikely that the depth of water overtopping the banks in a linear fashion would be more than one foot deep.

It should be noted that in estimating the bank-full capacity no additional reductions were made based on the inadequate capacities of the hydraulic structures.

Three different discharge values were used in modeling this flooding source as described below:

- From cross section 4119 to cross section 3476: 4,750 cfs (100-year discharge documented in the hydrology report)
- From cross section 3476 to cross section 2310: 4,400 cfs (estimated bank-full capacity)
- From cross section 2310 to Spring Creek Confluence with Shoal Creek: 1,500 cfs (estimated bank-full capacity).

Without Levee Scenario. The "without levee" scenario was run to estimate the base-flood elevations in the overbanks. In this scenario the geometry of the uncertified levees was left in the model, but flow was allowed in the overbanks. Using this approach the computed average depth in the right overbank from about 150 South to the upstream study limit is between 1.5 feet and 2.0 feet. The topography slopes away from the stream in this area. Therefore, this area was assumed to be hydraulically disconnected and therefore is mapped as Zone AO-2.

Using Flow Master (calculations attached) it was estimated that once the sheet flow spreads out to a width of 1,100 feet the average depth would be less than one foot deep. Therefore, the area downstream of approximately 150 South is designated as Shaded Zone X.

Similarly, Flow Master was used to confirm that estimated the depth of flow in the left overbank downstream 200 South Street is less than one foot deep. This area is also mapped as Shaded Zone X.

Top Widths. The floodplain and floodway were mapped based on the intersection of the computed water surface elevation from HEC-RAS with the existing topography. To verify that the flood boundaries were mapped correctly, the HEC-RAS computed floodplain and floodway top widths were compared to the mapped top widths. Some special cases exist where the mapped floodplain and floodway top widths do not match the computed top widths. Below is a description of these special cases.

- **Backwater Computation Exceptions** - HEC-RAS uses a backwater computation method (moving upstream) to compute a water surface profile for subcritical flow conditions, yet flooding occurs in a downstream direction. This can lead to unrealistic results. For example, if there is insufficient capacity in the channel at a given cross section HEC-RAS will compute flooding in the overbanks. If the channel capacity is sufficient at the next downstream cross section, HEC-RAS will compute the flow as being contained in the channel. However, it is unlikely that the actual flooding would make such an abrupt transition. Therefore, at some locations engineering judgment was used to override the HEC-RAS computations and the floodplain was mapped wider than the HEC-RAS computed width.

- **Islands** – The computed top width is based on the width of the computed water surface in the model cross sections. This measurement excludes land features that are located within the area of inundation that extend above the computed water surface. For example, these "islands" occur where there is flooding on both sides of an uncertified levee and where small topographic rises occur in areas of shallow flooding. In these areas, the islands were ignored and the floodplain/floodway was mapped as a continuous surface. The width of the "islands" should be added to the HEC-RAS computed top width to match the mapped floodplain.

Ineffective Flow Areas – The HEC-RAS top width includes water contained in ineffective flow areas. These ineffective flow areas were not mapped and should be subtracted from the HEC-RAS results to match the mapped floodplain.

2.4.19. Tuacahn Wash, Ivins, Santa Clara, and St. George.

Basic Information. Tuacahn Wash is an ephemeral stream whose watershed originates in Ivins. The drainage area north and upstream of the Santa Clara Reservoir is approximately 7.8 square miles. The limited detail study extends from the confluence with the Santa Clara River in the City of Santa Clara upstream 6 miles to a point located near the habitat conservation area in Ivins City and Snow Canyon State Park.

Topographic Data. LIDAR data from May 2005 was available for Tuacahn Wash. The Cities of Santa Clara and Ivins requested that flood mapping be developed from two foot contour data flown in January 2006 and provided by the Cities. The updated contour data was used to map the floodplain.

Seven hydraulic structures were field surveyed using a surveyor's level and referencing temporary bench marks established on the project control datum. There were seven surveyed cross sections on Tuacahn Wash in the city of Ivins.

Manning's "n" Values. Manning's n values are included in Table 2. Below is a representative photograph of the studied reaches of Tuacahn Wash.



Tuacahn – View Upstream of Little League Drive



Tuacahn – View Upstream of Center Street (Ivins)

Special Conditions and Notes to Reviewer. Several unique hydraulic modeling and floodplain mapping issues for this flood source are described below for reference.

- The Santa Clara Reservoir (a.k.a. Laub Pond) located along Tuacahn Wash from Little League Drive south one third of a mile, a calculation was performed using Flow Master software to determine the depth of the water at the point of the spillway. The depth was around 2,281.6 ft, therefore the 2,282 ft contour was used in the determination of the floodplain from Little League Drive bridge to the spillway. The reservoir was considered full for flood mapping purposes, and all inflow was passed through without attenuation in the hydraulic analyses and flood mapping.

The prevailing contours below this point result in a significant area of shallow sheet flow to the south.

- Under direction of the cities of Santa Clara and Ivins, three culverts are considered temporary structures that wash out during flood events, and were not modeled.

- Critical depth is computed at cross sections below each structure as well as at cross sections 14404, 14500, 16831, and 16853 due to two drop structures.

- Top widths at the following locations do not match the top widths calculated in the model: Stations 20432, 20237, 20150, 17885, 757, and 448. The first four have high points that were inundated in the floodplain shown on the workmap. These were not inundated in the model, but are shown as such for the general area of flooding. In addition, the top three cross sections have overland flow that is added in the floodplain mapping. These areas were not calculated in the model. As for the remaining two cross sections, they are wider on the workmap due to the calculations performed for the Santa Clara Reservoir.

Flooding. All seven of the culverts in the study reach overtop during the 100 year flood event.

As a result of the overtopping culverts a large amount of area will become flooded. Below Tuacahn Drive, water will follow the road as well as flowing back down into the channel. Water will flow West on Center Street and flow back into the main channel after entering a small tributary along its way. For the remaining culverts that will be overtopped, no major flooding will result.

As noted above, the Santa Clara Reservoir is not a certified flood control structure, and will pass the 100-year flood through without effective attenuation. The existing effective flood maps do not show flooding below Little League Drive, and significant area of new flooding will be shown on the revised flood maps. This was a recognized area of concern, and the issue was reviewed with the City of Santa Clara and St. George in evaluating the spillway overtopping and shallow sheet flow limits. Both entities concurred with the results.

2.4.20. Virgin River, St. George City, and Washington City.

Basic Information. The Virgin River is the primary drainage for the greater Washington County area, generally flowing northeast to southwest, eventually passing through Arizona and Nevada where it eventually discharges into the Lake Powel reach of the Colorado River. The Virgin River passes through several municipalities in Washington County, but the primary areas of flood concern with significant development pressure are in southern St. George and Washington City, Utah. The Virgin River is prone to flash flood events in addition to large floods due to snowmelt in the upper elevations of the drainage basin.

The Virgin River was studied by a combination of Detailed and Limited Detail (i.e., 100-year floodplain and floodway only) methods from a point located just downstream of Atkinville Wash below the Bloomington area of St. George, upstream approximately 18 miles to just downstream

of the Highway 9 crossing in Washington City. The Virgin River watershed has a mean basin elevation of 2,530 feet above sea level (NGVD 29). The effective hydrology used for the hydraulic analysis was updated by URS/Dewberry under FEMA Hazard Mitigation Technical Assistance Project (HMTAP) funding, and was used for this DFIRM project. The new 100-year discharge for the Virgin River upstream of the confluence with the Santa Clara River is 23,500 cfs, and the discharge below the confluence is 27,500 cfs.

Topographic Data. The LIDAR topographic data was used along the entire reach studied for the Virgin River. The LIDAR data was supplemented by FEMA through the HMTAP project with field surveyed channel cross-sections upstream and downstream of each hydraulic structure crossing the river. Three additional field surveyed cross sections were provided just upstream of the confluence with the Santa Clara River, along with a surveyed cross section at the location of the diversion structure.

Manning's "n" Values. Manning's n values are included in Table 2. Below are representative photographs of the studied reach of the Virgin River.



Upstream of Pedestrian Bridge in St. George



Upstream of 300 East Bridge in Washington

Special Conditions and Notes to Reviewer

- **Bathymetric Channel.** As mentioned in section 2.2.14, the Virgin River hydraulic model utilizes the May 17, 2005 LIDAR data. The LIDAR data did not reflect the bathymetric surface below the water level. Surveyed cross sections at each hydraulic structure along with river depths and flows obtained from the USGS gaging stations were used to estimate the depth of water in the river the day the LIDAR aerial mapping was obtained. A bathymetric channel was added to each cross section obtained from the LIDAR data by designing a trapezoidal channel using the estimated river depth based on gage data and varying the channel bottom width until the calculated water surface matched the LIDAR water surface for the known flow in the river on the day the LIDAR was flown.

- **NRCS Projects.** As previously mentioned, the NRCS has been constructing channel mitigation and maintenance improvements along the Virgin River since the January 2005 flood. These projects include dredging and construction of erosion control barriers (porous berms) along the river. The improvements along the Virgin River had not been completed in time for incorporation into the DFIRM project contract schedule. These improvements have not been included in the hydraulic model for the Virgin River. This issue and approach to mapping the floodplain has been discussed and approved in coordination meetings with the local communities, State of Utah, FEMA and the NSP.

- **Virgin River Floodplain.** The Virgin River has a defined floodplain with a channel that will migrate within the floodplain due to erosion and deposition during large flood events. The cross-section data obtained from the LIDAR mapping show remnants of the of historic channel locations. Through regular channel maintenance the channel has been dredged and sediment has been deposited on the channel banks creating small "islands" of sediment. For the hydraulic model, the entire area within the defined floodplain was considered to be effective in conveying flood water and the floodplain/floodway has been mapped as a continuous surface.

- **Model Calibration.** Calibration of models was not required in the scope of work for this project. However, the availability of recent flood flow data coupled with aerial photography from the January 2005 flood event created the opportunity to calibrate/validate the Virgin River model. The HEC-RAS model for the Virgin River was calibrated to the peak discharges published by the USGS for the January 2005 flood event. The computed floodplains using the established flood flows were compared to aerial photography taken January 13, 2005, which was during the later stages of the flood. The calibration results were reviewed with the local communities, State, FEMA, and NSP. This resulted in a greater level of accuracy and confidence in the hydraulic analysis and floodplain mapping.

Diversion Structure. An existing diversion structure is located near cross section 57170 of the proposed hydraulic model. Due to the backwater calculation employed by the HEC-RAS software for subcritical flow conditions, the cross section just downstream of the diversion contains the entire 100-year flood. The cross sections upstream of the diversion show that significant flow is outside the main channel, with a much wider top width. The floodplain in these situations was mapped from upstream to downstream, using the contour information to delineate the boundaries of the flood hazard. This means that actual mapped top widths at some cross section may not match the calculated top width from the HEC-RAS software. In this location sediment had been dredged out of the river and deposited on the left bank of the channel. For modeling purposes, this sediment was assumed to wash away during a flood event and the flood was allowed to extend across the entire floodplain. In addition, a negative surcharge was calculated in the floodway analysis at the top of the diversion where the profile breaches the top of the diversion, dropping through critical depth. The negative surcharge in this area is acceptable because it is due to velocity increase at a cross section that is already defaulting to critical depth.

HURRICANE CITY
UTAH

STAFF COMMENTS

Consideration and possible approval of **a contract award for a slurry seal project.**

Discussion:

Findings:

Recommendation:

Attachments:

1. 2022 Slurry Seal Bid Tabulation
2. 2022 Slurry Seal Maps

2022 Slurry Seal Project Bid Tabulation

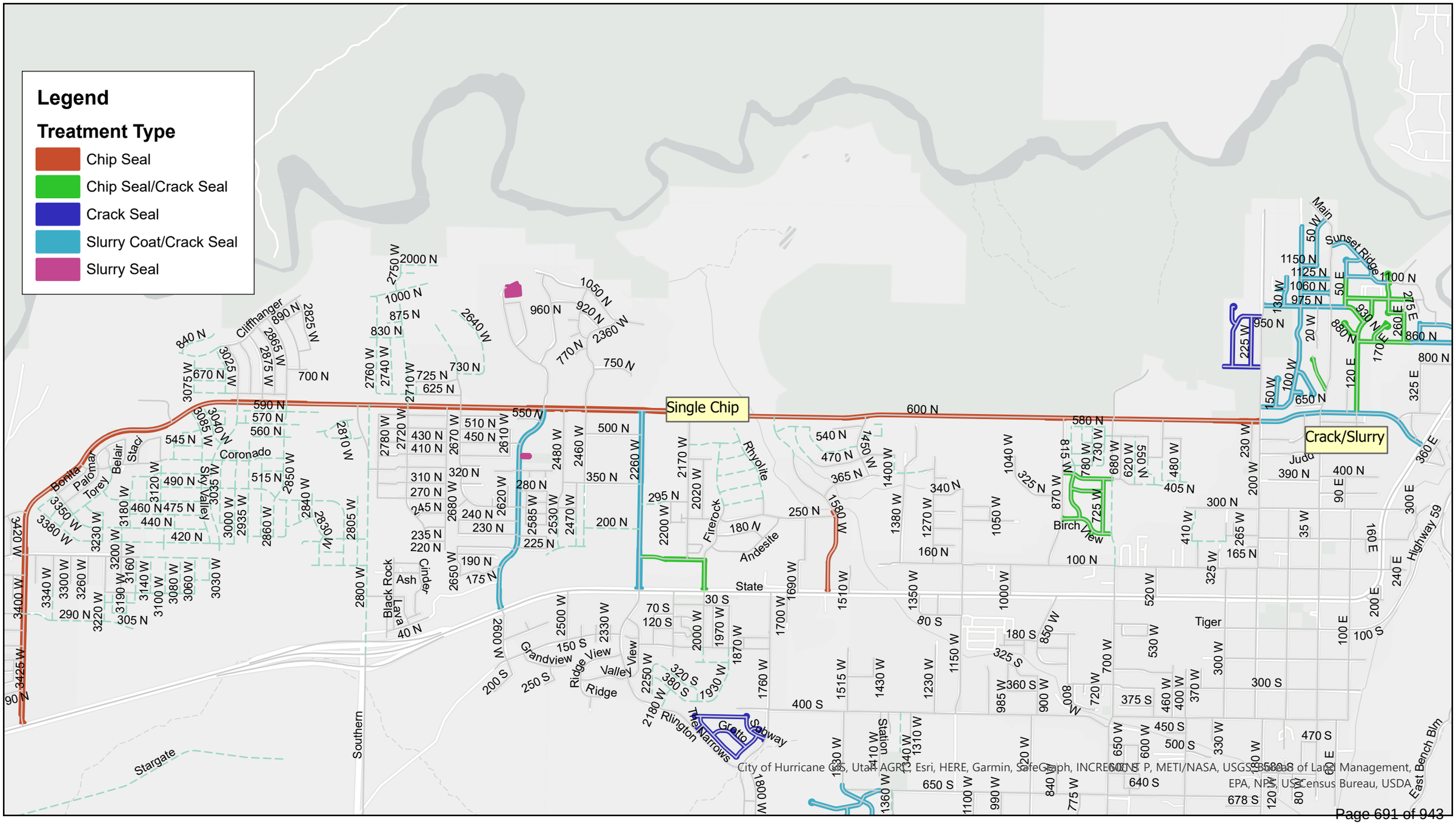
		Contractor:	American Pavement		Asphalt Preservation		Asphalt Preservation		Intermountain Slurry		Morgan Pavement	
Item	**Quantity**	**Unit**	**Unit Price**	**Cost**	**Unit Price**	**Cost**	**Unit Price**	**Cost**	**Unit Price**	**Cost**	**Unit Price**	**Cost**
Mobilization	1	Lump Sum	$ 2,000.00	$ 2,000.00	$ 10,000.00	$ 10,000.00	$ 1,000.00	$ 1,000.00	$ 15,000.00	$ 15,000.00	$ 12,000.00	$ 12,000.00
Traffic Control	1	Lump Sum	$ 5,021.00	$ 5,021.00	$ 6,000.00	$ 6,000.00	$ 1,500.00	$ 1,500.00	$ 9,000.00	$ 9,000.00	$ 2,500.00	$ 2,500.00
Type II Slurry Seal	141502	SY	$ 1.33	$ 188,197.66	$ 1.34	$ 189,612.68	$ 1.55	$ 219,328.10	$ 1.27	$ 179,707.54	$ 1.51	$ 213,668.02
			Total:	**$ 195,218.66**	**Total:**	**$ 205,612.68**	**Total:**	**$ 221,828.10**	**Total:**	**$ 203,707.54**	**Total:**	**$ 228,168.02**

600 North

0 1,500 3,000 6,000 Feet

City of Hurricane
GIS Department

This map is provided on an as is basis. The City of Hurricane makes no warranties expressed or implied as to the quality, and completeness, of the map and data provided. While the City of Hurricane has reviewed the information on this map, in no event shall the City of Hurricane be liable for damages arising from use by others.

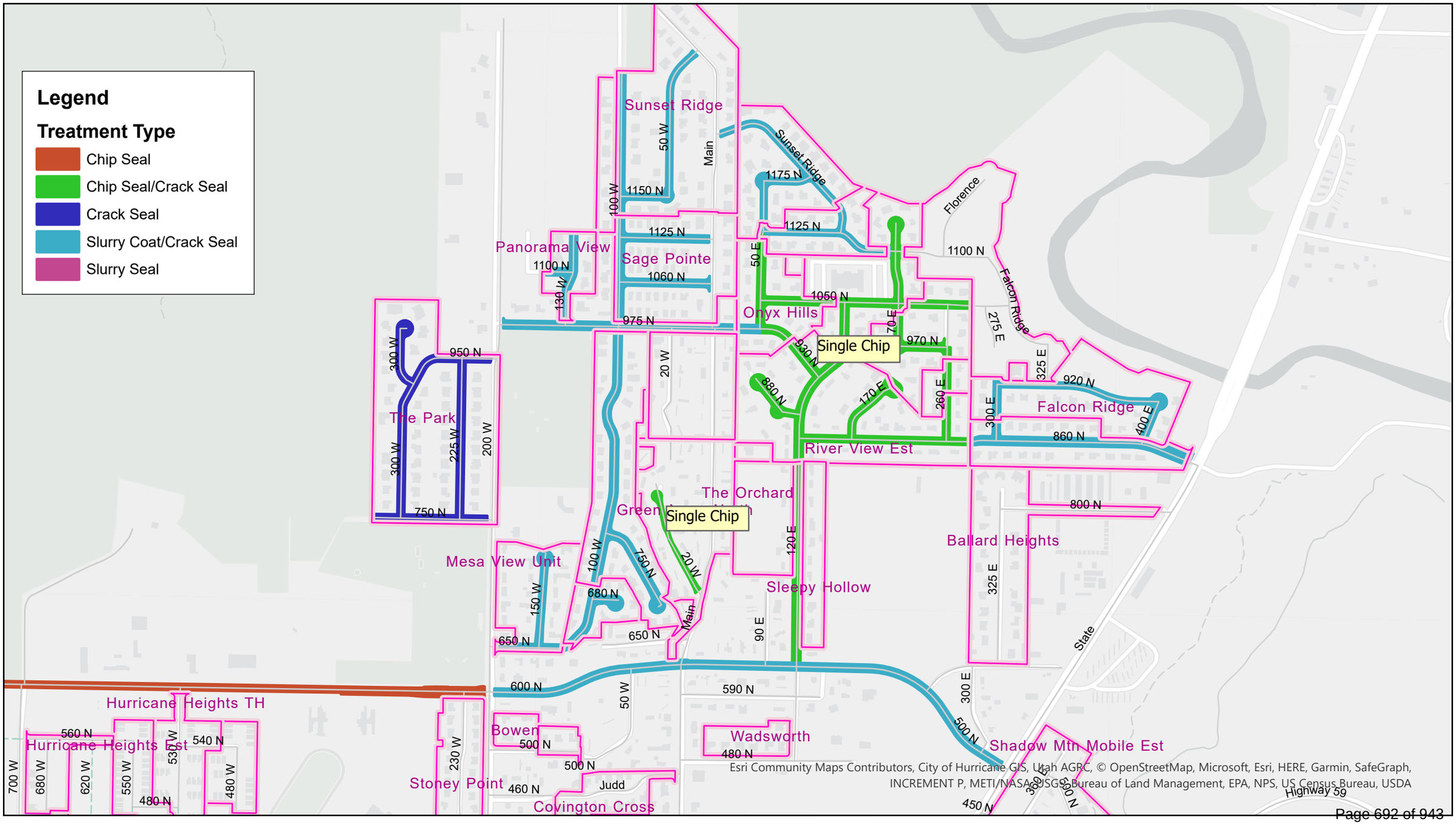


NE Hurricane Slurry/Crack
River View\Onyx Hills\Green Acres North Single Chip

0 475 950 1,900 Feet

City of Hurricane
GIS Department

This map is provided on an as is basis. The City of Hurricane makes no warranties expressed or implied as to the quality, and completeness, of the map and data provided. While the City of Hurricane has reviewed the information on this map, in no event shall the City of Hurricane be liable for damages arising from use by others.

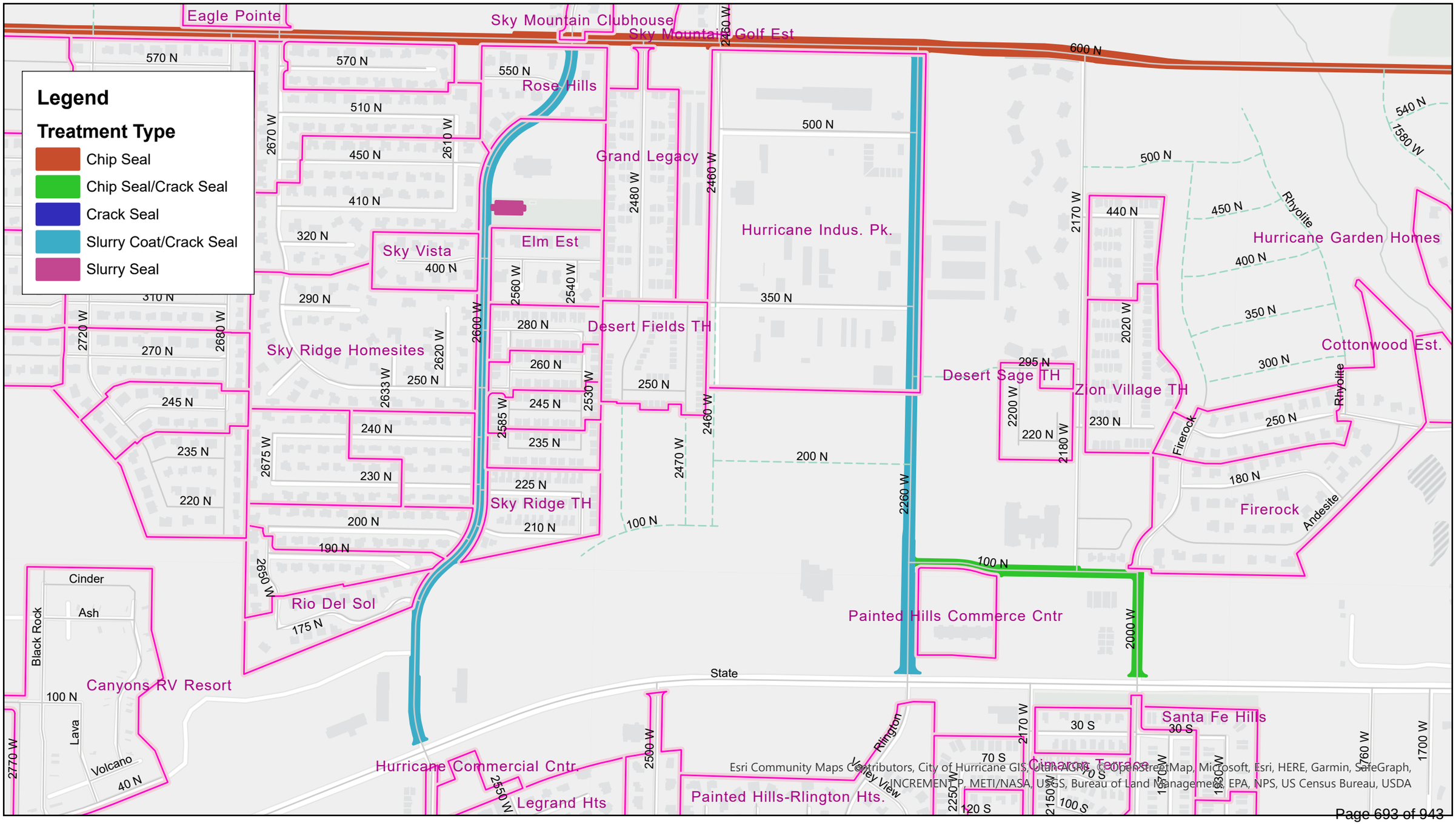


2260 W, 2600 W
100 N Crack/Single Chip Seal

0 425 850 1,700 Feet

This map is provided on an as is basis. The City of Hurricane makes no warranties expressed or implied as to the quality, and completeness, of the map and data provided. While the City of Hurricane has reviewed the information on this map, in no event shall the City of Hurricane be liable for damages arising from use by others.

City of Hurricane
GIS Department



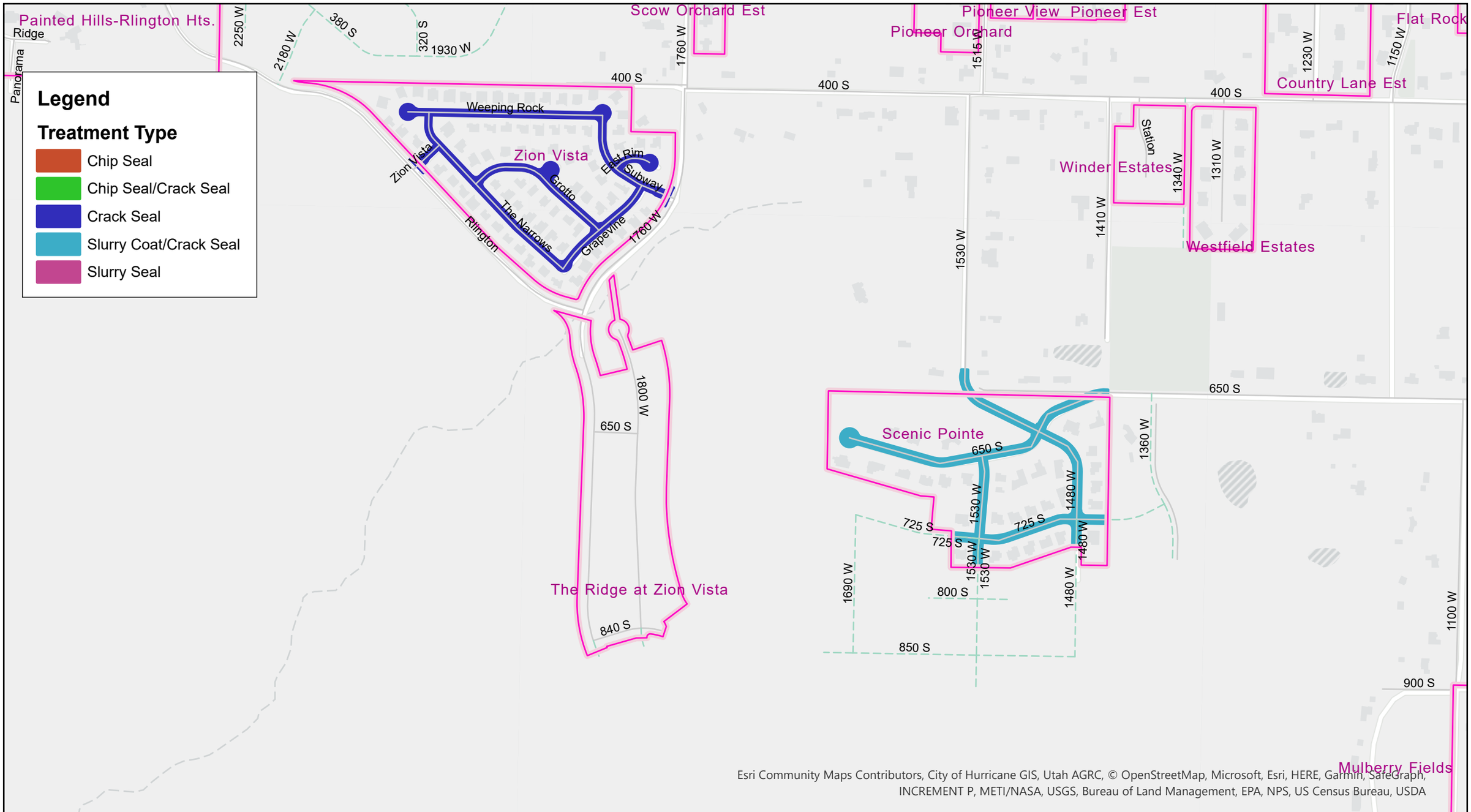
Esri Community Maps Contributors, City of Hurricane GIS, Utah AGRC, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA

Zion Vista Crack Seal
Scenic Point Crack/Slurry Seal

City of Hurricane
GIS Department

0 400 800 1,600 Feet

This map is provided on an as is basis. The City of Hurricane makes no warranties expressed or implied as to the quality, and completeness, of the map and data provided. While the City of Hurricane has reviewed the information on this map, in no event shall the City of Hurricane be liable for damages arising from use by others.



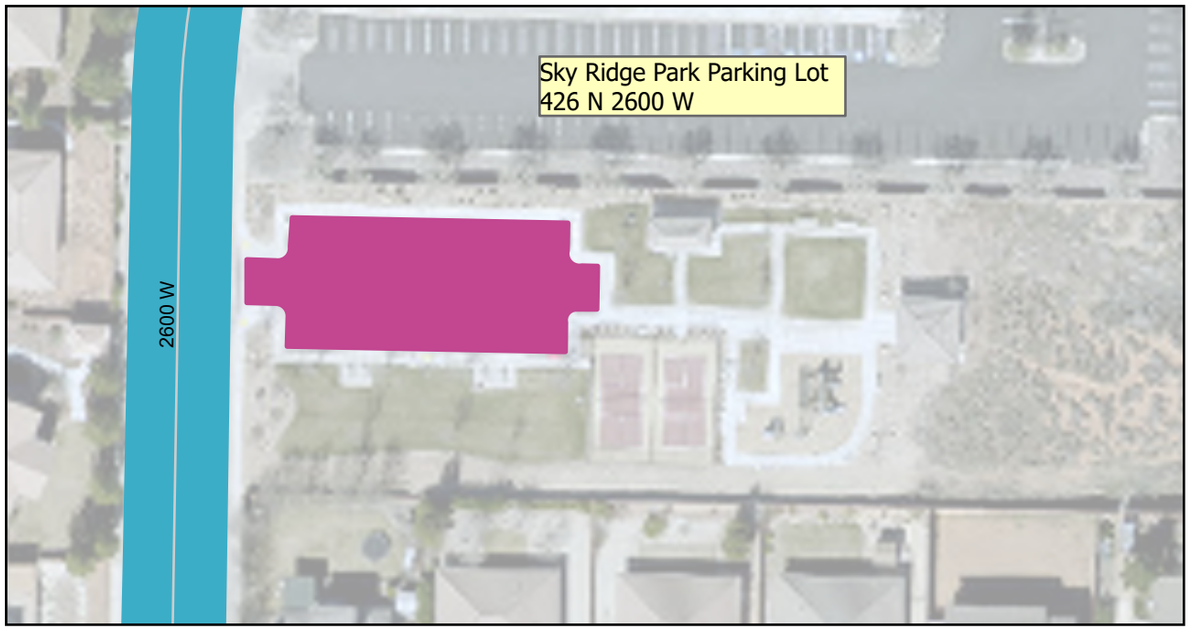
Esri Community Maps Contributors, City of Hurricane GIS, Utah AGRC, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA

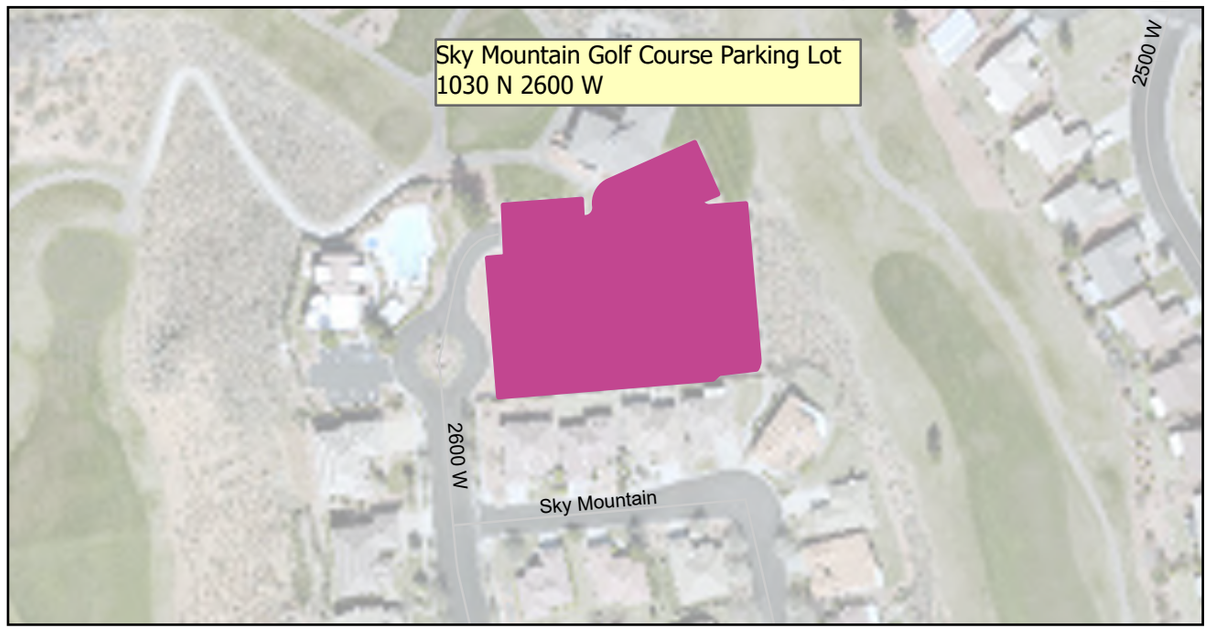
Sky Ridge Park, Sky Mountain Golf Course, Dixie Springs Park

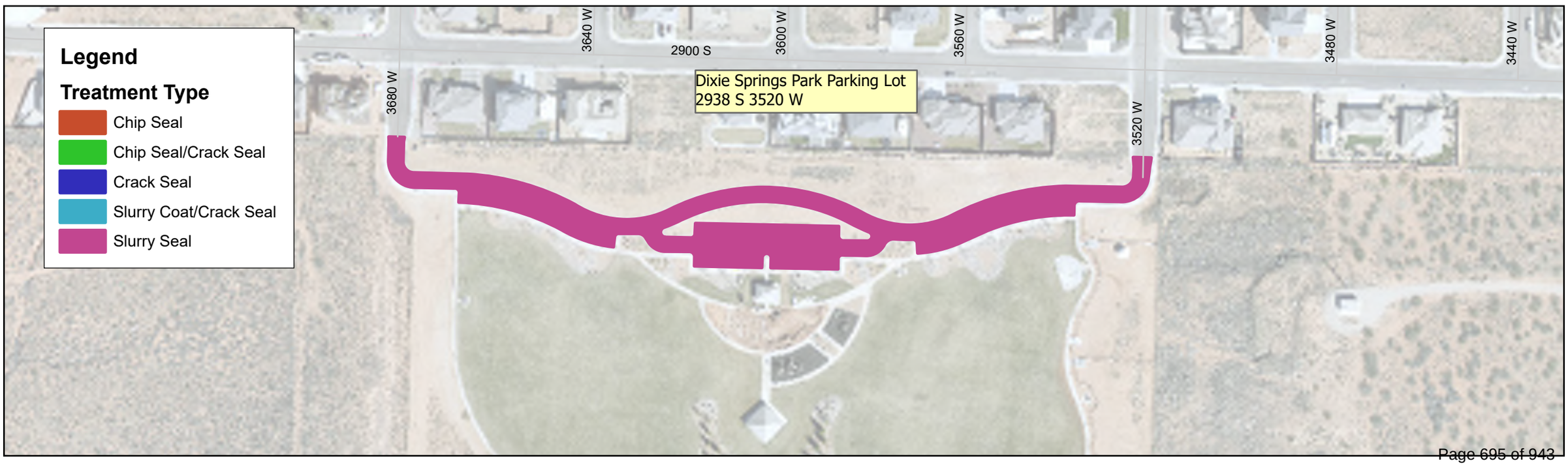
0 130 260 520 Feet

City of Hurricane
GIS Department

This map is provided on an as is basis. The City of Hurricane makes no warranties expressed or implied as to the quality, and completeness, of the map and data provided. While the City of Hurricane has reviewed the information on this map, in no event shall the City of Hurricane be liable for damages arising from use by others.





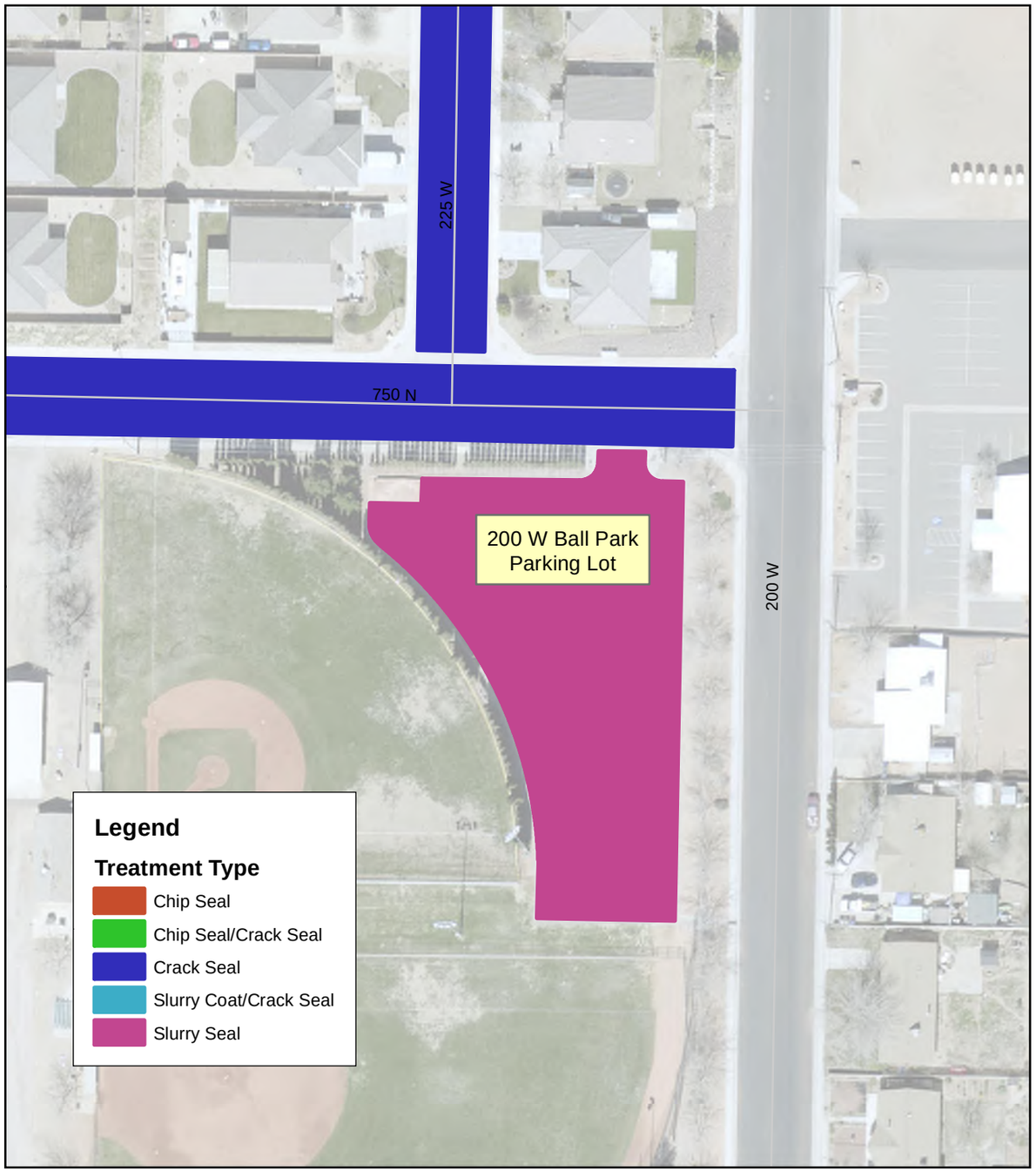


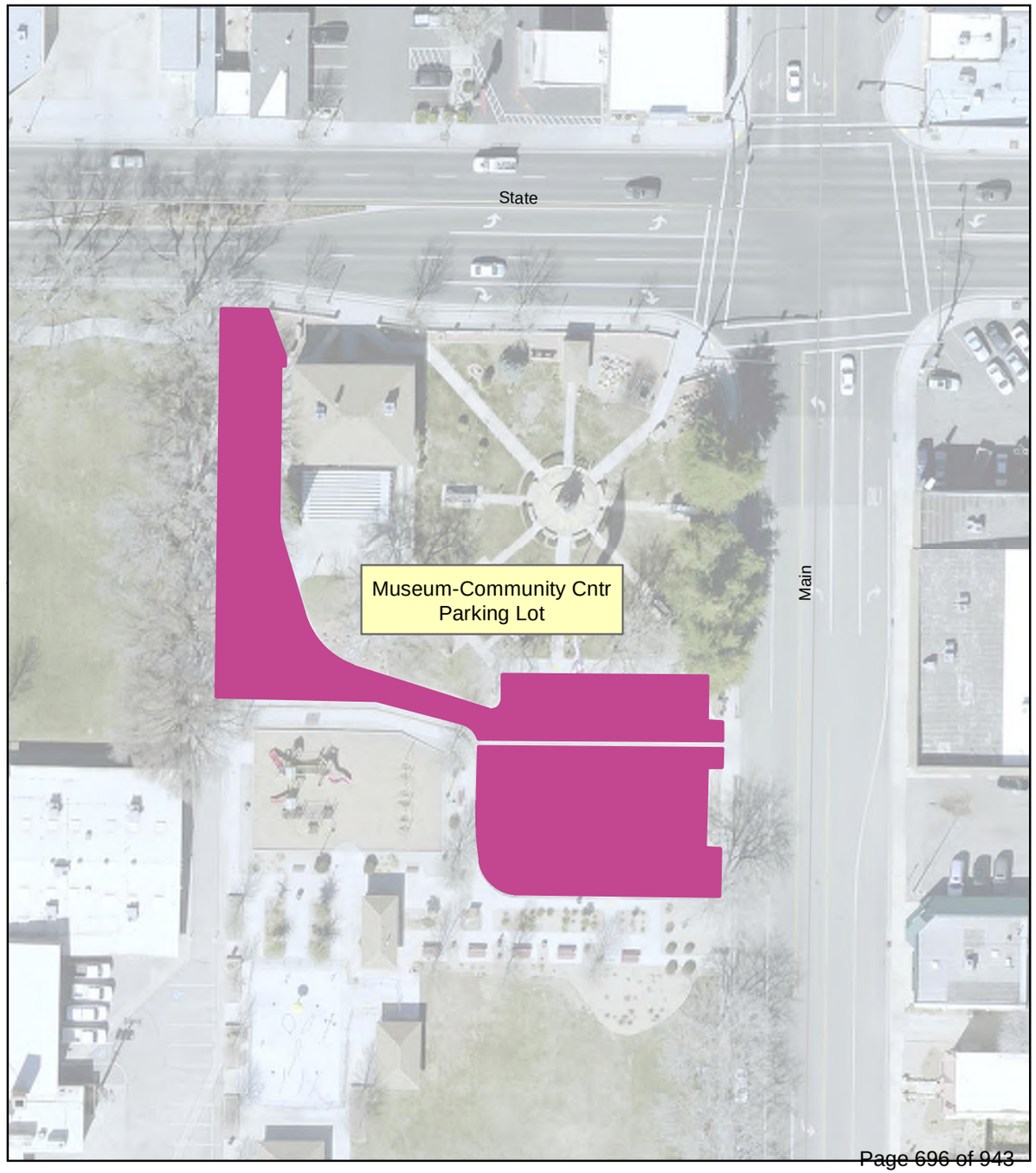
Ball Park Park and Comminity Cntr Parking Lots

0 65 130 260 Feet

City of Hurricane
GIS Department

This map is provided on an as is basis. The City of Hurricane makes no warranties expressed or implied as to the quality, and completeness, of the map and data provided. While the City of Hurricane has reviewed the information on this map, in no event shall the City of Hurricane be liable for damages arising from use by others.





HURRICANE CITY
UTAH

STAFF COMMENTS

Consideration and possible approval of a **contract award for a chip seal project**.

Discussion:

Findings:

Recommendation:

Attachments:

1. 2022 Chip Seal Bid Tabulation
2. 2022 Chip Seal Maps

2022 Chip Seal Project Bid Tabulation

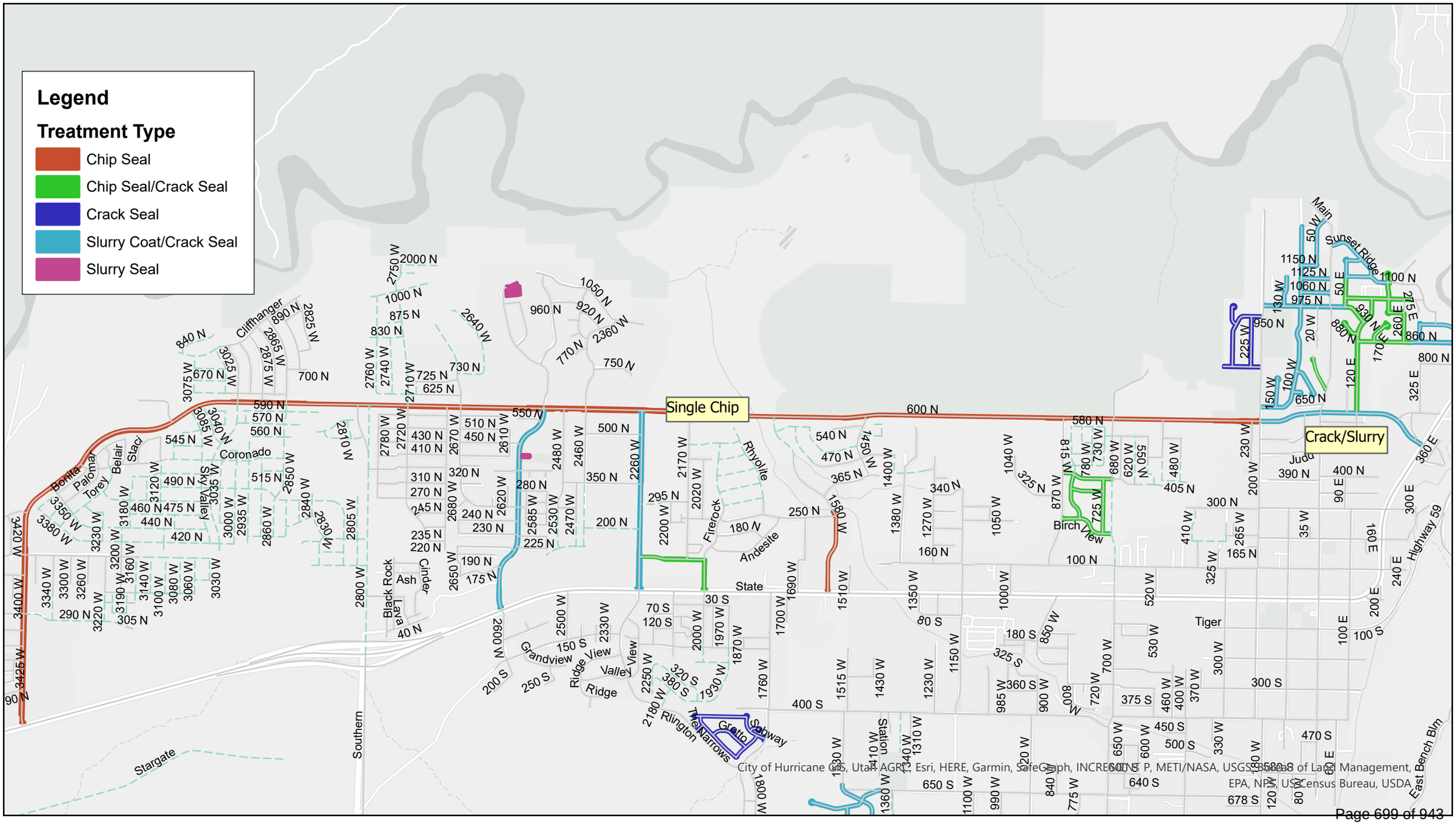
Contractor:			Interstate Rock Products		CKC Operations		CPCO		Staker Parsons		Intermountain	
Bid Schedule (Single Chip)												
Item	**Quantity**	**Unit**	**Unit Price**	**Cost**	**Unit Price**	**Cost**	**Unit Price**	**Cost**	**Unit Price**	**Cost**	**Unit Price**	**Cost**
Mobilization	1	Lump Sum	$ 27,964.81	$ 27,964.81	$ 252.67	$ 44,218.09	$ 33,235.00	$ 33,235.00	$ 35,000.00	$ 35,000.00	$ 10,000.00	$ 10,000.00
Traffic Control	1	Lump Sum	$ 11,640.79	$ 11,640.79	$ 2,456.16	$ 17,193.09	$ 4,025.00	$ 4,025.00	$ 52,000.00	$ 52,000.00	$ 10,000.00	$ 10,000.00
Chip Seal, Single Layer	147606	SY	$ 1.01	$ 149,082.06	$ 1.16	$ 171,222.96	$ 1.01	$ 149,082.06	$ 1.40	$ 206,648.40	$ 0.90	$ 132,845.40
LMCRS-2H Oil	248	Ton	$ 838.14	$ 207,858.72	$ 771.68	$ 191,376.64	$ 746.60	$ 185,156.80	$ 860.00	$ 213,280.00	$ 725.00	$ 179,800.00
			Total:	**$ 396,546.38**	**Total:**	**$ 424,010.78**	**Total:**	**$ 371,498.86**	**Total:**	**$ 506,928.40**	**Total:**	**$ 332,645.40**
Alternate A Bid Schedule (Double Chip)												
Item	**Quantity**	**Unit**	**Unit Price**	**Cost**			**Unit Price**	**Cost**	**Unit Price**	**Cost**	**Unit Price**	**Cost**
Mobilization	1	Lump Sum	$ 40,769.68	$ 40,769.68			$ 50,232.00	$ 50,232.00	$ 38,000.00	$ 38,000.00	$ 10,000.00	$ 10,000.00
Traffic Control	1	Lump Sum	$ 24,445.67	$ 24,445.67			$ 6,957.50	$ 6,957.50	$ 88,000.00	$ 88,000.00	$ 15,000.00	$ 15,000.00
Chip Seal, Double Layer	147606	SY	$ 1.76	$ 259,786.56			$ 1.69	$ 249,454.14	$ 2.80	$ 413,296.80	$ 1.80	$ 265,690.80
LMCRS-2H Oil	496	Ton	$ 838.14	$ 415,717.44			$ 746.60	$ 370,313.60	$ 860.00	$ 426,560.00	$ 725.00	$ 359,600.00
			Total:	**$ 740,719.35**			**Total:**	**$ 676,957.24**	**Total:**	**$ 965,856.80**	**Total:**	**$ 650,290.80**
Alternate B Bid Schedule (900 South)												
Item	**Quantity**	**Unit**	**Unit Price**	**Cost**			**Unit Price**	**Cost**	**Unit Price**	**Cost**	**Unit Price**	**Cost**
Mobilization	1	Lump Sum	$ 3,903.33	$ 3,903.33			$ 4,910.50	$ 4,910.50	$ 4,000.00	$ 4,000.00	$ 2,500.00	$ 2,500.00
Traffic Control	1	Lump Sum	$ 2,910.22	$ 2,910.22			$ 460.00	$ 460.00	$ 2,000.00	$ 2,000.00	$ 5,000.00	$ 5,000.00
Chip Seal, Double Layer	4641	SY	$ 6.52	$ 30,259.32			$ 4.40	$ 20,420.40	$ 9.20	$ 42,697.20	$ 11.00	$ 51,051.00
LMCRS-2H Oil	8	Ton	$ 1,129.17	$ 9,033.36			$ 1,699.53	$ 13,596.24	$ 1,100.00	$ 8,800.00	$ 4,000.00	$ 32,000.00
			Total:	**$ 46,106.23**			**Total:**	**$ 39,387.14**	**Total:**	**$ 57,497.20**	**Total:**	**$ 90,551.00**

600 North

0 1,500 3,000 6,000 Feet

City of Hurricane
GIS Department

This map is provided on an as is basis. The City of Hurricane makes no warranties expressed or implied as to the quality, and completeness, of the map and data provided. While the City of Hurricane has reviewed the information on this map, in no event shall the City of Hurricane be liable for damages arising from use by others.

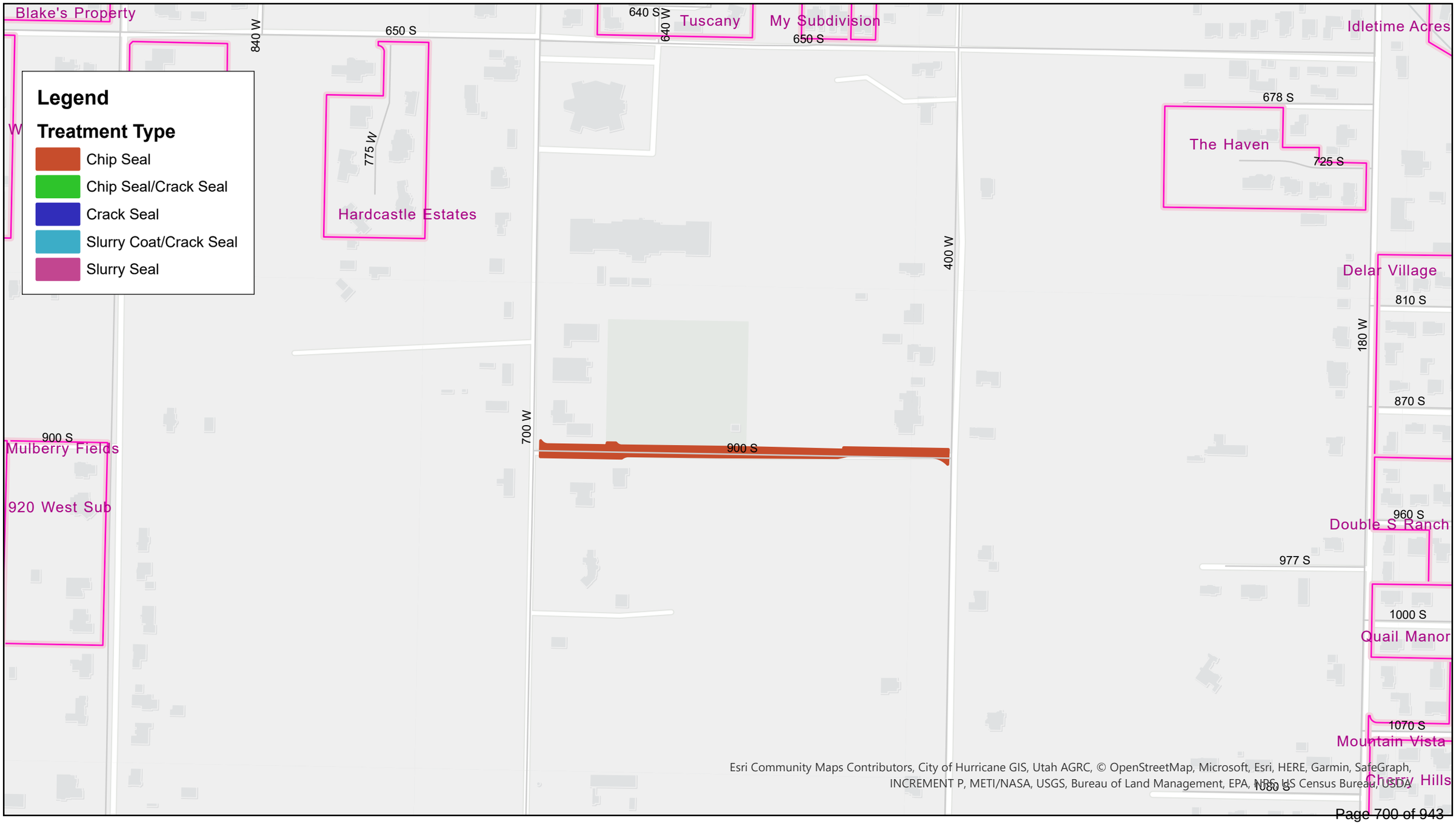


900 South
Double Chip

0 275 550 1,100 Feet

This map is provided on an as is basis. The City of Hurricane makes no warranties expressed or implied as to the quality, and completeness, of the map and data provided. While the City of Hurricane has reviewed the information on this map, in no event shall the City of Hurricane be liable for damages arising from use by others.

City of Hurricane
GIS Department



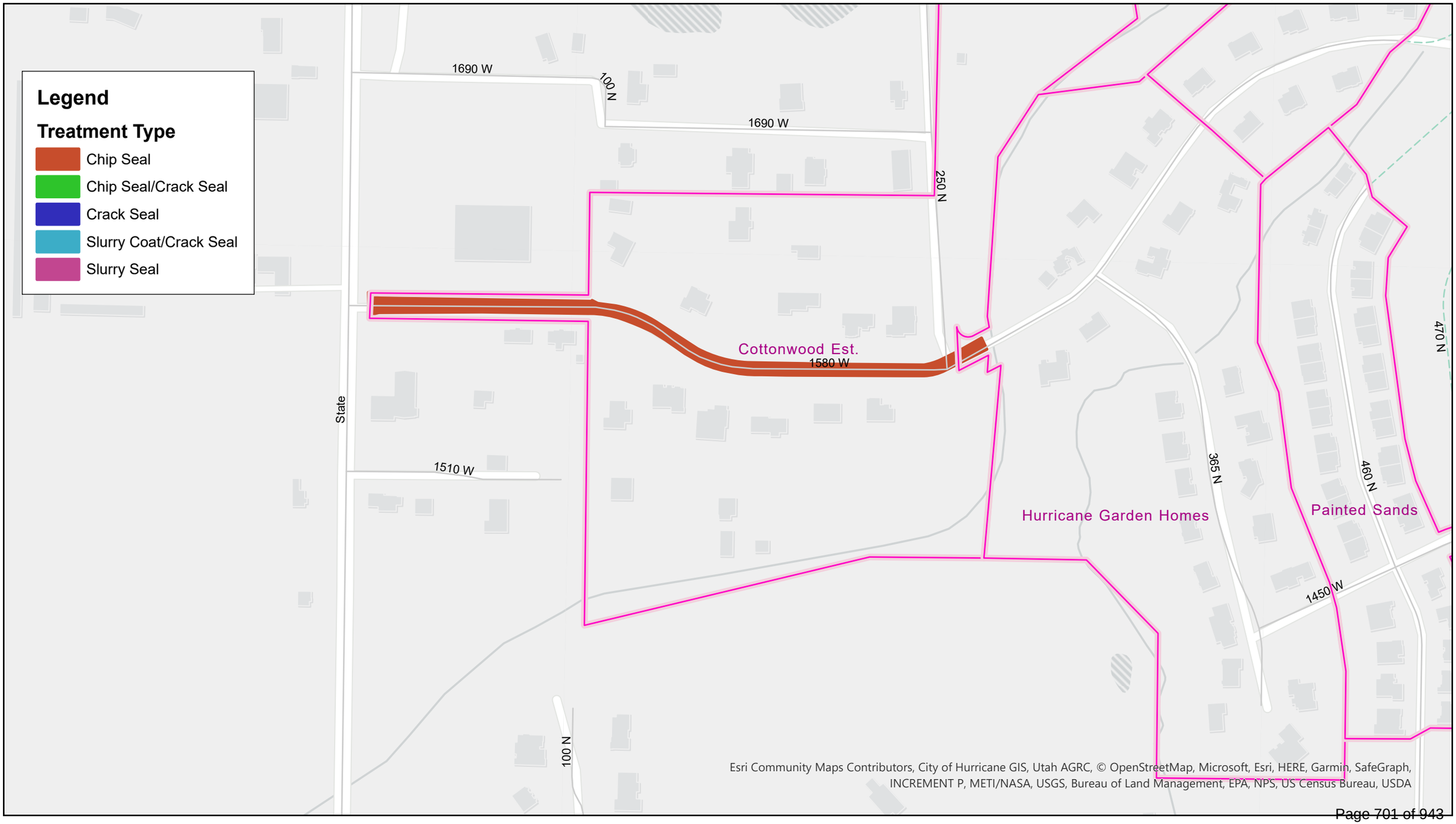
Esri Community Maps Contributors, City of Hurricane GIS, Utah AGRC, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA

1580 W Double Chip

0 195 390 780 Feet

City of Hurricane
GIS Department

This map is provided on an as is basis. The City of Hurricane makes no warranties expressed or implied as to the quality, and completeness, of the map and data provided. While the City of Hurricane has reviewed the information on this map, in no event shall the City of Hurricane be liable for damages arising from use by others.

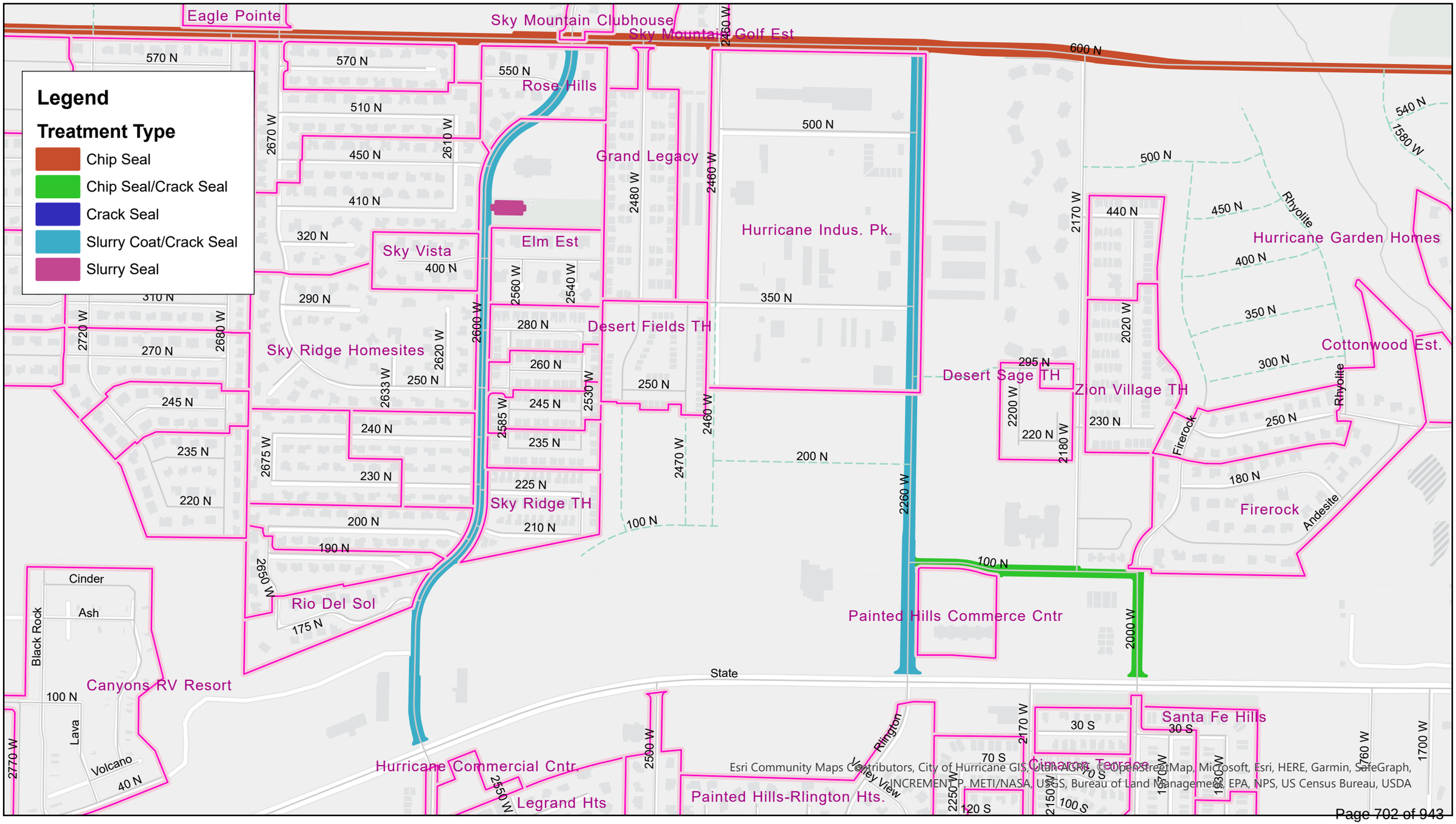


2260 W, 2600 W
100 N Crack/Single Chip Seal

0 425 850 1,700 Feet

City of Hurricane
GIS Department

This map is provided on an as is basis. The City of Hurricane makes no warranties expressed or implied as to the quality, and completeness, of the map and data provided. While the City of Hurricane has reviewed the information on this map, in no event shall the City of Hurricane be liable for damages arising from use by others.



Esri Community Maps Contributors, City of Hurricane GIS, Utah AGRC, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA

3400 W Single Chip

0 300 600 1,200 Feet

City of Hurricane
GIS Department

This map is provided on an as is basis. The City of Hurricane makes no warranties expressed or implied as to the quality, and completeness, of the map and data provided. While the City of Hurricane has reviewed the information on this map, in no event shall the City of Hurricane be liable for damages arising from use by others.



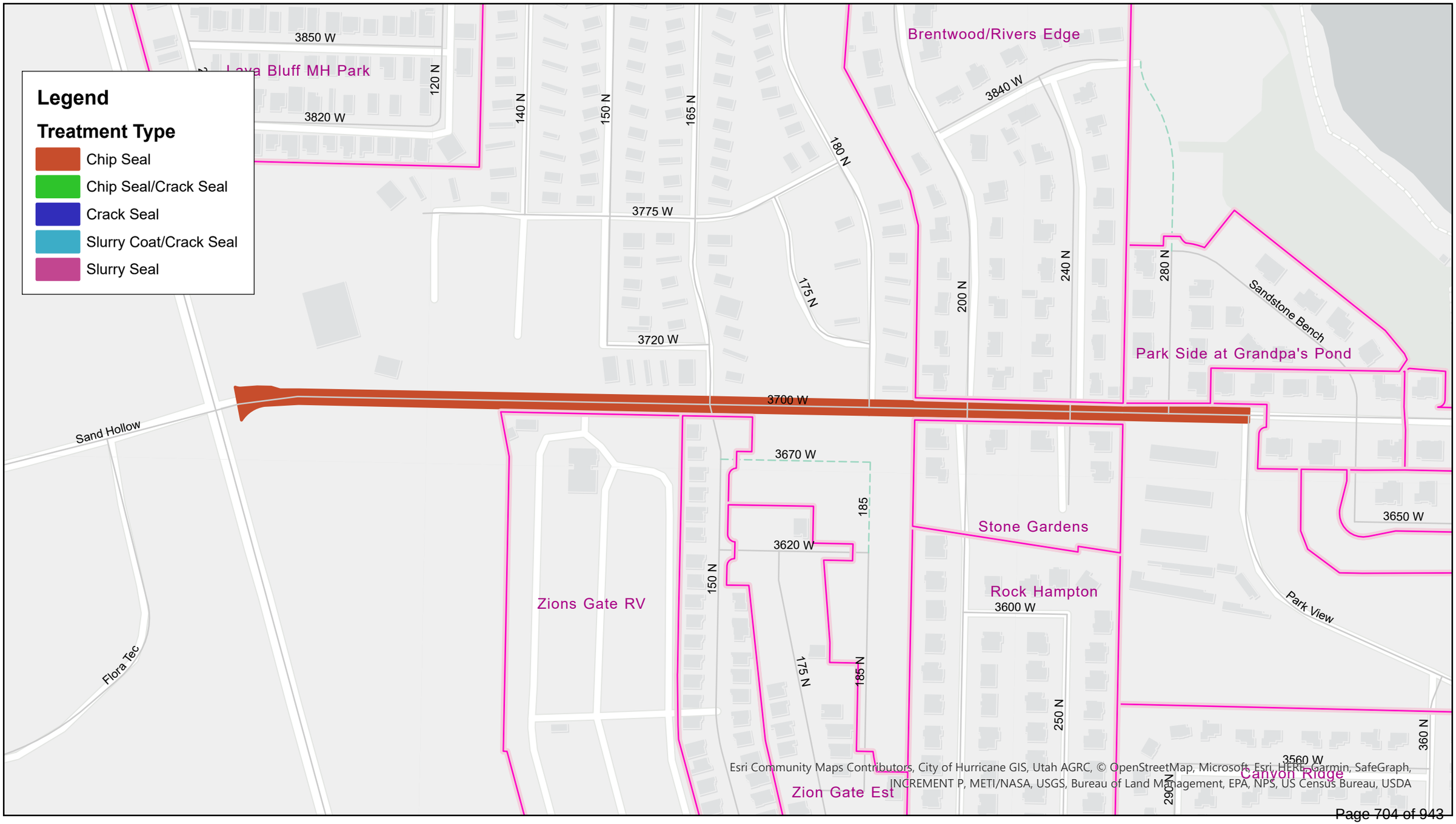
Esri Community Maps Contributors, City of Hurricane GIS, Utah AGRC, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA

3700 W Double Chip

0 230 460 920 Feet

City of Hurricane
GIS Department

This map is provided on an as is basis. The City of Hurricane makes no warranties expressed or implied as to the quality, and completeness, of the map and data provided. While the City of Hurricane has reviewed the information on this map, in no event shall the City of Hurricane be liable for damages arising from use by others.

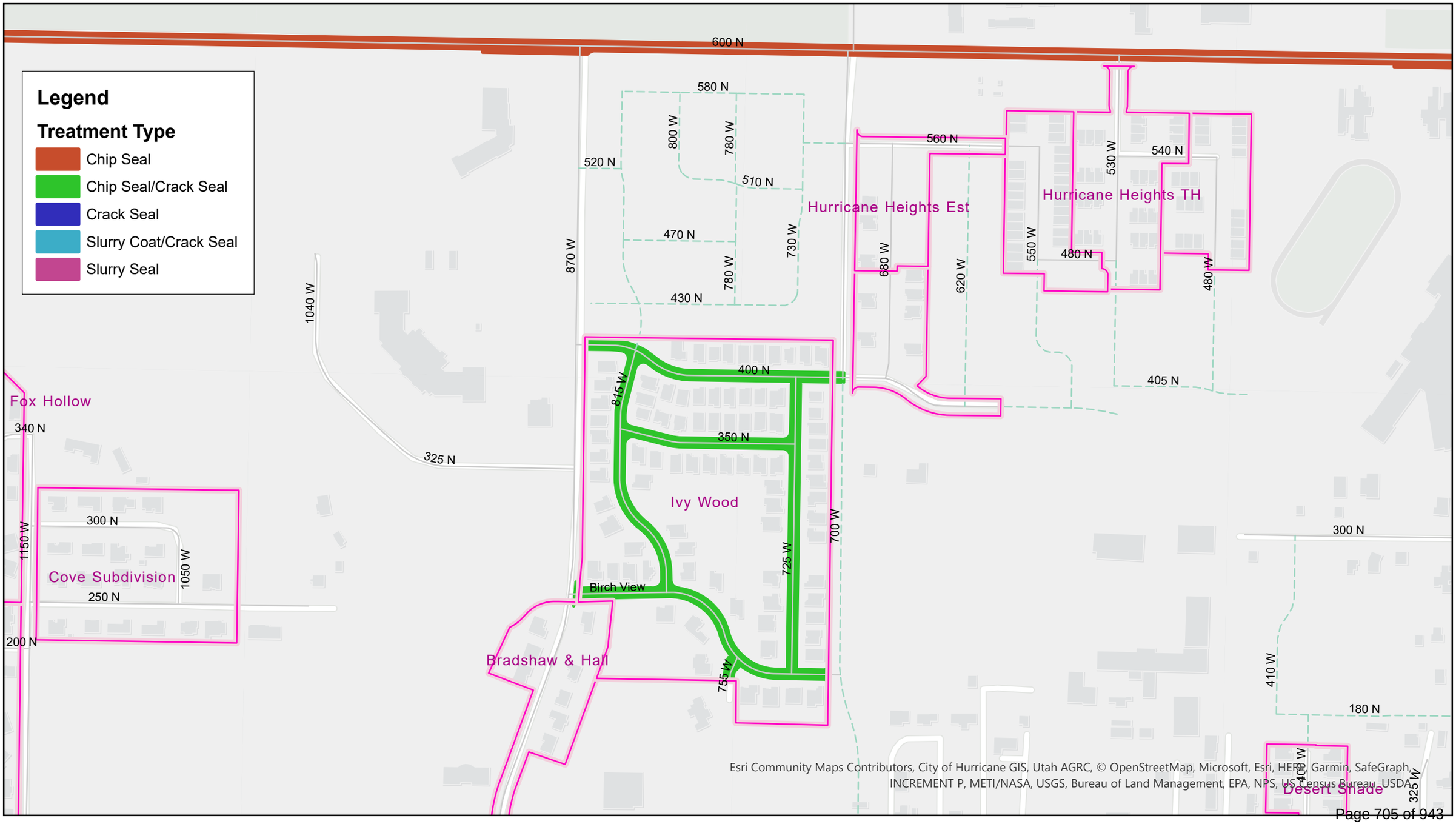


Ivy Wood Sub
Single Chip

0 275 550 1,100 Feet

City of Hurricane
GIS Department

This map is provided on an as is basis. The City of Hurricane makes no warranties expressed or implied as to the quality, and completeness, of the map and data provided. While the City of Hurricane has reviewed the information on this map, in no event shall the City of Hurricane be liable for damages arising from use by others.

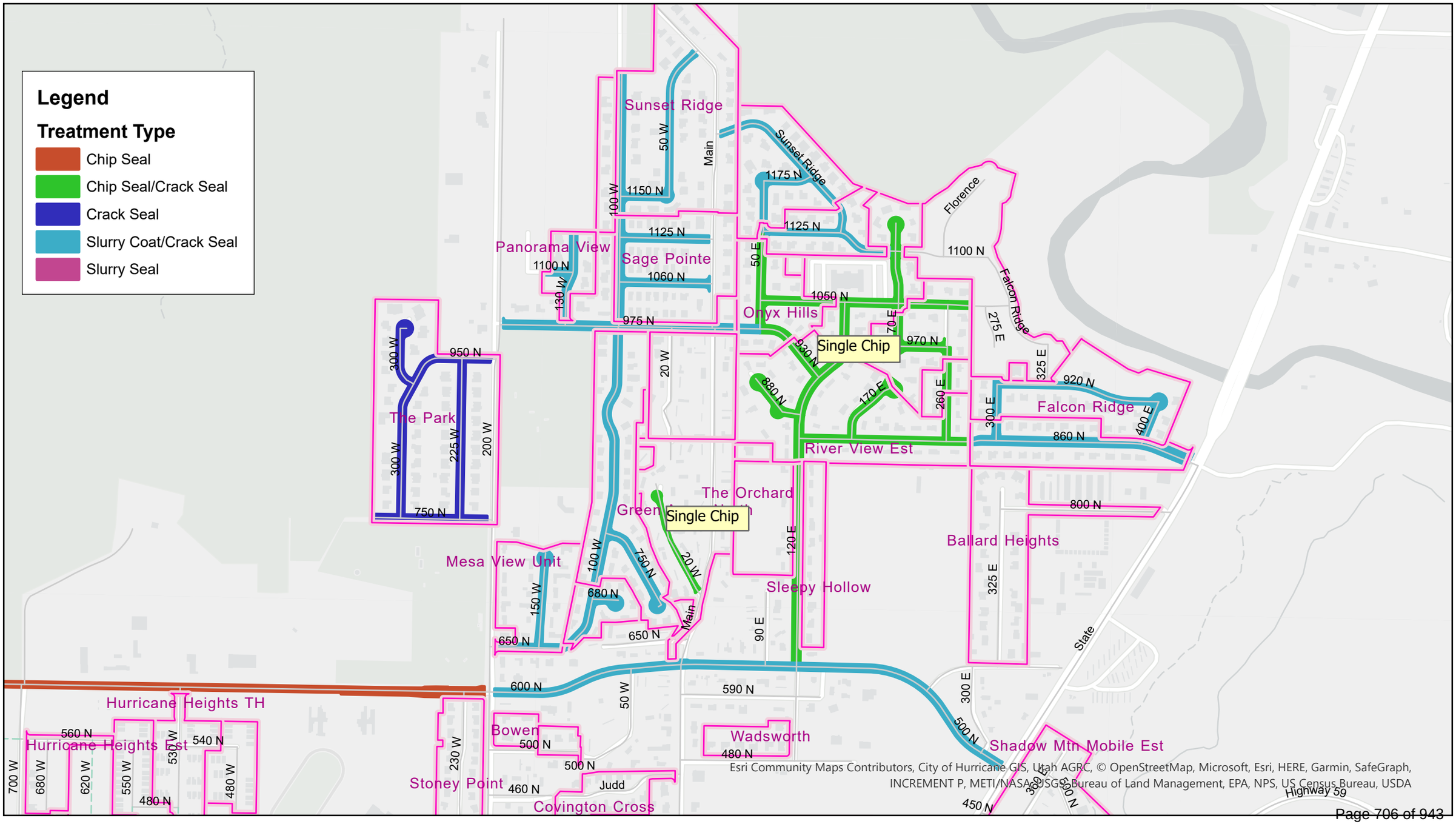


NE Hurricane Slurry/Crack
River View\Onyx Hills\Green Acres North Single Chip

0 475 950 1,900 Feet

City of Hurricane
GIS Department

This map is provided on an as is basis. The City of Hurricane makes no warranties expressed or implied as to the quality, and completeness, of the map and data provided. While the City of Hurricane has reviewed the information on this map, in no event shall the City of Hurricane be liable for damages arising from use by others.



AGENDA FORM

Date of City Council meeting: 2/17/2022

Name of Person Making Presentation: Douglas T Dennett

Address: 1413 S. Sandhill Drive, Washington, Utah 84780

Contact #:

Phone: (435)-703-3684

e-mail: dennettconstruction@gmail.com

Approximate length of discussion: 15 minutes

Description of item to be discussed: Quail Creek Industrial Grading Permit

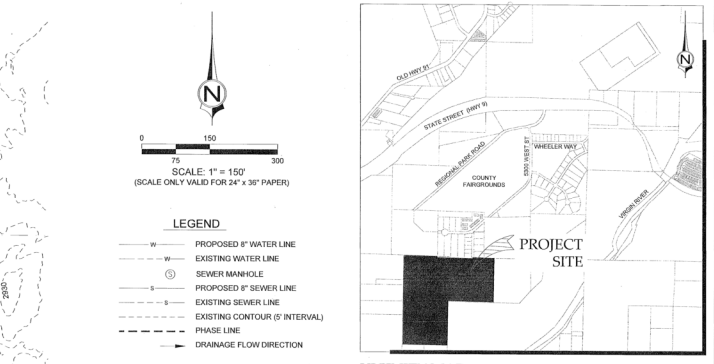
If this is a complaint issue:

Have you tried to resolve the issue with staff? __ ***yes*** __ ***no***

If yes, with whom? _____

If you have a power point presentation, we would encourage you to keep it under 10 minutes. All other items discussed will be done as quickly and as efficiently as possible.





VICINITY MAP
(N.T.S.)

SCALE: 1" = 150'
(SCALE ONLY VALID FOR 24" x 36" PAPER)

LEGEND
- PROPOSED 8" WATER LINE
- EXISTING WATER LINE
- SEWER MANHOLE
- PROPOSED 8" SEWER LINE
- EXISTING SEWER LINE
- EXISTING CONTOUR (5' INTERVAL)
- PHASE LINE
- DRAINAGE FLOW DIRECTION

LEGAL DESCRIPTION (ALL PHASES)

BEGINNING AT THE NORTHWEST CORNER OF SECTION 10, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SALT LAKE BASE AND MERIDIAN, AND RUNNING THENCE S 88°08'24" E 995.87 FEET ALONG THE NORTH LINE OF SAID SECTION 10, TO A POINT ON THE WEST BOUNDARY LINE OF QUAIL CREEK INDUSTRIAL PARK SUBDIVISION PHASE 3, RECORDED AND ON FILE IN THE OFFICE OF THE RECORDER, WASHINGTON COUNTY, STATE OF UTAH; THENCE ALONG SAID SUBDIVISION THE FOLLOWING TWO (2) COURSES, (1) S 0°48'39" W 31.28 FEET, (2) THENCE S 88°08'15" E 785.79 FEET, TO THE SOUTHWEST CORNER OF QUAIL CREEK INDUSTRIAL PARK SUBDIVISION PHASE 2, RECORDED AND ON FILE IN THE OFFICE OF SAID RECORDER; THENCE ALONG SAID SUBDIVISION BOUNDARY THE FOLLOWING THREE (3) COURSES, (1) S 89°08'15" E 247.72 FEET, (2) THENCE N 0°38'37" E 31.33 FEET, (3) THENCE S 88°08'15" E 657.00 FEET ALONG SAID BOUNDARY AND THE EXTENSION THEREOF, TO THE NORTH 1/4 CORNER OF SAID SECTION 10; THENCE S 1°29'06" W 1304.55 FEET ALONG THE CENTER SECTION LINE OF SAID SECTION 10, TO THE CENTER NORTH 1/16TH CORNER; THENCE N 88°23'15" W 1338.75 FEET ALONG THE NORTH 1/16TH LINE TO THE NORTHWEST 1/16TH CORNER OF SAID SECTION 10; THENCE S 1°17'29" W 1310.51 FEET ALONG THE WEST 1/16TH LINE TO THE CENTER WEST 1/16TH CORNER; THENCE N 88°38'05" W 1334.20 FEET ALONG THE CENTER SECTION LINE TO THE WEST 1/4 CORNER OF SAID SECTION 10; THENCE N 1°05'58" E 2632.50 FEET ALONG THE WEST LINE OF SAID SECTION 10, TO THE POINT OF BEGINNING.

CONTAINS 120.22 ACRES MORE OR LESS

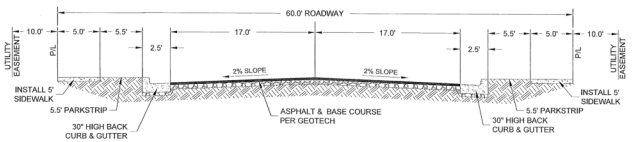
PROJECT NOTES

1. PROJECT TO BE DEVELOPED IN MULTIPLE PHASES AS NOTED. PHASE 1 CONTAINS FIFTEEN LOTS ON 25.3 ACRES.
2. PROPERTY IS NOT LOCATED IN DESERT TORTOISE TAKE AREA.
3. DRAINAGE WILL BE CONVEYED THROUGH A SYSTEM OF CURBS, GUTTERS, CATCH BASINS, AND PIPES. ALL STORM EVENTS WILL CONVERGE THROUGH THIS SYSTEM TO A DETENTION BASIN THAT WILL BE DESIGNED AT THE LOW POINT OF THE SITE (NORTH OF LOT #801). AN OUTLET WILL BE DESIGNED IN THE BASIN THAT WILL ALLOW STORM FLOWS TO ULTIMATELY DAYLIGHT TO THE WEST OF THE SITE. INDIVIDUAL LOTS WILL PROVIDE REAR LOT DETENTION. OFFSITE FLOWS WILL BE MITIGATED THROUGH THIS SAME SYSTEM.
4. SEWER FLOWS WILL BE DIRECTED TO A SEWER LIFT STATION AT THE LOW POINT OF THE SITE (NORTH OF LOT #801) VIA A GRAVITY SYSTEM. A SEWER FORCE MAIN WILL THEN DIRECT FLOWS OUT OF THE LIFT STATION NORTH ALONG REGIONAL PARK ROAD, THEN EAST ALONG THE NORTHERN END OF THE SITE AND THEN OUT TO THE NORTH ALONG THE PROPOSED REALIGNMENT OF PURGATORY ROAD. THIS FORCE MAIN WILL CONNECT TO A GRAVITY SEWER MAIN.

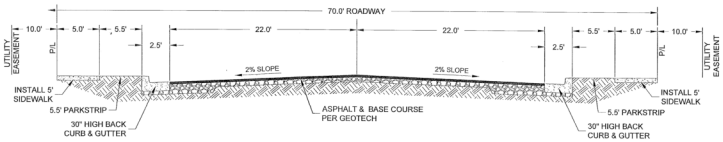
USGS SPECIAL STUDY 127

- GEOLOGIC HAZARD FAULTS AND SURFACE FAULTING: CONSIDERED LOW
- GEOLOGIC HAZARD LIQUEFACTION: CONSIDERED LOW
- FEMA FLOODING: NOT AFFECTED
- GEOLOGIC HAZARD LANDSLIDE HAZARD: CONSIDERED LOW
- GEOLOGIC HAZARD ROCK FALL HAZARD: NOT AFFECTED
- PROBLEM SOIL & ROCK HAZARDS: SILTY SAND OVERLYING FRACTURED CLAYSTONE/SILTSTONE/SANDSTONE BEDROCK
- SHALLOW GROUND WATER: GROUND WATER NOT ENCOUNTERED
- NO EXPANSIVE OR COLLAPSIBLE SOILS HAVE BEEN ENCOUNTERED (GEOTECHNICAL REPORT HAS BEEN PROVIDED)

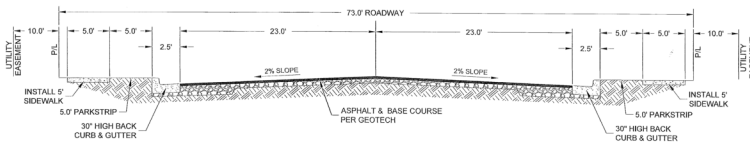
60' PUBLIC STREET



70' PUBLIC STREET



73' PUBLIC STREET



PROPERTY OWNER
D & G PROPERTY HOLDING LLC
1413 SANDHILL DR
WASHINGTON, UT 84780

DENNETTCONSTRUCTION@GMAIL.COM

PROJECT INFORMATION

AREA: 120.22 ACRES
UNITS: 63 INDUSTRIAL UNITS
DENSITY: 0.52 D.U./ACRE
STREETS: PUBLIC STREETS
ZONING: M-1

QUAIL CREEK INDUSTRIAL PHASES 5-8

PRELIMINARY PLAT

SECTION 10, T 42 S, R 14 W, SLB&M

HURRICANE CITY
UTAH

STAFF COMMENTS

Consideration and possible approval of **a grading permit for Scholzen Products-**Bruce Ballard

Discussion:
Hurricane City Code allows a property owner to see a grading permit prior to any development based on the standards below:

Sec. 10-7-23. - Grading permit by exception.
Notwithstanding any other provision in this title to the contrary, the Zoning Administrator shall be authorized, upon an affirmative vote of the City Council, to issue a grading permit for property not scheduled for immediate or reasonably imminent development upon such terms and conditions as may be deemed necessary by said City Council to guarantee the protection of the property and neighboring properties against problems resulting from such grading, including, but not limited to, the accumulation of weeds, soil erosion, surface drainage, and dust.

Normally, a property that is seeking a grading permit and development waits until the preliminary plat and full construction drawings have been approved. This ensures that all aspects of the development have been reviewed to ensure items like stormwater and utility drainage have been addressed before work begins. Based on this standard, the City does not allow for a grading permit for a property that is " immediate or reasonably imminent development".

Findings:
There is insufficient details based on the information that has been submitted by the property owner.

Recommendation:
There is insufficient information for the Council to make any decisions at this time. The item should be continued until more information can be provided.

Attachments:
None

ZONE CHANGE APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $500.00

For Office Use Only:
File No. 2022-ZC-04
Receipt No. 7.689243

Name: Molly's View, LLC **Telephone:** (435) 767-1463

Address: 1568 S RIVER RD STE 200, ST. GEORGE, UT 84790 **Fax No:** _____

Agent (If Applicable): RICHARD WEDIG **Telephone:** (435) 229-4878

Email: promedmgt@gmail.com **Agent Email:** promedmgt@gmail.com

Address/Location of Subject Property: 2600 South 2350 West

Tax ID of Subject Property: H-3373-NP **Existing Zone District:** M-1/R1-10 PDO

Proposed Zoning District and reason for the request (Describe, use extra sheet if necessary)
Change M-1 ZONE FROM 26.7 ACRES TO 31.83 ACRES to BUILD A SPRUNG BUILDING TO BEGIN MANUFACTURING IN JULY.

