DEVELOPER INFORMATION BOOK

FOR INSTALLING UNDERGROUND ELECTRIC FACILITIES



TURLOCK IRRIGATION DISTRICT

WATER & POWER
Serving Central California since 1887

P.O. BOX 949
333 EAST CANAL DRIVE
TURLOCK, CA 95381
(209) 883-8415

Revised October 2026

November 2025

List of Changes

35201- Updated table 5 and added table 6

50500- Euserc 328A and 329A no longer accepted

30571- Misc. figure 1 changes

June 2025

List of Changes

Inspection Sheet- Added Pre Construction Meeting

30570- Added Warning Tape, Compaction Test, and Non-Native Sand Backfill

30700- Include Pad and Bollards In clearances

30900- Added Tape and Traceable Pull Rope

35051- Removed Single Phase Flat Pad

35202- Removed 4x4 pull Box

35056- New Standard; Load Break Box

35110- Misc Changes to figure

35151- Moved Bollards from 18” to 24” from pad

35152- Moved bollards from 18” to 24” from pad

35154- Moved bollards from 18” to 24” from pad

35155- New Standard; Barriers for load break box

30710- New Standard; Retaining Wall

35201- Added 320A

30571- Added Tape

34701- Added 320A, Single Lug CT bases 800A and below acceptable

34750- X0 and X1 Figure 1, Single lug CT bases

24250- Added standard to Blue book

34030- Added Note 5

50500- Single lug ct bases acceptable

2202- Added 4/0 Quad

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Section I: General Information

1.1. Scope

The purpose of this booklet is to provide assistance to developers and their contractors in installing underground cable, transformer vaults, transformer pads, secondary boxes, pull boxes, conduits, meters, and other facilities necessary for the District to provide underground electric service.

Questions and problems not covered in this booklet should be brought to the attention of the Line Engineering Department at (209) 883-8415.

1.2. Application Procedures

The District requires a completed application before it can begin to engineer a customer's project. A completed application is defined to mean all material required by the District to design the customer's facilities. This material normally includes the following:

- Signed and dated application forms.
- Map showing layout of customer facilities.
- Proposed improvement plan showing locations of all water and sewer facilities.
- Driveway layout or garage locations.
- Any other drawings that may be required to complete District engineering of project. These include, but are not limited to, landscape plans, architectural drawings and electrical schematics.
- Approved reproducible tentative map or site plan.
- The rules and rates in place at the time the District receives the last piece of information needed to complete an application will govern the developer's project.
- If TID construction has not been completed within 2 years of receipt of a completed application, the customer may be required to re-apply under the then current Electric Service Rules, Electric Service Schedule of Charges, and other construction requirements.

The necessary form can be obtained at the District's main office at 333 East Canal Drive, Turlock, California, Line Engineering Department, downloaded from http://www.tig.org/underground, or print the following two pages.

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APPLICATION FOR NEW SERVICE

Date: _____

NOTE: See the reverse side for an explanation

1. Project Site Information:

a. Project Name: _____

b. Project Address: _____

2. Customer Information:

a. **Name**: _____ (Email): _____

b. Mailing Address: _____

c. Phone: _____ (Cell): _____

d. **Engineer/Contractor**: _____ (Email): _____

e. Mailing Address: _____

f. Phone: _____ (Cell): _____

3. General Information:

Type: ☐ Commercial/Industrial (Describe) _____

☐ Ag – Pump Horsepower _____

☐ **Residential – No. Meters:** _____

☐ Single Family ☐ Subdivision ☐ Condo (Real Property)

☐ Multi Family, Apartment, Condo ☐ Mobile Home Park

Approximate Square Footage/Unit: _____

Land, Gross, Acreage: _____

4. Type of Service and:

Phase: _____ Service Voltage: _____ Est. Demand (KVA Total/Unit): _____

☐ Overhead ☐ IU ☐ Primary Meter (12KV Service) ☐ **Primary Underground**:

☐ Padmount TX ☐ SubSurface

5. Main Switchgear/Panel Sizes (Note 1):

a. _____ Amps, b. _____ Amps, c. _____ Amps

Note 1. All electrical equipment, including panels, conduits, fittings, conductors etc, must be used in the way they were intended, per their listing and classifications. For example: if an electrical panel states 'for underground use only,' that panel may not be modified for overhead use unless specifically allowed by the manufacturer to use equipment and/or methods the manufacturer approves.

6. Type of Construction: ☐ New ☐ Existing

7. Duration of Service: ☐ Permanent ☐ Temporary(Start and End) _____

8. Project Load Information (Must be Completed for All Services)

Load	Initially (KW)	Future (KW)	Load	Initially (HP/Tons)	Future (HP/Tons)
Lighting			1 Phase AC		
Receptacles			3 Phase AC		
Water Heating			1 Phase Heat Pumps		
Duct Air Heaters			3 Phase Heat Pumps		
Unit Air Heaters			1 Phase Misc. Motors		
Cooking			3 Phase Misc. Motors		
X-Ray (Input)*			Largest Motor*		
Welders (Input)*			Other		
Aux. Strip Heaters			EV-Pre Wiring		
***Additional information may be required on this equipment if voltage flicker problems are anticipated**					

Other Utilities That Serve Project

☐ PG&E ☐ Water line ☐ Sewer Line

☐ Telephone ☐ Cable TV ☐ Others (explain)

- Show on-site plan proposed main/meter arrangements and locations at each building.
- Show on the Site plan the proposed location of padmount transformer(s) (underground only).
- Provide a site plan showing other underground utilities.

If any of the utilities listed are to occupy the same trench with TID, the customer must have a signed service agreement with these utilities prior to a pre-construction meeting with TID.

9. Underground Residential/Commercial/Industrial Developments require the following information on the site plans.

a. Service size and location of the Main switchboard.

b. Commercial/Industrial – All MSB locations must be approved by District Engineering prior to receiving an approved District electrical design.

c. Manufacturer cut sheets of MSB/Panel for approval. Cut sheets must show EUSERC standard numbers.

d. All electric meters and main disconnects shall be accessible by TID 24 hours a day, 7 days a week. Remote metering may be required. Consult TID Engineering.

e. Roadway drawings that show elevations, curve data, and pavement sections.

f. Driveways and building locations.

g. Storm, water main, and sanitary sewer drawings where applicable.

Signature of Applicant:_____

OFFICE USE ONLY

Application Complete: ☐ Yes

☐ No By: _____ Date: _____

If No, explain:_____

Email or Mail Application and Supporting Documents to:

LineEngineering@tid.org

TID: PO Box 949

333 East Canal Drive

Turlock, CA 95381

Attention Standards & Line Engineering

PROCEDURE FOR PROCESSING SERVICE REQUEST

The following procedure has been established to provide electric service in an orderly manner. This procedure works best when all parties cooperate to provide accurate, complete and timely data.

1. It is the responsibility of the applicant to notify the Turlock Irrigation District's New Business & Standards representative as soon as possible of the proposed project to request service. The request should provide lead time of approximately ninety (90) days for engineering and determination of charges. A lead time of 30 days from date of payment is normally necessary to start construction (180 to 210 days may be required for delivery of transformers sized from 500 KVA to 2,500 KVA).

2. The applicant should include the completed data sheet and two copies of an approved plot plan with all requests for service. (See the reverse side of this form.)

3. After service arrangements have been determined, a copy of the plot plan will be returned with information of service details including a cost (firm for 30 days) and information for bid purposes.

COMMENTS:

TID has specific rules, requirements and standards relating to electric service facilities. I have been informed that information booklets containing pertinent information have been offered and I have accepted or declined receipt of a booklet at mydiscretion.

INITIALS ☐

Office Use Only

TRENCHING INFORMATION:

Trenching to be Joint with: (Elec.) _____ (Gas) _____

(Telephone) _____ (CATV) _____

Trenching to be Performed by:

(Customer) _____ (Other – Identify) _____

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Underground Inspection Check Sheet

INSPECTIONS: www.tid.org/power/electrical-inspection-request/

Inspections: (209)883-8476 OR call (209) 606-0136 for questions

CUSTOMER NAME: _____

CONTACT NUMBER: _____

JOB LOCATION: _____

JOB NUMBER: _____

W.O. NUMBER: _____

INSPECTIONS:	**INSPECTOR:**	**DATE:**
☐ **PRE CONSTRUCTION MEETING**		
☐ **TRENCH:** *Ref: 30571		
☐ **PRIMARY CONDUIT:** *Ref: 30570,35201		
☐ **SECONDARY CONDUIT:** *Ref: 30571,035201		
☐ **WIRE:** *Ref: 30800, 34701		
☐ **SECONDARY BOX:** *Ref: 34805, 35201		
☐ **TRANSFORMER PAD:** *Ref: 35051,35054		
☐ **GROUND GRID:** *Ref: 35051		
☐ **REBAR:** *Ref: 35101		
☐ **SECONDARY MANDRIL:**		
☐ **PRIMARY MANDRIL:** *Ref: 35201		
☐ **PANEL:** Ref: 34815		
☐ **PLACARDS:**		
☐ **BOLLARDS:** Ref: 35151, 35152, 35154,35155		
☐ **INSPECTION TAG:**		
☐ **KNOX BOX:** Ref: 50510		
☐ **VAULT:** Ref: 35202		

NOTES:

*Reference Constriction Standards

*Photos will NOT be accepted
in lieu of inspections

customer information sticker

1.3 Requested Drawing Format

TID currently utilizes Autodesk's AutoCAD and ESRI's ArcGIS suite of software programs for drawing and mapping information. Drawings submitted to TID in electronic form should be in either *.dwg or *.dxf file format. For electronic files, please ensure that all associated files (externally referenced by the drawings) are included in the transmitted package.

TID requires certain information to effectively support customers with their projects and electric service needs. Please include the following (as they apply) in your drawing package:

Civil drawings

Site Plan – On Site Civil
Including underground utilities and other hidden features
For subdivisions, include garage and driveway locations, as well as building setback lines
Site Plan – Off Site Civil
Including underground utilities and other hidden features
Include street names

Electrical drawings

Site Plan – On Site Electrical
Site Plan – Off Site Electrical
Single Line Electrical diagram
Main Distribution Panel Manufacturer drawings
TID has requirements for service panels/switchboards, including adherence to EUSERC, and may reject panels that are not in compliance. We recommend that you submit main switchboard specifications and manufacturer's drawings to TID for review and approval prior to ordering the switchboard.
Transfer Switch
If you are considering a standby generator, we require that you submit transfer switch specifications and manufacturer's drawings to us for review and approval prior to installation.
Support Facilities (such as Lift Stations, Sprinkler Booster Pumps, etc.)

Architectural drawings

Only as may influence TID's ability to provide electric service, including accessibility both for construction and to TID owned and maintained facilities. This may include landscaping or structural considerations, building set back lines and the actual building footprint for each residential lot.

Helpful to TID:

Electronic file clear and concise layer naming convention
Electronic site plan geo-referencing
NAD (North American Datum) 1983 State Plane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
GCS North American 1983

1.4. General District and Developer/Builder Responsibilities

After the developer has paid for electric service, (or paid the required deposit), the District will provide him a material list and map showing the location of cable, underground markers, and all substructures (e.g. conduit, transformer vaults, secondary boxes, and TID specified pull boxes). The provided material list is for information only and does not include service run equipment. It is the developer's responsibility to insure that the correct type and amount of materials are procured.

At the time of payment, developers of residential subdivisions will be required to sign up for all meters.

The developer will be responsible for procuring and installing conduit, pull lines, transformer vaults, transformer pads, secondary boxes, pull boxes, transformer ground rods, ground wire, power markers, and other substructures as identified by the District. Ownership of these items will transfer from the developer to the District upon final acceptance of them by the TID inspector.

The builder will be responsible for providing and installing the service conduit, service conductor, and for connecting the service wire to his panel. (Service runs are defined as originating from the customer's electrical panel back to the first structure.)

Facilities constructed by either the developer or the builder must be constructed according to TID standards as described in this booklet.

The materials provided by the developer are identified in this booklet by TID stock numbers. Unavailable from the District, these materials must be procured using a cross-reference list (in the back of this booklet) matching TID stock numbers with acceptable manufacturer part numbers. Because this list will be updated on a continuing basis, lists from previous projects should not be used. Questions regarding procurement of materials should be directed to the District's Purchasing Department at (209) 883-8401.

It will be the developer's responsibility to coordinate with all other utilities sharing the same trench as District facilities and to acquire any necessary easements or right-of-ways.

Underground Service Alert (USA) North (Phone: 1-800-227-2600) shall be contacted at least 48

hours prior to any excavation to determine location of other existing underground facilities at the job site.

If the TID inspector determines that any of the developer installed facilities do not meet TID standards, the developer will be responsible for making necessary corrections at his cost.

No TID crews will be scheduled to install transformers or perform other TID work until the developer provided conduits and substructures have passed inspection. Similarly, no services will be connected until the builder's service wire and conduit installation passes inspection.

The TID inspector will signify acceptance of facilities during various phases of the project by providing the developer or builder a signed inspection tag.

After the customer has successfully installed all facilities required by the District, ownership of conduit, substructures and service conductors used to serve the project will transfer from the customer to the District. The customer will be required to guarantee these facilities for one year from the date of the last inspection tag issued.

The developer must notify the Line Department at least three working days in advance for inspecting facilities. The preferred method is by phone at (209) 606-0136 or send an email to tidunderground@tid.org with the following information:

Email subject line = Inspection Request
Body
- Address of Inspection
- Type of Inspection Requested
- Contact Information
  - Name
  - Phone

All customer work shall be performed to District Standards and drawings by a contractor. The customer shall independently determine the qualifications of the contractor used to install District facilities and the District shall have no liability for the contractor's work nor for approving or disapproving a contractor. The customer shall bear all expenses for contractor services.

All obligations for meeting District requirements are the sole responsibility of the developer, not his contractor(s).

The customer shall be responsible for initiating, maintaining and supervising all safety precautions, measures, and programs at the work site and shall maintain the entire work site(s) in a safe manner and condition. In the interest of safety to District employees and its equipment, the District reserves any and all rights to refuse to enter the project and proceed with installation of electric power service if, in the opinion of the District, unsafe conditions

exist.

The District will provide and install all secondary (excluding services) and primary cable and transformers, and will make all electrical connections (excluding those at the service panel).

1.5. Meter Set Requirements

Prior to underground trench inspections, temporary service or permanent service meter installations, all Service Meters to be set within an Underground Development, either Residential or Commercial must be signed up for in advance. For underground subdivisions, developers are required to provide street addresses with applicable lot numbers for cross-reference. If a developer contacts a T.I.D. Underground Inspector for a trench inspection or meter set and meter cards have not yet been signed for the development, the T.I.D. Underground Inspector will not inspect facilities or energize equipment until the requirements set above are met.

If a customer faxes a confirmation to T.I.D. Customer Service that a service location is tagged and ready, and the Underground Inspector finds the site not ready for electrical approval, the contractor will be notified of the problem(s) found at the location and what should be done to correct the problem(s). The Service Meter Work Order will be put back on-file, at the end of the queue, to await confirmation from the Contractor that the problem(s) have been corrected. When the customer faxes in the information that all corrections have been made, the T.I.D. Underground Inspector will inspect and/or energize as the work order comes to the front of the queue, and as time allows.

Contact T.I.D. Customer Service to sign up for Service Meters within a subdivision or for any Service Meters that have previously been applied for but were not tagged and ready.

Customer Service FAX # (209) 656-2149.

Contact T.I.D. Underground Inspectors for any trench inspections.

Line Department FAX # (209) 656-2140.

1.6. Electrical Easements

It will be the developer's responsibility to provide the District with all easements necessary for the developer's project.

These easements may have different restricted uses depending on the District's needs. For example, low voltage underground lines may only require a five-foot wide easement upon which the customer may plant shrubs or flowers. Contrarily, a high voltage overhead line may require a twenty-foot easement, which must be fenced. A normal underground public utility easement is ten feet wide.

If an existing power line is within the boundaries of your project, it is important that you notify the Electrical Engineering Department at the time you apply for service.

1.7. Transformer and Other District Equipment Locations

Although the District's design will specify a transformer location, it is the responsibility of the developer to ensure that the location of doors, windows, vents, and other building features do not violate any applicable codes such as the Uniform Building Code, California Administrative Code Title 8 and 24, or local ordinances.

1.8. Back-Up Generators

Back-up generators are a significant safety issue. Even a small generator that is improperly connected can result in serious injury or death to TID line workers and customers and can cause significant damage to facilities. For this reason, TID requires that any backup generators our customers may use to supply load that is also supplied by TID must be interconnected via a TID-approved transfer switch, such that the generator is prevented from ever connecting to TID's system in a fail-safe manner. To avoid expensive redesign and panel/equipment replacement, please provide a single line diagram showing the proposed interconnection of any generators, and detailed model and specifications for the proposed transfer switch to TID for approval prior to purchase of equipment. In general, TID will approve transfer switches that are mechanically interlocked throw-over type knife blade switches without bypass provisions, though alternative transfer switch types will be considered if adequate details are provided.

1.9. Lead Times/Workflows For Typical Underground Projects

In the normal course of an underground development, certain construction events must proceed through a certain sequence so as to provide for proper lead times so that each party may plan and coordinate their work from job site to job site. Whenever a contributing party to the development does not proceed in the normal sequence of events, it causes the process to become askew and can cause delays to one or more of the parties.

Shown on the next few pages are typical work flows to provide electric service to a residential subdivision (excluding services) and a commercial development. Individual underground service (low voltage service connected to an overhead transformer) is described in a booklet entitled "Customer Information Booklet for Installing Individual Underground Services."

Note that initiation of most TID work stages is dependent on completion of work by the developer/builder. If the developer/builder experiences delays in completing his work or delays in requesting a TID inspection, the date electric service is provided may be delayed.

1.10. Underground Residential Subdivision (Excluding Services)

Party	Typical Time Required of District	Action
Customer		Provides all information necessary to make a completed application.
TID	10 Working Days	Estimator informs customer of cost estimate.
Customer		Pays 10% engineering deposit.
TID	60 Working Days	Engineers project and determines customer charge.
Customer		Meets all Irrigation System Administration requirements.
TID	3 Working Days	Issues letter stating cost of project.
Customer		Calls USA, coordinates with other utilities, installs conduit and substructures, and requests inspection for transformer vaults and conduits.
TID	5 Working Days	Inspects vaults and conduits. This stage repeats until customer satisfactorily passes inspection. Customer must request successive inspections.
Customer		Closes trench, installs secondary boxes and requests inspection.
TID	3 Working Days	Updates TID schedule and notifies customer.
TID	45 Working Days	Installs primary conductor and transformers.

1.11. Commercial Development

Party	Typical Time Required of District	Action
Customer		Provides all information necessary to make a completed application.
TID	10 Working Days	Estimator informs customer of cost estimate.
Customer		Pays 10% engineering deposit.
TID	60 Working Days	Engineers project and determines customer charge.
Customer		Meets all Irrigation System Administration requirements.
TID	3 Working Days	Issues letter stating cost of project.
Customer		Calls USA, coordinates with other utilities (schedules and holds pre-construction meeting with other utilities), installs conduit and substructures, obtains panel inspection tag from governing authority, signs up for the meter, and requests TID inspection for conduit and transformer pad.
TID	5 Working Days	Inspects transformer pad or vault and service conduit. This stage repeats until customer installation satisfactorily passes inspection. Customer must request successive inspections three days in advance. At this stage, the TID inspector also reviews work schedule with customer.
Customer		Closes trench and signs up for service.

1.11. Commercial Development (Cont.)

Party	Typical Time Required of District	Action
TID	45 Working Days	Installs transformers and primary cable. Customer pulls service conductors. TID connects service conductors to transformer or service box while customer connects service conductors to panel. TID provides customer signed inspection tag for cable installation if cable was installed properly and then energizes service.
Customer		Requests meter set.

Section II: Construction Standards

2.1. Primary/Secondary Conduit and Substructures

The developer will be required to coordinate with all other utilities using the same trench.

The applicant shall guarantee no less than 0.95 relative compaction for all disturbed soils. The District will require a written test report indicating the level of compaction obtained based on accepted and common industry standard test procedures and performed by trained personnel. The cost for such test and report shall be borne by the developer. The developer shall be responsible for ensuring that all others working on the project on behalf of the developer maintain no less than 0.95 compaction for work that will intrude within the TID or joint trench area or immediately adjacent to TID facilities.

Where less than 0.95 soil compaction is suspect, the District may request that additional written test reports are provided at the expense of the developer. The developer shall retain responsibility for repair and/or repair costs related to improper compaction.

The electrical layout provided by the District will identify which of the following substructures will be used.

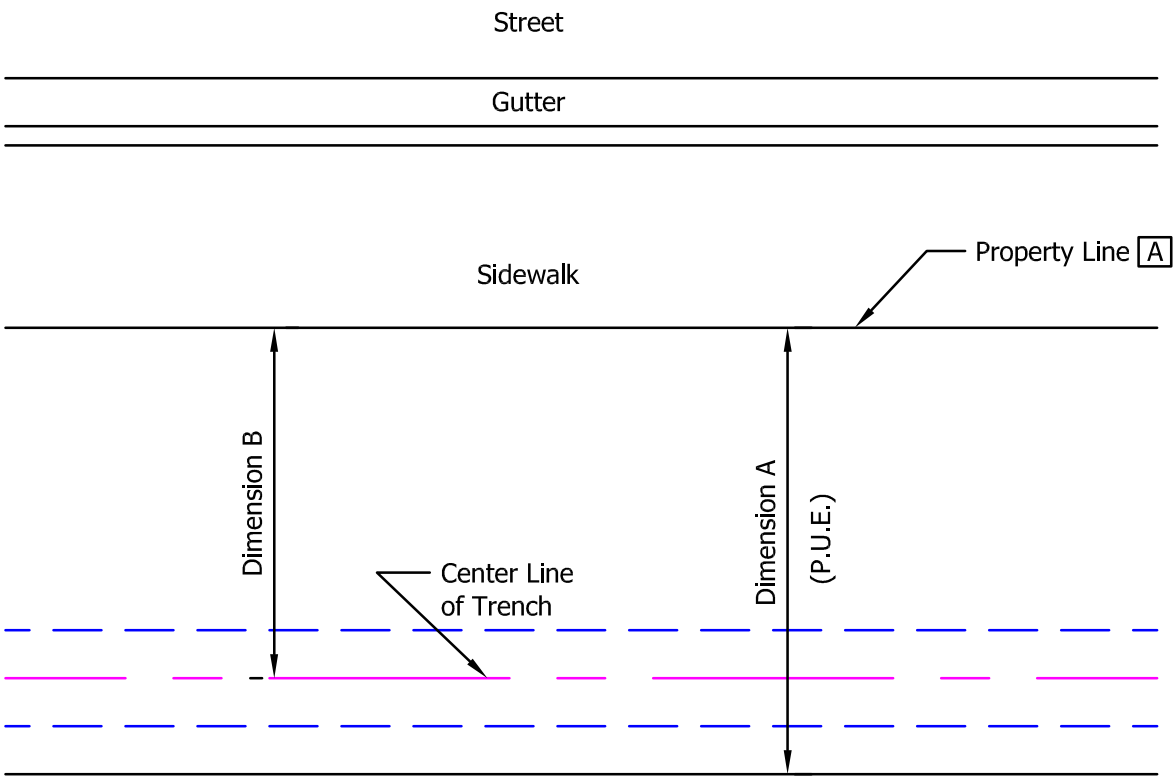


Figure 1
Trench Locations In Public Utility Easements

Table 1 - Dimensions

Public Utility Easement Width (Dimension A)	Dimension to Center Line of Trench (Dimension B)
13 Feet	8 FT ± 6"
15 Feet	13 FT ± 6"

Table 2 - Dimensions (Medium to High Density)

Public Utility Easement Width (Dimension A)	Dimension to Center Line of Trench (Dimension B)
13 Feet	2 FT (MIN.)
15 Feet	11 FT (MIN.)

NOTES:

A. Property line may or may not be at the back of sidewalk.
B. Trench dimensions per TID Construction Standard 30570.
C. 15 foot Irrigation and public utility easement is required where irrigation and electrical facilities are both present.
D. When using table 2, consult TID engineering.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
D	ADDED TABLE 2	SSG	DP	JA	AB		EDJ	09-2019
C	UPDATE TITLEBLOCK, TABLES	ELJ					MSG	09-2016
B	REDRAWN IN AUTOCAD	SDC	PJO	KJO			BLL	04-2003
A	REDRAWN	BB	SP	FS			RA	06-1990
--	INITIAL ISSUE							

TRENCH LOCATIONS
IN PUBLIC UTILITY EASEMENTS

SHEET 1 OF 2

30550 DWG. NO. **D**

18 PAGE

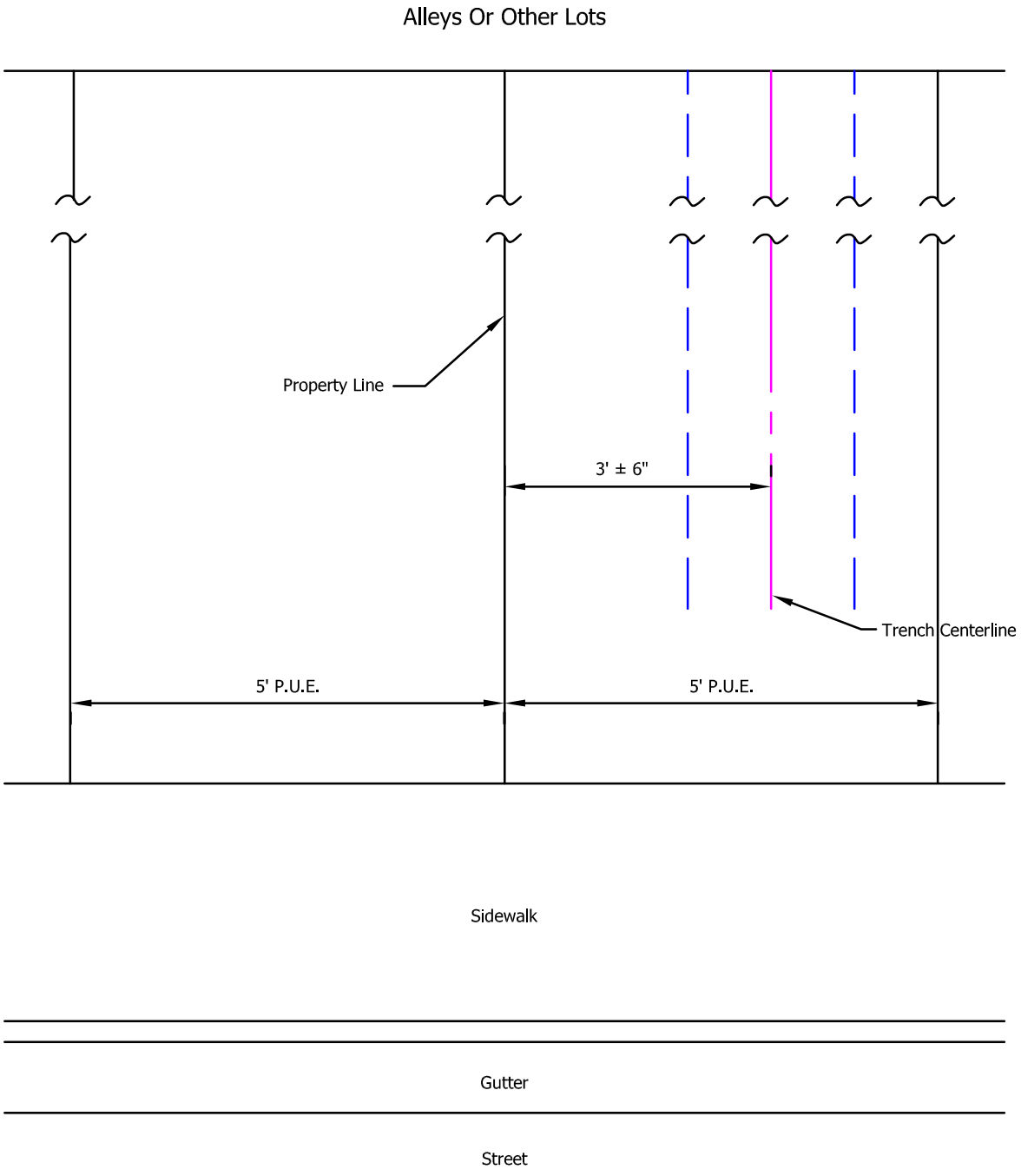


Figure 2
10' Side Lot P.U.E.

TRENCH LOCATIONS IN PUBLIC UTILITY EASEMENTS	**CONSTRUCTION STANDARDS**		
	SHEET 2 OF 2	**30550** D DWG. NO.	19 PAGE

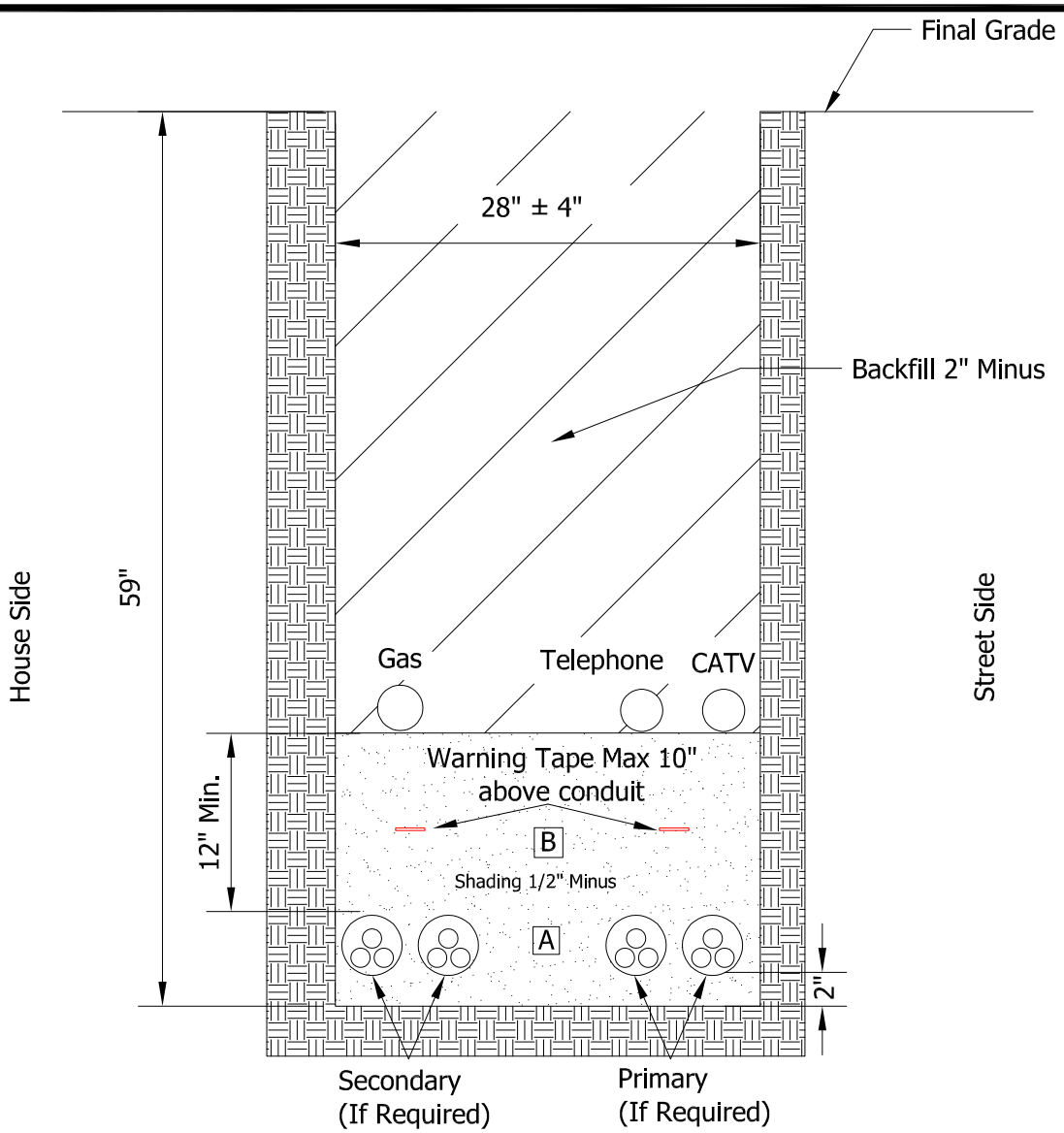


Figure 1
Primary/Secondary Trench Configuration

NOTES:

A. Competent native soil is allowed for shading, bedding, and backfill. 100% of native soil sample shall pass through a 1/2" sieve.
B. Shading area shall consist of 12" of 1/2" minus above the conduit and 2" of bedding under the conduit.
C. Backfill shall consist of 2" minus.
D. Where native soil conditions exceed 1/2" minus, imported 1/2" minus screened structural backfill shall be used for shading and bedding.
E. Compaction to be not less than .95 relative compaction.
F. A compaction test may be required. Test results shall include the testing companies information: Name, Address and Contact Information may be required by TID.
G. Conduit size as per TID Construction Standard 35201.
H. For trench details, see TID Construction Standard 30580.
I. Warning tape details see standard 30900.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
G	REVISED NON NATIVE SAND TO 1/2-	ADL		DNP	JSN		SSG	05-2025
F	ADDED NON NATIVE SAND	ADL					SSG	05-2025
E	ADDED WARNING TAPE AND COMPACTION TEST	ADL					SSG	05-2024
D	UPDATED TITLEBLOCK, ADD HYPERLINKS	ELJ					MSG	09-2016
C	REDRAWN IN AUTOCAD	SDC		KJO			BLL	04-2003

PRIMARY/SECONDARY
TRENCH CONFIGURATION

SHEET 1 OF 1

30570 DWG. NO.

G

20 PAGE

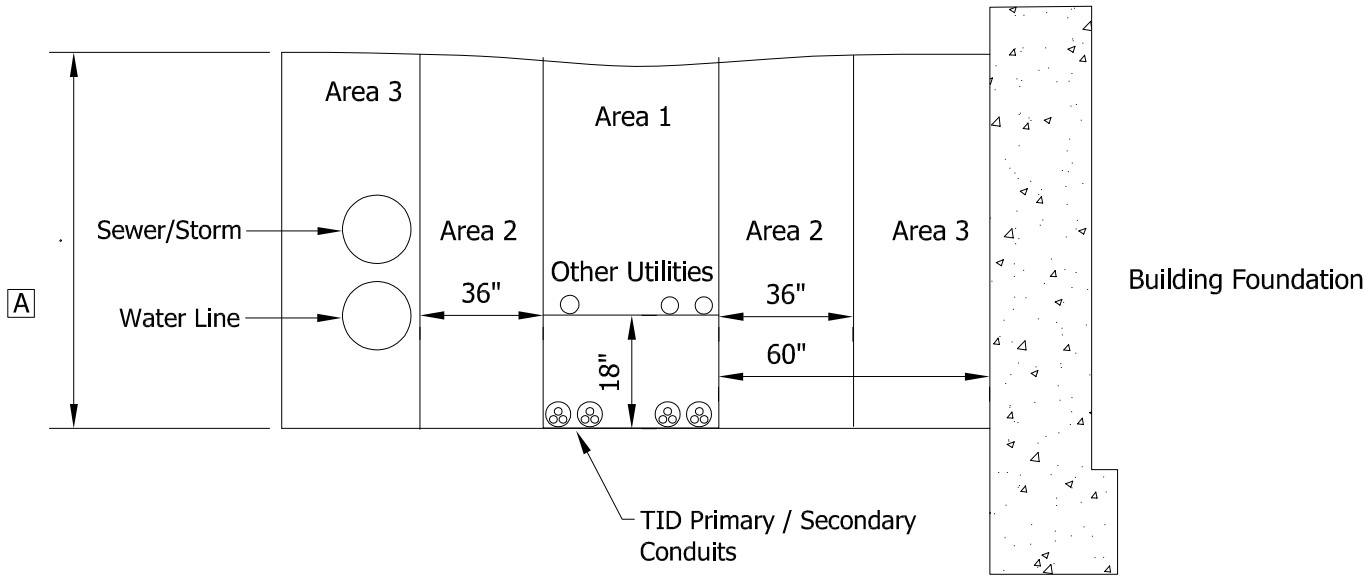


Figure 1

Table 1 Minimum Distance from Foreign Utilities

Location	Foreign Utility or Structure Permitted	Minimum Seperation	
		Paralleling	Crossing
Area 1	No foreign lines or structures allowed	N/A	N/A
Area 2	Communication (Telephone, Fiber, Cable etc)	18" (Horizontal)	12" (Vertical)
	Minor Structures (Vaults, manhole, poles foundations)		
	Gas (Mains and Services)		
Area 3	Water Lines	36" (Horizontal)	18" (Vertical)
	Sewer Sanitary		
-	Building Footings	60" (Horizontal)	Prohibted

Notes:

A. Trench dimension per TID construction standard 30570.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
A	INTIAL ISSUE	SSG	DNP	DD	LM	AS	SCM	5-2022

SEPERATION FROM FOREIGN UTILITIES AND STRUCTURES

SHEET 1 OF 1

30573 DWG. NO. A

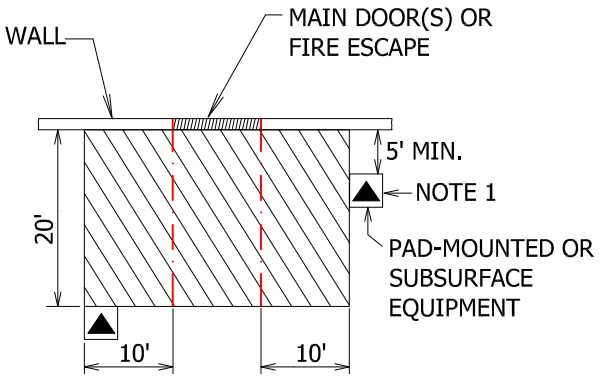


Figure 1
Door or Fire Escape

Pad-mounted and subsurface oil-filled equipment shall not be located within a zone extending 20 ft. outward or 10 ft. to either side of a main building door or fire escape. Note "MAIN DOOR(S)" those which are the normal means of pedestrian access to and from the building.

