HURRICANE CITY
UTAH

Power Board Meeting Agenda

6/10/2026

3:00 PM

Power Department Meeting Room – 526 W 600 N

Notice is hereby given that the Power Board will hold a Regular Meeting in the Power Department Meeting room located at 526 W 600 N, Hurricane, UT. A silent roll call will be taken, along with the Pledge of Allegiance and prayer by invitation.

AGENDA

1. Pledge of Allegiance
2. Prayer
3. Approval of minutes from April 2026

STAFF REPORTS

Mike Johns/Power Director
Brian Anderson/Transmission & Distribution Superintendent
Mike Ramirez/Service Superintendent
Jared Ross/Substation & Generation Foreman

OLD BUSINESS

NEW BUSINESS

1. Discussion and possible recommendation to the City Council regarding updates to **Underground Standards and Specifications** – Alex Farnsworth
2. UAMPS Updates
3. **Closed Meeting pursuant to Utah Code Section 52-4-205, upon request**

ADJOURNMENT

The above notice was posted to the Hurricane City website, the Utah State Public Notice Website, and at the following locations:

1. Hurricane City Office – 147 North 870 West, Hurricane, UT
2. US Post Office – 1075 West 100 North, Hurricane, UT
3. Washington County Library (Hurricane Branch) – 36 South 300 West, Hurricane, UT

REASONABLE ACCOMMODATION: Hurricane City will make efforts to provide reasonable accommodations to disabled members of the public in accessing City programs, please contact the Executive Assistant, 435-635-5536, at least 24 hours in advance if you have special needs.

The Hurricane City Power Board met on April 8, 2026, at 3:00 p.m. at the Clifton Wilson Substation located at 526 W 600 N.

In attendance were Mac Hall, Dave Imlay, Colt Stratton, Kerry Prince, Mark Maag, Angie Erickson, Mike Johns, Brian Anderson, Mike Ramirez, Alex Farnsworth, Dayton Hall, Mike Vercimak, Weston Walker, and Crystal Wright.

Mac Hall welcomed everyone to the meeting. Angie Erickson led the Pledge of Allegiance and Kerry Prince offered the prayer. Dave Imlay motioned to approve the minutes from March 2026. Colt Stratton seconded the motion. Motion passed unanimously.

Mike Johns: Mike Johns reported that he has requested an additional substation employee for this upcoming budget year. He stated the Line Crew has requested a temporary groundman for the summer. He reminded the board regarding the UAMPS Municipal Toolkit Workshop coming up next week and the Annual UAMPS Member Conference held annually in August. He updated the board on the City Council items that were approved after our board meeting last month including the 5-year rate design and the Power Cost Adjustment (PCA). We will be providing the PCA number as part of our monthly Power Board meetings each month.

Brian Anderson: Brian Anderson stated there's a line extension toward the end of the line near Sky Ranch. We have all the poles set except for one. This line extension is for the 3-phase line extension for the booster pump for the Water Department. We removed the old Rocky Mountain Power (RMP) metering point and changed out three poles for Rock View Estates. We removed the old overhead 3-phase line feeding the Water Department's well by Wal-Mart because it is now fed by a new underground line. We're about halfway through the annual tree trimming.

Mike Ramirez: Mike Ramirez reported on some missed locates we've had in Southern Shores and on 650 South. He detailed that we have experienced four hits within the last two weeks. There was a discussion about costs incurred due to missed locates. They discussed additional training, making sure the locator has enough paint and flags, and some challenges that inherently exist for locators in addition to specifications for depths of infrastructure for primary power and communications. He then provided an AMI update. He stated that nearly all the gateways and relays are installed and powered up. Things are continuing to progress with this project.

Jared Ross: Mike Johns reported for Jared Ross in his absence. He provided an update on the Sky Mountain Substation. The walls around the building are approximately 30% completed. Masons are out laying blocks for the wall currently. The generators are all put back together and function well. They are still working on some maintenance in preparation for the summer generation run season.

Discussion regarding Pole Attachment Agreements – Mike Johns explained the process that exists for current pole attachments. Each agreement is individual and has been hard to keep track of because of the nature of communications companies which frequently change hands and are sold. He would like to see a city-wide policy regarding pole attachments that would streamline changes necessary to the policy without requiring each individual agreement to be updated separately. He used the example of the cost to attach per pole of $10 that exists currently.

He would like the agreement to state that the amount could be updated by resolution of the City Council so that instead of having to update each individual agreement he would be able to take the change to City Council for approval. Upon an approval by resolution, each agreement would update automatically without having to obtain new signatures for each individual agreement. That is a large driving factor as well as installation requirements specifically detailed in the new agreement. Brian Anderson showed a multitude of pictures of inadequate pole attachment installations that currently exist. Mike Johns explained that he will have Alex Farnsworth researching some changes and updates to the pole attachment agreement. Dayton Hall referenced Hurricane City Code Title 7 Chapter 12 that addresses this topic as well as what is currently within the Power Standards. There is a difference between the franchise agreements and the pole attachment agreements, and he detailed his initial thoughts about how that might look. He is happy to discuss this further if necessary. Mike Johns stated once we have a rough idea of what we'd like the agreement to look like we will bring it back to the board for further discussion. He just wanted to present the issues we're facing with the existing agreements and attachments and why we are looking at updates.

UAMPS Updates: Mike Johns stated we discussed a lot of these items earlier. The Amended and Restated Pooling Agreement was approved by the City Council. Upcoming items that will be coming include the All-In Requirement and the implementation of EDAM in May.

Meeting adjourned at 4:09 p.m. The next Power Board meeting is scheduled for May 13, 2026, at 3:00 p.m.

BUDGET

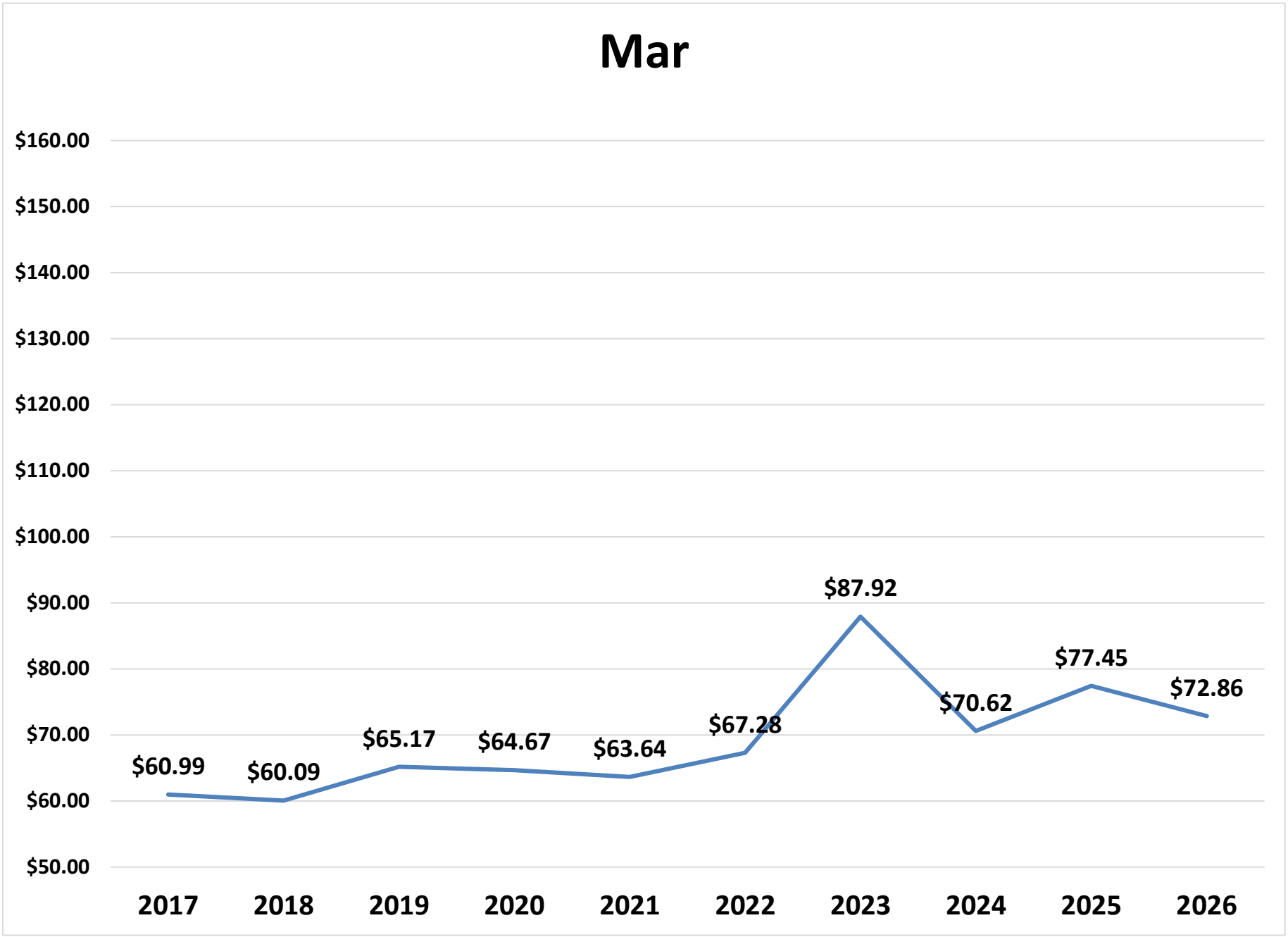
AVERAGE YEARLY POWER PRICES

25-26 bdgt amount (thru Apr 2026) **$72.89**

BDGT Year to Date **$72.71**

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Jan	$59.07	$60.62	$59.75	$57.76	$60.14	$68.25	$132.44	$80.85	$73.20	$75.88
Feb	$63.04	$60.96	$67.00	$60.67	$63.19	$70.88	$83.72	$71.23	$74.69	$76.52
Mar	$60.99	$60.09	$65.17	$64.67	$63.64	$67.28	$87.92	$70.62	$77.45	$72.86
Apr	$59.49	$55.02	$55.44	$55.92	$61.86	$82.63	$75.32	$70.32	$76.44	$68.93
May	$60.32	$58.86	$58.55	$58.55	$59.69	$72.66	$67.45	$64.54	$63.90	$55.00
June	$58.54	$52.17	$55.30	$53.44	$86.91	$77.60	$69.52	$63.88	$63.66	
Jul	$58.29	$67.87	$54.29	$55.98	$81.04	$85.31	$90.48	$70.51	$71.49	
Aug	$59.00	$66.55	$54.58	$78.40	$72.03	$96.60	$84.39	$67.05	$65.48	
Sep	$62.36	$55.00	$54.34	$64.93	$82.38	$127.29	$83.74	$66.46	$74.68	
Oct	$59.79	$59.36	$59.70	$62.82	$75.92	$83.45	$83.77	$75.82	$71.95	
Nov	$62.14	$64.60	$63.80	$63.60	$70.47	$96.34	$73.03	$85.85	$81.66	
Dec	$58.80	$61.61	$58.55	$60.33	$70.07	$161.27	$71.99	$68.50	$75.69	
Yr Avg	$60.15	$60.23	$58.87	$61.42	$70.61	$90.80	$83.65	$71.30	$72.52	$69.84
Weighted Avg	$59.90	$60.56	$58.11	$61.98	$72.46	$92.09	$84.16	$70.50	$71.50	$73.46
										Cy to Date