Submittal Requirements: The zone change application shall provide the following:

- ✓ a. The name and address of every person or company the applicant represents;
- ✓ b. An accurate property map showing the existing and proposed zoning classifications;
- ✓ c. All abutting properties showing present zoning classifications;
- ✓ d. An accurate legal description of the property to be rezoned;
- ✓ e. Stamped envelopes with the names and addresses of all property owners within 250 feet of the boundaries of the property proposed for rezoning.
- ✓ f. Warranty deed or preliminary title report or other document (see attached Affidavit) showing evidence that the applicant has control of the property

Note: It is important that all applicable information noted above along with the fee is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. Planning Commission meetings are held on the second Thursday and fourth Wednesday of each month at 6:00 p.m. Contact the Planning Department for the deadline date for submissions. Once your application is deemed complete, it will be put on the agenda for the next Planning Commission meeting. A deadline missed or an incomplete application could result in a month's delay.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete: _____ Completion determination made by: _____

DOC ID 20200047385

Warranty Deed Page 1 of 3
Russell Shirts Washington County Recorder
09/01/2020 02:49:13 PM Fee $40.00 By
SOUTHERN UTAH TITLE COMPANY

When recorded mail deed and tax notice to:
Molly's View, LLC, a Nevada limited liability company
4730 S. Fort Apache Rd., Ste. 300
Las Vegas, NV 89147

SOUTHERN UTAH TITLE COMPANY
"Doing good Deeds for over 70 years"
suic.com

Order No. 212574 - EFP
Tax I.D. No. H-3373-NP

Space Above This Line for Recorder's Use

WARRANTY DEED

Hurricane Land, LLC, a Nevada Limited Liability Company, grantor(s), of Las Vegas, County of Clark, State of NV, hereby **CONVEY and WARRANT to**

Molly's View, LLC, a Nevada limited liability company, grantee(s) of Las Vegas, County of Clark, State of Nevada, for the sum of TEN DOLLARS AND OTHER GOOD AND VALUABLE CONSIDERATION the following described tract of land in Washington County, State of Utah:

The South One-Half of the Northeast Quarter (S½NE¼) and North One-Half of the Southeast Quarter (N½SE¼) of Section 17, Township 42 South, Range 13 West, Salt Lake Base and Meridian.

See Water Rights Addendum to Land Deeds attached hereto and made a part hereof

TOGETHER WITH all improvements and appurtenances there unto belonging, and being SUBJECT TO easements, rights of way, restrictions, and reservations of record and those enforceable in law and equity.

WITNESS the hand(s) of said grantor(s), this 28th day of August, 2020.

Hurricane Land, LLC, a Nevada Limited Liability Company

By: Al Fasano
Al Fasano, Authorized Agent

STATE OF ~~Utah~~ NY)
:ss.
COUNTY OF ~~Washington~~ NASSAU)

On the 28th day of August, 2020, personally appeared before me, Al Fasano, who being by me duly sworn, did say that he/she is the Authorized Agent of Hurricane Land, LLC, a Nevada Limited Liability Company, and that said instrument was signed by him/her in behalf of said limited liability company by authority of statute, its articles of organization or its operating agreement, for the uses and purposes herein mentioned, and said Al Fasano acknowledged to me that said limited liability company executed the same.

Wayne Ulrich
NOTARY PUBLIC

My Commission Expires:

WAYNE ULRICH
Notary Public, State of New York
No. 01UL9411880
Qualified in Nassau County
Commission Expires Sept. 30, 2022

Unofficial Copy

Unofficial Copy

WATER RIGHTS ADDENDUM TO LAND DEEDS

Grantor: Hurricane Land, LLC, a Nevada Limited Liability Company
Grantee: Molly's View, LLC, a Nevada limited liability company
Tax ID Number(s): H-3373-NP

In connection with the conveyance of the above referenced parcel(s), Grantor hereby conveys to Grantee without warranty, except for a warranty of title as to all claiming title by or through Grantor, the following interests in water and/or makes the following disclosures:

Check one box only — Proceed to Section

1 ☐ All of Grantor's water rights used on Grantor's Parcel(s) are being conveyed. — A
2 ☐ Only a portion of Grantor's water rights are being conveyed. (County Recorder should forward a copy of this form to the Utah Division of Water Rights if Box 1 or 2 above is checked) — B
3 ☑ No water rights are being conveyed. — C
4 ☐ Water rights are being conveyed by separate deed. — C

Section		Important Notes (see other side)
A	The water right(s) being conveyed include Water Right No(s). along with all applications pertaining to the water right(s) listed in this Section A, and all other appurtenant water rights (Proceed to Section C)	N1 N2 N3
B	Only the following water rights are being conveyed: (check all boxes that apply) ☐ All of Water Rights No(s). ☐ acre-feet from Water Right No. for: families acres of irrigated land: stock water for Equivalent Livestock Units; and/or for the following other uses ☐ acre-feet from Water Right No. for families acres of irrigated land: stock water for Equivalent Livestock Units; and/or for the following other uses Along with all applications pertaining to the water right(s) listed in this Section B. (Proceed to Section C)	N1 N4 N5 N5 N2
C	Disclosures By Grantor: (check all boxes that apply) ☐ Grantor is endorsing and delivering To Grantee stock certificates for Shares stock in the following water company: ☐ Culinary water service is provided by: ☐ Outdoor water service is provided by: ☐ There is no water service available to Grantor's Parcel(s). ☐ Other water related disclosures:	N6 N7 N8 N9 N10

Attach and sign additional copies of this form if more space is needed.

The undersigned acknowledge sole responsibility for the information contained herein even though they may have been assisted by employees of the Utah Division of Water Rights, real estate professionals, or other professionals, except to the extent that title insurance or a legal opinion concerning such information is obtained.

Grantor's Signature: Hurricane Land, LLC, a Nevada Limited Liability Company

Al Fasano, Authorized Agent

Grantee's Acknowledgment of Receipt: Molly's View, LLC, a Nevada limited liability company

Nate Hadley

Nate Hadley, Authorized Agent

Grantee's Address: 4730 S. Fort Apache Rd., Ste. 300 , Las Vegas, Nevada 89147

NOTE: GRANTEE MUST KEEP A CURRENT ADDRESS ON FILE WITH THE UTAH DIVISION OF WATER RIGHTS.

BALANCE OF NATURE LEGAL DESCRIPTION

ENTIRE PARCEL LEGAL DESCRIPTION:

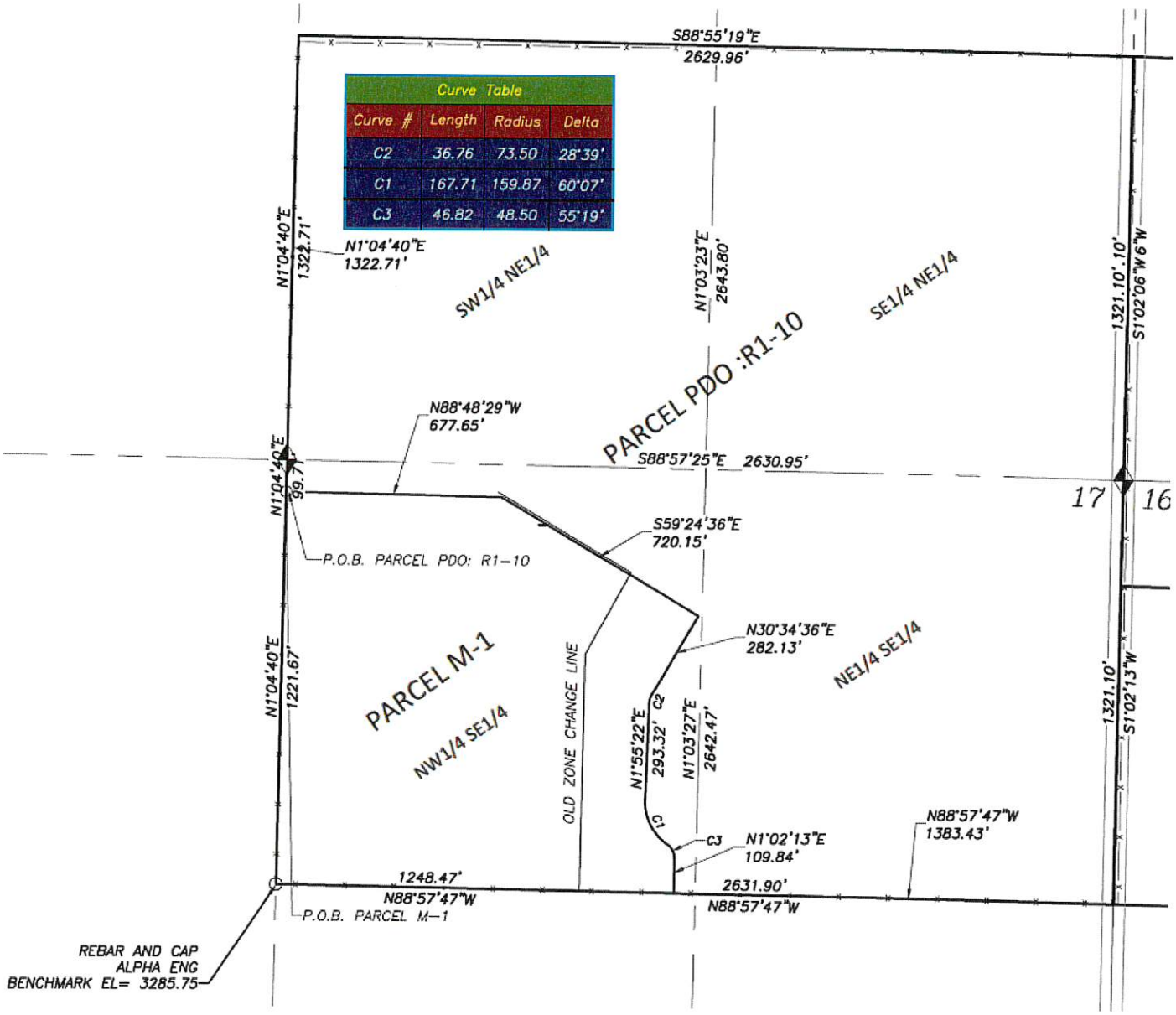
BEGINNING AT THE SOUTHWEST CORNER OF THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 17, TOWNSHIP 42 SOUTH, RANGE 13 WEST, SALT LAKE BASE AND MERIDIAN; THENCE N01°04'40"E, ALONG THE QUARTER SECTION LINE 1321.37 FEET TO THE CENTER QUARTER CORNER OF SECTION 17; THENCE N01°04'40"E ALONG THE QUARTER SECTION LINE, 1322.71 FEET TO THE NORTHWEST CORNER OF THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 17; THENCE S88°55'19"E ALONG THE SIXTEENTH LINE, 2629.96 FEET TO THE NORTHEAST CORNER OF THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 17; THENCE S01°02'06"W ALONG THE EAST SECTION LINE, 1321.10 FEET TO THE EAST QUARTER CORNER OF SECTION 17; THENCE S01°02'13" ALONG THE EAST SECTION LINE, 1321.10 FEET TO THE SOUTHEAST CORNER OF THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 17; THENCE N88°57'47"W ALONG THE SIXTEENTH LINE, 2631.90 FEET TO THE POINT OF BEGINNING.

AREA CONTAINS 6,953,936 SQUARE FEET OR 159.640 ACRES

PARCEL M-1

BEGINNING AT THE SOUTHWEST CORNER OF THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 17, TOWNSHIP 42 SOUTH, RANGE 13 WEST, SALT LAKE BASE AND MERIDIAN;
THENCE N01°04'40"E ALONG THE QUARTER SECTION LINE, 1221.67 FEET; THENCE S88°48'29"E 677.65 FEET; THENCE S59°24'36"E 720.15 FEET; THENCE S30°34'36"W 282.13 FEET; THENCE SOUTHERLY ALONG THE ARC OF A 73.50 FOOT RADIUS CURVE TO THE LEFT A DISTANCE OF 36.76 FEET, THROUGH A CENTRAL ANGLE OF 28°39'13" (LONG CHORD BEARS: S16°14'59"W 36.38 FEET); THENCE S01°55'22"W 293.32 FEET; THENCE SOUTHEASTERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 159.87 FEET AND A RADIAL BEARING OF S86°53'55"E, A DISTANCE OF 167.71 FEET, THROUGH A CENTRAL ANGLE OF 60°06'31" (LONG CHORD BEARS: S26°57'10"E 160.13 FEET); THENCE SOUTHEASTERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 48.50 FEET AND A RADIAL BEARING OF S34°50'27"W, A DISTANCE OF 46.82 FEET, THROUGH A CENTRAL ANGLE OF 55°18'36" (LONG CHORD BEARS: S27°30'15"E 45.02 FEET); THENCE S01°02'13"W 109.84 FEET TO THE SIXTEENTH LINE; THENCE N88°57'47"W ALONG SAID LINE, 1248.47 FEET TO THE POINT OF BEGINNING.

AREA CONTAINS 1,386,885 SQUARE FEET OR 31.839 ACRES.


S88°55'19"E
2629.96'
Curve Table
Curve # | Length | Radius | Delta
C2 | 36.76 | 73.50 | 28°39'
C1 | 167.71 | 159.87 | 60°07'
C3 | 46.82 | 48.50 | 55°19'
N1°04'40"E
1322.71'
N1°04'40"E
1322.71'
SW1/4 NE1/4
N1°03'23"E
2643.80'
SE1/4 NE1/4
1321.10'
S1°02'06"W
1321.10'
PARCEL PDO :R1-10
N88°48'29"W
677.65'
S88°57'25"E 2630.95'
99.71'
17
16
S59°24'36"E
720.15'
P.O.B. PARCEL PDO: R1-10
N30°34'36"E
282.13'
NE1/4 SE1/4
PARCEL M-1
NW1/4 SE1/4
OLD ZONE CHANGE LINE
N1°04'40"E
1221.67'
N1°55'22"E
293.32'
C2
N1°03'27"E
2642.47'
1321.10'
S1°02'13"W
C1
C3
N1°02'13"E
109.84'
N88°57'47"W
1383.43'
1248.47'
N88°57'47"W
2631.90'
N88°57'47"W
P.O.B. PARCEL M-1
REBAR AND CAP
ALPHA ENG
BENCHMARK EL= 3285.75

PLANNING & ZONING
HURRICANE CITY
UTAH

Stephen Nelson, Planning Director
Fred Resch, Assistant Planner/Code Enforcement
Brienna Spencer, Planning Technician

January 28, 2022

Dear property owner,

The Hurricane City Planning Commission will hold a Public Hearing during its regular meeting on October 14, 2021 commencing at 6 p.m. to take comments on a zone change amendment request located at approx.. 2600 South 2350 West to change the current 26.7 acres of M-1, light industrial, to have a total of 31.83 acres of M-1, light industrial. Parcel number H-3373-NP. A map showing the proposal is included with this mailing.

If you would like to make comments, please plan to attend the meeting, or provide written comments for the Planning Commission's consideration by 3 p.m. the day of the meeting.

If you are a property owner within the zone change area, you may access the City's land use code providing information on the specific zone to be applied to your property via the city's website, cityofhurricane.com, under the Planning and Zoning link. The land use code is Title 10 the zone included in this zone change request is located in Chapter 16. The purpose statement for each zone may be found in Chapter 11.

If you are a property owner within the zone change area you may, no later than 10 days after the day of the first public hearing, file a written object to the inclusion of your property in the proposed zoning map amendment. Send any such objection to the Planning Department at 147 N. 870 West, Hurricane, UT 84737. A copy of any and all objections will be provided to the City Council for their consideration during the decision-making process for the zone map amendment.

Please contact me at 435-635-2811 X 118 or email publiccomment@cityofhurricane.com if you have any questions or concerns.

Sincerely,

Stephen Nelson

Stephen Nelson, Planning Director

147 North 870 West • Hurricane, UT • 84737
Phone: (435) 635-2811 • Fax: (435) 635-4284
WEB: www.cityofhurricane.com

PLANNING & ZONING
HURRICANE CITY
UTAH

STAFF COMMENTS

Agenda Date:	**02/17/2022**
Application Number:	2021-ZC-04
Type of Application:	Zone Change PDO Amendment
Action Type:	Legislative
Applicant:	Molly's View LLC
Agent:	Richard Wedig
Request:	A Zone Change Request from R1-10 PDO to M-1
Location:	North of 3000 S and 2100 W
Zoning:	R1-10 PDO
General Plan Map:	Mixed-Use

Planning Commission Recommendation
The Planning Commission recommended approval with the condition that the remaining R1-10 PDO remains at a 2.35 base density to align with the original approval. The Development Agreement should be updated to reflect this change.

Discussion:
The applicant is seeking zone change on 5.13 acres within the already approved Balance Pointe development from R1-10 PDO to M-1 to add on to their industrial area. While creating their plans, the applicant realized they needed more space for their manufacturing hub. They want to build a temporary hub while they build their main building, so they are applying for a zone change to add to their already approved development. City staff, including the heads of the utility departments, have already met with the applicants to discuss their options.

	Zoning	Adjacent Land Use
North	R1-10 PDO	Already approved Balance Pointe development
East	R1-10 PDO	Already approved Balance Pointe development
South	RA-1	Undeveloped and Washington County Water Conservancy District clay extraction pit.
West	M-1	Already approved, Balance Pointe development and RA-1 undeveloped property.

JUC Comments

1. **Power:** No concerns
2. **Water:** Still waiting on water model but no concerns at this time
3. **Streets:** No concerns
4. **Sewer:** No concerns
5. **Engineering:** Previous concerns still outstanding but this is a minor change
6. **Fire:** No concerns just far from a fire station currently
7. **Gas/Cable/Water Conservancy:** No issues

Staff Comments

1. **Density:** By adding to the M-1 and taking away from the R1-10 PDO portion of the development the density calculations for the development have changed slightly. The R1-10 PDO portion of the development is now 2.5 units an acre, an increase from 2.3, this is still well within the compliance of the R1-10 PDO zoning. R1-10 zoning typically allows for up to 3.49 units an acre. The development was approved for a total of 325 units.

1. Is the proposed amendment consistent with the City's General Plan's goals, objectives, and policies?

Response: The General Plan Map shows this area as a future Mixed Use:

Mixed use areas should be developed as small districts or community centers offering a mix of retail, dining, entertainment, employment, and supporting residential. These developments should be easy and safe to navigate on foot and located in areas with access to major roads and surrounded with appropriate residential densities to support these uses.

At the request of Balance of Nature, this area was mapped as Mixed Use on the General Plan Map. This would allow the area to include manufacturing, commercial, and residential uses as well as take advantage of its location near the SR-7 and 3000 S interchange. This zone change would add to the development's potential as an economic development driver in the area. The General Plan has the following goals with regards to economic development.

ECONOMY GOAL 1: SUSTAIN A DIVERSE AND RESILIENT ECONOMY

POLICIES

1.1. The City supports the revitalization of the downtown area.

1.2. The City strives to create an environment that will attract new business and employment to Hurricane.

1.3. The City strives to attract clean, non-polluting industries.

1.4. The City supports industrial uses with convenient access to transportation and other services.

1.5. The City encourages commercial development in "walkable" (pedestrian - oriented) centers.

1.6. The City supports private investments in workforce development, training, technology, and education for the evolving needs of a diverse workforce and changing economy.

1.7. The City supports the redevelopment of existing commercial and industrial sites in both urban and rural areas.

1.8. The City supports provision of basic and enhanced services needed to foster local employment oppor-tunities.

1.9.The City supports secondary-income options on agricultural land through home and accessory rural occupations.

1.10. The City supports the development of businesses that will pay living wage jobs.

1.11. School sites should be located in such a manner that they provide educational services in convenient
and safe locations.

1.12. The City shall work with the School District to ensure that schools are designed to minimize negative impacts on surrounding neighborhoods.

1.13. The City shall continue to work with Dixie State College to expand programs and facilities in the Hurricane Valley.

1.14. The City continually collaborates with municipalities, economic development, business groups, non-profit organizations, and educational institutions on a coordinated regional approach to economic and workforce development.

STRATEGIES

1.1. Coordinate with health care companies to expand their medical facility in Hurricane.

1.2. Create a downtown master plan that will guide the City in redevelopment and recommend standards for public infrastructure, streets, sidewalks and trails, bike lanes, housing, and commercial uses.

1.3. Create an economic development master plan that will outline strategies for attracting business and retaining current business within the City and identify a council to execute and implement the plan.

1.4. Create a retail strategy plan that understands current sales tax generators and where areas of growth might be best accommodated.

1.5. Create a financial sustainability model that projects key future expenditures and revenues to best understand city capacity and future development potential/impacts.

1.6. Support creating commercial spaces in population Centers in the City to provide services to those areas.

1.7. Create a citywide understanding of the financial implications of each development type, clearly outlining fiscal impacts and costs of services for all commercial and residential uses.

1.8. Support mixed use developments in key areas to support future commercial growth. Require a minimum percentage of those developments be retained as commercial space.

1.9. Support continued industrial growth and zone changes in appropriate areas of the City.

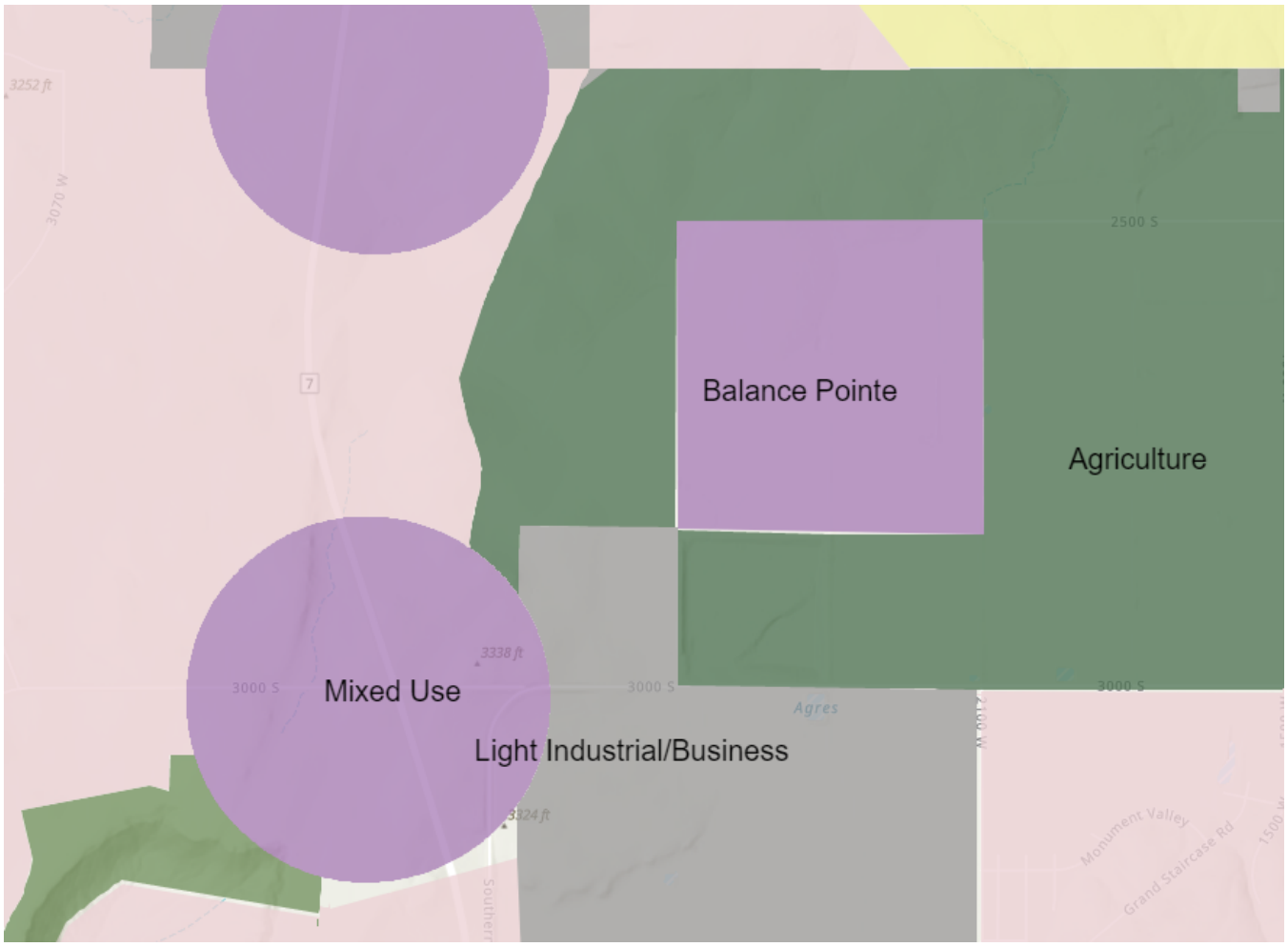
1.10. Support the Zion Regional Collaborative to bring infrastructure improvements into the area that will help attract tourists.
1.11. Create activities in the downtown area to attract people to commercial sites.
1.12. Periodically review and update the City's policy regarding the implementation of Public Infrastructure
Districts (PIDs), as well as a vision for enacting Community Reinvestment Areas (CRAs) to support a variety of commercial and residential properties.
1.13. Allow for Heavy Industrial in proper areas, ensure there is proper buffering between heavy industrial sites and residential areas.

(Hurricane General Plan 2021, p 54-55)

The General Plan also supports the mixed-used and placing housing next to services and job opportunities. (See Hurricane General Plan 2021 pages 41-43).

2. Is the proposed amendment harmonious with the overall character of existing development in the subject property's vicinity?

Response: Most of the area is undeveloped. The area surrounding this proposed change has already been approved as an R1-10 PDO for the remainder of Balance Pointe. The north, east, and west properties to the overall development are planned to remain in agricultural use with RA-1 zoning. The property to the south is an extraction pit used by the water conservancy district. In addition, there are some proposed and planned mixed-use and commercial development areas to the south and southwest of the property around the SR-7 and 3000 S Interchange.



3. Will the proposed amendment affect the adjacent property?

Response: Yes, it will have some impact on the area. This will marginally increase the amount of industrial use on the property but it's impact on adjacent property will pale in comparison to the impact of the rest of the already approved development.

4. Are public facilities and services adequate to serve the subject property?

Response: There are currently almost no services in the area. Balance of Nature, along with a number of other developers, are working to get services to the area. Balance of Nature wants to get moving on their manufacturing area as soon as possible which the power and water departments have given preliminary approval to.

Findings:
Staff makes the following findings:

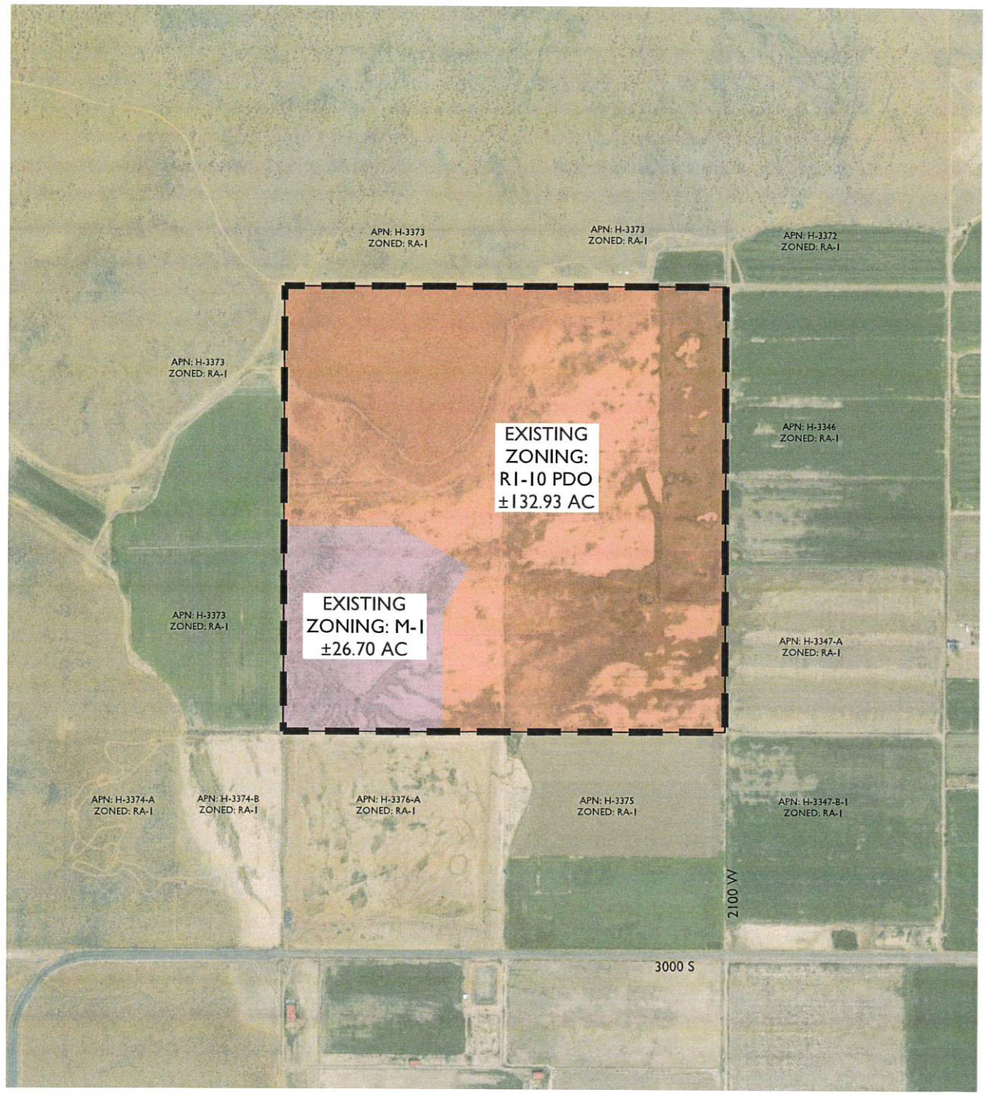
1. The proposed amendment is generally compatible with the current General Plan's map and goals.

2. The proposed amendment is generally in harmony with the overall character of the approved development surrounding it, but there is almost no development adjacent to the property right now.
3. The proposed amendment will have an impact on the area but it is as anticipated with the remainder of the Balance Pointe development.
4. The services are currently not adequate for the development, and would only become adequate after surrounding properties develop or the applicant may install and construct significant offsite improvements. The applicant has signaled a willingness to complete these improvements

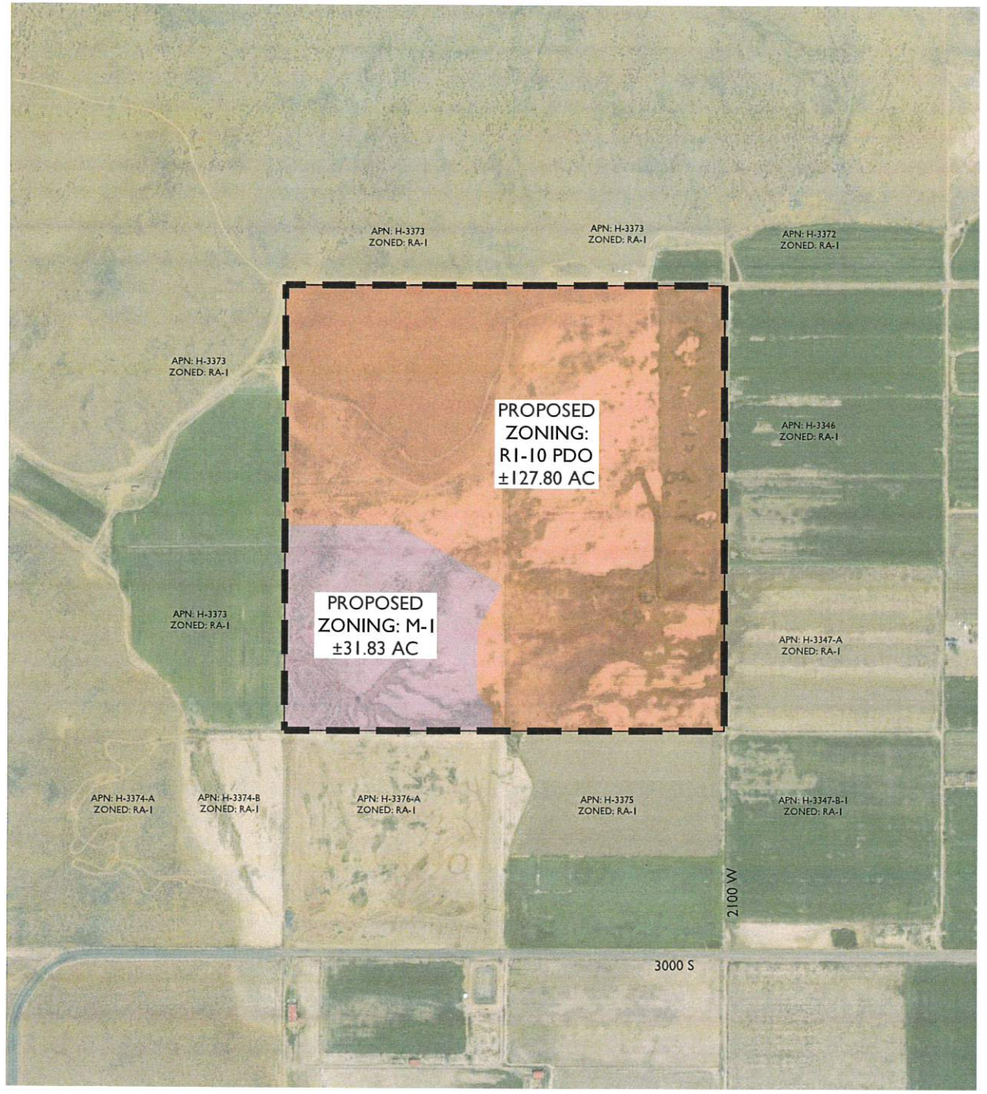
Recommendation: Staff recommends the Planning Commission review this application and the zone change based on standards and consider residents' comments. Staff would recommend approval of this amendment to their development based on staff and JUC comments including the increased density for the R1-10 PDO.

ZONING EXHIBIT FOR BALANCE POINTE

EXISTING



PROPOSED



PROJECT TEAM

PROPERTY OWNER:
MOLLYS VIEW LLC
1568 S RIVER RD, STE 200
SAINT GEORGE, UT 84790
CONTACT: ORCUTT | WINSLOW

ARCHITECT:
ORCUTT | WINSLOW
2929 N CENTRAL AVE, ELEVENTH FLOOR
PHOENIX, AZ 85012
TEL: (602) 257-1764
CONTACT: NEIL TERRY

PLANNING, & LANDSCAPE ARCHITECTURE:
EPS GROUP, INC.
1130 N ALMA SCHOOL RD., SUITE 120
MESA, AZ 85201
TEL: (480)-503-2250
FAX: (480)-503-2258
CONTACT: JOSH HANNON
josh.hannon@epsgroupinc.com

PROJECT DATA

A.P.N.:	H-3373-NP
GROSS AREA:	± 159.63 AC
EXISTING LAND USE: PROPOSED LAND USE:	VACANT/ UNDEVELOPED MIXED-USE
EXISTING GENERAL PLAN DESIGNATION:	MIXED USE
EXISTING ZONING:	R1-10 PDO (132.93 AC) M-1 (26.70 AC)
PROPOSED ZONING:	R1-10 PDO (127.80 AC) M-1 (31.83 AC)

NORTH

400 0 400 800
scale: 1" = 400' feet

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250 | F:480.503.2258
w w w . e p s g r o u p i n c . c o m

Balance Pointe
Hurricane, UT

Zoning Exhibit

Project:

Revisions:

Call at least two full working days before you begin excavation.
ARIZONA811
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)
In Maricopa County: (602)263-1100

Designer: EPS
Drawn by: EPS

Preliminary
Not For
Construction
Or
Recording

Job No.
21-0167

ZX02

Sheet No.
01
of 01

21-0167

ngriffin Jan. 19, 2022 11:36am \\Eps-m16-fs01\shared\Projects\2021\21-0167\Planning\Drawings\Entitlements\21-0167 - ZX02.dwg

Phase	Housing Type	Acres	
3E	Medium Density Homes (Quarter Acres)	6.3	
3E	Low Density Homes (Half Acres)	6.9	
3E	Green Court Homes	5.5	
2D	Rowhouses	5.9	
2D	Alley Loaded Homes	6	
2D	Sudio (Avoved Mixed Use)	3.9*	
2D	1 Bedroom (Aboved Mixed Use		
2D	2 Bedroom (Aboved Mixed Use		
Total		Units/Per Acre	2.543035994
Section	Public Uses/Non Retail Commercal Areas	Area	
4H	Hospital/Wellness/Medical Offices	7.6	
3F	Chapel	5.4	
3G	School	5.6	
4I	Heritage Center/American Village	10.1	
Every Section	Open Space/ Trails	29	
Each Section	Community Parks	8.1	
Each Section	Community Gardens/Agrarian Fields	4.7	
2C and 4I	Lakes and Water Features	1.8	
2B	Sculpture/State/Ampitheater/Great Lawn	5.2	
Each Section	Public Rights of Way	8.5	
Section	Commercail and Industrail	Area	
1A	Manufacturing Facility	20	
2B	Headquarters Campus/ Offices	13.9	
2D	Mixed Use	3.9*	
1A and others	Parking	4.4	

Number of Units	Percentage of Unit Type
33	10.15%
20	6.15%
44	13.54%
74	22.77%
46	14.15%
32	9.85%
46	14.15%
30	9.23%
325	

MASTERPLAN REPORT

SEPTEMBER 2021

BALANCE POINTE

A PLANNED COMMUNITY FOR BALANCE OF NATURE • HURRICANE, UT

BALANCE OF NATURE

orcutt | winslow

EPS GROUP



ACKNOWLEDGEMENTS

Individuals and organizations who generously devoted their time to guide the development of the Balance Pointe Master Plan include:

BALANCE OF NATURE

orcutt | winslow

Stakeholders:

BON Executive Committee

Dr. Douglas Howard
Founder

Lex Howard
President

Richard Wedig
ProMed Management, Owner's Representative

Cedric Ebisch
Executive Vice President, Business Administration

Nate Hadley
Executive Vice President, Operations

Tommy Cummings
Executive Vice President, New Business Development

City of Hurricane

John Bramall
Mayor

Stephen Nelson
Director of Planning

Design Team:

Orcutt | Winslow

Neil Terry
Partner

Kristine Millar
Principal

John Cantrell
Principal Designer

Tom Payton
Associate, Project Manager

Ashley Mulhall
Associate, High Performance Building Design

Brian Fish
Associate, Warehouse and Manufacturing Designer

EPS Group

Josh Hannon
Planner

Tom Snyder
Planner and Landscape Architect

Ali Azimi
Civil Engineer

EPS GROUP

THE CITY OF HURRICANE
WELL ROOTED IN THE PAST • WITH A GROWING FUTURE

EXECUTIVE SUMMARY

A Commitment to Health & Heritage

Building a Healthy Community Through Authentic Connections

Balance Pointe offers a transformational experience for the City of Hurricane that will present both primary and secondary assets to the community within a healthy environment. The project will not only produce economic resilience, but launch employment and development growth that will sustain local and regional vitality for decades to come.

Based on the parent company's foundational triad of Physical, Spiritual and Chemical wellbeing, the community of Balance Pointe fulfills a vision – "to achieve complete health, you must strive for a balanced life." This vision will transform a quarter section of farmland in the historic town of Hurricane, Utah nestled between the majestic mountains of Zion National Park and Signal Peak.

At 160+ acres the community is a modest size, yet offers room for big ideas to take root and grow. Balance of Nature will move its corporate headquarters and production facilities to this location providing economic, cultural, and infrastructure support for the surrounding area. As the site development evolves, each amenity will have an opportunity to build on concepts that draw on heritage and healthy living.

Precinct A:
Production | Catalyst

- Warehouse and Production | Distribution Center
- Orchard Parking
- Ability to expand by 2x its size
- Solar panels to shade roof and generate power
- Freeway visibility - building as signage opportunities

Precinct B:
Foundation | Heart

- Balance of Nature Corporate Headquarters
- Prominent location on Sullivans Knoll
- Focus on building from main entry boulevarde
- Large scale building with a mix of at grade and below grade parking
- Variety of building height to take advantage of views
- Observation deck looking into amphitheatre

Precinct C:
Engagement | First Impression

- Water wheel entry monument
- Stormwater conveyance
- Trail system
- Community gardens
- Parking Orchards
- Carriage stops
- Brand

Precinct D:
Convergence | Live Work Place

- Town Center
- Mix of Retail and Commercial uses
- High density live work space
- Walkable streetscape
- Doubles as an event plaza
- Seasonal activities space
- Three story maximum building heights

Precinct E:
Home | Hearth

- Housing for BON employees
- Single family homes on ¼ and ½ acre lots
- Garden homes
- High density live work units near town center
- Home gardens
- Street paving to encourage walking
- Access to trail system

Precincts F & G:
Enrichment | Culture

- Church
- Located near entry off water feature
- Shared parking for town center during peak hours
- Educational (K-8th Grade School)
- Walkable school access
- Playfields for school and community
- Access to community gardens for hands on teaching

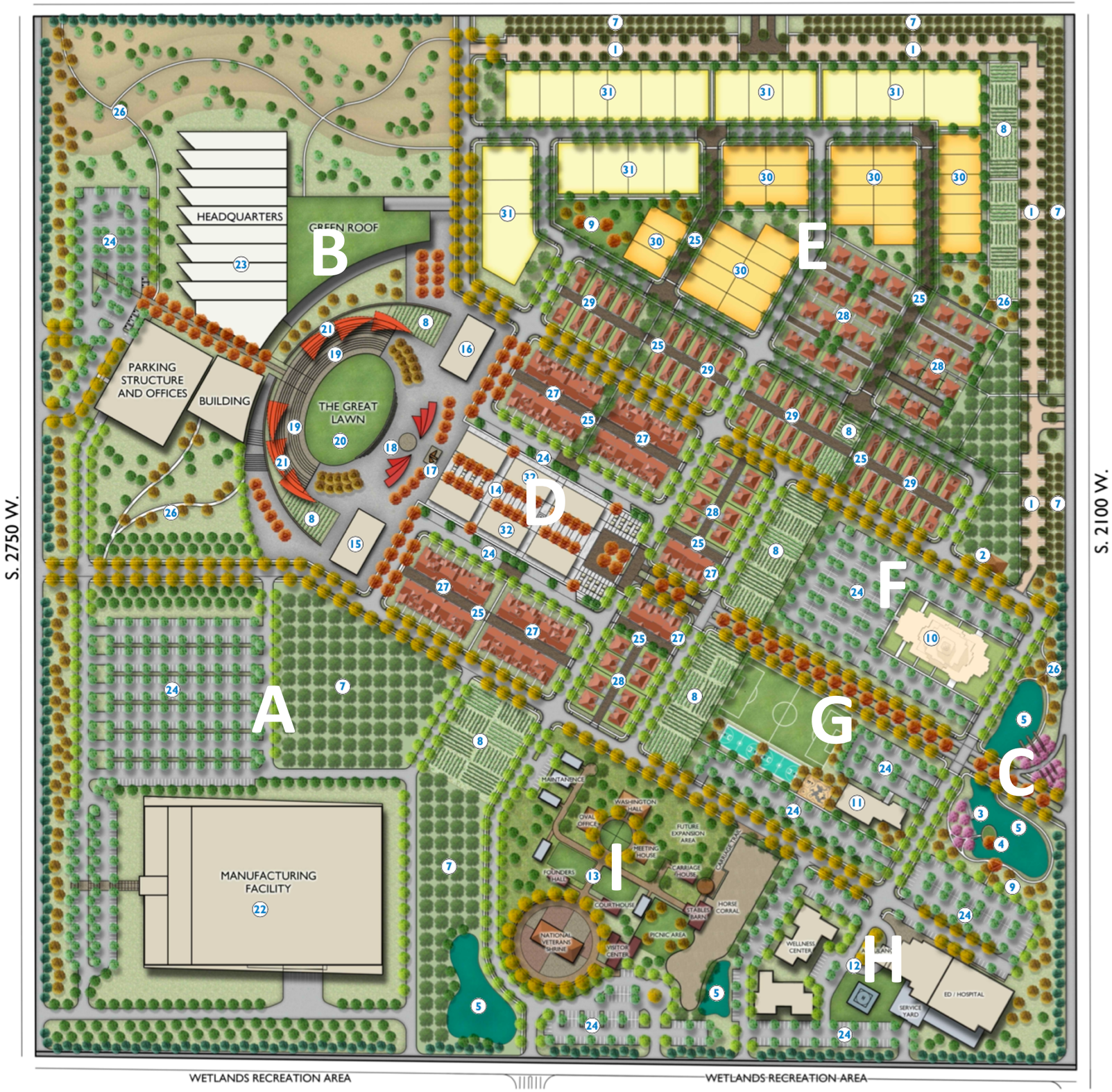
Precinct H:
Health | Wellness

- Low scale community hospital
- Emergency services
- Medical Clinic
- Surgery, Imaging, Therapy and Pharmacy
- In-Patient Hospital Rooms
- Emergency Helipad
- Fronts the water feature
- Visible and easily accessible

Precinct I:
American Village | Experience

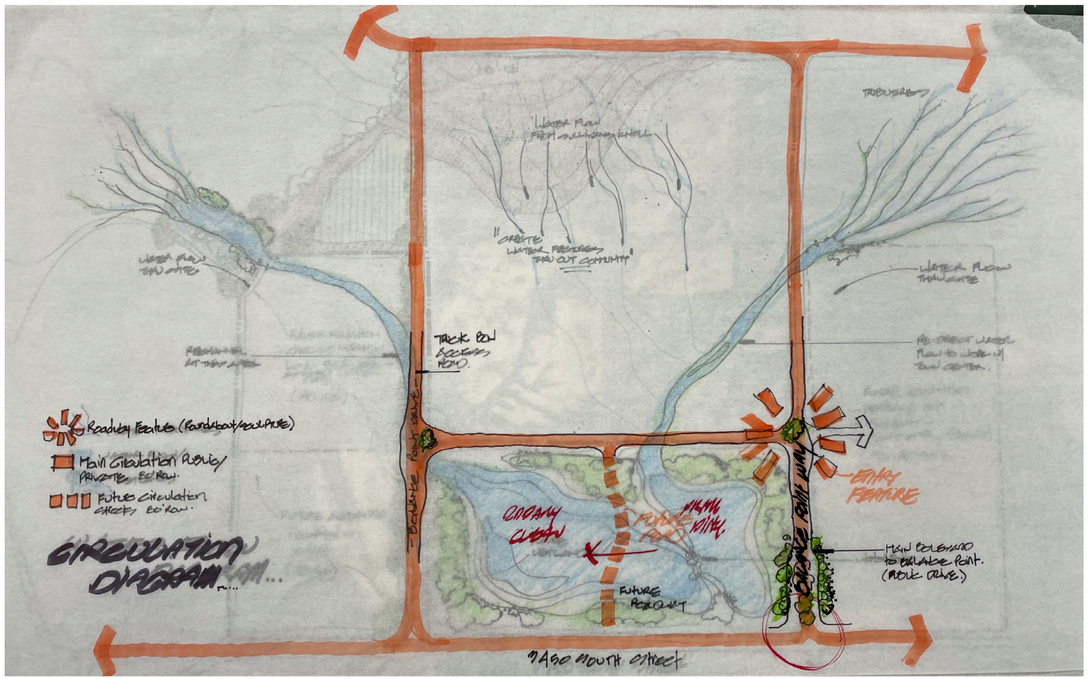
- American Village First Person Learning Experience
- Follows the Alabama model
- Express the three branches of government
- Veterans Memorial
- Admissions building
- Stables and corral for carriage horses
- Picnic areas
- Staff maintenance buildings

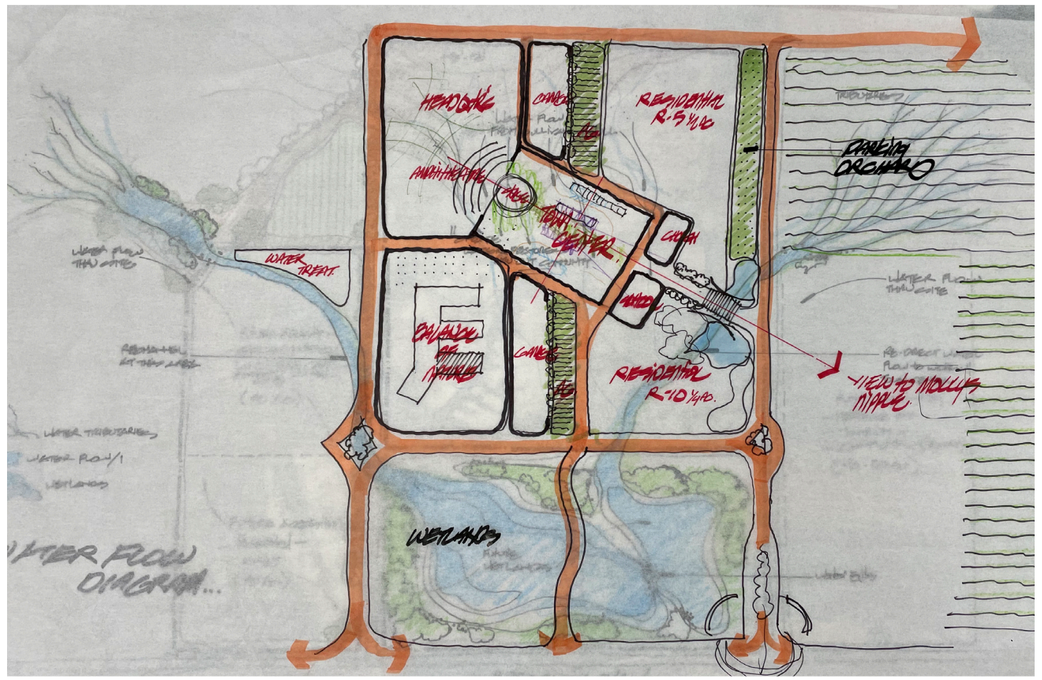



S. 2750 W.
S. 2100 W.
HEADQUARTERS
GREEN ROOF
B
PARKING STRUCTURE AND OFFICES
BUILDING
THE GREAT LAWN
E
D
F
A
G
C
I
H
MANUFACTURING FACILITY
MAINTANENCE
WASHINGTON HALL
OVAL OFFICES
FUTURE EXPANSION AREA
MEETING HOUSE
CARRIAGE HOUSE
CARRIAGE PARK
FOUNDERS HALL
COURTHOUSE
STABLES BARN
HORSE CORRAL
PICNIC AREA
NATIONAL VETERANS SHRINE
VISITOR CENTER
WELLNESS CENTER
ED / HOSPITAL
SERVICE YARD
WETLANDS RECREATION AREA
WETLANDS RECREATION AREA


Bench Lake
Future Acquisition
- Skilled Nursing/
Long Term Care
(40 ac)
Future Acquisition
- Hospital -
(40 ac)
Future Acquisition
- Heritage or -
- Museum -
- Comm Ctr. (80,000sf)
(40-80 ac)


Water Flow
Thru Site
Water Flow
From Hillsides Enroll
"Create
Water Presence
Thru Out Community"
Tributaries
Water Flow
Thru Site
Re-Direct Water
Flow to Work w/
Town Center.
Water Tributaries
Water Flow
Wetlands
WATER FLOW
DIAGRAM...
Future
Wetlands
Water Exits


Roadway Features (Roundabouts/Signals)
Main Circulation Public/
Private Eg/Row.
Future Circulation
streets Eg/Row.
CIRCULATION
DIAGRAM...
Water Flow
From Hillsides Enroll
Tributaries
Water Flow
Thru Site
Re-Direct Water
Flow to Work w/
Town Center.
Track Rd
Across
Road.
Entry
Feature
Main Boulevard
to Available Pkwy.
(Adult Drive)
Future
Resort
Base Mountain Street


Water
Treat
Residential
R-5 3/4 ac
Amphitheatre
Town
Center
Residential
R-10 3/4 ac
Wetlands
WATER FLOW
DIAGRAM...

INTRODUCTION

The Balance of Nature Planned Community master planning team embarked on the design process with key executive stakeholders in a commitment to create a healthy, vibrant community like no other. Tentatively named Balance Pointe, a title inspired by the company's name and convergence of the 3 pillars of healthy living espoused by Dr. Howard, called the Triad, there were few constraints in planning the new community beyond the physical characteristics of the site itself and the vision that the community should become a destination focused on an educational lifestyle of health and wellness. As a result, the design grew organically, based on the input of Balance of Nature's leadership, the City, various stakeholders, and the impact a community of this type could bring to the wider geographical area. In the end, a great number of alternatives and strategies coalesced to create a visionary design that captures the imagination, catalyzes re-investment, and will inspire BON leadership, employees, patrons, and contributors eager to see a place that personifies healthy living as reality. Our hope is that Balance Pointe will become a model for other visionary communities that will shift paradigms and perceptions and places like Epic Park in Wisconsin, Market Common in Myrtle Beach, South Carolina, and Celebration, Florida. These places are keenly focused on the need for people to connect with nature in a modified-urban setting for the benefit of their health and wellbeing.

MISSION & VISION

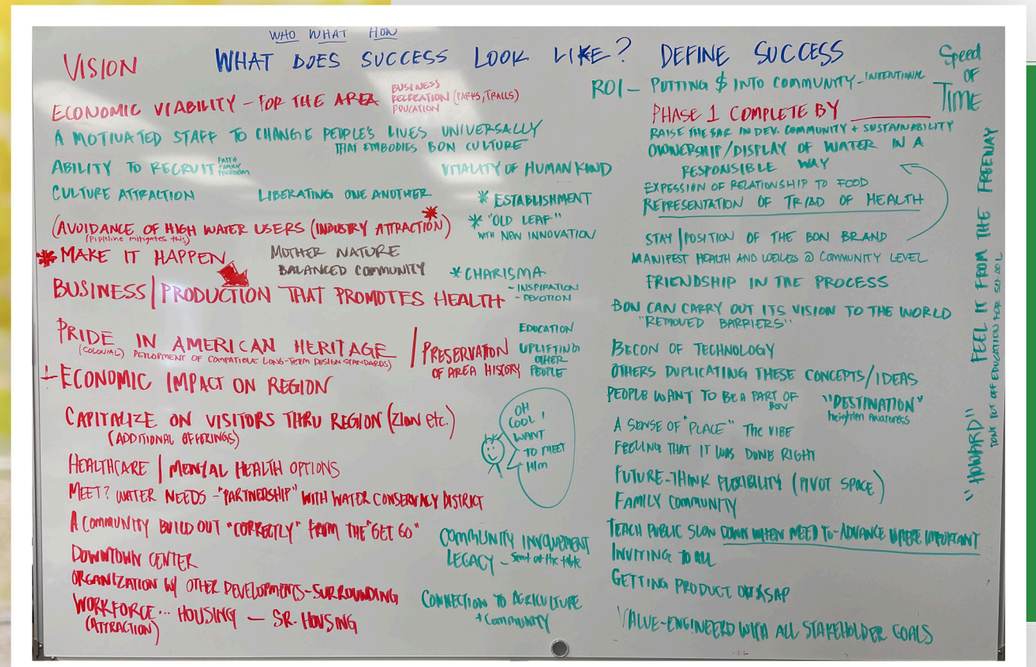
During an initial visioning session stakeholders discussed how this community could transform Balance of Nature into more than just an employment and production entity. It was important that the mission be evident in all aspects of design and development and that the process produced deep friendships and confidences along the way. Many adjectives and descriptions were conjured up to evoke what Balance Point should mean as the vision evolved.

Mission:

Balance of Nature's global mission is to educate the world about the benefits of living a life of health and wellness. At a local level their mission is to create an environmentally, economically sustainable planned community that supports this mission.

Vision:

To develop a globally-recognized community showcasing innovatively designed elements that encourage healthy behaviors, enhance critical care and healing, and promote a culture of wellness, all consistent with a triad of health (chemical, physical, spiritual): Eat, Do, Think.



OBJECTIVES

- Promote health and healthy lifestyles through unique design, amenities and activities specifically focused on improving and nurturing Faith, Family, and Freedom via a triad of spiritual, chemical and physical attributes.
- Use design strategy to help teach the general public to "slow down" when they need to, and advance where it is important.
- Serve as a resource to the local community, businesses, City of Hurricane, worldwide users of Balance of Nature coaching and products, Zion visitors, and BON employees.
- Demonstrate pride in American Heritage and the preservation of history through interactive, passive experiences.
- Provide economic viability and recruitment opportunities for BoN and Washington County businesses
- Create a place where staff is motivated to change the lives of others universally
- Position the BoN Brand world-wide in the development of a world-class community that others will want to replicate and duplicate.
- Provide Innovation and Business production that promotes health
- Express of the relationship of food and agriculture to health
- Be a Beacon of technology
- Raise the Bar in a development community and sustainability in a responsible way
- Increase opportunities for intergenerational living/learning/playing and social interchange

GUIDING PRINCIPLES YIELD RESULTS

Remove Barriers
Allow BON to carry out its vision to the world

Economic
Growth | Workforce | Budget
- The Expansion of Balance of Nature Projects
- Ability to serve 5m customers per month

Spiritual
Wellness
- Implementation of health and wellness areas
- Accessibility to environments that promote physical and mental health

Cultural
Brand | Charisma | Global Influence
- Do others use or recognize the BON name/mission through the mp/site? A reflection of the culture
- Core Values "vibe"
- Foundation of Health: Triad and Eat, Think, Do

Operational
Efficiencies and Timing
- Can we handle future growth? Is there a pivot plan/space?

Community
- Did BoN prove "the point?"









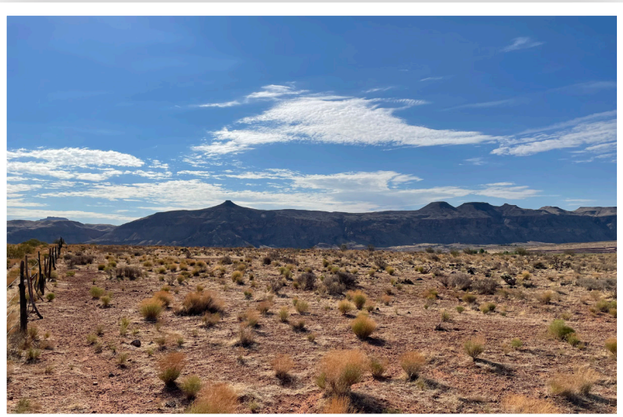
PROJECT BACKGROUND

Balance Pointe is located on a 162-acre site just off the State Route 7 exit 22 to Hurricane via West 3450 Street South. The site was selected as Balance of Nature's new planned community to provide a unique work-live experience focused on health and anchored by BoN's main production and warehouse/distribution center. Access to the site will require construction of a planned collector street access that will travel north approximately 1320' (1/4 mile) from Roadway 3000 S to the SW corner of the property.

Between the site and Roadway 3000 S is a single large retention basin that is controlled by the local Water Conservancy and is planned to remain under their control for the foreseeable future. BoN will plan to utilize this area and a similar future basin to the east as retention areas, that will continue to retain water runoff from the adjacent agricultural fields and new BoN community and eventually become a natural wetland area and habitat for wildlife.

Over the next 5 years of growth in this area BoN will continue to work with the City of Hurricane, adjacent property owners and developers in the area to build the infrastructure necessary to support planned thoughtful growth in this area of Utah.









CURRENT CONDITIONS

CURRENT CONDITIONS

The heritage and cultural vision of the City of Hurricane from its General Plan:

"Hurricane values and celebrates its agricultural heritage and works to preserve the charter, open space and scenic qualities that residents treasure. Known as an adventurous, active, and family-friendly city, Hurricane has year-round events for all ages and strives to create a culture of inclusion. Goals: Preserving agriculture, Incorporating heritage-based design elements in public places, Creating a vibrant downtown, Facilitating inclusive events, and preserving open space....."

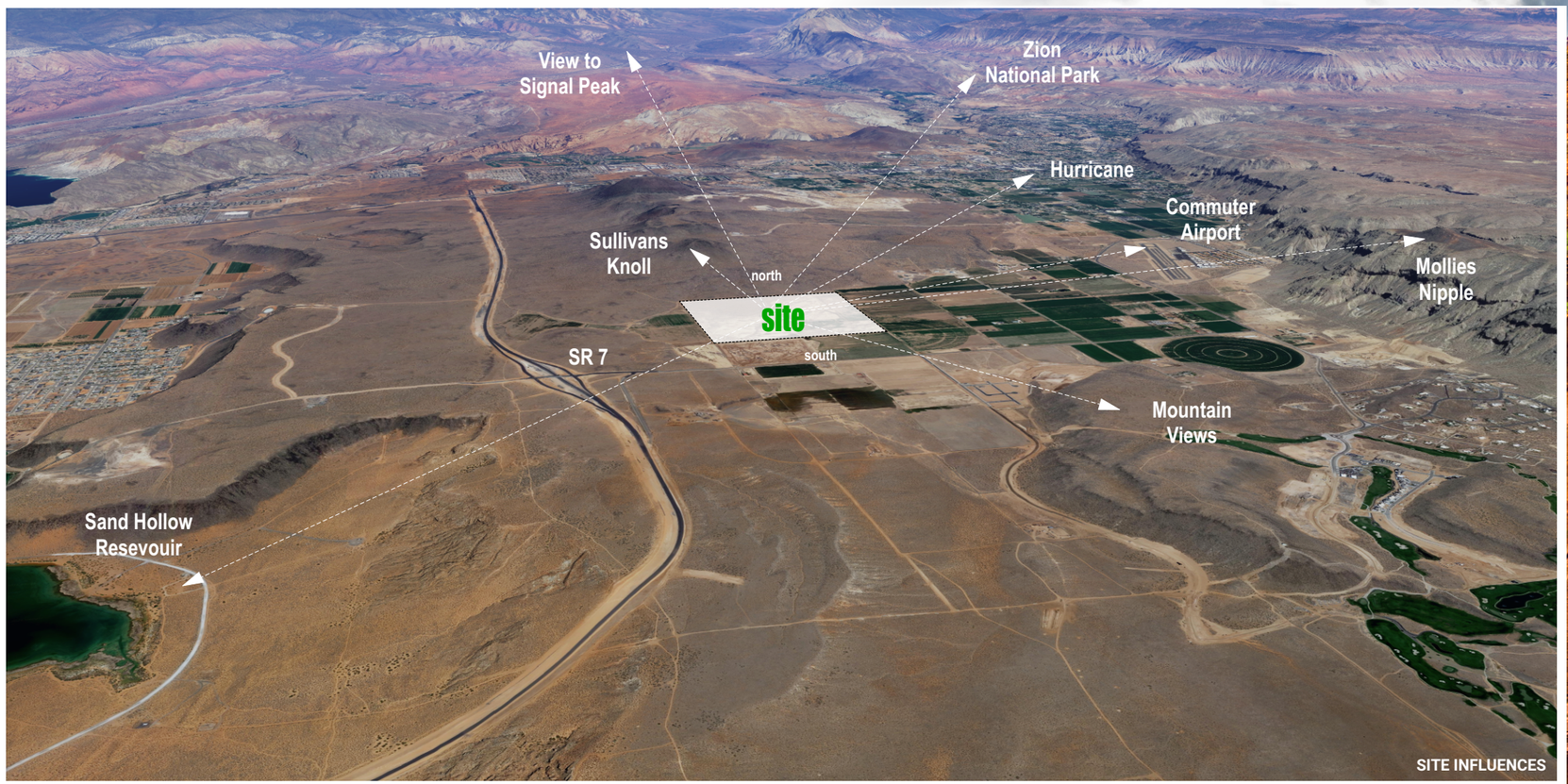
VEGETATION, LANDFORMS AND STRUCTURES

The four quadrants of the existing site are mostly flat, indicative of their past use as agricultural farm and grazing land. For the most part the site is fallow with scattered grasses, shrubs and a bosque of trees that appear to be growing around a small trough of water. The northwest quadrant of the site has a slight rise that is part of the topography created by Sullivan's Knoll to the north. In general water flows on the site are from the north to the south and east and west.





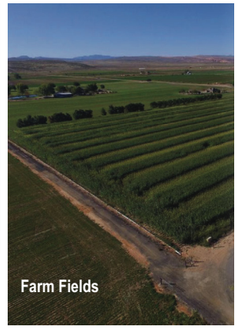



View to
Signal Peak
Zion
National Park
Hurricane
Commuter
Airport
Mollies
Nipple
Sullivans
Knoll
north
site
south
SR 7
Mountain
Views
Sand Hollow
Resevoir
SITE INFLUENCES

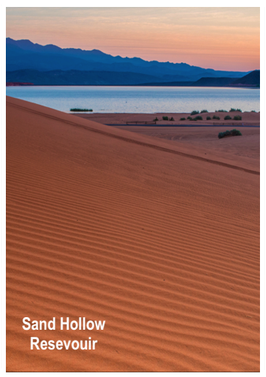

Mountain
Views


Mollies
Nipple


View to
Signal Peak

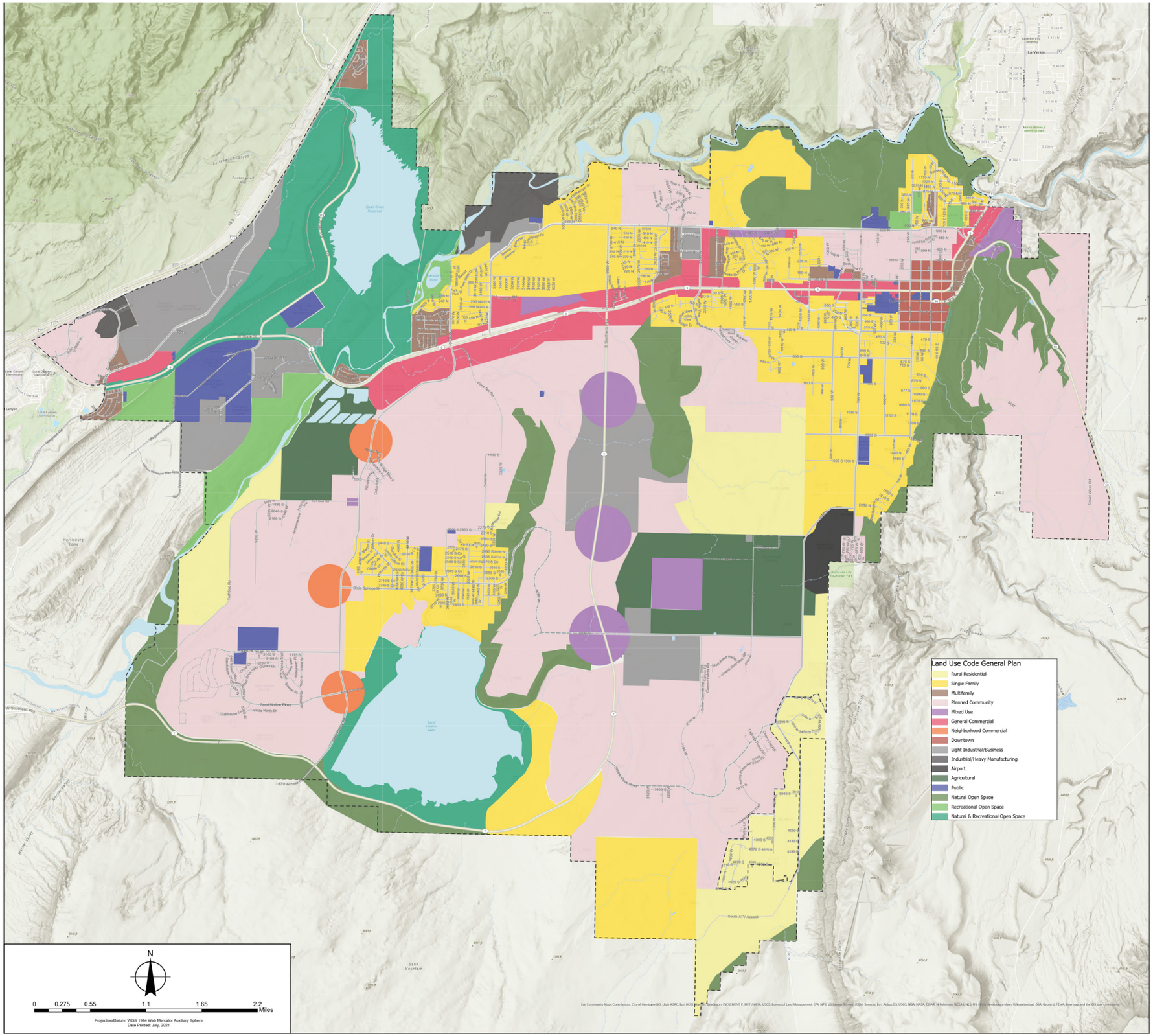

Farm Fields


Hurricane


Sand Hollow
Resevoir


Sand Hollow
Resevoir


Zion
National Park



ZONING

The City of Hurricane General Plan identifies the site as Mixed Use

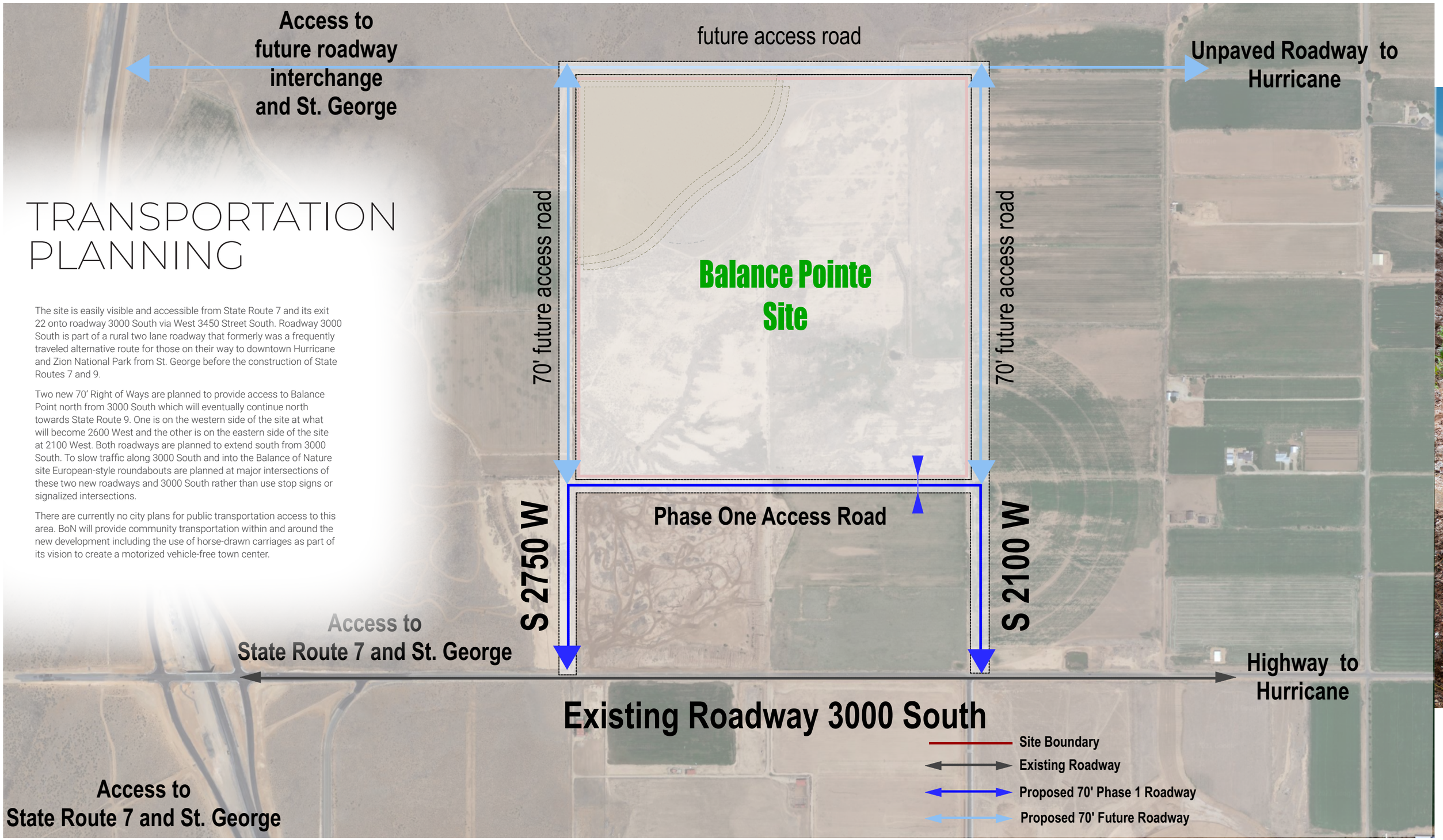
According to the City's Zoning map the 162 acre BoN site is in an RA-1 Residential Agricultural district. The RA-1 district allows 1 dwelling unit per acre while maintaining an agricultural setting. BoN intends to request that the City grant the 162 acre site a Planned Development Overlay (PDO) to allow a variety of uses that will support a mix of residential, mixed use, office, commercial and light industrial. In general the plan will restrict construction height to 3 stories around the residential components of the community with 4 stories (65') allowed for the BoN headquarters and production facilities on the western perimeter of the site.

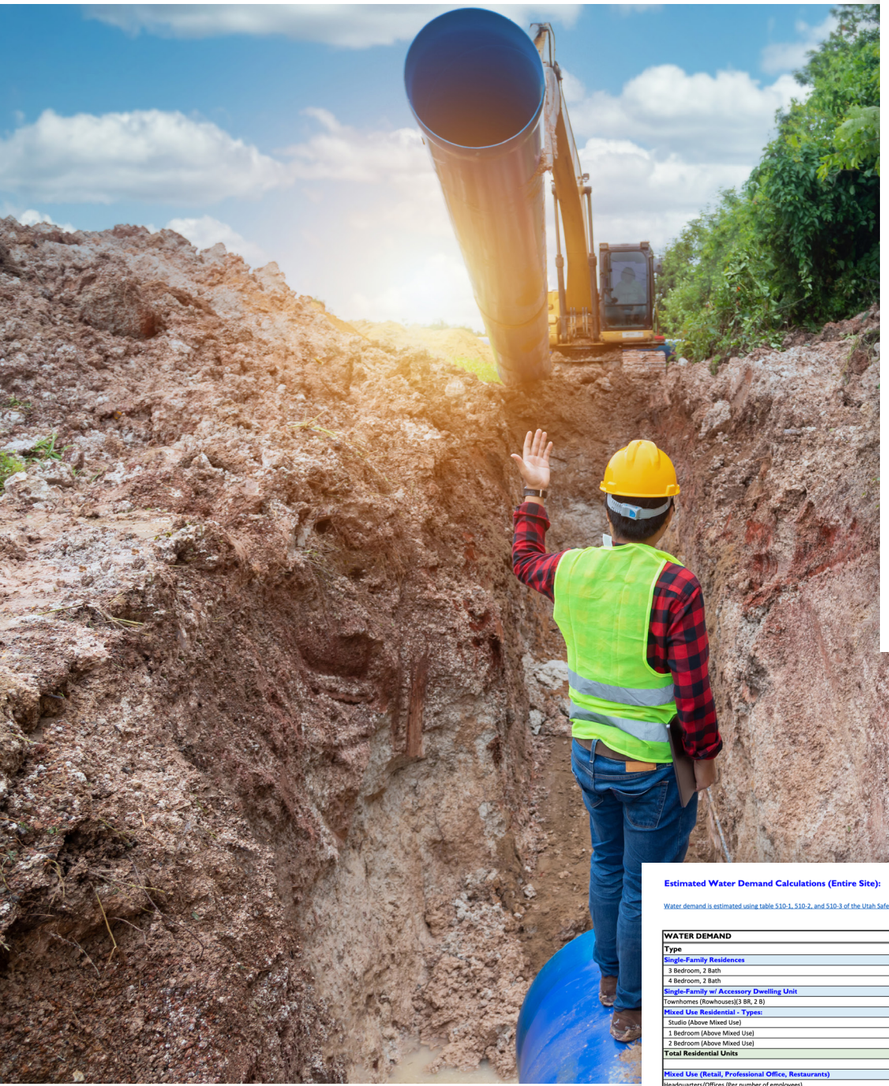
TRANSPORTATION PLANNING

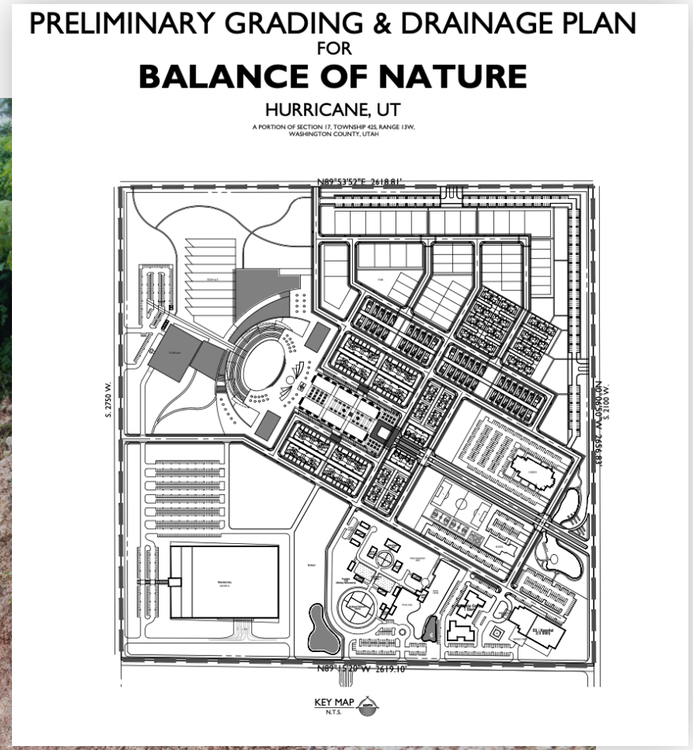
The site is easily visible and accessible from State Route 7 and its exit 22 onto roadway 3000 South via West 3450 Street South. Roadway 3000 South is part of a rural two lane roadway that formerly was a frequently traveled alternative route for those on their way to downtown Hurricane and Zion National Park from St. George before the construction of State Routes 7 and 9.

Two new 70' Right of Ways are planned to provide access to Balance Point north from 3000 South which will eventually continue north towards State Route 9. One is on the western side of the site at what will become 2600 West and the other is on the eastern side of the site at 2100 West. Both roadways are planned to extend south from 3000 South. To slow traffic along 3000 South and into the Balance of Nature site European-style roundabouts are planned at major intersections of these two new roadways and 3000 South rather than use stop signs or signalized intersections.

There are currently no city plans for public transportation access to this area. BoN will provide community transportation within and around the new development including the use of horse-drawn carriages as part of its vision to create a motorized vehicle-free town center.







Estimated Water Demand Calculations (Entire Site):

Water demand is estimated using table 510-1, 510-2, and 510-3 of the Utah Safe Drinking Water Act (Title 19, Chapter 4 of the Utah Code):

BALANCE OF NATURE (HURRICANE, UT)

WATER DEMAND					
Type	**Number Units/Employees**	**Peak Day Demand (gpd/conn)**	**Total Peak Day Demand (gpd)**	**Avg. Yearly Demand (gal/conn)**	**Avg. Yearly Demand (gal)**
Single-Family Residences					
3 Bedroom, 2 Bath	131	800	104,800	146,000	19,126,000
4 Bedroom, 2 Bath	131	800	104,800	146,000	19,126,000
Single-Family w/ Accessory Dwelling Unit					
Townhomes (Rowhouses)(3 BR, 2 B)	74	800	59,200	146,000	10,804,000
Mixed Use Residential - Types:					
Studio (Above Mixed Use)	100	800	80,000	146,000	14,600,000
1 Bedroom (Above Mixed Use)	100	800	80,000	146,000	14,600,000
2 Bedroom (Above Mixed Use)	100	800	80,000	146,000	14,600,000
Total Residential Units	**636**	800	**508,800**		**92,856,000**
Mixed Use (Retail, Professional Office, Restaurants)					
Headquarters/Offices (Per number of employees)	7000	25	**175,000**	87500	612,500,000
Warehouse/Manufacturing (Per number of employees)	133	35	4655	2327.5	309,558
Data Center (Per number of employees)	50	25	1250	625	31,250
Central Plant/Facilities (Per number of employees)	50	25	1250	625	31,250
Ampetheater (Per number of seats)	200	5	1000	500	100,000
Library (Per number of ublic toilets)	4	500	2000	1000	4,000
Museum (Per number of public toilets)	8	500	4000	2000	16,000
Hospital (Per number of beds)	100	250	25000	12500	1,250,000
Wellness / Medical Offices (Per number of staff)	50	35	1750	875	43,750
Chapel (one) (Per person)	50	5	**250**	125	6,250
School (one) (Per number of Students)	600	25	**15,000**	7500	4,500,000
Irrigation Water Demand (Zone 6**th**, 187 acres total site area, assumed 30% landscape area)	56	4.9	**274.4**	137.2	7,683
Total			**231,429**	**115714.7**	**618,799,741**
Total Estimated Water Demand for Residential and Commercial			**740,229**		**711,655,741** **Gallons**
					2,184 acre -feet

* See Tables 510-1, 510-2, and 510-3 on following pages for per capita values used in calculations.

* *See Irrigation-Map on page 6.

EXISTING UTILITY INFRASTRUCTURE

Offsite flows will be managed by a network of onsite lakes, and ultimately, the offsite Utah Water Conservancy District's Lake south of the Project site.

Two primary watersheds, of a total of 5.33 square miles, contribute to the offsite drainage conditions of the Project.

The Onsite Master Plan will coordinate offsite flows for management in the drainage system. The majority of the offsite flow will be conveyed south along the west side if 2100 W. to Utah Water Conservancy District's Lake south of the Project site. Some offsite flow may be directed to on-site ponds. To manage the size of the on-site ponds an overflow system will be designed to direct excess stormwater runoff to Utah Water Conservancy District's Lake.

Facilities offsite will be used to manage the flows reaching the Project in a channel or basin configuration, to be determined with final engineering.

A 14" water line along 2100 W. from a 2 million Gallon water tank north of the subject property is proposed as the primary source of water. There are a few alternatives for the secondary source of water. 1st, the property owner is in the process of acquiring water rights for water wells. The second source will be either from the existing 12" water line, which terminates at the intersection of 2100 W and 300 S. or an existing 8" water line east of subject property.

See Appendix documents for the following :

- Domestic Water
- Sewer
- Reclaimed Water
- Electricity
- Communication
- Natural Gas
- Flood Control

DESIGN PROCESS.

The design process commenced via a week long design charette in a big room format the week of July 5, 2021. Balance of Nature's company values were reflected within the fabric of this exercise. To achieve this vision, the design team offered a work plan that engaged executive leadership during each phase to allow participation and control its destiny, while tapping into resources and trends that will make the Balance Pointe community a one-of-a-kind experience. As the Master Architect Orcutt | Winslow work with BoN to help give form to their big ideas within the following prescribed process:

A Master Architect Approach:

It is important to define success as a common vision. Our team jump started this process by getting to understand one another, varying perspectives and an overall vision. Various goals and objectives for the BoN community were established. Our first sessions included all project leadership in attendance where we asked just this one simple question, "what does success mean to you on this project." The voices and various perspectives around the room, formed a baseline of understanding for each person and the vision that will be measured against during the entire project. The team attempted to synthesize all definitions of success into a one-line vision statement for the team, with a level of difficulty. What was understood was that heritage and health would be paramount, within a shared relationship for success and friendship.

Adoption of high success criteria.

This goes along with number one. To meet success, our goals were clarified, adopted by all team members, and continue to be high reaching.

A Defined structure and role.

One of the most important factors in this success is allowing each person to feel ownership of his or her role in the project itself. To accomplish this, we: 1) identified decision-makers and brought the right people to the table at the right times. 2) Right-sized the team for decision-making to keep the project moving forward (including members of the City and planning) and 3) Tom Patyon as Project Manager to bring the difficult decisions to BoN leadership, and to forge solutions.

Personified BoN Brand

The story of Balance point began to tell itself within the Health and Wellness core that exists today. The team was able to easily transfer the company's strong branding into future expansion opportunities.

Collaboration with best-in-class planners

The design process introduced best-in-class planners who actively participated in the creation of a master community plan capturing the essence of BoN's vision.

Holistic Design Standards

To ensure that the development of the community stays focused on our stated vision, design guidelines will be established for future development including building materials, colors, heights, landscape materials, signage lighting, building and landscape setbacks and site furniture. The design and construction team will use these standards as the basis for design while still allowing for creative thinking.

Introduction of Sustainability | High Performance and WELL Initiatives

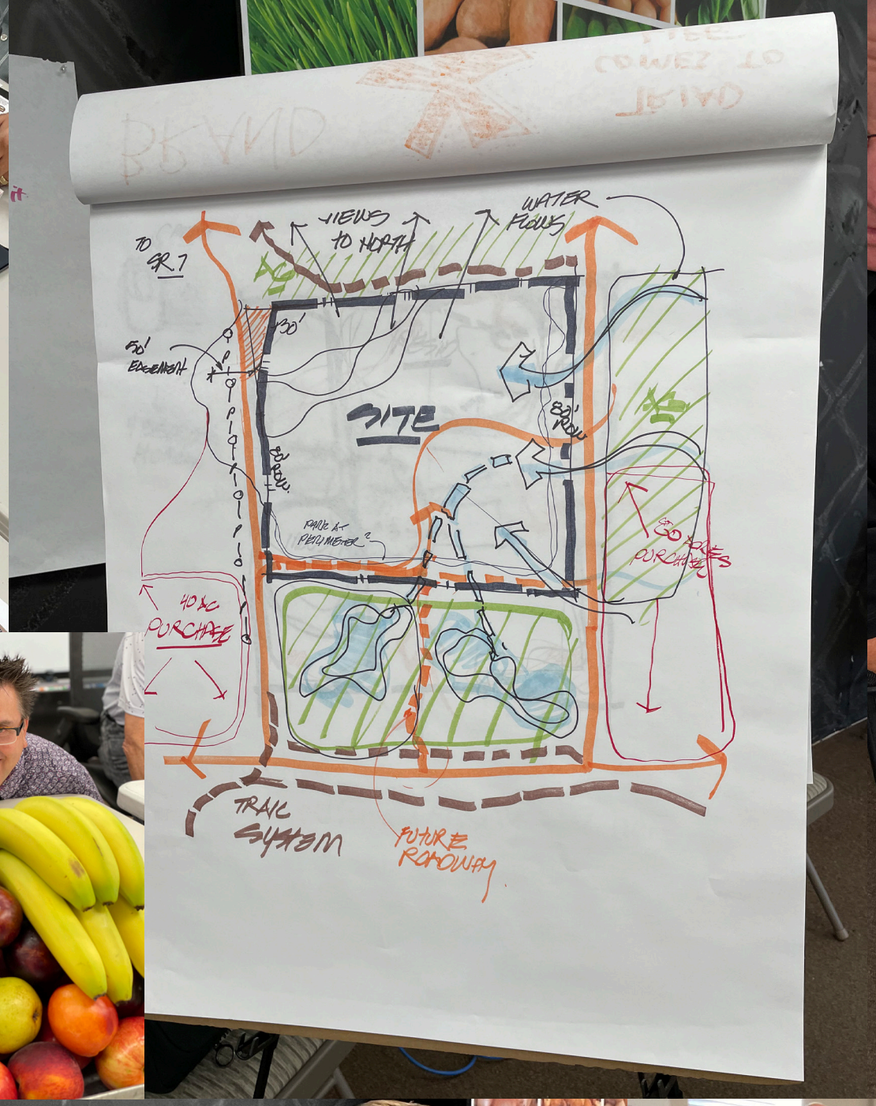
We see Balance Pointe as one that is vibrant and healthy while being responsible to the stewardship of our earth. Toward that goal, we will introduce initiatives that promote well-living and sustainable practices in design, including elements of LEED, Well Building and Community and the Living Building Challenge, but not necessarily certification.

Leverage of Native Assets and Talent:

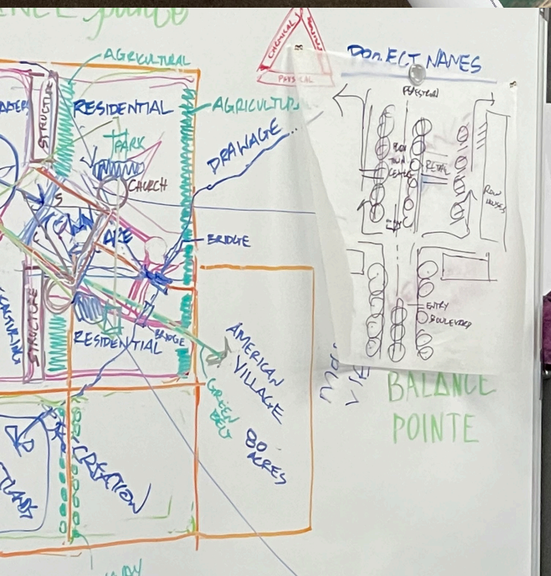
The design team committed to work with local civil and landscape designers to take advantage of their expertise about the environment and civic structure in which Balance Pointe resides.