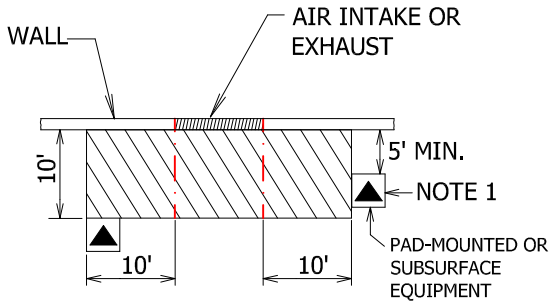


Figure 2
Air Intake or Exhaust

Pad-mounted and subsurface oil-filled equipment shall not be located within a zone extending 10 ft. outward or 10 ft. to either side of an air intake or exhaust which is located less than 20 ft. above the top of the equipment.

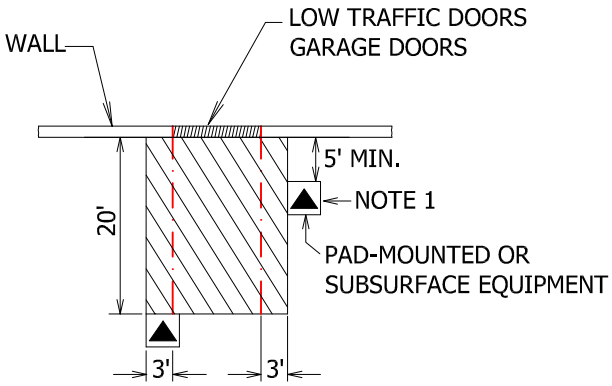


Figure 3
Low Pedestrian Traffic Doors or Garage Doors

Pad-mounted and subsurface oil-filled equipment shall not be located within a zone extending 20 ft. outward or 3 ft. to either side of a low pedestrian traffic or garage door.

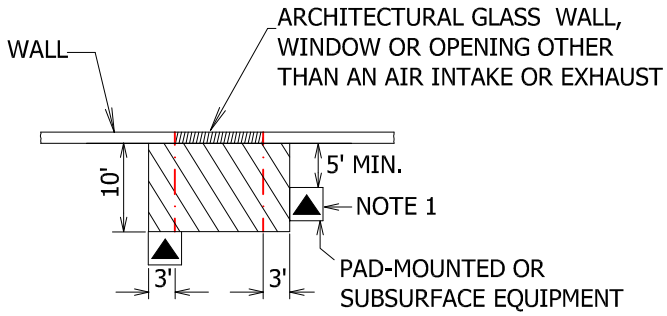


Figure 4
Window or Opening

Pad-mounted and subsurface oil-filled equipment shall not be located within a zone extending 10 ft. outward or 3 ft. to either side of a building window or opening (other than an air intake) which is located less than 20 ft. above the top of the equipment.

NOTES:

1. Front of pad must afford 10 feet of clear working space in front of equipment doors.
2. TID gives general location. Customer must install pad and insure specific location is in compliance with TITLE 8, TITLE 24, & UBC, which restricts the location of transformers relative to walls, doors, vents, windows, etc.
3. If the above conflicts with local codes or applicable regulations, customer will inform TID.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
C	INCREASED TEXT SIZE	ADL					SSG	03-2023
B	UPDATED TITLEBLOCK	ELJ					MSG	09-2016
A	REQ 10' CLEAR IN FRONT OF EQUIP DOORS	SDC	MSG	DBM	BS		EDJ	03-2009
--	INITIAL ISSUE	BB					BLL	12-1996

LOCATION AND CLEARANCES DETAILS FOR PAD-MOUNTED AND SUBSURFACE EQUIPMENT

SHEET 1 OF 1

30700 DWG. NO.

C

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DIRECTIVE FOR PULLING CONDUCTOR IN UNDERGROUND CONDUIT

1. On all pulls, the pullout manhole should be rigged so that an adequate amount of conductor for splicing or terminating may be pulled into the manhole without the necessity of taking hitches on the conductor sheath or jacket. The maximum stress occurs at the leading end of the conductor.
2. Conductor pulls shall be made such that bends are nearest to the feed end. This arrangement results in minimum tension on the conductor.
3. Before making a pull, the duct line should be clear and free of dirt, rocks, etc. If necessary, clean duct by use of wire brush, mandrell, etc.
4. The pulling line used to pull conductors through conduit shall be of adequate strength to pull the maximum allowable conductor pulling tensions. The use of "Flat Strap" or "Mule Tape" (TID Stock number U-8200-004) pulling line is recommended to avoid the pulling line burning through the elbows during difficult pulls.
5. Tables 1 through 4 describe the conductors used in underground construction and list the maximum allowable pulling tensions for each conductor. The use of a basket grip over the insulation is allowed only on pulls where the maximum tensions are expected to be less than 1,000 pounds per conductor. Pulling eyes that pull directly on the conductor(s) are acceptable on all pulls.
6. The minimum bending radius for insulated conductor shall be calculated as the overall conductor diameter times the multiplier as shown in Table 5, Sheet 2 of this standard.
7. The use of a conductor protector (TID Stock Number U-6360-001) is required on all conductor pulls into conduit as shown in Figure 1, Sheet 3 of this standard. The cable should be carefully guided into the duct, particularly at the start of a pull. Ample amounts of conductor pulling compound (TID Stock Number U-6290-001) should be used. The use of a feed-in tube extending from the pulling area directly into the conduit may be utilized where hand feeding the conductor into horizontal conduits is difficult.
8. When the conductor pull is complete, the conductor ends shall be wiped clean of the conductor pulling compound. All conductors shall then be capped to prevent water from entering the conductor strands. On primary cables, use heat shrink end caps (TID Stock Number U-6390-XXX). On secondary conductors, seal the conductor ends with a double wrap of plactic tape.

Table 1 Primary (25 kV) Cable Physical Data

Cable Size	Insulation	Cable O.D. (in.)	Maximum Allowable Pulling Tension (lbs./cable)
#2	TR-XLPE	1.14	400
1/0	TR-XLPE	1.24	400
1/0	EPR	1.22	400
600 MCM	EPR	1.80	4,800
1000 MCM	EPR	2.26	8,000
1100 MCM	EPR	2.05	8,800

Table 2 Secondary (600 V) Conductor Physical Data (Single Conductor)

Conductor Size	Conductor O.D. (in.)	Maximum Allowable Pulling Tension (lbs./conductor)
#6	0.36	160
4/0	0.70	1,270
350 MCM	0.89	2,100
500 MCM	1.02	3,000
750 MCM	1.20	4,500
1000 MCM	1.35	6,000

Table 3 Secondary (600 V) Conductor Physical Data (Triplex Conductor)

Conductor Size	Conductor O.D. (in.)	Maximum Allowable Pulling Tension (lbs./conductor)
1/0	1.09	1,670
2/0	1.18	2,235
4/0	1.39	3,175
350 MCM	1.78	5,470
500 MCM	2.04	8,100

Table 4 Secondary (600 V) Conductor Physical Data (Quadplex Conductor)

Conductor Size	Conductor O.D. (in.)	Maximum Allowable Pulling Tension (lbs./conductor)
1/0	1.16	2,305
2/0	1.25	3,035
500 MCM	2.16	11,100

Table 5 Minimum Bending Radius Multiplier

Type of Conductor	Multiplier
Primary (25 kV) Cable	12
Secondary (600 V) Conductor	5

See Note 6, Sheet 1 of this standard

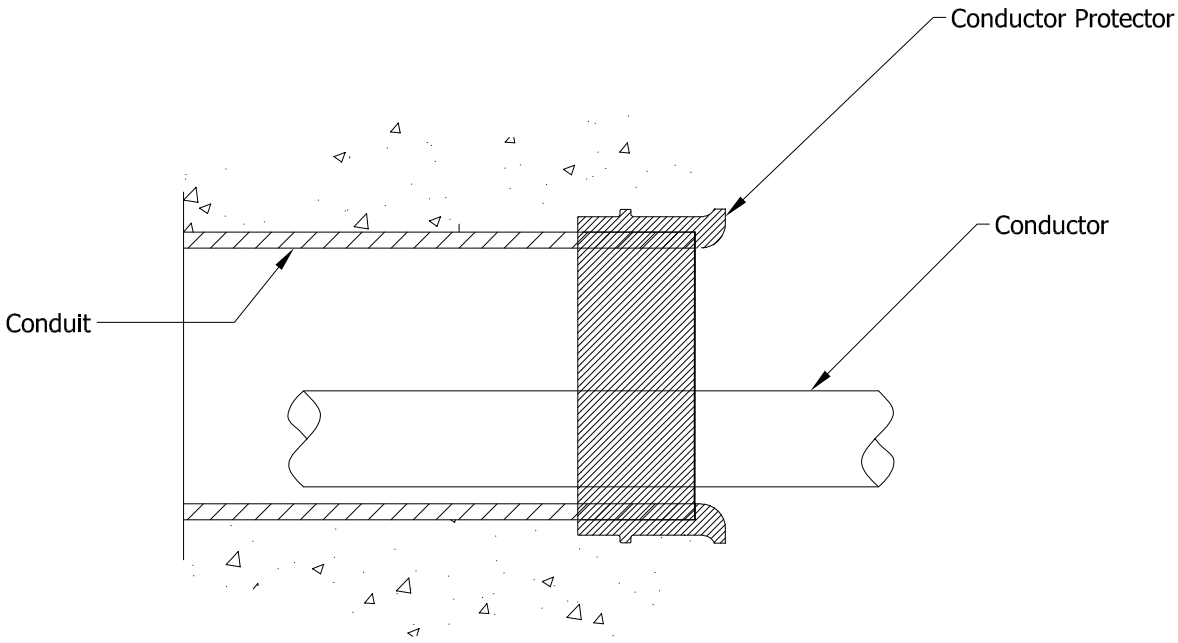


Figure 1
Conductor Protector

BALL MARKER



Figure 1

NOTES:

1. SCOPE:

The ball marker is a device used to assist in the location of specified underground equipment. Electrical ball marker devices shall be red in color, Communication ball markers shall be orange in color, and are tuned to a predetermined frequency.

2. INSTALLATION:

A. Ball marker shall be buried at least 1 foot above any conduit stub with a maximum depth 4 feet. In instances where there are both secondary and primary conduits in the same trench, ball markers shall be placed just below the secondary conduit.

B. Ball Markers are the only style accepted. Flat markers are not accepted.

Table 1 Bill of Material

TID Stock Number	Dimensions (Dia.)	Marker Depth (Max)	Color
U-6440-001	4 Inches	4 Feet	Orange
U-6440-002	4 Inches	4 Feet	Red

3. LOCATION AND USE:

Install as shown on estimators plot drawing of subdivision.

Caution Electric Tape



Figure 2 (6")



Figure 3 (3")

NOTES:

1. SCOPE:

Alert excavators of buried utility lines with Detectable Underground Warning Tape. Tape shall be 6" or 3" wide and red in color

2. INSTALLATION:

A. Tape shall be buried at least 1 foot above top of any conduit and stub. In instances where there are both secondary and primary conduits in the same trench, tape shall be centered between conduits.

Table 2 Bill of Material

TID Stock Number	Dimension	Tape Depth (Max)	Color
U-6441-003	3"	1' above top of conduit	Red
U-6441-006	6"	1' above top of conduit	Red

Traceable Mule Tape



Figure 4

NOTES:

1. SCOPE:

All empty, spare, stubbed conduits shall have a run of detectable polyester pulling tape. Detectable pulling tape has a 22–AWG insulated coated copper wire woven in. A marker ball is still required at the end of the stubbed conduit.

2. INSTALLATION:

A. Tape shall be secured to the underside of the conduit cap and leave enough slack to tie it to existing frame of primary subsurface enclosure, or ring bus of pad–mounted equipment.

B. Detectable polyester tape shall not be installed into or leaving substation ground grid. Install shall begin at first enclosure outside of substation ground grid.

Table 3 Bill of Material

TID Stock Number	Dimension	Pulling Strength	Tracer Wire
U-8201-001	3/4"	Min. 2500lbs	22 AWG

Transformer Pad Box

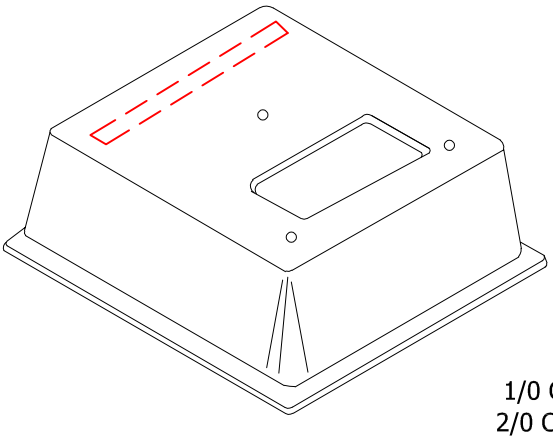


Figure 1

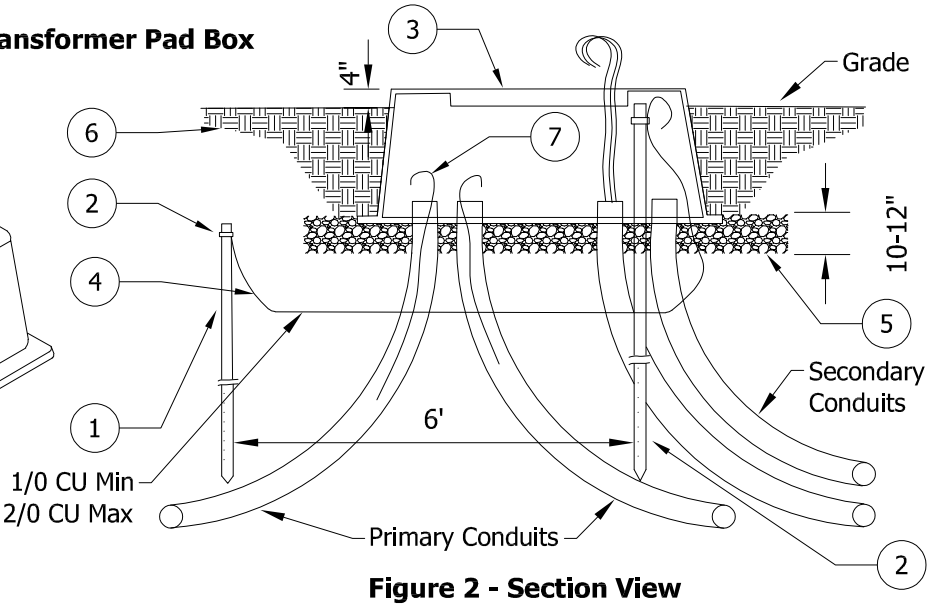


Figure 2 - Section View

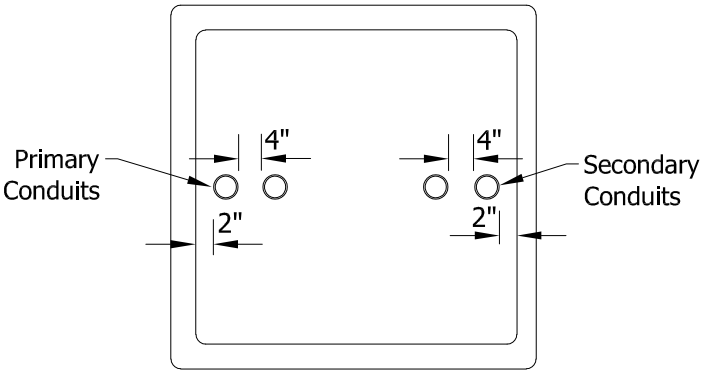


Figure 3 - Top View

Notes

A. Prior to setting a pad, the applicant shall request an inspection by TID. TID shall determine the acceptability of each pad installation. The pad installation includes two grounds rods and the interconnecting ground wire.

B. If required , the applicant shall provide suitable barriers for the protection of the transformer per TID construction standard 35151.

C. The transformer pad shall be placed on a firm 10"-12" rock base on top of native material, which has been compacted to least the requirements of Note E.

D. Minimum distance shall be 18" from the edge of the transformer pad to other utilities infrastructures.

E. In case it is necessary to excavate deeper than required grade to reach firm material, backfill to the required grade in one of the following ways.

- Backfill with clean, non-expansive soil compacted to 90% of maximum density.
- Backfill with soil or red slurry and clean native soil or sand per TID construction standard 30572.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

BOX - PAD FOR
PAD MOUNTED TRANSFORMER

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
A	INITIAL ISSUE	SSG		DD	AS	DNP	SCM	05-2022

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35052 DWG. NO.

A

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Notes

F. In areas of known soft soil conditions, trenches within the pad excavation area for the installation of conduits shall be backfilled in one of the ways specified in Note E.

G. A minimum distance of 6 feet shall be maintained between the ground rods. Connect the rods together using 1/0 min., 2/0 max. bare copper wires, leaving a 4' coil above clamp. Ground rods shall be installed at time of conduit installation to avoid future damage to other facilities.

H. All equipments pads should be installed as level as practicable.

I. Place the primary conduit bends into the pad excavation. Place the secondary and the service conduit into the pad excavation.

J. The conduits are to be stubbed out minimum 2"-4"above the ground.

K. Primary conduits located at extreme left side and secondary conduits located at extreme right side.

L. Leave approximately 5 feet of service conductor extending from conduit.

Table 1 Bill of Materials

Item	Stock Number	Qty	Description	Material Std
1	O-3325-008	2	Ground Rod	2122
2	O-7370-001	4	Ground Rod Clamps	2132
3	U-2054-002	1	Transformer Pad Box	2019
4	O-5505-001	As Req'd	Ground Wire, 1/0 Bare Copper	2200
5		As Req'd	Rock Base (Compact)	
6		As Req'd	Compacted Backfill or Native Soil (Depends on Soil Conditions)	
7	U-8200-004	As Req'd	3/4 " Pull Rope	2401

Table 2 Resources

Resource	Qty	Hours
Line Supervisor	1	4
Electrical Lineworker	3	
Foreman Truck	1	
Line Truck	1	
Compactor	1	

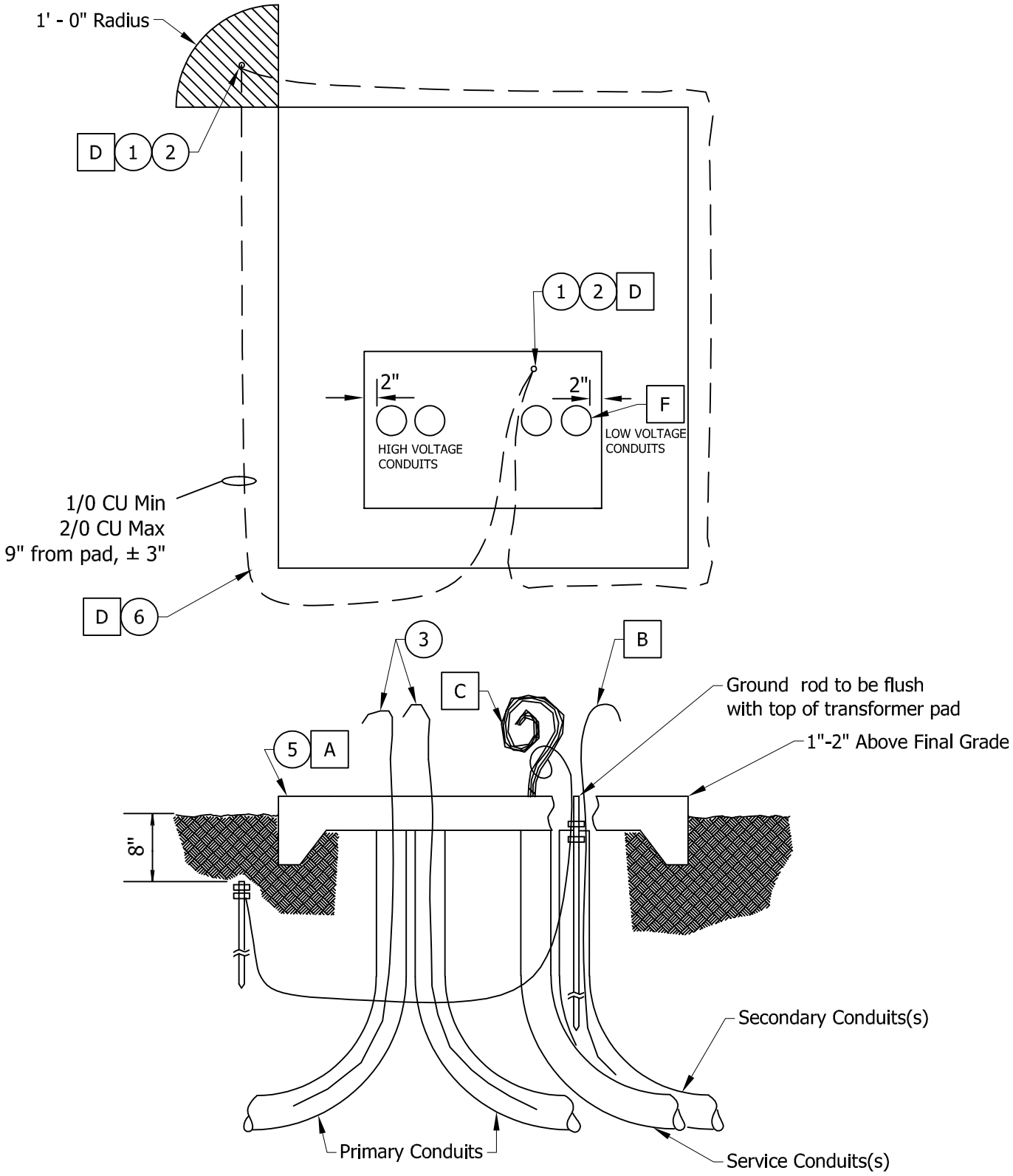


Figure 1
Pad for Three Phase Transformer

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
I	ADDED 2" MEASUREMENT	NJT	ADL				SSG	06-2024
H	ADDED TABLE 3	SSG		DNP	AAS	MLN	MSG	06-2021
G	UPADED FIGURE 1 TITLE	SSG					EDJ	07-2018
F	UPADED TITLEBLOCK AND TABLES	ELJ					MSG	09-2016
E	REDRAWN, LOWERED GROUND ROD IN PAD	SDC	PJO	KJO			BLL	04-2003

PAD FOR THREE PHASE TRANSFORMER

SHEET 1 OF 2

35054 DWG. NO. **I**

Table 1 Bill of Materials

Item	Stock Number	Qty	Description	Material Std
1	O-3325-008	2	Ground Rod	2122
2	O-7370-001	4	Ground Rod Clamp	2132
3	U-8200-004	As Req'd	3/4" Pull Rope	2401
4	O-5505-001	As Req'd	Ground Wire, 1/0 Bare Copper	2200
5	U-2056-XXX	1	Transformer Pad	2017

Table 2 Resources

Resource	Qty	Hours
Line Supervisor	1	4
Lineman	1	4
Apprentice Lineman	1	4
Foreman Truck	1	4
Line Truck	1	4
Flatbed Truck	1	4

Table 3 Clearances (Min. in Ft)

From TID Equipment	Front	Sides	Back
Transformer Pad	10	5	5

Notes:

A. Pad may be poured in-place if desired. If poured in-place, see Construction Standard 35101 for details. Use small size pad for transformers 75-500 KVA. Use large size pad for transformers 750 KVA and above.
B. Leave approximately 3 feet of pull rope extending from conduit.
C. Leave approximately 5 feet of service conductor extending from conduit.
D. Install one (1) 5/8" x 8' copper clad ground rod in the back right side of the pad opening, taking care to avoid all conduits. Install a second ground rod in the area shown. Connect the rods together using 1/0 bare copper wires, leaving a minimum 4' coil above clamp. The ground wires shall be routed as shown to insure equal potential grounding around the entire pad. Ground rods shall be installed at time of conduit installation to avoid future damage to other facilities.
E. Soils under the pad shall be compacted to no less than 0.95 relative compaction.
F. Low voltage conduits are to be as close to right side of opening as possible.

PAD FOR THREE PHASE TRANSFORMER

CONSTRUCTION STANDARDS

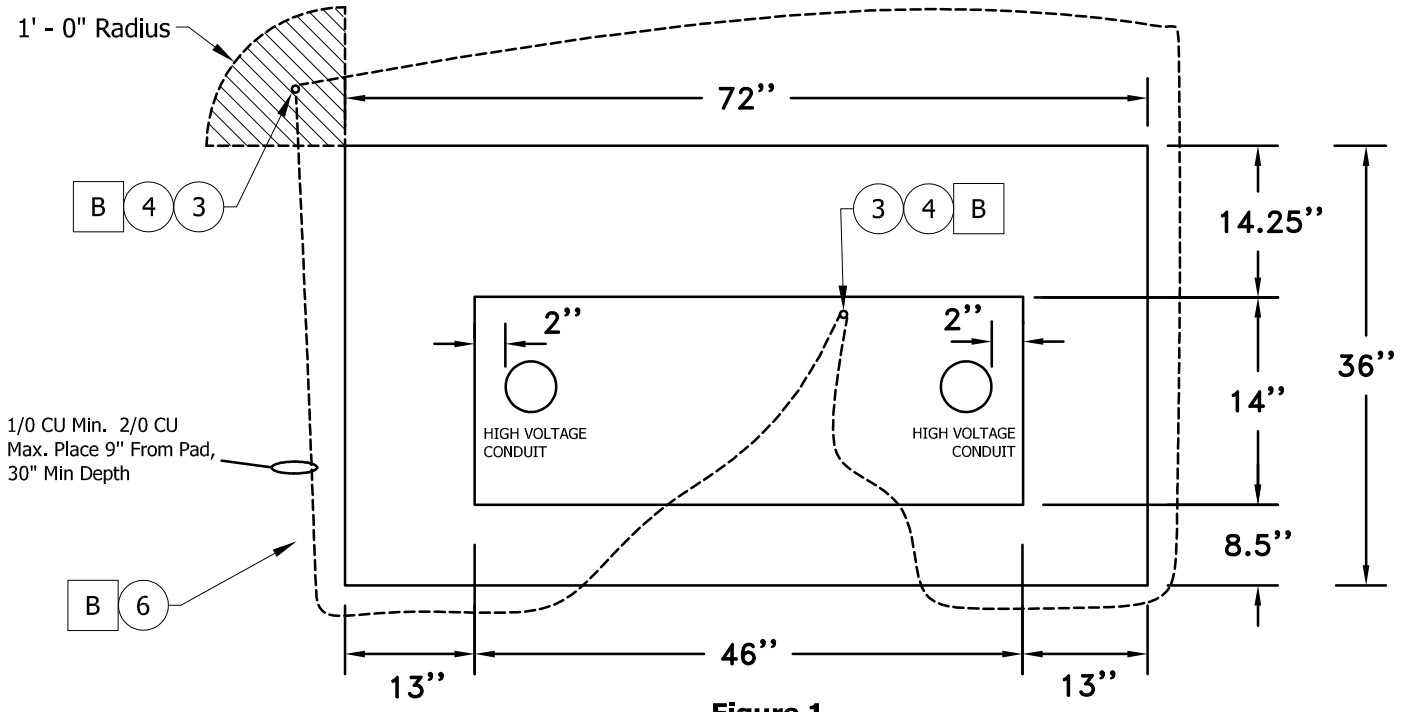


Figure 1
Pad for Load Break Junction Box

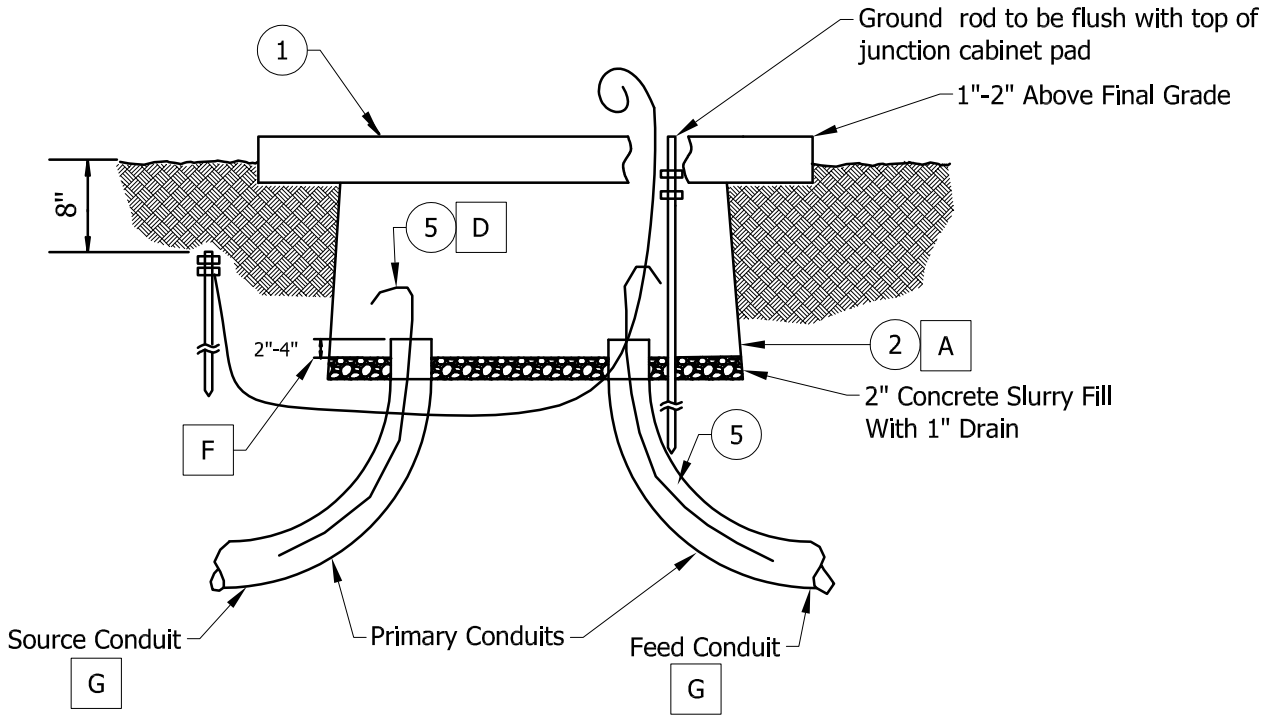


Figure 2
Side View

TURLOCK IRRIGATION DISTRICT								
REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
-	INITIAL ISSUE	NJT	ADL				SSG	07-2024

CONSTRUCTION STANDARDS

PAD FOR LOAD
BREAK JUNCTION BOX

SHEET 1 OF 2

35056 - DWG. NO.

