Grant County
PUBLIC UTILITY
DISTRICT

Electric System and Fiber Optic Design and Construction Procedures

for

Subdivisions and Mobile Home Park Developments

REVISED: August, 2010
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Underground Design and Construction Procedures

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SERVICE CONNECTION AGREEMENT

PUBLIC UTILITY DISTRICT OF GRANT COUNTY
PO Box 878 Ephrata WA 98823

SERVICE CONNECTION AGREEMENT

(All conditions of service are subject to the District Customer Service Policies)
SERVICE EXPEDITER: Telephone 509-766-2501 Fax 509-754-6658 email serviceexpediter@gcpud.org

1) CUSTOMER INFORMATION:

NAME			DATE
MAILING ADDRESS (for Billing Purposes)			
PHONE	Home:	Work:	Cell:
EMPLOYER			
SPOUSE			
SPOUSE EMPLOYER			
NEED LIFE SUPPORT?	□ YES □ NO If yes, what type?		
PRIOR GRANT PUD SERVICE	□ YES □ NO List name(s) service was listed under:		
Description of animals that would interfere with meter reading			
Contact Person if other than owner	Name:	Phone:	

2) SERVICE LOCATION:

Residential or Commercial

SERVICE ADDRESS & CITY			
PLAT ADDITION		Lot:	Block:
LEGAL OWNER			
MAILING ADDRESS			

Irrigation

Farm Unit		Block	Twp	Rng	Sec
LEGAL OWNER					
MAILING ADDRESS					

3) LOAD INFORMATION:

□ Single Phase 120/240 (recommended residential)		
□ Three Phase 120/240 (OH only)	□ Three Phase 120/208	□ Three Phase 277/480

Construction Temporary

□ Non Metered	□ Metered

Residential:

House size (Sq Ft)		Anticipated KW Usage (including HVAC)	
Shop size (Sq Ft)		Anticipated KW Usage (including HVAC)	
Meter Base Size in Amps	□ 200	□ 400 (320 continuous)	□ Over 400 (CT Meter)
Building Type	□ Stick Built	□ Manufactured Home	

Irrigation:

Service Size	
Individual Pump(s) - HP	
Number of Drive motors	
Other Pumps or Motors	
End Gun Pump	
TOTAL LOAD	

Commercial/Non-Residential :

Type of Business or Facility	
Service Size in Amps	
General Load in HP/KW	
Motors in HP	
Other	

***Please be sure to sign the application on the back**

RIGHTS AND OBLIGATIONS

Public Utility District No. 2 of Grant County (Grant County PUD) will construct electrical facilities on customer's property, if necessary. In exchange for part of this value received, Customer grants Grant County PUD the right to construct, operate, patrol, maintain and remove overhead and/or underground electrical distribution lines and associated appurtenances. Customer grants Grant County PUD the right to clear the area where the distribution equipment and facilities are located on the customer's property and keep the same clear of brush, trees, timber, structures, improvements and all fire hazards. Customer also grants to Grant County PUD the right of ingress and egress to and from Grant County PUD distribution electrical facilities. Customer agrees no to place, construct or maintain any building, structures or other improvements within a 10 foot area of Grant County PUD electrical facilities. Customer agrees not to reduce or enlarge the clearances between the ground and any distribution lines within a 10 foot area of Grant County PUD electrical facilities. Grant County PUD may seek and enforce specific performance of any activities required of the customer by this section.

SITE SKETCH

Draw a plan of your site including building, septic, drain field, sewer, cable TV, telephone, gas, driveway, other future structures, property lines, proposed power line route and nearest transformer number if available. Also, identify at least two bordering roads and any other foreign easements areas (i.e., irrigation district, public lands, properties belonging to other individuals, etc.)

Please note the date you will have your proposed transformer/service/meter locations staked. Date:

Site Sketch

North

Be sure to include location of customer's meter socket

FIELD NOTES:

Legal Land Owner of Record Signature

Your signature indicates you have read and agree to Conditions stated in the "Rights and Obligations" section. Customer understands the work requested & authorizes PUD to begin work as listed on the Service Connection Agreement form. Customer agrees to pay all charges associated with Construction.

_____

_____

Official Use:

_____

_____

_____

_____

_____

Chapter One – General Information

Introduction:

This packet provides information for Owner/Developer's to install overhead and underground facilities within their platted subdivision, master planned resort, planned unit development, binding site plan or any other development and/or segregation of land as approved by the county and/or city planning department. This includes the District's requirements for electrical design, fiber optic design, quality assurance, and construction standards. In addition this packet covers right-of-way requirements, vault and conduit locations and placement, and street light design. It is intended to guide the Owner/Developer and his Design Engineer through the design process. Deviation from these guidelines must be pre-approved in writing by the District's Engineering Technician. As always, the District's Customer Service Policies as written or amended, and all applicable national, state and local codes take precedent over these guidelines.

Owner/Developer Responsibility:

The Owner/Developer is responsible for the entire design, right-of-way and/or right-of-way acquisition, staking, construction, and project management. This includes compliance with all land use requirements within the city and/or county and all code, permit, and right-of-way requirements required by the jurisdictional agencies.

An overlay of all utilities is mandatory to assure proper clearances. All utilities that are installed within the boundaries of the development need to be designed so that adequate clearances as required by the district and all other agencies are maintained. The owner/developer shall coordinate the design and installation with all utilities so that conflicts are minimal or non-existing.

District Design Acceptance:

The District will not accept any design unless it meets the following guidelines & design criteria. If there are deficiencies, the District will give the Owner/Developer a list of deficient items. Construction will not be approved until all deficiencies have been rectified to the satisfaction of the District and approved by the District's Engineering Technician.
The Owner/Developer shall also ascertain that all conflicts with the installation of other utilities (phone, TV, water, sewer, gas, Etc..) have been rectified. The District **WILL NOT** continue installation of their facilities or provide service to future customers until all deficiencies are corrected to the districts satisfaction.

Section Two – Right-of-Way

General Information
This chapter covers the District's requirements and the Customer's responsibilities for land use requirements, rights-of-way and permits. An Engineering Technician will be assigned to any "complex project" that requires additional rights-of way and/or permits.

Land Use Requirements
The customer shall comply with the following land use requirements for both the electric system and the fiber optic system.

Compliance with other Agencies
The Customer will be required to comply with all applicable jurisdictional agencies, state, county, and local statutes. These shall include, but not necessarily be limited to, the County Unified Development Code, Uniform Building Code, Urban Growth Management Area development standards, and regulations requiring certain minimum improvements.

Provide Copies to District
The customer shall provide the District with executed copies of any and all required agency developmental approvals, i.e. approved building site plan.

Property Corners
Property corners that are disturbed shall be replaced by the owner. Property corners shall not be driven deeper than 18 inches below final grade in order to protect buried facilities.

Easements for Rights-of-Way
The customer shall complete the "Service Connection Agreement" with the names of legal land owners, property description(s), and sketch showing all property boundaries that the service connection will affect. The customer is required to obtain the property owner's signature on the "Service Connection Agreement" in order for the District to install facilities on the property. The District will determine if additional easements for rights-of-way are required. The District will prepare all easement documents on District easement templates and the Customer shall obtain all property owners' signatures. The District's cost for preparing the easement(s) for rights-of- way will be a flat "fee" per easement. The assigned Engineering Technician will advise the customer of the required fees. Once the easement(s) for rights-of-way are signed by the property owner(s) and notarized in the presence of a Notary Public, return them to the District: Attention; Lands Department – Distribution Right-of-Way. The District will record the easement(s) at the respective Auditor's Office of the appropriate county, i.e. Grant, Lincoln, Adams, Douglas, etc.

Public Agency Permits/Licenses for Rights-of-Way
The District will obtain the required permits/licenses from public agencies or entities (DOT, USBR, BLM, DNR, Railroads, Cities, etc.) and coordinate any professional land survey(s), if required, for these permits. The customer shall pay for any or all permits/licenses, including but not limited to, Washington State Department of Transportation, United States Bureau of Reclamation, Bureau of Land Management, Department of Natural Resources, Railroad, and other permits/licenses as may be required along with any required professional surveys.

Columbia Basin Irrigation District Permits
Are required if the District's electrical wires, fiber optic cables or conduits cross over or under an irrigation district waterway. These permits will be obtained by the District from the appropriate irrigation district (i.e. South Columbia Basin Irrigation District, Quincy Columbia Basin Irrigation District, or East Columbia Basin Irrigation District.) A minimum of three weeks is required to obtain permit(s).

Grant County Road Permits
Are required if the District's electrical wires, fiber optic cables or conduits cross over or under a county road. A minimum of two weeks is required to obtain permit(s).

Lincoln County Road Permits
Are required if the District's electrical wires, fiber optic cables or conduits cross a county road. The cost varies from $75 to $150, and is subject to change. A minimum of three weeks is required to obtain the permit(s).

Washington State Department of Transportation (WSDOT) Permits
Are required if the District's electrical wires, fiber optic cables or conduits cross over or under a state highway or parallel a state highway within their right-of-way and easement. There is a fee for this permit, usually ranging in cost from $150 to $500. A minimum of four to six months is required to obtain the permit(s).

City Permits
May be required if the District's electrical wires, fiber optic cables or conduits are constructed within city limits. A minimum of two weeks is required to obtain permit(s).

Bonneville Power Administration (BPA) Permits
Are required if the District's electrical wires, fiber optic cables or conduits cross under a BPA power line or are located in the BPA easement area. A minimum of three months is required to obtain permit(s).

United States Bureau of Reclamation (USBR) Licenses
Are required if the District's electrical wires, fiber optic cables or conduits cross over or under USBR property. The USBR charges $200 (subject to change) and a percentage of Fair Market Value for this license. A minimum of six months is required to obtain license(s).

Department of Natural Resources (DNR) Easements
Are required if the District's electrical wires, fiber optic cables or conduits cross over or under DNR property. To obtain this permit a professional survey is required at the customers expense. The District will obtain the survey and the permit. The DNR charges $2,500 (subject to change) for the costs of the permit. Upon completion of the survey, the survey and application fee will be submitted to DNR for processing and approval. A minimum of three to four months is required to obtain permit(s). DNR tenants will not be required to obtain a permit; however, DNR must approve and sign the tenant's Service Connection Agreement.

Bureau of Land Management (BLM) Easements
Are required if the District's electrical wires, fiber optic cables or conduits cross over or under BLM property. To obtain this permit, an application and permit fee must be submitted to BLM. The permit fee ranges from $175 to $1,125. A minimum of three months is required to obtain easement(s).

Railroad Permits
Are required if the District's electrical wires, fiber optic cables or conduits cross over or under a railroad track. The cost for a permit from Burlington Northern Santa Fe Railroad is $3,000 and the cost for a permit from Washington Central Railroad is $3,000 (either fee is subject to change). A minimum of six weeks is required to obtain permit(s).

Professional Survey's
Are provided by a licensed land surveyor and are obtained by the District. All survey fees and costs are the customer's responsibility. The customer has the option to provide the District with a "Record of Survey" that will be acceptable to the permitting agencies. The customer shall be familiar with the permitting agencies requirements if supplying the "Record of Survey".

District Responsibility
Prepare the easement documents for rights-of-way. Determine what easement for rights-of- way are required and prepare legal documents for signatures. Receive the signed and notarized easement(s) for rights-of-way from the Customer. Record the signed and notarized easement for rights-of-way at the designated County Courthouse. Obtain all required permits for rights-of-way to facilitate construction of the Districts electrical and fiber optic equipment including coordinating the required professional surveys. The Customer may choose to provide a professional survey to save cost and/or time. The District will acquire the permit for right of way from other agencies and pass on the fees associated with the permits.

Customer Responsibility
Obtain appropriate signatures on District prepared easement forms for rights-of-way. All easements and permits for right of way must be, notarized, and received by the District prior to any construction. Obtain any permits or easements for rights-of way that may be required for the Customers own equipment, construction, access, etc. Pay for State Highway Permits, United States Bureau of Reclamation Permits, Bureau of Land Management, Department of Natural Resources Permits, and Railroad Permits and their required professional surveys. Pay a legal documentation preparation fee to the district for easements and rights-of-way.

Section Three – Electrical and Fiber Optic System Process:

Owner/Developer Requirements:

From an approved preliminary plat or other development plan, the Owner/Developer shall be responsible for the design and installation of the underground electrical & fiber optic system. The Owner/Developer shall be responsible for all coordination from beginning to end of the project including but not limited to: utility staking, road crossing placement, material and construction inspection. The following steps will assist the Owner/Developer during the planning, design, and construction stages of the project.

Step 1: Owner/Developer shall secure the services of a Design Engineer or Engineering firm licensed in the State of Washington in accordance to WAC and RCW requirements.

Step 2: Owner(s) / Underlying fee owner shall be required to execute a District Service Connection Agreement and return said document to the District's Service Expediter.

Step 3: The Owner/Developer shall schedule a preliminary plan review with the District's Engineering Technician to obtain the required information necessary to design the electric and fiber optic system.

Step 4: The Owner/Developers Design Engineer shall design and layout the complete electrical and fiber optic distribution systems to the District's design specifications. The design shall be shown in relation to all other utilities and be free from conflicts. A professional Engineer shall stamp all drawings per WAC and RCW requirements upon approved design by the PUD.

Step 5: Submit preliminary design drawings to the District's Engineering Technician for review and approval.

Step 6: Work with the District's right-of-way staff to complete and submit all needed easements and permits as outlined in section two of this document. All easements shall be to the GCPUD only.

Step 7: The Owner/Developer shall obtain from the appropriate city/county agency, directives for street lighting installations. Per the GCPUD customer Service Policy and per IEEE standard street lighting design criteria, if so required.

Step 8: After the district approves the design and design drawings:

a) Furnish four (4) complete sets of stamped drawings marked "Approved for Construction" in a "B" size (11"x17") format along with one (1) electronic copy of the design in an AutoCAD format.
b) Coordinate w/ other utilities (Telephone, Cable TV, & Natural Gas)
c) Furnish a construction schedule to the District's Engineering Technician.
d) Schedule an on-site pre-construction meeting with the District's Engineering Technician, Inspector and the owner/developers construction foreman.
e) Furnish to the district's Engineering Technician and Inspector a complete list of material for owner/developer furnished material along with a list of all vendors.

Step 9: Using the "Approved for Construction" drawings the District's Engineering Technician will prepare a cost estimate for district furnished labor, material, and equipment. A Contribution-in-Aid-of-Construction (CIAC) will be calculated from this estimate. **THE CIAC MUST BE PAID IN FULL PRIOR TO ANY ELECTRICAL CONDUCTOR BEING INSTALLED AND ENGERGIZED.**

Step 10: The District shall inspect and approve all material prior to installation. **MATERIAL USED AND OR PLACED BEFORE INSPECTION SHALL BE SUBJECT TO REPLACEMENT AT THE OWNER/DEVELOPER'S COST.**

Step 11: Proceed with the installation of the electrical and fiber optic vault and duct system, street light circuits, secondary pedestals, transformer pads, switching vaults, and switchgear vaults.

Step 12: Schedule District inspection(s) prior to covering/backfilling vault and duct systems. Repair and/or replace any item that does not meet district standards or specifications. **ITEMS NOT INSPECTED, PRIOR TO COVERING/BACKFILLING, SUBJECT TO THE OWNER/DEVELOPER TO ADDITIONAL COSTS FOR INSPECTIONS.**

Step 13: Furnish **"As-Built"** drawings of the Owner/Developer installed vault and duct system. If there are no **"As-Builts"** furnish a set of drawings marked **"No Change".**

Step 14: The District will schedule its work after receiving the CIAC, As-Builts, and after completion of the Owner/Developer portion of the project.
THE DISTRICT WILL NOT SCHEDULE ANY WORK UNTILTHE CIAC HAS BEEN PAID, ALL EASEMENTS, PERMITS AND ANY OTHER AUTHORIZATIONS HAVE BEEN RECEIVED AND THE AS-BUILTS HAVE BEEN RECEIVED.

IF DURING THE GCPUD INSTALLATION PROCESS, THERE ARE DEFECTIVE OR INFERIOR MATERIALS DISCOVERED OR IF THE WORK PRACTICES OF THE CONTRACTOR ARE FOUND TO BE DEFICIENT EVEN AFTER THE INSPECTION PROCESS, THE COST OF REPLACEMENT OR RE-WORK WILL BE AT THE OWNER'S EXPENSE.

Owner/Developer Supplied Material:

All materials shall comply with the District's most recent specifications or be pre-approved by the District's Standards Department.

a) **Trenching, Bedding and Backfill**

Developer is responsible for all excavation, bedding and backfilling per District specifications, which are included in this document. See District Standard No. 10.0008.

b) **Conduit**

- Refer to "Conduit Standards for Customer Service Workbooks", which is part of this document.
- Electrical conduit shall be gray Schedule 40 rigid PVC or rigid steel as listed in the attached specifications for design work.
- Acceptable conduit diameters shall be limited to 2, 3, 4, or 6 inches.
- Conduit sweeps shall be 24, 36, or 48 inch radius, as specified or approved by the Engineering Design Technician.
- All Fiber conduit and sweeps will be provided by the District.

c) **Transformer Box and Pad**

The developer shall supply transformer concrete vaults and pads, per District standards and specifications.

d) **Switching Vaults**

The developer shall supply all concrete switching vaults, per District Standards and specifications

e) **Barriers**

Suitable barriers shall be supplied by the Owner/Developer similar to the District's material stock page no. 83271800 or a barrier approved by the District's Engineering Technician.

f) **Secondary Mopeds/Pedestals**

Pedestals per District standards and specifications shall be supplied by the developer.

g) **Material Inspection and Quality Assurance**

All materials shall meet the District's QA standards. Vaults, transformer vaults and lids shall be inspected and approved by the District prior to placement. QA of vaults are of particular concern. It should be noted that some suppliers might be temporarily taken off District Standards due to QA concerns. The design Engineer needs to contact the District's Standards Department to see if vendors are still approved.

Owner/Developer Installation:

All material(s) shall be installed to District standards and specifications and within the following parameters:

a) **Trenching, Bedding and Backfill**

- Developer is responsible for all excavation bedding and backfilling per District specifications, which are included in this document. See District Standard No. 10.0008.

- Open excavations shall be guarded per WAC requirements.

- Road and street crossings may be either trenched and backfilled, bored or pushed, whichever is acceptable to the governing agency.

b) Conduit

- Conduit shall be installed according to the District's "Conduit Standards for Customer Workbooks" and within the following parameters:

- All conduit shall be installed within the District's Easements and Rights-of-Way.

- Spare electrical conduits installed for future use shall be marked six inches from both ends with Electrical Markers or in some other form approved by the District's Engineering Technician. All ends shall be capped with non-permanent caps.

- Where conduit bends are required, they shall meet the requirements for cable pulling as required in the District's Conduit Specifications.

- Conduit locations entering transformer boxes, hand holes, and vaults shall be coordinated with the District's Engineering Inspector. Conduit shall extend 3 inches inside all vaults and manholes, be perpendicular to the side and have bell ends installed on all conduit ends.

- All conduit runs shall have a steel mandrel pulled through them in order to clear out debris and locate damaged conduits. Any damaged conduits shall be repaired by the Owner/Developer. This shall be done prior to the district pulling cable.

- **THE OWNER/DEVELOPER WILL BE SUBJECT TO ADDITIONAL COST IF THE DISTRICT'S CREWS EXPERIENCE DAMAGED OR BLOCKED CONDUITS.**

c) Manholes – Switching & Transformer Boxes

- Manholes and transformer boxes shall be installed within utility easements and adjacent to lot lines.

- All manholes, transformers, etc.. shall be set to the grade established in the approved drawings. Adjustments to grade shall be pre-approved by the District's Engineering Technician or may subject the Owner/Developer to additional cost.

- Manholes and transformer boxes installed on sloping terrain shall be protected from erosion and earth movement.

- Manhole and transformer pads shall be set so that the transformer doors and switch cabinet/manholes are operable from the street side. All equipment shall have and maintain adequate clearances in accordance to the National Electrical Safety Code (NESC) & Washingotn Administrative Code (WAC) from the front and sides, and back for safe operation.

- If either a transformer or manhole is located where it is susceptible to vehicular contact, District approved barriers shall be installed.

- Prior to equipment placement openings in transformer pads and switching manholes shall be covered for safety at time of installation.

d) Transformer Box and Pads

- All transformer boxes and pads shall be installed to District Standards and Specifications. Refer to District Standard No. 10.1130, "Concrete transformer Box Pad Installation", which is part of this document for further information. All transformers shall be supplied and installed by the District.

e) **Switching Vaults**

- The owner/developer shall install all switching vaults to the District's Standards and Specifications. All switchgear will be supplied and installed by the District.

f) **Secondary Pedestals**

- Secondary pedestals shall be installed to the District's Standards and Specifications. Refer to District Standard No. 10.1140 that is part of this document for more information.
- Pedestals shall be installed on easements and adjacent to property corners.
- Pedestals shall be installed 3.5 feet minimum on either side or back of, but not in front of the transformer.
- Pedestals shall have 3.5 feet minimum working clearance from designated "front" side.
- Pedestal orientation shall be front parallel and facing the street.
- Conduits shall enter the Pedestal from the bottom with conduit elbows. No cutting of Pedestals will be permitted.
- If a Pedestal must be located where it is susceptible to vehicular contact. Protective barriers shall be installed.

g) **Roadway Lighting**

- The developer shall obtain a written request from the governing agency for street lighting requirements.
- Install 2-inch schedule 40 PVC conduit from the transformer pad vault to each street light hand hole according to the District's Conduit Specifications attached to this document.
- Conduit shall enter the hand hole from the bottom.
- Install hand hole per District Construction Standard 17.0003 "Street Light Hand Hole".
- Hand hole should be 2 to 5 ft. from the pole locations and conduits installed per GCPUD street light standards.
- The developer shall furnish conduit from street light hand hole to steel pole standard, wood pole, or concrete pedestal for steel pole.

h) **Individual Services**

- For Individual Residence Service, see the "Residential service Workbook". Contact the service expediter for a copy at 509-766-2501.

District Supplied Material & Equipment

The District will supply primary and secondary conductors, transformers, switch cabinets, and District owned streetlights. The District will install the above material and equipment in the vault and duct system supplied by the Owner/Developer at the Owner/Developer's cost, provided all the criteria is met within these procedures. The District will supply all fiber optic conduits, vaults, and handholes for the Owner/Developer to install at no cost to the Owner/Developer.

a) Background
   - SV-LOTL-EXST-LIN - YELLOW – CONTINUOUS - DEFAULT
   - SV-LOTL-FUTR-LIN - YELLOW – CONTINUOUS – 0.20
   - SV-LOTN-EXST-TXT - CYAN – PHANTOM – 0.13
   - SV-RDRW-EXST-LIN - YELLOW – CONTINUOUS – 0.13
   - SV-RDRW-EXST-TXT - YELLOW – CONTINUOUS – 0.13

b) Civil
   - All layers that contain the civil infrastructure.

c) Electrical-OH
   - ED-CPOH-EXST-LIN - WHITE – CONTINUOUS - DEFAULT
   - ED-PPOL-EXST-BLK - WHITE – CONTINUOUS – DEFAULT

d) Electrical-UG
   - ED-CPUG-EXST-LIN-1PH – WHITE – DASHED4 – 0.09
   - ED-CPUG-EXST-LIN-3PH - WHITE – DASHED6 – 0.09
   - ED-CPUG-1PH-FUTR-LIN - WHITE – CONTINUOUS – 0.40
   - ED-CPUG-3PH-750-FUTR-LIN - WHITE – CENTER4 – 0.40
   - ED-CPUG-3PH-FUTR-LIN - WHITE – DASHED6 – 0.40
   - ED-CSSU-FUTR-LIN - 94 – DASHDOT4 – 0.30
   - ED-FRAM-FUTR-LIN - WHITE – CONTINUOUS – 0.15
   - ED-LBL-CON-PRI - MAGENTA – CONTINUOUS – 0.30
   - ED-LBL-CON-SEC - 92 – CONTINUOUS – 0.30
   - ED-PADS-FUTR-BLK - WHITE – CONTINUOUS – 0.20
   - ED-PED-FUTR-BLK - 94 – CONTINUOUS – 0.20
   - ED-STLT-EXST-BLK - MAGENTA – CONTINUOUS - DEFAULT
   - ED-VAUL-FUTR-BLK - WHITE – CONTINUOUS - DEFAULT

e) Fiber
   - ED-FIBER-FUTR-LIN - WHITE – DASHDOT4 – 0.40
   - EF-FVLT-FUTR-BLK - MAGENTA – CONTINUOUS - DEFAULT
   - EF-HHOL-FUTR-BLK - MAGENTA – CONTINUOUS - DEFAULT
   - EF-TEXT-DIM - MAGENTA – CONTINUOUS - DEFAULT

f) Misc.
   - TBLOCK - YELLOW – CONTINUOUS - DEFAULT
   - BORDER - 8 – CONTINUOUS - DEFAULT

The previously mentioned layers are to be used for construction design drawings only. The following layers are to be used for the schematic drawings only and are also listed on the sample schematic drawing with there corresponding use.

a) Schematic
   - UGTEXT - MAGENTA – CONTINUOUS - DEFAULT
   - A - RED – CONTINUOUS - DEFAULT
   - B - BLUE – CONTINUOUS - DEFAULT
   - C - GREEN – CONTINUOS - DEFAULT
   - UGSCHEM - WHITE – CONTINUOUS - DEFAULT
   - DDINUMBER - WHITE – CONTINUOUS - DEFAULT
   - WOHISTRY - MAGENTA – CONTINUOUS - DEFAULT
   - OPEN-TXT - GREEN – CONTINUOUS - DEFAULT
   - BORDER - YELLOW – CONTINUOUS - DEFAULT
   - TBLOCK - 8 – CONTINUOUS - DEFAULT

Any layers that are used in paper space such as the layers used for text, borders, details and dimensions do not need to be placed in layer filters.

There shall be only one layout in each drawing with all subsequent layouts layered on top. The filters shall be used to control each layout in model and paper space.

There shall be no need to alter or add any layers to the District's layer set. The only layer that shall deviate from the layers mentioned above will be layers that contain the civil infrastructure.

Electric System:

The Owner/Developer shall procure the services of a Design Engineer, registered in the State of Washington, to design the electric system from an approved plat in accordance with the District standards and specifications. The design shall incorporate the following items:

Design Criteria:

Plat Design Drawings:

a) The Plat design drawing shall consist of a map base background, existing electrical facilities, and proposed new electrical facilities, routes and assembly unit framing.

b) Different AutoCAD blocks shall be used to represent existing facilities and new facilities.

c) In all designs separate drawings will be needed for the following:
- Vicinity Map
- Electrical Layout
- Fiber Layout
- Framing
- Schedules
- Underground Schematic
- Construction Details
- Combined Layout

d) The framing and schedules can be placed on the same drawing as their associated layout as long as it all fits on a "B" size 11"x17" drawing and is clean and readable.

e) The District will supply a handout and Disk or will deliver via email the following plat standards:
- Drawing Template
- Standard Border
- Standard Blocks
- Standard Details

f) Remove needless entities from frozen layers and purge all un-necessary blocks, layers, text, text styles etc.. All custom fonts and text styles should be converted to RomanS only and the custom items deleted.

g) Basic layout information will be given to the Design Engineer as to conduit requirements, size and number of underground cables per duct, etc. at the time of preliminary plan review.

h) All electric facilities shall utilize the front lot line design. Front lot line design is along the main street in front of the lot(s). The layout shall include the vault and duct system, switch cabinets, pad-mounted transformers, above ground secondary pedestals, and service locations. PLEASE NOTE: The fiber optic cable system and the electrical system are complete systems unto themselves and shall be designed separately.

i) Conduit design, cable pulling, tensions, direction of pull, and installation shall meet the District's Design Standard No. 10.0008, "Trench Construction, PVC Pipe", and No. 10.0010, " Trench Bedding and Backfilling Requirements".

j) Elevations shall be shown on design drawings. The Owner/Developer will be responsible for any added expenses if the district needs to adjust, raise, or lower equipment to meet grade or clearances.

k) Non-standard burial depths shall be pre-approved by the District's Engineering Technician and so noted on the design drawings.

Standard underground conductor make-up lengths - Primary Conductor locations:

a) Dip pole:
Primary conductor make up will be the total height of the primary pole.
i.e. 40 foot, class 3 pole, make up length is 40 feet. 45 foot, class 2 pole, make up length is 45 feet.

b) Single phase padmount transformer vault:
Primary conductor make up will be 10 feet into the transformer vault. Conductor make up will be 10 feet out of the transformer vault.
i.e. transformer at loc 1 to transformer at loc 2, with 100 feet between transformer vaults. 10 + 100 + 10 = 120'.

c) Three phase padmount transformer vault, three phase switching vault (4'x6') and phase switchgear vault (U56G, U56SG, U56V):
Primary conductor make up will be 20 feet into the vault. Conductor make up will be 20 feet out of the vault.
i.e. 45 foot dip pole at loc 1 to switchgear at loc 2, with 100 feet between dip pole and switchgear vault. 45 + 100 + 20 = 165'.

Standard underground conductor make-up lengths - Secondary Conductor loc's:

a) Single Phase padmount transformer:
Secondary conductor make up out of the transformer vault will be 5 feet.

b) Single Phase moped:
Secondary conductor make up into the moped will be 5 feet. Secondary conductor out of the moped will be 5 feet.

c) Single Phase meter base (6 ft. max above ground) & mobile home meter base:
Secondary conductor make up into the meter base 10 feet.

d) Single Phase or Three Phase Secondary riser on Primary or Secondary pole:
Secondary conductor make up on the rise pole will be the height of the pole.
i.e. 40 foot, class 3 pole, make up length is 40 feet. 25 foot, class 4 pole, make up length is 25 feet. Secondary riser on 45 foot primary pole to moped ten feet away is: 45 + 10 + 5 = 60'

e) Single Phase and Three Phase Hand hole (flush mount to ground elevation):
Secondary conductor make up into hand hole will be 5 feet. Secondary conductor make up out hand hole will be 5 feet.

Underground Schematics:

a) An underground schematic is a three-line diagram, showing underground primary electrical facility designs.

b) Underground schematics will include the transition from overhead to underground conductors, vaults, switch gear, transformers, transformer pads, transformer size, fuse size, switch rating, fault indicators, cable type, cable phasing, cable size, cable lengths, and cable tags.

c) All schematics will be drawn on a "B" size (11"x17") border provided there is clarity of detail. Schematics can be drawn on a "D" size (22"x34") border or larger if needed. Consult the District's Engineering Technician for assistance in determining border size.

d) For schematic conductor lengths use the edge to edge distance (i.e. edge of vault to edge of vault) with no conductor make up added. Conductor lengths must match the distances contained within the plan drawing conductor schedule and must match the conduit length contained within the conduit schedule.

e) All schematics must meet the criteria and be laid out as shown in the sample schematic supplied in this package.

f) Schematics will be contained within their own drawing file. The border and schematic shall be drawn in model space only at 1:1 scale.

g) When submitted all schematics must be submitted in **COLOR**, either in electronic or hardcopy form, any schematics submitted in black and white **will not** be accepted.

h) If the design schematic is an addition to an existing schematic, three separate drawings must be submitted.
   a. A before construction schematic (furnished by the district).
   b. A design schematic which contains only the new portion.

c. An as-built schematic containing the design schematic added to the existing schematic. When adding to an existing schematic the design schematic scale must match the existing schematic scale.

Street Lighting:

General:

For qualified applicants, the District will provide and install a system of non-metered street lighting facilities for dusk to dawn operation. Conventional street lighting consists of transformers and overhead or underground secondary conductors with mast arms and luminaries mounted on wood or metal poles. Additional primary conductor and transformers shall be at the expense of the Owner/Developer in accordance to the District's Line extension Policy, section 4.0 and monthly billing will be in accordance with Rate Schedule 6.

Qualified Applicants:

Qualified Applicants shall be a State, County, City, Public Agency, organization, and Homeowners Association (minimum of 5 Residences), that can contract with the District to provide street lighting.

Design for Qualified Applicants:

The layout and design of the street lights shall meet all criteria and directives set forth by the County/City that has jurisdiction over them. The construction and wiring shall meet all the requirements of applicable federal, state, and local codes. Under certain conditions break-a-way pole bases are required.

The lamps are of High pressure Sodium (HPS) of the non-cycling type in 150 watt, 200 watt, and 400 watt sizes.

Street Lighting Luminaries for Qualified Applicants

The District has standardized on the following High Pressure Sodium (HPS) Luminaries for street lighting.

Multi-Tap, Cutoff Optics Luminaire		
Size (Watts)	Ballast Rating (Volts)	District Stock No.
150	120	39000013
200	120	39000213
400	Multi Tap 120 thru 277	39000615

Decorative Luminaire / With 14 foot Standard		
Size (Watts)	Ballast Rating (Volts)	District Stock No.
70	240	39110207 Ballast Assembly
150	240	39110215 Ballast Assembly

Street Lighting Standard for Qualified Applicants

Standard for Multi-Tap, Cutoff Optics Luminaire		
Type (Pole)	Size	District Stock No.
Steel	30 foot	49071130 – Break-a-Way
Steel	40 foot	49071140 – Break-a-Way
Steel	30 foot	49001130 – Direct Bury
Steel	40 foot	49001140 – Direct Bury
Wood	30 foot	48304818
Wood	40 foot	48404818

Controls for Qualified Applicants

The luminaries for the Multi-Tap, Cutoff optics shall be controlled by individual photo-cells. The Decorative Street Lights can be group controlled using a photoelectric control receptacle shorting block with a photoelectric control relay.

Design for Un-Qualified Applicants

Service to un-qualified Applicants (Applicants not utilizing District Standards) will be considered a line extension and appropriate fees and charges will apply in accordance with Line Extension Policy, Section 4.0. The service will be metered and the Applicant will be responsible for the design, installation, and maintenance of the lighting system

GCPUD Fiber Optic System:

The Owner/Developer "Requirements and Procedures" are identical to the electrical-Owner/Developer requirements, except street lighting requirements. Application for the fiber system shall be made at the same time as application for the electric system.

GCPUD FIBER OPTIC CONDUITS ARE REQUIRED ON ALL PLATS.

Design Criteria:

a) Each vault is capable of accommodating 12 services only. Any more then 12 services will require an additional vault.

b) The fiber optic system shall incorporate street side arrangement with vaults set to grade for splicing and terminations.

c) The District allows joint trench with fiber optic cable, see trenching and conduit details in the attached sample drawing.

d) The District will supply all Orange PVC Conduit, Grey Conduit sweeps, Manholes and other pertinent materials to Owner/Developer. Owner/developer shall install all material as designed.

e) The District will furnish and install fiber optic cable and splices in accordance to the District's fiber optic Customer Service Policies and build out schedule or as amended.

f) All fiber optic facilities shall be installed within easements and rights-of-way.

g) Fiber optic vaults and handholes shall be installed 3 ft. to 10 ft. on either side of but not in the front or back of the transformer pad, or vault.

h) If fiber optic vaults or handholes must be located where susceptible to vehicular contact protective barriers shall be installed.

i) Conduits shall enter the bottom of the fiber optic vault or handhole. No cutting of the vault or handhole is permitted.

Specific by Sheet Design Information for Electrical and Fiber Optic Layouts:

I) The cover sheet will contain the following:

a) A list of assembly units and descriptions used in the design.

b) The development name

c) The Section, Township and Range that the development will be in.

d) A vicinity map as described on the example cover sheet

e) All typical road sections. If there is more then one section in the project they all must be included. If there is not enough room on the cover sheet, include them in the detail sheets with the most common or typical cross section included on the cover sheet as shown in the example.

f) A sheet index

g) The "Call before you dig" (811 or 1-800-424-5555) shall be up to date and on the cover sheet.

II) The Electrical Layout will contain the following:

a) North Arrow

b) Legend

c) Roads and Road Names

d) Road Right of Way & Utility Easements

e) Lot lines, with Lot and Block Numbers.

f) All existing adjacent Overhead and Underground electrical facilities.

g) All proposed new primary and secondary electrical facilities

h) All locations will be numbered sequentially starting at location 1, all new facilities and sweeps will be numbered. Only primary locations will have sequential numbers, all secondary locations will be alpha-numeric, the numeric number will match the number on the primary structure and will be sequential alpha characters after. See the attached drawing package for examples.

i) Street Lighting plan according to the specifications set forth by the appropriate County/City agency & in accordance with IEEE standards.

j) The "Call before you dig" (811 or 1-800-424-5555) shall be up to date and contained on each sheet.

III) The Fiber Layout will contain the following:

a) North Arrow

b) Legend

c) Roads and Road Names

d) Road Right of Way & Utility Easements

e) Lot lines, with Lot and Block Numbers.

f) All existing adjacent Overhead and Underground fiber facilities.

g) All proposed new fiber facilities.

h) All locations will be numbered sequentially starting at a number rounded up to the nearest hundredth from the last electrical location. For instance if the last electrical location is 75 the first location for the fiber layout will be location 100, all new facilities and sweeps will be numbered. Only primary locations will have sequential numbers, all secondary locations will be alpha-numeric, the numeric number will match the number on the primary structure and will be sequential alpha characters after. See the attached drawing package for examples.

i) The "Call before you dig" (811 or 1-800-424-5555) shall be up to date and contained on each sheet.

IV.) The Framing Layout will contain the following:

a) Shall contain all framing for the electrical, street light, and fiber optic layouts.

b) The electrical framing shall be first, followed by the street light framing and lastly the fiber optic framing. If possible contain all framing within one sheet but if needed more sheets can be used.

c) All secondary locations must be below the primary locations they are associated with.

d) All overhead dip locations will be framed by the District's Engineering Technician. If the design is all overhead the Technician will assist and guide the Design Engineer in the correct framing.

e) The framing shall designate the difference between owner/developer supplied and installed - district supplied, owner/developer installed and district supplied and installed.

f) The "Call before you dig" (811 or 1-800-424-5555) shall be up to date and contained on each detail sheet.

V.) The Schedules Layout will contain the following:

a) The electrical schedules shall be laid out as follows:

- 6" Conduit, 3 Phase Primary (3-750AL), 6" Sweeps
- 4" Conduit, 3 Phase Primary (3-1/0AL-EPR), 4" Sweeps
- 2" Conduit, 1 Phase Primary (1/0AL-EPR), 2" Sweeps
- 3" Conduit, 1 Phase Secondary (350AL TX), 3" Sweeps
- 2" Street Light Conduit, 1 Phase Secondary (2-#6AL), 2" Sweeps (or larger if needed)
- 3 phase secondary as needed

b) The Fiber Optic schedules shall be laid out as follows:

- 2" Conduit (Orange) w/ #12 THHN Wire, 2" Sweeps – (express)
- 2" Conduit (Orange) w/ #12 THHN Wire, 2" Sweeps – (distribution)

c) There is no need to designate Fiber Optic Cable unless directed otherwise by the District's Engineering Technician.

d) The schedules shall designate the difference between Owner/Developer supplied and installed, District supplied - Owner/Developer installed, and District supplied and installed.

e) All schedules shall show the conductor make up as follows:

- 20'+120'+20', this represents 20' out of the vault of transformer pad + the conduit length as shown on the drawings and in the conduit schedule + into the transformer vault or pad.

f) For all make up lengths please reference the Standard Underground Conductor Make-Up Lengths, shown in the Electric System Design criteria above.