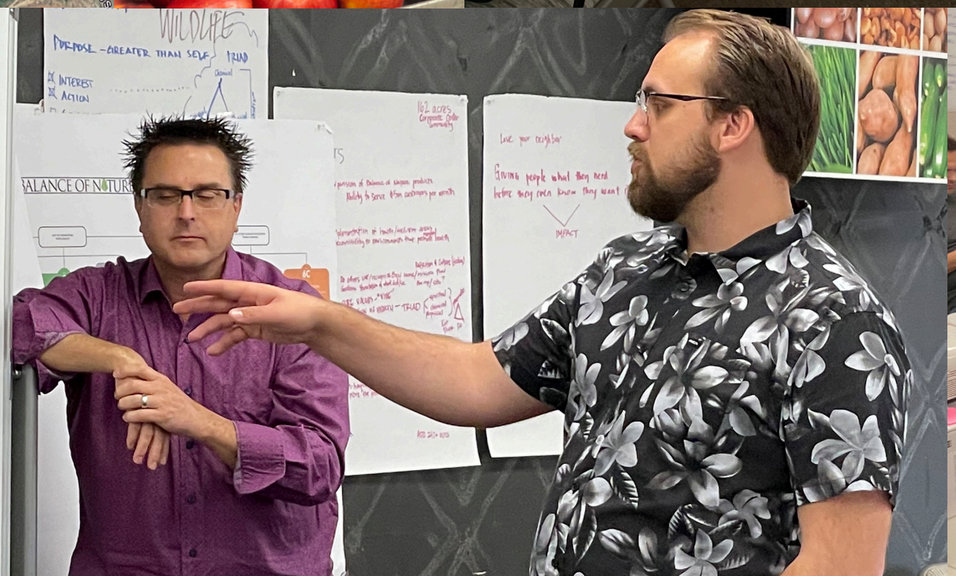
Watch the Balance Point Charrette




VIEWS TO NORTH
WATER FLOWS
TO SR 7
30'
50' EASEMENT
SITE
80' ROW
80' ROW
50 ACRES PURCHASE
40 AC PURCHASE
TRAIL SYSTEM
FUTURE RAILWAY




AGRICULTURAL
RESIDENTIAL
AGRICULTURAL
DRAINAGE
BRIDGE
RESIDENTIAL
AMERICAN VILLAGE
80 ACRES
PROJECT NAMES
BALANCE POINTE


WILDLIFE
PURPOSE - GREATER THAN SELF
INTEREST
ACTION
BALANCE OF NATURE





RESOURCES | SUSTAINABLE STEWARDSHIP

Site and Ecosystems

Create a community that regenerates the local ecosystem.

- Restore regional ecological health/balance - Bench Lake water system
- Circular Agriculture Food, Waste (Compost), Reuse/ Restore Soils
- Native and Native Adapted Plants and Grasses
- Site as Education Opportunity
- Bring back the wildlife (ducks, rabbits, coyotes, quail)
- Permeable site features to reduce runoff

Water

Celebrate water!

- Conserve, improve, and celebrate water as life-giving.
- Toilet to tap - how circular can the water system be?
- Recharge groundwater resources
- Create a water amenity - make it visible
- Celebrate water

Economy

Add value to the company, employees, community, and surrounding ecosystem.

- Utilize Life-Cycle Cost Analysis
- Develop a sustainable economy
- home grown business incubator
- Reinvestment of profit
- Focus on Quality
- Emphasis on Human Capital
- Efficient use of resources
- Plan for sustained growth
- Build for future technology
- Create for quality of life
- Economy/Efficiency of space

Community

Design a community with purpose that will provide a positive and lasting impact on those living in Balance Pointe and the larger region.

- A purpose greater than self
- Practice and promote healthy lifestyle
- "Triad" translated to business, living, play
- Elegantly merge pedestrian focus with "reality"
- Education focused
- Holiday focused

Energy and Resiliency

Reduce dependence on non-local resources, improve community resilience and plan for sustainable growth.

- Create self sustaining systems - energy and water
- Education
- Local materials with longevity
- Future Risks:
- Water
- Pivotability
- Space
- Waste
- Future Growth Plan
- Supply Chain
- Transportation

Wellness

Welcome and support the health and well-being of all people.

- Walking trails
- Parks with trees
- Multi-use fields
- Proving healthy food
- Classes - Food Prep/Fitness/Gardening
- Progressive garden program/HOA sponsored/ edible landscape
- Rotational ranching
- Decentralized/Specialized merchants in lieu of supermarkets
- On-site doctor
- Daycare
- How do we create a "welcoming/wellness first impression"?
- Misting/Heating systems to maximize time spent outdoors
- Horses
- Christmas caroling
- Colonial influence
- Trail system
- Statues/Public Art
- Festivals
- Celebrate holidays and seasons
- Fishing/Swimming
- Hide cars/Limit vehicles
- Control light and noise pollution
- How do you make a large manufacturing facility welcoming?













CONCEPTUAL MASTERPLAN

Fundamental to the master planning efforts, health and wellness became the main driver of the master plan concept. Creating an organic, yet structured development will allow individuals and the community-at-large the opportunity to be immersed in an environment that has both synchronous and parallel encounters, providing therapeutic benefits and improving their overall health just by being there. Access to nature, including water, vegetation, stone, and other natural elements, has been documented to lower stress, lower blood pressure, and increase well-being and mental health. And with so many health and community providers located within Balance Pointe and their interaction with nature will offer an enormous benefit to each user group including employees, residents and visitors.

Abundant opportunities are incorporated into the Conceptual Master Plan including alternatives to establish direct connections to healthy ignitors including education, spiritual growth and renewal of heritage.

Enhanced paving surfaces; improved circulation and connectivity; mobility accommodation; trails/pathways; and directional and interpretive signage were considered as part of the Conceptual Master Plan to gain or improve the internal and external relationships involved in the plan.

Community health will be improved through the multiple park pathways and by development of recreational and rehabilitation features scheduled to occur throughout the various precincts . Opportunities to further improve mental health exist in the Conceptual Master Plan by incorporating additional spaces for meditation, reflexology, socialization, and play.

Health and wellness ideas and concepts expressed below (and others), are integral to the Conceptual Master Plan development.

Watch the entire Balance Point Fly-Thru





COMMUNITY PRECINCTS

Precinct A:

Production | Catalyst

- Warehouse and Production | Distribution Center
- Orchard Parking
- Ability to expand by 2x its size
- Solar panels to shade roof and generate power
- Freeway visibility - building as signage opportunities

Precinct B:

Foundation | Heart

- Balance of Nature Corporate Headquarters
- Prominent location on Sullivan's Knoll
- Focus on building from main entry boulevarde
- Large scale building with a mix of at grade and below grade parking
- Variety of building height to take advantage of views
- Observation deck looking into amphitheatre

Precinct C:

Engagement | First Impression

- Water wheel entry monument
- Stormwater conveyance
- Trail system
- Community gardens
- Parking Orchards
- Carriage stops
- Brand

Precinct D:

Convergence| Live Work Play

- Town Center
- Mix of Retail, and Commercial uses
- High density live work space
- Walkable streetscape
- Doubles as an event plaza
- Seasonal activities space
- Three story maximum building heights

Precinct E:

Home | Hearth

- Housing for BON employees
- Single family homes on ¼ and ½ acre lots
- Garden homes
- High density live work units near town center
- Home gardens
- Street paving to encourage walking
- Access to trail system

Precincts F & G:

Enrichment | Culture

- Church
- Located near entry off water feature
- Shared parking for town center during peak hours
- Educational (K-8th Grade School
- Walkable school access
- Playfields for school and community
- Access to community gardens for hands on teaching

Precinct H:

Health | Wellness

- Low scale community hospital
- Emergency services
- Medical Clinic
- Surgery, Imaging, Therapy and Pharmacy
- In-Patient Hospital Rooms
- Emergency Helipad
- Fronts the water feature
- Visible and easily accessible

Precinct I:

American Village | Experience

- American Village First Person Learning Experience
- Follows the Alabama model
- Express the three branches of government
- Veterans Memorial
- Admissions building
- Stables and corral for carriage horses
- Picnic areas
- Staff maintenance buildings

PRECINCT A

Production | Catalyst

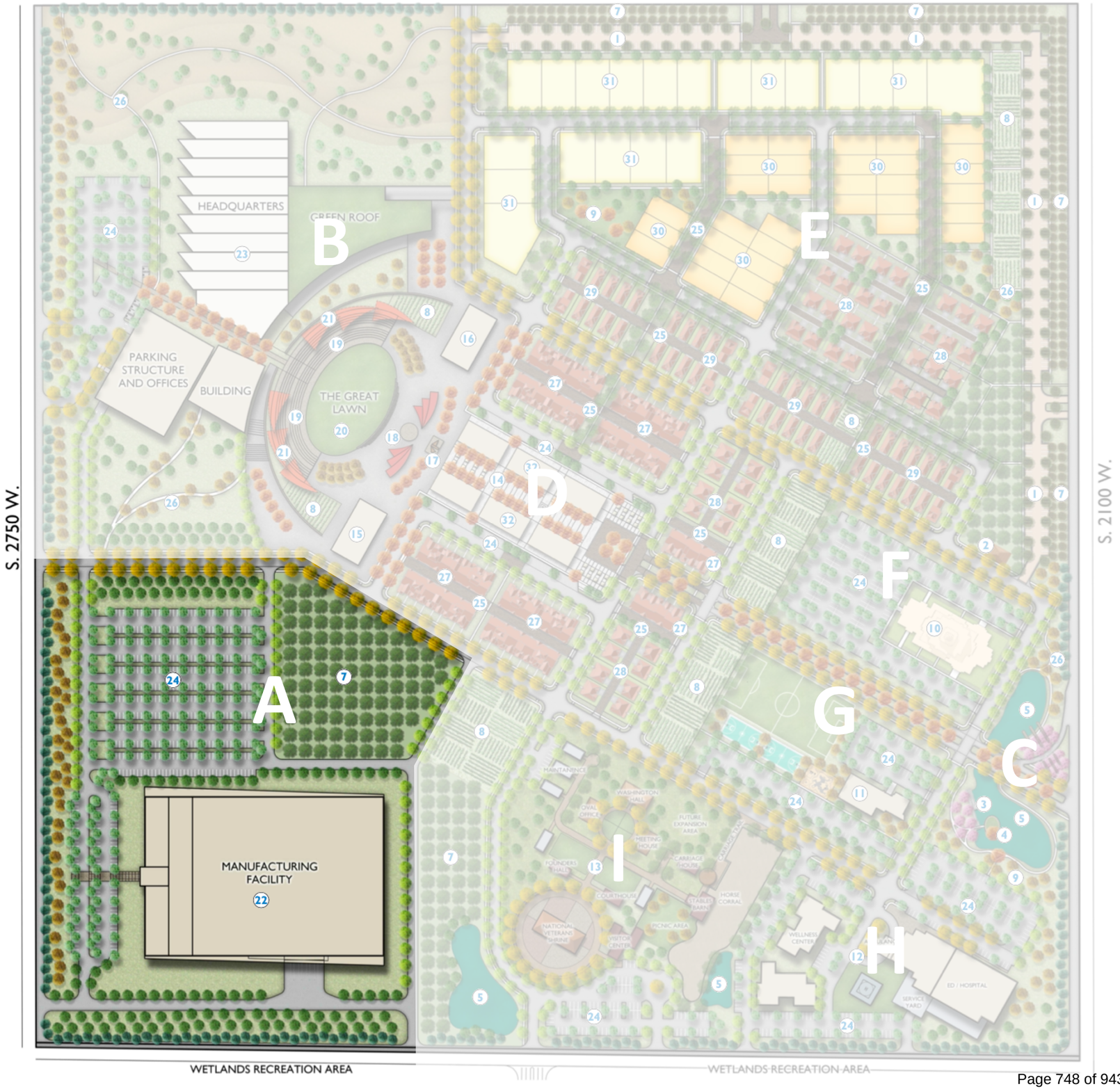
Warehouse and Production Facility

Set on approximately 28 acres and surrounded by tree orchards, the first phase Manufacturing | Production facility is the cornerstone building block for the community and CATALYST for development. This 200,000 sf + building produces and stores the bulk of Balance of Nature's products and as such it is the economic driver for the community. Sited on this southeastern corner of the site because of its compatibility with the current Light Industrial Zoning of the adjacent land parcels as well as the easy access to State Route 7 this large scale building is visible from the state highway and presents an opportunity for architectural "Balance of Nature branding".

We envision a building that is efficient in its design with an understated elegance that reflects its use. Agrarian materials of concrete, steel and metal panels will be used in its composition. Photovoltaic panels will be used to at the roof line to produce power and shade the roof. Surrounding the building is staff and visitor parking that is separated from truck traffic. A large field of "orchard style parking" is designed north of the building to provide parking for the new Headquarters building to the north. Space has been landbank to allow for a 200,000 sf warehouse expansion in the future.

At a glance:

- Warehouse and Production | Distribution Center
- Orchard Parking
- Ability to expand by 2x its size
- Solar panels to shade roof and generate power
- Freeway visibility - building as signage opportunities




520




Phone
50-9156
GOLDEN CRUST
BAKERY

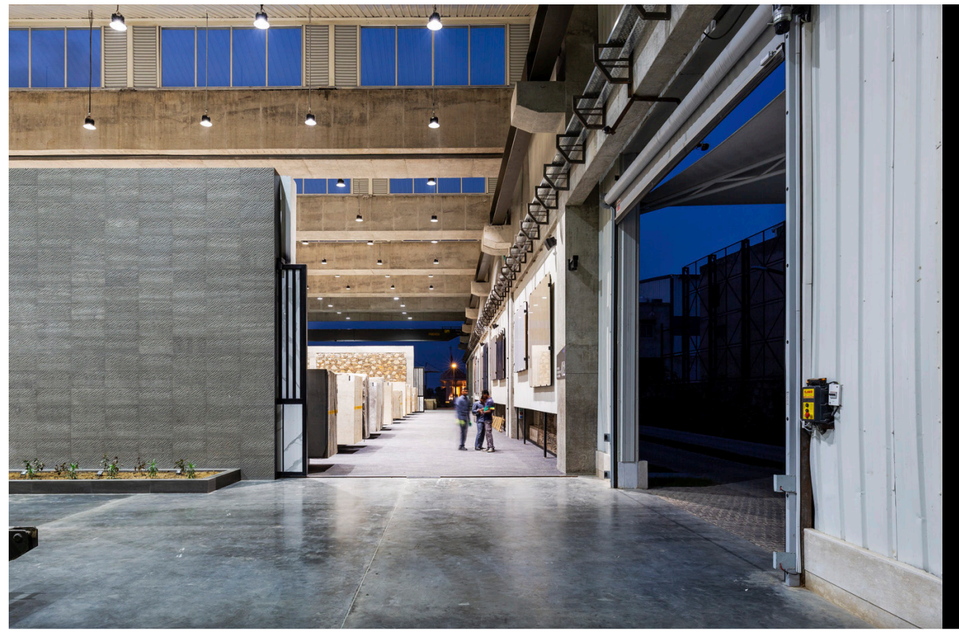

VILLAGE LAMA


FARM CIRC




520
SURLY


520
SURLY





PRECINCT B

Headquarters | Foundation Heart

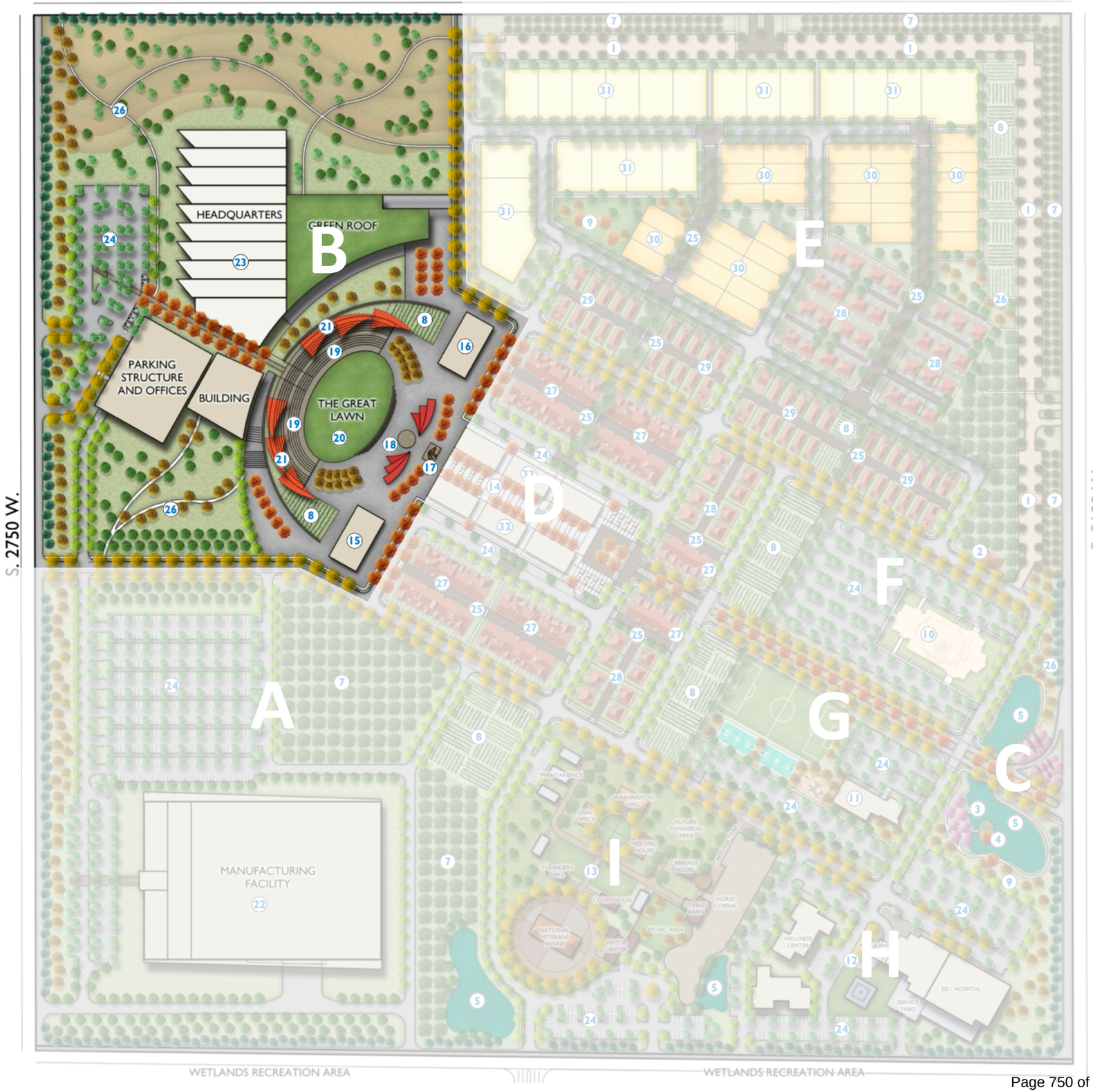
Corporate Offices and Amphitheater

Representing the Heart and Soul of the Balance and Nature Organization is their new corporate headquarters. Planned to be built in multiple phases this 750,000 sf building will be the largest structure in the community and purposely set into the grades on Sullivan's Knoll. Designed to be part of the hill rather than atop, the office spaces will overlook the public amphitheater and performance stage and have a view through the Town Center and out to the surrounding peaks.

The headquarters building features naturally daylit space via its sawtooth shaped roof structure that mimics the distant mountain peaks. Green roofs, views to the new community town center, and the entry to Zion Park can all be experienced in this building and will be an attraction to recruit and maintain employees. Access to the state trail system for early morning mountain bike rides or sunset hikes are available to employees. Visitor parking will be located on the west side of the building to remove the view of cars from the community side of the building. Staff parking and service is planned to be a mix of surface and primarily parking below the grade of the building.

At a glance:

- Balance of Nature Corporate Headquarters
- Prominent location on Sullivan's Knoll
- Focus on building from main entry boulevarde
- Large scale building with a mix of at grade and below grade parking
- Variety of building height to take advantage of views
- Observation deck looking into amphitheatre

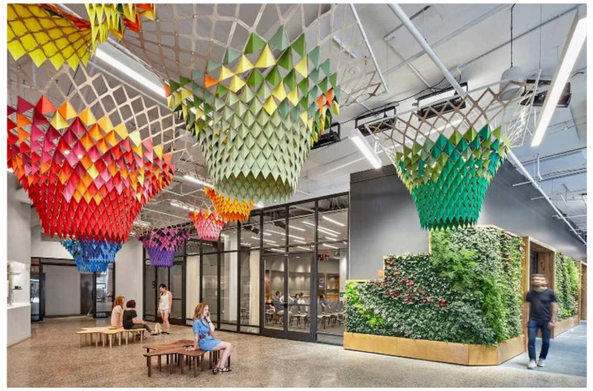


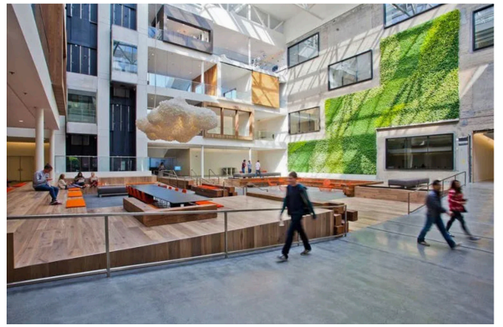




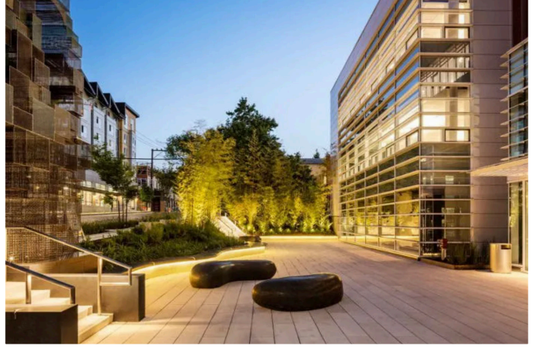










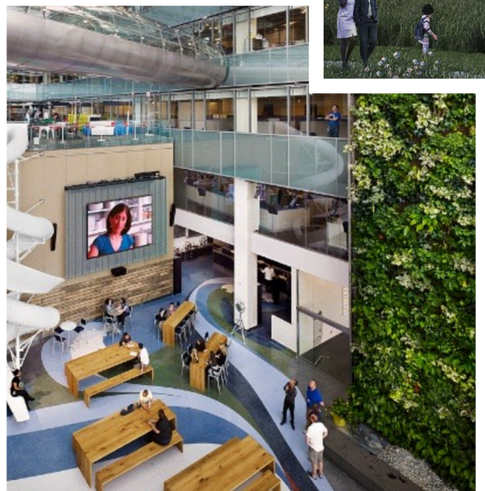


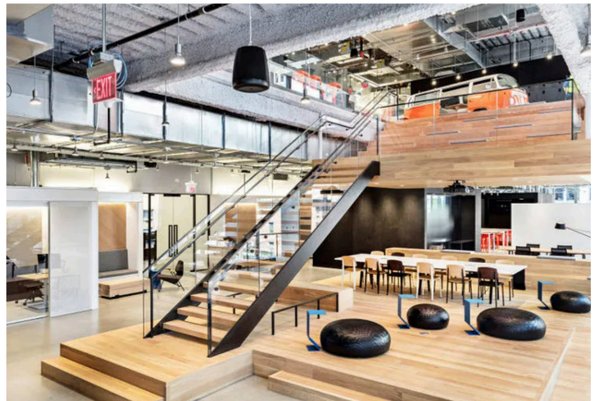














PRECINCT C

Engagement | First Impression

Main Entrance to the Community

Making a big splash with its entry feature lake and tree lined boulevard and its kinetic water wheel sign/sculpture you know you've arrived at Balance Pointe. The lake is surrounded by a grassy shore line that features a small island and a bridge that appears to float above the water. The bridge signals a passage from life in the fast lane to a quieter, more peaceful life in small town america.

This tree lined roadway is the connecting spine that links the Town Center, School and Church as well as Residential Neighborhoods and Wellness Center. To passively discourage the use of motorized vehicles within the town, shaded parking orchards are provided around the perimeter of the site with a connecting trail system to nearby carriage stops that let visitors experience what it's like to ride in an old fashioned horse and buggy. Crossing a bridge over the running stream signals entry into the town. Church and Schools frame the view into the town square with its pedestrian friendly walkable sidewalks and park

At a glance:

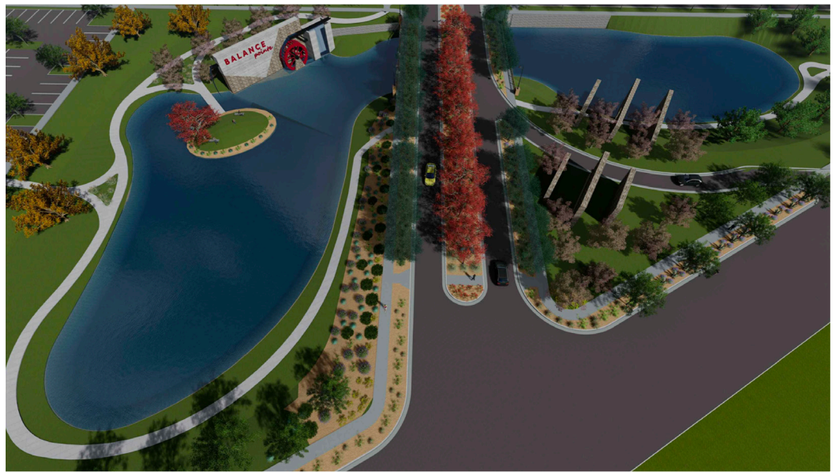
- Water wheel entry monument
- Stormwater conveyance
- Trail system
- Community gardens
- Parking Orchards
- Carriage stops
- Brand





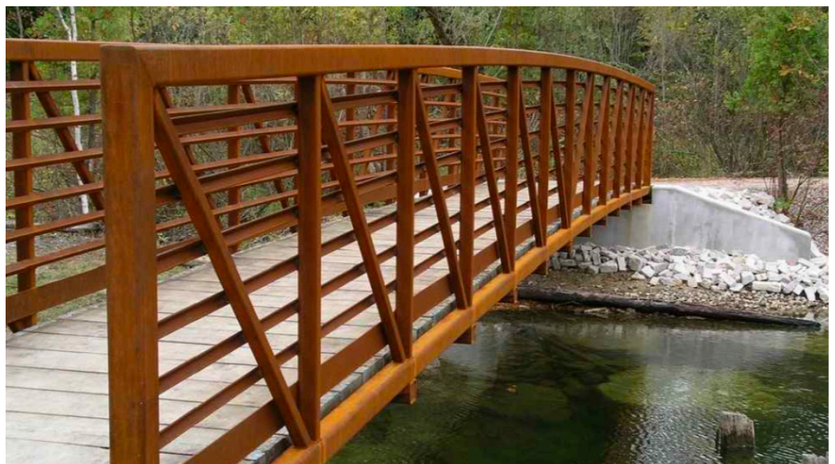

BALANCE
pointe




BALANCE
pointe








BALANCE
pointe

PRECINCT D

Convergence | Live Work Play

A Small-Town Walkable Square

Located at the geographic center of the community. Here the Town Center or Square is where the concept of Live Work and Play converge. The walkable design of this town center intentionally distracts its population long enough to enjoy the slower pace of the community. Visitors that parked in the orchards and rode the horse crown carriage are dropped off at the entry to the town center.

The architecture of the town square is a slice of familiar Americana with small scale shops that provide the retail services we have come to enjoy, fresh groceries, icecream, restaurants, a bed and breakfast and a movie theatre with a brightly lit marquee! A post office where you can mail letters, packages and postcards all with the special Balance Pointe postmark is open from 8am to 5pm monday thru saturdays.

A fitness center and museum are planned to flank the public outdoor stage. The community's stage and amphitheatre take advantage of the gentle slope of Sullivans Knolll to provide seating to view the local talent that's on display nightly and at special seasonal events. Mixed use live work space and lofts are available for young couples and small families that enjoy the lifestyle of living "Downtown."

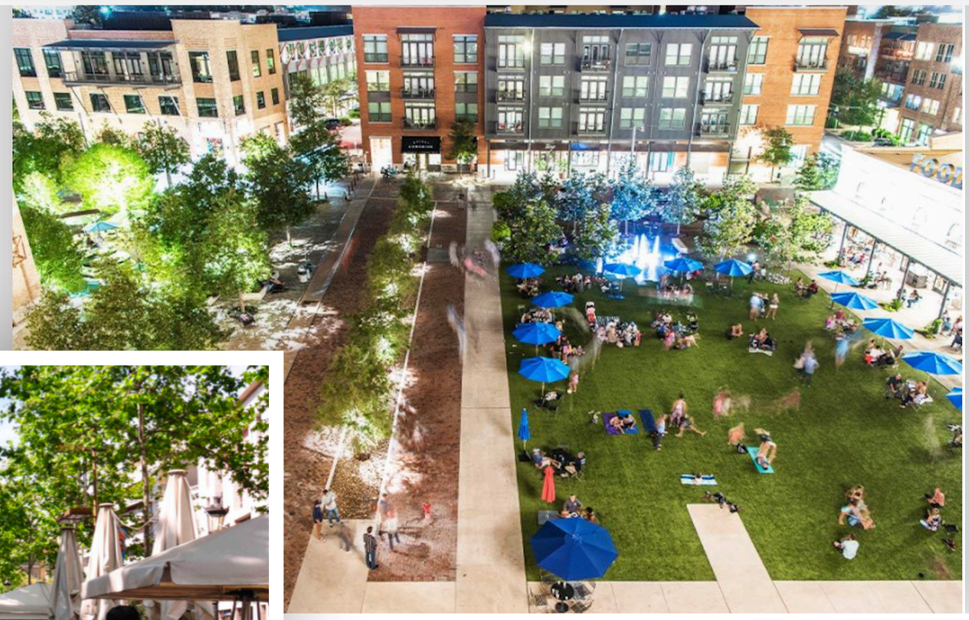
At a glance:

- Town Center
- Mix of Retail, and Commercial uses
- High density live work space
- Walkable streetscape
- Doubles as an event plaza
- Seasonal activities space
- Three story maximum building heights




TO VISITOR/ RECREATION CENTER
TO AMPHITHEATER AND HEADQUARTERS
TO GYM/ FITNESS CENTER
BUILDING A
BUILDING B
BUILDING C
BUILDING D
BUILDING E
BUILDING F
RESIDENTIAL ROW HOUSES
RESIDENTIAL ROW HOUSES


H. KEPNER
DESIGN STUDIO
ANTIQUES
201
Feast & Reason







PRECINCT E

Home | Hearth

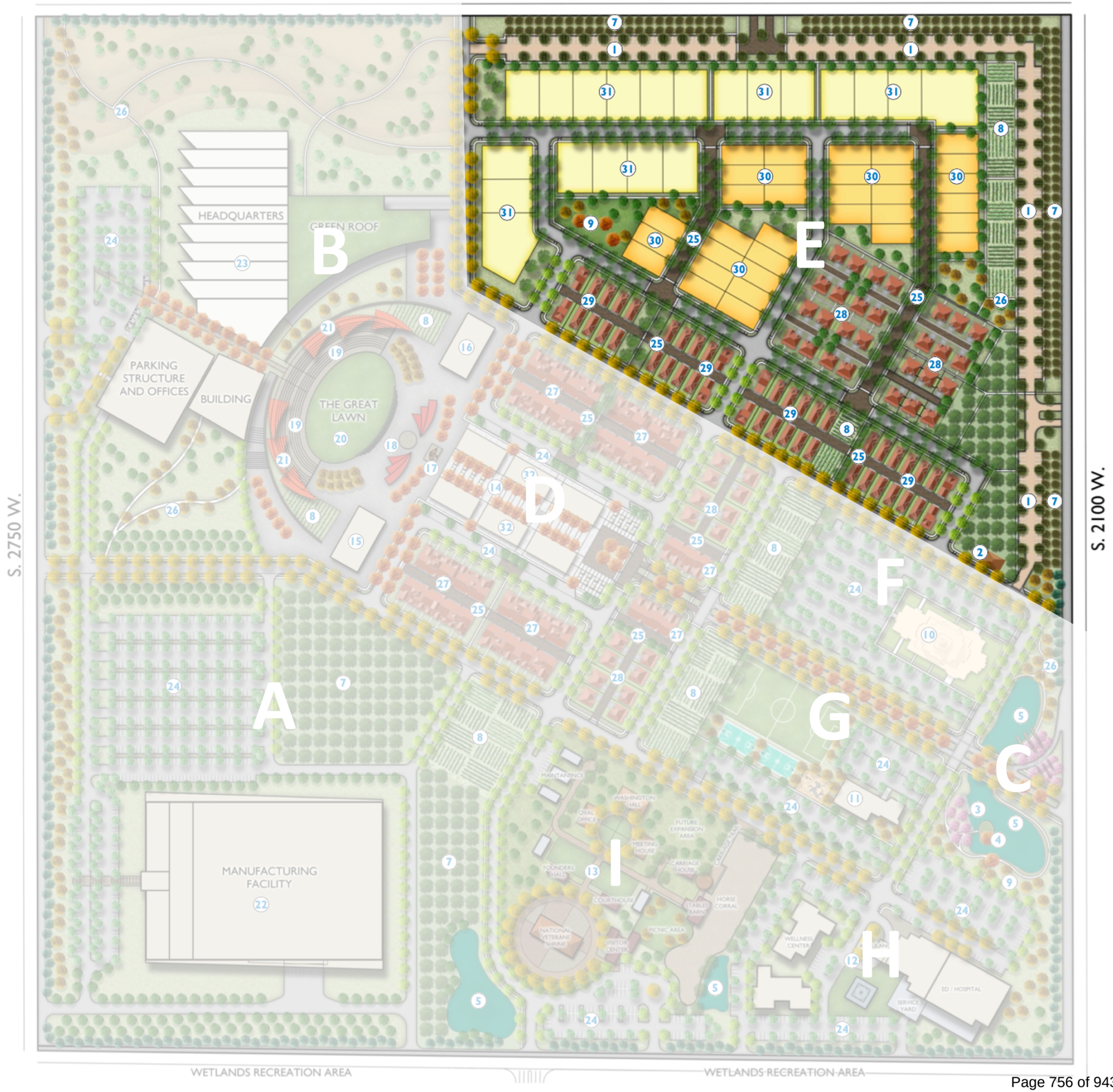
Front Porch Living: Live | Work Residences

Surrounding the town square, a variety of Live/Work homes meet the needs of each generation and encourage connection and hospitality. In addition, the residences leading away from the square include a mix of single-family homes that are focused on community gardens and green parks. Front porches encourage social interaction with neighbors, creating a sense of community.

Pocket parks, trails and community gardens surround the residential component of Balance Pointe creating the opportunities for families to socialize and form lifelong bonds. A mix of cobblestone streets, oversized front yard setbacks and safe sidewalks create a feeling of well-being and peace of mind that our children are safe when playing outside. Neighborhoods will be themed to give an identity to each area and are designed for Multi-Generational living.

At a glance:

- Housing for BON employees
- Single family homes on ¼ and ½ acre lots
- Garden homes
- High density live work units near town center
- Home gardens
- Street paving to encourage walking instead of driving
- Access to trail system













PRECINCTS F & G

Enrichment | Culture

Church and School

Positioned as bookend 5 acre sites at the entry to Balance Pointe are the church and school. The importance of education and faith is expressed by their location as two of the buildings seen first by visitors. Overlooking the entry lake the church reflects off the water and provides a beautiful setting for weddings and receptions. Parking for the church may be opened to visitors during the week during special Town Center events.

The school is planned as a Kindergarten thru 8th grade charter school that serves Balance Pointe and the Hurricane Valley. The school is situated near the lake with its playfields to the opposite end of the site to allow for special event parking on the soccer field lawn. Community gardens are linked to the school and offer students the ability to learn about gardening and healthy foods.

At a glance:

- Church
- Located near entry off water feature
- Shared parking for town center during peak hours
- Educational (K-8th Grade School)
- Walkable school access
- Playfields for school and community
- Access to community gardens for hands on teaching




100
VERRADO
Elementary Sch
20873 West Sunrise Law
ADMINISTRATION
VERRADO ELEMENTARY
WELCOME!
PLEASE
SIGN-IN AT
THE MAIN
OFFICE


800







PRECINCT H

Health | Wellness

Hospital and Wellness Campus

Fundamental to a community built on health and wellness is the ability to provide emergency healthcare services to those needing care. Planned as an expandable medical center that grows with the community, the hospital is designed to begin as an Urgent Care / Emergency Department with a helipad as a first phase. As the population increases the hospital can be expanded to include surgery (in and out-patient) with overnight patient rooms. The surgery center is designed to double in size and add additional patient rooms as necessary. Service to the hospital is located on the side opposite of the main entry away from public view.

A low scale single story grouping of medical offices for specialists is planned adjacent to the hospital and completes the medical campus. These buildings will offer outpatient services such as physical therapy, rehab, plastic surgeons, imaging, chiropractic, and dental services.

At a glance:

- Low scale community hospital
- Emergency services
- Medical Clinic
- Surgery, Imaging, Therapy and Pharmacy
- In-Patient Hospital Rooms
- Emergency Helipad
- Fronts the water feature
- Visible and easily accessible




























EMERGENCY



PRECINCT I

American Village | Experience

A Lesson in American History

Modeled after the American Village in Alabama, this 10-acre site allows kids as well as students of history of all ages to step back in time and relive what it was like to live in the early days of our country. Here the price of the freedom we all enjoy now is made evident. Located to take advantage of those traveling on Roadway 3000 South to Zion Park, the village can be accessed on either side of Balance Pointe or, when the Wetlands is developed a separate roadway will lead directly to the American Village. The architecture of this precinct is reminiscent of colonial days. Organized around the formal geometric principals as our capital one can begin to pick out buildings that reflect the Executive, Legislative and Judicial branches of American Government.

Adding to the mystic of the area is a Veterans memorial that pays tribute to our fallen heroes of past wars. This area has a large picnic area where families can spread out a blanket, have lunch and enjoy watching the carriage horses running and playing in the corral. Easy RV access and overnight spots with dry hookups are planned for travelers convenience.

At a glance:

- American Village First Person Learning Experience
- Follows the Alabama model
- Express the three branches of government
- Veterans Memorial
- Admissions building
- Stables and corral for carriage horses
- Picnic areas
- Staff maintenance buildings

















ARCHITECTURAL & SITE CHARACTER

Architectural Character:

The agricultural heritage of southern Utah and the City of Hurricane aligns well with the Goals, Values, Mission and Vision of Balance of Nature as a company and what they want to reflect in their new community Balance Pointe. The architectural character of Balance Pointe is meant to reinforce an agrarian lifestyle that is at the intersection of Industrial, Farm and early American architecture. Reinterpreted as New American Industrial Farmhouse, elements of these touchpoints can be seen **in the following materials and compositions:**

- Low scale buildings
- Indigenous materials
- Massing that is both lightweight and solid
- Reflects permanence
- Is authentic and genuine
- Seamlessly integrated indoor and outdoor spaces
- Organic forms, terraces, decks, rooftops and open walls that support programming that compliments healthy activities

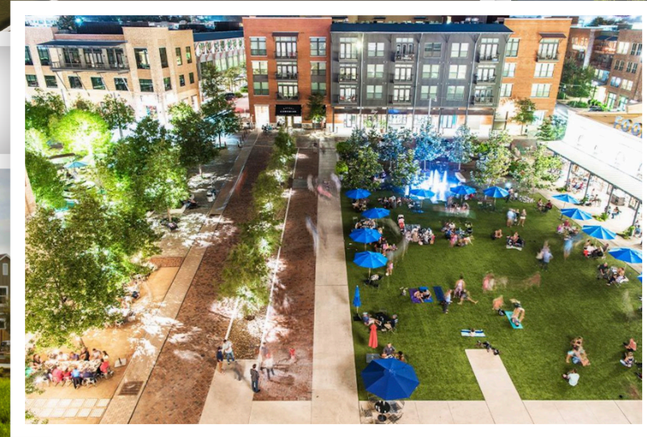




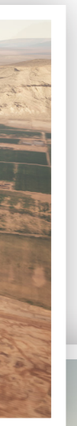
























SITE CHARACTER & AMENITIES

The masterplan balances the notion of Live, Work and Play with its highly amenitized environment that includes the following:

- Water is to be used in creative ways that reflect the high value placed on it as a resource and its power to create comfort, recreation, habitat and interest
- Natural flows of water on the site will be channeled to the lower section of the site to create a Wetlands area that brings back natural wildlife to the area
- Balance Pointe is planned to have interconnectivity of trails and pathways that encourage walking and discourages the use of motorized vehicles
- Where parking is provided for vehicles it is intended to be hidden below grade and or in treed parking orchard
- To encourage parking outside of the community horse drawn carriages carry visitors to the town center for events and shopping
- Site amenities such as community gardens and "edible landscaping" is planned throughout the community
- Catch and release ponds let families enjoy the simple pleasures of life
- Utilizing the natural grading of the land a large public amphitheatre is positioned at the high end of the retail site that leads to the new Headquarters Building

PRELIMINARY PROGRAM ELEMENTS

Community Elements as Depicted on Master Plan

PHASING PRIORITY	DESCRIPTION	SIZE EACH (INCL GARAGE)	QUANTITY	TOTAL SIZE	COST/SF	TOTAL COST	FLOORS	FOOTPRINT AREA	PARKING RATIO	REQUIRED PARKING
Buildings										
	Single-Family Residences - Sizes:									
3	Medium Density Homes	3,320 SF	33	109,560 SF	$160/SF	$17,529,600	1 1/2	73,040	2.00 per unit	66 Spaces
3	Low Density Homes	3,864 SF	20	77,280 SF	$175/SF	$13,524,000	1 1/2	51,520	2.00 per unit	40 Spaces
3	Green Court Homes	3,108 SF	44	136,752 SF	$160/SF	$21,880,320	2	55,176	2.00 per unit	88 Spaces
3	Rowhouses	2,920 SF	74	216,080 SF	$150/SF	$32,412,000	2	108,040	2.00 per unit	148 Spaces
3	Alley-Loaded Homes	2,508 SF	46	115,368 SF	$150/SF	$17,305,200	2	57,684	2.00 per unit	92 Spaces
	Mixed Use Residential - Types:									
2	Studio (Above Mixed Use)	500 SF	32	16,000 SF	$173/SF	$2,768,000	2	N/A	1.00 per unit	32 Spaces
2	1 Bedroom (Above Mixed Use)	750 SF	46	34,500 SF	$173/SF	$5,968,500	2	N/A	1.00 per unit	46 Spaces
2	2 Bedroom (Above Mixed Use)	900 SF	30	27,000 SF	$173/SF	$4,671,000	2	N/A	2.00 per unit	60 Spaces
2	Mixed Use (Retail, Professional Office, Restaurants)	67,988 SF	1	67,988 SF	$200/SF	$13,597,600	1	67,988	1 per 250	272 Spaces
4	Parking Structure (650 Spaces)	206,004 SF	1	206,004 SF	$75/SF	$15,450,300	4	51,501		
2	Corporate Offices (1/200 Ratio)	175,000 SF	1	175,000 SF	$275/SF	$48,125,000	4	43,750	1 per 200	875 Spaces
2	Offices/Call Center (1/150 Ratio)	393,750 SF	1	393,750 SF			4	98,438	1 per 200	1,969 Spaces
1	Warehouse/Manufacturing	240,000 SF	1	240,000 SF	$150/SF	$36,000,000	1.1	218,182	1 per employee	200 Spaces
1	Data Center	TBD	1		$500/SF	$0	1	0	1 per employee	6 Spaces
1	Central Plant/Facilities	TBD	1		$1,000/SF	$0	1	0	1 per employee	12 Spaces
	Hospital	78,000 SF	1	78,000 SF			2	39,000	1 per 500	156 Spaces
	Wellness / Medical Offices	24,000 SF	2	48,000 SF			1	48,000	1 per 200	240 Spaces
	Chapel	25,190 SF	1	25,190 SF		By Others	1	25,190	1 per 6 seats	125 Spaces
	School	10,196 SF	1	10,196 SF		By Others	1	10,196	1 per Classroom	7 Spaces
2	Water Treatment Plant (on adjacent property)	152,460 SF	1	152,460 SF		TBD	1	152,460	1 per employee	6 Spaces
	Heritage Center	12,164 SF	1	12,164 SF			1	12,164	1 per 300	41 Spaces
	Building Totals			**2,141,292 SF**				**1,112,328 SF**		**4,480 Spaces**
Site										

FUTURE
RISKS

- WATER
- Pivot ability
- Space
- Waste
- future growth plan
- Supply chain
- transportation
-

RESILIENCY / ENERGY

WIND?
* SOLAR?
WATER? Irrigation? re use Lake?
Sustainability
GEO THERMAL
Redunant TYPES OF COOLING & HEATING Systems
longevity of materials, local materials
* education

underground power lines?
Green materials
grey water system

SELF SUSTAINABLE SYSTEMS

Segmentation
Transition

COMMUNITY (2)

NOT JUST FOR EMPLOYEES
LEVELS of "CONTROL"
HIGH USE
"MINDSET"

AMPHITHEATER - concerts/plays/gatherings
HOW TO MERGE PEDESTRIAN ONLY (WITH reality

OPEN EDUCATION / LEARNING SPACE
"VALUE OF BOOKS" LIBRARY

ZING

WELLNESS

- WALKING TRAILS
- PARKS W/ TREES
- MULTI-USE FIELDS soccer/BASEBALL
- GROWING HEALTHY FOOD
- CLASSES - FOOD PREP/FITNESS/GARDENING
- PROGRESSIVE GARDEN PROGRAM (HOA SPONSORED) - "EDIBLE LANDSCAPE"
- ROTATIONAL RANCHING
- DECENTRALIZED / SPECIALIZED MARKETS
  - SCHOOL
  - CHURCH
  - DAYCARE
  - ONSITE DOCTOR
  - POST OFFICE / BOX

COMMUNITY

WILDLIFE

PURPOSE - GREATER THAN SELF
TRIAD
Chemical
Spiritual
Physical
- [x] INTEREST
- [x] ACTION
- [ ] GEOGRAPHY
- [x] PRACTICE - practice healthy lifestyle
- [ ] CIRCUMSTANCE

MULTI-USE
HOLIDAYS
FARMER MKT
WILDLIFE
ANIMAL HOUSING
PEDESTRIAN
TOWN CENTER
HQ
TOWN CENTER

BUSINESS
LIVING
PLAY

HOW DO THEY MIX
HOW DO THEY SCALE?

PARKS, PLAYFIELDS (SOCCER), TRAILS (WALK, BIKE)
CONNECTIONS TO NEIGHBORS COMMUNITY
AMMENITY CENTER - SWIM

LIMIT Vehicular patterns

INTEGRATION
Segmentation
Transition

MMUNITY (2)
JUST FOR EMPLOYEES
LS of "CONTROL"
HIGH USE
"MINDSET"

PHASING PLAN

The phasing recommendations for the Balance Point project focus on first developing access to the community - specifically the Southwestern 40 acres of the site where the first phase of Manufacturing, Warehouse and Distribution facilities for Balance of Natures product lines will be constructed. Initiating this as an early success project is critical to financing the rest of the community's development on a precinct-by-precinct basis. Early success projects could be developed and undertaken within each precinct to encourage early use of the community.

It is important to note that phasing will be driven by visionary ideas and funding opportunities that are unknown at this point. Future components of the development may be not-for-profit based and will develop as revenues are generated from the for-profit earlier components of the community. Based on priorities set by BoN's leadership committee, the preliminary phasing of the community's development are identified as:

1

Phase One:

(Precinct A): Production | Catalyst

- Phase 1a - Provide access and basic infrastructure needs to make the site safe for private and public access
- Phase 1b - Develop 200,000 sf + of Balance of Nature's Production, Manufacturing and Warehouse

2

Phase Two:

(Precinct B): Foundation | Heart

- Phase 2a - Develop 175,000 sf the BoN Headquarters

(Precinct C): Engagement | First Impression

- Phase 2b - Develop Entry Feature and Main Street
- Develop early success projects (Community wide) such as early grading for updated stormwater conveyance and storage, community trails, gardens and main entry roadways.

(Precinct D): Convergence| Live Work Play

- Phase 2c - Begin developing Town Center, Retail, Commercial and Amphitheatre. The Town Center will provide residential service opportunities necessary to sustain the new community

3

Phase Three:

(Precinct E): Home | Hearth

- Begin to develop mixed use and single family housing for BON employees.
- Mixed Use and high density homes first
- Garden homes
- Larger lot homes

(Precincts F & G): Enrichment | Culture

- Concurrently phasing of Cultural enrichment sites F & G
- Spiritual - Church Site
- Education K-8th Grade School

4

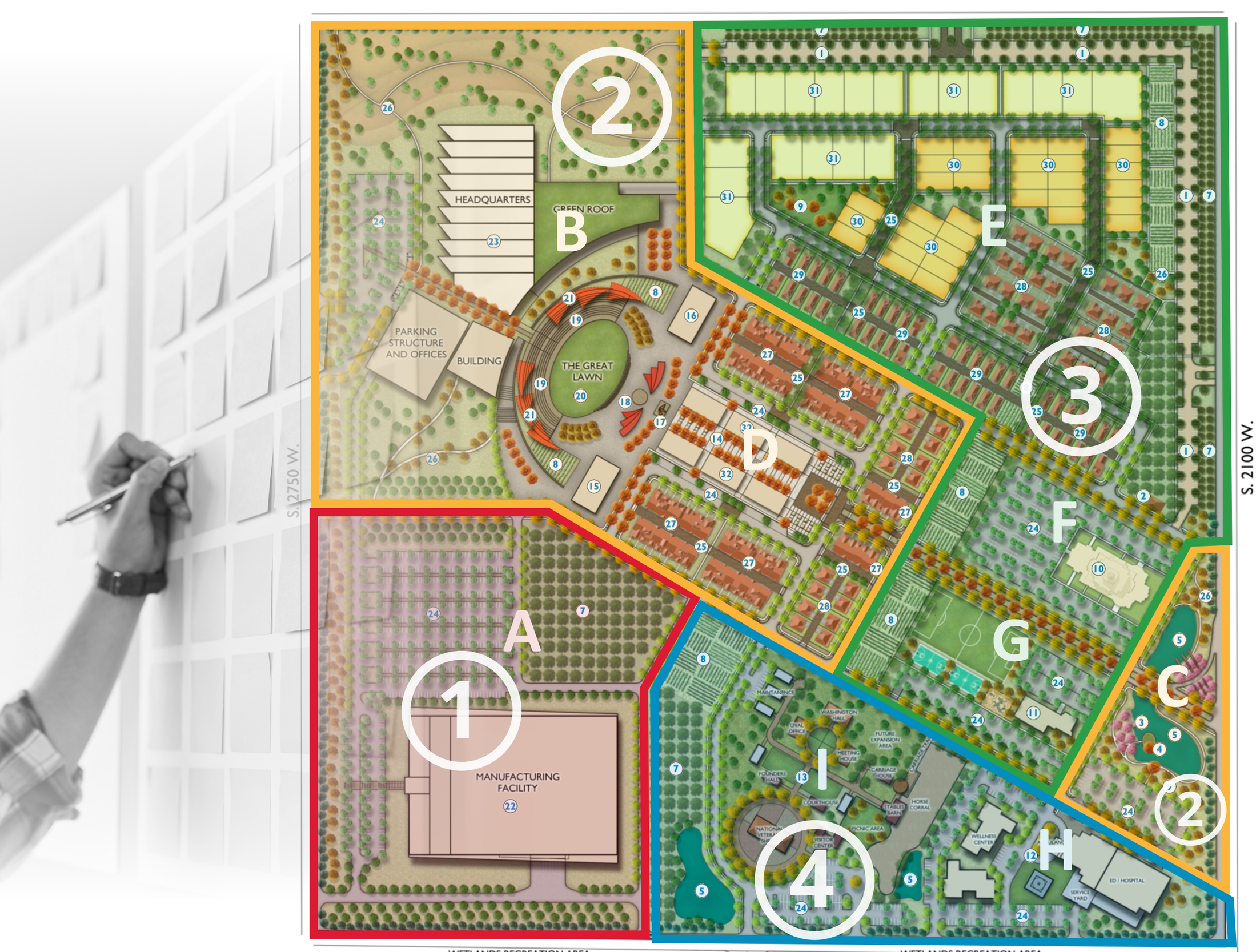
Phase Four

(Precinct H): Health | Wellness

- Develop the wellness and healing village due to its proximity to the main entry and serving those in the community

(Precinct I): American Village | Experience

- Develop all remaining precincts and areas including the American Village
- Maintaining flexibility is important when prioritizing the phasing for the community. Factors such as the pace of development , the economy and availability of funding and land acquisitions could significantly impact the communities phasing priorities.


S. 2750 W.
S. 2100 W.
HEADQUARTERS
GREEN ROOF
B
PARKING STRUCTURE AND OFFICES
BUILDING
THE GREAT LAWN
D
E
3
F
G
C
2
A
1
MANUFACTURING FACILITY
I
4
H
MAINTANENCE
WASHINGTON HALL
OVAL OFFICE
FUTURE EXPANSION AREA
MEETING HOUSE
CARRIAGE HOUSE
CARRIAGE TRAIL
FOUNDERS HALL
COURTHOUSE
STABLES BARN
HORSE CORRAL
PICNIC AREA
VISITOR CENTER
WELLNESS CENTER
ED / HOSPITAL
SERVICE YARD

IMPLEMENTATION STRATEGIES

Next Steps

The Conceptual Master Plan was developed to serve as a high-level visioning document for the future Balance of Nature Planned Community known as Balance Point. In order to further advance these concepts the plan must move forward from conceptual design to schematic design. This means moving from small (graphically) scale drawings to large scale drawings to develop infrastructure, grading and drainage and layouts that will shape the various components of the community.

Advancing from conceptual to schematic design of the Phase One development:

- Confirming the Manufacturing Plant Program including -
- Design and layout of the building
- Parking required
- Utilities /infrastructure required to serve this building
- Transportation access from roadway 3000 S.
- Grading and drainage capacity and layout
- Conduct a Geotechnical Report
- Other community components to continue to develop:
- Advancing the development of the Balance Point Brand
- Communicate the Balance Pointe Brand, its philosophy, values and vision.
- Integrate these ideas into the Master Site Plan
- Develop Specific Implementation Projects
- Refine the design of Community features including horizontal layout, grading and amenities
- Develop conceptual programming and design for early success buildings and identify potential building tenants and users
- Generate and determine cost and feasibility of available water resource options
- Develop utility (water, sewer, power, gas and communication) designs
- Power and water backbone systems
- Develop Cost Estimates and Phasing and an Implementation Plan:
- Update the cost estimate base on the Phase One Schematic Plan
- Further refine overall implementation plan
- Establish overall schedule
- Determine an acquisition strategy for additional adjacent land













APPENDICES

- **ALTA Survey** *(provided by Balance of Nature)*
- **Geotech Report** *(provided by Balance of Nature)*
- **Preliminary Water and Sewer Demands Report**
- **Preliminary Master Utility Plans**
- **Preliminary Master Drainage Study**
- **Preliminary Master Drainage Plans**
- **Photos of the site and surroundings (Drone images)**
- **Design Process**
- **Program Data**
- **Concept Sketches**

PRELIMINARY WATER AND SEWER DEMANDS REPORT

Estimated
Water Demand & Sewer Flow Report

For

Balance of Nature

City of Hurricane, Utah

Project No. 21-0167

Date: September 2021

1130 N. Alma School Road, Suite 120
Mesa, AZ 85201
o: 480.503.2250
f: 480.503.2258
www.epsgroupinc.com

Estimated Water Demand Calculations (Entire Site):

Water demand is estimated using table 510-1, 510-2, and 510-3 of the Utah Safe Drinking Water Act (Title 19, Chapter 4 of the Utah Code):

BALANCE OF NATURE (HURRICANE, UT)

WATER DEMAND					
Type	**Number Units/Employees**	**Peak Day Demand (gpd/conn)**	**Total Peak Day Demand (gpd)**	**Avg. Yearly Demand (gal/conn)**	**Avg. Yearly Demand (gal)**
Single-Family Residences					
3 Bedroom, 2 Bath	131	800	104,800	146,000	19,126,000
4 Bedroom, 2 Bath	131	800	104,800	146,000	19,126,000
Single-Family w/ Accessory Dwelling Unit					
Townhomes (Rowhouses)(3 BR, 2 B)	74	800	59,200	146,000	10,804,000
Mixed Use Residential - Types:					
Studio (Above Mixed Use)	100	800	80,000	146,000	14,600,000
1 Bedroom (Above Mixed Use)	100	800	80,000	146,000	14,600,000
2 Bedroom (Above Mixed Use)	100	800	80,000	146,000	14,600,000
Total Residential Units	**636**	800	**508,800**		**92,856,000**
Mixed Use (Retail, Professional Office, Restaurants)					
Headquarters/Offices (Per number of employees)	7000	25	**175,000**	87500	612,500,000
Warehouse/Manufacturing (Per number of employees)	133	35	4655	2327.5	309,558
Data Center (Per number of employees)	50	25	1250	625	31,250
Central Plant/Facilities (Per number of employees)	50	25	1250	625	31,250
Ampetheater (Per number of seats)	200	5	1000	500	100,000
Library (Per number of ublic toilets)	4	500	2000	1000	4,000
Museum (Per number of public toilets)	8	500	4000	2000	16,000
Hospital (Per number of beds)	100	250	25000	12500	1,250,000
Wellness / Medical Offices (Per number of staff)	50	35	1750	875	43,750
Chapel (one) (Per person)	50	5	**250**	125	6,250
School (one) (Per number of Students)	600	25	**15,000**	7500	4,500,000
Irrigation Water Demand (Zone 6[ss], 187 acres total site area, assumed 30% landscape area)	56	4.9	**274.4**	137.2	7,683
Total			**231,429**	**115714.7**	**618,799,741**

Total Estimated Water Demand for Residential and Commercial	**740,229**	**711,655,741**	**Gallons**
		2,184	**acre -foot**

* See Tables 510-1, 510-2, and 510-3 on following pages for per capita values used in calculations.
* *See Irrigation-Map on page 6.

Table 510-1 Source Demand for Indoor Use		
Type of Connection	Peak Day Demand	Average Yearly Demand
Year-Round Use		
Residential	800 gpd/conn	146,000 gal./conn
Equivalent Residential Connection (ERC)	800 gpd/ERC	146,000 gal./ERC
Seasonal / Non-Residential Use		
Modern Recreation Camp	60 gpd/person	(See Note 1)
Semi-Developed Camp a. With pit privies b. With flush toilets	 5 gpd/person 20 gpd/person	 (See Note 1) (See Note 1)
Hotels, Motel & Resort	150 gpd/unit	(See Note 1)
Labor Camp	50 gpd/person	(See Note 1)
Recreational Vehicle Park	100 gpd/pad	(See Note 1)
Roadway Rest Stop	7 gpd/vehicle	(See Note 1)
Recreational Home Development (i.e., developments with limited water use) [See Note 2]	400 gpd/conn	(See Note 1)

TABLE 510-2 Source Demand for Indoor Use - Individual Establishments (Note 1)	
Type of Establishment	Peak Day Demand (gpd) (Notes 2 & 3)
Churches, per person	5
Industrial Buildings, per 8-hour shift, per employee (exclusive of industrial waste) a. with showers b. with no showers	 35 15
Office Buildings & Business Establishments, per shift, per employee (sanitary wastes only) a. with cafeteria b. with no cafeteria	 25 15
Schools, per person a. boarding b. day, without cafeteria, gym or showers c. day, with cafeteria, but no gym or showers d. day, with cafeteria, gym and showers	 75 15 20 25

Table 510-3 Source Demand for Irrigation		
Map Zone	Peak Day Demand (gpm/irrigated acre)	Average Yearly Demand (AF/ irrigated acre) (Note 1)
1	2.26	1.17
2	2.80	1.23
3	3.39	1.66
4	3.96	1.87
5	4.52	2.69
6	4.90	3.26

3.6.1 DESIGN FLOW PRESSURE. Water mains shall be designed to provide a minimum residual pressure of twenty (20) psi under maximum day demand conditions including designed fire flow (as called out in

SECTION 3.6.7 of these Standards). A minimum of forty (40) psi residual pressure must be maintained under normal peak hour conditions without fire flow. Water systems shall be gravity systems regulated by tank overflow.

3.6.2 FLOW DESIGN CRITERIA. Flow design criteria shall conform to the requirements outlined in the current edition of the State of Utah Rules for Public Drinking Water Systems, Section R309-1-5 "Quantity Requirements" and R309-112 "Distribution System".

A 14" water line along 2100 W. from a 2 million Gallon water tank north of the subject property is proposed as the primary source of water. There are a few alternatives for the secondary source of water. 1st, the property owner is in the process of acquiring water rights for water wells. The second source will be either from the existing 12" water line, which terminates at the intersection of 2100 W and 300 S. or an existing 8" water line east of subject property.

Estimated Sewer Flow Calculations (Entire Site):

The following sewage flow parameters from Ash Creek Special Service District manual were used as a general guideline for minimum estimated flows generated from future land use.

Future Residential Areas	1250 gal. Per/acre/day
Commercial Areas	1000 gal. Per/acre/day
Infiltration-inflow allowance	500 gal. Per/acre/day

Sanitary sewer peak loads designed to carry, when full, not less than the following:

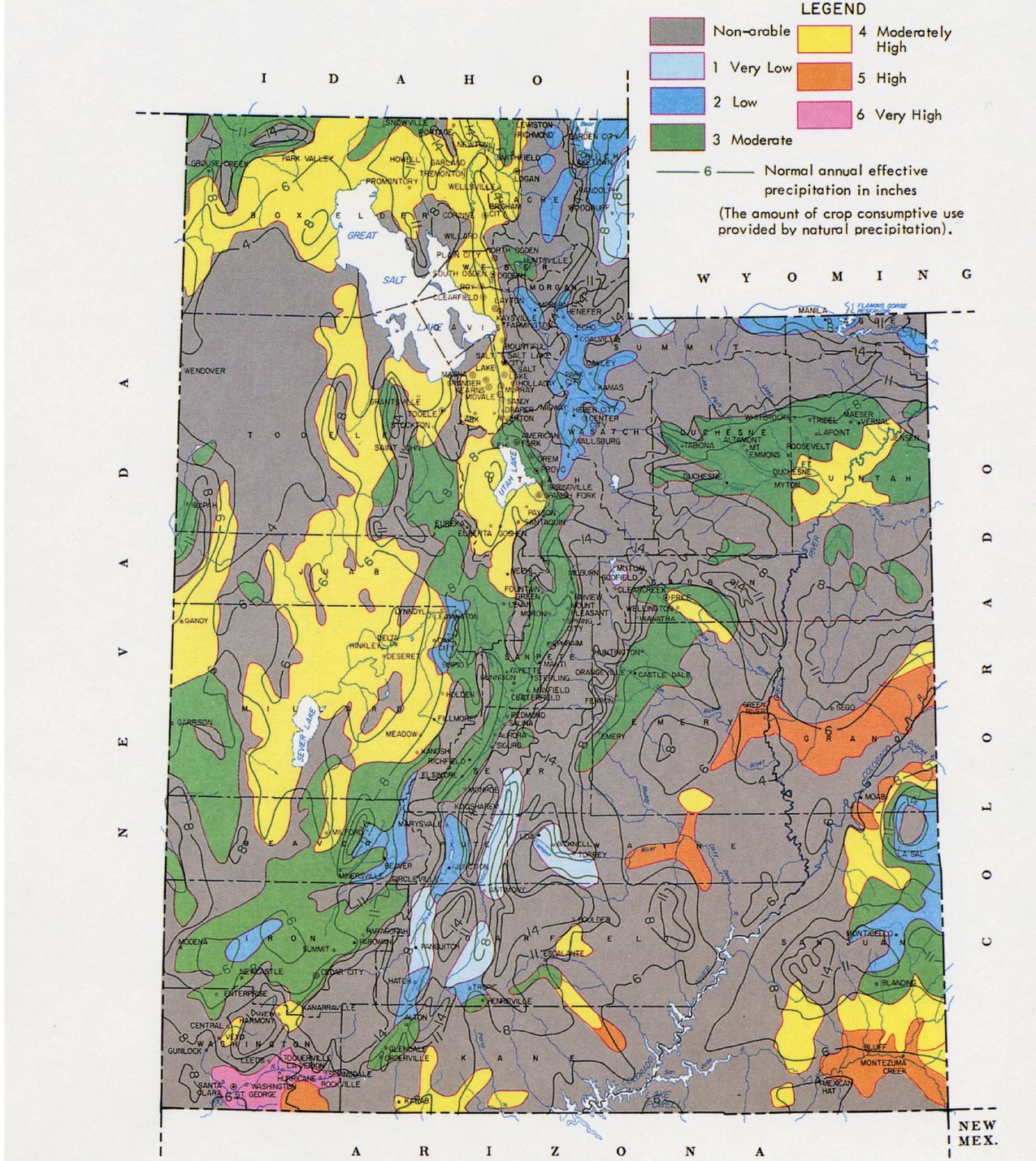
Sewer Load			
	gal. Per/acre/day	Area (Acres)	Averager Daily Flow (gal)
Future Residential Areas	1250	400	500,000
Commercial Areas	1000	8	8,112
Infiltration-inflow allowance	500	420	210,000
Total			**718,112**

Estimated Water Demand and Sewer Flow (Phase 1):

Water Demand (Phase 1)			
Type	Number Units	Peak Day Demand (gpd/conn)	Total Peak Day Demand
2 story office building (40,000 sf) Assumed 100 Employees	100	15	1500

Sewer Flow (Phase 1)			
	gal. Per/acre/day	Area (Acres)	Averager Daily Flow
40,000 s.f. Office	1,000	0.9	918

The proposed sewer will run along 2100 W., southerly to an existing 12" SDR, PVC sewer pipe stubbed just north of the intersection of 2100 W and 300 S.



IRRIGATED CROP CONSUMPTIVE USE ZONES AND NORMAL ANNUAL EFFECTIVE PRECIPITATION

UTAH

Source:
Base map prepared by SCS, WTSC Carto Staff from USGS 1:1,000,000 National Atlas.
Thematic detail compiled by state staff.

NOVEMBER 1978

10 0 10 20 30 40 50 60 MILES

PRELIMINARY MASTER UTILITY PLANS

ENGINEERS GENERAL CONSTRUCTION NOTES:

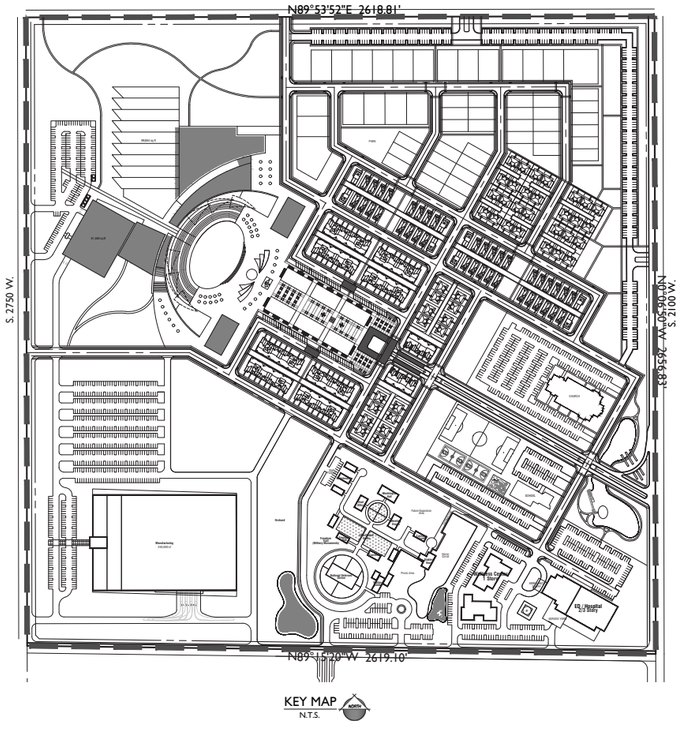
1. THESE PLANS ARE SUBJECT TO THE INTERPRETATION OF INTENT BY THE ENGINEER. ALL QUESTIONS REGARDING THESE PLANS SHALL BE PRESENTED TO THE ENGINEER. ANYONE WHO TAKES UPON HIMSELF THE INTERPRETATION OF THE DRAWINGS OR MAKES REVISIONS TO THEM WITHOUT CONFERRING WITH THE DESIGN ENGINEER SHALL BE RESPONSIBLE FOR THE CONSEQUENCES THEREOF.
2. THE PLANS PREPARED FOR THIS PROJECT PRESENT A DESCRIPTION OF THE WORK TO BE ACCOMPLISHED. THE CONTRACTOR SHALL VISIT THE PROJECT SITE AND DETERMINE, FROM HIS OWN INSPECTION, THE CONDITIONS UNDER WHICH IT IS TO BE PERFORMED. THE CONTRACTOR, BY MAKING HIS BID, REPRESENTS THAT HE HAS VISITED THE SITE AND FAMILIARIZED HIMSELF WITH LOCAL CONDITIONS, THE TYPE OF WORK TO BE PERFORMED, EVALUATED THE DIFFICULTY OF PERFORMING THE REQUIRED TASKS, AND THE LABOR, EQUIPMENT AND MATERIAL THAT ARE REQUIRED TO PROVIDE A COMPLETE PROJECT.
3. THE CONTRACTOR SHALL VERIFY WITH THE DESIGN ENGINEER THAT HE HAS THE MOST CURRENT SET OF CONSTRUCTION PLANS PRIOR TO COMMENCEMENT OF CONSTRUCTION AND MUST KEEP THE APPROVED SET OF PLANS ON-SITE FROM START OF CONSTRUCTION TO PROJECT COMPLETION. ANY CONSTRUCTION OR INSTALLATION BASED ON OUT-OF-DATE PLANS SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
4. QUANTITIES LISTED ON THESE PLANS ARE ESTIMATES ONLY. THE CONTRACTOR SHALL VERIFY ALL QUANTITIES BEFORE SUBMITTING A BID FOR THIS WORK.
5. UNLESS NOTED OTHERWISE, THIS PROJECT WAS DESIGNED IN AN EFFORT TO BALANCE THE EARTHWORK. ANY EARTHWORK VOLUMES SHOWN ON THESE PLANS ARE FOR INFORMATION ONLY AND SHALL NOT BE USED FOR BIDDING PURPOSES. THE CONTRACTOR'S BID SHALL INCLUDE ALL COSTS ASSOCIATED WITH IMPORTING AND PLACING MATERIAL OR STOCKPILING, HAULING AND DISPOSING OF EXCESS MATERIAL IN ACCORDANCE WITH THEIR CALCULATIONS AND DETERMINATION.
6. A THOROUGH ATTEMPT HAS BEEN MADE TO SHOW THE LOCATIONS OF ALL UNDERGROUND OBSTRUCTIONS AND UTILITY LINES IN THE WORK AREA; HOWEVER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO OBSTRUCTIONS AND UTILITY LINES ENCOUNTERED DURING CONSTRUCTION AND SHALL DETERMINE THE EXACT LOCATION OF SAID UTILITIES IN ADVANCE OF TRENCHING. THE ENGINEER WILL NOT GUARANTEE ANY ELEVATIONS OR LOCATIONS OF EXISTING UNDER-GROUND UTILITIES SHOWN ON THESE PLANS.
7. THE CONTRACTOR SHALL CALL BLUE STAKE PRIOR TO CONSTRUCTION AND VERIFY THE PRESENCE OF UTILITIES AND SHALL PROTECT ANY OVERHEAD OR UNDERGROUND UTILITIES DURING CONSTRUCTION, WHETHER OR NOT SAID UTILITIES ARE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL MAKE EXPLORATORY EXCAVATIONS TO LOCATE UNDERGROUND UTILITIES AND/OR STRUCTURES IF NECESSARY TO VERIFY UNDERGROUND UTILITIES. WHERE EXISTING UNDERGROUND UTILITIES ARE EXPOSED, CONTRACTOR SHALL NOTIFY THE APPROPRIATE UTILITY COMPANY FOR INSPECTION PRIOR TO BACKFILLING.
8. THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF ALL POINTS OF CONNECTION PRIOR TO DIGGING BEYOND THE POINT OF CONNECTION.
9. CONSTRUCTION OF THE SEWER LINE SHALL COMMENCE AT THE FURTHEST DOWNSTREAM POINT OF CONNECTION AND SHALL PROGRESS UPSTREAM FROM THAT POINT.
10. ALL HANDICAP ACCESS RAMPS, PARKING STALLS, AND DELINEATED WALKWAYS SHALL BE CONSTRUCTED AND MARKED IN ACCORDANCE WITH CURRENT FEDERAL AND/OR LOCAL A.D.A. STANDARDS AND REQUIREMENTS. THE CONTRACTOR SHALL COORDINATE WITH THE LOCAL AUTHORITIES PRIOR TO CONSTRUCTING AND/OR STRIPING TO CONFIRM CURRENT REQUIREMENTS.
11. ALL SLOPES HIGHER THAN ONE (1) FOOT AND STEEPER THAN 20:1, UNLESS LINED WITH TURF, SHALL BE COMPACTED AND TESTED PER MAG SPECIFICATION 215. RE-COMPACTION IS RECOMMENDED PER MAG SPECIFICATION 215 AFTER INSTALLATION OF IRRIGATION LINES, AND STABILIZATION OF DECOMPOSED GRANITE IS ALSO RECOMMENDED.
12. THE CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS SPECIFIED IN THE GEOTECHNICAL INVESTIGATION. NO PONDING DEEPER THAN 0.05' IS PERMITTED WITHIN 10' OF ANY BUILDING.
13. THE CLIENT AND CONTRACTOR ASSUME ALL RESPONSIBILITY AND COSTS INCURRED IF THEY ELECT TO LANDSCAPE RETENTION BASINS BEFORE THE REQUIRED RETENTION VOLUMES HAVE BEEN CERTIFIED BY THE ENGINEER.
14. THE CONTRACTOR SHALL OBTAIN PERMISSION FROM THE OWNER'S ENGINEER-OF-RECORD PRIOR TO BACKFILLING ANY WET OR DRY UTILITY MAIN OR SERVICE LINES TO ENSURE ALL INSPECTIONS AND TESTING HAS BEEN COMPLETED. NO UTILITY LINES SHALL BE BACKFILLED UNTIL AS-BUILT HORIZONTAL AND VERTICAL LOCATIONS HAVE BEEN OBTAINED. ANY ADDITIONAL COST REQUIRED
15. THE CONTRACTOR SHALL REGISTER ALL DRYWELLS WITH THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY AT THE CONCLUSION OF INSTALLATION AND TESTING. DRYWELL REGISTRATION NUMBERS SHALL BE PROVIDED TO THE OWNER AND ENGINEER OR RECORD.

STAKING NOTES:

CALL THE BLUE STAKE CENTER (263-1100) 48 HOURS BEFORE DIGGING FOR LOCATION OF UNDERGROUND UTILITIES. ALL OFFSET OR REFERENCE STAKES SET BY THE ENGINEER ARE TO BE MAINTAINED INTACT. NO CLAIMS FOR ADDITIONAL COMPENSATION FOR CORRECTIONS SHALL BE PRESENTED TO ANY PARTY UNLESS SUCH STAKES ARE PRESENT AND THEIR ORIGIN IS VERIFIED. IF STAKES ARE NOT MAINTAINED INTACT, ALL CORRECTIONS SHALL BE MADE BY THE CONTRACTOR AT HIS EXPENSE. ONE SET OF STAKES WILL BE FURNISHED BY THE OWNER FOR THE WATER LINE, WATER SERVICES, FIRE HYDRANT LOCATIONS AND GRADE, SEWER LINES AND SERVICES, CONCRETE SUBGRADE AND A.B.C.. ALL ADDITIONAL STAKING TO BE CHARGED TO THE CONTRACTOR. 24 WORKING HOUR NOTICE IS REQUIRED FOR STAKING BY THE SUBDIVISION ENGINEER.

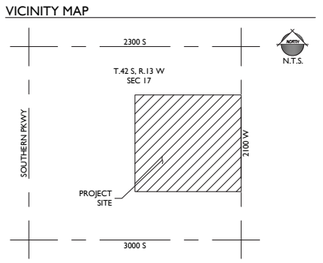
PRELIMINARY UTILITIES PLAN
FOR
BALANCE OF NATURE
HURRICANE, UT

A PORTION OF SECTION 17, TOWNSHIP 42S, RANGE 13W,
WASHINGTON COUNTY, UTAH



KEY MAP
N.T.S.

VICINITY MAP



CIVIL ENGINEER:
EPS GROUP, INC.
1130 N. ALMA SCHOOL RD, SUITE 120
MESA, ARIZONA 85201
PHONE: (480) 503-2250
FAX: (480) 503-2258
CONTACT: ALI AZIMI, P.E.
EMAIL: Ali.Azimi@epsgroupinc.com

DESCRIPTION		SHEET NO
COVER SHEET	CS01	1
INDEX SHEET	ID01	2
PRELIMINARY UTILITIES PLAN	UT01 - UT12	3 - 14

PROJECT DATA
APN: H-3373-NP
ACREAGE: 158356

LEGEND

- SEWER LINE
- SEWER MANHOLE
- WATER LINE
- FIRE HYDRANT
- WATER VALVE
- STORM DRAIN PIPE
- CATCH BASIN

1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T: 480.503.2250 | F:480.503.2258
w w w . e p s g r o u p i n c . c o m
EPS GROUP

Balance of Nature
Preliminary Utilities Plan
Hurricane, Utah

Project:

Cover Sheet

Revisions:

Call at least two full working days before you begin excavation.

Designer: EPS
Drawn by: EPS

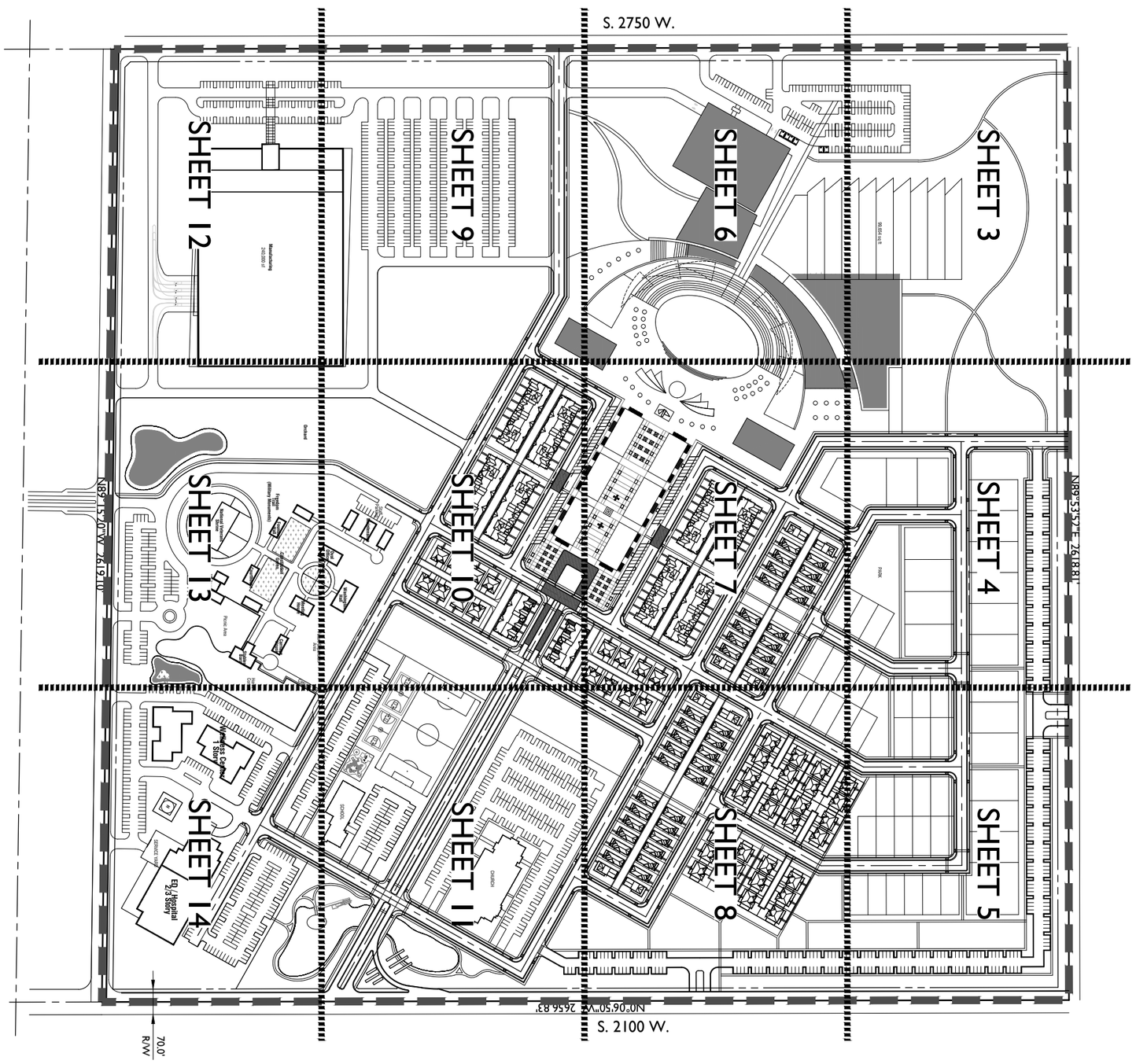
Preliminary
Not For Construction
Or Recordation

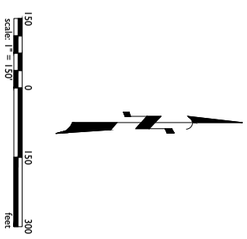
Job No.
21-0167
CS01

Sheet No.
1
of 14

21-0167 - Balance of Nature
Sep 13, 2021 8:51pm \\fps-m16-hp01\shared$\Projects\2021\21-0167\Civil_Preliminary_Utility\21-0167 - CS01.dwg
aoziml

21-0167 - Balance of Nature





Job No. 21-0167
ID01
Sheet No. 2 of 14

Designer: EPS
Drawn by: EPS

Revisions:

Project: Balance of Nature
Preliminary Utilities Plan
Hurricane, Utah

Index Sheet

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250 | F:480.503.2258
w w w . e p s g r o u p i n c . c o m

21-0167 - Balance of Nature

Sep 13, 2021 1:59pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Utility\21-0167 – UT01.dwg
azimi

2750 W. (70' ROW)

70.0'

30.0'

PROPERTY LINE (TYP)

FIRE WATER LINE (TYP)

FIRE WATER LINE (TYP)

FIRE WATER LINE (TYP)

MATCH SHEET 4

SEWER MANHOLE (TYP)

SDR 35, PVC SEWER (TYP)

5.0'

DOMESTIC WATER SERVICE (TYP)

10.0'

FIRE WATER LINE (TYP)

FIRE HYDRANT (TYP)

SEWER CLEANOUT (TYP)

99,654 sq ft

65,566 sq ft

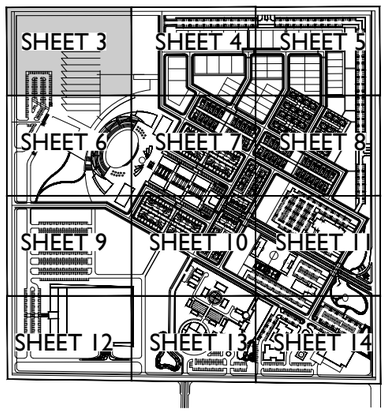
MATCH SHEET 6

CONSTRUCTION NOTES

N

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Utilities Plan

Preliminary Not For Construction

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation, Know what's below. Call 811 before you dig. BLUE STAKES OF UTAH (Arizona Blue Stake, Inc.) www.azbluestake.org 1-800-662-4111

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. UT01
Sheet No. 3 of 14

21-0167 - Balance of Nature

Sep 13, 2021 10:17pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Utility\21-0167 - UT02.dwg

azimi

N89°53'52"E 2618.81'

MATCH SHEET 3

MATCH SHEET 5

MATCH SHEET 7

SEWER MANHOLE (TYP)

SDR 35, PVC SEWER (TYP)

SEWER CLEANOUT (TYP)

SDR 35, PVC SEWER (TYP)

DOMESTIC WATER SERVICE (TYP)

FIRE WATER LINE (TY

SEWER MANHOLE (TYP)

FIRE HYDRANT (TYP)

10.0'

5.0'

SEWER CLEANOUT (TYP)

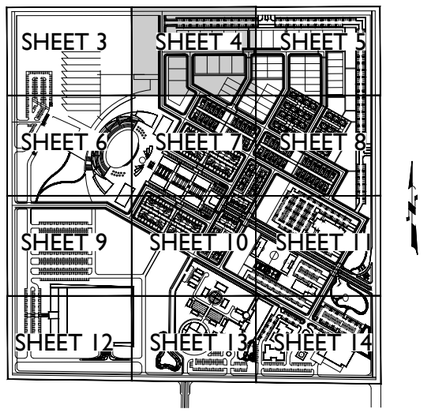
PARK

q ft

CONSTRUCTION NOTES

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Utilities Plan

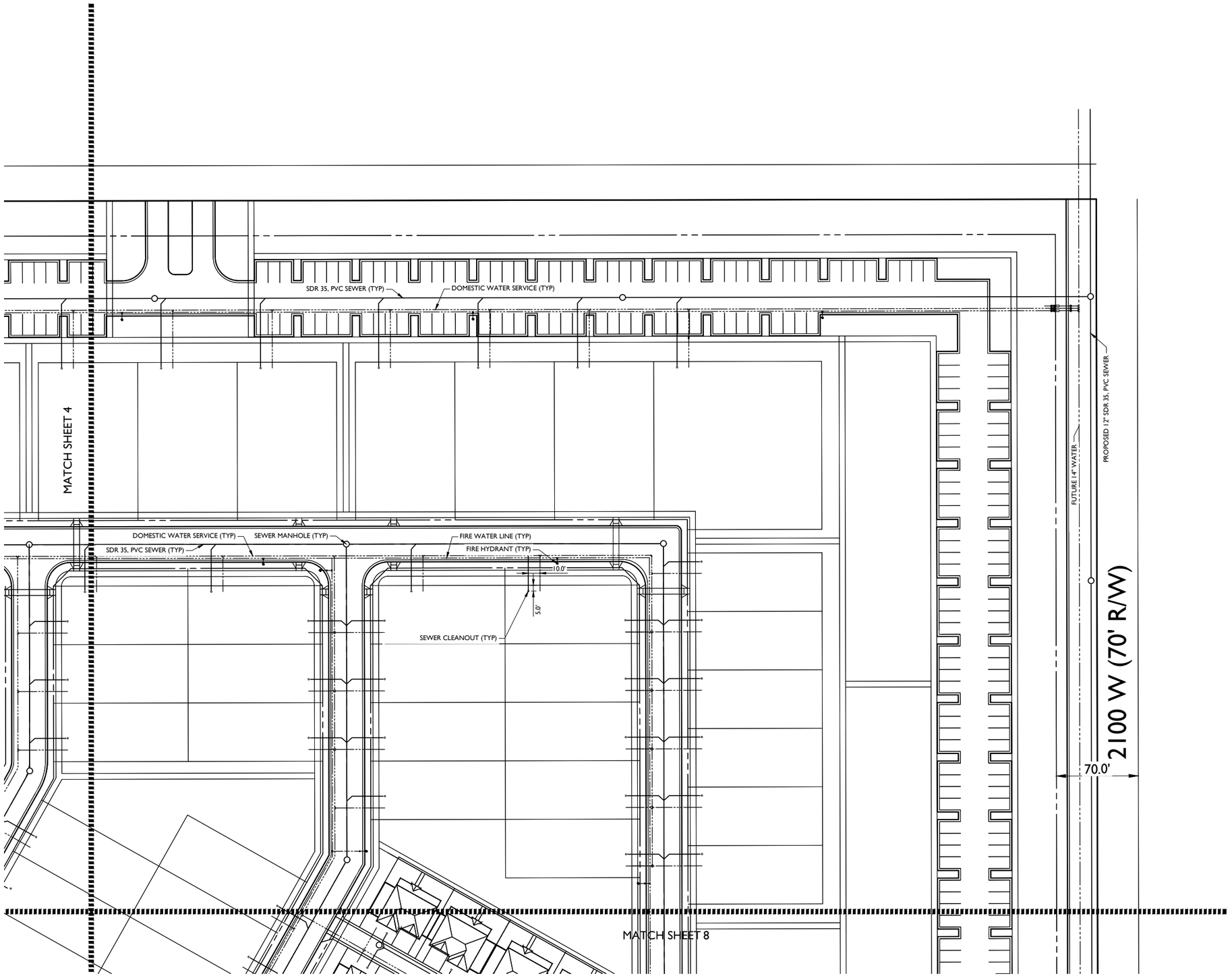
Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation.
Know what's below. Call 811 before you dig.