These figures capture the total cost of power to the power department. The power department uses costs only associated with the purchasing and generation of power and includes debt payments and interest associated with power resources.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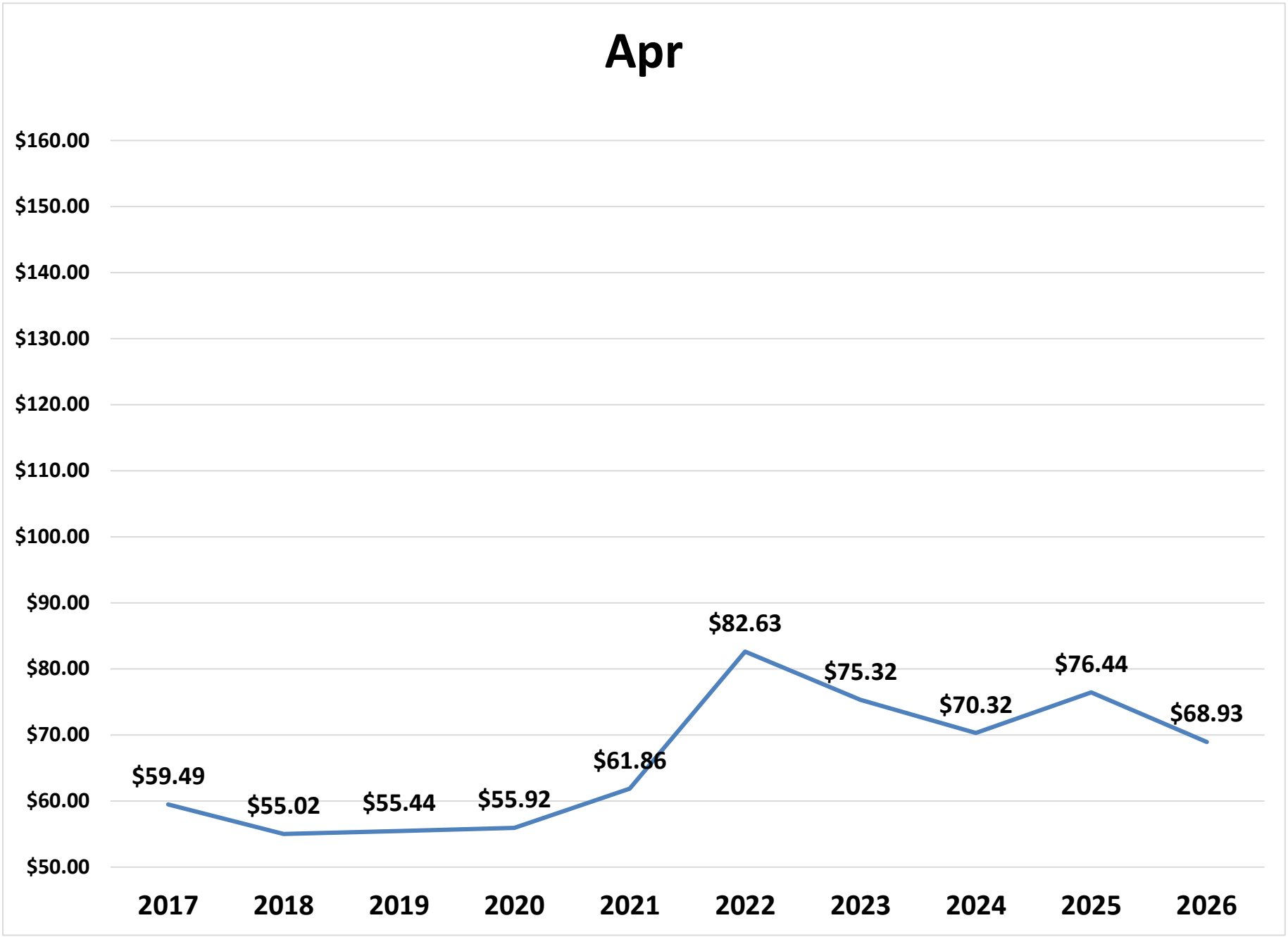
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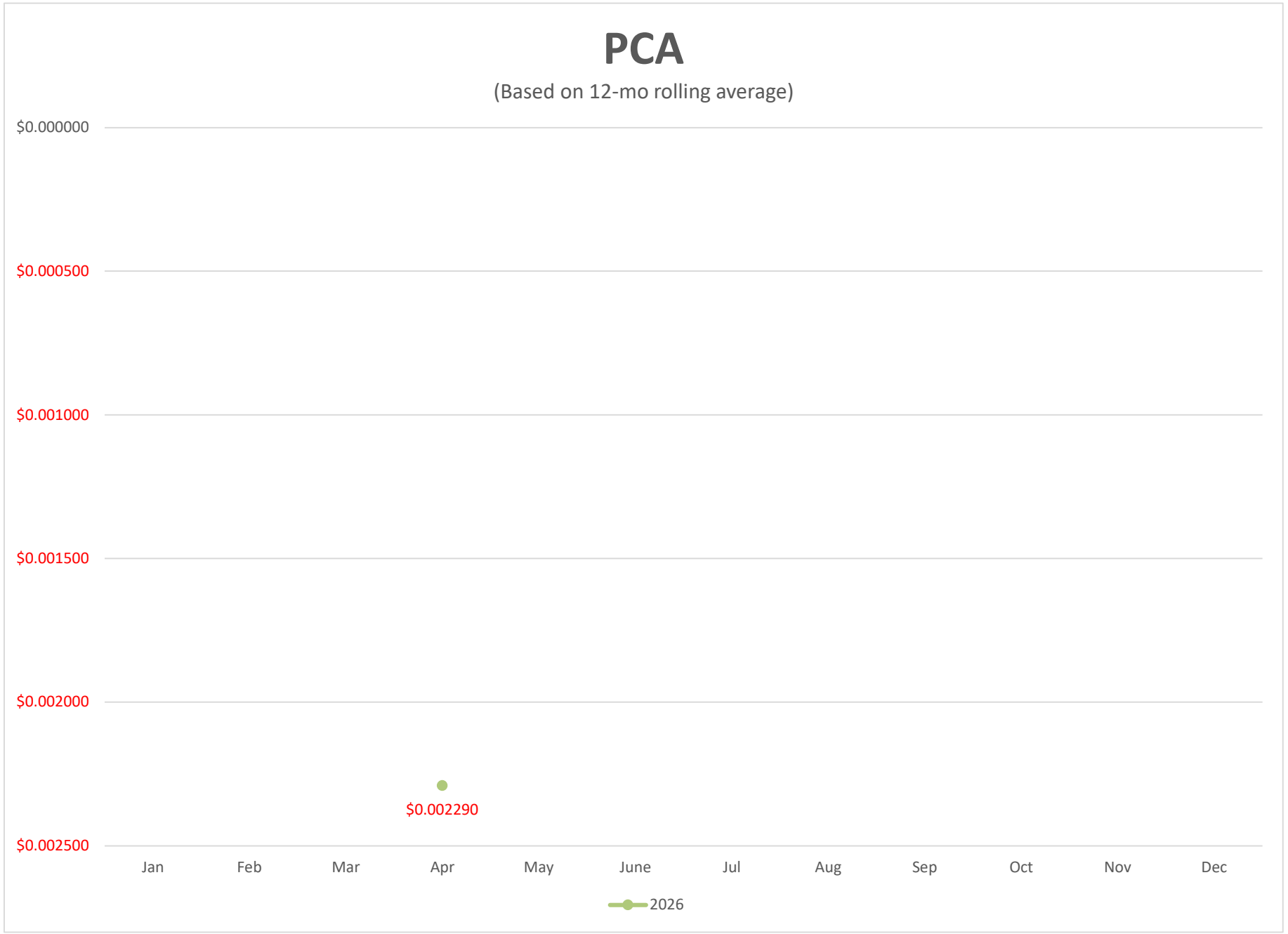
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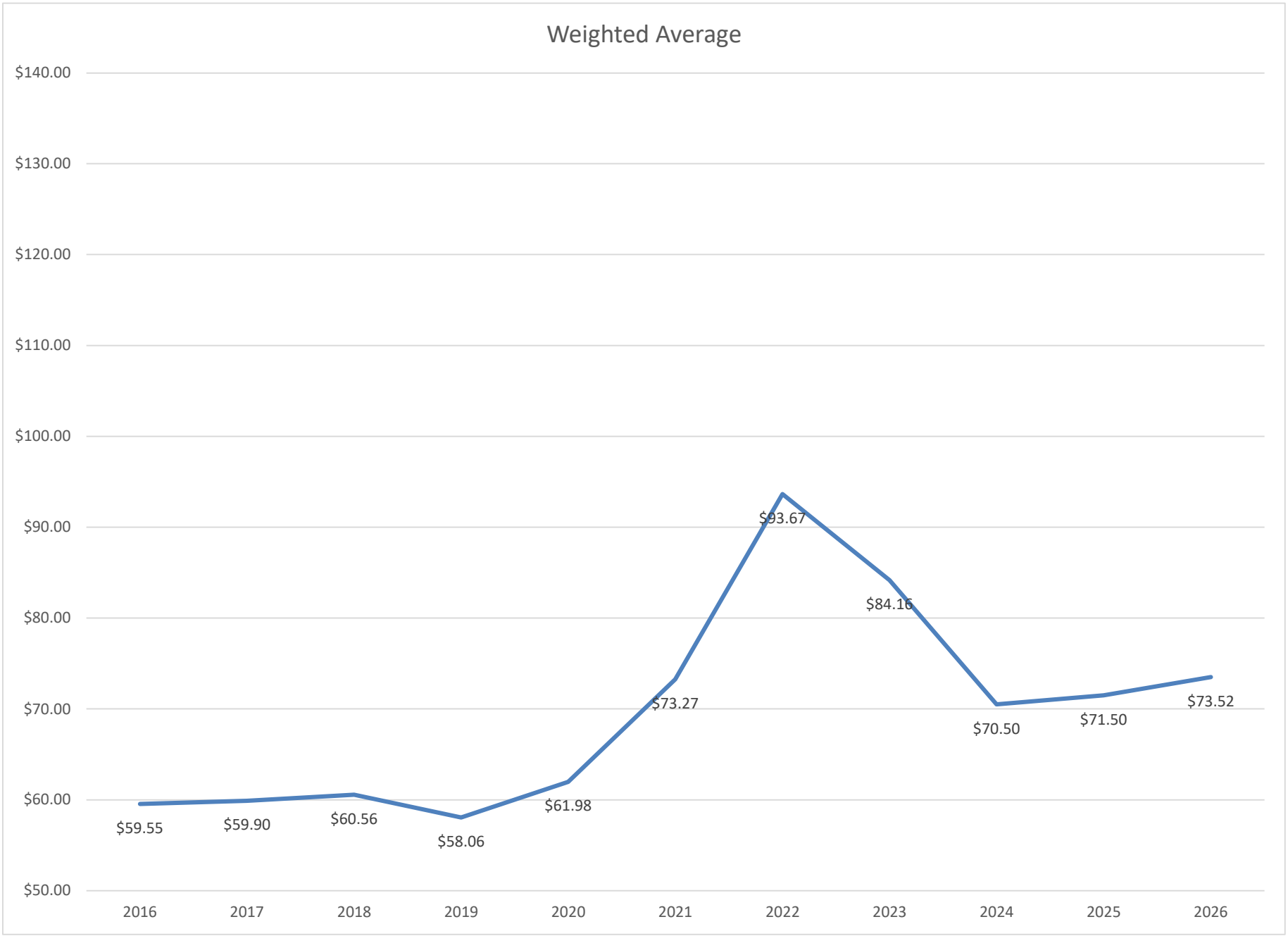
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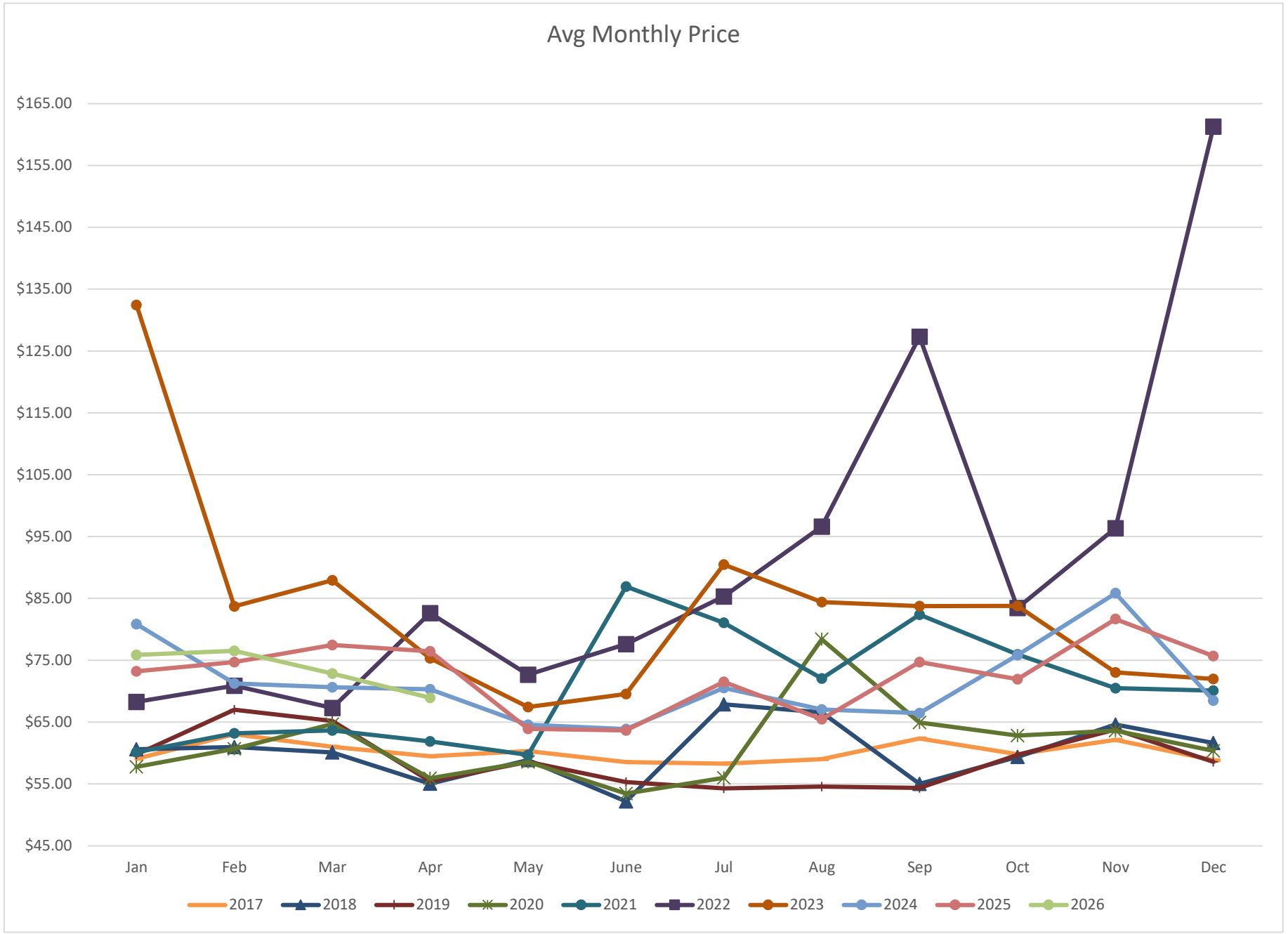
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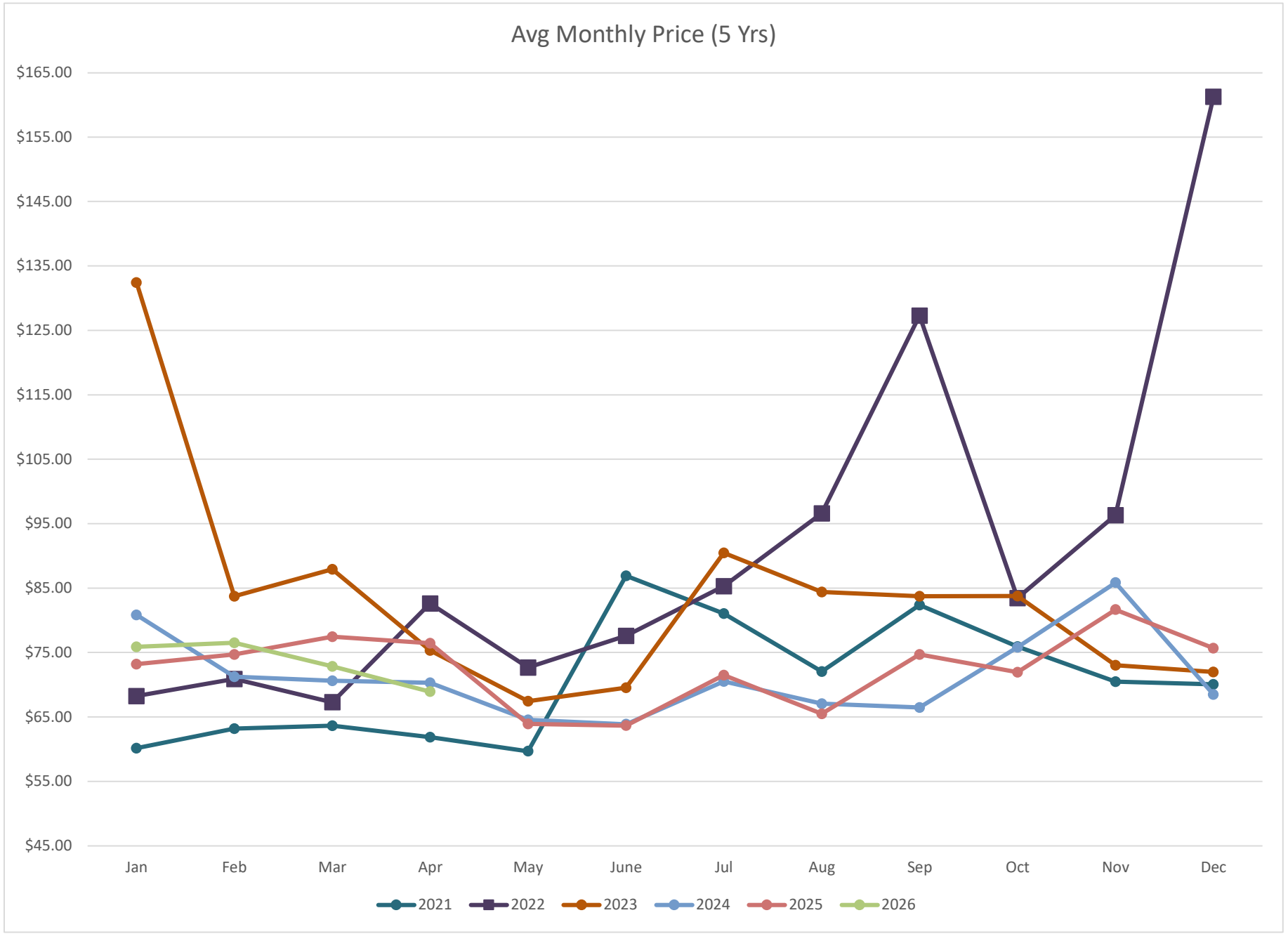
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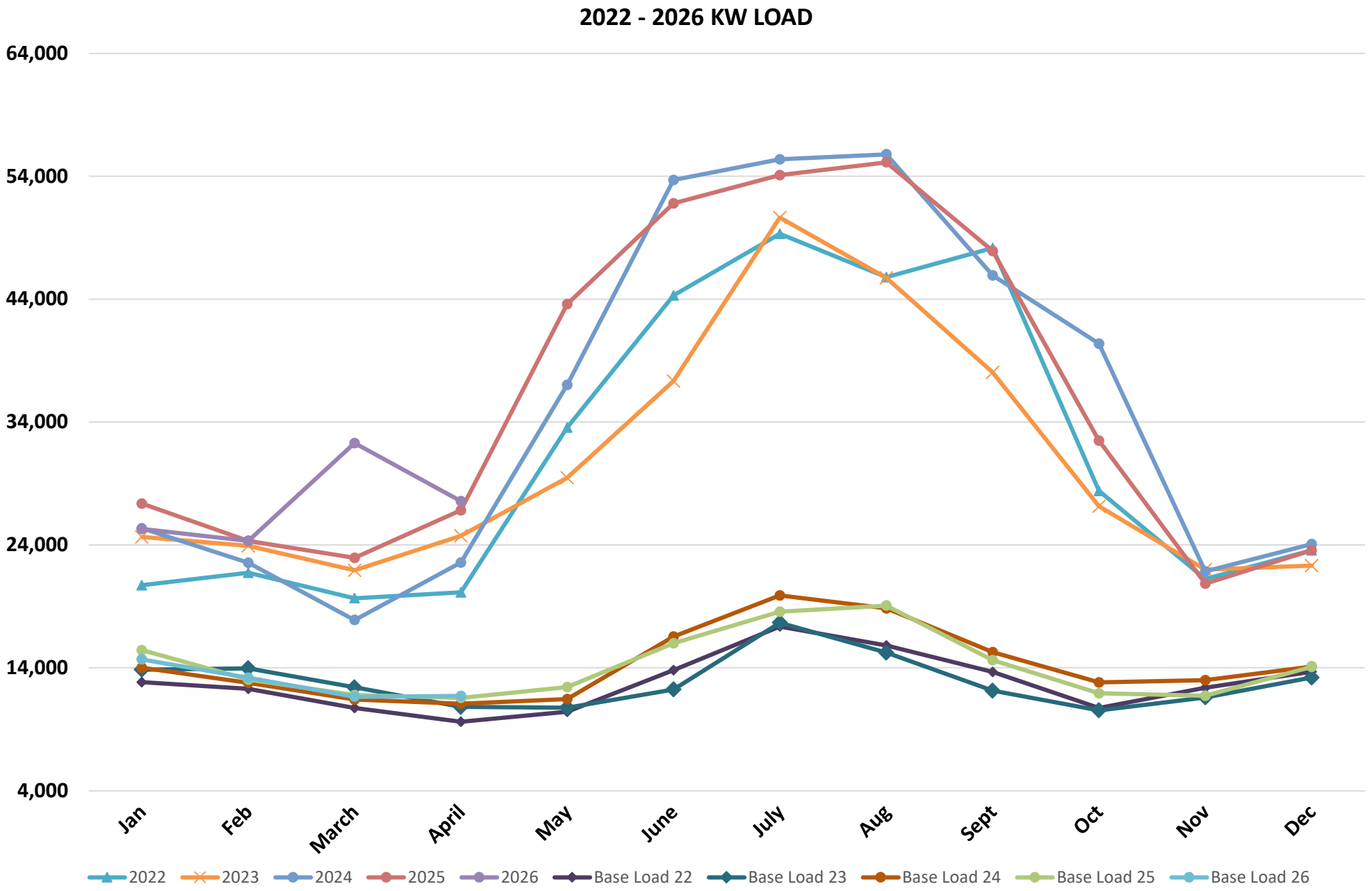
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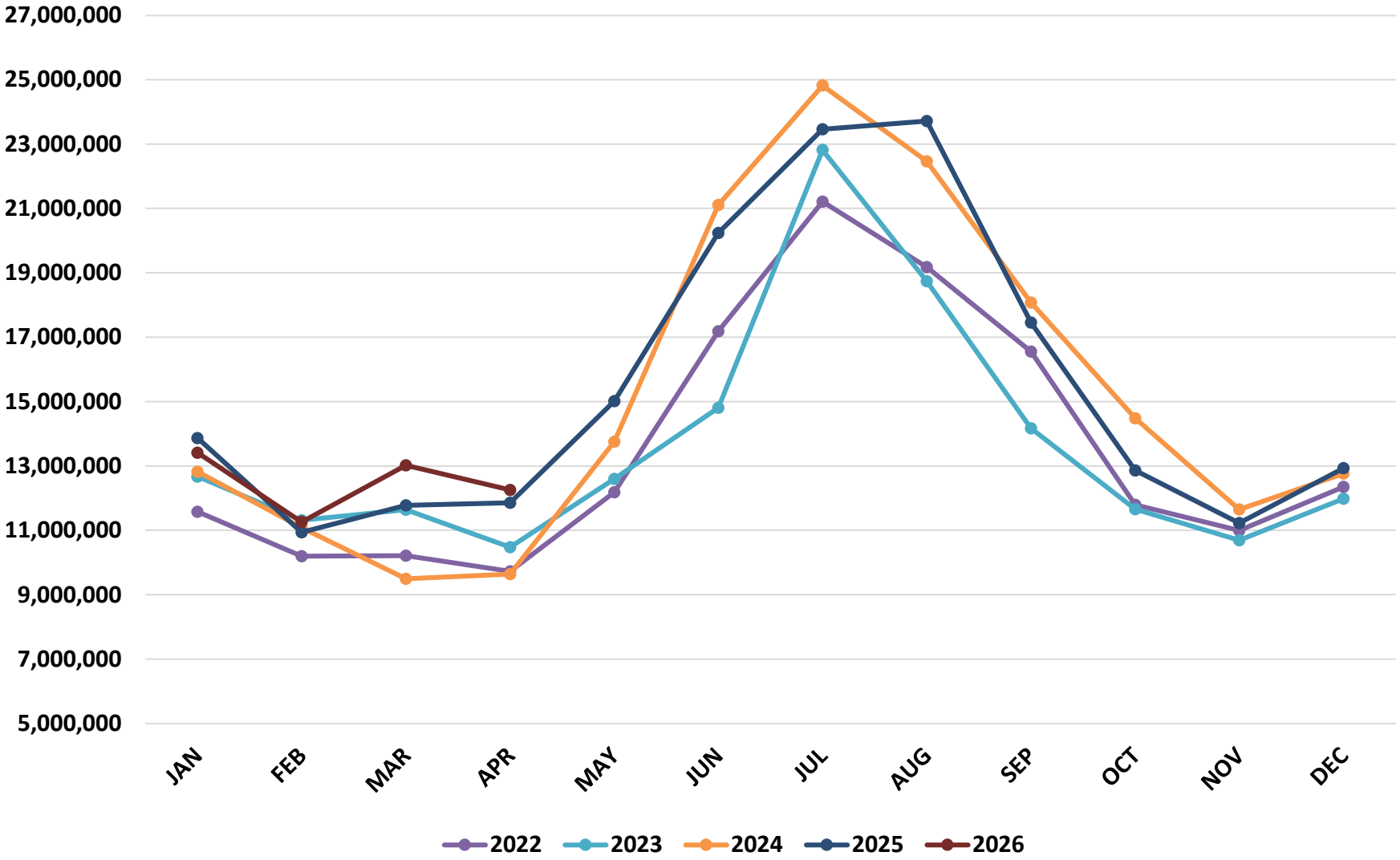
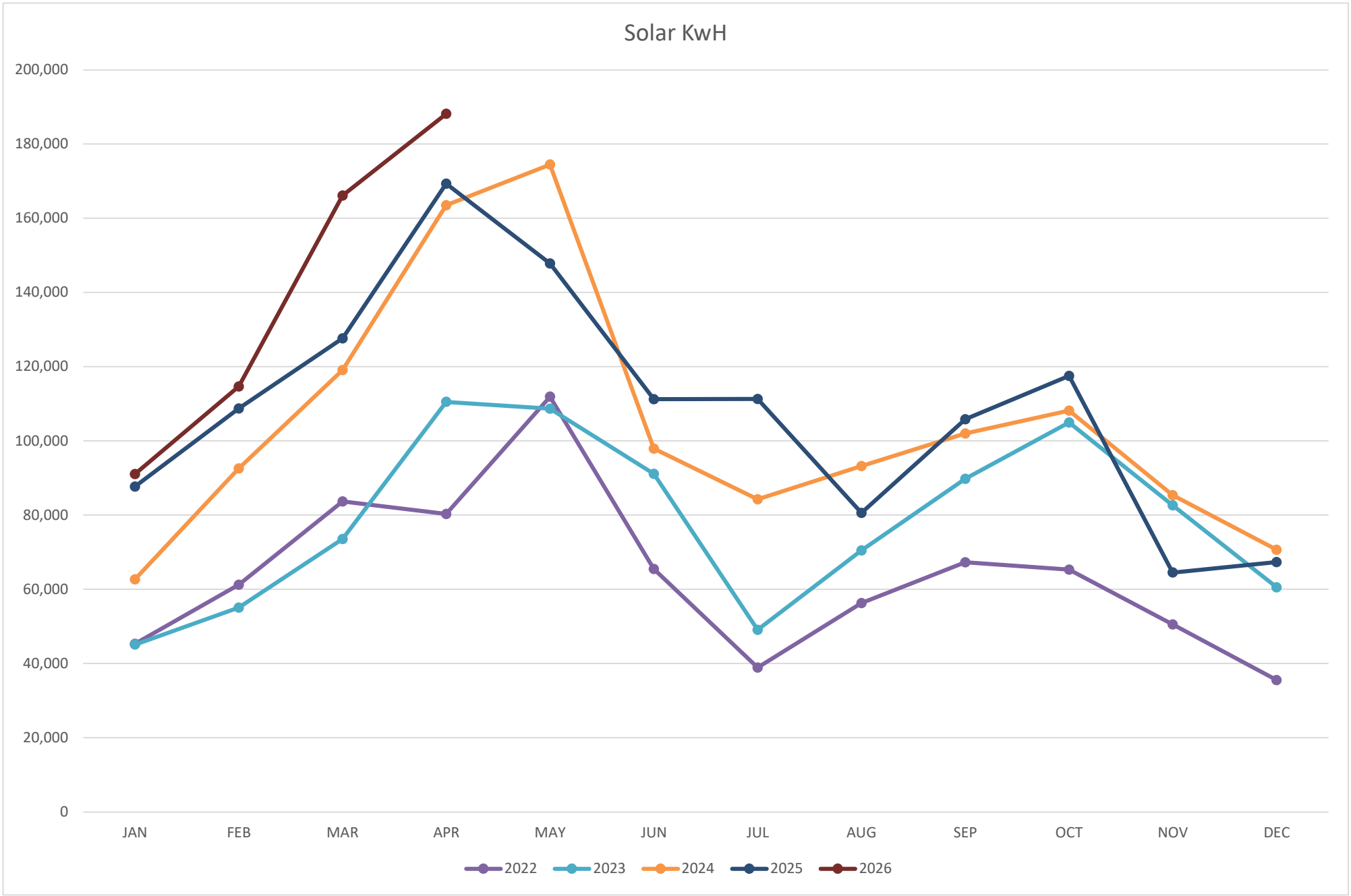
Base Load 24
Base Load 25
Base Load 26

2022 - 2026 KWH LOAD

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2026

STANDARDS AND SPECIFICATIONS

HURRICANE CITY

DESIGN AND INSTALLATION
OF UNDERGROUND POWER DISTRIBUTION SYSTEMS

BOOK NO. _____

ADOPTED BY HURRICANE CITY COUNCIL
JUNE 06, 1996

Updated – December 01, 1996
Updated– July 14, 1999
Updated – September 28, 1999
Updated – January 6, 2000
Updated – January 25, 2006
Updated - March 20, 2008
Updated- December 5, 2013
Updated- April 10, 2014
Updated- May 30, 2014
Updated- January 4, 2016
Updated- June 28, 2017
Updated- January 15, 2022

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~~**HURRICANE POWER STANDARD DRAWINGS**~~

~~The Hurricane Power Standard Drawings as posted on the City website, may be amended from time to time by The Hurricane City Power Department ("HCP"), are incorporated herein by reference.~~

SECTION I

HURRICANE CITY
Underground Power Distribution Systems

GENERAL PREFACE

Hurricane City has prepared and approved this set of standards and specifications for the purpose of maintaining a safe, consistent, and reliable underground power distribution system. These standards are required to be used by anyone who is involved with design and/or installation of underground power distribution systems within Hurricane City limits.

If a Contractor needs to have the HCP provide access to electrical facilities, they are required to set up an appointment to have HCP meet them at the job site.

All costs for underground power distribution systems are the responsibility of the Contractor/Developer unless otherwise stated in these Standards and Specifications.

If a Contractor/Developer re-plats or otherwise changes the underground power distribution system within a development, it will be the Contractor/Developer's responsibility to make sure the system meets the requirements of these standards and specifications. All costs for the changes to the underground power distribution system will be the responsibility of the Contractor/Developer. HCP will do all primary terminations at cost of the developer.

If these standards conflict with federal, state, or local codes, the more stringent requirement is to be followed.

In consultation with the Hurricane City Power Board, HCP may make minor adjustments to these standards at any time to address unique or unusual circumstances or to align with updated industry standards. Within 30 days of making such adjustments to these standards, HCP shall submit a report to the Hurricane City Council detailing all changes to these standards.

SECTION II

HURRICANE CITY
Joint Utility
Design and Construction Standards

These Design and Construction Standards are to be followed at all times. In unusual or unique circumstances, HCP may authorize deviations to these standards in consultation with the Hurricane City Power Board

- A proximity detail and street locations will be required on all utility drawings.
- For joint utilities trench details, see Drawing DR-18
- For placement and layout of utilities, see Drawings DR-21, DR-22
- For burial depths, see Drawing DR-18
- Licensed Professional Engineers will be required to submit sealed (drawings that are stamped by a professional engineer) utility drawings as per the standards contained herein. All utilities (i.e., gas, cable, phone, power, sewer, and water) will be shown on the appropriate drawings. The utility drawings are subject to approval by the City Staff. All drawings are to be submitted in AutoCAD or PDF. **Plans must include a full utility layout page and an electrical only page**.
- Power infrastructure will generally be located on the north and west side of roadways. In new developments with sidewalks, the power infrastructure will be located at the back of the sidewalk where possible. In developments without sidewalks, the power infrastructure will be at least five feet (5') back of curb. Locations must be approved by City Staff.
- It is at the sole discretion of HCP to install or allow developers to install overhead power lines in place of underground buried power lines at any location considered a main roadway, temporary power source, or main gut line.
- Cable and phone boxes will be installed and located in accordance with Drawing DR-21, DR-22**.**
- For commercial projects, building layout, square footage, panel size in amps, number of meters/breaker sizes, voltage needed, and load calculations will be required.
- For high density projects, the number of units per lot and building, panel size in amps, number meters/breaker sizes and voltage needed will be required.

- Qualified Contractors must have a valid Hurricane City Underground High Voltage Certificate to install electrical facilities in the Hurricane City Power System

- ~~Only a Hurricane City Power approved contractor or~~ Journeymen Electrician may install secondary service lines from Hurricane City Power's designated connection point to the customers meter base. This includes all conduit and wire installation.

- Qualified Electrical Contractors will be responsible to install the joint trench as described and shown on Drawing DR-18.

SECTION III

HURRICANE CITY
Underground Construction Standard
Cable Installation

I. SCOPE

This standard outlines installation details for primary and secondary cable used in underground distribution.

II. DEFINITIONS

A. SECONDARY CABLES

All cables with voltage ratings of 600 volts or less including grounding conductors.

B. PRIMARY CABLES

All cables with voltage ratings greater than 600 volts. The thickness of conductor insulation shall be 220 mils.

C. BURIAL DEPTH

Vertical distance from the surface under which cables are installed to the center of the conduit nearest the surface. Drawing DR-18

III. INSTALLATION

A. CABLE INSTALLATION METHODS

1. Conduit Sizes. See Drawings DR-18

2. Loading Guidelines.

Loadings on the City of Hurricane's system is limited to the values listed below. These limitations are set to allow the city to maintain three-phase balanced loads on the system's main overhead circuits.

a) Primary Conductor Loading.

i) A maximum of 400 kVA connected is allowed for single phase.

ii) A 1/0 AWG aluminum conductor is required where the connected single-phase and/or three-phase load is less than 400 kVA connected per cable/phase or total 1,200 kVA connected for three-phase cable.

ii) When the connected single-phase and three phase loads exceed 400 kVA per cable a backbone-feeder system shall be used. It is required that a 4/0 AWG aluminum conductor be used for the backbone when the total connected kVA is less than 3,600 kVA. When the total kVA connected exceeds 3,600kVA an aluminum conductor of 750kcmil is required. The size of the conductor shall be approved by HCP. The connected load shall be divided so that it can be fed by 1/0 AWG aluminum conductor feeders.

iv) If 750kcmil aluminum conductor is required for the backbone feeder, switchgear must be installed.

v) All areas or subdivisions with potential development beyond their property may be required to extend power to the far side of the property.

vi) All main 750mcm trunk lines will be designed and installed to accommodate current or future back feed.

B. CABLES IN CONDUIT

1. Miscellaneous Installation Instruction.

i) Cables shall be pulled so that all conduit and bends will be installed and backfilled before any wire is pulled. This will result in minimum tension on the cables.

ii) Any pull over 950 feet must be approved by HCP.

iii) In highly congested ~~manholes~~ or where cables must be bent sharply to permit pulling, a feed-in tube shall be used for pulling cables. This will reduce pulling tensions and prevent damage to the cables being pulled and to other adjacent cables.

iv) Single-phase conductor cables must be installed one cable per conduit and conduit must be nonmetallic as per requirements.

v) Three-phase conductor cable must be installed three cables per conduit and conduit must be nonmetallic as per requirements.

vi) Before making a pull, conduits shall be cleared and free of dirt, rocks, etc.

vii) ~~Cable pulling compounds (Bentonite clay in a water slurry or pulling compound)~~ shall be used to facilitate pulling of primary and secondary cables. Compounds shall be compatible for use with high voltage cable(s) shield(s).

iix) When two or more cables (secondary) and/or bare conductors are pulled into one conduit, they shall be pulled at the same time.

ix) Primary cables shall not be installed in the same conduit as secondary or communication cables.

x) Primary or secondary cables shall not be pulled into plastic conduit until all conduit joints made using plastic conduit cement have been allowed to dry for at least one-half (1/2) hour.

xi) Sufficient excess cable shall be pulled into all duct runs to allow at least five (5') of cable to be removed from each end of the installed cable ~~yet~~ providing adequate cable for termination or splicing. Removal of the five feet (5') of cable will eliminate cable damaged by pulling grips from the system.

2. Maximum Pulling Line Tensions.

When pulling cable(s) into conduit, the pulling line used shall have a safe working load rating (minimum) equal to the manufacturer's specification maximum allowable pulling line tensions. An approved hydraulic pressure cable tension monitoring system or dynamometer will be used on all pulls where the cable(s) cannot be pulled by hand.

3. Pulling Eyes and Grips.

Cables shall be pulled into conduit with a pulling eye attached to the cable's conductor or a pulling grip placed over the cable sheath, insulation, or jacket.

4. Pulls with Bends and/or Sweeps.

Extreme care must be exercised when pulling cable into runs containing sweeps or bends. There are two concerns; 1) the cable manufacturer's maximum recommended pulling tension must not be exceeded, and 2) the cable manufacturer's maximum sidewall bearing pressure is not to be exceeded. Different manufacturers of cable have differing requirements as

to the maximum pulling tension depending on the type of pulling used (pulling grips such as "Kellams" or pulling eyes affixed to the cable's conductor). Sidewall bearing pressures are also dependent on the manufacturer. It is the engineer's responsibility to calculate expected cable-pulling tensions and sidewall bearing pressures based on the manufacturer's recommendations. Pulling tension calculations shall be provided to HCP for approval.