VI.) The Underground Schematic Layout will contain the following

a) North Arrow

b) Road Names

c) Dimensions from device to section corners or road intersections where applicable.

d) All new cable tags, pad tags, vault tags and device's to be fused (as in the case of switchgear or DIP poles) shall be underlined to differentiate the new from the old. Especially important on combined schematics where the new meets the old.

e) All existing underground electrical facilities where applicable.

f) All proposed new primary underground facilities.

g) Each cable run will include the cable size and length

VII.) The Details Layout will contain the following:

a) A north arrow on each detail where applicable.

b) The following details shall be contained within each drawing package:

- Typical trench construction (Can be modified to match design)

- Typical Common Trench Detail
- U46V / Pedestal – Section Detail
- Typical Fiber Hand Hole/Transformer Moped/Street Light/Switch Vault Placement
- Typical Fiber Vault/Transformer Moped/Street Light/Switch Vault Placement
- Secondary Pedestal Detail
- Typical groupings of all utility structures such as @ lot lines that contain electric, fiber, telephone, TV, & gas structures.

c) The following details are optional but must be contained within the drawing package if the facilities are contained within the design.

- Street Light Pole & Hand Hole Placement
- Concrete Encased Conduit Construction
- Sonet Tube Detail

d) Typical Details can be altered to match the design.

e) The notes contained within the sample drawing shall be on each detail page.

f) The Conduit specifications contained within the sample drawing shall be on each detail page.

g) The "Call before you dig" (811 or 1-800-424-5555) shall be up to date and contained on each detail sheet.

VIII.) The All Combined Layout will contain the following:

a) North Arrow

b) Legend

c) Roads and Road Names

d) Road Right of Way & Utility Easements

e) Lot lines, with Lot and Block Numbers.

f) All existing adjacent Overhead and Underground electrical and fiber optic facilities.

g) All proposed new primary and secondary electrical facilities and all new fiber optic facilities.

h) All new and existing adjacent infrastructure and utilities, including but not limited to, water pipe runs and water meters, sewer pipe runs and sewer services, storm drains and catch basins, Gas, Phone, TV and Cable.

i) All civil infrastructure will be contained within one AutoCAD block.

Deliverables:

The Owner/Developer shall deliver to the district the following deliverables as required through-out the design and construction process:

Land Use Documents:

The Owner/Developer shall provide executed copies of any and all required agency developmental approvals to the District's Engineering Technician, i.e. approved preliminary plat, approved building site plan, etc., prior to the placement of any electrical facilities.

Preliminary Drawings:

Submit two (2) sets of preliminary hard copy drawings for mark-up and approval prior to the pre-construction meeting and approval of the construction drawings. At the District's Engineering Technician's discretion electronic CAD files via email may be acceptable.

"Approved for Construction" Drawings

Furnish four (4) sets of District approved drawings marked "Approved for Construction" and one electronic copy in an AutoCAD format to the District's Engineering Technician within two(2) weeks of final approval. The drawings shall contain Professional Engineer signed and stamped per RCW and WAC requirements.

As-Built Drawings:

Upon completion of construction the Owner/Developer shall furnish the district a signed and stamped set of drawings marked "As-Built" with the date of construction completion and an electronic copy in an AutoCAD format for District use.

SAMPLE DRAWINGS

GCPUD AMFM LAYERS/BLOCKS

ITEM	NAME	LAYER NAME	LINE TYPE	PEN	SCREEN	BLOCK NAME	ATTRIBUTES
———	15kV OVERHEAD	ED-CPOH-EXST-LIN	CONTINUOUS	7	WHITE	NONE	NONE
— — — —	15kV UNDERGROUND	ED-CPUG-EXST-LIN	DASHED2	7	WHITE	NONE	NONE
———	600V OVERHEAD	ED-CSSO-EXST-LIN	CONTINUOUS	3	GREEN	NONE	NONE
— — — — — —	600V UNDERGROUND	ED-CSSU-EXST-LIN	UG_SEC	3	GREEN	NONE	NONE
———	STREETLIGHT - OVERHEAD	ED-CSLO-EXST-LIN	CONTINUOUS	3	GREEN	NONE	NONE
———	115/230kV OVERHEAD	ET-CPUD-EXST-LIN	CENTER	1	RED	NONE	NONE
—— — — ——	CANAL RIGHT OF WAY	SF-CANL-EXST-LIN	CANAL	180		NONE	NONE
———	SHORELINE	SF-SHOR-EXST-LIN	CONTINUOUS	7	WHITE	NONE	NONE
—— — — ——	DRAINAGE RIGHT OF WAY	SV-DRRW-EXST-LIN	CANAL	180		NONE	NONE
———	FENCE	SF-FENC-EXST-LIN	CONTINUOUS	7	WHITE	NONE	NONE
———	COUNTY LINE	SV-CNTY-EXST-LIN	CONTINUOUS	7	WHITE	NONE	NONE
———	RAILROAD	SF-RLRD-EXST-LIN	PHANTOM	4	CYAN	NONE	NONE
—— — — ——	EASEMENT	SV-ESMT-EXST-LIN	CANAL	180		NONE	NONE
———	FARM UNIT	SV-FARM-EXST-LIN	CONTINUOUS	2	YELLOW	NONE	NONE
———	LOT LINE	SV-LOTL-EXST-LIN	CONTINUOUS	2	YELLOW	NONE	NONE
———	MEANDER LINE	SV-MEAN-EXST-LIN	CONTINUOUS	7	WHITE	NONE	NONE
———	PROJECT LANDS	SV-PROJ-EXST-LIN	PHANTOM	7	WHITE	NONE	NONE
———	ROAD RIGHT OF WAY	SV-RDRW-EXST-LIN	PHANTOM	4	CYAN	NONE	NONE
———	SECTION LINE	SV-SECT-EXST-LIN	CONTINUOUS	2	YELLOW	NONE	NONE
F / 8T E122	DEVICES	ED-DEVS-EXST-BLK	CONTINUOUS	6	MAGENTA	DEVICE	TYPE, DEVICE, RATING
○ 40P3	POLE	ED-PPOL-EXST-BLK	CONTINUOUS	7	WHITE	DWPOLE	OWNER, CABLETV, PHONE, OTHER, MATERIAL, TREAMENT YEAR, HEIGHT, CLASS, INSTALL YEAR, WO
● 40P3	NEW POLE	ED-PPOL-PREL-BLK	CONTINUOUS	7	WHITE	DWPOLE	OWNER, CABLETV, PHONE, OTHER, MATERIAL, TREAMENT YEAR, HEIGHT, CLASS, INSTALL YEAR, WO
□ P1234	TRANSFORMER BOX	ED-PADS-EXST-BLK	CONTINUOUS	7	WHITE	EXST_XMR	NONE
■ ———	NEW TRANFORMER BOX	ED-PADS-FUTR-BLK	CONTINUOUS	7	WHITE	NEW_XMR	NONE
S V0234	SWITCHGEAR	ED-VAUL-EXST-BLK	CONTINUOUS	7	WHITE	EXST_SWGRVT	NONE
S ———	NEW SWITCHGEAR	ED-VAUL-FUTR-BLK	CONTINUOUS	7	WHITE	NEW_SWRVT	NONE
V V0235	VAULT	ED-VAUL-EXST-BLK	CONTINUOUS	7	WHITE	EXST_SWVT	NONE
V ———	NEW VAULT	ED-VAUL-FUTR-BLK	CONTINUOUS	7	WHITE	NEW_SWVT	NONE

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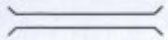
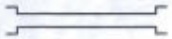
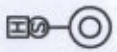
GCPUD AMFM LAYERS/BLOCKS

ITEM	NAME	LAYER NAME	LINE TYPE	PEN	SCREEN	BLOCK NAME	ATTRIBUTES
	PVC CONDUIT	ED-DUCT-EXST-LIN	CONTINUOUS	2	YELLOW	DDUCTP	NONE
	METAL CONDUIT	ED-DUCT-EXST-LIN	CONTINUOUS	2	YELLOW	DDUCTP	NONE
	DOWN GUY	ED-GUYS-EXST-BLK	CONTINUOUS	6	MAGENTA	DGUY	NONE
	SIDEWALK GUY	ED-GUYS-EXST-BLK	CONTINUOUS	6	MAGENTA	DSGUY	NONE
	SPAN GUY	ED-GUYS-EXST-BLK	CONTINUOUS	6	MAGENTA	DSPAN	NONE
	DOUBLE SPAN GUY	ED-GUYS-EXST-BLK	CONTINUOUS	6	MAGENTA	DBGUY	NONE
	POLEMOUNT TRANSFORMER	ED-XMRS-EXST-BLK	CONTINUOUS	6	MAGENTA	XPOLMT	STENCIL, PHASE, BANK, POINT #, WO, TAP
	PADMOUNT TRANSFORMER	ED-XMRS-EXST-BLK	CONTINUOUS	6	MAGENTA	XPADMT	STENCIL, PHASE, BANK, POINT #, WO, TAP
	TRANSCLOSURES *NOTE: NO LONGER USED FOR NEW DESIGN.	ED-XTRN-EXST-BLK	CONTINUOUS	6	MAGENTA	XTRNSCL	PHASE, STENCIL#, VOLTAGE, KVA
	DEVICE	ED-DEVS-EXST-BLK	CONTINUOUS	6	MAGENTA	DEVICE	TYPE, DEVICE, RATING A AIR SWITCH C CAPACITOR D DISCONNECT F FUSED CUTOUT O OIL SWITCH P POTHEAD PC PHOTO CONTROL RM RELAY, MULTIPLE RS RELAY, SERIES SC SWITCHED CAPACITOR SS SUN SWITCH X RECLOSER
	REGULATOR	ED-DEVS-EXST-BLK	CONTINUOUS	6	MAGENTA	DVREG	DEVICE TYPE, DDI #, RATING, STENCIL, PHASE
	HANDHOLE	ED-HHOL-EXST-BLK	CONTINUOUS	3	GREEN	DVHNDHO	NONE
	PEDESTAL	ED-PED-FUTR-BLK	CONTINUOUS	94		PED	NONE
	STREET LIGHT	ED-STLT-EXST-BLK	CONTINUOUS	6	MAGENTA	DSTLITE	AREA, NUMBER
	STREET LIGHT & HANDHOLE	ED-STLT-EXST-BLK	CONTINUOUS	6	MAGENTA	NEW_SLHH	NONE
	TRANSMISSION POLE	ET-POLE-EXST-BLK	CONTINUOUS	1	RED	TPOLE	# POLES, OWNER, CABLETV, PHONE, MATERIAL TREATMENT YEAR, HEIGHT, INSTALL YEAR, WO, ID#
	TRANSMISSION TOWER	ET-POLE-EXST-BLK	CONTINUOUS	1	RED	TTOWER	ED, CLASS, HEIGHT, TYPE, LINE NAME, DISTANCE TO, BEARING TO

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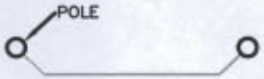
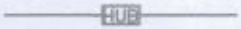
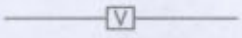
GCPUD AMFM LAYERS/BLOCKS

ITEM	NAME	LAYER NAME	LINE TYPE	PEN	SCREEN	BLOCK NAME	ATTRIBUTES
	ELECTRONIC MARKER	ED-MARK-EXST-BLK	CONTINUOUS	7	WHITE	MARKER	NONE
	FIBER OVERHEAD	EF-CFOH-EXST-LIN	CONTINUOUS	30		NONE	NONE
	FIBER UNDERGROUND	EF-CFUG-EXST-LIN	CONTINUOUS	30		NONE	NONE
	FIBER OH CONDUIT	EF-CFOC-EXST-LIN	CONTINUOUS	30		NONE	NONE
	FIBER HUB	EF-FHUB-EXST-BLK	CONTINUOUS	30		FHUB	VAULTID
	FIBER HAND HOLE	EF-HHOL-EXST-BLK	CONTINUOUS	30		EXST_FHH	NONE
	NEW FIBER HAND HOLE	EF-HHOL-FUTR-BLK	CONTINUOUS	6	MAGENTA	NEW_FHH	NONE
	FIBER VAULT	EF-FVLT-EXST-BLK	CONTINUOUS	30		EXST_FVT	NONE
	NEW FIBER VAULT	EF-FVLT-FUTR-BLK	CONTINUOUS	6	MAGENTA	NEW_FVT	NONE
	FIBER LOOP	EF-LOOP-EXST-BLK	CONTINUOUS	30		FLOOP	ID
	FIBER SPLICE	EF-SPLC-EXST-BLK	CONTINUOUS	30		FSPLICE	ID
	SONETGEAR	EF-_____-EXST-BLK	CONTINUOUS	30		F_____	ID

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COMMON PUD PARTS & ASSEMBLYS

ITEM#	DESCRIPTION
FIBER	
J085	CONDUIT, SCH 40, FIBER OPTIC (ORANGE), 2"
J088	TRACER WIRE, #12 THHN ORG
J230	FIBER VAULT
JT02	CONDUIT, STEEL ELBOW GALV 2" 90 DEG
JT32	CONDUIT, SCH 40 ELBOW 2" 90 DEG
JU78	FIBER HANDHOLE
STREET LIGHTS	
L20	LIGHT 200W HPS 120V W/PC
LA12	12 FT STEEL MAST ARM, STREET LIGHT
LDB30	LIGHT DIRECT BURIED, STEEL STANDARD, 30 FT
LDB40	LIGHT DIRECT BURIED, STEEL STANDARD, 40 FT
LF1	LIGHT FUSE, BREAK-AWAY SINGLE
LV	ENCLOSURE, LIGHTING JUNCTION BOX
LW	WIRE, CONDUIT, & ACCESORIES FOR LDB30-40, LPED30-40
UNDERGROUND FACILITIES	
U46V	VAULT, TRANSFORMER, 1 PHASE, 15-167KVA, 4'8" SQ. X 3'6"
U47V	VAULT, TRANSFORMER, 3 PHASE, 45-500KVA, 4'8" SQ. X 3'6"
U54V	VAULT, CONCRETE, SWITCHING, 1 PHASE, 4'8" SQ., 4'
U55V	VAULT, CONCRETE, SWITCHING, 3 PHASE, 6' X 4' X 3'6"
U56SG	VAULT, CONCRETE, SWITCHGEAR, 9' X 5' X 7'2"
U56V	VAULT, CONCRETE, SWITCHING, 3 PHASE, 9' X 5" X 7'2"
U59	JUNCTION BUS, 4 POS
U69	CAP, PROTECTIVE GROUNDED
U79	PEDESTAL, SECONDARY - ABOVE GROUND
U84TEP	CONNECTOR, ELBOW, 1/0 AL EPR, 15KV LOADBREAK W/TEST POINT
UFIV03	FAULT INDICATOR UG TPR 300A 1P
UA9	CONCRETE GUARD POST
CONDUIT, ELBOWS & BELL ENDS	
T22	CONDUIT, SCH 40 PVC, 2"
T13	CONDUIT, SCH 40 PVC, 3"
T14	CONDUIT, SCH 40 PVC, 4"
T16	CONDUIT, SCH 40 PVC, 6"
T32	CONDUIT, SCH 40 PVC ELBOW DB 2" X 36"R, 90 DEG
T32A	CONDUIT, SCH 40 PVC ELBOW DB 2" X 24"R, 90 DEG
T33	CONDUIT, SCH 40 PVC ELBOW DB 3" X 36"R, 90 DEG
T33A	CONDUIT, SCH 40 PVC ELBOW DB 3" X 24"R, 90 DEG
T34	CONDUIT, SCH 40 PVC ELBOW DB 4" X 36"R, 90 DEG
T42	CONDUIT, SCH 40 PVC SWEEP DB 4" X 36"R, 45 DEG
T52	CONDUIT, STEEL ELBOW GALV 2" X 36"R - 45 DEG
T53	CONDUIT, STEEL ELBOW GALV 3" X 36"R - 45 DEG
T54	CONDUIT, STEEL ELBOW GALV 4" X 36"R - 45 DEG
T56	CONDUIT, STEEL ELBOW GALV 6" X 36"R - 45 DEG
T62	CONDUIT, STEEL ELBOW GALV 2" X 36"R - 90 DEG
T63	CONDUIT, STEEL ELBOW GALV 3" X 36"R - 90 DEG
T64	CONDUIT, STEEL ELBOW GALV 4" X 36"R - 90 DEG
T66	CONDUIT, STEEL ELBOW GALV 6" X 36"R - 90 DEG
T92	CONDUIT, FIBERGLASS ELBOW 2" X 36"R - 90 DEG
T93	CONDUIT, FIBERGLASS ELBOW 3" X 36"R - 90 DEG
T94	CONDUIT, FIBERGLASS ELBOW 4" X 36"R - 90 DEG
T96	CONDUIT, FIBERGLASS ELBOW 6" X 36"R - 90 DEG
T80	SEALANT, INSTA-FOAM, 1 CU. FT. KIT
T82	BELL END, 2" PVC
T83	BELL END, 3" PVC
T84	BELL END, 4" PVC
T86	BELL END, 6" PVC
CONDUCTORS	
A10C	600V UG SNGL #6 AL
A36C	600V UG TRIPLEX AL, 2 - 350 & 1 - 4/0
A01C1E	1/0 AL EPR 15KV, 1 PHASE
A01C3E	1/0 AL EPR 15KV, 3 PHASE
A06C31	750 AL EPR 15KV, 3 PHASE

SEE GRANT COUNTY P.U.D. PARTS CATALOG FOR ITEMS NOT LISTED ABOVE.

DEVELOPMENT NAME

T.00N R.00E S.00

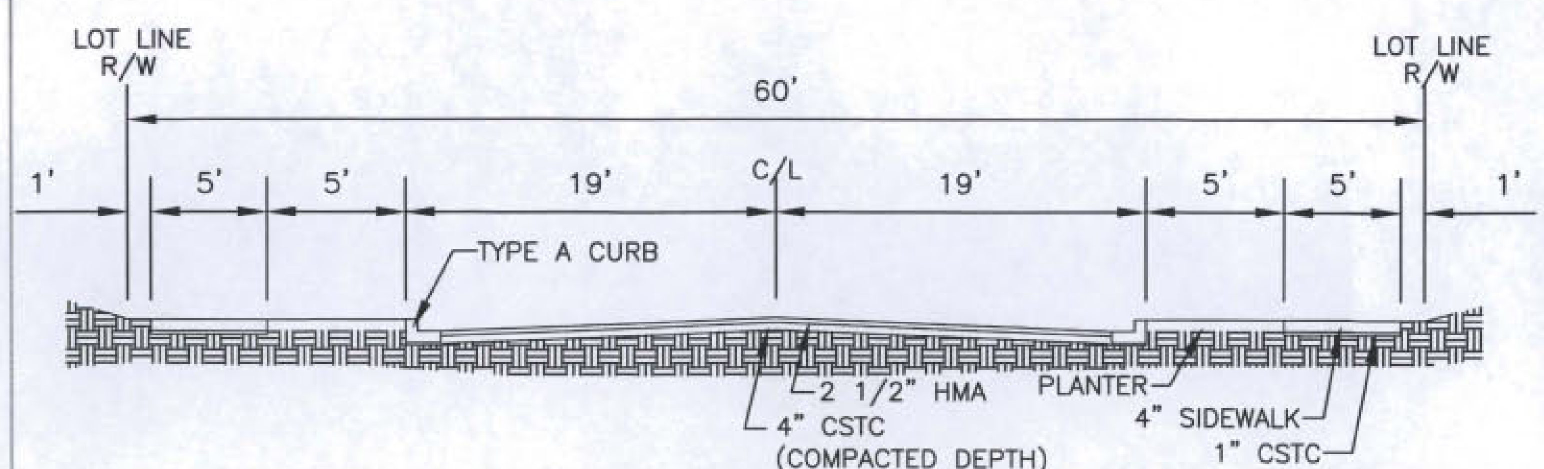
INCLUDE A VICINITY MAP OF THE AREA AROUND THE PLAT IN A 1/2 MILE RADIUS. INCLUDE THE CITY OR OUTLYING AREA NAME, ALL MAJOR STREET NAMES AND ANY ARTERIAL STREETS ADJACENT TO THE PLAT, A NORTH ARROW, ANY SURROUNDING PLAT NAMES. VICINITY MAP MAY NEED TO BE ENLARGED DEPENDING ON THE AREA THE PLAT IS LOCATED. THIS DECISION IS AT THE DISCRETION OF THE DESIGNER.

N

VICINITY MAP
NOT TO SCALE

SHEET INDEX

- SHEET 1 .... COVER SHEET
- SHEET 2 .... PRIMARY CONDUIT LAYOUT
- SHEET 3 .... FIBER CONDUIT LAYOUT
- SHEET 4 .... FRAMING
- SHEET 5 .... SCHEDULES
- SHEET 6 .... SCHEMATIC
- SHEET 7 .... DETAIL SHT. 1
- SHEET 8 .... DETAIL SHT. 2
- SHEET 9 .... DETAIL SHT. 3
- SHEET 10 .... ALL FACILITIES COMBINED



TYPICAL CROSS SECTION

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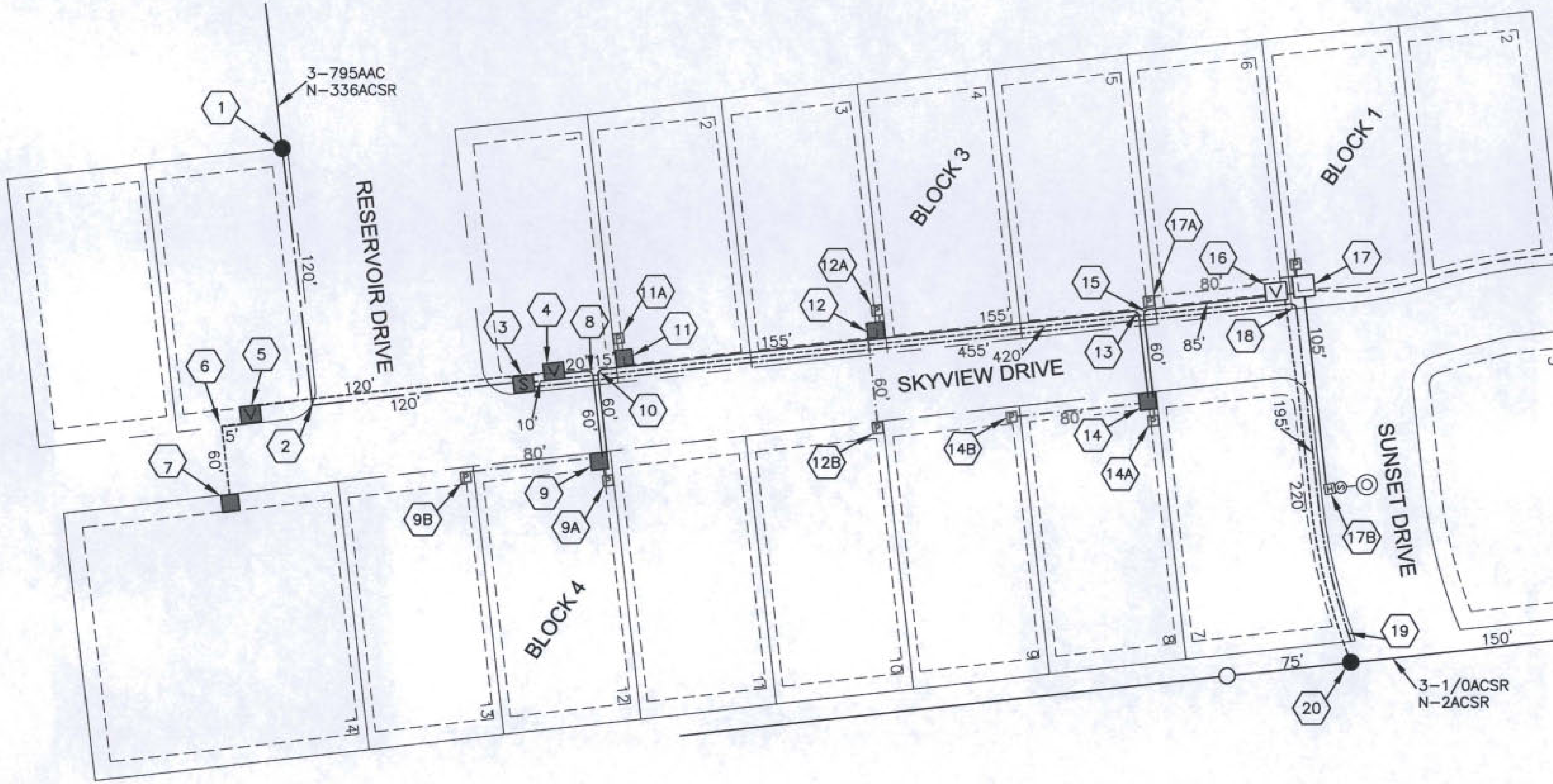
REV.	DESCRIPTION	DSN	CHK	DRG	APP1	APP2	DATE
3							
2							
1							
A0	PRELIMINARY New Drawing						_/_/_

TITLE: YELLOW BOOK
EXHIBIT DRAWING
VICINITY MAP

CATEGORY: PRELIMINARY
DOC FILE: EXHIBIT-DWG
LAST FILE: 06/25/09
DESIGNER: MAB | ORIGINATOR: TCY | CHECKED: TCY | DATE: 04/07/09 | SHT. 1 OF 10 | DWG SIZE: B
DRAWING NUMBER: EXHIBIT-DWG



LEGEND

- EXISTING POLE
- NEW POLE
- NEW SWITCH VAULT
- EXISTING SWITCH VAULT
- NEW SWITCHGEAR VAULT
- EXISTING SWITCHGEAR VAULT
- NEW TRANSFORMER
- EXISTING TRANSFORMER
- PEDESTAL
- NEW STREET LIGHT & HAND HOLE
- RIGHT OF WAY
- PROPERTY LINE
- PUBLIC UTILITY EASEMENT
- 2" SCH40 PVC CONDUIT
- 3" SCH40 PVC CONDUIT
- 4" SCH40 PVC CONDUIT
- 6" SCH40 PVC CONDUIT
- EXST. 1-PHASE POWER (IN CONDUIT)
- EXST. 3-PHASE POWER (IN CONDUIT)

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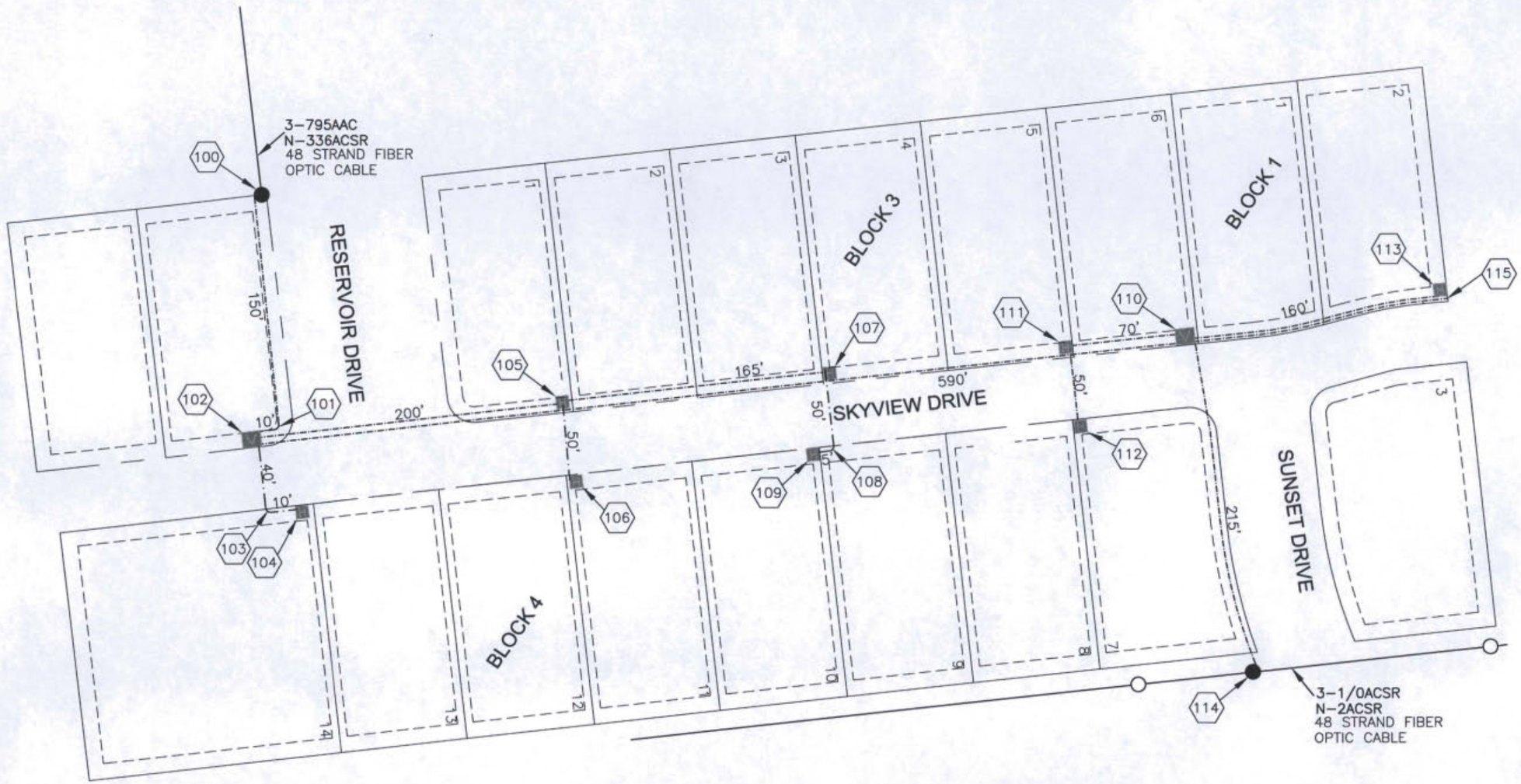
REV	DESCRIPTION
3	
2	
1	
A0	PRELIMINARY New Drawing

YELLOW BOOK
EXHIBIT DRAWING
ELECTRICAL LAYOUT

PRELIMINARY
EXHIBIT-DWG
06/25/09
MAB TCY TCY 04/07/09 2 10 B
EXHIBIT-DWG



LEGEND

- EXISTING POLE
- NEW POLE
- NEW FIBER VAULT
- NEW FIBER HANDHOLE
- EXISTING FIBER VAULT
- EXISTING FIBER HANDHOLE

- RIGHT OF WAY
- PROPERTY LINE
- PUBLIC UTILITY EASEMENT
- 2" SCH40 PVC ORG CONDUIT

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REV.	DESCRIPTION	DES	CHK	ORG	APP'D	DATE
3						
2						
1	PRELIMINARY Name Drawing					
A0						

YELLOW BOOK
EXHIBIT DRAWING
FIBER LAYOUT

PRELIMINARY

CATEGORY	SUB-CATEGORY	CAD FILE	PLOT BY:	PLOT SIZE
		06/25/09		
DESIGNER MAB	DRAFTER TCY	DATE 04/07/09	PLOT SCALE	DWG SIZE B
DRAWING NUMBER EXHIBIT-DWG		SHT # 10		

ELECTRICAL FRAMING

1 — D / 900 — GRID #_____-___
3-900A DISC SWITCH
DEVICE #_____
45P2 – XHH48 – FM9 – D65 – NO4
3D22HE 6HL5C W22 NOM
3E33 30C5W
3H30F U38SEP
3HL9 5U29E
2U16
U06
2T96
T92

3 — D / 900 — D / 900 — F — F — GRID# _____-___
PME/PSE-9 SWITCH GEAR
(STK.# TDSI-65716709)
DEVICE _____ 900A DISCONNECT
DEVICE _____ 900A DISCONNECT
DEVICE _____
DEVICE _____
FUSE @ _____
FUSE @ _____
*U56SG – 3UDB2
3U84TEP
3U69
TDSI-66945046
600A CAP
*T86
*T84

4
*U55V – 3U59
10U84TEP
7UFIV03
2U69
*3T84
*T82

5
*U55V – 3U59
6U84TEP
3UFIV03
6U69
*2T84

7 — ABC / T / 225 — GRID# _____-___
1-225KVA-PAD MT XFMR
13.2/7.6KV-240/480V
(QT1122)
*U47V-2U84TEP
*3T82 UFIV03
*2T83

9 — A / T / 37 — GRID# _____-___
*U46V-2U84TEP
*2T82 UFIV03
*2T83

9A *U79 *T33A

9B *U79 *T33A

11 — A / T / 25 — GRID# _____-___
1-37KVA-PAD MT XFMR
7.6KV-120/240V – (PT1437)
*U46V-2U84TEP
*2T82 UFIV03
*T83

11A *U79 *T33A

12 — A / T / 37 — GRID# _____-___
1-37KVA-PAD MT XFMR
7.6KV-120/240V – (PT1437)
*U46V-2U84TEP
*2T82 UFIV03
*2T83

12A *U79 *T33A

12B *U79 *T33A

14 — A / T / 37 — GRID# _____-___
1-37KVA-PAD MT XFMR
7.6KV-120/240V – (PT1437)
*U46V-2U84TEP
*2T82 UFIV03
*2T83

14A *U79 *T33A

14B *U79 *T33A

16
0 – 4U69
0 – 4U84TEP
*T84
*T82

17 — C / T / 12891 / 37
0 – *2T83

17A *U79 *T33A

20 — F — GRID# _____-___
3-FUSED CUTOUTS
DEVICE #_____
FUSE @ _____
45P2 – X18 – F21 – R05 – NO4
P01 W75 W21 NOM
2P06 5U29
3W13 2U22
3HS3B U06
3HJ2

STREET LIGHTS

17B STEEL STREET #_____
LDB40 – LA15 – *LV – LF1
L40 LW U51

FIBER FRAMING

102 **J230 – **4JT32

104 **JU78 – **JT32

105 **JU78 – **3JT32

106 **JU78 – **JT32

107 **JU78 – **2JT32

109 **JU78 – **JT32

110 **J230 – **5JT32

111 **JU78 – **2JT32

112 **JU78 – **JT32

113 **JU78 – **JT32

DISTRICT PROVIDED AND INSTALLED.
* SUPPLIED & INSTALLED BY THE DEVELOPER.
** DISTRICT PROVIDED, DEVELOPER INSTALLED.