Designer:	Job No.	Sheet No.
EPS	21-0167	4 of 14
Drawn by: EPS	Dwg No. UT02	

21-0167 - Balance of Nature

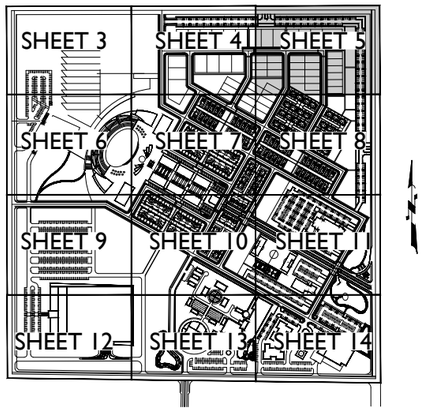


CONSTRUCTION NOTES

N

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Utilities Plan

Preliminary Not for Construction or Recordation

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation.
Know what's below. Call 811 before you dig.
Blue Stake of Utah
www.bluestakesutah.org
1-800-662-4111

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. UT03
Sheet No. 5 of 14

Sep 13, 2021 9:58pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Utility\21-0167 - UT03.dwg
aazimi

21-0167 - Balance of Nature

S. 2750 W.

2750 W. (70' ROW)

FUTURE 12" WATER

70.0'

FIRE HYDRANT (TYP)

FIRE WATER LINE (TYP)

MATCH SHEET 3

65,566 sq ft

51,505 sq ft

5.0'

SEWER CLEANOUT (TYP)

SEWER MANHOLE (TYP)

DOMESTIC WATER SERVICE (TYP)

10.0'

FIRE HYDRANT (TYP)

FIRE WATER LINE (TYP)

SDR 35, PVC SEWER (TYP)

MATCH SHEET 7

MATCH SHEET 9

12,493 sq ft

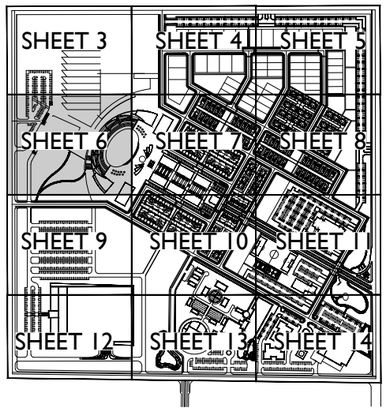
CONSTRUCTION NOTES

N

40 0 40 80

scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Utilities Plan

Preliminary Not For Construction

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation.

Know what's below. Call 811 before you dig.

Designer: EPS

Drawn by: EPS

Job No. 21-0167

Dwg No. UT04

Sheet No. 6 of 14

Sep 13, 2021 12:58pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Utility\21-0167 - UT04.dwg

azimi

21-0167 - Balance of Nature

q ft

MATCH SHEET 4

MATCH SHEET 6

12,493 sq ft

FIRE HYDRANT (TYP)

DOMESTIC WATER SERVICE (TYP)

SEWER MANHOLE (TYP)

SDR 35, PVC SEWER (TYP)

10.0'

5.0'

FIRE WATER LINE (TYP)

SEWER CLEANOUT (TYP)

MATCH SHEET 8

12,493 sq ft

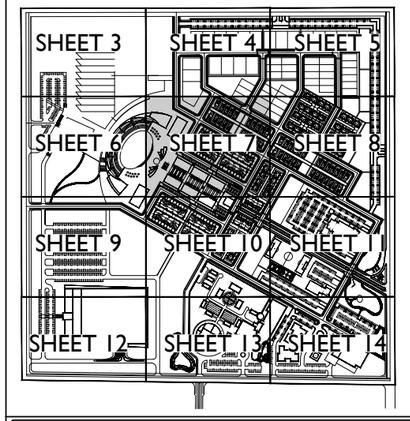
MATCH SHEET 10

CONSTRUCTION NOTES

N

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Utilities Plan

Not For Preliminary Review Not For Construction Or Recordation

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
w w w . e p s g r o u p i n c . c o m

Call at least two full working days before you begin excavation.
Know what's below. Call 811 before you dig.
BLUE STAKES OF UTAH

Designer:	Job No.	Sheet No.
EPS	21-0167	7 of 14
Drawn by: EPS	Dwg No. UT05	

Sep 13, 2021 10:35pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Utility\21-0167 - UT05.dwg

azimi

21-0167 - Balance of Nature

Sep 13, 2021 9:10pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Utility\21-0167 – UT06.dwg

azimi

MATCH SHEET 5

MATCH SHEET 7

MATCH SHEET 11

FIRE HYDRANT (TYP)

FIRE WATER LINE (TYP)

SEWER MANHOLE (TYP)

SEWER CLEANOUT (TYP)

DOMESTIC WATER SERVICE (TYP)

SDR 35, PVC SEWER (TYP)

PROPOSED 12" SDR PVC SEWER

SEWER MANHOLE (TYP)

FUTURE 14" WATER

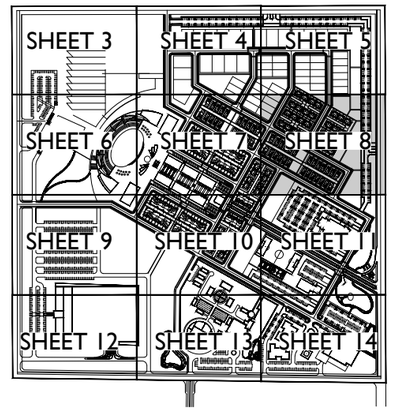
N00°05'90"W 2656.83'

S. 2100 W.

CONSTRUCTION NOTES

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Utilities Plan

Preliminary Not for Construction

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation.
Know what's below. Call 811 before you dig.
BLUE STAKES OF UTAH

Designer:	Job No.	Sheet No.
EPS	21-0167	8 of 14
Drawn by: EPS	Dwg No. UT06	

MATCH SHEET 6

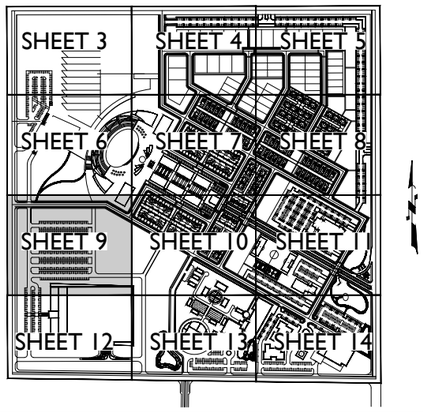
10.0'
SDR 35, PVC SEWER (TYP)
DOMESTIC WATER SERVICE (TYP)
SEWER MANHOLE (TYP)
FH (TYP)
FIRE WATER LINE (TYP)
FIRE HYDRANT (TYP)
DOMESTIC WATER SERVICE (TYP)
FH (TYP)
FH (TYP)
SEWER MANHOLE (TYP)
12,493 sq ft
5.0'
10.0'
SEWER CLEANOUT (TYP)
DOMESTIC WATER SERVICE (TYP)
SDR 35, PVC SEWER (TYP)
DOMESTIC WATER SERVICE (TYP)
FIRE WATER LINE (TYP)
FH (TYP)
5.0'
10.0'
FUTURE 12" WATER
70.0'
2750 W. (70' ROW)
FH (TYP)
FIRE WATER LINE (TYP)
FIRE HYDRANT (TYP)
MATCH SHEET 10
DOMESTIC WATER SERVICE (TYP)
SDR 35, PVC SEWER (TYP)
FIRE HYDRANT (TYP)
FIRE WATER LINE (TYP)
SEWER MANHOLE (TYP)
10.0'
SEWER CLEANOUT (TYP)
5.0'
MATCH SHEET 12

CONSTRUCTION NOTES

N

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Utilities Plan

Preliminary
Not for Construction
Or
Recordation

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation.
Know what's below. Call 811 before you dig.
BLUE STAKES OF UTAH

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. UT07
Sheet No. 9 of 14

21-0167 - Balance of Nature

Sep 13, 2021 12:54pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Utility\21-0167 - UT07.dwg

aazimi

21-0167 - Balance of Nature

Sep 13, 2021 11:00pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Utility\21-0167 – UT08.dwg

azimi

12,493 sq ft

MATCH SHEET 7

MATCH SHEET 9

MATCH SHEET 11

MATCH SHEET13

FIRE WATER LINE (TYP)

DOMESTIC WATER SERVICE (TYP)

SEWER MANHOLE (TYP)

SEWER CLEANOUT (TYP)

FIRE HYDRANT (TYP)

SDR 35 PVC SEWER (TYP)

10.0'

5.0'

Staff Parking

Maintenance

Oval Office

Washington Hall

Future Expansion Area

Orchard

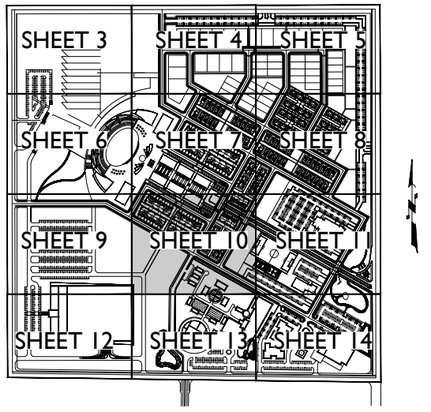
Meetin

Niagara Trail

CONSTRUCTION NOTES

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Utilities Plan

Preliminary Not for Construction Or ... STATE OF UTAH

Revisions:

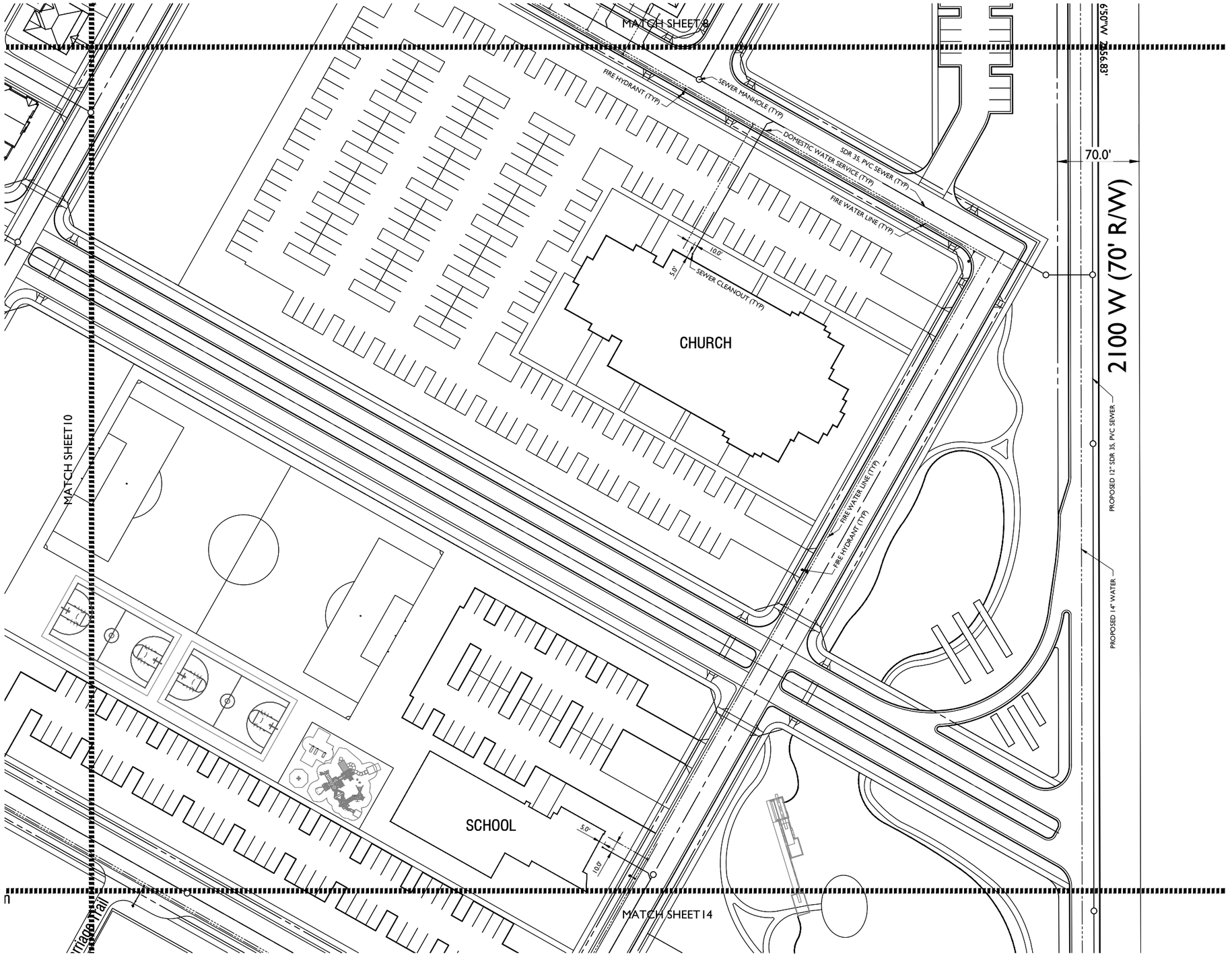
EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation. Know what's below. Call 811 before you dig. BLUE STAKES OF UTAH

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. UT08
Sheet No. 10 of 14

21-0167 - Balance of Nature

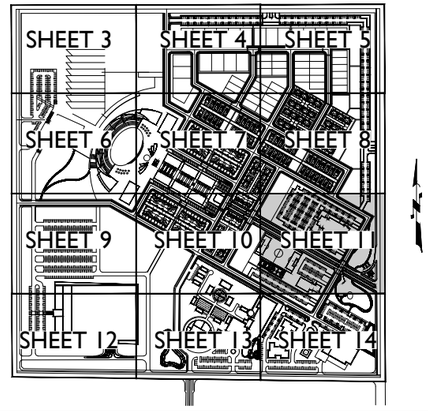
azimi Sep 13, 2021 8:44pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Utility\21-0167 – UT09.dwg



CONSTRUCTION NOTES

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Utilities Plan

Preliminary Not For Construction Or Recordation

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation. Know what's below. Call 811 before you dig. BLUE STAKES OF UTAH

Designer:	Job No.	Sheet No.
EPS	21-0167	11 of 14
Drawn by: EPS	Dwg No. UT09	

MATCH SHEET 9

FIRE WATER LINE (TYP)

70.0'

2750 W. (70' ROW)

FIRE HYDRANT (TYP)

Manufacturing
240,000 sf

FH (TYP)

MATCH SHEET 13

FUTURE 12" WATER

FIRE HYDRANT (TYP)

FIRE WATER LINE (TYP)

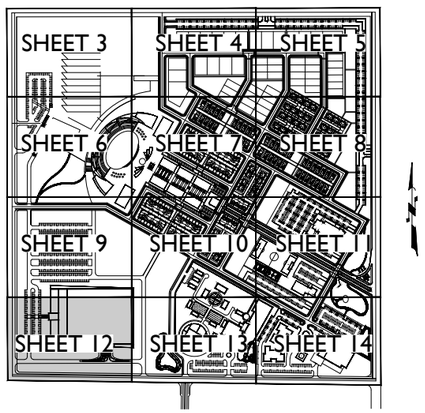
CENTERLINE

3000 SOUTH

CONSTRUCTION NOTES

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Utilities Plan

Preliminary Not For Construction

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation.
Know what's below. Call 811 before you dig.
BLUE STAKES OF UTAH
www.bluestakes.org
1-800-662-4111

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. UT10
Sheet No. 12 of 14

21-0167 - Balance of Nature

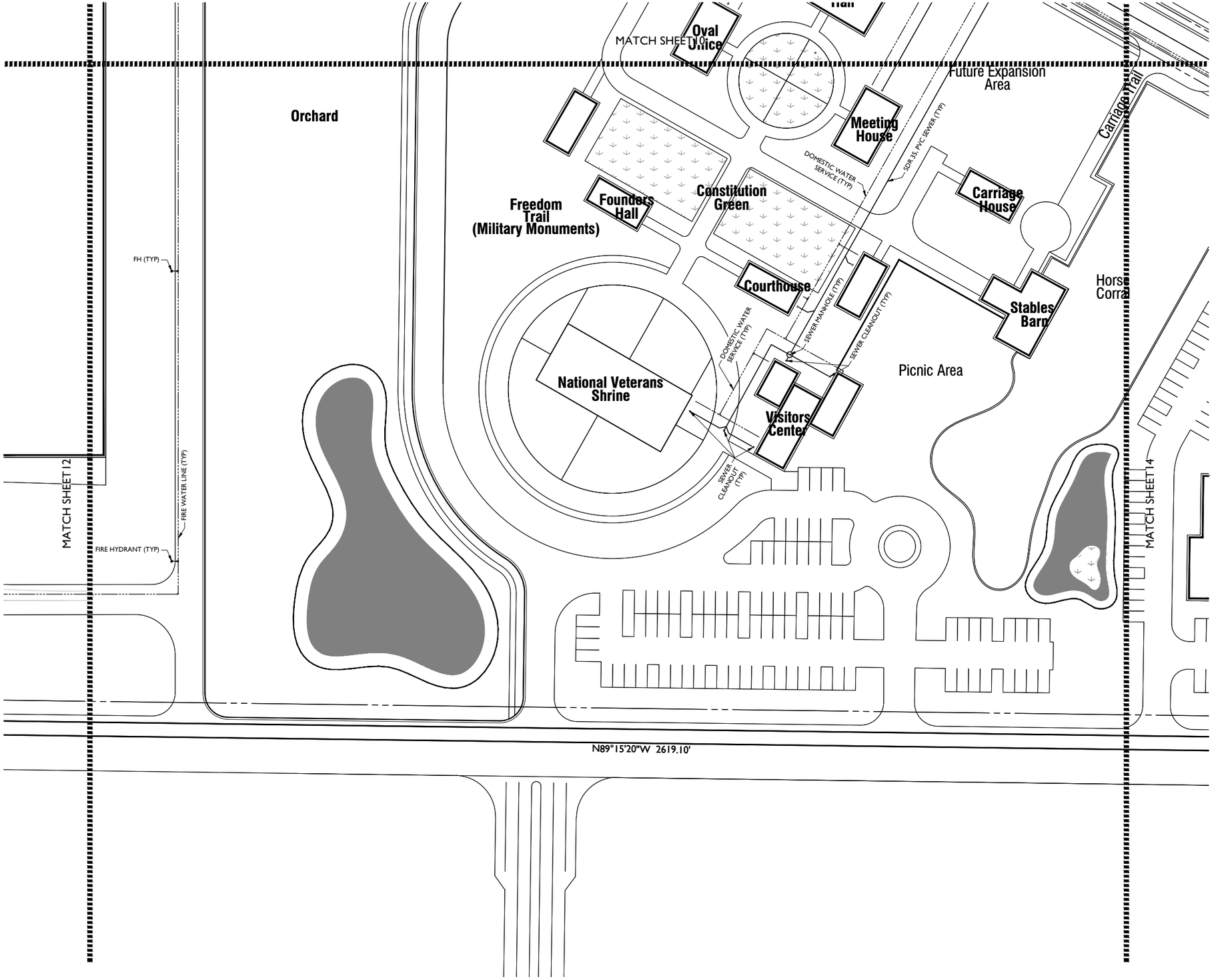
Sep 13, 2021 2:06pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Utility\21-0167 - UT10.dwg

azimi

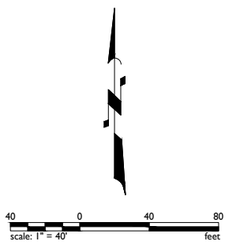
21-0167 - Balance of Nature

Sep 13, 2021 2:27pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Utility\21-0167 - UT11.dwg

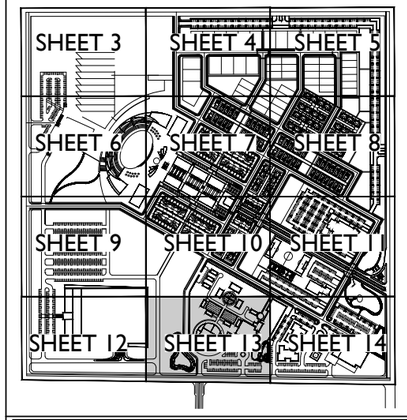
gazimi



CONSTRUCTION NOTES



KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Utilities Plan

Not For Construction

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation. Know what's below. Call 811 before you dig.

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. UT11
Sheet No. 13 of 14

21-0167 - Balance of Nature

Sep 13, 2021 4:17pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Utility\21-0167 - UT12.dwg

azimi

MATCH SHEET 11

MATCH SHEET 13

Carnation Trail

Horse Corral

FIRE HYDRANT (TYP)

FIRE WATER LINE (TYP)

DOMESTIC WATER SERVICE (TYP)

SDR 35, PVC SEWER (TYP)

SEWER MANHOLE (TYP)

Wellness Center
1 Story

AMBULANCE ENTRY

ED / Hospital
2/3 Story

SERVICE YARD

SEWER CLEANOUT (TYP)

10.0'

5.0'

FUTURE 14" WATER

PROPOSED 12" SDR, PVC SEWER

EX. 12" SDR, PVC SEWER (STUBBED)

EX. 60" SEWER MANHOLE

EX. 12" WATER

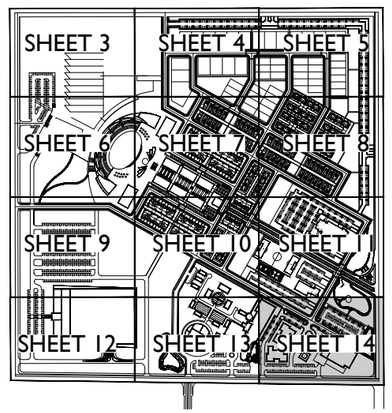
3000 SOUTH

CENTERLINE

CONSTRUCTION NOTES

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Utilities Plan

Preliminary Not For Construction or Recordation

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation. Know what's below. Call 811 before you dig. BLUE STAKES OF UTAH www.bluestakes.org 1-800-662-4111

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. UT12
Sheet No. 14 of 14

PRELIMINARY MASTER DRAINAGE STUDY

Offsite Master Drainage Study

For

Balance of Nature

City of Hurricane, UT

Owner/Developer
Orcutt/Winslow
2929 N. Central Avenue, 11th Floor
Phoenix, AZ 85012

Project No. 21-0167

Date: September 2021

1130 N. Alma School Rd, Ste 120
Mesa, AZ 85201
o: 480.503.2250
f: 480.503.2258

Table of Contents

1.0 Introduction 1
1.1 Project Description 1
2.0 Existing Site Conditions 1
2.1 National Flood Insurance Program 1
3.0 Offsite Drainage 1
4.0 Conclusions 4
5.0 References 4

Appendix List

Appendix A: Figures

Appendix B: Offsite Flow Calculations

List of Figures

Figure 1: Vicinity Map..... Appendix A

Figure 2: FIRM Map ..... Appendix A

Figure 3: NOAA Atlas ..... Appendix A

Figure 4: Offsite Drainage Exhibit ..... Appendix A

1.0 Introduction

This report has been prepared for the preliminary analysis of the proposed drainage system for an approximate 160.5-acre multi-use development community - Balance of Nature (the Project). The Project is located in the City of Hurricane, Utah and is bounded by West 2700 to the north, farm land to the east, vacant desert land and Bench Lake to the west, and a clay mine operation currently excavated to the south. The site can be further located within a portion of Section 17, Township 42 South, Range 13 West of the Salt Lake Base and Meridian Washington County, UT. A vicinity map for the project is provided in Appendix A.

1.1 Project Description

Balance of Nature, to be built in 1 phase, will consist of multi-use developments with supporting infrastructure and constructed lakes. Phase 1 includes the entire project area. The existing general plan for the site is multi-use. Descriptions of drainage improvements for the site follow.

2.0 Existing Site Conditions

The natural grade for the Project slopes from the north and east to southwest with 8 feet of fall and an average grade of approximately 0.25 percent from the northeast to the southwest corner of the site. Th northeast borders of the project consist of agricultural lands and vacant farmland. The southwest borders of the project are currently Bench Lake and a clay mine currently excavated.

The overall region and the upper watersheds of the Project are characterized by steep rock outcroppings with several defined wash corridors.

2.1 National Flood Insurance Program

The entirety of the site is located within FEMA Flood Zone Unshaded X as shown on FEMA Flood Insurance Rate Map number 49053C0840G dated April 2, 2009. See Figure 2: FIRM Map.

Flood Zone Unshaded X is defined as:

> Areas outside of the 0.2% annual chance flood.

3.0 Offsite Drainage

There are four locations of geographic significance to the offsite drainage. These are Sullivan Knoll to the north, Bench Lake to the west, the future constructed lake to the south, and agricultural lands and Frog Hollow Reservoir to the east. Criteria for

the analysis of the offsite discharges were obtained from USGS Topography and other publicly available references, which provided for area delineation and the basis of hydrologic modeling. A HEC-1 model was constructed for the specified storm event to analyze the offsite conditions, which according to design guidelines is the 100-year, 3-hour event.

3.1 Sullivan Knoll

Sullivan Knoll is located 4,500 feet north of the northern boundary of the Project and has an elevation 500 feet above that of the northeast corner of the site. Flows from Sullivan Knoll travel south to enter the site primarily from its northeastern edge. Some of the drainage area extends to the east and west of the Project onto adjacent lands. Sullivan Knoll is associated with a total drainage area of 0.78 square miles and has an anticipated drainage of 313 cubic feet per second. This is one of the primary watersheds of the Project offsite drainage.

3.2 Bench Lake

Bench Lake has two components associated with the Project: a small area of ponding located within the eastern half of the Project and a larger basin immediately adjacent to the western border of the site. The former is intended to become a permanent lake in the development area and the latter is run by the Utah Water Conservancy District. Flows entering the site from Sullivan Knoll and the Frog Hollow Watershed, described in later sections of this report, will be designed to provide volume to the on-site lakes and excess flows to a future lake south of the Project property described in the following section.

3.3 Future Constructed Lake

The Utah Water Conservancy District is the owner of the lands located south of the Project. The western half of this property is intended to become a permanent reservoir with the majority of the off-site drainage routing to this location. The existing elevation of the excavation is 20 feet lower than that at all other locations on the Project site.

3.4 Agricultural Lands and Frog Hollow Reservoir

Agricultural lands compose the current eastern border of the Project. These lands have elevations no more than 10 feet higher than those of the Project and drain in the westerly direction, towards the Project. East and north of the agricultural lands is Rainbow, a small, existing residential community. Beginning southeast of Rainbow Canyon is a 3-mile-long wash called Frog Hollow. The origin point of Frog Hollow is the Frog Hollow Debris Basin Reservoir located 1.7 miles east and 1.2 miles south of the mouth of Frog Hollow at Rainbow Canyon. The elevation of Frog Hollow Debris Basin Reservoir is 1,300 feet higher than any at the Project.

Frog Hollow and its tributaries account for a drainage area of 4.55 square miles and have an anticipated discharge of 1,535 cubic feet per second under the 100-year, 3-hour storm (Appendix A, Figure 3: NOAA Atlas). Based on the analysis performed in HEC-1 (Appendix B), 1,535 cubic feet per second of total discharge from Frog Hollow will reach the Project.

4.0 HEC-1 Drainage Summary

The following table shows the HEC-1 flowrates with key flowrate magnitudes shown in Figure 4: Offsite Drainage Exhibit (Appendix A).

Station	Peak Flow (cfs)	Basin Area (sq mi)
A1	413	0.95
A2	199	0.54
A3	282	0.51
CP1	861	2.01
A4	182	0.33
CP2	995	2.34
A5	115	0.23
A6	75	0.13
A7	388	0.56
A8	249	0.33
CP3	1415	3.58
A9	238	0.33
CP4	1509	3.91
A10	137	0.18
A11	24	0.36
A12	14	0.10
CP5	1535	4.55
B3	128	0.24
B2	188	0.35
B4	11	0.11
CP6	313	0.70
B1	30	0.08

5.0 Conclusions

This report concluded that:

- Offsite flows will be managed by a network of onsite lakes, and ultimately, the offsite Utah Water Conservancy District's Lake south of the Project site.
- Two primary watersheds, of a total of 5.33 square miles, contribute to the offsite drainage conditions of the Project.
- The Onsite Master Plan will coordinate offsite flows for management in the drainage system. The majority of the offsite flow will be conveyed south along the west side if 2100 W. to Utah Water Conservancy District's Lake south of the Project site. Some offsite flow may be directed to on-site ponds. To manage the size of the on-site ponds an overflow system will be designed to direct excess stormwater runoff to Utah Water Conservancy District's Lake.
- Facilities offsite will be used to manage the flows reaching the Project in a channel or basin configuration, to be determined with final engineering.

6.0 References

Hurricane City Drainage Manual

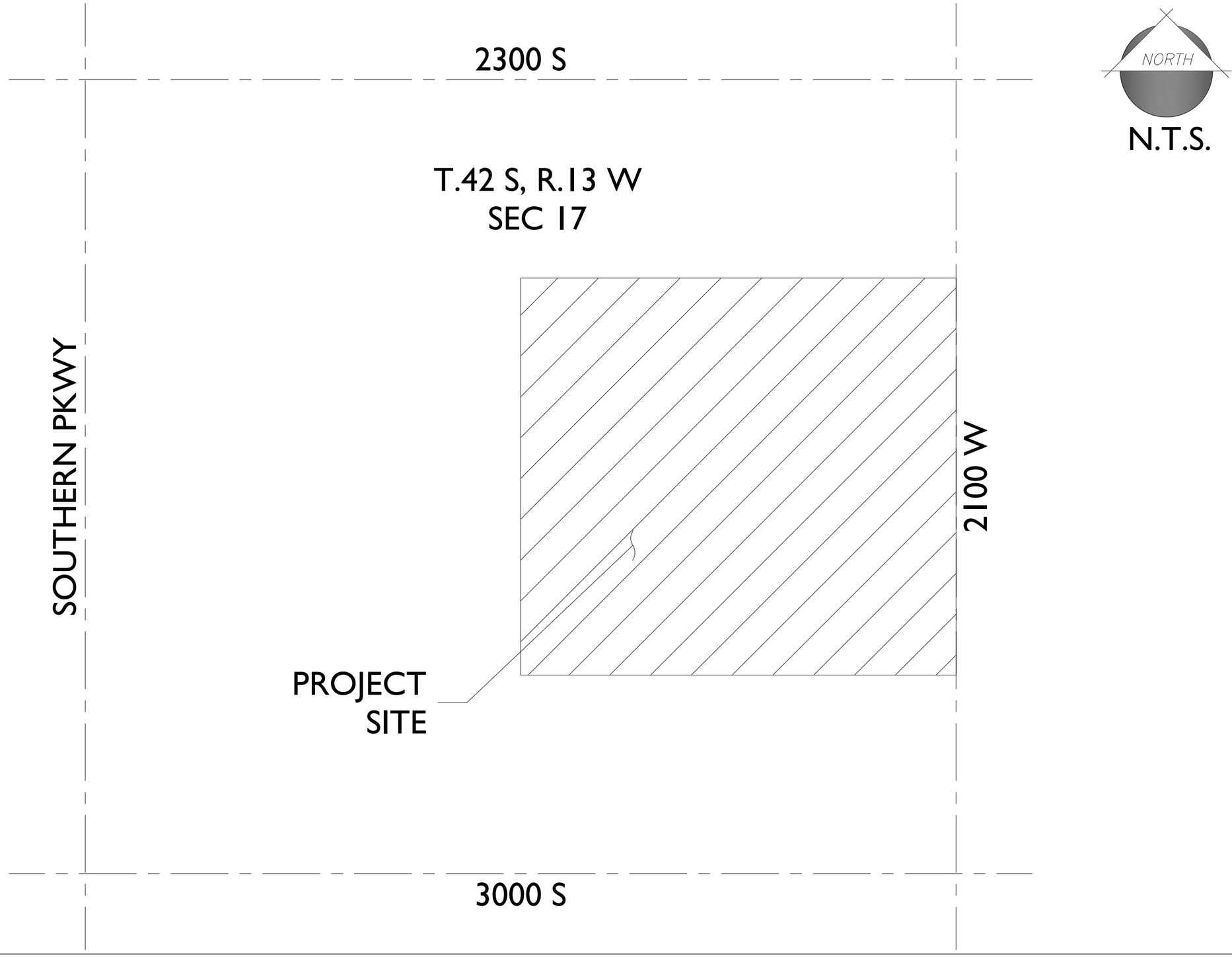
Google Maps

USGS Topography

Appendix B

Offsite Drainage Calculations

VICINITY MAP



NORTH

N.T.S.

EPS GROUP
1130 N. Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250 | F:480.503.2258
w w w . e p s g r o u p i n c . c o m

Balance of Nature

A portion of Section 17, Township 42S, Range 13W, Washington County, UT
Hurricane, UT

Project:

Revisions:

Call at least two full working days before you begin excavation.
ARIZONA811
Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)
In Maricopa County: (602)263-1100

Designer: XXX
Drawn by: XXX

Job No.
21-0167

Sheet No.
of 1

21-0167
jzimmerman Sep. 10, 2021 8:33am S:\Projects\2021\21-0167\Civil_Preliminary\Design\Drainage\USGS Topo Maps\Drawing2.dwg



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee See Notes Zone X
- Area with Flood Risk due to Levee Zone D

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard Zone X
- Effective LOMRs
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including the current status of the coastal flood hazard analysis, and how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The basemap shown is the USGS National Map: Orthoimagery. Last refreshed October, 2020.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 9/9/2021 4:17 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

Map Projection:
GCS, Geodetic Reference System 1980.
Vertical Datum: NAVD88
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

1 inch = 1,000 feet 1:12,000

N

0 500 1,000 2,000 3,000 4,000 Feet

0 105 210 420 630 840 Meters

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

PANEL 840 OF 1165

Panel Contains:

COMMUNITY	NUMBER	PANEL
CITY OF HURRICANE	490172	0840
WASHINGTON COUNTY	490224	0840

MAP NUMBER
49053C0840G
EFFECTIVE DATE
April 02, 2009

Precipitation Depth-Frequency Estimates for Hurricane, Utah*

Duration	Estimated Precipitation Depth (inches)					
	Annual Exceedance Probability					
	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
5 min	0.16	0.23	0.29	0.38	0.45	0.54
10 min	0.24	0.35	0.44	0.58	0.69	0.82
15 min	0.29	0.43	0.55	0.71	0.86	1.02
30 min	0.40	0.58	0.74	0.96	1.15	1.38
60 min	0.49	0.72	0.91	1.19	1.43	1.70
2 hr	0.58	0.83	1.03	1.32	1.56	1.84
3 hr	0.65	0.91	1.10	1.38	1.62	1.89
6 hr	0.80	1.11	1.33	1.63	1.87	2.14
12 hr	0.99	1.35	1.60	1.92	2.17	2.42
24 hr	1.16	1.57	1.85	2.21	2.48	2.76
2 day	1.31	1.77	2.08	2.48	2.79	3.10
4 day	1.52	2.04	2.40	2.86	3.21	3.56

21-0167

jzimmerman Sep. 10, 2021 11:31am S:\Projects\2021\21-0167\Civil_Preliminary\Design\Drainage\Offsite Drainage Master Study\PreliminaryOffsiteDrainage_JZ.dwg

HURRICANE

NORTH

1000 0 1000 2000
scale: 1" = 1000' feet

B1

B2

B3

B4

313 CFS

30 CFS

THIS SITE

BENCH LAKE (OFFSITE)

BENCH LAKE (ONSITE)

1535 CFS

A12

A11

A10

A9

A8

A7

A6

A5

A4

A3

A2

A1

UPPER WATERSHED FLOOD CONTROL FACILITY FROG HOLLOW DETENTION

W 1500 S

W 1700 ST S

W 2060 S

W 2700 S

TRUF SOD RD

3000 S

W 3390 S

W 4370 ST S

S 1500 W

S 1100 W

S 700 W

S 160 W

S 1200 SW

S 1150 W

General Dick Stout Field

Frog Hollow

Mollies Nipple

Wilkman Wash

Jem/Goulds Loop

Sand Hollow Draw

Grassy Meadows/Sky Ranch Landowners Association Airport

Grass Valley

ARIZONA STRIP RD

0462

0464

0468

0469

0483

EPS GROUP
1130 N. Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250 | F:480.503.2258
w w w . e p s g r o u p i n c . c o m

Balance of Nature

A portion of Section 17, Township 42S, Range 13W, Washington County, Utah
Hurricane, Utah

Project:

Revisions:

Call at least two full working days before you begin excavation
ARIZONA811
Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)
In Maricopa County: (602)263-1100

Designer: XXX
Drawn by: XXX

Job No.
21-0167

Sheet No.
of 1

```
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              JUN   1998              *
 *            VERSION 4.1               *
 *                                      *
 *  RUN DATE   10SEP21  TIME  10:00:13  *
 *                                      *
 ****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*         609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
          LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
            1           ID        BALANCE OF NATURE
            2           ID        HYDROLOGIC EVALUATION OF THE EXISTING CONDITIONS OF BALANCE OF NATURE
            3           ID        MIXED USE DEVELOPMENT PROJECT, HURRICANE UT
            4           ID        100-YEAR 3-HOUR
            5           ID        ALL WATERSHED METRICS FOLLOW THE CITY OF HURRICANE DESIGN GUIDELINES
            6           ID        Unit Hydrograph: Clark
            7           ID        09/09/2021  OFFSITE DRAINAGE HYDROLOGY
                        *DIAGRAM
            8           IT       5  1JAN94      0    1500
            9           IO       5
           10           IN      15  1JAN94      0
           11           JD    1.89    0.01
                        * 3-hour distribution
           12           PC     0.0   0.285   0.510   0.667   0.767   0.827   0.873   0.907   0.933   0.953
           13           PC   0.971   0.987   1.000
           14           JD   1.870    10.0
           15           JD   1.850    20.0
           16           JD   1.830    40.0
           17           JD   1.810    80.0
           18           JD   1.790   120.0
           19           JD   1.770   200.0
           20           JD   1.750   300.0
           21           JD   1.730   500.0
                        *
           22           KK      A1   BASIN
           23           KM        UPPER WATERSHED OFFSITE DRAINAGE AREA A1- ROCK OUTCROP AREA
           24           BA   0.955
           25           LG    0.25    0.25    4.30    0.48      67
           26           UC   0.991   0.698
           27           UA       0       3       5       8      12      20      43      75      90      96
           28           UA     100
                        *
           29           KK      A2   BASIN
           30           KM        UPPER WATERSHED OFFSITE DRAINAGE AREA A2- ROCK OUTCROP AREA
           31           BA   0.542
           32           LG    0.25    0.25    4.30    0.48      67
           33           UC   1.243   0.935
           34           UA       0       3       5       8      12      20      43      75      90      96
           35           UA     100
                        *
           36           KK      A3   BASIN
           37           KM        UPPER WATERSHED OFFSITE DRAINAGE AREA A3- ROCK OUTCROP AREA
           38           BA   0.512
           39           LG    0.25    0.25    4.30    0.48      67
           40           UC   0.927   0.399
           41           UA       0       3       5       8      12      20      43      75      90      96
           42           UA     100
                        *
```



```
          LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
           43           KK     CP1 COMBINE
           44           KM       COMBINE AREAS A1 + A2 + A3
           45           HC       3
                        *
           46           KK   RTCP1
           47           KM        ROUTE THE A1 + A2 + A3 COMBINATION UNTIL DOWNSTREAM DISCHARGE MEETS
           48           KM        AREA A4
           49           RS       8    FLOW       0
           50           RC   0.055   0.045   0.055    2900   .0180
           51           RX       0       4       8      28      50      68      80      84
           52           RY       8       6       5       1       1       5       6       8
                        *
           53           KK      A4   BASIN
           54           KM        UPPER WATERSHED OFFSITE DRAINAGE AREA A4- ROCK OUTCROP AREA
           55           BA   0.327
           56           LG    0.25    0.25    4.30    0.48      67
           57           UC    0.55   0.422
           58           UA       0       3       5       8      12      20      43      75      90      96
           59           UA     100
                        *
           60           KK     CP2   COMBINE
           61           KM       COMBINATION OF ALL WATERSHED AREAS CP1 + AREA A4
           62           KM        AT EXISTING WASH
           63           HC       2
                        *
           64           KK   RTCP2   ROUTE
           65           KM        ROUTE HYDROGRAPH FROM CP2
           66           RS       5    FLOW       0
           67           RC   0.055   0.045   0.055    3900   .0205
           68           RX       0       4       8      28      50      68      80      84
           69           RY       8       6       5       1       1       5       6       8
                        *
           70           KK      A5   BASIN
           71           KM        UPPER WATERSHED OFFSITE DRAINAGE AREA A5- ROCK OUTCROP AREA
           72           BA   0.234
           73           LG    0.25    0.25    4.30    0.48      67
           74           UC   0.591   0.557
           75           UA       0       3       5       8      12      20      43      75      90      96
           76           UA     100
                        *
           77           KK      A6   BASIN
           78           KM        UPPER WATERSHED OFFSITE DRAINAGE AREA A6- ROCK OUTCROP AREA
           79           BA   0.127
           80           LG    0.25    0.25    4.30    0.48      67
           81           UC   0.408   0.373
           82           UA       0       3       5       8      12      20      43      75      90      96
           83           UA     100
                        *
```



```
          LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
           84           KK      A7   BASIN
           85           KM        UPPER WATERSHED OFFSITE DRAINAGE AREA A7- ROCK OUTCROP AREA
           86           BA   0.559
           87           LG    0.25    0.25    4.30    0.48      67
           88           UC   0.447   0.218
           89           UA       0       3       5       8      12      20      43      75      90      96
           90           UA     100
                        *
           91           KK      A8   BASIN
           92           KM        UPPER WATERSHED OFFSITE DRAINAGE AREA A8- ROCK OUTCROP AREA
           93           BA   0.326
           94           LG    0.25    0.25    4.30    0.48      67
           95           UC   0.306   0.138
           96           UA       0       3       5       8      12      20      43      75      90      96
           97           UA     100
                        *
           98           KK     CP3   COMBINE
           99           KM       COMBINATION OF ALL WATERSHED AREAS RTCP2 + AREAS A5 - A8
          100           HC       5
                        *
          101           KK   RTCP3   ROUTE
          102           KM        ROUTE HYDROGRAPH FROM CP3
          103           RS       5    FLOW       0
          104           RC   0.055   0.045   0.055    4700   .0285
          105           RX       0       4       8      28      50      68      80      84
          106           RY       8       6       5       1       1       5       6       8
                        *
```

```
          107          KK      A9   BASIN
          108          KM        UPPER WATERSHED OFFSITE DRAINAGE AREA A9- ROCK OUTCROP AREA
          109          BA   0.329
          110          LG    0.25    0.25    4.30    0.48      67
          111          UC   0.345   0.190
          112          UA       0       3       5       8      12      20      43      75      90      96
          113          UA     100
                       *

          114          KK     CP4   COMBINE
          115          KM        COMBINATION OF ALL WATERSHED AREAS RTCP3 + AREA A9
          116          HC       2
                       *

          117          KK   RTCP4   ROUTE
          118          KM        ROUTE HYDROGRAPH FROM CP4
          119          RS       5    FLOW       0
          120          RC   0.055   0.045   0.055    5280   .0016
          121          RX       0       2       5      18      32      44      58      68
          122          RY       8       6       5       1       1       5       6       8
                       *
1                                              HEC-1 INPUT                                              PAGE  4

        LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          123          KK     A10   BASIN
          124          KM        UPPER WATERSHED OFFSITE DRAINAGE AREA A10- ROCK OUTCROP AREA
          125          BA   0.183
          126          LG    0.25    0.25    4.30    0.48      67
          127          UC   0.267   0.158
          128          UA       0       3       5       8      12      20      43      75      90      96
          129          UA     100
                       *

          130          KK     A11   BASIN
          131          KM        UPPER WATERSHED OFFSITE DRAINAGE AREA A11- AGRICULTURAL AREA
          132          BA   0.357
          133          LG    0.30    0.25    4.30    0.48      10
          134          UC   1.281   1.002
          135          UA       0       3       5       8      12      20      43      75      90      96
          136          UA     100
                       *

          137          KK     A12   BASIN
          138          KM        UPPER WATERSHED OFFSITE DRAINAGE AREA A12- AGRICULTURAL AREA
          139          BA   0.103
          140          LG    0.30    0.25    4.30    0.48      10
          141          UC    0.55   0.254
          142          UA       0       3       5       8      12      20      43      75      90      96
          143          UA     100
                       *

          144          KK     CP5   COMBINE
          145          KM        COMBINATION OF ALL WATERSHED AREAS RTCP4 + AREA A10 - A12
          146          HC       4
                       *

          147          KK      B3   BASIN
          148          KM        UPPER WATERSHED OFFSITE DRAINAGE AREA B3- ROCK OUTCROP AREA
          149          BA   0.242
          150          LG    0.25    0.25    4.30    0.48      67
          151          UC   0.867   0.451
          152          UA       0       3       5       8      12      20      43      75      90      96
          153          UA     100
                       *

          154          KK    RTB3   ROUTE
          155          KM        ROUTE HYDROGRAPH FROM B3
          156          RS       5    FLOW       0
          157          RC   0.055   0.045   0.055    2640   .0016
          158          RX       0       2       5      18      32      44      58      68
          159          RY       8       6       5       1       1       5       6       8
                       *
1                                              HEC-1 INPUT                                              PAGE  5

        LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          160          KK      B2   BASIN
          161          KM        UPPER WATERSHED OFFSITE DRAINAGE AREA B2- ROCK OUTCROP AREA
          162          BA   0.351
          163          LG    0.25    0.25    4.30    0.48      67
          164          UC   0.915   0.428
          165          UA       0       3       5       8      12      20      43      75      90      96
          166          UA     100
                       *

          167          KK      B4   BASIN
          168          KM        UPPER WATERSHED OFFSITE DRAINAGE AREA B4- AGRICULTURAL AREA
          169          BA   0.106
          170          LG    0.25    0.25    4.30    0.48      10
          171          UC   0.778   0.553
          172          UA       0       3       5       8      12      20      43      75      90      96
          173          UA     100
                       *

          174          KK     CP6   COMBINE
          175          KM        COMBINATION OF ALL WATERSHED AREAS "B2-B4"
          176          HC       3
                       *

          177          KK      B1   BASIN
          178          KM        UPPER WATERSHED OFFSITE DRAINAGE AREA B1- ROCK OUTCROP AREA
          179          BA   0.082
          180          LG    0.25    0.25    4.30    0.48      67
          181          UC   0.917   0.978
          182          UA       0       3       5       8      12      20      43      75      90      96
          183          UA     100
                       *

          184          ZZ
1
                  SCHEMATIC DIAGRAM OF STREAM NETWORK

        INPUT
        LINE      (V) ROUTING          (---->) DIVERSION OR PUMP FLOW

          NO.     (.) CONNECTOR        (<----) RETURN OF DIVERTED OR PUMPED FLOW

           22          A1
                        .
                        .
           29           .          A2
                        .           .
                        .           .
           36           .           .          A3
                        .           .           .
                        .           .           .
           43         CP1.......................
                       V
                       V
           46        RTCP1
                        .
                        .
           53           .          A4
                        .           .
                        .           .
           60         CP2............
                       V
                       V
           64        RTCP2
                        .
                        .
           70           .          A5
                        .           .
                        .           .
           77           .           .          A6
                        .           .           .
                        .           .           .
           84           .           .           .          A7
                        .           .           .           .
                        .           .           .           .
           91           .           .           .           .          A8
                        .           .           .           .           .
                        .           .           .           .           .
           98         CP3.............................................
                       V
                       V
          101        RTCP3
                        .
                        .
          107           .          A9
                        .           .
                        .           .
          114         CP4............
                       V
                       V
          117        RTCP4
                        .
                        .
          123           .         A10
                        .           .
                        .           .
          130           .           .         A11
                        .           .           .
                        .           .           .
          137           .           .           .         A12
                        .           .           .           .
                        .           .           .           .
          144         CP5.....................................
                        .
                        .
          147           .          B3
                        .           V
                        .           V
```

```
  154           .        RTB3
                .           .
                .           .
  160           .           .          B2
                .           .           .
                .           .           .
  167           .           .           .          B4
                .           .           .           .
                .           .           .           .
  174           .         CP6.......................
                .           .
                .           .
  177           .           .          B1

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************                                   ****************************************
 *                                      *                                   *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                   *    U.S. ARMY CORPS OF ENGINEERS      *
 *             JUN   1998               *                                   *    HYDROLOGIC ENGINEERING CENTER     *
 *          VERSION 4.1                 *                                   *          609 SECOND STREET           *
 *                                      *                                   *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   10SEP21  TIME  10:00:13  *                                   *           (916) 756-1104             *
 *                                      *                                   *                                      *
 ****************************************                                   ****************************************




                              BALANCE OF NATURE
                              HYDROLOGIC EVALUATION OF THE EXISTING CONDITIONS OF BALANCE OF NATURE
                              MIXED USE DEVELOPMENT PROJECT, HURRICANE UT
                              100-YEAR 3-HOUR
                              ALL WATERSHED METRICS FOLLOW THE CITY OF HURRICANE DESIGN GUIDELINES
                              Unit Hydrograph: Clark
                              09/09/2021  OFFSITE DRAINAGE HYDROLOGY

   9 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

    IT           HYDROGRAPH TIME DATA
                        NMIN           5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1JAN94  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ        1500  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      6JAN94  ENDING DATE
                      NDTIME        0455  ENDING TIME
                      ICENT           19  CENTURY MARK

                   COMPUTATION INTERVAL     .08 HOURS
                        TOTAL TIME BASE  124.92 HOURS

            ENGLISH UNITS
                 DRAINAGE AREA          SQUARE MILES
                 PRECIPITATION DEPTH    INCHES
                 LENGTH, ELEVATION      FEET
                 FLOW                   CUBIC FEET PER SECOND
                 STORAGE VOLUME         ACRE-FEET
                 SURFACE AREA           ACRES
                 TEMPERATURE            DEGREES FAHRENHEIT

  11 JD          INDEX STORM NO. 1
                        STRM        1.89  PRECIPITATION DEPTH
                        TRDA         .01  TRANSPOSITION DRAINAGE AREA

  12 PI            PRECIPITATION PATTERN
                       .10       .10       .09       .07       .08       .07       .05       .05       .05       .03
                       .03       .03       .02       .02       .02       .02       .02       .02       .01       .01
                       .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                       .01       .01       .01       .00       .00       .00

  14 JD          INDEX STORM NO. 2
                        STRM        1.87  PRECIPITATION DEPTH
                        TRDA       10.00  TRANSPOSITION DRAINAGE AREA

   0 PI            PRECIPITATION PATTERN
                       .10       .10       .09       .07       .08       .07       .05       .05       .05       .03
                       .03       .03       .02       .02       .02       .02       .02       .02       .01       .01
                       .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                       .01       .01       .01       .00       .00       .00

  15 JD          INDEX STORM NO. 3
                        STRM        1.85  PRECIPITATION DEPTH
                        TRDA       20.00  TRANSPOSITION DRAINAGE AREA

   0 PI            PRECIPITATION PATTERN
                       .10       .10       .09       .07       .08       .07       .05       .05       .05       .03
                       .03       .03       .02       .02       .02       .02       .02       .02       .01       .01
                       .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                       .01       .01       .01       .00       .00       .00

  16 JD          INDEX STORM NO. 4
                        STRM        1.83  PRECIPITATION DEPTH
                        TRDA       40.00  TRANSPOSITION DRAINAGE AREA

   0 PI            PRECIPITATION PATTERN
                       .10       .10       .09       .07       .08       .07       .05       .05       .05       .03
                       .03       .03       .02       .02       .02       .02       .02       .02       .01       .01
                       .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                       .01       .01       .01       .00       .00       .00

  17 JD          INDEX STORM NO. 5
                        STRM        1.81  PRECIPITATION DEPTH
                        TRDA       80.00  TRANSPOSITION DRAINAGE AREA

   0 PI            PRECIPITATION PATTERN
                       .10       .10       .09       .07       .08       .07       .05       .05       .05       .03
                       .03       .03       .02       .02       .02       .02       .02       .02       .01       .01
                       .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                       .01       .01       .01       .00       .00       .00

  18 JD          INDEX STORM NO. 6
                        STRM        1.79  PRECIPITATION DEPTH
                        TRDA      120.00  TRANSPOSITION DRAINAGE AREA

   0 PI            PRECIPITATION PATTERN
                       .10       .10       .09       .07       .08       .07       .05       .05       .05       .03
                       .03       .03       .02       .02       .02       .02       .02       .02       .01       .01
                       .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                       .01       .01       .01       .00       .00       .00

  19 JD          INDEX STORM NO. 7
                        STRM        1.77  PRECIPITATION DEPTH
                        TRDA      200.00  TRANSPOSITION DRAINAGE AREA

   0 PI            PRECIPITATION PATTERN
                       .10       .10       .09       .07       .08       .07       .05       .05       .05       .03
                       .03       .03       .02       .02       .02       .02       .02       .02       .01       .01
                       .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                       .01       .01       .01       .00       .00       .00

  20 JD          INDEX STORM NO. 8
                        STRM        1.75  PRECIPITATION DEPTH
                        TRDA      300.00  TRANSPOSITION DRAINAGE AREA

   0 PI            PRECIPITATION PATTERN
                       .10       .10       .09       .07       .08       .07       .05       .05       .05       .03
                       .03       .03       .02       .02       .02       .02       .02       .02       .01       .01
                       .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                       .01       .01       .01       .00       .00       .00

  21 JD          INDEX STORM NO. 9
                        STRM        1.73  PRECIPITATION DEPTH
                        TRDA      500.00  TRANSPOSITION DRAINAGE AREA

   0 PI            PRECIPITATION PATTERN
                       .10       .10       .09       .07       .08       .07       .05       .05       .05       .03
                       .03       .03       .02       .02       .02       .02       .02       .02       .01       .01
                       .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                       .01       .01       .01       .00       .00       .00

 WARNING --- ROUTED OUTFLOW (   1105.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1196.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1280.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1358.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1434.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1492.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1519.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1518.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1495.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1456.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1405.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1345.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1281.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1213.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1143.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (   1072.) IS GREATER THAN MAXIMUM OUTFLOW (   1012.) IN STORAGE-OUTFLOW TABLE
```

WARNING --- ROUTED OUTFLOW (1118.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1191.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1256.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1308.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1339.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1348.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1336.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1308.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1268.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1219.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1165.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1106.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1046.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1054.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1136.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1207.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1268.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1313.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1338.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1341.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1325.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1295.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1253.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1203.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1148.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1089.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1029.) IS GREATER THAN MAXIMUM OUTFLOW (1012.) IN STORAGE-OUTFLOW TABLE

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	A1	413.	1.33	130.	33.	11.	.95		
+	HYDROGRAPH AT	A2	199.	1.58	74.	19.	6.	.54		
+	HYDROGRAPH AT	A3	282.	1.17	70.	18.	6.	.51		
+	3 COMBINED AT	CP1	861.	1.33	274.	69.	23.	2.01		
+	ROUTED TO	RTCP1	860.	1.42	274.	69.	23.	2.01		
+	HYDROGRAPH AT	A4	182.	.92	45.	11.	4.	.33		
+	2 COMBINED AT	CP2	995.	1.33	318.	80.	27.	2.34		
+	ROUTED TO	RTCP2	992.	1.50	318.	80.	27.	2.34		
+	HYDROGRAPH AT	A5	115.	1.00	32.	8.	3.	.23		
+	HYDROGRAPH AT	A6	75.	.83	17.	4.	1.	.13		
+	HYDROGRAPH AT	A7	388.	.75	77.	19.	6.	.56		
+	HYDROGRAPH AT	A8	249.	.50	45.	11.	4.	.33		
+	5 COMBINED AT	CP3	1415.	1.25	486.	122.	41.	3.58		
+	ROUTED TO	RTCP3	1410.	1.33	486.	122.	41.	3.58		
+	HYDROGRAPH AT	A9	238.	.67	45.	11.	4.	.33		
+	2 COMBINED AT	CP4	1509.	1.33	530.	133.	44.	3.91		
+	ROUTED TO	RTCP4	1476.	1.67	527.	133.	44.	3.91		
+	HYDROGRAPH AT	A10	137.	.58	25.	6.	2.	.18		
+	HYDROGRAPH AT	A11	24.	1.67	9.	2.	1.	.36		
+	HYDROGRAPH AT	A12	14.	.92	3.	1.	0.	.10		
+	4 COMBINED AT	CP5	1535.	1.58	560.	142.	47.	4.55		
+	HYDROGRAPH AT	B3	128.	1.17	33.	8.	3.	.24		
+	ROUTED TO	RTB3	125.	1.42	33.	8.	3.	.24		
+	HYDROGRAPH AT	B2	188.	1.17	48.	12.	4.	.35		
+	HYDROGRAPH AT	B4	11.	1.17	3.	1.	0.	.11		
+	3 COMBINED AT	CP6	313.	1.33	84.	21.	7.	.70		
+	HYDROGRAPH AT	B1	30.	1.42	11.	3.	1.	.08		

*** NORMAL END OF HEC-1 ***

PRELIMINARY MASTER DRAINAGE PLANS

ENGINEERS GENERAL CONSTRUCTION NOTES:

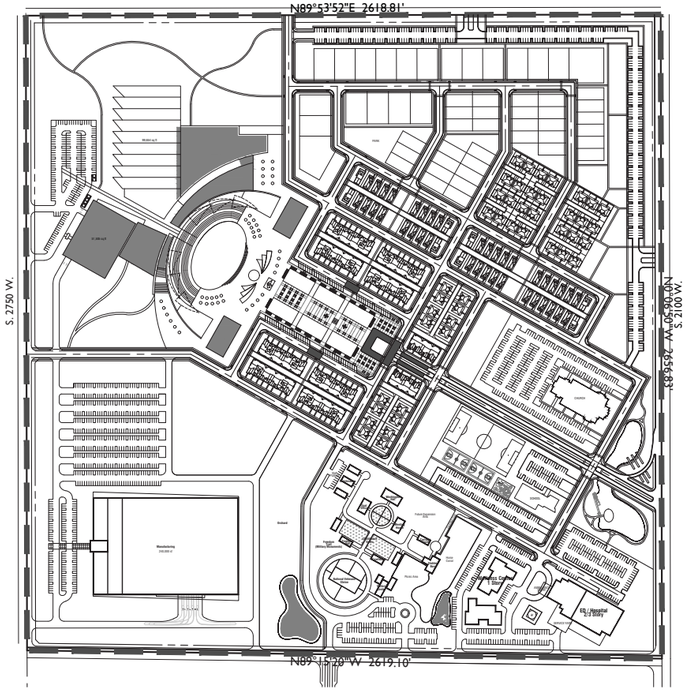
1. THESE PLANS ARE SUBJECT TO THE INTERPRETATION OF INTENT BY THE ENGINEER. ALL QUESTIONS REGARDING THESE PLANS SHALL BE PRESENTED TO THE ENGINEER. ANYONE WHO TAKES UPON HIMSELF THE INTERPRETATION OF THE DRAWINGS OR MAKES REVISIONS TO THEM WITHOUT CONFERRING WITH THE DESIGN ENGINEER SHALL BE RESPONSIBLE FOR THE CONSEQUENCES THEREOF.
2. THE PLANS PREPARED FOR THIS PROJECT PRESENT A DESCRIPTION OF THE WORK TO BE ACCOMPLISHED. THE CONTRACTOR SHALL VISIT THE PROJECT SITE AND DETERMINE, FROM HIS OWN INSPECTION, THE CONDITIONS UNDER WHICH IT IS TO BE PERFORMED. THE CONTRACTOR, BY MAKING HIS BID, REPRESENTS THAT HE HAS VISITED THE SITE AND FAMILIARIZED HIMSELF WITH LOCAL CONDITIONS, THE TYPE OF WORK TO BE PERFORMED, EVALUATED THE DIFFICULTY OF PERFORMING THE REQUIRED TASKS, AND THE LABOR, EQUIPMENT AND MATERIAL THAT ARE REQUIRED TO PROVIDE A COMPLETE PROJECT.
3. THE CONTRACTOR SHALL VERIFY WITH THE DESIGN ENGINEER THAT HE HAS THE MOST CURRENT SET OF CONSTRUCTION PLANS PRIOR TO COMMENCEMENT OF CONSTRUCTION AND MUST KEEP THE APPROVED SET OF PLANS ON-SITE FROM START OF CONSTRUCTION TO PROJECT COMPLETION. ANY CONSTRUCTION OR INSTALLATION BASED ON OUT-OF-DATE PLANS SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
4. QUANTITIES LISTED ON THESE PLANS ARE ESTIMATES ONLY. THE CONTRACTOR SHALL VERIFY ALL QUANTITIES BEFORE SUBMITTING A BID FOR THIS WORK.
5. UNLESS NOTED OTHERWISE, THIS PROJECT WAS DESIGNED IN AN EFFORT TO BALANCE THE EARTHWORK. ANY EARTHWORK VOLUMES SHOWN ON THESE PLANS ARE FOR INFORMATION ONLY AND SHALL NOT BE USED FOR BIDDING PURPOSES. THE CONTRACTOR'S BID SHALL INCLUDE ALL COSTS ASSOCIATED WITH IMPORTING AND PLACING MATERIAL OR STOCKPILING, HAULING AND DISPOSING OF EXCESS MATERIAL IN ACCORDANCE WITH THEIR CALCULATIONS AND DETERMINATION.
6. A THOROUGH ATTEMPT HAS BEEN MADE TO SHOW THE LOCATIONS OF ALL UNDERGROUND OBSTRUCTIONS AND UTILITY LINES IN THE WORK AREA. HOWEVER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO OBSTRUCTIONS AND UTILITY LINES ENCOUNTERED DURING CONSTRUCTION AND SHALL DETERMINE THE EXACT LOCATION OF SAID UTILITIES IN ADVANCE OF TRENCHING. THE ENGINEER WILL NOT GUARANTEE ANY ELEVATIONS OR LOCATIONS OF EXISTING UNDER-GROUND UTILITIES SHOWN ON THESE PLANS.
7. THE CONTRACTOR SHALL CALL BLUE STAKE PRIOR TO CONSTRUCTION AND VERIFY THE PRESENCE OF UTILITIES AND SHALL PROTECT ANY OVERHEAD OR UNDERGROUND UTILITIES DURING CONSTRUCTION, WHETHER OR NOT SAID UTILITIES ARE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL MAKE EXPLORATORY EXCAVATIONS TO LOCATE UNDERGROUND UTILITIES AND/OR STRUCTURES IF NECESSARY TO VERIFY UNDERGROUND UTILITIES. WHERE EXISTING UNDERGROUND UTILITIES ARE EXPOSED, CONTRACTOR SHALL NOTIFY THE APPROPRIATE UTILITY COMPANY FOR INSPECTION PRIOR TO BACKFILLING.
8. THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF ALL POINTS OF CONNECTION PRIOR TO DIGGING BEYOND THE POINT OF CONNECTION.
9. CONSTRUCTION OF THE SEWER LINE SHALL COMMENCE AT THE FURTHEST DOWNSTREAM POINT OF CONNECTION AND SHALL PROGRESS UPSTREAM FROM THAT POINT.
10. ALL HANDICAP ACCESS RAMPS, PARKING STALLS, AND DELINEATED WALKWAYS SHALL BE CONSTRUCTED AND MARKED IN ACCORDANCE WITH CURRENT FEDERAL AND/OR LOCAL A.D.A. STANDARDS AND REQUIREMENTS. THE CONTRACTOR SHALL COORDINATE WITH THE LOCAL AUTHORITIES PRIOR TO CONSTRUCTING AND/OR STRIPING TO CONFIRM CURRENT REQUIREMENTS.
11. ALL SLOPES HIGHER THAN ONE (1) FOOT AND STEEPER THAN 20:1, UNLESS LINED WITH TURF, SHALL BE COMPACTED AND TESTED PER MAG SPECIFICATION 215. RE-COMPACTION IS RECOMMENDED PER MAG SPECIFICATION 215 AFTER INSTALLATION OF IRRIGATION LINES, AND STABILIZATION OF DECOMPOSED GRANITE IS ALSO RECOMMENDED.
12. THE CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS SPECIFIED IN THE GEOTECHNICAL INVESTIGATION. NO PONDING DEEPER THAN 0.05' IS PERMITTED WITHIN 10' OF ANY BUILDING.
13. THE CLIENT AND CONTRACTOR ASSUME ALL RESPONSIBILITY AND COSTS INCURRED IF THEY ELECT TO LANDSCAPE RETENTION BASINS BEFORE THE REQUIRED RETENTION VOLUMES HAVE BEEN CERTIFIED BY THE ENGINEER.
14. THE CONTRACTOR SHALL OBTAIN PERMISSION FROM THE OWNER'S ENGINEER-OF-RECORD PRIOR TO BACKFILLING ANY WET OR DRY UTILITY MAIN OR SERVICE LINES TO ENSURE ALL INSPECTIONS AND TESTING HAS BEEN COMPLETED. NO UTILITY LINES SHALL BE BACKFILLED UNTIL AS-BUILT HORIZONTAL AND VERTICAL LOCATIONS HAVE BEEN OBTAINED. ANY ADDITIONAL COST REQUIRED
15. THE CONTRACTOR SHALL REGISTER ALL DRYWELLS WITH THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY AT THE CONCLUSION OF INSTALLATION AND TESTING. DRYWELL REGISTRATION NUMBERS SHALL BE PROVIDED TO THE OWNER AND ENGINEER OR RECORD.

STAKING NOTES:

CALL THE BLUE STAKE CENTER (263-1100) 48 HOURS BEFORE DIGGING FOR LOCATION OF UNDERGROUND UTILITIES. ALL OFFSET OR REFERENCE STAKES SET BY THE ENGINEER ARE TO BE MAINTAINED INTACT. NO CLAIMS FOR ADDITIONAL COMPENSATION FOR CORRECTIONS SHALL BE PRESENTED TO ANY PARTY UNLESS SUCH STAKES ARE PRESENT AND THEIR ORIGIN IS VERIFIED. IF STAKES ARE NOT MAINTAINED INTACT, ALL CORRECTIONS SHALL BE MADE BY THE CONTRACTOR AT HIS EXPENSE. ONE SET OF STAKES WILL BE FURNISHED BY THE OWNER FOR THE WATER LINE. WATER SERVICES, FIRE HYDRANT LOCATIONS AND GRADE, SEWER LINES AND SERVICES, CONCRETE SUBGRADE AND A.B.C.. ALL ADDITIONAL STAKING TO BE CHARGED TO THE CONTRACTOR. 24 WORKING HOUR NOTICE IS REQUIRED FOR STAKING BY THE SUBDIVISION ENGINEER.

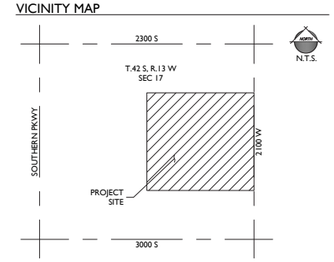
PRELIMINARY GRADING & DRAINAGE PLAN
FOR
BALANCE OF NATURE
HURRICANE, UT

A PORTION OF SECTION 17, TOWNSHIP 42S, RANGE 13W,
WASHINGTON COUNTY, UTAH



KEY MAP
N.T.S.

VICINITY MAP



CIVIL ENGINEER:
EPS GROUP, INC.
1130 N. ALMA SCHOOL RD, SUITE 120
MESA, ARIZONA 85201
PHONE: (480) 503-2250
FAX: (480) 503-2258
CONTACT: ALI AZIMI, P.E.
EMAIL: Ali.Azimi@epsgroupinc.com

DESCRIPTION		SHEET NO
COVER SHEET	CS01	1
INDEX SHEET	ID01	2
PRELIMINARY GRADING & DRAINAGE PLAN	GD01 - GD12	3 - 14

PROJECT DATA
APN: H-3373-NP
ACREAGE: 158356

LEGEND

- STORM SEWER MANHOLE
- STORM DRAIN PIPE
- SLOPE DIRECTION
- CATCH BASIN

1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250 | F:480.503.2258
www.epsgroupinc.com
EPS GROUP

Balance of Nature
Preliminary Drainage Plan
Hurricane, Utah.

Project

Cover Sheet

Revisions:

Designer: EPS
Drawn by: EPS

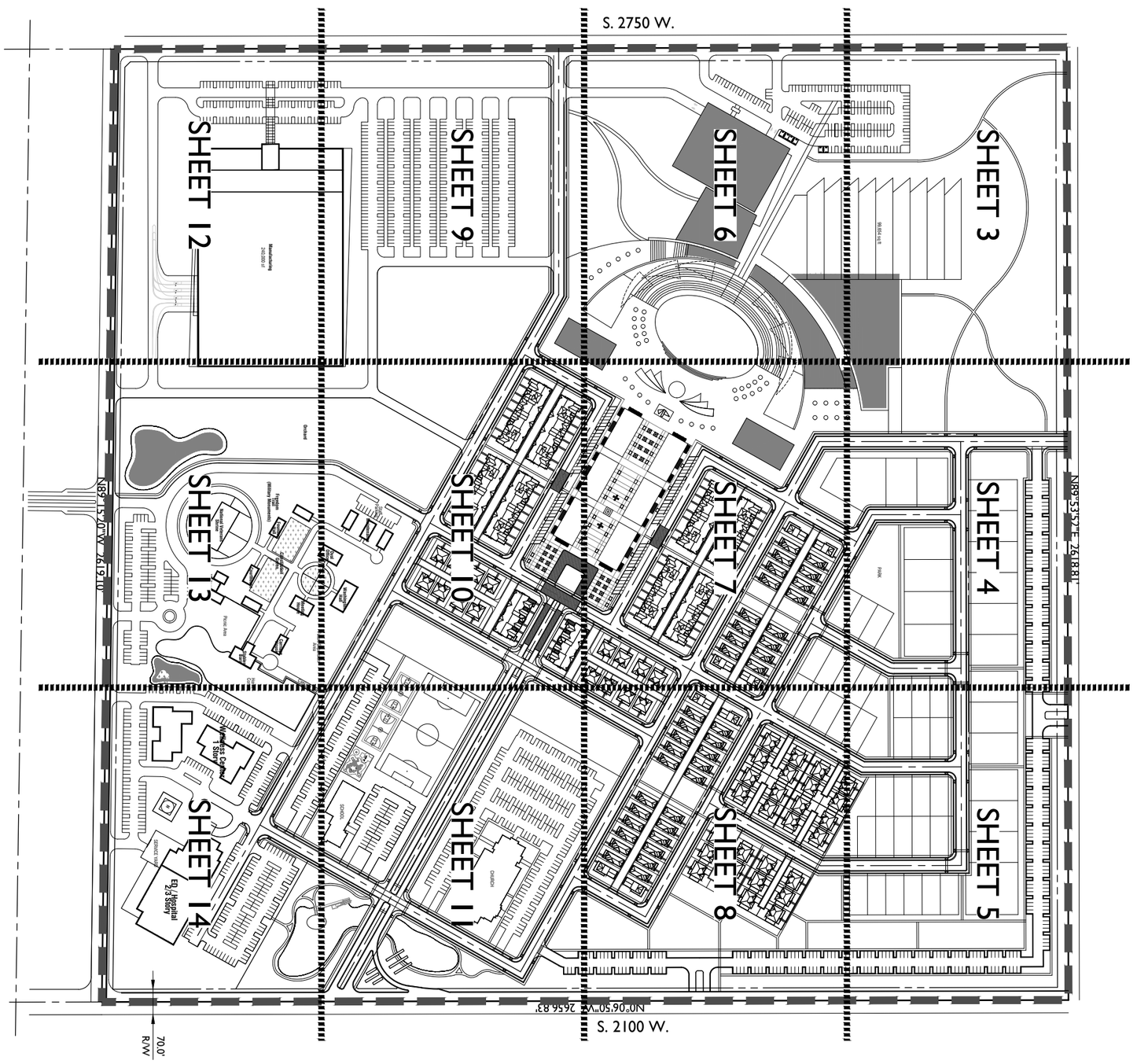
Job No.
21-0167

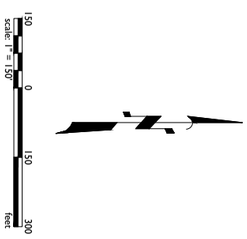
CS01

Sheet No.
1
of 14

21-0167 - Balance of Nature
aazimi Sep 13, 2021 11:39pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Grading & Drainage\21-0167 - CS01.dwg

21-0167 - Balance of Nature





Job No. 21-0167
ID01
Sheet No. 2 of 14

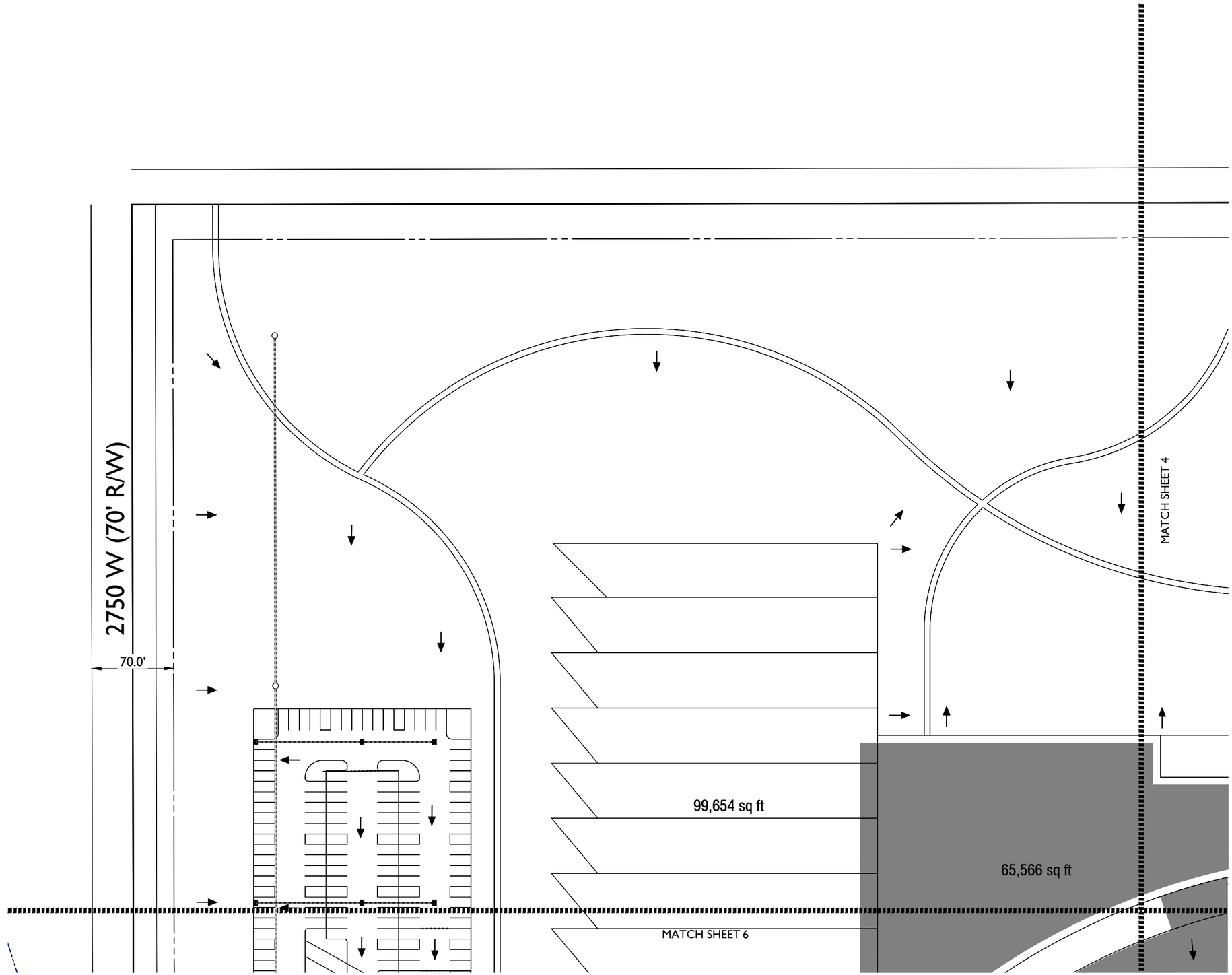
Designed: EPS
Drawn by: EPS

Revisions:

Project: Balance of Nature
Preliminary Drainage Plan
Hurricane, Utah

Index Sheet

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250 | F:480.503.2258
w w w . e p s g r o u p i n c . c o m



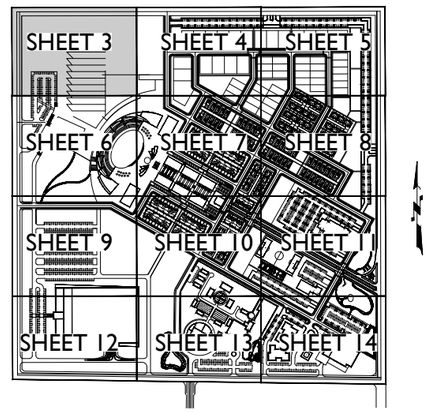
CONSTRUCTION NOTES

LEGEND

- STORM SEWER MANHOLE
- STORM DRAIN PIPE
- SLOPE DIRECTION
- CATCH BASIN

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Drainage Plan

Preliminary Not for Construction or Recordation

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation. Know what's below. Call 811 before you dig. BLUE STAKES OF UTAH www.bluestakes.org 811

Designer:	Job No.	Sheet No.
EPS	21-0167	3 of 14
Drawn by: EPS	Dwg No. GD01	

azimi Sep 13, 2021 11:41pm \\Eps-m16-fs01\shared$\Projects\2021\21-0167\Civil_Preliminary_Grading & Drainage\21-0167 - GD01.dwg

21-0167 - Balance of Nature

N89°53'52"E 2618.81'

MATCH SHEET 3

MATCH SHEET 5

MATCH SHEET 7

PARK

q ft

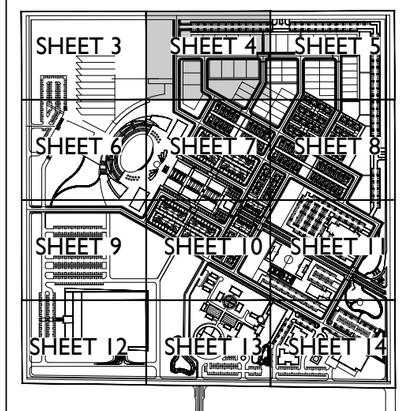
CONSTRUCTION NOTES

LEGEND

- STORM SEWER MANHOLE
- STORM DRAIN PIPE
- SLOPE DIRECTION
- CATCH BASIN

scale: 1" = 40'

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Grading & Drainage Plan

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation, Know what's below. Call811 before you dig. BLUE STAKES OF UTAH www.bluestakes.org 811 or 1-800-662-4111

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. GD02
Sheet No. 4

azimi Sep 13, 2021 11:49pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Grading & Drainage\21-0167 - GD02.dwg

21-0167 - Balance of Nature

azimi Sep 13, 2021 11:58pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Grading & Drainage\21-0167 - GD03.dwg

MATCH SHEET 4

MATCH SHEET 8

70.0'
R/W

S. 2100 W.

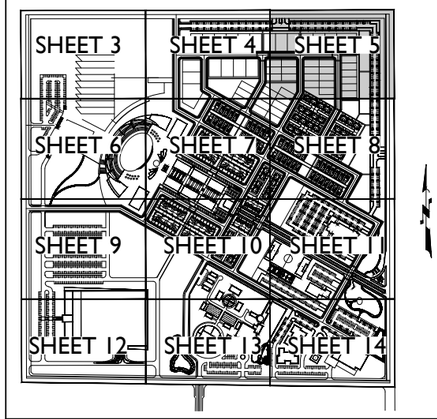
CONSTRUCTION NOTES

LEGEND

- STORM SEWER MANHOLE
- STORM DRAIN PIPE
- SLOPE DIRECTION
- CATCH BASIN

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Grading & Drainage Plan

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. GD03
Sheet No. 5

Call at least two full working days before you begin excavation.
Blue Stakes of Utah Call 811 before you dig.

21-0167 - Balance of Nature

S. 2750 W.

MATCH SHEET 3

MATCH SHEET 9

MATCH SHEET 7

51,505 sq ft

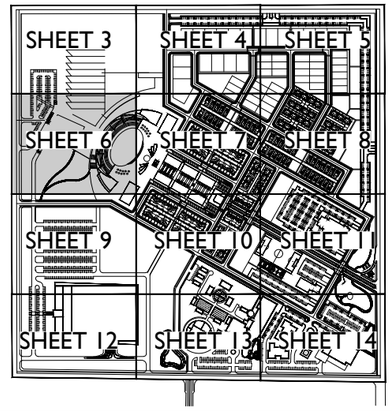
CONSTRUCTION NOTES

LEGEND

- STORM SEWER MANHOLE
- STORM DRAIN PIPE
- SLOPE DIRECTION
- CATCH BASIN

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Grading & Drainage Plan

Not For Construction

Revisions:

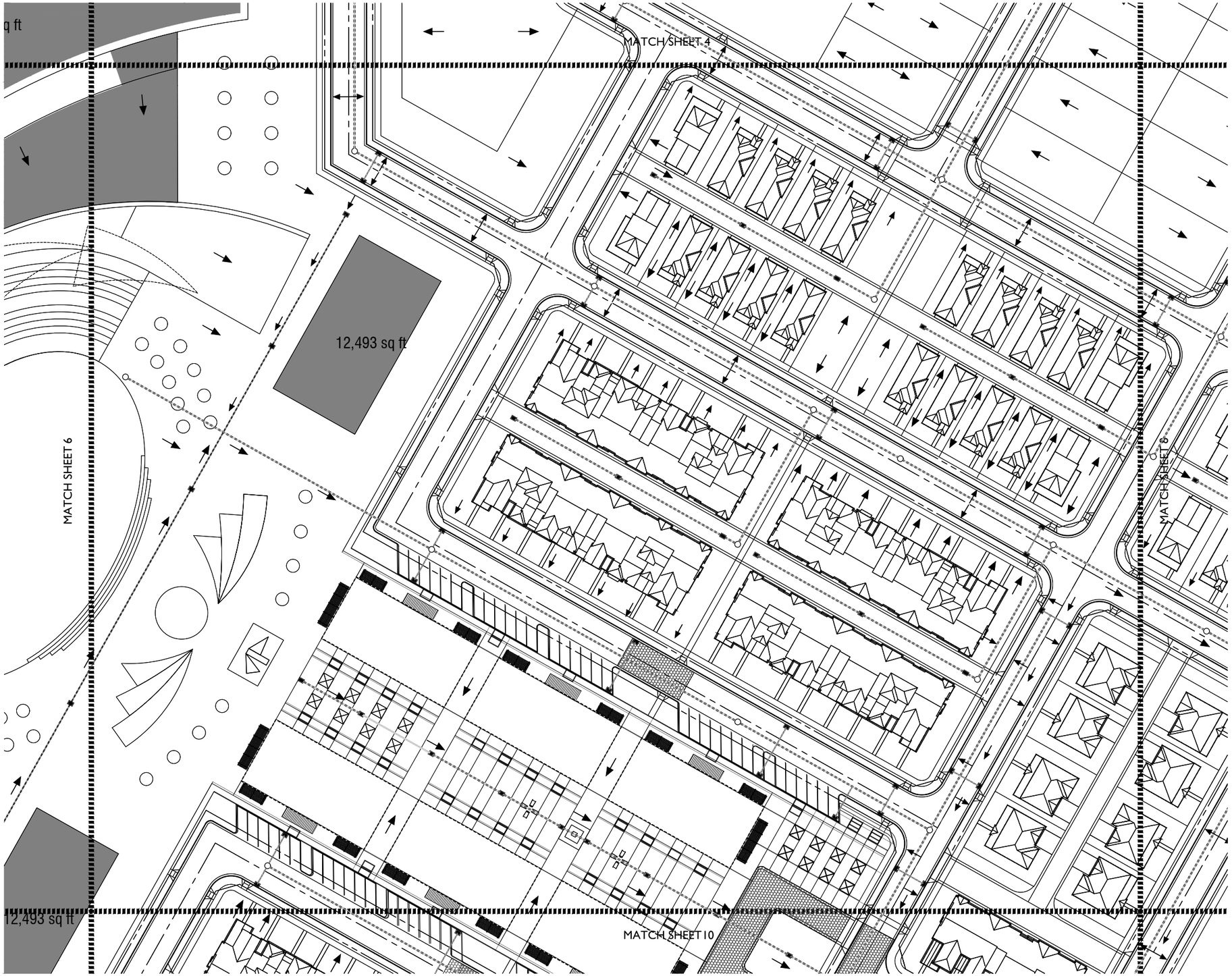
EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation.
Know what's below. Call811 before you dig.