5. The number of 90-degree and 45-degree elbows will be limited to the following:

   i) For secondary or primary conduit runs using 4" PVC or less, the number of 90-degree elbows shall be limited to two (2), and if needed one (1) 45-degree elbow may be used in addition to the two (2) 90-degree elbows.
   ii) For primary conduit runs using 6" PVC, the number of 90-degree elbows shall be limited to one (1).
   iii) Any additional elbows (90 or 45-degree) needed to be installed must be approved by HCP.

B. BENDING RADIUS FOR CABLES

The minimum bending radius for both single and multiple conductor cables shall be per manufacturer's specification.

C. BURIAL DEPTH

See Drawings DR-18

D. SOIL COMPACTION

1. Backfill placed over primary and/or secondary cables must be compacted. Machine compaction shall be used after placing a minimum of twelve inches (12") of fill over the conduit.

Refer to the Conduit Installation section for compaction requirements.

E. MULTIPLE PRIMARY CIRCUITS IN ONE TRENCH

1. When the cables comprising two primary circuits (whether single or three-phase) are installed in a common trench the horizontal separation between the two circuits shall be six inches (6") minimum.

NOTE: This requirement is not meant to prohibit random lay of different phases of the same circuit in a common trench.

TABLE ~~2~~

CLEARANCES FROM UNDERGROUND POWER CABLE TO OTHER UNDERGROUND UTILITIES

Water:	5 Feet horizontal
Sewer:	5 Feet horizontal
Natural Gas:	10 feet horizontal
Cable TV:	1 foot vertical
Phone:	1 foot vertical

HURRICANE CITY
Underground Construction Standard
Cable Marking & Location

I. SCOPE

This specification details the standard method to be used for making primary and secondary underground cables to indicate the general direction from which each cable extends from a given site.

It also details a method for identifying individual phases in multi-cable primary and secondary cable systems.

II. INSTALLATION

A. DIRECTION IDENTIFICATION

Primary and secondary cables shall be marked with one tag indicating direction or exit from underground facilities (i.e., vaults, primary junction boxes, ~~service holes, manholes~~, secondary junction boxes, transformers, or splice boxes). This tag shall indicate the general direction of the cable(s) to the next facilities where the cable is located. The tags used must be approved by the Hurricane City staff.

All tags will be labeled with the next point of connector (i.e. Transformer 1 to Transformer 2).

All equipment will be numbered prior to tagging the cable in order to be accurate. The tagging will be inspected by City of Hurricane Power Department personnel prior to energizing.

NOTE: Approved tags (cow tag) can be purchased at any Intermountain Farmers outlet.

B. PHASE IDENTIFICATION

When individual phases in a primary or secondary multi-cable installation are to be identified, bands of colored tape shall be used. Each phase shall be identified with bands as follows:

"A" Phase ……Black
"B" Phase ……Red
"C" Phase ……Blue

SAFETY

Do not shortcut or forget safe working procedures. Regardless of the accuracy of cable labeling, it cannot be relied upon when working and handling cables.
The energized status of any individual cable must be tested. Proper cable grounding procedures must be followed.

HURRICANE CITY
Underground Construction Standard
Conduit Installation

I. SCOPE

These standards outline installation details for plastic conduit (PVC) used in underground distribution.

II. DEFINITIONS

A. PLASTIC CONDUIT

Conduit shall be one of the following types:

PVC Schedule 40

Steel conduit shall not be used without the approval of HCP.

B. BURIAL DEPTH

1. Conduit:

Vertical distance measured from the surface under which conduits are installed to the center of the conduit nearest the surface.

2. Concrete Encased Conduit

Vertical distance measured from the surface under which conduits are installed to the top of the concrete envelope surrounding the conduits.

C. SWEEP

Changes in direction of a conduit or group of conduits with an angle of bend of 10 Degrees or less or a radius of bend of fifteen feet (15') or more.

D. Change in direction of a conduit or group of conduits that, due to the angle of bend or radius of bend, cannot be defined as a sweep.

III. APPLICATIONS

A. Refer to drawing DR-18,20 for determining conduit depth and location for primary and secondary cable applications.

B. CONDUIT SIZES

Refer to Drawing DR-18 for determining conduit sizes for primary and secondary conductors.

C. WARNING TAPE

Six-inch (6") red warning tape shall be installed twelve inches (12") below final grade for the length of the entire trench.

IV. INSTALLATION

A. The minimum allowable burial depths for non-encased and concrete encased conduits are shown in the following table.

Table 3
BURIAL DEPTHS-NON-ENCASED AND ENCASED CONDUIT

	Installed Under Paved Surface		**All Other Locations**	
	Non-Encased Conduit	**Concrete Encased Conduit**	**Non-Encased Conduit**	**Concrete Encased Conduit**
SCH 40 PVC Conduit Secondary	36 Inches	See Notes	36 Inches	See Notes
SCH 40 PVC Conduit Primary	48 Inches	See Notes	48 Inches	See Notes

NOTES: A. If, in a particular installation, burial depths less than permitted by the table above are required, the reduced burial depths must be approved by ~~the~~ HCP.

B. Concrete encased conduit must be covered with a three-inch (3") envelope. There must also be six inches (6") of select bedding and eighteen inches (18") of fill on top of the concrete encasement. Drawing DR-19

B. TRENCHES FOR CONDUITS

1. Trench Bottoms.

When conduits are directly buried or concrete encased, the bottom of the trench into which the conduits are placed shall be free from rocks exceeding one inch (1") in their largest dimension. When the trench bottom contains rocks exceeding this size requirement, the trench shall be excavated six inches (6") deeper than the burial depth required for the conduits and then backfilled to the required burial depth with sand or screened backfill. Backfill shall be compact ~~to~~ within 95 percent (95%) of the maximum dry density prior to installation of conduit.

2. Trench Backfill

The JUT (Utility Trench) trench shall be backfilled with (1") minus material from the bottom of the trench to the top. No spoil material shall be used, unless screened, (1") minus, and is compactable material.

a) Direct Buried Plastic Conduit.

b) Concrete Encased Plastic Conduit.

Concrete encased conduit is not the standard and will only be accepted in extreme circumstances.

c) Drying Time for Concrete Before Backfilling.

Backfill shall not be placed in trenches containing concrete-encased conduits until the concrete has been allowed to set for at least 36 hours.

C. SOIL COMPACTION

Backfill placed over direct buried plastic conduit must be compacted; machine compaction shall not be used within twelve inches (12") of the conduits. For concrete encased plastic conduits, machine compaction may be used without restriction in proximity to the concrete envelope.

E. CONCRETE ENVELOPE REQUIREMENTS

1. Minimum Envelope Dimensions.

   When conduits are encased in concrete, they shall be enclosed by a concrete envelope. See Drawing DR-19.

2. Concrete.

   A three-quarter inch (3/4") minus 3000 PSI mix as per ASTM (American Society for Testing and Materials) C94 specification is required. In all cases a Type 2 modified, or Type 5 cement will be used. Air entraining agents shall not to be used. Slump shall not exceed six inches (6") at site.

3. Conduit Retention

   Weights of approximately 75 pounds or other means may be used to prevent conduits from floating during pouring of the concrete envelope.

F. CONDUIT BENDS AND SWEEPS

1. Minimum Radius

   a) Bends.

      The minimum radius of bends in conduits shall not be less than ten (10) times the diameter of the largest conduit being installed. If smaller minimum bending radii are required, they shall not be less than the manufacturer's recommended minimum bending radii of the cables to be installed in the conduits.

G. SHORING, LAYING BACK, SPOIL PLACEMENT AND RETENTION

When employees must enter a trench to install conduits, the trench shall be shored or laid back and the spoil shall be effectively retained and placed back from the edges of the trench as required by local state and national codes or ordinances to ensure that the employees are not subject to moving ground or cave-ins.

H. If conduit is damaged during installation, damaged section(s) shall be removed and replaced with like conduit and couplings. Use of split ducts for repair of damage during installation is not permitted. A full stock length (usually 10 foot segments) will be used to repair a damaged section. Repair collars will not be allowed.

I. RISER POLE CONDUIT INCLUDES POWER, PHONE, TV

Conduits for a riser pole shall be rigid steel or aluminum, shall continue up the pole from the PVC elbow to the top of the riser. The riser pole conduit shall be straight and supported with a six-inch (6") aluminum-strut system. Any crooked or misaligned conduits will not be accepted. The contractor shall install the first ten feet (10') of the riser and one six-inch (6") standoff. The city will provide the rest of the materials for the completion of the power riser at the contractor's expense. Placement and height of riser shall be approved by HCP personnel. See Drawings DR-26.

NOTE: There will be a fee charged for the installations: Please see HCP personnel for current fees. These fees are subject to change without notice.

I. SCOPE

These standards outline installation details for primary equipment (transformer pads, splice boxes, switch basements, sectionalizing cabinets~~, etc..)~~ use in an underground distribution system.

II. ~~INSTALLATION~~

~~A. ABOVE GROUND PRIMARY SWITCH BASEMENTS~~

1. Switch Basement Installation Depth.

   The switch basement shall be installed with the top being within six inches (6”) above the finished grade.

   Splice boxes shall be installed the same as switch basements.

2. Transformer Pad Installation Depth.

   The transformer pad shall be installed 6” above finished grade.

3. Sectionalizing Cabinets Installation

   Sectionalizing Cabinets shall be installed according to Standards Drawings DR-14, DR-21, and DR-22.

B. LOCATION

Primary enclosures shall be located in a manner that adjacent obstacles such as fences, buildings, etc. do not interfere with operation, installation, or maintenance of the enclosures. If less than ten feet (10’) of clear space is to be provided, HCP approval is required.

HURRICANE CITY
Underground Standard
Equipment, Line Location, and Right of Way Requirements

I. SCOPE

These standards outline the location, with respect to property lines, of underground distribution facilities. See Drawings DR-20, 21, 22.

II. BACK LOT AND SIDE YARD LINE INSTALLATIONS

Installation along back-lot and side yards will not be allowed. If front installation is not possible, Contact HCP for further review of electrical installation plan.

III. RIGHT-OF-WAY REQUIREMENTS

Before any power system design approval, the property owner or developer will be required to grant Hurricane City the proper easements and rights-of-way.

The standard requirements are as follows:

Residential:

10 feet (10') on the front of each lot or parcel
~~7.5 feet (7.5') on the sides and back of each lot or parcel~~

Multi-Building or Condominium:

10 feet (10') on the front of each lot or parcel

Commercial:

15 feet (15') on the front of each lot or parcel
~~7.5 feet (7.5') on the side and back of each lot or parcel~~

Common Areas:

The equipment (i.e. transformers, vaults, switches) will be placed along access roads as per standards. If placement along access roads cannot be accomplished as determined by HCP, equipment will be placed with at least ten feet (10') of clearance from any permanent structure.

All power equipment will be designed and installed as per the location drawings contained in these specifications; Drawings DR-20,21,22 in order to assure equipment falls within the established rights-of-way and easements and to maintain consistency of equipment placement throughout the City.

SECTION
IV

HURRICANE CITY
Underground Construction Standard
Primary Junction Installation

I. SCOPE

These standards outline installation details applicable to fused 15kV, 200 and 600-ampere primary junction installation.

II. INSTALLATION

A. All single-phase pad mount transformers will have a ground sleeve, see Drawing DR-11. All three-phase transformers will be placed on the transformer pad as shown on Drawing DR-10.

B. Fusing requirements for any industrial or commercial facility will be reviewed, coordinated, and approved by HCP. Any system that has the potential of serving more than one commercial or industrial location or more than one circuit/feeder such fusing will be determined by HCP and each subdivision or development will be fused according to its needs.

C. Connection requirements vary between the type of service being rendered (residential, commercial, or industrial) and location on the electrical system.

~~**Residential Single-Phase**~~
~~The subdivision shall not contain a single transformer larger than 100 kVA. Fuse sizing must be approved by HCP.~~

Residential Three-Phase
Subdivision will be tapped via appropriate sectionalizing cabinets or switches, see Drawings DR-14,15. ~~Where a switch cabinet is required, no more than nine (9) fused single-phase taps can be fed from the cabinet. Each tap shall have not more than 400 kVA of connected single-phase load. Loads served by such a system shall be balanced by connected transformer kVA per phase. No single transformer shall exceed 100 kVA.~~ A set of three (3) fused disconnects will be provided on the riser pole serving the subdivision. Fuse sizing must be approved by city staff.

~~**Commercial Single-Phase**~~
~~Maximum single-phase load is 400 kVA. No transformer may be larger than 100 kVA. Fuse sizing must be approved by HCP.~~

Commercial Three-Phase
~~Taps to serve single-phase connected kVA of 400 or less are permitted but shall be connected to the feeder by a switched, fused cabinet. Where a switch cabinet is required, no more than nine (9) fused single-phase taps can be fed from the cabinet. Each tap shall have not more than 400 kVA of connected single-phase load. Single-phase loads shall be balanced between the phases by balancing connected transformer kVA.~~ Fuses shall be sized based on connected kVA and shall coordinate with the up-line protective devices. HCP personnel shall be consulted early in the planning stage to determine the appropriate maximum fuse size. 750~~mcm~~ backbone feeders will be required to be looped or developed in such a manner as to have future loop and back feed capabilities.

Residential and Commercial

When fused switchgear is required the developer/customer is responsible for paying a pro-rate share of the current costs for the existing three-phase fused bay. Current costs to be obtained from HCP.

TABLE-4
FUSE SIZES

Description	Location	Fuse Size	Cable Size
~~Residential~~ Single-Phase Less Than 400 kVA	Riser Pole	40T	1/0
~~Residential~~ Three-Phase 400 kVA-1200 kVA	Riser Pole ~~Cabinet Outgoing Taps~~	40T 40E	1/0
~~Residential Three-Phase Greater Than 3600 kVA~~ - - -	~~Riser Pole~~ ~~Cabinet Outgoing Taps~~ ~~Cabinet Outgoing Taps~~ ~~Less Than 1200 kVA~~	~~80T~~ ~~80E~~ - -	~~4/0~~
~~Residential Three-Phase Greater Than 3600 kVA~~ - -	~~Cabinet Outgoing Taps~~ ~~Cabinet Outgoing Taps~~ ~~Less Than 1200 kVA~~	~~80E~~ - ~~40E~~	~~4/0~~
~~Commercial Single-Phase Less Than 400 kVA~~	~~Riser Pole~~	~~40T~~	~~1/0~~
~~Commercial Three-Phase Less Than 1500 kVA~~	~~Riser Pole~~	~~80T~~	~~4/0~~
~~Commercial Three-Phase 1500 kVA-3600 kVA~~ - -	~~Cabinet Outgoing Taps~~ ~~Cabinet Outgoing Taps~~ ~~Less Than1200 kVA~~	~~80E~~ - ~~40E~~	~~4/0~~ ~~1/0~~
~~Commercial Three-Phase Greater Than 3600 kVA~~ - -	~~Cabinet Outgoing Taps~~ ~~Cabinet Outgoing Taps~~ ~~Less Than1200 kVA~~	~~80E~~ - ~~40E~~	~~4/0~~ ~~1/0~~

Note: The fuse sizes shown are a maximum. Fuse sizing must be approved by HCP.

III. TESTING BEFORE ENERGIZING

A. LOADBREAK ELBOWS AND INSULATING RECEPTACLES

Primary Junction Installation, which include load-break elbows and/or insulating receptacles, shall be operated before the installation is energized to ensure there is no interference from concentric neutral conductors, adjacent elbows, etc.

B. SWITCHES

Test operate all switches in fused, primary installations prior to energizing to ensure proper operation and that adjacent obstacles such as fences, walls, etc. do not interfere with the switch operating handle.

IV. LOCATION

Primary junction installations shall be located in a manner that adjacent obstacles such as fences, buildings, etc. do not interfere with installation or operation and maintenance of the equipment.

HURRICANE CITY
Underground Construction Standard
Secondary Junction Installation

I. SCOPE

These standards outline the installation of secondary junction boxes and mobile home park meter pedestals.

II. INSTALLATION

A. BURIAL DEPTHS

1. Secondary Junction Boxes.

a. Secondary junction boxes shall be installed with 6 inches (6") above final grade and be located six inches (6") behind sidewalk. See drawings DR-12 and DR-13

b. Drive over secondary boxes will not be permitted if box contains (1) 500~~mcm~~ or (2) 350~~mcm~~ wires. Drive over concrete boxes are not a power department standard and will only be allowed in special circumstances.

2. Mobile Home Park Metering Pedestals.

a. Mobile Home Park Metering Pedestals shall be installed to the depth indicated on the pedestal by the manufacturer, see Drawings DR-25.

III. SAFETY

A. LOCKING

1. Secondary Junction Boxes.

a. All secondary junction boxes shall be bolted with penta head bolts. Standard tumbler-type locks or other devices are not approved for this application.

2. Mobile Home Park Meter Pedestals.

a. The access panel to the unmetered bus in all mobile home park meter pedestals shall be locked with pedestal equipment locks. Standard tumbler type locks or other devices are not approved for this application.

HURRICANE CITY
Underground Construction Standard
Cable Taps (200 Amperes)

I. SCOPE

These standards outline installation details for 200 ampere, 15 kV load break junctions used in underground distribution.

II. INSTALLATION

A. GENERAL

200 ampere, 15 kV load break junctions must be installed in primary enclosures. Not suitable for direct burial.

B. TESTING BEFORE ENERGIZING

Operate load break elbows and insulating receptacles before energizing 200 ampere, 15 kV load break junction installations to ensure:

1. They can be operated without interference from concentric neutral conductors, adjacent elbows, etc.

2. The mounting location of the load break junction is such that rings and covers or doors of primary enclosures, adjacent junctions, etc. do not interfere with operations.

Elbow arrestors or stand-off arrestors or a combination of the two will be required at all locations deemed necessary by HCP.

HURRICANE CITY
Underground Construction Standard
Cable Taps (600 Amperes)

I. SCOPE

These standards outline installation details applicable to 15 kV, 600 ampere spice-tap configuration used in underground distribution systems.

II. INSTALLATION

When assembling 15 kV, 600 ampere ~~spice tap~~ configurations, a spanner wrench may be used to facilitate installation or removal of connector plugs and reducing tap wells (with or without studs). They are not suitable for direct burial.

III. CAUTIONS

600 Ampere elbows are dead-break and only suitable for operation when de-energized.

SECTION V

HURRICANE CITY
Underground Standard
Transformer Installation

I. SCOPE

These standards outline the installation of single-phase and three phase transformers used in underground distribution.

II. EQUIPMENT

A. PRIMARY SYSTEM CONFIGURATION

1. Single-Phase pad mount transformers.

a. Single-Phase pad mount transformers should be equipped with two primary bushings for installation in loop or radial feed primary systems.

2. Three-Phase pad mount Transformers.

a. Three-phase pad mount transformers shall be purchased and installed with six primary bushings and feed through capabilities.

III. INSTALLATION

A. Connect the secondary ground strap, supplied on ~~most~~ pad mount transformers, between the transformer tank wall and the secondary neutral.

B. The soil backfill to be placed around the transformer ground sleeve shall be compacted to within 95 percent (95%) of the maximum dry density to support the transformer. A level pad around all sides of five feet (5') shall be maintained.

CAUTION: Do not disconnect either end of the secondary ground strap unless the transformer is de-energized.

IV. TRANSFORMER SIZING

A. Residential transformers will be incrementally sized based on 8kVA per 200 amperes.

B. Commercial/Industrial transformers will be sized based on ~~**80 percent (80%) of the panel size**~~.

~~V. TRANSFORMER ORDINANCE~~

~~Please refer to the Hurricane City's most recent transformer ordinance.~~

VI. TRANSFORMER POLICY

It is permissible for a Contractor to acquire transformers from sources other than HCP, provided the transformer(s) fully meets Hurricane City specifications.

~~It will be the policy of HCP that the electrical contractor will be responsible to provide to HCP, prior to energizing the circuit or transformer, but not limited to, the following:~~

1. Certified load loss certificate by serial number of unit

2. Certificate from manufacturer:
   a) Compliance of standards testing required in the transformer specifications.
   b) Warranty.
   c) Polychlorinated Biphenyl (PCB) certificate.

3. Numbering of Transformer and Information needed
   a) All nameplate information.
   b) Street Address.

It is the responsibility of the Contractor to see that HCP inspector receives transformer information before the final inspection walk through. The City Power inspector will assign a number for each transformer to be painted on the front of the transformer.

All appurtenances to the transformers such as, but not limited to, elbows, neutral grounding bushings (when required), stand-offs, dummy receptacles, etc. will be provided by the contractor. Single-phase transformer secondary bar connectors capable of accepting 6-500~~mcm~~ aluminum conductors shall be supplied by the Contractor.

~~Prior to placing a transformer on order, it will be the responsibility of the Contractor to ensure that the transformer distributor is aware of the conditions of the ordinance. It also will be the responsibility of the Contractor to inform HCP of transformers placed on order, size of transformer, project name, and name of transformer distributor.~~

HURRICANE CITY
Transformer Bid Specifications
Single-Phase Pad-mounted Distribution Transformer

I. SCOPE

A. GENERAL

This specification outlines the electrical characteristics and the mechanical features of single-phase, 60Hz; oil ~~filtered~~, pad-mounted, dead-front compartmental-type distribution transformers with separable insulated high voltage.

B. STANDARDS

1. All transformers shall be constructed and tested in accordance with latest revision of ANSI ~~C57.12.25 (American National Standards Institute); and the applicable~~ NEMA ~~(National Electrical Manufacturers Association)~~ standards.

2. No used or remanufactured material or components will be acceptable.

C. RATINGS

1. KILOVOLT AMPERE (kVA) RATINGS

a. The standard kVA ratings shall be one of the following:
25kVA, 37.5kVA, 50kVA, 75kVA, or 100kVA as required.

b. These standard kVA ratings are continuous and based on not exceeding either a 65º C average winding temperature rise or an 80º C hot spot temperature rise. The temperature rise of the insulating oil shall not exceed 65º C when measured near the top of the tank.

2. VOLTAGE

a. The high voltage rating shall be 12470Y/7200 volts. The low voltage rating shall be 240/120 volts. Unless otherwise directed by HCP.

3. BASIC IMPULSE INSULATION LEVEL

a. The basic impulse insulation level (BIL) shall be 95 kV.

C. CONSTRUCTION

1. GENERAL

a. All transformers shall consist of a transformer tank and a high and low-voltage cable termination compartment. These components shall be assembled as an integral, tamperproof, and weatherproof unit for mounting on a pad. The transformer shall meet the requirements for tamper resistance as set forth by the Western Underground Committee. There shall be no exposed bolts, screws or other fastening devices which are extremely removable. There shall be no openings through which foreign objects such as wires or rods might be inserted to contact live parts.

2. HIGH AND LOW-VOLTAGE COMPARTMENT

a. Access to the high and low-voltage compartment shall be through a hinged door suitable for locking with a padlock.

b. The high-voltage segment of the compartment shall contain the high voltage terminations and be provided with an elbow accessory parking stand. High voltage will be of the loop type/feed through configuration.

c. The low-voltage segment of the compartment shall contain the low-voltage terminations.

3. TANK

a. All transformer tanks shall have sealed tank construction and sufficient strength to withstand a pressure of seven (7) PSIG without permanent distortion.

b. A tank that has sealed tank construction is one that seals the tank from the atmosphere.

c. The tank shall remain effectively sealed for a top oil temperature range of -5ºC to 105ºC.

~~4. MAN COVER~~

~~a. Welded main cover construction shall be provided. If access to internal connection for testing is required, a handhole(s) shall be provided.~~

5. LOW-VOLTAGE TERMINATIONS

a. The electrical characteristics of the completely assembled low-voltage terminations shall be:

i. Insulation Class – 1.2kV.
ii. Basic Impulse Insulation Level (BIL)-30 kV.
iii. One minute withstand – 10 kV.

b. The terminals of the low-voltage terminations shall be as shown in ~~Figure 4A, Low Voltage Terminals, of American National Standards Institute (~~ANSI~~) C57.12.25 latest revision~~.

c. The number location and arrangement of the low-voltage terminations shall be as shown ~~I Figure 2, Interchangeability Dimensions Type 2 Arrangement, of American National Standards Institute (~~ANSI~~) C57-12.25 latest revision.~~

c. All low-voltage terminations shall be externally bolted to facilitate field replacement.

6. HIGH-VOLTAGE TERMINATIONS

a. All high-voltage terminations shall be 15 kV class universal bushing wells and inserts suitable for use with 15 kV class load-break elbow connectors. NOTE: All load-break bushing inserts shall be provided with the transformer.

b. All high-voltage terminations shall be externally bolted to facilitate field replacement.

c. The number, location and arrangement of the high-voltage terminations shall be shown in Figure 2, Interchangeability Dimensions-Type2 Arrangement, of American National Standards Institute (ANSI) C57312.25-latest revision.

7. NEUTRAL CONNECTIONS

a. The H2 end of the high-voltage windings shall be connected to the transformer tank internally and this connection shall be securely grounded to the tank and shall be independent of all other connections.

b. The low-voltage neutral shall be a fully insulated bushing. A ground pad shall be provided on the outer surface of the tank. A removable ground strap shall be provided and connected between the low-voltage neutral bushing and the ground pad.