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REV.	DESCRIPTION	DSN	CHK	APP'D	APP'D	DATE
3						
2						
1	PRELIMINARY New Drawing					
A0						1_A

YELLOW BOOK
EXHIBIT DRAWING
FRAMING DRAWING

TITLE
PRELIMINARY
CATEGORY
SUB-CATEGORY
DGN FILE: EXHIBIT-DWG
DESIGNER MAB
ORIGINATOR TCY
CHECKER TCY
DATE 04/07/09
DWG FILE 06/25/09
SHT # 4 OF 10
PLOT BY
PLOT SCALE
PLOT DATE
DWG SIZE B
DRAWING NUMBER
EXHIBIT-DWG

ELECTRICAL SCHEDULES

6" CONDUIT SCHEDULE
CUSTOMER PROVIDED & INSTALLED

LOC	LOC	DESCRIPTION	DISTANCE
1	3	2-6" SCH 40 PVC	240'
3	19	2-6" SCH 40 PVC	650'
TOTAL 6" SCH 40 PVC CONDUIT			990'x2=1880'

3 PHASE PRIMARY CONDUCTOR SCHEDULE
PUD PROVIDED & INSTALLED

LOC	LOC	DESCRIPTION	DISTANCE
1	3	3-750AL-15KV (A05C3E)	45'+240'+20'=305'
		3-750AL-15KV (A05C3E)	TOTAL = 305'

6" SWEEP SCHEDULE
CUSTOMER PROVIDED & INSTALLED

LOC	DESCRIPTION	QTY
2,18	6" GALV STEEL-36" RAD-90°	2
TOTAL 6" GALV STEEL-36" RAD-90°		4

3" SECONDARY CONDUIT SCHEDULE
CUSTOMER PROVIDED & INSTALLED

LOC	LOC	DESCRIPTION	DISTANCE
9	9A	3" SCH 40 PVC CONDUIT	3'
9	9B	3" SCH 40 PVC CONDUIT	80'
11	11A	3" SCH 40 PVC CONDUIT	3'
12	12A	3" SCH 40 PVC CONDUIT	3'
12	12B	3" SCH 40 PVC CONDUIT	60'
14	14A	3" SCH 40 PVC CONDUIT	3'
14	14B	3" SCH 40 PVC CONDUIT	80'
17	17A	3" SCH 40 PVC CONDUIT	80'
TOTAL 3" SCH 40 PVC CONDUIT			312'

4" CONDUIT SCHEDULE
CUSTOMER PROVIDED & INSTALLED

LOC	LOC	DESCRIPTION	DISTANCE
3	4	4" SCH 40 PVC	10'
4	5	4" SCH 40 PVC	120'
5	7	4" SCH 40 PVC	65'
4	16	4" SCH 40 PVC	420'
16	20	4" SCH 40 PVC	220'
TOTAL 4" SCH 40 CONDUIT			835'

3 PHASE PRIMARY CONDUCTOR SCHEDULE
PUD PROVIDED & INSTALLED

LOC	LOC	DESCRIPTION	DISTANCE
3	4	3-1/0AL-EPR-15KV (A01C3E)	20+10'+20'=50'
4	5	3-1/0AL-EPR-15KV (A01C3E)	20+120'+20'=160'
5	7	3-1/0AL-EPR-15KV (A01C3E)	20+65'+20'=105'
4	16	3-1/0AL-EPR-15KV (A01C3E)	20+420'+20'=460'
16	20	3-1/0AL-EPR-15KV (A01C3E)	20+220'+45'=285'
		3-1/0AL-EPR-15KV (A01C3E)	TOTAL=1,060'

4" SWEEP SCHEDULE
CUSTOMER PROVIDED & INSTALLED

LOC	DESCRIPTION	QTY
6	4" GALV STEEL-36" RAD-90°	1
TOTAL 4" GALV STEEL-36" RAD-90°		1

SECONDARY CONDUCTOR SCHEDULE
CONTINUED

LOC	LOC	DESCRIPTION	DISTANCE
9	9A	350 AL TX UG (A36C)	5'+3'+5'=13'
9	9B	350 AL TX UG (A36C)	5'+80'+5'=90'
11	11A	350 AL TX UG (A36C)	5'+3'+5'=13'
12	12A	350 AL TX UG (A36C)	5'+3'+5'=13'
12	12B	350 AL TX UG (A36C)	5'+60'+5'=70'
14	14A	350 AL TX UG (A36C)	5'+3'+5'=13'
14	14B	350 AL TX UG (A36C)	5'+80'+5'=90'
17	17A	350 AL TX UG (A36C)	5'+80'+5'=90'
TOTAL 350 AL TX UG (A36C)			392'

2" PRIMARY CONDUIT SCHEDULE
CUSTOMER PROVIDED & INSTALLED

LOC	LOC	DESCRIPTION	DISTANCE
4	9	2" SCH 40 PVC	80'
9	11	2" SCH 40 PVC	75'
11	12	2" SCH 40 PVC	155'
12	14	2" SCH 40 PVC	215'
14	16	2" SCH 40 PVC	145'
TOTAL 2" SCH 40 PVC CONDUIT			670'

SINGLE PHASE PRIMARY CONDUCTOR SCHEDULE
PUD PROVIDED & INSTALLED

LOC	LOC	DESCRIPTION	DISTANCE
4	9	1/0AL-EPR-15KV (A01C1E)	20'+80'+5'=105'
9	11	1/0AL-EPR-15KV (A01C1E)	5'+75'+5'=85'
11	12	1/0AL-EPR-15KV (A01C1E)	5'+155'+5'=165'
12	14	1/0AL-EPR-15KV (A01C1E)	5'+215'+5'=225'
14	16	1/0AL-EPR-15KV (A01C1E)	5'+145'+20'=130'
		1/0AL-EPR-15KV (A01C1E)	TOTAL = 710'

2" SWEEP SCHEDULE
CUSTOMER PROVIDED & INSTALLED

LOC	DESCRIPTION	QTY
8,10,13,15	2" GALV STEEL-36" RAD-90°	4
TOTAL 2" GALV STEEL-36" RAD-90°		4

2" STREET LIGHT CONDUIT SCHEDULE
CUSTOMER PROVIDED & INSTALLED

LOC	LOC	DESCRIPTION	DISTANCE
17	17B	2" SCH 40 PVC CONDUIT	105'
TOTAL 2" SCH 40 PVC CONDUIT			105'

STREET LIGHT CONDUCTOR SCHEDULE
PUD PROVIDED & INSTALLED

LOC	LOC	DESCRIPTION	DISTANCE
17	17B	2 - #6 AL (A30C)	5'+105'+40'=150'
		#6 AL (A30C)	TOTAL = 300'

FIBER SCHEDULES

2" FI. OP. (ORANGE) CONDUIT SCHEDULE
PUD PROVIDED - CUSTOMER INSTALLED

LOC	LOC	DESCRIPTION	DISTANCE
100	102	2" SCH 40 PVC W/#12 THH WIRE	160'
102	104	2" SCH 40 PVC W/#12 THH WIRE	50'
102	105	2" SCH 40 PVC W/#12 THH WIRE	200'
105	106	2" SCH 40 PVC W/#12 THH WIRE	50'
105	107	2" SCH 40 PVC W/#12 THH WIRE	165'
107	108	2" SCH 40 PVC W/#12 THH WIRE	55'
102	110	2" SCH 40 PVC W/#12 THH WIRE	590'
110	111	2" SCH 40 PVC W/#12 THH WIRE	70'
111	112	2" SCH 40 PVC W/#12 THH WIRE	50'
110	113	2" SCH 40 PVC W/#12 THH WIRE	160'
110	114	2" SCH 40 PVC W/#12 THH WIRE	215'
110	115	2" SCH 40 PVC W/#12 THH WIRE	160'
TOTAL 2" SCH 40 PVC (ORANGE)(J085)			1,927'
TOTAL #12 THH TRACER WIRE (J088)			2,200'

2" FI. OP. (ORANGE) CONDUIT SWEEP SCHEDULE
PUD PROVIDED - CUSTOMER INSTALLED

LOC	DESCRIPTION	QTY
101,103,108	2" SCH 40 PVC-36" RAD-90°	1
TOTAL 2" SCH 40 PVC SWEEPS-36" RAD-90°		3

SEE FRAMING SHEET FOR OTHER
SWEEP LOCATIONS (JT32)

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REV.	DESCRIPTION	DRN	CHK	ORIG	APP1	APP2	DATE
3							
2							
1	PRELIMINARY New Drawing						
A0							4/_/09

YELLOW BOOK
EXHIBIT DRAWING
SCHEDULES DRAWING

TITLE

PRELIMINARY

DESIGNER	MAB
DRAWING	TCY
CHECKED	TCY
DATE	04/07/09
DWG. NUMBER	EXHIBIT-DWG
DSN. FILE	EXHIBIT-DWG
LAST PLT.	08/25/09
SHT. #	5
OF	10
PLOT SCALE	
PLOT BY:	
PLOT DATE:	
SHT. SIZE	B

Prototype Drawings:
1PHASE
3PHASE
UGSCHEMB
UGSCHEMD

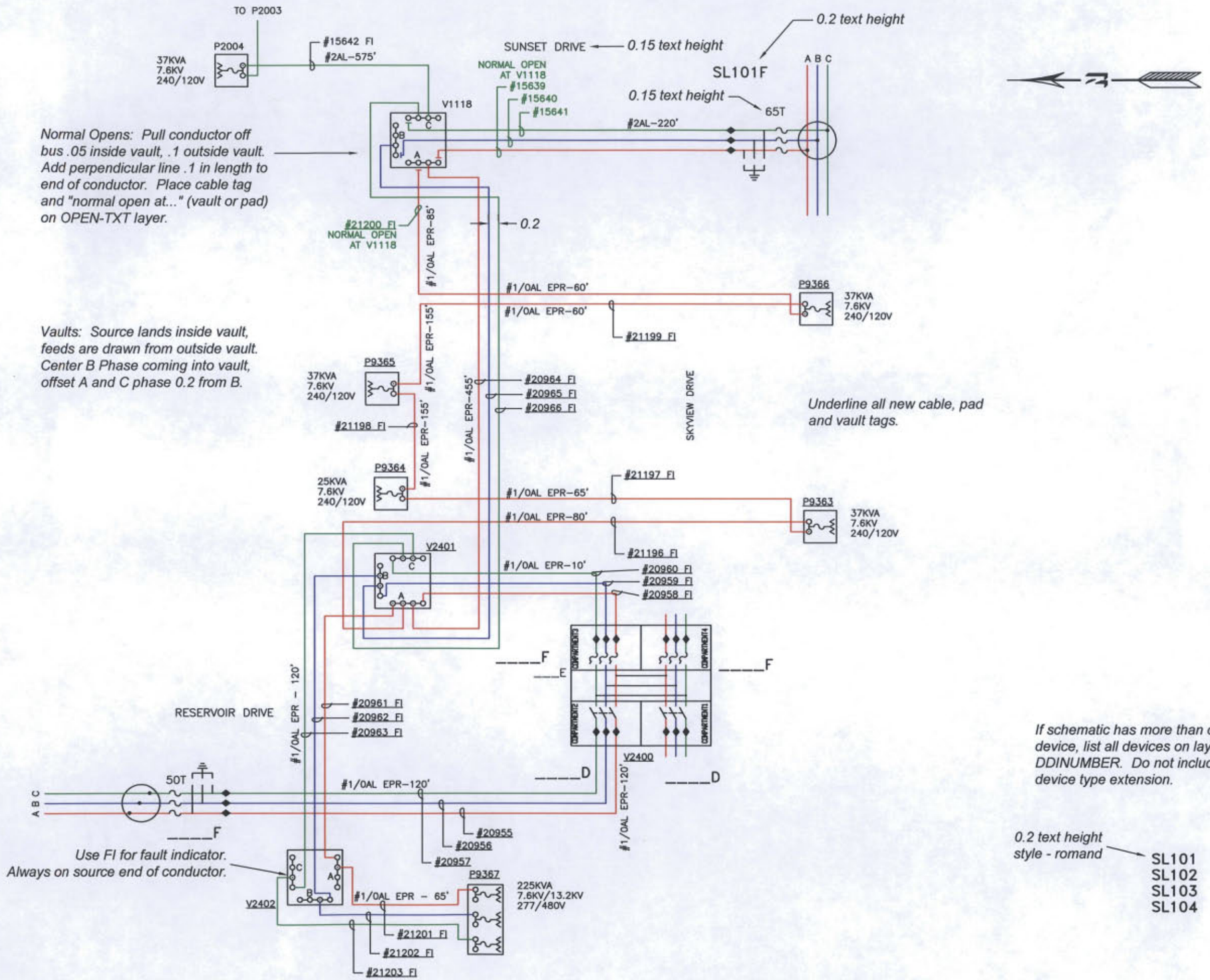
Use ortho mode when applicable. Schematic blocks are designed to be used with SNAP set to .05 x drawing scale. Make sure converging lines meet. Use District's blocks, linetypes, layers. Do not create any new entities. Use example for text styles and heights. All dimensions are from edge of vault to edge of vault, not conductor lengths. Purge the drawing when finished, zoom extents and plot to .dwf.

All text height is 0.125, style ROMANS unless noted.

County Road Names:
"K" S.E. - No road exists.
CO. RD. "K" S.E. - Road exists.

Dimension to section corners where applicable.

Layers
Text - UGTEXT
Conductor - A, B or C
Blocks - UGSCHEM
DDI Numbers - DDINUMBER
Multiple numbers in lower right
WOs - WOHISTRY
Normal Opens - OPEN-TXT



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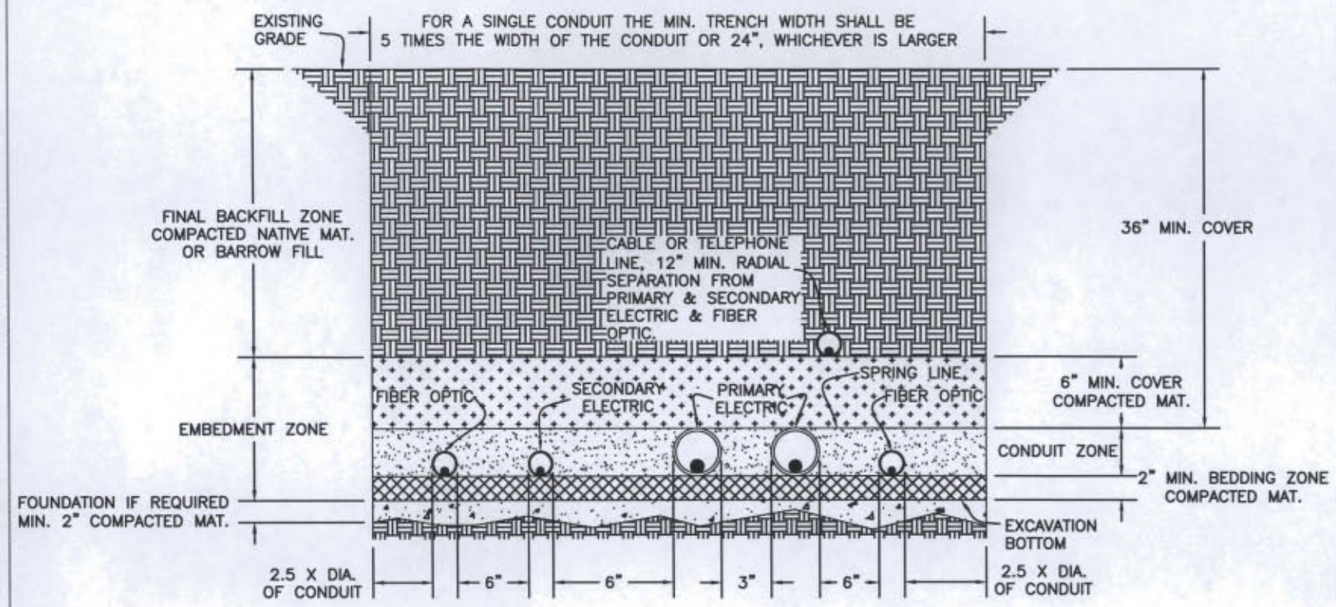
REV.	DESCRIPTION	DSN	DWN	ORG	APP'D	DATE
3						
2						
1	PRELIMINARY New Drawing					
A0						

TITLE
YELLOW BOOK
EXHIBIT DRAWING
UNDERGROUND SCHEMATIC

PRELIMINARY
SUB-CATEGORY
CATEGORY
DGN FILE: EXHIBIT-DWG
LAST FILE: 06/25/09
PLOT BY:
PLOT SCALE:
PLOT SIZE: D
DESIGNER: SMA
DRAWN BY: TCY
CHECKED BY: MAB
DATE: 06/24/09
DWG #: 10
DRAWING NUMBER
EXHIBIT-DWG

TYPICAL TRENCH CONSTRUCTION

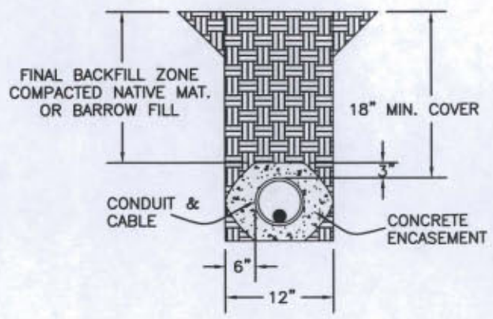


MULTI–CONDUITS SHALL BE CONFIGURED AS SHOWN.

NOTE:
ALL TRENCHING, TRENCH LOCATION IN REFERENCE TO OTHER UTILITIES, CONDUIT LOCATION WITHIN THE TRENCH, BACKFILL AND COMPACTION OF BACKFILL SHALL BE IN ACCORDANCE WITH ASTM INTERNATIONAL STANDARDS.

NOT TO SCALE

CONCRETE ENCASED CONSTRUCTION



NOTE:
THIS METHOD OF REDUCED CLEARANCES IS ONLY ACCEPTABLE WITH PRIOR APPROVAL OF DISTRICT STAFF.
CONDUIT SHALL REST ON EITHER CONCRETE OR SUITABLE FOUNDATION.
CONCRETE ENCASEMENT SHALL BE A FOUR SACK MIX.

NOT TO SCALE

NOTES:

1. CUSTOMER TO PROVIDE ALL TRENCH, BACKFILL, CONDUIT, BEDDING, CONCRETE TRANSFORMER VAULTS, SWITCHING VAULTS, MOPEDS AND HAND HOLES TO GRANT COUNTY PUD SPECIFICATIONS.

2. INSTALL CAP AT END OF SPARE CONDUITS.

3. CORDINATE CONSTRUCTION WITH AREA LINE FOREMAN PHONE:

4. DEVELOPER TO PROVIDE ALL LOT CORNERS AND GRADE STAKES FOR CONSTRUCTION AND STAKING OF BURIED POWER LINES.

5. ALL SWITCHING VAULTS, TRANSFORMER VAULTS, AND HAND HOLES ARE TO BE INSTALLED AT FINAL GRADE PER GRANT COUNTY P.U.D. STANDARDS.

6. DEVELOPER TO COORDINATE WITH OTHER UTILITIES.

7. WARNING TAPE TO BE INSTALLED OVER ALL CONDUITS EXPOSED ABOVE FINAL GRADE.

8. P.U.D. MUST INSPECT AND APPROVE ALL CONDUITS AND VAULTS BEFORE BACKFILL.

9. OBTAIN FIBER OPTIC CONDUIT, VAULTS, AND HAND HOLES FROM GRANT COUNTY P.U.D. AND INSTALL PER GRANT COUNTY P.U.D. STANDARDS.

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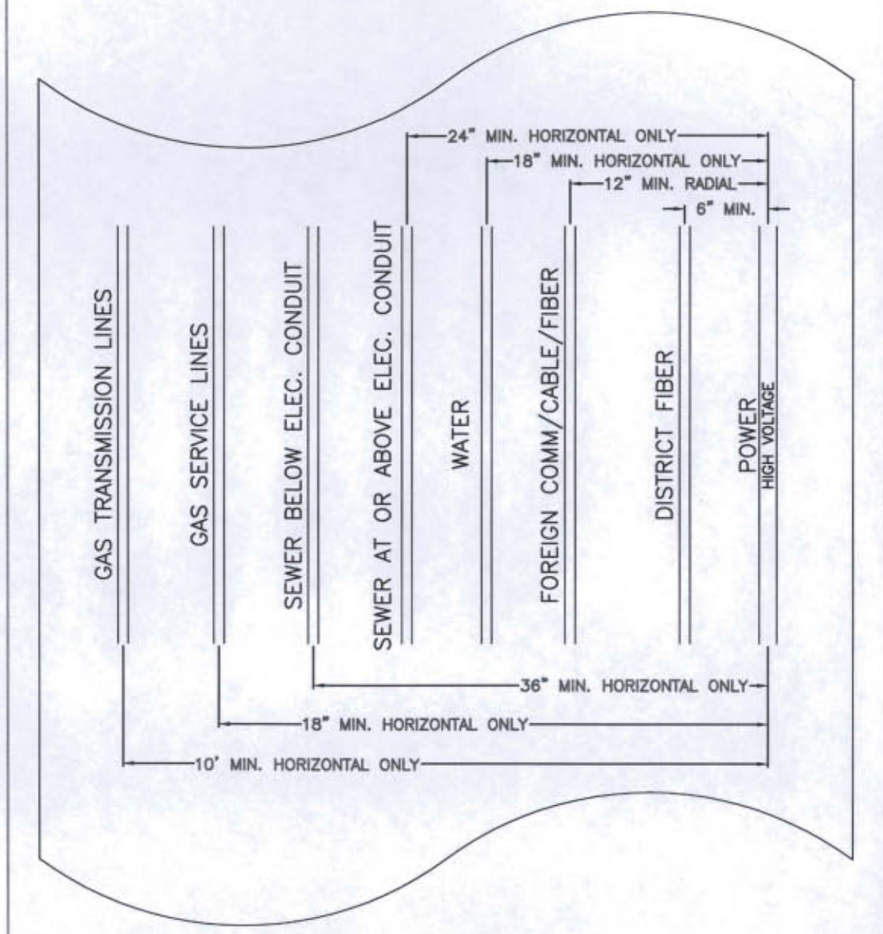
TYPICAL COMMON TRENCH DETAIL



NOTE:
LOW VOLTAGE 120/240V REQUIRES 12" RADIAL SEPARATION FOR TELEPHONE OR TELEVISON–CABLE, 6" FOR DISTRICT FIBER, AND 12" FOR FOREIGN FIBER.

NOT TO SCALE

CONDUIT SPECIFICATIONS:

1. CONDUITS TO BE CENTERED AND ALIGNED TO PULL POWER CABLES DIRECTLY THROUGH KNOCKOUT ACCESS OPENING OF THE TRANSFORMER VAULT OR SWITCHING VAULT ⊙ APPROXIMATELY 4" ABOVE INSIDE GRADE. PRIMARY CONDUITS SHALL ENTER AND EXIT ⊙ OPPOSITE CORNERS OF VAULTS.

2. ALL MEDIUM HIGH VOLTAGE 36" RADIUS SWEEPS MUST BE MODIFIED TO EXTEND JUST ABOVE INSIDE GRADE ⊙ TRANSFORMER VAULT OR SWITCH VAULT LOCATIONS.

3. USE GALV. STEEL SWEEPS OR FIBERGLASS FOR ALL PRIMARY CONDUIT.

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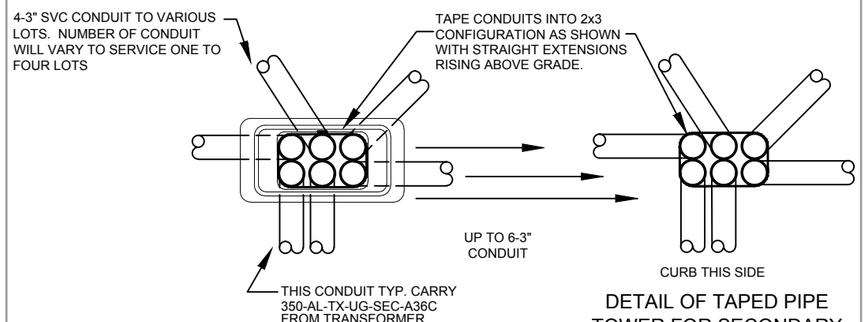
REV.	DESCRIPTION	DSN	CHK	ORIG	APP'D	DATE
3						
2						
1	PRELIMINARY New Drawing					
A0						

YELLOW BOOK
EXHIBIT DRAWING
DETAIL LAYOUT 1

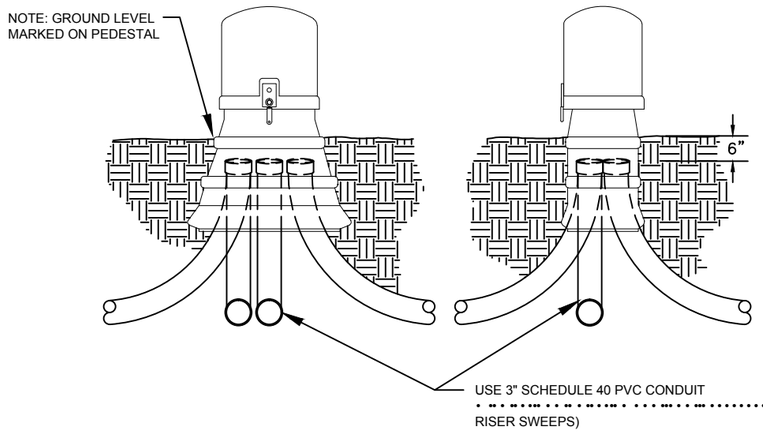
PRELIMINARY

CATEGORY	SUB-CATEGORY
DGN FILE	EXHIBIT–DWG
DESIGNER	MAB
DRAWN BY	TCY
CHECKED	TCY
DATE	04/07/09
DRAWING NUMBER	EXHIBIT–DWG
PLOT FILE	06/25/09
PLOT BY	
PLOT SCALE	1" = 10'
PLOT DATE	
DRAWING SIZE	B

PEDESTAL CONSTRUCTION DETAIL



DETAIL OF TAPED PIPE TOWER FOR SECONDARY PEDESTALS



NOT TO SCALE

STREET LIGHT & HAND HOLE PLACEMENT

PROFILE VIEW

NOTE:

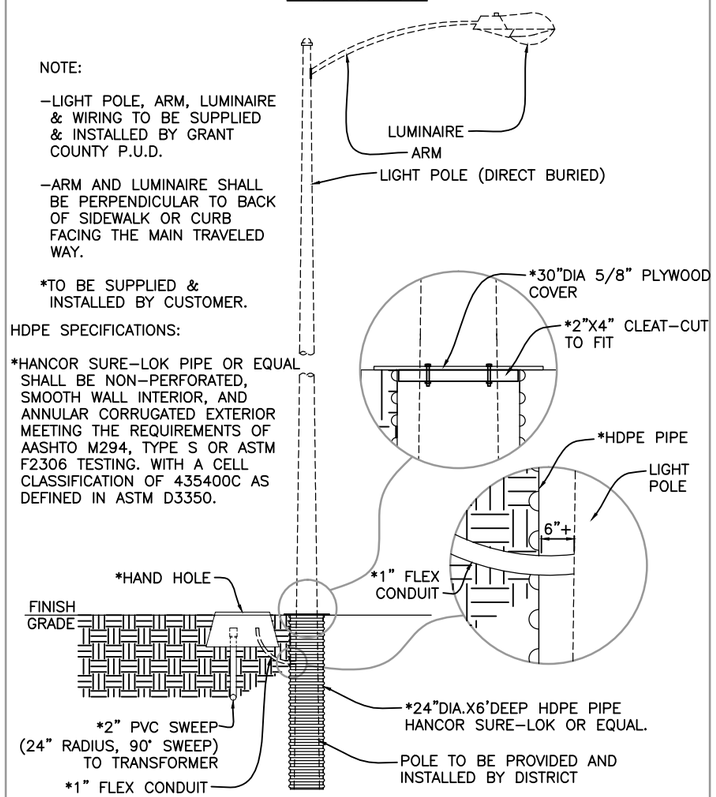
–LIGHT POLE, ARM, LUMINAIRE & WIRING TO BE SUPPLIED & INSTALLED BY GRANT COUNTY P.U.D.

–ARM AND LUMINAIRE SHALL BE PERPENDICULAR TO BACK OF SIDEWALK OR CURB FACING THE MAIN TRAVELED WAY.

*TO BE SUPPLIED & INSTALLED BY CUSTOMER.

HDPE SPECIFICATIONS:

*HANCOR SURE–LOK PIPE OR EQUAL SHALL BE NON–PERFORATED, SMOOTH WALL INTERIOR, AND ANNULAR CORRUGATED EXTERIOR MEETING THE REQUIREMENTS OF AASHTO M294, TYPE S OR ASTM F2306 TESTING. WITH A CELL CLASSIFICATION OF 435400C AS DEFINED IN ASTM D3350.



NOT TO SCALE

NOTES:

1. CUSTOMER TO PROVIDE ALL TRENCH, BACKFILL, CONDUIT, BEDDING, CONCRETE TRANSFORMER VAULTS, SWITCHING VAULTS, MOPEDS AND HAND HOLES TO GRANT COUNTY PUD SPECIFICATIONS.

2. INSTALL CAP AT END OF SPARE CONDUITS.

3. CORDINATE CONSTRUCTION WITH AREA LINE FOREMAN PHONE:

4. DEVELOPER TO PROVIDE ALL LOT CORNERS AND GRADE STAKES FOR CONSTRUCTION AND STAKING OF BURIED POWER LINES.

5. ALL SWITCHING VAULTS, TRANSFORMER VAULTS, AND HAND HOLES ARE TO BE INSTALLED AT FINAL GRADE PER GRANT COUNTY P.U.D. STANDARDS.

6. DEVELOPER TO COORDINATE WITH OTHER UTILITIES.

7. WARNING TAPE TO BE INSTALLED OVER ALL CONDUITS EXPOSED ABOVE FINAL GRADE.

8. P.U.D. MUST INSPECT AND APPROVE ALL CONDUITS AND VAULTS BEFORE BACKFILL.

9. OBTAIN FIBER OPTIC CONDUIT, VAULTS, AND HAND HOLES FROM GRANT COUNTY P.U.D. AND INSTALL PER GRANT COUNTY P.U.D. STANDARDS.

CONDUIT SPECIFICATIONS:

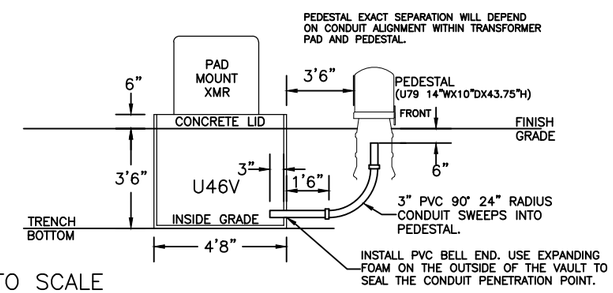
1. CONDUITS TO BE CENTERED AND ALIGNED TO PULL POWER CABLES DIRECTLY THROUGH KNOCKOUT ACCESS OPENING OF THE TRANSFORMER VAULT OR SWITCHING VAULT @ APPROXIMATELY 4" ABOVE INSIDE GRADE. PRIMARY CONDUITS SHALL ENTER AND EXIT @ OPPOSITE CORNERS OF VAULTS.

2. ALL MEDIUM HIGH VOLTAGE 36" RADIUS SWEEPS MUST BE MODIFIED TO EXTEND JUST ABOVE INSIDE GRADE @ TRANSFORMER VAULT OR SWITCH VAULT LOCATIONS.

3. USE GALV. STEEL SWEEPS OR FIBERGLASS FOR ALL PRIMARY CONDUIT.

U46V – PEDESTAL

SECTION DETAIL



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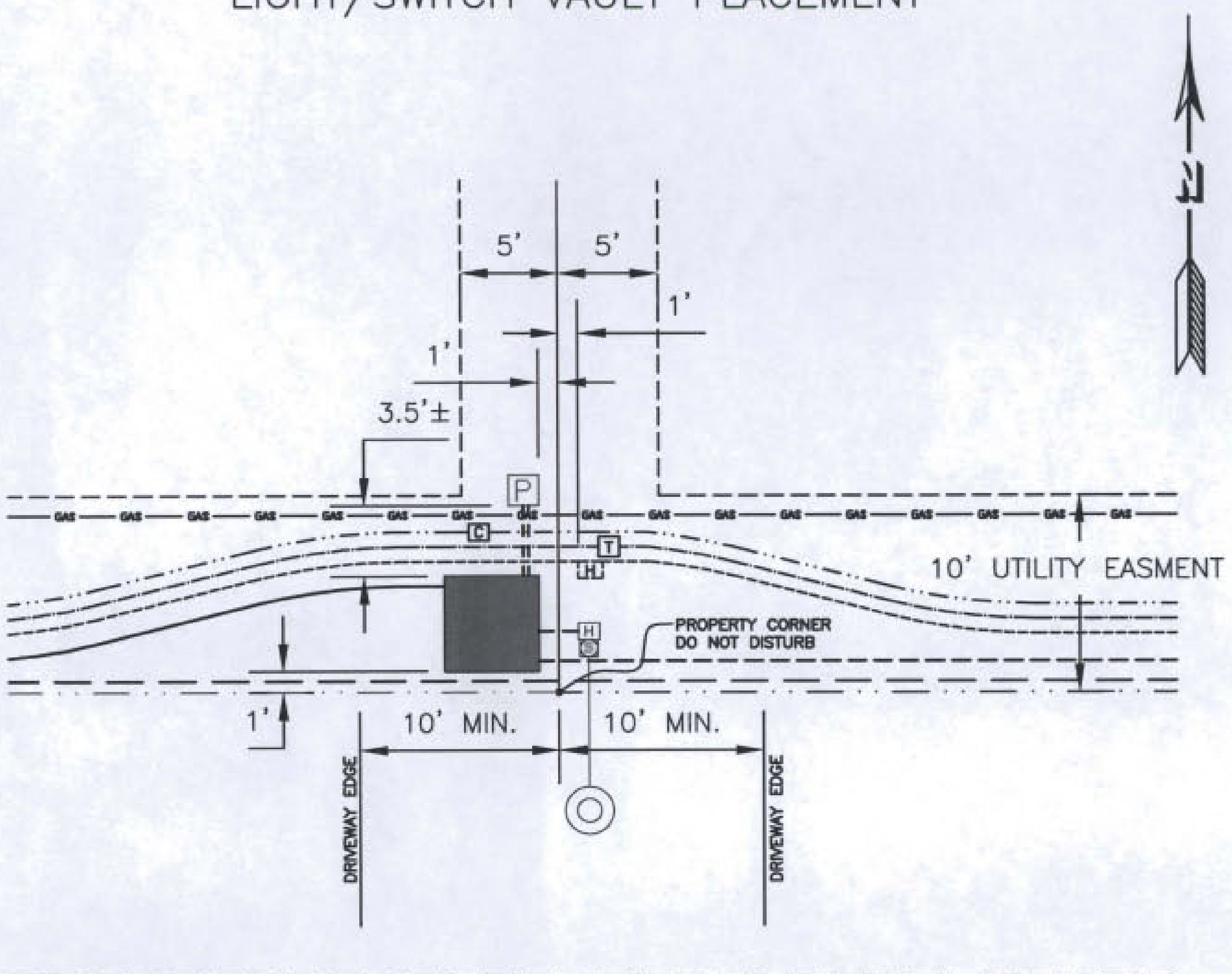
REV.	DESCRIPTION	DSN	CHK	ORG	APP1	APP2	DATE
3							
2							
1	PRELIMINARY New Drawing						
AO							/_/0_

TITLE
YELLOW BOOK
EXHIBIT DRAWING
DETAIL LAYOUT 2

PRELIMINARY
SUB-CATEGORY

CATEGORY		LAST FILE: 06/25/09	PLOT BY:	PLOT DATE:	
DGS FILE: EXHIBIT–DWG		SHT. # OF 10	PLOT SCALE	DWG SIZE B	
DESIGNER MAB	ORIGINATOR TCY	CHECKER TCY	DATE 04/07/09	SCALE	
DRAWING NUMBER EXHIBIT–DWG					

TYPICAL FIBER HAND HOLE/TRANSFORMER MOPED/STREET LIGHT/SWITCH VAULT PLACEMENT



GAS LINE
TELEPHONE, 4" PVC CONDUIT
CABLE, 2" PVC CONDUIT
FIBER OPTIC, 2" PVC CONDUIT
SECONDARY 3" PVC CONDUIT
STREET LIGHT, 2" PVC CONDUIT
SINGLE PHASE PRIMARY 2" PVC CONDUIT
THREE PHASE PRIMARY 4" PVC CONDUIT
PROPERTY LINE
UTILITY EASMENT
ROAD CENTER LINE
RIGHT OF WAY: RIGHT OF WAY LINE POSITION SHOWN VARIES WITH ROAD WIDTH.

U46V, TRANSFORMER PAD 4'8"SQX3'6"H W/OUT COVER
U54V, 1 PHASE SWITCHING VAULT 4'8"SQX3'6"H W/OUT COVER
U55V, 3 PHASE SWITCHING VAULT 6'LX4'WX4'H W/OUT COVER
U79, MO-PED 14"WX10"DX43.75"H
JU78, FIBER HAND HOLE 14"LX10"WX8"H
TELEPHONE PEDESTAL
CABLE PEDESTAL
STREET LIGHT & HAND HOLE

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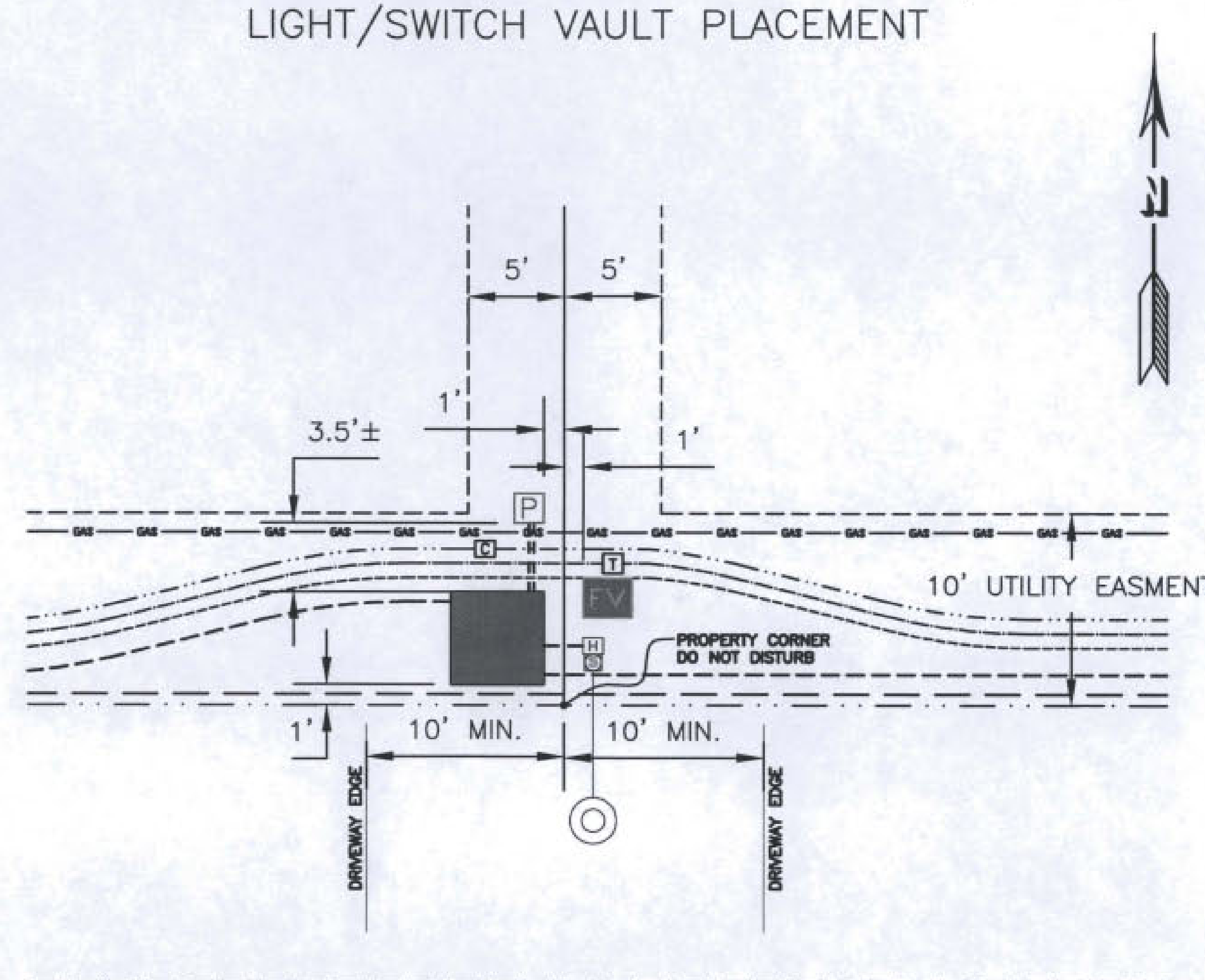
NOT TO SCALE

TYPICAL FIBER VAULT/TRANSFORMER MOPED/STREET LIGHT/SWITCH VAULT PLACEMENT



GAS LINE
TELEPHONE, 4" PVC CONDUIT
CABLE, 2" PVC CONDUIT
FIBER OPTIC, 2" PVC CONDUIT
SECONDARY 3" PVC CONDUIT
STREET LIGHT, 2" PVC CONDUIT
SINGLE PHASE PRIMARY 2" PVC CONDUIT
THREE PHASE PRIMARY 4" PVC CONDUIT
PROPERTY LINE
UTILITY EASMENT
ROAD CENTER LINE
RIGHT OF WAY: RIGHT OF WAY LINE POSITION SHOWN VARIES WITH ROAD WIDTH.

U46V, TRANSFORMER PAD 4'8"SQX3'6"H W/OUT COVER
U54V, 1 PHASE SWITCHING VAULT 4'8"SQX3'6"H W/OUT COVER
U55V, 3 PHASE SWITCHING VAULT 6'LX4'WX4'H W/OUT COVER
U79, MO-PED 14"WX10"DX43.75"H
J230, FIBER VAULT 48"LX42"WX32"H
TELEPHONE PEDESTAL
CABLE PEDESTAL
STREET LIGHT & HAND HOLE

NOT TO SCALE

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PRELIMINARY
New Drawing

YELLOW BOOK
EXHIBIT DRAWING
DETAIL LAYOUT 3

PRELIMINARY
EXHIBIT-DWG
MAB TCY 04/07/09 05/25/09 10 B
EXHIBIT-DWG

CIVIL LEGEND

- WATER SERVICE
- STORM DRAIN
- STORM DRAIN MANHOLE
- FIRE HYDRANT
- WATER VALVE
- WATER TEE
- 24"SD — 24" STORMDRAIN
- 18"SD — 18" STORMDRAIN
- 12"SD — 12" STORMDRAIN
- 8"W — 8"WATER LINE

LEGEND

- NEW SWITCH VAULT
- EXISTING SWITCH VAULT
- NEW SWITCHGEAR VAULT
- EXISTING SWITCHGEAR VAULT
- NEW TRANSFORMER
- EXISTING TRANSFORMER
- PEDESTAL
- NEW STREET LIGHT & HAND HOLE
- RIGHT OF WAY
- PROPERTY LINE
- PUBLIC UTILITY EASEMENT
- 2" SCH40 PVC CONDUIT
- 3" SCH40 PVC CONDUIT
- 4" SCH40 PVC CONDUIT
- 6" SCH40 PVC CONDUIT
- EXST. 1-PHASE POWER (IN CONDUIT)
- EXST. 3-PHASE POWER (IN CONDUIT)

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REV.	DESCRIPTION	DSN	CHK	ORG	APP'D	DATE
3						
2						
1						
A0	PRELIMINARY New Drawing					-/-/-

YELLOW BOOK
EXHIBIT DRAWING
ALL COMBINED LAYOUT

TITLE	
CATEGORY	PRELIMINARY
SUB-CATEGORY	
DSE FILE:	EXHIBIT-DWG
DESIGNER	MAB
DRAWING	TCY
CHECKER	TCY
DATE	06/07/09
LAST FILE	06/25/09
SHT #	10
PLOT SCALE	10
PLOT DATE	
PLOT BY	
DWG SIZE	B
DRAWING NUMBER	EXHIBIT-DWG

GCPUD CONSTRUCTION STANDARDS

CONDUIT STANDARDS FOR CUSTOMER WORKBOOKS

Standard Cable Conduit Design and Application

SCOPE

This Construction Standard is intended to point out the special requirements necessary for proper installation of rigid and polyvinyl chloride (PVC) conduit for underground primary medium high voltage (13.2 kV) and secondary low voltage (600 volt) cable installation. This Standard also includes limits of conduit runs and pulling tensions.

1. Electrical Plastic Conduit (EPC-40)
   a. PVC conduit (EPC-40) shall meet all requirements listed in NEMA Standard Publication TC 2, latest editions.

   b. PVC fittings shall meet the requirements of NEMA Standard Publication TC 3 latest editions for Schedule 40 dimensions.

   c. The solvent cement shall meet the requirements of ASTM D 2564 or it shall be in accordance with the conduit manufacturer's recommendations.