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Table 1 Bill of Materials

Item	Stock Number	Qty	Description	Material Std
1	U-3053-001	1	Junction Cabinet Pad - Single Phase	2028
2	U-1376-001	1	Service Box (Extra Large)	2022
3	O-3325-008	2	Ground Rod	2122
4	O-7370-001	4	Ground Rod Clamp	2132
5	U-8200-004	As Req'd	3/4" Pull Rope	2401
6	O-5505-001	As Req'd	Ground Wire, 1/0 Bare Copper	2200

Table 2 Resources

Resource	Qty	Hours
Line Supervisor	1	2.5
Lineman	1	2.5
Apprentice Lineman	1	2.5
Foreman Truck	1	2.5
Line Truck	1	2.5
Compactor	1	2.5

Table 3 Clearances (Min. in Ft)

From TID Equipment	Front	Sides	Back
Junction Cabinet Pad	10	5	5

Notes:

A. Service box (large) shall be installed upside down without the lid.
B. Install one (1) 5/8" x 8' copper clad ground rod in the back right side of the pad opening, taking care to avoid all conduits. Install a second ground rod in the area shown. Connect the rods together using 1/0 bare copper wires, leaving a minimum 4' coil above clamp. The ground wires shall be routed as shown to insure equal potential grounding around the entire pad. Ground rods shall be installed at time of conduit installation to avoid future damage to other facilities.
C. The soils under the pad shall be compacted to no less than 0.95 relative compaction.
D. Leave approximately 3 feet of pull rope extending from conduit.
E. Leave approximately 5 feet of service conductor extending from conduit.
F. Conduit is to be stubbed out 2" to 4" above slurry.
G. Primary 4" conduits.
H. Center two conduits are field determined.

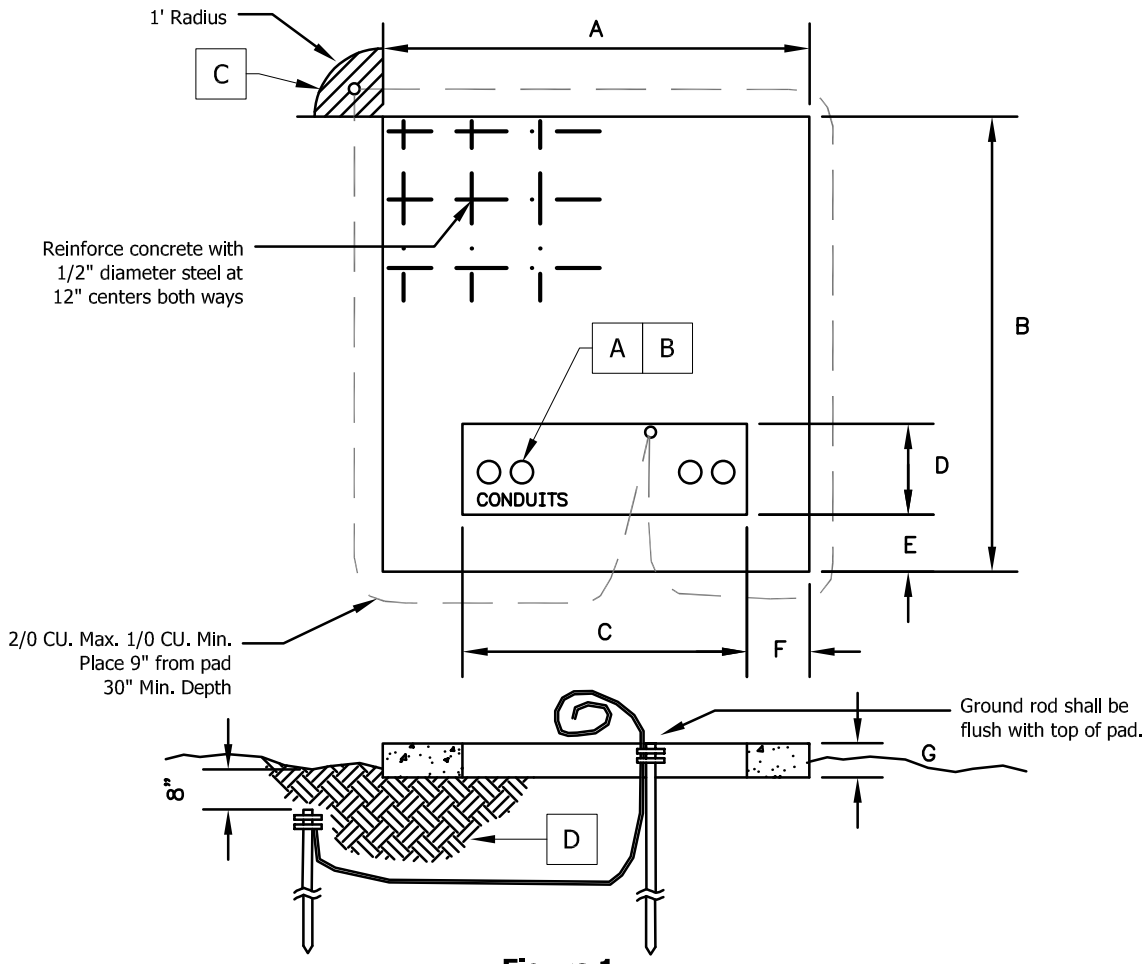


Figure 1
Concrete Pad for Three Phase Transformer

Table 1 Dimensions

KVA	A	B	C	D	E	F	G
75 - 500	75"	80"	50"	16"	10"	11"	6"
750 - 2500	105"	112"	58" [E]	16"	10"	11"	6"

NOTES:

A. See Construction Standard 35201 for size and quantity of conduit required.
B. Primary conduits located at extreme left side of opening. Secondary conduits located at extreme right side of opening.
C. Install one (1) 5/8" x 8' copper clad ground rod in the back right side of the pad opening, taking care to avoid all conduits. Install a second ground rod in the area shown. Connect the rods together using 1/0 bare copper wires, leaving a minimum 4' coil above clamp. The ground wires shall be routed as shown to insure equal potential grounding around the entire pad.
D. The soil under the pad shall be compacted to no less than 0.95 relative compaction.
E. When installing a 750-2500 KVA transformer pad and it is expected that a 500 KVA transformer will be temporarily installed, the dimension "C" shall be 50" instead of 58".

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
J	UPDATED TITLEBLOCK AND TABLE	ELJ					MSG	09-2016
H	LOWERED GROUND ROD IN PAD	SDC	PJO	KJO			BLL	04-2003
G	CHANGED GROUNDING CONFIGURATION	BB	ETE	RWB	LBG		RA	06-1994
F	REDRAWN	BB	SCP	RWB	RA		AKH	02-1989

CONCRETE TRANSFORMER PAD
THREE PHASE TRANSFORMER

SHEET 1 OF 1

35101 DWG. NO. **J**

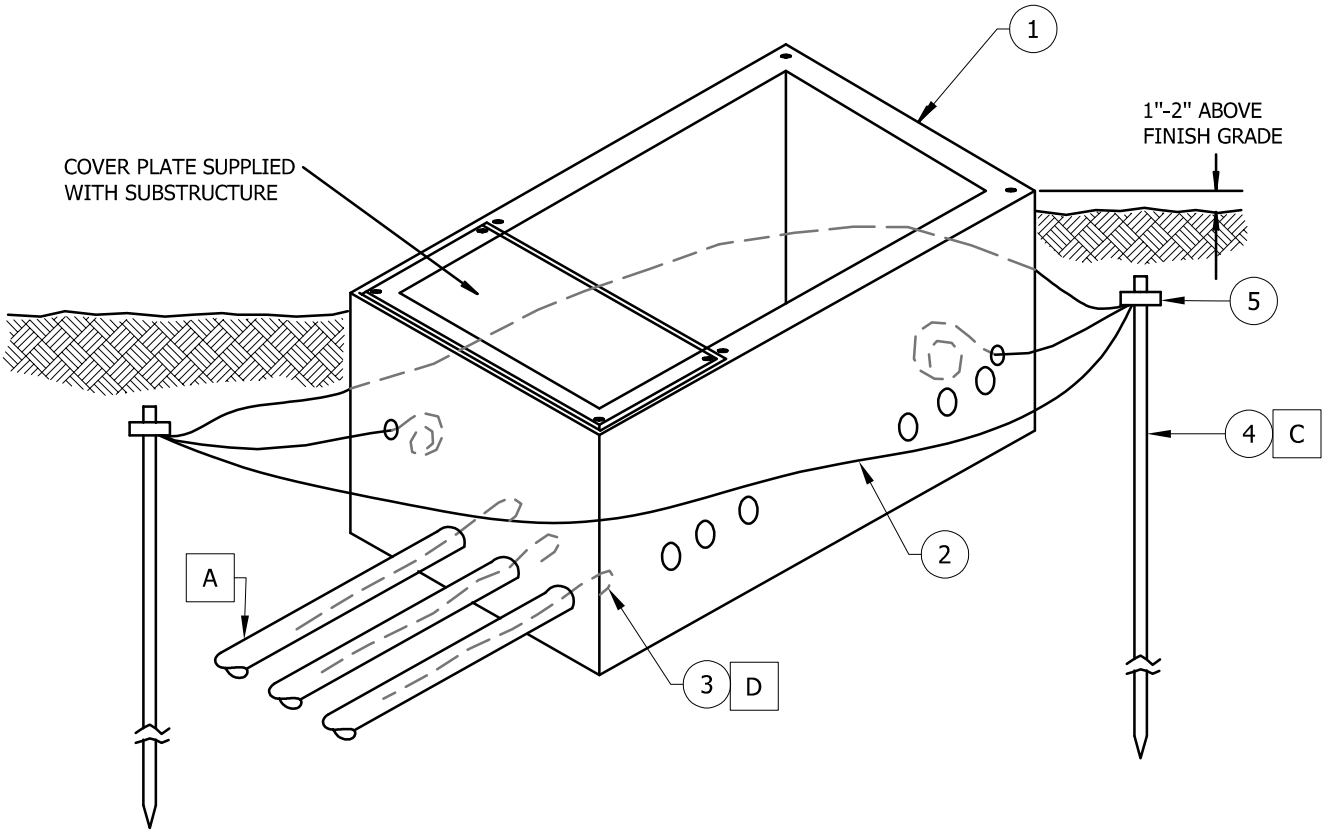


Figure 1
Padmounted Switch
Substructure Detail

Notes:

A. Conduit sizes and quantity as per plot plan. (T.I.D. crews use Construction Standard 35201)
B. The soils under and around the substructure shall be compacted to no less than 0.95 relative compaction.
C. Install first ground rod within 2 feet of front-center of switch pad approximately 6" under finish grade. Install a second ground rod similarly, but within 2 feet fo the rear-center of pad. Alternately, the ground rod may be installed inside the box in opposite corners using the 1" knockouts. Connect the 2 rods together using 2/0 bare copper wires. Bring a minimum of 8 feet of 2/0 bare copper tail from each ground rod into the substructure and coil.
D. Leave approximately 3 feet of pull rope extending from conduit.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
F	UPDATED GROUNDING	PEM		LRM	RB	DNP	SSG	09-2022
E	ADDED TABLE 3	SSG		DNP	MLN	AAS	MSG	06-2021
D	UPDATED TITLEBLOCK AND TABLES	ELJ					MSG	09-2016
C	REDRAWN IN AUTOCAD	SDC	PJO	KJO			BLL	04-2003
B	SUBSTRUCTURE NOW PREFORMED	BB	ETE	RWB	LBG		RA	02-1993

PADMOUNTED SWITCH
SUBSTRUCTURE DETAIL

SHEET 1 OF 2

35110 DWG. NO. **F**

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Table 1 Bill of Materials

Item	Stock Number	Qty	Description	Material Std
1	U-2095-001	1	Switch Substructure With Lid	2018
2	O-5505-002	As Req'd	2/0 Bare Copper Wire	2200
3	U-8200-004	As Req'd	3/4" Pull Tape	2401
4	O-3325-008	2	Ground Rod	2122
5	O-7370-001	2	Ground Rod Clamp	2132

Table 2 Resources

Resource	Qty	Hours
Line Supervisor	1	2
Lineman	1	2
Apprentice Lineman	1	2
Foreman Truck	1	2
Line Truck	1	2

Table 3 Clearances (Min. in Ft)

From TID Equipment	Front	Sides	Back
Switch Substructure	5	5	5

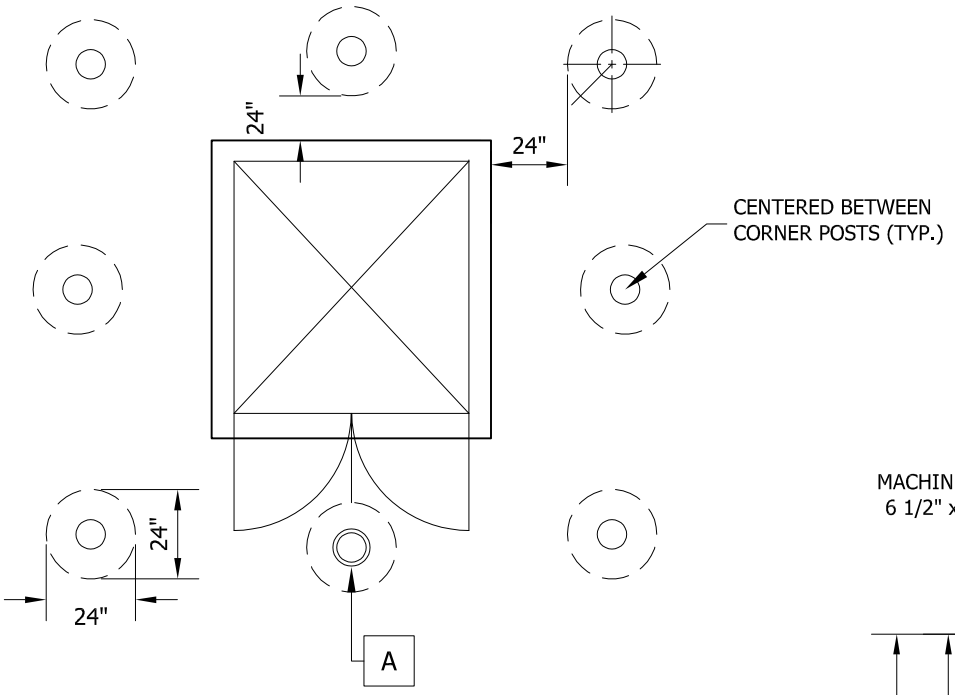


Figure 1
Barrier Locations

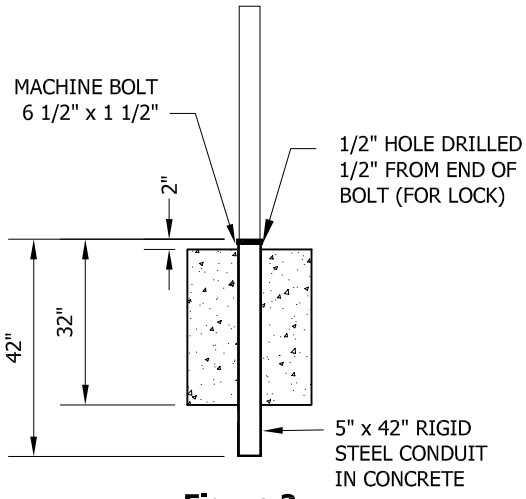


Figure 2
Removable Barrier

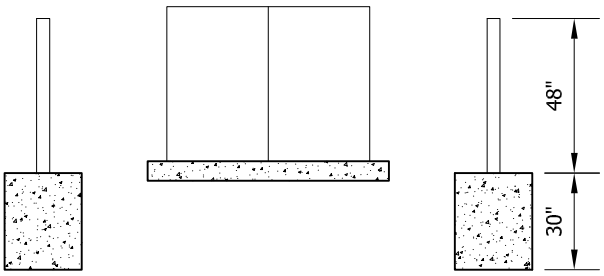


Figure 3
Barrier Elevation

SCOPE:

The purpose of this standard is to define barrier protection requirements for pad mounted transformer installations. Barriers shall be installed on any or all transformer faces where they could easily be exposed to vehicular traffic.

NOTES:

A. Removable barrier shall be provided per FIGURE 2.
B. Rounded cement cap may be substituted for steel cap.
C. Concrete is to be uniform column shape 38" minimum depth (approximately 10 cubic feet). Concrete to have a minimum of strength of 1500 PSI.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
F	REVISED BOLLARD DISTANCE FROM 18" TO 24"	ADL					SSG	05-2025
E	REVISED BOLLARD SHAPE TO ROUND	ADL					SSG	09-2023
D	UPDATED TITLEBLOCK	ELJ					MSG	09-2016
C	ADD ALTERNATE CONSTRUCTION METHOD	SDC					BLL	06-2002
B	REDRAWN FOR BOUND BOOK	BB	ETE	RWB	LBG		RA	05-1994

PAD MOUNT TRANSFORMER BARRIERS

SHEET 1 OF 1

35151 DWG. NO.

F

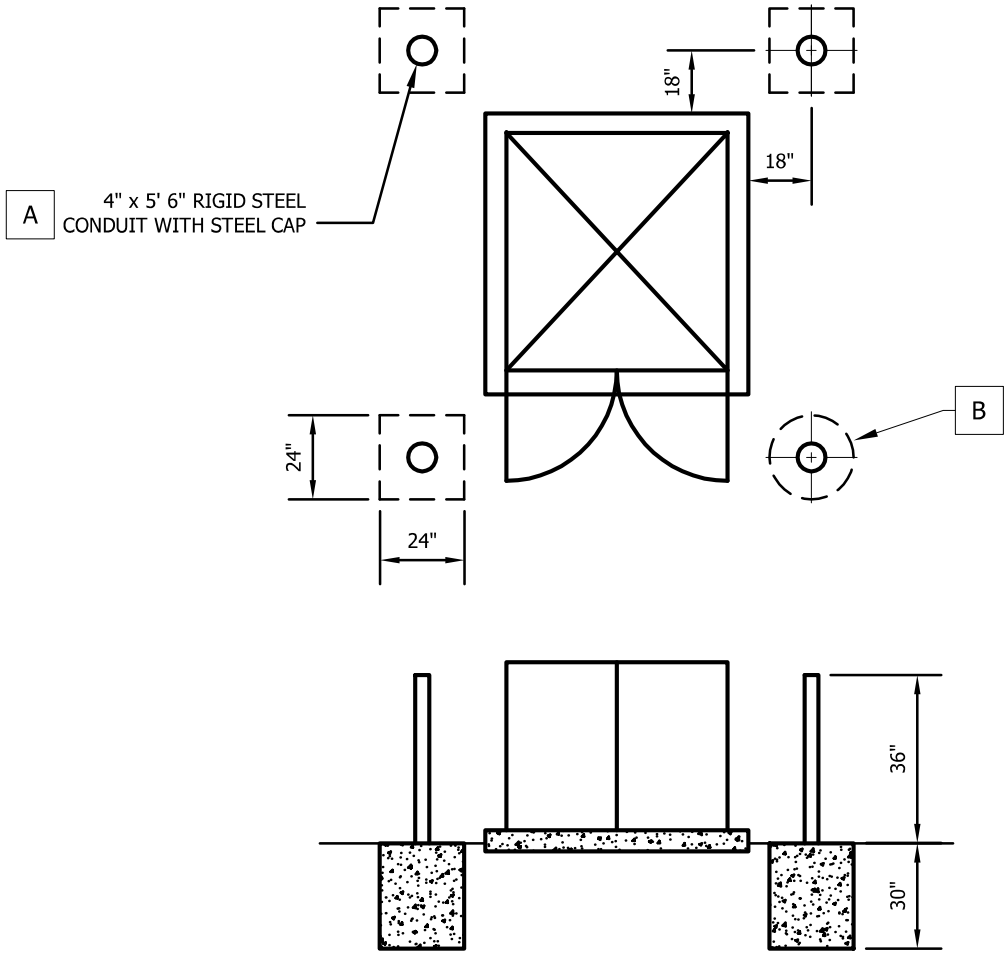


Figure 1
Residential Pad Mount
Transformer Barriers

SCOPE:

The purpose of this standard is to define barrier protection requirements for pad mounted or subsurface, residential transformer installations. Barriers shall be installed on any or all transformer faces where they could easily be exposed to vehicular traffic.

NOTES:

A. Rounded cement cap may be substituted for steel cap.

B. Alternate construction method: 24" round auger hole and round concrete column may be substituted for 2' x 2' square. Concrete is to be uniform column shape, 38" minimum depth (approximately 10 cubic feet). Concrete to have a minimum of strength of 1500 PSI.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
A	UPDATED TITLEBLOCK	ELJ					MSG	09-2016
--	INITIAL ISSUE	SDC					BLL	12-2006

RESIDENTIAL PAD MOUNT
TRANSFORMER BARRIERS

SHEET 1 OF 1

35152 DWG. NO. **A**

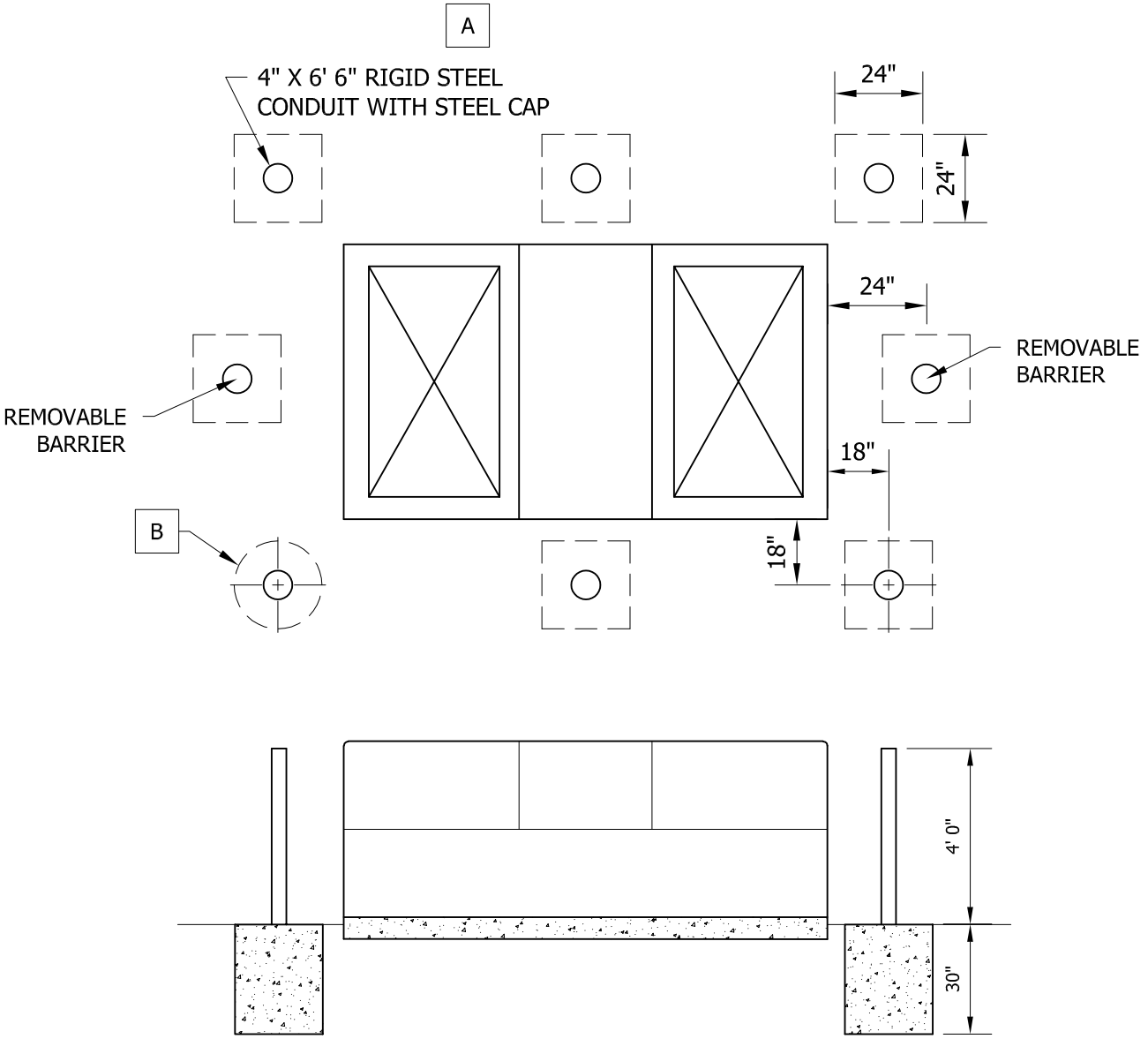


Figure 1
Pad Mount Switch Barriers

SCOPE:

The purpose of this standard is to define barrier protection requirements for pad mounted switchgear. Barriers shall be installed on any or all switch faces where switch could easily be exposed to vehicular traffic.

NOTES:

A. Rounded cement cap may be substituted for steel cap.

B. Alternate construction method: 24" round auger hole and round concrete column may be substituted for 2' x 2' square. Concrete is to be uniform column shape, 38" minimum depth (approximately 10 cubic feet). Concrete to have a minimum strength of 1500 PSI.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
B	ADDED REMOVABLE BARRIERS	ADL					SSG	03-2023
A	UPDATE TITLEBLOCK	ELJ					MSG	09-2016
--	INITIAL ISSUE	SDC					BLL	12-2006

PAD MOUNT SWITCH BARRIERS

SHEET 1 OF 1

35154 DWG. NO.

B

40 PAGE

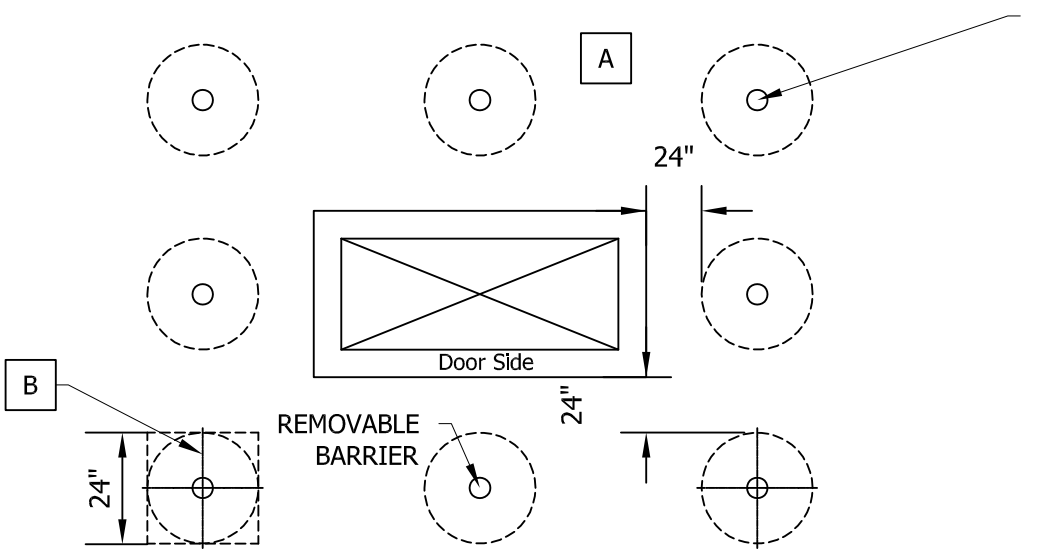


Figure 1
Pad Mount Junction Box
Barriers

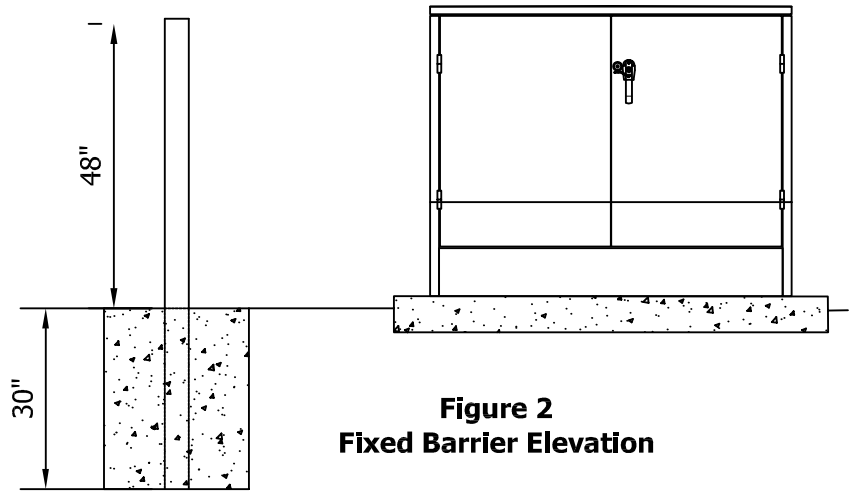


Figure 2
Fixed Barrier Elevation

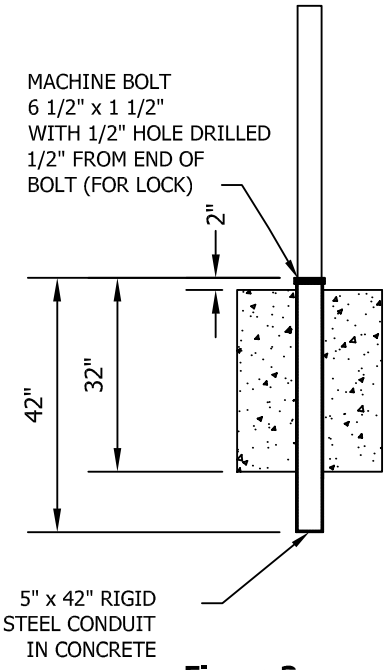


Figure 3
Removable Barrier

SCOPE:

The purpose of this standard is to define barrier protection requirements for pad mounted junction box. Barriers shall be installed on any or all switch faces where switch could easily be exposed to vehicular traffic.

NOTES:

A. Rounded cement cap may be substituted for steel cap.

B. Alternate construction method: 24" round auger hole and round concrete column may be substituted for 2' x 2' square. Concrete is to be uniform column shape, 38" minimum depth (approximately 10 cubic feet). Concrete to have a minimum strength of 1500 PSI.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
-	INITIAL ISSUE	NJT	ADL				SSG	07-2024

BARRRIERS FOR LOAD
BREAK JUNCTION BOX

SHEET 1 OF 1

35155 - DWG. NO.