8. CORE AND WINDINGS

a. One piece core construction is desired. Where other construction is used, minimum assembly joints shall be provided. For approved two-part cores, the core shall be held together with bands and torqued bolts. Crimped banding is not acceptable for ratings over 50 kVA.

b. Copper or aluminum winding conductors are desired.

c. Core material may be either silicon steel or amorphous.

d. Core losses shall be minimized by the core material and core construction.

9. INSULATION

a. All insulating paper used as layer insulation in transformer coils shall be coated on both sides with a thermosetting adhesive and properly cured prior to impregnating with oil or the coils shall be wound with primary conductor containing a thermosetting adhesive that when properly cured will form an effective bond.

b. Insulating/cooling fluid within the tank shall be electrical grade mineral oil or a nonflammable environmentally accepted fluid.

c. Fluids shall be certified and indicated on the nameplate to be less than 1 part per million (ppm) polychlorinated biphenyl (PCB) content.

d. Fluids other than mineral oil shall have submitted with the quotation complete chemical and electrical characteristics and a statement of being non-PCB.

10. GROUND CONNECTION

a. The tank shall have a welded ground lug boss attached on the secondary side of the tank near the bottom of the tank of secondary bushings and attached conductors.

b. The grounding boss shall be free of paint and shall be 7/16 inch (7/16") deep and threaded for a one-half inch (1/2") 13 NC grounding stud or connector.

c. The tank cover shall have a grounding strap between the cover and the tank.

D. ACCESSORY EQUIPMENT

1. HIGH-VOLTAGE PROTECTIVE FUSES

a. All transformers shall be equipped with an externally removable, oil immersed, expulsion fuse, in a load-break bayonet suitable for hot stick operation. This fuse must be designed to protect the transformer in the event of internal or secondary faults or under overload conditions.

2. PRESSURE RELIEF DEVICE

   a. Each transformer shall be equipped with a self-actuating relief device to relieve slow pressure buildup and to automatically vent when pressure reaches + 10 PSIG and recloses when pressure falls to + 6 PSIG.

3. ROLLING, LIFTING, AND MOUNTING FACILITIES

   a. The transformer shall be equipped with lifting provisions of adequate strength and size and arranged on the transformer to permit lifting of the completely assembled and oil filled unit.

   b. An internal flange shall be provided at the base of the high and low-voltage compartment to provide means for mounting the transformer on a pad.

4. IDENTIFICATION NAMPLATE

   a. An identification nameplate shall be located in the low-voltage segment of the high and low voltage compartments and shall be readable with cables in place.

   b. If the nameplate is mounted on a removable part, the manufacturer's name and the transformer serial number shall be permanently affixed to a non-removable part.

   c. The identification nameplate shall conform ~~to Section 6.4, Instruction Nameplate, of American National Standard Institute (~~ANSI) ~~C57.12.25 latest revision. The nameplate shall also conform to Section 5.12, Nameplates, of American National Standard Institute (ANSI) C57.12.00 latest revision~~.

E. TESTING

1. All transformers shall be tested in accordance with ~~requirements of American National Standard Institute (~~ANSI~~) C57.12.25 latest revision~~. All transformers shall be capable of withstanding short circuit tests.

F. FINISH

1. The transformer shall be given a durable, corrosion resistant, green, or desert tan (as specified) outdoor finish capable of meeting or exceeding EEI finishing requirements.

2. All transformer surfaces in contact with the pad shall be designed or treated to minimize corrosion.

G. SHIPPING AND LABELING INSTRUCTIONS

1. Transformers shall be mounted on a pallet for shipment.

2. A shipping tag indicating the kVA size, manufacturer, voltage ratings, serial number and purchase order number shall be attached to all transformers.

H. LOSS EVALUATION

1. Total losses will be invoiced at ~~$6.85~~ per watt over allowable losses according to the chart below.

3. Evaluated losses will be calculated by multiplying the appropriate dollars/watt values by guaranteed maximum load losses at maximum nameplate kVA rating and no-load losses at 100 percent voltage. These products will be added to the bid price for evaluation.

3. Total watt losses shall not exceed the following:

Single-Phase Pad-mount 120/240 Volt

kVA Rating	Losses in Watts	kVA Rating	Losses in Watts
25 kVA	275 Watts	75 kVA	675 Watts
37.5 kVA	360 Watts	100 kVA	750 Watts
50 kVA	460 Watts	167 kVA	1,310 Watts

4. If the actual tested loss values exceed the guaranteed maximum values stated in the proposal of the Contractor, the Contractor will be charged a penalty value for every kilowatt by which the actual tested transformer losses exceed the guaranteed maximum losses upon which the proposal was evaluated. This penalty value will be the difference between the total actual test loss evaluation and the total guaranteed bid loss evaluation.

5. ~~All actual tested loss data will be supplied to HCP within five (5) days after shipment of the transformers.~~

I. VENDOR EVALUATION

1. Vendor evaluations, as well as loss evaluations, will be used to determine the low bidder. Delivery dates will be of prime concern during the bid evaluation.

J. EXCEPTIONS

1. Exceptions to this Specifications shall not be accepted, unless approved by HCP. Any exceptions shall be noted in the proposal.

K. WARRANTY

1. Manufacturer shall warrant to purchaser that the apparatus or service to be furnished hereunder shall be of the highest quality and free from defects in material, workmanship, and title and will be of the kind designated in the pertinent purchase order. ~~The Manufacturer's warranty shall be effective~~ for a period of twelve (12) months after the ~~date of shipment to Purchaser~~.

2. The Manufacturer shall guarantee that all transformers furnished under this specification are of first-class material and workmanship throughout, that they have been tested in accordance with this specification, and that the results of the tests comply with the requirements of this specification, and in lieu of other claims against it, agrees to replace or repair:

   a. Any transformer found to be defective in material or workmanship or found not to be in compliance with the requirements of this specification before or during installation of the transformer.

   b. Any transformer failure during normal and proper use within the manufacturer's guarantee period which shows defects of materials or workmanship.

   c. All transformers must be of new construction, no remanufactured transformers will be accepted. New construction means not used and is less than 2 years old.

HURRICANE CITY
Transformer Bid Specifications
Three-Phase Pad-mounted Distribution Transformer

I. SCOPE

A. GENERAL

This specification outlines the electrical characteristics and the mechanical features of dead-front outdoor three-phase, 60 Hz, oil immersed, self-cooled pad-mounted, compartment-type distribution transformer with separable insulated high voltage connectors.

B. STANDARDS

1. All transformers shall be constructed and tested in accordance with ~~latest revision American Standards Institute (~~ANSI~~) C57.12.26, and the applicable National Electrical Manufacturers Association (~~NEMA~~)~~ standards.

2. No used or remanufactured material or components will be acceptable. All transformers must be of new construction, no remanufactured transformers will be accepted. New construction means not used and is less than 2 years old.

II.. RATINGS

A. KILOVOLT AMPERE (kVA) RATINGS

1. The standard kVA ratings shall be on of the following:

75kVA, 112.5kVA, 150kVA, 225kVA, 300kVA, 500kVA, 750kVA, 1000kVA, 1500kVA, or 2000kVA as required.

2. These standard kVA ratings are continuous and based on not exceeding either a 65º C average winding temperature rise or an 80º C hot spot temperature rise. The temperature rise of the insulating oil shall not exceed 65º C when measured near the top of the tank.

B. VOLTAGE

1. The high voltage rating shall be 12470Y/7200 volts. The low voltage rating shall be 208Y/120 volts or 480Y/277 volts as required, unless otherwise directed and approved by HCP. Transformers must be wound in a Wye-Wye ~~scenario~~.

C. TAP RATINGS

1. The transformers shall be equipped with: (2) 2-1/2 percent taps above and (2) 2-1/2 percent taps below normal voltage. All taps shall be full capacity taps.

2. Tap changing to be through the wall in the high voltage connection compartment.

3. Taps shall have the positions of the changer clearly marked to indicate actual voltage on the primary, or as a percentage (%) of above and below normal primary voltage.

4. Taps shall be operable only with the transformer de-energized.

D. BASIC IMPULSE INSULATION LEVEL

1. The basic impulse insulation level (BIL) shall be 95 kV.

III. CONSTRUCTION

A. GENERAL

1. All transformers shall consist of a transformer tank and a high and low-voltage cable termination compartment. These components shall be assembled as an integral, tamperproof, weatherproof unit for mounting on a pad. The transformer shall meet the requirements for tamper resistance as set forth by the Western Underground Committee. There shall be no exposed bolts, screws or other fastening devices which are externally removable. There shall be no openings through which foreign objects such as wires or rods might be inserted to contact live parts.

B. TANK

1. Transformer tank shall be suitable for outdoor installation. The tank shall be of a construction that effectively seals the tank interior from the atmosphere but will allow entry for service.

2. Construction of the seal shall maintain the integrity of the seal over an operating oil temperature range of -5º C to 105º C.

3. Tank construction shall be such that it has sufficient strength to withstand a pressure of seven (7) PSIG without permanent distortion.

C. HIGH AND LOW-VOLTAGE COMPARTMENT

1. The high and low-voltage cable terminating compartment shall:

   a. Be compartmentalized into high-voltage and low-voltage segments by a suitable barrier.

   b. Includes two doors, one for the high-voltage segment and one for the low-voltage segment. These doors shall have stainless steel hinges and pins and three-point latching with provisions for padlocking. Unlocking the padlock shall permit access to the low-voltage segment of the terminating compartment only. Access to the high-voltage segment of the terminating compartment shall not be attained until an additional fastening device has been released.

   c. ~~Meet the dimensional requirements of Figure 7 – Compartment Designations and Specific Dimensions for Loop-Feed and Radial-Feed Transformers,~~ of ANSI ~~Publication C57.12.26 latest revision~~.

   d. The high-voltage compartment shall be equipped with accessory elbow stands for each elbow.

D. TERMINATION ARRANGEMENT AND DIMENSIONS

1. The termination arrangements and dimensions ~~for Figures 6, 7, and 8 of ANSI Publication C57.12.26 latest revision shall be applicable to this specification. Figure 6 – Specific Dimensions for Loop-Feed Transformers Figure 7 – Compartment Designations and Specific Dimension for Loop-Feed and Radial-Feed Transformers.~~
~~Figure 8 – Low-Voltage Terminal Arrangements and Specific Dimensions~~

E. HIGH-VOLTAGE TERMINATIONS

1. Configuration – The configuration of the high-voltage terminations shall be Loop Feed (ANSI C57.1226 latest revision)

2. Type – The high-voltage terminations shall be 15 kV class universal bushing wells and inserts suitable for use with 15 kV class load-break elbow connectors.

   The continuous current rating shall be 200 Amps.

NOTE: All load-break bushing inserts shall be provided with the transformer.

F. LOW-VOLTAGE TERMINATIONS

1. ~~Terminals –~~ The terminals of the low-voltage terminations shall be as shown in ~~Figure 9A, 9B, or 9C of ANSI Publication C57.12.26 latest revision for the applicable transformer size Figure 9 – Low-Voltage Terminals.~~

2. ~~Configuration –~~ The configuration of the low-voltage terminations shall be as shown in ~~Figure 8 – Low-Voltage Terminal Arrangements and Specific Dimensions~~.

3. Secondary low-voltage bushings shall include a full capacity neutral (grounded conductor) bushing.

4. The electrical characteristics of the completely assembled low-voltage bushing and terminals shall be:

   a. Insulation Class – 1.2 kV.

   b. Basic Impulse Insulation Level (BIL) – 30 kV.

   c. One minute withstand – 10 kV.

5. Internal connections to the secondary bushings shall be by lugs welded to the secondary conductor and bolted to the bushing stud.

G. FUSING EQUIPMENT

1. The transformer shall be equipped with externally removable, oil immersed, expulsion fuses in load-break bayonets, in series with under oil partial range current limiting fuses.

2. All under oil fuses shall be easily accessible through a large "hand hole~~" in the high voltage compartment~~. The hand hole shall be large enough and placed in such a location that all internal fusing elements will be "within" the hand hole area. In no case shall the hand hole area be smaller than 10 inches by 12 inches (10" X 12") unless approved in writing by HCP. The hand hole cover shall be tamper resistant ~~and its locking device shall be accessible from inside the high voltage or low voltage transformer compartment~~.

3. The transformer shall be equipped with an under oil partial range current limiting fuse. The bayonet expulsion fuses, and backup current limiting fuses shall be coordinated to ensure that the current limiting fuse will only operate on faults internal to the transformer. The current limiting fuse used shall have an interrupting rating of 50,000 Amp (minimum) symmetrical.

H. CORE AND WINDINGS

1. All transformers must be wye-wye connected windings and shall have four – or five-legged core construction or shall otherwise include provisions to prevent excessive tank heating. The core construction or other provisions for preventing tank heating shall be adequate for unbalanced loading conditions of one or more of the primary phases of the transformer being energized from the same (single-phase) source.

2. One-piece core construction is desired. Where other construction is used, minimum assembly joints shall be provided. For approved two-part cores, the core shall be held together with bands and torqued bolts. Crimped banding is not acceptable for ratings over 50 kVA.

3. Copper winding conductors are desired.

4. Core material may be either silicon steel or amorphous.

5. Core losses shall be minimized by the core material and core construction.

6. Transformers shall be equipped with a common H0X0 bushing with a copper grounding strap to the transformer case.

I. ~~INSTALLATION~~

1. All insulating paper used as layer insulation in transformer coils shall be coated on both sides with a thermosetting adhesive and properly cured prior to impregnating with oil, or the coils shall be wound with primary conductor containing a thermosetting adhesive that when properly cured will form an effective bond.

2. Insulating/cooling fluid within the tank shall be electric grade mineral oil or a less flammable, environmentally accepted fluid where required.

3. All fluids shall be certified and indicated on the nameplate to be less than 1 part per million (ppm) polychlorinated biphenyl (PCB) content.

4. Fluids other than mineral oil shall have submitted with the quotation complete chemical and electrical characteristics and a statement of being non-PCB.

J. PRESSURE RELIEF DEVICE

1. Each transformer shall be equipped with a self-actuating relief device to relieve slow pressure buildup and to automatically vent when pressure reaches + 10 PSIG and recloses when pressure falls to +9 PSIG.

K MOUNTING AND LIFTING

1. Mounting shall be suitable for concrete pad mounting. Drawing DR-10 Provide suitable anchorage brackets for Seismic Zone3.

2. The tank shall have lifting provisions of adequate strength; size and arrangement on the transformer to permit lifting the transformer in an upright position when filled with insulating fluid.

L. GROUND CONNECTION

1. The tank shall have a welded ground lug boss attached on the secondary side of the tank near the bottom of the tank, clear of secondary and attached conductors.

2. The grounding boss shall be free of paint and shall be 7/16 inch (7/16") deep and threaded for a one-half (1/2") 13 NC grounding stud or connector.

3. The tank cover shall have a grounding strap between the cover and the tank.

M. ACCESSORIES

1. ANSI ~~C57.12.26, latest revision,~~ standard accessories shall be provided.

IV. FINISH

A. The transformer shall be given a durable, corrosion resistant, non-chalking, green or desert tan (as specified) outdoor finish capable of meeting or exceeding EEI finishing requirements.

V. SHIPPING AND IDENTIFICATION

A. SHIPPING

1. Transformers shall be mounted on a pallet for shipment.

B. IDENTIFICATION

1. The nameplate shall contain the manufacturers name, address, kVA, primary voltage, secondary voltage(s), % impedance, rated temperature rise, a wiring diagram indicating connections and voltages with polarity (additive or subtractive), core losses (no load and full load), insulating fluid identification, and PCB content, weight when full, manufacturer part (catalogue) number, and serial number unique to the transformer.

2. The nameplate shall conform to ANSI standards ~~C57312.00 and C57.12.26 latest revisions~~.

3. The nameplate shall be mounted on a permanently attached backing plate with welds or rivets. Removable nameplates or nameplates attached to removable parts will not be accepted.

VI. TESTING

A. All transformers shall be tested in accordance with requirements ~~of American National Standard Institute (~~ANSI~~) C57.12.26 latest revision~~. All transformers shall be capable of withstanding short circuit tests.

VII. LOSS EVALUATION

A. Total losses will be invoiced at ~~$6.85~~ per watt over allowable losses according to the chart below.

B. Evaluated losses will be calculated by multiplying the appropriate dollars/watt values by guaranteed maximum load losses at maximum nameplate kVA rating and no-load losses at 100 percent voltage. These products will be added to the bid price for evaluation.

C. Total watt losses shall not exceed the following:

3-Phase Pad-mount 120/208 Volt

kVA Rating	Losses in Watts	kVA Rating	Losses in Watts
75 kVA	815 Watts	300 kVA	2,380 Watts
112.5 kVA	1,125 Watts	500 kVA	4,060 Watts
150 kVA	1,300 Watts	750 kVA	6,500 Watts
225 kVA	1,950 Watts	1000 KVA	8,980 Watts

3-Phase Pad-mount 277/480 Volt

kVA Rating	Losses in Watts	kVA Rating	Losses in Watts
150 kVA	1,385 Watts	750 kVA	4,500 Watts
225 kVA	2,000 Watts	1,000 kVA	6,500 Watts
300 kVA	2,460 Watts	1,500 kVA	10,500 Watts
500 kVA	4,325 Watts	2,000 kVA	14,000 Watts

D. If the actual tested loss values exceed the guaranteed maximum loss values stated in the proposal of the Successful Bidder, the Successful Bidder (Seller) will be charged a penalty value for every watt by which the actual tested transformer losses exceed the guaranteed maximum losses upon which the proposal was evaluated. This penalty value will be the difference between the total actual test loss evaluation and the total guaranteed bid loss evaluation.

E. ~~All actual tested loss data will be supplied to HCP within five (5) days after shipment of the transformers.~~

VIII. VENDOR EVALUATION

A. Vendor evaluations, as well as loss evaluations, will be used to determine the low bidder. Delivery dates will be of prime concern during the bid evaluation.

IX. EXCEPTIONS

A. Exceptions to this Specification shall not be accepted, unless approved by HCP. Any exceptions shall be noted in the proposal.

X. WARRANTY

A. Manufacturer shall warrant to Purchaser that the apparatus or service to be furnished hereunder shall be of the highest quality and free from defects in material, workmanship, and title and will be of the kind designated in the pertinent purchase order. ~~The Manufacturer's warranty shall be effective for a period of twelve (12) months after the date of shipment to Purchaser~~. Terms of Manufacturer's warranty shall be included in the bid proposal and will be a criterion for evaluation of the proposal.

B The Manufacturer shall guarantee that all transformers furnished under this specification are of first-class material and workmanship throughout, that they have been tested in accordance with this specification, and that the results of the tests comply with the requirements of this specification, and in lieu of other claims against it, agrees to replace or repair.

1. Any transformer found to be defective in material or workmanship or found not to be in compliance with the requirements of this specification before or during installation of the transformer.

2. Any transformer failure during normal and proper use within the Manufacturer's guarantee period which shows defects of materials or workmanship.

3. All transformers must be of new construction, no remanufactured transformers will be accepted. New construction means not used and is less than 2 years old.

SECTION VI

HURRICANE CITY
Underground Construction Standard
General Secondary Line and Meter Installation

I. SCOPE

These standards outline minimum requirements for the service equipment, service conductors, etc., installed from the secondary junction box to and including the meter.

It also includes information necessary to determine ownership maintenance responsibility for associated conductors, equipment, etc.

II. APPLICATION

A. GENERAL

1. This standard shall be used as a guideline for determining whether or not the service equipment, service conductors, etc. that comprise the secondary service meet all applicable national, state, and local codes and ordinances and HCP requirements.

III. DEFINITIONS

A. SERVICE EQUIPMENT, See Drawings DR-24, DR-25.

~~1. The equipment containing the disconnecting means and overcurrent protective devices, located near the point of entrance of supply conductors to a building, and intended to constitute the main control and means of cutoff of the supply to a building.~~

B. UNDERGROUND SERVICE CONDUCTORS

1. The underground supply conductors that extend from the City's secondary junction box to the metering provision.

C. GROUNDING ELECTRODE

1. Grounding shall be done through a UFER grounding system, or per latest building code requirements.

2. As a minimum, a 5/8-inch X 8 foot (5/8" X 8') ground rod shall be used as the grounding electrode. When a metal underground water pipe system is available on the premises, the water pipe system and the ground rod shall be used as grounding electrodes.

D. GROUNDING ELECTRODE CONDUCTOR

1. The conductors used to connect the grounding electrode to the grounded conductor of the underground service.

E. BURIAL DEPTH

~~1.~~ Underground service conductors will be installed in ~~conduits with supplemental protective covering or in raceways.~~

2. The vertical distance from the surface under which the conduit, ~~supplemental protective covering, or raceway~~ is installed, to the ~~portion of the conduit, supplemental protective covering, or raceway nearest the surface.~~

F. METERING PROVISIONS

1. The enclosures, meter sockets, switch boxes, conduit, conduit elbows, etc. are required to provide a place for mounting a National Electrical Manufacturers Association (NEMA~~)~~ meter enclosure, required for installation of a meter.

G. SERVICE RISER

1. Conduit, conduit elbow~~, etc.~~ that extend from the bottom of the service trench to the meter mounting provisions and main disconnecting means ~~and~~ enclose the service conductors.

IV. CODES

1. Underground services shall be installed in accordance with applicable HCP requirements and local, state, and national codes and ordinances.
2. All equipment and conductors installed shall meet or exceed applicable HCP requirements and local, state, and national codes and ordinances.

V. INSTALLATION

A. Type.

1. All underground service conductors shall be type USE (underground service.)

B. Protection.

1. Underground service conductors shall be protected by installation in conduit (PVC Schedule 40).

C. Burial Depths.

1. The minimum burial depth for conduit protected burial underground service conductors shall be 24 inches (24”). DR-18

D. Splices.

1. Underground service conductors shall not be spliced.

E. Installation Methods

~~1. In Conduit.~~

2. Underground service conductors pulled in conduit; care shall be taken to ensure that the conductors are not damaged during the pulling operation. Pulling tensions shall be monitored to ensure proper installation.

E. Grounding Requirements

1. A grounding electrode shall be connected via grounding electrode conductor to the underground service conductors (grounded conductors only) on the line side of and/or within the service disconnecting means.

VI. SERVICE EQUIPMENT

A. Continuous Current Rating

1. All service equipment shall have a minimum current rating of 100 amperes.

B. Short Circuit Current Rating.

1. Service equipment and its overcurrent protective devices shall have short circuit current ratings greater than or equal to the short circuit current available at their supply terminals.

VII. SERVICE DISCONNECT MEANS

1. All service disconnecting means shall have a current rating of not less than 100 amperes unless otherwise permitted by federal, state, or local authorities.

2. When multiple switches or circuit breakers are used as the disconnecting means, their combined current rating shall not be less than 100 amperes unless otherwise permitted by federal, state, or local authorities.

VIII. SERVICE CONDUIT

A. General.

1. Service conduit installations shall be carefully designed (length, number of bends, bend radii, etc.) to ensure that the underground service conductors can be pulled into and through the conduit without damage.

B. Trench Requirements.

1. Trench Bottom

a. When conduits are direct buried or concrete encased, the bottom of the trench into which the conduits are placed shall be free from rocks exceeding one inch (1") in their largest dimension. When the trench bottom contains rocks exceeding this size requirement, the trench shall be excavated six inches (6") deeper than the burial depth required for the conduits and then backfilled to the required burial depth with compacted sand or clean backfill.

2. Trench Backfill.

a. The JUT (Joint Utility Trench) trench shall be backfilled with (1") minus material from the bottom of the trench to the top. No spoil material shall be used, unless screened, (1") minus, and is machine compactable material.

b. At least twelve inches (12") of compacted sand or screened backfill shall be placed over the conduits.

IX. METERING PROVISIONS

A. General.

1. Typical requirements for meter mounting provisions for all applications are shown on Drawings DR-23, DR-24, and DR-25 when meter mounting provisions different from those shown are required, HCP shall detail specific metering provision requirements.

2. The meter mounting provisions must be installed in a true vertical plane.

3. Meter mounting provisions with extruded or cast aluminum meter jaws shall not be used.

4. Remote metering will not be allowed for new construction or rebuild/add on construction jobs.

5. The meter main will provide a disconnect. All **400 amp** meter sockets shall contain a lever bypass.

6. All external exposed standoff conduit must be rigid steel and wrapped with anticorrosion tape where buried.

B. Location.

1. Meters **shall not** be located in carports, breezeways, covered or screened porches, or other areas that might be enclosed at some future date.

2. The area on either side of a door or swinging window equal to the width of the door or swinging window is unacceptable as a meter location.

3. A level standing and working surface of 48 inches x 48 inches (48" x 48") shall be provided in front of all meters. Meters shall not be located behind fenced ~~in~~ areas.

4. Meters shall be set at a height of five feet six inches to six feet six inches (5'6" to 6'6").

5. Meters shall be installed on front of the structure (side of building facing the street) or within the first ten feet (10') of the front of the structure **closest to the power source**.

6. Meters must be accessible to the City Meter Reader and shall not be hindered by animals, landscape, fences, etc.

X. CONDUCTOR SIZE AND OWNERSHIP

A. Service Conductors Owned and Maintained by Customer.

B. The underground service conductors shall have adequate ampacity to supply the load requirements of the premises served by the conductors~~. HCP requires that all services less than 150 amperes be served by 2/0 aluminum conductors and services between 150-200 amperes be served by 4/0 aluminum conductor. Above 200 amperes the service conductor will be a minimum of 350kcmil aluminum conductor. No larger than 500kcmil aluminum conductor.~~

I. METERING PROVISIONS

A. General.

1. Typical requirements for meter mounting provisions for residential subdivisions are shown on Drawings DR-24, when meter mounting provisions different from those shown are required, HCP shall detail specific metering provision requirements.