2. PVC Conduit Laying

   a. All PVC conduit and fittings to be joined should be exposed to the same temperature conditions for a reasonable length of time before assembly. PVC conduit can expand or contract about 1" to 1-1/2" per 100 feet for every temperature change of 20 degrees.

      Where a large difference between the temperature of the air and soil exists (air to damp trench), consideration should be given to making tie-ins at both manholes or vaults after the conduit bank has been covered a few hours in order to obtain a permanent connection to the manhole or vault.

   b. PVC conduit entrance into manholes or vaults shall be horizontal for a length of 10' prior to being grouted into the inside wall of the manhole or vault. All PVC conduit shall be grouted on entrance to concrete manholes or vaults and end bells installed.

   c. Where sidewall-bearing pressure will exceed 600 pounds, PVC or steel sweeps shall be concrete encased to a point 12 inches beyond the ends of the sweep couplings.

3. Cutting, Conduit and Preparing the Joint

   a. Cutting the conduit square is important to insure a maximum bonding surface and to avoid a gap where the end meets the shoulder of the fitting. A fine - tooth saw shall be used to cut conduit (i.e. hacksaw for conduit 2 inches or less, wood saw for conduit greater than 2 inches). The conduit must be cut straight and cleaned of burrs.

   b. Remove the burrs left by sawing with a knife or file. Remove all sharp edges on the O.D.

and I.D. of the cut with a knife, file or other beveling tool to prevent possible injury to hands during handling and to prevent damage to cable during pulling. If burrs are not removed, inferior joint may result.

c. Using a clean rag, wipe the pipe surface and fitting to be joined. Manufacturers in the process of belling pipe use a silicone release agent on the belling plug, and a residue of this agent can remain inside the bell. This must be removed in the cleaning process.

d. Assembly of a cemented joint should be completed within 15 seconds after application of cement. Initial bonding begins immediately when the cement coated joint surfaces are in position.
If there is any sign of drying of the cement surfaces prior to assembly, precoat the duct spigot with a heavy even coat of cement and IMMEDIATELY, while cement is still wet, insert the spigot into the socket.

4. Conduit Selection

a. The selection of a duct or conduit size for use with a given conductor size is influenced by a number of factors: duct fill, jamming ratio, side pressure, pulling tension, and friction.

TABLE 1. MAXIMUM CONDUIT FILL (SCHEDULE 40)

Conduit Size (Inches)	Inside Diameter (Inches)	1 Cable 53% fill (inches/sq)	2 Cables 31% Fill (inches /sq)	3+ Cables 40% Fill (inches/sq)
1.0	1.049	0.458	0.268	0.346
2.0	2.067	1.778	1.040	1.342
3.0	3.068	3.918	2.292	2.957
4.0	4.026	6.747	3.946	5.092
6.0	6.065	15.312	8.956	11.556

For all sizes, combinations, and types of cable (except lead covered) to be installed in conduit, total cross sectional area taken by cables, including insulation, is not to be greater than the area specified in the table above.

Cable Fill:

Example: 3 each 1/0 primary cable. Diameter of 1/0 primary cable = 1.17 inches.

Area = $\pi (1.17/2)^2 = 1.0746$

3 Cables = 1.0746 x 3 = 3.22 square inches.

In Table 1, select column with 3 or more cables 40% fill. The 3" conduit exceeds the 40% fill so 4" conduit is selected.

- Low-voltage circuits in 4 inch conduit 36" radius
- Primary circuits in 2 or 4 inch conduit 36" radius
- Feeder circuits in 6 inch conduit 48" radius
- Individual feeder phases in 3 inch conduit 36" radius

5. Conduit Sweep Bends: Use of rigid steel elbows are required for all ends where conduit extends more than 150 feet in length or contains more then two (2) 90° bends installed by the customer and one (1) bend installed by the District. Total bends in a 150 feet conduit run shall not exceed 270° for the Schedule 40, gray PVC elbow usage.

c. Conduit Termination:

When installing Schedule 40 sweeps for primary and feeder cable at manholes, pull boxes, transformer box pads or transformer pads, a short section (minimum 8 inches) of conduit shall be installed on the end of each sweep to facilitate the use of (fit) the cable blowing (plug) tool. A short straight section of conduit is also required whenever an expandable plug or a "conduit and cable seal plug" is required.

All direct buried conduit to be terminated in the walls of a manhole, pull boxes, shall be approximately perpendicular to the walls and shall be grouted into the walls. After conduits have been properly aligned and terminated, proper compaction shall be attained to prevent shear stress on the conduit(s) at the point of entrance to the manhole or concrete handhole. Conduit(s) shall be terminated into manufacturer installed duct terminators or end bells.

Conduit installed through a building wall or into a customer's vault shall be sealed (before and after the cable has been installed) internally and externally against the entry of noise, moisture and gas into the building or vault. After pulling primary or feeder cable into conduit, the conduit ends shall be sealed using foam Duo Fill 400 plastic filler.

Where cables exits a buried conduit sleeve or sweep, the cable shall be protected from the sharp conduit edge by chamfering the inside edge of the conduit sleeve or sweep and installing a cable leader guard (bell end). All exposed conduit ends shall be "covered" at the end of each work day to ensure a clean conduit run.

Stub outs or other exposed (above grade or not buried and not inside a locked enclosure) conduit ends that provide access to energized equipment shall be "glued and capped" unless construction crews are present. Conduit plugs (non-expandable type) shall be installed at all buried conduit stub-outs. Expandable conduit plugs shall be installed at all other newly installed conduit ends except where conduit is required to be "glued and capped".

When a contractor leaves a conduit system (for more than one day) in which "others" will be responsible for installing the cable, any conduit ends left exposed shall be "primered, glued and capped" and conduit ends which are not exposed shall be sealed with expandable conduit plugs.

Jamming Ratio:

Conduit I.D./Cable O.D. (Cable O.D for 1 cable)

- Check jamming ratio: 4.026/1.17 = 3.44. **Jamming not likely...use 4" conduit.**
  If Jamming Ratio is between 2.8 and 3.0 Jamming is probable and a larger size conduit is needed.

Sidewall Load Pressure:

Is the radial force exerted at a bend when cable is being pulled around a bend or sheave? Exceeding the maximum sidewall load may subject the cable to crushing damage. See Table 2 for sidewall bearing pressure.

TABLE 2. MAXIMUM PULLING TENSION LIMITS, EPR 133% INSULATION

Cable Size	Cable O.D (Inches)	Conductor Grip		Basket Grip		Sidewall Bearing Pressure	
		Maximum Tension (lbs)		Maximum Tension (lbs)		Maximum (lbs)	
		Single Cond.	Three Cond.	Single Cond.	Three Cond.	Single Cond.	Three Cond.
1/0	1.17	850	1,650	850	1,000	500	1,000
4/0	1.32	1,700	3,400	1,000	1,000	500	1,000
350	1.50	2,800	5,600	1,000	1,000	500	1,000
750	1.96	6,000	10,000	1,000	1,000	500	1,000
1000	2.15	6,000	10,000	1,000	1,000	500	1,000

b. Guidelines for Conduit Sweeps:

1. **PVC Sweeps:**
   All PVC sweeps shall be factory bent. Heating and bending of conduit is **prohibited.**

2. **Steel Sweeps**:
   All steel sweeps and fittings shall be hot-dip galvanized. All steel sweeps shall be manufactured with an extrusion process.

3. **Flex Conduit Sweeps**:
   Shall not be used except where specified for street lights.

4. Standard Radii for PVC and Steel Sweeps: The following standard radius sweeps are required as follows:

   • Low voltage circuits in 2 and 3 inch conduit 36" radius
   (**Exception:** 24" sweep will be allowed to enter a secondary pedestal or other equipment where a 36" sweep will not allow the pulling of cable.)

When a contractor leaves a conduit system temporarily (for more than one day) but is also the responsible party which must later install the cable, then the conduit system can be plugged or can be primered, glued and capped at the contractor's discretion.

Where the Customer installs service conduit prior to the existence of District facilities and thus cannot complete the required connection (tie) to District facilities, the last 8 to 10 feet of the customer installed service conduit shall be left exposed and plugged, to facilitate the later connection to District facilities. Empty conduits which have been stubbed out by District for future attachment to customer may be located and exposed by the customer performing the attachment, provided there are not other District facilities within 2 feet and provided the clearance requirement from poles and anchors are met. To avoid misalignment of conduits when attaching to existing stubbed service conduit, the existing stubbed conduit ends should first be located to determine depth, then adjust the trench depth (if necessary) while trenching towards the service entrance section.

In direct-buried conduit systems, concrete encasement of conduit sweeps is required wherever the sidewall bearing pressure exceeds 600 pounds. The encasement shall be a minimum of 3 inches thick surrounding the sweeps and shall extend 12 inches beyond the sweep couplings.

Trenches shall be compacted to a minimum 85 percent of the maximum density as defined by AASHTO T99 or ASTM D 698 or ASTM D 2922 and D 3017, unless otherwise specified on the work order drawings or unless more stringent requirements prevail as dictated by local governmental agencies or other public regulatory agencies.

d. Compaction Methods:

1. See District Construction Standard No. 10.0010.

2. Inspection and Inventory of Buried Units:

Before backfilling, the contractor and District shall jointly inspect all trenches, conduit, cable placement, risers, pedestals transformer box pads and other construction not accessible after backfilling, and an inventory of units shall be taken. If corrections are required, a second inspection shall be made after completion of the changes.

8. Fiber Optic Duct.

a. Fiber conduit will conform to the previous conduit standard with the following exceptions:
1. Fiber conduit will be orange in color

2. Fiber feeders will be 2"

3. Fiber service drops will be 1"

Section Number 10.0008

TRENCH CONSTRUCTION, PVC CONDUIT

1. SCOPE:

This specification covers trenching, trenching location in reference to other utilities, conduit location within the trench, backfill and compaction of backfill.

2. STANDARDS:

This specification includes reference to the following "*The American Society for Testing and Materials International*" (ASTM International) standards.

2.1. Soil Compaction:
ASTM D 698.00a Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort 12,400 ft.-lb/ft cubed.

2.2 Soil Classifications for Backfill:
ASTM D 2487-00 Standard Practice for Classifications of Soils for Engineering Purposes. (Unified Soil Classification System)
ASTM D 2488-00 Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)

3. TERMINOLOGY:

3.1. Trench: Excavation for placement of individual conduits or duct systems for electrical and/or communication services.

3.2. Backfill Area: Area of trench backfilled in three zones- 1) Foundation 2) Embedment 3) Final Backfill Zone.

3.2.1. Foundation: Used only where the trench bottom is unstable or a material that does not compact. Additional compacted material may be added to make a secure base.

3.2.2. Embedment: Compacted material placed below, around and above the conduit/duct system to provide support and protection for the conduit/duct system..

3.2.2.a. Bedding: Material placed on the trench bottom or on foundation to provide uniform support and protection for the conduit(s)

2.2.2.b.Conduit Zone: Material placed on either side of the conduit and/or between ducts. This material prevents lateral displacement of the conduit/duct due to live loads or water infiltration.

3.2.2.c.Spring Line Cover: Six inches of material placed above the top of the

conduit/duct system. This material provides protection for the conduit duct system from final backfill and/or live loads imposed on the trench.

3.2.3. Final Backfill: Trench area that extends from the top of the 6 inch cover to the top of the trench. Material here is native soil, unless the material contains cobbles or boulders over 4 inches in diameter.

3.3. Spring Line: The top of a single conduit or highest duct in the trench with more than one conduit.

3.4. PVC Conduit: Polyvinylchloride (PVC) conduit used for single conduit runs or duct systems. PVC conduit for electric systems will be grey. PVC conduit for fiber optic system shall be orange.

3.5. Definitions: This standard includes the definitions in ASTM 2487 and 2488, Section 3 "Terminology."

4. BACKFILL MATERIALS:

General: All backfill materials are defined in ASTM 2487 & 2488, Section 3 'Terminology.' All backfill used in any trench shall be organic-free material. This includes organic particles and larger organic debris.

4.1. Foundation Materials:
This material shall be compactible material such as gravel, sand, silt or clay or a mixture of those materials. Nothing larger than 1 inch minus gravel/aggregate shall be used. See ASTM 2487 & 2488, Section 3 "Terminology," 3.1.2 "Gravel" (subsection "fine")

4.2. Embedment Zone Materials:
Material in all three areas, bedding, conduit zone and cover, shall be sand, silt or clay material. Material shall pass a number 40 sieve but does not have to pass a number 200 sieve. Clay or Silt materials are defined as *fine grained top soil or soil free of any gravel, rock or rock chips.* See ASTM 2487 & 2488, Section 3 "Terminology," 3.1.1 "Clay" & 3.1.7 "Silt."
Sand is defined as *fine particles of rock, common reference "blow sand".* See ASTM 2487 & 2488, Section 3 "Terminology," 3.1.6 "Sand" (subsection "fine")

4.3. Final Backfill Zone Materials
This material can in most cases be native soil/rock excavated from the trench. However if this material contains cobble/boulders larger than 4 inches in diameter it shall not be used.

5. CONSTRUCTION LOCATION/DIMENSIONS:

5.1. Location: The trench shall be within the easement granted to the District. The trench shall not be closer to other utilities than described below.

5.1.1. Water Lines: The electric trench shall be a minimum of 18 inches horizontally from any water line at any elevation.

5.1.2. Gas Lines: The electric trench shall be a minimum of 10 feet horizontally from any gas transmission line and 18 inches horizontally from any gas service line.

5.1.3. Sewer Lines: Where the sewer line is at or above the electric line elevation the horizontal separation shall be a minimum of 24 inches. If the sewer line is at a lower elevation than the electric line the trench shall be a minimum of 36 inches horizontally from the sewer line trench.

5.1.4. Communications: Communication lines, other than the District's fiber optic cable, shall be located no closer to the primary or secondary electric lines than 12 inches. This is a radial measurement of 360 degrees.

5.2. Width:

The minimum width of an electrical trench shall be 24 inches for a single conduit up to 4 inches in diameter. (See Figure # 1 in Section 7 under 7.1 Cross Section Dimension on page 5 of 6.} Trenches for conduit larger than 4 inches in diameter or with more than one conduit shall be determined by the conduit(s) placement in the trench. Minimum trench width shall be 5 times the diameter of a single conduit or 24 inches. (Which ever is larger).

5.3. Depth:

The minimum depth of an electrical service trench shall be 36 inches for primary power, 30 inches for secondary power, and 36 inches for fiber optic cable. This depth shall be measured from the top of the conduit (Conduit Spring Line). The trench must be deep enough to place the foundation (if required) and bedding so the entire diameter of the conduit is below minimum grade. (Exceptions to this must have prior District approval and be installed as shown in this Standard. See Figure # 2 in Section 7 under 7.2 Concrete Encased Conduit on page 6 of 6.)

5.4 Backfill:

5.4.1 Foundation: Foundation where required shall be a minimum of 2 inches of compacted material. Foundation backfill does not need to be continuous provided compaction & cable protection is achieved.

5.4.2 Bedding: Bedding shall be a minimum of 2 inches continuous compacted material and shall be constructed so the conduit is in contact with the bedding at all times.

5.4.3 Conduit Zone: Conduit Zone depth shall be determined by the diameter of the conduit. The conduit zone shall be from the bedding to the spring line of the conduit and shall consist of material compacted along each side of the conduit. The material shall be

installed so there are no voids along the bottom sides of the conduit. Filling these voids shall be accomplished by shovel slicing, water compaction or other standard method.

5.4.4. Six Inch Cover: Cover zone shall be a minimum of 6 inches of compacted material.

5.4.5. Final Back Fill Zone: The final back fill zone shall restore the trenched area to the original contours with compacted native or barrow fill.

6. COMPACTION:

6.1. General Compaction:
All trench materials shall be compacted to 95% compaction. Compaction can be achieved by water, vibration or mechanical means. All material shall be compacted in 6 inch layers or as per ASTM D 698.
See ASTM D 698 for full requirements.

6.2. Zone Required Compaction:

6.2.1. Trench Bottom/Foundation: The trench base shall be compacted if excavated with a back hoe. All rake ridges shall be compacted or removed to undisturbed soil. If full or partial foundation is required it shall be added in minimal lifts and compacted to 95% compaction.

6.2.2. Bedding: The compacted (95%) two inches of bedding shall form a smooth pipe bed for uniform support of the conduit.

6.2.3. Conduit Zone: The compaction of the conduit zone shall be done in a manner that shall not damage or compress the conduit. Compaction shall be a minimum of 95%, as required.

6.2.4. Six Inch Cover: The conduit cover zone shall be in one lift and compacted to 6 inches @ 95% compaction.

6.2.5. Final Backfill: Final backfill requirements shall be determined by the material used and the land use over the trenched area. Compaction shall be a minimum of 95% with lifts that shall not exceed 8 inches regardless of the material employed as backfill.

6.2.5.1. Landscaped Areas: Any landscaped area shall be restored with acceptable top soil or native fill.

6.2.5.2. Parking Lot/Street: Any material and compaction under lots and/or streets shall be determined by the governing agency/owner.

6.2.5.3. Sidewalks/Curbs/Retaining Walls: Native fill shall be replaced with either 5/8 or 3/4 inch minus material that is compacted to full density.

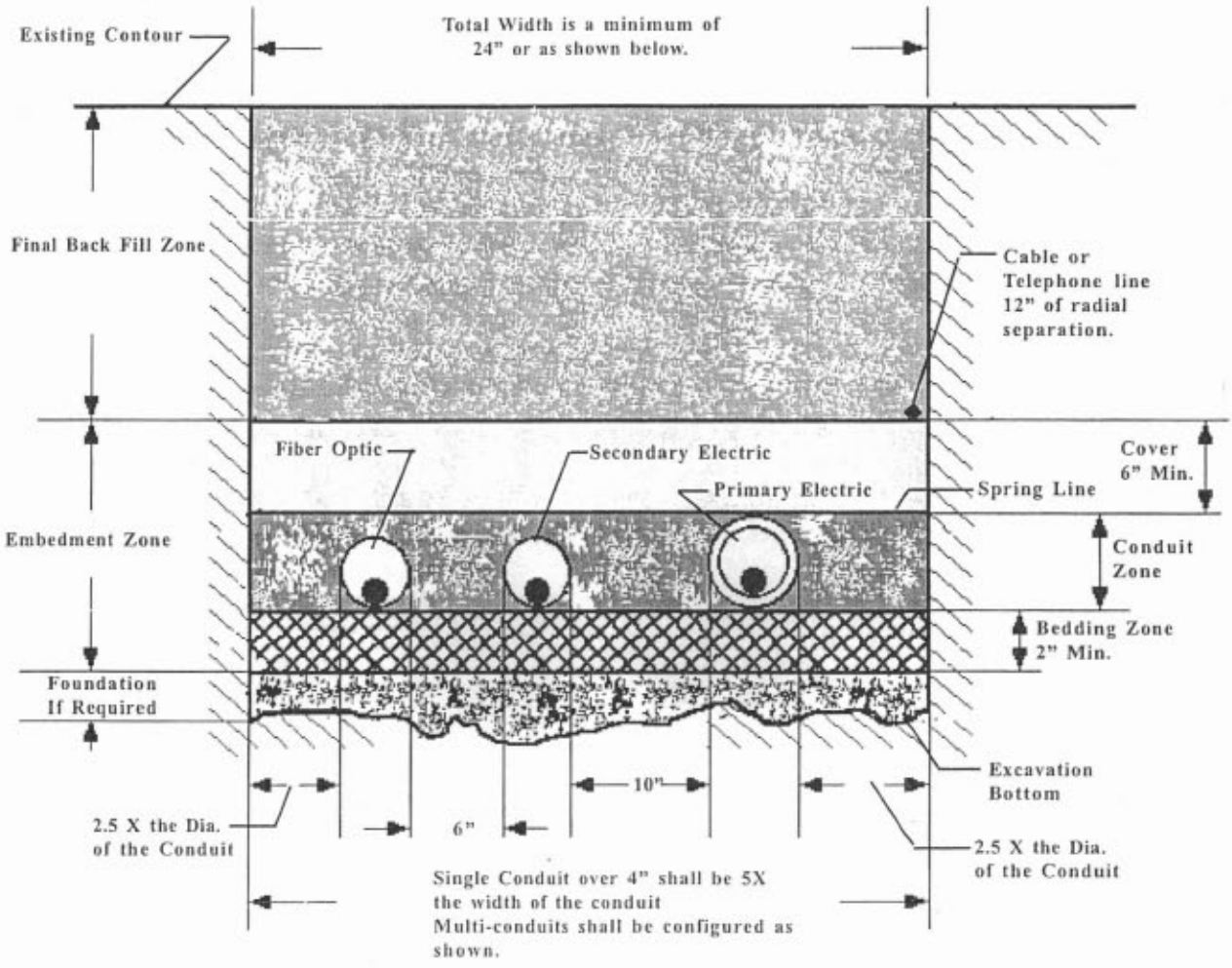
TRENCH CONSTRUCTION, PVC CONDUIT

7. DRAWINGS/DIAGRAMS/ILLUSTRATIONS

Figure #1 below is a typical trench layout cross sectional view showing the various zones and minimum required dimensions.

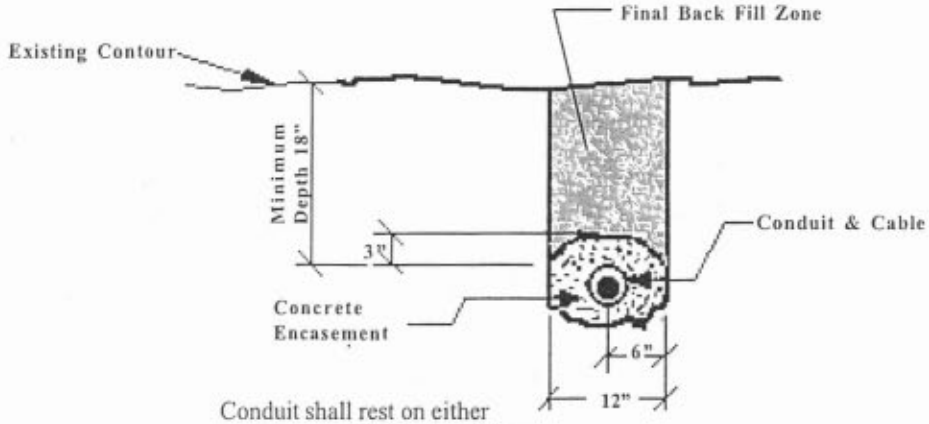
Figure #2 on page 6 of 6 is a cross section view of a concrete encased conduit. This method of reduced clearances is acceptable only with approval of District Staff.

7.1 Figure # 1 Cross Section Dimension:



TRENCH CONSTRUCTION, PVC CONDUIT

7.2 Figure #2 Concrete Encased Conduit



Conduit shall rest on either concrete or suitable foundation.
Concrete encasement shall be a 4 sack cement mix.

Notes:

1. Gas Transmission Lines require 10 feet of separation.
2. Horizontal Separation: Water/Gas Service lines must be a minimum of 18 inches from electric primary and secondary conductors.
   Secondary conductors must be a minimum of 6 inches from primary conductors
   Sewer shall be separated as per instruction in Section 5.1.3 of this document.
3. Radial Separation TV/Tele-Cable must be a minimum of 12 inches from primary and secondary conductors.
4. The District fiber optic conduit must be a minimum of 6 inches from the electric primary and secondary coductors and have a minimum radial seperation of 12 inches from foreign cable/telephone utilities.

Section Number 10.1130

CONCRETE TRANSFORMER BOX PAD INSTALLATION

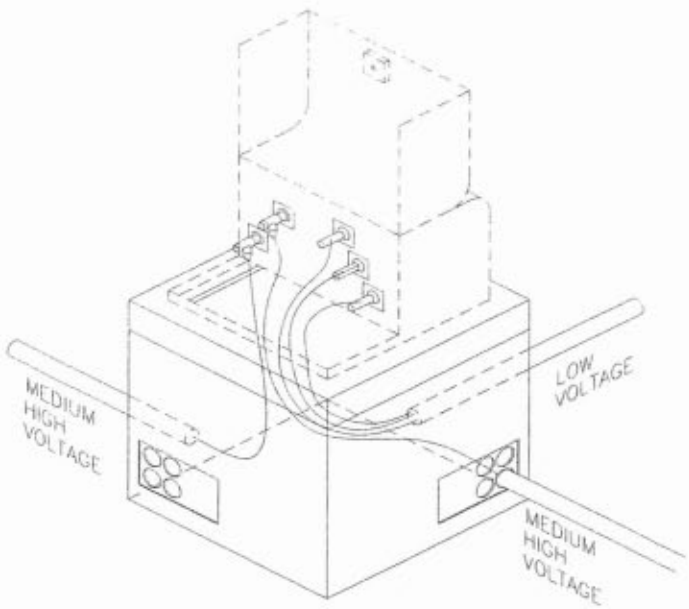
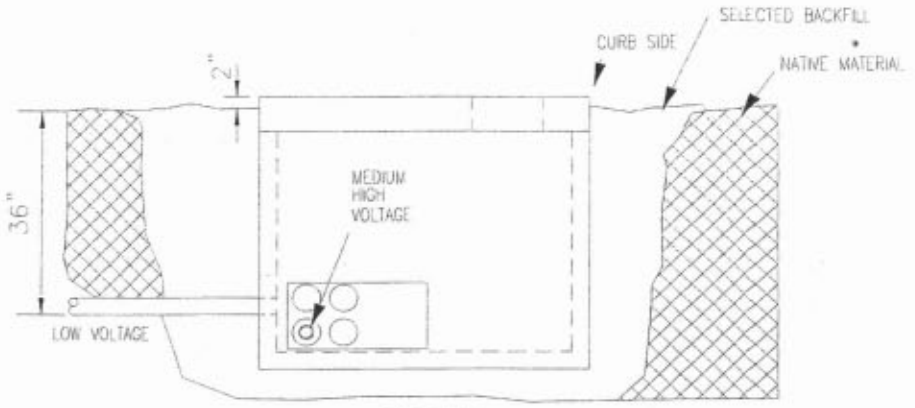


Figure 1. Concrete Transformer Vault (typical installation):

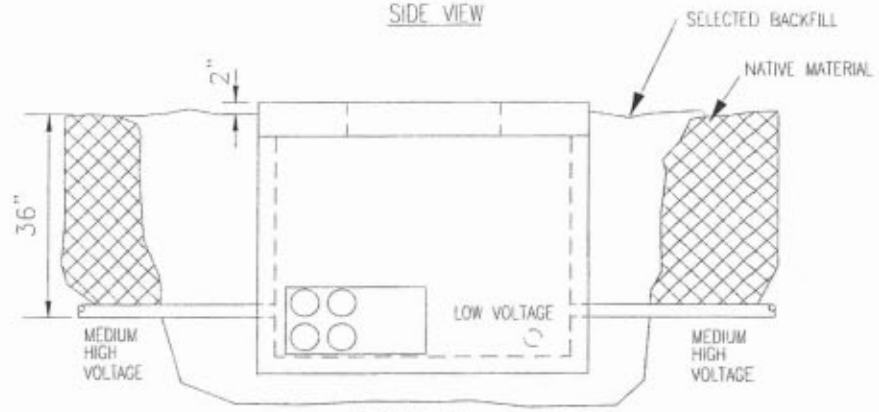
- All disturbed soil beneath the transformer vault shall be compacted.
- The bottom of the transformer box pad excavation shall be set level utilizing final grade.
- Backfilling shall not be performed until inspected and approved by Grant County PUD to ensure installation requirements have been met. Grounds, if necessary, shall be installed before backfill.
- Conduit, vault, and duct system shall not be displaced during backfilling and compaction.
- Conduit entering transformer box pads shall be supported in their proper position during backfill and compaction.
- The conduit for medium high voltage cable shall be positioned as indicated in the figures. Conduit for low voltage should be positioned to avoid cable pulling conflicts with the high voltage conductor and bushings.
- Developer shall be responsible for the replacement of any disturbed property corner pins. Property corner pins shall not extend more than 18 inches below final grade.
- Conduit shall be terminated as specified in the District's Conduit Specifications.
- Minimum clearance requirements and terrain limitations surrounding the transformer vault site should be 8 feet in front of the transformer and 3 feet to the sides and back .
- Primary distribution cable/conduits system identification shall be installed.

Section Number 10.1130

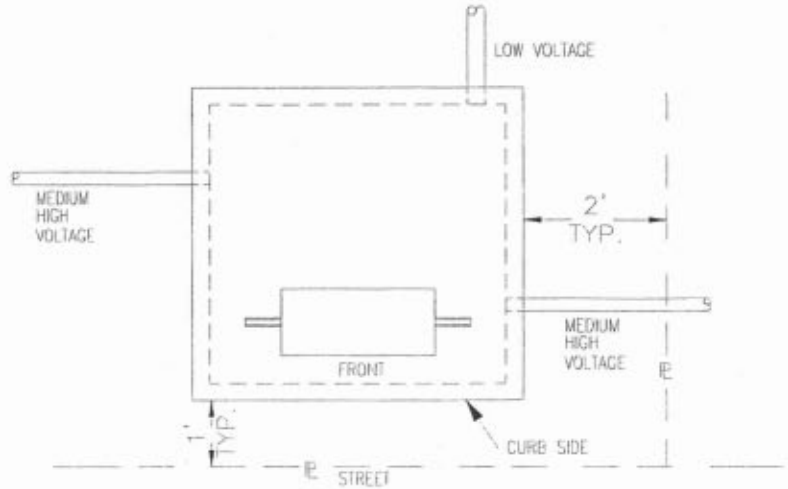
CONCRETE TRANSFORMER BOX PAD INSTALLATION



SIDE VIEW



FRONT VIEW



PLAN VIEW

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT COUNTY, WASHINGTON				
CONSTRUCTION STANDARDS				
STANDARDS COMMITTEE APPROVAL DATE:	05/24/01	Title: CONCRETE TRANSFORMER BOX PAD INSTALLATION		10.1130
DESIGNER:	AJW			
STANDARDS ENGR:	E WENKE	LAST REV.	04/23/09	Page 2 of 2

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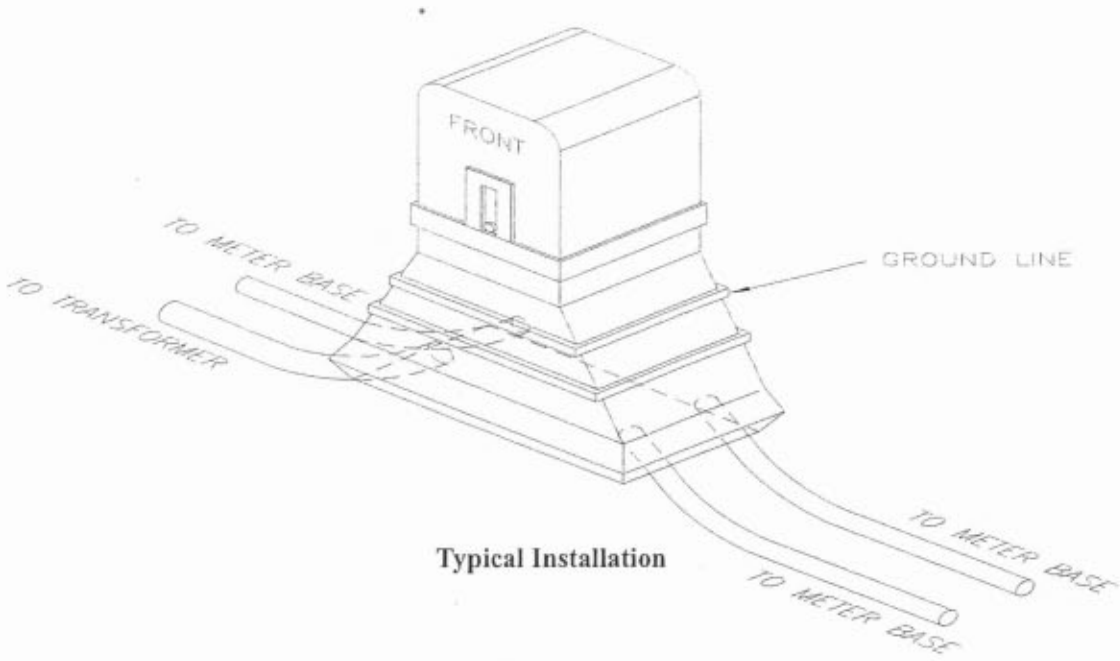
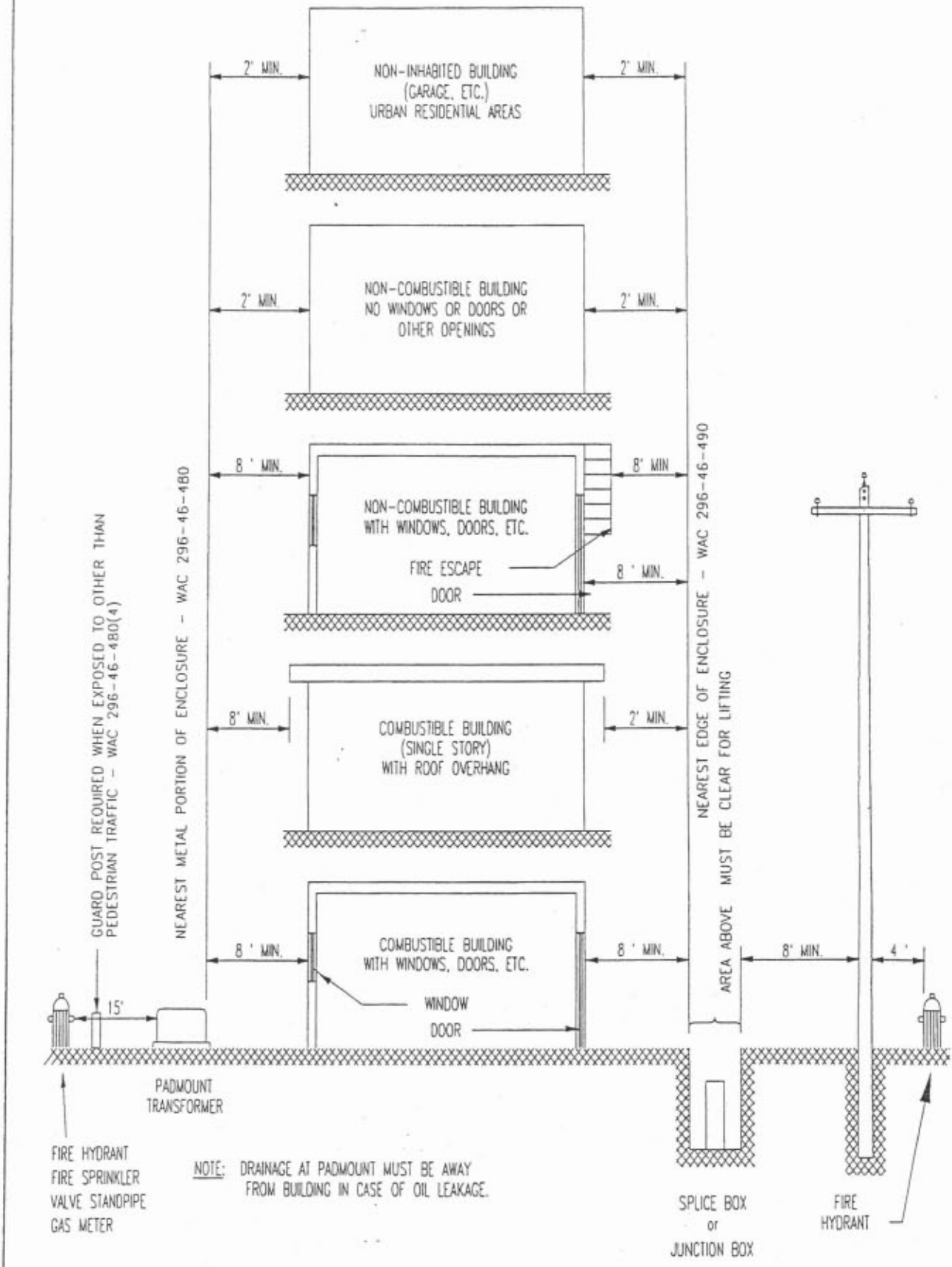
Section Number 10.1140

SECONDARY PEDESTAL INSTALLATION



Typical Installation

- All disturbed soil beneath the secondary pedestal shall be compacted.
- The bottom of the secondary pedestal shall be set level utilizing final grade.
- Backfilling shall not be performed until inspected and approved by Grant County PUD to ensure installation requirements have been met.
- Conduit , vault, and duct system shall not be displaced during backfilling and compaction.
- Conduit sweeps into secondary pedestals shall be supported in their proper position during backfill and compaction.
- Developer shall be responsible for the replacement of any disturbed property corner pins. Property corner pins shall not extend more than 18 inches below final grade.
- Conduit shall be terminated as specified in the District's Conduit Specifications.
- Minimum clearance requirements and terrain limitations surrounding the secondary pedestal site should be 8 feet in front of the transformer and 3.5 feet to the sides and back .
- Low voltage distribution cable/conduits system identification shall be installed.



PUBLIC UTILITY DISTRICT OF GRANT COUNTY	TITLE CLEARANCES-PADMOUNTS AND VAULTS FROM BUILDINGS AND POLES	DESIGNER Linda Lynn	Last File: 01-27-97	19.0010
		STANDARDS ENGINEER:		
		OPERATIONS ENGINEER:		

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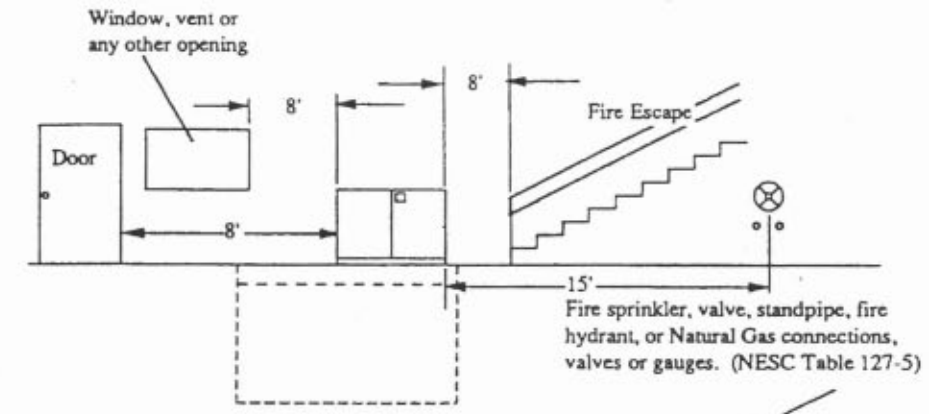
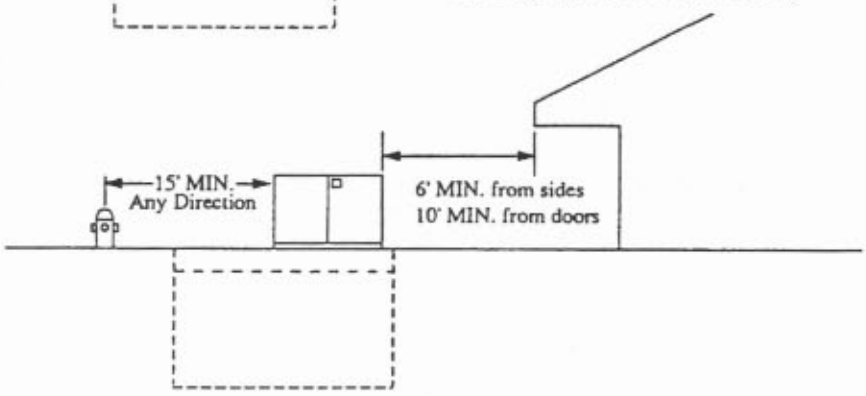
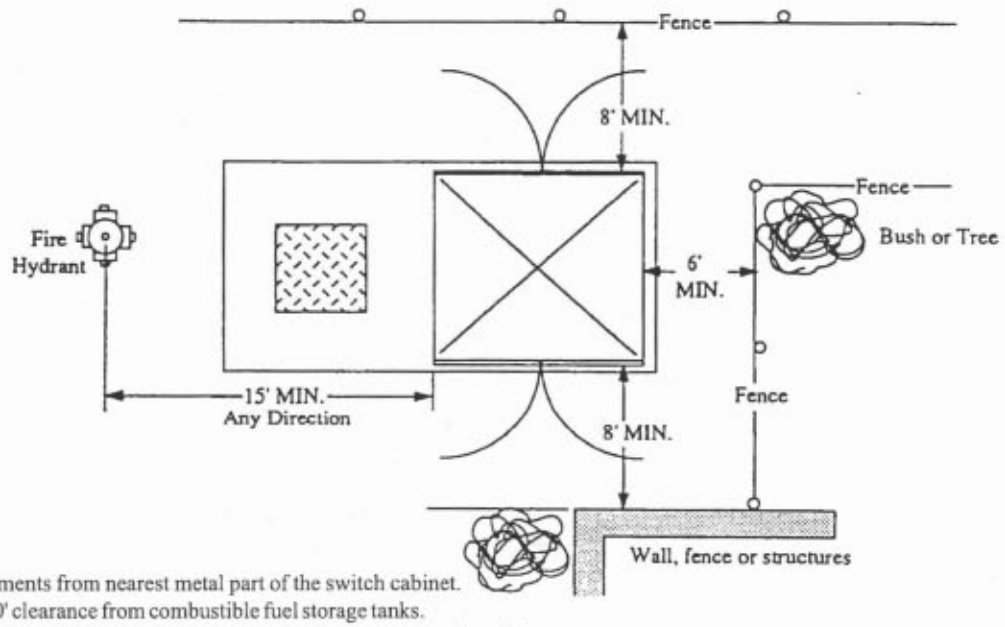
Section Number 19.0010

CONDUCTOR CLEARANCES FROM BUILDINGS (NOT ATTACHED)







NOTES:

1. All measurements from nearest metal part of the switch cabinet.
2. Minimum 20' clearance from combustible fuel storage tanks.
3. Padmount equipment shall be not more than 15' from access road or driveway.
4. Landscaping which does not interfere with operation and maintenance of the switch cabinet is allowed.