41 PAGE

Figure 1
Rebar for Poured Wall

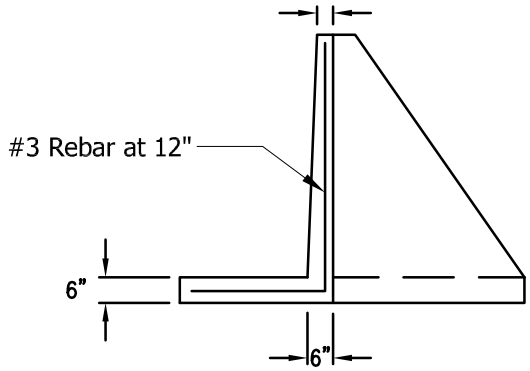


Figure 2
Precast Dimensions

Table 1
Wall Lengths

Usage	L
Single Phase Tx Pad	11'
Three Phase Tx Pad	15'
Pull Box	15'

Notes:

1. Retaining walls are required when TID engineering determines one is necessary to protect equipment or enclosures. Retaining walls will be designed with sufficient strength to to provide adequate protection. The applicant is responsible for installation and maintenance of retaining walls.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
--	INITIAL ISSUE	ADL	MAC	DNP			SSG	11/2022

PRECAST/POURED
RETAINING WALL

SHEET 1 OF 2

30710 DWG. NO. --

Figure 3
Draining Detail

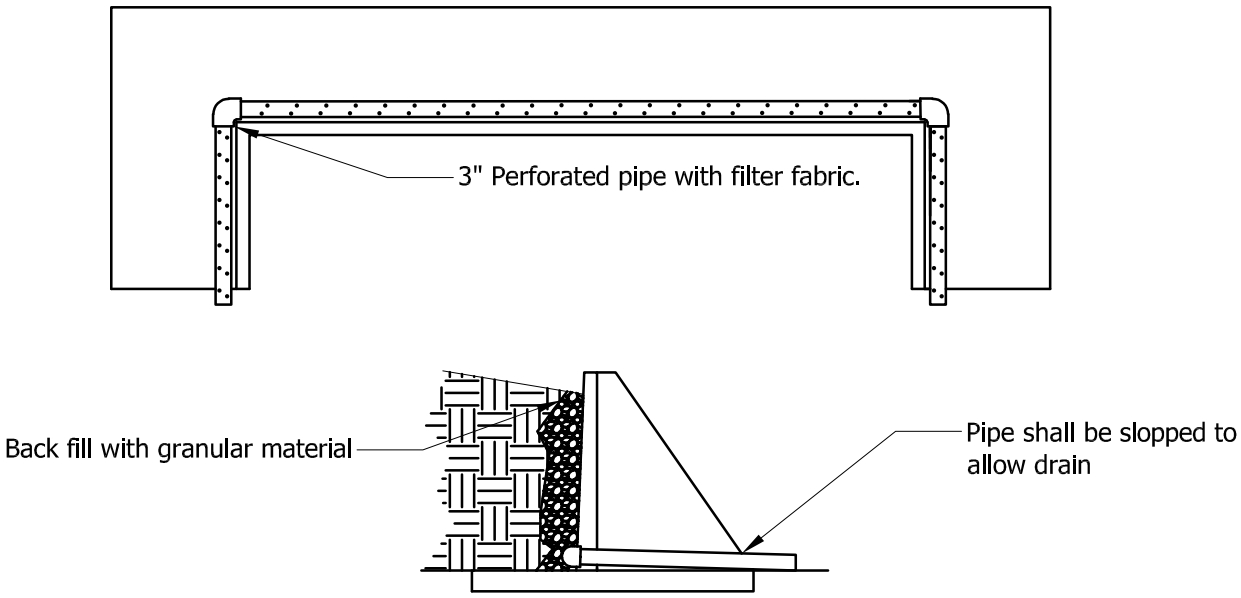
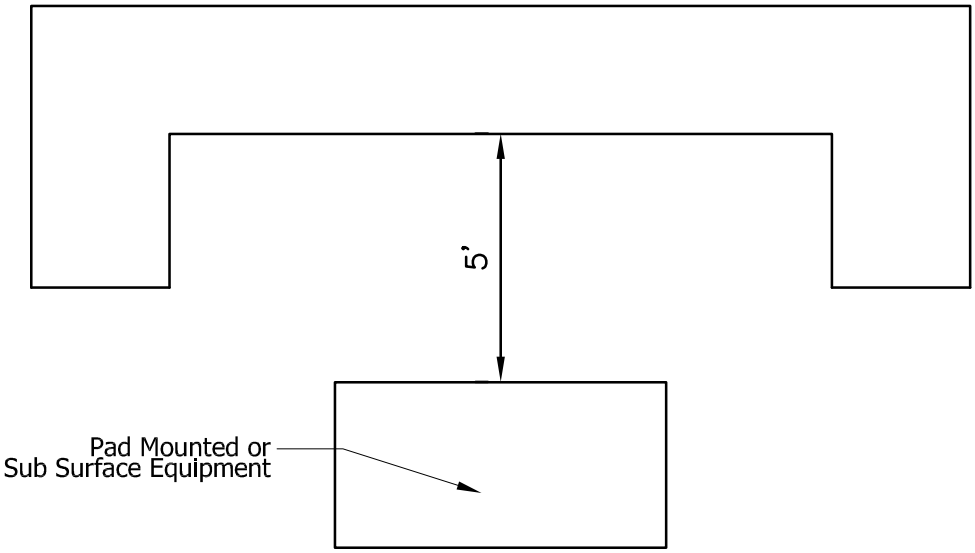


Figure 4
Work Space Requirement



General Information:

Electrical plastic conduit constructed of polyvinyl chloride (PVC) will be used in all underground developments. PVC schedule 40 conduit will be used for all subsurface straight runs and all subsurface elbows. PVC schedule 80 conduit will be used for all above ground runs. The following tables describe general sizes and uses for PVC conduits. These sizes shall be used unless otherwise specified by the District.

General Practice:

After conduits are installed, an appropriately sized mandrel will be pulled through them, and the pull rope installed. Immediately after pulling the mandrel and pull rope, the conduits will be plugged. The mandrel and plugging procedure must be done in the presence of the TID Inspector.

Table 1 Primary Circuit Conduits

Size of Primary Cable	Conduit Quantity and Size	
	Single Phase	Three Phase
#2 AL or 1/0 AL	(1) 4"	(1) 4"
4/0 AL	(1) 5"	(1) 5"
600 Compact AL (See Note 1)	--	(1) 6", (1) 2"
1100 Compact AL (See Note 1)	--	(1) 6", (1) 2"

Table 2 Secondary Circuit Conduits (Residential type construction)

Size of Secondary Conductor	Conduit Quantity and Size
4/0 Triplex (Maintenance Only)	(1) 3"
500 Triplex	(1) 4"

Table 3 Service Conduits (Residential type construction)

Service Entrance Size (Amp)	Conduit Quantity and Size
100 or 200	(1)-3"
320 or 400	(1)-4"
600	(1) 5" (See Note 2)
800	(1) 5" (See Note 2)

Table 4 Secondary/Service Conduits (Commercial type construction)

Service Entrance Size (Amp)	Conduit Quantity and Size	
	Single Phase	Three Phase
100*	(1) 3"	(1) 3"
200*	(1) 3"	(1) 3"
320	(1) 4"	(1) 4"
400	(2) 4"	(3) 4"
600	(2) 4"	(3) 4"
800	(2) 5"	(3) 5"
1000	--	(3) 5"
1200	--	(3) 5"
1400	--	(3) 5"
1600	--	(4) 5"
1800	--	(4) 5"
2000	--	(6) 5"
2500	--	(6) 5"
3000	--	(6) 5"

Table 5 Conduit Sweep Radius (Vertical)

Conduit Size	Angle	Trench Depth	**Sweep Radius
2"	90°	36"	36"
3"	90°	36"	36"
4"	90°	48"	48"
5"	90°	59"	60"
6"	90°	59"	60"

Table 6 Conduit Sweep Radius (Horizontal)

Conduit Size	Angle	*Sweep Radius
2"	Any	48"
3"	Any	48"
4"	Any	60"
5"	Any	60"
6"	Any	60"

Notes:

1. There should not be more a than total of 270° [3 (90°) or combinations of 90° and 45°] bends in the conduits.
2. Sweep radius subject to change depending on trench depth and equipment
3. *Consult engineering for allowable 2"
4. **2" Conduit for feeder neutral shall use 60" sweeps

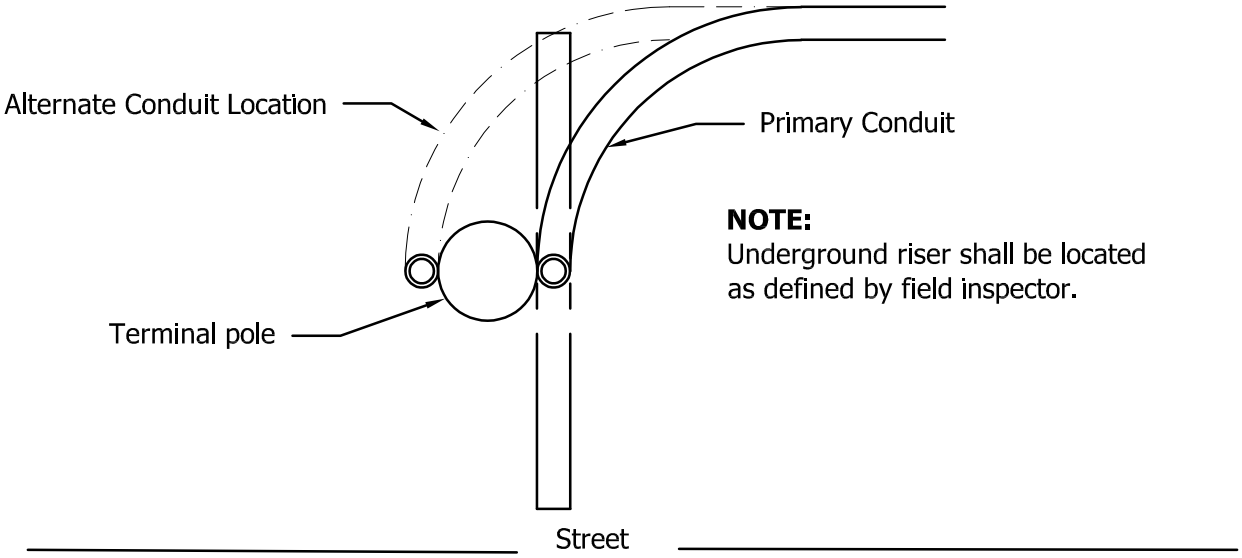


Figure 1
Orientation At Terminal Pole

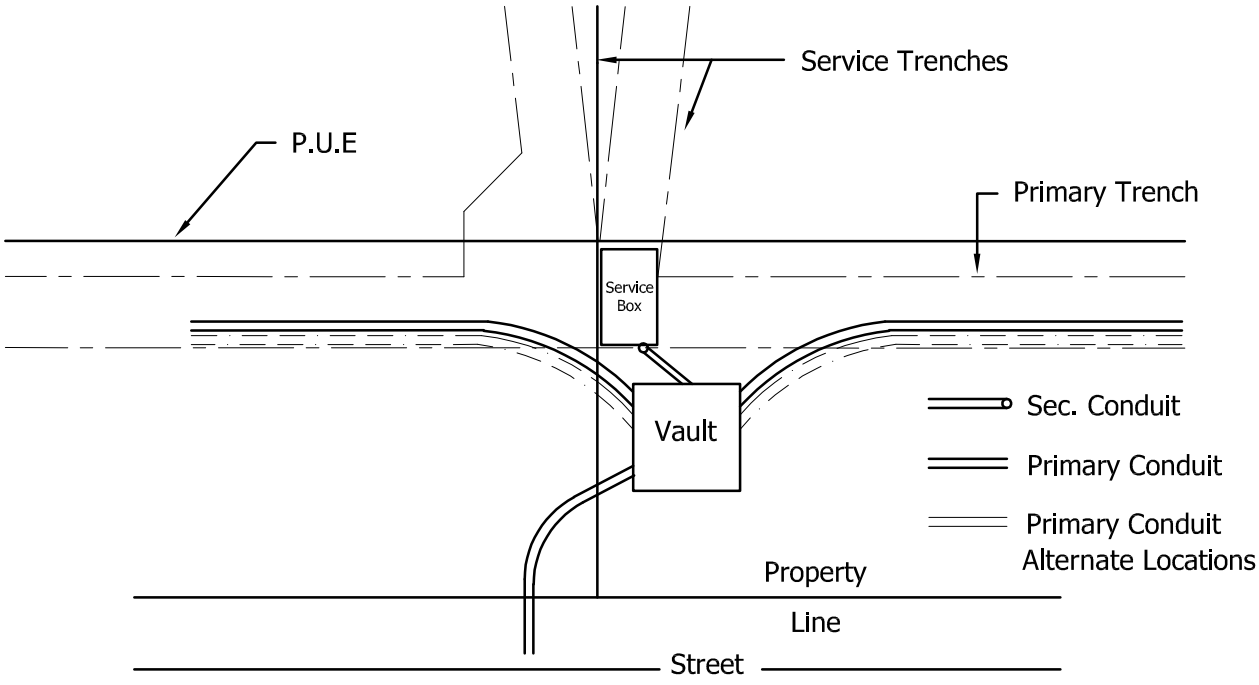


Figure 2
Orientation At Subsurface Transformer Vault

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
D	ADDED FIGURE 4	SSG	DP	JA	AB		EDJ	09-2019
C	UPDATED TITLEBLOCK	ELJ					MSG	09-2016
B	REDRAWN IN AUTOCAD	SDC	PJO	KJO			BLL	04-2003
A	CHANGED ORIENTATION AT SERVICE BOX	BB					BLL	06-1999
--	INITIAL ISSUE	SCP	RWB	RCM	RA		AKH	07-1990

CONDUIT ORIENTATION AT SUBSTRUCTURES

SHEET 1 OF 3

35210 DWG. NO.

D

46 PAGE

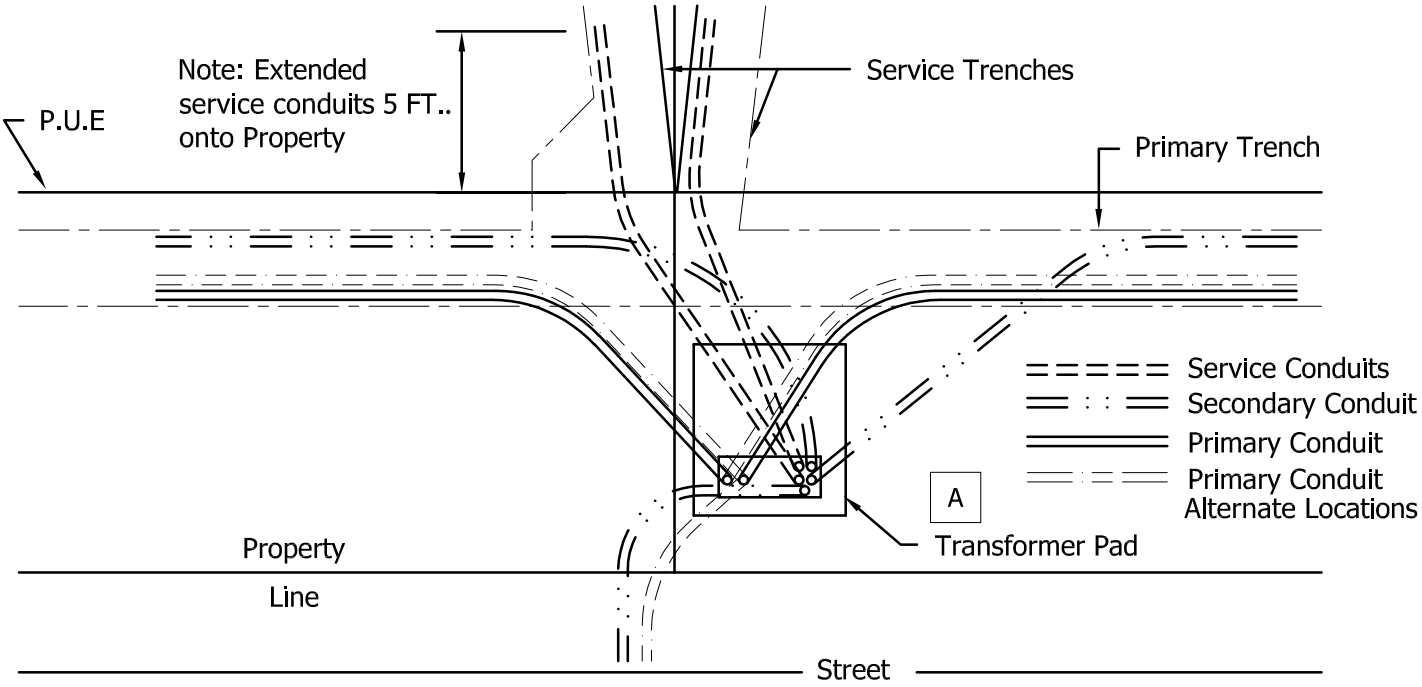
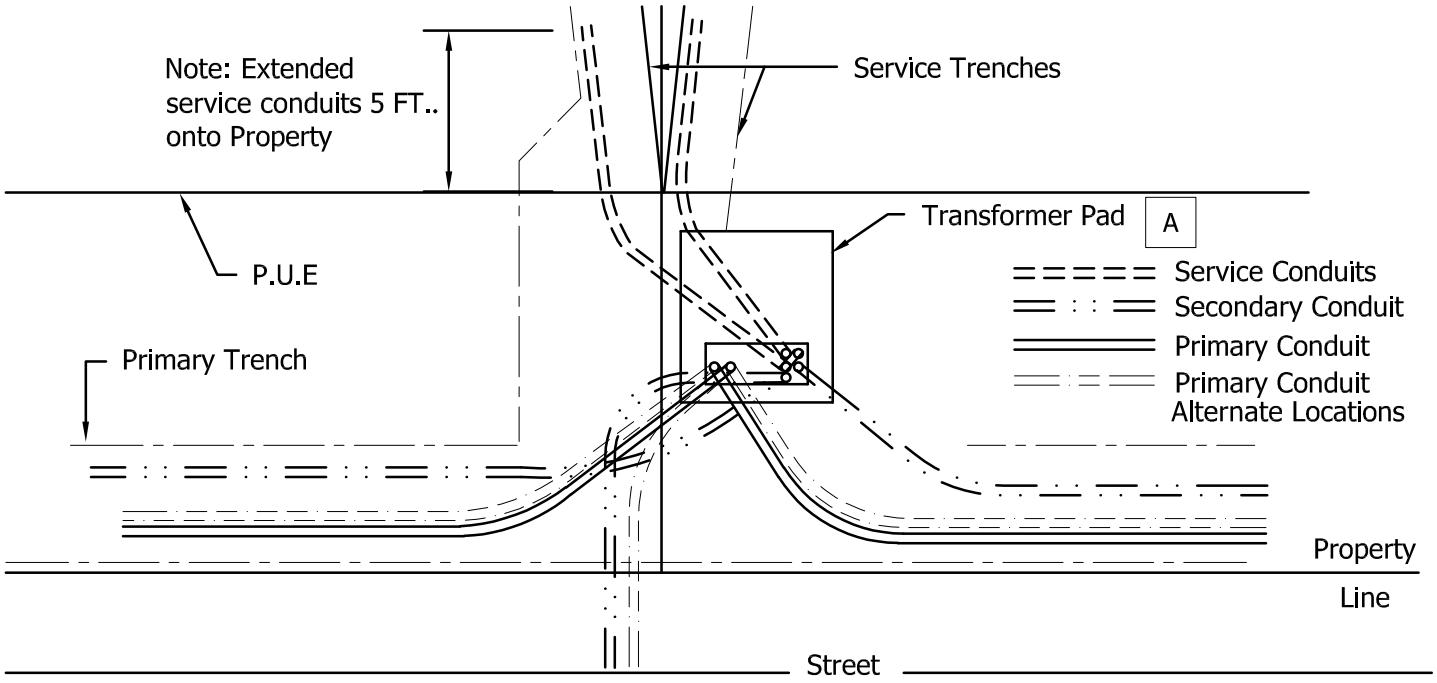


Figure 3
Orientation At Pad Mounted Transformer



Notes:

A. There should be no other utilities under and 2' around the TID transformer pad.

Figure 4
Orientation At Pad Mounted Transformer (Medium to High Density)

CONDUIT ORIENTATION AT SUBSTRUCTURES	**CONSTRUCTION STANDARDS**		
	SHEET 2 OF 3	**35210** DWG. NO.	**D** 47 PAGE

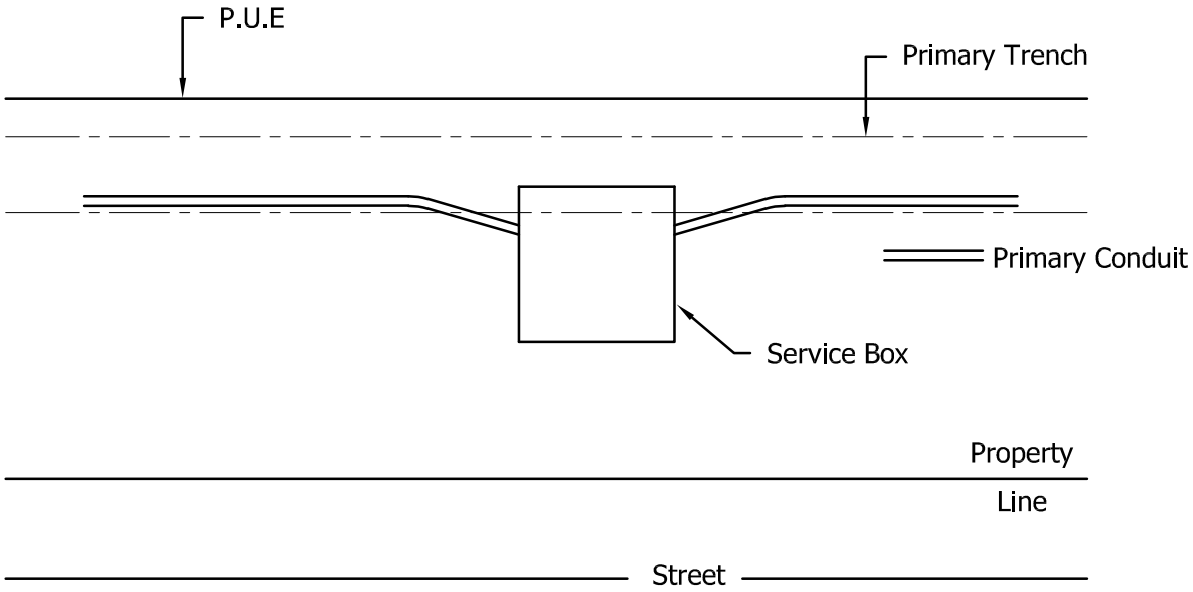


Figure 5
Orientation At Primary Pull Box

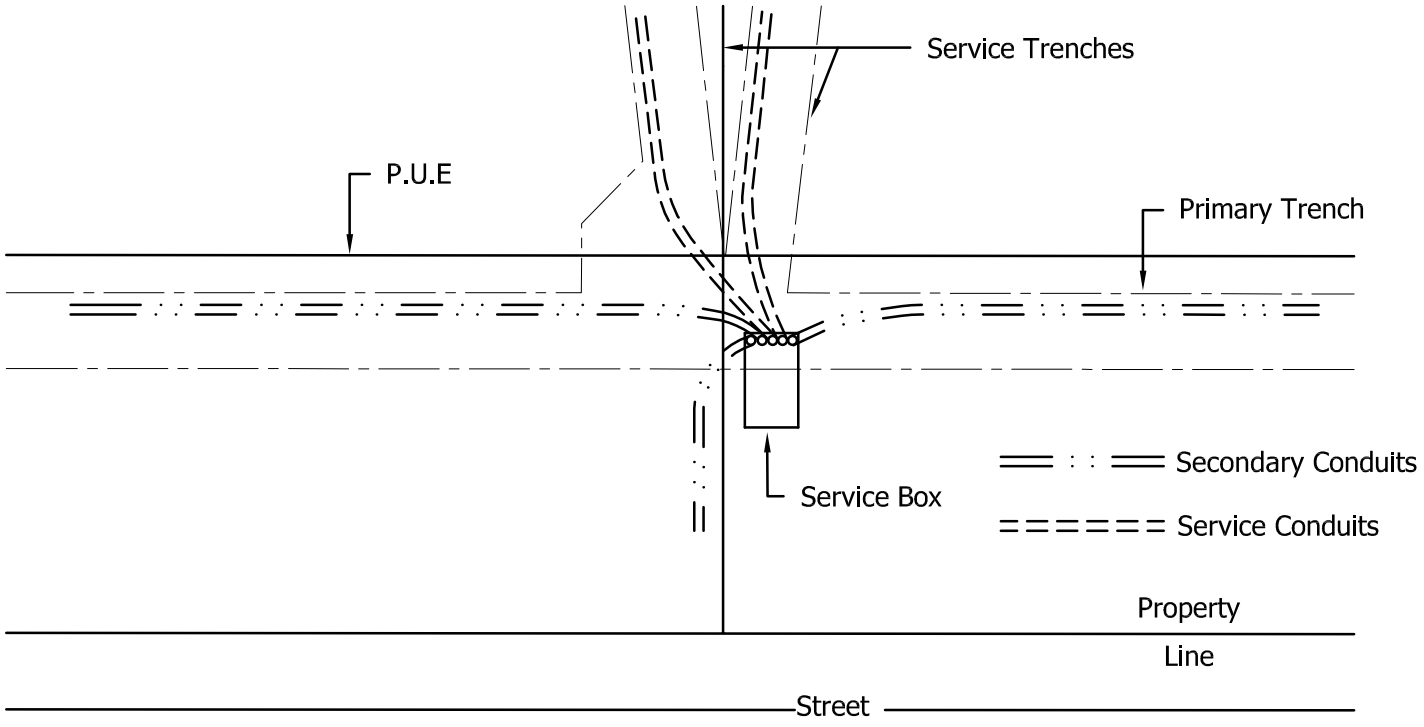


Figure 6
Orientation At Service Box

CONDUIT ORIENTATION AT SUBSTRUCTURES	**CONSTRUCTION STANDARDS**		
	SHEET 3 OF 3	**35210** DWG. NO.	**D** 48 PAGE

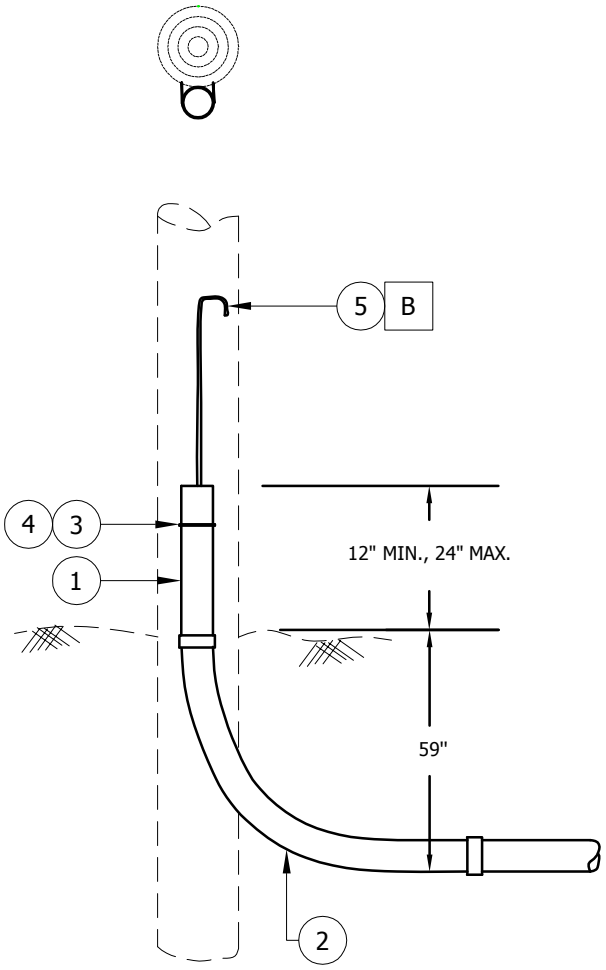


Figure 1
Configuration A
USE WHEN NEUTRAL CIRCUIT IS NOT REQUIRED

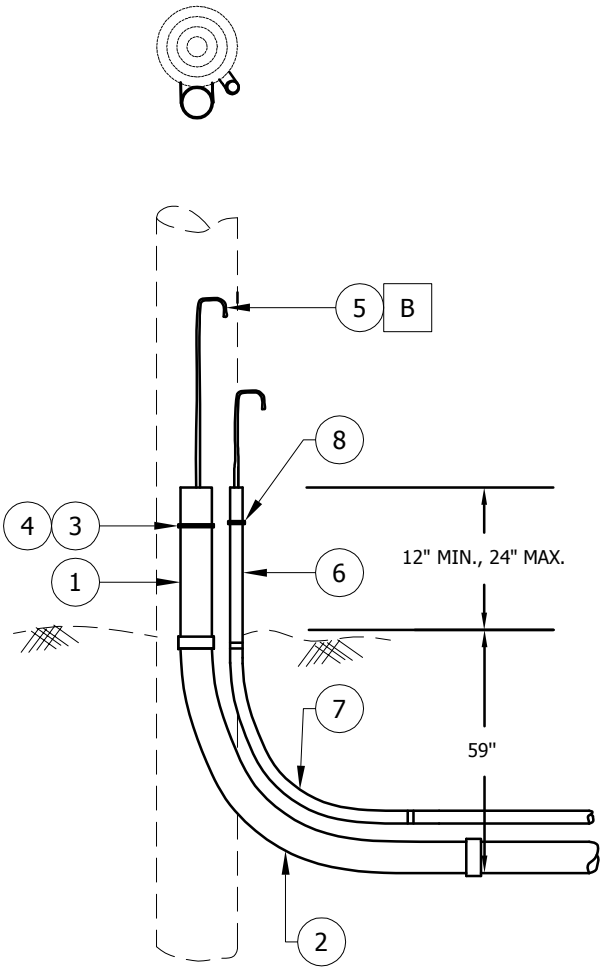


Figure 2
Configuration B
USE WHEN NEUTRAL CIRCUIT IS REQUIRED

TURLOCK IRRIGATION DISTRICT

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
E	UPDATED TITLEBLOCK AND TABLES	ELJ					MSG	09-2016
D	CHANGED CONDUIT LENGTH	NY	MSG				BLL	02-2010
C	REVISED PULL TAPE SIZE	SDC	PJO				BLL	04-2003
B	CAHNGED ELBOW TO SCH. 40	BB	JD				BLL	06-1998
A	ADD LABOR STDS.	BB	RWB				AKH	07-1991

CONSTRUCTION STANDARDS

CONDUIT RUN TO
TERMINAL POLE DETAILS

SHEET 1 OF 2

35300 DWG. NO.

E

Table 1 Bill of Materials - Configuration A

Item	Stock Number	Qty	Description	Material Std
1	U-6050-XXX	5'	Schedule 80 PVC Conduit	2170
2	U-6085-XXX	1	Schedule 40 PVC 90° Elbow	2170
3	U-6048-XXX	1	Conduit Strap	2170
4	O-7189-002	2	Washerhead Lag Screw	2322
5	U-8200-004	As Req'd	3/4" Pull Tape	2401

Table 2 Bill of Materials - Configuration B

Item	Stock Number	Qty	Description	Material Std
1	U-6050-XXX	5'	Schedule 80 PVC Conduit	2170
2	U-6085-XXX	1	Schedule 40 PVC 90° Elbow	2170
3	U-6048-XXX	1	Conduit Strap	2170
4	O-7189-002	2	Washerhead Lag Screw	2322
5	U-8200-004	As Req'd	3/4" Pull Tape	2401
6	U-6050-002	5'	Schedule 80 PVC Conduit - 2"	2170
7	U-6085-002	1	Schedule 40 PVC 90° Elbow - 2"	2170
8	U-6048-002	1	Conduit Strap - 2"	2170

Table 3 Resources

Resource	Qty	Hours
Line Supervisor	1	1
Lineman	3	1
Apprentice Lineman	1	1
Foreman Truck	1	1
Line Truck	1	1
Digger/Derick	1	1

NOTES:

A. Conduit and conduit strap sizes as per TID Construction Standard 35201.

B. Leave minimum of 3 feet of pull rope extended past end of conduit. Fasten coil of rope to pole above conduit.

CONDUIT RUN TO
TERMINAL POLE DETAILS

CONSTRUCTION STANDARDS

SHEET 2 OF 2

35300 DWG. NO. **E**

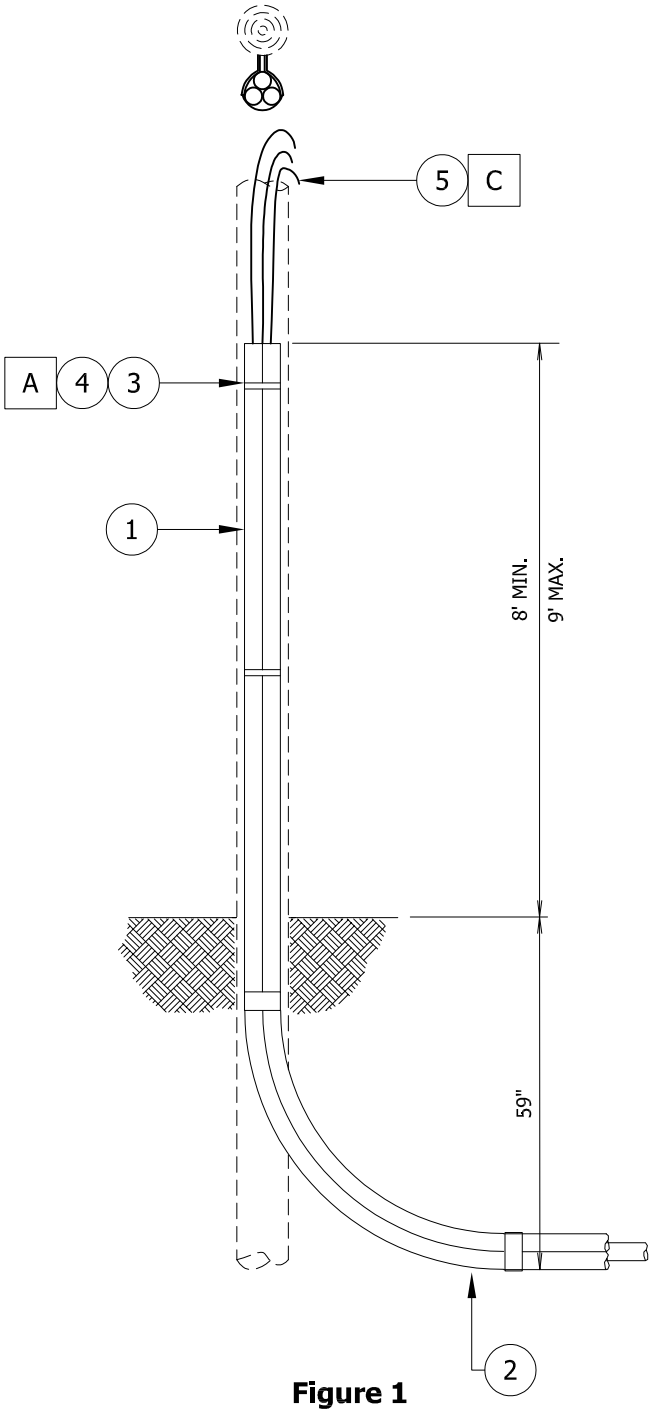


Figure 1
Configuration A
USE WHEN NEUTRAL IS NOT REQUIRED

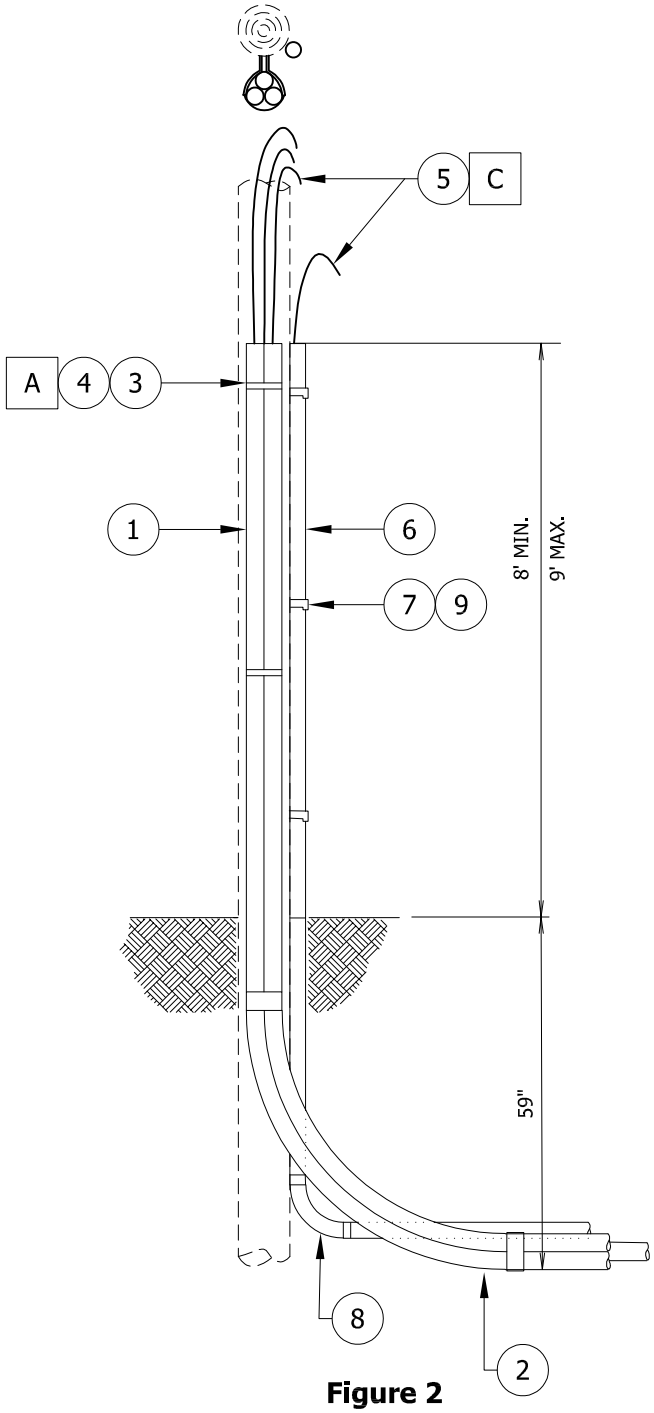


Figure 2
Configuration B
USE WHEN NEUTRAL IS REQUIRED

TURLOCK IRRIGATION DISTRICT

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
D	UPDATED TITLEBLOCK AND TABLES	ELJ					MSG	09-2016
C	REVISE PULL TAPE SIZE	SDC	PJO	KJO			BLL	04-2003
B	CHANGED ELBOW TO SCHEDULE 40	BB	JD				BLL	06-1998
A	ADD LABOR STANDARDS	BB	SCP	RWB	LBG		RA	07-1991