Designer:	Job No.	Sheet No.
EPS	21-0167	6
Drawn by: EPS	Dwg No. GD04	

azimi Sep 14, 2021 12:17am \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Grading & Drainage\21-0167 - GD04.dwg

21-0167 - Balance of Nature



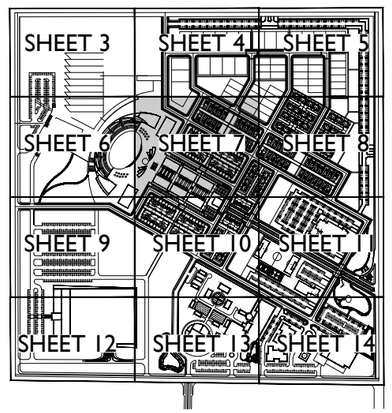
CONSTRUCTION NOTES

LEGEND

- STORM SEWER MANHOLE
- STORM DRAIN PIPE
- SLOPE DIRECTION
- CATCH BASIN

scale: 1" = 40' (40 0 40 80 feet)

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Grading & Drainage Plan

Preliminary Not For Construction Or Recordation

Revisions:

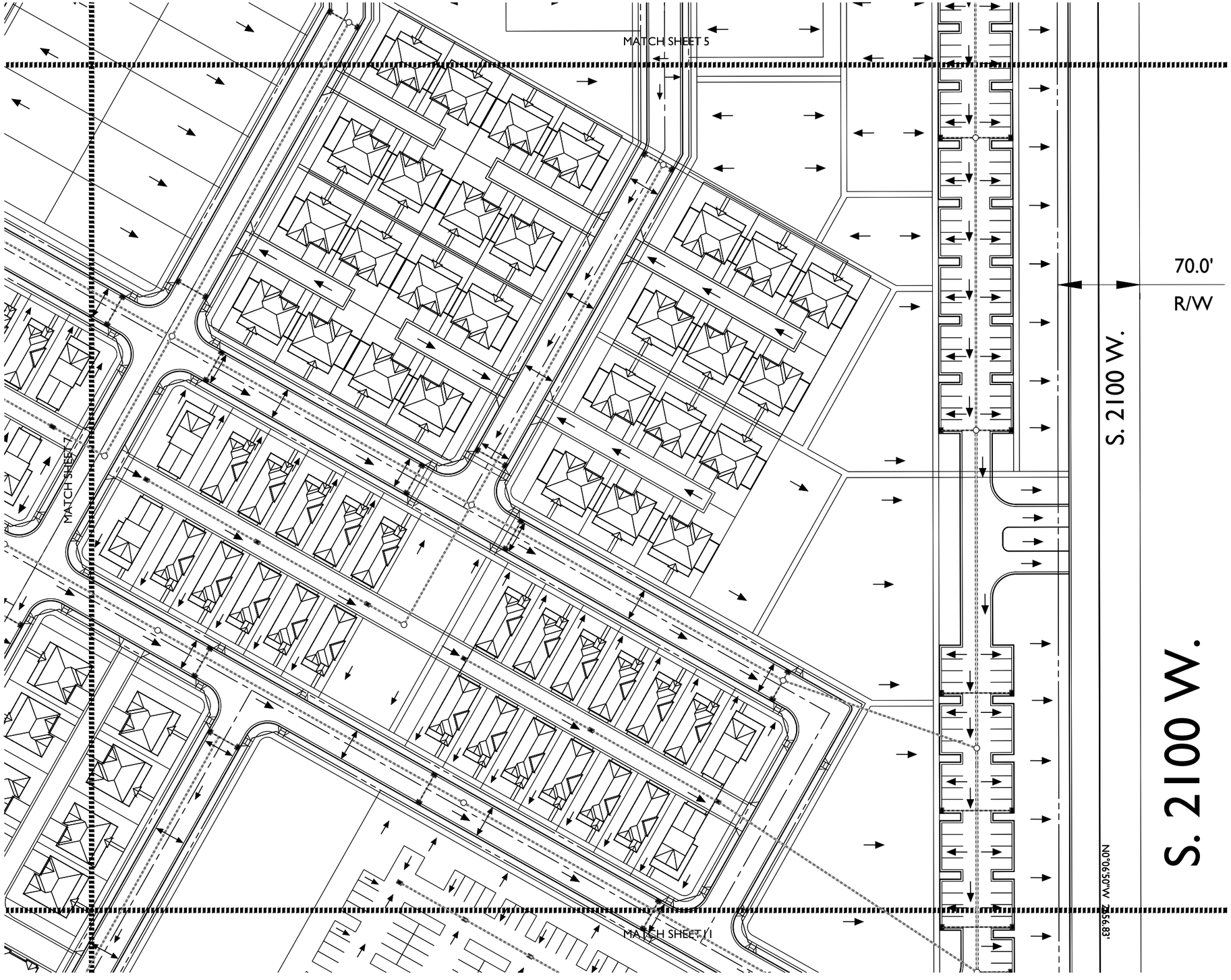
EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation. Know what's below. Call 811 before you dig. BLUE STAKE OF UTAH

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. GD05
Sheet No. 7

Sep 14, 2021 12:22am \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Grading & Drainage\21-0167 - GD05.dwg
rbower

21-0167 - Balance of Nature



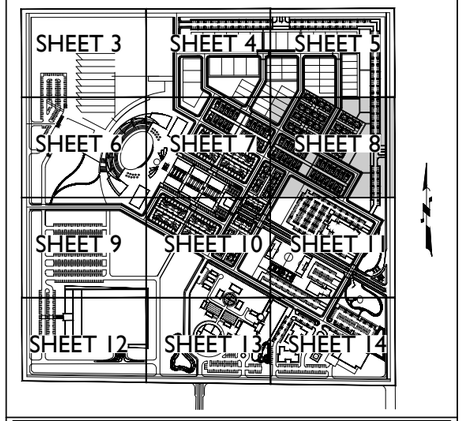
CONSTRUCTION NOTES

LEGEND

- STORM SEWER MANHOLE
- STORM DRAIN PIPE
- SLOPE DIRECTION
- CATCH BASIN

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Grading & Drainage Plan

Revisions:

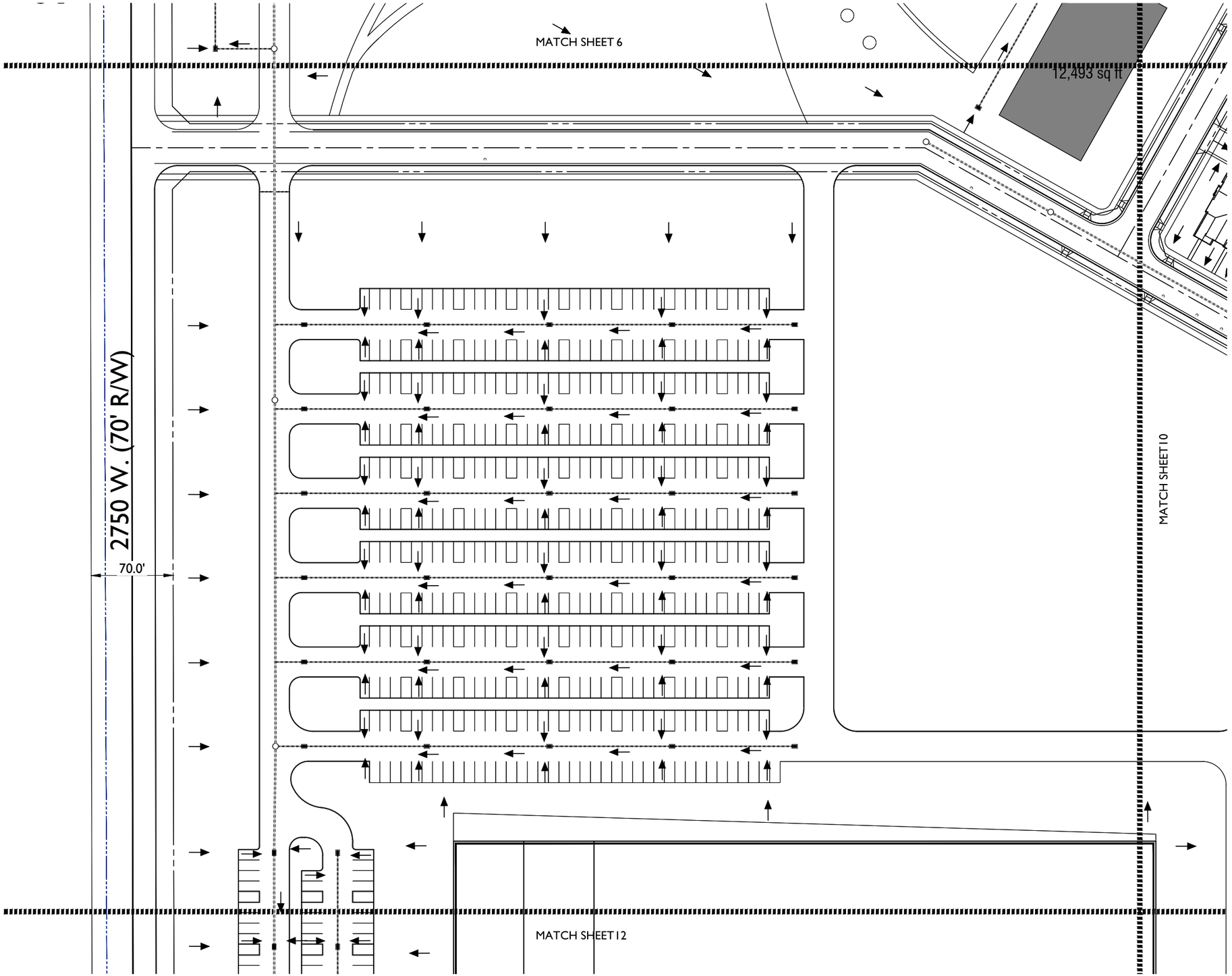
EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation. Know what's below. Call811 before you dig. BLUE STAKES OF UTAH

Designer:	Job No.	Sheet No.
EPS	21-0167	8 of 14
Drawn by: EPS	Dwg No. GD06	

azimi Sep 14, 2021 12:30am \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Grading & Drainage\21-0167 - GD06.dwg

21-0167 - Balance of Nature



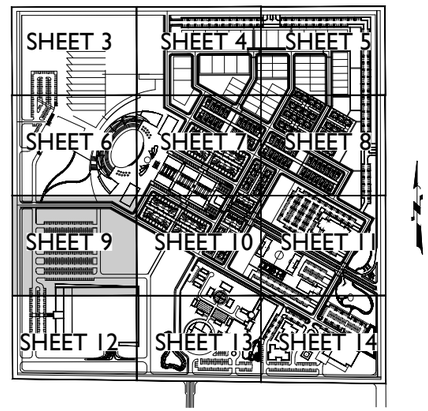
CONSTRUCTION NOTES

LEGEND

- STORM SEWER MANHOLE
- STORM DRAIN PIPE
- SLOPE DIRECTION
- CATCH BASIN

scale: 1" = 40'

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Grading & Drainage Plan

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
w w w . e p s g r o u p i n c . c o m

Call at least two full working days before you begin excavation. Know what's below. Call 811 before you dig. BLUE STAKES OF UTAH

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. GD07
Sheet No. 9 of 14

Sep 14, 2021 12:41am \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Grading & Drainage\21-0167 - GD07.dwg
rbower

21-0167 - Balance of Nature

Sep. 14, 2021 12:48am \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Grading & Drainage\21-0167 - GD08.dwg

aazimi

12,493 sq ft

MATCH SHEET 7

MATCH SHEET 9

MATCH SHEET 11

Staff Parking

Maintenance

Oval Office

Washington Hall

MATCH SHEET 13

Future Expansion Area

Orchard

Meetinn

Harriman Trail

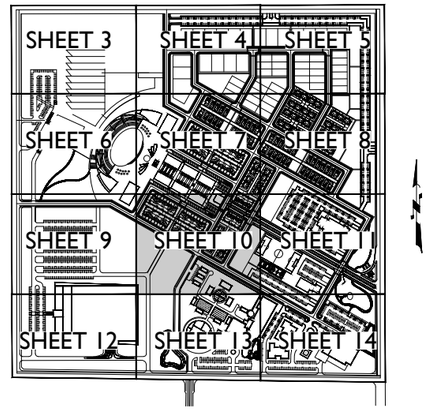
CONSTRUCTION NOTES

LEGEND

- STORM SEWER MANHOLE
- STORM DRAIN PIPE
- SLOPE DIRECTION
- CATCH BASIN

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Grading & Drainage Plan

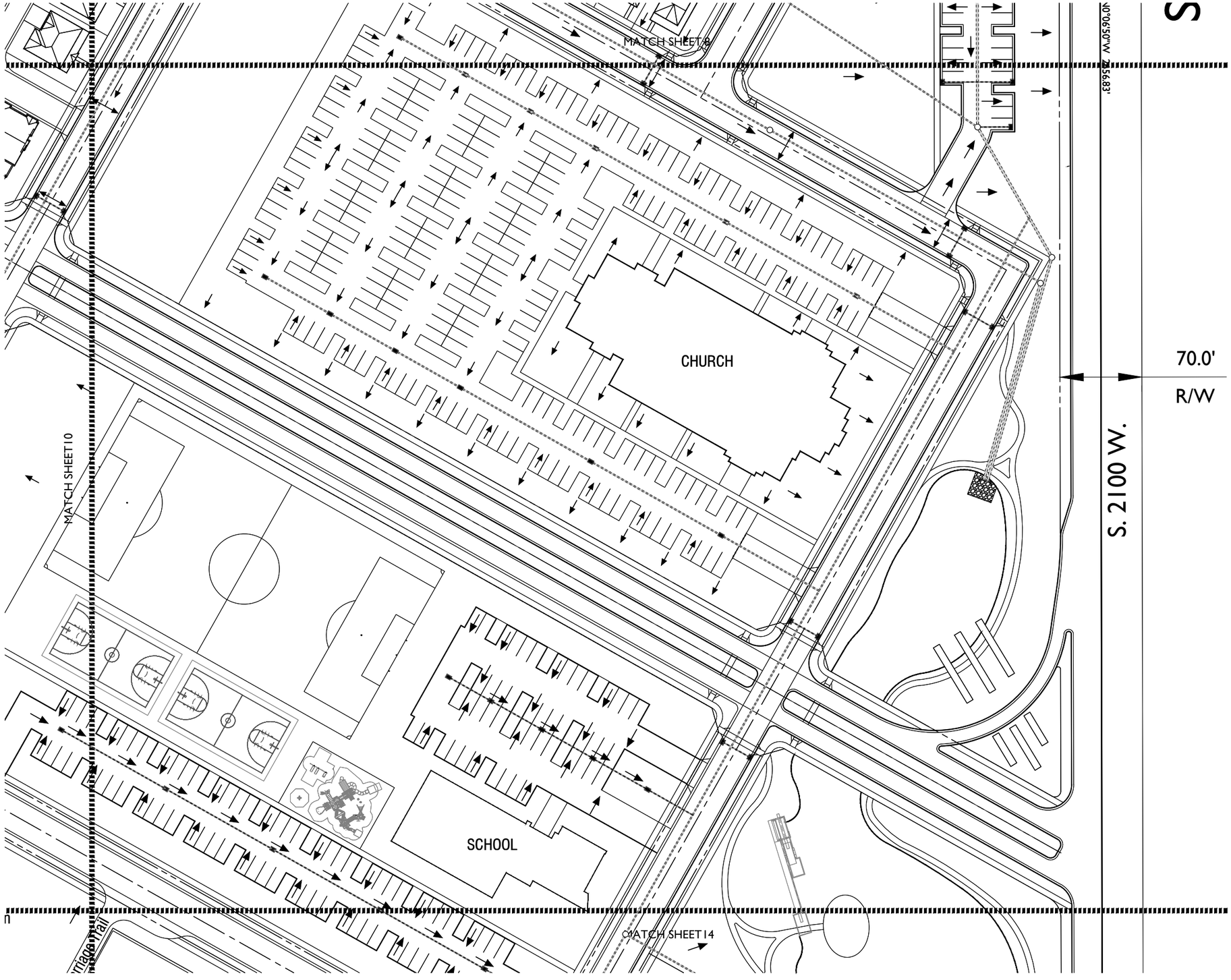
Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation.
Know what's below. Call BLUE STAKES OF UTAH

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. GD08
Sheet No. 10 of 14

21-0167 - Balance of Nature



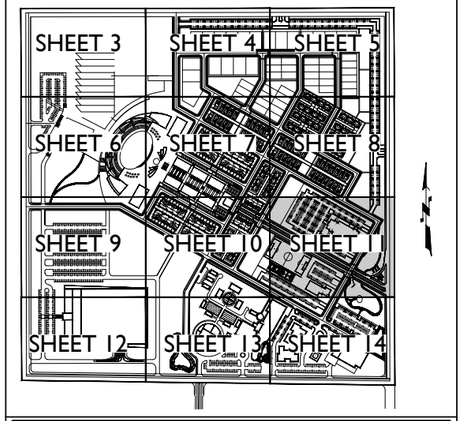
CONSTRUCTION NOTES

LEGEND

- STORM SEWER MANHOLE
- STORM DRAIN PIPE
- SLOPE DIRECTION
- CATCH BASIN

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature
Hurricane, Utah

Prelim Grading & Drainage Plan

Preliminary Not For Construction

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation, Know what's below. Call 811 before you dig. BLUE STAKES OF UTAH

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. GD09
Sheet No. 11 of 14

azimi Sep 14, 2021 1:00pm \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Grading & Drainage\21-0167 - GD09.dwg

21-0167 - Balance of Nature

MATCH SHEET 9

2750 W (70' R/W)

70.0'

Manufacturing
240,000 sf

MATCH SHEET 13

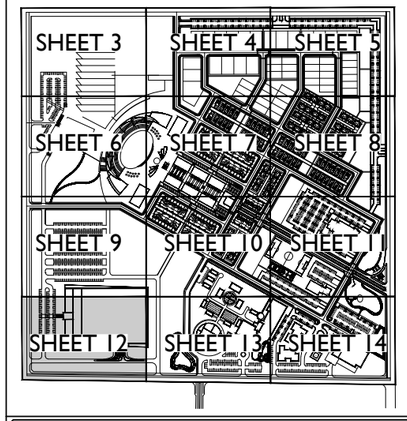
CONSTRUCTION NOTES

LEGEND

- STORM SEWER MANHOLE
- STORM DRAIN PIPE
- SLOPE DIRECTION
- CATCH BASIN

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature
Hurricane, Utah

Prelim Grading & Drainage Plan

Preliminary Not For Construction

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation, Know what's below. Call811 before you dig. BLUE STAKES OF UTAH

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. GD10
Sheet No. 12 of 14

rbower Sep 14, 2021 1:11am \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Grading & Drainage\21-0167 - GD10.dwg

21-0167 - Balance of Nature

Sep 14, 2021 1:19am \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Grading & Drainage\21-0167 - GD11.dwg

rbower

MATCH SHEET 12

MATCH SHEET 13

MATCH SHEET 14

Orchard

Oval Office

Future Expansion Area

Meeting House

Carriage Trail

Freedom Trail (Military Monuments)

Founders Hall

Constitution Green

Carriage House

Courthouse

Stables Barn

Horse Corral

National Veterans Shrine

Visitors Center

Picnic Area

N89°15'20"W 2619.10'

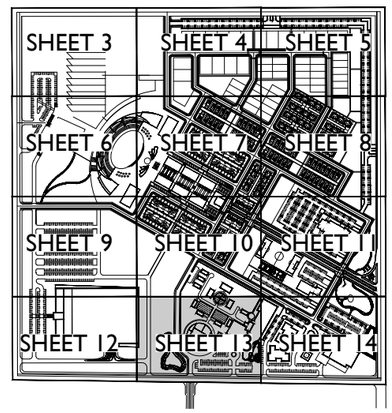
CONSTRUCTION NOTES

LEGEND

- STORM SEWER MANHOLE
- STORM DRAIN PIPE
- SLOPE DIRECTION
- CATCH BASIN

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Grading & Drainage Plan

Preliminary
Not For Construction
Or
09-10-2021

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation.
Know what's below. Call 811 before you dig.
BLUE STAKES OF UTAH
www.bluestakes.org

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. GD11
Sheet No. 13 of 14

21-0167 - Balance of Nature

MATCH SHEET 11

Carnaby Trail

Horse Corral

Wellness Center
1 Story

AMBULANCE ENTRY

ED / Hospital
2/3 Story

SERVICE YARD

MATCH SHEET 13

2100 W (70' R/W)

70.0'

R/W

3000 SOUTH

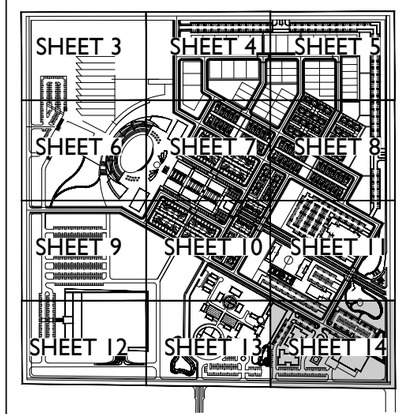
CONSTRUCTION NOTES

LEGEND

- STORM SEWER MANHOLE
- STORM DRAIN PIPE
- SLOPE DIRECTION
- CATCH BASIN

40 0 40 80
scale: 1" = 40' feet

KEY MAP



Balance of Nature

Hurricane, Utah

Prelim Grading & Drainage Plan

Preliminary Not For Construction

Revisions:

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250|F:480.503.2258
www.epsgroupinc.com

Call at least two full working days before you begin excavation. Know what's below. Call811 before you dig.

Designer: EPS
Drawn by: EPS
Job No. 21-0167
Dwg No. GD12
Sheet No. 14 of 14

azimi Sep 14, 2021 12:56am \\EPS-M16-FS01\SHARED$\Projects\2021\21-0167\Civil_Preliminary_Grading & Drainage\21-0167 - GD12.dwg

PHOTOS OF THE SITE AND SURROUNDINGS



































DESIGN PROCESS

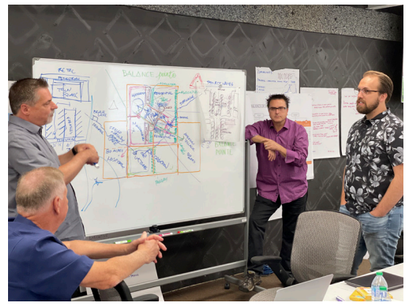










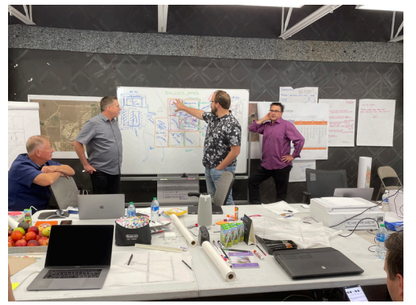














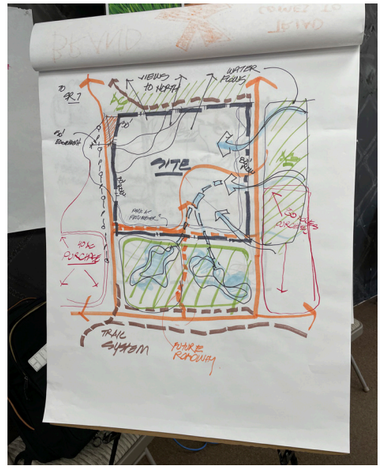




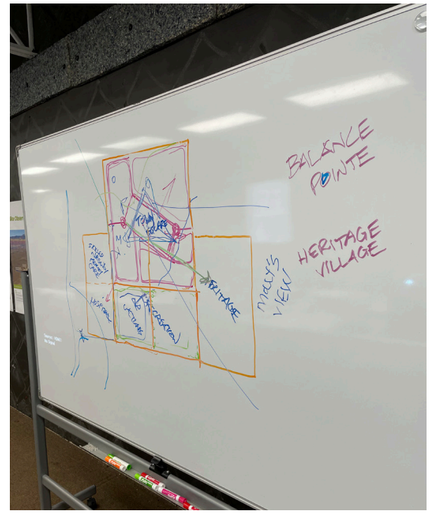




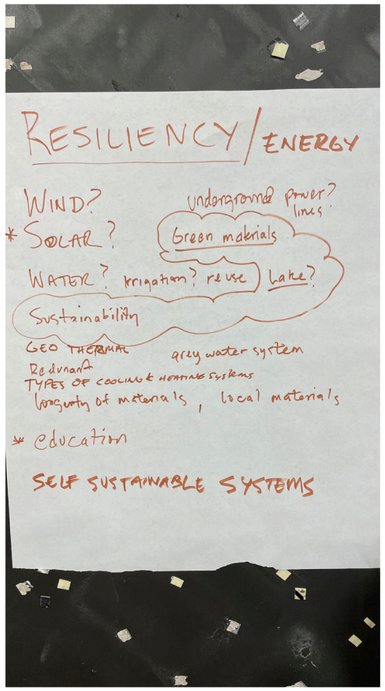


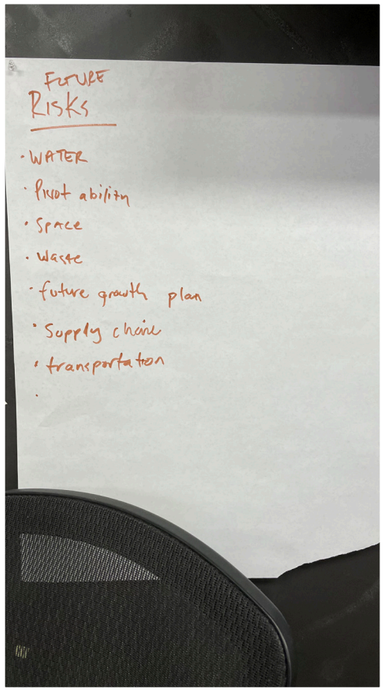


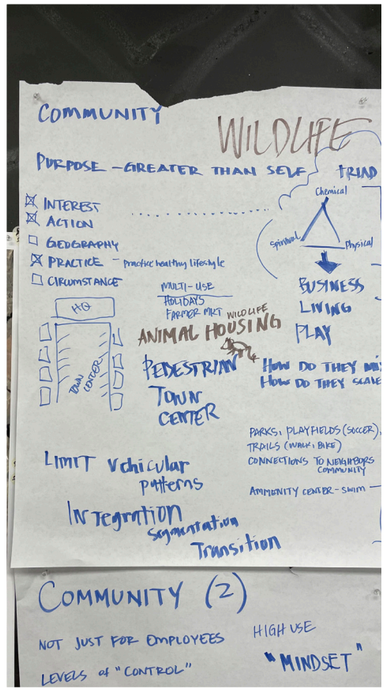


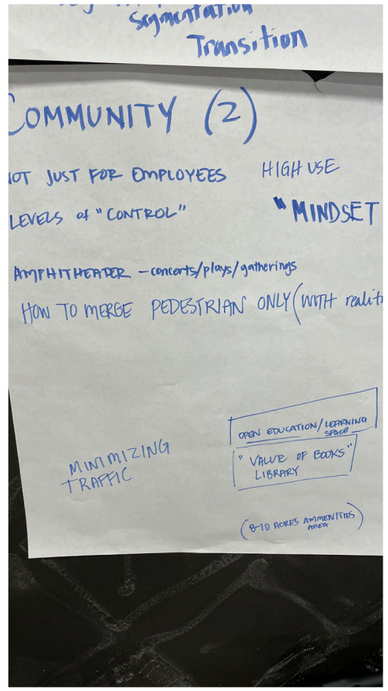


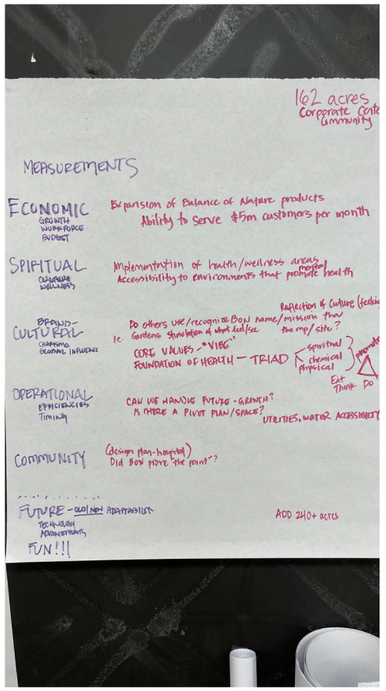
PROGRAM DATA

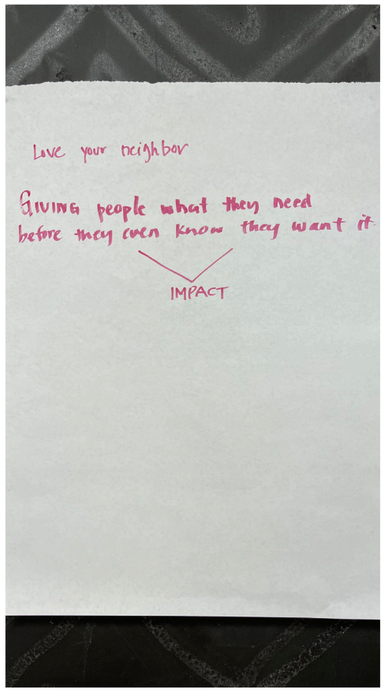


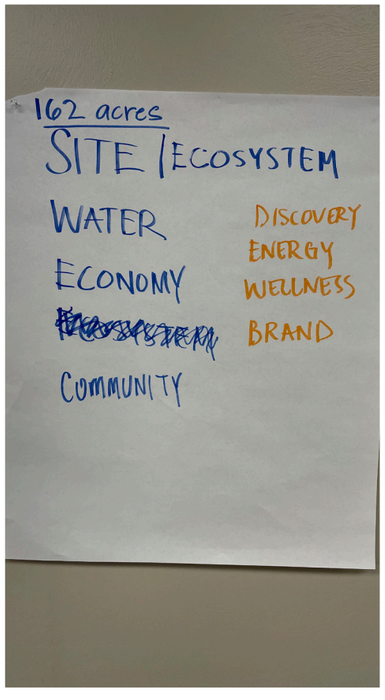


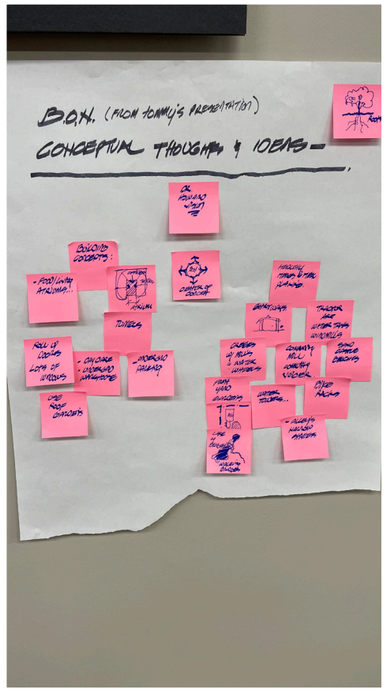


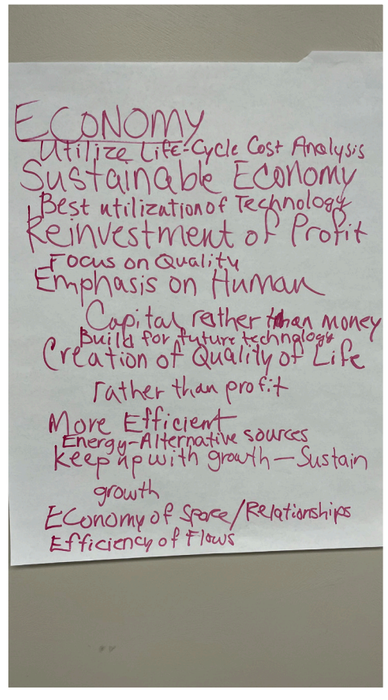


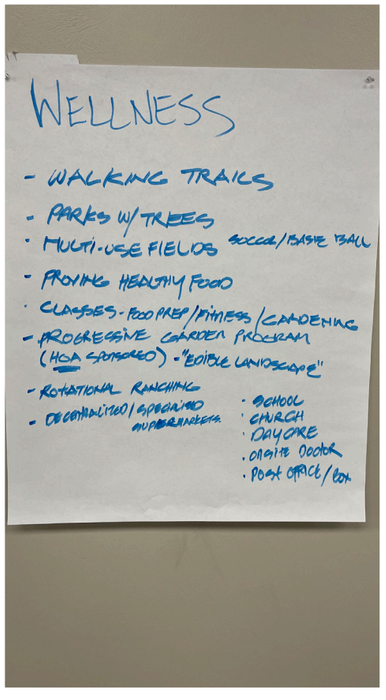


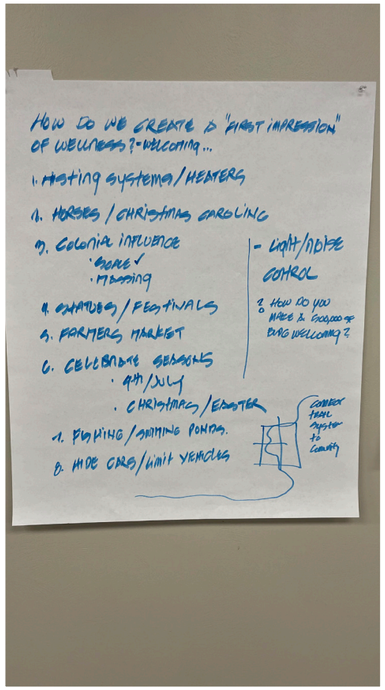


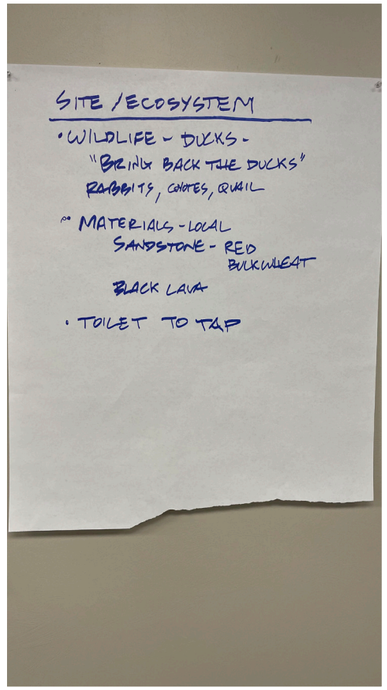


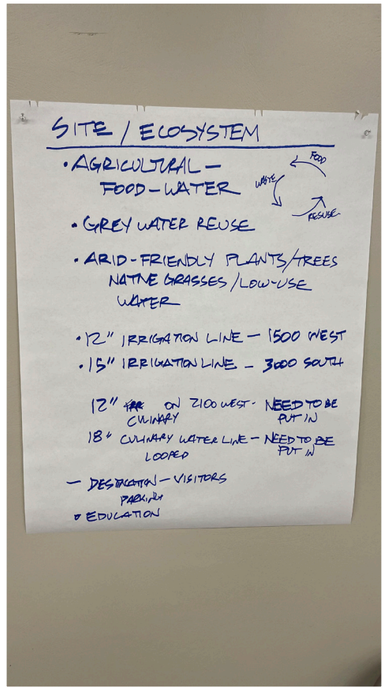


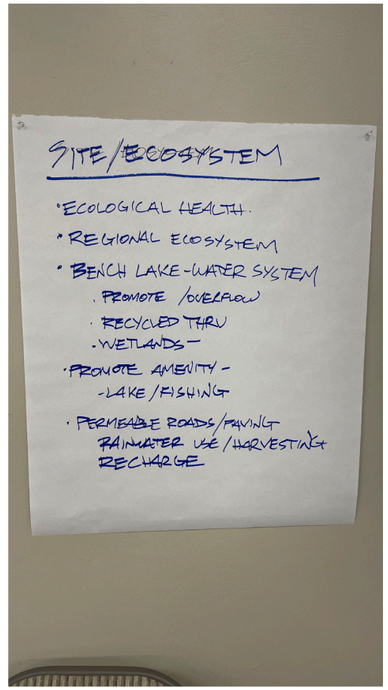


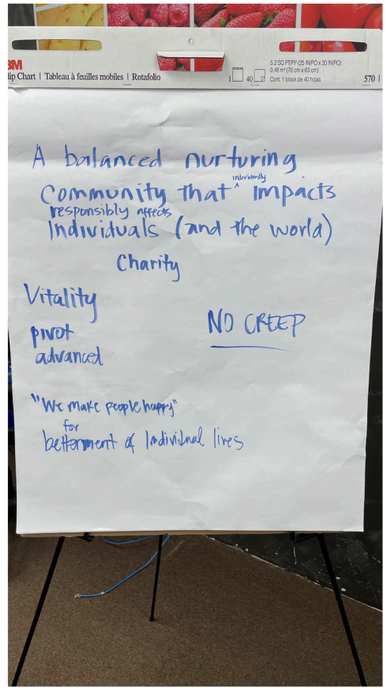


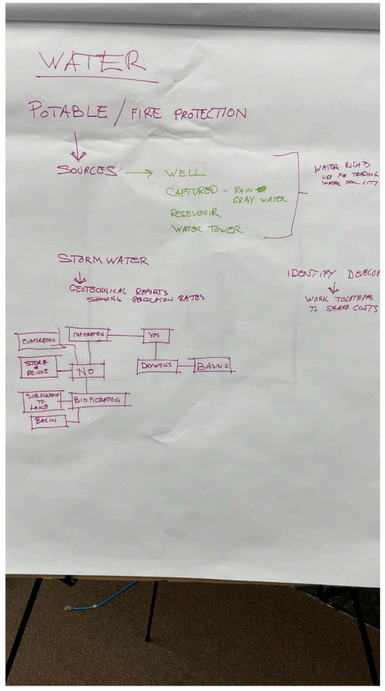

HOW DO WE CREATE A "FIRST IMPRESSION" OF WELLNESS? - WELCOMING...
1. HEATING SYSTEMS / HEATERS
2. HORSES / CHRISTMAS CAROLING
3. COLONIAL INFLUENCE
· BARE ✓
· MISSING
4. CANDLES / FESTIVALS
5. FARMERS MARKET
6. CELEBRATE SEASONS
· 4TH/JULY
· CHRISTMAS / EASTER
7. FISHING / SWIMMING PONDS
8. HIDE CARS / LIMIT VEHICLES
- LIGHT/NOISE CONTROL
? HOW DO YOU MAKE A ECOLOGY BE DARK WELCOMING ?
CONNECT TRAIL SYSTEM TO COUNTY

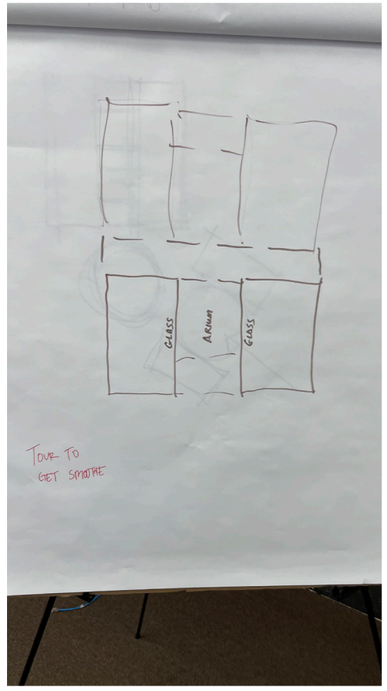

SITE / ECOSYSTEM
• WILDLIFE - DUCKS -
"BRING BACK THE DUCKS"
RABBITS, COYOTES, QUAIL
• MATERIALS - LOCAL
SANDSTONE - RED
BUCKWHEAT
BLACK LAVA
• TOILET TO TAP

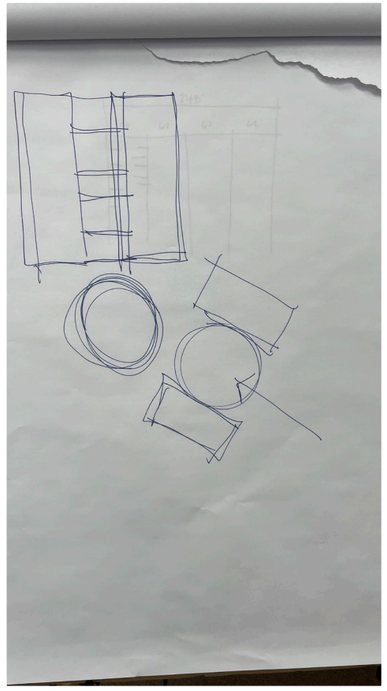

SITE / ECOSYSTEM
• AGRICULTURAL - FOOD - WATER
FOOD
WATER
REUSE
• GREY WATER REUSE
• ARID-FRIENDLY PLANTS/TREES NATIVE GRASSES/LOW-USE WATER
• 12" IRRIGATION LINE - 1500 WEST
• 15" IRRIGATION LINE - 3000 SOUTH
12" CULINARY ON 2100 WEST - NEED TO BE PUT IN
18" CULINARY WATER LINE - NEED TO BE PUT IN LOOPED
- DESTINATION - VISITORS PARKING
• EDUCATION

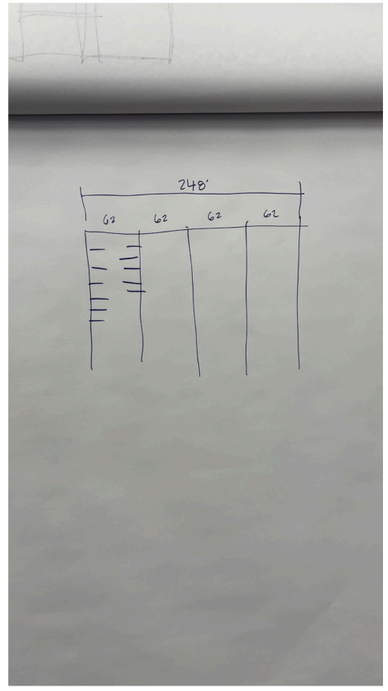

SITE / ECOSYSTEM
• ECOLOGICAL HEALTH
• REGIONAL ECOSYSTEM
• BENCH LAKE - WATER SYSTEM
· PROMOTE / OVERFLOW
· RECYCLED THRU
· WETLANDS -
• PROMOTE AMENITY -
- LAKE / FISHING
· PERMEABLE ROADS / PAVING
RAINWATER USE / HARVESTING
RECHARGE

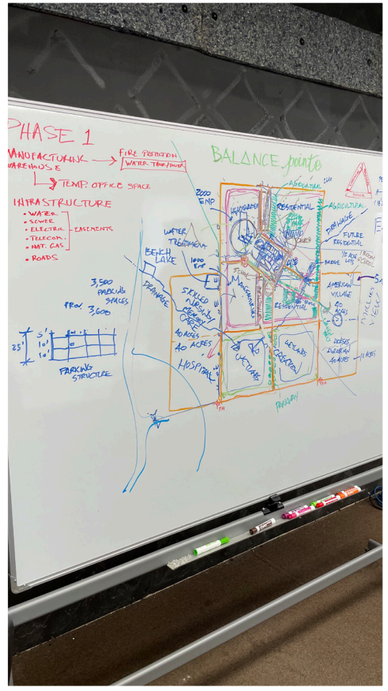

A balanced nurturing
Community that (individually) Impacts responsibly affects Individuals (and the world)
Charity
Vitality
pivot
advanced
NO CREEP
"We make people happy"
for betterment of individual lives


WATER
POTABLE / FIRE PROTECTION
SOURCES → WELL
CAPTURED - RAIN
GRAY WATER
RESERVOIR
WATER TOWER
WATER RIGHTS USE FOR TRADING WITH CITY
STORM WATER
GEOTECHNICAL REPORTS SOILS FACILITATION RATES
IDENTIFY DISCHARGE
WORK TOGETHER TO SHARE COSTS
CONVEYANCE
INTERFACE
YES
STORE RELEASE
NO
DRAINAGE
BASINS
SUBSURFACE LAYER
BIO FILTRATION
BASIN

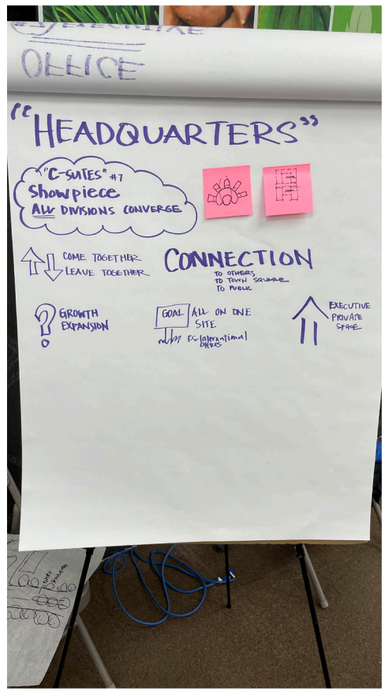

GLASS
ARMOR
GLASS
TOUR TO
GET SPRITE

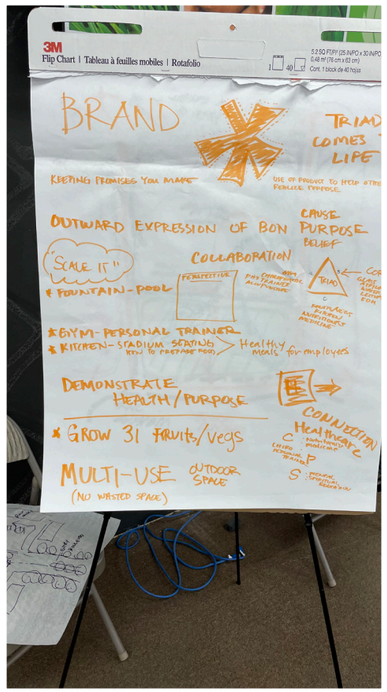


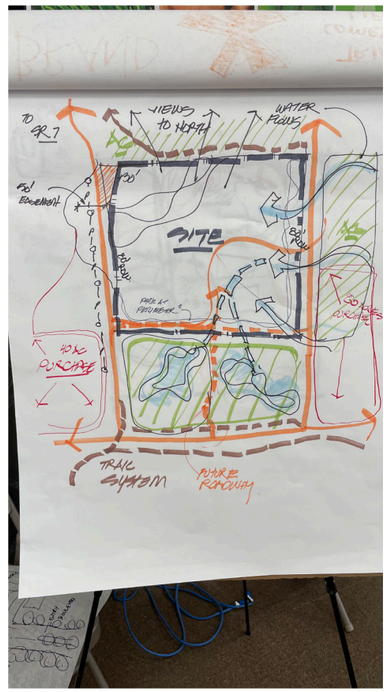

248'
62
62
62
62

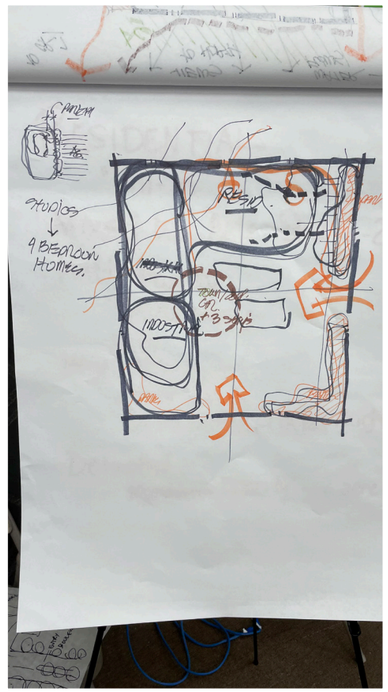

PHASE 1
MANUFACTURING
WAREHOUSE
FIRE PROTECTION
WATER TOWER/TANK
TEMP OFFICE SPACE
INFRASTRUCTURE
• WATER
• SEWER
• ELECTRIC - EASEMENTS
• TELECOM
• NAT. GAS
• ROADS
BALANCE POINT
2000 ERU
RESIDENTIAL
AGRICULTURAL
WATER TREATMENT
FUTURE RESIDENTIAL
BEACH LAKE
3,500 PARKING SPACES
FROM 3,600
PARKING
SPECIFIC AGRICULTURAL USES 40 ACRES
40 ACRES
HOSPITAL
CULTURE
RESORT
AGRICULTURAL VILLAGE
PARKING STRUCTURE
PARKING

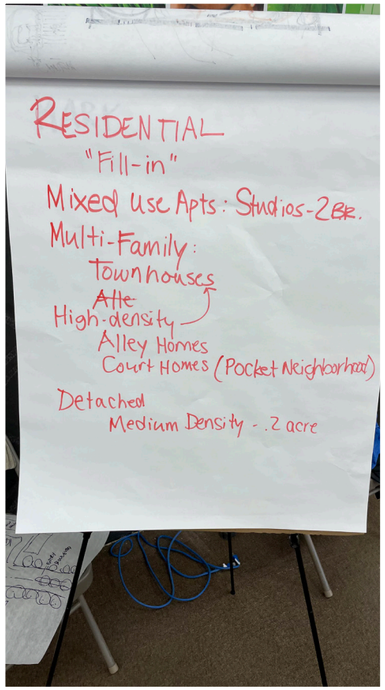

BALANCE point
2000 EMP
RESIDENTIAL
AGRICULTURAL
FUTURE RESIDENTIAL
1000 EMP
AMERICAN VILLAGE
40 ACRES
SKILLED NURSING MEMORY CARE
40 ACRES
40 ACRES
HOSPITAL
WETLANDS
PARKWAY

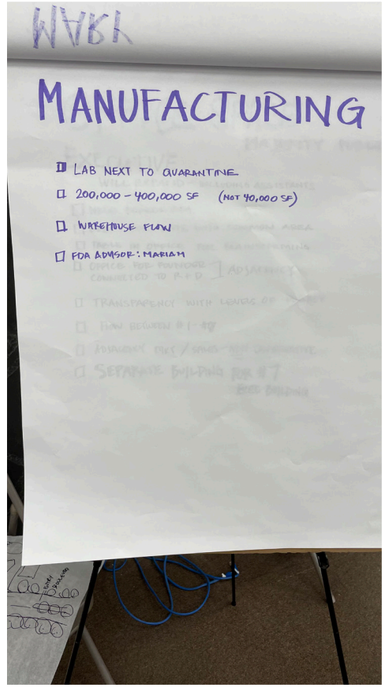

"HEADQUARTERS"
"C-SUITES" #7
Showpiece
ALL DIVISIONS CONVERGE
CONNECTION
COME TOGETHER
LEAVE TOGETHER
GROWTH EXPANSION
GOAL ALL ON ONE SITE
EXECUTIVE PRIVATE SPACE

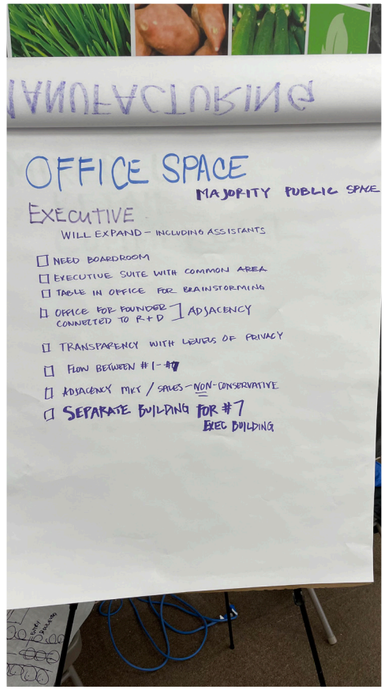

BRAND
KEEPING PROMISES YOU MAKE
OUTWARD EXPRESSION OF BON
CAUSE PURPOSE BELIEF
"SCALE IT"
COLLABORATION
FOUNTAIN-POOL
GYM-PERSONAL TRAINER
KITCHEN-
Healthy meals for employees
DEMONSTRATE HEALTH/PURPOSE
GROW 31 fruits/vegs
MULTI-USE OUTDOOR SPACE
(NO WASTED SPACE)

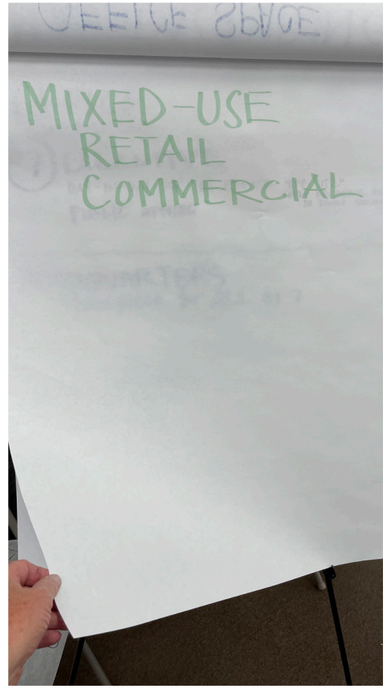

VIEWS TO NORTH
WATER FLOWS
SITE
TRAIL SYSTEM
FUTURE RAILWAY

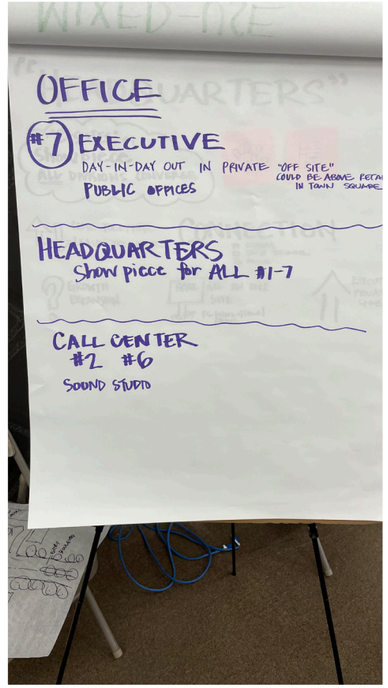

9 BEDROOM HOMES


RESIDENTIAL
"Fill-in"
Mixed Use Apts: Studios-2BR.
Multi-Family:
Townhouses
Alley Homes
Court Homes (Pocket Neighborhood)
Detached
Medium Density - .2 acre

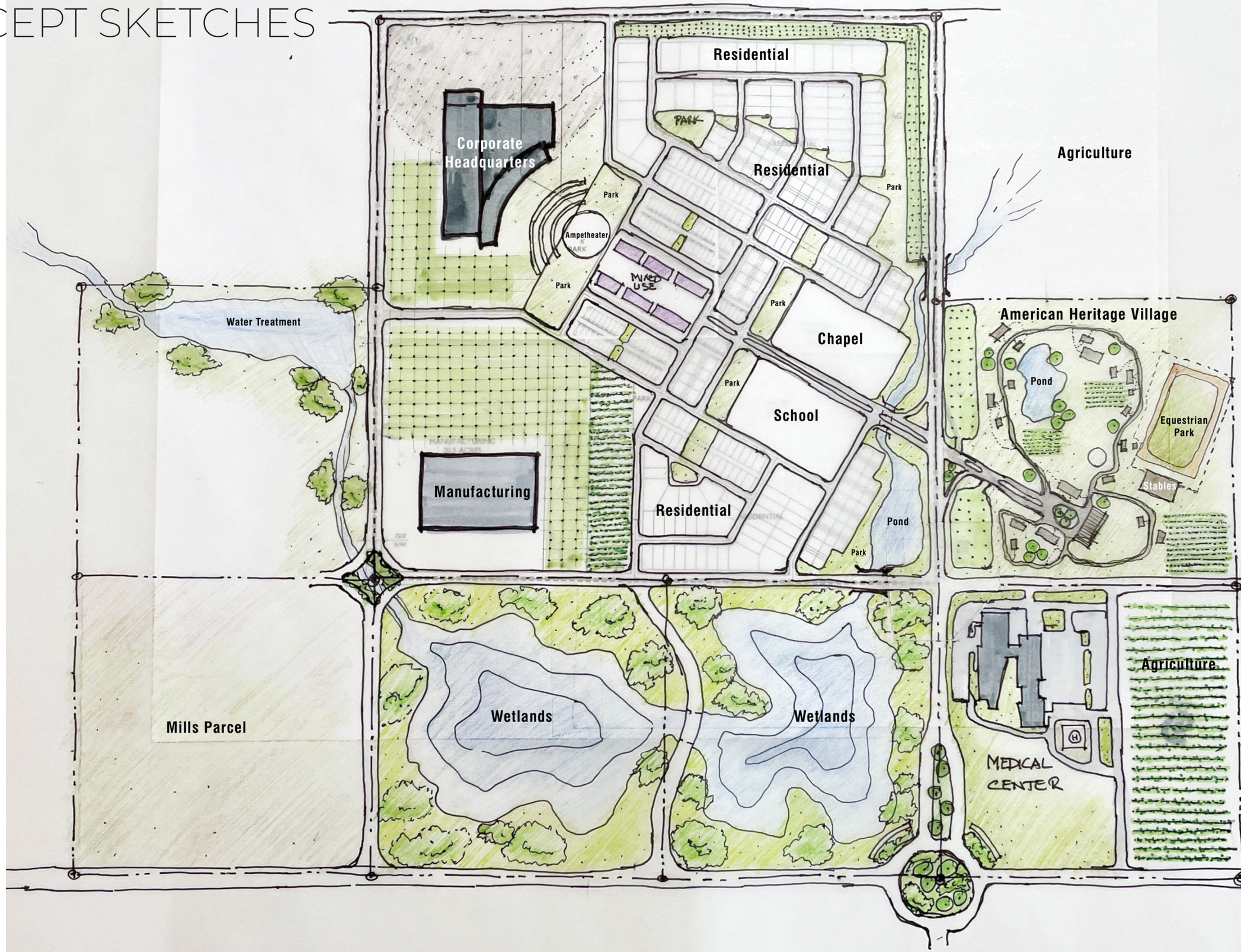

MANUFACTURING
LAB NEXT TO QUARANTINE
200,000 - 400,000 SF (NOT 40,000 SF)
WAREHOUSE FLOW
FDA ADVISOR: MARIAM

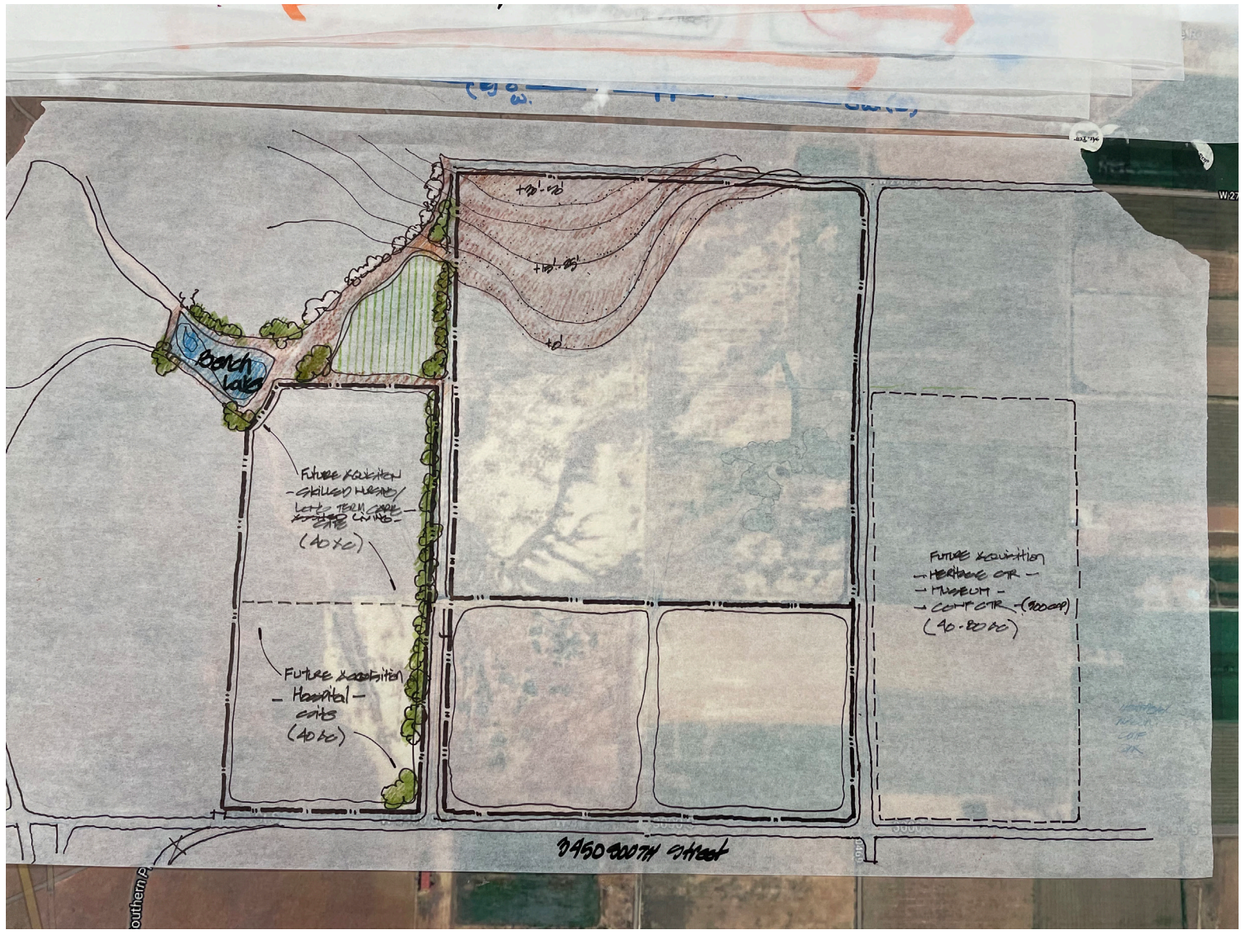

OFFICE SPACE
MAJORITY PUBLIC SPACE
EXECUTIVE
WILL EXPAND - INCLUDING ASSISTANTS
NEED BOARDROOM
EXECUTIVE SUITE WITH COMMON AREA
TABLE IN OFFICE FOR BRAINSTORMING
OFFICE FOR FOUNDER CONNECTED TO R+D
ADJACENCY
TRANSPARENCY WITH LEVELS OF PRIVACY
FLOW BETWEEN #1-#7
ADJACENCY MIX / SPACES - NON-CONSERVATIVE
SEPARATE BUILDING FOR #7
BEEC BUILDING

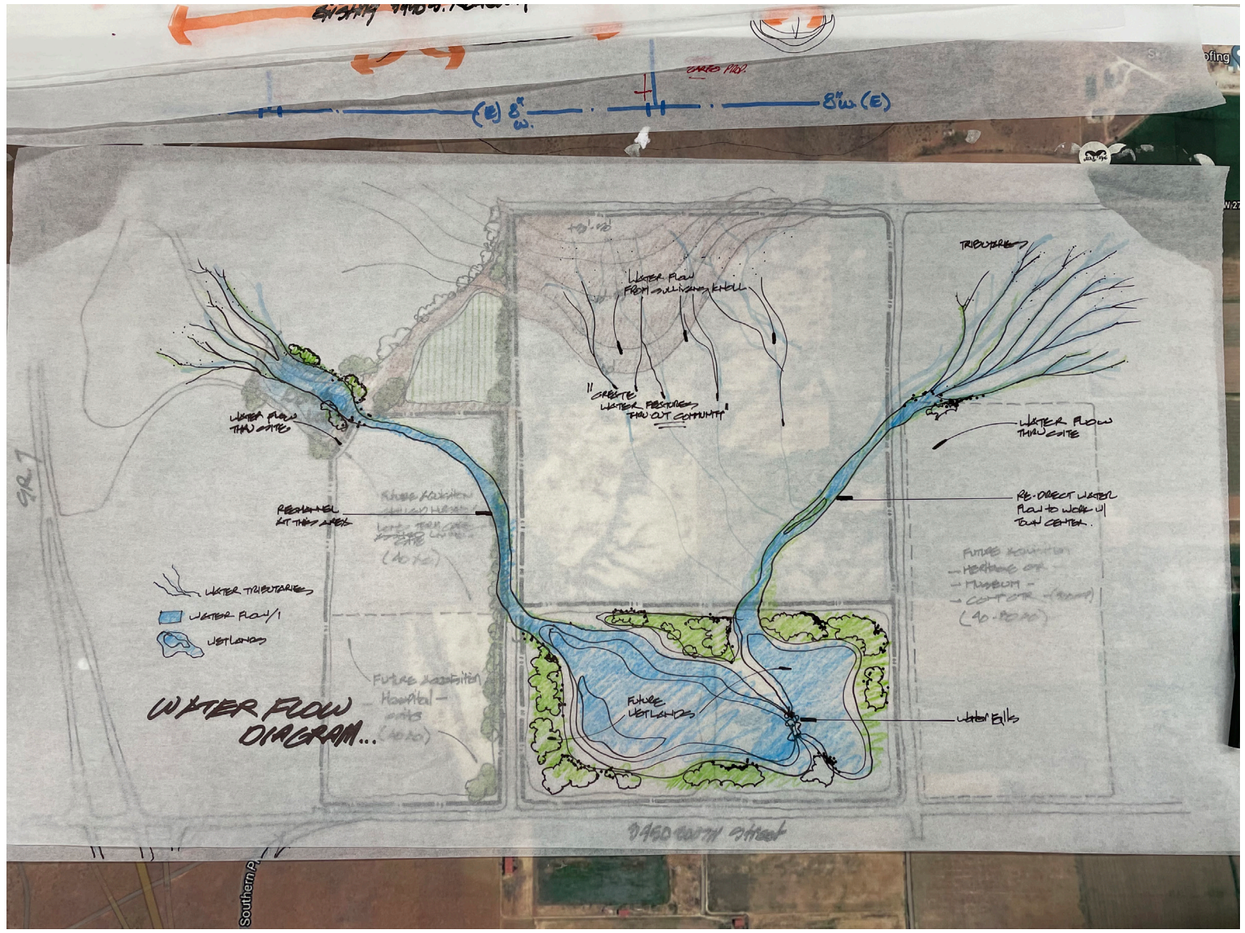

MIXED-USE
RETAIL
COMMERCIAL

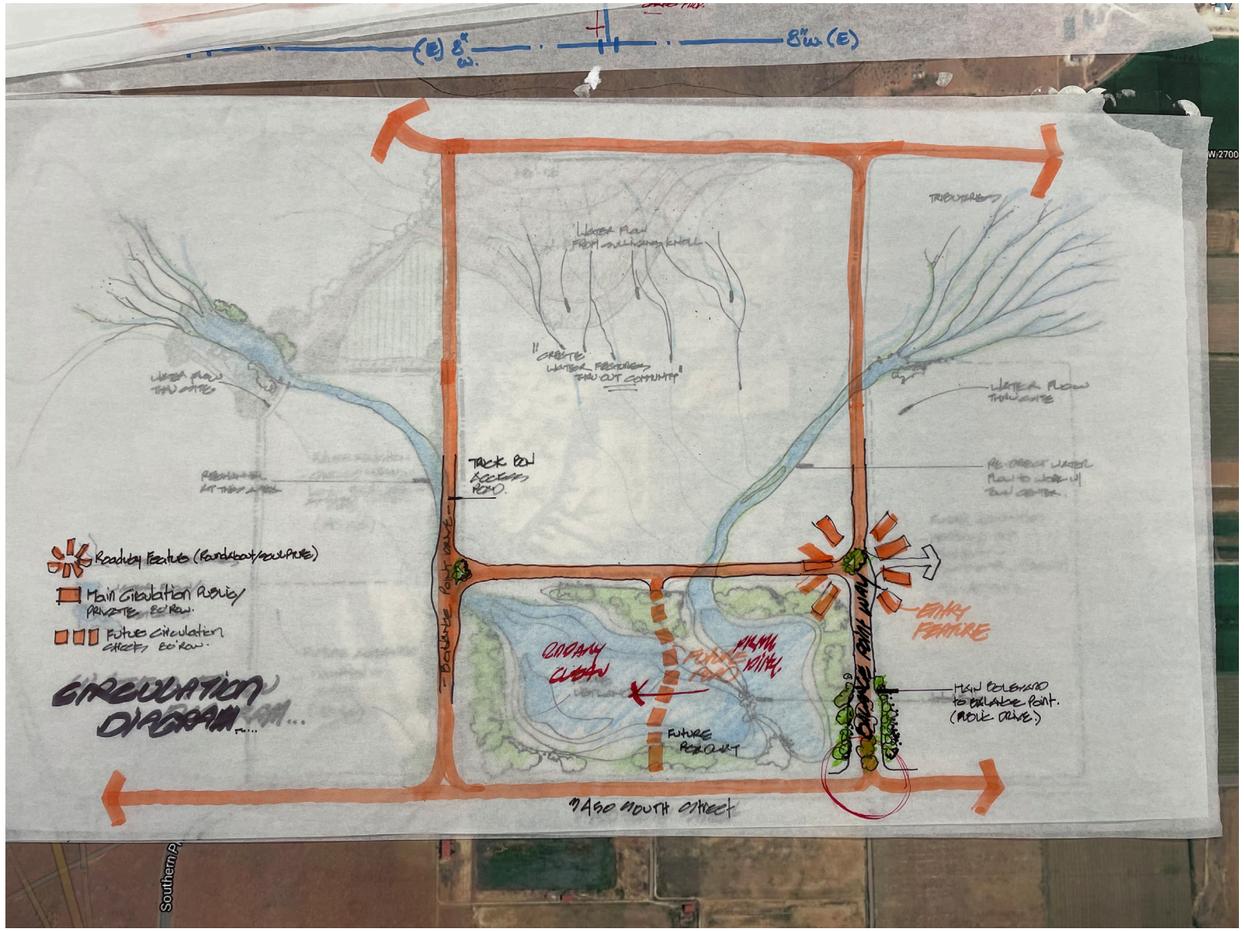

OFFICE
#7 EXECUTIVE
DAY-IN-DAY OUT IN PRIVATE "OFF SITE"
PUBLIC OFFICES
HEADQUARTERS
Showpiece for ALL #1-7
CALL CENTER
#2 #6
SOUND STUDIO

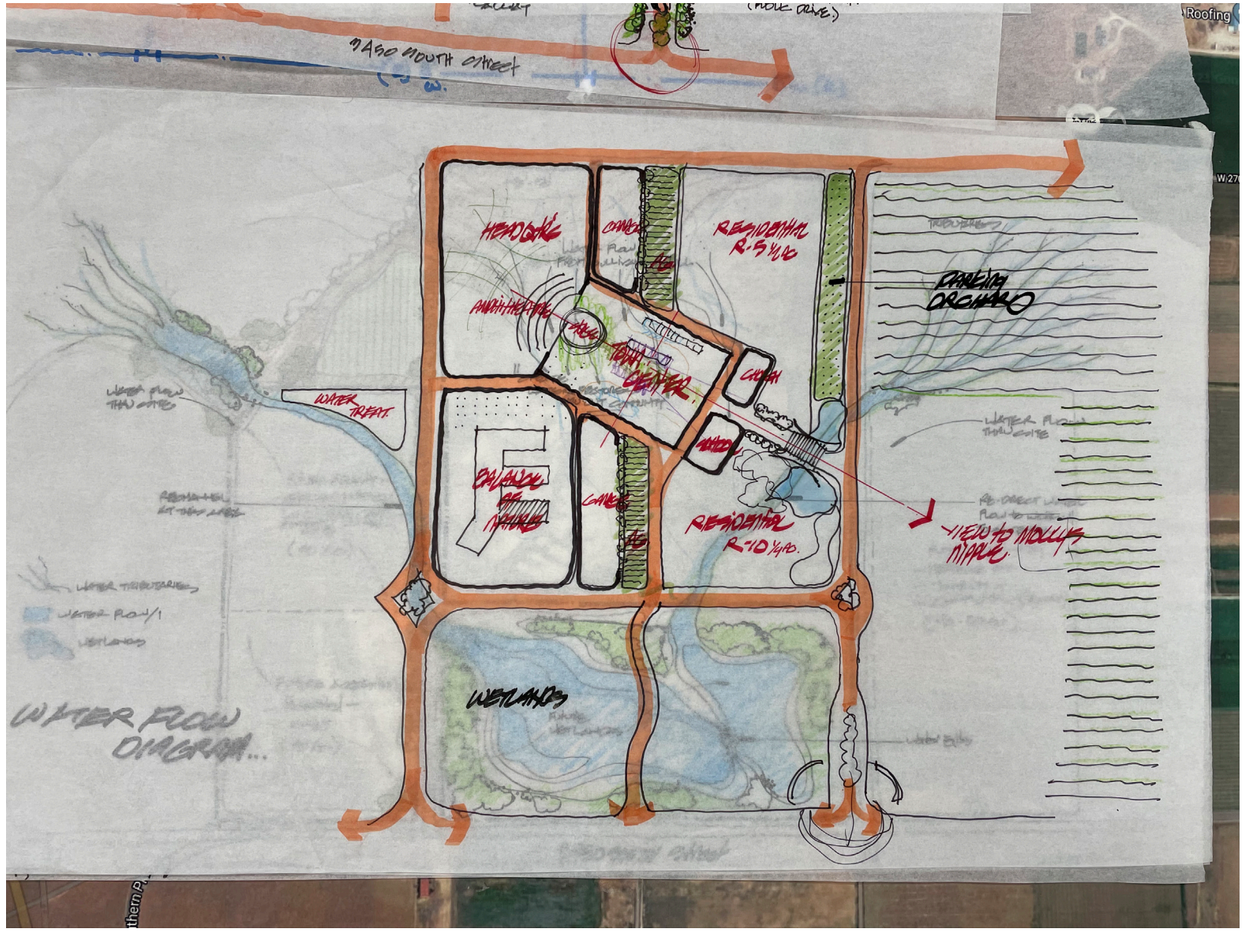
CONCEPT SKETCHES

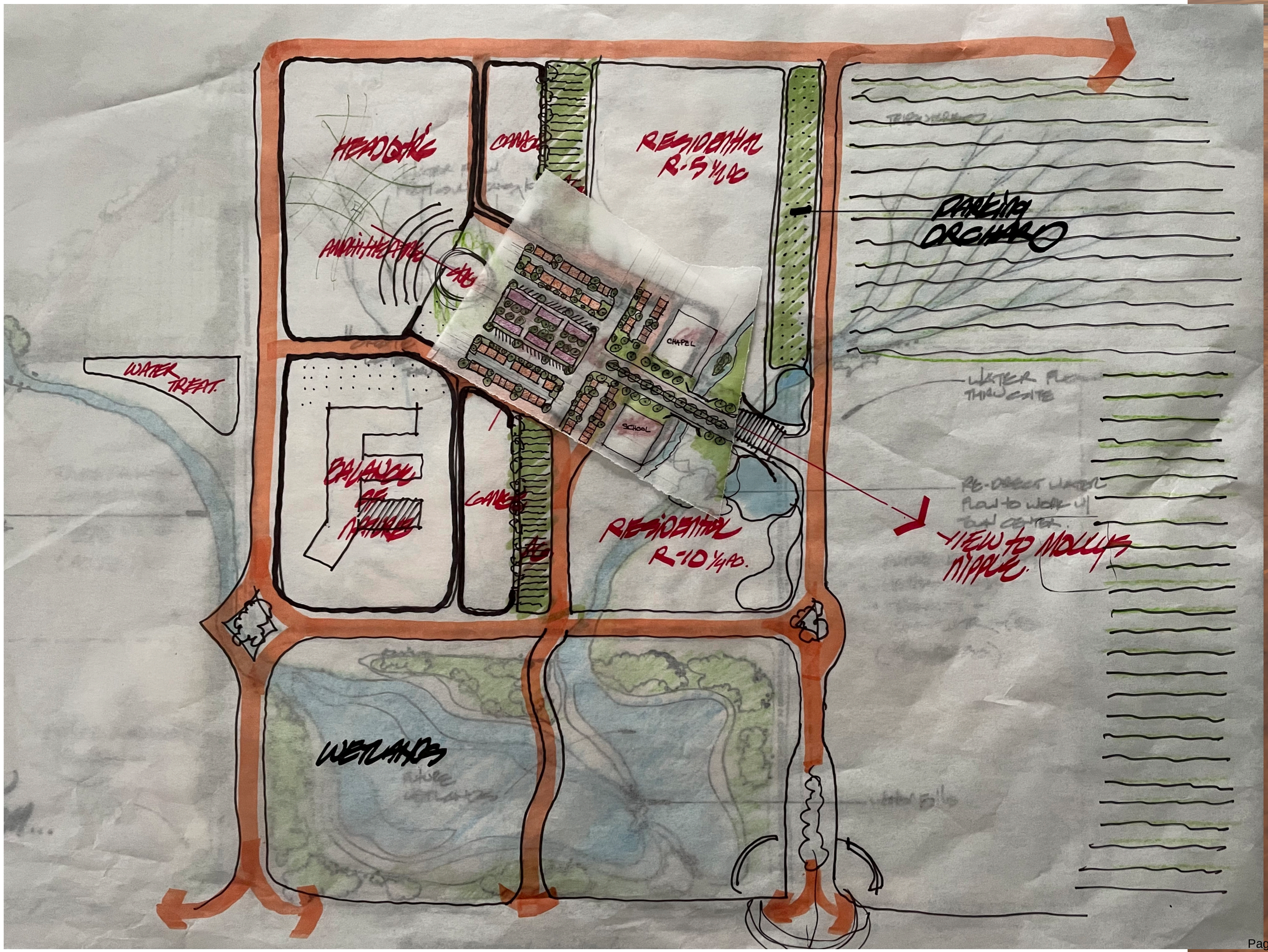



Beach Lake
Future Acquisition
- Skilled Nursing/
Long Term Care
(40 ac)
Future Acquisition
- Hospital -
units
(40 ac)
Future Acquisition
- Heritage Cir -
- Museum -
- Comm Ctr (200 ksf)
(40-80 ac)
9450 100th Street


Water Flow
Thru Center
Water Flow
From Surrounding Knoll
Create
Water Features
Thru Out Community
Tributaries
Water Flow
Thru Center
Re-Direct Water
Flow to Work Up
Town Center.
Future Wetlands
Water Falls
Water Tributaries
Water Flow
Wetlands
WATER FLOW
DIAGRAM...
9450 100th Street


(E) 8" W.
8" W. (E)
MAIN ROAD
Roadway Features (Roundabout/Focal Point)
Main Circulation Roads/ Private, 66' R.O.W.
Future circulation streets, 66' R.O.W.
CIRCULATION DIAGRAM...
WATER FLOW FROM SURROUNDING HILLS
TRIBUTARIES
WATER FLOW THRU SITE
CREATE WATER FEATURES THRU OUT COMMUNITY
RESIDENTIAL AT THIS LEVEL
TRACK RD ACCESS ROAD.
RE-DIRECT WATER FLOW TO WORK-UP TOWN CENTER.
ENTRY FEATURE
CREEK CROSSING
FUTURE ROUNDABOUT
MAIN ENTRY
MAIN RELOCATED TO ROUNDABOUT POINT. (MOLLY DRIVE)
FUTURE RESIDENTIAL
MAIN STREET
Southern P


MAIN STREET
(E) W.
Roofing
HEADGATE
CANAL
RESIDENTIAL R-5 1/2
AMPHITHEATRE
PARK
TOWN CENTER
CANAL
WATER TREAT
EXISTING ORCHARD
RESIDENTIAL R-10 1/2
VIEW TO MOLLYS PEAK
WATER TRIBUTARIES
WATER FLOW
WETLANDS
WATER FLOW DIAGRAM...
WETLANDS
Southern P


HEADQTRS
RESIDENTIAL R-5 1/2 AC
PARKING ORCHARD
WATER TREAT.
CHAPEL
SCHOOL
BALANCE OF CHURCH
RESIDENTIAL R-10 1/2 AC.
WETLANDS
VIEW TO MOLLUS NIPPLE.


BALANCE OF NATURE






BALANCE
pointe









orcutt | winslow

EPS GROUP

BALANCE OF NATURE

PREPARED BY;

Orcutt | Winslow

Architecture Planning Interior Design

2929 N Central Ave 11th Floor

Phoenix, AZ 85012

602.257.1764

www.owp.com

DEVELOPMENT AGREEMENT
FOR
BALANCE POINT PDO ZONE CHANGE AMENDMENT

THIS DEVELOPMENT AGREEMENT ("Agreement") is made and entered into as of the _____ day of _____, 2021~~1~~2 (the "Effective Date"), by and between the CITY OF HURRICANE, a Utah municipal corporation, hereinafter referred to as "City," and Molly's View LLC, a Utah limited liability company, hereinafter referred to as "Developer." The City and Developer are hereinafter collectively referred to as "Parties."

RECITALS

A. Developer is the owner of approximately 160 acres of land located within the City of Hurricane as is more particularly described on EXHIBIT A, attached hereto and incorporated herein by reference (the "Property").

B. On November 1, 2021, the City Council approved a zone change as shown in Exhibit B with the conditions laid out in the original agreement~~within this agreement~~.

C. Developer has proposed a Preliminary Site Plan EXHIBIT C.

D. Developer, has requested to alter the zoning boundaries, increasing M-1 areas from 26.70 acres to 31.83 acres. Therefore, decreasing the R1-10 PDO area from 132.93 acres to 127.80 acres. This change is shown in EXHIBIT D.

~~C.~~E. On February 17, 2022, the City Council approved the proposed amendment to the zone boundaries with conditions laid out in this agreement.

~~D.~~F. Developer is willing to design and construct the Project in a manner that is in harmony with and intended to promote the long-range policies, goals, and objectives of the City's general plan, zoning and development regulations in order to receive the benefit of vesting for certain uses and zoning designations under the terms of this Agreement as more fully set forth below.

~~E.~~G. The City Council accepted Developer's proffer to enter into this Agreement to memorialize the intent of Developer and City and decreed that the effective date of the Vesting for the zoning be the date of the execution and delivery of this Agreement and the recording thereof as a public record on title of the Property in the office of the Washington County Recorder.

~~F.~~H. The City Council further authorized the Mayor of the City to execute and deliver this Agreement on behalf of the City.

~~G.~~I. The City has the authority to enter into this Agreement pursuant to Utah Code Section 10-9a-102(2) and relevant municipal ordinances, and desires to enter into this Agreement with the Developer for the purpose of guiding the development of the Property in accordance with the terms and conditions of this Agreement and in accordance with applicable City Ordinances.

~~H.~~J. This Agreement is generally consistent with, and all preliminary and final plats within the Property are subject to and shall conform with, the City's General Plan, Zoning Ordinances, and Subdivision Ordinances, and any permits issued by the City pursuant to City Ordinances and regulations.

~~I.~~K. The Parties desire to enter into this Agreement to specify the rights and responsibilities of the Developer to develop the Property as expressed in this Agreement and the rights and responsibilities of the City to allow and regulate such development pursuant to the requirements of this Agreement.

~~J.~~L. The Parties understand and intend that this Agreement is a "development agreement" within the meaning of, and entered into pursuant to, the terms of Utah Code Ann., §10-9a-102.

~~K.~~M. The Parties intend to be bound by the terms of this Agreement as set forth herein.

AGREEMENT

NOW, THEREFORE, in consideration of the mutual covenants contained herein, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the City and the Developer hereby agree as follows:

1. Incorporation of Recitals. The foregoing Recitals are hereby incorporated into this Agreement, as a substantive part hereof.

2. Zoning. The Property shall be developed in accordance with (i) the requirements of an underlying zone of shown on EXHIBIT D~~B~~, (ii) all other features as generally shown on the Preliminary Site Plan, and (iii) this Agreement. The Developer shall not seek to develop the Property in a manner that deviates materially from the attached Preliminary Site Plan in EXHIBIT C as permitted by the aforementioned zoning designations for the Property. Except as otherwise approved in writing by City.

3. Governing Standards. The Preliminary Site Plan, the record of the City Council meeting, and this Agreement (together the "Approval Documents") establish the development rights for the Project, including the use, maximum density, intensity and general configuration for the Project. The Project shall be developed by the Developer in accordance with the Approval Documents. All Developer submittals must comply generally with the Approval Documents. Non-material variations to the Preliminary Site Plan, as defined and approved by the City's Zoning Administrator, such as exact building locations, location of local roadways, exact locations of open space and parking may be varied by the Developer without official City Council or Planning Commission approval. Such variations however shall in no way change the maximum density, use and intensity of the development of the Project.

4. Additional Specific Developer Obligations. As an integral part of the consideration for this agreement, the Developer voluntarily agrees as follows:

a. Guaranteed Density and Uses. City specifically acknowledges that at build-out Developer shall be entitled to a total overall density of 325 ERUs, including recreation resort units within the Project. That density equals approximately 2.542.32 residential units to the acre. Further, the parties acknowledge that actual densities on certain acreage will exceed 2.5432 units per acre because several acres of the Property will be (a) set aside as open space, and (b) larger lots. The Developer shall provide a table on the preliminary plat with each phase of development the total number of ERUs that have been approved for the total project.

5. Construction Standards and Requirements. All construction on the Property at the direction of the Developer shall be conducted and completed in accordance with the City Ordinances and Design Standards, including, but not limited to infrastructure construction, setback requirements, minimum lot sizes, building height requirements, lot coverage requirements and all other zoning requirements.

a. Owner/Developer understands, acknowledges and specifically agrees that: (a) power, water, and other utility services to the Property are not currently available and have not been extended to the Property, (b) the granting of this zone change does not in any way guarantee or warrant the availability and extension of power and water utility services to the Property, (c) no application for any permit requiring the availability and extension of power or water service, and no other request requiring the availability and extension of power and water services, shall be filed or made until such time that such services are available and have been extended to the Property, and (d) Owner/Developer assumes all risk and liability associated with any development activity on the Property, including but not limited to all costs incurred for engineering, feasibility studies, etc., in the event that such services do not become available and are not extended to the Property.

b. Adequate Public Facilities. The City may deny any land use application for any development on the property, including but not limited to preliminary plats, building permits, zone changes, and preliminary site plans by finding that utilities and roadways are 1) inadequate to support the proposed development or 2) services are not in the vicinity of the proposed application. The City may consider approval of a project if the applicant can show that current utility and roadway systems are adequate to meet the demand for the project and the applicant can provide a plan on how to reasonably connect utilities and roadways to the proposed development.

c. Acceptance of Improvements. The City shall accept all improvements which are intended for public use and which have been constructed by Developer or its agents in accordance with the City's standards and as shown on the approved construction drawings. Prior to the construction of any road, utility, or public improvements within the Project, the City shall review proposed construction drawings and require adjustments or changes to meet the requirements of this Agreement and applicable City standards. The City shall cooperate and allow

Developer to construct the Offsite Improvements, and the City shall accept Developer's dedication of the Offsite Improvements. The City shall only accept improvements once improvements have been installed, inspected by the City or its representative, and a warrantee bond has been provided by Developer.

d. Unless otherwise specifically approved by the City Council and clearly labeled on the final subdivision plat, all roads within the Project shall be public roads. Upon final acceptance of such roads as having been constructed in conformity with all approved plans and City standards, City shall be responsible for maintenance of the roads at the same level of maintenance applicable to other similar roads within the City. City shall not be responsible for maintenance of any private road within the Project.

e. Drainage Plan. The applicant shall submit a full drainage plan for the site with the first phase of the development. This drainage plan shall provide plans for proper retention or detention for runoff generated by the development, together with a plan to mitigate impacts from regional historic stormwater runoff onto and through the property in EXHIBT DA according to Hurricane City stormwater standards. These facilities plans shall be reviewed and approved by the City Engineer.

6. Reimbursement for Improvements. Developer and Hurricane City may enter into an agreement whereby the developer is reimbursed by the City for the cost of constructing eligible public facilities. All reimbursement agreements shall comply with Hurricane City Code 9-6.

7. Vested Rights and Reserved Legislative Powers.

a. Vested Rights. As of the Effective Date, Developer shall have the vested right to develop and construct the Project in accordance with the uses, maximum permissible densities, intensities, and general configuration of development established in the Approval Documents, subject to compliance with the City Ordinances in existence on the Effective Date. The Parties intend that the rights granted to Developer under this Agreement are contractual and also those rights that exist under statute, common law and at equity. The Parties specifically intend that this Agreement grants to Developer "vested rights" as that term is construed in Utah's common law and pursuant to Utah Code Ann., §10-9a-509.

i. Examples of Exceptions to Vested Rights. Notwithstanding the foregoing, the Parties understand and agree that the Project will be required to comply with future changes to City Laws that do not limit or interfere with the vested rights granted pursuant to the terms of this Agreement. The following are examples for illustrative purposes of a non-exhaustive list of the type of future laws that may be enacted by the City that would be applicable to the Project:

1. Developer Agreement. Future laws that Developer agrees in writing to the application thereof to the Project;

2. Compliance with State and Federal Laws. Future laws which are generally applicable to all properties in the City and which are required to comply with State and Federal laws and regulations affecting the Project;

3. Safety Code Updates. Future laws that are updates or amendments to existing building, plumbing, mechanical, electrical, dangerous buildings, drainage, or similar construction or safety related codes, such as the International Building Code, the APWA Specifications, AAHSTO Standards, the Manual of Uniform Traffic Control Devices or similar standards that are generated by a nationally or statewide recognized construction/safety organization, or by the State or Federal governments and are required to meet legitimate concerns related to public health, safety or welfare; or,

4. Taxes. Taxes, or modifications thereto, so long as such taxes are lawfully imposed and charged uniformly by the City to all properties, applications, persons and entities similarly situated.

5. Fees. Changes to the amounts of fees for the processing of Development Applications that are generally applicable to all development within the City (or a portion of the City as specified in the lawfully adopted fee schedule) and which are adopted pursuant to State law.

6. Impact Fees. Impact Fees or modifications thereto which are lawfully adopted, imposed and collected.

a. Reserved Legislative Powers. The Developer acknowledges that the City is restricted in its authority to limit its police power by contract and that the limitations, reservations and exceptions set forth herein are intended to reserve to the City all of its police power that cannot be so limited. Notwithstanding the retained power of the City to enact such legislation of the police powers, such legislation shall not modify the Developer's vested right as set forth herein unless facts and circumstances are present which meet the exceptions to the vested rights doctrine as set forth in Section 10-9a-509 of the Municipal Land Use, Development, and Management Act, as adopted on the Effective Date, *Western Land Equities, Inc. v. City of Logan*, 617 P.2d 388 (Utah 1980), its progeny, or any other exception to the doctrine of vested rights recognized under state or federal law. Notwithstanding the foregoing, the City reserves the right to enact an ordinance in accordance with Utah Code Ann. §10-9a-504 establishing a temporary land use regulation for any

part or all of the area within the municipality, including area within the Project, which prohibits or regulates issuance of any building permit or the erection, construction, reconstruction or alteration of any building or structure or any subdivision approval if the City Council makes a finding of compelling countervailing public interest in accordance with Utah and federal law after notice to Developer and an opportunity to be heard.

8. Default. An "Event of Default" shall occur under this Agreement if any party fails to perform its obligations hereunder when due and the defaulting party has not performed the delinquent obligations within sixty (60) days following delivery to the delinquent party of written notice of such delinquency. Notwithstanding the foregoing, if the default cannot reasonably be cured within that 60-day period, a party shall not be in default so long as that party commences to cure the default within that 60-day period and diligently continues such cure in good faith until complete.

9. Default and Remedies. Failure of a party to perform any of the Party's obligations under this Agreement within a thirty (30) day period (the "**Cure Period**") after written notice thereof from the other party shall constitute a default ("**Default**") by such failing party under this Agreement; provided, however, that if the failure cannot reasonably be cured within thirty (30) days, the Cure Period shall be extended for the time period reasonably required to cure such failure so long as the failing party commences its efforts to cure within the initial thirty (30) day period and thereafter diligently proceeds to complete the cure. Such notice shall specify the nature of the alleged Default and the manner in which such Default may be satisfactorily cured, if possible. If the Default is cured, then no Default shall exist and the noticing Party shall take no further action.

a. In the event of an uncured Default, the non-defaulting party shall, in addition to any other remedy allowed by law, be entitled to the court's imposition of specific performance and /or injunctive relief, but not monetary damages. All rights and remedies under this Agreement, and /or statute or common law shall be deemed cumulative and the selection of one of the rights or remedies shall not be deemed a waiver of any other right or remedy.

b. If City elects to consider terminating this Agreement due to a Default by Developer, then City shall give to Developer written notice of City's intent to terminate this Agreement and the matter shall be scheduled for consideration and review by City's legislative body at a duly noticed public meeting. Developer shall have the right to offer written and oral evidence prior to or at the time of said public meeting. If City's legislative body determines that a material uncured Default has occurred and is continuing, City may thereafter pursue the remedy of termination through an appropriate judicial proceeding.

10. Specific Acts of Default. The Parties hereto agree that any of the following occurrences, acts or failure to act shall constitute a Default by Developer, for which City may elect to terminate the agreement in accordance with Section 8 above: (a) the filing of a petition in bankruptcy by Developer, (b) foreclosure on any portion of the Property which has the effect of creating an unapproved or illegal subdivision under Utah law or

City ordinances, (c) the Developer's failure to comply with the requirements of any Section above, or (d) Developer's failure, without good cause as determined in good faith by City, for a period of five (5) years to commence construction of improvements in any new development phase or new Development Parcel. Upon such termination, all approvals or development rights granted hereunder to Developer shall lapse and all obligations of City hereunder shall cease.