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON

CONSTRUCTION STANDARDS

STANDARDS COMMITTEE APPROVAL DATE:	1/27/97	**Title: CONDUCTOR CLEARANCES FROM BUILDINGS (NOT ATTACHED)**		**19.0010**
DESIGNER:	AJW			
STANDARDS ENGR:	x/x/xx	LAST REV.	8/21/01	

Section Number 17.0000

ROADWAY LIGHTING

1. SCOPE

The principal purpose of roadway street lighting is to produce quick, accurate, and comfortable seeing at night. These qualities of seeing combine to safeguard, facilitate, and encourage vehicular and pedestrian traffic.

2. DESIGN

Design of roadway street lighting shall be based on the I.E.S. Lighting Handbook. Construction and wiring shall meet all the requirements of the NESC and Washington State Department of Labor and Industries code. The NESC shall be the ruling code.

3. STREET LIGHTING LUMINARIES

The following schedule outlines the District's High Pressure Sodium (HPS) sizes and types:

Size Watts	Ballast Rating (Volts)	Lumens		Ballast Types
		Initial	Mean	
150	120	13,000	14,400	Reactor HPF
200	120	22,000	19,800	Reactor HPF
400	120-277	50,000	45,000	Variable Tap

Luminaires are installed for use with individually-controlled (with PE control) or group-controlled (with PE control) relays. Individually controlled luminaires are equipped with a twist-lock receptacle for photoelectric control installation. Group controlled luminaires use a photoelectric control receptacle shorting block and using a photoelectric control operated multiple control relay (used for decorative lights only).

Luminaires operate on the following voltages: 150 and 200 watt units use 120 volts. 400 watt units use 120 through 277 watts.

4. LAMPS

New High Pressure Sodium (HPS) vapor lamps shall be of the type: Clear, Non-Cycling, High Pressure Sodium Vapor, 150 watt, 200 watt, 250 watt and 400 watt.

High Pressure Sodium Vapor lamps are intended to be group replaced once every four years due to lamp tolerances. When a High Pressure Sodium lamp reaches the end of life and starts to cycle, the lamp short cycle will damage the luminaire ballast and will result in total unit replacement.

All lamp bases are imprinted with numbers and letters for date coding purposes. Date coding is done by scratching one letter which represents "the month installed" and one number which represents "the year installed." Should the lamp failure occur within one (1) year of installation, the lamp shall be returned to the District's Warehouse for warranty replacement by the manufacturer.

Example: Date Coding of Lamps. The letters are arranged to correspond to the months of the year and the numbers are used to indicate the last digit of the year of installation. Month - September = S, February = F, December = D, Year - 1994 = 4, 1995 = 5....etc.

5. INSTALLATION OF LAMPS IN THE FIELD

All lamps shall be date coded, at the time of installation, by scratching the appropriate letter and number with a screwdriver to indicate the month and year installed.

6. REMOVAL OF LAMPS IN THE FIELD

All lamps removed from service shall be returned to the District's Warehouse locations for inspection and proper disposal by the Warehouse.

All lamp failures within the one (1) year of the original date of installation as indicated by the marks on the lamp base shall be reported to the District's Purchasing Agent for warranty replacements.

7. STREET LIGHTING LIGHT PATTERNS

District Standard is I.E.S. Type III.

8. CIRCUITS AND THEIR APPLICATION:

Various types of street lighting circuits and combinations exist on the distribution system. Since these circuits and their associated switching components vary, it will be necessary to analyze each circuit for the most practical solution. Group controlled systems will be removed where possible.

8.1. Application of Multiple Systems:

8.1.1 Individual Photocell Control: For new installations of luminaires on either distribution line poles or on steel poles, that can be supplied by individual service drops, the standard photoelectric control system shall consist of multiple luminaires with individual photocell control.

8.1.2 Group Controlled Systems: The group-multiple installation is intended primarily for supplying groups of luminaires by means of multiple circuits extending from luminaire pole to luminaire pole. Group controlled system are only approved for decorative street light circuits.

8.2 Photocell Cell (Photoelectric Controls):

8.2.1 Photoelectric controls are designed to see the light from one direction only and should be installed so that the window faces approximately North. This is important as direct exposure to the sun will damage the light cell.

8.2.2 Should installations be encountered where existing signs, etc., interfere with proper operation of the photoelectric control, the unit may be rotated slightly to position the window away from the source of light to provide proper operation.

9. POLE SELECTION GUIDELINES

The District standard for lighting poles include either a Wood distribution line pole, direct buried steel pole, or a concrete anchor base steel pole.

9.1 District Assembly Units describe the bill of materials and types of lighting equipment for installation on lighting poles.

9.2 A lighting pole or standard must support the weight of the equipment mounted on it and at the same time be able to withstand the effect of the maximum velocity winds to which it will be subjected.

9.3 Steel poles or standards as purchased are designed to withstand dead loads and theoretical dynamic loads developed by 100 mph winds with a 1.3 gust factor.

10. MAST ARM STEEL BRACKETS

Overhang distance of luminaires to the lighting surface is measured from the curb when installing Anchor Base steel poles or standards. A street/roadway overhang minimum of four (4) feet is recommended for business and residential traffic.

10.1 Distribution line wood poles being considered for pole bracket and luminaire installation shall have minimum roadway overhang distance of three (3) feet.

10.2 The standard mast arm for mounting of street lighting luminaires on wood poles is the "Upsweep" type mast arm. The following kinds are available for use with high pressure sodium vapor street lights:

10.2.1 The Cantilever Type (no tie rods).
10.2.3 The Double-Guy Type (two tie rods)

11. GROUNDING

Mast Arm Steel Brackets and Steel Poles/Standards shall be grounded to meet NESC requirements.

11.1 A ground rod shall be furnished and connected to all Steel Poles/Standards and shall have a grounding lead of no less than No. 6 copper strand wire from the ground rod to the steel pole ground connector. The equipment ground shall also terminate at the steel pole ground connector

11.2 Mast Arm Steel Brackets installed on distribution line wood poles shall be grounded and have the mast arms connected to the system neutral and pole grounds. Mast Arms mounted on wood poles without distribution system neutrals shall have an equipment ground connection with pole ground and one (1) ground rod assembly.

12. FUSING

Individual luminaire ballast types shall be fused. In addition, underground street lighting circuits shall be fused at the padmounted transformer or riser pole if being served from an overhead circuit.

12.1 Group Controlled Systems shall be protected with photoelectric controlled multiple pole relays, and with either 30, 40 or 60 ampere rated circuit breakers.

13. WIRING

The individual conductors or street light wiring shall have the "UL" testing laboratories stamp identifying the conductor or wire as meeting nationally recognized standards or have been found suitable for use in a specified manner.

STANDARDS NO. FO 9.0001
FIBER OPTIC NEW PLAT DESIGN

December 6, 2004.

A. DEFINITIONS:

FIBER OPTIC ADSS CABLES: All-Dielectric Self-Supporting (ADSS) single mode, telecommunications grade aerial fiber optic cable is designed for applications in placement on overhead transmission and distribution support structures. ADSS cables are not affected by electro-magnetic fields, resulting in data being transmitted error-free. The cable shall incorporate a filled loose buffer tube design.

FIBER OPTIC ADNS CABLE FOR BURIED OR AERIAL DUCT: Add-Dielectric Non-Supporting (ADNS) single mode, telecommunications grade, for installation inside a buried or aerial duct. The 12-192 strand cable shall be a filled loose buffer tube design.

COYOTE CLOSURE SPLICE KITS: The Coyote Closure is a splice container that stores up to 288 fiber splices (36 per tray, 8 trays max). The three-section end plate comes with six entry ports for cables up to 7/8" in diameter. Splice trays for single fiber splices are available. Coyote Closures can be used in aerial or underground applications.

COYOTE PUP CLOSURE: The Coyote Pup Closure is a splice container and stores up to 48 fiber splices (12 per tray, 4 trays max.). The Coyote Pup Closure contains unique fiber management systems with compact, user friendly, 12-fiber splice trays, and shorter shell halves. The Coyote Pup Closure is compatible with the Coyote Closure for future expansion. Coyote Pup Closures can be used in aerial or underground applications.

COYOTE RUNT CLOSURE: The Coyote Runt Closure is a splice container and stores up to 12 fiber splices. The Coyote Runt Closure will easily fit into most pedestals and handholes. The Coyote Runt Closure is compatible will all Coyote products. The Coyote Runt Closure can be used in aerial or underground applications.

HANDHOLE, FIBER OPTIC JUNCTION BOX: Assembly Unit (JU78) for installation of a fiber glass below ground junction box for Coyote Runt and Coyote Pup Splice installations.

HANDHOLE, CONCRETE W/COVER: Assembly Unit (J230) for installation of Concrete Handhole w/Cover, 36" L x 30' W X 32' H. Concrete handhole accepts the larger Fiber Optic Splice Kits.

CONDUIT, FIBER OPTIC, ORANGE SCH40, 1" DIA: Assembly Unit (JO81) for installation of Fiber Optic Residential Cables.

CONDUIT, FIBER OPTIC, ORANGE SCH40, 2" DIA: Assembly Unit (JO85) for installation of Fiber Optic Main Feeder Cables.

CONDUIT, FIBER OPTIC ORANGE, HDPE 1" SILICORE LINING: Assembly Unit (JO86) for installation of underground Fiber Optic Service Cable.

CONDUIT, FIBER OPTIC ORANGE, HDPE 2" SILICORE LINING: Assembly Unit (JO87) for installation of underground Fiber Optic Service Cable.

B. FIBER OPTIC CABLES IN NEW SUBDIVISIONS: BASIC DESIGN CONSIDERATIONS.

1. Fiber Optic Cables shall occupy the same trench as power supply cables.

2. Two separate two-inch Fiber Optic Orange Conduit shall be designated for major Feeder Backbone Fiber Optic Cable installation. A single two-inch Fiber Optic Orange Conduit may be used on small radial feeders. Check with a Grant PUD Fiber engineering technician for requirements.

3. One (1) inch Fiber Optic Orange 1" PVC Conduit shall be designated for Fiber Optic Service Cable installation from splice box to the residence.

4. All conduits will terminate in a vault or handhole except the residential drops.

5. Basic Service design shall consist of a two inch conduit from fiber optic vault to fiber optic handhole(s). Service drops from handholes are in multiples of two. Only twelve service drops per each two-inch conduits are permitted.

6. A maximum number of two strand service drops shall be in multiples of six service drops (12 strands) per Coyote Splice in vault.

7. Design must be approved by a Grant CPUD fiber engineering technician.

C. FIBER OPTIC CABLES IN TRENCHES:

1. Fiber Optic Feeder Backbone Conduit located in trenches shall be located adjacent to other communication facilities.

2. All service conduits not containing Fiber Optic Cables shall be capped and identified.

3. It is preferred to have a have a locating wire buried with the Fiber Optic conduit. If the conduit is within one foot of an electric utility conductor, no locating wire is reqired.

4. Trenching for Fiber Optic conduit shall conform to Grant PUD Standard No. 10.0008 Trench Construction, PVC Pipe and 10.0010 Trench Bedding And Backfill Requirements.

5. Fiber Optic conduit and direct buried electric supply primary cables shall be separated by a minimum of 12inches..

D. FIBER OPTIC CABLE BACKBONE FEEDER:

1. Fiber Optic Cable Handhole Concrete Junction Boxes shall be located over joint use trench and offset to padmount transformer placements.

2. Buried ends of fiber conduit shall have an electronic marking device buried with it. See assembly unit UA1

3. Customer shall provide trench and install Fiber Optic Conduits. Grant PUD shall supply Fiber Optic Conduit for Customer installation.

E. FIBER OPTIC CABLE SERVICE INSTALLATION.

See *Electric and Fiber Optic Service Workbook for Permanent Single-Family Residential Services and Construction Temporary Services.*

ASSEMBLY UNITS

COMMON GCPUD ASSEMBLY UNITS

ITEM#	DESCRIPTION
A01C1E	1/0 AL EPR 15KV, 1 PHASE
A01C3E	1/0 AL EPR 15KV, 3 PHASE
A05C3E	750 AL EPR 15KV, 3 PHASE
A10C	600V UG SNGL #6 AL
A36C	600V UG TRIPLEX AL, 2 - 350 & 1 - 4/0
J085	CONDUIT, SCH 40, FIBER OPTIC (ORANGE), 2"
J088	TRACER WIRE, #12 THHN ORG
J230	FIBER VAULT
JT02	CONDUIT, STEEL ELBOW GALV 2" 90 DEG
JT32	CONDUIT, SCH 40 ELBOW 2" 90 DEG
JT92	CONDUIT, FIBERGLASS ELBOW 2" X 36"R - 90 DEG
JT93	CONDUIT, FIBERGLASS ELBOW 3" X 36"R - 90 DEG
JT94	CONDUIT, FIBERGLASS ELBOW 4" X 36"R - 90 DEG
JT96	CONDUIT, FIBERGLASS ELBOW 6" X 36"R - 90 DEG
JU78	FIBER HANDHOLE
L20	LIGHT 200W HPS 120V W/PC
LA12	12 FT STEEL MAST ARM, STREET LIGHT
LDB30	LIGHT DIRECT BURIED, STEEL STANDARD, 30 FT
LDB40	LIGHT DIRECT BURIED, STEEL STANDARD, 40 FT
LF1	LIGHT FUSE, BREAK-AWAY SINGLE
LV	ENCLOSURE, LIGHTING JUNCTION BOX
LW	WIRE, CONDUIT, & ACCESORIES FOR LDB30-40, LPED30-40
T22	CONDUIT, SCH 40 PVC, 2"
T13	CONDUIT, SCH 40 PVC, 3"
T14	CONDUIT, SCH 40 PVC, 4"
T16	CONDUIT, SCH 40 PVC, 6"
T32	CONDUIT, SCH 40 PVC ELBOW DB 2" X 36"R, 90 DEG
T32A	CONDUIT, SCH 40 PVC ELBOW DB 2" X 24"R, 90 DEG
T33	CONDUIT, SCH 40 PVC ELBOW DB 3" X 36"R, 90 DEG
T33A	CONDUIT, SCH 40 PVC ELBOW DB 3" X 24"R, 90 DEG
T34	CONDUIT, SCH 40 PVC ELBOW DB 4" X 36"R, 90 DEG
T42	CONDUIT, SCH 40 PVC SWEEP DB 4" X 36"R, 45 DEG
T52	CONDUIT, STEEL ELBOW GALV 2" X 36"R - 45 DEG
T53	CONDUIT, STEEL ELBOW GALV 3" X 36"R - 45 DEG
T54	CONDUIT, STEEL ELBOW GALV 4" X 36"R - 45 DEG
T56	CONDUIT, STEEL ELBOW GALV 6" X 36"R - 45 DEG
T62	CONDUIT, STEEL ELBOW GALV 2" X 36"R - 90 DEG
T63	CONDUIT, STEEL ELBOW GALV 3" X 36"R - 90 DEG
T64	CONDUIT, STEEL ELBOW GALV 4" X 36"R - 90 DEG
T66	CONDUIT, STEEL ELBOW GALV 6" X 36"R - 90 DEG
T92	CONDUIT, FIBERGLASS ELBOW 2" X 36"R - 90 DEG
T93	CONDUIT, FIBERGLASS ELBOW 3" X 36"R - 90 DEG
T94	CONDUIT, FIBERGLASS ELBOW 4" X 36"R - 90 DEG
T96	CONDUIT, FIBERGLASS ELBOW 6" X 36"R - 90 DEG
T80	SEALANT, INSTA-FOAM, 1 CU. FT. KIT

T82	BELL END, 2" PVC
T83	BELL END, 3" PVC
T84	BELL END, 4" PVC
T86	BELL END, 6" PVC
U46V	VAULT, TRANSFORMER, 1 PHASE, 15-167KVA, 4'8" SQ. X 3'6"
U47V	VAULT, TRANSFORMER, 3 PHASE, 45-500KVA, 4'8" SQ. X 3'6"
U54V	VAULT, CONCRETE, SWITCHING, 1 PHASE, 4'8" SQ., 4'
U55V	VAULT, CONCRETE, SWITCHING, 3 PHASE, 4'8" X 4'8" X 4'
U56SG	VAULT, CONCRETE, SWITCHGEAR, 9' X 5' X 7'2"
U56V	VAULT, CONCRETE, SWITCHING, 3 PHASE, 9' X 5" X 7'2"
U59	JUNCTION BUS, 4 POS
U69	CAP, PROTECTIVE GRONDED
U79	PEDESTAL, SECONDARY - ABOVE GROUND
U84TEP	CONNECTOR, ELBOW, 1/0 AL EPR, 15KV LOADBREAK W/TEST POINT
UFIV03	FAULT INDICATOR UG TPR 300A 1P
UA9	GUARD POST

SEE GRANT COUNTY P.U.D. PARTS CATALOG FOR ITEMS NOT LISTED ABOVE.

CONDUCTOR

STOCK#	DESCRIPTION	QTY	ASSEMBLY UNIT
TDSI-09128612	**1/0AL EPR 15KV – IN CONDUIT – 1 Ø**	1 FT.	A01C1E
TDSI-09128612	**1/0AL EPR 15KV – IN CONDUIT – 3 Ø**	1 FT.	A01C3E
TDSI-09128876	**750AL EPR 15KV – IN CONDUIT – 3 Ø**	1 FT.	A05C3E
TDSI-09200608	**#6 AL SNGL 600V SEC. CONDUCTOR**	1 FT.	A10C
TDSI-09103036	**350AL TX 600V SEC. CONDUCTOR**	1 FT	A36C

FIBER OPTIC EQUIPMENT

STOCK#	DESCRIPTION	QTY.	ASSEMBLY UNIT
TDSI-76010320	**2", SCH 40 PVC, CONDUIT (ORG)**	1 FT.	J085
TDSI-72101203	**#12 THHN ORG, TRACER WIRE**	1 FT.	J088
FIBER VAULT			J230
TDSI-22022329	36x42x32 CONC. VAULT W/ STL LID	1 EA.	
TDSI-58090301	72 IN. ORG. UTILITY MARKER		
TDSI-76050320	**2", 90 DEG., 36" RAD., SCH 40 PVC. ELBOW**	1 FT.	JT32
TDSI-76054020	**2"x 36"R, 90 DEG., FIBERGLASS ELBOW**	1 EA.	JT92
TDSI-76054030	**3"x 36"R, 90 DEG., FIBERGLASS ELBOW**	1 EA.	JT93
TDSI-76054040	**4"x 36"R, 90 DEG., FIBERGLASS ELBOW**	1 EA.	JT94
TDSI-76054060	**6"x 48"R, 90 DEG., FIBERGLASS ELBOW**	1 EA.	JT96
TDSI-22097714	**FIBER OPTIC JUNCTION BOX (HANDHOLE)**	1 EA.	JU78

LIGHTING

STOCK#	DESCRIPTION	QTY.	ASSEMBLY UNIT
LIGHT 200W HPS 120V W/ PC			L20
TDSI-17010350	CABELOK, AL-CU 14-6 TO 6-2	2 EA	
TDSI-39000213	LUMINAIRE, HPS 200W 120V, LAMP	1 EA	
TDSI-39014010	LAMP, HPS 200W	1 EA	
TDSI-39020118	CONTROL, PE SS 105-285V, FAIL ON	1 EA	

TDSI-49001112	**LUMINARIE ARM, STEEL 12 FEET**	1 EA.	LA12
TDSI-49001130	**STEEL DIRECT BURIAL POLE – 30FT**	1 EA.	LDB30
TDSI-49001140	**STEEL DIRECT BURIAL POLE – 40FT**	1 EA.	LDB40
BREAKAWAY LIGHT FUSE			LF1
TDSI-84299930	1-POLE CU #12-32 BUSS	1 EA	
TDSI-24630308	600V ST. LT. FUSE	1 EA	
TDSI-22097799	**LIGHTING JUNCTION ENCLOSURE**	1 EA.	LV
WIRE, CONDUIT, & ACCESSORIES FOR LDB-30 & LDB-40			LW
TDSI-72101202	#12 CU STR THHN WIRE, WHITE	70 FT	
TDSI-72101201	#12 CU STR THHN WIRE, BLACK	140 FT	
TDSI-76050310	90 DEG., 1 IN., SCH 40 PVC ELBOW	3 EA	
TDSI-76090010	1 IN., PVC COUPLING	6 EA	
TDSI-76010710	1 IN., SCH. 40 PVC CONDUIT	10 FT	
TDSI-17010375	CABELOK, 2-6:2-76 ACSR, 1-6:1-6 STR	2 EA	

CONDUIT

STOCK#	DESCRIPTION	QTY.	ASSEMBLY UNIT
TDSI-76010720	**2 IN. SCH 40 PVC, CONDUIT**	1 FT.	T22
TDSI-76010730	**3 IN. SCH 40 PVC, CONDUIT**	1 FT.	T13
TDSI-76010740	**4 IN. SCH 40 PVC, CONDUIT**	1 FT.	T14
TDSI-76010760	**6 IN. SCH 40 PVC, CONDUIT**	1 FT.	T16
TDSI-76050320	**2"x 36"R, 90 DEG., SCH. 40 PVC ELBOW**	1 EA.	T32
TDSI-76050318	**2"x 24"R, 90 DEG., SCH. 40 PVC ELBOW**	1 EA.	T32A
TDSI-76050330	**3"x 36"R, 90 DEG., SCH. 40 PVC ELBOW**	1 EA.	T33
TDSI-76050328	**3"x 24"R, 90 DEG., SCH. 40 PVC ELBOW**	1 EA.	T33A
TDSI-76050340	**4"x 36"R, 90 DEG., SCH. 40 PVC ELBOW**	1 EA.	T34
TDSI-76060340	**4"x 36"R, 45 DEG., SCH. 40 PVC ELBOW**	1 EA.	T42
2"x 36"R, 45 DEG., STEEL GALV. ELBOW			T52
TDSI-76060120	2 IN. 45 DEG. GALV. ELBOW	1 EA.	
TDSI-76320020	2 IN. PVC FEMALE ADAPTER	1 EA.	
3"x 36"R, 45 DEG., STEEL GALV. ELBOW			T53
TDSI-76060130	3 IN. 45 DEG. GALV. ELBOW	1 EA.	
TDSI-76320030	3 IN. PVC FEMALE ADAPTER	1 EA.	
4"x 36"R, 45 DEG., STEEL GALV. ELBOW			T54
TDSI-76060140	4 IN. 45 DEG. GALV. ELBOW	1 EA.	
TDSI-76320040	4 IN. PVC FEMALE ADAPTER	1 EA.	
6"x 48"R, 45 DEG., STEEL GALV. ELBOW			T56
TDSI-76060160	6 IN. 45 DEG. GALV. ELBOW	1 EA.	
TDSI-76320060	6 IN. PVC FEMALE ADAPTER	1 EA.	
2"x 48"R, 90 DEG., STEEL GALV. ELBOW			T62
TDSI-76050120	2 IN. 90 DEG. GALV. ELBOW	1 EA.	
TDSI-76320020	2 IN. PVC FEMALE ADAPTER	1 EA.	
3"x 48"R, 90 DEG., STEEL GALV. ELBOW			T63
TDSI-76050130	3 IN. 90 DEG. GALV. ELBOW	1 EA.	
TDSI-76320030	3 IN. PVC FEMALE ADAPTER	1 EA.	
4"x 48"R, 90 DEG., STEEL GALV. ELBOW			T64
TDSI-76050140	4 IN. 90 DEG. GALV. ELBOW	1 EA.	
TDSI-76320040	4 IN. PVC FEMALE ADAPTER	1 EA.	

6"x 48"R, 90 DEG., STEEL GALV. ELBOW			T66
TDSI-76050160	6 IN. 90 DEG. GALV. ELBOW	1 EA.	
TDSI-76320060	6 IN. PVC FEMALE ADAPTER	1 EA.	
TDSI-76054020	**2"x 36"R, 90 DEG., FIBERGLASS ELBOW**	1 EA.	T92
TDSI-76054030	**3"x 36"R, 90 DEG., FIBERGLASS ELBOW**	1 EA.	T93
TDSI-76054040	**4"x 36"R, 90 DEG., FIBERGLASS ELBOW**	1 EA.	T94
TDSI-76054060	**6"x 48"R, 90 DEG., FIBERGLASS ELBOW**	1 EA.	T96
TDSI-83762700	**INSTA-FOAM SEALANT, 1 CU. FT.**	1 EA.	T80
TDSI-76670020	**2" PVC BELL END**	1 EA.	T82
TDSI-76670030	**3" PVC BELL END**	1 EA.	T83
TDSI-76670040	**4" PVC BELL END**	1 EA.	T84
TDSI-76670060	**6" PVC BELL END**	1 EA.	T86

UNDERGROUND FACILITIES

STOCK #	DESCRIPTION	QTY.	ASSEMBLY UNIT
XMR VAULT, 1P 15-167KVA			**U46V**
TDSI-06352412	BOLT, HEX 1/2 IN. X 1-1/4 IN. NC,	2 EA.	
TDSI-15620407	COND, OH BARE CU 7 STR 4 SD	2 LBS.	
TDSI-17022120	CRIMPIT, CU 2-2 TO 2-2 STR	2 EA.	
TDSI-17220001	GRD TRANSF-LUG, 6 SOL TO 1/0 STR	2 EA.	
TDSI-17624507	LUG, TERM BOLT 1-HOLE 4-1/0 CU	1 EA.	
TDSI-22022374	VAULT, JUNCTION, 4 FT. 8 IN. SQ X 3 FT. 6 IN. DEEP W/O COVER	1 EA.	
TDSI-22412478	COVER, PAD TRANSFORMER 15-167 KVA	1 EA	
TDSI-42911705	NUT, SPRING, 1/2 IN. X 1-1/2 IN.	2 EA.	
TDSI-71020442	WASHER, FLAT, SQ GALV, 2-1/4 IN. X 2-1/4 IN. X 11/16 IN. HOLE	2 EA.	
TDSI-71039927	WASHER, FLAT 1/2 IN. ZC	2 EA.	
XMR VAULT, 3P 45-500 KVA			**U47V**
TDSI-06352410	BOLT, HEX 1/2 IN. X 1 IN. NC	2 EA.	
TDSI-15620207	COND, OH BARE CU 7 STR 2 SD	12 LBS.	
TDSI-17022120	CRIMPIT, CU 2-2 TO 2-2 STR	4 EA.	
TDSI-17220001	CLAMP, GRD TRANSF-LUG, 6 SOL TO 1/0	2 EA.	
TDSI-17624507	LUG, TERM BOLT 1-HOLE 4-1/0 CU	1 EA.	
TDSI-22022374	VAULT, JUNCTION, 4 FT. 8 IN. SQ X 3 FT. 6 IN. DEEP W/O COVER	1 EA.	
TDSI-22402486	COVER, PAD TRANSF VAULT 45-500 KVA, 74 IN. X 60 IN., WITH PAD OPENING 16 IN. X 40 IN.	1 EA.	
TDSI-42911705	NUT, SPRING, 1/2 IN. X 1-1/2 IN.	2 EA.	
TDSI-71039927	WASHER, FLAT 1/2 IN. ZC	2 EA.	
1P SWITCHING VAULT 4'8" x 4'8" x 4'			**U54V**
TDSI-15620207	COND, OH BARE CU 7 STR 2 SD	10 LBS	
TDSI-17022120	CRIMPIT, CU 2-2 TO 2-2 STR	4 EA.	
TDSI-17220001	CLAMP, GRD TRANSF-LUG, 6 SOL TO 1/0	4 EA.	
TDSI-22022374	VAULT, JUNCTION, 4 FT. 8 IN. SQ X 3 FT. 6 IN. DEEP W/O COVER	1 EA.	
~~TDSI-22152378~~	~~VAULT, COVER, W/3 FT. X 3 FT. DIAMOND~~	~~1 EA.~~	

	PLATE (FOR 4 FT. 8 IN. X 4 FT. 8 IN. VAULT COVER)		
TDSI-58090381	MARKER, UTILITY, UG, RED, 72 IN. WITH DECAL (BLACK ON YELLOW)	1 EA.	
SWITCHING VAULT 4' x 6' x 4'			**U55V**
TDSI-15620207	COND, OH BARE CU 7 STR 2 SD	15 LBS.	
TDSI-17022120	CRIMPIT, CU 2-2 TO 2-2 STR	5 EA.	
TDSI-17220001	CLAMP, GRD TRANSF-LUG, 6 SOL TO 1/0	4 EA.	
TDSI-22022462	VAULT, LOADBREAK BUS JUNCTION, 6 FT. X 4 FT. X 4 FT. WITH COVER AND GROUNDING SYSTEM	1 EA.	
TDSI-58090381	MARKER, UTILITY, UG, RED, 72 IN. WITH DECAL (BLACK ON YELLOW)	1 EA.	
PSE/PME SWITCHGEAR VAULT			**U56SG**
TDSI-06351410	BOLT, HEX, 1/2 IN. X 1 IN. SS (18-8) NC	4 EA.	
TDSI-15621007	COND, OH BARE CU 19 STR 1/0 SD	25 LBS.	
TDSI-17022250	CRIMPIT, CU 1/0-2/0 TO 1/0-2/0	7 EA.	
TDSI-17220001	CLAMP, GRD TRANSF-LUG, 6 SOL TO 1/0	4 EA.	
TDSI-17624518	LUG, TERM BOLT 1-HOLE 1/0-4/0 CU	4 EA.	
TDSI-22022092	MANHOLE, TRANSFORMER 750-2500KVA W/O COVER (80 IN. X 104 IN. X 80 IN.)	1 EA.	
TDSI-42940705	NUT, HEX SB, 1/2 IN.	4 EA.	
TDSI-58090381	MARKER, UTILITY, UG, RED, 72 IN. WITH DECAL (BLACK ON YELLOW)	1 EA.	
TDSI-71059921	WASHER, LOCK 1/2 IN. SS (18-8)	4 EA.	
3P SWITCHING VAULT, 5' x 9' x 7' 2"			**U56V**
TDSI-15621007	COND, OH BARE CU 19 STR 1/0 SD	25 LBS.	
TDSI-17022250	CRIMPIT, CU 1/0-2/0 TO 1/0-2/0	5 EA.	
TDSI-17220001	CLAMP, GRD TRANSF-LUG, 6 SOL TO 1/0	3 EA.	
TDSI-22023083	VAULT, SPLICING, 9 FT. X 5 FT. W/COVER	1 EA.	
TDSI-58090381	MARKER, UTILITY, UG, RED, 72 IN. WITH DECAL (BLACK ON YELLOW)	1 EA.	
4 POS., JUNCTION BUS			**U59**
TDSI-06351410	BOLT, HEX, 1/2 IN. X 1 IN. SS (18-8) NC	2 EA.	
TDSI-42911505	NUT, SPRING 1/2 IN. X 3/4 IN.	2 EA.	
TDSI-66940005	BUSS, JUNCTION LOADBREAK 4-BUSHING	1 EA.	
TDSI-66945044	**CAP, PROTECTIVE GROUNDED**	1 EA.	**U69**
TDSI-44402439	**PEDESTAL, SECONDARY - ABOVE GROUND MO-PED**	1 EA.	**U79**
1/0 AL EPR CONNECTOR ELBOW, 15KV LOADBREAK			**U84TEP**
TDSI-60809800	SEAL, COND END NON-SHRINK #2-1/0	1 EA.	
TDSI-66930452	TERMINATOR, LOADBREAK ELBOW 1/0 EPR AL, W/TEST	1 EA.	
TDSI-23151130	**IND, FAULT URD 400 A TEST P0INT RESET**	1 EA.	**UFIV03**
TDSI-81040700	**MARKER, UNDERGROUND**	1 EA.	**UA1**
TDSI-83271800	**GUARD POST**	1 EA.	**UA9**

STOCK PAGES

MULTI-CONDUCTOR, UG, 600V, ALUMINUM

Duplex Secondary
1 conductor, 1 neutral

Triplex Secondary
2 conductors, 1 neutral

Quadruplex Secondary
3 conductors, 1 neutral

GENERAL: For secondary distribution and underground service at 600 volts or less.

SPECIFICATIONS: Conductors shall be stranded, compressed 1350-H19 aluminum, insulated with vulcanized interlinked polyethylene. Neutrals shall have three yellow extruded stripes located at 120° intervals. Cables shall have sequential footage marks. Conductor shall meet or exceed the following applicable specifications: ASTM B-230, B-231, B-786, ICEA S-66-524, and UL standard 854 for Type USE-2. See District Specification Section 16240.2.

PACKAGING: Conductor shall be supplied on non-returnable reels in either "cut to order" or standard lengths as specified. The conductor shall be level wound on the reel. Reel sizes shall be a minimum of 1-1/2" inch larger than the wound conductor. Conductor shall be protected by heavy wrapping, either heavy fiberboard or 10 mil. plastic. Package material shall have two shipping/loading tags: A weather protected tag shall be attached to the reel secure enough for shipping and handling. The second tag shall be stapled or glued to the reel face. Each tag shall contain the following in a legible print or type: Product identification, Item description, Conductor length, Gross, and Net weight. The District purchase order number shall be stamped or marked on the reel and both tags.

PURCHASING: Quantity per feet.

STOCK NUMBER	POWER CONDUCTORS			NEUTRAL CONDUCTORS			APPROX. NET WT (lb/M ft.)	CODE NAME
	SIZE	STR	INSUL. (mils)	SIZE	STR	INSUL. (mils)		
DUPLEX								
09102004	4	7	60	4	7	60	135	**DELGADO**
09102006	6	7	60	6	7	60	95	**CLAFLIN**
TRIPLEX								
09103010	2	7	60	2	7	60	292	**RAMAPO**
09103013	2/0	19	80	2/0	19	80	559	**HUNTER**
09103012	1/0	19	80	2	7	60	407	**BRENAU**
09103016	4/0	19	80	2/0	19	80	738	**SWEETBRIAR**
09103036	350	37	95	4/0	19	80	1157	**WESLEYAN**
QUADRUPLEX								
09104010	2	7	60	4	7	60	377	**DYKE**
09104013	2/0	19	80	1	19	80	723	**SYRACUSE**
09104016	4/0	19	80	2/0	19	80	1063	**WAKE FORREST**
09104036	350	37	95	4/0	19	80	1598	**SLIPPERY ROCK**

Rev. 11-26-08 MHS "Added Duplex numbers; Changed page number; Removed 'Yellow Neutral' column; ."
Rev. 10-11-07 DH "formerly 09722302 - 09722609; Deleted 09722307; Changed UOM to ft. from lbs.;
Rev. 04-04-07 DH "Changed Title; Separated Triplex and Quad types; Changed cond. no. for 09722302-7; Reformatted page."
Rev. 11-17-04 MS "Deleted 09722405 - 2/0 #2-19 strand, code Bliss and Converse."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	09/26/77	MULTI-CONDUCTOR, UG, 600V, ALUMINUM	ASSEMBLY UNIT	Yes
	Rev #	6		SOLE SOURCE	No
	Designer	JB		TDSI X / TTNI / TMNI / TSNI	
	Standards Engineer: AL SILVA			**09102004**	

CABLE, URD SINGLE CONDUCTOR, 600V, USE-2, ALUMINUM

GENERAL: For secondary distribution, station control wiring in conduits or ducts rated at 600 volts or less.

SPECIFICATIONS: Conductors shall be stranded, compressed 1350-H19 aluminum, insulated with crosslink polyethylene. Conductors shall meet or exceed the following applicable specifications: ASTM B-230, B-231, B-766, ICEA S-66-524, and UL standard 854 for Type USE-2.

PURCHASING: Quantity per foot.

STOCK NUMBER	COND. SIZE	STR	APPROX. CABLE OD (INCHES)	AMPACITY		APPROVED MANUFACTURER & CATALOG NUMBERS		
				DIRECT BURIED	IN DUCTS	OKONITE	CME	SOUTHWIRE
09200608	6	7	.31	19	65			
09200609	4	7	.35	120	85			
09200610	2	7	.41	155	115			

Rev. 10-11-07 DH "Formerly 09722000-09722002; Deleted 09722005-09722009; changed UOM to ft.; added CME and Southwire."
Rev. 06-15-05 DH "Updated to PageMaker; Added specifications and second page for product info."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	01/07/79	CABLE URD SINGLE CONDUCTOR, USE-2, 600V, AL	ASSEMBLY UNIT	Yes
	Rev #	3		SUBSTITUIONS	Approval Required
	Designer	AS		TDSI X / TTNI / TMNI / TSNI	
	Standards Engineer: A. SILVA			**09200608**	

CABLE, URD SINGLE CONDUCTOR, 600V, USE-2, ALUMINUM

1.0 ***Scope*** This specification covers 600V underground service entrance cable.

2.0 ***Standard Reference:***

The materials, construction and tests for conductors shall conform to the applicable requirements of the latest publication of the American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI) and National Electrical Manufacturers Associations (NEMA).

3.0 ***Specifications:***

3.1 Conductors shall be UL-listed Type RHH, RHW-2, or USE-2, suitable for operation at 600 volts or less in wet or dry locations.