CONSTRUCTION STANDARDS

MULTI-CONDUIT RUN TO TERMINAL POLE DETAILS

SHEET	DWG. NO.		PAGE
1 OF 2	**35301**	**D**	51

Table 1 Bill of Materials - Configuration A

Item	Stock Number	Qty	Description	Material Std
1	U-6050-XXX	30'	Schedule 80 PVC Conduit	2170
2	U-6085-XXX	3	Schedule 40 PVC 90° Elbow	2170
3	U-6045-001	2	Conduit Brace	2171
4	O-7190-004	2	Lag Screw 1/2" x 4 1/2"	2322
5	U-8200-004	As Req'd	3/4" Pull Tape	2401

Table 2 Bill of Materials - Configuration B

Item	Stock Number	Qty	Description	Material Std
1	U-6050-XXX	30'	Schedule 80 PVC Conduit	2170
2	U-6085-XXX	3	Schedule 40 PVC 90° Elbow	2170
3	U-6045-001	2	Conduit Brace	2171
4	O-7190-004	2	Lag Screw 1/2" x 4 1/2"	2322
5	U-8200-004	As Req'd	3/4" Pull Tape	2401
6	U-6050-002	14'	Schedule 80 PVC Conduit - 2"	2170
7	U-6048-002	3	Conduit Strap - 2"	2170
8	U-6085-002	1	Schedule 40 PVC 90° Elbow - 2"	2170
9	O-7189-002	6	Washerhead Lag Screw	2322

Table 3 Resources

Resource	Qty	Hours
Line Supervisor	1	1.5
Lineman	2	1.5
Apprentice Lineman	1	1.5
Foreman Truck	1	1.5
Line Truck	1	1.5

NOTES:

A. Attach conduit braces to pole using lag screws.
B. Conduit sizes as per TID Construction Standard 35201.
C. Leave minimum of 3 ft. of pull rope extended past end of conduit. Fasten coil of rope to pole above conduit.

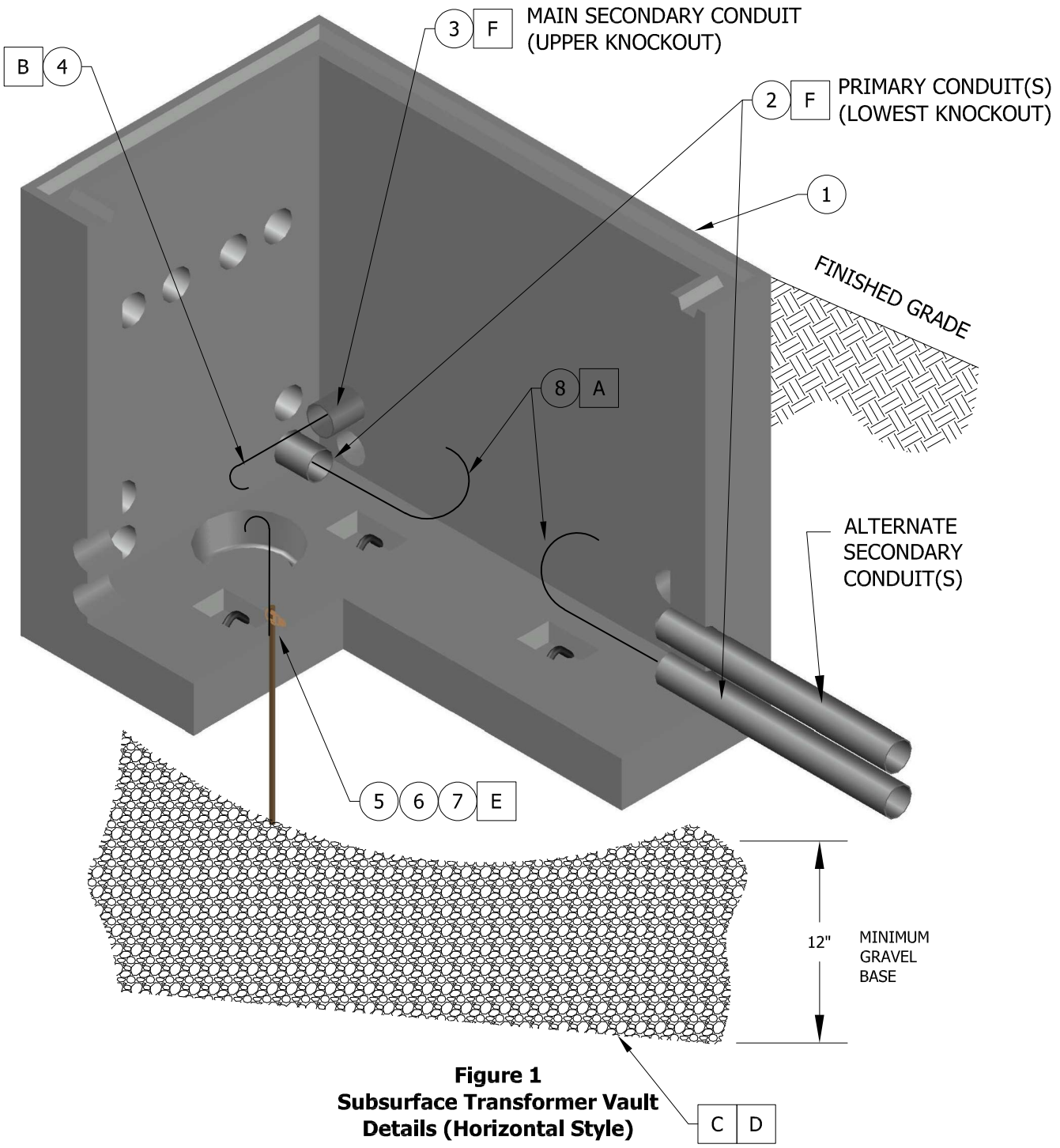


Figure 1
Subsurface Transformer Vault Details (Horizontal Style)

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
D	SPECIFIED 750 MCM SECONDARY	ADL	RMB				SSG	03-2023
C	ADDED TABLE 2	SSG		DNP	MLN	AAS	MSG	09-2021
B	UPDATE TITLEBLOCK AND TABLES	ELJ					MSG	09-2016
A	CHG SEC. ROUTING, DELETE ALT. ROUTE	SDC	MSG				BLL	03-2007
--	INITIAL ISSUE	SDC	GKT				BLL	11-2006

SUBSURFACE TRANSFORMER VAULT DETAILS (HORIZONTAL STYLE)

SHEET 1 OF 3

35313 DWG. NO. **D**

53 PAGE

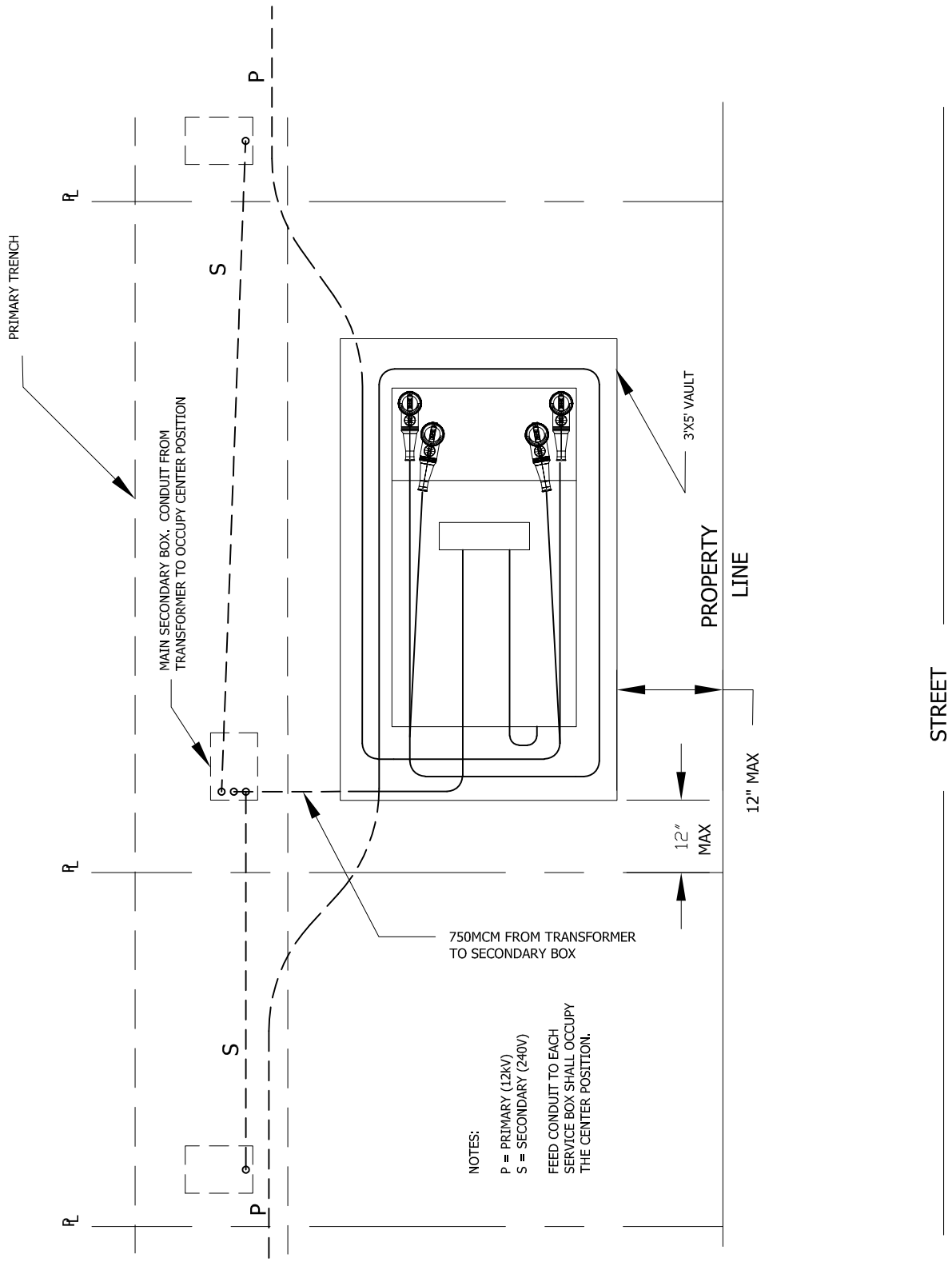


Figure 2
Preferred Cable/Conduit Arrangement

SUBSURFACE TRANSFORMER VAULT DETAILS (HORIZONTAL STYLE)	**CONSTRUCTION STANDARDS**			
	SHEET 2 OF 3	**35313** DWG. NO.	**D**	54 PAGE

Table 1 Bill of Materials

Item	Stock Number	Qty	Description	Material Std
1	U-2179-001	1	Horizontal Transformer Vault With Lid	2016
2	U-6060-XXX	As Req'd	Primary Conduit SCH 40	2170
3	U-6060-XXX	As Req'd	Secondary Conduit SCH 40	2170
4	U-6300-001	As Req'd	Sealing Compound	2242
5	O-3325-008	1	Ground Rod	2122
6	O-7370-001	1	Ground Rod Clamp	2132
7	O-5505-000	8'	#2 Copper Ground Wire	2200
8	U-8200-004	As Req'd	3/4" Pull Tape	2401
9	O-5985-005	As Req'd	750 MCM Insulated Single Conductor, Aluminum	2202

Table 2 Clearances (Min. in Ft)

From TID Equipment	Front	Sides	Back
Transformer Vault	10	5	5

NOTES:

A. Leave approximately 10' of pull rope in vault.
B. Grout in conduit using sealing compound.
C. Provide gravel base as shown. Gravel size to be 3/4" to 1" diameter. Top of vault lid shall be 1" to 2" above finished grade.
D. Soil under and around the vault shall be compacted to no less than 0.95 relative compaction.
E. Coil copper ground wire in vault.
F. Conduit size(s) per TID Construction Standard 35201. Leave approximately 2" of conduit extended into the vault.

2.2. Service Conduit and Conductors

No services or primary lines shall be run under permanent structures

Note that the District uses special types of triplex and quadruplex service conductors. Service conductor sizes will be shown on a drawing provided to the builder.

Builders will be required to install service conduit, service conductors, and to make all connections at the service entrance in accordance with the Construction Standards shown following:

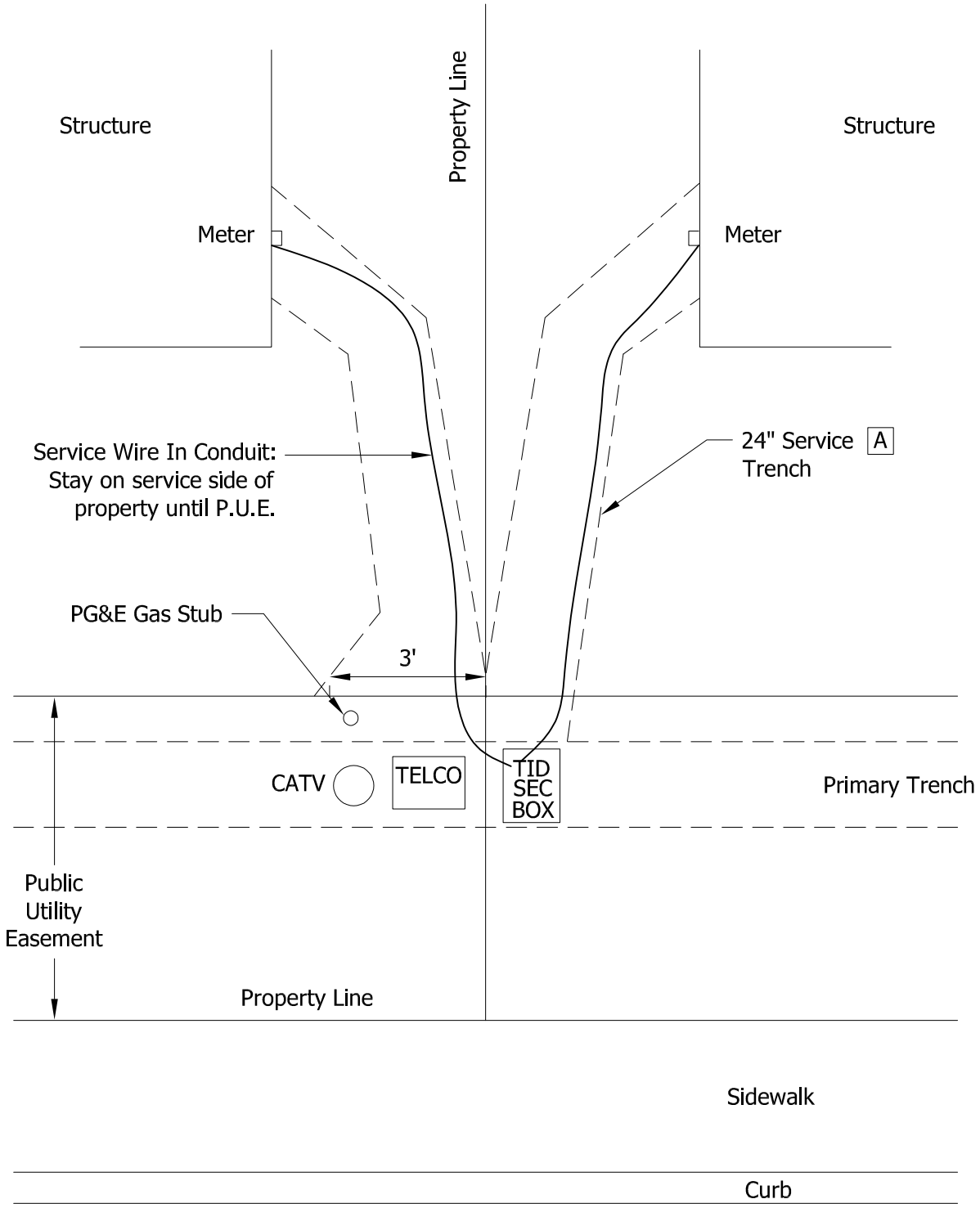


Figure 1
Hardware Detail

NOTES:

A. Refer to TID Construction Standard 30571 for placement of service equipment in trench.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
C	UPDATED TITLEBLOCK	ELJ					MSG	09-2016
B	REDRAWN IN AUTOCAD	SDC					BLL	04-2003
A	CHANGED CLEARANCE			RWB	JWT	RA	AKH	09-1989
--	INITIAL ISSUE	DN	ETE	RWB	LJC		AKH	11-1988

JOINT SERVICE TRENCH
MINIMUM REQUIREMENTS

SHEET 1 OF 1

30555 DWG. NO. **C**

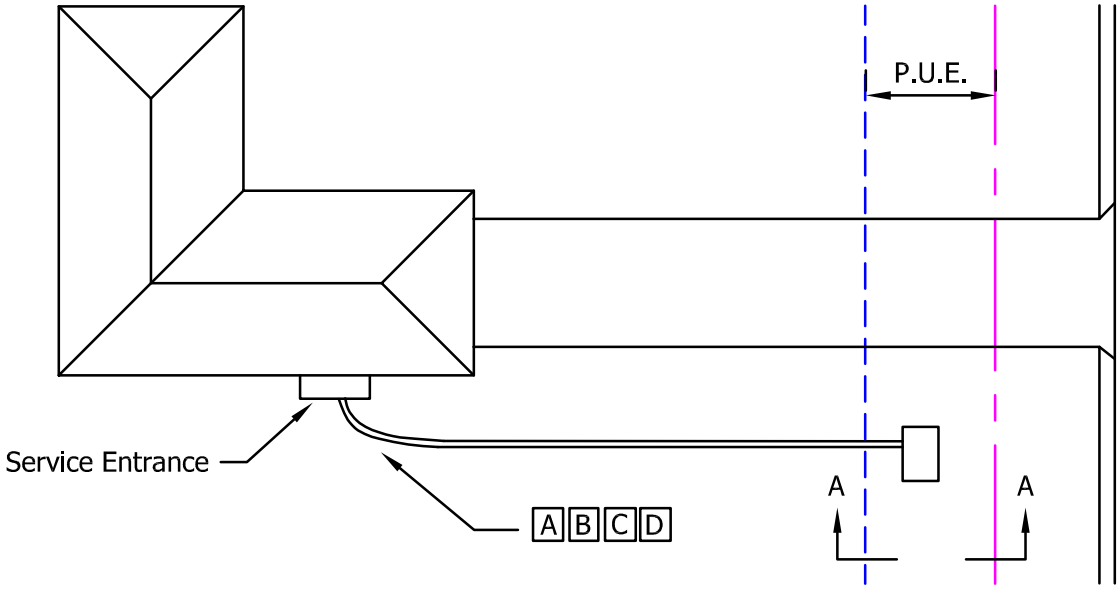


Figure 1
Residential Service

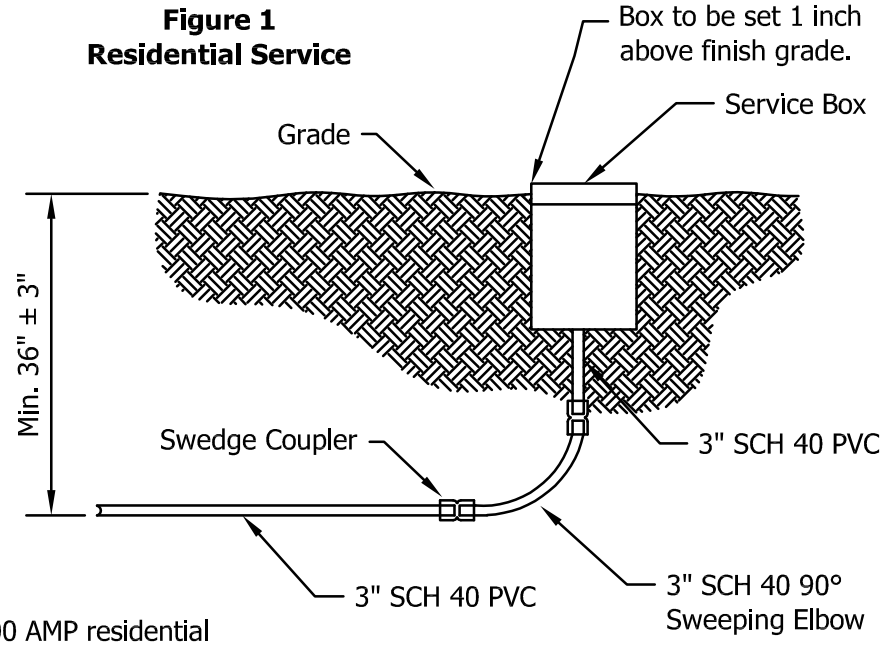


Figure 2
Section A-A

NOTES:

A. Conduit sizes indicated are for 200 AMP residential services as per TID Construction Standard 34800. Refer to TID Construction Standard 35201 for conduit requirements for other size panels.

B. If elbow is required, it shall be 3" schedule 40 sweeping type.

C. Refer to TID Construction Standard 34810 for service entrance requirements.

D. Refer to TID Construction Standard 30555 for routing requirements.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
F	CHANGED 2' TO 3' CONDUIT	ADL	RMB				SSG	03-2023
E	UPDATE TITLEBLOCK	ELJ					MSG	09-2016
D	CHG ELBOW TO 90, ELIMINATE DB CONDUIT	SDC		KJO			BLL	11-2004
C	REDRAWN IN AUTOCAD	SDC		KJO			BLL	04-2003
B	CHANGED NOTES	RB	LJC	RA			AKH	09-1989

RESIDENTIAL SERVICES IN CONDUIT

SHEET 1 OF 1

30567 DWG. NO.

F

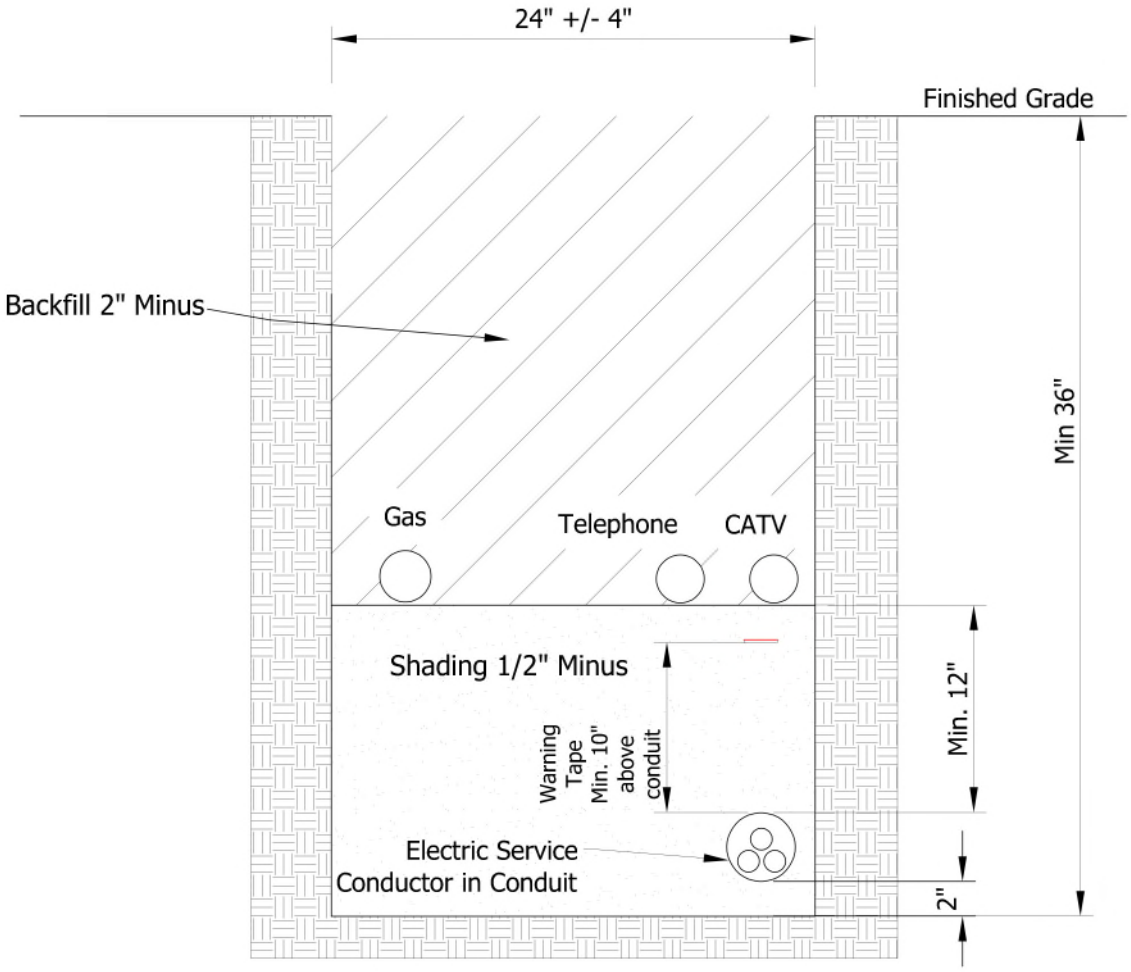


Figure 1
Service Trench Configuration

NOTES:

A. Competent native soil is allowed for shading, bedding, and backfill. 100% of native soil sample shall pass through a 1/2" sieve.
B. Shading area shall consist of 12" of 1/2" minus above the conduit and 2" of bedding under the conduit. 100% of material sample shall pass through a 1/2" sieve.
C. Backfill shall consist of 2" minus.
D. Where native soil conditions exceed 1/2" minus, imported 1/2" minus screened structural backfill shall be used for shading and bedding.
E. Compaction to be not less than .95 relative compaction.
F. A compaction test may be required. Test results shall include the testing companies information: Name, Address and Contact Information may be required by TID.
G. Conduit size as per TID Construction Standard 35201.
H. For trench details, see TID Construction Standard 30580.
I. Warning tape details see standard 30900.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
I	1/2 MINUS SHADDING BEDDING BACKFILL	ADL		MCV	JSA	DNP	SSG	03-2026
H	MISC. FIGURE 1 CHANGES	ADL					SSG	11-2025
G	ADDED WARNING TAPE AND COMPACTION TEST	ADL					SSG	05-2024
F	UPDATED TITLEBLOCK, ADDED HYPERLINK	ELJ	RWB	LJC	RA		MSG	09-2016
E	REPLACE TITLE BLOCK	JRS	MSG	JSA	MLH	SDP	EDJ	06-2013

SERVICE TRENCH CONFIGURATION

SHEET 1 OF 1

30571 I
DWG. NO.

TEMPORARY UNDERGOUND ELECTRIC SERVICE

1. GENERAL:
   - 1.a. The information shown on this drawing is intended to advise customer of the minimum requirements for customer owned service poles for temporary underground electric service. These requirements have been established by the State of California and followed by T.I.D. in the interest of safety to the public and to workmen. The T.I.D. cannot establish service to temporary services which do not meet these minimum requirements. The maintenance of customer owned service poles in conformity with these requirements is the sole responsibility of the customer.
   - 1.b. Local ordinances may include wiring requirements in addition to those shown on this drawing. Consult local inspection authorities fore these requirements and for City or County Permits. Inspection and approval is required before service can be connected.
   - 1.c. When single-phase service larger than 100 amps, or three-phase service is desired, consult T.I.D. Engineering.
   - 1.d. The use of temporary service poles shall be restricted to installation of a temporary nature such as building construction, temporary sales locations, etc., temporary service poles shall be furnished and installed by the customer.
2. GROUNDING:
   - 2.a. The grounding system shall conform to the minimum grounding requirements of the Electrical Safety Orders.
   - 2.b. The path to ground from circuits, equipment and conductor enclosures shall be permanent and continuous. All metallic enclosures and conduit enclosing service entrance conductors shall be connected to the common ground.
   - 2.c. A continuous grounding conductor shall be extended from the neutral terminal of the service switch to a grounding electrode. The ground conductor shall be protected against mechanical injury by rigid steel conduit or armor cladding connected to the ground electrode by means of an approved conduit grounding clamp. The connection to the ground electrode must be above ground or otherwise readily accessible for inspection.
   - 2.d. Ground electrode shall meet requirements of the National Electric Code.
3. LOCATION:
   - 3.a. Preferred location for temporary service is a 4 foot by 4 foot shaded area designated AREA 'A' on the drawing. Temporary service SHALL be between T.I.D. service box and sidewalk. Proper location of temporary service will avoid damaging other structures when setting the pole and installing the ground rod.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
C	UPDATE TITLEBLOCK AND TABLE	ELJ					MSG	09-2016
B	MOVED LOCATION OF TEMP SERVICE	SDC					BLL	06-2005
A	REDRAWN IN AUTOCAD	SDC		KJO			BLL	04-2003
--	INITIAL ISSUE	BB	ETE	RWB	LBG		RA	08-1990