11. Notices. Any notices, requests and demands required or desired to be given hereunder shall be in writing and shall be served personally upon the party for whom intended, or if mailed, by certified mail, return receipt requested, postage prepaid, to such party at its address shown below:

To the Developer:

To the City: City of Hurricane
Attention: Fay Reber, City Attorney
68 S. 700 W.
Hurricane, UT 84737

12. General Term and Conditions.

a. Headings. The headings contained in this Agreement are intended for convenience only and are in no way to be used to construe or limit the text herein.

b. Binding Effect. This Agreement shall inure to the benefit of, and be binding upon, the parties hereto and their respective heirs, representatives, officers, agents, employees, members, successors and assigns (to the extent that assignment is permitted). Without limiting the generality of the foregoing, a "successor" includes a party that succeeds to the rights and interests of the Developer as evidenced by, among other things, such party's submission of land use applications to the City relating to the Property or the Project.

c. Non Liability of City Officials and Employees. No officer, representative, consultant, attorney, agent or employee of the City shall be personally liable to the Developer, or any successor in interest or assignee of the Developer, for any default or breach by the City, or for any amount which may become due to the Developer, or its successors or assignees, or for any obligation arising under the terms of this Agreement. Nothing herein will release any person from personal liability for their own individual acts or omissions.

d. Third Party Rights. Except for the Developer, the City and other parties that may succeed the Developer on title to any portion of the Property, all of whom are express intended beneficiaries of this Agreement, this Agreement shall not create any rights in and/or obligations to any other persons or parties. The Parties acknowledge that this Agreement refers to a private development and that the City has no interest in,

responsibility for, or duty to any third parties concerning any improvements to the Property unless the City has accepted the dedication of such improvements

e. Further Documentation. This Agreement is entered into by the Parties with the recognition and anticipation that subsequent agreements, plans, profiles, engineering and other documentation implementing and carrying out the provisions of this Agreement may be necessary. The Parties agree to negotiate and act in good faith with respect to all such future items.

f. Relationship of Parties. This Agreement does not create any joint venture, partnership, undertaking, business arrangement or fiduciary relationship between the City and the Developer.

g. Agreement to Run With the Land. This Agreement shall be recorded in the Office of the Washington County Recorder against the Property and is intended to and shall be deemed to run with the land, and shall be binding on and shall benefit all successors in the ownership of any portion of the Property.

h. Performance. Each party, person and/or entity governed by this Agreement shall perform its respective obligations under this Agreement in a manner that will not unreasonably or materially delay, disrupt or inconvenience any other party, person and/or entity governed by this Agreement, the development of any portion of the Property or the issuance of final plats, certificates of occupancy or other approvals associated therewith.

i. Applicable Law. This Agreement is entered into under and pursuant to, and is to be construed and enforceable in accordance with, the laws of the State of Utah.

j. Construction. This Agreement has been reviewed and revised by legal counsel for both the City and the Developer, and no presumption or rule that ambiguities shall be construed against the drafting party shall apply to the interpretation or enforcement of this Agreement.

k. Consents and Approvals. Except as expressly stated in this Agreement, the consent, approval, permit, license or other authorization of any party under this Agreement shall be given in a prompt and timely manner and shall not be unreasonably withheld, conditioned or delayed. Any consent, approval, permit, license or other authorization required hereunder from the City shall be given or withheld by the City in compliance with this Agreement and the City Ordinances.

l. Approval and Authority to Execute. Each of the Parties represents and warrants as of the Effective Date this Agreement, it/he/she has all requisite power and authority to execute and deliver this Agreement, being fully authorized so to do and that this Agreement constitutes a valid and binding agreement.

m. Termination.

i. Notwithstanding anything in this Agreement to the contrary, it is agreed by the parties hereto that in the event the final plat for the Property has not been recorded in the Office of the Washington County Recorder within five (5) years from the date of this Agreement (the "Term"), or upon the occurrence of an event of default of this Agreement that is not cured, the City shall have the right, but not the obligation, at the sole discretion of the City Council, to terminate this Agreement as to the defaulting party (*i.e.*, the Developer). The Term may be extended by mutual agreement of the Parties.

ii. Upon termination of this Agreement for the reasons set forth herein, following the notice and process required hereby, the obligations of the City and the defaulting party to each other hereunder shall terminate, but none of the licenses, building permits, or certificates of occupancy granted prior to expiration of the Term or termination of this Agreement shall be rescinded or limited in any manner.

13. Assignability. The rights and responsibilities of Developer under this Agreement may be assigned in whole or in part by Developer with the consent of the City as provided herein.

a. Notice. Developer shall give Notice to the City of any proposed assignment and provide such information regarding the proposed assignee that the City may reasonably request in making the evaluation permitted under this Section. Such Notice shall include providing the City with all necessary contact information for the proposed assignee.

b. Partial Assignment. If any proposed assignment is for less than all of Developer's rights and responsibilities, then the assignee shall be responsible for the performance of each of the obligations contained in this Agreement to which the assignee succeeds. Upon any such approved partial assignment, Developer shall be released from any future obligations as to those obligations which are assigned but shall remain responsible for the performance of any obligations that were not assigned.

c. Grounds for Denying Assignment. The City may only withhold its consent if the City is not reasonably satisfied of the assignee's reasonable financial ability to perform the obligations of Developer proposed to be assigned.

d. Assignee Bound by this Agreement. Any assignee shall consent in writing to be bound by the assigned terms and conditions of this Agreement as a condition precedent to the effectiveness of the assignment.

14. Sale or Conveyance. If Developer sells or conveys parcels of land, the lands so sold and conveyed shall bear the same rights, privileges, intended uses, configurations, and density as applicable to such parcel and be subject to the same limitations and rights of the City as when owned by Developer and as set forth in this Agreement without any required approval, review, or consent by the City except as otherwise provided herein.

15. No Waiver. Any party's failure to enforce any provision of this Agreement shall not constitute a waiver of the right to enforce such provision. The provisions may be waived only in writing by the party intended to be benefited by the provisions, and a waiver by a party of a breach hereunder by the other party shall not be construed as a waiver of any succeeding breach of the same or other provisions.

16. Severability. If any portion of this Agreement is held to be unenforceable for any reason, the remaining provisions shall continue in full force and effect.

17. Force Majeure. Any prevention, delay or stoppage of the performance of any obligation under this Agreement which is due to strikes, labor disputes, inability to obtain labor, materials, equipment or reasonable substitutes therefore; acts of nature; governmental restrictions, regulations or controls; judicial orders; enemy or hostile government actions; wars, civil commotions; fires or other casualties or other causes beyond the reasonable control of the party obligated to perform hereunder shall excuse performance of the obligation by that party for a period equal to the duration of that prevention, delay or stoppage.

18. Amendment. This Agreement may be amended only in writing signed by the Parties hereto.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement by and through their respective, duly authorized representatives as of the day and year first hereinabove written.

CITY:

CITY OF HURRICANE

ATTEST:

By: _____
City Recorder

By:_____
Mayor

DEVELOPER:

By: _____
Name:
Title: _____

STATE OF UTAH)
:ss
COUNTY OF UTAH)

On the ____ day of _____, 202_, personally appeared before me _____, who being by me duly sworn, did say that he is the _____ of_____, a Utah limited liability company, and that the within and foregoing instrument was signed on behalf of said limited liability company with proper authority and duly acknowledged to me that he executed the same.

_____
Notary Public
Residing at:

EXHIBIT A

Legal Description Parcel:

EXHIBIT B
Zoning Amendment

EXHIBIT C
Site Plan

PRELIMINARY PLAT APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $150.00

For Office Use Only:
File No. 2022-PP-04
Receipt No. 8.154843

Name: Western MTG & Realty Co. **Telephone:** _____

Address: 6610 W Court St. Pasco, WA 99302 **Fax No.** _____

Email: tippett@westernmort.com **Agent Email:** enhancedhomesofutah@gmail.com

Agent (If Applicable): Brent Moser **Telephone:** 801-793-0346

Address/Location of Subject Property: Sand Hollow Rd.

Tax ID of Subject Property: See Attached **Zone District:** See Attached

Proposed Use: (Describe, use extra sheet if necessary. Include total number of lots) _____

Submittal Requirements: The preliminary plat application shall provide the following:

_____1. Description: In a title block located in the lower right-hand corner of the sheet the following is required:
- ✓ a. The proposed name of the subdivision.
- ✓ b. The location of the subdivision, including the address and section, township and range.
- ✓ c. The names and addresses of the owner or subdivider, if other than the owner.
- ✓ d. Date of preparation, and north point.
- ✓ e. Scale shall be of sufficient size to adequately describe in legible form, all required conditions of Chapter 39, City Subdivision regulations.

_____2. Existing Conditions: The preliminary plat shall show:
- _____ a. The location of the nearest monument.
- ✓ b. The boundary of the proposed subdivision and the acreage included.
- ✓ c. All property under the control of the subdivider, even though only a portion is being subdivided. (Where the plat submitted covers only a part of the subdivider's tract, a sketch of the prospective street system of the unplatted parts of the subdivider's land shall be submitted, and the street system of the part submitted shall be considered in light of existing Master Street Plan or other Commission studies.)
- ✓ d. The location, width and names/numbers of all existing streets within two hundred (200) feet of the subdivision and of all prior streets or other public ways, utility rights of way, parks and other public open spaces, within and adjacent to the tract.
- ✓ e. The location of all wells and springs or seeps, proposed, active and abandoned, and of all reservoirs or ponds within the tract and at a distance of at least one hundred feet (100') beyond the tract boundaries.
- _____ f. Existing sewers, water mains, culverts or other underground facilities within the tract, indicating the pipe sizes, grades, manholes and the exact locations.

✓ g. Existing Hurricane Canal Company facilities; other ditches, canals, natural drainage channels and open waterways and any proposed realignments.

✓ h. Contours at vertical intervals not greater than five (5) feet.

✓ i. Identification of potential geotechnical constraints on the project site (such as expansive rock and soil, collapsible soil, shallow bedrock and caliche, gypsiferous rock and soil, potentially unstable rock or soil units including fault lines, shallow groundwater, and windblown sand) and recommendations for their mitigation.

✓ j. Information on whether property is located in desert tortoise take area

_____3. Proposed Plan: The subdivision plans shall show:

✓ a. The layout of streets, showing location, widths, and other dimensions of proposed streets, crosswalks, alleys and easements.

✓ b. The layout, numbers and typical dimensions of lots.

✓ c. Parcels of land intended to be dedicated or temporarily reserved for public use or set aside for use of property owners in the subdivision.

_____ d. Easements for water, sewers, drainage, utilities, lines and other purposes.

✓ e. Typical street cross sections and street grades where required by the Planning Commission. (All street grades over 5% should be noted on the preliminary plat)

✓ f. A tentative plan or method by which the subdivider proposes to handle the storm water drainage for the subdivision.

✓ g. Approximate radius of all center line curves on highways or streets.

N/A h. Each lot shall abut a street shown on the subdivision plat or on an existing publicly-dedicated street. (Double frontage or flag lots shall be prohibited except where conditions make other design undesirable)

N/A i. In general, all remnants of lots below minimum size left over after subdividing of a larger tract must be added to adjacent lots, rather than allow to remain as unusable parcels.

N/A j. Where necessary, copies of any agreements with adjacent property owners relevant to the proposed subdivision shall be presented to the Planning Commission.

_____ k. A letter from both the local sanitary sewer provider and culinary water provider indicating availability of service.

NO l. Will this subdivision be phased? If yes show possible phasing lines.

✓ m. A tentative plan or method for providing non-discriminatory access to the subdivision for purposes of placement of communications infrastructure, and for purposes of placement of utility infrastructure.

_____4. Required copies of plans:

✓ a. Three copies of all full scale drawings

✓ b. One copy of each drawing on a 11 x 17 inch sheets. (8 ½ x 11 is acceptable if the project is small and the plans are readable at that size).

5. Warranty deed or preliminary title report or other document (see attached Affidavit) showing evidence that the applicant has control of the property

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. A deadline missed due to an incomplete application, could result in a month's delay. Planning Commission meetings are held on the second Thursday and fourth Wednesday of each month at 6:00 p.m. The deadline to submit an application to be placed on an agenda is no later than <u>12:00 noon</u> 10 full business days before the Planning Commission meeting at which you plan for your application to be heard.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete:_____ Completion determination made by: _____

PURPOSE

The preliminary plat application is the first step in land development process in those instances where land is divided for eventual sale. The process is established to insure that all proposed divisions of land conform to the City General Plan and to adopted development standards of the Land Use Ordinance.

WHEN REQUIRED

The preliminary plat is required any time land is to be divided, re-subdivided or proposed to be divided into two (2) or more lots, parcels, sites, units, plots or other division of land for the purpose, whether immediate or future, for offer, sale, lease or development either on installment plan or upon any and all other plans, terms and conditions. It is not required on agricultural divisions where the agricultural parcel is divided to be combined with another agricultural parcel, nor is it required when two un-subdivided properties are merged, or where the boundary between two un-subdivided properties are adjusted.

The preliminary plat must be approved before a final plat can be processed and recorded.

Subdivision approval process:

- Determine current zoning for property.
- If zoning fits desired subdivision, meet with Planning staff to discussed the proposed project.
- Obtain a preliminary plat application form and complete the application and have a plat prepared by an engineer to meet the requirements on the preliminary plat application.
- Submit completed application, preliminary plat, and required $150 fee to Planning Department before noon on the Wednesday two weeks before desired Planning Commission meeting. (see submittal dates sheet)
- Appear at the scheduled Planning Commission meeting to discuss preliminary plat, hear comments, answer questions, and receive recommendation of approval or disapproval from Planning Commission.
- Appear at the next scheduled City Council meeting that occurs after the Planning Commission meeting at which a recommendation was received. Hear City Council comments, answer questions, and receive City Council decision. City Council can approve the plat with conditions, recommend changes and send it back to the Planning Commission, or deny the plat.

If the preliminary plat is approved, have construction drawings for utilities and streets prepared by an engineer according to Hurricane City standards. Construction drawings must be approved by both the Hurricane Joint Utilities Committee and the Ash Creek Special Service District. Approval means changes are made and all required signatures are obtained.

Once the preliminary plat is approved by the City Council, the applicant has one year after receiving approval of the preliminary plat to submit the final plat to the Planning Commission for action. The Planning Commission may authorize a one-year time extension, provided the extension request is made before the one year time limit is reached. The Planning Commission will review and make recommendation to the City Council on the final plat when submitted. The City Council will typically review the Planning Commission recommendation within 1-2 weeks after the Commission action on the final plat.

APPEALS

The Planning Commission makes a recommendation to the City Council, so there is no appeal. The City Council's action on a preliminary plat is final unless appealed to the appropriate court.

AFFIDAVIT
PROPERTY OWNER

STATE OF UTAH)
:ss
COUNTY OF Washington

I (we), Western Mortgage + Realty Company, being duly sworn, depose and say that I (we) am (are) the owner(s) of the property identified in the attached application and that the statements herein contained and the information provided identified in the attached plans and other exhibits are in all respects true and correct to the best of my (our) knowledge. I (we) also acknowledge that I have received written instructions regarding the process for which I am applying and the Hurricane City Planning staff have indicated they are available to assist me in making this application.

Western Mortgage + Realty Co.
(Property Owner)

Vice President
(Property Owner)

Subscribed and sworn to me this 13th day of May 2024.

(Notary Public)

ASHLEY BLACKNER
NOTARY PUBLIC
STATE OF UTAH
MY COMM. EXPIRES MAY. 07, 2024
711906

Residing in: Hurricane, UT

My Commission Expires: 5/7/2024

Agent Authorization

I (we), _____, the owner(s) of the real property described in the attached application, do authorize as my (our) agent(s) _____ to represent me (us) regarding the attached application and to appear on my (our) behalf before any administrative or legislative body in the City considering this application and to act in all respects as our agent in matters pertaining to the attached application.

_____
(Property Owner)

_____
(Property Owner)

Subscribed and sworn to me this _____ day of _____ 20___.

_____
(Notary Public)

Residing in: _____

My Commission Expires: _____

AFFIDAVIT
PROPERTY OWNER

STATE OF UTAH)
:ss
COUNTY OF)

I (we), B Taylor Richards, being duly sworn, depose and say that I (we) am (are) the owner(s) of the property identified in the attached application and that the statements herein contained and the information provided identified in the attached plans and other exhibits are in all respects true and correct to the best of my (our) knowledge. I (we) also acknowledge that I have received written instructions regarding the process for which I am applying and the Hurricane City Planning staff have indicated they are available to assist me in making this application.

B. Taylor Richards
(Property Owner)

(Property Owner)

Subscribed and sworn to me this 27 day of July 2022

(Notary Public)

ILENE H. HILL
NOTARY PUBLIC- STATE OF UTAH
COMMISSION# 719356
COMM. EXP. 07-28-2025

Residing in: Salt Lake

My Commission Expires: 7/28/25

Agent Authorization

I (we), _____, the owner(s) of the real property described in the attached application, do authorize as my (our) agent(s) _____ to represent me (us) regarding the attached application and to appear on my (our) behalf before any administrative or legislative body in the City considering this application and to act in all respects as our agent in matters pertaining to the attached application.

_____
(Property Owner)

_____
(Property Owner)

Subscribed and sworn to me this _____ day of _____ 20___.

_____
(Notary Public)

Residing in: _____

My Commission Expires: _____

PLANNING & ZONING
HURRICANE CITY
UTAH

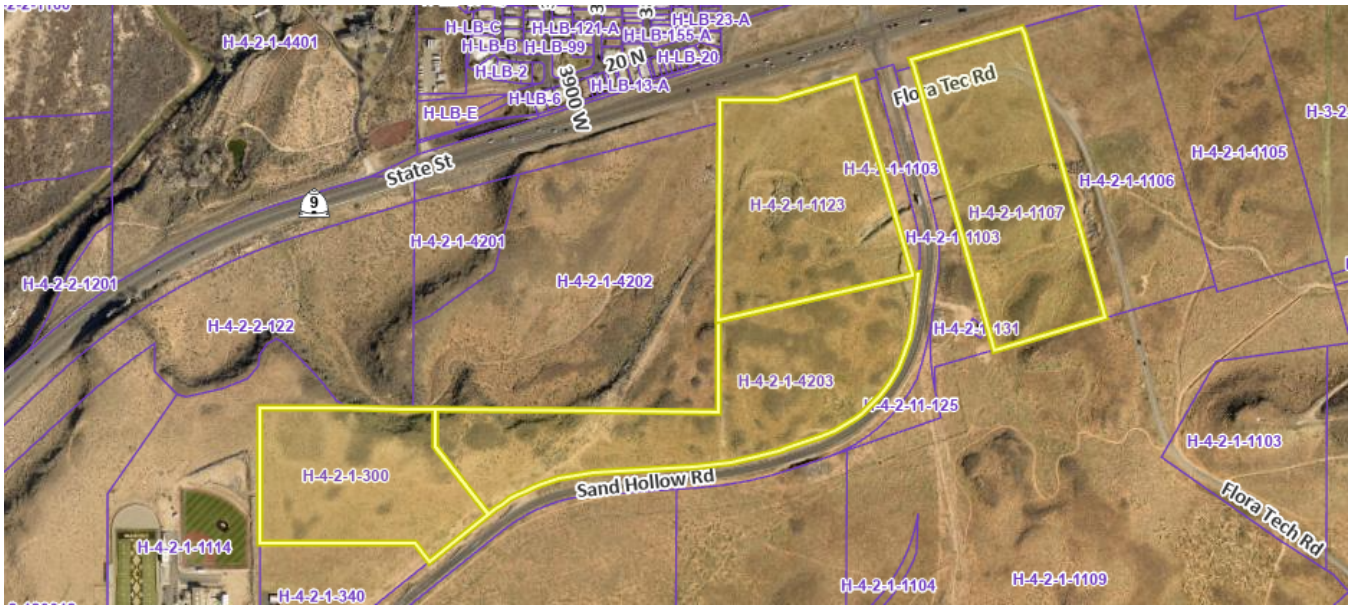
STAFF COMMENTS

Agenda Date:	**02/17/2022**
Application Number:	2022-PP-04
Type of Application:	Preliminary Plat Application
Action Type:	Administrative
Applicant:	Western MTG & Realty Co
Agent:	Brent Moser
Request:	Approval of a Preliminary Plat
Location:	Between SR-9 and Sand Hollow Road
Zoning:	HC and GC
General Plan Map:	General Commercial

Planning Commission Recommendation
The Planning Commission gave a positive recommendation based on staff and JUC comments.

Update 2/10/2022
The affidavit from the other property owner within this proposed subdivision has been provided by the applicant. Staff would recommend approval of this preliminary plat subject to staff and JUC comments and sufficient buildout of the Sand Hollow Gateway PID.

Discussion:
The applicant has filed a preliminary plat for the Gateway at Sand Hollow Commercial District. This area is currently proposed as six commercial lots all fronting Sand Hollow Road. A preliminary site plan for part of the property was approved in December and now the applicant is going to subdivide the property. This project will be highly dependent on utilities and road connections from the Gateway at Sand Hollow PID.



Map is approximate.

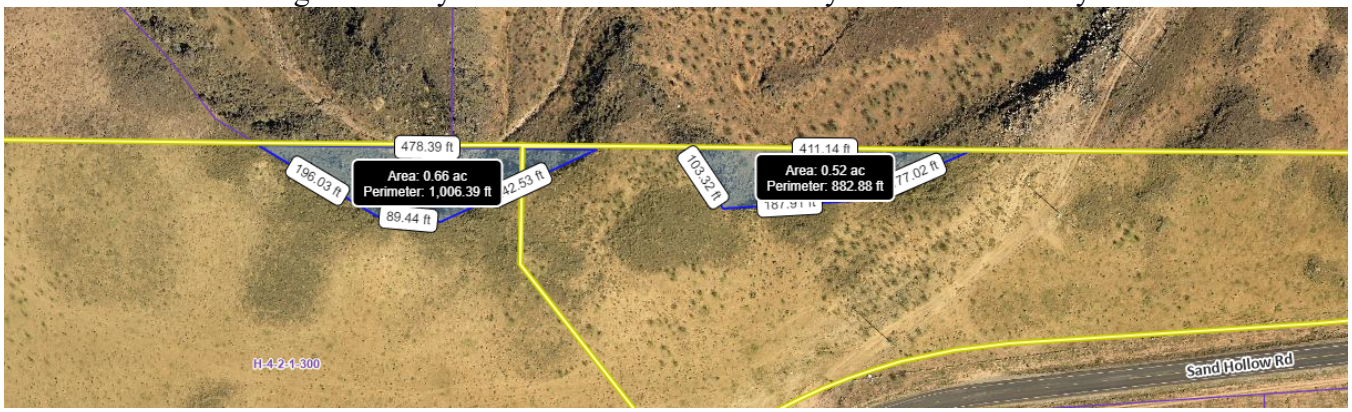
JUC Comments
The following items will need to be addressed:

1. **Power:** This area borders the line between Hurricane City Power and Dixie Power so both entities will have to work together. Overhead power lines are in the area. Will need a survey
2. **Sewer:** Need to build out a lot of sewer based on current PID sewer drawings prior to development.
3. **Street:** No comments
4. **Water:** Served off the Dixie Springs tank. Whole system will need a water loop for fire protection at least, likely through PID.
5. **Engineering:** Lot 3 and 4 abut property owned by UDOT. UDOT needs to be notified and review the plans.
6. **Fire:** Water needs to be there.
7. **Phone:** No comments
8. **Gas**: No comments
9. **WCWCD**: No comments

Staff Comments: Preliminary Plat

1. There is no proposed use yet for any lot except for Lot 3. Lots 5 and 6 are zoned Highway Commercial and Lots 1 through 4 are zoned General Commercial.
2. This property may be subdivided further and city staff would prefer that is indicated on the plat
3. A 10 foot setback is required for all properties bordering the UDOT owned parcel located to the north and west of this property
4. Lot 1, located on parcel H-4-2-1-300 is not owned by the applicant and the property owner has not signed off on the application. This will need to be resolved before this application can move forward.
5. Access points between Lots 1 and 2 will need to be properly spaced.

6. There are two cliffs on the property. The Sensitive Lands code states that sensitive lands are defined as:
    a. *Any area where there is a change in elevation which is equal to or greater than ten percent (10%) (1 foot of vertical grade change for every 10 feet of horizontal run) for a distance of one hundred feet (100') or more, and where said grade change covers an area of at least two (2) contiguous acres, or an entire parcel if said parcel is less than two (2) acres. (See section 10-24-9, appendix diagram A of this chapter.)*
    b. *Any area within one hundred feet (100') of the edge of a bluff. The "edge of a bluff" means an area where there is a substantial abrupt change in slope along the edge of a predominantly flat area of land. The slope of the land below the abrupt edge typically has a grade that is near or exceeds thirty percent (30%) or greater, and has a vertical elevation change of at least one hundred feet (100') or greater, and lies within sensitive lands described in subsection A of this section. (See section 10-24-9, appendix diagram B of this chapter.)*
    c. *The boundaries of all areas within one hundred (100) vertical feet of a ridgeline. A "ridgeline" means the junction of a rising steep slope on one side and a descending slope that may be gentle or steep on the opposite side. (See section 10-24-9, appendix diagram C of this chapter.)*
    d. From Washington County GIS it appears that less than 2 acres of the property are cliff face so no sensitive lands application is required. Applicant will need to keep all buildings at least 25 feet from the cliff face.
    e. The contours on the plat do not appear to fully match the contours shown on the Washington County GIS. Staff will use the county data for their analysis.

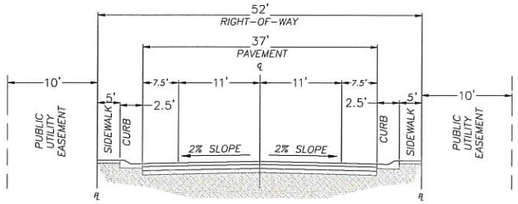


7. Utilities are not available to the property but will be with the PID buildout. Construction drawings will not be accepted for this property until PID construction drawings are approved.

Recommendation: Staff recommends the City Council review this application based on standards with Hurricane City Code. Staff recommends approval based on staff and JUC comments and sufficient build out of PID infrastructure.

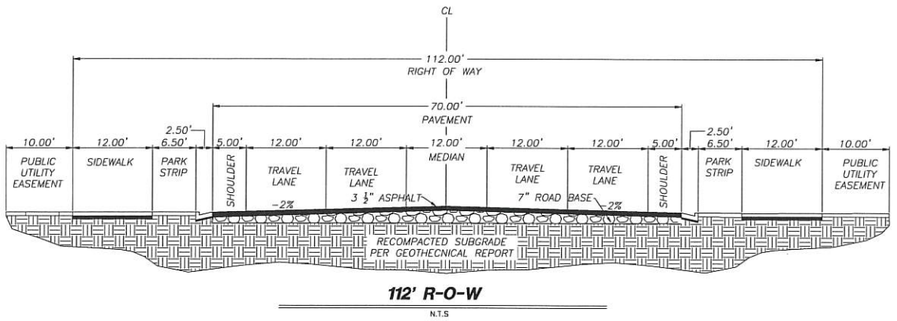
PRELIMINARY PLAT FOR:
GATEWAY COMMERCIAL AT SAND HOLLOW

LOCATED IN SECTION 1, T42S, R14W, S.L.B.&M.
HURRICANE, WASHINGTON COUNTY, UTAH



52' R-O-W

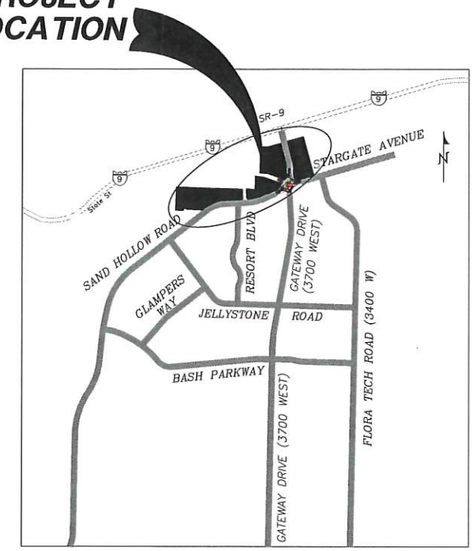
N.T.S



112' R-O-W

N.T.S

PROJECT LOCATION



VICINITY MAP

N. T. S.



GEOLOGICAL NARRATIVE

THIS PARCEL OF LAND LIES INSIDE A VOLCANO MOUNTAIN LAVA FLOW (MIDDLE PLEISTOCENE) SHOWN WITH A Qbv. IT ALSO LIES INSIDE AN ALLUVIAL AND EOLIAN DEPOSITS (HOLOCENE TO UPPER PLEISTOCENE) SHOWN WITH A Qae. THIS AREA ALSO HAS A MEDIUM TO DARK-GRAY TO GRAYISH-BLACK, FINE TO MEDIUM-GRAINED ALKALI BASALT (Qbv) WITH SPARSE OLIVINE PHENOCRYSTS; ERUPTED FROM A VENT AT VOLCANO MOUNTAIN (Qbvc) SOUTHWEST OF HURRICANE; DIVISIBLE INTO THREE SEPARATE FLOWS (BieK, 2003a, 2003b); YOUNGEST AND MIDDLE-LEVEL FLOWS YIELDED 40Ar/39Ar AGES OF 0.289 ± 0.024 Ma AND 0.353 ± 0.045 Ma, RESPECTIVELY (SANCHEZ, 1995), IN ACCORD WITH K-Ar AGES OF 0.289 ± 0.085 AND 0.303 ± 0.30 (BEST AND OTHERS, 1980) ON THE MIDDLE-LEVEL FLOW; MIDDLE-LEVEL FLOW IS DISPLACED ABOUT 240 FEET (73 m) BY THE HURRICANE FAULT AT TIMPOWEAP CANYON AND LOCALLY HAS PILLOW BASALT AT ITS BASE; THE OLDEST LAVA FLOW FLOWED ABOUT 8 MILES (13 km) DOWN THE VIRGIN RIVER; LAVA FLOWS ARE GENERALLY 35 TO 45 FEET (11-14 m) THICK AND FORM ROUGH, BLOCKY SURFACES, BUT THE MIDDLE-LEVEL FLOW IS AS MUCH AS 170 FEET (50 m) THICK WHERE IT FILLS THE ANCESTRAL VIRGIN RIVER CHANNEL. THIS AREA ALSO HAS MODERATELY SORTED GRAVEL, SAND, AND SILT DEPOSITED IN SMALL CHANNELS AND ON ALLUVIAL FLATS, AND WELL-SORTED, FINE- TO MEDIUM-GRAINED, REDDISH-BROWN EOLIAN SAND LOCALLY REWORKED BY ALLUVIAL PROCESSES, YOUNGER DEPOSITS (Qae) FORM ACTIVE DEPOSITIONAL SURFACES, WHEREAS OLDER DEPOSITS (Qaeo) TYPICALLY FORM INCISED, INACTIVE SURFACES; AS MUCH AS ABOUT 20 FEET (6 m) THICK.

GEOLOGICAL HAZARDS

FAULTS & SURFACE FAULTING	NONE
LIQUEFACTION	H2 – HIGH2–SIMILAR IN TEXTURE TO HIGH CATEGORY, NO GROUND–WATER INFORMATION
FLOODING	ZONE X–AREA OF MINIMAL FLOOD HAZARD
LANDSLIDE HAZARD	NONE
ROCKFALL HAZARD	NONE
BRECCIA PIPES AND PALEOKARST	NONE
CALICHE	CA – CALICHE
COLLAPSIBLE SOIL	CSA–STREAM/TERRACE ALLUVIUM >=3%
EXPANSIVE SOIL	ESL–LOW SUSCEPTIBILITY TO EXPANSION
GYPSIFEROUS SOIL & ROCK	NONE
PIPING & EROSION	P&ES–SOILS SUSCEPTIBLE TO PIPING AND EROSION
SHALLOW BEDROCK	BRB–BURIED: AREAS WHERE DEPTH TO BEDROCK IS GENERALLY ≤10 FEET BENEATH SOIL COVER
WIND BLOWN SAND	WBSL–LOW: MIXED–UNIT GEOLOGIC DEPOSITS WHICH CONTAIN WIND–BLOWN COMPONENT
SHALLOW GROUND WATER	NONE

GATEWAY COMMERCIAL AT SAND HOLLOW DESCRIPTION:

COMMENCING AT THE SOUTH QUARTER CORNER OF SECTION 1, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SALT LAKE BASE AND MERIDIAN; THENCE N1°24'34"E 2310.43 FEET; THENCE N1°24'34"E 97.33 FEET TO THE POINT OF BEGINNING. THENCE S83°40'58"W 12.51 FEET; THENCE N89°25'51"W 22.89 FEET; THENCE WESTERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 1616.32 FEET AND A RADIAL BEARING OF N05°17'42"W, A DISTANCE OF 72.41 FEET, THROUGH A CENTRAL ANGLE OF 02°34'01" (LONG CHORD BEARS: S85°59'19"W 72.41 FEET); THENCE S87°16'22"W 80.70 FEET; THENCE NORTHWESTERLY ALONG THE ARC OF A 19.50 FOOT RADIUS CURVE TO THE RIGHT A DISTANCE OF 30.63 FEET, THROUGH A CENTRAL ANGLE OF 90°00'00" (LONG CHORD BEARS: N47°43'38"W 27.58 FEET); THENCE S84°31'13"W 52.06 FEET; THENCE SOUTHWESTERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 19.50 FEET AND A RADIAL BEARING OF S87°16'22"W, A DISTANCE OF 30.63 FEET, THROUGH A CENTRAL ANGLE OF 90°00'00" (LONG CHORD BEARS: S42°16'22"W 27.58 FEET); THENCE S87°16'22"W 249.86 FEET; THENCE WESTERLY ALONG THE ARC OF A 826.50 FOOT RADIUS CURVE TO THE LEFT A DISTANCE OF 501.64 FEET, THROUGH A CENTRAL ANGLE OF 34°46'31" (LONG CHORD BEARS: S69°53'07"W 493.97 FEET); THENCE S52°29'51"W 313.79 FEET; THENCE N37°19'49"W 33.37 FEET; THENCE NORTHWESTERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 208.67 FEET AND A RADIAL BEARING OF S47°15'52"W, A DISTANCE OF 168.22 FEET, THROUGH A CENTRAL ANGLE OF 46°11'20" (LONG CHORD BEARS: N65°49'48"W 163.70 FEET); THENCE N88°51'09"W 285.33 FEET; THENCE WESTERLY ALONG THE ARC OF A 28.00 FOOT RADIUS CURVE TO THE RIGHT A DISTANCE OF 20.51 FEET, THROUGH A CENTRAL ANGLE OF 41°57'43" (LONG CHORD BEARS: N67°52'17"W 20.05 FEET); THENCE WESTERLY ALONG THE ARC OF A 50.00 FOOT RADIUS REVERSE CURVE TO THE LEFT (LONG CHORD BEARS: N80°03'34"W 54.71 FEET), CENTER POINT LIES S43°06'34"W THROUGH A CENTRAL ANGLE OF 66°20'17" A DISTANCE OF 57.89 FEET; THENCE SOUTHWESTERLY ALONG THE ARC OF A 50.00 FOOT RADIUS COMPOUND CURVE TO THE LEFT (LONG CHORD BEARS: S33°36'09"W 54.71 FEET), CENTER POINT LIES S23°13'43"E THROUGH A CENTRAL ANGLE OF 66°20'17" A DISTANCE OF 57.89 FEET; THENCE N88°40'59"W 199.69 FEET; THENCE N01°31'31"E 591.26 FEET; THENCE S88°16'22"E 765.18 FEET; THENCE S88°27'47"E 947.23 FEET; THENCE S88°30'21"E 52.14 FEET; THENCE S88°27'11"E 224.48 FEET; THENCE N01°24'29"E 378.60 FEET; THENCE N02°17'47"E 90.13 FEET; THENCE N01°17'31"E 880.34 FEET; THENCE S88°43'14"E 254.45 FEET; THENCE N74°26'03"E 348.01 FEET; THENCE N74°35'29"E 248.68 FEET; THENCE N74°46'22"E 500.00 FEET; THENCE S15°13'38"E 1306.80 FEET; THENCE S74°46'24"W 476.08 FEET; THENCE S77°30'55"W 77.72 FEET; THENCE WESTERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 90.00 FEET AND A RADIAL BEARING OF N17°28'13"W, A DISTANCE OF 24.40 FEET, THROUGH A CENTRAL ANGLE OF 15°31'55" (LONG CHORD BEARS: S80°17'45"W 24.32 FEET); THENCE WESTERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 89.91 FEET AND A RADIAL BEARING OF N01°53'21"W, A DISTANCE OF 20.25 FEET, THROUGH A CENTRAL ANGLE OF 12°54'20" (LONG CHORD BEARS: N85°26'11"W 20.21 FEET); THENCE WESTERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 89.92 FEET AND A RADIAL BEARING OF N11°00'04"E, A DISTANCE OF 29.91 FEET, THROUGH A CENTRAL ANGLE OF 19°03'40" (LONG CHORD BEARS: N69°28'06"W 29.78 FEET); THENCE N59°56'46"W 15.87 FEET; THENCE NORTHWESTERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 100.43 FEET AND A RADIAL BEARING OF N30°53'43"E, A DISTANCE OF 29.07 FEET, THROUGH A CENTRAL ANGLE OF 16°34'58" (LONG CHORD BEARS: N50°48'47"W 28.96 FEET); THENCE NORTHWESTERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 88.83 FEET AND A RADIAL BEARING OF N48°34'15"E, A DISTANCE OF 33.42 FEET, THROUGH A CENTRAL ANGLE OF 21°33'34" (LONG CHORD BEARS: N30°38'58"W 33.23 FEET); THENCE NORTHERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 580.00 FEET AND A RADIAL BEARING OF N69°51'22"E, A DISTANCE OF 159.43 FEET, THROUGH A CENTRAL ANGLE OF 15°44'57" (LONG CHORD BEARS: N12°16'09"W 158.93 FEET); THENCE S87°08'40"W 96.87 FEET; THENCE SOUTHERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 378.12 FEET AND A RADIAL BEARING OF S89°56'48"E, A DISTANCE OF 42.34 FEET, THROUGH A CENTRAL ANGLE OF 06°24'55" (LONG CHORD BEARS: S03°09'16"E 42.32 FEET); THENCE SOUTHERLY ALONG THE ARC OF A 105.00 FOOT RADIUS REVERSE CURVE TO THE RIGHT (LONG CHORD BEARS: S18°04'24"W 86.87 FEET), CENTER POINT LIES S83°38'18"W THROUGH A CENTRAL ANGLE OF 48°52'14" A DISTANCE OF 89.56 FEET; THENCE S42°30'35"W 15.13 FEET; THENCE SOUTHWESTERLY ALONG THE ARC OF A 115.00 FOOT RADIUS CURVE TO THE RIGHT A DISTANCE OF 82.38 FEET, THROUGH A CENTRAL ANGLE OF 41°02'42" (LONG CHORD BEARS: S63°01'56"W 80.63 FEET); THENCE WESTERLY ALONG THE ARC OF A 285.00 FOOT RADIUS COMPOUND CURVE TO THE RIGHT (LONG CHORD BEARS: S88°18'00"W 47.15 FEET), CENTER POINT LIES N06°26'43"W THROUGH A CENTRAL ANGLE OF 09°29'25" A DISTANCE OF 47.21 FEET; THENCE WESTERLY ALONG THE ARC OF A 285.00 FOOT RADIUS COMPOUND CURVE TO THE RIGHT (LONG CHORD BEARS: N80°49'54"W 60.80 FEET), CENTER POINT LIES N03°02'42"E THROUGH A CENTRAL ANGLE OF 12°14'48" A DISTANCE OF 60.92 FEET; THENCE S17°13'22"W 72.11 FEET; THENCE S74°36'08"E 15.52 FEET; THENCE SOUTHERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 82.00 FEET AND A RADIAL BEARING OF S14°08'43"W, A DISTANCE OF 158.96 FEET, THROUGH A CENTRAL ANGLE OF 111°04'17" (LONG CHORD BEARS: S20°19'08"E 135.21 FEET); THENCE SOUTHWESTERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 588.93 FEET AND A RADIAL BEARING OF N52°39'11"W, A DISTANCE OF 92.54 FEET, THROUGH A CENTRAL ANGLE OF 09°00'12" (LONG CHORD BEARS: S41°50'55"W 92.45 FEET); THENCE SOUTHWESTERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 714.11 FEET AND A RADIAL BEARING OF N38°54'42"W, A DISTANCE OF 265.23 FEET, THROUGH A CENTRAL ANGLE OF 21°16'50" (LONG CHORD BEARS: S61°43'43"W 263.71 FEET); THENCE S72°04'43"W 22.72 FEET; THENCE S72°07'26"W 105.95 FEET; THENCE WESTERLY ALONG THE ARC OF A 1619.45 FOOT RADIUS CURVE TO THE RIGHT A DISTANCE OF 243.83 FEET, THROUGH A CENTRAL ANGLE OF 08°37'35" (LONG CHORD BEARS: S76°25'49"W 243.60 FEET); THENCE WESTERLY ALONG THE ARC OF A 1618.82 FOOT RADIUS COMPOUND CURVE TO THE RIGHT (LONG CHORD BEARS: S82°06'02"W 76.59 FEET), CENTER POINT LIES N09°15'18"W THROUGH A CENTRAL ANGLE OF 02°42'40" A DISTANCE OF 76.60 FEET TO THE POINT OF BEGINNING.

ADDITIONAL NOTES

STORM WATER CAN BE LOCALLY DETAINED AND CONTROLLED USING DETENTION BASINS. WATER WILL BE COLLECTED AND DELIVERED TO THE REGIONAL DETENTION BASIN AT THE PROPOSED PARK
THERE ARE NO IRRIGATION FACILITIES.

PROPERTY CAN BE SERVED BY HURRICANE CITY WATER,
AND ASH CREEK SPECIAL SERVICE DISTRICT.

THERE ARE NO WELLS, SPRINGS OR SEEPS ON THIS PROPERTY.

OWNER PLANS TO ALLOW PLACEMENT OF COMMUNICATIONS INFRASTRUCTURE AND PLACEMENT OF UTILITY INFRASTRUCTURE ON AND ALONG ALL RIGHTS-OF-WAY AND EASEMENTS.

OWNER:

WESTERN MTG & REALTY CO
6610 WEST COURT STREET
PASCO, WASHINGTON 99302
(509) 521-9354

LAND USE SUMMARY

TOTAL LOTS: 6

AVERAGE LOT SIZE: 454,036 SQ FT (10.42 AC)

COPYRIGHT © 2013 PROVALUE ENGINEERING, INC.

NO	REVISIONS DESCRIPTION	DATE	BY

PROVALUE ENGINEERING, INC.
Engineers - Land Surveyors - Land Planners
20 South 850 West, Suite 1
Hurricane City, Utah 84737
Phone: (435) 668-8367

PRELIMINARY PLAT FOR:
GATEWAY COMMERCIAL AT SAND HOLLOW

LOCATED IN SECTION 1, T42S, R14W, S.L.B.&M.
HURRICANE, WASHINGTON COUNTY, UTAH

DATE: 1/24/2022
SCALE: N/A

JOB NO.
336-002

SHEET NO:
1 OF 2

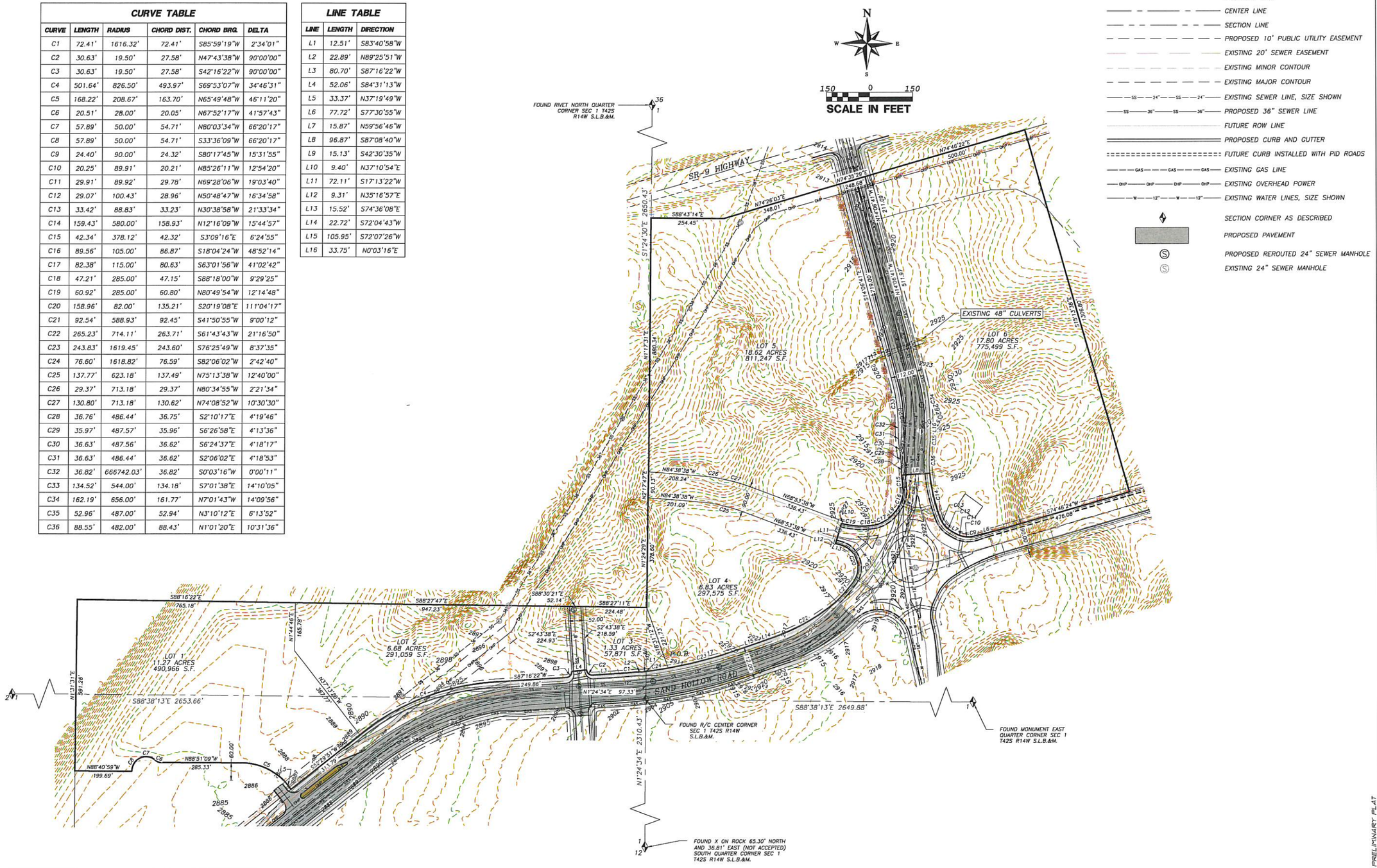
PRELIMINARY PLAT

PRELIMINARY PLAT FOR:
GATEWAY COMMERCIAL AT SAND HOLLOW

LOCATED IN SECTION 1, T42S, R14W, S.L.B.&M.
HURRICANE, WASHINGTON COUNTY, UTAH

CURVE TABLE					
CURVE	LENGTH	RADIUS	CHORD DIST.	CHORD BRG.	DELTA
C1	72.41'	1616.32'	72.41'	S85°59'19"W	2°34'01"
C2	30.63'	19.50'	27.58'	N47°43'38"W	90°00'00"
C3	30.63'	19.50'	27.58'	S42°16'22"W	90°00'00"
C4	501.64'	826.50'	493.97'	S69°53'07"W	34°46'31"
C5	168.22'	208.67'	163.70'	N65°49'48"W	46°11'20"
C6	20.51'	28.00'	20.05'	N67°52'17"W	41°57'43"
C7	57.89'	50.00'	54.71'	N80°03'34"W	66°20'17"
C8	57.89'	50.00'	54.71'	S33°36'09"W	66°20'17"
C9	24.40'	90.00'	24.32'	S80°17'45"W	15°31'55"
C10	20.25'	89.91'	20.21'	N85°26'11"W	12°54'20"
C11	29.91'	89.92'	29.78'	N69°28'06"W	19°03'40"
C12	29.07'	100.43'	28.96'	N50°48'47"W	16°34'58"
C13	33.42'	88.83'	33.23'	N30°38'58"W	21°33'34"
C14	159.43'	580.00'	158.93'	N12°16'09"W	15°44'57"
C15	42.34'	378.12'	42.32'	S3°09'16"E	6°24'55"
C16	89.56'	105.00'	86.87'	S18°04'24"W	48°52'14"
C17	82.38'	115.00'	80.63'	S63°01'56"W	41°02'42"
C18	47.21'	285.00'	47.15'	S88°18'00"W	9°29'25"
C19	60.92'	285.00'	60.80'	N80°49'54"W	12°14'48"
C20	158.96'	82.00'	135.21'	S20°19'08"E	111°04'17"
C21	92.54'	588.93'	92.45'	S41°50'55"W	9°00'12"
C22	265.23'	714.11'	263.71'	S61°43'43"W	21°16'50"
C23	243.83'	1619.45'	243.60'	S76°25'49"W	8°37'35"
C24	76.60'	1618.82'	76.59'	S82°06'02"W	2°42'40"
C25	137.77'	623.18'	137.49'	N75°13'38"W	12°40'00"
C26	29.37'	713.18'	29.37'	N80°34'55"W	2°21'34"
C27	130.80'	713.18'	130.62'	N74°08'52"W	10°30'30"
C28	36.76'	486.44'	36.75'	S2°10'17"E	4°19'46"
C29	35.97'	487.57'	35.96'	S6°26'58"E	4°13'36"
C30	36.63'	487.56'	36.62'	S6°24'37"E	4°18'17"
C31	36.63'	486.44'	36.62'	S2°06'02"E	4°18'53"
C32	36.82'	666742.03'	36.82'	S0°03'16"W	0°00'11"
C33	134.52'	544.00'	134.18'	S7°01'38"E	14°10'05"
C34	162.19'	656.00'	161.77'	N7°01'43"W	14°09'56"
C35	52.96'	487.00'	52.94'	N3°10'12"E	6°13'52"
C36	88.55'	482.00'	88.43'	N1°01'20"E	10°31'36"

LINE TABLE		
LINE	LENGTH	DIRECTION
L1	12.51'	S83°40'58"W
L2	22.89'	N89°25'51"W
L3	80.70'	S87°16'22"W
L4	52.06'	S84°31'13"W
L5	33.37'	N37°19'49"W
L6	77.72'	S77°30'55"W
L7	15.87'	N59°56'46"W
L8	96.87'	S87°08'40"W
L9	15.13'	S42°30'35"W
L10	9.40'	N37°10'54"E
L11	72.11'	S17°13'22"W
L12	9.31'	N35°16'57"E
L13	15.52'	S74°36'08"E
L14	22.72'	S72°04'43"W
L15	105.95'	S72°07'26"W
L16	33.75'	N0°03'16"E



LEGEND

- OUTER PROPERTY LINE
- PROPERTY LINE
- CENTER LINE
- SECTION LINE
- PROPOSED 10' PUBLIC UTILITY EASEMENT
- EXISTING 20' SEWER EASEMENT
- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING SEWER LINE, SIZE SHOWN
- PROPOSED 36" SEWER LINE
- FUTURE ROW LINE
- PROPOSED CURB AND GUTTER
- FUTURE CURB INSTALLED WITH PID ROADS
- EXISTING GAS LINE
- EXISTING OVERHEAD POWER
- EXISTING WATER LINES, SIZE SHOWN
- SECTION CORNER AS DESCRIBED
- PROPOSED PAVEMENT
- PROPOSED REROUTED 24" SEWER MANHOLE
- EXISTING 24" SEWER MANHOLE

REVISIONS			
NO	DESCRIPTION	DATE	BY

COPYRIGHT © 2013 PROVALLUE ENGINEERING INC.

PROVALLUE ENGINEERING, INC.
Engineers - Land Surveyors - Land Planners
20 South 850 West, Suite 1
Hurricane City, Utah 84737
Phone: (435) 668-8367

PRELIMINARY PLAT FOR:
GATEWAY COMMERCIAL AT SAND HOLLOW
LOCATED IN SECTION 1, T42S, R14W S.L.B.&M.
HURRICANE, WASHINGTON COUNTY, UTAH

DATE: 1/04/2022
SCALE: 1"=150'

JOB NO.
336-002

SHEET NO:
2 OF 2

PRELIMINARY PLAT

AMENDED FINAL PLAT APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $150

For Office Use Only:
File No. 2022-AFP-01
Receipt No. S-165168

Name: Pat Stone **Telephone:** (435) 619-7994

Address: 328 S 1150 W, Hurricane, UT **Fax No.** _____

Email: stonepat1969@gmail.com **Agent Email:** _____

Agent (If Applicable): _____ **Telephone:** _____

Address/Location of Subject Property: Pioneer Estates Subdivision, Lot 5

Tax ID of Subject Property: H-PE-5 **Number of Lots:** 2

Subdivision Name: Pioneer Estates Subdivision **Phase:** 1

Submittal Requirements: 1-large paper copy, 1-11 X 17, and 1 disk in 2004 or newer Auto-Cad format

1. The final plat shall show:

_____a. The name or designation of the subdivision that is distinct from any plat already recorded in the County Recorder's office, as approved by the Planning Commission.

_____b. The boundaries, course, and dimensions of all of the parcels of ground divided, by their boundaries, course, and extent, whether the owner proposes that any parcel of ground is intended to be used as a street or for another public use, and whether any such area is reserved or proposed for dedication for a public purpose.

_____c. The lot or unit reference, block or building reference, street or site address, street name or coordinate address, acreage or square footage of all parcels, units, lots, and the length and width of the blocks and lots intended for sale.

_____d. Every existing right-of-way and easement grant of record for communications infrastructure, for underground facilities as defined in Section 54-8a-2 of the Utah Code and for other utility facilities. Where the same is granted to a specific entity, that entity must be clearly identified.

_____e. True angles and distances to the nearest established street lines or official monument, which shall be accurately described on the plat and shown by appropriate symbols.

_____f. All street center line data must be shown, together with its relationship to the property lines, corners, etc.

_____g. The accurate location of all monuments shall be shown on the plat, and shall be identified, including all United States, State, County or other official monuments.

_____h. The dedication to the public of all streets and highways included in the proposed subdivision (except approved private streets).

_____i. Street monuments shall be installed by the subdivider in accordance with the requirements of City Standards. Locations of said monuments shall be approved by the City Engineer and indicated on the subdivider's plat by the appropriate symbols.

_____j. Accurate outlines and legal descriptions of any areas to be dedicated or reserved for public use, with the purposes indicated thereon, and of any area to be reserved by deed or covenant for common uses by all property owners.

_____k. Where it is proposed that streets be constructed on property controlled by a public agency or utility company, approval for the location, improvement and maintenance of such streets shall be obtained from the public agency or utility company and entered on the final plat in a form approved by the City Attorney.

2. Required Forms & Certificates: In addition the final plat shall contain the standard forms for the following:

_____a. A registered professional land surveyor's certificate of survey, together with a statement that: (a) the surveyor holds a license in accordance with Title 58, Chapter 22 of the Utah Code, Professional Engineers and Professional Land Surveyor's Licensing Act; (b) the surveyor has completed a survey of the property described on the plat in accordance with Section 17-23-17 of the Utah Code and has verified all measurements; (c) has placed monuments as represented on the plat. **Plat must signed and stamped by the licensed surveyor prior to final plat submittal.**

_____b. The owner's certificate of dedication of all streets, roads, rights-of-way or other parcels intended for the use and benefit of the general public.

_____c. Mortgagee or other lien holder's Consent to Record, if applicable.

_____d. A notary public's acknowledgement space for the signature of the mortgagee and/or each owner signing the plat.

_____e. Certificate of approval of Ash Creek Special Service District.

_____f. Certificate of approval of the City Engineer.

_____g. Certificate of approval of the City Council, as evidenced by the signature of the Mayor

_____h. Certificate of approval as to form executed by the City Attorney.

_____i. A one and one-half inch by five inch (1 ½" x 5") space in the lower right-hand corner of the drawing for the use of the County Recorder.

3. **Other Information Required**: The following information or documentation shall be submitted:

_____a. A completed form from the Washington County Treasurer's office (see attached copy of form) for property located within the subdivision verifying that all taxes or special assessments payable on all property within the limits of the subdivision are paid in full

_____b. An original copy for Staff review of the proposed deed restrictions or CC&Rs in proposed final form with signature lines for all owners of any interest in the subdivision who would sign the final subdivision plat must be submitted with final plat application. After being approved by staff this document shall be signed, acknowledged by a notary public, and recorded in the office of the County Recorder along with the final plat.

_____c. Title report for the property being subdivided.

_____d. A disk of the final plat prepared in 'Auto-Cad 2004' (or newer format)

Application Process: The following steps occur:

- A completed application with all required documents and fee payment as outlined above is submitted to the Planning Department along with the paper copy of the amended plat.

- A paper copy of the amended plat is submitted to the City Engineer for review. The City Engineer will red line the plat and email the subdivision engineer of required changes that need to be made. If a plat is still not ready for the City Engineers signature after the second submittal, an additional fee must be paid before the Engineer performs another review. An approved mylar of the final plat must

be signed by the City Engineer before the City Council meeting at which the amendment is to be submitted

- A plat amendment without the notarized signatures of all the owners of record on the mylar or on consent to record forms will require a public hearing. The applicant will be required to pay all notification and/or publication costs for notice of the hearing.

Requirements for recordation:

1. Amended plat approval by the City Council

4. Two disks of the final plat provided in 'Auto Cad 2004' format – one for the City, and one for the County Recorder.

5. Review of the title report by the City Attorney.

7. All signatures must be on the mylar, including property owners of record according to the title report, City officials and Ash Creek Special Service District Superintendent. The City Attorney is the last signer of the mylar just prior to recordation.

8. Someone from the City Attorney's office will accompany the developer's representative to the County Recorder's office for recordation. The developer pays recording fees.

A development with CC&R's should submit a copy of the CC&R's to the Planning Staff and one to the City Attorney for review at the time the plat amendment is submitted.

Note: An amended plat that includes the abandonment of a dedicated road or for a subdivision that is not fully improved requires a different application and procedure

****

(Office Use Only)

Date Received: _____ Application Complete: ☐ YES ☐ NO

Date application deemed to be complete:_____Completion determination made by:_____

PLANNING & ZONING
HURRICANE CITY
UTAH

STAFF COMMENTS

Agenda Date:	**02/17/2022**
Application Number:	2022-AFP-01
Type of Application:	Amended Final Plat
Action Type:	Administrative
Applicant:	Pat Stone
Agent:	
Request:	Approval of an Amended Final Plat
Location:	252 S 1430 W
Zoning:	RA-0.5
General Plan Map:	Single Family

Planning Commission Recommendation
The Planning Commission gave a positive recommendation subject to staff and JUC comments, including adding the PUEs on back on the plat.

Discussion: The applicant has applied to amend the final plat for Pioneer Estates to divide Lot 5 into two separate parcels. Since the subdivision was already recorded an amended final plat is required for any further subdivisions.

JUC Comments

1. **Power:** Will need to build in power according to red lines
2. **Water:** Will need to dig in another meter
3. **Streets:** Will need improvements
4. **Sewer:** Lot 5A would need additional improvements. Sewer line is next to the property line which may require a public utility easement. Will need to look out for sewer line with road improvements
5. **Engineering:** As required for several other lots within this development that were split, road improvements will be needed on 300 S and 1430 W including curb, cutter, and sidewalk.
6. **Cable/Phone/Gas/Water Conservancy/Parks:** No comments

Staff Comments

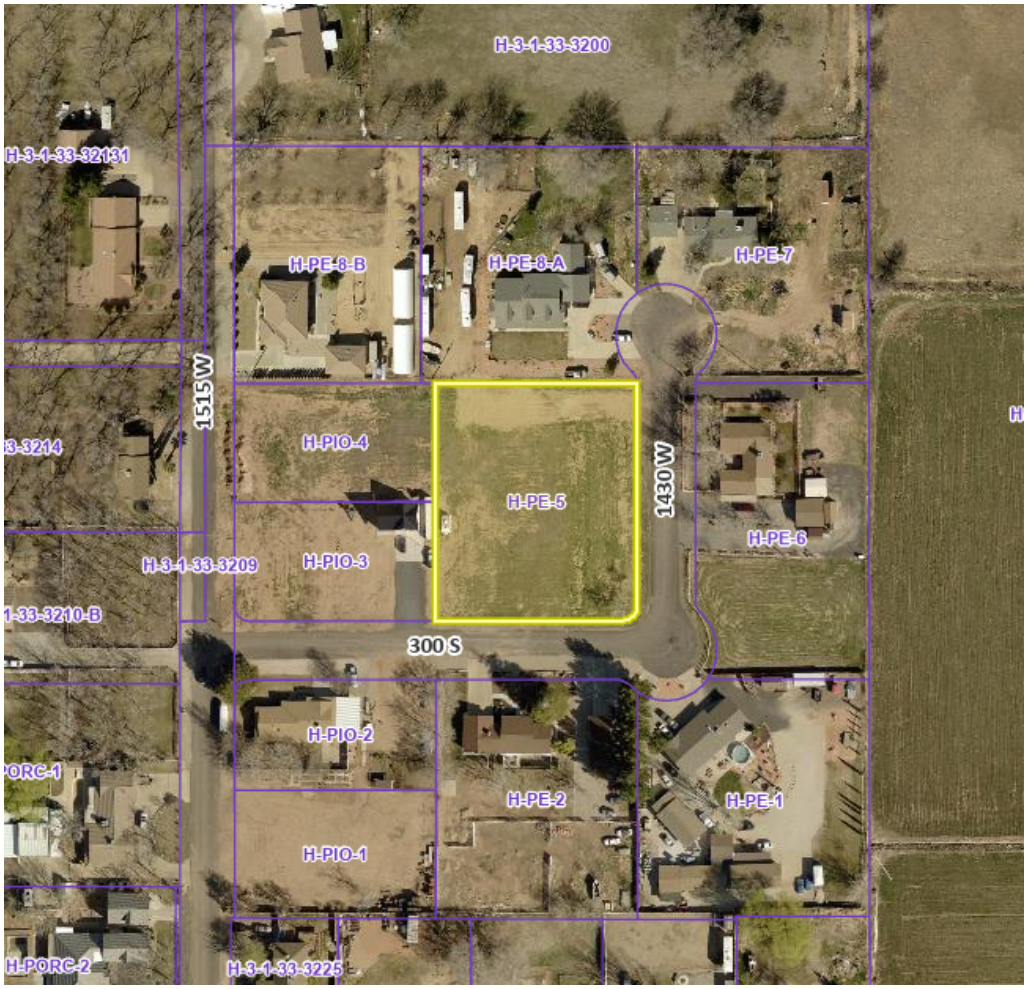
1. The plat meets amended final plat standards contained in Utah Code 10-9a-608. Subdivision Amendments, updated in 2020. The following are the key items:
    a. Depicts only the portion of the subdivision that is proposed to be amended
    b. Includes a plat name distinguishing the amended plat from the original plat
    c. Describes the differences between the amended plat and the original plat
    d. Includes references to the original plat

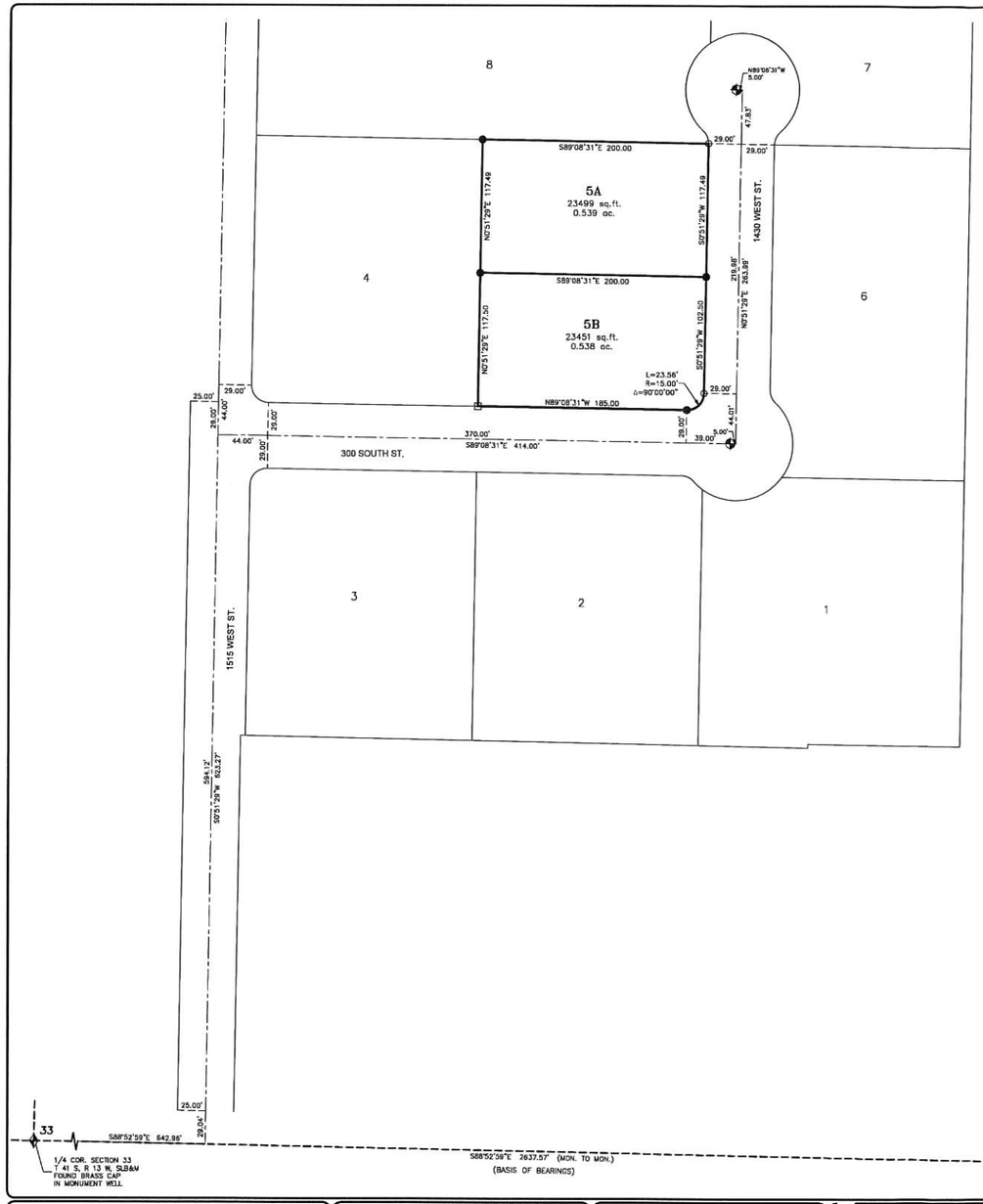
2. The Final Plat needs a full review by the City Engineering Department for surveying details.
3. There is a 7.5” utility easement along the northern and western property boundary that is not indicated on this amended final plat but is on the original final plat for this subdivision. There is currently a power line that is located within that easement as shown below.



4. The property is zoned RA-0.5, the two lots will be .539 and .538 acres so they are in compliance with the zoning

Recommendation: Staff recommends that the City Council review this application based on Hurricane City and State Code standards. Staff would recommend approval of the item subject to staff and JUC comments.


H-3-1-33-3200
H-3-1-33-32131
H-PE-8-B
H-PE-8-A
H-PE-7
1515 W
H-PIO-4
H-PE-5
1430 W
H-PE-6
H-3-1-33-3209
H-PIO-3
300 S
H-PIO-2
H-PE-2
H-PE-1
H-PIO-1
H-PORC-2
H-3-1-33-3225



50 0 50
SCALE IN FEET

NARRATIVE

AT THE REQUEST OF MR PATRICK D. STONE AND MRS. JACKIE L. STONE, A SURVEY WAS CONDUCTED TO PROVIDE FOR FURTHER DIVIDING LOT 5 OF THE PIONEER ESTATES SUBDIVISION INTO TWO (2) SEPARATE BUILDABLE PARCELS, AND MARK THE CORNERS OF EACH PARCEL ON THE GROUND. THE CORNERS ARE MARKED WITH 5/8 INCH STEEL REBAR WITH PLASTIC CAP STAMPED "G.E. PRATT PLS 176247", UNLESS OTHERWISE NOTED OR SHOWN ON THE PLAT.

THIS SURVEY WAS PERFORMED UNDER THE REQUIREMENTS OF HURRICANE CITY AND THROUGH ITS APPLICATION PROCESS FOR APPROVAL NO OTHER LOTS WERE CHANGED NOR WERE ANY OTHER CHANGES INTENDED WITH THIS PLAT

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS SUBDIVISION IS SOUTH 88°52'59" EAST BETWEEN THE SOUTH 1/4 CORNER OF SECTION 33, AND THE SOUTHEAST CORNER OF SECTION 33, TOWNSHIP 41 SOUTH, RANGE 13 WEST, OF THE SALT LAKE BASE AND MERIDIAN AND MEASURES 2637.57'.

LEGEND

- FOUND CENTERLINE MONUMENT
- SET 5/8" X 20" REBAR WITH PLASTIC CAP, MARKED "PRATT ENGINEERING PC * GEP 176247
- FOUND 5/8" X 20" REBAR PIN AND PLASTIC CAP SET BY OTHERS.
- FOUND REBAR PIN, NO CAP, SET BY OTHERS
- LOT LINES
- EXISTING SUBDIVISION LINES
- CENTERLINE OF ROAD
- SECTION LINES

SURVEYOR'S CERTIFICATE

I, GEROLD E. PRATT, DO HEREBY CERTIFY THAT I AM A PROFESSIONAL LAND SURVEYOR, HOLDING REGISTRATION CERTIFICATE NO. 176247, AS PRESCRIBED BY THE LAWS OF THE STATE OF UTAH. I FURTHER CERTIFY THAT BY THE AUTHORITY OF THE OWNER, I HAVE MADE A SURVEY OF THE TRACT OF LAND SHOWN ON THIS PLAT, AND HAVE SUBDIVIDED SAID TRACT OF LAND INTO LOTS AND EASEMENTS, HEREAFTER TO BE KNOWN AS:

"PIONEER ESTATES SUBDIVISION, LOT 5 AMENDED"

AND IS AS DESCRIBED IN THE BOUNDARY DESCRIPTIONS BELOW:

GEROLD E. PRATT
CERTIFICATE #176247

BOUNDARY DESCRIPTION LOT 5A

ALL OF THE NORTH HALF OF LOT 5 OF THE PIONEER ESTATES SUBDIVISION AS RECORDED IN THE RECORDS OF THE WASHINGTON COUNTY, UTAH RECORDERS OFFICE.

BOUNDARY DESCRIPTION LOT 5B

ALL OF THE SOUTH HALF OF LOT 5 OF THE PIONEER ESTATES SUBDIVISION AS RECORDED IN THE RECORDS OF THE WASHINGTON COUNTY, UTAH RECORDERS OFFICE.

OWNER'S DEDICATION

KNOW ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED OWNERS OF ALL OF THE DESCRIBED TRACT OF LAND HAVING CAUSED THE SAME TO BE SUBDIVIDED INTO LOTS AND EASEMENTS TO BE HEREAFTER KNOWN AS:

"PIONEER ESTATES SUBDIVISION, LOT 5 AMENDED"

DO HEREBY DEDICATE FOR THE PERPETUAL USE OF THE PUBLIC ALL PARCELS OF LAND SHOWN ON THIS PLAT AS INTENDED FOR PUBLIC USE, INCLUDING STREET RIGHT-OF-WAYS, AND EASEMENTS AS NOTED OR SHOWN, TO THE CITY OF HURRICANE.

WHEREOF WE HAVE HEREUNTO SET OUR HAND THIS___ DAY OF _____ , A.D. 2021.

PATRICK D. STONE

JACKIE L. STONE

ACKNOWLEDGMENT

STATE OF UTAH
COUNTY OF _____

ON THIS ____ DAY OF _____ A.D. 2021, PERSONALLY APPEARED BEFORE ME, PATRICK D. STONE AND JACKIE L. STONE, WHO BEING BY ME DULY SWORN DID SAY THAT THEY ARE THE OWNERS AND THAT THEY EXECUTED THE FOREGOING OWNER'S DEDICATION, AND THEY DID FOR THEMSELVES DULY ACKNOWLEDGE TO ME THAT THEY EXECUTED THE SAME FOR THE USES AND PURPOSES STATED THEREIN.

NOTARY PUBLIC

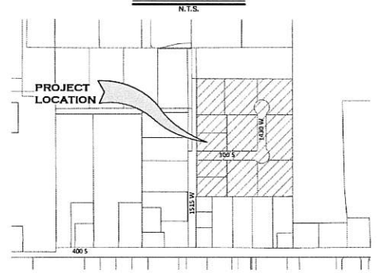
NOTARY PUBLIC FULL NAME:_____

COMMISSION NUMBER: _____

MY COMMISSION EXPIRES:_____

A NOTARY PUBLIC COMMISSIONED IN UTAH_____

VICINITY MAP
N.T.S.



PIONEER ESTATES SUBDIVISION, LOT 5 AMENDED

LOCATED IN THE SE 1/4 OF SECTION 33, TOWNSHIP 41 SOUTH, RANGE 13 WEST, SLB&M
CITY OF HURRICANE, COUNTY OF WASHINGTON, STATE OF UTAH

PRATT ENGINEERING, P.C.
CIVIL ENGINEERING AND LAND SURVEYING
51 NORTH 1000 WEST, SUITE 5-HURRICANE, UTAH 84737
FAX: (435) 635-5765 TEL: (435) 635-2329

CITY ENGINEER'S APPROVAL
THIS ABOVE SUBDIVISION HAS BEEN REVIEWED AND IS APPROVED IN ACCORDANCE WITH INFORMATION ON FILE IN THIS OFFICE THIS ___ DAY OF _____, A.D. 2021.
DATE: HURRICANE CITY ENGINEER

APPROVAL OF ASH CREEK SPECIAL SERVICE DIST.
I HEREBY CERTIFY THAT THIS OFFICE HAS EXAMINED THIS PLAT AND IT IS CORRECT IN ACCORDANCE WITH INFORMATION ON FILE IN THIS OFFICE. THIS ____ DAY OF _____, A.D. 2021.
SUPERINTENDENT, SSD

APPROVAL AND ACCEPTANCE BY HURRICANE CITY, UTAH
WE, THE CITY OF HURRICANE, HAVE REVIEWED THE ABOVE PLAT AND HEREBY ACCEPT SAID PLAT WITH ALL COMMITMENTS AND ALL OBLIGATIONS PERTAINING THERETO THIS ___ DAY OF _____, A.D. 2021.
ATTEST: CITY RECORDER, HURRICANE, UTAH
JOHN W. BRAMALL, MAYOR, HURRICANE, UTAH

APPROVAL AS TO FORM
APPROVED AS TO FORM THIS ___ DAY OF _____, A.D. 2021.
HURRICANE CITY ATTORNEY

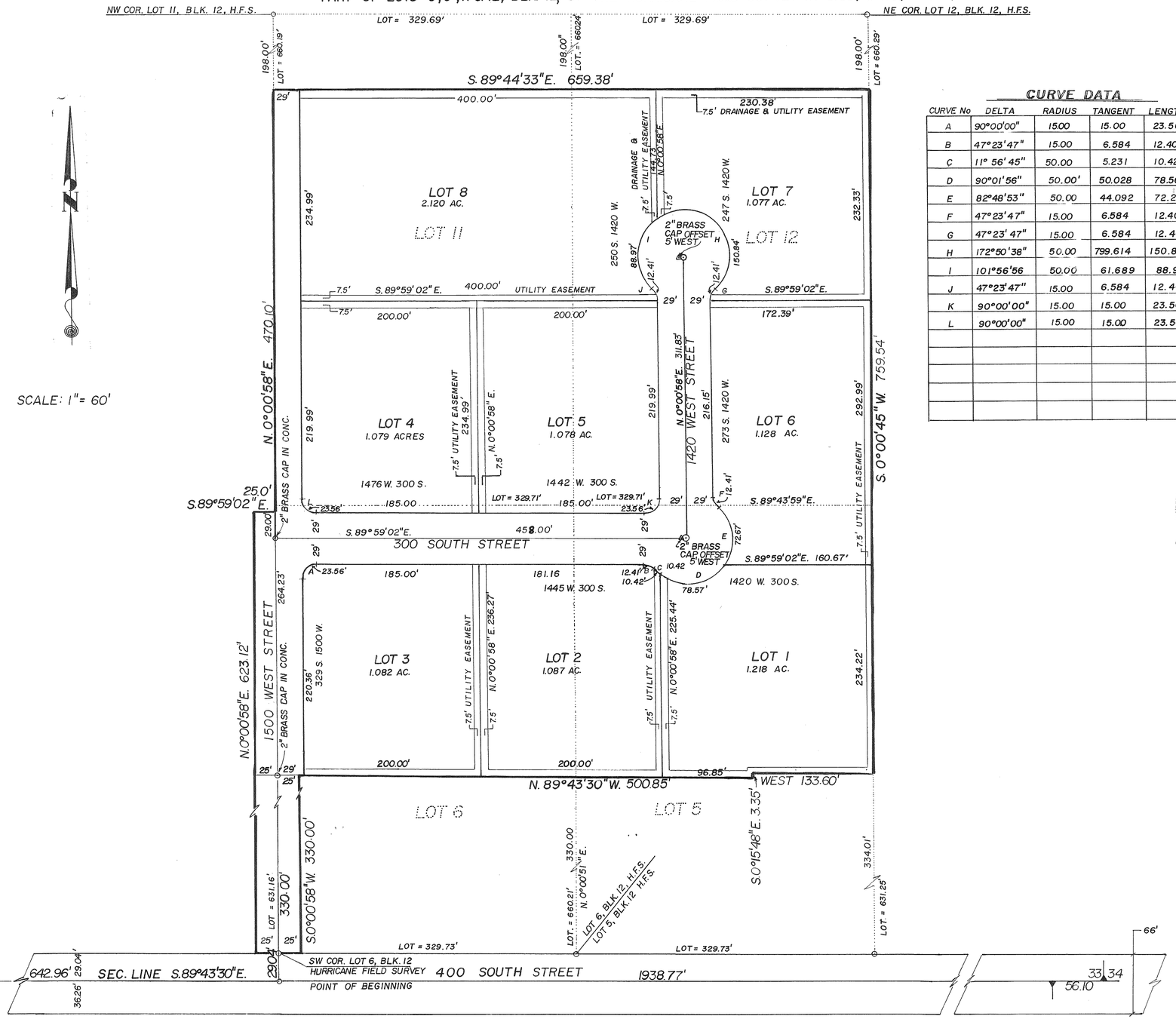
TREASURER APPROVAL
I, WASHINGTON COUNTY TREASURER, CERTIFY ON THIS ____ DAY OF _____ A.D. 2021 THAT ALL TAXES, SPECIAL ASSESSMENTS, AND FEES DUE AND OWING ON THIS SUBDIVISION FINAL PLAT HAVE BEEN PAID IN FULL.
WASHINGTON COUNTY TREASURER

ACCEPTANCE OF COUNTY RECORDER
WASHINGTON COUNTY RECORDER

FILE NAME: 2009-0825
DATE: MAY 06, 2021
SHEET 1 OF 1

PIONEER ESTATES SUBDIVISION

PART OF LOTS 5,6,11 & 12, BLK. 12, OF THE HURRICANE FIELD SURVEY IN S.33, T.41S., R.13W, S.L.B.& M.



SCALE: 1"= 60'

CURVE DATA

CURVE No	DELTA	RADIUS	TANGENT	LENGTH	LONG CORD
A	90°00'00"	15.00	15.00	23.562	21.213
B	47°23'47"	15.00	6.584	12.408	12.058
C	11° 56' 45"	50.00	5.231	10.424	10.406
D	90°01'56"	50.00'	50.028	78.568	70.730
E	82°48'53"	50.00	44.092	72.269	66.141
F	47°23'47"	15.00	6.584	12.408	12.058
G	47°23' 47"	15.00	6.584	12.408	12.058
H	172°50'38"	50.00	799.614	150.835	99.805
I	101°56'56	50.00	61.689	88.967	77.686
J	47°23'47"	15.00	6.584	12.408	12.058
K	90°00'00"	15.00	15.00	23.562	21.213
L	90°00'00"	15.00	15.00	23.562	21.213

SURVEYOR'S CERTIFICATE

I, JAMES T. BALLARD do hereby certify that I am a Registered Land Surveyor, and that I hold Certificate No. 4490, as prescribed under the laws of the State of Utah. I further certify that by authority of the Owners, I have made a survey of the tract of land shown on this plat and described below, and have subdivided said tract of land into lots and streets, hereafter to be known as PIONEER ESTATES SUBDIVISION

BOUNDARY DESCRIPTION

COURSE	DIST.	REMARKS
		BEGINNING AT THE SW COR. OF LOT 6, BLK. 12, HURRICANE FIELD SURVEY & RUNNING THENCE N. 89°43'30"W. 25.00 FT.
		THENCE
N.0°00'58"E.	623.12 FT.	THENCE
S.89°59'02"E.	25.00 FT.	TO THE W. LINE OF SAID LOT 6; THENCE
N.0°00'58"E.	470.10 FT.	ALONG SAID LOT LINE; THENCE
S.89°44'33"E.	659.38 FT.	TO THE EAST LINE OF LOT 12, BLK. 12, H.F.S., THENCE
S.0°00'45"W	759.54 FT.	ALONG SAID LOT LINE; THENCE
WEST	133.60 FT.	THENCE
S0°15'48"E.	3.35 FT.	THENCE
N.89°43'30"W.	500.85 FT.	PARALLEL TO THE SOUTH LINE OF BLK. 12 H.F.S.; THENCE
S.0°00'58"W.	330.00 FT.	TO THE SOUTH LINE SAID BLK. 12, THENCE
N.89°43'30"W.	25.00 FT.	TO THE POINT OF BEGINNING. CONTAINING 12.087 ACRES.

BASIS FOR BEARING S.89°43'30"E. BET. THE S.1/4 COR. & THE SE COR. S.33

5/7/1981
DATE

James T. Ballard No. 4490
MR. JAMES BALLARD
P.O. BOX 387
HURRICANE, UTAH 84737

No. 4490 5/22/1981 JAMES T. BALLARD STATE OF UTAH
James T. Ballard

OWNER'S DEDICATION

Know all men by these presents that WE, the undersigned owner (s) of the above described tract of land, having caused same to be subdivided into lots and streets to be hereafter known as

PIONEER ESTATES SUBDIVISION

do hereby dedicate for perpetual use of the public all parcels of land shown on this plat as intended for Public use.

In witness whereof WE have hereunto set our hands this 5TH day of JUNE A.D. 19 81

× Robert F. Williams
× Mabel B. Williams
× Joseph C. Spencer
M. Lee Morrell, Attorney in fact for Marciner & Jessie Morrell

Wilma A. Horton
Harold A. Horton
Robert G. Perry
Joan A. Perry

ACKNOWLEDGEMENT

STATE OF UTAH
County of WASHINGTON } S.S.

On the 5TH day of JUNE A.D. 19 81, personally appeared before me, the undersigned Notary Public, in and for said County of WASHINGTON, in said State of Utah, the signer(s) of the above Owner's Dedication. 9 in number, who duly acknowledged to me that THEY signed it freely and voluntarily and for the uses and purposes therein mentioned.

My Commission expires 12-28-81
Notary Public
Residing in WASHINGTON County

CORPORATE ACKNOWLEDGEMENT

STATE OF UTAH
County of _____ } S.S.

On this the _____ day of _____ A.D. 19____, personally appeared before me, the undersigned notary public in and for said State and County _____, who after being duly sworn, acknowledged to me that _____,

a _____ corporation, that _____ signed the owners dedication freely and voluntarily for and in behalf of said corporation for the purposes therein mentioned and that said corporation executed the same.

My Commission expires _____
Notary Public
Residing in _____ County

PIONEER ESTATES SUBDIVISION
(NAME OF SUBDIVISION)

SALT LAKE BASE & MERIDIAN

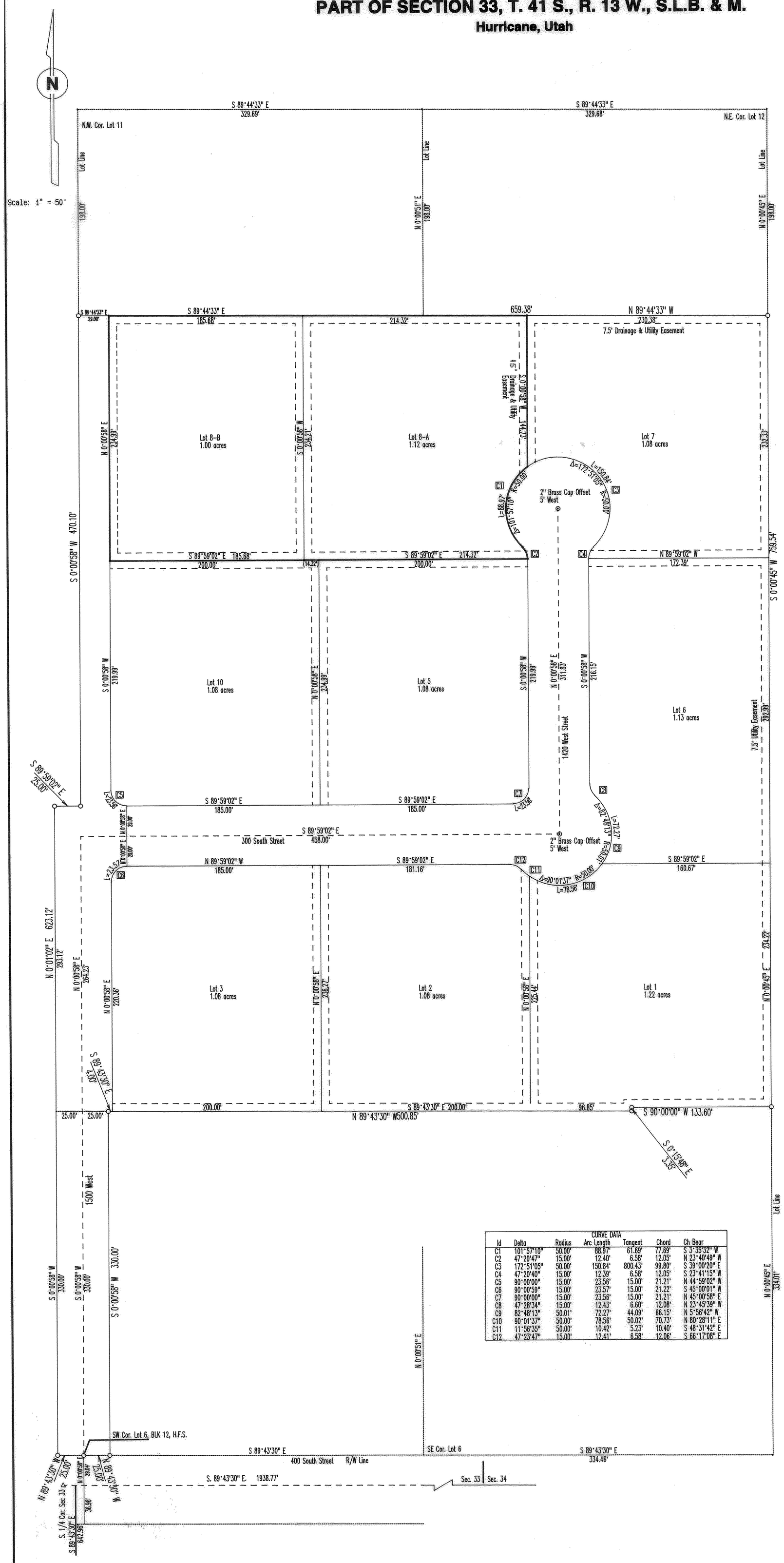
PLANNING COMMISSION	CITY ENGINEER'S CERTIFICATE	APPROVAL AS TO FORM	CITY COUNCIL	RECORDED #228098
APPROVED THIS 5TH DAY OF JUNE A.D. 1981 BY THE CITY PLANNING COMMISSION. Rosemary Lee VICE-CHAIRMAN, PLANNING COMM.	I HEREBY CERTIFY THAT THIS OFFICE HAS EXAMINED THIS PLAT AND IT IS CORRECT IN ACCORDANCE WITH INFORMATION ON FILE IN THIS OFFICE. 6/5/81 DATE CITY ENGINEER	APPROVED AS TO FORM THIS 5TH DAY OF JUNE A.D. 19 81 Ronald W. Thompson CITY ATTORNEY	PRESENTED TO THE HURRICANE CITY COUNCIL THIS 5TH DAY OF JUNE 1981 A.D. 19 81 AT WHICH TIME THIS SUBDIVISION WAS APPROVED AND ACCEPTED. June S. Raemon ATTEST: CLERK Don R. Gardner PRO-TEM MAYOR	STATE OF UTAH, COUNTY OF WASHINGTON RECORDED AND FILED AT THE REQUEST OF SOUTHERN UTAH TITLE COMPANY DATE JUNE 9, 1981 TIME 9:45 AM BOOK ____ PAGE FILED FEE $14.00 Herbert S. Bradley COUNTY RECORDER

PIONEER ESTATES SUBDIVISION - (AMENDED)

FOR THE PURPOSE OF DIVIDING LOT 8 INTO LOT 8-A & LOT 8-B

PART OF SECTION 33, T. 41 S., R. 13 W., S.L.B. & M.