3.2 Cable shall have a temperature rated to 90° C.

3.3 Cable shall be approved for direct burial, conduct insulation, and underground duct.

4.0 ***Packaging:***

4.1 The conductor shall be supplied on non-returnable reels in standard packaging lengths for the reel size specified. The packaging lengths shall not exceed 5% over nor 5% under the standard packaging length. Reel sizes shall be a minimum of 1-1/2 inch larger than the wound conductor.

4.2 The conductor shall be level wound reels. For conductor sizes up to #2 reels may be plastic. Wooden reels may be used for all conductors; wooden reels shall have counter sunk bolt ends and nuts.* The conductor shall be protected by heavy fiberboard wrapping secured with steel banding.

4.3 Each reel shall be tagged with two shipping tags. One tag shall be weather protected and securely attached to the outside of the reel flange. The second tag shall be stapled or secured on the inside of the flange. Each tag shall contain the following information.

a. Product Identification
b. Item Description
c. Conductor Length
d. **Gross, Tare and Net Weight**
e. PUD Purchase Order Number

4.4 Reel type and dimensions shall be specified with each other.

Note: Reels with protruding nuts and/or bolts shall not be accepted.

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	01/07/79	CABLE URD SINGLE CONDUCTOR, USE-2, 600V, AL	ASSEMBLY UNIT	Yes	
	Rev #	3		SUBSTITUIONS	Approval Required	
	Designer	AS		TDSI X / TTNI	TMNI	TSNI
	Standards Engineer A. SILVA			09200608		

UG PRIMARY CABLE, 15kV EPR-INSULATED, ALUMINUM

CONCENTRIC NEUTRAL, JACKETED

GENERAL: For distribution underground installations.

SPECIFICATIONS: District Product Specifications Section 16120.40 "Medium Voltage 15 kV, Jacketed, Concentric Neutral, Underground Distribution Cable, EPR-Insulated. Q\Data\Standard\Product Specification\16120.40

INSULATION: 220 mils, 133% Insulation Level

PRE-QUALIFICATION: The District's stock catalog pages which are attached and made a part of the Technical Specifications, list pre-approved manufacturers for supplying Underground Primary Cable, 15 kV, EPR-Insulated Concentric Neutral, Jacketed. Only approved suppliers shall be considered for supplying underground cable as specified in these requirements. Manufacturers not listed as approved for bidding can apply for approval by submitting the requirements outlined in Specification 16120.40.

PURCHASING: Quantity per foot.

STOCK NUMBER	COND. SIZE	STR	COPPER NEUTRAL (NO. X AWG)	APPROVED MANUFACTURERS & CATALOG NUMBERS			
				OKONITE	KERITE	PRYSMIAN	GENERAL CABLE
FULL NEUTRAL							
09300610	2	7	10 x 14	**161-23-3060**	**102A15-31200**	**QNM010A**	**352817**
09300612	1/0	19	16 x 14	**161-23-3072**	**111A15-31200**	**QNQ010A**	**127295**
1/3 NEUTRAL							
09300616	4/0	19	11 x 14	**160-23-3081**	**141A15-33200**	**QNT000A**	**859119**
09300636	350	37	18 x 14	**160-23-3090**	**135A15-33200**	**QNV000A**	**196029**
09300676	750	61	15 x 10	**160-23-3096**	**175A15-33200**	**QNX000A**	**864446**
09300691	1000	61	20 x 10	**160-23-3099**	**190A15-33200**	**QNY000A**	**629316**
FILLED STRAND 1/3 NEUTRAL							
09300876	750	61	15 x 10	**162-23-3096**	**175F15-3320**	**QNX020A**	**269579**

Rev. 05-09-08 DH "Added 'General Cable' as approved manufacturer."
Rev. 09-10-07 DH "Formerly numbers 09128202 - 09128247; changed UOM to ft.; added Prysmian."
Rev. 06-20-05 DH "Added 'Kerite' as approved manufacturer."
Rev. 01-22-04 MS "Changed part # for 4/0 Okonite Stock program; added 09128244 for filled strand."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	03/17/95	UG PRIMARY CABLE, 15kV EPR-INSULATED, AL	ASSEMBLY UNIT	Yes		
	Rev #	4		SUBSTITUIONS	Approval Required		
	Designer	LL		TDSI X	TTNI	TMNI	TSNI
	Standards Engineer E. WENKE			**09300610**			

UG PRIMARY CABLE, 15kV EPR-INSULATED, ALUMINUM

CONCENTRIC NEUTRAL, JACKETED

1.0 Scope This specification covers 15kV underground primary distribution cable-jacketed

2.0 Standard Reference:

The materials, construction and tests for conductors shall conform to the applicable requirements of the latest publication of the American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), National Electrical Manufacturers Associations (NEMA), Association of Edison Illuminating Companies (AEIC), and Insulated Cable Engineering Association (ICEA).

3.0 Specifications:

3.1 Jacketed underground distribution cable shall be rated for 15kV application with aluminum conductor.

3.2 Cable shall have a temperature rated to 105° C.

3.3 Cable shall be approved for direct burial, conduit installation, and underground duct banks.

3.4 Cable shall be marked with a continuous red identification stripe, manufacturer name, voltage rating, and insulation factor.

4.0 Packaging:

4.1 The conductor shall be supplied on non-returnable reels in standard packaging lengths for the reel size specified. The packaging lengths shall not exceed 5% over nor 5% under the standard packaging length. Reel sizes shall be a minimum of 1-1/2 inch larger than the wound conductor.

4.2 The conductor shall be level wound reels. Wooden reels shall be used for all conductors; wooden reels shall have counter sunk bolt ends and nuts.* The conductor shall be protected by heavy fiberboard wrapping secured with steel banding.

4.3 Each reel shall be tagged with two shipping tags. One tag shall be weather protected and securely attached to the outside of the reel flange. The second tag shall be stapled or secured on the inside of the flange. Each tag shall contain the following information.

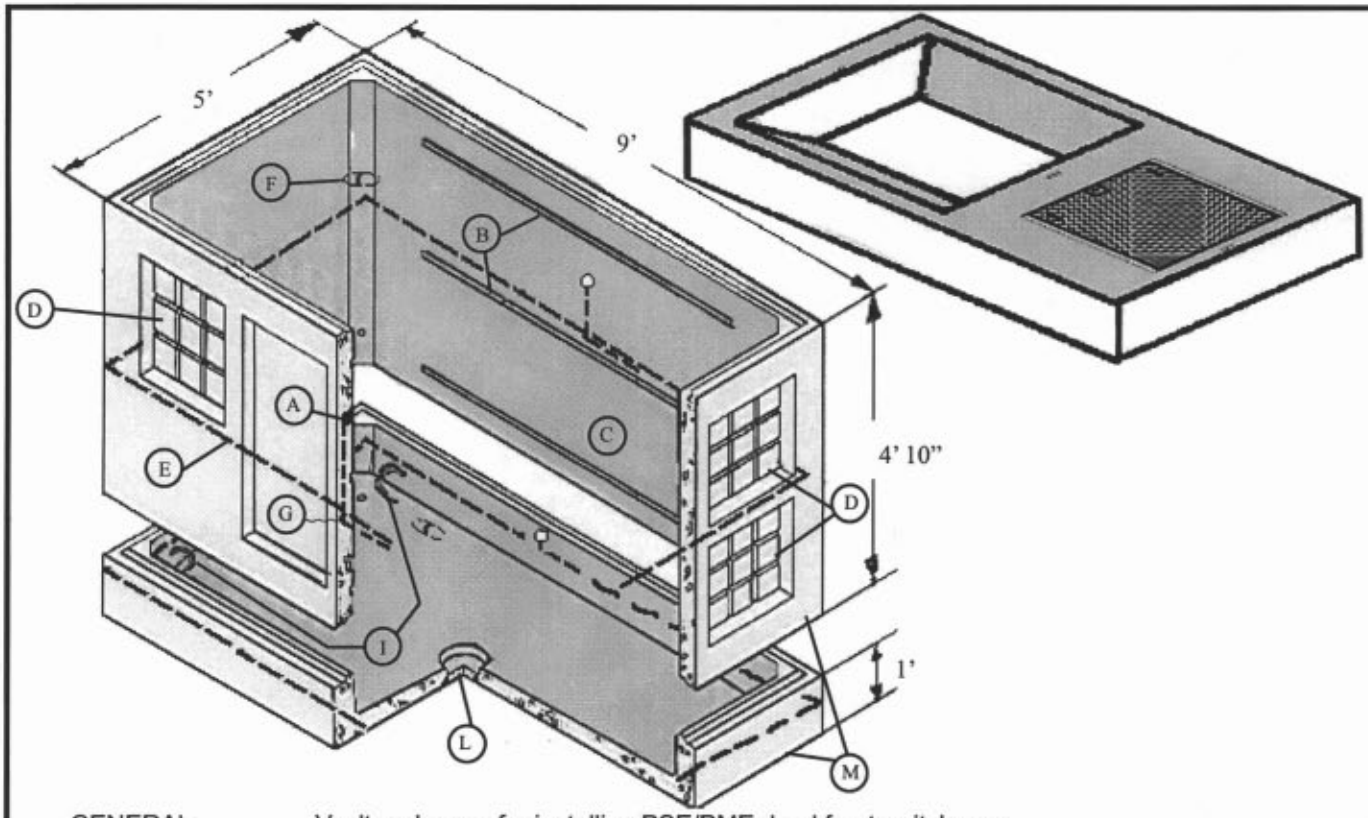
a. Product Identification
b. Item Description
c. Conductor Length
d. **Gross, Tare and Net Weight**
e. PUD Purchase Order Number

4.4 Reel type and dimensions shall be specified with each other.

****Note: Reels with protruding nuts and/or bolts shall not be accepted.***

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	03/17/95	UG PRIMARY CABLE, 15kV EPR-INSULATED, AL	ASSEMBLY UNIT	Yes	
	Rev #	4		SUBSTITUIONS	Approval Required	
	Designer	LL		TDSI X / TTNI	TMNI	TSNI
	Standards Engineer E. WENKE			09300610		

VAULT, DEAD FRONT SWITCHGEAR



GENERAL: Vault and cover for installing PSE/PME dead front switchgear.

SPECIFICATIONS: Concrete vault and cover shall be constructed per the Districts Precast Concrete Product Specification #03800: *Q:\DATA\STANDARD\Product Specifications/ 03800 Precast Concrete Products.* See page 2 of 2 for construction notes and cover plan view. The cover shall have a fully galvanized diamond plate hatch with torsion spring hinges, two lighting rings for left and right opening, and double locking provisions. The hatch shall have raised word of "ELECTRIC" at least 4" high. Grant County PUD shall be imbedded in either the concrete of the cover or welded on the hatch. The Unit must support 16,500 lbs. loading. **Each piece shall have a manufactured date, inspection stamp, and weight stamp or stencil impressed or painted on it.**

PURCHASING: Base, Riser, and Cover shall be purchased as one unit.
Include stock page and District specs with each purchase request or contract bid document.

SHIPPING: Units shall be shipped, unstacked, on a minimum of 4" x 6" dunnage for each piece.

STOCK NUMBER		SIZE			APPROVED MANUFACTURERS & CATALOG NUMBERS	
		L	W	D	UTILITY VAULT	H-2 PRECAST
22022092	VAULT	9'	5'	5'10"	**4484-LA**	**VB4484B and VB4484D**
	COVER	9'	5'	varies	**4484-2436-6552 PAD**	**TPG4484-2436PL-6265**

Rev. 04-10-09 DH "Updated H2 catalog number; Added stock page and specifications inclusion note."
Rev. 07-06-07 DH "Changed vault size; Combined with cover 22202393; Changed rebar size in construction notes; Add ship note."
Rev. 06-13-07 DH "Reactivate item for switchgear use; Changed title to describe use; Changed rebar size; reformatted page."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	12/04/89	VAULT, DEAD FRONT SWITCHGEAR	ASSEMBLY UNIT: Yes
	Rev #	8		SOLE SOURCE: No
	Designer	LW		TDSI X / TTNI / TMNI / TSNI
	Standards Engineer: AL SILVA			**22022092**

VAULT, DEAD FRONT SWITCHGEAR

CONSTRUCTION NOTES:

Joints shall be constructed so that the various units interlock when assembles. The mastic between sections shall be ¾" thick.
The vault shall be constructed with the following items included:

A. Exterior Grounding System
⅝" dia. steel lead with ½" dia. bronze grounding inserts & cap protector, located on each long side of riser.

B. Galvanized C Channel 4' long
Three (3) on each long side of riser.

C. Interior Grounding System
⅝" dia. steel lead with ½" dia. bronze grounding inserts & cap protector, located on all 4 sides of base and riser

D. Precast Knockouts
On all four (4) sides of riser for installing conduits

E. Grounding Bar
Minimum length of 20 feet of #4 rebar around the vault perimeter

F. Burke's Lifting Eye
On all four (4) sides of base and riser.
Size as required for lifting load.

G. Weld Detail

H. Ground Rod Knockouts 1" dia.
spaced evenly on 4 places in the floor of the base.

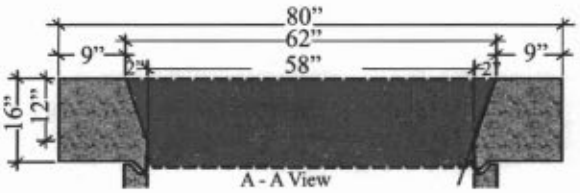
I. Galvanized Pulling Loops
Loops shall be capable of supporting the entire weight of the unit.
Positioned at the center from the corner on all four (4) sides of the base

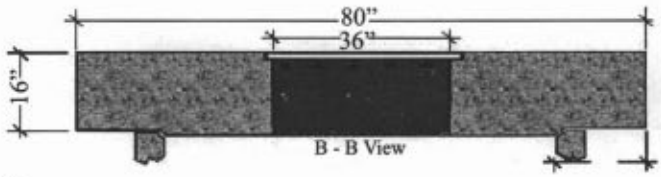
J. Galvanized Trench Grate

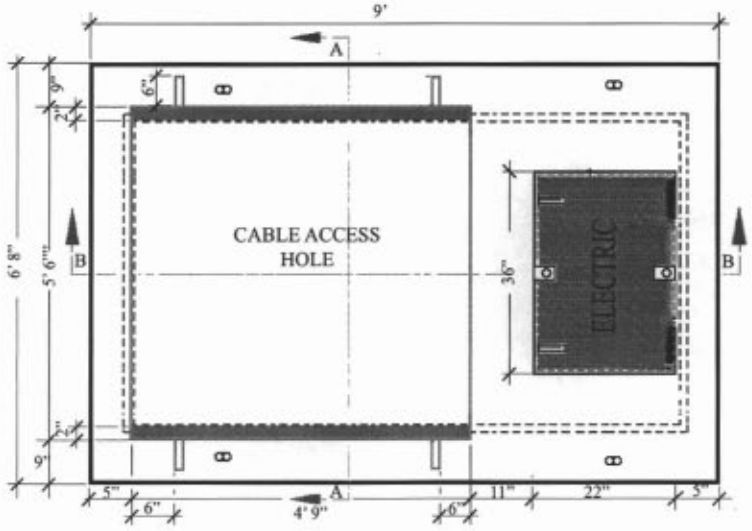
K. Drainage Trench - cast in place

L. Drain Sump - centered in the middle of the floor (not pictuired)

M. Date and Inspection Stamp

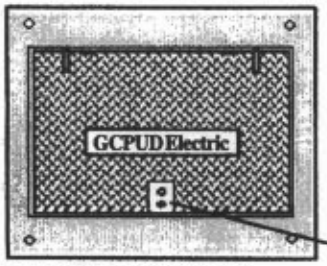




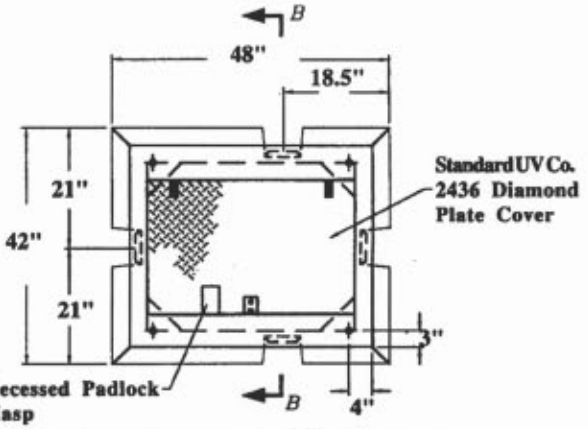


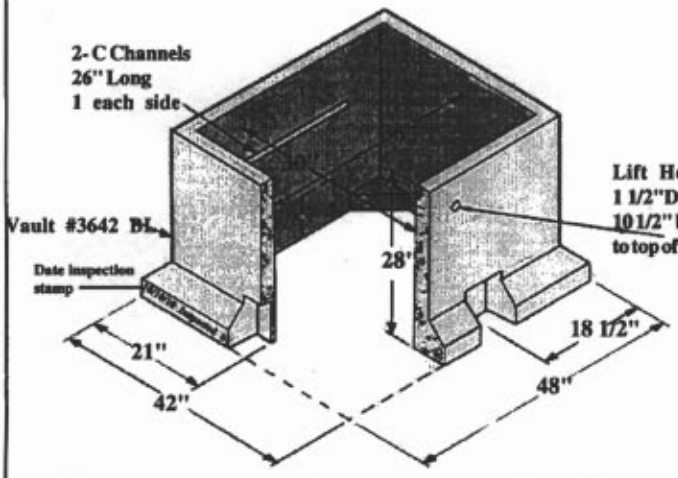
PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	12/04/89	VAULT, DEAD FRONT SWITCHGEAR	ASSEMBLY UNIT	Yes		
	Rev #	8		SOLE SOURCE	No		
	Designer	LW		TDSI X	TTNI	TMNI	TSNI
	Standards Engineer AL SILVA			22022092			

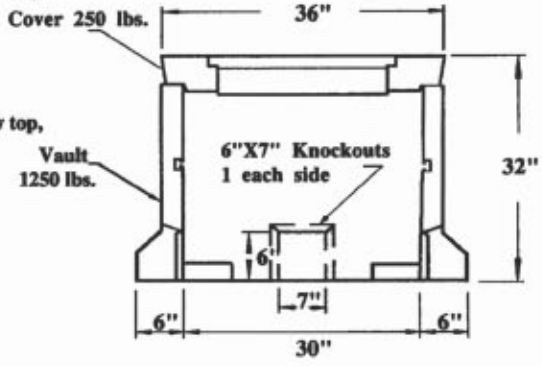
VAULT, HANDHOLE, COVER



Cover #3642-TL Special w/24" X 36"
Hinged access cover plate







GENERAL: Concrete Vault constructed per the Districts **Precast Concrete Product Specification: Section # 9.03000 Reference Precast Concrete Products Section # 03800.**

SIZE: The vault shall be constructed to the measurements shown on the drawing above.

NOTES: The vault will be constructed with the following items included: Lifting holes or eyes capable of supporting the entire weight of the unit. Preset knock outs for pulling conductors, installing conduits and/or installing ground rods. Struts, Channels or other methods of mounting clamps, clips and conduits to the side walls shall be installed. All metal inserts, decks or lids, channels and lifting devices will be galvanized steel.. Joints will be constructed so that the various units inter lock when assembled.

Each piece shall have a manufactured date, inspection stamp, and weight stamp or stencil impressed or paint on it.

PURCHASING: Order as unit indicated below.

OFF-LOADING: Any units with pallets that are oversized, undersized, damaged, broken, have loose boards, or protruding nails or screws shall not be accepted.

STOCK NUMBER	ITEM	APPROVED MANUFACTURERS & CATALOG NUMBERS	
		UTILITY VAULT CO.	H 2 PRECAST
22022329	Vault Body w/o Base	3642-BL	3642 TBX
	Cover/Special Diamond Plate	3642-Standard UV cover	2436 D/P

Rev. 07-11-05 DJ "Added 'Off-Loading' info and date inspection requirements."
Rev. 11-12-98 AAS "Revised UV Cat. Number" / Rev. 09-21-00 "Revised page & Cat Number"

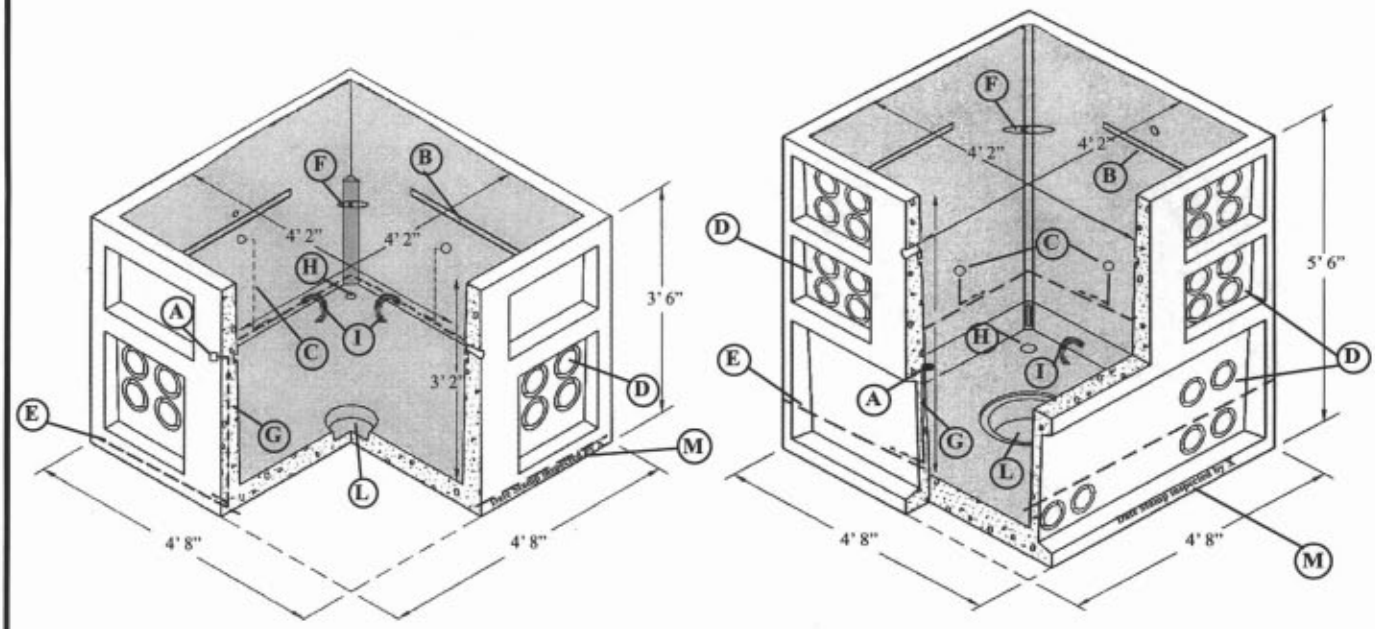
PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON

VAULT, HANDHOLE, COVER

DATE:	02/02/88	STOCK CATALOG	☒ TDSI ☐ TINI ☐ TMNI ☐ TSNI	22022329
DESIGNER;	mb			
STANDARDS ENGR;	AL SILVA			Page 1 of 1

Q:\Data\Standards\Stkcat\22022329.pmd

VAULT, JUNCTION, 4'8" x 4'8"



GENERAL: Vault for switching and installing transformers.

SPECIFICATIONS: Concrete Vault constructed per the Districts Precast Concrete Product Specification #03800: ***Q:\DATA\STANDARD\SPECIFICATIONS/District Specs/03800 Precast Concrete Products.*** See page 2 of 2 for construction notes. Unit must support 4000 lbs. transformer loading. **Each piece shall have a manufactured date, inspection stamp, and weight stamp or stencil impressed or painted on it.**

PURCHASING: **Include stock page and District specs with each purchase request and bid contract document.**
See stock #22052078 for Secondary Cabinet Cover.
#22152378 for Junction Cover.
#22402486 for 3 phase (45 kVA - 500 kVA) Transformer Cover.
#22412478 for 1 phase (15 kVA - 167 kVA) Transformer Cover.

OFF-LOADING: **Any units with pallets that are oversized, undersized, damaged, broken, have loose boards, or protruding nails or screws shall not be accepted.**

STOCK NUMBER	HEIGHT	APPROVED MANUFACTURERS & CATALOG NUMBERS	
		UTILITY VAULT	H-2 PRECAST
22022374	3'6"	**504-L w/ grounding system**	**VBG554**
22022377	5'6"	**506-L w/ grounding system**	**VBG556**

Rev. 05-06-09 DH "Updated H2 catalog number; Added stock page and specifications inclusion note."
Rev. 10-14-08 DH "Updated stock number references for covers."
Rev. 06-15-07 DH "Changed rebar size in construction notes."
Rev. 08-30-06 DH "Added 'Burke lifting eyes' to specs; reformatted page in InDesign; combined pages with #22022377."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	05/06/91	VAULT, JUNCTION, 4'8" x 4'8"	ASSEMBLY UNIT	Yes	
	Rev #	8		SUBSTITUTION	Upon Approval	
	Designer	HC		TDSI X / TTNI	TMNI	TSNI
	Standards Engineer: AL SILVA			**22022374**		

VAULT, JUNCTION, 4'8" x 4'8"

CONSTRUCTION NOTES: Joints shall be constructed so that the various units interlock when assembles. The vault shall be constructed with the following items included:

A. Exterior Grounding System
⅜" dia. steel lead with ½" dia. bronze grounding inserts & cap protector, located on each side of riser.

B. Galvanized C Channel 4' long
One (1) on each side

C. Interior Grounding System
⅜" dia. steel lead with ½" dia. bronze grounding inserts & cap protector, located on each side.

D. Precast Knockouts
On all four (4) sides for installing conduits

E. Grounding Bar
Minimum length of 20 feet of #4 rebar around the vault perimeter

F. Burke's Lifting Eye
On all four (4) sides.
Size as required for lifting load.

G. Weld Detail
(see drawing below)

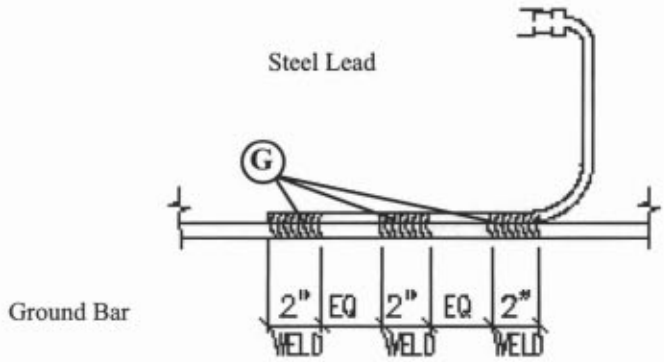
H. Ground Rod Knockouts 1" dia.
Spaced evenly on 4 places in the floor of the base.

I. Galvanized Pulling Loops
Loops shall be capable of supporting the entire weight of the unit.
Positioned at the center of the wall from the corner on all four (4) sides

L. Drain Sump - centered in the middle of the floor

M. Date and Inspection Stamp

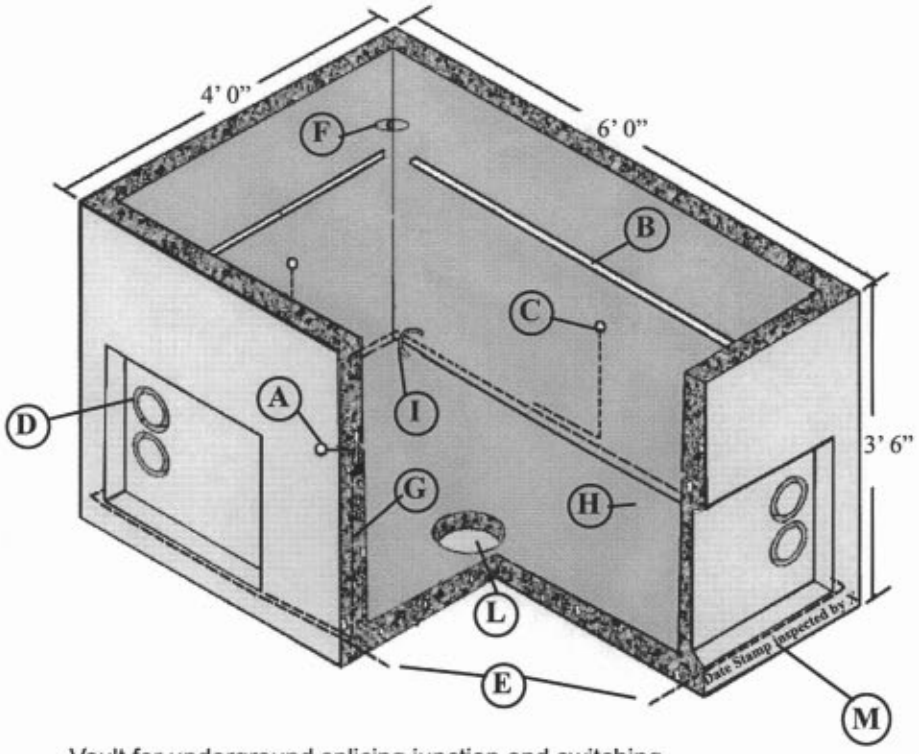
Bronze Grounding Insert



Enlarged View of Weld Detail

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	05/06/91	VAULT, JUNCTION, 4'8" x 4'8"	ASSEMBLY UNIT		Yes	
	Rev #	8		SUBSTITUTION		Upon Approval	
	Designer	HC		TDSI X	TTNI	TMNI	TSNI
	Standards Engineer AL SILVA			22022374			

VAULT, LOADBREAK BUS JUNCTION



GENERAL: Vault for underground splicing junction and switching.

SPECIFICATIONS: Concrete Vault constructed per the Districts Precast Concrete Product Specification #03800: ***Q:\DATA\STANDARD\Product Specifications/ 03800 Precast Concrete Products.*** See page 2 of 2 for construction notes. The hatch shall have manufacturer's name or emblem and the words "GCPUD" and "ELECTRIC". All exposed metal shall be hot-dipped galvanized . The hatch shall have double locking capability and have .281" diameter torsion springs for assist lifting and closing. **Each piece shall have a manufactured date, inspection stamp, and weight stamp or stencil impressed or painted on it.**

PURCHASING: **Include stock page and District specs with each purchase request and bid contract document.**
Cover: Approximately 1,200 Lbs Body: Approximately 3,000 Lbs

OFF-LOADING: **Any units with pallets that are oversized, undersized, damaged, broken, have loose boards, or protruding nails or screws shall not be accepted.**

STOCK NUMBER		SIZE		APPROVED MANUFACTURERS & CATALOG NUMBERS	
		L	W	UTILITY VAULT COMPANY	H-2 PRECAST
22022462	VAULT	6'	4'	**644-L w/ grounding system**	**VBG464**
	COVER	6'8"	4'8"	**64-2-332P**	**VLG460-23PL**

Rev. 05-06-09 DH "Updated H2 catalog number; Added stock page and specifications inclusion note."
Rev. 06-20-07 DH "Changed the rebar size in the construction notes."
Rev. 08-30-06 DH "Added 'Burke lifting eyes'to specs; Reformatted page in InDesign."
Rev. 07-11-05 DH "Added 'Off-loading' conditions information; Drawn addition grounding lug into photo."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	05/07/91	VAULT, LOADBREAK BUS JUNCTION	ASSEMBLY UNIT: Yes
	Rev #	8		SOLE SOURCE: No
	Designer	HC		TDSI X / TTNI / TMNI / TSNI
	Standards Engineer: AL SILVA			**22022462**

VAULT, LOADBREAK BUS JUNCTION

CONSTRUCTION NOTES: Joints shall be constructed so that the various units interlock when assembles. The vault shall be constructed with the following items included:

A. Exterior Grounding System
⅜" dia. steel lead with ½" dia. bronze grounding inserts & cap protector, located on each long side of riser.

B. Galvanized C Channel 4' long
One (1) on each side

C. Interior Grounding System
⅜" dia. steel lead with ½" dia. bronze grounding inserts & cap protector, located on all 4 sides

D. Precast Knockouts
On all four (4) sides of riser for installing conduits

E. Grounding Bar #4
Minimum length of 20 feet of #4 rebar around the vault perimeter

F. Burke's Lifting Eye
On all four (4) sides
Size as required for lifting load.

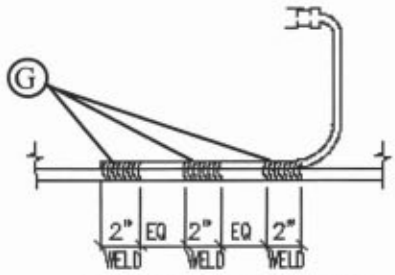
G. Weld Detail
(see drawing below)

H. Ground Rod Knockouts 1" dia.
Spaced evenly on 4 places in the floor of the base.

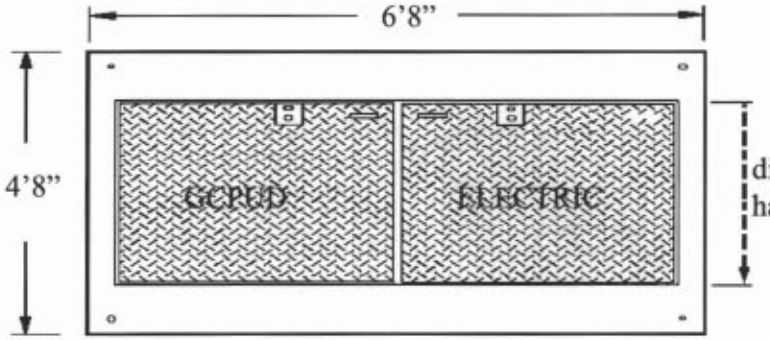
I. Galvanized Pulling Loops
Loops shall be capable of supporting the entire weight of the unit.
Positioned at the center of the wall from the corner on all four (4) sides

L. Drain Sump - centered in the middle of the floor

M. Date and Inspection Stamp

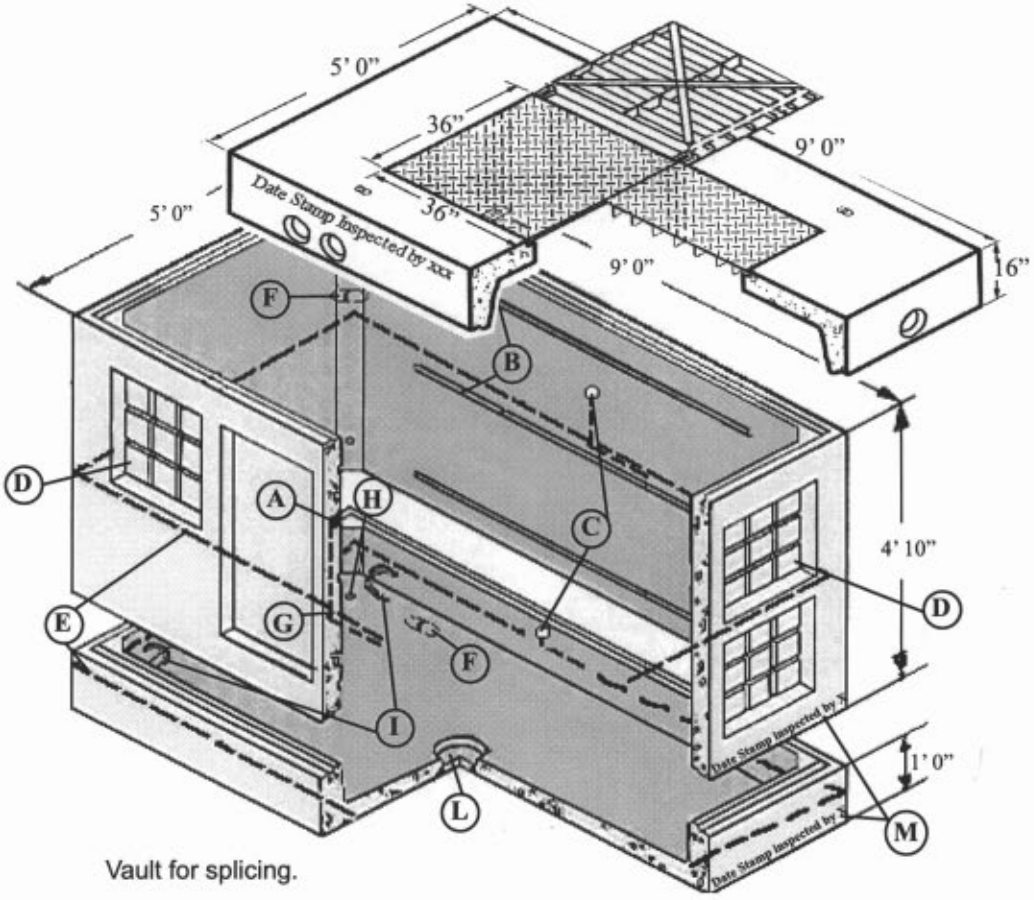


Enlarged View of Weld Detail



PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	05/07/91	VAULT, LOADBREAK BUS JUNCTION	ASSEMBLY UNIT	Yes
	Rev #	8		SOLE SOURCE	No
	Designer	HC		TDSI X / TTNI / TMNI / TSNI	
	Standards Engineer: AL SILVA			22022462	

VAULT, SPLICING, 9' x 5'



GENERAL: Vault for splicing.

SPECIFICATIONS: Concrete Vault constructed per the Districts Precast Concrete Product Specification #03800: ***Q:\DATA\STANDARD\Product Specifications/ 03800 Precast Concrete Products.*** See page 2 of 2 for construction notes. Unit must support 9,860 lbs. transformer loading. The hatch shall open a full 180°. Both leaves shall be hinged to lift to the same side. The hatch shall have double locking capability and have .281" diameter torsion springs for assisted lifting and closing. **Each piece shall have a manufactured date, inspection stamp, and weight stamp or stencil impressed or painted on it.**

PURCHASING: **Include stock page and District specs with each purchase request and bid contract document.** Base: Approximately 3,880 Lbs. Body: Approximately 5,980 Lbs.

SHIPPING: Units shall be shipped, unstacked, on a minimum of 4" x 6" dunnage for each piece.

STOCK NUMBER		SIZE			APPROVED MANUFACTURERS & CATALOG NUMBERS	
		L	W	D	UTILITY VAULT	H-2 PRECAST
22023083	VAULT	9' 0"	5' 0"	5"10	**4484-LA**	**VB4484B & VB4484D**
	COVER	9' 0"	5' 0"	16"	**4484-TL2-332P**	**VLG4484-23PL**

Rev. 05-06-09 DH "Updated H2 catalog number; Added stock page and specifications inclusion note."
Rev. 06-25-07 DH "Combined with cover 22142385; Changed rebar size in construction notes; Added shipping note."
Rev. 09-08-06 DH "Added 'Burke's lifting eyes to specs; reformatted page in InDesign; change min/max to zero."
Rev. 07-11-05 DH "Added 'Off-loading' condition information."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	12/04/89	VAULT, SPLICING, 9' x 5'	ASSEMBLY UNIT: Yes
	Rev #	9		SUBSTITUTION: Upon Approval
	Designer	GW		TDSI X TTNI TMNI TSNI
	Standards Engineer: AL SILVA			**22023083**

VAULT, SPLICING, 9' x 5'

CONSTRUCTION NOTES:

Joints shall be constructed so that the various units interlock when assembles. The mastic between sections shall be ¾" thick.