TEMPORARY UNDERGROUND ELECTRIC SERVICE

SHEET 1 OF 3

34600 C
DWG. NO.

60
PAGE

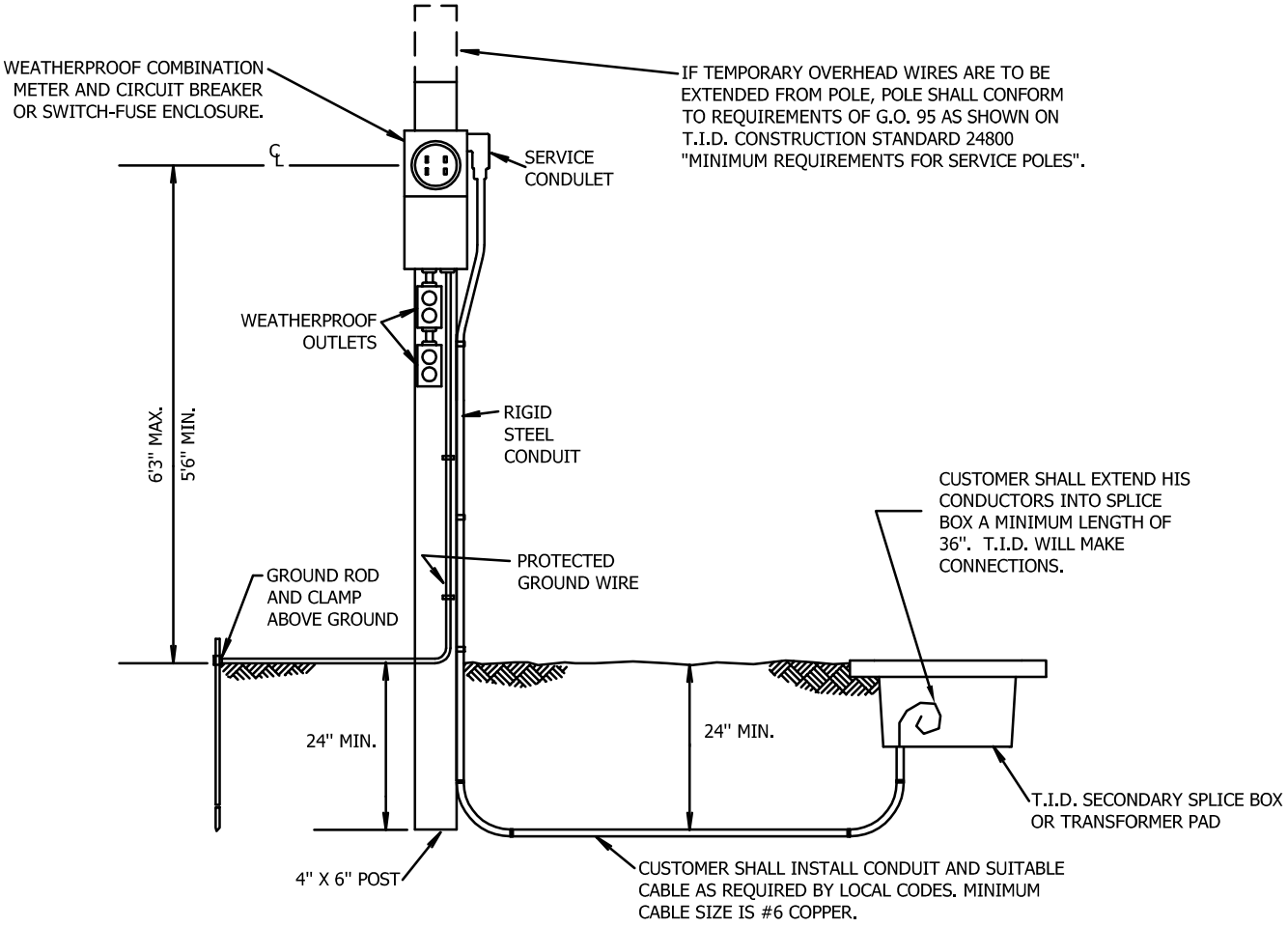


Figure 1
Temporary Underground
Electric Service Requirements

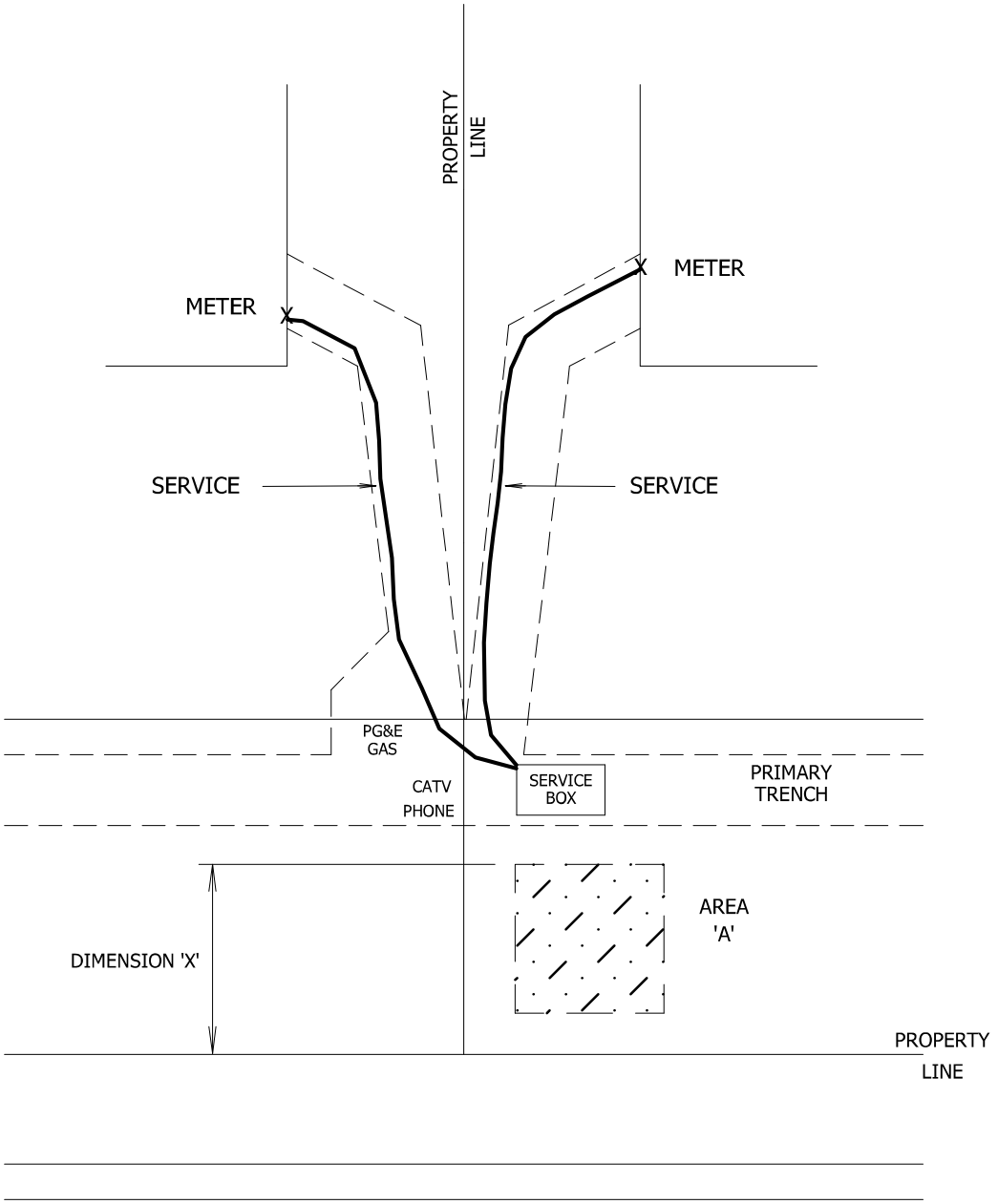


Figure 2
Temporary Service Location

Table 1

Public Utility Easement Width	Dimension to Area 'A' (Dimension X)
10 Feet	6 Feet
15 Feet	11 Feet

NOTES:

A. Place temporary service pole in front of T.I.D. service box as indicated by area 'A'.

TEMPORARY UNDERGROUND
ELECTRIC SERVICE

CONSTRUCTION STANDARDS

Table 1 Service Conductor Size - Underground

Service Entrance Size (Amp)	Conductor Quantity and Size	
	Single Phase	Three Phase
30 (Maintenance Only)	(1) #6 per Phase (Note 1) (1) #6 Neutral	--
60-70 (Maintenance Only)	(1) #6 per Phase (1) #6 Neutral	--
100-125	1/0 Triplex (Note 4)	1/0 Quadplex (Note 4)
200-225	4/0 Triplex (Notes 2, 4)	4/0 Quadplex (Note 4)
320	500 Triplex (Note 4)	--
400	(2) 4/0 per Phase (1) 4/0 Neutral	(2) 4/0 per Phase (1) 4/0 Neutral
600	(2) 500 per Phase (1) 500 Neutral	(2) 500 per Phase (1) 500 Neutral
800	(3) 500 per Phase (1) 500 Neutral	(3) 500 per Phase (1) 500 Neutral
1,000	--	(3) 500 per Phase (1) 500 Neutral
1,200	--	(3) 750 per Phase (1) 750 Neutral
1,400	--	(4) 750 per Phase (1) 750 Neutral
1,600	--	(4) 750 per Phase (2) 750 Neutral
1,800	--	(4) 1000 per Phase (2) 1000 Neutral
2,000	--	(5) 1000 per Phase (2) 1000 Neutral
2,500	--	(5) 1000 per Phase (2) 1000 Neutral
3,000	--	(6) 1000 per Phase (2) 1000 Neutral

Notes:

1. Use one phase conductor and one neutral conductor for 120-volt circuits.
2. Refer to Construction Standard 30510 for service size to limit residential fault current.
3. Where voltage drop, voltage flicker, or other practical reasons necessitate, Engineering may specify a service size other than as listed above.
4. Individual conductors of appropriate size may be substituted for Triplex or Quadplex in accordance with TID Material Standard 2202.
5. All conductors shall be aluminum and are to be in accordance with TID conductor specifications.
6. Conductor ampacities refrenced from latest NEC version 310.16

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

SERVICE WIRE SIZE
UNDERGROUND

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
N	ADDED 320A	ADL					SSG	11-2024
M	REVISED CONDUCTOR AMPS BASED ON TABLE 310.16	ADL					SSG	1-2024
L	UPDATED 1800A CONDUCTOR	ADL					SSG	03-2023
K	UPDATED TITLEBLOCK AND TABLES	ELJ					MSG	09-2016
J	REPLACE TITLE BLOCK, REMOVE 4,000 A	JRS	MSG	JSA	MLH	SDP	EDJ	06-2013

SHEET 1 OF 2

34701 DWG. NO. **N**



Figure 1
Compression Type Connector

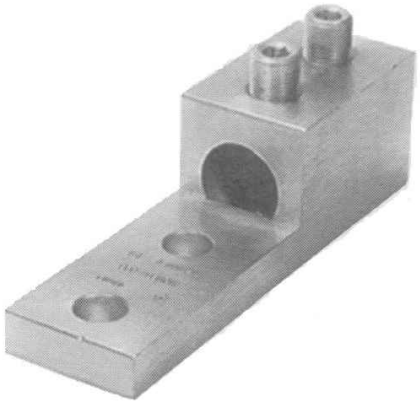


Figure 2
Set Screw Type Connector

NOTES:

1. Aluminum tin plated
2. Terminal lug to carry full continuous current rating of conductor
3. NEMA bolt hole spacing is required on all connectors. Compression connectors must be long barrel type, similar to TID Stock Number U-6220-XXX.
4. On 3 phase, 400 amp and larger panel, terminal lugs shall be suitable compression type or 2 set screw type on conductor end. The lugs must have a minimum 2 bolt connection on the panel spades. See figures 1 and 2. Single lug CT bases are allowed 800A and below.
5. Before installation TID underground inspector must approve lugs and crimping die.

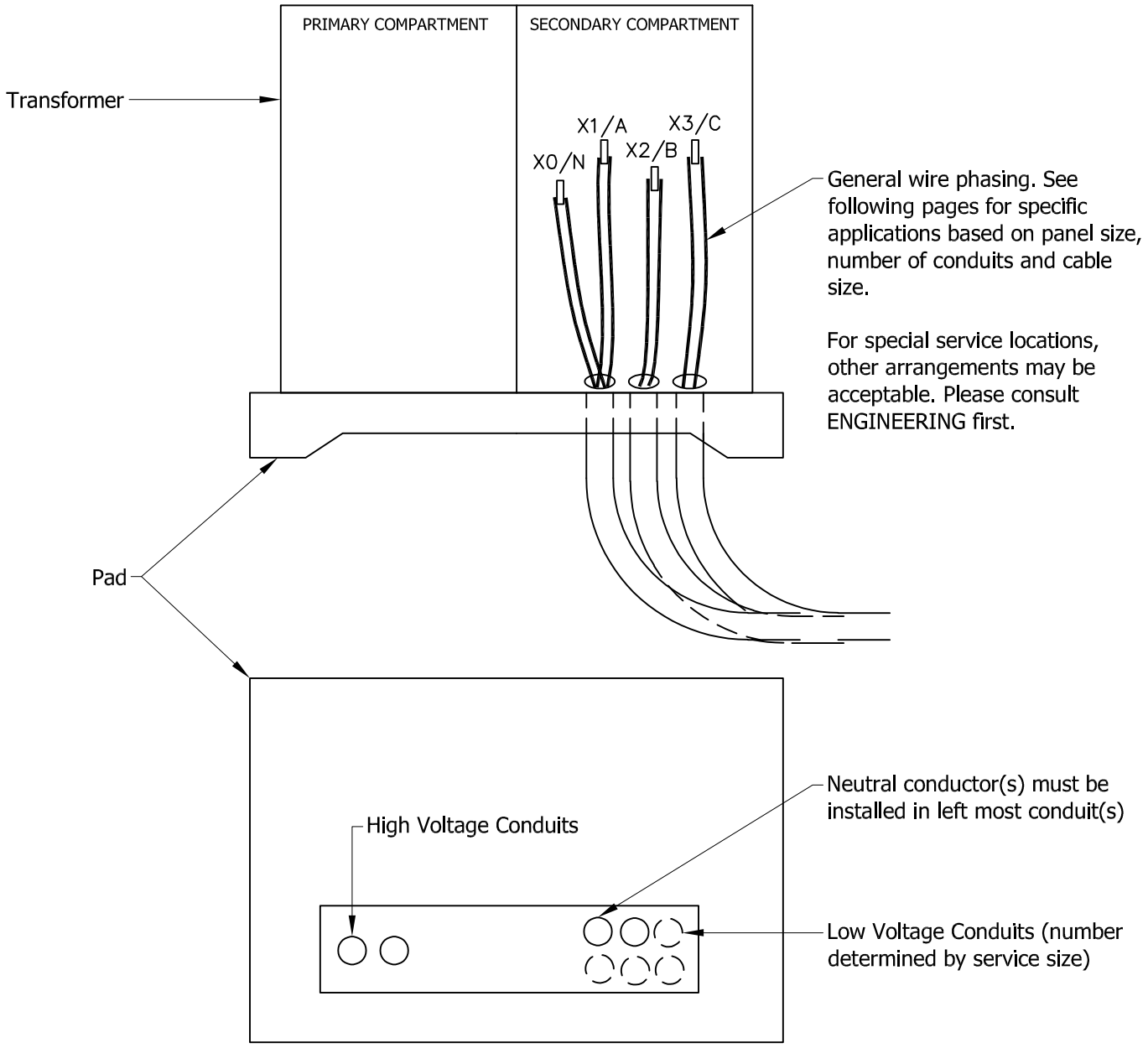


Figure 1
General Wire Phasing

NOTES:

1. Bell ends must be installed on each conduit.

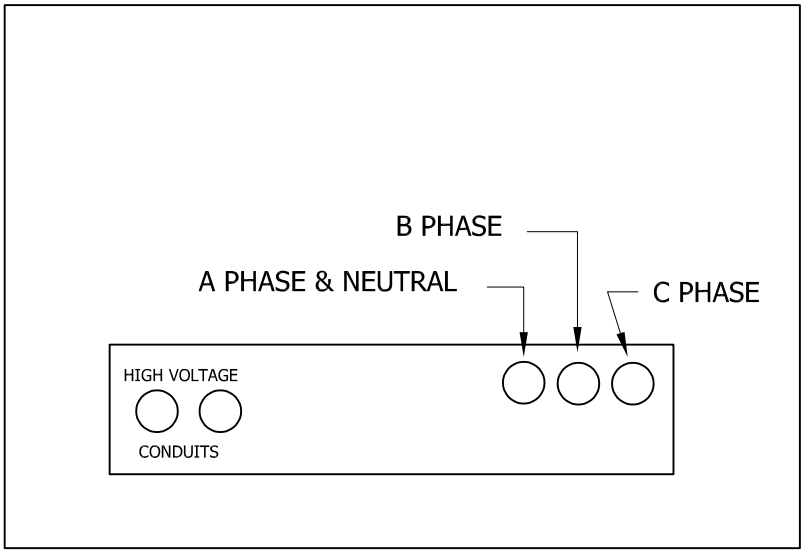
REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
F	REVISED CONDUITS	ADL					SSG	01-2024
E	ADDED NOTE 1	SSG		AJB	DNP		MSG	03-2021
D	CHANGED FROM CONDUCTOR TO CONDUIT ON PG. 3	SSG					EDJ	06-2019
C	UPDATE TITLEBLOCK	ELJ					MSG	09-2016
B	ADD 3RD CONDUIT TO 600 & 800 AMP PANEL	SDC	MSG				EDJ	03-2009

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

UNDERGROUND COMMERCIAL SERVICE INSTALLATION GUIDELINES

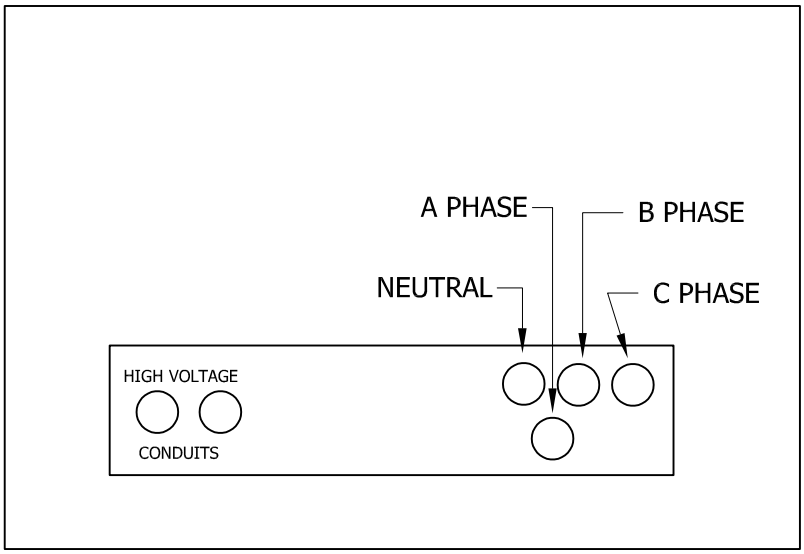
SHEET 1 OF 4 | **34750** DWG. NO. | **F** | 65 PAGE



400 & 600AMP
3 - 4" CONDUITS
2 CONDUCTORS PER PHASE
1 NEUTRAL CONDUCTOR

800, 1000, 1200, & 1400 AMP
3 - 5" CONDUITS
3 CONDUCTORS PER PHASE
1 NEUTRAL CONDUCTOR

Figure 2
400, 600, 800, 1000, 1200 and 1400 Amps

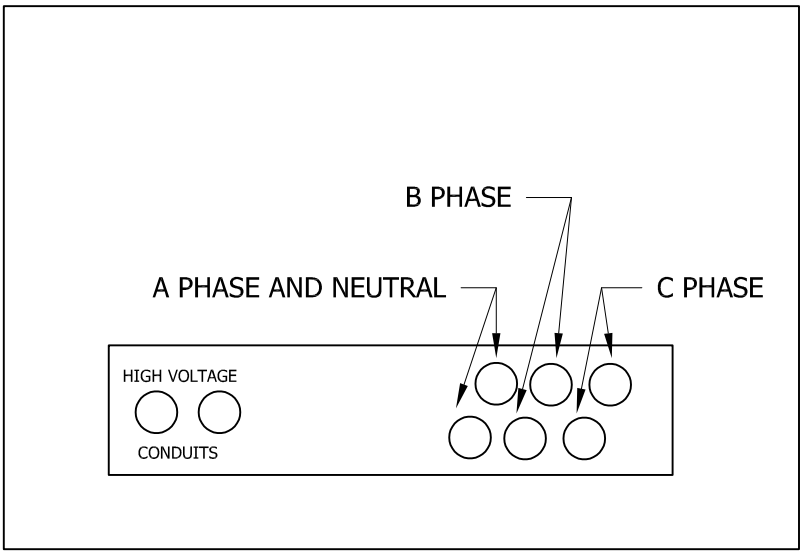


1600 & 1800 AMP
4-5" CONDUITS
4 CONDUCTORS PER PHASE
2 NEUTRAL CONDUCTORS

Figure 3
1600 and 1800 Amps

NOTES:

1. Bell ends must be installed on each conduit.
2. 2023 NEC Table C.11 referenced for conduit fill



2000 & 2500 AMP
6 - 5" CONDUITS
5 CONDUCTORS PER PHASE
2 Neutral Conductors

3000 AMP
6 - 5" CONDUITS
6 CONDUCTORS PER PHASE
2 NEUTRAL CONDUCTORS

Figure 4
2000 ,2500, and 3000 Amps

NOTES:

1. Bell ends must be installed on each conduit.
2. 2023 NEC Table C.11 referenced for conduit fill



Figure 7
Compression Type Connector



Figure 8
Set Screw Type Connector

NOTES:

1. Customer installed conduit, pad, conductors, and associated materials to be per TID specification. See Developer Information Book.
2. Facing the front of the pad, the neutral conductor(s) must be installed in the left-most low voltage conduit(s).
3. Where multiple conductors per phase are specified by TID, like phase conductors shall be grouped within conduits (reference the latest edition of the NEC Handbook, sections 310.4 and 300.5(i)). See preceding pages of this standard for details.
4. The customer is to terminate service conductors at the panel. TID will terminate at the transformer.
5. On 3 phase, 400 Amp and larger panels, terminal lugs shall be suitable compression type or 2 set screw type on the conductor end. The lugs must have a minimum 2-bolt connection to the panel spades. See figures 7 and 8. Single lug CT bases are allowed 800A and below.
6. NEMA bolt hole spacing is required on all connectors. Compression connectors must be long barrel type, similar to TID Stock Number U-6220-XXX.

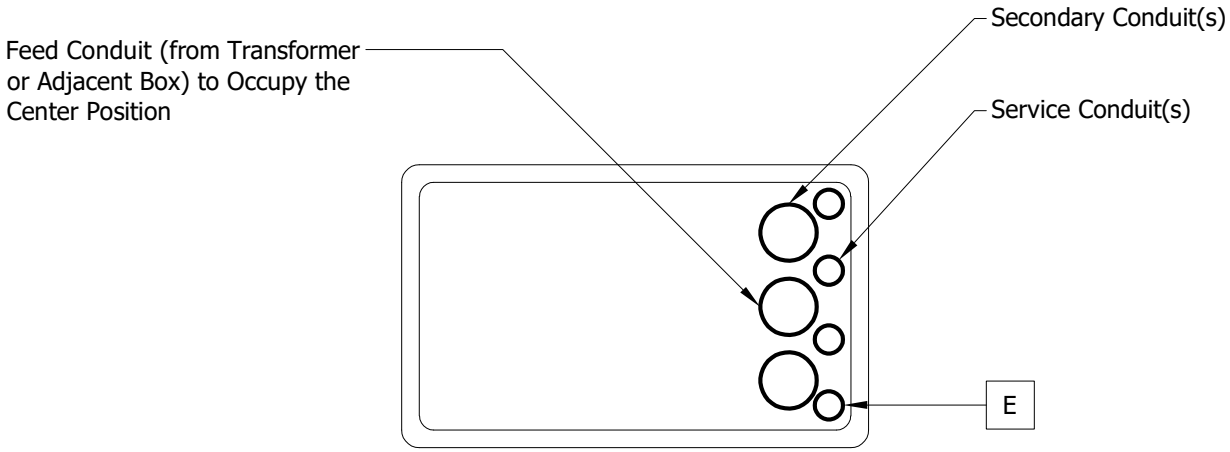


Figure 1
Plan View

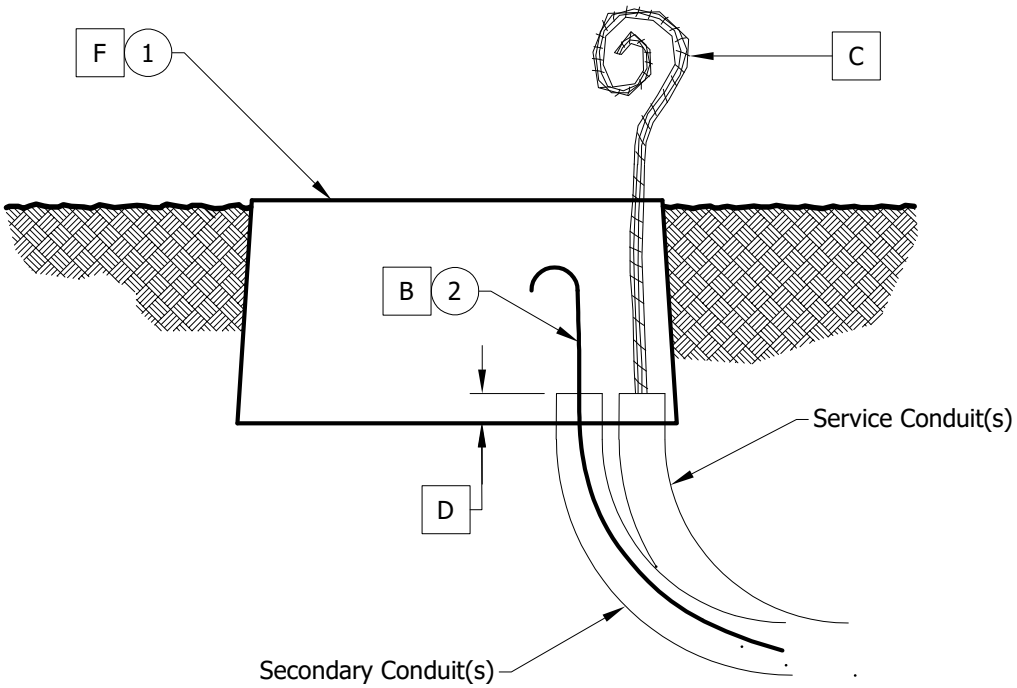


Figure 2
Profile View

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
I	ADDED TABLE 3	SSG		DNH	DP	MN	MSG	06-2021
H	UPDATED TITLEBLOCK, TABLES, NOTES	ELJ					MSG	09-2016
G	REPLACE TITLE BLOCK, ADDED MATERIAL STD	JRS	MSG	JSA	MLH	SDP	EDJ	06-2013
F	RELABEL CONDUITS	SDC	BS	KJO	DBM	GKT	BLL	09-2007
E	SPECIFY FEED CONDUIT IN CENTER POSITION	SDC	GKT	MSG	DBM	KJO	BLL	03-2007

SERVICE BOX INSTALLATION

SHEET 1 OF 2

34805 DWG. NO. **I**

Table 1 Bill of Materials

Item	Stock Number	Qty	Description	Material STD
1	O-13XX-XXX	1	Service Box (size as required)	2022
2	U-8200-004	As Req'd	¾" Pull Rope	2401

Table 2 Resources

Resource	Qty	Hours
Line Supervisor	1	1.0
Lineman	1	
Line Truck	1	

Table 3 Clearances (Min. in Ft)

TID Equipment	Front	Sides	Back
Service Box	3	3	3

Notes:

A. The soil under the service box shall be compacted to no less than 95% relative compaction.
B. Leave approximately 3 feet of pull rope extended past conduit.
C. Leave approximately 4 feet of service conductor extended past conduit.
D. Insert conduit 2 inches inside service box.
E. All conduits are to be located against the same end of the service box.
F. The box lid must be labeled "ELECTRIC".
G. See Construction Standard 35201 for size and quantity of conduits required.

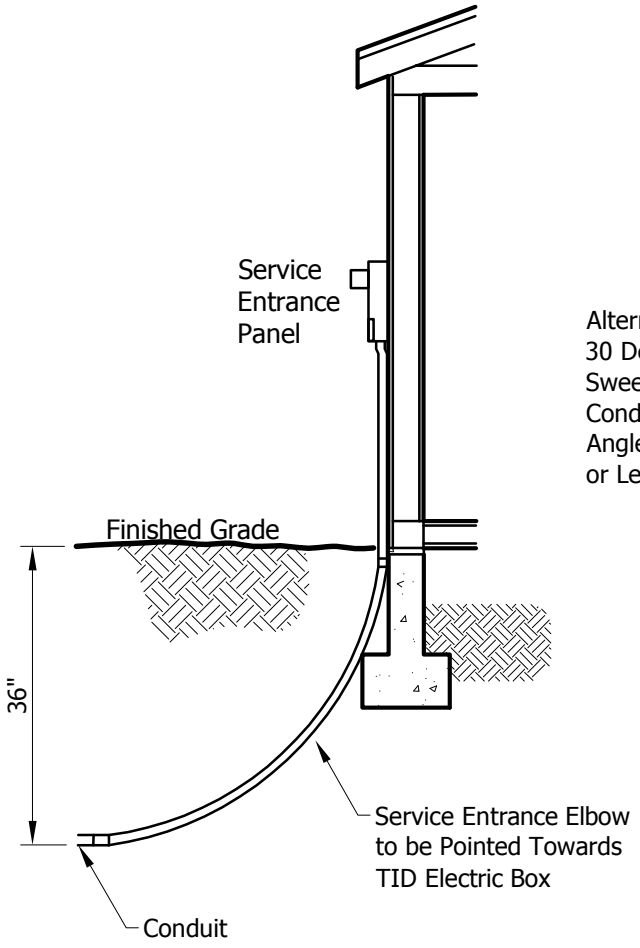


Figure 1
Typical Surface Mount

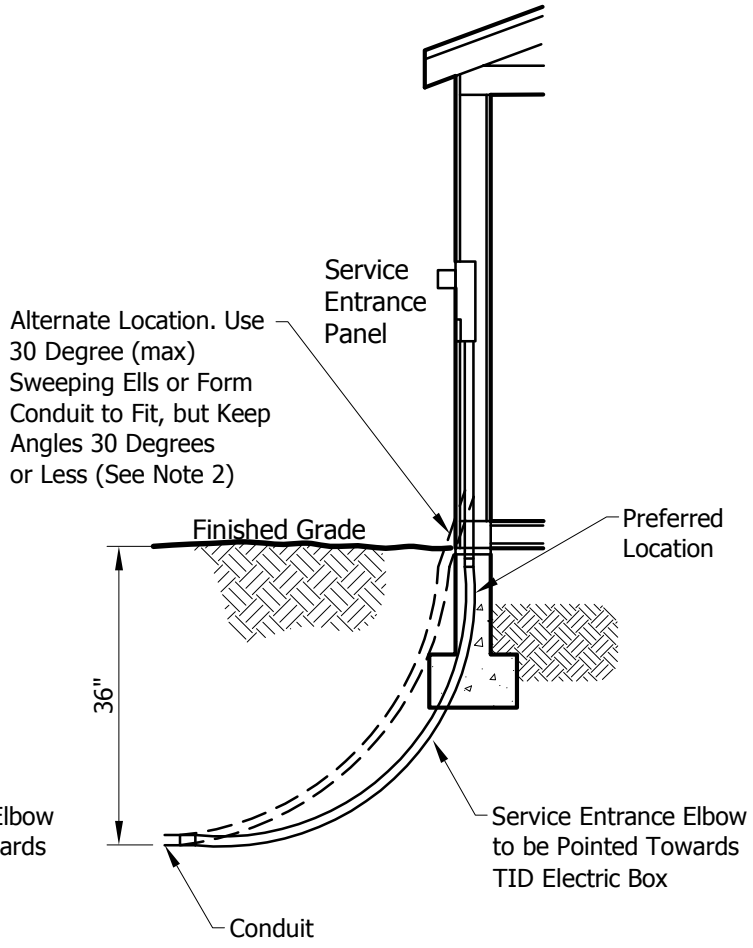


Figure 2
Typical Flush Mount

Notes:

1. Service entrance equipment will conform to applicable sections of the Electric Utility Service Equipment Requirements Committee (EUSERC) Standards.
2. All PVC conduits must be adequately glued and set prior to installation of conductors. Only sweeping types of bends are acceptable. Conduit that is deformed due to heating or over stressing during installation will not be acceptable.
3. Meters will be furnished and set by TID after the installation has been approved by the governing inspection agency.
4. The service entrance panel shall be mounted so that the center of the meter will be at a height between a minimum of 48 inches and a maximum of 75 inches above finished grade.
5. Grounding shall be in accordance with the National Electric Code (NEC) and local codes. TID may require that the grounding conductor be installed in EMT or cable armor to protect the conductor from mechanical damage. Use approved cast ground clamp.
6. Conduit size and schedule per TID Construction Standard 35201.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
F	CORRECTED METER HEIGHT	BB	RWC	RWB	LBG		RA	03-1994
G	REDRAWN IN AUTOCAD	SDC	PJO	KJO	LBG		BLL	04-2003
H	CLARIFY GROUNDING REQUIREMENTS	SDC	KJO	DM	GKT		BLL	02-2006
I	REPLACE TITLE BLOCK	JRS	MSG	JSA	MLH	SDP	EDJ	06-2013
J	UPDATED TITLEBLOCK	ELJ					MSG	09-2016

MINIMUM REQUIREMENTS FOR RESIDENTIAL SERVICES USING UNDERGROUND CONSTRUCTION

SHEET 1 OF 1

34810 DWG. NO. **J**

2.3. Street Lights

Streetlights are normally served from the service box of transformer as designated by the District. Street light voltages are 120 volts for residential subdivisions and either 120 or 277 volts (depending on availability) for commercial or industrial tracts.

The developer or contractor is responsible for placing the TID identification numbers on city owned street lights in accordance with the drawing shown in this section. The number tags must be obtained from Customer Service at the District's main office. A copy of the letter and location map from the city/county to the District requesting light service will be required before any number tags are issued. The District will not provide electric service to a light if it is not numbered or is numbered incorrectly.

STREET AND AREA LIGHT NUMBERING:

1. Street and area lights shall be labeled with their assigned Type (T3 or T5) and fixture wattage.
2. The TID LED type and wattage shall be placed on the bottom of the light such that it is visible from ground level.
3. The numbers affixed to the street and area light shall conform to TID Stock Number O-7805-00X.