Hurricane, Utah



CURVE DATA						
Id	Delta	Radius	Arc Length	Tangent	Chord	Ch Bear
C1	101°57'10"	50.00'	88.97'	61.69'	77.69'	S 3°35'32" W
C2	47°20'47"	15.00'	12.40'	6.58'	12.05'	N 23°40'49" W
C3	172°51'05"	50.00'	150.84'	800.43'	99.80'	S 39°00'20" E
C4	47°20'40"	15.00'	12.39'	6.58'	12.05'	S 23°41'15" W
C5	90°00'00"	15.00'	23.56'	15.00'	21.21'	N 44°59'02" W
C6	90°00'59"	15.00'	23.57'	15.00'	21.22'	S 45°00'01" W
C7	90°00'00"	15.00'	23.56'	15.00'	21.21'	N 45°00'58" E
C8	47°28'34"	15.00'	12.43'	6.60'	12.08'	N 23°45'39" W
C9	82°48'13"	50.01'	72.27'	44.09'	66.15'	N 5°56'42" W
C10	90°01'37"	50.00'	78.56'	50.02'	70.73'	N 80°28'11" E
C11	11°56'35"	50.00'	10.42'	5.23'	10.40'	S 48°31'42" E
C12	47°23'47"	15.00'	12.41'	6.58'	12.06'	S 66°17'08" E

SURVEYOR'S CERTIFICATE

I, Ferel L. Campbell do hereby certify that I am a registered land surveyor, holding certificate No. 4492, as prescribed by the laws of the State of Utah. I further certify that by the authority of the owners, I have made a survey of the tract of land shown on this plat and described below, and have divided Lot 8 into Lot 8-A & Lot 8-B, as shown on this plat, and hereafter referred to as

PIONEER SUBDIVISION - (AMENDED)

Beginning at the Southwest Corner of Lot 6, Block 12, HURRICANE FIELD SURVEY, and running thence N.89°43'30"W. 25.00 feet; thence N.0°00'58"E. 623.12 feet; thence S.89°59'02"E. 25.00 feet to the West Line of said Lot 6; thence N.0°00'58"E., along said Lot Line, 470.10 feet; thence S.89°44'33"E. 659.38 feet to the East Line of Lot 12, Block 12, HURRICANE FIELD SURVEY; thence S.0°00'45"W., along the Lot Line, 759.54 feet; thence S.90°00'W. 133.60 feet; thence S.0°15'48"E. 3.35 feet; thence N.89°43'30"W. 500.85 feet, parallel to the South Line of Block 12, HURRICANE FIELD SURVEY; thence S.0°00'58"W. 330.00 feet to the South Line of said Block 12; thence N.89°43'30"W. 25.00 feet to the point of beginning.

Containing 12.087 acres.

Basis for Bearings: S. 89° 43' 30" E. along the Section Line, between the South 1/4 Cor. and the Southeast Corner of Section 33, T. 41 S., R. 13 W., SLB&M.

Date: April 10, 1997

REGISTERED LAND SURVEYOR No. 4492 FEREL L. CAMPBELL STATE OF UTAH

Ferel L. Campbell
332 W. 400 S.
Hurricane, Utah 84737

OWNER'S DEDICATION

Know all men by these presents that 15 the undersigned owners of the above described tract of land, having caused the same to be subdivided into lots and streets to be hereafter known as

PIONEER SUBDIVISON - (AMENDED)

do hereby dedicate for perpetual use of the public all parcels of land shown on this plat , including streets, right-of-ways, and easements as intended for public use.

In witness whereof we have hereunto set our hands this 7th Day of May A.D. 1997.

Earl Barney
Gloria L. Barney
Jason Gubler
Colleen Gubler
Laurance E. Dittman
Lorraine Dittman
Janet Bauer
Charles G. Bauer
Gaylord Oberst
Meri Oberst
Herbert C. Trader
Gloria Trader
Larin E. Cox
Dowanna Kay Cox
Kay Wright

ACKNOWLEDGEMENT

STATE OF UTAH
SS
COUNTY OF WASHINGTON

On the 7th day of May A.D. 1997 personally appeared before me the undersigned notary public in and for said County of Washington, in said State of Utah, the signers of the above owner's dedication 15 in number, who duly acknowledged to me that they signed it freely and voluntary and for the uses and purpose therein mentioned.

NOTARY PUBLIC SUSAN C. KELSEY 181 North 160 East Hurricane, UT 84737 My Commission Expires July 15th, 1999 STATE OF UTAH

Susan C. Kelsey
Notary Public
Residing in Washington County

My Commission Expires 7/15/99

BALLARD & CAMPBELL
332 West 400 South
Hurricane, Utah 84737
635-2463

PLANNING COMMISSION

APPROVED THIS 15 DAY OF Dec. A.D. 1997 BY THE CITY PLANNING COMMISSION.

David L Sorn
CHAIRMAN, PLANNING COMMISSION

CITY ENGINEER'S CERTIFICATE

I HEREBY CERTIFY THAT THIS OFFICE HAS EXAMINED THIS PLAT AND IT IS CORRECT IN ACCORDANCE WITH INFORMATION ON FILE IN THIS OFFICE.

4/8/98 DATE
Brent E. Gardner ENGINEER

APPROVAL AS TO FORM

APPROVAL AS TO FORM THIS 28th DAY OF April A.D. 1997.

CITY ATTORNEY

HURRICANE CITY COUNCIL

PRESENTED TO THE HURRICANE CITY COUNCIL THIS 4th DAY OF January A.D. 1997, AT WHICH TIME THIS PLAT WAS APPROVED AND ACCEPTED.

ATTEST: CITY RECORDER
MAYOR

RECORDED No. 600684

STATE OF UTAH COUNTY OF WASHINGTON

RECORDED AND FILED AT THE REQUEST OF: Larin E. Cox

DATE: 04-28-98 TIME: 14:10 PM BOOK: 1206 PAGE: 890

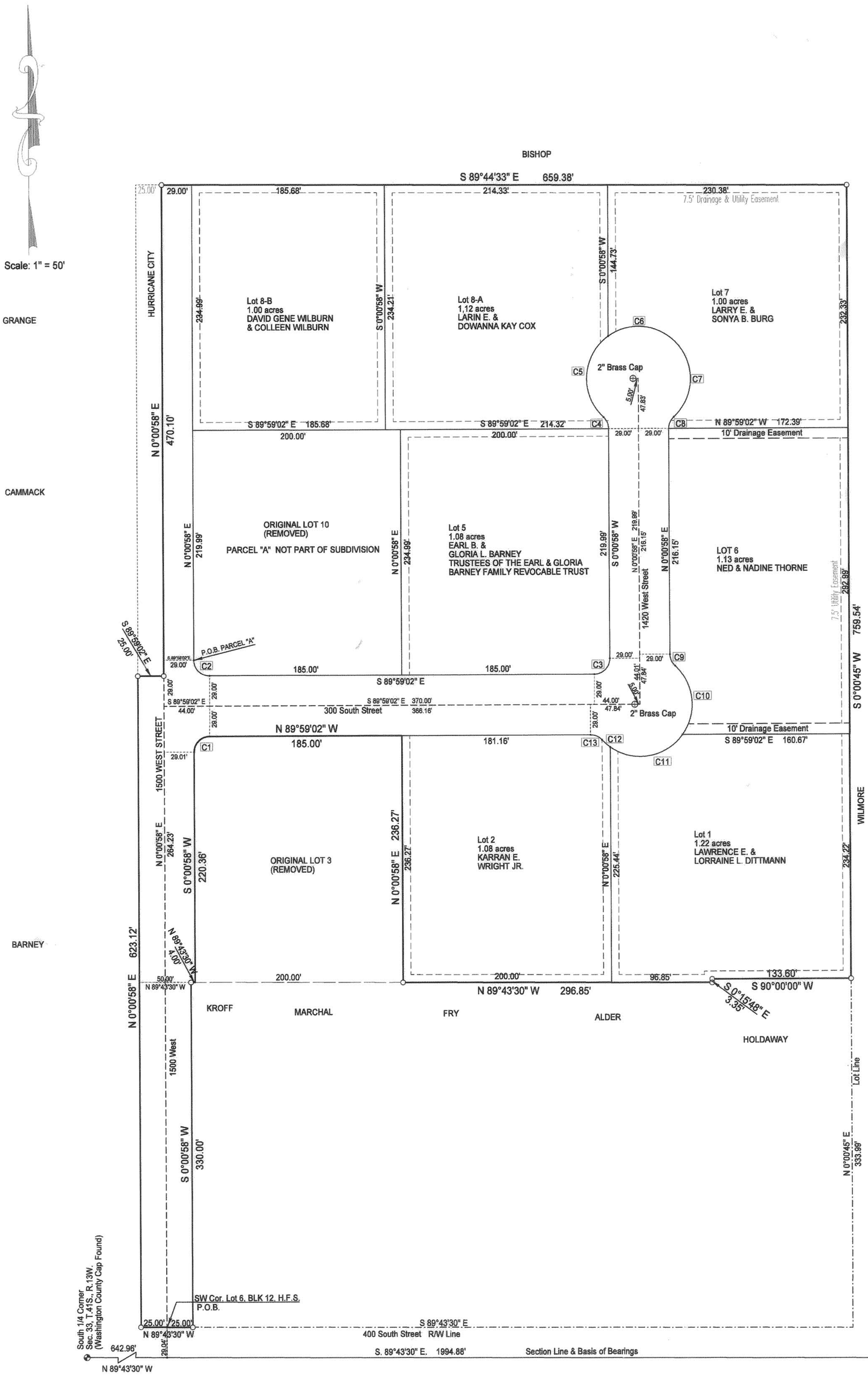
FEE: 52.00

COUNTY RECORDER

PIONEER ESTATES SUBDIVISION 2ND AMENDMENT

PART OF LOTS 5, 6, 11 AND 12 OF BLOCK 12, HURRICANE FIELD SURVEY

WITHIN THE SOUTHEAST 1/4 OF SECTION 33, TOWNSHIP 41 SOUTH, RANGE 13 WEST, SALT LAKE BASE AND MERIDIAN



SURVEYOR"S CERTIFICATE

I, Ferel L. Campbell do hereby certify that I am a registered land surveyor, holding certificate No. 4492, as prescribed by the laws of the State of Utah. I further certify that by the authority of the owners, I have made a survey of the tract of land shown on this plat and described below, and have subdivided said tract of land into lots and streets, hereafter to be known as:

PIONEER ESTATES SUBDIVISION 2ND AMENDMENT

A Parcel of Land within Section 33, Township 41 South, Range 13 West, Salt Lake Base and Merdian, Described as follows:
Beginning at the Southwest Corner of Lot 6, Block 12, HURRICANE FIELD SURVEY, and running thence N.89°43'30"W., along the Lot Line, 25.00 feet; thence N.0°00'58"E. 623.12 feet; thence S.89°59'02"E. 25.00 feet; thence N.0°00'58"E. 470.10 feet; thence S.89°44'33"E. 659.38 feet; thence S.0°00'45"W. 759.54 feet; thence S.90°00'00"W. 133.60 feet; thence S.0°15'48"E. 3.35 feet; thence N.89°43'30"W. 296.85 feet; thence N.0°00'58"E. 236.27 feet; thence N.89°59'02"W. 185.00 feet to the beginning of a 15.00 foot radius curve, concave southeasterly; thence southwesterly, to the left, along the arc of said curve, 23.57 feet, through a central angle of 90°00'59"; thence S.0°00'58"W. 220.36 feet; thence N.89°43'30"W. 4.00 feet; thence S.0°00'58"W. 330.00 feet to a point on the South boundary line of said Lot 6, and on the North right-of-line of 400 South Street; thence N.89°43'30"W., along said boundary line and right-of-way line, 25.00 feet to the point of beginning.
Containing 11.09 acres.
LESS PARCEL "A" as described: Beginning at a point N.0°00'58"E. 638.24 feet and S.89°59'02"E. 29.00 feet from the Southwest Corner of said Lot 6, and running thence N.0°00'58"E. 219.99 feet; thence S.89°59'02"E. 200.00 feet; thence S.0°00'58"W. 234.99 feet; thence N.89°59'02"W. 185.00 feet to the beginning of a 15.00 foot radius curve concave to the northeast; thence northwesterly, to the right, along the arc of said curve, 23.56 feet, through a central angle of 90°00'00" to the point of beginning.
Containing 1.08 acres, for a total in the Subdivision of 10.01 acres.

Basis for Bearings: S.89°43'30"E. between the South 1/4 Corner and the Southeast Corner of Section 33, Township 41 South, Range 13 West, Salt Lake Base and Meridian.

Date: September 8, 2005

REGISTERED LAND SURVEYOR No. 4492 FERELL. CAMPBELL STATE OF UTAH

Ferel L Campbell
332 W. 400 S.
Hurricane, Utah 84737

OWNER'S DEDICATION

Know all men by these presents that All the undersigned owners of the above described tract of land, having caused the same to be subdivided into lots and streets to be hereafter known as:

PIONEER ESTATE SUBDIVISION - 2ND AMENDMENT

do hereby dedicate for perpetual use of the public all parcels of land shown on this plat as intened for public use, including street right-of-ways and easements as established in the original PIONEER ESTATES SUBDIVISION - AMENDED.

In witness wherof they have hereunto set their hands this 12th day of December A.D. 2005.

Karran E. Wright Jr.
Lawrence E. Dittmann
Lorraine L. Dittmann
Earl B. Barney, Trustee of the Earl & Gloria Barney Family Revocable Trust
Gloria L. Barney, Trustee of the Earl & Gloria Barney Family Revocable Trust
Ned Thorne
Nadine Thorne
Larin E. Cox
Dowanna Kay Cox
David Gene Wilburn
Colleen Wilburn
Larry E. Burg
Sonya B. Burg

ACKNOWLEDGEMENT

STATE OF UTAH
SS
COUNTY OF WASHINGTON

On the 12th day of December A.D. 2005 personally appeared before me the undersigned notary public in and for said County of Washington, in said State of Utah, the signers of the above owner's dedication, 13 in number, who duly acknowledged to me that they signed it freely and voluntarily and for the uses and purposes therein mentioned.

Notary Public
Residing in Washington County

My Commission Expires 12-23-07

NOTARY PUBLIC
JULIE SIMMSKEY
260 W 530N
LA VERKIN UT 84745
COMM EXP 12/23/07
STATE OF UTAH

CURVE DATA

Id	Delta	Radius	Arc Length	Tangent	Chord
C1	90°00'59"	15.00'	23.57'	15.00'	21.22'
C2	90°00'00"	15.00'	23.56'	15.00'	21.21'
C3	90°00'00"	15.00'	23.56'	15.00'	21.21'
C4	47°20'47"	15.00'	12.40'	6.58'	12.05'
C5	101°57'10"	50.00'	88.97'	61.69'	77.69'
C6	85°24'50"	50.00'	74.54'	46.15'	67.82'
C7	87°26'12"	50.00'	76.30'	47.81'	69.11'
C8	47°20'40"	15.00'	12.39'	6.58'	12.05'
C9	47°28'34"	15.00'	12.43'	6.60'	12.08'
C10	82°49'22"	50.00'	72.28'	44.10'	66.15'
C11	90°01'37"	50.00'	78.56'	50.02'	70.73'
C12	11°56'35"	50.00'	10.42'	5.23'	10.40'
C13	47°23'47"	15.00'	12.41'	6.58'	12.06'

NOTES: THIS 2ND AMENDMENT TO PIONEER SUBDIVISION IS FOR THE PURPOSE OF DIVIDING A PORTION OF THE ONE ACRE LOTS INTO ONE-HALF ACRE LOTS, AND FOR REMOVING THE ORIGNAL LOTS, NUMBERED LOT 3 AND LOT 10, FROM THIS SUBDIVISION.

STREET MONUMENTS SET IN 1420 WEST STREET HAVE BEEN OFFSET 5' WEST OF CENTERLINE BECAUSE OF SEWER MANHOLE LOCATIONS.

LEGEND

⊕ FOUND SECTION CORNER (AS NOTED)

○ BOUNDARY MONUMENT - SET 1/2" X 18" REBAR WITH B&C CAP, MARKED LS 4492

BALLARD & CAMPBELL
332 W. 400 S.
Hurricane, Utah 84737
635-8726

HURRICANE CITY PLANNING COMMISSION

APPROVED THIS 12th DAY OF January A.D. 2005 BY THE HURRICANE CITY PLANNING COMMISSION.

Margaret Pamela Humphries
CHAIRMAN, PLANNING COMMISSION

CITY ENGINEER'S CERTIFICATE

I HEREBY CERTIFY THAT THIS OFFICE HAS EXAMINED THIS PLAT AND FOUND IT IS CORRECT IN ACCORDANCE WTIH INFORMATION ON FILE IN THIS OFFICE.

Jan. 18, 2006 DATE
CITY ENGINEER

APPROVAL AS TO FORM

APPROVAL AS TO FORM THIS 12th DAY OF June A.D. 2007.

CITY ATTORNEY

ACCEPTANCE

PRESENTED TO THE HURRICANE CITY COUNCIL THIS _____ DAY OF _____ A.D. 2005, AT WHICH TIME THIS PLAT WAS APPROVED AND ACCEPTED.

ATTEST: CITY RECORDER
CITY OF HURRICANE, UTAH

MAYOR
CITY OF HURRICANE, UTAH

DOC # 20070030286
Map (Conveying Property) Page 1 of 1
Russell Shirts Washington County Recorder
06/12/2007 03:51:35 PM Fee $ 48.00
By DIXIE TITLE CO

DEPUTY COUNTY RECORDER

PRELIMINARY SITE PLAN REVIEW APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee $200.00

For Office Use Only:
File No. 2022-PSP-03
Receipt No. 8-154977

Name: DIXIE MAN CAVES LLC **Telephone:** 435-632-3303

Address: 1101 W BLACKBERRY CIRC **Fax No.** _____

Agent (If applicable): JASON MILLER **Agent's Phone:** 435-632-3303

Email: SUNRISEELECTRIC@MSN.COM **Agent Email:** "

Address/Location of Subject Property: SAND HOLLOW ROAD

Tax ID of Subject Property: 87-4184598 **Zone District:** _____

Proposed Use: (Describe, use extra sheet if necessary) MAN CAVE STORAGE

This application shall be accompanied by the following:

_____1. A vicinity map showing the general location of the project.

_____2. Three (3) copies of a site plan showing:

- _____ Topography showing 2' contours, identification of 30% or greater slopes:
- _____ The layout of proposed uses;
- _____ Location of open space when applicable;
- _____ Proposed access to the property and traffic circulation patterns;
- _____ Adjoining properties and uses:
- _____ Proposed reservations for parks, playgrounds, school, and any other public facility sites, if any;

_____3. Preliminary utility plan, including water, sewer, and storm drainage plans, and including access points to utilities;

_____4. Tables showing the number of acres in the proposed development and a land use summary; and

_____5. A phased development plan if applicable.

_____6. Warranty deed or preliminary title report or other document (see attached Affidavit) showing evidence that the applicant has control of the property

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. Planning Commission meetings are held on the second Thursday and the fourth Wednesday of each month at 6:00 p.m. Contact the Planning Department for the deadline date for submissions. Once your application is deemed complete, it will be put on the agenda for the next Planning Commission meeting. A deadline missed due to an incomplete application could result in a month's delay.

****

(Office Use Only)

Date Received:_____ Received by: _____

Date application deemed to be complete: _____Completion determination made by:_____

PRELIMINARY SITE PLAN

PURPOSE
The site plan review process is established to encourage adequate advanced planning and assure a good quality environment for the City. Such procedure is intended to provide for orderly, harmonious, safe, and functionally efficient development consistent with priorities, values, and guidelines stated in the various elements of the Hurricane City General Plan, and the Land Use Ordinance, and to protect the general welfare of the community.

WHEN REQUIRED
The preliminary site plan review is only required on the following projects when the Zoning Administrator determines the scope of the project requires both the preliminary site plan and site plan approval.

a. Any multiple-family residential use;
b. Any public or civic use;
c. Any commercial use; or
d. Any industrial use.

The preliminary site plan is also required with a submittal of zone changes to Planned Development Overlay, or changes to an approved Planned Development Overlay.

A preliminary site plan is not intended to permit actual development of property pursuant to such plan, but is prepared merely to represent how the property could be developed. Submittal, review, and approval of an application for a preliminary site plan shall not create any vested rights to development.

Upon approval of a preliminary site plan, the applicant may prepare and submit the greater level of detail required for a site plan review application, which is required before construction may commence.

PROCESS
The preliminary site plan is submitted to the Planning and Building Department approximately 1 week and 1 day by no later than 12:00 p.m. prior to a regularly scheduled Planning Commission meeting. During this time prior to the meeting, staff will review the plan, and prepare a report and recommendation for the Planning Commission. The Planning Commission at the public meeting will review the application and staff's report, and approve, approve with conditions, or deny the preliminary site plan.

APPEALS
Since there are no vested rights with the approval of a preliminary site plan, the matter is generally not appealed. However, if an appeal is made, it would be filed with the Clerk of the Board of Adjustment located in the Planning and Building Department, and heard by the Board of Adjustment. The decision of the Board of Adjustment is final unless appealed to a court of competent jurisdiction within thirty (30) days from the date of decision of the Board of Adjustment.

AFFIDAVIT
PROPERTY OWNER

STATE OF UTAH)
:ss
COUNTY OF)

I (we),_____, being duly sworn, depose and say that I (we) am (are) the owner(s) of the property identified in the attached application and that the statements herein contained and the information provided identified in the attached plans and other exhibits are in all respects true and correct to the best of my (our) knowledge. I (we) also acknowledge that I have received written instructions regarding the process for which I am applying and the Hurricane City Planning staff have indicated they are available to assist me in making this application.

_____
(Property Owner)

_____
(Property Owner)

Subscribed and sworn to me this _____ day of _____20___.

_____
(Notary Public)

Residing in:_____

My Commission Expires:_____

Agent Authorization

I (we),_____, the owner(s) of the real property described in the attached application, do authorize as my (our) agent(s)_____ to represent me (us) regarding the attached application and to appear on my (our) behalf before any administrative or legislative body in the City considering this application and to act in all respects as our agent in matters pertaining to the attached application.

_____
(Property Owner)

_____
(Property Owner)

Subscribed and sworn to me this _____ day of _____ 20___.

_____
(Notary Public)

Residing in:_____

My Commission Expires:_____

Utah Association of REALTORS®
REALTOR®

EQUAL HOUSING OPPORTUNITY

REAL ESTATE PURCHASE CONTRACT FOR LAND

This is a legally binding Real Estate Purchase Contract ("REPC"). If you desire legal or tax advice, consult your attorney or tax advisor.

OFFER TO PURCHASE AND EARNEST MONEY DEPOSIT

On this 6 day of January, 2022 ("Offer Reference Date") Wade Foster and or Assigns ("Buyer") offers to purchase from DDD Investment LLC and Brett A Christian ("Seller") the Property described below and **[ ] delivers to the Buyer's Brokerage with this offer, or [X] agrees to deliver no later than four (4) calendar days after Acceptance (as defined in Section 23),** Earnest Money in the amount of $ 10,000.00 in the form of Check. After Acceptance of the REPC by Buyer and Seller, and receipt of the Earnest Money by the Brokerage, the Brokerage shall have four (4) calendar days in which to deposit the Earnest Money into the Brokerage Real Estate Trust Account.

Buyer's Brokerage RED ROCK REAL ESTATE Phone: 435-275-2775

Received by: _____ on _____ (Date)
(Signature above acknowledges receipt of Earnest Money)

OTHER PROVISIONS

1. PROPERTY: Approximately 3 Acres West Abbey Road Hurricane UT.
also described as: Part of parcel H-4-2-11-127 and H-4-2-11-130 to be combined as referenced on Exhibit A and E.
City of Hurricane County of Washington, State of Utah, Zip 84737 (the "Property").
Any reference below to the term "Property" shall include the Property described above, together with the Included Items and water rights/water shares, if any, referenced in Sections 1.1, and 1.3.

1.1 Included Items (specify) Bush & Gudgell Sand Hollow ManCaves concept plan

1.2 Excluded Items (specify) None

1.3 Water Service. The Purchase Price for the Property shall include all water rights/water shares, if any, that are the legal source for Seller's current culinary water service and irrigation water service, if any, to the Property. The water rights/water shares will be conveyed or otherwise transferred to Buyer at Closing by applicable deed or legal instruments. The following water rights/water shares, if applicable, are specifically excluded from this sale: _____
None

2. PURCHASE PRICE. The Purchase Price for the Property is $ 1,400,000.00. Except as provided in this Section, the Purchase Price shall be paid as provided in Sections 2(a) through 2(d) below. Any amounts shown in 2(b) and 2(d) may be adjusted as deemed necessary by Buyer and the Lender.

$ 10,000.00	**(a) Earnest Money Deposit.** Under certain conditions described in the REPC, this deposit may become totally non refundable.
$ 0	**(b) New Loan.** Buyer may apply for mortgage loan financing (the "Loan") on terms acceptable to Buyer.
$ 0	**(c) Seller Financing** (see attached Seller Financing Addendum)
$ 1,390,000.00	**(d) Balance of Purchase Price in Cash at Settlement**
$ 1,400,000.00	**PURCHASE PRICE. Total of lines (a) through (d)**

3. SETTLEMENT AND CLOSING.

3.1 Settlement. Settlement shall take place no later than the Settlement Deadline referenced in Section 24(d), or as otherwise mutually agreed by Buyer and Seller in writing. "Settlement" shall occur only when all of the following have been completed: (a) Buyer and Seller have signed and delivered to each other or to the escrow/closing office all documents required by the REPC, by the Lender, by the title insurance and escrow/closing offices, by written escrow instructions (including any split closing instructions, if applicable), or by applicable law; (b) any monies required to be paid by Buyer or Seller under these documents (except for the proceeds of any new loan) have been delivered by Buyer or Seller to the other party, or to the escrow/closing office, in the form of cash, wire transfer, cashier's check, or other form acceptable to the escrow/closing office.

3.2 Prorations. All prorations, including, but not limited to, homeowner's association dues, property taxes for the current year, rents, and interest on assumed obligations, if any, shall be made as of the Settlement Deadline referenced in Section 24(d), unless otherwise agreed to in writing by the parties. Such writing could include the settlement statement. The provisions of this Section 3.2 shall survive Closing.

3.3 Greenbelt. If any portion of the Property is presently assessed as "Greenbelt" the payment of any roll-back taxes assessed against the Property shall be paid for by: **[X] Seller [ ] Buyer [ ] Split Equally Between Buyer and Seller [ ] Other (explain)** _____

3.4 Special Assessments. Any assessments for capital improvements as approved by the HOA (pursuant to HOA governing documents) or as assessed by a municipality or special improvement district, prior to the Settlement Deadline shall be paid for by: **[X] Seller [ ] Buyer [ ] Split Equally Between Buyer and Seller [ ] Other (explain)**_____

_____

The provisions of this Section 3.4 shall survive Closing.

3.5 Fees/Costs/Payment Obligations. Unless otherwise agreed to in writing, Seller and Buyer shall each pay one-half (1/2) of the fee charged by the escrow/closing office for its services in the settlement/closing process. Tenant deposits (including any prepaid rents) shall be paid or credited by Seller to Buyer at Settlement. Buyer agrees to be responsible for homeowners' association and private and public utility service transfer fees, if any, and all utilities and other services provided to the Property after the Settlement Deadline. The escrow/closing office is authorized and directed to withhold from Seller's proceeds at Closing, sufficient funds to pay off on Seller's behalf all mortgages, trust deeds, judgments, mechanic's liens, tax liens and warrants. The provisions of this Section 3.5 shall survive Closing.

3.6 Closing. For purposes of the REPC, "Closing" means that: (a) Settlement has been completed; (b) the proceeds of any new loan have been delivered by the Lender to Seller or to the escrow/closing office; and (c) the applicable Closing documents have been recorded in the office of the county recorder. The actions described in 3.6 (b) and (c) shall be completed within four calendar days after Settlement.

4. POSSESSION. Seller shall deliver physical possession of the Property to Buyer as follows: **[X] Upon Closing**; **[ ] _____Hours after Closing; [ ] ___ Calendar Days after Closing; [ ] Other (explain)**_____

_____

Any contracted rental of the Property prior to or after Closing, between Buyer and Seller, shall be by separate written agreement. Seller and Buyer shall each be responsible for any insurance coverage each party deems necessary for the Property. Seller agrees to deliver the Property to Buyer free of debris and personal belongings. The provisions of this Section 4 shall survive Closing.

5. CONFIRMATION OF AGENCY DISCLOSURE. Buyer and Seller acknowledge prior written receipt of agency disclosure provided by their respective agent that has disclosed the agency relationships confirmed below. At the signing of the REPC:

Seller's Agent David Nasal, represents **[X] Seller [ ] both Buyer and Seller as a Limited Agent;**
Seller's Brokerage Investment Property Real Estate, represents **[X] Seller [ ] both Buyer and Seller as a Limited Agent;**
Buyer's Agent BLAKE YOUD, represents **[X] Buyer [ ] both Buyer and Seller as a Limited Agent;**
Buyer's Brokerage RED ROCK REAL ESTATE, represents **[X] Buyer [ ] both Buyer and Seller as a Limited Agent.**

6. TITLE & TITLE INSURANCE.

6.1 Title to Property. Seller represents that Seller has fee title to the Property and will convey marketable title to the Property to Buyer at Closing by general warranty deed. Buyer does agree to accept title to the Property subject to the contents of the Commitment for Title Insurance (the "Commitment") provided by Seller under Section 7, and as reviewed and approved by Buyer under Section 8. Buyer also agrees to accept title to the Property subject to any existing leases rental and property management agreements affecting the Property not expiring prior to Closing which were provided to Buyer pursuant to Section 7(e). The provisions of this Section 6.1 shall survive Closing.

6.2 Title Insurance. At Settlement, Seller agrees to pay for and cause to be issued in favor of Buyer, through the title insurance agency that issued the Commitment, the most current version of an ALTA standard coverage owner's policy of title insurance. Any additional title insurance coverage desired by Buyer shall be at Buyer's expense.

7. SELLER DISCLOSURES. No later than the Seller Disclosure Deadline referenced in Section 24(a), Seller shall provide to Buyer the following documents in hard copy or electronic format which are collectively referred to as the "Seller Disclosures":

(a) a written Seller Property Condition Disclosure (Land) for the Property, completed, signed and dated by Seller as provided in Section10.2;
(b) a Commitment for Title Insurance as referenced in Section 6.1;
(c) a copy of any restrictive covenants (CC&R's), rules and regulations affecting the Property;
(d) a copy of the most recent minutes, budget and financial statement for the homeowners' association, if any;
(e) a copy of any lease, rental, and property management agreements affecting the Property not expiring prior to Closing;

(f) evidence of any water rights and/or water shares referenced in Section 1.3;
(g) written notice of any claims and/or conditions known to Seller relating to environmental problems; and violation of any CC&R's, federal, state or local laws, and building or zoning code violations; and
(h) Other (specify) _____

8. BUYER'S CONDITIONS OF PURCHASE.

8.1 DUE DILIGENCE CONDITION. Buyer's obligation to purchase the Property: **[X] IS [ ] IS NOT** conditioned upon Buyer's Due Diligence as defined in this Section 8.1(a) below. This condition is referred to as the "Due Diligence Condition." If checked in the affirmative, Sections 8.1(a) through 8.1(c) apply; otherwise they do not.

(a) Due Diligence Items. Buyer's Due Diligence shall consist of Buyer's review and approval of the contents of the Seller Disclosures referenced in Section 7, and any other tests, evaluations and verifications of the Property deemed necessary or appropriate by Buyer, such as: the physical condition of the Property; the existence of any hazardous substances, environmental issues or geologic conditions; the square footage or acreage of the Property; the costs and availability of flood insurance, if applicable; water source, availability and quality; the location of property lines; regulatory use restrictions or violations; fees for services such as HOA dues, municipal services, and utility costs; convicted sex offenders residing in proximity to the Property; and any other matters deemed material to Buyer in making a decision to purchase the Property. Unless otherwise provided in the REPC, all of Buyer's Due Diligence shall be paid for by Buyer and shall be conducted by individuals or entities of Buyer's choice. Seller agrees to cooperate with Buyer's Due Diligence. Buyer agrees to pay for any damage to the Property resulting from any such inspections or tests during the Due Diligence.

(b) Buyer's Right to Cancel or Resolve Objections. If Buyer determines, in Buyer's sole discretion, that the results of the Due Diligence are unacceptable, Buyer may either: (i) no later than the Due Diligence Deadline referenced in Section 24(b), cancel the REPC by providing written notice to Seller, whereupon the Earnest Money Deposit shall be released to Buyer without the requirement of further written authorization from Seller; or (ii) no later than the Due Diligence Deadline referenced in Section 24(b), resolve in writing with Seller any objections Buyer has arising from Buyer's Due Diligence.

(c) Failure to Cancel or Resolve Objections. If Buyer fails to cancel the REPC or fails to resolve in writing any objections Buyer has arising from Buyer's Due Diligence, as provided in Section 8.1(b), Buyer shall be deemed to have waived the Due Diligence Condition.

8.2 APPRAISAL CONDITION. Buyer's obligation to purchase the Property: **[ ] IS [X] IS NOT** conditioned upon the Property appraising for not less than the Purchase Price. This condition is referred to as the "Appraisal Condition." If checked in the affirmative, Sections 8.2(a) and 8.2(b) apply; otherwise they do not.

(a) Buyer's Right to Cancel. If after completion of an appraisal by a licensed appraiser, Buyer receives written notice from the Lender or the appraiser that the Property has appraised for less than the Purchase Price (a "Notice of Appraised Value"), Buyer may cancel the REPC by providing written notice to Seller (with a copy of the Notice of Appraised Value) no later than the Financing & Appraisal Deadline referenced in Section 24(c); whereupon the Earnest Money Deposit shall be released to Buyer without the requirement of further written authorization from Seller.

(b) Failure to Cancel. If the REPC is not cancelled as provided in this section 8.2(a), Buyer shall be deemed to have waived the Appraisal Condition.

8.3 FINANCING CONDITION. Buyer's obligation to purchase the property: **[ ] IS [X] IS NOT** conditioned upon Buyer obtaining the Loan referenced in Section 2(b). This condition is referred to as the "Financing Condition." If checked in the affirmative, Sections 8.3(a) and 8.3(b) apply; otherwise they do not. If the Financing Condition applies, Buyer agrees to work diligently and in good faith to obtain the Loan.

(a) Buyer's Right to Cancel Before the Financing & Appraisal Deadline. If Buyer, in Buyer's sole discretion, is not satisfied with the terms and conditions of the Loan, Buyer may cancel the REPC by providing written notice to Seller no later than the Financing & Appraisal Deadline referenced in Section 24(c); whereupon the Earnest Money Deposit shall be released to Buyer without the requirement of further written authorization from Seller.

(b) Buyer's Right to Cancel After the Financing & Appraisal Deadline. If after expiration of the Financing & Appraisal Deadline referenced in Section 24(c), Buyer fails to obtain the Loan, meaning that the proceeds of the Loan have not been delivered by the Lender to Seller or to the escrow/closing office as required under Section 3.6 of the REPC, then Buyer or Seller may cancel the REPC by providing written notice to the other party; whereupon the Earnest Money Deposit, or Deposits, if applicable (see Section 8.4 below), shall be released to Seller without the requirement of further written authorization from Buyer. In the event of such cancellation, Seller agrees to accept as Seller's exclusive remedy, the Earnest Money Deposit, or Deposits, if applicable, as liquidated damages. Buyer and Seller agree that liquidated damages would be difficult and impractical to calculate, and the Earnest Money Deposit, or Deposits, if applicable, is a fair and reasonable estimate of Seller's damages in the event Buyer fails to obtain the Loan.

8.4 ADDITIONAL EARNEST MONEY DEPOSIT. If the REPC has not been previously cancelled by Buyer as provided in Sections 8.1, 8.2 or 8.3(a), then no later than the Due Diligence Deadline referenced in Section 24(b), or the Financing & Appraisal Deadline referenced in Section 24(c), whichever is later, Buyer: **[ ] WILL [X] WILL NOT** deliver to the Buyer's Brokerage, an Additional Earnest Money Deposit in the amount of $_____. The Earnest Money Deposit and the Additional Earnest Money Deposit, if applicable, are sometimes referred to herein as the "Deposits". The Earnest Money Deposit, or Deposits, if applicable, shall be credited toward the Purchase Price at Closing.

9. ADDENDA. There **[X] ARE [ ] ARE NOT** addenda to the REPC containing additional terms. If there are, the terms of the following addenda are incorporated into the REPC by this reference: **[X] Addendum No.** 1
[ ] Seller Financing Addendum [X] Other (specify) Exhibits A & E

10. AS-IS CONDITION OF PROPERTY.

10.1 Condition of Property/Buyer Acknowledgements. Buyer acknowledges and agrees that in reference to the physical condition of the Property: (a) Buyer is purchasing the Property in its "As-Is" condition without expressed or implied warranties of any kind; (b) Buyer shall have, during Buyer's Due Diligence as referenced in Section 8.1, an opportunity to completely inspect and evaluate the condition of the Property; and (c) if based on the Buyer's Due Diligence, Buyer elects to proceed with the purchase of the Property, Buyer is relying wholly on Buyer's own judgment and that of any contractors or inspectors engaged by Buyer to review, evaluate and inspect the Property.

10.2 Condition of Property/Seller Acknowledgements. Seller acknowledges and agrees that in reference to the physical condition of the Property, Seller agrees to: (a) disclose in writing to Buyer defects in the Property known to Seller that materially affect the value of the Property that cannot be discovered by a reasonable inspection by an ordinary prudent Buyer; (b) carefully review, complete, and provide to Buyer a written Seller Property Condition Disclosure (Land) as stated in Section 7(a); and (c) deliver the Property to Buyer in substantially the same general condition as it was on the date of Acceptance, as defined in Section 23. The provisions of Sections 10.1 and 10.2 shall survive Closing.

11. FINAL PRE-SETTLEMENT INSPECTION.

11.1 Pre-Settlement Inspection. At any time prior to Settlement, Buyer may conduct a final pre-Settlement inspection of the Property to determine only that the Property is "as represented," meaning that the items referenced in Sections 1.1, 1.3 and 8.1(b)(ii) ("the items") are respectively present, repaired or corrected as agreed. The failure to conduct a pre-Settlement inspection or to claim that an item is not as represented shall not constitute a waiver by Buyer of the right to receive, on the date of possession, the items as represented. If the items are not as represented, Seller agrees to cause all applicable items to be corrected, repaired or replaced (the "Work") prior to the Settlement Deadline referenced in Section 24(d).

11.2 Escrow to Complete the Work. If, as of Settlement, the Work has not been completed, then Buyer and Seller agree to withhold in escrow at Settlement a reasonable amount agreed to by Seller, Buyer (and Lender, if applicable), sufficient to pay for completion of the Work. If the Work is not completed within thirty (30) calendar days after the Settlement Deadline, the amount so escrowed may, subject to Lender's approval, be released to Buyer as liquidated damages for failure to complete the Work. The provisions of this Section 11.2 shall survive Closing.

12. CHANGES DURING TRANSACTION. Seller agrees that from the date of Acceptance until the date of Closing, none of the following shall occur without the prior written consent of Buyer: (a) no changes in any leases, rental or property management agreements shall be made; (b) no new lease, rental or property management agreements shall be entered into; (c) no substantial alterations or improvements to the Property shall be made or undertaken; (d) no further financial encumbrances to the Property shall be made, and (e) no changes in the legal title to the Property shall be made.

13. AUTHORITY OF SIGNERS. If Buyer or Seller is a corporation, partnership, trust, estate, limited liability company or other entity, the person signing the REPC on its behalf warrants his or her authority to do so and to bind Buyer and Seller.

14. COMPLETE CONTRACT. The REPC together with its addenda, any attached exhibits, and Seller Disclosures (collectively referred to as the "REPC"), constitutes the entire contract between the parties and supersedes and replaces any and all prior negotiations, representations, warranties, understandings or contracts between the parties whether verbal or otherwise. The REPC cannot be changed except by written agreement of the parties.

15. MEDIATION. Any dispute relating to the REPC arising prior to or after Closing: **[X] SHALL [ ] MAY AT THE OPTION OF THE PARTIES** first be submitted to mediation. Mediation is a process in which the parties meet with an impartial person who helps to resolve the dispute informally and confidentially. Mediators cannot impose binding decisions. The parties to the dispute must agree before any settlement is binding. The parties will jointly appoint an acceptable mediator and share equally in the cost of such mediation. If mediation fails, the other procedures and remedies available under the REPC shall apply. Nothing in this Section 15 prohibits any party from seeking emergency legal or equitable relief, pending mediation. The provisions of this Section 15 shall survive Closing.

16. DEFAULT.

16.1 Buyer Default. If Buyer defaults, Seller may elect one of the following remedies: (a) cancel the REPC and retain the Earnest Money Deposit, or Deposits, if applicable, as liquidated damages; (b) maintain the Earnest Money Deposit, or Deposits, if applicable, in trust and sue Buyer to specifically enforce the REPC; or (c) return the Earnest Money Deposit, or Deposits, if applicable, to Buyer and pursue any other remedies available at law.

16.2 Seller Default. If Seller defaults, Buyer may elect one of the following remedies: (a) cancel the REPC, and in addition to the return of the Earnest Money Deposit, or Deposits, if applicable, Buyer may elect to accept from Seller, as liquidated damages, a sum equal to the Earnest Money Deposit, or Deposits, if applicable; or (b) maintain the Earnest Money Deposit, or Deposits, if applicable, in trust and sue Seller to specifically enforce the REPC; or (c) accept a return of the Earnest Money Deposit, or Deposits, if applicable, and pursue any other remedies available at law. If Buyer elects to accept liquidated damages, Seller agrees to pay the liquidated damages to Buyer upon demand.

17. ATTORNEY FEES AND COSTS/GOVERNING LAW. In the event of litigation or binding arbitration to enforce the REPC, the prevailing party shall be entitled to costs and reasonable attorney fees. However, attorney fees shall not be awarded for participation in mediation under Section 15. This contract shall be governed by and construed in accordance with the laws of the State of Utah. The provisions of this Section 17 shall survive Closing.

18. NOTICES. Except as provided in Section 23, all notices required under the REPC must be: (a) in writing; (b) signed by the Buyer or Seller giving notice; and (c) received by the Buyer or the Seller, or their respective agent, or by the brokerage firm representing the Buyer or Seller, no later than the applicable date referenced in the REPC.

19. NO ASSIGNMENT. The REPC and the rights and obligations of Buyer hereunder, are personal to Buyer. The REPC may not be assigned by Buyer without the prior written consent of Seller. Provided, however, the transfer of Buyer's interest in the REPC to any business entity in which Buyer holds a legal interest, including, but not limited to, a family partnership, family trust, limited liability company, partnership, or corporation (collectively referred to as a "Permissible Transfer"), shall not be treated as an assignment by Buyer that requires Seller's prior written consent. Furthermore, the inclusion of "and/or assigns" or similar language on the line identifying Buyer on the first page of the REPC shall constitute Seller's written consent only to a Permissible Transfer.

20. INSURANCE & RISK OF LOSS.

20.1 Insurance Coverage. As of Closing, Buyer shall be responsible to obtain such casualty and liability insurance coverage on the Property in amounts acceptable to Buyer and Buyer's Lender, if applicable.

20.2 Risk of Loss. If prior to Closing, any part of the Property is damaged or destroyed by fire, vandalism, flood, earthquake, or act of God, the risk of such loss or damage shall be borne by Seller; provided however, that if the cost of repairing such loss or damage would exceed ten percent (10%) of the Purchase Price referenced in Section 2, Buyer may elect to either: (i) cancel the REPC by providing written notice to the other party, in which instance the Earnest Money, or Deposits, if applicable, shall be returned to Buyer; or (ii) proceed to Closing, and accept the Property in its "As-Is" condition.

21. TIME IS OF THE ESSENCE. Time is of the essence regarding the dates set forth in the REPC. Extensions must be agreed to in writing by all parties. Unless otherwise explicitly stated in the REPC: (a) performance under each Section of the REPC which references a date shall absolutely be required by 5:00 PM Mountain Time on the stated date; and (b) the term "days" and "calendar days" shall mean calendar days and shall be counted beginning on the day following the event which triggers the timing requirement (e.g. Acceptance). Performance dates and times referenced herein shall not be binding upon title companies, lenders, appraisers and others not parties to the REPC, except as otherwise agreed to in writing by such non-party.

22. ELECTRONIC TRANSMISSION AND COUNTERPARTS. Electronic transmission (including email and fax) of a signed copy of the REPC, any addenda and counteroffers, and the retransmission of any signed electronic transmission shall be the same as delivery of an original. The REPC and any addenda and counteroffers may be executed in counterparts.

23. ACCEPTANCE. "Acceptance" occurs **only** when **all** of the following have occurred: (a) Seller or Buyer has signed the offer or counteroffer where noted to indicate acceptance; and (b) Seller or Buyer or their agent has communicated to the other party or to the other party's agent that the offer or counteroffer has been signed as required.

24. CONTRACT DEADLINES. Buyer and Seller agree that the following deadlines shall apply to the REPC:

(a) Seller Disclosure Deadline	01/15/2022	(Date)
(b) Due Diligence Deadline	02/19/2022	(Date)
(c) Financing & Appraisal Deadline	NA	(Date)
(d) Settlement Deadline	02/28/2022	(Date)

25. OFFER AND TIME FOR ACCEPTANCE. Buyer offers to purchase the Property on the above terms and conditions. If Seller does not accept this offer by: 3:00 **[ ] AM [X] PM** Mountain Time on 01/07/2022 (Date), this offer shall lapse; and the Brokerage shall return any Earnest Money Deposit to Buyer.

(Buyer's Signature) (Offer Date) (Buyer's Signature) (Offer Date)

(Buyer's Names) **(PLEASE PRINT)** (Notice Address) (Zip Code) (Phone)

(Buyer's Names) **(PLEASE PRINT)** (Notice Address) (Zip Code) (Phone)

ACCEPTANCE/COUNTEROFFER/REJECTION

CHECK ONE:

[ ] ACCEPTANCE OF OFFER TO PURCHASE: Seller Accepts the foregoing offer on the terms and conditions specified above.

[ ] COUNTEROFFER: Seller presents for Buyer's Acceptance the terms of Buyer's offer subject to the exceptions or modifications as specified in the attached ADDENDUM NO. _____.

[ ] REJECTION: Seller rejects the foregoing offer.

(Seller's Signature) (Date) (Time) (Seller's Signature) (Date) (Time)

(Seller's Names) **(PLEASE PRINT)** (Notice Address) (Zip Code) (Phone)

(Seller's Names) **(PLEASE PRINT)** (Notice Address) (Zip Code) (Phone)

This form is COPYRIGHTED by the UTAH ASSOCIATION OF REALTORS® for use solely by its members. Any unauthorized use, modification, copying or distribution without written consent is prohibited. NO REPRESENTATION IS MADE AS TO THE LEGAL VALIDITY OR ADEQUACY OF ANY PROVISION OF THIS FORM IN ANY SPECIFIC TRANSACTION. IF YOU DESIRE SPECIFIC LEGAL OR TAX ADVICE, CONSULT AN APPROPRIATE PROFESSIONAL.

COPYRIGHT© UTAH ASSOCIATION OF REALTORS® - 7.4.04 - REVISED – 4.22.10 - ALL RIGHTS RESERVED **UAR FORM 19**

ADDENDUM NO. 1
TO
REAL ESTATE PURCHASE CONTRACT

THIS IS AN [X] ADDENDUM [ ] COUNTEROFFER to that REAL ESTATE PURCHASE CONTRACT (the "REPC") with an Offer Reference Date of 01/06/2022, including all prior addenda and counteroffers, between Wade Foster and or Assigns as Buyer, and DDD Investments LLC and Brett A Christian as Seller, regarding the Property located at Part of H-4-2-11-127 and part of H-4-2-11-130. The following terms are hereby incorporated as part of the REPC:

1. This offer is made subject to Hurricane City Council approving the 33 unit Mancave concept drawing as noted on Exhibit A, located on the properties as outlined in the Exhibits A & E, within the due diligence deadline. In the event that there are unavoidable delays on part of the engineer or Hurricane City Council, the seller agrees to extend the due diligence deadline to accommodate the additional time that may be required.
2. Upon Hurricane City approval, seller will provide a correct legal description and boundary survey of the property.
3. Seller to provide the engineering design and construction bid for the Abbey road construction and other items, buyer deems necessary for the buyer's due diligence.
4. Buyer to pay an additional $100,000 at closing for Abbey Road improvements that have been approved by Hurricane City and will commence prior to closing.
5. One or more principals in this transaction hold an active Utah real estate license.

To the extent the terms of this ADDENDUM modify or conflict with any provisions of the REPC, including all prior addenda and counteroffers, these terms shall control. All other terms of the REPC, including all prior addenda and counteroffers, not modified by this ADDENDUM shall remain the same. **[X] Seller [ ] Buyer** shall have until 3:00 **[ ] AM [X] PM** Mountain Time on 01/07/2022 (Date), to accept the terms of this ADDENDUM in accordance with the provisions of Section 23 of the REPC. Unless so accepted, the offer as set forth in this ADDENDUM shall lapse.

[ ] Buyer [ ] Seller Signature (Date) (Time)

[ ] Buyer [ ] Seller Signature (Date) (Time)

ACCEPTANCE/COUNTEROFFER/REJECTION

CHECK ONE:

[ ] ACCEPTANCE: [ ] Seller [ ] Buyer hereby accepts the terms of this ADDENDUM.

[ ] COUNTEROFFER: [ ] Seller [ ] Buyer presents as a counteroffer the terms of attached ADDENDUM NO. ____.

(Signature) (Date) (Time) (Signature) (Date) (Time)

[ ] REJECTION: [ ] Seller [ ] Buyer rejects the foregoing ADDENDUM.

(Signature) (Date) (Time) (Signature) (Date) (Time)

THIS FORM APPROVED BY THE UTAH REAL ESTATE COMMISSION AND THE OFFICE OF THE UTAH ATTORNEY GENERAL, EFFECTIVE JANUARY 1, 2020. IT REPLACES AND SUPERSEDES ALL PREVIOUSLY APPROVED VERSIONS OF THIS FORM.

PRELIMINARY PLAT APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $150.00

For Office Use Only:
File No. _____
Receipt No. _____

Name: Dixie Mesa Caves LLC **Telephone:** 435-632-3303

Address: 1101 W blackberry Circle **Fax No.** _____

Email: SUNRISEELDER@msn.com **Agent Email:** _____

Agent (If Applicable): _____ **Telephone:** _____

Address/Location of Subject Property: Scho Hollow Rd

_____

Tax ID of Subject Property: 87-416456 **Zone District:** GC

Proposed Use: (Describe, use extra sheet if necessary. Include total number of lots) _____

_____

Submittal Requirements: The preliminary plat application shall provide the following:

_____1. Description: In a title block located in the lower right-hand corner of the sheet the following is required:
- _____a. The proposed name of the subdivision.
- _____b. The location of the subdivision, including the address and section, township and range.
- _____c. The names and addresses of the owner or subdivider, if other than the owner.
- _____d. Date of preparation, and north point.
- _____e. Scale shall be of sufficient size to adequately describe in legible form, all required conditions of Chapter 39, City Subdivision regulations.

_____2. Existing Conditions: The preliminary plat shall show:
- _____a. The location of the nearest monument.
- _____b. The boundary of the proposed subdivision and the acreage included.
- _____c. All property under the control of the subdivider, even though only a portion is being subdivided. (Where the plat submitted covers only a part of the subdivider's tract, a sketch of the prospective street system of the unplatted parts of the subdivider's land shall be submitted, and the street system of the part submitted shall be considered in light of existing Master Street Plan or other Commission studies.)
- _____d. The location, width and names/numbers of all existing streets within two hundred (200) feet of the subdivision and of all prior streets or other public ways, utility rights of way, parks and other public open spaces, within and adjacent to the tract.
- _____e. The location of all wells and springs or seeps, proposed, active and abandoned, and of all reservoirs or ponds within the tract and at a distance of at least one hundred feet (100') beyond the tract boundaries.
- _____f. Existing sewers, water mains, culverts or other underground facilities within the tract, indicating the pipe sizes, grades, manholes and the exact locations.

_____g. Existing Hurricane Canal Company facilities; other ditches, canals, natural drainage channels and open waterways and any proposed realignments.

_____h. Contours at vertical intervals not greater than five (5) feet.

____i. Identification of potential geotechnical constraints on the project site (such as expansive rock and soil, collapsible soil, shallow bedrock and caliche, gypsiferous rock and soil, potentially unstable rock or soil units including fault lines, shallow groundwater, and windblown sand) and recommendations for their mitigation.

____j. Information on whether property is located in desert tortoise take area

_____3. Proposed Plan: The subdivision plans shall show:

_____a. The layout of streets, showing location, widths, and other dimensions of proposed streets, crosswalks, alleys and easements.

_____b. The layout, numbers and typical dimensions of lots.

_____c. Parcels of land intended to be dedicated or temporarily reserved for public use or set aside for use of property owners in the subdivision.

_____d. Easements for water, sewers, drainage, utilities, lines and other purposes.

_____e. Typical street cross sections and street grades where required by the Planning Commission. (All street grades over 5% should be noted on the preliminary plat)

_____f. A tentative plan or method by which the subdivider proposes to handle the storm water drainage for the subdivision.

_____g. Approximate radius of all center line curves on highways or streets.

_____h. Each lot shall abut a street shown on the subdivision plat or on an existing publicly-dedicated street. (Double frontage or flag lots shall be prohibited except where conditions make other design undesirable)

_____i. In general, all remnants of lots below minimum size left over after subdividing of a larger tract must be added to adjacent lots, rather than allow to remain as unusable parcels.

_____j. Where necessary, copies of any agreements with adjacent property owners relevant to the proposed subdivision shall be presented to the Planning Commission.

_____k. A letter from both the local sanitary sewer provider and culinary water provider indicating availability of service.

_____l. Will this subdivision be phased? If yes show possible phasing lines.

____ m. A tentative plan or method for providing non-discriminatory access to the subdivision for purposes of placement of communications infrastructure, and for purposes of placement of utility infrastructure.

_____4. Required copies of plans:

_____a. Three copies of all full scale drawings

_____b. One copy of each drawing on a 11 x 17 inch sheets. (8 ½ x 11 is acceptable if the project is small and the plans are readable at that size).

5. Warranty deed or preliminary title report or other document (see attached Affidavit) showing evidence that the applicant has control of the property

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. A deadline missed due to an incomplete application, could result in a month's delay. Planning Commission meetings are held on the second Thursday and fourth Wednesday of each month at 6:00 p.m. The deadline to submit an application to be placed on an agenda is no later than <u>12:00 noon</u> 10 full business days before the Planning Commission meeting at which you plan for your application to be heard.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete:_____ Completion determination made by: _____

PURPOSE

The preliminary plat application is the first step in land development process in those instances where land is divided for eventual sale. The process is established to insure that all proposed divisions of land conform to the City General Plan and to adopted development standards of the Land Use Ordinance.

WHEN REQUIRED

The preliminary plat is required any time land is to be divided, re-subdivided or proposed to be divided into two (2) or more lots, parcels, sites, units, plots or other division of land for the purpose, whether immediate or future, for offer, sale, lease or development either on installment plan or upon any and all other plans, terms and conditions. It is not required on agricultural divisions where the agricultural parcel is divided to be combined with another agricultural parcel, nor is it required when two un-subdivided properties are merged, or where the boundary between two un-subdivided properties are adjusted.

The preliminary plat must be approved before a final plat can be processed and recorded.

Subdivision approval process:

- Determine current zoning for property.
- If zoning fits desired subdivision, meet with Planning staff to discussed the proposed project.
- Obtain a preliminary plat application form and complete the application and have a plat prepared by an engineer to meet the requirements on the preliminary plat application.
- Submit completed application, preliminary plat, and required $150 fee to Planning Department before noon on the Wednesday two weeks before desired Planning Commission meeting. (see submittal dates sheet)
- Appear at the scheduled Planning Commission meeting to discuss preliminary plat, hear comments, answer questions, and receive recommendation of approval or disapproval from Planning Commission.
- Appear at the next scheduled City Council meeting that occurs after the Planning Commission meeting at which a recommendation was received. Hear City Council comments, answer questions, and receive City Council decision. City Council can approve the plat with conditions, recommend changes and send it back to the Planning Commission, or deny the plat.

If the preliminary plat is approved, have construction drawings for utilities and streets prepared by an engineer according to Hurricane City standards. Construction drawings must be approved by both the Hurricane Joint Utilities Committee and the Ash Creek Special Service District. Approval means changes are made and all required signatures are obtained.

Once the preliminary plat is approved by the City Council, the applicant has one year after receiving approval of the preliminary plat to submit the final plat to the Planning Commission for action. The Planning Commission may authorize a one-year time extension, provided the extension request is made before the one year time limit is reached. The Planning Commission will review and make recommendation to the City Council on the final plat when submitted. The City Council will typically review the Planning Commission recommendation within 1-2 weeks after the Commission action on the final plat.

APPEALS

The Planning Commission makes a recommendation to the City Council, so there is no appeal. The City Council's action on a preliminary plat is final unless appealed to the appropriate court.

AFFIDAVIT
PROPERTY OWNER

STATE OF UTAH)
:ss
COUNTY OF)

I (we),_____, being duly sworn, depose and say that I (we) am (are) the owner(s) of the property identified in the attached application and that the statements herein contained and the information provided identified in the attached plans and other exhibits are in all respects true and correct to the best of my (our) knowledge. I (we) also acknowledge that I have received written instructions regarding the process for which I am applying and the Hurricane City Planning staff have indicated they are available to assist me in making this application.

_____
(Property Owner)

_____
(Property Owner)

Subscribed and sworn to me this _____ day of _____20___.

_____
(Notary Public)

Residing in:_____

My Commission Expires:_____

Agent Authorization

I (we),_____, the owner(s) of the real property described in the attached application, do authorize as my (our) agent(s)_____ to represent me (us) regarding the attached application and to appear on my (our) behalf before any administrative or legislative body in the City considering this application and to act in all respects as our agent in matters pertaining to the attached application.

_____
(Property Owner)

_____
(Property Owner)

Subscribed and sworn to me this _____ day of _____ 20___.

_____
(Notary Public)

Residing in:_____

My Commission Expires:_____

SAND HOLLOW MANCAVES
ABBEY ROAD
HURRICANE, UTAH

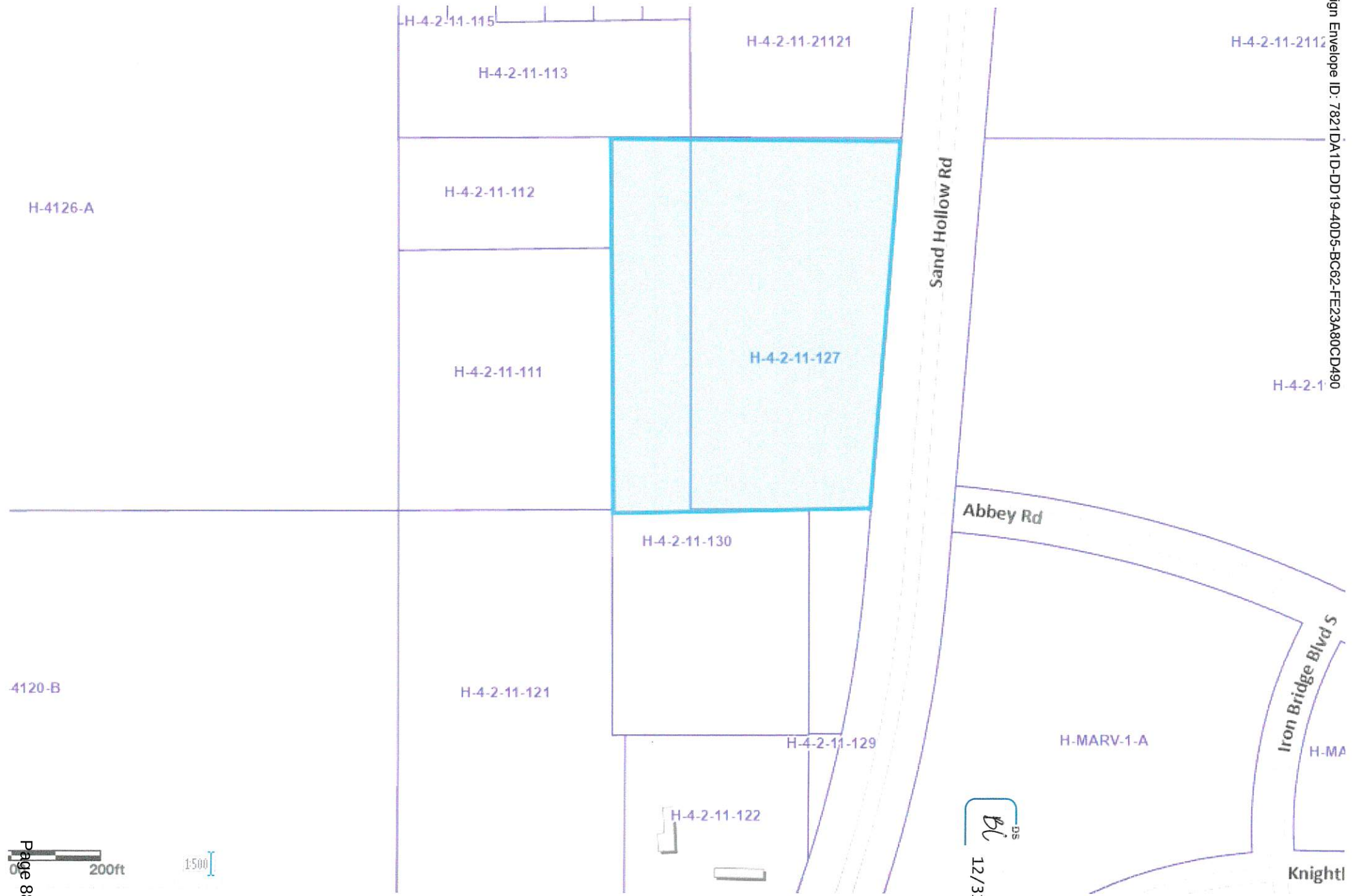
SHEET 1 of 1 SHEETS
PLS211167

DATE: 11/04/2021
DRAWN: TSC
APPROVED:
SCALE: 1" = 20'
JOB NO. 211167

BUSH & GUDGELL, INC.
Engineers - Planners - Surveyors
205 East Tabernacle Suite #4
St. George, Utah 84770
Phone (435) 673-2337 / Fax (435) 673-3161
www.bushandgudgell.com

No.	Date	By	Revision

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.



DocuSign Envelope ID: 7821DA1D-DD19-40D5-BC62-FE23A80CD490

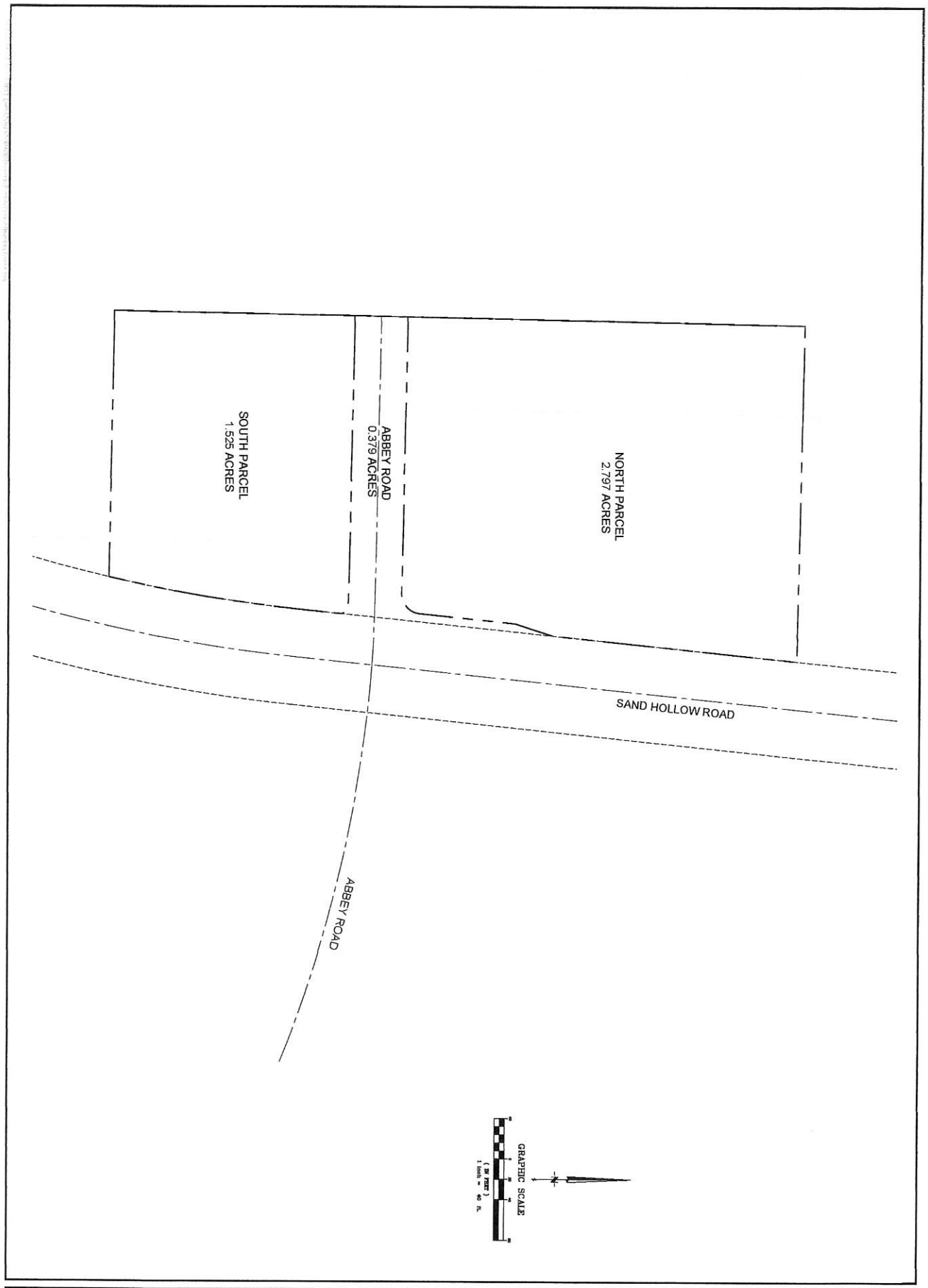


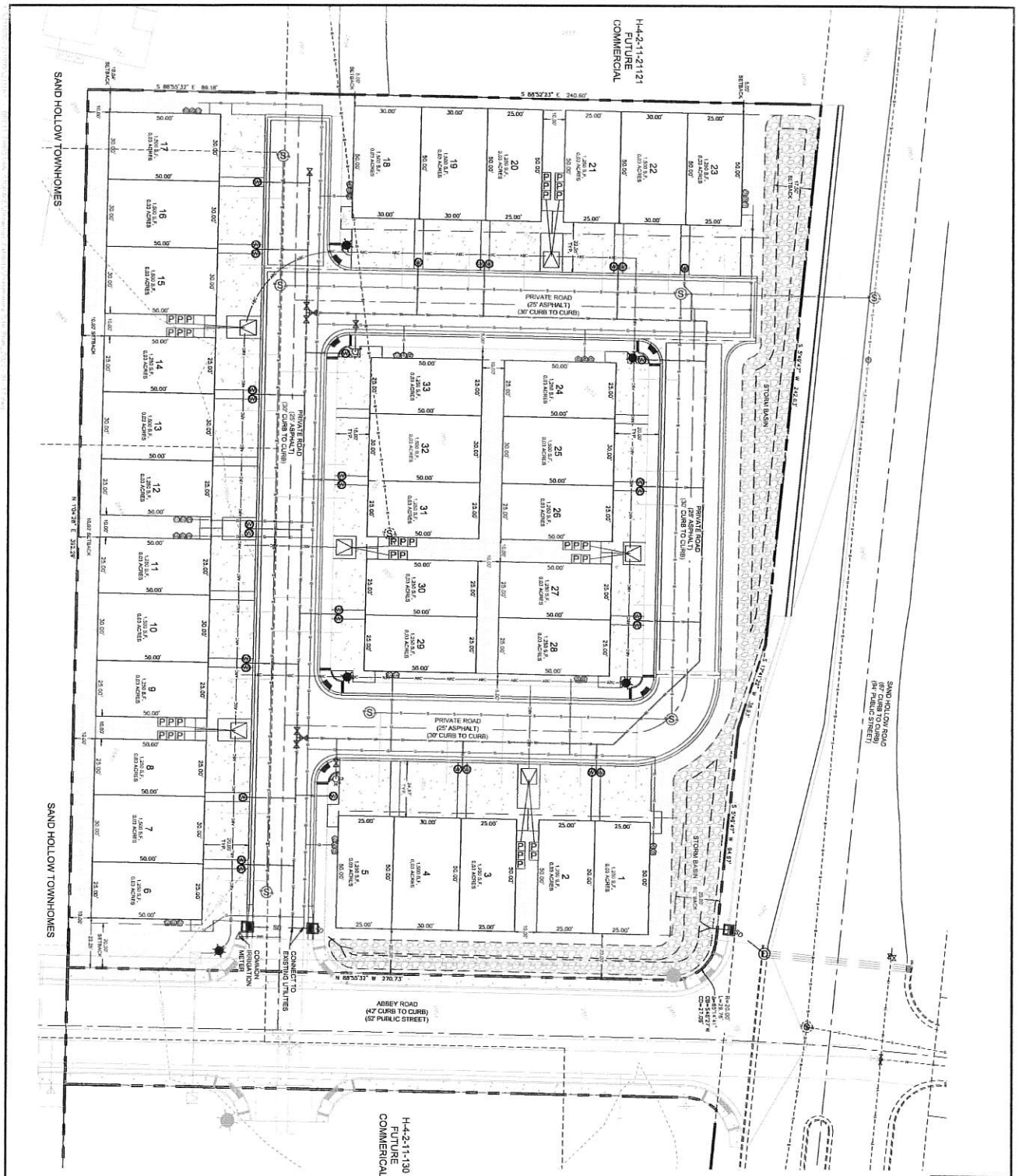
EXHIBIT SHEET 1 OF 1 SHEETS

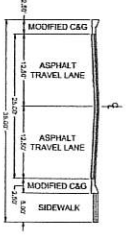
PROJECT BOUNDARIES
AT SAND HOLLOW
LOCATED IN HURRICANE, UTAH

DATE: 01-05-22
DRAWN: TDP
APPROVED:
SCALE: 1" = 40'
JOB NO. 211167

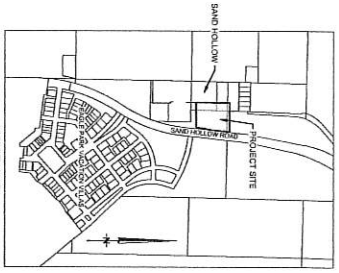
BUSH & GUDGELL, INC.
Engineers - Planners - Surveyors
205 East Tabernacle Suite #4
St. George, Utah 84770
Phone (435) 673-2337 / Fax (435) 673-3161
www.bushandgudgell.com

No	Date	By	Revision









PROJECT INFORMATION	
CURRENT ZONE	SC
GENERAL PLAN	NEIGHBORHOOD COMMERCIAL
SITE AREA	121,822 Sq. Ft. / 2.80 AC
LANDSCAPING	PERVIOUS 61,602 Sq. Ft. (50.57%) IMPERVIOUS 60,220 Sq. Ft. (49.43%)
BUILDING SQUARE FOOTAGE	44,280 SQ. FT.

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.

PRELIMINARY SITE PLAN
SAND HOLLOW MANCAVES
ABBEY ROAD - SAND HOLLOW ROAD
LOCATED IN HURRICANE CITY, 84737

DATE: 1/18/2022
DRAWN: JAN 2022
APPROVED:
SCALE: 1" = 20'
JOB NO. 211167

SHEET 1 OF 1 SHEETS
FILE:PRELIM SITE PLAN

BUSH & GUDGELL, INC.
Engineers - Planners - Surveyors
205 East Tabernacle Suite #4
St. George, Utah 84770
Phone (435) 673-2337 / Fax (435) 673-3161
www.bushandgudgell.com

No	Date	By	Revision

Bush and Gudgell, Inc.
Engineers • Planners • Surveyors
St. George, Utah
www.bushandgudgell.com

Exhibit "A"
Legal Description

Abandoning a portion of a prescriptive roadway in the Northeast Quarter of Section 11, Township 42 South, Range 14 West, Salt Lake Base and Meridian, more particularly described as follows:

Beginning at a point on the south boundary line of a parcel of land, more particularly described in document no. 20200058888, Official Records, Washington County, Utah, said point lies North 01°05'29" East along the section line 1762.23 feet and West 937.86 feet, from the East Quarter Corner of Section 11, Township 42 South, Range 14 West, Salt Lake Base and Meridian, and running thence southerly along a 327.50 foot radius non-tangent curve to the left, (long chord bears South 13°04'04" East a distance of 99.78 feet), center point lies North 85°41'42" East through a central angle of 17°31'31", a distance of 100.17 feet; thence South 21°49'50" East 220.37 feet; thence southerly along a 447.50 foot radius curve to the right, (long chord bears South 12°05'15" East a distance of 151.46 feet), center point lies South 68°10'10" West through a central angle of 19°29'10", a distance of 152.19 feet to a point on the west right-of-way line of Sand Hollow Road, a public road dedicated as document no. 20080020605, Official Records, Washington County, Utah; thence along said line the following two (2) courses: 1) South 05°49'47" West 44.09 feet and 2) southerly along a 1570.54 foot radius curve to the right, (long chord bears South 09°32'56" West a distance of 203.75 feet), center point lies North 84°10'13" West through a central angle of 07°26'18", a distance of 203.89 feet; thence North 01°34'02" West 237.58 feet; thence northerly along a 402.50 foot radius curve to the left, (long chord bears North 11°41'56" West a distance of 141.61 feet), center point lies South 88°25'58" West through a central angle of 20°15'48", a distance of 142.35 feet; thence North 21°49'50" West 220.37 feet; thence northerly along a 372.50 foot radius curve to the right, (long chord bears North 12°44'20" West a distance of 117.72 feet), center point lies North 68°10'10" East through a central angle of 18°11'00", a distance of 118.22 feet to said south boundary line; thence South 88°52'23" East along said line 45.18 feet, to the point of beginning.

Containing 27,539 square feet or 0.63 acres.

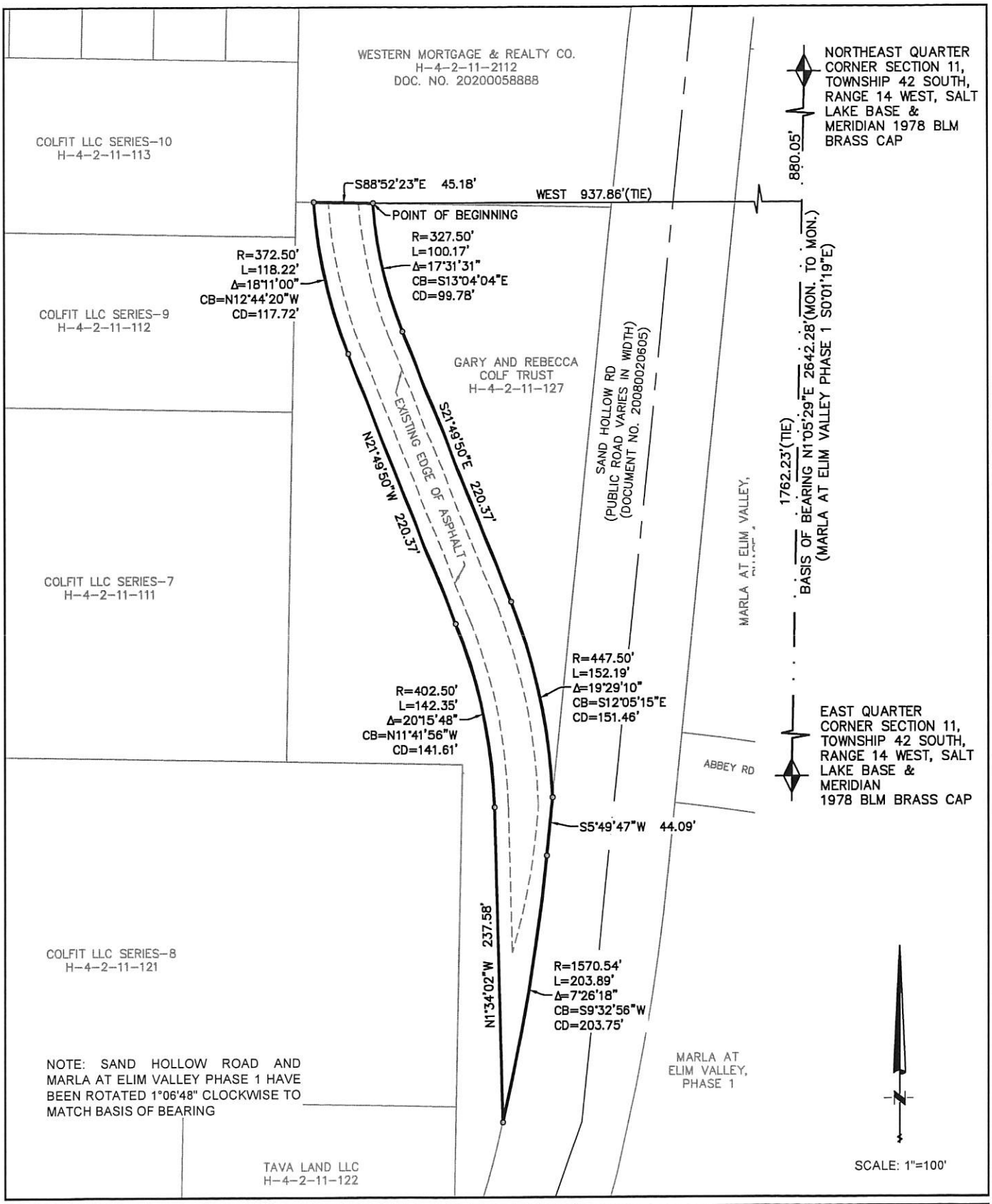


EXHIBIT B

ROADWAY ABANDONMENT

B & G 211065

BUSH & GUDGELL, INC.
Engineers - Planners - Surveyors
205 East Tabernacle Suite #4
St. George, Utah 84770
Phone (435) 673-2337 / Fax (435) 673-3161

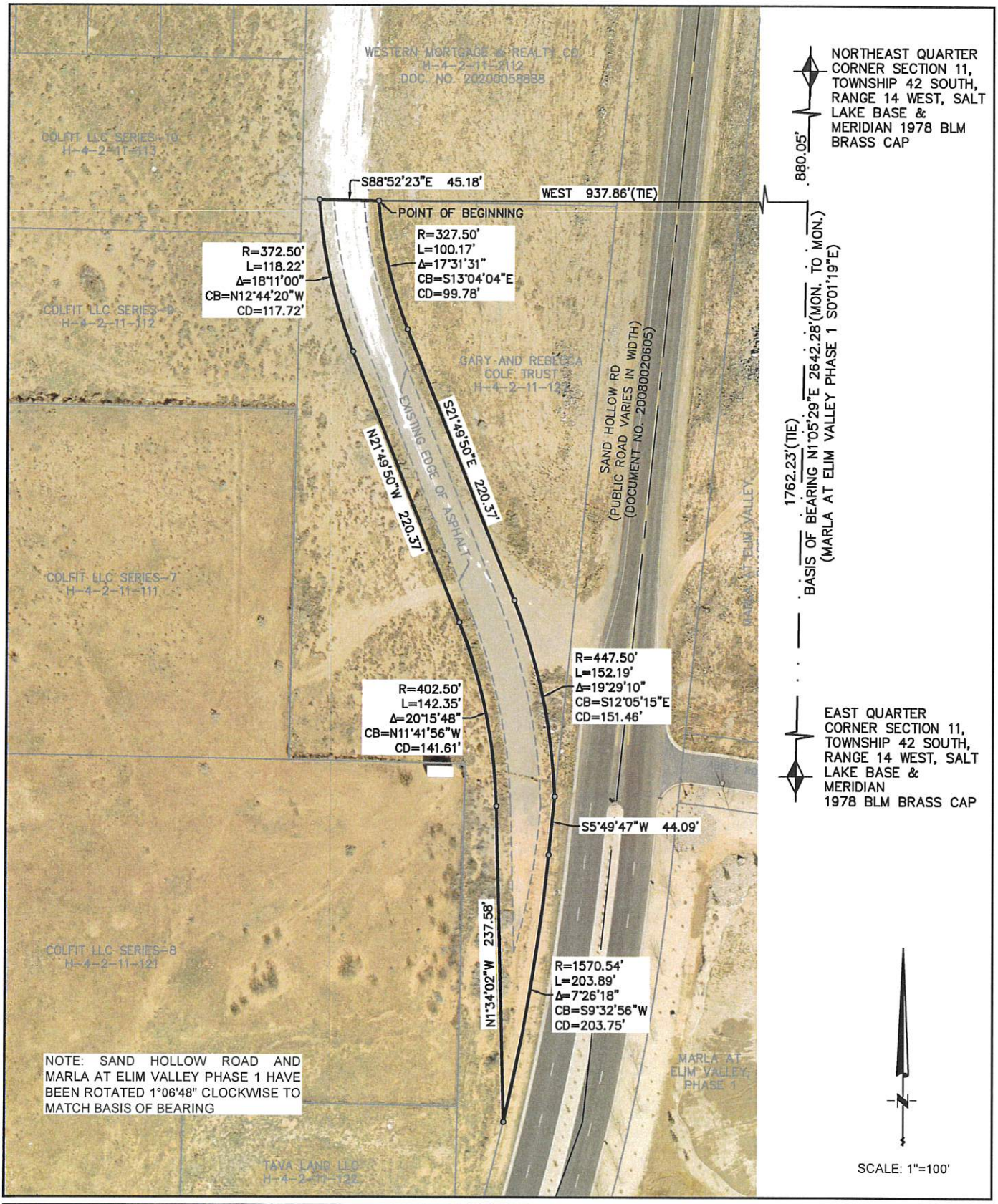


EXHIBIT C

ROADWAY ABANDONMENT
B & G 211065

BUSH & GUDGELL, INC.
Engineers - Planners - Surveyors
205 East Tabernacle Suite #4
St. George, Utah 84770
Phone (435) 673-2337 / Fax (435) 673-3161

STAFF COMMENTS

Agenda Date:	**4/1/2021**
Application Number:	N/A
Type of Application:	Roadway Abandonment
Action Type:	Legislative
Applicant:	Gary Colf
Agent:	Bob Hermandson, Bush & Gudgell, Inc
Request:	Roadway Abandonment on Parcel H-4-2-11-127
Location:	Westside of Sand Hollow Road and Abbey Road
Zoning:	General Commercial
General Plan Map:	Planned Community

Discussion: The property owner is asking the City to abandon the existing right-of-way on his property so he can develop the property in a way that is more beneficial to the site. The state gives City's the authority to abandon roadways and dedicated right-of-way, but the City must follow the proper process. The codes are below:

Effective 7/1/2020

10-9a-208 Hearing and notice for petition to vacate a public street.

(1) For any petition to vacate some or all of a public street or municipal utility easement the legislative body shall:

(a) hold a public hearing; and

(b) give notice of the date, place, and time of the hearing, as provided in Subsection (2).

(2) At least 10 days before the public hearing under Subsection (1)(a), the legislative body shall ensure that the notice required under Subsection (1)(b) is:

(a) mailed to the record owner of each parcel that is accessed by the public street or municipal utility easement;

(b) mailed to each affected entity;
(c) posted on or near the public street or municipal utility easement in a manner that is calculated to alert the public; and
(d)
(i) published on the website of the municipality in which the land subject to the petition is located until the public hearing concludes; and
(ii) published on the Utah Public Notice Website created in Section 63F-1-701.

Amended by Chapter 4, 2020 Special Session 5

The City has advertised and noticed in accordance with the code above. The following is the code that dictates how a roadway is to be vacated:

Effective 9/22/2017

72-5-105 Highways, streets, or roads once established continue until abandoned -- Temporary closure.

(1) Except as provided in Subsections (3) and (7), all public highways, streets, or roads once established shall continue to be highways, streets, or roads until formally abandoned or vacated by written order, resolution, or ordinance resolution of a highway authority having jurisdiction or by court decree, and the written order, resolution, ordinance, or court decree has been duly recorded in the office of the recorder of the county or counties where the highway, street, or road is located.

(2)
(a) For purposes of assessment, upon the recordation of an order executed by the proper authority with the county recorder's office, title to the vacated or abandoned highway, street, or road shall vest to the adjoining record owners, with one-half of the width of the highway, street, or road assessed to each of the adjoining owners.
(b) Provided, however, that should a description of an owner of record extend into the vacated or abandoned highway, street, or road that portion of the vacated or abandoned highway, street, or road shall vest in the record owner, with the remainder of the highway, street, or road vested as otherwise provided in this Subsection (2).
(c) Title to a highway, street, or road that a local highway authority closes to vehicular traffic under Subsection (3) or (7) remains vested in the city.

JUC Review

The site has been reviewed by the JUC and there were no major concerns raised by any of the utility companies. There is a sewer line in the roadway, but the petitioner has met with Ash Creek and resolved their concerns by agreeing to remove the pipe and fill where the pipe was to their standards. An official notice has been sent to all of the utility companies.

Staff Review

Staff has reviewed the application and does not have major concerns about the roadway abandonment. A realignment of roadways within the area would likely lead to better connectivity. The applicant will need to provide additional roadways and access point to develop the property as requested by the zone change.

The roadway in question is not part of the City's Transporation Master Plan.

Recommendation: Staff recommends the City Council review this application and the attached resolution.

Resolution 2021-06

A RESOLUTION OF THE CITY COUNCIL OF HURRICANE, UTAH, APPROVING THE COLF PETITION FOR ABANDONMENT OF A PUBLIC RIGHT-OF-WAY LOCATED ON PARCEL H-4-2-11-127

WHEREAS, Utah Code 72-5-105 grants the City power to abandon public highways, streets, or roads that are maintained and operated by the City; and

WHEREAS, Gary Colf has petitioned the City requesting the public right-of-way located on his property described in the attached survey and legal description be abandoned; and

WHEREAS, the City has held a public hearing and provided notice as required by Utah Code 10-9a-208;

WHEREAS, the proposed abandonment has been presented to the Hurricane Joint Utility Committee and no objections were raised; and

WHEREAS, the roadway in question is not part of the City's Transportation Master Plan and a new roadway and intersection layout in the area would be beneficial to the City, the property owner, and adjacent property owners; and

WHEREAS, the roadway has limited traffic and the abonnement will not negatively effect adjacent property owners.

BE IT HEREBY RESOLVED by the City Council of Hurricane, Utah that the attached petition and survey to vacate the public roadway, as described in the attached record of survey, located on Parcel H-4-2-11-127, be abandoned and vacated.

DATED this 1st day of April, 2021.

_____
John Bramall, Mayor

Attest:

_____
Cindy Beteag, Recorder

The foregoing Resolution was presented at a regular meeting of the Hurricane City Council held at the Hurricane City Office Building on the 1st day of April, 2021. Whereupon a motion to adopt and approve said Resolution was made by _____ and seconded by _____. A roll call vote was then taken with the following results:

	Yea	Nay	Abstain	Absent
Nanette Billings	___	___	___	___
Darin Larson	___	___	___	___
Joseph Prete	___	___	___	___
Dave Sanders	___	___	___	___
Kevin Tervort	___	___	___	___

_____
Cindy Beteag

PLANNING & ZONING
HURRICANE CITY
UTAH

STAFF COMMENTS

Agenda Date:	**02/17/2022**
Application Number:	2022-PSP-03 2022-PP-08
Type of Application:	Preliminary Site Plan and Preliminary Plat Application
Action Type:	Administrative
Applicant:	Dixie Man Caves LLC
Agent:	Jason Miller
Request:	Approval of a Preliminary Site Plan
Location:	Northwest corner of Sand Hollow Road and Abbey Road
Zoning:	GC
General Plan Map:	Neighborhood Commercial

Planning Commission Recommendation
The Planning Commission approved the preliminary site plan and gave a positive recommendation on the preliminary plat. There were two Commissioners who dissented on their recommendation with the objection that CC&R's submission with the final site plan should be required as part of the preliminary approval. Their main concern is the fear that the use will change over time, and that those changes may not align with the City zoning code. The majority of the Commission felt that it was not needed and the typical licensing and code enforcement measure would be sufficient.