~~II. SECONDARY DISTANCES~~

~~A. The distances from HCP transformer that secondary cable can be run due to voltage drop limitations are listed below. These limitations are based on the distribution transformer having the capacity to adequately serve the load.~~

~~B. The maximum secondary cable distances are based on:~~

~~1. Aluminum conductors in non-magnetic conduit~~

~~2. A five volt (5V) drop across the secondary cable~~

~~3. Up to 100 amperes of load current in the first table~~

~~4. Up to 200 amperes of load current in the second table~~

~~5. 0.95 load power factor~~

~~C. The voltage drop calculations are based on Table 13 from the ANSI/IEEE Standard 141-1986, IEE Recommended Practice for Electric Power Distribution (IEEE Red Book).~~

~~Table 5~~

~~SECONDARY 600V CABLE LENGTHS RESIDENTIAL – UP TO 100 AMPERES~~

~~Conductor~~	~~Maximum Distance~~
~~1/0 AWG~~	~~150 feet~~
~~2/0 AWG~~	~~185 feet~~
~~4/0 AWG~~	~~280 feet~~

~~Table 6~~

~~SECONDARY 600 V CABLE LENGTHS RESIDENTIAL – UP TO 200 AMPERES~~

~~Conductor~~	~~Maximum Distance~~
~~4/0 AWG~~	~~140 feet~~
~~350kcmil~~	~~225 feet~~
~~500kcmil~~	~~295 feet~~

- ~~The residential subdivision design should consider the location of the power source as close as possible to the center of the load to keep voltage drop within satisfactory limits.~~

I. SERVICE EQUIPMENT

1. Equipment containing the disconnecting means, overcurrent protective devices, and receptacle or other means for connection of a mobile home feeder assembly. This equipment shall be located adjacent to and not mounted in or on the mobile home.

II. FEEDER ASSEMBLY

1. The underground feeder conductors, including the grounding conductor together with the necessary fittings and equipment or a power supply cord designed to connect a mobile home to its metering provisions.

2. Conductors connect the service equipment to the distribution panel inside the mobile home. ~~There shall be four (4) conductors; one (1) of which shall be identified by a continuous green color or a continuous green color with one (1) or more yellow stripes for use as a grounding conductor.~~

3. As a minimum, a 5/8-inch x 8foot (5/8" X 8') ground rod shall be used as the grounding electrode. When a metal underground water pipe system is available the water pipes and the ground rod shall be used as grounding electrodes.

III. INSTALLATION

A. FEEDER ASSEMBLY

1. All conductors in the feeder assembly shall be insulated, color-coded, and installed without splices.

B. GROUNDING

1. The neutral conductor and the grounding conductor shall be bonded together only at the service equipment, not on or within the mobile home.

C. PROTECTIVE EQUIPMENT SIZING

1. The service equipment shall contain a properly rated fused disconnect switch or a circuit breaker corresponding to the load requirements of the mobile home.

IV. METERING PROVISIONS

A. Individual Meters.

1. Typical requirements for meter mounting provisions for mobile homes and trailers with individual meters are shown on Drawing DR-25. When meter mounting provisions different from those shown are required, specific meter mounting provision requirements shall be detailed by HCP.

B. Single Meter.

1. When mobile home parks or trailer courts are metered at a single point, the metering provisions at that point shall be detailed by HCP.

C. General Requirements.

1. Mobile home meter pedestals shall be constructed and installed so that the vertical distance from the ground level to the centerline of the meter is 30 Inches (30”) minimum to ~~72 inches (72”) maximum~~.

I. METERING PROVISIONS

A. General.

1. Typical requirements for meter mounting provisions for apartments and condominiums subdivisions are shown on Drawings DR-27, when meter mounting provisions ~~different~~ from those shown are required, HCP shall detail specific metering provision requirements.

2. The meter main will provide a disconnect. All 3 phase meter sockets shall contain a bypass lever. All 400-amp meter sockets shall contain a lever bypass

3. All meter sockets shall be clearly labeled with permanent placards or permanent metallic stickers. See DR-27

B. Mounting Heights.

1. Single Horizontal Row of Meters.

   a. When meters for an apartment or condominium can be mounted in a single horizontal row, the vertical distance from the ground level to the center line of meters shall be five feet six inches (5'6") minimum to six feet six inches (6'6") maximum.

2. Multiple Rows of Meters.

   a. When meters for an apartment or condominium can be mounted in two (2) or more horizontal rows, the vertical distance from the ground level to the center line of the top row of meters shall be six feet six inches (6'6") maximum and the distance from the ground level to the center line of the bottom row of meters shall be four feet zero inches (4'0" minimum.

C. Labeling Meter Bases.

1. Meter bases shall be numbered according to the apartment/condominium numbers as recorded on the official plat.

2. One inch (1") wide placards or metallic sticker shall be used to identify the meter/unit disconnect breaker is feeding.

3. Labels shall contain the unit number and/or address to correlate what each meter/unit disconnect breaker is feeding. For example: Unit 1, Unit 2, or 299 n 2600 W, 287 N 2600 W.

4. Labels shall be installed to the right or directly beneath the unit disconnect breaker to which the correlating meter is feeding.

5. Placards shall be installed using self tapping screws and shall be lubricated using a rust resistive compound.

6. No letters shall be used to identify meters/unit disconnect breaker. For example: Unit A, Unit B, Unit C are not permitted.

~~II. SECONDARY DISTANCES~~

~~1. The distances from the City of Hurricane Power transformer that secondary cable can be run due to voltage drop limitations are listed below. These limitations are based on the distribution transformer having the capacity to adequately serve the load.~~

~~2. The maximum secondary cable distances are based on:~~

~~a. Aluminum conductors in non-magnetic conduit~~

~~b. Five volt (5V) drop across the secondary cable~~

~~c. Up to 200 amperes of load current~~

~~d. 0.95 load power factor~~

~~3. The voltage drop calculations are based on Table 13 from the ANSI/IEEE Standard 141-1986, IEEE Recommended Practice for Electric Power Distribution (IEEE Red Book).~~

~~**TABLE 7**~~

~~**SECONDARY 600V CABLE LENGTHS**~~
~~**APARTMENTS AND CONDOMINIUMS – UP TO 200 AMPERES**~~

~~Conductor~~	~~Maximum Distance~~
~~4/0 AWG~~	~~140 Feet~~
~~350kcmil~~	~~225 Feet~~
~~500kcmil~~	~~295 Feet~~

- ~~The apartment/condominium facility design should consider the location of the power source as close as possible to the center of the load to keep voltage drop within satisfactory limits.~~

I. SERVICE DISCONNECTING MEANS

A. Single phase or three phase commercial services will be required to have a lockable fuse or knife disconnect located on the building to disconnect power from the building. Disconnect must be situated in a manner as to leave the meter energized when disconnect is turned off.

II. METERING PROVISIONS

A. General.

1. Typical requirements for meter mounting provisions for commercial subdivisions are shown on Drawings DR-23, when meter mounting provisions different from those shown are required, HCP shall detail specific metering provision requirements.

a. All services over 400 amps will be CT metered. Hurricane Power will provide and install the metering equipment and will charge the development cost of the materials.

b. Building layout, square footage, panel size in amps, number of meters/breaker sizes, voltage needed, and load calculations will be required before HCP can determine the sizing of all metering provisions.

B. Mounting Heights

1. Single Horizontal Row of Meters

a. When meter for a commercial facility can be mounted in a single horizontal row, the vertical distance from the ground level to the center line of the meters shall be five feet six inches (5’6”) minimum to six feet six inches (6’6”) maximum.

2. Multiple Rows of Meters

a. When meters for a commercial facility can be mounted in two (2) or more horizontal rows, the vertical distance from the ground level to the center line of the top row of meters shall be six feet six inches (6’6”) maximum and the distance from the ground level to the center line of the bottom row of meters shall be four feet zero inches (4’0”) minimum.

C. LABELINIG METER BASES

1. Meter bases shall be numbered according to the ~~apartment/condominium~~ numbers as recorded on the official plat.

2. One inch (1") wide placards or metallic stickers shall be used to identify the meter/unit disconnect breaker is feeding.

3. Labels shall contain the unit number and/or address to correlate what each meter/unit disconnect breaker is feeding. For example: Unit 1, Unit 2, or 299 N 2600 W, 287 N 2600 W.

4. Labels shall be installed to the right or directly beneath the unit disconnect breaker to which the correlating meter is feeding.

5. Placards shall be installed using self-tapping screws and shall be lubricated using a rust resistive compound.

6. No letters shall be used to identify meters/unit disconnect breaker. For example: Unit A, Unit B, Unit C are not permitted.

~~III. SECONDARY DISTANCES~~

~~1. The distances from the HCP transformer that secondary cable can be ran due to voltage drop limitations are listed below. These limitations are based on the distribution transformer having the capacity to adequately serve the load.~~

~~a. Aluminum conductors in non-metallic conduit~~

~~b. A five volt (5V) drop across the secondary cable~~

~~c. Up to 200 amperes of load current~~

~~d. 0.95 load power factor~~

~~2. The voltage drop calculations are based on Table 25 from the ANSI Standard 241-1983, IEEE Recommended Practice for Electric Power Systems in Commercial Buildings.~~

~~**TABLE 8**~~

~~**SECONDARY 600V CABLE LENGHTS**~~
~~**COMMERCIAL FACILITIES – UP TO 200 AMPERES**~~

~~Conductor~~	~~**Maximum Distance**~~
~~250mcm~~	~~170 feet~~
~~350mcm~~	~~225 feet~~
~~500mcm~~	~~295 feet~~

- ~~The commercial facility design should consider the location of the power source as close as possible to the center of the load to keep voltage drop within satisfactory limits.~~

SECTION VII

City of Hurricane
Underground Construction Standard
Street Light Installation

I. SCOPE

This standard outlines the requirements for installing streetlights erected in any subdivision within Hurricane City Limits.

II. EQUIPMENT SPECIFICATIONS/INSTALLATION

A. POLICY: It is the policy of the City of Hurricane that all streetlights erected in the City shall adhere to the following standard.

B. PURPOSE AND OBJECTIVE: To ensure streetlights are installed according to uniform construction guidelines and equipment specifications.

A. STREET LIGHT POLE SPACING AND HEIGHT:

1. Pole Height 15’ 200’ – 250’
2. Pole Height 25’ 225’ – 300’
3. A streetlight shall be placed at each intersection.
4. All poles shall be anchor base poles and the foundation design shall be adequate for the height of pole, the arm that is being installed, the soil conditions and 80-mile per hour winds.
5. Luminaries shall be 120 volt.
6. All streetlight bases must be precast and supplied by a preapproved vendor
7. For current acceptable streetlight make and models, see HCP personnel.

Note: **All poles are black, all post top and cobra style heads are black.**

III. INSTALLATION STREET LIGHT

A. Installation

1. Customers requesting to add or delete streetlights will be required to meet with the HCP staff during a regularly scheduled planning meeting to discuss details and procedures.

2. If the City Council or Hurricane City Power Board determines a streetlight should be installed at City expense for safety or other reasonable public consideration, HCP will install the streetlight(s) as directed and according to this policy.

IV. OWNERSHIP

A. Streetlights shall be installed at Owner/Developer expense in new/proposed subdivisions and projects. The owner will warrant lights for one year, then the Hurricane City accepts ownership.

V. FOOTING SPECIFICATION

A. Per manufacturer, See Drawing DR-4,5. These drawings are for 15’ decorative and 25’ mongoose light only.

SECTION VIII

HURRICANE CITY
Underground Construction Standard
Concentric Neutral URD Primary Cable

I. SCOPE

All primary cable used on the Hurricane City electrical system shall comply with the following:

A. Insulation Type – EPR

B. Insulation Thickness:

1. Minimum average thickness -220 mils minimum.

2. Minimum thickness at any point – 209 mils

C. Voltage Class – 15 kVA

D. All cable produced under this specification shall comply with the latest editions of AEIC C56 and ICEA S-68-516

B. All cable installed shall be new (not used) and within 2 years of manufacture date.

C. All cables installed in a conduit shall be the same voltage, insulation level, size and cable manufacturer.

G. Conductor sizes are:

1. 1/0 AWG aluminum compressed stranded with 16-#14 AWG bare copper concentric neutral wires (full neutral) with an encapsulating jacket whose thickness is not less than 0.05 inches (0.05”).

a. Jacket material shall be LLDPE or approved equal and shall be insulating.

b. Single-phase 1/0 AWG underground cable shall be installed in two and one-half inch (2 ½”) conduit and three-phase 1/0 AWG underground cable shall be installed in four-inch (4”) conduit, unless otherwise approved by HCP.

2. 4/0 AWG aluminum compressed stranding with 18-#14 AWG bare copper concentric neutral wires (1/3 neutral) with an encapsulating jacket whose thickness is not less than 0.05 inches (0.05”).

    a. Jacket material shall be LLDPE or approved equal and shall be insulating.

    b. 4/0 AWG underground cable shall be installed in four-inch (4”) conduit, unless otherwise approved by HCP.

3. 750mcm aluminum compressed stranded with 24-#12 AWG bare copper concentric neutral wires (1/3 neutral) with an encapsulating jacket whose thickness is not less than 0.08 inches (0.08”).

    a. Jacket material shall be LLDPE or approved equal and shall be insulating.

    b. 750mcm underground cable shall be installed in six-inch (6”) conduit, unless otherwise approved by HCP.

H. Approved cable manufacturers are:

1. Okonite

2. Kerite

~~**3.** CME~~

AEIC is Association of Edison Illuminating Companies

AWG is American Wire Gage

ICEA is Insulated Cable Engineers Association (formerly ICPEA)

EPR is Ethylene Propylene Rubber

LLDPE is Liner Low-Density Polyethylene

I. THREE-PHASE AND SINGLE-PHASE ABOVE GROUND PRIMARY VAULT

A. Units must meet the following specification: See Drawings DR-15, DR-17.

1. HCP approved
2. Penta Head bolts on lid with locking capabilities
3. Fiberglass
4. All hardware including hinges to be stainless steel
5. Color – Munsell Green, Willow Green, or Desert Tan
6. Four-Way Junctions required

B. Approved Vendors

~~1.~~ Nordic ND-350 ~~Three Phase~~

~~2. Nordic ND-155 Single Phase~~

3. Other vendors of equivalent equipment are acceptable if approved by HCP.

C. Vaults will include:

1. Three-Phase
    a. Three (3) four-way junctions, standoff brackets, and necessary receptacles, etc.
2. Single-Phase
    a. One (1) four-way junction, standoff bracket, and necessary receptacles, etc.

I. METAL ENCLOSED SWITCHGEAR

~~A.~~ HCP shall determine the ~~class of~~ switchgear needed for each job. The switch gear specifications being a model ~~P.H.~~ 600 Amp Main Buss capacity. These will be designed per individual needs. ~~Approved Manufacturers are A.B. Chance, S&C, and Federal Pacific.~~

1. Outdoor-Style, Manual Operation is as follows:

kV, Normal……...14.4
kV, Maximum……...17.0
kV, BIL……95
Main Buss Continuous, Amperes……...600/200
Three-Pole Interrupter Switches
Continuous, Amperes (Source/Feeder)……...600/200
Live Switching, Amperes (Source/Feeder)……600/200
Two-Time Duty-Cycle Fault-Closing
Amperes RMS Asymmetrical……...23,400
Fuses with integral Load Interrupter
Maximum, Amperes……....200E
Live Switching, Amperes……..200
Two-Time Duty-Cycle Fault-Closing
Capacity, Amperes RMS Symmetrical……12,500
Short-Circuit Ratings
Amperes, RMS Symmetrical……....12,500
MVA Three-Phase Symmetrical at
Rated Nominal Voltage……310

B. The momentary and two-time duty-cycle fault-closing ratings of switches, momentary rating of bus, interrupting ratings of fuses, and on time duty-cycle fault-closing capabilities of the fuses with integral load interrupters shall equal or exceed the short circuit ratings of the pad-mounted gear.

C. The pad-mounted gear shall consist of a single self-supporting enclosure, containing single blade interrupter switches, non-key interlock, dual purpose barriers for the switches and fuses (-G1 & G2), component grounding studs for switches and fuses (H & J).

D. The switches and fuse components shall be arranged for full visibility when the enclosure doors are open. Open switch gaps and blown-fuse indicators shall be readily visible to provide for ease of operation.

E. Interrupter switches shall have a two-time duty-cycle fault-closing rating equal to or exceeding the short-circuit rating of the integrated pad-mounted gear assembly. This rating defines the ability to close the interrupter switch twice against a three-phase fault with asymmetrical current in at least one phase equal to the rated value, with the switch remaining operable and able to carry and interrupt rated current. Tests substantiating this rating shall be performed at maximum design voltage with current applied for at least ten (10) cycles. Certified test abstracts establishing this rating shall be furnished upon request.

F. Interrupter switches shall have the capability established by test to perform switching duties which include interrupting load current up through the assigned live-switching rating, as well as transformer magnetizing currents associated with the applicable loads, cable-charging current, and line-charging current typical for distribution systems of the applicable voltage ratings. All arcing accompanying interruption shall be contained within the interrupters and products/gases evolved during interruption shall be vented through exhaust-control chambers to eliminate discharge of ionized gases. Switches shall have a single blade per phase and shall be externally operable. A quick-make/quick-brake mechanism, non-defeatable under normal operation and shall make operation of the switchblades independent of the speed of the manual operating handle.

G. Solid-material power fuse shall be capable of detecting and interrupting all faults up to the short-circuit interrupting rating of the integrated pad-mounted gear assembly. Fusible elements shall be non-aging and non-damageable. All arching accompanying power fuse operation shall be contained within the fuse and all arc products and gases evolved shall be effectively contained within exhaust control devices during fuse operation. Power fuses shall have a blown-fuse indicator that shall be readily visible without removing the fuse from the mounting location. Fuse type shall be S & C Type SMU-20 for system compatibility.

H. Fuse mounting jaw contracts shall be equipped with integral load interrupters to permit live switching of fuses with a rated hot stick. Integral load interrupters shall have an on-time duty –cycle fault-closing capability equal to the short-circuit rating of the pad-mounted gear. The duty-cycle capability defines the level of available fault current into which the fuse can be closed without a quick-make mechanism and when operated vigorously through its full travel without hesitation at any point, with the integral load interrupter remaining operable and able to carry and interrupt currents up to the emergency peak-load capabilities of the fuse.

I. All terminations will be done with ~~3M, TE, or Raycam~~ Termination Kits and two (2) hole termination lugs. The contractor will supply the above-mentioned.

STANDARDS AND SPECIFICATIONS

HURRICANE CITY

POWER
HURRICANE CITY
UTAH

DESIGN AND INSTALLATION OF UNDERGROUND POWER DISTRIBUTION SYSTEMS

BOOK NO. _____

ADOPTED BY HURRICANE CITY COUNCIL
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Contents

SECTION 1 – UNDERGROUND POWER DISTRIBUTION SYSTEMS

GENERAL PREFACE

Hurricane City has prepared and approved this set of standards and specifications for the purpose of maintaining a safe, consistent, and reliable underground power distribution system. These standards are required to be used by anyone who is involved with design and/or installation of underground power distribution systems within Hurricane City limits.

If a Contractor needs to have Hurricane City Power, which may be referred to as HCP throughout this document, provide access to electrical facilities, they are required to set up an appointment to have HCP meet them at the job site.

All costs for underground power distribution systems are the responsibility of the Contractor/Developer unless otherwise stated in these Standards and Specifications.

If a Contractor/Developer re-plats or otherwise changes the underground power distribution system within a development, it will be the Contractor/Developer's responsibility to make sure the system meets the requirements of these standards and specifications. All costs for the changes to the underground power distribution system will be the responsibility of the Contractor/Developer. HCP will do all primary terminations at cost of the developer.

If these standards conflict with federal, state, or local codes, the more stringent requirement is to be followed.

In consultation with the Hurricane City Power Board, HCP may make minor adjustments to these standards at any time to address unique or unusual circumstances or to align with updated industry standards. Within 30 days of making such adjustments to these standards, HCP shall submit a report to the Hurricane City Council detailing all changes to these standards.

SECTION 2 – JOINT UTILITY

DESIGN AND CONSTRUCTION STANDARDS

These Design and Construction Standards are to be followed at all times. In unusual or unique circumstances, HCP may authorize deviations to these standards in consultation with the Hurricane City Power Board.

- A proximity detail and street locations will be required on all utility drawings.
- For joint utilities trench details, see Drawing DR-18
- For placement and layout of utilities, see Drawings DR-21, DR-22

- For burial depths, see Drawing DR-18

- Licensed Professional Engineers will be required to submit sealed (drawings that are stamped by a professional engineer) utility drawings as per the standards contained herein. All utilities (i.e., gas, cable, phone, power, sewer, and water) will be shown on the appropriate drawings. The utility drawings are subject to approval by the City Staff. All drawings are to be submitted in AutoCAD or PDF. **Plans must include a full utility layout page and an electrical only page**.

- Power infrastructure will generally be located on the north and west side of roadways. In new developments with sidewalks, the power infrastructure will be located at the back of the sidewalk where possible. In developments without sidewalks, the power infrastructure will be five feet (5') back of curb. Locations must be approved by City Staff.

- It is at the sole discretion of HCP to install or allow developers to install overhead power lines in place of underground buried power lines at any location considered a main roadway, temporary power source, or main gut line.

- Cable and phone boxes will be installed and located in accordance with Drawing DR-21, DR-22**.**

- For commercial projects building layout, square footage, and load calculations will be required as well as an application for power service containing panel size in amps, number of meters/breakers, and voltage needed.

- For high density projects, the number of units per lot and building, panel size in amps, number and sizes of meters/breakers and voltage needed will be required.

- Qualified Contractors must have a valid Hurricane City Underground High Voltage Certificate to install electrical facilities in the Hurricane City Power System

- Journeymen Electrician may install service cables from Hurricane City Power's designated connection point to the customers meter base. This includes all conduit and wire installation.

- Qualified Electrical Contractors will be responsible for installing the joint trench as described and shown on Drawing DR-18.

- Any lot being zoned as commercial/industrial shall be configured for 3-phase power.

SECTION 3 – UNDERGROUND CONSTRUCTION STANDARDS

CABLE INSTALLATION

I. SCOPE

This standard outlines installation details for primary and secondary cable used in underground distribution.

II. DEFINITIONS

A. SECONDARY CABLES

All cables inside a transformer and from secondary box to secondary box with voltage ratings of 600 volts or less including grounding conductors.

B. PRIMARY CABLES

All cables with voltage ratings greater than 600 volts. The thickness of conductor insulation shall be 220 mils.

C. SERVICE CABLES

All cables from a transformer or secondary box to the meter with voltage ratings of 600 volts or less.

D. BURIAL DEPTH

Vertical distance from the surface under which cables are installed to the center of the conduit nearest the surface. See drawing DR-18 for secondary cables and primary cables. Service cables shall follow applicable NEC standards.

III. INSTALLATION

A. CABLE INSTALLATION METHODS

i. Conduit Sizes

See Drawings DR-18.

ii. Loading Guidelines

Loadings on the City of Hurricane's system are limited to the values listed below. These limitations are set to allow the city to maintain three-phase balanced loads on the system's main overhead circuits.

iii. Primary Conductor Loading

1. A maximum of 400 kVA connected is allowed for single phase.

2. A 1/0 AWG aluminum conductor is required where the connected single-phase and/or three-phase load is less than 400 kVA connected per cable/phase or total 1,200 kVA connected for three-phase cable.
3. When the connected single-phase and three phase loads exceed 400 kVA per cable a backbone-feeder system shall be used. It is required that a 4/0 AWG aluminum conductor be used for the backbone when the total connected kVA is less than 3,600 kVA. When the total kVA connected exceeds 3,600kVA an aluminum conductor of 750kcmil is required. The size of the conductor shall be approved by HCP. The connected load shall be divided so that it can be fed by 1/0 AWG aluminum conductor feeders.
4. If 750kcmil aluminum conductor is required for the backbone feeder, switchgear must be installed.
5. All areas or subdivisions with potential development beyond their property may be required to extend power infrastructure to the far side of the property.
6. All main 750kcmil trunk lines will be designed and installed to accommodate current or future back feed.

iv. SECONDARY CONDUCTOR LOADING

1. Secondary conductor loading shall meet all code requirements in NEC 310.16.

B. CABLES IN CONDUIT

i. MISCELLANEOUS INSTALLATION INSTRUCTIONS

1. Cables shall be pulled so that all conduit and bends will be installed and backfilled before any wire is pulled. This will result in minimum tension on the cables.
2. Any pulls over 950 feet must be approved by HCP.
3. In highly congested switch basements or where cables must be bent sharply to permit pulling, a feed-in tube shall be used for pulling cables. This will reduce pulling tensions and prevent damage to the cables being pulled and to other adjacent cables.
4. Single-phase conductor cables must be installed one cable per conduit and conduit must be nonmetallic as per requirements.