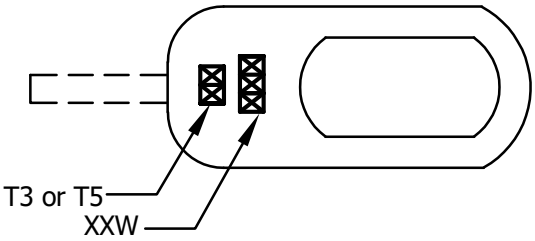


Figure 1
Bottom View

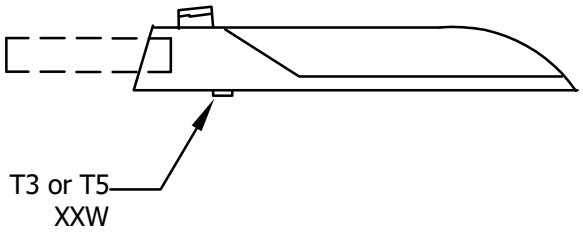


Figure 2
Side View

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

LABELING FOR
STREET AND AREA LIGHTS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
C	UPDATED FOR LED STREET AND AREA LIGHT NUMBER	SSG		AB	DMH		EDJ	03-2019
B	UPDATE TITLEBLOCK	ELJ					MSG	09-2016
A	REDRAWN IN AUTOCAD	SDC	PJO		KJO		BLL	04-2003
--	INITIAL ISSUE	BB	ETE		RWB	RCM	AKH	

SHEET 1 OF 1

24060 DWG. NO. **C**

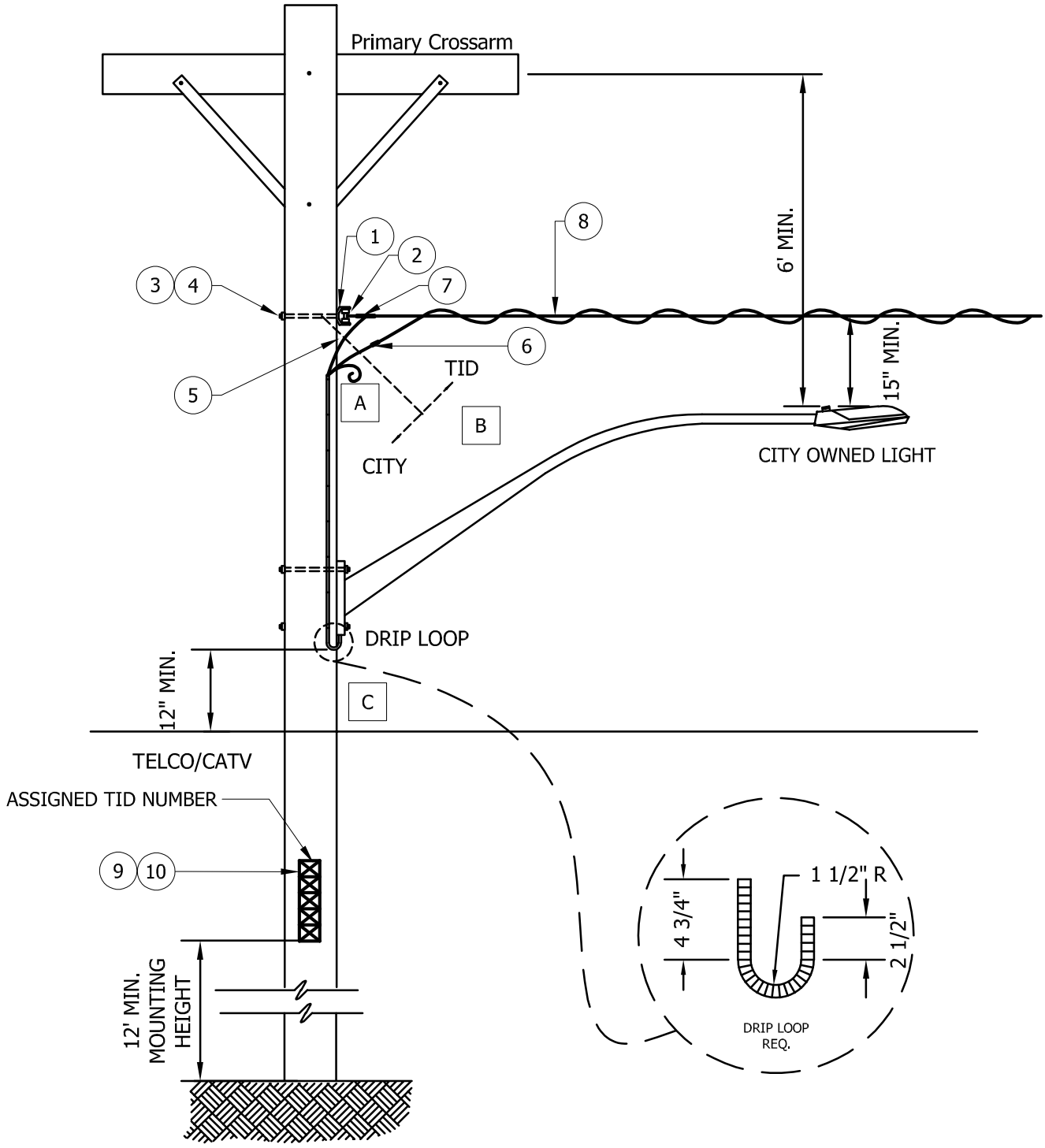


Figure 1
Hardware Detail FIELD MAINTENANCE

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
E	ADDED STICKERS ON POLES WITH MOUNTING HGT.	SSG	EDJ	AB	DMH		EDJ	08-2019
D	REDRAWN IN AUTOCAD	HJ						05-2006
C	ADD LABOR STD	LBG	RWB	SP			RA	02-1991
B	ADD WASHER - UPDATE STOCK NOS.	SP	LBG				RA	02-1990
A	COMMITTEE REVIEW	SP	RWB	LJC	RA		AKH	05-1983

STREET LIGHT
CITY OWNED

SHEET 1 OF 3

24250 DWG. NO. **E**

74 PAGE

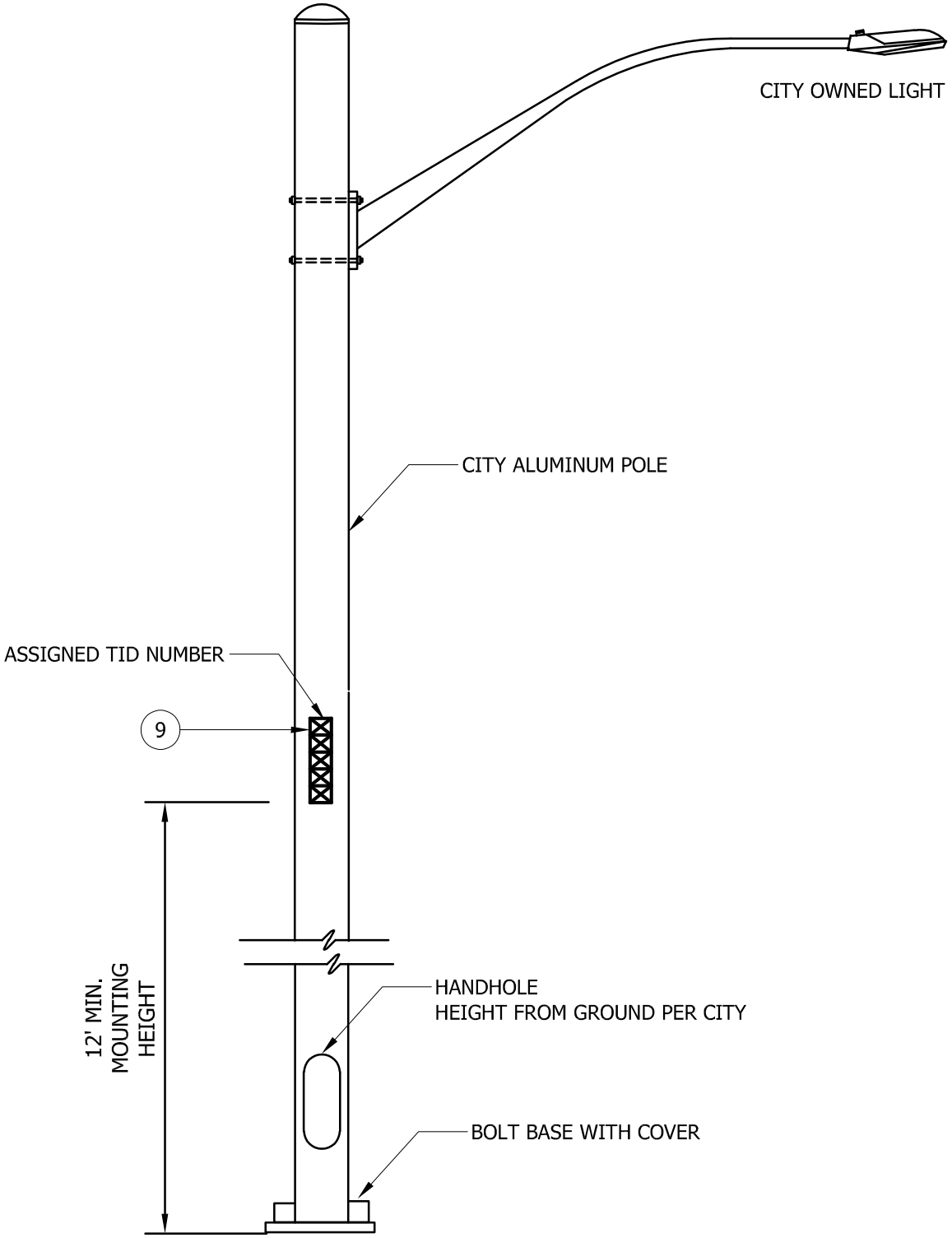


Figure 2
Hardware Detail For New City Pole

Table 1 Bill of Materials

Item	Stock Number	Qty	Description	Material Std
1	O-7520-001	1	Wire Holder	2134
2	O-7530-001	1	Spool Insulator	2056
3	O-7161-00X	1	5 /8" Machine Bolt	2322
4	O-7222-002	1	Washer Square Flat	2323
5	O-7410-00X	1	Insulated Service Connector	2133
6	U-6470-001	1	Street Light Fuse Holder	2182
7	O-7300-001	1	Service Grip	2128
8	O-6125-000	As Req'd	#6 Duplex Wire	2200
9	O-7808-00X	8	Stick on Number	2167
10	O-7808-099	1	Mounting Bar Plastic	

Notes

A. City shall provide a 24" length of wire out of the upper conduit end, which will be the attachment used by the district. District ill complete connection upon receipt of application for connection from the city.

B. City maintains ownership and maintenance responsibility for fixture and all wiring beyond point indicated.

C. Conduit extends into laminar mast arm. Laminar mast arm.

D. Service voltage will be 120 Volts.

Table 2 Resources

Resource	Qty	Hours
Line Supervisor	1	1.5
Electrical Lineworker	1	
Groundman	1	
Digger/Derrick	1	
Personnel Lift	1	

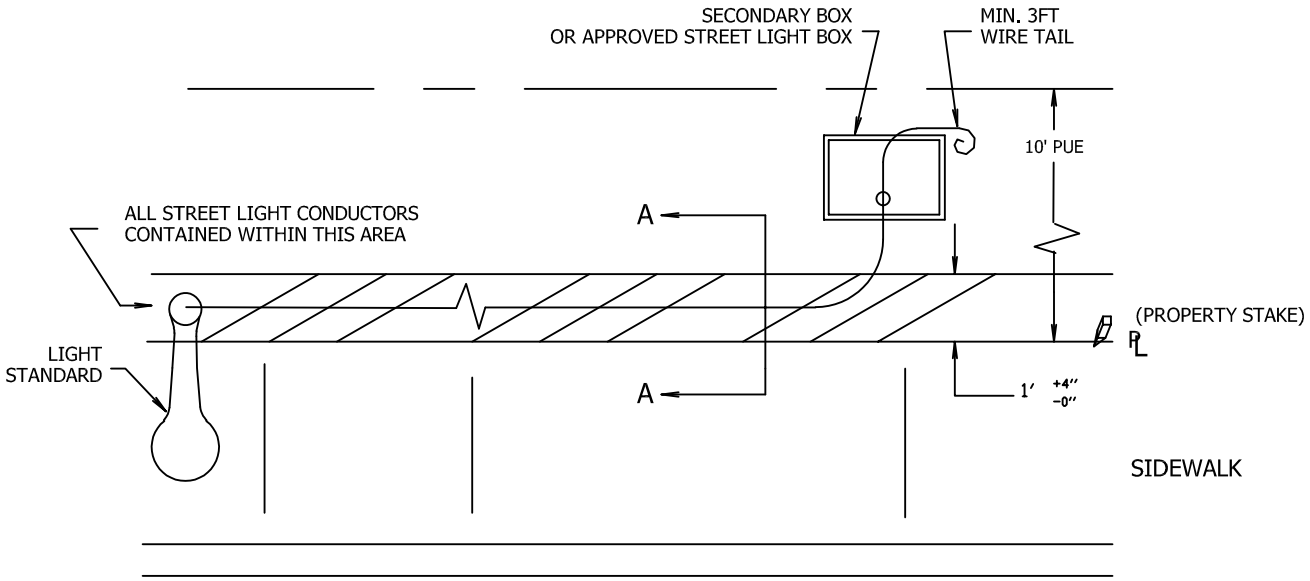


Figure 1
Overhead Layout

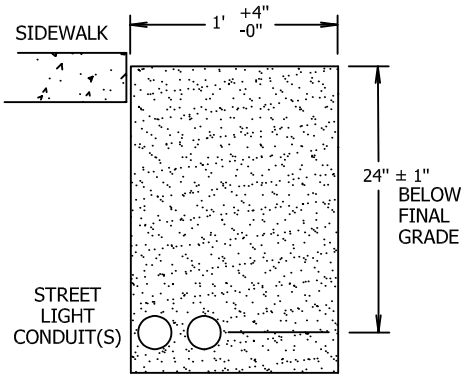


Figure 2
Underground Cross Section A-A

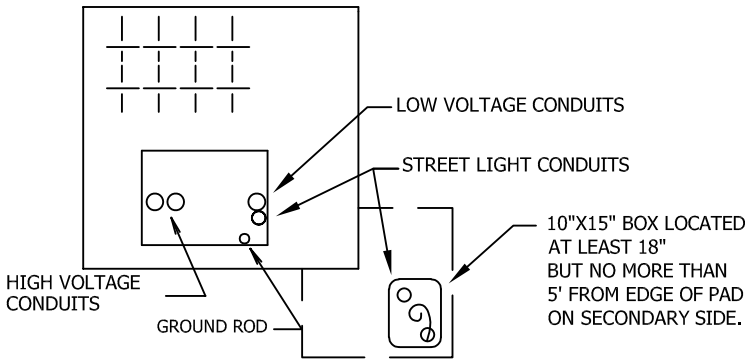


Figure 3
Transformer Pad Detail

NOTES:

1. All conduit to be 2" schedule 40 PVC. All 90° bends to be preformed schedule 40 elbows with a standard radius sweep. All conduits for street lights to be placed on the far right side of the transformer pad (where applicable).
2. Street light conduits will be placed in the P.U.E. in the first foot behind the property line.
3. All conductors to be sized per code with the appropriate wire. Neutral shall be marked per code.
4. Applicant shall guarantee no less than 0.95 relative compaction for all disturbed soils.

TURLOCK IRRIGATION DISTRICT

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
E	CONDUIT SIZE 2" AND DISTANCE FROM PAD	ADL		LRM			SSG	09-2026
D	CHANGED SECONDARY BOX SIZE	SSG		DH	AB		EDJ	04-2020
C	UPDATED TITLEBLOCK	ELJ					MSG	09-2016
B	REDRAWN IN AUTOCAD	SDC		KJO			BLL	04-2003
A	REDRAWN		RWB			RA	AKH	10-1987

CONSTRUCTION STANDARDS

UNDERGROUND STREET
LIGHT SERVICE
CONDUIT DETAILS

SHEET	DWG. NO.		PAGE
1 OF 1	34030	E	77

Section III: Meter Requirements

3.1. Who Provides Meters?

All meters and metering transformers will be provided, installed, owned and maintained by TID.

3.2. Customer Metering Equipment Ownership and Responsibilities

The applicant will provide, install, own and maintain all meter sockets, meter socket enclosures, metering transformer cabinets and switchboard service sections of the type approved by TID.

3.3. When Are Meters Installed?

Meters will be installed and energized by TID after the customer's metering equipment has been properly installed and after an inspection clearance has been given by the appropriate electrical inspection authority. The inspection tag must be present before the serviceman arrives to set the meter.

3.4. Meter Access

All metering facilities shall be installed in locations which will be readily accessible at all times for inspection, reading and testing. By definition, readily accessible means capable of being reached quickly, for operation, replacement, or inspections, without requiring those to whom ready access is necessary to climb over or remove obstacles or to resort to portable ladders, chairs, etc.

3.5. Meter Height

The requirements for meter height, which is the vertical distance between the centerline of the meter and the ground or standing surface, shall be as follows:

48" minimum - 75" maximum for single meter residential & meter pedestals

36" minimum – 75” maximum allowed for commercial meter clusters in self-supporting, rain-tight cabinets

3.6. Meter Working Space

Working space in front of the meter permits access to the metering installation and provides working safety for personnel. A working space entirely on the property of the customer is required in front of all meters except for buildings constructed on zero lot lines.

The working space is to be kept clear and unobstructed and shall not be used for storage.

When meters or metering equipment are placed in cabinet enclosures, the clear working space shall extend from the outer face of the cabinet.

The height of the clear working space shall be 78 inches minimum from the standing surface.

The width of the clear working space shall be 36 inches minimum for a single meter installation and shall extend the additional width necessary for access to the total number of metering panels. The centerline of any meter shall not be less than 18 inches from any adjacent side wall or other protruding obstruction.

The depth of the clear working space shall be 36 inches minimum for services rated 150 volts or less to ground. When the service is rated in excess of 150 volts to ground, the depth shall be as required by applicable electrical codes or as dictated by the physical design and arrangement of the metering cubicles.

3.7. Barricades

Permanent barricades shall be required to maintain the clearances for meter locations where the working space is exposed to vehicles or hazardous conditions. As examples, suitable barricades may include: (1) concrete-filled steel pipes, 3 inches in diameter or greater, securely set in an adequate concrete pour for support, or sleeve mounted with the sleeves set in concrete, which may be used for a vehicle barricade, or (2) heavy wire mesh fencing, securely supported, which may be used as a barricade. Curbs do not constitute barriers.

3.8. Meter Locations – General Conditions

In order that the most satisfactory meter location may be determined and adequate space provided, TID should be consulted while the building or residence is in the preliminary planning stage. Installation of additional facilities at the customer's expense or future relocations at his expense may be prevented by early consultation with TID. The following basic location requirements shall apply in all cases:

1. All locations for meters and metering equipment are subject to TID approval.

2. Meters shall be accessible (with dual locking devices if necessary) during and after landscaping or other building construction. No meter shall be enclosed by any fencing without permission from an authorized TID representative.

3. Meters and metering equipment installed on or recessed in the external surface of any building shall have a clear working and standing space entirely on the property of the customer served. Any exception from this requirement must be approved by TID.

4. For the meter distance from the transformer, refer to construction standard 50510.

The following are unacceptable locations for electric meters:

1. In any location that is hazardous to equipment or persons or unsuitable for entry, such as:

    a. any elevator shaft.
    b. any doorway or hatchway.
    c. directly over any stairway, ramp or steps.
    d. any area accessible only through a trap-door, hatchway, or by means of a ladder.
    e. Any area where personnel may contact exposed high voltage conductors or equipment in motion.

2. In any place where vibration, moisture, excessive temperature, fumes, or dust may damage the meter or interfere with its operation.

3. Within or requiring access through any bath, shower, powder or toilet room.

4. On any portion of a building where later landscaping, fencing or other building construction will make the meter inaccessible.

5. Within any enclosed area that contains or will contain gas meters.

6. Meters and metering equipment shall not be installed within any locked facility in which TID would be denied access at any time of the day.

7. Indoors.

8. Outdoor meters shall not be installed where they will interfere with traffic, sidewalks, driveways, or where they will obstruct the opening of doors or windows, or in any location which may be considered hazardous or cause damage to the metering equipment.

3.9. Remote Metering

Remote metering is acceptable in instances where an external panel or switchboard is not utilized.

The following special arrangements are required:

1. Applicant shall provide an approved CT mounting cabinet that complies with the previous paragraph "Meter Locations - General Conditions."
2. 1 1/4" steel conduit between the CT cabinet and meter socket.
3. Meter will be located within 50 conductor feet of CT cabinet
4. For special meter distance requirements refer to construction standard 50510.
5. Junction boxes are permitted only if they can be sealed.
6. Couplings must have seal screws.

3.10. Planning and Grouping of Additional Meters

Occasionally there is need to locate and install additional service and metering equipment after the originally planned electric service for a building is installed and energized. Where possible, additional meters should be grouped with those electric meters already in service.

3.11. Two or More Houses on One Lot

If more than two dwellings or buildings are located on the same lot, consult TID to determine acceptable meter locations before proceeding with the wiring of the buildings.
For a single-family dwelling located behind another dwelling or commercial establishment on an inside (non-corner) lot not subject to further subdivision, the meters shall be located adjacent to each other at the building closest to the distribution

line from which service will be supplied. All wiring beyond the meters will be at the customer's expense.
For multi-dwelling buildings constructed on the rear of non-commercial lots, if practical, and at the customer's request, TID will install separate service facilities to the rear building. The meters for the rear building shall be grouped together at a suitable location at the rear building.

3.12. Meter Occupancy Identification

Where meters are grouped at a common location, such as for two or more houses on a lot or for a multiple occupancy building, either residential or non-residential, each meter position and its directly identifiable service disconnect shall be clearly and permanently marked by the building owner or his representative to indicate the occupancy served (Per N.E.C. 230-72a). Examples of permanent markingshall be engraved plate attached by screws, rivets, or two-part epoxy. . Clear identification means a legible apartment or street number. The store name may be included but does not constitute a clear designation in itself. Apartment or suite numbers must be on or adjacent to the door of each unit.

3.13. Sealing of Meters and Metering Equipment

All meters and enclosures for meters, metering equipment and service entrance equipment on the line side of the meter will be sealed by TID. The TID seal shall not be broken except by an authorized representative of TID. No person is permitted to tamper, remove, replace, or in any way interfere with a meter or its connections as placed by TID.

3.14. Meter Socket Bypass Devices

Automatic bypass or circuit closing devices that close when the meter is removed from the socket shall not be used.

Manual circuit closing devices are required on all service entrance equipment exceeding 30 amps nameplate rating except, domestic, signboards and temporary service. Service entrance equipment must be continuously rated per U/L 414.

3.15. Self-contained Metering Defined

A self-contained meter is capable of carrying the total current at the voltage of the electric service supplied to the customer. Sockets for self-contained meters are directly

connected to the customer's service entrance conductors, and the meter is inserted into the socket. Meter sockets are available with nominal ratings of 100 or 200 amperes. . Contact TID for details on single-phase, 400 Amp service.

3.16. Transformer-rated Metering Defined

When the electric service needs of the applicant exceed the ampacity or voltage limitations of a self-contained meter, metering transformers, which connect directly to the customer's service entrance conductors, must be used. A transformer-rated meter is then connected to the metering transformers to measure the energy delivered to the customer. The metering transformers and the transformer-rated meter(s) are furnished and installed by TID.

3.17. EUSERC

Electric Utility Service Equipment Requirements Committee (EUSERC) is an organization whose purpose is to promote uniform electric service requirements among the utilities. TID is a member of and supports EUSERC. As such, when an applicant wishes service within the District service area and the equipment chosen meets EUSERC, it is understood, with some specific exceptions, that TID will provide power to the equipment. Check with the District for details.

3.18. Switchboards

Switchboards are considered a specialty item for metering equipment. TID requires two sets of approval drawings of such equipment. If TID takes exception to the equipment, the applicant will be notified of the changes required. Should the applicant request service and the equipment is not acceptable, service will not be connected. Have the equipment checked and approved prior to requesting service. It will save time and headaches for everyone involved.
The switchboard must, at a minimum, meet EUSERC requirements. A switchboard service section has a hinged meter panel located in front of the instrument transformer compartment. Hinged meter panels must have EUSERC handles and open a minimum of 90° with meters and test switches mounted. Hinged meter panels must be sealable.

For special meter distance requirements, refer to construction standard 50510

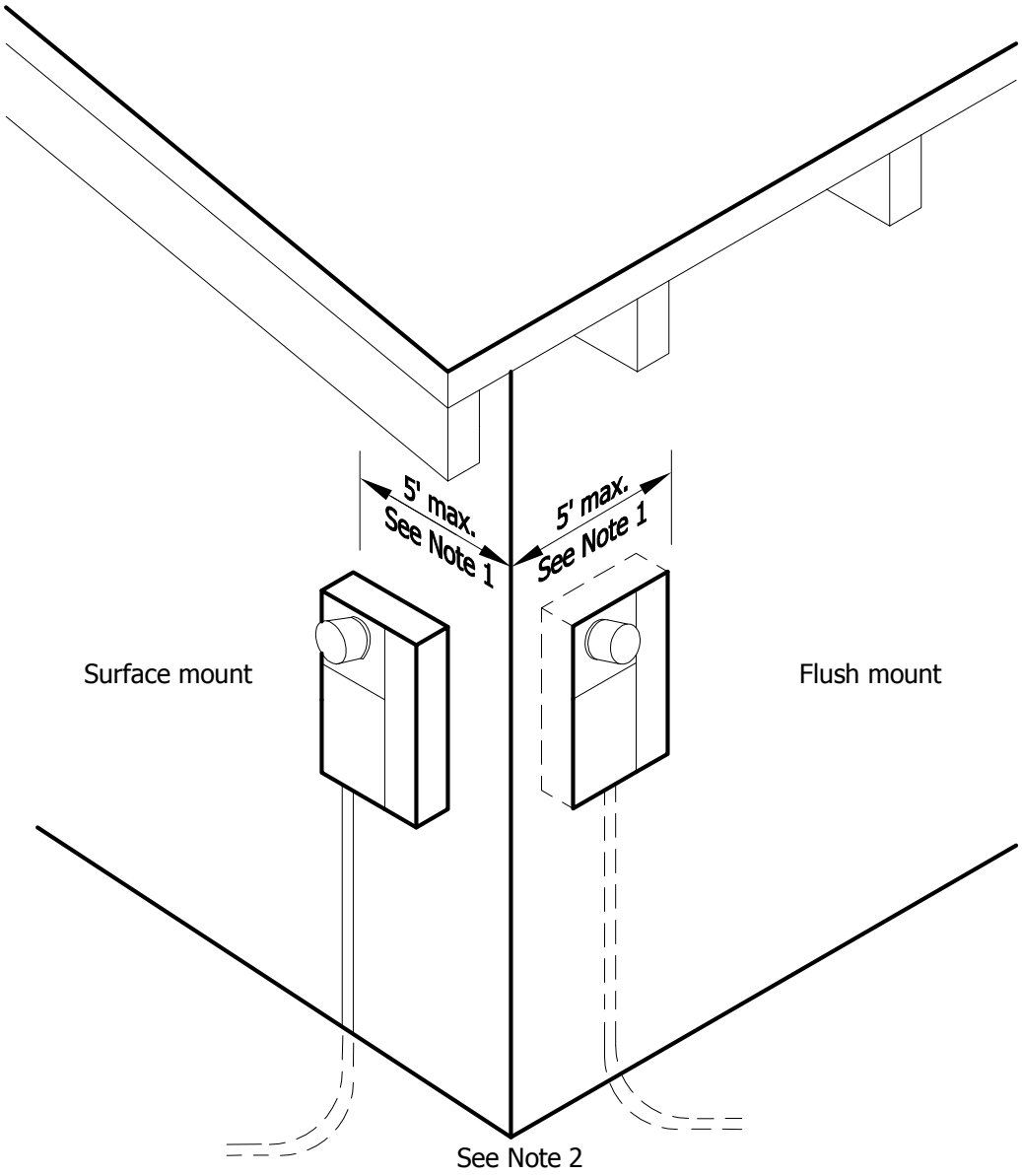


Figure 1
Underground Residential
Service Panel Location

Notes:

1. The electrical panel shall be installed within the first five feet of the corner of the structure.
2. The electrical panel shall be installed near the corner of the structure closest to the utility trench.
3. The electrical panel shall be adjacent to other utilities.
4. The electrical panel shall be on the street side of any fences.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
--	INITIAL ISSUE	SDC		KJO			BLL	04-2003
A	REPLACE TITLE BLOCK	JRS	MSG	JSA	MLH	SDP	EDJ	06-2013
B	UPDATE TITLE BLOCK	ELJ					MSG	09-2016

UNDERGROUND RESIDENTIAL
SERVICE PANEL LOCATION

SHEET 1 OF 1

34815 DWG. NO.

B

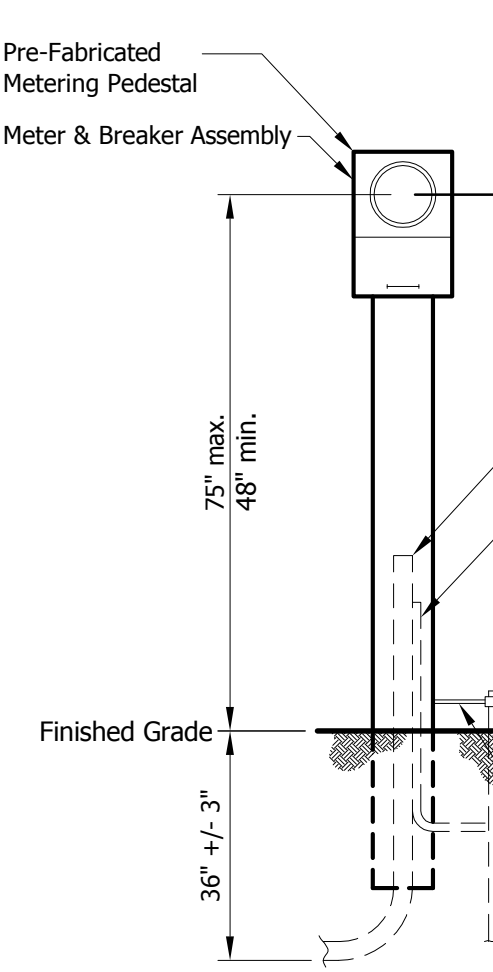


Figure 1
Pre-Fabricated
Metering Pedestal

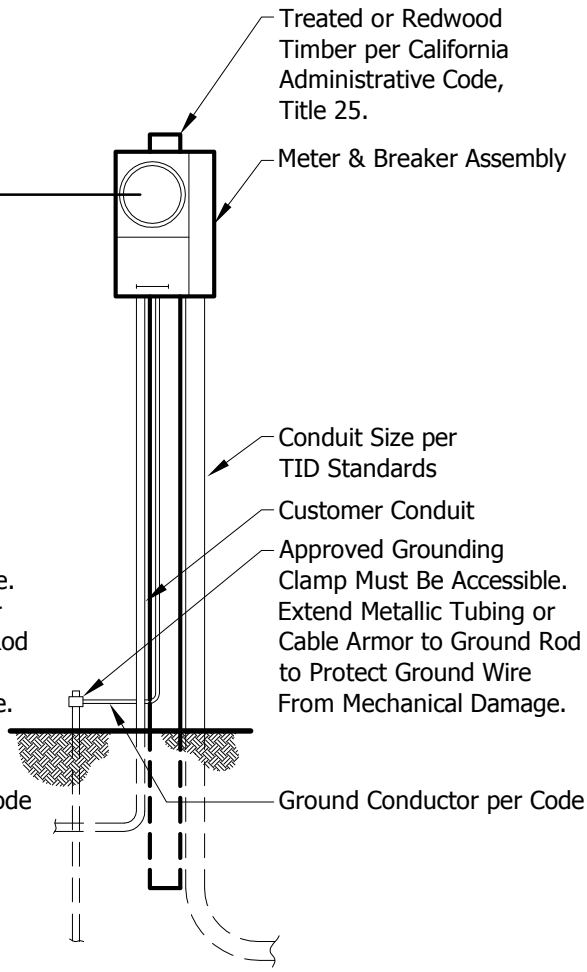


Figure 2
Treated or Redwood Timber
Metering Pedestal

Notes:

1. Service entrance equipment will conform to applicable sections of the Electric Utility Service Equipment Requirements Committee (EUSERC) Standards.
2. Customer shall supply panel with bus bar lugs where one set of lugs feeds all meters. Lug size and quantity will be specified by the District.
3. Meters will be furnished and set by TID after the installation has been approved by the governing inspection agency.
4. No service will be run under existing or future concrete areas.
5. All PVC conduits must be adequately glued and set prior to installation of conductors. Only sweeping type bends are acceptable.
6. See Construction Standard 30571 for trench configurations.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

MINIMUM REQUIREMENTS FOR SINGLE MOBILE HOME METERING USING UNDERGROUND CONSTRUCTION

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
B	CHANGED NOTES	SP	RWB	RCM	RA		AKH	10-1989
C	COMBINED WITH CUSTOMER BOOK	BB	ETE	RWB	LBG		RA	06-1993
D	REDRAWN IN AUTOCAD	SDC	PJO	KJO			BLL	04-2003
E	REPLACE TITLE BLOCK	JRS	MSG	JSA	MLH	SDP	EDJ	06-2013
F	UPDATE TITLEBLOCK	ELJ					MSG	09-2016