Discussion:
The applicant has filed a preliminary plat and site plan for "man cave" storage units to be built along Sand Hollow Road to the west of the Marla at Elim Valley development. The applicant is planning 33 luxury storage units to be sold off as condominium units. The applicant has also filed a preliminary plat application for the subdivision.

JUC Comments
The following items will need to be addressed:

1. **Power:** Dixie Power area. No power in the area. PID is likely to bring power to the area. Will likely need 20' power easement along Sand Hollow Road for a major power line.
2. **Sewer:** An abandoned sewer line goes through the full parcel that needs to be accounted for. Each lot has their own lateral
3. **Street:** Private streets may need a second access if not sprinkled.

4. **Water:** Meter to east unit, needs ductile iron piping within private roadways. Fire lines will be required. Need a looped system. Will need to review construction drawings.
5. **Engineering:** 26’ asphalt driving surface. No parking along the streets. Full improvements along Sand Hollow Road and Abbey Road. Need to loop water. Likely does not need second access if it meets the fire code.
6. **Fire:** Will need sprinklers and fire separation.
7. **Phone:**.No comments
8. **Gas**: In Sand Hollow Road. Streets need utility easements



Map is approximate

Staff Comments: Preliminary Site Plan and Preliminary Plat

1. The property is zoned General Commercial. The site would be classified as “warehouse/self storage” which is a permitted use in that zone. Applicant wants to allow for flexibility in uses and the General Commercial zoning allows for a wide variety of uses. Overnight occupancy would not be allowed.
2. The plan does not indicate where or if there will be any office space within this development.

3. The site plan does not indicate parking: Parking is required at a calculation of: "*1 space per employee on highest employment shift"* ; it looks like most parking will be contained on the lots. Street parking will not be allowed with this current design.
4. The plan does not show what the surrounding uses are, which is required. Most of the area is currently undeveloped but there are multiple residential projects planned in the area.
5. Plans do not show any potential contour or geotechnical restraints in the area. This is a requirement but the area is relatively flat.
6. Setbacks are compliant with General Commercial standards of 20 feet in the front and 10 feet on the sides and rear sides near residential uses. There are no minimum-size lots in commercial zones.
7. A will serve letter from the culinary and sanitary water providers has not been submitted.

Recommendation: Staff recommends the Planning Commission review this application based on standards with Hurricane City Code. Staff would recommend approval based on staff and JUC comments.

PRELIMINARY PLAT APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee: $150.00

For Office Use Only:
File No. 2022-PP-08
Receipt No. 8-155190

Name: Bright Ideas REI **Telephone:** 801-979-8633

Address: 1173 S 240 W #504 **Fax No.** _____

Email: Todd@brotherskeeperutah.com

Agent (If Applicable): Adam Allen **Telephone:** 435-680-6711

Address/Location of Subject Property: Approx 1400S 4300W

Tax ID of Subject Property: H-4-2-12-1102 **Zone District:** R-1-8

Proposed Use: (Describe, use extra sheet if necessary. Include total number of lots) _____

Single Family Lots - 135 Lots Total

Submittal Requirements: The preliminary plat application shall provide the following:

X 1. Description: In a title block located in the lower right-hand corner of the sheet the following is required:
- x a. The proposed name of the subdivision.
- x b. The location of the subdivision, including the address and section, township and range.
- x c. The names and addresses of the owner or subdivider, if other than the owner.
- x d. Date of preparation, and north point.
- x e. Scale shall be of sufficient size to adequately describe in legible form, all required conditions of Chapter 39, City Subdivision regulations.

X 2. Existing Conditions: The preliminary plat shall show:
- x a. The location of the nearest monument.
- x b. The boundary of the proposed subdivision and the acreage included.
- x c. All property under the control of the subdivider, even though only a portion is being subdivided. (Where the plat submitted covers only a part of the subdivider's tract, a sketch of the prospective street system of the unplatted parts of the subdivider's land shall be submitted, and the street system of the part submitted shall be considered in light of existing Master Street Plan or other Commission studies.)
- x d. The location, width and names/numbers of all existing streets within two hundred (200) feet of the subdivision and of all prior streets or other public ways, utility rights of way, parks and other public open spaces, within and adjacent to the tract.
- x e. The location of all wells and springs or seeps, proposed, active and abandoned, and of all reservoirs or ponds within the tract and at a distance of at least one hundred feet (100') beyond the tract boundaries.
- x f. Existing sewers, water mains, culverts or other underground facilities within the tract, indicating the pipe sizes, grades, manholes and the exact locations.

x g. Existing Hurricane Canal Company facilities; other ditches, canals, natural drainage channels and open waterways and any proposed realignments.

x h. Contours at vertical intervals not greater than five (5) feet.

N/A i. Identification of potential geotechnical constraints on the project site (such as expansive rock and soil, collapsible soil, shallow bedrock and caliche, gypsiferous rock and soil, potentially unstable rock or soil units including fault lines, shallow groundwater, and windblown sand) and recommendations for their mitigation.

x j. Information on whether property is located in desert tortoise take area

X 3. Proposed Plan: The subdivision plans shall show:

x a. The layout of streets, showing location, widths, and other dimensions of proposed streets, crosswalks, alleys and easements.

x b. The layout, numbers and typical dimensions of lots.

x c. Parcels of land intended to be dedicated or temporarily reserved for public use or set aside for use of property owners in the subdivision.

x d. Easements for water, sewers, drainage, utilities, lines and other purposes.

x e. Typical street cross sections and street grades where required by the Planning Commission. (All street grades over 5% should be noted on the preliminary plat)

x f. A tentative plan or method by which the subdivider proposes to handle the storm water drainage for the subdivision.

x g. Approximate radius of all center line curves on highways or streets.

x h. Each lot shall abut a street shown on the subdivision plat or on an existing publicly-dedicated street. (Double frontage or flag lots shall be prohibited except where conditions make other design undesirable)

x i. In general, all remnants of lots below minimum size left over after subdividing of a larger tract must be added to adjacent lots, rather than allow to remain as unusable parcels.

x j. Where necessary, copies of any agreements with adjacent property owners relevant to the proposed subdivision shall be presented to the Planning Commission.

x k. A letter from both the local sanitary sewer provider and culinary water provider indicating availability of service.

x l. Will this subdivision be phased? If yes show possible phasing lines.

x m. A tentative plan or method for providing non-discriminatory access to the subdivision for purposes of placement of communications infrastructure, and for purposes of placement of utility infrastructure.

X 4. Required copies of plans:

x a. Three copies of all full scale drawings

x b. One copy of each drawing on a 11 x 17 inch sheets. (8 ½ x 11 is acceptable if the project is small and the plans are readable at that size).

5. Warranty deed or preliminary title report or other document (see attached Affidavit) showing evidence that the applicant has control of the property

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. A deadline missed due to an incomplete application, could result in a month's delay. Planning Commission meetings are held on the second Thursday and fourth Wednesday of each month at 6:00 p.m. The deadline to submit an application to be placed on an agenda is no later than 12:00 noon 10 full business days before the Planning Commission meeting at which you plan for your application to be heard.

****

(Office Use Only)

Date Received: _____ Application Complete: YES ☐ NO ☐

Date application deemed to be complete:_____ Completion determination made by: _____

AFFIDAVIT
PROPERTY OWNER

STATE OF Arizona)
COUNTY OF Mohave) :ss

I (we), Western Mortgage + Realty Co., being duly sworn, depose and say that I (we) am (are) the owner(s) of the property identified in the attached application and that the statements herein contained and the information provided identified in the attached plans and other exhibits are in all respects true and correct to the best of my (our) knowledge. I (we) also acknowledge that I have received written instructions regarding the process for which I am applying and the Hurricane City Planning staff have indicated they are available to assist me in making this application.

Western Mortgage & Realty Co.
(Property Owner)

(Property Owner) Tim. M Tippett, Vice Pres

Subscribed and sworn to me this 18th day of January 2022.

ALICE LOZOYA
Notary Public - Arizona
Mohave County
Commission # 602798
My Comm. Expires Apr 25, 2025

Alice Lozoya
(Notary Public)

Residing in: Arizona

My Commission Expires: April 25, 2025

Agent Authorization

I (we),_____, the owner(s) of the real property described in the attached application, do authorize as my (our) agent(s)_____ to represent me (us) regarding the attached application and to appear on my (our) behalf before any administrative or legislative body in the City considering this application and to act in all respects as our agent in matters pertaining to the attached application.

_____
(Property Owner)

_____
(Property Owner)

Subscribed and sworn to me this _____ day of _____ 20___.

_____
(Notary Public)

Residing in:_____

My Commission Expires:_____

PRELIMINARY SITE PLAN REVIEW APPLICATION

City of Hurricane
147 North 870 West
Hurricane, UT 84737
(435) 635-2811
FAX (435) 635-2184

Fee $200.00

For Office Use Only:
File No. 2022-PSP-05
Receipt No. 8-156190

Name: BRIGHT IDEAS REI **Telephone:** 801-979-8633
1173 S 250 W #250
Address: ST GEORGE, UTAH 84770 **Fax No.** _____

Agent (If applicable): ADAM ALLEN **Agent's Phone:** 435-680-6711

Email: adam@alcsg.com

Address/Location of Subject Property: approx 1400 S 4300W

Tax ID of Subject Property: H-4-2-12-1102 **Zone District:** R-1-8

Proposed Use: (Describe, use extra sheet if necessary)
135 Single Family Lots

This application shall be accompanied by the following:

x 1. A vicinity map showing the general location of the project.
x 2. Three (3) copies of a site plan showing:
- x Topography showing 2' contours, identification of 30% or greater slopes:
- x The layout of proposed uses;
- x Location of open space when applicable;
- x Proposed access to the property and traffic circulation patterns;
- x Adjoining properties and uses:
- x Proposed reservations for parks, playgrounds, school, and any other public facility sites, if any;

x 3. Preliminary utility plan, including water, sewer, and storm drainage plans, and including access points to utilities;
x 4. Tables showing the number of acres in the proposed development and a land use summary; and
x 5. A phased development plan if applicable.

x 6. Warranty deed or preliminary title report or other document (see attached Affidavit) showing evidence that the applicant has control of the property

NOTE: It is important that all applicable information noted above is submitted with the application. An incomplete application will not be scheduled for Planning Commission consideration. Planning Commission meetings are held on the second Thursday and the fourth Wednesday of each month at 6:00 p.m. Contact the Planning Department for the deadline date for submissions. Once your application is deemed complete, it will be put on the agenda for the next Planning Commission meeting. A deadline missed due to an incomplete application could result in a month's delay.

****

(Office Use Only)

Date Received: _____ Received by: _____

Date application deemed to be complete: _____Completion determination made by:_____

AFFIDAVIT
PROPERTY OWNER

STATE OF Arizona)
COUNTY OF Mohave) :ss

I (we), Western Mortgage & Realty Co., being duly sworn, depose and say that I (we) am (are) the owner(s) of the property identified in the attached application and that the statements herein contained and the information provided identified in the attached plans and other exhibits are in all respects true and correct to the best of my (our) knowledge. I (we) also acknowledge that I have received written instructions regarding the process for which I am applying and the Hurricane City Planning staff have indicated they are available to assist me in making this application.

Western Mortgage & Realty Co.
(Property Owner)

(Property Owner) Tim. M Tippett, Vice Pres

Subscribed and sworn to me this 18th day of January 2022

ALICE LOZOYA
Notary Public - Arizona
Mohave County
Commission # 602798
My Comm. Expires Apr 25, 2025

Alice Lozoya
(Notary Public)

Residing in: Arizona

My Commission Expires: April 25, 2025

Agent Authorization

I (we),_____, the owner(s) of the real property described in the attached application, do authorize as my (our) agent(s)_____ to represent me (us) regarding the attached application and to appear on my (our) behalf before any administrative or legislative body in the City considering this application and to act in all respects as our agent in matters pertaining to the attached application.

_____
(Property Owner)

_____
(Property Owner)

Subscribed and sworn to me this _____ day of _____ 20___.

_____
(Notary Public)

Residing in:_____

My Commission Expires:_____

PLANNING & ZONING
HURRICANE CITY
UTAH

STAFF COMMENTS

Agenda Date:	**02/17/2022**
Application Number:	2022-PP-08
Type of Application:	Preliminary Plat and Preliminary Site Plan Application
Action Type:	Administrative
Applicant:	Bright Ideas REI
Agent:	Adam Allen
Request:	Preliminary Plat and Preliminary Site Plan Application
Location:	Approximately 1400 S 4300 W
Zoning:	R1-8
General Plan Map:	Planned Community

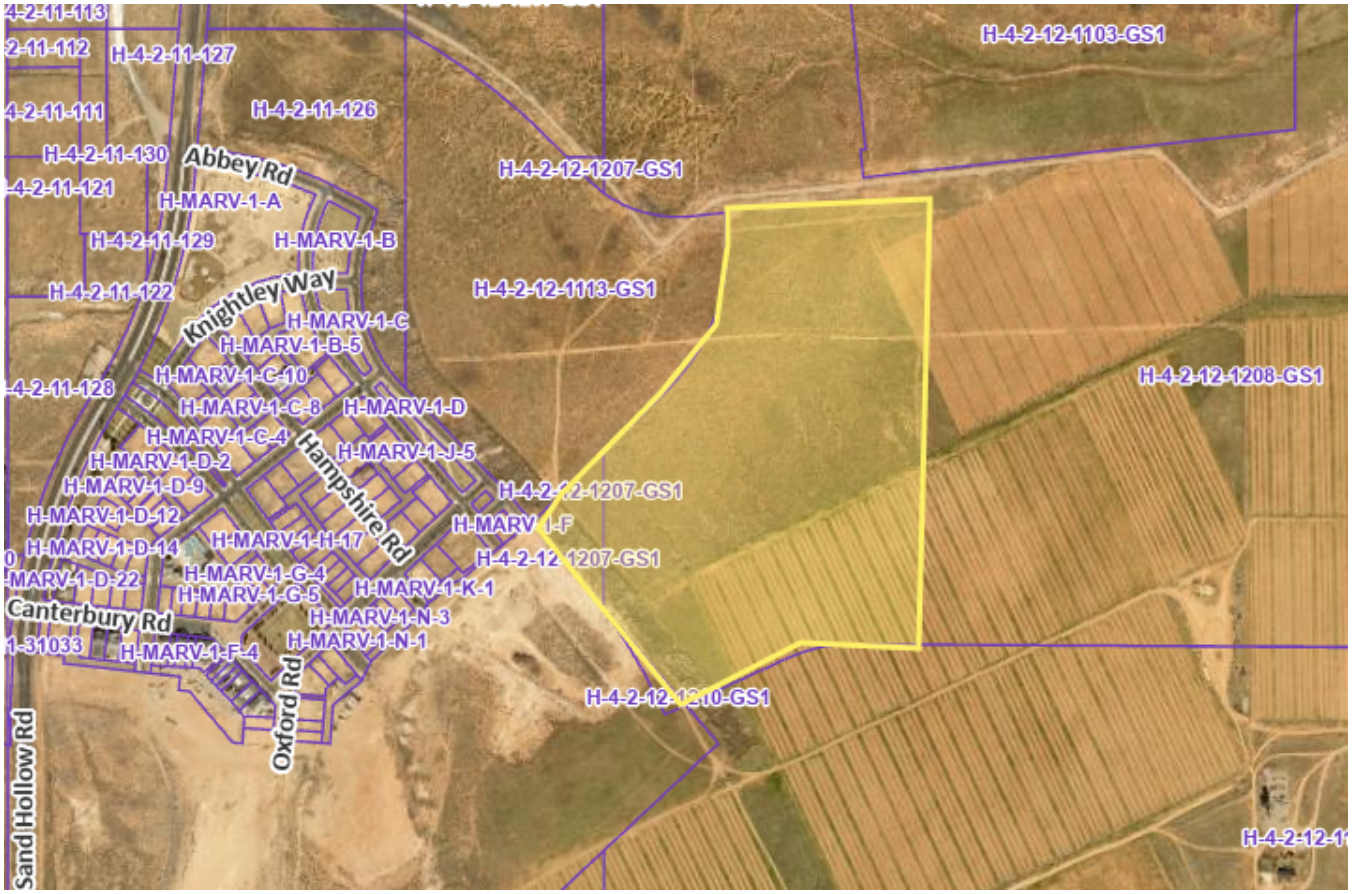
Planning Commission Recommendation
The Planning Commission gave a positive recommendation on preliminary plat subject to staff and JUC comments.

Discussion:
The applicant is seeking preliminary plat and preliminary site plan approval for a subdivision containing 135 lots located within the Sand Hollow Gateway PID for the Elim Estates subdivision. This property is due east of the existing Marla at the Elim Valley development. This property requires extensive PID infrastructure to be put in and is planned to be served by several PID roadways. Construction drawings for the PID are still under review. Any approval should be conditioned on sufficient buildout of the Sand Hollow Gateway PID infrastructure

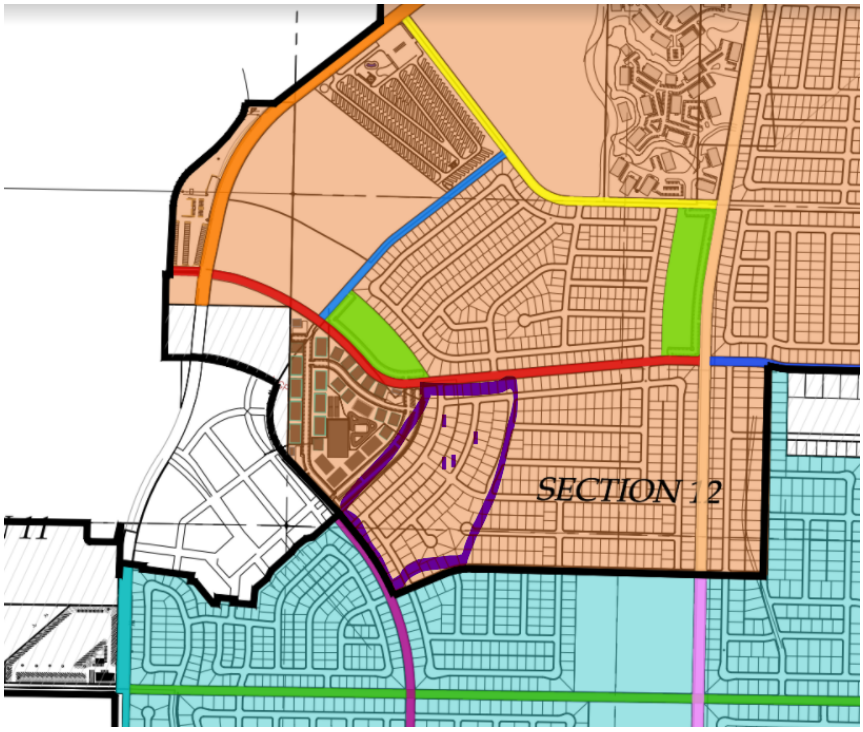
JUC Comments
The following items will need to be addressed:

1. **Power:** Need Bash Parkway to be put in for power
2. **Sewer:** Need PID improvements
3. **Streets:** Need to get infrastructure to it
4. **Water**: Will need a full water model. Water line in Iron Bridge Boulevard should be dedicated right up front. Need phasing plan if applicable.
5. **Engineer:** Traffic impact study needed. Drainage plan submitted
6. **Fire:** Have an access issue currently. Need two accesses
7. **Cable/Phone:** Good

8. **Gas:** Good
9. **Water Conservancy District**: The drainage area to the north needs to be maintained.



Map is approximate



Elim Estates on Gateway at Sand Hollow PID Map. Boundaries are approximate

Staff Comments: Preliminary Plat

1. Zoning is R1-8. Staff would recommend that the average lot size be put on a note on the plat. 3.31 units an acre is less dense than the maximum density in R1-8.
2. The plat shows the future roadways and utilities in the area, but currently, these services do not exist.
3. The applicant has noted that the property isn't located in a desert tortoise take area.
4. All block lengths meet city standards
5. Road N is a 60' right of way. Houses are allowed to front 60' right of ways. Generally speaking, staff recommends that collector roadways have limited driveway access.
6. Staff appreciates the connections to the property to the east. There are no planned connections to the property to the west, but that area is zoned Recreation Resort with a planned parking lot along the border and thus may not be desirable for connections.
7. There is no open space planned within this development. None is required by code; however, there is a PID planned park to the north of this development.
8. A will serve letter from Hurricane City Water and Ash Creek Sewer District has been provided
9. Utilities: The property is isolated but has services planned for the area. The PID has submitted plans to bring services to the site to the JUC, but these plans are in the review process and have not received approval at the time of this report. Hurricane City Code states the following:

   10-37-4: ADEQUATE PUBLIC FACILITIES:
   Land shall be developed only where existing infrastructure is in place or will be timely provided to service proposed development. The city may require an analysis to be completed to determine whether adequate public facilities are available to service a development and whether such development will change existing levels of service or will create a demand which exceeds

acceptable levels of service for roadways, intersections, bridges, storm drainage facilities, water lines, water pressure, sewer lines, fire and emergency response times, and other similar public services. The city may disapprove a proposed development if demand for public services exceeds accepted levels of service. No subsequent approval of such development shall be given until either the developer or the city installs improvements calculated to raise service levels to the standard adopted by the City. (Ord. 03-5-1, 5-1-2003, eff. 6-1-2003)

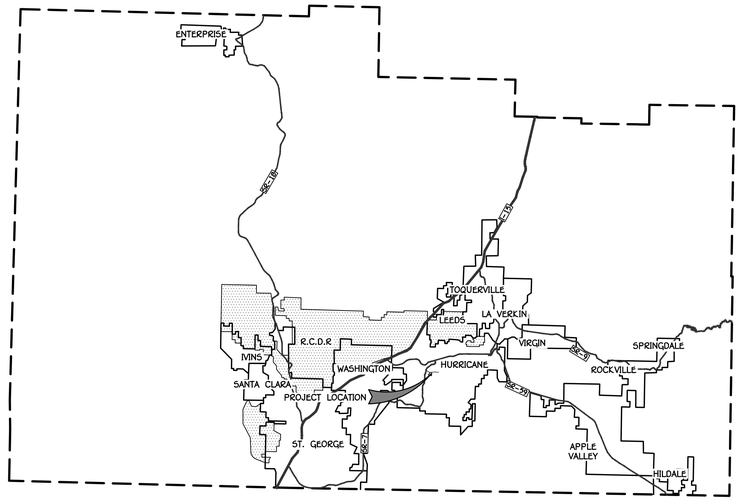
Recommendation: Staff recommends the City Council review this application based on standards with Hurricane City Code. Any approval of the application should have the following conditions.

1. That Sand Hollow PID roadway and utility plans are approved by the JUC, and that the PID provides a plan and timing for bringing services to this property before it can move forward.
2. Staff and JUC comments

ELIM ESTATES

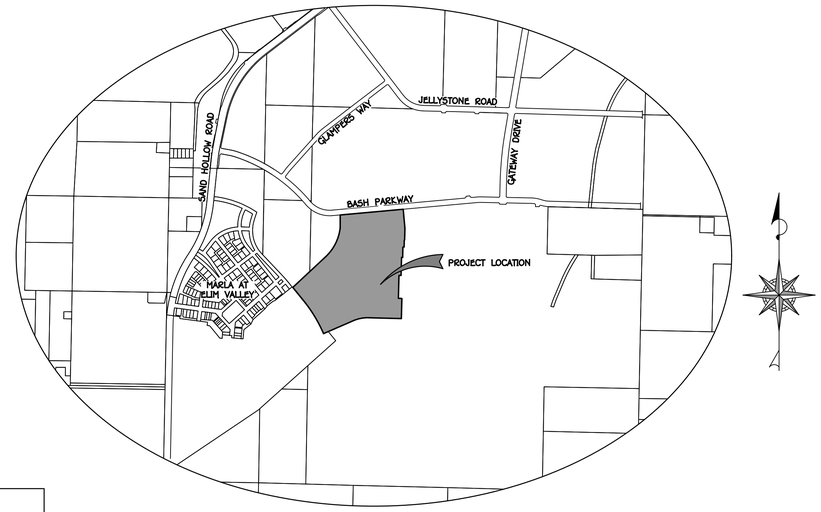
SECTION 12, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SLB&M
COUNTY OF WASHINGTON, CITY OF HURRICANE, UTAH

PRELIMINARY PLAT
JANUARY 2022

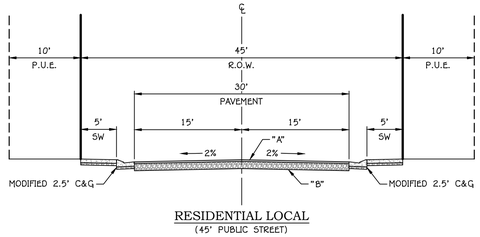


WASHINGTON COUNTY

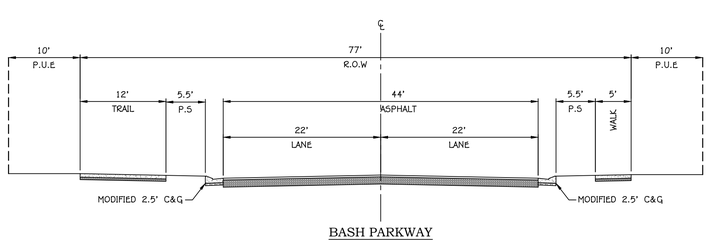
SHEET INDEX		
#	SHEET	DESCRIPTION
1	P.1.1	COVER SHEET
2	P.1.2	SITE PLAN
3	P.1.3	GRADING PLAN
4	P.1.4	UTILITY PLAN



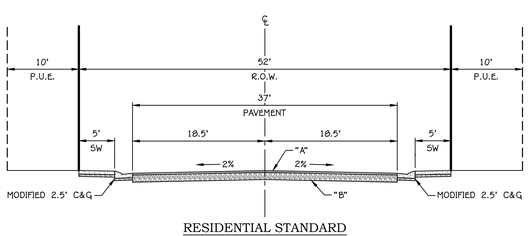
VICINITY MAP (N.T.S.)
SECTION 12, TOWNSHIP 42 SOUTH
RANGE 14 WEST SLB&M



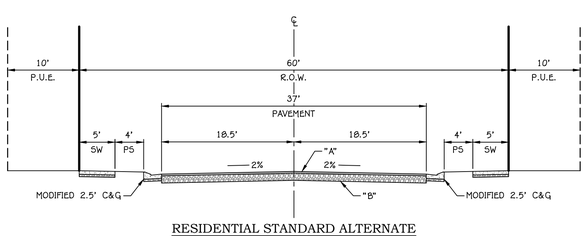
RESIDENTIAL LOCAL
(45' PUBLIC STREET)



BASH PARKWAY
(77' PUBLIC STREET)



RESIDENTIAL STANDARD
(52' PUBLIC STREET)



RESIDENTIAL STANDARD ALTERNATE
(60' PUBLIC STREET)

LEGAL DESCRIPTION:

BEGINNING AT A POINT THAT LIES ON THE SOUTH LINE OF BASH PARKWAY, SAID POINT LIES SOUTH 01°07'24" WEST 1,536.05 FEET AND EAST 1,066.28 FEET FROM THE NORTHWEST CORNER OF SECTION 12, TOWNSHIP 42 SOUTH, RANGE 14 WEST, SALT LAKE BASE AND MERIDIAN; RUNNING THENCE NORTH 84°49'05" EAST ALONG THE SOUTH LINE OF BASH PARKWAY 804.71 FEET; THENCE SOUTH 05°10'55" EAST 152.00 FEET; THENCE SOUTH 05°11'52" EAST 116.12 FEET; THENCE SOUTH 01°30'03" WEST 161.98 FEET; THENCE NORTH 88°29'57" WEST 5.00 FEET; THENCE SOUTH 01°30'03" WEST 100.00 FEET; THENCE NORTH 88°29'57" WEST 16.44 FEET; THENCE SOUTH 01°30'03" WEST 145.00 FEET; THENCE NORTH 88°29'57" WEST 15.40 FEET; THENCE SOUTH 01°30'03" WEST 252.00 FEET; THENCE NORTH 88°29'57" WEST 29.43 FEET; THENCE SOUTH 01°30'03" WEST 321.46 FEET; THENCE SOUTH 88°29'57" EAST 49.37 FEET; THENCE SOUTH 01°30'03" WEST 282.00 FEET; THENCE NORTH 88°29'57" WEST 459.08 FEET; THENCE WESTERLY ALONG A 500.00 FOOT RADIUS NON-TANGENT CURVE TO THE LEFT, (LONG CHORD BEARS SOUTH 79°00'54" WEST 215.97 FEET, CENTER POINT LIES SOUTH 01°29'14" WEST) THROUGH A CENTRAL ANGLE OF 24°56'41", A DISTANCE OF 217.68 FEET; THENCE SOUTH 66°32'33" WEST 454.07 FEET; THENCE NORTHWESTERLY ALONG A 2,000.00 FOOT RADIUS NON-TANGENT CURVE TO THE LEFT, (LONG CHORD BEARS NORTH 31°16'01" WEST 544.08 FEET, CENTER POINT LIES SOUTH 66°33'03" WEST) THROUGH A CENTRAL ANGLE OF 15°38'05", A DISTANCE OF 545.77 FEET; THENCE NORTH 39°05'04" WEST 233.49 FEET; THENCE NORTH 46°57'15" EAST 627.22 FEET; THENCE NORTHEASTERLY ALONG A 653.44 FOOT RADIUS CURVE TO THE LEFT, (LONG CHORD BEARS NORTH 26°39'56" EAST 453.16 FEET, CENTER POINT LIES NORTH 43°02'45" WEST) THROUGH A CENTRAL ANGLE OF 40°34'38", A DISTANCE OF 462.77 FEET; THENCE NORTH 00°01'18" WEST 179.18 FEET TO THE POINT OF BEGINNING.

CONTAINING 1,771,478 SQUARE FEET OR 40.67 ACRES.

PROJECT MANAGER
AMERICAN LAND CONSULTING
1173 SOUTH 250 WEST, SUITE 502
ST. GEORGE, UT 84770
CONTACT: ADAM ALLEN
PHONE: (435) 680-6711
EMAIL: adam@alcsg.com

APPLICANT:
BRIGHT IDEAS REI
1173 SOUTH 250 WEST, SUITE 504
ST. GEORGE, UTAH 84770
CONTACT: TODD SMITH
PHONE: (801) 979-8633
EMAIL: TODD@BROTHERSKEEPERUTAH.com

CIVIL ENGINEER
AMERICAN ENGINEERING & LAND SURVEYING
1173 SOUTH 250 WEST, SUITE 502
ST. GEORGE, UT 84770
CONTACT: AUSTIN CHAPPELL, P.E.
PHONE: (435) 668-5015
EMAIL: austin@aelsg.com

REV.	DATE:	REVISION

PRELIMINARY
NOT FOR
CONSTRUCTION

AMERICAN LAND CONSULTING
1173 SOUTH 250 WEST, SUITE 502
ST. GEORGE, UT 84770

DATE:	12/15/2021
JOB #:	ALC-21-0XX
DRAWN BY:	SSA
CHECKED BY:	ASA

ELIM ESTATES
SECTION 12, TOWNSHIP 42 S, RANGE 14 W SLB&M
HURRICANE, UTAH

COVER SHEET
PRELIMINARY PLAT

P.1.1

SHEET: 1 of 5

C:\Dropbox\ALCSG\JOBS\2021\21-052 - Bright Ideas - Elim Single Family\Drawings\Preliminary Plat\21-052 - Pre Plat.dwg

NORTH CORNER SECTION 12, TOWNSHIP 42 SOUTH
RANGE 14 WEST SLB&M

(TIE) 1536.05' EAST 1066.28'

S 1°07'24" W 2642.11
1106.06'

SOUTH CORNER SECTION 12, TOWNSHIP 42 SOUTH
RANGE 14 WEST SLB&M

0 80' 160'
SCALE: 1" = 80'

BASH PARKWAY
(77.0' WIDE ROW)

N 84°49'05" E 884.71

P.O.B.

N 0°01'18" W 1791.16

S 5°10'55" E 152.00

S 5°11'52" E 116.12

WESTERN MTG & REALTY CO
H-4-2-12-1102

S 1°30'03" W 161.98

N 88°29'57" W 5.00

S 1°30'03" W 100.00

N 88°29'57" W 16.44

S 1°30'03" W 145.00

N 88°29'57" W 15.40

S 1°30'03" W 252.00

N 88°29'57" W 29.43

S 1°30'03" W 321.46

S 88°29'57" E 49.37

S 1°30'03" W 282.00

N 88°29'57" W 459.08

S 66°32'33" W 454.07

N 39°05'04" W 233.43

N 46°57'15" E 627.22

PL DATA:
L=462.77'
R=653.44'
Δ=040°34'38"
CB=N26°39'56"E
CL=453.16'

PL DATA:
L=545.77'
R=2000.00'
Δ=015°38'06"
CB=N31°16'01"W
CL=544.08'

PL DATA:
L=217.68'
R=500.00'
Δ=024°56'41"
CB=S79°00'54"W
CL=215.97'

PHASE 1
PHASE 2
PHASE 3
PHASE 4

ROAD A (52' ROW)
ROAD B (45' ROW)
ROAD C (45' ROW)
ROAD D (52' ROW)
ROAD E (45' ROW)
ROAD F (45' ROW)
ROAD G (52' ROW)
ROAD H (52' ROW)
ROAD J (45' ROW)
ROAD K (45' ROW)
ROAD L (45' ROW)
ROAD M (45' ROW)
ROAD N (60' ROW)

LOT 101 10,429 S.F.
LOT 102 9,250 S.F.
LOT 103 9,250 S.F.
LOT 104 10,153 S.F.
LOT 105 9,903 S.F.
LOT 106 9,000 S.F.
LOT 107 9,000 S.F.
LOT 108 10,221 S.F.
LOT 109 9,760 S.F.
LOT 110 10,606 S.F.
LOT 111 10,127 S.F.
LOT 112 9,801 S.F.
LOT 113 10,286 S.F.
LOT 114 9,000 S.F.
LOT 115 9,000 S.F.
LOT 116 10,077 S.F.
LOT 117 9,712 S.F.
LOT 118 9,374 S.F.
LOT 119 10,143 S.F.
LOT 120 9,251 S.F.
LOT 121 8,212 S.F.
LOT 122 8,864 S.F.
LOT 123 8,922 S.F.
LOT 124 10,404 S.F.
LOT 125 10,303 S.F.
LOT 126 11,774 S.F.
LOT 127 9,604 S.F.
LOT 128 8,928 S.F.
LOT 129 8,918 S.F.
LOT 130 9,244 S.F.
LOT 131 9,244 S.F.
LOT 132 9,579 S.F.
LOT 133 11,314 S.F.
LOT 201 9,244 S.F.
LOT 202 9,244 S.F.
LOT 203 9,244 S.F.
LOT 204 9,799 S.F.
LOT 205 10,992 S.F.
LOT 206 9,182 S.F.
LOT 207 12,599 S.F.
LOT 208 11,054 S.F.
LOT 209 10,146 S.F.
LOT 210 10,146 S.F.
LOT 211 10,914 S.F.
LOT 212 10,914 S.F.
LOT 213 10,146 S.F.
LOT 214 10,146 S.F.
LOT 215 10,914 S.F.
LOT 216 8,500 S.F.
LOT 217 8,500 S.F.
LOT 218 8,500 S.F.
LOT 219 10,720 S.F.
LOT 220 12,092 S.F.
LOT 221 9,971 S.F.
LOT 222 10,471 S.F.
LOT 223 9,000 S.F.
LOT 224 9,000 S.F.
LOT 225 10,649 S.F.
LOT 226 9,682 S.F.
LOT 227 9,662 S.F.
LOT 228 9,665 S.F.
LOT 229 12,390 S.F.
LOT 230 9,304 S.F.
LOT 231 8,936 S.F.
LOT 232 8,942 S.F.
LOT 233 10,339 S.F.
LOT 234 11,160 S.F.
LOT 235 9,857 S.F.
LOT 236 8,920 S.F.
LOT 301 9,238 S.F.
LOT 302 9,237 S.F.
LOT 303 9,237 S.F.
LOT 304 9,237 S.F.
LOT 305 9,237 S.F.
LOT 306 9,237 S.F.
LOT 307 10,544 S.F.
LOT 308 11,446 S.F.
LOT 309 9,327 S.F.
LOT 310 8,757 S.F.
LOT 311 8,800 S.F.
LOT 312 8,800 S.F.
LOT 313 8,800 S.F.
LOT 314 8,758 S.F.
LOT 315 9,045 S.F.
LOT 316 9,000 S.F.
LOT 317 9,000 S.F.
LOT 318 9,000 S.F.
LOT 319 9,024 S.F.
LOT 320 10,054 S.F.
LOT 321 9,501 S.F.
LOT 322 9,501 S.F.
LOT 323 8,814 S.F.
LOT 324 8,707 S.F.
LOT 325 10,446 S.F.
LOT 326 12,076 S.F.
LOT 327 9,814 S.F.
LOT 328 9,873 S.F.
LOT 329 11,691 S.F.
LOT 330 11,010 S.F.
LOT 331 9,876 S.F.
LOT 401 10,151 S.F.
LOT 402 8,800 S.F.
LOT 403 8,800 S.F.
LOT 404 8,800 S.F.
LOT 405 8,800 S.F.
LOT 406 9,440 S.F.
LOT 407 9,464 S.F.
LOT 408 9,220 S.F.
LOT 409 9,914 S.F.
LOT 410 9,914 S.F.
LOT 411 9,000 S.F.
LOT 412 9,000 S.F.
LOT 413 9,000 S.F.
LOT 414 9,000 S.F.
LOT 415 9,914 S.F.
LOT 416 9,914 S.F.
LOT 417 9,366 S.F.
LOT 418 9,373 S.F.
LOT 419 9,385 S.F.
LOT 420 9,194 S.F.
LOT 421 9,000 S.F.
LOT 422 9,000 S.F.
LOT 423 8,899 S.F.
LOT 424 13,944 S.F.
LOT 425 10,773 S.F.
LOT 426 8,905 S.F.
LOT 427 9,146 S.F.
LOT 428 10,385 S.F.
LOT 429 11,698 S.F.
LOT 430 9,777 S.F.
LOT 431 9,976 S.F.
LOT 432 10,818 S.F.
LOT 433 10,914 S.F.
LOT 434 10,914 S.F.
LOT 435 10,914 S.F.

BASH RESORTS LLC
H-4-2-12-1113

WESTERN MTG & REALTY CO
H-4-2-11-31031

MARLA @
ELIM VALLEY

IRON RIDGE BLVD

IRON RIDGE BLVD (FUTURE 71' ROW) TO BE BUILT BY 3RD PHASE 4

WESTERN MTG & REALTY CO
H-4-2-12-1102

WESTERN MTG & REALTY CO
H-4-2-12-1102

PRELIMINARY PLAT NOTES:

1. THE PROPOSED PROJECT IS LOCATED IN SECTION 12, TOWNSHIP 42 SOUTH, RANGE 14 WEST SBL&M
2. BASED ON THE RED CLIFFS DESERT RESERVE TAKE AREA MAPS THE PROJECT SITE IS NOT LOCATED IN A DESERT TORTOISE TAKE AREA.

SITE & UTILITY PLAN LEGEND:

- PROPERTY BOUNDARY LINE
- PHASE LINE
- UTILITY EASEMENT

TOTAL ACREAGE= 40.50 ACRES
TOTAL LOTS = 135
UNITS PER ACRE = 3.31

TYPICAL SINGLE FAMILY LOT

REAR
SIDE-1
SIDE-2 OR STREET SIDE
FRONT

TYPICAL SETBACKS	
FRONT	25'
REAR	10'
SIDE-1	10'
SIDE-2	10'
STREET SIDE	20'

REV.	DATE:	REVISION

PRELIMINARY
NOT FOR
CONSTRUCTION

AMERICAN LAND CONSULTING
1173 SOUTH 250 WEST, SUITE 502
ST. GEORGE, UT 84770

DATE:	12/15/2021
JOB #	ALC-21-0XX
DRAWN BY:	SSA
CHECKED BY:	ASA

ELIM ESTATES
SECTION 12, TOWNSHIP 42 S, RANGE 14 W SLB&M
HURRICANE, UTAH

OVERALL SITE AND PHASING PLAN
PRELIMINARY PLAT

P.1.2

SHEET: 2 of 5

C:\Dropbox\ALCSG\JOBS\2021\21-052 - Bright Ideas - Elim Single Family\Drawings\Preliminary Plat\21-052 - Pre Plat.dwg

BASH PARKWAY
(77.0' WIDE ROW)

CONNECT TO EXISTING STORM DRAIN

ROAD A (52' ROW)
ROAD B (45' ROW)
ROAD C (45' ROW)
ROAD D (52' ROW)
ROAD E (45' ROW)
ROAD F (45' ROW)
ROAD G (52' ROW)
ROAD H (52' ROW)
ROAD I (45' ROW)
ROAD J (45' ROW)
ROAD K (45' ROW)
ROAD M (45' ROW)
ROAD N (60' ROW)

PHASE 1
PHASE 2
PHASE 3
PHASE 4

IRON BRIDGE BLVD

IRON BRIDGE BLVD (FUTURE) TO BE BUILT BY ROAD TO PHASE 4

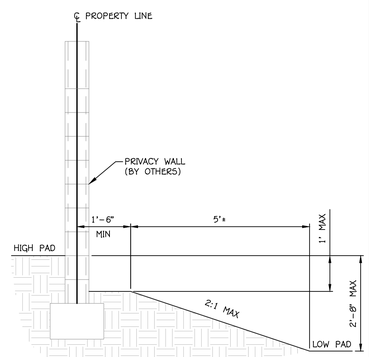
LOT 101 PAD:2875.5
LOT 102 PAD:2877.5
LOT 103 PAD:2880.0
LOT 104 PAD:2881.8
LOT 105 PAD:2884.2
LOT 106 PAD:2886.0
LOT 107 PAD:2888.0
LOT 108 PAD:2889.5
LOT 109 PAD:2887.5
LOT 110 PAD:2885.5
LOT 111 PAD:2891.0
LOT 112 PAD:2895.2
LOT 113 PAD:2899.8
LOT 114 PAD:2902.0
LOT 115 PAD:2897.0
LOT 116 PAD:2893.0
LOT 117 PAD:2889.0
LOT 118 PAD:2886.5
LOT 119 PAD:2884.0
LOT 120 PAD:2881.0
LOT 121 PAD:2882.0
LOT 122 PAD:2884.0
LOT 123 PAD:2885.8
LOT 124 PAD:2884.0
LOT 125 PAD:2882.0
LOT 126 PAD:2880.0
LOT 127 PAD:2878.0
LOT 128 PAD:2879.0
LOT 129 PAD:2880.0
LOT 130 PAD:2878.0
LOT 131 PAD:2877.0
LOT 132 PAD:2875.5
LOT 133 PAD:2874.0
LOT 201 PAD:2879.5
LOT 202 PAD:2880.5
LOT 203 PAD:2882.0
LOT 204 PAD:2884.0
LOT 205 PAD:2890.2
LOT 206 PAD:2894.0
LOT 207 PAD:2898.0
LOT 208 PAD:2902.2
LOT 209 PAD:2906.2
LOT 210 PAD:2906.5
LOT 211 PAD:2902.2
LOT 212 PAD:2906.0
LOT 213 PAD:2910.0
LOT 214 PAD:2909.5
LOT 215 PAD:2906.0
LOT 216 PAD:2906.2
LOT 217 PAD:2904.5
LOT 218 PAD:2903.0
LOT 219 PAD:2901.0
LOT 220 PAD:2896.0
LOT 221 PAD:2900.2
LOT 222 PAD:2904.5
LOT 223 PAD:2905.0
LOT 224 PAD:2901.5
LOT 225 PAD:2896.0
LOT 226 PAD:2891.2
LOT 227 PAD:2893.8
LOT 228 PAD:2896.0
LOT 229 PAD:2897.0
LOT 230 PAD:2890.2
LOT 231 PAD:2889.0
LOT 232 PAD:2887.2
LOT 233 PAD:2886.2
LOT 234 PAD:2888.0
LOT 235 PAD:2882.0
LOT 236 PAD:2881.0
LOT 301 PAD:2883.0
LOT 302 PAD:2884.5
LOT 303 PAD:2885.5
LOT 304 PAD:2887.0
LOT 305 PAD:2888.0
LOT 306 PAD:2889.0
LOT 307 PAD:2890.0
LOT 308 PAD:2893.0
LOT 309 PAD:2890.0
LOT 310 PAD:2889.0
LOT 311 PAD:2888.0
LOT 312 PAD:2887.0
LOT 313 PAD:2886.0
LOT 314 PAD:2885.0
LOT 315 PAD:2891.2
LOT 316 PAD:2892.2
LOT 317 PAD:2893.2
LOT 318 PAD:2894.5
LOT 319 PAD:2895.5
LOT 320 PAD:2896.5
LOT 321 PAD:2898.0
LOT 322 PAD:2903.0
LOT 323 PAD:2899.0
LOT 324 PAD:2897.5
LOT 325 PAD:2896.5
LOT 326 PAD:2895.5
LOT 327 PAD:2898.5
LOT 328 PAD:2905.0
LOT 329 PAD:2904.2
LOT 330 PAD:2900.5
LOT 331 PAD:2896.0
LOT 401 PAD:2916.0
LOT 402 PAD:2916.8
LOT 403 PAD:2917.2
LOT 404 PAD:2918.0
LOT 405 PAD:2918.8
LOT 406 PAD:2919.2
LOT 407 PAD:2919.2
LOT 408 PAD:2918.8
LOT 409 PAD:2917.2
LOT 410 PAD:2915.4
LOT 411 PAD:2916.5
LOT 412 PAD:2917.8
LOT 413 PAD:2915.0
LOT 414 PAD:2914.2
LOT 415 PAD:2913.5
LOT 416 PAD:2914.0
LOT 417 PAD:2913.5
LOT 418 PAD:2912.5
LOT 419 PAD:2912.0
LOT 420 PAD:2911.5
LOT 421 PAD:2911.0
LOT 422 PAD:2910.5
LOT 423 PAD:2910.0
LOT 424 PAD:2909.5
LOT 425 PAD:2906.0
LOT 426 PAD:2908.0
LOT 427 PAD:2908.5
LOT 428 PAD:2909.0
LOT 429 PAD:2909.6
LOT 430 PAD:2909.0
LOT 431 PAD:2908.0
LOT 432 PAD:2910.5
LOT 433 PAD:2911.0
LOT 434 PAD:2912.0
LOT 435 PAD:2912.0

GRADING & DRAINAGE LEGEND:

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY BOUNDARY LINE
		PHASE LINE
50	50	60" STORM DRAIN MANHOLE
		CURB INLET SINGLE CATCH BASIN
		CURB INLET DOUBLE CATCH BASIN
2010		FINISH GRADE MAJOR CONTOUR
2002		FINISH GRADE MINOR CONTOUR
2010		EXISTING GRADE MAJOR CONTOUR
2002		EXISTING GRADE MINOR CONTOUR
	50	PROPOSED STORM DRAIN LINE
	50	EXISTING STORM DRAIN LINE

NOTES:
1. DRAIN AWAY FROM STRUCTURES AT 5% FOR 10' MINIMUM.
2. PROVIDE POSITIVE DRAINAGE FROM REAR OF LOT TO STREET.

TYPICAL LOT DRAINAGE
SCALE: 1" = 40'



PAD TRANSITION: NO RETAINING WALL
SCALE: 1/2" = 1'-0"

REV.	DATE:	REVISION

PRELIMINARY
NOT FOR
CONSTRUCTION

AMERICAN
LAND CONSULTING
1173 SOUTH 250 WEST, SUITE 502
ST. GEORGE, UT 84770

DATE:	12/15/2021
JOB #:	ALC-21-0XX
DRAWN BY:	SSA
CHECKED BY:	ASA

ELIM ESTATES
SECTION 12, TOWNSHIP 42 S, RANGE 14 W SLB&M
HURRICANE, UTAH

GRADING PLAN
PRELIMINARY PLAT

P.1.3

SHEET: 3 of 5

C:\Dropbox\ALCSG\JOBS\2021\21-052 - Bright Ideas - Elim Single Family\Drawings\Preliminary Plat\21-052 - Pre Plat.dwg



REV.	DATE:	REVISION

PRELIMINARY
NOT FOR
CONSTRUCTION

AMERICAN LAND CONSULTING
1173 SOUTH 250 WEST, SUITE 502
ST. GEORGE, UT 84770

DATE:	12/15/2021
JOB #:	ALC-21-0XX
DRAWN BY:	SSA
CHECKED BY:	ASA

ELIM ESTATES

SECTION 12, TOWNSHIP 42 S, RANGE 14 W SLB&M
HURRICANE, UTAH

UTILITY PLAN

PRELIMINARY PLAT

P.1.4

SHEET: 4 of 5

C:\Dropbox\ALCSG\JOBS\2021\21-052 - Bright Ideas - Elim Single Family\Drawings\Preliminary Plat\21-052 - Pre Plat.dwg

Ash Creek Special Service District

1350 S. Sand Hollow Road
Hurricane, UT 84737
Office: (435) 635-2348 Fax: (435) 635-8550
ashcreek@infowest.com

January 18, 2022

Hurricane City
Stephen Nelson
127 N. 870 W.
Hurricane, UT 84737

RE: Elim Single Family – Section 12, Township 42 South, Range 14 West, SLB&M

Stephen,

There is sewer capacity for this project. The developers understand that utilities are not currently in place. The developers understand and agree that they will need to get plan approval for the sewer system.

After approval they agree to pay all costs associated with construction and impact fees.

Please let us know if you have any questions.

Sincerely,

Amber Gillette, P.E.
Engineer
Ash Creek Special Service District

City of Hurricane
Water Department
Ken Richins, Superintendent

January 12, 2022

To Whom It May Concern:

A will serve letter has been requested for Elim Valley Estates located at approximately 400 S and 4300 W in Hurricane, Utah.

Yes, we do have culinary water in the area of 400 S and 4300 W in Hurricane, Utah.

A hydraulic water study may be required to ensure the waterline will deliver the required fire flows. A looped water system may be required

Sincerely,

Hurricane City Water – Dallan Wadsworth

646 West 600 North • Hurricane, UT • 84737
Phone: (435) 635-9442 • Fax: (435) 635-2616
WEB: www.cityofhurricane.com

1-4-1: SENTENCING:

A. Penalty For Violation Of Ordinance [1] : Unless otherwise specifically authorized by statute, the city council may provide a penalty for the violation of any city ordinance by a fine not to exceed the maximum class B misdemeanor fine under Utah Code Annotated section 76-3-301, or by a term of imprisonment up to six (6) months, or by both the fine and term of imprisonment. The city council may prescribe a minimum civil or criminal penalty for the violation of any city ordinance ~~and may impose a civil penalty for the unauthorized use of city property, including, but not limited to, the use of parks, streets and other public grounds or equipment. Rules of civil procedure shall be substantially followed. (2000 Code)~~

1. Exceptions: The municipality may not impose a civil penalty and adjudication for the violation of a municipal moving traffic ordinance, except as authorized in U.C.A. § 10-3-703.5.

Commented [1]: That's in the state law

B. Term Of Imprisonment For Misdemeanors [2] : A person who has been convicted of a misdemeanor may be sentenced to imprisonment as follows:

1. In the case of a class B misdemeanor, for a term not exceeding six (6) months;

2. In the case of a class C misdemeanor, for a term not exceeding ninety (90) days. (1998 Code § 1-322)

C. Infractions [3] :

1. A person convicted of an infraction may not be imprisoned but may be subject to a fine, forfeiture and disqualification, or any combination. (1998 Code § 1-323; amd. 2000 Code)

2. Whenever a person is convicted of an infraction and no punishment is specified, the person may be fined as for a class C misdemeanor. (1998 Code § 1-323)

D. Fines Of Persons [4] : A person convicted of an offense may, in addition to any term of imprisonment imposed, be sentenced to pay a fine not to exceed:

1. Class B Misdemeanor: One thousand dollars ($1,000.00) when the conviction is of a class B misdemeanor conviction; and

2. Class C Misdemeanor; Infraction: Seven hundred fifty dollars ($750.00) when the conviction is of a class C misdemeanor conviction or infraction conviction. (1998 Code § 1-331; amd. 2000 Code)

E. Fines Of Corporations [5] : The sentence to pay a fine, when imposed upon a corporation, association, partnership or governmental instrumentality for an offense defined in this code, or the ordinances of the city, or for an offense defined outside of this code over which this city has jurisdiction, for which no special corporate fine is specified, shall be to pay an amount fixed by the court, not exceeding:

1. Class B Misdemeanor: Five thousand dollars ($5,000.00) when the conviction is for a class B misdemeanor conviction; and

2. Class C Misdemeanor; Infraction: One thousand dollars ($1,000.00) when the conviction is for a class C misdemeanor conviction or for an infraction conviction. (1998 Code § 1-332; amd. 2000 Code)

F. Bail/Fee Schedule:

CRIMINAL BAIL/FEE SCHEDULE FOR HURRICANE CITY ORDINANCES

Commented [2]: This table needs to be reformed at some point

Code Violation	Description	Class	Recommended Bail Amount	Recommendations For Notes
	Business License Violations			
3-1-4	No business license	B	$200.00	
3-2-4	Sale of alcohol without a license	B	600.00	
3-3A	Failure to pay sales tax	B	100.00	

3-4-5	Operation of a sexually oriented business without a valid license	B	400.00	
3-4-9	Employee of an SOB not licensed	B	300.00	
3-5-2	No transient merchant license	B	200.00	No mandatory court appearance required
3-6-5	Solicitation prohibited/no solicitor's license	B	360.00	No mandatory court appearance required
3-6-18	Solicitor violation of a "No Solicitation" notice	B	100.00	No mandatory court appearance required
3-6-19	Solicitor violating time of day restrictions	B	100.00	No mandatory court appearance required
3-9-2	No business license for rental property	B	200.00	

3-9-3	Rental of property in a residential zone for less than 30 days	B	300.00	
3-10-2	No on site manager	Infraction	50.00	
3-10-4	No guest register available/license not displayed	Infraction	50.00	
3-10-5	Occupancy violation	Infraction	50.00	
3-10-6	Room rented to a minor	Infraction	50.00	
3-10-7	Room rented for longer than 30 days	Infraction	50.00	
3-10-8	Sanitation requirements violation (each violation)	Infraction	50.00	
3-10-9	Failure to cooperate with an inspection	Infraction	50.00	
3-10-10	Failure to report violation of the law	Infraction	50.00	

	Public Health And Safety Violations			
4-2-3	Maintaining a public nuisance	C	100.00	
4-3-2	Weed nuisance	C	100.00	
4-4-1	Burn permit required	Infraction	100.00	
4-5-3	Disposal not in landfill	Infraction	100.00	
4-6-5	Litter regulations	Infraction	100.00	
4-6-6	Handbill regulations	Infraction	100.00	
4-8-1	No restroom facility	B	100.00	No mandatory court appearance required
4-8-2	No/improper dumpster	B	100.00	No mandatory court appearance required
4-8-3	Failure to place waste in dumpster	B	100.00	No mandatory court

				appearance required
4-8-4	Failure to dispose of waste	B	100.00	No mandatory court appearance required
4-9-1	Noise	Infraction	50.00	
4-10-4	Fugitive dust		Administrative	
4-11-4	Fireworks	B	$100.00	
	Animal Control Violations			
5-2-3A1	2 limit kennel license	Infraction	100.00	
5-2-3A4a	No license each dog (first offense)	Infraction	50.00	Suspend $10.00 on compliance
5-2-3A4a	No license each dog (second/subsequent offense)	Infraction	75.00	Suspend $10.00 on compliance
5-2-3D3	Dog bite	Infraction	100.00	

5-2-3E1	No rabies vaccination (first offense)	Infraction	50.00	Suspend $10.00 on compliance
5-2-3E1	No rabies vaccination (second/subsequent offense)	Infraction	75.00	Suspend $10.00 on compliance
5-2-4A1	At large dog (first offense/each dog)	Infraction	50.00	
5-2-4A1	At large dog (second/subsequent offense per dog)	Infraction	75.00	
5-2-4A2	At large other	Infraction	50.00	
5-2-4A2	At large other (second/ subsequent offense)	Infraction	75.00	
5-2-4D/ 5-2-7A	Vicious animal not controlled	Infraction	100.00	
5-2-4E	Defecate in public place	Infraction	100.00	
5-2-4G	Animal trespass	Infraction	100.00	

5-2-4H	Poisoning	Infraction	100.00	
5-2-4K	Fail to give care	Infraction	100.00	
5-2-4K3	Promoting animal fighting	Infraction	100.00	
5-2-5A6	Chase cars	Infraction	50.00	
5-2-5A7	Attacks other animals	Infraction	100.00	
5-2-5A	Nuisance animal other offense	Infraction	100.00	
5-2-5B	Excessive barking	Infraction	100.00	
5-2-8B	Hit and run dog with car	Infraction	100.00	
5-2-11K	Retaking animal unlawfully	Infraction	50.00	
	Other Police Regulations			
5-3-2	Loitering	Infraction	50.00	

5-3-3	Discharging weapons in city limits (firearms)	B	100.00	
5-3-3	Discharging weapons in city limits (air rifle)	Infraction	50.00	
5-4-1A	Curfew	B	100.00	
5-4-1B	Parents responsible for curfew	Infraction	50.00	
	Vehicle Violations			
6-1-3D1	Too many vehicles for sale	Infraction	50.00	
6-1-3E2	Illegal parking of a semi	Infraction	100.00	
The late fee for parking violations shall be as follows (6-1-3F): $20.00 if paid after 14 days following the violation notice. $5.00 additional per month if not paid within 30 days.				
	Public Ways And Property Violations			

7-1-3	Obstructing the public right of way/construction materials in the roadway	B	$100.00	No mandatory court appearance required
7-1-8	Illegal operation of an ATV	Infraction	50.00	
7-2-5	Concrete on the street	B	100.00	
7-3-3	Excavating in the street without a permit	B	200.00	
7-5-12B	Defacing headstone/ landscape at the cemetery	Infraction	100.00	
7-6-2A	Defacing anything at a park	Infraction	100.00	
7-6-2B	Alcohol in parks	Infraction	100.00	
7-6-2C	Indecent language	Infraction	50.00	
7-6-2D	Camping in unassigned area	Infraction	50.00	

7-6-2E	Motor vehicles in park	Infraction	50.00	
7-6-2F	Skateboards at park	Infraction	50.00	
7-6-2G	Livestock in park	Infraction	50.00	
7-6-2I	Endangering a person	Infraction	50.00	
7-6-2J	Fire in unapproved area	Infraction	100.00	
7-6-2K	Posting handbills/ solicitation at park	Infraction	50.00	
7-6-2L	Weapon or firearm in park	Infraction	50.00	
7-6-2M	Teaching for profit without a permit	Infraction	50.00	
7-6-2O	Entertainment/exhibition without a permit	Infraction	50.00	
7-6-3A	Parks closed after dark	Infraction	50.00	

7-7-2	Failure to obtain an event permit	B	200.00	
	Land Use Code Violations			
10-9-5A	Development or use without a permit	C	150.00	
10-9-5B	Use inconsistent with permit	C	150.00	
10-9-5C	Use inconsistent with conditions of approval	C	150.00	
10-9-5D	Use inconsistent with land use title	C	150.00	
10-9-5E	Lot or setback nonconforming	C	150.00	
10-9-5F	Increasing intensity of use	C	150.00	
10-9-5G	Removing, defacing, or obscuring notice	C	150.00	

10-12-3A	Violation of use in an agricultural zone	C	150.00	
10-13-3A	Violation of use in a residential zone	C	150.00	
10-14-3A	Violation of use in a residential agriculture zone	C	150.00	
10-15-3A	Violation of use in a commercial zone	C	150.00	
10-16-3A	Violation of use in business and industrial zones	C	150.00	
10-17-3A	Violation of use in an open space and public facility zone	C	150.00	
10-32-7D	Failure to maintain landscape	C	150.00	
10-36	Sign ordinance violation	C	150.00	
10-37-5	Illegal accessory building/structure	C	150.00	

10-37-9	Fence too high	C	150.00	
10-37-9E	Fence is a visual obstruction	C	150.00	
10-42-3	Violation of home based business regulation	C	150.00	
10-43-3B	Illegal location of a manufactured/mobile home	C	150.00	
10-43-3C	Illegal location of an occupied recreational vehicle	C	150.00	
10-48-3B	No temporary use permit	C	150.00	
10-50-5	Violation of zoning for wireless telecommunications facilities	C	150.00	
10-51-3	Operating a bed and breakfast without a permit	C	150.00	

(Ord. 2008-6, 3-20-2008; amd. Ord. 2009-05, 4-16-2009; Ord. 2009-16, 11-5-2009; Ord. 2016-09, 10-20-2016; Ord. 2017-02, 1-5-2017; Ord. 2017-04, 2-2-2017)

Notes

1 1. UCA § 10-3-703.

2 2. UCA § 76-3-204.

3 3. UCA § 76-3-205.

4 4. UCA § 76-3-301.

5 1. UCA § 76-3-302.

1-4-2: OFFENSES DESIGNATED; CLASSIFIED:

A. Sentencing In Accordance With Chapter:

1. A person adjudged guilty of an offense under this code or the ordinances of this city shall be sentenced in accordance with the provisions of this chapter.

2. Ordinances enacted after the effective date of this code which involve an offense should be classified for sentencing purposes in accordance with this chapter, unless otherwise expressly provided. (1998 Code § 1-311)

B. Designation Of Offenses: Offenses are designated as misdemeanors or infractions. (1998 Code § 1-312)

C. Misdemeanors Classified 1 :

1. Misdemeanors are classified into two (2) categories:

a. Class B misdemeanors;

b. Class C misdemeanors.

2. An offense designated as a misdemeanor or any act prohibited or declared to be unlawful in this code or any ordinance of this city when no other specification as to punishment or category is made, is a class B misdemeanor. (1998 Code § 1-313)

D. Infractions:

1. Infractions are not classified.

2. Any offense which is made an infraction in this code or other ordinances of this city, or which is expressly designated an infraction and any offense designated by this code or other ordinances of this city which is not designated as a misdemeanor and for which no penalty is specified is an infraction. (1998 Code § 1-314)

E. Continuing Violation: In all instances where the violation of this code or any ordinance hereinafter enacted is a continuing violation, a separate offense shall be deemed committed on each day during or on which the violation occurs or continues to occur. (1998 Code § 1-315)

Notes

1 1. UCA § 76-3-104.

1-4-3: ADMINISTRATIVE HEARINGS:

A. Request: Unless otherwise specifically provided in any ordinance of the city or any code adopted by reference, a hearing before the city council may be requested by any person:

1. Who is denied or refused a permit or license by any officer, agent or employee of this city.

2. Whose permit or license is revoked, restricted, qualified or limited from that for which it was first issued. (1998 Code § 1-411)

B. Form Of Request; Time Limitation: The request for hearing must be made in writing to the mayor or city recorder-clerk and made within thirty (30) days following the date notice denying, refusing, revoking, qualifying or restricting the license or permit is mailed by the city to the applicant or license holder at his address as it appears on the application or license. (1998 Code § 4-412)

C. Procedure:

1. Time And Place: Following receipt of a request for hearing, the city council shall inform the person requesting a hearing of the time and place the hearing is to be held.

2. Witnesses; Evidence: At the hearing, the aggrieved party shall have the right to hear and examine any witnesses the city may produce to support its decision and to present his own evidence in support of his contention.

3. Decision Of City Council: The city council shall, within ten (10) days following the conclusion of the hearing, in writing, inform the person who requested the hearing of the decision of the city council. (1998 Code § 1-413)

D. Not Additional Remedy: This section shall not be construed so as to afford any aggrieved party more than one hearing before the city council nor shall the hearing provided in this section apply to any criminal complaint or proceeding. (1998 Code § 1-414)

1-4-4: RETURNED CHECKS OR OTHER NEGOTIABLE INSTRUMENTS:

Any person who makes, draws, signs or issues a check, draft, order or other instrument to the city of Hurricane shall be liable for the amount of such check, draft, order or instrument, plus a service fee in the amount of twenty dollars ($20.00), if the check is not honored upon presentment and is marked "refer to maker", or the account upon which the check, draft, order or instrument is drawn does not exist, has been closed or does not have sufficient funds for payment in full of the check, draft, order or instrument. (Ord. 21-5-3, 5-3-2001)

1-5-5 CIVIL ENFORCEMENT

The City may impose civil penalties for the violation of any requirement, regulation, ordinance, or other provision of the Hurricane City Code. When imposing a civil penalty for violation of any requirement, regulation, ordinance, or other provision of the Hurricane City Code, the City shall follow the procedure of this section. Civil enforcement of any violation is only one option for enforcement. Nothing in this section removes the City's ability to use criminal proceedings or other enforcement strategies authorized by state law and this code in the resolution of code violations.

A. Notice of violation. Upon inspection and discovery that any provision of Hurricane City Code is being violated, the Planning Director, Chief of Police, Code Enforcement Officer, City Recorder or designee, shall provide written notice of the violation to the property owner, and in addition, may provide written notice of the violation to any other responsible party.

1. The notice of violation shall: (1) indicate the nature of the violation; (2) order the necessary action to correct the violation; (3) establish a reasonable time period for the necessary corrective actions to be completed (the "warning period"); and (4) state that the property owner and other responsible party (if any) will be subject to civil penalties if the violation is not corrected within the warning period.

2. The warning period shall be the minimum time period reasonably necessary to correct the violation, given the nature of the violation and the amount of effort needed to correct the violation. The warning period could be as short as several hours or as long as several weeks.

3. The notice of violation shall be delivered personally or mailed to the owner of record at the address shown on the records of the County Recorder, or to a person designated, in writing, by the owner of record as the owner's agent for the purpose of receiving notice of an ordinance violation. The notice of violation may also be delivered personally or mailed to any other responsible party. Personal delivery or mailing of the written notice shall serve to start the warning period.

B. Civil citation. If the violation remains uncorrected at the end of the warning period, the Planning Director, Chief of Police, City Recorder or Code Enforcement Officer may issue a civil citation to the property owner and/or other responsible party.

1. The civil citation shall be personally delivered, or mailed to the property owner, as shown on the records of the County Recorder.

2. The civil citation shall serve to start the imposition and accrual of civil penalties. The civil citation shall state that civil penalties are being assessed to the property owner and/or other responsible party for each day the violation persists, beginning on the date the civil citation is personally delivered or mailed.

C. Referral to Police Department. The Planning Director or Code Enforcement Officer may refer any violation to the Chief of Police for an immediate criminal enforcement action, as allowed by state law.

D. Daily violations. If provided in the citation, each day a violation is continued or maintained after the date the civil citation is personally delivered or mailed is considered a separate violation and shall give rise to a separate civil penalty for each day of violation. The filing of an appeal does not stop the daily accrual of any penalty unless the civil hearing officer ultimately dismisses the citation.

E. Civil penalties. A violation of any provision of this Code shall result in a civil penalty pursuant to the following schedule:

Violation	Penalty
Unlicensed short-term rental (see section 3-10-11)	$750 per day
Violation of short-term rental licensing standards (see section 3-10-11)	$750 per day
Violation of zoning and licensing standards for Residential Hosting (see section 10-51)	$750 per day

F. Correction of violation required. The payment of a civil penalty does not relieve the obligation to correct the violation. The property owner or other responsible party is required to correct the violation regardless of whether or not the civil penalty has been paid.

G. Citation appeal. Any person who has received a civil citation and who wishes to dispute the violation may appeal the citation in writing to the civil hearing officer within 15 calendar days after the citation has been issued. If a person who has received a citation does not appeal within 15 days, the right to an appeal is lost. In such case, the person shall be responsible for both correcting the violation and paying all applicable civil penalties.

H. Appeal procedures.

1. The City Manager shall appoint the Civil Hearing Officer.

2. The Hearing Officer shall adopt rules of procedure that govern the review and adjudication of civil citation appeals. Such rules shall provide a meaningful opportunity for the appellant to present evidence documenting one of the following defenses:

a. At the time of the citation and at all times ensuing, the alleged violation did not and does not exist.

b. At the time of citation, compliance with the subject ordinance(s) would have violated the criminal laws of the state.

c. Compliance with the subject ordinance(s) would have presented an imminent and irreparable physical injury to persons or property.

d. The violation and failure to correct the violation were both caused by a force majeure event such as war, act of nature, or civil disturbance.

3. After reviewing the appeal, the Civil Hearing Officer may dismiss the citation only on a finding that one of the four defenses in paragraph 2 above applies to the appeal. If the hearing officer finds none of the defenses apply, the Hearing Officer shall uphold the citation and associated civil penalties. If the hearing officer upholds the citation, daily civil penalties shall continue to accrue after the hearing until the violation is corrected.

4. If the Hearing Officer upholds the citation, the Hearing Officer may, in the interest of justice and on behalf of the City, enter into an agreement for the delayed or periodic payment of the civil penalty by the violator.

5. If the Civil Hearing Officer upholds the citation, the hearing officer may partially or wholly abate the civil penalties for one of the following reasons only:

a. The violation was corrected promptly after the issuance of the civil citation and at the time of the appeal hearing the violation does not exist.

b. There has been a change in the actual ownership of the property where the violation exists since the time the citation was written, and the new owner is not related by blood, marriage, adoption, or common ownership to the prior owner.

I. Late fees. A late fee will be assessed for any unpaid civil penalty in instances where daily penalties are not accruing (such as when a violation has been corrected on the property but the civil penalty imposed by a citation for the earlier violation has not been paid, or when the violation was transitory and the unpaid civil penalty was only imposed for the period of time the violation existed). In such cases, a late fee equivalent to 25 percent of the civil penalty will be assessed 30 days after the date the civil citation is issued, or 15 days after the date of the appeal hearing, whichever is later. The property owner shall pay any late fee that is assessed in accordance with this section.

J. Collection of civil penalties. The City may file a civil action to collect any unpaid amount under this section. The violator and any responsible person shall pay for all costs of collection, including but not limited to attorney's fees and costs.

Sec. 3-10-11. Short term vacation rentals.

Regulations and restrictions imposed by this section are in recognition of the premise that a vacation rental provides lodging for a transient population that may or may not honor neighborhood mores or exhibit neighborly consideration to the same extent as permanent residents. Separation requirements listed in subsection B of this section and total license limits listed in subsection C of this section are based on a desire to maintain the overall residential character of neighborhoods and the purpose of single-family residential zones to promote safe locations for residential uses.

A. *Business license required.* No dwelling in any permitted zone shall be occupied or used as short term vacation rental until such time that the owner has obtained a short term vacation rental business license issued in accordance with the provisions of this section.

B. *Conditions for issuance of a business license for a short term vacation rental.* Issuance of a short term vacation rental business license by the Business License Officer shall be subject to the following:

1. A complete application for a short term vacation rental business license shall have been submitted in accordance with section 3-1-5, and which shall also include:

a. The name, address and phone number of the owner or other person designated by the owner as the property manager who shall be responsible for ensuring compliance with the rules and regulations specified in this section, and

b. A valid state tax number for remittance of transient lodging taxes.

2. The dwelling unit for which the business license is sought shall be a located in a permitted zone according to this title and that has been built to meet building and fire codes for transient occupancy and has been issued a certificate of occupancy.

3. Portions of a single-family dwelling may not be used as a short term vacation rental unless licensed as a bed and breakfast or residential hosting facility in accordance with the regulations for that use. A short term vacation rental and a bed and breakfast or residential hosting facility may not be located in the same single-family dwelling. Only one vacation rental is allowed per property.

4. In permitted single-family zones, the owner of a single-family dwelling for which a short term vacation business license is sought does not hold a business license to operate another short term vacation rental within the City limits. For purposes of this subsection, "owner" means any individual, corporation, partnership, limited liability company, trust or other entity which has a legal or equitable ownership interest in the single-family dwelling, or any individual who has an ownership interest in any corporation, partnership, limited liability company, trust or other entity which has a legal or equitable ownership interest in the single-family dwelling.

5. In permitted single-family zones, the property line of another dwelling licensed as a short term vacation rental is not located within 300 feet, as measured along the same street or around the corner, of the front property line corners of the property where the proposed short term vacation rental license is being sought. This criterion does not apply to recreation resort zoning or motel type uses within commercial zoning.

C. *Limit on total number of short term vacation rental licenses within single-family zones as contained in title 10, chapter 13 of this Code.* The total number of short term vacation rental business licenses issued within single-family zones shall be limited in accordance with the following:

1. The maximum number of short term vacation rental business licenses for property in single-family zones to be issued shall be based on the total population of the City, allowing three licenses for every 1,000 of total population.

2. The total number of licenses available each year shall be recalculated based on an estimated population derived by adding the total number of new dwelling units times 2.9 residents per unit to the prior year's base population. The City shall readjust the population numbers every ten years after the release of the census numbers. If the census numbers are lower than the City's projection, the City shall not revoke any issued license but shall not issue any additional licenses until City population justifies additional license availability.

3. If, after the maximum number of licenses has been issued, an application meeting all other requirements for issuance of a license is received, the application shall be placed on a waiting list in order of the date of receipt. No fees will be due until a license becomes available. When a license becomes available, the first applicant on the waiting list shall be notified of the license availability, and the applicant shall have 45 days from the date of such notice to file a complete application and pay the filing fee, and six months thereafter to complete the licensing process. In the event that the applicant fails to file a complete application and filing fee within said 45 days, or fails to complete the licensing process within said six months, the application shall be deemed to have expired, and the next applicant will be notified of the license availability, and the same procedure shall apply.

4. In the event of a sale or other transfer of any property containing a dwelling licensed as a short term vacation rental, the purchaser or transferee of the property shall be required to apply for a new license within 45 days of the date of purchase or transfer. In the event that the purchaser or transferee fails to apply for a new license within said 45 days, the license will be forfeited and the owner must reapply for any available license or be placed on the waiting list.

D. *Parking regulations.* The owner of any property licensed as a short term vacation rental shall provide off street parking for guests in accordance with the following:

1. Off street parking shall be provided on the same lot as the dwelling which is licensed as a short term vacation rental.

2. Parking shall be provided at one vehicle per bedroom. Tandem spaces on a driveway may be used.

3. All guest parking shall be contained on the site.

4. No off street parking space may be located in front of the living area of the dwelling unless there is a circular driveway.

5. The number of vehicles allowed by the occupants of a vacation rental home shall be restricted to the number of off street parking spaces provided by the owner.

E. *Maintenance standards.* Any property that contains a dwelling which is licensed as a short term vacation rental shall conform to the following standards:

1. Structures shall be properly maintained, painted and kept in good repair, and grounds and landscaped areas shall be properly maintained and watered in order that the use in no way detracts from the general appearance of the neighborhood;

2. The use of a dwelling as a short term rental shall not in any way change the appearance of the dwelling or property for residential purposes; and

3. Each sleeping room must meet current international residential code codes for egress and be equipped with smoke and CO2 detectors. A fire exiting route plan and maximum occupancy number must be posted in each sleeping room.

F. *Prevention of noise, nuisance or trespass.* The owner of any dwelling licensed as a short term vacation rental shall be responsible to ensure that guests or occupants of the short term rental do not:

1. Create noises that by reason of time, nature, intensity or duration are out of character with noises customarily heard in the surrounding residential neighborhood.

2. Disturb the peace of surrounding residential property residents by engaging in shouting, fighting, playing of loud music, racing of cars or recreational vehicles on streets, engaging in outside recreational activities after 10:00 p.m., or other similar activities.

3. Interfere with the privacy of surrounding residents or trespass onto surrounding properties.

4. Allow pets or animals to create noise, roam the streets, trespass on neighboring properties, or create a mess that is not cleaned up by the owner or custodian of the pet or animal.

5. Engage in any disorderly or illegal conduct, including illegal consumption of drugs and alcohol.

G. *Required posting.* The following information must be posted in a clear, concise, and unambiguous manner and in a conspicuous location inside any dwelling licensed as a short term vacation rental:

1. A copy of the vacation rental business license.

2. The name, address, and phone number of the owner or property manager.

3. The location of all fire extinguishers.

4. A list of all rules applicable for vacation rentals.

5. The maximum occupancy of the vacation rental and the maximum number of vehicles allowed.

H. *Miscellaneous rules and regulations.* The following rules and regulations shall apply to any dwelling for which a short term vacation rental business license has been issued:

1. Outdoor pools, hot tubs or spas shall not be used between the hours of 11:00 p.m. and 6:00 a.m.

2. Maximum occupancy in any dwelling licensed as a short term vacation rental shall be ten persons at any one time. If, however, the property has a fire sprinkler system or other fire suppression system acceptable to the Hurricane Valley Fire District, a greater occupancy may be approved. Maximum occupancy of the dwelling must be included in the regulations sign.

3. The owner of any property containing a dwelling licensed as a short term vacation rental shall cause to be displayed in a City approved location on the exterior of the property an approved sign containing the name and 24-hour per day, 365-day per year telephone number of the owner or other party designated by the owner as property manager who will be responsible for receiving and resolving complaints regarding activities on the property and the conduct of its occupants and guests. The sign shall not exceed 12 inches by 18 inches and shall be the only sign other than an address permitted on a short term vacation rental property.

4. The owner or property manager shall provide information on current occupants to police, emergency, or City personnel as requested. The owner or other person designated as the property manager shall respond to complaints and concerns within one hour of any phone call or other notification. Failure of the owner or property manager to respond in a timely manner may result in a violation and possible fines to the business license holder and property owner.

5. The requirements of this section shall be in effect throughout the time a short term vacation rental license is in effect on the property, regardless of whether the property is occupied by the owner, nonpaying guests of the owner, or paying guests of the owner. The City finds that, given the practical difficulty of determining whether or not the occupants are paying guests, enforcement of the requirements contained in this section shall be based on whether the property is licensed as a short term vacation rental.

6. An inspection of a vacation rental property for compliance with these regulations will be performed at the time of business license review. Additional inspections may be performed with 24 hour notice to the license holder/property manager if deemed necessary by the City.

7. The owner of any dwelling licensed as a short term vacation rental shall be required to collect and remit on a timely basis transient lodging taxes.

I. *Enforcement provisions.*

1. Any owner of any dwelling within the City who allows or permits occupation of said dwelling as a short term vacation rental, as defined herein, without having first obtained a business license in accordance with the provisions of this section shall be in violation of this section and shall be cited with a civil citation or guilty of an infraction, which shall be punishable by a fine of up to $750.00 for each day that they are found to be in violation. In addition, in the event that such dwelling is on the waiting list described in subsection C3 above at the time of such violation, the business license application for said dwelling shall be removed from said waiting list and the dwelling shall not be considered for a short term vacation rental business license unless a new application is submitted.

2. Any owner of any dwelling within the City, who, having first obtained a business license for use or occupation of said dwelling as a short term vacation rental, thereafter operates or permits operation of said short term vacation rental in violation of the terms and provisions of this section shall be cited with a civil citation or guilty of an infraction, and shall be punished by a fine of up to $750.00 for each such violation.

3. Any person who occupies a short term rental as a guest and who violates any local ordinance or state law shall be subject to arrest, issuance of a citation, or other criminal process in accordance with all state, federal or local statutes, rules or ordinances.

4. Violation of any provision of this section regulating short term vacation rentals shall constitute a separate offense for each day said violation occurs or continues.

5. In the event of three or more violations of this section committed by an owner or guest, or any combination of the two, within any 12-month period, the City Council may, depending on the nature or extent of the violations, proceed with revocation of the business license for any short term vacation rental property in accordance with the provisions of the general business license ordinance.

(Ord. No. 2021-06 , 7-1-2021)

Sec. 3-10-11. Short term vacation rentals.

Regulations and restrictions imposed by this section are in recognition of the premise that a vacation rental provides lodging for a transient population that may or may not honor neighborhood mores or exhibit neighborly consideration to the same extent as permanent residents. Separation requirements listed in subsection B of this section and total license limits listed in subsection C of this section are based on a desire to maintain the overall residential character of neighborhoods and the purpose of single-family residential zones to promote safe locations for residential uses.

A. *Business license required.* No dwelling in any permitted zone shall be occupied or used as short term vacation rental until such time that the owner has obtained a short term vacation rental business license issued in accordance with the provisions of this section.

B. *Conditions for issuance of a business license for a short term vacation rental.* Issuance of a short term vacation rental business license by the Business License Officer shall be subject to the following:

1. A complete application for a short term vacation rental business license shall have been submitted in accordance with section 3-1-5, and which shall also include:

a. The name, address and phone number of the owner or other person designated by the owner as the property manager who shall be responsible for ensuring compliance with the rules and regulations specified in this section, and

b. A valid state tax number for remittance of transient lodging taxes.

2. The dwelling unit for which the business license is sought shall be a located in a permitted zone according to this title and that has been built to meet building and fire codes for transient occupancy and has been issued a certificate of occupancy.

3. Portions of a single-family dwelling may not be used as a short term vacation rental unless licensed as a bed and breakfast or residential hosting facility in accordance with the regulations for that use. A short term vacation rental and a bed and breakfast or residential hosting facility may not be located in the same single-family dwelling. Only one short term vacation rental is permitted per property

4. In permitted single-family zones, the owner of a single-family dwelling for which a short term vacation business license is sought does not hold a business license to operate another short term vacation rental within the City limits. For purposes of this subsection, "owner" means any individual, corporation, partnership, limited liability company, trust or other entity which has a legal or equitable ownership interest in the single-family dwelling, or any individual who has an ownership interest in any corporation, partnership, limited liability company, trust or other entity which has a legal or equitable ownership interest in the single-family dwelling.

5. In permitted single-family zones, the property line of another dwelling licensed as a short term vacation rental is not located within 300 feet, as measured along the same street or around the corner, of the front property line corners of the property where the proposed short term vacation rental license is being sought. This criterion does not apply to recreation resort zoning or motel type uses within commercial zoning.

C. *Limit on total number of short term vacation rental licenses within single-family zones as contained in title 10, chapter 13 of this Code.* The total number of short term vacation rental business licenses issued within single-family zones shall be limited in accordance with the following:

1. The maximum number of short term vacation rental business licenses for property in single-family zones to be issued shall be based on the total population of the City, allowing three licenses for every 1,000 of total population.

2. The total number of licenses available each year shall be recalculated based on an estimated population derived by adding the total number of new dwelling units times 2.9 residents per unit to the prior year's base population. The City shall readjust the population numbers every ten years after the release of the census numbers. If the census numbers are lower than the City's projection, the City shall not revoke any issued license but shall not issue any additional licenses until City population justifies additional license availability.

3. If, after the maximum number of licenses has been issued, an application meeting all other requirements for issuance of a license is received, the application shall be placed on a waiting list in order of the date of receipt. No fees will be due until a license becomes available. When a license becomes available, the first applicant on the waiting list shall be notified of the license availability, and the applicant shall have 45 days from the date of such notice to file a complete application and pay the filing fee, and six months thereafter to complete the licensing process. In the event that the applicant fails to file a complete application and filing fee within said 45 days, or fails to complete the licensing process within said six months, the application shall be deemed to have expired, and the next applicant will be notified of the license availability, and the same procedure shall apply.

4. In the event of a sale or other transfer of any property containing a dwelling licensed as a short term vacation rental, the purchaser or transferee of the property shall be required to apply for a new license within 45 days of the date of purchase or transfer. In the event that the purchaser or transferee fails to apply for a new license within said 45 days, the license will be forfeited and the owner must reapply for any available license or be placed on the waiting list.

D. *Parking regulations.* The owner of any property licensed as a short term vacation rental shall provide off street parking for guests in accordance with the following:

1. Off street parking shall be provided on the same lot as the dwelling which is licensed as a short term vacation rental.

2. Parking shall be provided at one vehicle per bedroom. Tandem spaces on a driveway may be used.

3. All guest parking shall be contained on the site.

4. No off street parking space may be located in front of the living area of the dwelling unless there is a circular driveway.

5. The number of vehicles allowed by the occupants of a vacation rental home shall be restricted to the number of off street parking spaces provided by the owner.

E. *Maintenance standards.* Any property that contains a dwelling which is licensed as a short term vacation rental shall conform to the following standards:

1. Structures shall be properly maintained, painted and kept in good repair, and grounds and landscaped areas shall be properly maintained and watered in order that the use in no way detracts from the general appearance of the neighborhood;

2. The use of a dwelling as a short term rental shall not in any way change the appearance of the dwelling or property for residential purposes; and

3. Each sleeping room must meet current international residential code codes for egress and be equipped with smoke and CO2 detectors. A fire exiting route plan and maximum occupancy number must be posted in each sleeping room.

F. *Prevention of noise, nuisance or trespass.* The owner of any dwelling licensed as a short term vacation rental shall be responsible to ensure that guests or occupants of the short term rental do not:

1. Create noises that by reason of time, nature, intensity or duration are out of character with noises customarily heard in the surrounding residential neighborhood.

2. Disturb the peace of surrounding residential property residents by engaging in shouting, fighting, playing of loud music, racing of cars or recreational vehicles on streets, engaging in outside recreational activities after 10:00 p.m., or other similar activities.

3. Interfere with the privacy of surrounding residents or trespass onto surrounding properties.

4. Allow pets or animals to create noise, roam the streets, trespass on neighboring properties, or create a mess that is not cleaned up by the owner or custodian of the pet or animal.

5. Engage in any disorderly or illegal conduct, including illegal consumption of drugs and alcohol.

G. *Required posting.* The following information must be posted in a clear, concise, and unambiguous manner and in a conspicuous location inside any dwelling licensed as a short term vacation rental:

1. A copy of the vacation rental business license.

2. The name, address, and phone number of the owner or property manager.

3. The location of all fire extinguishers.

4. A list of all rules applicable for vacation rentals.

5. The maximum occupancy of the vacation rental and the maximum number of vehicles allowed.

H. *Miscellaneous rules and regulations.* The following rules and regulations shall apply to any dwelling for which a short term vacation rental business license has been issued:

1. Outdoor pools, hot tubs or spas shall not be used between the hours of 11:00 p.m. and 6:00 a.m.

2. Maximum occupancy in any dwelling licensed as a short term vacation rental shall be ten persons at any one time. If, however, the property has a fire sprinkler system or other fire suppression system acceptable to the Hurricane Valley Fire District, a greater occupancy may be approved. Maximum occupancy of the dwelling must be included in the regulations sign.

3. The owner of any property containing a dwelling licensed as a short term vacation rental shall cause to be displayed in a City approved location on the exterior of the property an approved sign containing the name and 24-hour per day, 365-day per year telephone number of the owner or other party designated by the owner as property manager who will be responsible for receiving and resolving complaints regarding activities on the property and the conduct of its occupants and guests. The sign shall not exceed 12 inches by 18 inches and shall be the only sign other than an address permitted on a short term vacation rental property.

4. The owner or property manager shall provide information on current occupants to police, emergency, or City personnel as requested. The owner or other person designated as the property manager shall respond to complaints and concerns within one hour of any phone call or other notification. Failure of the owner or property manager to respond in a timely manner may result in a violation and possible fines to the business license holder and property owner.

5. The requirements of this section shall be in effect throughout the time a short term vacation rental license is in effect on the property, regardless of whether the property is occupied by the owner, nonpaying guests of the owner, or paying guests of the owner. The City finds that, given the practical difficulty of determining whether or not the occupants are paying guests, enforcement of the requirements contained in this section shall be based on whether the property is licensed as a short term vacation rental.

6. An inspection of a vacation rental property for compliance with these regulations will be performed at the time of business license review. Additional inspections may be performed with 24 hour notice to the license holder/property manager if deemed necessary by the City.

7. The owner of any dwelling licensed as a short term vacation rental shall be required to collect and remit on a timely basis transient lodging taxes.

I. *Enforcement provisions.*

1. Any owner of any dwelling within the City who allows or permits occupation of said dwelling as a short term vacation rental, as defined herein, without having first obtained a business license in accordance with the provisions of this section shall be in violation of this section and shall be cited with a civil citation or guilty of an infraction~~guilty of an infraction~~, which shall be punishable by a fine of up to $750.00 for each day that they are found to be in violation~~such violation~~. In addition, in the event that such dwelling is on the waiting list described in subsection C3 above at the time of such violation, the business license application for said dwelling shall be removed from said waiting list and the dwelling shall not be considered for a short term vacation rental business license unless a new application is submitted.

2. Any owner of any dwelling within the City, who, having first obtained a business license for use or occupation of said dwelling as a short term vacation rental, thereafter operates or permits operation of said short term vacation rental in violation of the terms and provisions of this section shall be cited with a civil citation or guilty of an infraction~~guilty of an infraction~~, and shall be punished by a fine of up to $750.00 for each such violation.

3. Any person who occupies a short term rental as a guest and who violates any local ordinance or state law shall be subject to arrest, issuance of a citation, or other criminal process in accordance with all state, federal or local statutes, rules or ordinances.

4. Violation of any provision of this section regulating short term vacation rentals shall constitute a separate offense for each day said violation occurs or continues.

5. In the event of three or more violations of this section committed by an owner or guest, or any combination of the two, within any 12-month period, the City Council may, depending on the nature or extent of the violations, proceed with revocation of the business license for any short term vacation rental property in accordance with the provisions of the general business license ordinance.

(Ord. No. 2021-06 , 7-1-2021)