5. Three-phase conductor cable must be installed three cables per conduit and conduit must be nonmetallic as per requirements.
6. Before making a pull, conduits shall be cleared and free of dirt, rocks, etc.
7. Pulling lube shall be used to facilitate pulling of primary and secondary cables. Compounds shall be compatible for use with high voltage cable(s) shield(s).
8. When two or more cables (secondary) and/or bare conductors are pulled into one conduit, they shall be pulled at the same time.
9. Primary cables shall not be installed in the same conduit as secondary or communication cables.
10. Primary or secondary cables shall not be pulled into plastic conduit until all conduit joints made using plastic conduit cement have been allowed to dry for at least one-half (1/2) hour.
11. Sufficient excess cable shall be pulled into all duct runs to allow at least five feet (5') of cable to be removed from each end of the installed cable while providing adequate cable for termination or splicing. Removal of the five feet (5') of cable will eliminate cable damaged by pulling grips from the system.

ii. MAXIMUM PULLING LINE TENSIONS

When pulling cable(s) into conduit, the pulling line used shall have a safe working load rating (minimum) equal to the manufacturer's specification maximum allowable pulling line tensions. An approved hydraulic pressure cable tension monitoring system or dynamometer will be used on all pulls where the cable(s) cannot be pulled by hand.

iii. PULLING EYES AND GRIPS

Cables shall be pulled into conduit with a pulling eye attached to the cable's conductor or a pulling grip placed over the cable sheath, insulation, or jacket.

iv. PULLS WITH BENDS AND/OR SWEEPS

Extreme care must be exercised when pulling cable(s) into runs containing sweeps or bends. There are two concerns; 1) the cable

manufacturer's maximum recommended pulling tension must not be exceeded, and 2) the cable manufacturer's maximum sidewall bearing pressure is not to be exceeded. Different manufacturers of cable have differing requirements as to the maximum pulling tension depending on the type of pulling used (pulling grips such as "Kellams" or pulling eyes affixed to the cable's conductor). Sidewall bearing pressures are also dependent on the manufacturer. It is the engineer's responsibility to calculate expected cable-pulling tensions and sidewall bearing pressures based on the manufacturer's recommendations. Pulling tension calculations shall be provided to HCP for approval.

v. THE NUMBER OF 90-DEGREE AND 45-DEGREE ELBOWS WILL BE LIMITED TO THE FOLLOWING
    1. For secondary or primary conduit runs using 4" PVC or less, the number of 90-degree elbows shall be limited to two (2), and if needed one (1) 45-degree elbow may be used in addition to the two (2) 90-degree elbows.
    2. For primary conduit runs using 6" PVC, the number of 90-degree elbows shall be limited to one (1).
    3. Any additional elbows (90 or 45-degree) needed to be installed must be approved by HCP.

vi. BENDING RADIUS FOR CABLES

The minimum bending radius for both single and multiple conductor cables shall be per manufacturer's specification.

vii. BURIAL DEPTH

See drawing DR-18.

viii. SOIL COMPACTION

Backfill placed over primary and/or secondary cables must be compacted. Machine compaction shall be used after placing a minimum of twelve inches (12") of fill over the conduit.

Refer to the conduit installation section for compaction requirements.

ix. MULTIPLE PRIMARY CIRCUITS IN ONE TRENCH

When the cables comprising two primary circuits (whether single or three-phase) are installed in a common trench the horizontal separation between the two circuits shall be six inches (6”) minimum.

NOTE: This requirement is not meant to prohibit random lay of different phases of the same circuit in a common trench.

Table 1

CLEARANCES FROM UNDERGROUND POWER CABLE TO OTHER UNDERGROUND UTILITIES

Water:	5 Feet horizontal
Sewer:	5 Feet horizontal
Natural Gas:	10 feet horizontal
Cable TV:	1 foot vertical
Phone:	1 foot vertical

CABLE MARKING & LOCATION

I. SCOPE

This specification details the standard method to be used for making primary and secondary underground cables to indicate the general direction from which each cable extends from a given site.

It also details a method for identifying individual phases in multi-cable primary and secondary cable systems.

II. INSTALLATION

A. DIRECTION INDETIFICATION

Primary and secondary cables shall be marked with one tag indicating direction or exit from underground facilities (i.e., vaults, primary junction boxes, switch basement, secondary junction boxes, transformers, or splice boxes). This tag shall indicate the general direction of the cable(s) to the next facilities where the cable is located and the length of the cable. There shall be adequate space left available for HCP to add the phase of the cable as

well as any applicable transformer numbers. The tags used must be approved by the Hurricane City staff.

All tags will be labeled with the next point of connector (i.e. Transformer 1 to Transformer 2).

All equipment will be numbered prior to tagging the cable in order to be accurate. The tagging will be inspected by City of Hurricane Power Department personnel prior to energizing.

NOTE: Approved 4"x4" tags (cow tag) can be purchased at any Intermountain Farmers outlet.

B. PHASE IDENTIFICATION

When individual phases in a primary or secondary multi-cable installation are to be identified, bands of colored tape shall be used. Each phase shall be identified with bands as follows:

"A"PHASE	BLACK
"B"PHASE	RED
"C"PHASE	BLUE

C. SAFETY

Do not shortcut or forget safe working procedures. Regardless of the accuracy of cable labeling, it cannot be relied upon when working and handling cables. The energized status of any individual cable must be tested. Proper cable grounding procedures must be followed.

CONDUIT INSTALLATION

I. SCOPE

These standards outline installation details for plastic conduit (PVC) used in underground distribution.

II. DEFINITIONS

I. PLASTIC CONDUIT

Conduit shall be one of the following types:

PVC Schedule 40

Steel conduit shall not be used without the approval of HCP.

II. BURIAL DEPTH

i. Conduit

Vertical distance measured from the surface under which conduits are installed to the center of the conduit nearest the surface. See drawing DR-18.

ii. Concrete Encased Conduit

Vertical distance measured from the surface under which conduits are installed to the top of the concrete envelope surrounding the conduits. All concrete encased conduit must be approved by HCP.

III. SWEEP

Changes in direction of a conduit or group of conduits with an angle of bend of 10 degrees or less or a radius of bend of fifteen feet (15') or more.

BEND

Change in direction of a conduit or group of conduits that, due to the angle of bend or radius of bend, cannot be defined as a sweep.

III. APPLICATIONS

I. CONDUIT DEPTH

Refer to drawing DR-18,20 for determining conduit depth and location for primary and secondary cable applications.

II. CONDUIT SIZES

Refer to Drawing DR-18 for determining conduit sizes for primary and secondary conductors.

III. WARNING TAPE

A minimum of six-inch (6") red warning tape shall be installed directly above the conduit, twelve inches (12") below final grade for the length of the entire trench.

IV. INSTALLATION

The minimum allowable burial depths for non-encased and concrete encased conduits are shown in the following table.

Table 2

BURIAL DEPTHS-NON-ENCASED AND ENCASED CONDUIT

Installed Under Paved Surface			All Other Locations	
	Non-Encased Conduit	**Concrete Encased Conduit**	**Non-Encased Conduit**	**Concrete Encased Conduit**
SCH 40 PVC Conduit Secondary	36 Inches	See Notes	36 Inches	See Notes
SCH 40 PVC Conduit Primary	48 Inches	See Notes	48 Inches	See Notes

NOTES:

- If, in a particular installation, burial depths less than permitted by the table above are required, the reduced burial depths must be approved by HCP.
- Concrete encased conduit must be covered with a three-inch (3") envelope. There must also be six inches (6") of select bedding and eighteen inches (18") of fill on top of the concrete encasement. Drawing DR-19

A. TRENCHES FOR CONDUITS

i. TRENCH BOTTOMS

When conduits are directly buried or concrete encased, the bottom of the trench into which the conduits are placed shall be free from rocks exceeding one inch (1") in their largest dimension. When the trench bottom contains rocks exceeding this size requirement, the trench shall be excavated six inches (6") deeper than the burial depth required for the conduits and then backfilled to the required burial depth with sand or screened backfill. Backfill shall be compact within

95 percent (95%) of the maximum dry density prior to installation of conduit.

ii. TRENCH BACKFILL

The JUT (Joint Utility Trench) trench shall be backfilled with (1") minus material from the bottom of the trench to the top. No spoil material shall be used, unless screened, (1") minus, and is compactable material.

- Direct buried plastic conduit
- Concrete encased plastic conduit
  - Concrete encased conduit is not the standard and will only be accepted in extreme circumstances.
- Drying time for concrete before backfilling
  - Backfill shall not be placed in trenches containing concrete-encased conduits until the concrete has been allowed to set for at least 36 hours

iii. SOIL COMPACTION

Backfill placed over direct buried plastic conduit must be compacted; machine compaction shall not be used within twelve inches (12") of the conduits. For concrete encased plastic conduits, machine compaction may be used without restriction in proximity to the concrete envelope.

iv. CONCRETE ENVELOPE DIMENSIONS

1. Minimum Envelope Dimensions

   When conduits are encased in concrete, they shall be enclosed by a concrete envelope. See Drawing DR-19.

2. Concrete

   A three-quarter inch (3/4") minus 3000 PSI mix as per ASTM (American Society for Testing and Materials) C94 specification is required. In all cases a Type 2 modified, or Type 5 cement will be used. Air entraining agents shall not to be used. Slump shall not exceed six inches (6") at site. The concrete shall be poured slowly to prevent the conduit from floating. Where necessary the conduit may need to be staked in place.

Concrete shall be vibrated to ensure that all the spaces around the conduit is filled.

v. CONDUIT BENDS AND SWEEPS

1. Minimum Radius

The minimum radius of bends in conduits shall not be less than ten (10) times the diameter of the largest conduit being installed. If smaller minimum bending radii are required, they shall not be less than the manufacturer's recommended minimum bending radii of the cables to be installed in the conduits.

vi. SHORING, LAYING BACK, SPOIL PLACEMENT AND RETENTION

When employees must enter a trench to install conduits, the trench shall be shored or laid back and the spoil shall be effectively retained and placed back from the edges of the trench as required by local state and national codes or ordinances to ensure that the employees are not subject to moving ground or cave-ins.

vii. CONDUIT REPAIR

If conduit is damaged during installation, damaged section(s) shall be removed and replaced with like conduit and couplings. Use of split ducts for repair of damage during installation is not permitted. A full stock length (usually 10 foot segments) will be used to repair a damaged section. Repair collars will not be allowed.

viii. RISER POLE CONDUIT INCLUDES POWER, PHONE, TV

Conduits for a riser pole shall be rigid steel or aluminum, shall continue up the pole from the PVC elbow to the top of the riser. The riser pole conduit shall be straight and supported with a six-inch (6") aluminum-strut system. Any crooked or misaligned conduits will not be accepted. The contractor shall install the first ten feet (10') of the riser and one six-inch (6") standoff. The city will provide the rest of the materials for the completion of the power riser at the contractor's expense. Placement and height of riser shall be approved by HCP personnel. See Drawings DR-26.

NOTE: There will be a fee charged for the installations. Please see HCP personnel for current fees. These fees are subject to change without notice.

INFASTRUCTURE INSTALLATION

I. SCOPE

These standards outline installation details for primary equipment (transformer pads, splice boxes, switch basements, sectionalizing cabinets used in an underground distribution system.

II. DEPTH

i. SWITCH BASEMENT INSTALLTION DEPTH

The switch basement shall be installed with the top being within six inches (6”) above the finished grade or sidewalk.

Splice boxes shall be installed the same as switch basements.

ii. TRANSFORMER PAD INSTALLATION DEPTH

The transformer pad shall be installed 4”- 6” above finished grade or sidewalk.

iii. SECTIONALIZING CABINETS

Sectionalizing Cabinets shall be installed according to Standards Drawings DR-14, DR-21, and DR-22. With it extending 18” below finished grade.

B. LOCATION

Primary enclosures shall be located in a manner that adjacent obstacles such as fences, buildings, etc. do not interfere with operation, installation, or maintenance of the enclosures. If less than ten feet (10’) of clear space is to be provided, HCP approval is required.

Electrical equipment shall be installed within 6”–12” from the back of sidewalk or walking path.

If a streetlight is present on a property line, the electrical equipment shall be installed 12”-18” to the right side of the edge of the street light base. If no light is present the electrical equipment shall be installed 6”-12” to the right of the property line as shown in drawing DR-21.

EQUIPMENT, LINE LOCATION, AND RIGHT OF WAY REQUIREMENTS

I. SCOPE

These standards outline the location, with respect to property lines, of underground distribution facilities. See Drawings DR-20, 21, 22.

II. BACK LOT AND SIDE YARD LINE INSTALLATIONS

Installation along back-lot and side yards will not be allowed. If front installation is not possible, Contact HCP for further review of electrical installation plan.

III. RIGHT OF WAY REQUIREMENTS

Before any power system design approval, the property owner or developer will be required to grant Hurricane City the proper easements and right-of-way at no cost to the city. Additional easements may be required for equipment access.

The standard requirements are as follows:

Residential:

10 feet (10') on the front of each lot or parcel

Multi-Building or Condominium:

10 feet (10') on the front of each lot or parcel

Commercial:

15 feet (15') on the front of each lot or parcel

Common Areas:

The equipment (i.e. transformers, vaults, switches) will be placed along access roads as per standards. If placement along access roads cannot be accomplished as determined by HCP, equipment will be placed with at least ten feet (10') of clearance from any permanent structure.

All power equipment will be designed and installed as per the location drawings contained in these specifications; Drawings DR-20,21,22 in order to assure equipment falls within the established right-of-way and easements and to maintain consistency of equipment placement throughout the city.

SECTION 4 – PRIMARY AND SECONDARY INSTALLATION

PRIMARY JUNCTION INSTALLATION

I. SCOPE

These standards outline installation details applicable to fused 15kV, 200 and 600-ampere primary junction installation.

II. INSTALLATION

A. All single-phase pad mount transformers will have a ground sleeve, see Drawing DR-11. All three-phase transformers will be placed on the transformer pad as shown on Drawing DR-10.

B. Fusing requirements for any residential, industrial or commercial facility will be reviewed, coordinated, and approved by HCP. Any system that has the potential of serving more than one residential, commercial or industrial location or more than one circuit/feeder such fusing will be determined by HCP and each subdivision or development will be fused according to its needs.

C. Connection requirements vary between the type of service being rendered (residential, commercial, or industrial) and location on the electrical system.

D. No single-phase tap shall have more than 400kVA connected load except in commercial or industrial three-phase applications.

E. No single phase transformer shall exceed 100kVA.

F. Where a switch cabinet is required, no more than nine (9) fused single-phase taps can be fed from the cabinet.

G. All transformers and vaults shall utilize approximately 10’-12’ of #4 solid bare copper for ground connections.

Residential Three-Phase:

Subdivision will be tapped via appropriate sectionalizing cabinets or switches, see Drawings DR-14,15. A set of three (3) fused disconnects will be provided on the riser pole serving the subdivision. Fuse sizing must be approved by HCP.

Commercial Three-Phase:

Fuses shall be sized based on connected kVA and shall coordinate with the up-line protective devices. HCP personnel shall be consulted early in the planning stage to determine the appropriate maximum fuse size. 750kcmil backbone feeders will be required to be looped or

developed in such a manner as to have future loop and back feed capabilities.

Residential and Commercial:

When fused switchgear is required the developer/customer is responsible for paying a pro-rate share of the current costs for the existing three-phase fused bay. Current costs to be obtained from HCP.

Table 3

FUSE SIZES

Description	Location	Fuse Size	Cable Size
Single-Phase Less Than 400 kVA	Riser Pole Switch Fuse Bay	40T 40E	1/0
Three-Phase 400 kVA-1200 kVA	Riser Pole Switch Fuse Bay	40T 40E	1/0
Three-Phase 1200 kVA-3600 kVA	Riser Pole Switch Fuse Bay	80T 80E	4/0

Note: The fuse sizes shown are a maximum. Fuse sizing must be approved by HCP.

III. TESTING BEFORE ENERGIZING

A. LOADBREAK ELBOWS AND INSULATING RECEPTACLES

Primary Junction Installation, which include load-break elbows and/or insulating receptacles, shall be operated before the installation is energized to ensure there is no interference from concentric neutral conductors, adjacent elbows, etc.

B. SWITCHES

Test operate all switches in fused, primary installations prior to energizing to ensure proper operation and that adjacent obstacles such as fences, walls, etc. do not interfere with the switch operating handle.

IV. LOCATION

Primary junction installations shall be located in a manner that adjacent obstacles such as fences, buildings, etc. do not interfere with installation or operation and maintenance of the equipment.

SECONDARY JUNCTION INSTALLATION

I. SCOPE

These standards outline the installation of secondary junction boxes and mobile home park meter pedestals.

II. INSTALLATION

A. BURIAL DEPTHS

i. Secondary Junction Boxes

1. Secondary junction boxes shall be installed with 6 inches (6”) above final grade and be located six inches (6”) behind sidewalk. See drawings DR-12 and DR-13.
2. Drive over secondary boxes will not be permitted if box contains (1) 500kcmil or (2) 350kcmil wires. Drive over concrete boxes are not a power department standard and will only be allowed in special circumstances.

ii. Mobile Home Park Metering Pedestals

1. Mobile Home Park Metering Pedestals shall be installed to the depth indicated on the pedestal by the manufacturer, see Drawings DR-25.

III. SAFETY

A. LOCKING

i. Secondary Junction Boxes

1. All secondary junction boxes shall be bolted with Penta head bolts. Standard tumbler-type locks or other devices are not approved for this application.

ii. Mobile Home Park Meter Pedestals

1. The access panel to the unmetered bus in all mobile home park meter pedestals shall be locked with pedestal equipment locks. Standard tumbler type locks or other devices are not approved for this application.

CABLE TAPS (200 AMPERES)

I. SCOPE

These standards outline installation details for 200 ampere, 15 kV load break junctions used in underground distribution.

II. INSTALLATION

A. GENERAL

200 ampere, 15 kV load break junctions must be installed in primary enclosures. Not suitable for direct burial.

B. TESTING BEFORE ENERGIZING

Operate load break elbows and insulating receptacles before energizing 200 ampere, 15kV load break junction installations to ensure:

i. They can be operated without interference from concentric neutral conductors, adjacent elbows, etc.
ii. The mounting location of the load break junction is such that rings and covers or doors of primary enclosures, adjacent junctions, etc. do not interfere with operations

Elbow arrestors or stand-off arrestors or a combination of the two will be required at all locations deemed necessary by HCP.

CABLE TAPS (600 AMPS)

I. SCOPE

These standards outline installation details applicable to 15 kV, 600 ampere spice-tap configuration used in underground distribution systems.

II. INSTALLATION

When assembling 15 kV, 600 ampere T-body elbow configurations, a spanner wrench may be used to facilitate installation or removal of connector plugs and reducing tap wells (with or without studs). They are not suitable for direct burial.

III. CAUTIONS

600 Ampere elbows are dead-break and only suitable for operation when de-energized.

SECTION 5 – TRANSFORMER INSTALLATION AND BID SPECIFICATIONS

TRANSFORMER INSTALLATION

I. SCOPE

These standards outline the installation of single-phase and three-phase transformers used in underground distribution.

II. EQUIPMENT

A. PRIMARY SYSTEM CONFIGURATION

i. Single-phase pad mounted transformers

Single-phase pad mount transformers should be equipped with two primary bushings for installation in loop or radial feed primary systems.

ii. Three-phase pad mounted transformers

Three-phase pad mount transformers shall be purchased and installed with six primary bushings and feed through capabilities.

III. INSTALLATION

A. Connect the secondary ground strap, supplied on the pad mounted transformer, between the transformer tank wall and the secondary neutral.

B. The soil backfill to be placed around the transformer ground sleeve shall be compacted to within 95 percent (95%) of the maximum dry density to support the transformer. A level pad around all sides of five feet (5') shall be maintained.

CAUTION: Do not disconnect either end of the secondary ground strap unless the transformer is de-energized.

IV. TRANSFORMER SIZING

A. Residential transformers will be incrementally sized based on 8kVA per 200 amperes. Transformer size not to exceed 100 kVA.

B. Commercial/Industrial transformers will be sized based on Table 4. HCP reserves the right to adjust transformer size as needed.

Table 4

TYPICAL COMMERCIAL/INDUSTRIAL TRANSFORMER SIZING GUIDLINES

Service Voltage	Panel Rating (Amps)	Transformer size (kVA)
Single Phase Service		
240/120	200	37.5
	400	75
	600	100
Three Phase Service		
208Y/120	200	75
	400	112.5
	600	150
	800	225
	1000	300
	1200	500
	1600	500
	2000	750
	2500	750
	3000	1000
	4000	1500
480Y/277	200	150
	400	300
	600	500
	800	500
	1000	750
	1200	1000
	1600	1500
	2000	1500
	2500	2000
	3000	2000

Note: Transformer sizes are based on a standard diversified load. Transformer size may vary. HCP to determine final transformer size based on type of load being served.

V. TRANSFORMER POLICY

It is permissible for a Contractor to acquire transformers from sources other than HCP, provided the transformer(s) fully meets Hurricane City specifications.

The contractor shall be responsible for providing the following prior to energizing the circuit or transformer:

- Certified load loss certificate by serial number of unit
- Certificate from manufacturer:
  - Compliance of standards testing required in the transformer specifications
  - Warranty
  - Polychlorinated Biphenyl (PCB) certificate
- Numbering of transformer and information needed
  - All nameplate information
  - Street address

It is the responsibility of the contractor to see that HCP inspector receives transformer information before the final inspection walk through. The city power inspector will assign a number for each transformer to be painted on the front of the transformer.

All appurtenances to the transformers such as, but not limited to, elbows, neutral grounding bushings (when required), stand-offs, dummy receptacles, etc. will be provided by the contractor. Single-phase transformer secondary bar connectors capable of accepting 6-500kcmil aluminum conductors shall be supplied by the Contractor.

SINGLE-PHASE PAD MOUNTED DISTRIBUTION TRANSFORMER

I. SCOPE

This specification outlines the electrical characteristics and the mechanical features of single-phase, 60Hz; oil filled, pad-mounted, dead-front compartmental-type distribution transformers with separable insulated high voltage.

II. STANDARDS

A. All transformers shall be constructed and tested in accordance with latest revision of applicable ANSI, and NEMA standards.

B. No used or remanufactured material or components will be acceptable.

III. RATINGS

A. KILOVOLT AMPERE (kVA) RATINGS

i. The standard kVA ratings shall be one of the following: 25kVA, 37.5kVA, 50kVA, 75kVA, or 100kVA as required.

ii. These standard kVA ratings are continuous and based on not exceeding either a 65º C average winding temperature rise or an 80º C hot spot temperature rise. The temperature rise of the insulating oil shall not exceed 65º C when measured near the top of the tank.

B. VOLTAGE

i. The high voltage rating shall be 12470Y/7200 volts. The low voltage rating shall be 240/120 volts. Unless otherwise directed by HCP.

C. BASIC IMPULSE INSULATION LEVEL

i. The basic impulse insulation level (BIL) shall be 95 kV.

IV. CONSTRUCTION

A. GENERAL

i. All transformers shall consist of a transformer tank and a high and low-voltage cable termination compartment. These components shall be assembled as an integral, tamperproof, and weatherproof unit for mounting on a pad. There shall be no exposed bolts, screws or other fastening devices which are externally removable. There shall be no openings through which foreign objects such as wires or rods might be inserted to contact live parts.

B. HIGH AND LOW-VOLTAGE COMPARTMENT

i. Access to the high and low-voltage compartment shall be through a hinged door suitable for locking with a padlock.

ii. The high-voltage segment of the compartment shall contain the high voltage terminations and be provided with an elbow accessory parking stand. High voltage will be of the loop type/feed through configuration.

iii. The low-voltage segment of the compartment shall contain the low-voltage terminations.

C. TANK

i. All transformer tanks shall have sealed tank construction and sufficient strength to withstand a pressure of seven (7) PSIG without permanent distortion.

ii. A tank that has sealed tank construction is one that seals the tank from the atmosphere.

iii. The tank shall remain effectively sealed for a top oil temperature range of -5ºC to 105ºC.

D. LOW-VOLTAGE TERMINATIONS
   i. The electrical characteristics of the completely assembled low-voltage terminations shall be:
      1. Insulation Class – 1.2Kv
      2. Basic Impulse Insulation Level (BIL)-30 kV
      3. One minute withstand – 10 kV
   ii. The terminals of the low-voltage terminations shall be as shown in applicable ANSI standards.
   iii. The number location and arrangement of the low-voltage terminations shall be as shown in applicable ANSI standards.
   iv. All low-voltage terminations shall be externally bolted to facilitate field replacement.

E. HIGH-VOLTAGE TERMINATIONS
   i. All high-voltage terminations shall be 15 kV class universal bushing wells and inserts suitable for use with 15 kV class load-break elbow connectors.

      NOTE: All load-break bushing inserts shall be provided with the transformer.

   ii. All high-voltage terminations shall be externally bolted to facilitate field replacement.
   iii. The number, location and arrangement of the high-voltage terminations shall be as shown in applicable ANSI standards.

F. NEUTRAL CONNECTIONS
   i. The H2 end of the high-voltage windings shall be connected to the transformer tank internally and this connection shall be securely grounded to the tank and shall be independent of all other connections.
   ii. The low-voltage neutral shall be a fully insulated bushing. A ground pad shall be provided on the outer surface of the tank. A removable ground strap shall be provided and connected between the low-voltage neutral bushing and the ground pad.