The vault shall be constructed with the following items included:

A. Exterior Grounding System
⅜" dia. steel lead with ½" dia. bronze grounding inserts & cap protector, located on each long side of riser

B. Galvanized C Channel 4' long
Three (3) on each long side

C. Interior Grounding System
⅜" dia. steel lead with ½" dia. bronze grounding inserts & cap protector, located on all four (4) sides of base and riser

D. Precast Knockouts
On all four (4) sides of riser for installing conduits

E. Grounding Bar
Minimum length of 20 feet of #4 rebar around the vault perimeter

F. Burke's Lifting Eye
On all four (4) sides of base and riser.
Size as required for lifting load.

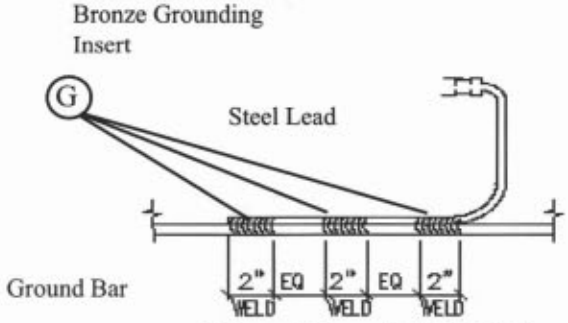
G. Weld Detail
(see drawing below)

H. Ground Rod Knockouts 1" dia.
Spaced evenly on 4 places in the floor of the base.

I. Galvanized Pulling Loops
Loops shall be capable of supporting the entire weight of the unit. Positioned at the center of the wall from the corner on all four (4) sides of the base

L. Drain Sump - centered in the middle of the floor

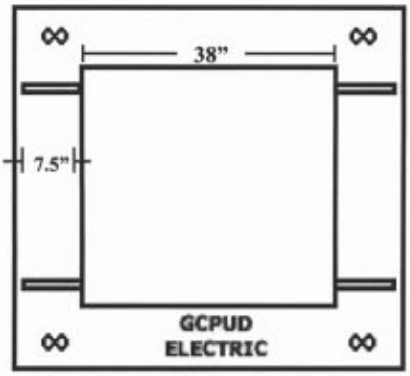
M. Date and Inspection Stamp



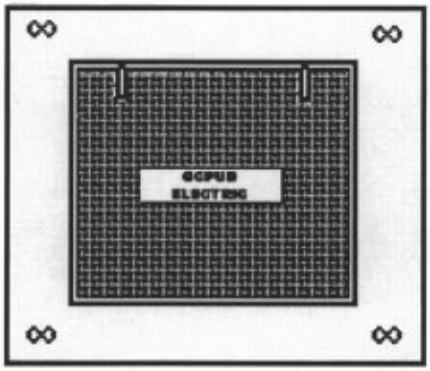
Enlarged View of Weld Detail

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	12/04/89	VAULT, SPLICING, 9' x 5'	ASSEMBLY UNIT		Yes	
	Rev #	9		SUBSTITUTION		Upon Approval	
	Designer	GW		TDSI X	TTNI	TMNI	TSNI
	Standards Engineer AL SILVA			22023083			

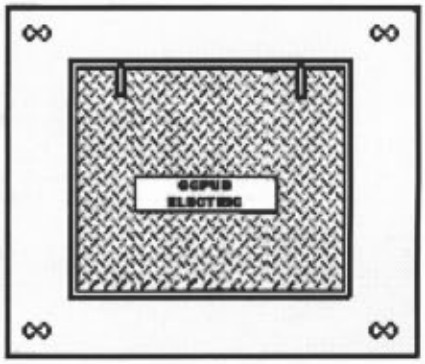
VAULT, COVER, 4'8" x 4'8"



Secondary cabinet cover without hatch



Chevron 36" Square Grate Hatch



Diamond Plate 36" Square Steel Hatch

GENERAL: Covers for junction vault stock numbers 22022374 & 22022377.

SPECIFICATIONS: Concrete cover shall be constructed per the Districts Precast Concrete Product Specification #03800: ***Q:\DATA\STANDARD\SPECIFICATIONS/District Specs/03800 Precast Concrete Products.*** The hatch shall have the manufacturer's name or emblem and the words "GCPUD ELECTRIC". On the Secondary cabinet cover, "GCPUD ELECTRIC" shall be made in the concrete. The cover shall have 4 Burke's lifting eye, one at each corner. All exposed metal shall be hot-dipped galvanized. The hatch shall have double locking capability and have .281" diameter torsion springs for assist lifting and closing.
The secondary cover shall have four (4) 3/4" uni-strut channels 7.5" long poured in the concrete, a minimum of 6" from the corner as shown.
Each piece shall have a manufactured date, inspection stamp, and weight stamp or stencil impressed or painted on it.

PURCHASING: Quantity "Each"
Include stock page and District specs with each purchase request and bid contract document.

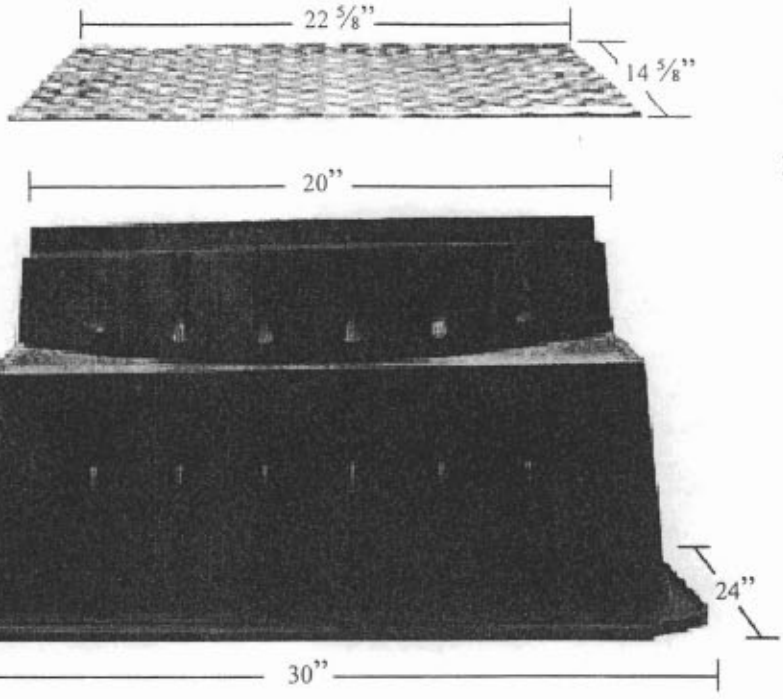
OFF-LOADING: **Any units with pallets that are oversized, undersized, damaged, broken, have loose boards, or protruding nails or screws shall not be accepted.**

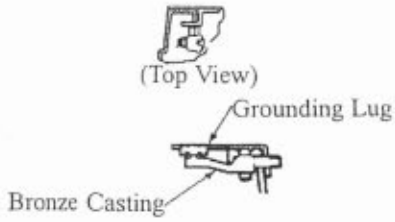
STOCK NUMBER	OPENING HATCH SIZE	TYPE	WEIGHT	APPROVED MANUFACTURERS & CATALOG NUMBERS	
				UTILITY VAULT	H-2 PRECAST
22052078	3' 2" x 3' 2"	OPEN TOP	979 lbs	**55-CAB-GCPUD**	**TPG550-3838**
22142378	3' x 3'	CHEVRON GRATE	1045 lbs.	**55-332**	**VLG550-13PL-G**
22152378	3' x 3'	DIAMOND PLATE	1031 lbs.	**55-332P**	**VLG550-13PL**

Rev. 05-06-09 DH "Updated H2 catalog number; Added stock page and specifications inclusion note."
Rev. 10-14-08 DH "Changed size in the title."
Rev. 05-14-08 MHS "Added 22052078; changed page number to lowest stock."
Rev. 09-11-06 DH "Added 'Burke lifting eyes' to specs; reformatted page in InDesign; deleted #22162378 & 22172378, 2' x 2' hatch."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	12/04/01	VAULT, COVER 4'8" x 4'8"	ASSEMBLY UNIT	Yes
	Rev #	8		SUBSTITUTION	Upon Approval
	Designer	GW		TDSI X / TTNI / TMNI / TSNI	
	Standards Engineer: AL SILVA			**22052078**	

ENCLOSURE, FIBER OPTIC JUNCTION BOX





Lock and Ground Detail

Locking Plate

Head Dimensions of Penta Bolt

GENERAL: Fiber Optic junction box with reinforcing ribs and cover with recessed penta-head locking bolt.

SPECIFICATIONS: Enclosure shall be molded of green high density polyethelene with a min. thickness of 5/16". Cover shall be hot-dipped galvanized 3/16" diamond plate steel per ASTM A123 with "FIBER" identified on the cover. (Either embossed or a metal tag attached with 4 corner rivets is acceptable.) Letters shall be at least 1" high.

RATING: Only use in non-vehicular traffic situations. Not recommended for use in concrete or asphalt.

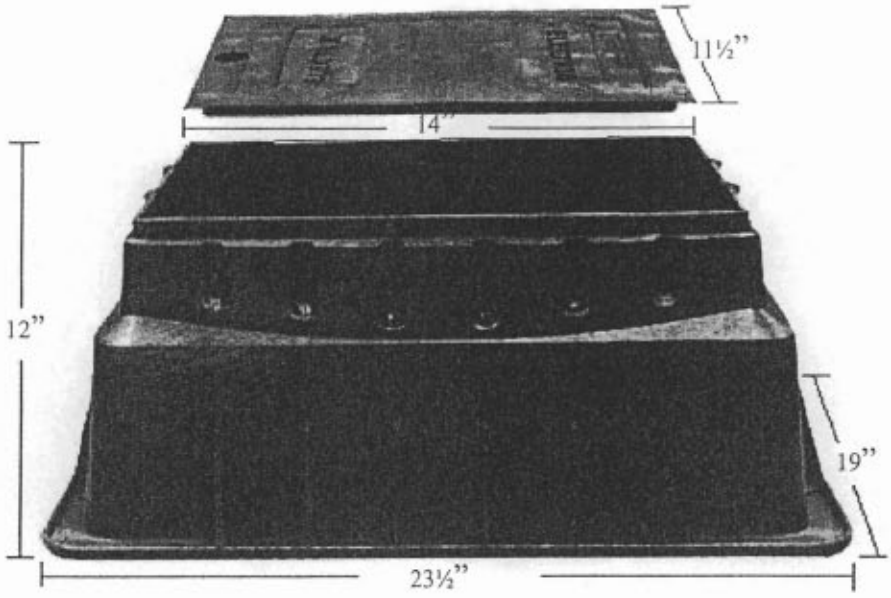
PURCHASING: Quantity "Each".
Each unit shall include cover and penta head locking bolt.
Enclosure must include 1/2" Penta-head bolts with 7/8" heads, no substitutions.

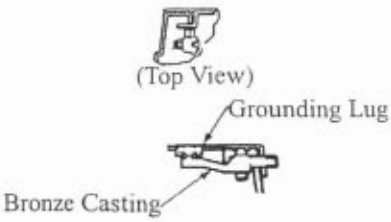
STOCK NUMBER	TYPE	APPROVED MANUFACTURERS & CATALOG NUMBERS
		PENCELL
22097714	FIBER	**PE20UX**

Rev. 09-15-08 DH "Removed 'Applied Engineering'; Updated Pencell catalog number for complete unit."
Rev. 12-22-05 DH "Added Penta Bolt Head dimension requirements; updated 'PenCell' catalog number."
Rev. 07-20-04 MRS "Corrected specs to specify hot-dipped galvanized finish, ASTM A123."
Rev. 04-11-02 AL "Added Applied Engineering as Approved Manufacturer."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	09/14/00	ENCLOSURE, FIBER OPTIC BOX	ASSEMBLY UNIT	Yes	
	Rev #	4		SOLE SOURCE	No	
	Designer	MHS		TDSI X	TTNI	TMNI TSNI
	Standards Engineer E. WENKE			**22097714**		

ENCLOSURE, LIGHTING JUNCTION BOX





Lock and Ground Detail

Locking Plate

Head Dimensions of Penta Bolt

GENERAL: Lighting junction box with reinforcing ribs and cover with recessed penta-head locking bolt.

SPECIFICATIONS: Enclosure shall be molded of green high density polyethelene with a min. thickness of 5/16". Cover shall be made of high density polyethylene with "ELECTRIC" molded into two areas. Letters shall be at least 1" high.

RATING: Only use in non-vehicular traffic situations. Not recommended for use in concrete or asphalt.

SIZE: Exterior dimensions of the base must be a minimum of 15¼" x 20½" x 12" high.

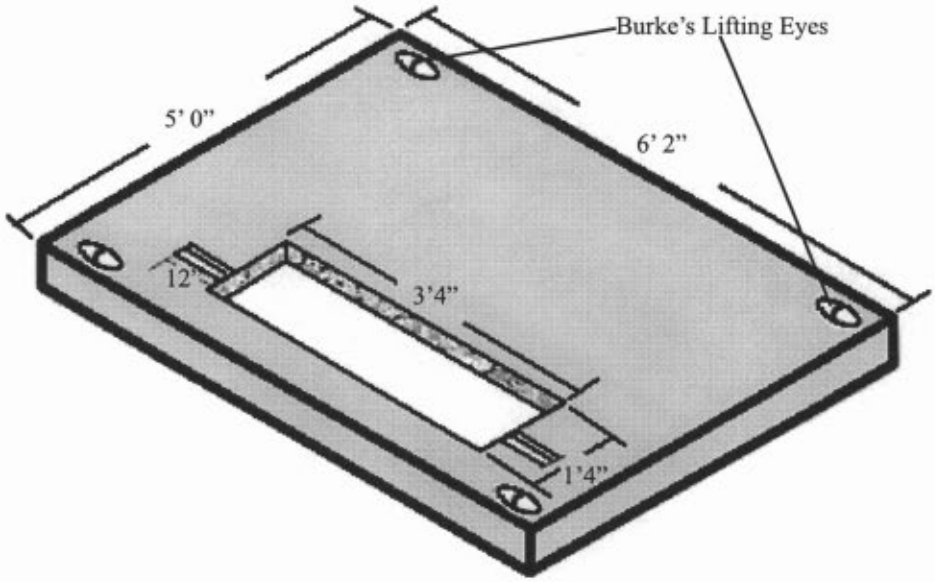
PURCHASING: Quantity "Each".
Each unit shall include cover and penta head locking bolt.
Enclosure must include 1/2" Penta-head bolts with 7/8" heads, no substitutions.

STOCK NUMBER	TYPE	APPROVED MANUFACTURERS & CATALOG NUMBERS		
		CARSON INDUSTRIES	PENCELL	APPLIED ENGINEERING
22097799	LIGHTING	**1419-12-4+large penta-GE**	**PE-14HDX**	**1015T-1G2G-penta**

Rev. 09-15-08 DH "Updated Carson Ind. and Applied Eng. catalog numbers for penta head requirement."
Rev. 12-22-05 DH "Added Penta Bolt Head dimension requirements; updated 'Carson' catalog number."
Rev. 04-11-02 AL "Added Applied Engineering as approved manufacturer."
Rev. 08-15-01 LW "Changed 'Carlson Sales' to 'Carson Industries'."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	03/24/87	ENCLOSURE, LIGHTING BOX	ASSEMBLY UNIT	Yes		
	Rev #	5		SOLE SOURCE	No		
	Designer	RS		TDSI X	TTNI	TMNI	TSNI
	Standards Engineer AL SILVA			22097799			

VAULT, COVER, 6'2" x 5'0", 45 kVA - 500 kVA TRANSFORMER



GENERAL: Cover for 3 phase (45 kVA - 500 kVA) pad mount transformer vaults.

SPECIFICATIONS: Concrete cover shall be constructed per the Districts Precast Concrete Product Specification #03800: ***Q:\DATA\STANDARD\Product Specifications/ 03800 Precast Concrete Products.*** The cover must support at least a 6,500 lb. transformer loading. The cover must have the manufacturer's name or emblem and the words "GCPUD ELECTRIC". The cover shall have a 3'4" x 1'4" knockout with 1½" x 1½" x 12" unistrut channel mounted flush to the top. The cover shall have 4 Burke's lifting eye, one at each corner. All exposed metal shall be hot-dipped galvanized. . **Each piece shall have a manufactured date, inspection stamp, and weight stamp or stencil impressed or painted on it.**

PURCHASING: **Include stock page and District specs with each purchase request and bid contract document.**
Approximately 1,950 Lbs.
See stock page #22022374 for 4'8" x 4'8" junction vaults.

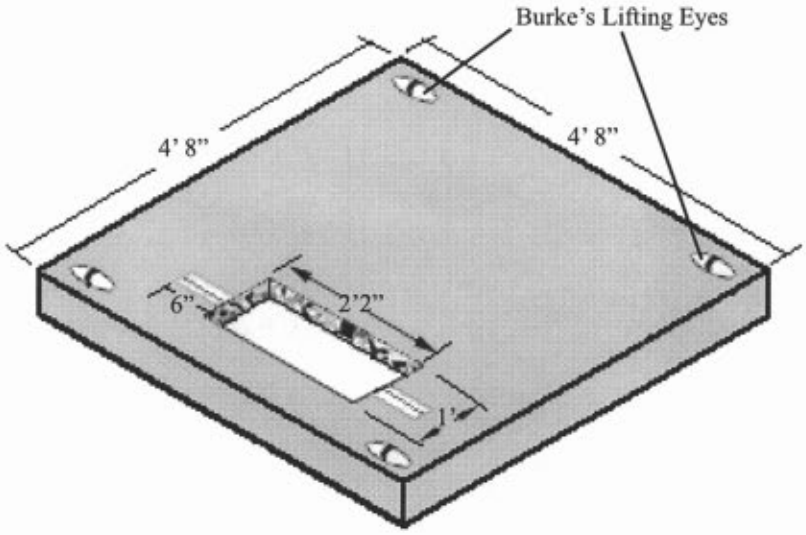
OFF-LOADING: **Any units with pallets that are oversized, undersized, damaged, broken, have loose boards, or protruding nails or screws shall not be accepted.**

STOCK NUMBER	SIZE		APPROVED MANUFACTURERS & CATALOG NUMBERS	
	L	W	UTILITY VAULT COMPANY	H-2 PRECAST
22402486	6' 2"	5' 0"	**504 PAD SPECIAL** drawing #BID-610 sheet 2 with 12" channel	**TPG7460-1640**

Rev. 05-06-09 DH "Updated H2 catalog number; Added stock page and specifications inclusion note."
Rev. 09-15-06 DH "Added Burke's lifting eyes to specs; reformatted page in InDesign."
Rev. 07-11-05 DH "Added 'Off-loading' condition information and date inspection stamp requirement."
Rev. 06-06-01 MS "Added 'H2' and reformatted the page for legibility."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	12/04/89	VAULT, COVER, 6'2" x 5'0" 45 kVA - 500 kVA TRANSFORMER	ASSEMBLY UNIT	Yes		
	Rev #	5		SUBSTITUTION	Upon Approval		
	Designer	GW		TDSI X	TTNI	TMNI	TSNI
	Standards Engineer AL SILVA			**22402486**			

VAULT, COVER, 4'8" x 4'8", 15 kVA - 167 kVA TRANSFORMER



GENERAL: Cover for 1 phase (15 kVA - 167 kVA) pad mount transformer vault.

SPECIFICATIONS: Concrete cover shall be constructed per the Districts Precast Concrete Product Specification #03800: ***Q:\DATA\STANDARD\Product Specifications/ 03800 Precast Concrete Products.*** The cover must support at least 3,000 lbs. The cover must have the manufacturer's name or emblem and the words "GCPUD ELECTRIC". The cover shall have a 2'2" x 1' knockout with 1½" x 1½" x 6" unistrut channel mounted flush to the top. The cover shall have 4 Burke's lifting eye, one at each corner. All exposed metal shall be hot-dipped galvanized. . **Each piece shall have a manufactured date, inspection stamp, and weight stamp or stencil impressed or painted on it.**

PURCHASING: **Include stock page and District specs with each purchase request and bid contract document.**
Approximately 1,600 Lbs.
See stock page #22022374 for vault.

OFF-LOADING: **Any units with pallets that are oversized, undersized, damaged, broken, have loose boards, or protruding nails or screws shall not be accepted.**

STOCK NUMBER	SIZE		APPROVED MANUFACTURERS & CATALOG NUMBERS	
	L	W	UTILITY VAULT COMPANY	H-2 PRECAST
22412478	4' 8"	4' 8"	**504 PAD SPECIAL**	**TPG550-1226**

Rev. 05-06-09 DH "Updated H2 catalog number; Added stock page and specifications inclusion note."
Rev. 09-15-06 DH "Added Burke's lifting eyes to specs; reformatted page in InDesign."
Rev. 07-11-05 DH "Added 'Off-loading' condition information and date inspection stamp requirement."
Rev. 07-23-04 MS "Updated page drawing."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	12/05/89	VAULT, COVER, 4'8" x 4'8", 15 kVA - 167 kVA TRANSFORMER	ASSEMBLY UNIT		Yes	
	Rev #	6		SUBSTITUTION		Upon Approval	
	Designer	GW		TDSI X	TTNI	TMNI	TSNI
	Standards Engineer AL SILVA			**22412478**			

FAULT INDICATORS - UNDERGROUND
TEST POINT RESET

Photo of E.O. Schweitzer Fault Indicator..

Photo of Cooper Fault Indicator.

General: Fault indicators for both 200 & 600 Amp circuits.

Rating: Rated for 15kV systems.

Power Requirements	5 kV Minimum
Continuous Current	125% of Trip Current Max.
Maximum Fault Current	20,000 for 10 Cycles
Reset Time	3 Min. @ 5 kV @ 25° C automatic at minimum voltage.

Specifications: Indicators shall be fabricated of conductive EPDM rubber, epoxy encapsulated electronic componentry and shall be suitable for submersible application. Indicators shall be fabricated and tested per ANSI/IEEE 495 latest edition.
Indicators shall be mountable on both Elastimold and Cooper elbows. Adapter kits, when required, for mounting shall be included with the indicator.

Purchasing: Order each including adaptor kits for Cooper and Elastimold elbows in the 200 and 600 amp configuration. See stock #23154004 for adaptor kits.

STOCK NUMBER	TRIP AMPS	CIRCUIT AMPS	APPROVED MANUFACTURERS & CATALOG NUMBER	
			RTE Cooper	E.O. Schweitzer
23151130	400	200	STLO	1TPRI0400B
23151180	800	600	STHI	1TPRI0800B

Option "B" includes bailing ring

Rev. 02-01-05 MHS "Deleted 23151140, 1150, 1170 &1190 changed specifications and photos."
Rev. 06-03-98 M.B. "Deleted RTE Cooper Prod. No.-Changed RTE Cooper Catalog No."
Rev. 04-24-97 "Updated ABChance/Hubbell numbers.
Rev. 08-22-95 "Removed Adapter Information - reassign adapter to #23154000.

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON

FAULT INDICATORS - UNDERGROUND

DATE:	09/10/87	STOCK CATALOG	☒ TDSI ☐ TTNI ☐ TMNI ☐ TSNI	**23151130**
DESIGNER;	LL			
STANDARDS ENGR;	A. Silva			Page 1 of 1

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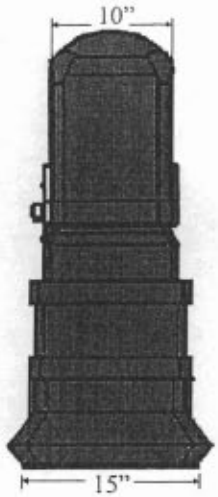
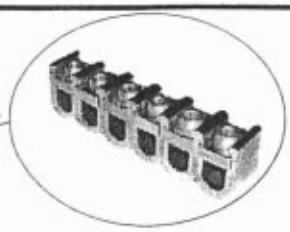
PEDESTAL, SECONDARY, ABOVE GROUND



Side View

Front View with cover

Front View without cover



Enlarged view of 6-way 350 MCM Lay-in connector

GENERAL: Underground-fed enclosure pedestal with connectors for secondary connections from transformers.

SPECIFICATIONS: The pedestal shall be made with UV stabilized polyethylene. The pedestal shall have a flared base and step design to resist deflection when buried. The words "GROUND LINE" or "GRADE LINE" shall be molded into the front and back of the pedestal or molded on each side. The word "ELECTRIC" shall be molded into the top of the cover. The pedestal shall be provided with penta bolt lock and provisions for ring lock for ANSI type double-locking system consisting of captive penta head bolt recessed into blind hole. The penta head bolt shall be sized to fit a Snap-on socket head #B2191. All locking hardware shall be stainless steel.

Three 6-way 350 MCM lay-in connectors shall be installed in each pedestal. The connectors shall include clear lexan or plastic covers. The connectors shall be fabricated from 6061-T6 aluminum alloy and shall be compatible with both copper and aluminum conductor. All connectors shall conform to ANSI 119.4 Class A conductors.

LABELS: The warning label shall be supplied by the District, Stock Number 58080555. The label shall be in both English & Spanish. The label shall be 7" x 11.
After award of the contract, the District shall ship the required number of labels plus 10% extra. The manufacturer may request additional labels at an extra charge.

PURCHASING: Quantity "Each". Standard package is 100 each.

STOCK NUMBER	COLOR	SUGGESTED BURIAL DEPTH	APPROVED MANUFACTURERS & CATALOG NUMBERS		
			CMC / ESP	COLUMBIA	NORDIC
44402439	MUNSEL GREEN	16"	**PF3-L1350-6IG**	**PF300C1G-MG188**	**PSPF-101538-MG-L6350-GRANT**

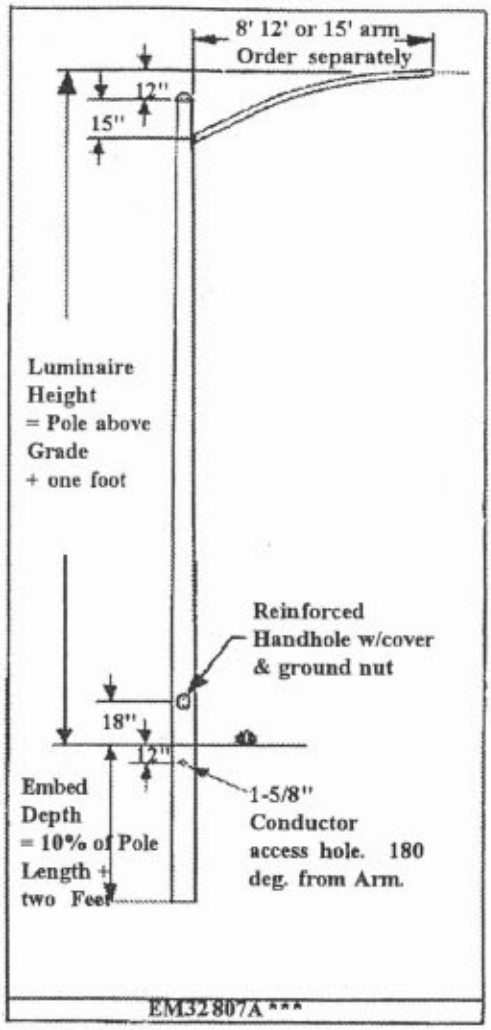
Rev. 03-11-09 DH "Updated Columbia cat. number; Corrected measurements in photo; Corrected referenced label stock number."
Rev. 09-08-05 DH "Changed specs to 'District supplying labels'; Added photo of decal to drawing."
Rev. 04-19-01 MHS "Change catalog number for Columbia & CMC/ESP."
Rev. 03-20-01 MHS "Change catalog number for Columbia; Added Nordic; Removed stake."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	08/14/96	PEDESTAL, SECONDARY, ABOVE GROUND	ASSEMBLY UNIT	Yes
	Rev #	5		SUBSTITUTIONS	Approval Required
	Designer	MHS		TDSI X / TTNI / TMNI / TSNI	
	Standards Engineer E. WENKE			**44402439**	

POLES, STEEL, DIRECT BURIAL

GENERAL: Steel pole designed for direct burial. Pole profile is to be round, tapered and suitable for luminaire arm installation or other electric utility applications

SPECIFICATIONS: POLE: Pole shaft shall conform to ASTM A 595 Grade-A steel and be 11 gauge (0.1196" nominal) thickness. The pole shall be constructed in one piece with a full length longitudinal high frequency electric resistance weld. The taper shall be a uniform 0.14 inches per foot.



STOCK NUMBER	ITEM	APPROVED MANUFACTURERS & CATALOG NUMBER	
		Valmont	
49001130	EM32 STEEL POLE	EM32-870A336-OS GV HH AH	
49001140	EM32 STEEL POLE	EM32-E00B460-OS GV HH AH	

Catalog # or Description will indicate the following: Pole Type = EM32 Base Dia. = 8.7 inches Gauge of pole materail = A=11 Nominal shaft length =first two digits are feet, last is inches {ie, 336= 33 feet, 6 inches} Not ordered with arms = OS Finish type = GV (Hot dip galvanized) HH indicates hand hole. AH indicates one 1-5/8 inch Dia. hole for conductor access in base.

Rev 02-20-02 AL Added AH note to to Valmont catalog number.
Rev 08-29-00 MHS Changed Stock Number/Page number and added 49001140.
Rev 08-22-00 AS Changed Valmont Stock Number
Rev. 06-14-00 MHS. First Edition

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON

POLES, STEEL, DIRECT BURIAL

DATE:	06/13/00	STOCK CATALOG	[X] TDSI [ ] TTNI [ ] TMNI [ ] TSNI	**49001130**
DESIGNER;	MHS			
STANDARDS ENGR;	E WENGE			Page 1 of 3

Q:\Data\Standards\Stkcat\49001130

POLES, STEEL, DIRECT BURIAL

HANDHOLE: Hand hold shall be 4" X 6.5" oval shape constructed of oval pipe material with two tabs for mounting the steel cover. Include the cover and two hex headed steel attachment screws. The handhole is to be installed so it will be 1' 6" above grade after burial and be 90 degrees clockwise from the luminaire arm mounting base.

ELECTRICAL GROUND: A grounding nut shall be installed near the hand-hole and shall include a 0.5 "-13 UNC hex head bolt and nut to complete grounding of the pole.

UNDERGROUND WIRING ACCESS: Wiring access shall be provided for by drilling an 1 5/8" hole so it will be 1' below grade and 180 degrees from the luminaire arm after installation. The hole will be drilled prior to application of the finish coating and have all burs and sharp edges removed prior to finishing.

LUMINAIRE ARM ATTACHMENT: Pole mounted simplex for luminaire arm attachment shall be fabricated from hot rolled carbon steel conforming with ASTM A 36, then welded to the pole. The simplex shall be constructed so the arm can be connected with three high strength hex headed head bolts. (Head bolts are to be included with the luminaire arm.) The connection of the arm and pole shall form a weather resistant conductor raceway when assembled.

POLE CAP: Include a removable pole top cap constructed of the same materials and finish as the pole. Top cap will be attached with three set screws included with the pole.

FINISH CLEANING AND PRIMING: After cleaning (Sand blast where required to remove corrosion or scale) and removal of burs and non metallic foreign materials the formed and shaped pole is to be immersed in an agitated 4.5% to 6% concentrated caustic solution with a temperature range of 150 to 180 degree F. This procedure is to be followed by immersion in a sulfuric acid solution of not less than 10% or more than 12% concentration within a temperature range of 150 to 160 degree F. Deep rinse in a fully submerged fresh water bath. After completely drying, the poles shall be immersed in a concentrated zinc ammoniumchloride flux solution heated to 170 degree F. The acidity of the flux solution shall be between 4.5 and 5.0 pH.

GALVANIZED FINISH: The pole shall be finished with a hot-dip method as required by ASTM 123 (Fabricated Products). Hardware items will be finished with a hot-dip method as required by ASTM 153. Both shall be by immersion in a molten bath of prime grade zinc maintained at a temperature range of 810 to 850 degree F. Restrict aluminum content of the bath to less than 0.01% and skim the surface prior to immersion and removal. If the finish is contaminated by slag or flux ash the pole shall be refinished by repeating the cleaning and priming steps prior to reemerging in the molten bath.

DESIGN: It is the intent of this specification to produce a standard pole capable of withstanding dead loads and theoretical dynamic loads imposed by 100 mile per hour winds with a 1.3 gust factor. When installed the arms must also be capable of withstanding icing loads of 1/2" (0.5) inches. Height correction factors and drag coefficients must be applied to the entire structure with appropriate safety

POLES, STEEL, DIRECT BURIAL

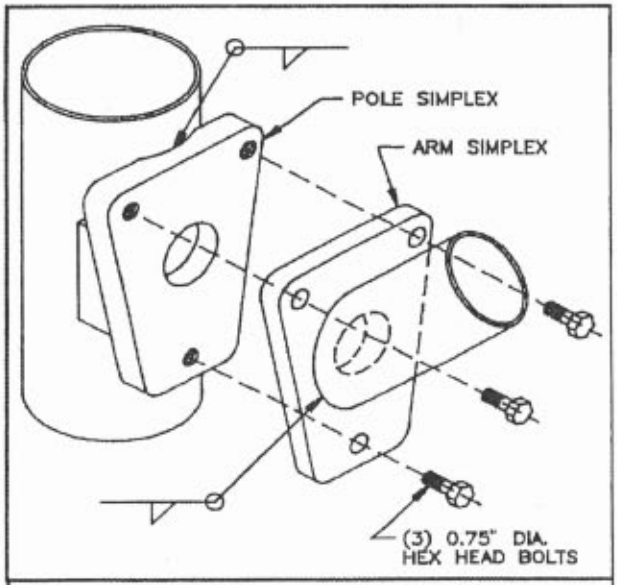
factors based on the minimum yield strength of the material incorporated in the standard. Poles shall be designed and constructed so that they remain straight when a single arm and luminaire are installed.

Pole Size Table: For all Arm Lengths.

POLE SIZING TABLE					Luminaire Arm Rise (from pole mount)		
DISTRICT STOCK NUMBER	Pole O.D. Bottom (Inches)	Pole O.D. Top (Inches)	Pole O.D./Embed At Grade	Pole Length (Feet)	8 Foot	12 Foot	15 Foot
49001130	8.7	4	8.3" / 5'	36	1'-4"	2'-0"	2'-6"
49001140	10	3.6	9" /7'	46			

SIZE: Pole size will be designed to make luminaire lens height approx. 30'. For a twelve foot arm use the table above. For other arms specify when ordering.

PURCHASING: Poles are to be EM32 (Valmont Number) "or equal" and follow the above specifications. Size according to table above. Order without arms. (The arms are purchased by size. See #49001108 for eight footers, 49001112 for twelve footers and 49001115 for fifteen footers.)



ARM ATTACHMENT DETAIL

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON				
POLES, STEEL, DIRECT BURIAL				
DATE:	06/13/00	STOCK CATALOG	☒ TDSI ☐ TTNI ☐ TMNI ☐ TSNI	49001130
DESIGNER;	MHS			
STANDARDS ENGR;	E WENKE			Page 3 of 3

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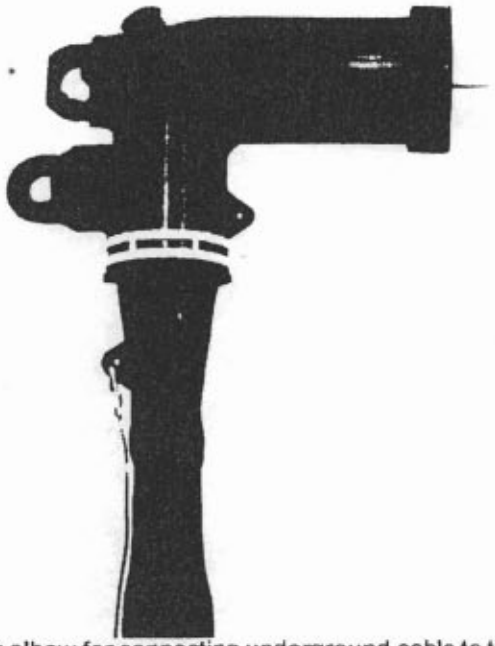
TERMINATION, ELBOW, 15kV 200 AMP, WITH TEST POINT



GENERAL: Loadbreak elbow for connecting underground cable to transformers, switching cabinets and junctions equipped with loadbreak bushings.

SPECIFICATIONS: Loadbreak elbow shall meet or exceed the requirements of ANSI/IEEE Standard 386 for loadbreak connectors.
Units shall be fully shielded and submersible moulded rubber (EPDM insulated with semi-conducting insert and shield), elbow configured as shown on page 2 of 2.
Loadbreak elbow shall be designed for installation on 220 mil., jacketed neutral, EPR cable.
Loadbreak elbow shall include a Capacitive Test Point on the molded body with snap-on cap.
See cut view for construction information on page 2 of 2.

RATING: See Rating Table on page 2 of 2.

PURCHASING Standard package shall be 20 per pack

NOTES: **The complete kit shall include all of the following items:**

Molded Rubber Elbow with Test Point
Copper Top Compression Connector
Loadbreak Probe
Probe Installation Tool
Silicone Lubricant
Installation Instruction Sheet

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON				
TERMINATION, ELBOW, 15KV 200 AMP, WITH TEST POINT				
DATE:	05/02/95	STOCK CATALOG	☒ TDSI ☐ TTNI ☐ TMNI ☐ TSNI	66930352
DESIGNER;	LL			
STANDARDS ENGR;	A. Silva			Page 1 of 2

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TERMINATION, ELBOW, 15kV 200 AMP, WITH TEST POINT

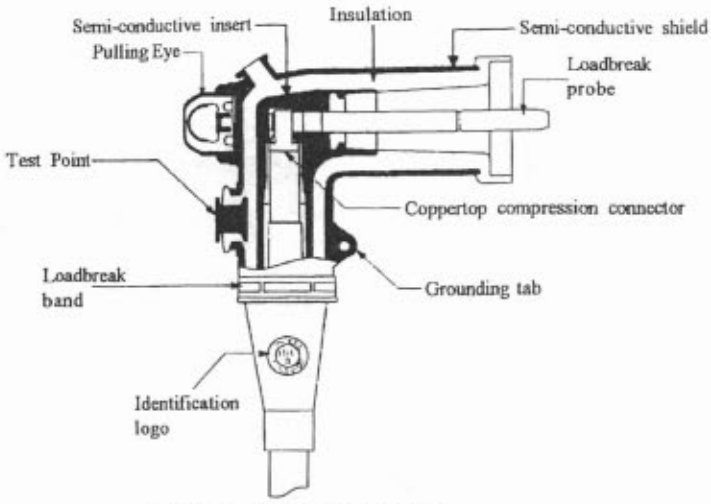
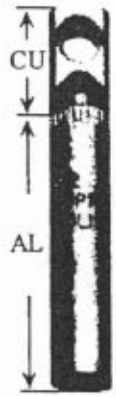


Diagram of loadbreak elbow.



Enlarged Photo of Copper Top Compression Connector

RATING TABLE (kV)					
VOLTAGE CLASS	PHASE TO PHASE MAX	PHASE TO GROUND MAX	60 Hz 1 MINUTE WITHSTAND	BIL	CORONA MIN V LEVEL
15	14.4	8.3	34	95	11

NUMBER OF OPERATIONS RATING	SHORT CURCUIT RATING
10 switching operations at 10,000 symmetrical amps	0.17 seconds at 10,000 symmetrical amps

STOCK NUMBER	CONDUCTOR SIZE	INSULATION SIZE	INSULATION TYPE	APPROVED MANUFACTURERS & CATALOG NUMBER	
				ELASTIMOLD	COOPER
66930352	#2 AL Str.	220 mil.	EPR	166LR-B-5220	LE215-B-04-T
66930452	1/0 AL Str.	220 mil.	EPR	166LR-B-5240	LE215-B-06-T
66930652	4/0 AL Str.	220 mil.	EPR	166LR-C-5270	LE215-C-09-T

Rev. 09-08-04 DJH "Updated photo on page 2 of 2; Reworded ratings table."
Rev. 01-19-04 MRS "Added tables for specifications; added connector specs; deleted 'XLPE' stock items."
Rev. 05-05-97 L.L. Updated Elastimold and RTE-Cooper Cat. numbers - removed Chardon due to short copper top contact, and combined page 66930352 and 66930650.
Rev. 08-02-95 L.L. Changed Elastimold Catalog Numbers.