G. CORE AND WINDINGS
   i. One piece core construction is desired. Where other construction is used, minimum assembly joints shall be provided. For approved two-part cores, the core shall be held together with bands and torqued bolts. Crimped banding is not acceptable for ratings over 50 kVA.
   ii. Copper or aluminum winding conductors are desired.

iii. Core material may be either silicon steel or amorphous.
iv. Core losses shall be minimized by the core material and core construction.

H. INSULATION
i. All insulating paper used as layer insulation in transformer coils shall be coated on both sides with a thermosetting adhesive and properly cured prior to impregnating with oil or the coils shall be wound with primary conductor containing a thermosetting adhesive that when properly cured will form an effective bond.
ii. Insulating/cooling fluid within the tank shall be electrical grade mineral oil or a nonflammable environmentally accepted fluid.
iii. Fluids shall be certified and indicated on the nameplate to be less than 1 part per million (ppm) polychlorinated biphenyl (PCB) content.
iv. Fluids other than mineral oil shall have submitted, with the quotation, complete chemical and electrical characteristics and a statement of being non-PCB.

I. GROUND CONNECTION
i. The tank shall have a welded ground lug boss attached on the secondary side of the tank near the bottom of the tank of secondary bushings and attached conductors.
ii. The grounding boss shall be free of paint and shall be 7/16 inch (7/16”) deep and threaded for a one-half inch (1/2”) 13 NC grounding stud or connector.
iii. The tank cover shall have a grounding strap between the cover and the tank.

V. ACCESSORY EQUIPMENT

A. HIGH-VOLTAGE PROTECTIVE FUSES
i. All transformers shall be equipped with an externally removable, oil immersed, expulsion fuse, in a load-break bayonet suitable for hot stick operation. This fuse must be designed to protect the transformer in the event of internal or secondary faults or under overload conditions.

B. PRESSURE RELIEF DEVICE
i. Each transformer shall be equipped with a self-actuating relief device to relieve slow pressure buildup and to automatically vent when pressure reaches + 10 PSIG and recloses when pressure falls to + 6 PSIG.

C. ROLLING, LIFTING, AND MOUNTING FACILITIES
    i. The transformer shall be equipped with lifting provisions of adequate strength and size and arranged on the transformer to permit lifting of the completely assembled and oil filled unit.
    ii. An internal flange shall be provided at the base of the high and low-voltage compartment to provide means for mounting the transformer on a pad.

D. IDENTIFICATION NAMEPLATE
    i. An identification nameplate shall be located in the low-voltage segment of the high and low voltage compartments and shall be readable with cables in place.
    ii. If the nameplate is mounted on a removable part, the manufacturer's name and the transformer serial number shall be permanently affixed to a non-removable part.
    iii. The identification nameplate shall conform with all applicable ANSI standards.

VI. TESTING

A. All transformers shall be tested in accordance with ANSI standards. All transformers shall be capable of withstanding short circuit tests.

VII. FINISH

A. The transformer shall be given a durable, corrosion resistant, green, or desert tan (as specified) outdoor finish capable of meeting or exceeding EEI finishing requirements.
B. All transformer surfaces in contact with the pad shall be designed or treated to minimize corrosion.

VIII. SHIPPING AND LABELING INSTRUCTIONS

A. Transformers shall be mounted on a pallet for shipment.
B. A shipping tag indicating the kVA size, manufacturer, voltage ratings, serial number and purchase order number shall be attached to all transformers.

IX. LOSS EVALUATION

A. Total losses will be invoiced at $4.30 per watt over allowable losses according to the chart below.
    i. Evaluated losses will be calculated by multiplying the appropriate dollar/watt values by guaranteed maximum load losses at maximum nameplate kVA rating and no-load losses at 100 percent voltage. These products will be added to the bid price for evaluation.

B. Total watt losses shall not exceed the following:

SINGLE-PHASE PAD-MOUNTED 120/240 VOLT

kVA Rating	Losses in Watts	kVA Rating	Losses in Watts
25 kVA	275 Watts	75 kVA	675 Watts
37.5 kVA	360 Watts	100 kVA	750 Watts
50 kVA	460 Watts	167 kVA	1,310 Watts

C. If the actual tested loss values exceed the guaranteed maximum values stated in the proposal of the Contractor, the Contractor will be charged a penalty value for every kilowatt by which the actual tested transformer losses exceed the guaranteed maximum losses upon which the proposal was evaluated. This penalty value will be the difference between the total actual test loss evaluation and the total guaranteed bid loss evaluation.

D. Transformer shall not be energized until all loss evaluation fees have been paid.

X. VENDOR EVALUATION

A. Vendor evaluations, as well as loss evaluations, will be used to determine the low bidder. Delivery dates will be of prime concern during the bid evaluation.

XI. EXCEPTIONS

A. Exceptions to this Specifications shall not be accepted, unless approved by HCP. Any exceptions shall be noted in the proposal.

XII. WARRANTY

A. Manufacturers shall warrant to purchaser that the apparatus or service to be furnished hereunder shall be of the highest quality and free from defects in material, workmanship, and title and will be of the kind designated in the pertinent purchase order. The developer shall warranty the installed transformer for a period of twelve (12) months after the preliminary acceptance.

B. The Manufacturer shall guarantee that all transformers furnished under this specification are of first-class material and workmanship throughout, that they have been tested in accordance with this specification, and that the results of the tests comply with the requirements of this specification, and in lieu of other claims against it, agrees to replace or repair:

i. Any transformer found to be defective in material or workmanship or found not to be in compliance with the requirements of this specification before or during installation of the transformer.

ii. Any transformer failure during normal and proper use within the manufacturer's guarantee period which shows defects of materials or workmanship.
iii. All transformers must be of new construction, no remanufactured transformers will be accepted. New construction means not used and is less than 2 years old.

THREE-PHASE PAD MOUNTED DISTRIBUTION TRANSFORMER

I. SCOPE

This specification outlines the electrical characteristics and the mechanical features of dead-front outdoor three-phase, 60 Hz, oil immersed, self-cooled pad-mounted, compartment-type distribution transformer with separable insulated high voltage connectors.

II. STANDARDS
   a. All transformers shall be constructed and tested in accordance with all applicable ANSI, and NEMA standards.
   b. No used or remanufactured material or components will be acceptable. All transformers must be of new construction; no remanufactured transformers will be accepted. New construction means not used and is less than 2 years old.

III. RATINGS
   a. KILOVOLT AMPERE (kVA) RATINGS
      i. The standard kVA ratings shall be one of the following: 75kVA, 112.5kVA, 150kVA, 225kVA, 300kVA, 500kVA, 750kVA,1000kVA, 1500kVA, or 2000kVA as required.
      ii. These standard kVA ratings are continuous and based on not exceeding either a 65º C average winding temperature rise or an 80º C hot spot temperature rise. The temperature rise of the insulating oil shall not exceed 65º C when measured near the top of the tank.
   b. VOLTAGE
      i. The high voltage rating shall be 12470Y/7200 volts. The low voltage rating shall be 208Y/120 volts or 480Y/277 volts as required, unless otherwise directed and approved by HCP. Transformers must be wound in a Wye-Wye configuration.

c. TAP RATINGS
    i. The transformers shall be equipped with: (2) 2-1/2 percent taps above and (2) 2-1/2 percent taps below normal voltage. All taps shall be full capacity taps.
    ii. Tap changing to be through the wall in the high voltage connection compartment.
    iii. Taps shall have the positions of the changer clearly marked to indicate actual voltage on the primary, or as a percentage (%) of above and below normal primary voltage.
    iv. Taps shall be operable only with the transformer de-energized.
d. BASIC IMPULSE INSULATION LEVEL
    i. The basic impulse insulation level (BIL) shall be 95 kV.

IV. CONSTRUCTION
a. GENERAL
    i. All transformers shall consist of a transformer tank and a high and low-voltage cable termination compartment. These components shall be assembled as an integral, tamperproof, weatherproof unit for mounting on a pad. The transformer shall meet the requirements for tamper resistance as set forth by the Western Underground Committee. There shall be no exposed bolts, screws or other fastening devices which are externally removable. There shall be no openings through which foreign objects such as wires or rods might be inserted to contact live parts.
b. TANK
    i. Transformer tank shall be suitable for outdoor installation. The tank shall be of a construction that effectively seals the tank interior from the atmosphere but will allow entry for service.
    ii. Construction of the seal shall maintain the integrity of the seal over an operating oil temperature range of -5º C to 105º C.
    iii. Tank construction shall be such that it has sufficient strength to withstand a pressure of seven (7) PSIG without permanent distortion.
c. HIGH AND LOW-VOLTAGE COMPARTMENT
    i. The high and low-voltage cable terminating compartment shall:
        1. Be compartmentalized into high-voltage and low-voltage segments by a suitable barrier.
        2. Includes two doors, one for the high-voltage segment and one for the low-voltage segment. These doors shall have stainless steel hinges and pins and three-point latching with provisions

for padlocking. Unlocking the padlock shall permit access to the low-voltage segment of the terminating compartment only. Access to the high-voltage segment of the terminating compartment shall not be attained until an additional fastening device has been released.

3. Meet the dimensional requirements of applicable ANSI standards.
4. The high-voltage compartment shall be equipped with accessory elbow stands for each elbow.

d. TERMINATION ARRAGEMENT AND DIMENSIONS
   i. The termination arrangements and dimensions shall be in accordance with ANSI standards.

e. HIGH-VOLTAGE TERMINATIONS
   i. Configuration – The configuration of the high-voltage terminations shall be Loop Feed.
   ii. Type – The high-voltage terminations shall be 15 kV class universal bushing wells and inserts suitable for use with 15 kV class load-break elbow connectors.
   The continuous current rating shall be 200 Amps

   NOTE: All load-break bushing inserts shall be provided with the transformer.

f. LOW-VOLTAGE TERMINATIONS
   i. The terminals of the low-voltage terminations shall be as shown in applicable ANSI standards.
   ii. The configuration of the low-voltage terminations shall be as shown in ANSI standards.
   iii. Secondary low-voltage bushings shall include a full capacity neutral (grounded conductor) bushing.
   iv. The electrical characteristics of the completely assembled low-voltage bushing and terminals shall be:
      1. Insulation Class – 1.2 Kv.
      2. Basic Impulse Insulation Level (BIL) – 30 kV.
      3. One minute withstand – 10 kV.
   v. Internal connections to the secondary bushings shall be by lugs welded to the secondary conductor and bolted to the bushing stud.

g. FUSING EQUIPMENT
    i. The transformer shall be equipped with externally removable, oil immersed, expulsion fuses in load-break bayonets, in series with under oil partial range current limiting fuses.
    ii. All under oil partial range current limiting fuses shall be easily accessible through a large "hand hole" on the exterior of the transformer. The hand hole shall be large enough and placed in such a location that all internal fusing elements will be "within" the hand hole area. In no case shall the hand hole area be smaller than 10 inches by 12 inches (10" X 12") unless approved in writing by HCP. The hand hole cover shall be tamper resistant and readily accessible.
    iii. All expulsion fuses shall be under oil in load-break bayonets. The bayonets shall be accessible through the high voltage compartment and there shall be a pressure relief valve in the low voltage compartment.
    iv. The transformer shall be equipped with an under oil partial range current limiting fuse. The bayonet expulsion fuses, and backup current limiting fuses shall be coordinated to ensure that the current limiting fuse will only operate on faults internal to the transformer. The current limiting fuse used shall have an interrupting rating of 50,000 Amp (minimum) symmetrical.

h. CORE AND WINDINGS
    i. All transformers must be wye-wye connected windings and shall have four – or five-legged core construction or shall otherwise include provisions to prevent excessive tank heating. The core construction or other provisions for preventing tank heating shall be adequate for unbalanced loading conditions of one or more of the primary phases of the transformer being energized from the same (single-phase) source.
    ii. One-piece core construction is desired. Where other construction is used, minimum assembly joints shall be provided. For approved two-part cores, the core shall be held together with bands and torqued bolts. Crimped banding is not acceptable for ratings over 50 kVA.
    iii. Copper winding conductors are desired.
    iv. Core material may be either silicon steel or amorphous.
    v. Core losses shall be minimized by the core material and core construction.

vi. Transformers shall be equipped with a common H0X0 bushing with a copper grounding strap to the transformer case.

i. INSULATION

i. All insulating paper used as layer insulation in transformer coils shall be coated on both sides with a thermosetting adhesive and properly cured prior to impregnating with oil, or the coils shall be wound with primary conductor containing a thermosetting adhesive that when properly cured will form an effective bond.

ii. Insulating/cooling fluid within the tank shall be electric grade mineral oil or a less flammable, environmentally accepted fluid where required.

iii. All fluids shall be certified and indicated on the nameplate to be less than 1 part per million (ppm) polychlorinated biphenyl (PCB) content.

iv. Fluids other than mineral oil shall have submitted, with the quotation, complete chemical and electrical characteristics and a statement of being non-PCB.

j. PRESSURE RELIEF DEVICE

i. Each transformer shall be equipped with a self-actuating relief device to relieve slow pressure buildup and to automatically vent when pressure reaches + 10 PSIG and recloses when pressure falls to +9 PSIG.

k. MOUNTING AND LIFTING

i. Mounting shall be suitable for concrete pad mounting. Drawing DR-10 Provide suitable anchorage brackets for Seismic Zone3.

ii. The tank shall have lifting provisions of adequate strength; size and arrangement on the transformer to permit lifting the transformer in an upright position when filled with insulating fluid.

l. GROUND CONNECTION

i. The tank shall have a welded ground lug boss attached on the secondary side of the tank near the bottom of the tank, clear of secondary and attached conductors.

ii. The grounding boss shall be free of paint and shall be 7/16 inch (7/16”) deep and threaded for a one-half (1/2”) 13 NC grounding stud or connector.

iii. The tank cover shall have a grounding strap between the cover and the tank.

m. ACCESSORIES

i. ANSI standard accessories shall be provided.

V. FINSIH
   a. The transformer shall be given a durable, corrosion resistant, non-chalking, green or desert tan (as specified) outdoor finish capable of meeting or exceeding EEI finishing requirements.

VI. SHIPPING AND IDENTIFICATION
   a. SHIPPING
      i. Transformers shall be mounted on a pallet for shipment.
   b. IDENTIFICATION
      i. The nameplate shall contain the manufacturers name, address, kVA, primary voltage, secondary voltage(s), % impedance, rated temperature rise, a wiring diagram indicating connections and voltages with polarity (additive or subtractive), core losses (no load and full load), insulating fluid identification, and PCB content, weight when full, manufacturer part (catalogue) number, and serial number unique to the transformer.
      ii. The nameplate shall conform to ANSI standards.
      iii. The nameplate shall be mounted on a permanently attached backing plate with welds or rivets. Removable nameplates or nameplates attached to removable parts will not be accepted.

VII. TESTING
   a. All transformers shall be tested in accordance with requirements of ANSI standards. All transformers shall be capable of withstanding short circuit tests.

VIII. LOSS EVALUATION
   a. Total losses will be invoiced at $4.30 per watt over allowable losses according to the chart below.
   b. Evaluated losses will be calculated by multiplying the appropriate dollar/watt values by guaranteed maximum load losses at maximum nameplate kVA rating and no-load losses at 100 percent voltage. These products will be added to the bid price for evaluation.
   c. Total watt losses shall not exceed the following:

3-PHASE PAD-MOUNT 120/208 VOLT

kVA Rating	Losses in Watts	kVA Rating	Losses in Watts
75 kVA	815 Watts	300 kVA	2,380 Watts
112.5 kVA	1,125 Watts	500 kVA	4,060 Watts
150 kVA	1,300 Watts	750 kVA	6,500 Watts
225 kVA	1,950 Watts	1000 kVA	8,980 Watts

3-PHASE PAD-MOUNT 277/480 VOLT

kVA Rating	Losses in Watts	kVA Rating	Losses in Watts
150 kVA	1,385 Watts	750 kVA	4,500 Watts
225 kVA	2,000 Watts	1,000 kVA	6,500 Watts
300 kVA	2,460 Watts	1,500 kVA	10,500 Watts
500 kVA	4,325 Watts	2,000 kVA	14,000 Watts
		2,500 kVA	22,057 Watts

d. If the actual tested loss values exceed the guaranteed maximum loss values stated in the proposal of the Successful Bidder, the Successful Bidder (Seller) will be charged a penalty value for every watt by which the actual tested transformer losses exceed the guaranteed maximum losses upon which the proposal was evaluated. This penalty value will be the difference between the total actual test loss evaluation and the total guaranteed bid loss evaluation.
e. Transformer shall not be energized until all loss evaluation fees have been paid.

IX. VENDOR EVALUATION

a. Vendor evaluations, as well as loss evaluations, will be used to determine the low bidder. Delivery dates will be of prime concern during the bid evaluation.

X. EXCEPTIONS

a. Exceptions to this Specification shall not be accepted, unless approved by HCP. Any exceptions shall be noted in the proposal.

XI. WARRANTY

a. Manufacturer shall warrant to Purchaser that the apparatus or service to be furnished hereunder shall be of the highest quality and free from defects in material, workmanship, and title and will be of the kind designated in the pertinent purchase order. Terms of Manufacturer's warranty shall be included in the bid proposal and will be a criterion for evaluation of the proposal. The developer shall warranty the installed transformer for a period of twelve (12) months after the date of preliminary acceptance.
b. The Manufacturer shall guarantee that all transformers furnished under this specification are of first-class material and workmanship throughout, that they have been tested in accordance with this specification, and that the

results of the tests comply with the requirements of this specification, and in lieu of other claims against it, agrees to replace or repair.

i. Any transformer found to be defective in material or workmanship or found not to be in compliance with the requirements of this specification before or during installation of the transformer.
ii. Any transformer failure during normal and proper use within the Manufacturer's guarantee period which shows defects of materials or workmanship.
iii. All transformers must be of new construction; no remanufactured transformers will be accepted. New construction means not used and is less than 2 years old.

SECTION 6 – SECONDARY LINE AND METER INSTALLATION

SECONDARY LINE AND METER INSTALLATION GENERAL

I. SCOPE

These standards outline minimum requirements for the service equipment, service conductors, etc., installed from the secondary junction box to and including the meter.

It also includes information necessary to determine ownership maintenance responsibility for associated conductors, equipment, etc.

II. APPLICATION
   a. GENERAL
      i. This standard shall be used as a guideline for determining whether or not the service equipment, service conductors, etc. that comprise the secondary service meet all applicable national, state, and local codes and ordinances and HCP requirements.

III. DEFINITIONS
   a. SERVICE EQUIPMENT, See Drawings DR-24, DR-25.
      i. All metering equipment, disconnecting equipment, and overcurrent protective devices near or on the building that provide power to the building from HCP service connection point.
   b. UNDERGROUND SERVICE CONDUCTORS
      i. The underground supply conductors that extend from the City's secondary junction box or transformer to the metering provision.
   c. GROUNDING ELECTRODE

i. Grounding shall be done through a UFER grounding system, or per latest building code requirements.
ii. As a minimum, a 5/8-inch X 8-foot (5/8" X 8') ground rod shall be used as the grounding electrode. When a metal underground water pipe system is available on the premises, the water pipe system and the ground rod shall be used as grounding electrodes.

d. GROUNDING ELECTRODE CONDUCTOR
   i. The conductors used to connect the grounding electrode to the grounded conductor of the underground service.

e. BURIAL DEPTH
   i. Underground service conductors will be installed in schedule 40 PVC conduit.
   ii. The vertical distance from the surface under which the conduit is installed, to the center of the conduit.

f. METERING PROVISIONS
   i. The enclosures, meter sockets, switch boxes, conduit, conduit elbows, etc. are required to provide a place for mounting a NEMA meter enclosure, required for installation of a meter.

g. SERVICE RISER STANDPIPE
   i. Metallic conduit, PVC conduit elbow, and mounting assemblies extend from the bottom of the service trench to the meter mounting provisions and main disconnecting means. These must enclose the service conductors.

IV. CODES

a. Underground services shall be installed in accordance with applicable HCP requirements and local, state, and national codes and ordinances.
b. All equipment and conductors installed shall meet or exceed applicable HCP requirements and local, state, and national codes and ordinances.

V. INSTALLATION

a. TYPE
   i. All underground service conductors shall be Type USE (underground service.)

b. PROTECTION
   i. Underground service conductors shall be protected by installation in conduit (PVC Schedule 40).

c. BURIAL DEPTHS
   i. The minimum burial depth for conduit protected burial underground service conductors shall be 24 inches (24"). See diagram DR-18.

d. SPLICES
    i. Underground service conductors shall not be spliced.
e. INSTALLATION METHODS
    All underground service conductors pulled in conduit; care shall be taken to ensure that the conductors are not damaged during the pulling operation. Pulling tensions shall be monitored to ensure proper installation.
f. GROUNDING REQUIREMENTS
    i. A grounding electrode shall be connected via grounding electrode conductor to the underground service conductors (grounded conductors only) on the line side of and/or within the service disconnecting means.

VI. SERVICE EQUIPMENT
a. CONTINUOUS CURRENT RATING
    i. All service equipment shall have a minimum current rating of 100 amperes.
b. SHORT CIRCUIT CURRENT RATING
    i. Service equipment and its overcurrent protective devices shall have short circuit current ratings greater than or equal to the short circuit current available at their supply terminals.

VII. SERVICE DISCONNECT MEANS
a. All service disconnecting means shall have a current rating of not less than 100 amperes unless otherwise permitted by federal, state, or local authorities.
b. When multiple switches or circuit breakers are used as the disconnecting means, their combined current rating shall not be less than 100 amperes unless otherwise permitted by federal, state, or local authorities.

VIII. SERVICE CONDUIT
a. GENERAL
    i. Service conduit installations shall be carefully designed (length, number of bends, bend radii, etc.) to ensure that the underground service conductors can be pulled into and through the conduit without damage.
b. TRENCH REQUIREMENTS
    i. TRENCH BOTTOM
        1. When conduits are direct buried or concrete encased, the bottom of the trench into which the conduits are placed shall be free from rocks exceeding one inch (1”) in their largest

dimension. When the trench bottom contains rocks exceeding this size requirement, the trench shall be excavated six inches (6") deeper than the burial depth required for the conduits and then backfilled to the required burial depth with compacted sand or clean backfill.

ii. TRENCH BACKFILL

1. The JUT (Joint Utility Trench) trench shall be backfilled with (1") minus material from the bottom of the trench to the top. No spoil material shall be used, unless screened, (1") minus, and is machine compactable material.
2. At least twelve inches (12") of compacted sand or screened backfill shall be placed over the conduits.

IX. METERING PROVISIONS

a. GENERAL

i. Typical requirements for meter mounting provisions for all applications are shown on Drawings DR-23, DR-24, and DR-25 when meter mounting provisions different from those shown are required, HCP shall detail specific metering provision requirements.

ii. The meter mounting provisions must be installed in a true vertical plane.

iii. Meter mounting provisions with extruded or cast aluminum meter jaws shall not be used.

iv. Remote metering will not be allowed for new construction or rebuild/add on construction jobs.

v. The meter main will provide a disconnect. All three phase meters and single phase 400 amp meter sockets shall contain a lever bypass.

vi. All external exposed standoff conduit must be aluminum or rigid steel wrapped with anticorrosion tape where buried.

b. LOCATION

i. Meters shall not be located in carports, breezeways, covered or screened porches, or other areas that might be enclosed at some future date.

ii. The area on either side of a door or swinging window equal to the width of the door or swinging window is unacceptable as a meter location.

iii. A level standing and working surface of 48 inches x 48 inches (48" x 48") shall be provided in front of all meters. Meters shall not be located behind fenced areas.

iv. Meters shall be set at a height of five feet six inches to six feet six inches (5'6" to 6'6").
v. Meters shall be installed on the front of the structure (side of building facing the street) or within the first ten feet (10') of the front of the structure closest to the power source.
vi. Meters must be accessible to the City Meter Reader and shall not be hindered by animals, landscape, fences, etc.
vii. If existing meters are not to current standards, no upgrades will be allowed until meter is brought into accordance with current standards.

X. CONDUCTOR SIZE AND OWNERSHIP

a. Service conductors are owned and maintained by Customer.
b. The underground service conductors shall have adequate ampacity to supply the load requirements of the premises served by the conductors. See the table below for quantities and conductor sizes required.

Table 5

COMMERCIAL CONDUCTOR QUANTITY & SIZE

Service Size (A)	Quantity	Size
Residential		
200	1	4/0 AWG
400	1	350 kcmil
Commercial/Industrial		
200	1	350kcmil
400	2	350kcmil
600	2	500kcmil
800	3	500kcmil
1000	4	350kcmil
1200	4	500kcmil
1600	5	500kcmil
2000	6	500kcmil

Note: For residential service sizes larger than 400A and commercial/industrial service sizes larger 2000A coordinate with HCP to determine adequate secondary conductor quantities and size.

XI. SECONDARY DISTANCES

a. For residential installations the maximum allowable distance from the transformer or secondary box to the service equipment shall be 150'.
b. For commercial/industrial it is recommended that the distance from the transformer to the service equipment allow for no more than a 1% voltage

drop with the conductor size outlined in table 5. This is to maintain the maximum 5% voltage drop across the feeders and branch circuits specified in IECC C405.9.

SECONDARY LINE AND METER INSTALLATION FOR RESIDENTIAL SUBDIVISIONS

I. METERING PROVISIONS
   a. GENERAL
      i. Typical requirements for meter mounting provisions for residential subdivisions are shown on Drawings DR-24, when meter mounting provisions differ from those shown are required, HCP shall detail specific metering provision requirements.
      ii. Only one service meter shall be allowed per lot. Any additional ADU or shop shall not have an additional service meter installed.

SECONDARY LINE AND METER INSTALLATION FOR MOBILE HOME AND TRAILER PARKS

I. SERVICE EQUIPMENT
   a. Equipment containing the disconnecting means, overcurrent protective devices, and receptacle or other means for connection of a mobile home feeder assembly. This equipment shall be located adjacent to and not mounted in or on the mobile home.

II. FEEDER ASSEMBLY
   a. The underground feeder conductors, including the grounding conductor, together with the necessary fittings and equipment or a power supply cord designed to connect a mobile home to its metering provisions.
   b. Conductors connect the service equipment to the distribution panel inside the mobile home.
   c. As a minimum, a 5/8-inch x 8foot (5/8” X 8’) ground rod shall be used as the grounding electrode. When a metal underground water pipe system is available the water pipes and the ground rod shall be used as the grounding electrode.

III. INSTALLATION
   a. FEEDER ASSEMBLY
      i. All conductors in the feeder assembly shall be insulated, color-coded, and installed without splices.

b. GROUNDING
    i. The neutral conductor and the grounding conductor shall be bonded together only at the service equipment, not on or within the mobile home.
c. PROTECTIVE EQUIPMENT SIZING
    i. The service equipment shall contain a properly rated fused disconnect switch or a circuit breaker corresponding to the load requirements of the mobile home.

IV. METERING PROVISIONS
a. INDIVIDUAL METERS
    i. Typical requirements for meter mounting provisions for mobile homes and trailers with individual meters are shown on Drawing DR-25. When meter mounting provisions differ from those shown are required, specific meter mounting provision requirements shall be detailed by HCP.
b. SINGLE METER
    i. When mobile home parks or trailer courts are metered at a single point, the metering provisions at that point shall be detailed by HCP.
c. GENERAL REQUIREMENTS
    i. Mobile home meter pedestals shall be constructed and installed so that the vertical distance from the ground level to the centerline of the meter is 30 Inches (30”) minimum to 42 inches (42”) maximum.
    ii. Hurricane Power no longer allows meters to be installed on power poles.
    iii. New mobile home meter pedestals will be underground type.
    iv. The meter shall have a working clearance of 3 feet (3’) around the entire meter.

SECONDARY LINE AND METER INSTALLATION FOR APARTMENTS AND CONDOMINIUMS

I. METERING PROVISIONS
a. GENERAL
    i. Typical requirements for meter mounting provisions for apartments and condominiums subdivisions are shown on Drawings DR-27, when meter mounting provisions differ from those shown are required, HCP shall detail specific meter mounting provision requirements.

ii. The meter main will provide a disconnect. All 3 phase meter sockets shall contain a bypass lever. All 400-amp meter sockets shall contain a lever bypass
iii. All meter sockets shall be clearly labeled with permanent placards or permanent metallic stickers. See DR-27

b. MOUNTING HEIGHTS
   i. SINGLE HORIZONTAL ROW OF METERS
      1. When meters for an apartment or condominium can be mounted in a single horizontal row, the vertical distance from the ground level to the center line of meters shall be five feet six inches (5'6") minimum to six feet six inches (6'6") maximum.
   ii. MULTIPLE ROWS OF METERS
      1. When meters for an apartment or condominium can be mounted in two (2) or more horizontal rows, the vertical distance from the ground level to the center line of the top row of meters shall be six feet six inches (6'6") maximum and the distance from the ground level to the center line of the bottom row of meters shall be four feet zero inches (4'0" minimum).

c. LABELING METER BASES
   i. Meter bases shall be numbered according to the apartment/condominium numbers as recorded on the official plat.
   ii. One inch (1") wide placards or metallic sticker shall be used to identify the meter/unit disconnect breaker is feeding.
   iii. Labels shall contain the unit number and/or address to correlate what each meter/unit disconnect breaker is feeding. For example: Unit 1, Unit 2, or 299 n 2600 W, 287 N 2600 W.
   iv. Labels shall be installed to the right or directly beneath the unit disconnect breaker to which the correlating meter is feeding.
   v. Placards shall be installed using self-tapping screws and shall be lubricated using a rust resistive compound.
   vi. No letters shall be used to identify meters/unit disconnect breaker. For example: Unit A, Unit B, Unit C are not permitted.

SECONDARY LINE AND METER INSTALLATION FOR COMMERCIAL FACILITIES

I. SERVICE DISCONNECTING MEANS
   a. Single phase or three phase commercial services will be required to have a lockable fuse or knife disconnect located on the building to disconnect

power from the building. Disconnect must be situated in a manner as to leave the meter energized when disconnect is turned off.

II. METERING PROVISIONS

a. GENERAL

i. Typical requirements for meter mounting provisions for commercial subdivisions are shown on Drawings DR-23, when meter mounting provisions differ from those shown are required, HCP shall detail specific metering provision requirements.

1. All services over 400 amps will be CT metered. Hurricane Power will provide and install the metering equipment and will charge the development cost of the materials.
2. Building layout, square footage, panel size in amps, number of meters/breaker sizes, voltage needed, and load calculations will be required before HCP can determine the sizing of all metering provisions.

ii. MOUNTING HEIGHTS

1. SINGLE HORIZONTAL ROW OF METERS
    a. When meter for a commercial facility can be mounted in a single horizontal row, the vertical distance from the ground level to the center line of the meters shall be five feet six inches (5’6”) minimum to six feet six inches (6’6”) maximum.
2. MULTIPLE ROWS OF METERS
    a. When meters for a commercial facility can be mounted in two (2) or more horizontal rows, the vertical distance from the ground level to the center line of the top row of meters shall be six feet six inches (6’6”) maximum and the distance from the ground level to the center line of the bottom row of meters shall be four feet zero inches (4’0”) minimum.

iii. LABELING METER BASES

1. Meter bases shall be numbered according to the commercial building numbers as recorded on the official plat.
2. One inch (1”) wide placards or metallic stickers shall be used to identify the meter/unit disconnect breaker is feeding.
3. Labels shall contain the unit number and/or address to correlate what each meter/unit disconnect breaker is feeding. For example: Unit 1, Unit 2, or 299 N 2600 W, 287 N 2600 W.

4. Labels shall be installed to the right or directly beneath the unit disconnect breaker to which the correlating meter is feeding.
5. Placards shall be installed using self-tapping screws and shall be lubricated using a rust resistive compound.
6. No letters shall be used to identify meters/unit disconnect breaker. For example: Unit A, Unit B, Unit C are not permitted.

SECTION 7 – STREET LIGHT INSTALLATION

I. SCOPE

This standard outlines the requirements for installing streetlights erected in any subdivision within Hurricane City Limits.

II. EQUIPMENT SPECIFICATIONS/INSTALLATION

a. POLICY: It is the policy of the City of Hurricane that all streetlights erected in the City shall adhere to the following standard.
b. PURPOSE AND OBJECTIVE: To ensure streetlights are installed according to uniform construction guidelines and equipment specifications.
c. STREET LIGHT POLE SPACING AND HEIGHT:
    i. Pole Height 15’ 200’ – 250’
    ii. Pole Height 25’ 225’ – 300’
    iii. A streetlight shall be placed at each intersection.
    iv. All poles shall be anchor base poles and the foundation design shall be adequate for the height of pole, the arm that is being installed, the soil conditions and 80-mile per hour winds.
    v. Luminaries shall be 120 volts.
    vi. All streetlight bases must be precast and supplied by a preapproved vendor.
    vii. For current acceptable streetlight make and models, see HCP personnel.

Note: All poles are black, all post top and cobra style heads are black

III. INSTALLATION OF STREET LIGHT

a. INSTALLATION
    i. Customers requesting to add or delete streetlights will be required to meet with the HCP staff during a regularly scheduled planning meeting to discuss details and procedures.
    ii. If the City Council or Hurricane City Power Board determines a streetlight should be installed at City expense for safety or other

reasonable public consideration, HCP will install the streetlight(s) as directed and according to this policy.

IV. OWNERSHIP
   a. Streetlights shall be installed at Owner/Developer expense in new/proposed subdivisions and projects. The owner will warrant lights for one year, then Hurricane City accepts ownership.

V. FOOTING SPECIFICATION
   a. Per manufacturer, See Drawing DR-4,5. These drawings are for 15' decorative and 25' mongoose light only.

SECTION 8 – SPECIFICATIONS

CONCENTRIC NEUTRAL URD PRIMARY CABLE

I. SCOPE

All primary cables used on the Hurricane City electrical system shall comply with the following:

II. SPECIFICATIONS
   a. Insulation Type – EPR
   b. Insulation Thickness:
      i. Minimum average thickness -220 mils minimum.
      ii. Minimum thickness at any point – 209 mils
   c. Voltage Class – 15 kVA
   d. All cable produced under this specification shall comply with the latest editions of AEIC C56 and ICEA S-68-516
   e. All cable installed shall be new (not used) and within 2 years of manufacture date.
   f. All cables installed in the same conduit must be of the same manufacturer and type.
   g. Conductor sizes are:
      i. 1/0 AWG aluminum compressed stranded with 16-#14 AWG bare copper concentric neutral wires (full neutral) with an encapsulating jacket whose thickness is not less than 0.05 inches (0.05").
         1. Jacket material shall be LLDPE or approved equal and shall be insulating.
         2. Single-phase 1/0 AWG underground cable shall be installed in two and one-half inch (2 ½") conduit and three-phase 1/0 AWG

underground cable shall be installed in four-inch (4") conduit, unless otherwise approved by HCP.

ii. 4/0 AWG aluminum compressed stranding with 18-#14 AWG bare copper concentric neutral wires (1/3 neutral) with an encapsulating jacket whose thickness is not less than 0.05 inches (0.05").
    1. Jacket material shall be LLDPE or approved equal and shall be insulating.
    2. 4/0 AWG underground cable shall be installed in four-inch (4") conduit, unless otherwise approved by HCP.

iii. 750kcmil aluminum compressed stranded with 24-#12 AWG bare copper concentric neutral wires (1/3 neutral) with an encapsulating jacket whose thickness is not less than 0.08 inches (0.08").
    1. Jacket material shall be LLDPE or approved equal and shall be insulating.
    2. 750kcmil underground cable shall be installed in six-inch (6") conduit, unless otherwise approved by HCP.

iv. Approved cable manufactures are:
    1. Okonite
    2. Kerite

v. Initialisms
    1. AEIC is Association of Edison Illuminating Companies
    2. AWG is American Wire Gage
    3. ICEA is Insulated Cable Engineers Association (formerly ICPEA)
    4. EPR is Ethylene Propylene Rubber
    5. LLDPE is Liner Low-Density Polyethylene

THREE-PHASE AND SINGLE-PHASE ABOVE GROUND PRIMARY VAULT

I. SPECIFICATIONS

a. Units must meet the following specification: See Drawings DR-15, DR-17.
    i. HCP approved
    ii. Penta Head bolts on lid with locking capabilities
    iii. Fiberglass
    iv. All hardware including hinges to be stainless steel
    v. Color – Munsell Green, Willow Green, or Desert Tan
    vi. Four-Way Junctions required

b. Approved vendors
    i. Nordic

ii. Other vendors of equivalent equipment are acceptable if approved by HCP.

c. Vaults will include:
   i. Three-phase
      1. Three (3) four-way junctions, standoff brackets, and necessary receptacles, etc.
   ii. Single-phase
      1. One (1) four-way junction, standoff bracket, and necessary receptacles, etc.

METAL ENCLOSED SWITCH GEAR

I. SPECIFICATION

a. HCP shall determine the switchgear class needed for each job. The switch gear specifications being a model P.M.H. 600 Amp Main Buss capacity. These will be designed per individual needs.

b. Approved Manufacturers
   i. A.B. Chance
   ii. S&C
   iii. Federal Pacific.

Outdoor-Style, Manual Operation is as follows:

kV, Normal 14.4
kV, Maximum 17.0
kV, BIL 95
Main Buss Continuous, Amperes 600/200

Three-Pole Interrupter Switches

Continuous, Amperes (Source/Feeder) 600/200
Live Switching, Amperes (Source/Feeder) 600/200

Two-Time Duty-Cycle Fault-Closing

Amperes RMS Asymmetrical 23,400

Fuses with Integral Load Interrupter

Maximum, Amperes 200E
Live Switching, Amperes 200

Two-Time Duty-Cycle Fault-Closing

Capacity, Amperes RMS Symmetrical 12,500

Short-Circuit Ratings

Amperes, RMS Symmetrical 12,500
MVA Three-Phase Symmetrical at Rated Nominal Voltage ... 310

c. The momentary and two-time duty-cycle fault-closing ratings of switches, momentary rating of bus, interrupting ratings of fuses, and on time duty-cycle fault-closing capabilities of the fuses with integral load interrupters shall equal or exceed the short circuit ratings of the pad-mounted gear.
d. The pad-mounted gear shall consist of a single self-supporting enclosure, containing single blade interrupter switches, non-key interlock, dual purpose barriers for the switches and fuses (G1 & G2), component grounding studs for switches and fuses (H & J).
e. The switches and fuse components shall be arranged for full visibility when the enclosure doors are open. Open switch gaps and blown-fuse indicators shall be readily visible to provide for ease of operation.
f. Interrupter switches shall have a two-time duty-cycle fault-closing rating equal to or exceeding the short-circuit rating of the integrated pad-mounted gear assembly. This rating defines the ability to close the interrupter switch twice against a three-phase fault with asymmetrical current in at least one phase equal to the rated value, with the switch remaining operable and able to carry and interrupt rated current. Tests substantiating this rating shall be performed at maximum design voltage with current applied for at least ten (10) cycles. Certified test abstracts establishing this rating shall be furnished upon request.
g. Interrupter switches shall have the capability established by test to perform switching duties which include interrupting load current up through the assigned live-switching rating, as well as transformer magnetizing currents associated with the applicable loads, cable-charging current, and line-charging current typical for distribution systems of the applicable voltage ratings. All arcs accompanying the interruption shall be contained within the interrupters and products/gases evolved during interruption shall be vented through exhaust-control chambers to eliminate discharge of ionized gases. Switches shall have a single blade per phase and shall be externally operable. A quick-make/quick-brake mechanism, non-defeatable under normal operation and shall make operation of the switchblades independent of the speed of the manual operating handle.
h. Solid-material power fuses shall be capable of detecting and interrupting all faults up to the short-circuit interrupting rating of the integrated pad-mounted gear assembly. Fusible elements shall be non-aging and non-damageable. All arching accompanying power fuse operation shall be contained within the fuse and all arc products and gases evolved shall be effectively contained within exhaust control devices during fuse operation.

Power fuses shall have a blown-fuse indicator that shall be readily visible without removing the fuse from the mounting location. Fuse type shall be S & C Type SMU-20 for system compatibility.

i. Fuse mounting jaw contacts shall be equipped with integral load interrupters to permit live switching of fuses with a rated hot stick. Integral load interrupters shall have an on-time duty-cycle fault-closing capability equal to the short-circuit rating of the pad-mounted gear. The duty-cycle capability defines the level of available fault current into which the fuse can be closed without a quick-make mechanism and when operated vigorously through its full travel without hesitation at any point, with the integral load interrupter remaining operable and able to carry and interrupt currents up to the emergency peak-load capabilities of the fuse.

j. All terminations will be done with approved termination kits and two (2) hole termination lugs. The contractor will supply the above-mentioned.

UTAH ASSOCIATED MUNICIPAL POWER SYSTEMS

April 2026

Project Meeting Overview Report

CARBON FREE POWER PROJECT (CFPP)

1. Discussed in Executive Session:
    a. Project status update, timeline and DOE engagement.

CENTRAL-ST. GEORGE PROJECT

1. Discussed the FY27 System Usage Analysis including monthly energy projections, energy projection comparisons and analysis results.
2. **Approved the FY27 System Usage Analysis, as presented.**
3. Discussed ROW updates including pole procurement and bid results.
4. Discussed the Operations Report including substation reports for the month of March.

COLORADO RIVER STORAGE PROJECT (CRSP)

1. Discussed CRSP/CREDA report including hydrology, Drought Response Operations Agreement (DROA) & 6(E) trying to avoid Glen Canyon Dam going below minimum power pool, Smallmouth Bass bypass flows with an emphasis on avoiding it, and WAPA starting SPP Markets+.
2. Discussed the Operations Report including output for each resource for the month of March.

FIRM POWER SUPPLY PROJECT

1. Discussed in Executive Session:

a. Steel Project Batteries including the landscape of battery storage, options for members, cost options and next steps.

b. Red Mesa including PPA Amendment details and changes.

2. **Approved the first amendment to the second amendment and restated solar power purchase agreement between UAMPS and NTUA Generation- Utah, LLC, as recommended.**
3. Discussed Steel Solar Scholarship including overview of the scholarship, highlights, and about the awardees.
4. Discussed the Operations Report including output and scheduling from each resource for the month of March.

GOVERNMENT AND PUBLIC AFFAIRS PROJECT (GPA)

1. Discussed Federal & State Legislation including Executive Branch and Congressional Updates:

a. Executive update including permitting reform, impacts due to the War in Iran, AG Bondi fired and Sec. De Remer's resignation.

b. Congressional update including potential Reconciliation 2.0, Senator Curtis Fiscal Commission Act, permitting reform, TAPS updates and the appropriation process.

c. 119th Congress including appropriations timeline and legislation timeline.

d. Democrat transmission Proposal including broad FERC backstop authority, unrealistic timelines, inconsistent application of FPA terms and TAPS advocating joint ownership.

e. AMWG Learning Group Workshop including learning the history of native & nonnative species in the Colorado River, methods of collecting data, evaluating impact on long-term management of GCD and the goal to ensure that UAMPS preference customers are well represented.

f. Utah Congressional Race including both Republican and Democratic polls and updates.

g. State update including primary season, Public Power PAC and preparation for the 2027 Session.

HUNTER PROJECT

1. **Approved resolution to authorize Omnibus Amendment to Hunter II Agreement; and related matters, as presented.**
2. Discussed the Operations Report including plant scheduled output for the month of March.

MEMBER SERVICES PROJECT

1. Discussed Pole Tester Service including pricing per Pole Tester, options for purchasing, potential scheduling per geographical location and staff recommendation.
2. **Approved the purchasing of 3 Pole Testers, located in a home base municipality, scheduled on a first-come, first-served basis, and approved retiring and surplusing the aging pole testers, as recommended.**

MILLARD COUNTY PROJECT

1. Guest Speaker:
    a. Brian Baker, with Zions Public Finance, discussed Shadow Ratings including model requirements, a walk through of the Bonding Rating Indicator Information Input Form and member credit & steps that member can take now.
    b. **Request to return the completed forms that were discussed by Friday, May 15th.**
2. **Approved resolution authorizing and approving a Millard County Power Project Power Sales Contract with Weber Basin Water Conservancy District, and related matters.**
3. Discussed in Executive Session:
    a. Recap of the Holden Town Hall meeting.
    b. Project update and details.
    c. LCOE update including results review and other details.
    d. Long lead materials including milestone payments, specific equipment and other details.

e. Revised budget & plan of finance including Development & Construction Budget, schedule & milestones, short-term & long-term financing and next steps.

4. **Approved resolution relating to the Millard County Project; (A) Authorizing and approving an update to the Budget and Plan of Finance for the Project and (B) Accepting the revised Projected Cost of Energy Prior to the Issuance of Purchase Orders for Long Lead Materials; (C) Authorizing and approving the Issuance of Purchase Orders for Long Lead Materials and delegating Authority with Respect Thereto; and related matters.**

NEBO PROJECT

1. Discussed Business Interruption (BI) Insurance Coverage including executive summary, how BI Insurance works, claim timing scenarios and staff recommendation to obtain this insurance coverage and amend the budget for the BI insurance premium.
2. **Approved proceeded with Business Interruption Insurance for FY27, as recommended.**
3. Discussed Principles for Operating and Scheduling Procedures Amendment including purpose & context, market participation model, operating strategy & decision framework, fuel & scheduling and implications.
4. **Approved the principles for Operating and Scheduling Procedures Amendment, as presented.**
5. Discussed Major Overhaul Reserve Account Analysis including major maintenance schedule and projected cash flow.
6. Discussed plant operations including March statistics, regulatory actions, trainings, other maintenance items and turbine repair update.
7. **Approved resolution approving the procurement of a Steam Turbine Rotor for the Nebo Power Station; authorizing the incurrence of project costs; delegating authority to negotiate and execute related agreements; and related matters, as presented.**
8. Discussed the Operations Report for the month of March including Nebo energy breakdown and Nebo sales margins.

POOL PROJECT

1. **Approved resolution to execute the Amended and Restated Pooling Agreement, as discussed.**
2. Discussed the PX & Scheduling Report including PacifiCorp & UAMPS peaking times, system peaking time comparisons by day of the month & hour of day.
3. Discussed updated forecasts that include the latest purchases included with resources compared to load. Also a forecast comparison before & after the latest purchases.
4. Discussed upcoming changes to the UAMPS Power Bill due to EDAM including differences in transmission, reserves, scheduling and line items.
5. Discussed Advisory Committee including meeting update.
6. Discussed the Operations Report for the month of March including load peak and energy.

POWER COUNTY PROJECT

1. Discussed in Executive Session:
    a. Project update including status on siting, partners, initial design and next steps.

RESOURCE PROJECT

1. Discussed in Executive Session:
    a. Geothermal generation including Rodatherm Project development, the technology, other developers and next steps.
2. Discussed transmission line including partnerships, transmission line route, overview, public outreach & talking points, timeline, Member Benefits Study and project participation options.

VEYO HEAT RECOVERY PROJECT

1. Discussed Business Interruption (BI) Insurance Coverage including executive summary, how BI Insurance works, claim timing scenarios and staff recommendation.
2. **Approved proceeding with Business Interruption Insurance for FY27, as recommended.**

3. Discussed project update including maintenance summary and the new transformer.
4. Discussed the Operations Report including scheduling Veyo for the month of March with peak output and tripped/restricted hours.

SPECIAL MEMBER MEETING

1. **Elected Project Directors.**

BOARD OF DIRECTORS MEETING

1. Discussed Rate Stabilization Fund (RSF) including overview, purpose of RSF, program structure and next steps.
2. **Approved resolution authorizing the creation and implementation of a Rate Stabilization Fund and related actions.**
3. Discussed FY27 Strategic Initiatives including comment & feedback period, implementation of Mission, Vision & Values statements, use for evaluations and formal approval will be in June.
4. Approved all action items for the Project Meetings.

INVENERGY WIND STUDY PROJECT AGREEMENT BETWEEN HURRICANE CITY AND UAMPS

This Invenergy Wind Study Project Agreement is made and entered into as of May 20, 2026, between Utah Associated Municipal Power Systems, a political subdivision of the State of Utah ("*UAMPS*"), and Hurricane City, a member of UAMPS (the "Participant").

As a Participant in the Invenergy Wind Study Project under the Resource Project, UAMPS and Participant hereby agree to the following terms.

1. The Entitlement Shares for the Participants in the Invenergy Wind Study Project are attached hereto as Exhibit A. *"Entitlement Share"* means, with respect to each Participant, that percentage of desired capacity shown opposite the name of such Participant in Exhibit A attached hereto.

2. Participant agrees to pay for all costs associated with its pro rata share of the Study Costs (defined below) based on its Entitlement Share and as approved by the Invenergy Wind Study Project Participants (the "Study Committee"). Each Participant shall have voting rights in proportion to the respective Participant's Entitlement Share as contained in Exhibit A. For voting purposes on adopting a decision by the Study Committee, the Resource Project Management Committee shall take action only upon the specific recommendation of the Study Committee and shall not have the power to change, modify, or substitute any such recommendation.

3. Study Costs shall consist of those costs that the Study Committee has budgeted to determine the feasibility of a 64.5 MW wind project as recommended by the Invenergy Wind Study Participants and approved by the Study Committee and the Resource Project Management Committee.

4. Participant may terminate its participation in the Invenergy Wind Study Project at any time; *provided however*, such termination shall not alleviate Participant from previously committed Study Costs.

HURRICANE CITY	UTAH ASSOCIATED MUNICIPAL POWER SYSTMS
By:_____	By:_____
Its:_____	Its:_____

EXHIBIT A

Member	Allocation 64,500 kW	New Resource Entitlement Share
Beaver	1,000	1.5504%
Blanding	500	0.7752%
Bountiful	5,000	7.7519%
Fallon	1,500	2.3256%
Heber	2,000	3.1008%
Hurricane	5,000	7.7519%
Hyrum	800	1.2403%
Kanosh	85	0.1318%
Lassen	3,002	4.6543%
Logan	10,000	15.5039%
Monroe	100	0.1550%
Morgan	800	1.2403%
Murray	5,000	7.7519%
Oak City	150	0.2326%
Paragonah	100	0.1550%
Parowan	250	0.3876%
Payson	4,500	6.9767%
Plumas	2,813	4.3612%
Price	2,000	3.1008%
Santa Clara	1,000	1.5504%
St. George	10,000	15.5039%
Truckee	7,400	11.4729%
Weber Basin	1,500	2.3256%
TOTAL	**64,500**	**100.0000%**