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON

TERMINATION, ELBOW, 15KV 200 AMP, WITH TEST POINT

DATE:	05/02/95	STOCK CATALOG	☒ TDSI ☐ TTNI ☐ TMNI ☐ TSNI	**66930352**
DESIGNER;	LL			
STANDARDS ENGR;	A. Silva			Page 2 of 2

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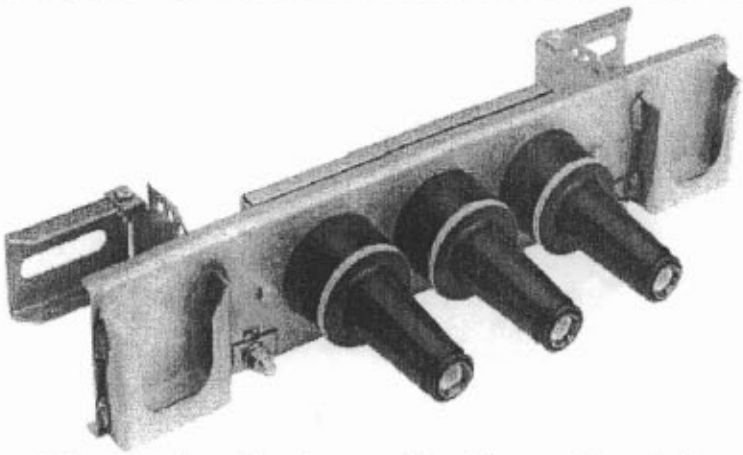
BUS, JUNCTION, LOADBREAK, 200 AMP



GENERAL: 200 amp loadbreak junction complete with ground lug attachments and variable-tilt mounting angle stainless steel bracket.

SPECIFICATIONS: The Junction shall meet all requirements of IEEE Standard 386-*Separable Insulated Connector Systems*. The loadbreak junction shall have a solid current path of copper alloy with no aluminum components. A latch ring indicator shall be located on the circumference of the interface collar. The junction shall have a fault activated piston that is forced forward by gas pressure during fault closing. Two drain wire clamps shall accommodate up to 1/0 stranded copper on the stainless steel bracket. The bracket shall be stainless steel and adjustable up to 90° tilt in 10° increments.

RATINGS: Max. Operations - 10 at 10,000 amps symmetrical
Short time - 10,000 for 0.17 sec. symmetrical.

RATING TABLE (Kv)			
PHASE TO PHASE MAX	PHASE TO GROUND MAX	60 Hz 1 MINUTE WITHSTAND	BIL
14.4	8.3	34	95

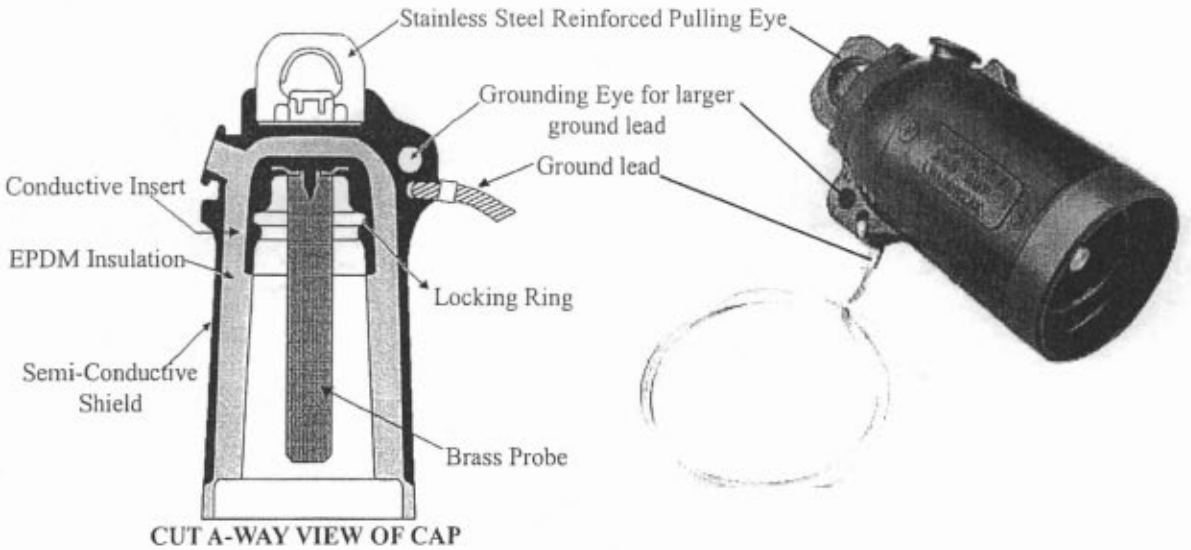
PURCHASING: The following items shall be included in kit form with each junction:
Loadbreak junction, Shipping caps/dust shield, Silicone Lubricant, and Installation instruction Sheet.
Tilt Mounting Bracket included from *Cooper*. (Order cat. # TMA - 2 per junction from *Elastimold)*.

STOCK NUMBER	BUSHINGS	VOLTAGE	CONTINUOUS AMPS	APPROVED MANUFACTURERS & CATALOG NUMBERS	
				COOPER	T & B (Elastimold)
66940003	3	15	200	**LJ215C3B**	**164J3-CS842**
66940005	4	15	200	**LJ215C4B**	**164J4-CS842**

Rev. 05-08-06 DH "Updated 'T&B' catalog number; Reworded 'general' and 'specification' statements; Converted page in InDesign."
Rev. 03-10-04 MRS "Changed 'RTE' to 'Cooper Power Systems'; Changed 'Elastimold' to 'T&B/Elastimold'; updated catalog numbers; deleted stk. # 66940002; changed page number to new lowest stk. #."
Rev. 05-01-85 KB "Add RTE Note."
Rev. 02-04-83 KW "Added qualification of Elastimold Product."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	12/15/76	BUS, JUNCTION, LOADBREAK, 200 AMP	ASSEMBLY UNIT	Yes
	Rev #	5 +		SOLE SOURCE	No
	Designer	GH		TDSI X / TTNI / TMNI / TSNI	
	Standards Engineer A. SILVA			**66940003**	

200 AMP PROTECTIVE CAP, 15kV



CUT A-WAY VIEW OF CAP

GENERAL: 200 amp protective cap for installation on 15kV load break bushings.

SPECIFICATIONS: Cap shall meet or exceed the requirements of ANSI/IEEE Standard 386. Cap shall be constructed to mechanically seal loadbreak bushing interfaces. Unit shall have brass probe with concentric locking ring, bedded in a conductive insert, EPDM insulation with a semi-conductive shield, in compliance with ANSI/IEEE Standard 592, a stainless steel reinforced pulling eye, grounding eye and a minimum 36" 14 AWG braided lead for grounding to avoid low energy discharge.

RATING: 200 amp.

RATING TABLE (kV)			
PHASE TO PHASE MAX	PHASE TO GROUND MAX	60 Hz 1 MINUTE WITHSTAND	BIL
14.4	8.3	34	95

PURCHASING: The following items shall be included in kit form with each Cap:
Protective strap with stranded copper ground wire
Silicone Lubricant
Installation Instruction sheet

STOCK NUMBER	VOLTAGE CLASS	APPROVED MANUFACTURERS & CATALOG NUMBERS		
		COOPER	ELASTIMOLD	HUBBELL
66945044	15	**LPC215**	**160DRG**	**215ICI**

Rev. 05-02-06 DH "Updated 'Hubbell' catalog number; converted page in InDesign."
Rev. 07-08-04 MRS "Updated page format; added 'T&B/Elastimold' and Hubbel/Chardon."
Rev. 07-26-00 MHS."Removed Blackburn, changed names and catalog numbers"
Rev. 01-25-97 L.L. "Added Chardon and removed Joslyn as approved."

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	03/15/91	200 AMP PROTECTIVE CAP, 15kV	ASSEMBLY UNIT	Yes		
	Rev #	5 +		SOLE SOURCE	No		
	Designer	MHS		TDSI X	TTNI	TMNI	TSNI
	Standards Engineer E. WENKE			**66945044**			

CONDUIT, FIBER OPTIC, SCHEDULE 40

Orange in Color only

GENERAL: Heavy wall rigid PVC Schedule 40 conduit for installation of fiber optic cables.

SPECIFICATIONS: PVC pipe shall meet or exceed the following standards and tests. NEMA standard TC-2, UL Listing UL-651, ASTM Test Method D 1598, dimensional requirements of ASTM D-1785 and the joint specifications of ASTM D 2672-96a. Specifically the socket length in inches shall comply with Table 1 Tapered Sockets for Bell-End pipe Column "C" Pressure.

ADDITIONAL: Conduit shall be orange color through the enrite depth of material. At 24" intervals the words "for communications cable only," shall be stamped/inked into the surface of the conduit.

SIZE: As specified.

PURCHASING: Conduit will be purchased in 10' {Foot} lengths.

STOCK NUMBER	DIMENSIONS (IN.)				UNIT QUANITIES {Feet}	lbs/100 ft.	APPR. MFG.	
	SIZE	O.D.	I.D.	WALL			ROYAL PIPE	PWPipe
76010310	1	1.315	1.049	.133	10 ea.	34	S. ORDER	S. ORDER
76010320	2	2.375	2.067	0.154	10 ea.	76	S. ORDER	S. ORDER

Rev. 09-27-02 EEA "Added 1" size changed page number."
Rev. 08/07/02 APL "Changed CED to Royal Pipe."
Rev. 03-14-02 MHS, Added warning print "For communication cable only"
Rev. 11/29/00 BY AAS, DELETED 1-1/2" CONDUIT SIZE

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON

CONDUIT, FIBER OPTIC, SCHEDULE 40

DATE:	09/12/00	STOCK CATALOG	☒ TDSI ☐ TTNI ☐ TMNI ☐ TSNI	76010310
DESIGNER;	MHS			
STANDARDS ENGR;	E WENKE			Page 1 of 1

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CONDUIT, HEAVY WALL RIGID PVC SCHEDULE 40

Photo of Solid Wall PVC Conduit

Permanent markings on conduit.

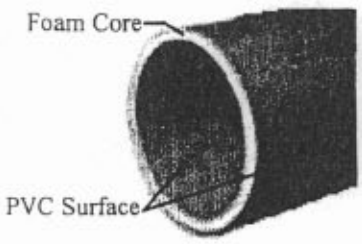


Photo of Foam Core PVC Conduit

GENERAL: Rigid Schedule 40 PVC (polyvinyl chloride) Conduit. Heavy wall electrical conduit with bell end configuration or coupling supplied. Acceptable for all underground, encased and above ground applications.

SPECIFICATIONS: PVC pipe shall meet or exceed the following standards and tests. NEMA standard TC-2, UL Listing UL-651, ASTM Test Method D 1598, dimensional requirements of ASTM D-1785 and the joint specifications of ASTM D-2672-96a. The socket length in inches shall comply with Table 1 on page 2 of 2. Bells shall be configured as per ASTM 2672 for minimum bell depth. Manufacturer data shall be printed on the side of each 10' length and shall include Manufacture name, schedule 40, plant and date of manufacture. These markings shall be legible and permanent. Each length shall be supplied with a coupling or integral coupling (Bell End).

PURCHASING: Sold in 10' lengths. See table on page 2 of 2 for additional ordering information. Either solid wall or foam core conduit is acceptable as long as it is UL listing -651.

Stock Number	APPROVED MANUFACTURERS & CATALOG NUMBERS			
	CARLON	PWPIPE	CANTEX	CANTEX (Foam Core)
76010707	**49007**	**4600 750103**	**A52AG12**	**----**
76010710	**49008**	**4601 000103**	**A52BA12**	**----**
76010715	**49010**	**4601 500103**	**A52BE12**	**----**
76010720	**49011**	**4602 000103**	**A52CA12**	**A60CA42**
76010730	**49013**	**4603 000103**	**A52DA12**	**A60DA42**
76010740	**49015**	**4604 000103**	**A52EA12**	**A60EA42**
76010760	**49017**	**4606 000103**	**A52GA12**	**A60GA42**

Rev. 01-31-06 MHS "Converted Page, Deleted vendor and added foam core specifications"
Rev. 01-11-01 MHS "Converted Page, Added PWPipe, Deleted two vendors and corrected Cat. #s"
Rev. 07-08-97 LL "Added 76010725"
Rev. 07-02-93 AA "converted to Pagemaker"

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	01-24-94	CONDUIT, HEAVY WALL RIGID PVC SCHEDULE 40	ASSEMBLY UNIT	Yes	
	Rev #	5		SOLE SOURCE	No	
	Designer	HC		TDSI X	TTNI	TMNI TSNI
	Standards Engineer AL SILVA			76010707		

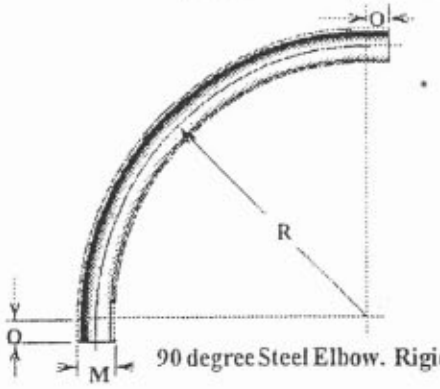
CONDUIT, HEAVY WALL RIGID PVC SCHEDULE 40

Table #1 Dimensional and Delivery Information.

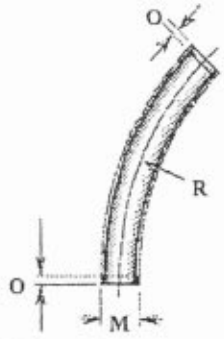
STOCK NUMBER	Dimensions (inches) Min.,				Stick/Bundle		Socket/Bell Lengths (Min. inches)	Units 10' Lengths Feet
	Conduit Size	O.D.	I.D.	Wall Thickness	Count	Feet		
76010707	3/4	1.05	0.824	0.113	10	100	1.00	4000
76010710	1	1.315	1.049	0.113			1.25	3200
76010715	1-1/2	1.9	1.610	0.145	5	50	2.00	1800
76010720	2	2.375	2.067	0.154			2.25	1400
76010730	3	3.5	3.068	0.216	1	10	3.25	880
76010740	4	4.5	4.026	0.237			4	570
76010760	6	6.625	6.065	0.280			6	260

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	01-24-94	CONDUIT, HEAVY WALL RIGID PVC SCHEDULE 40	ASSEMBLY UNIT	Yes	
	Rev #	5		SOLE SOURCE	No	
	Designer	HC		TDSI X	TTNI	TMNI TSNI
	Standards Engineer AL SILVA			**76010707**		

ELBOW, GALVANIZED SWEEP



90 degree Steel Elbow. Rigid.



45 degree Steel Elbow. Rigid.

GENERAL: 90 & 45 degree galvanized steel elbows in configurations for sweeps in distribution and transmission applications. These products are referred to as Rigid Metal Conduit {RMC}, Rigid Steel Conduit {RSC} & Galvanized Rigid Conduit {GRC}

SPECIFICATIONS: Elbows shall be galvanized steel pipe [mild steel tube] manufactured inaccordance with the following specifications.
All conduit shall be manufacturered to ANSI C80.1 and UL 6 safety standard. Interior shall be free from defects and the seam shall be continuously welded.
Both ends shall be threaded with 3/4" taper NPT threads according to ANSI B1.20.1 full cut.
After threading is complete the conduit shall be hot dipped galvanized according to ASTM A153.
Each elbow shall be equipped with two (2) deep threaded female couplings attached.

PURCHASING: Order quantity each. Check local supply for approved manufacturers. For each order list the size {R}, diameter {M} and degree {45 or 90} from the table below.

STOCK NUMBER	R [radius] {inches}	Degree	0 [tangent] threads {inches}	M [diameter] {inches}	Arc [length] {inches}	APPROVED MANUFACTURERS & CATALOG NUMBER		
						Wheatland Tube	Allied	Sesco
76050120	36	90	2	2	56	RMC	RSC	RSC
76050130	36		3	3	56	RMC	RSC	RSC
76050140	36		4	4	56	RMC	RSC	RSC
76050160	48		4	6	75 1/2	RMC	RSC	RSC
76060120	36	45	2	2	28	RMC	RSC	RSC
76060130	36		3	3	28	RMC	RSC	RSC
76060140	36		4	4	28	RMC	RSC	RSC
76060160	48		4	6	37 3/4	RMC	RSC	RSC

Rev. 12-27-02 MHS "Changed Specifications, Deleted 2.5" & updated sizes"

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON

ELBOW, GALVANIZED SWEEP

DATE:	07/30/76	STOCK CATALOG	☒ TDSI ☐ TTNI ☐ TMNI ☐ TSNI	76050120
DESIGNER;	RS			
STANDARDS ENGR;	A SILVA			Page 1 of 1

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ELBOW, PVC 90° SCHEDULE 40 CONDUIT

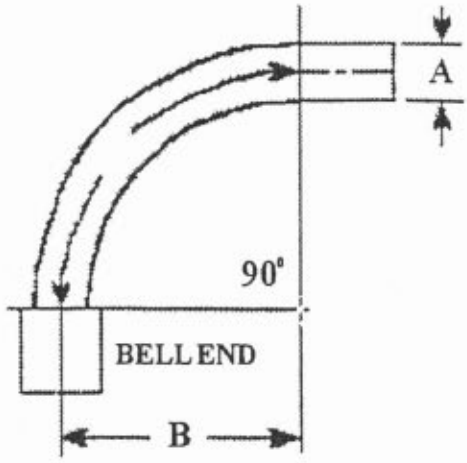
BELLED END

GENERAL: 90 Deg. Rigid PVC Conduit Schedule 40 for DB and OH-DB conduits installations.

SPECIFICATIONS: NEMA standard TC-2, UL Listing UL-651 and dimensional requirements of ASTM D-1785

MATERIAL: Polyvinyl chloride conduit. Acceptable for all underground, encased and above ground applications.

PURCHASING: 3/4, 1 and 1-1/2" elbows = pkg of 25 all others are 5/pkg.



STOCK NUMBER (NON-BELLED END)	DIA (in.) (A)	RADIUS (in.) (B)	APPROVED MANUFACTURERS & CATALOG NUMBER		
			CANTEX	CARLON	PW PIPE
76050307	3/4	4-1/2	5233824	UA9AEB	75900075
76050309	1	18	N/A	N/A	7590180100*
76050310	1	5-3/4	5233825	UA9AFB	75900100
76050315	1-1/2	36	N/A	UA9FHB*	7590360150*
76050316	2	18	5233846*	UA9CJB	7590180200*
76050318	2	24	5133924*	UA9DJB	7590240200*
76050320	2	36	5233848*	UA9FJB	7590360200*
76050325	2-1/2	24	5233847*	UA9DKB	7590240250*
76050326	2-1/2	36	5233857*	UA9FKB	7590360250*
76050327	3	18	5233850*	UA9CLB*	7590180300*
76050328	3	24	5233837*	UA9DLB	7590240300*
76050330	3	36	5233930*	UA9FLB	7590360300*
76050340	4	36	5233842*	UA9FNB	7590360400*
76050350	5	36	5233841*	UA9FPB	7590360500*
76050360	6	48	5233816*	UA9HRB	7590480600*

* Denotes Special Radius, Orders are Noncancelable and Nonreturnable

Rev. 03-13-02 AL "Changed from Plain End to Belled End, Changed Mfg. Catalog Numbers, reformatted page."
Rev. 01-15-01 MHS "Removed changed some 18" radius to 24" changed Cat. #s to new and removed some vendors."

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON

ELBOW, PVC 90 Deg. SCHEDULE 40 CONDUIT

DATE:	12/15/89	STOCK CATALOG	☒ TDSI ☐ TTNI ☐ TMNI ☐ TSNI	76050307
DESIGNER;	GW			
STANDARDS ENGR;	AL SILVA			Page 1 of 1

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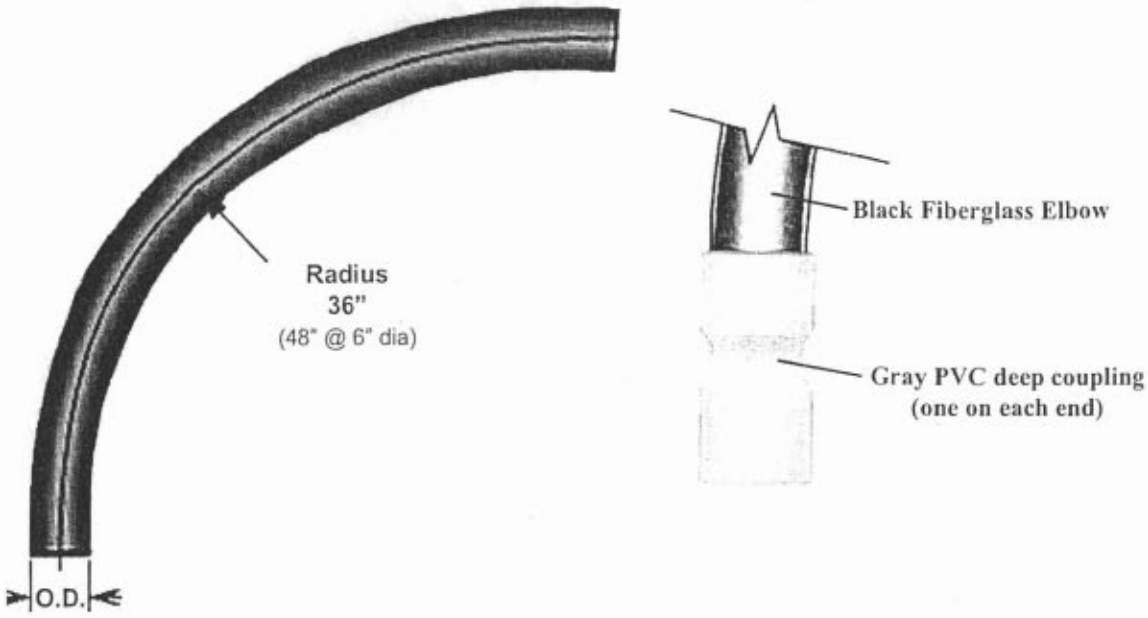
ELBOW, FIBERGLASS SWEEP 90 DEGREE



GENERAL: 90 degree fiberglass elbows in rigid nonmetallic conduit configurations for underground sweeps in distribution and transmission applications.

SPECIFICATIONS: Elbows shall be fiberglass reinforced epoxy manufactured in the filament wound system. Glass shall be E-type and the glass content shall be 70% + or - 5% as per API SPEC 15 LR, resin shall be epoxy without fillers. Barcol hardness shall be 54 + or - 2 as per ASTM D 2583. Underground listing shall be HB rating as per UL 94. Elbows shall be constructed to IPS, NEMA TC-14A standards and the radius shall be 90° + or - 1°. Minimum Tensile strength (Axial) shall be 11,000 psi as per ASTM D 2105. Minimum Compressive strength shall be 11,000 psi as per ASTM D 695. Impact resistance value in the table shall be measured in accordance with ASTM D 2444. Stiffness value in the table shall be measured in accordance with ASTM D 2412. Stiffness and Impact resistance shall not vary between 32° F and 74° F. Each elbow shall be equipped with two (2) permanently attached deep PVC couplings.

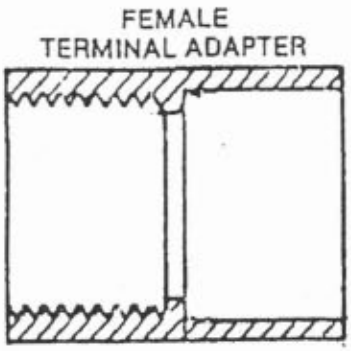
PURCHASING: Quantity "Each"

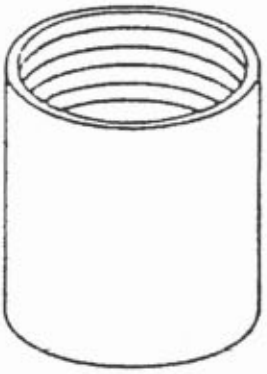
STOCK NUMBER	SIZE (inches)	WALL TYPE	O.D. (inches)	IMPACT VALUE (lb per ft)	STIFFNESS VALUE (32°-74° F)	APPROVED MANUFACTURERS & CATALOG NUMBERS	
						CHAMPION	UNITED / RACEWAYS
76054020	2	STANDARD	2.14	40	320	**20A-SW-92-2D**	**20A-SW-BG**
76054030	3	STANDARD	3.14	70	140	**30A-SW-92-2D**	**30A-SW-BG**
76054040	4	HEAVY	4.19	120	130	**40A-HW-92-2D**	**40A-HW-BG**
76054060	6	HEAVY	6.60	200	65	**60A-HW-93-2D**	**60A-HW-BG**

Rev. 05-18-07 DH "Added United Fiberglass/Raceway as approved mfg.; added O.D."
Rev. 06-29-05 MHS "Changed catalog numbers, deleted "P"."
Rev. 01-10-03 EEA "Added 3 inch elbow, stock 76054030."
Rev. 12-19-02 MHS "First Edition"

PUBLIC UTILITY DISTRICT #2 OF GRANT COUNTY	Date	12/19/02	ELBOW, FIBERGLASS SWEEP 90 DEGREE	ASSEMBLY UNIT: Yes
	Rev #	4		SOLE SOURCE: No
	Designer	MHS		TDSI X / TTNI / TMNI / TSNI
	Standards Engineer: E. WENKE			**76054020**

ADAPTER, PVC TO THREADED METALLIC, FEMALE





GENERAL: Socket type female terminal for rigid and DB PVC ducting. Fittings must conform to ANSI/NEMA Specification TC 3, "PVC Fittings for use with Rigid PVC Conduit and Tubing".

SIZE: As noted below.

PURCHASING: Quantity Each.

Stock Number	Size In.	APPROVED MANUFACTURERS & CATALOG NUMBER				
		CARLON	CERTAINTEED	KRALOY	CAN-TEX	RACETEC
76320007	3/4	E 942 E	59631	FA07	5140044	FEMALE ADAPTER*
76320010	1	E 942 F	59632	FA10	5140045	FEMALE ADAPTER*
76320015	1-1/2	E 942 H	59634	FA15	5140047	FEMALE ADAPTER*
76320020	2	E 942 J	59635	FA20	5140048	FEMALE ADAPTER*
76320025	2-1/2	E 942 K		FA25	5140049	FEMALE ADAPTER*
76320030	3	E 942 L	59637	FA30	5140050	FEMALE ADAPTER*
76320040	4	E 942 N	59639	FA40	5140052	FEMALE ADAPTER*
76320050	5	E 942 P	59640	FA50	5140053	FEMALE ADAPTER*
76320060	6	E 942 R	59641	FA60	5140054	FEMALE ADAPTER*

* Specify Size (In.) when ordering.

Rev. 09-15-95 L.L. "Added 2-1/2" as
Rev. 08/13/92 J.H. "Added RaceTec and catalog numbers."

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT COUNTY, WASHINGTON

Adapter, PVC to Threaded Metallic, Female

Date: 07/10/89	Approved: Al Silva	STOCK CATALOG	☒ TDSI ☐ TTNI ☐ TMNI ☐ TSNI	76320007
Scale: N T S				
Drawn: H.C.				

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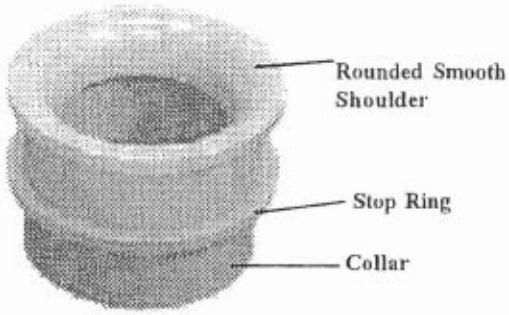
BELL, END
PVC Fitting



Bell End Photo

GENERAL: Bell ends designed to create a smooth end for PVC conduit in vaults, risers or other end of run areas. Used to protect cable insulation from abrading or other damage.

SPECIFICATIONS: Bell ends shall be made from PVC {Polyvinylchoride} with inert modifiers to improve weatherability. All fittings shall conform to NEMA TC-3 and UL 514. Only bell ends form molded to have round smooth shoulders will be accepted.
Each end must have an insert collar with molded stop.

SIZE: See Table for sizes

PURCHASING: Standard Pkg is listed for Can-Tex. Order like numbers from other manufacturers.

STOCK NUMBER	SIZE	Std. Pkg.	APPROVED MANUFACTURERS & CATALOG NUMBER			
			Can-Tex	Kraloy	Carlon	RaceTec
76670010	1"	50	5144005	MEB10	E997F-CAR	End Bells*
76670020	2"	40	5144008	MEB20	E997J-CAR	End Bells*
76670030	3"	50	5144010	MEB30	E997L-CAR	End Bells*
76670040	4"	50	5144012	MEB40	E997N	End Bells*
76670060	6"	15	5144014	MEB60	E997R	End Bells*

* Race Tec orders must list size and quanity.

Rev. 10-22-02 EA "Added 1" size changed page # to lowest stock number, deleted Certainteed"
Rev. 09-15-95 LL "Added 2-1/2""
Rev. 08-14-92 JH "Added Race-Tec"
Rev. 06-19-90 MP "Added Carlon"

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON

BELL, END

DATE:	06/19/90	STOCK CATALOG	[X] TDSI [ ] TTNI [ ] TMNI [ ] TSNI	76670010
DESIGNER;	GW			
STANDARDS ENGR;	AL SILVA			Page 1 of 1

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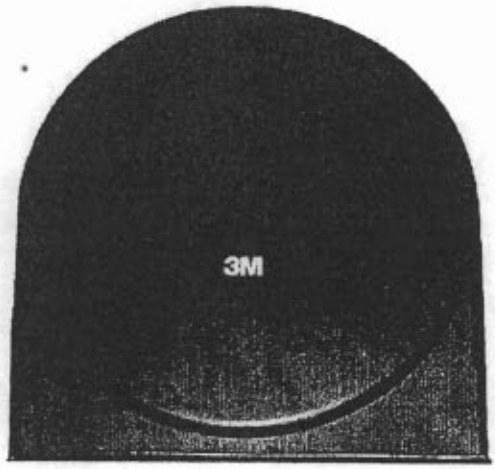
MARKERS, UNDERGROUND INSTALLATIONS

Mid-Range Marker
Approx. 8-1/4"
#81040700



Full Range Marker
Approx. 15"
#81040800

GENERAL: Markers for use of identifying any of the following: service drops, buried junctions, buried transformers, conduit stubs, road crossings, repair points, and snow covered installations.

SPECIFICATIONS: Red Polyethylene cover over nontoxic environmentally safe solution for self leveling of filament. 40 year life required. Red is the required electric marker color. Broadcast band width is 169.8 kH

MAX. DEPTH: 81040700 - 6 ft.
81040800 - 6 ft.

INSTALLATION: Shall not be buried greater than specified depth.
The marker should be at least 6 inches above buried object - flat and level.
Cover the marker with 4 inches of soil before back fill work is done.
*To be used with Scotchmark II Electronic Marker Locator.

STOCK NUMBER	APPROVED MANUFACTURERS & CATALOG NUMBER	
	3M ScotchMark	
81040700	1256	
81040800	1251	

Rev. 05-31-01 MHS- Added electric specification including band width.
Rev. 07-29-96 LL - Adding reference to electronic Marker Locator.

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON

MARKERS, UNDERGROUND INSTALLATION

DATE:	03/16/88	STOCK CATALOG	☒ TDSI ☐ TTNI ☐ TMNI ☐ TSNI	81040700
DESIGNER;	LL			
STANDARDS ENGR;	A. SILVA			Page 1 of 1

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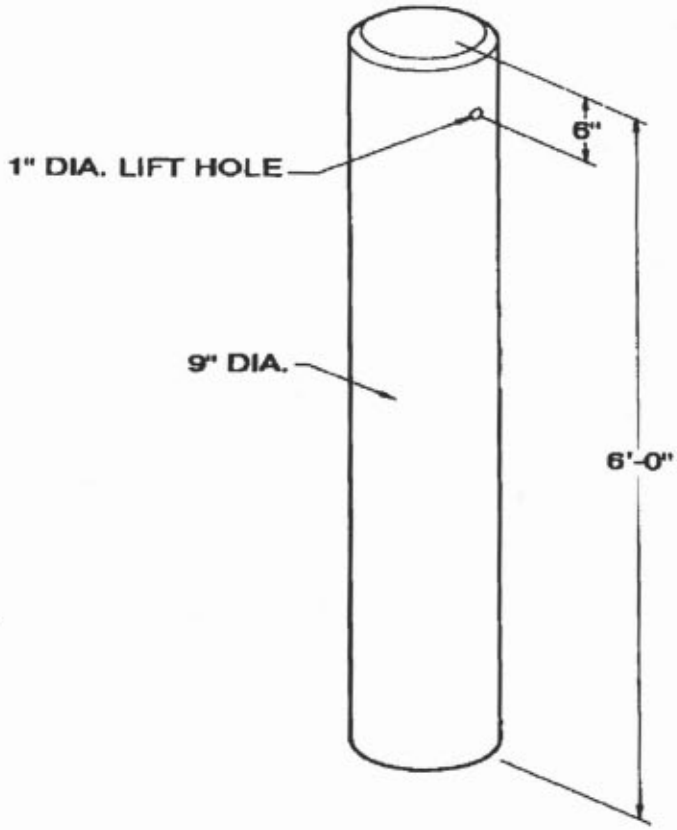
POST CONC 9" DIA. 72" LONG



Guard Post
398 lbs.

STOCK NUMBER	APPROVED MANUFACTURERS & CATALOG NUMBER
	UTILITY VAULT COMPANY
83271800	GUARD POST

Rev. 02-05-92 MG - Added drawing. Changed size from 8" dia. 64" long to 9" dia. 72" long. Added Utility Vault Co. and deleted Columbia Concrete and Spokane Concrete.
Rev. 04-22-85 KB - Added Spokane Concrete Products.

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON

POST CONC. 9" DIA. 72" LONG

DATE:	07/11/77	STOCK CATALOG	☒ TDSI ☐ TTNI ☐ TMNI ☐ TSNI	83271800
DESIGNER;	A.S			
STANDARDS ENGR;	A. SILVA			Page 1 of 1

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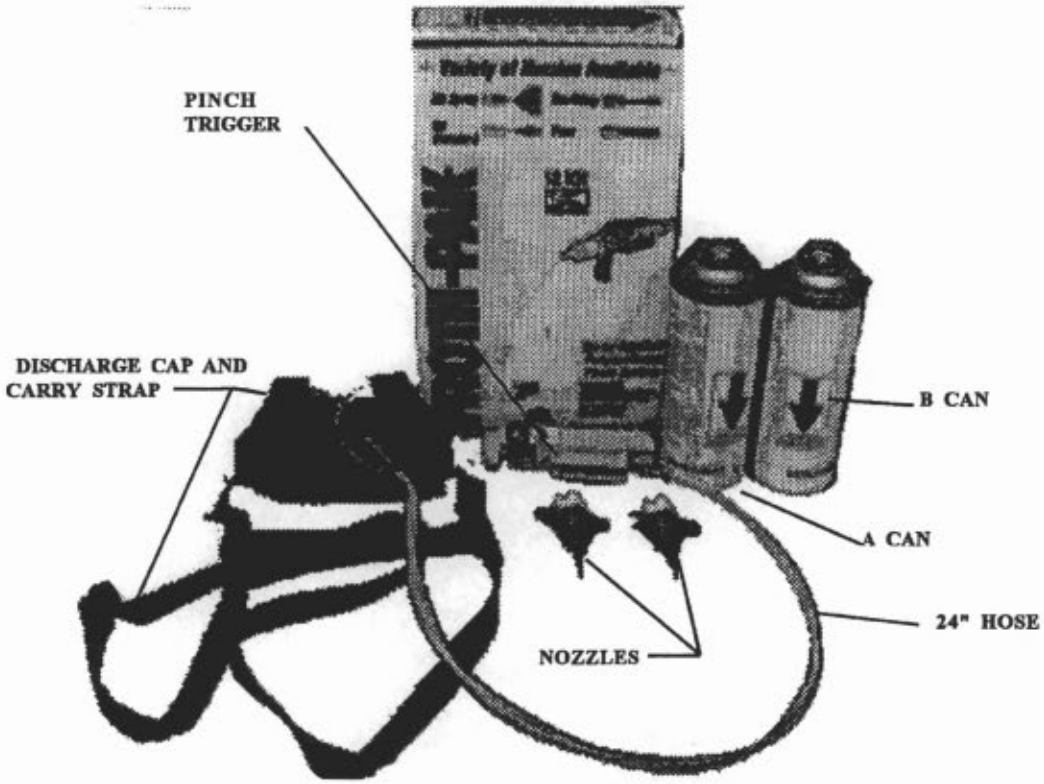
SEALANT, INSTA-FOAM KITS



GENERAL: Expanding foam in pressurized cans with nozzles to fill holes around conduits, in vaults, ducts and filling other voids. Used to deter rodents from entering substation control house along underground conduits and through other openings. Permanent seal do not use where later entry or access is required.

SPECIFICATIONS: Two component system: Froth-Pak 12 Polyurethane foam system conforming to ASTM

STOCK NUMBER	ITEM	APPROVED MANUFACTURERS & CATALOG NUMBER
		FLEXIBLE PRODUCTS (Insta-Foam)
83762700	Expanding Foam	FROTH-PAK 12
83762800	Expanding Foam	FROTH-PAK 110
83763000	Nozzles	30A2022

Rev. 10-18-02 EEA - "Deleted duo fill 400"
Rev. 11-03-00 LW - Changed catalog number for 8376300.
Rev. 07-31-00 MHS. "Changed catalog numbers, specifications, added # 8376300 (Nozzles) and reformated sheet
Rev. 05-04-99 L.L. "Updated catalog numbers and information. Deleted # 83762810

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON

SEALANT, INSTA-FOAM KITS

DATE:	05-18-87	STOCK CATALOG	[X] TDSI [ ] TTNI [ ] TMNI [ ] TSNI	83762700
DESIGNER;	L.J.			
STANDARDS ENGR;	AL SILVA			Page 1 of 2

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SEALANT, INSTA-FOAM KITS

E-162 Flame Spread. (Must have an index of 25 or less.) Either HCFC or HFC as a driver. Do not use CFC. Kit will include two can component system, two nozzles, 24" hose and pinch trigger, discharge cap and instructions for use.
Froth-Pak 12 Polyurethane foam system conforming to ASTM E-162 Flame Spread. (Must have an index of 25 or less.) Either HCFC or HFC as a driver. Do not use CFC. Kit will include two can component system, two nozzles, 5'6" gun hose assembly, discharge cap, wrench, vaseline packet and instructions for use.

Single can system: Expanding two part urethane foam in a single pressurized can. Expands 30 times. Do not use CFC as a driver. Can be ordered with 9" or 24" actuators.

SIZE:

Froth-Pak 12 contains one A can one B can and accessories listed above, yields 1 cubic foot
Froth-Pak 110 contains one A can one B can and accessories listed above, yields 9.2 cubic feet.

PURCHASING:

For Froth-Pak order quantity each. Nozzles ordered for Froth-Pak 12 only. Material safety data sheet is required with each package shipped.

PUBLIC UTILITY DISTRICT NO. 2 OF GRANT, COUNTY WASHINGTON				
SEALANT, INSTA-FOAM KITS				
DATE:	05-18-87	STOCK CATALOG	[X] TDSI [ ] TTNI [ ] TMNI [ ] TSNI	83762700
DESIGNER;	L.J.			
STANDARDS ENGR;	AL SILVA			Page 2 of 2

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