SHEET 1 OF 1

34820 DWG. NO. **F**

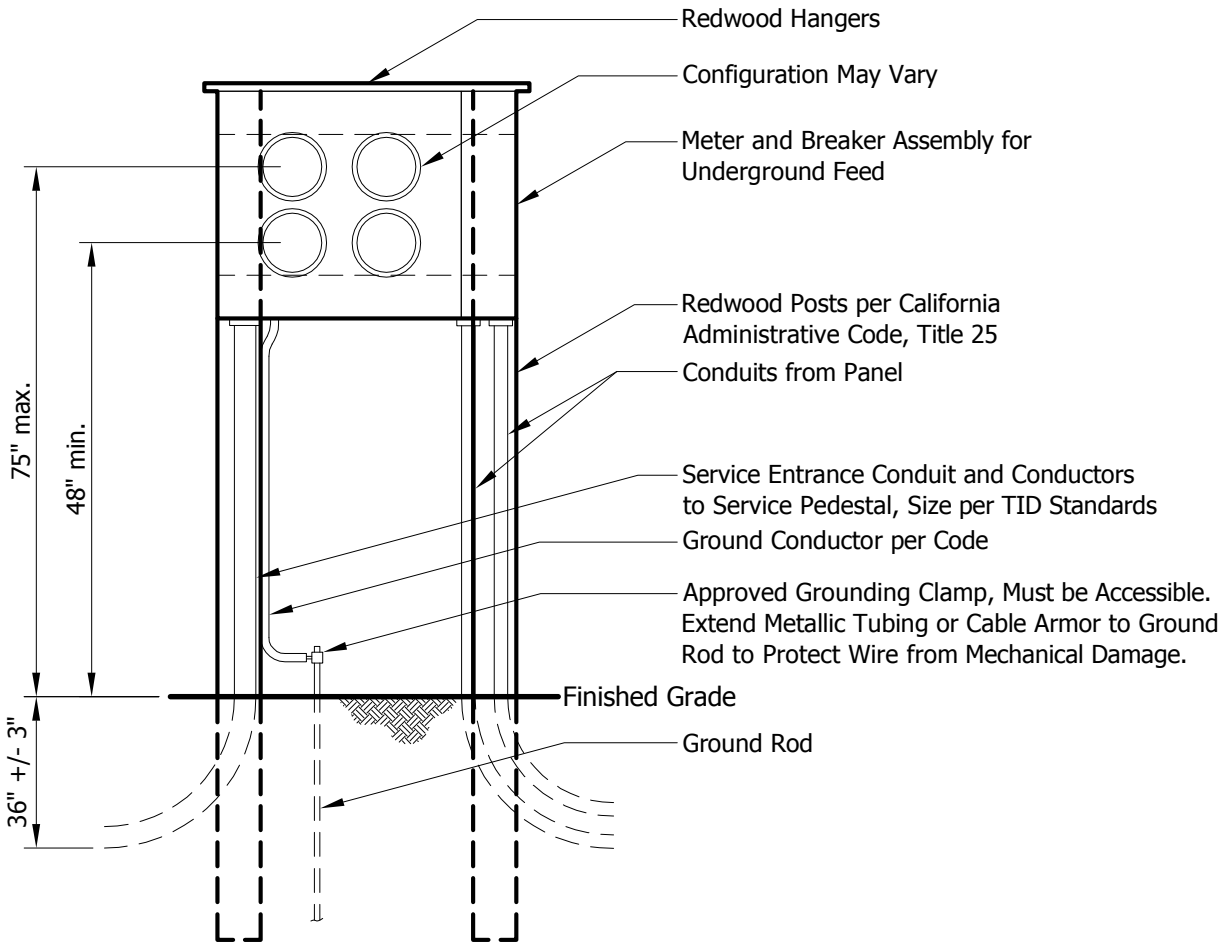


Figure 1
Multiple Mobile Home Metering
Using Underground Construction

Notes:

1. Service entrance equipment will conform to applicable sections of the Electric Utility Service Equipment Requirements Committee (EUSERC) Standards.
2. Customer shall supply panel and bus bar lugs where one set of lugs feeds all meters. Lug size and quantity will be specified by the District.
3. Meters will be furnished and set by TID after the installation has been approved by the governing inspection agency.
4. No service will be run under existing or future concrete areas.
5. All PVC conduits must be adequately glued and set prior to installation of conductors. Only sweeping type bends are acceptable.
6. See Construction Standard 30571 for trench configurations.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
B	CHANGED NOTES	SP	RWB	RCM	RA		AKH	10-1989
C	COMBINED WITH CUSTOMER BOOK	BB	ETE	RWB	LBG		RA	06-1993
D	REDRAWN IN AUTOCAD	SDC	PJO	KJO			BLL	04-2003
E	REPLACE TITLE BLOCK	JRS	MSG	JSA	MLH	SDP	EDJ	06-2013
F	UPDATE TITLEBLOCK	ELJ					MSG	09-2016

MINIMUM REQUIREMENTS FOR MULTIPLE MOBILE HOME METERING USING UNDERGROUND CONSTRUCTION

SHEET 1 OF 1

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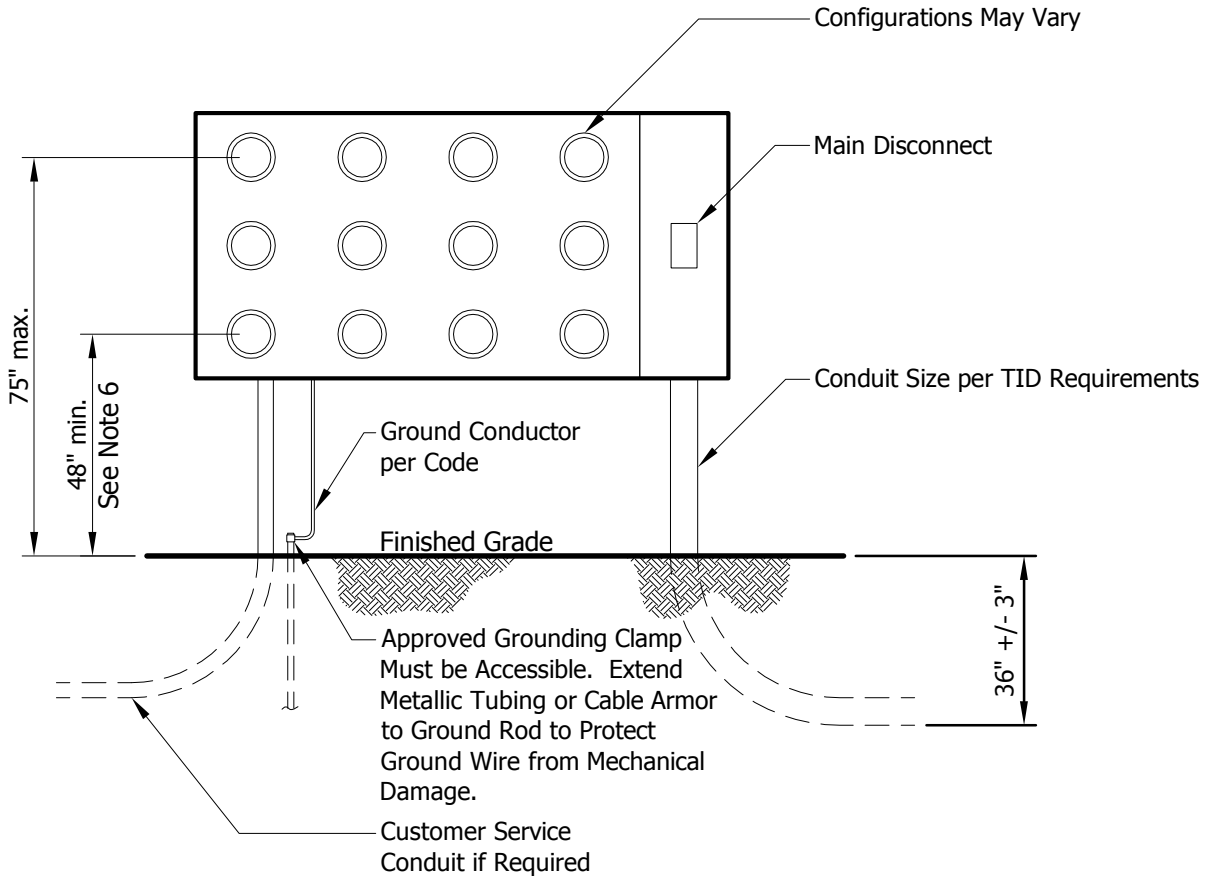


Figure 1
Multiple Metering
Using Underground Construction

Notes:

1. Service entrance equipment will conform to applicable sections of the Electric Utility Service Equipment Requirements Committee (EUSERC) Standards.
2. Customer shall supply panel with bus bar lugs where one set of lugs feeds all meters. Lug size and quantity will be specified by the District.
3. Meters will be furnished and set by TID after the installation has been approved by the governing inspection agency.
4. No service will be run under existing or future concrete areas.
5. All PVC conduits must be adequately glued and set prior to installation of conductors. Only sweeping type bends are acceptable.
6. Minimum meter height may be reduced to 36" when utilizing enclosed switchboards.
7. See Construction Standard 30571 for trench configurations.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
B	DIMENSION CHANGE	SP	RWB	RCM	RA		AKH	10-1989
C	COMBINED WITH CUSTOMER BOOK	BB	ETE	RWB	LBG		RA	06-1993
D	REDRAWN IN AUTOCAD							
E	REPLACE TITLE BLOCK	JRS	MSG	JSA	MLH	SDP	EDJ	06-2013
F	UPDATE TITLEBLOCK	ELJ					MSG	09/28/2016

MINIMUM REQUIREMENTS FOR MULTIPLE METERING USING UNDERGROUND CONSTRUCTION

SHEET 1 OF 1

34840 DWG. NO.

F

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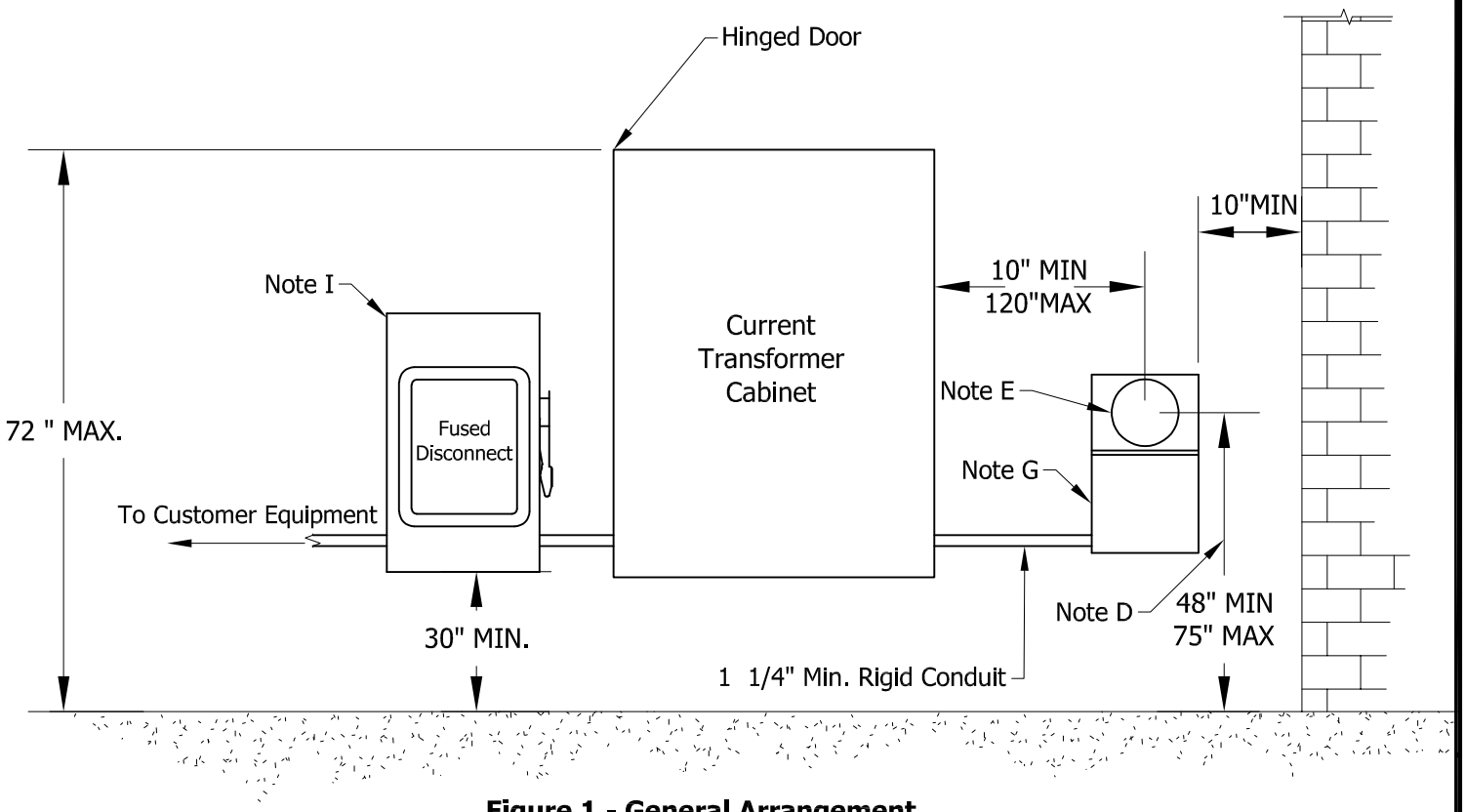


Figure 1 - General Arrangement
Current Transformer Cabinet

Notes

A. Cabinet shall have a hinged door with the hinges opposite of meter. The minimum cabinet size shall be 36" X 36".
B. The direction of feed through the current transformer cabinet shall be vertical.
C. For outdoor installations, CT cabinet and meter cabinet shall be NEMA 3R rated.
D. There must be minimum of 78" in height from the standing surface and 36" minimum in width around the cabinet of clear working space.
E. The customer shall furnish and install a meter socket(s) and a metal cabinet for housing the metering current transformers in accordance with specification shown.
F. Distance from the utility service meter and CT cabinet shall be less than 10 feet and within sight of each other. For remote meter situation, refer to TID standard 50510.
G. Meter panel shall have provision for test switch under cover.
H. EUSERC standards 313, 314, 328A, and 329A will not be acceptable.
I. For non fusible disconnect consult TID engineering.
J. Overhead Limited to 600A/250HP.
K. CT base to be same rating as disconnect.
L. "Studs" are not acceptable for service conductor landing, only set screw landing is acceptable.

Table 1 Bill of Materials

Item	Phase	Type of Service	No of Jaws
1	1 Phase	3W, 120/240V Delta	6
2	3 Phase	4W, 120/240, 120/208, 277/480 V	13 or 15

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
B	EUSERC 328A AND 329A NOT ACCEPTED	ADL					SSG	11-2025
A	ADDED SINGLE LUG LANDINGS ACCEPTABLE & 15 JAW	ADL					SSG	03-2025
-	INTIAL ISSUE	ADL	DNP				SSG	03-2023

CURRENT TRANSFORMER CABINETS
400 - 800 AMPS

SHEET 1 OF 1

50500 DWG. NO.

B

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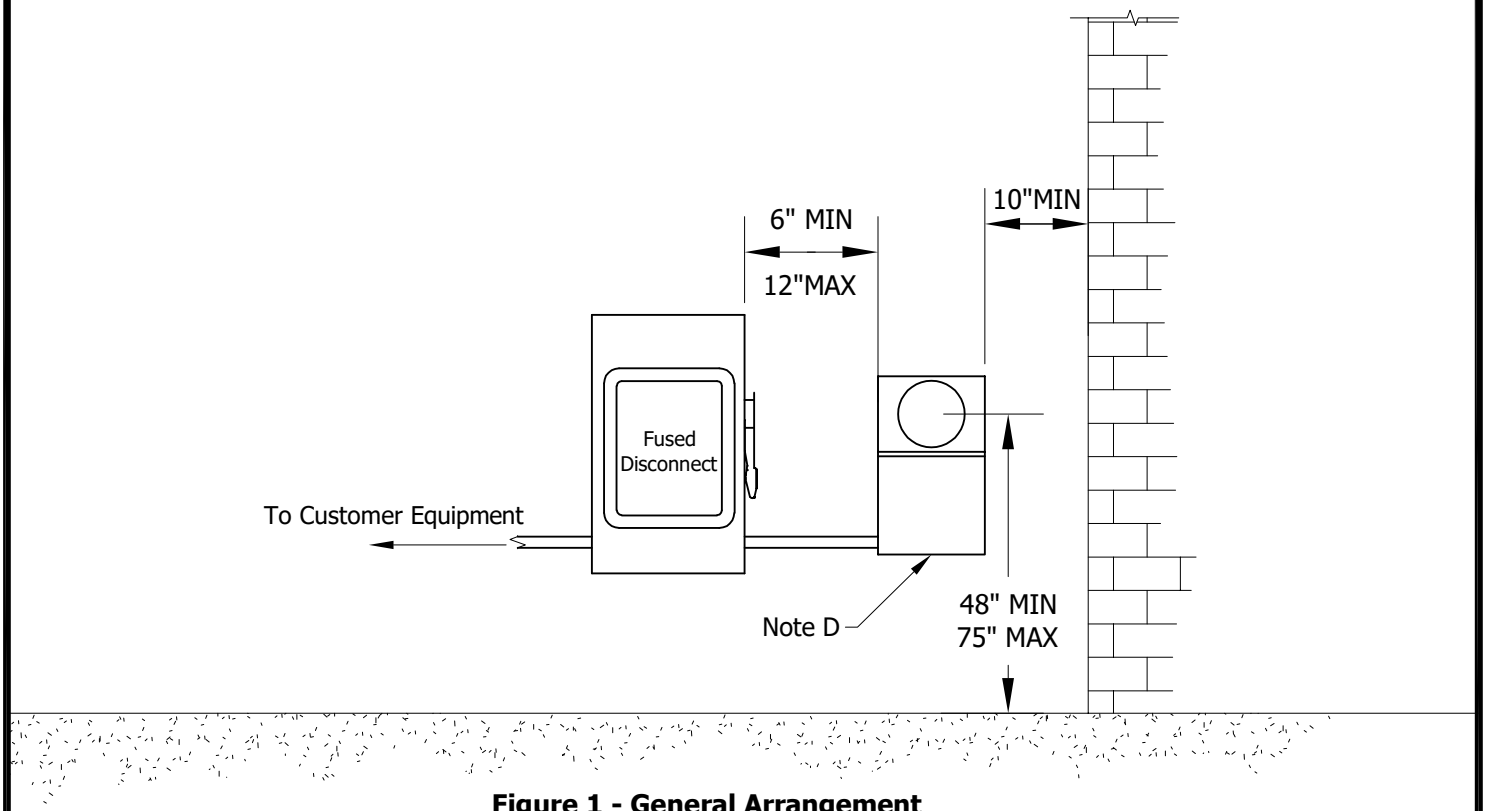


Figure 1 - General Arrangement
Pump Panel

Notes

A. For outdoor installations meter cabinet and disconnect shall be NEMA 3R rated.
B. There must be minimum of 78" in height from the standing surface and 36" minimum in width around the meter panel.
C. The customer shall furnish and install a meter socket(s) in accordance with specification shown.
D. Meter panel shall be ring type with bypass.
E. When overcurrent protection is present in pump switchgear consult TID engineering.

Table 1 Bill of Materials

Item	Phase	Type of Service	No of Jaws
1	1 Phase	3W, 120/240V Delta	4
2	3 Phase	4W, 120/240, 120/208, 277/480 V	7

CRITERIA FOR ELECTRICAL ROOMS

1. Electrical rooms shall only be allowed for commercial/ industrial meters.

2. The distance of the main meter from the transformer or CT compartment shall be as the following:

   (a) If service with a transformer ≥ 500 KVA - Maximum 75 unobstructed linear feet from the transformer.

   (b) If service with a transformer < 500 KVA - Maximum 75 unobstructed linear feet from the CT compartment . Doors or other means of entrance are acceptable.

3. The electrical room must be keyed such that the key made available to TID opens only the electrical room itself.

4. The key must be made available to TID via a lock-box, and must be keyed to TID specifications so that only TID may open the lock box. Sharing of the lock-box is NOT allowed.

5. The lock-box shall be located as close to the electrical room as possible in an unrestricted access area, but in no case farther than 10 feet from the meter room door. The lock-box must be between 36 inches and 72 inches above the adjacent walking surface.

6. The lock-box must be surface or recessed mount. Door bracket hanging is not permitted.

7. To ensure compatibility within the District, the lock-box used must be from the KNOX Company. The KNOX-BOX 1662 series or the 3200 series are the only approved lock-boxes.

8. The electrical room must meet all building, fire, safety codes and all applicable code requirements. The electrical room must be safe for TID personnel and free from any harmful or unsafe substances or vapors. The electrical room must be properly ventilated.

9. The electrical room must not be used in any way for storage. TID will not be responsible for missing or damaged goods stored in the electrical room. A well-readable sign stating "No Storage Allowed in this electrical Room" must be posted prominently inside the room or on the outside of the electrical room door.

10. The electrical room must provide a minimum clear, safe, level working space extending 3 feet horizontally in front of the meter panel, and to a ceiling height of a least seven feet one inch.

11. The electrical meter room must be immediately adjacent to and accessible from the outside of the building. Access to the meter room via successive doors and/or rooms is not allowable.

12. The electrical room must have a single entry from the outside. Entry to any other areas of the building via the meter room is not allowed.

13. The electrical room design and location is to be approved by TID staff.

14. The electrical room must provide an overhead light for adequate illumination of meters and safe entry and work within the room. A 120-volt convenience outlet shall be provided in accordance with the NEC and all applicable codes for use by persons who may need supplemental lighting or other meter work related power.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
C	REVISED NOTE 1 AND ADDED NOTE 2, 3	SSG		MC	AJB		MSG	04-2021
B	UPDATE TITLEBLOCK	ELJ					MSG	01-2017
A	ADD LOCK-BOX HEIGHT REQUIREMENT	GKT	KJO	KG	JC		BLL	06-2000
--	INITIAL ISSUE	GKT	KJO	KG	JC		BLL	05-2000

CRITERIA FOR ELECTRICAL ROOMS

SHEET 1 OF 1

50510 **C**
DWG. NO.

90
PAGE

Table 1 Single Phase Service From Single Phase or Delta Secondary Transformers

Type of Service	Main Size Amps	Meter Socket	Drawing Number
2 Wire 1 Phase 120 Volt	30 A	100A 4 Jaw MCC CDR	51010
3 Wire 1 Phase $^{120}/_{240}$ Volt	100 A	100A 4 Jaw MCC CDR	51015
3 Wire 1 Phase $^{120}/_{240}$ Volt	200 A	200A 4 Jaw MCC CDR	51015
3 Wire 1 Phase $^{120}/_{240}$ Volt	400 A	320A 4 Jaw MCC CDR	51025
3 Wire 1 Phase $^{120}/_{240}$ Volt	400 A	Self Contained Meter Receptacle	51030 Maintenance Only
3 Wire 1 Phase $^{120}/_{240}$ Volt	400 A 600 A 800 A	CMCTC 6 Jaw TP	51040

Table 2 Three Phase Service From Delta Secondary Transformers

Type of Service	Main Size Amps	Meter Socket	Drawing Number
4 Wire 3 Phase $^{120}/_{240}$ Volt	100 A Limit to 30 HP for Pumping Loads	100 A 7 Jaw MCC CDR	51050
4 Wire 3 Phase $^{120}/_{240}$ Volt	200 A Limit to 60 HP for Pumping Loads	200 A 7 Jaw MCC CDR	51050
4 Wire 3 Phase $^{120}/_{240}$ Volt	400 A 600 A 800 A	CMCTC 13 Jaw TP	51070
3 Wire 3 Phase 480 Volt	100 A Limit to 60 HP for Pumping Loads	100 A 5 Jaw MCC CDR	51020 Maintenance Only
3 Wire 3 Phase 480 Volt	200 A Limit to 125 HP for Pumping Loads	200 A 5 Jaw MCC CDR	51020 Maintenance Only
3 Wire 3 Phase 480 Volt	400 A 600 A 800 A	CMCTC 8 Jaw TP	51060 Maintenance Only

Table 3 Single Phase Service From Wye Secondary Transformers

Type of Service	Main Size Amps	Meter Socket	Drawing Number
2 Wire 1 Phase 120 Volt	30 A	100 A 4 Jaw MCC CDR	51020
3 Wire 1 Phase $^{120}/_{208}$ Volt	200 A	200 A 5 Jaw MCC CDR	51020

Table 4 Three Phase Service From Wye Secondary Transformers

Type of Service	Main Size Amps	Meter Socket	Drawing Number
4 Wire 3 Phase $^{120}/_{208}$ Volt	100 A Limit to 30 HP for Pumping Loads	100 A 7 Jaw MCC CDR	51055
4 Wire 3 Phase $^{120}/_{208}$ Volt	200 A Limit to 60 HP for Pumping Loads	200 A 7 Jaw MCC CDR	51055
4 Wire 3 Phase $^{120}/_{208}$ Volt	400 A to 2000 A	CMCTC 13 Jaw TP	51074
4 Wire 3 Phase $^{277}/_{480}$ Volt	100 A Limit to 60 HP for Pumping Loads	100 A 7 Jaw MCC CDR	51055
4 Wire 3 Phase $^{277}/_{480}$ Volt	200 A Limit to 125 HP for Pumping Loads	200 A 7 Jaw MCC CDR	51055
4 Wire 3 Phase $^{277}/_{480}$ Volt	400 A to 3000 A	CMCTC 13 Jaw TP	51074
3 Wire 3 Phase 12 kV	Varies	CMVTCTC 8 Jaw TP	51081 Maintenance Only
4 Wire 3 Phase 12 kV	Varies	CMCTC 13 Jaw TP	51081

Abbreviations:

CMVTCTC - Combination Meter and Voltage Transformer and Current Transformer Cabinet.

TP - Test Perch (Provisions for mounting meter test blocks in cabinet).

CDR - Continuous Duty Rated per UL 414 (CDR not required for domestic service).

MCC - Manual Circuit Closing Device.

CMCTC - Combination Meter and Current Transformer Cabinet.

Notes:

1. Manual Circuit closing devices will be required on all service entrance equipment exceeding 30 amps nameplate rating except:

   Domestic
   Signboards
   Temporary services

2. Meter socket and CT cabinets and mounting shall conform to applicable sections of the Electric Utility Service Equipment Requirements Committee (EUSERC) Standards. Consult TID Meter Shop if you have any questions.

3. Meter Sockets shall be located on the outside of buildings, where meters will be readily accessible for reading, unless prior arrangements are made with Standards and Line Engineering Dept.

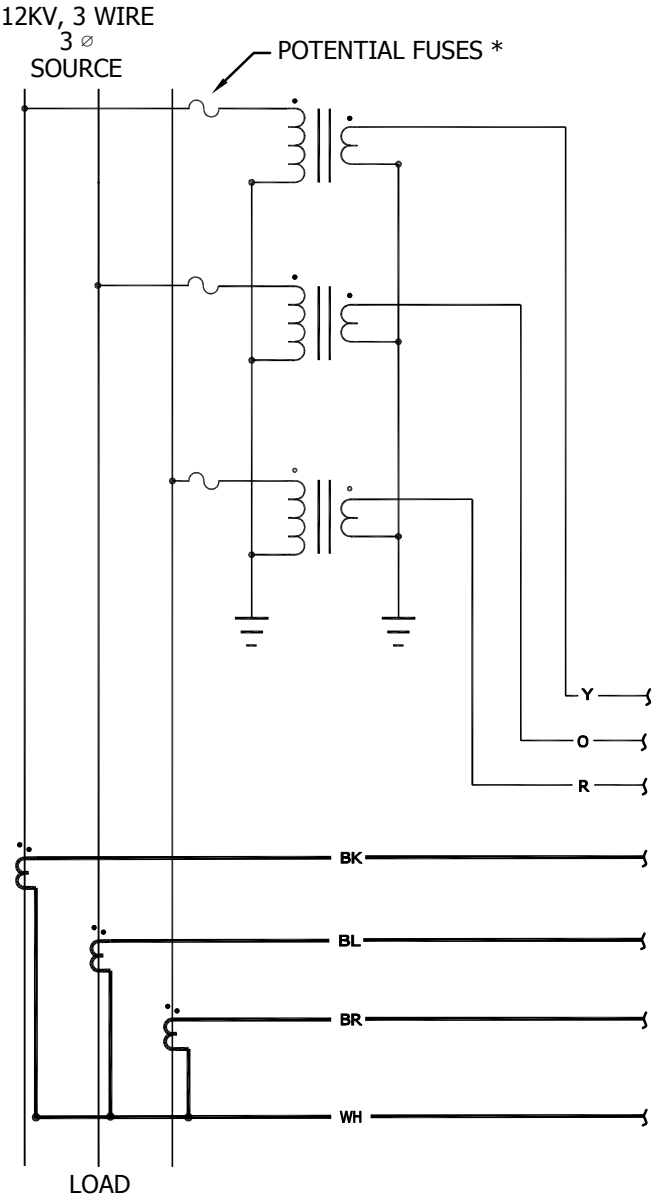
4. For remote meter installations, the customer shall provide an approved CT mounting cabinet, a 1 ¼ inch rigid steel conduit without junction boxes between the CT cabinet and meter socket and shall locate the meter socket not more than 50 circuit feet from the CT cabinet. T.I.D. will install the Current Transformers and wiring.

5. Service entrance equipment for commercial operation must be continuously rated for the load specified.

6. All electrical work on a customer's premise must be passed by the proper inspecting authorities before any hookup can be made by T.I.D.

7. Building plans and definite load information for commercial and industrial installations must be furnished to T.I.D.'s Standards and Line Engineering Department, P.O. Box 949, Turlock, CA 95381, as soon as possible.

8. "K-Base" meter panels and ringless meter sockets are not allowed or accepted.



* Potential fuses (TID Stock Number U-7115-000) are required for padmount and indoor metering enclosures. No potential fuses shall be installed on overhead/pole metering installations.

This standard is for all new primary metering services.
All new installations shall use 3 P.T.'s and 3 C.T.'s.
Page 2 shows metering wiring for new installations.
Page 3 shows EUSERC panel requirements.
Page 5 shows existing metering installations using 2 P.T.'s & 2 C.T.'s and shall be for maintenance only.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
E	UPDATE TITLEBLOCK AND STOCK NUMBERS	ELJ					MSG	09-2016
D	CHANGE TO 3 ELEMENT METERING		SDC	DBM	TWC	GKT	BLL	07-2004
C	COMBINE STD 51080, 51081, 51082, 51085,							
	SPECIFY SOLID STATE METER		BB	RCD	JT		BLL	06-1995
B	CLARIFY POLARITY MARKINGS		SP	ETE	LBG	RWB	RA	01-1992

METER WIRING
12 KV PRIMARY METERING

SHEET 1 OF 5

51081 DWG. NO. **E**

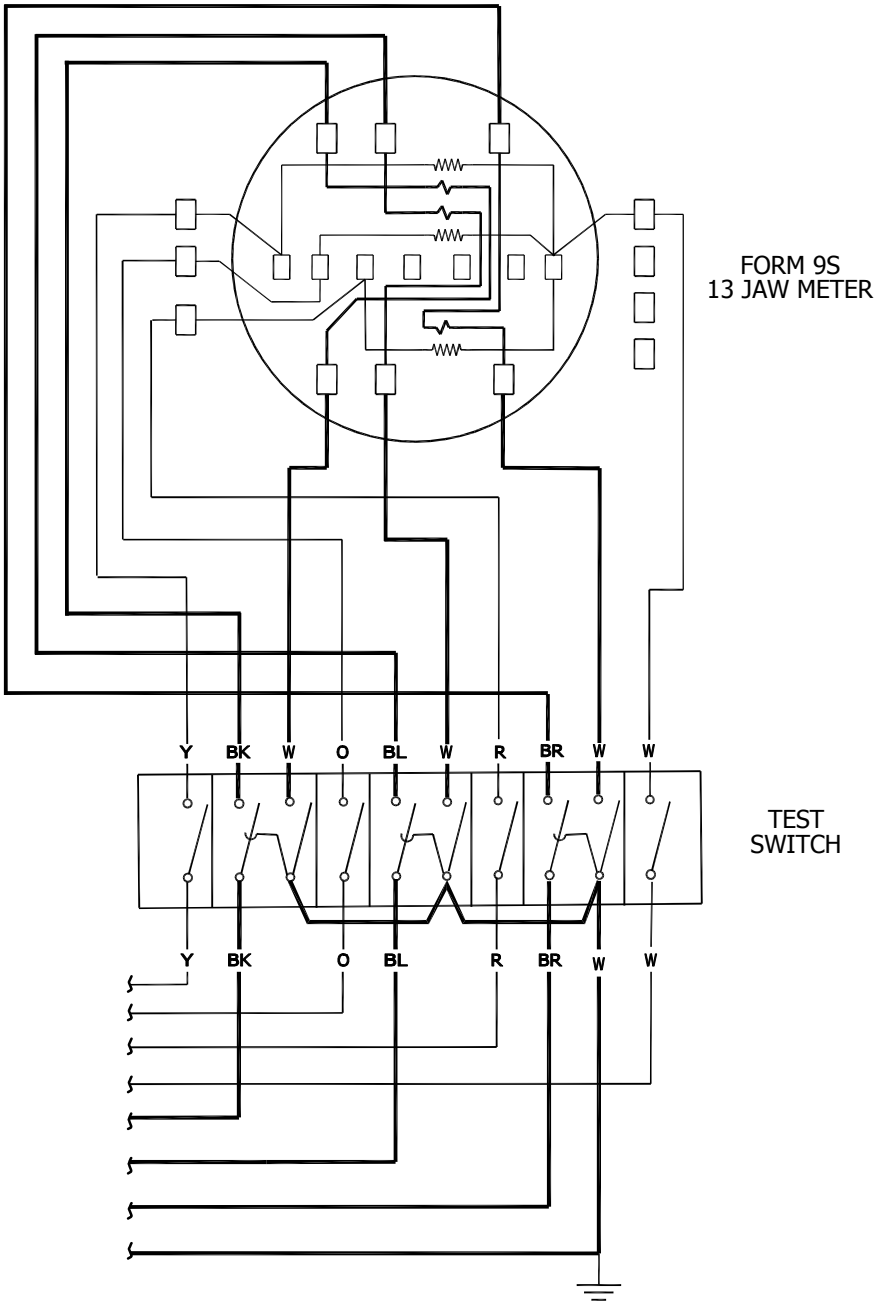
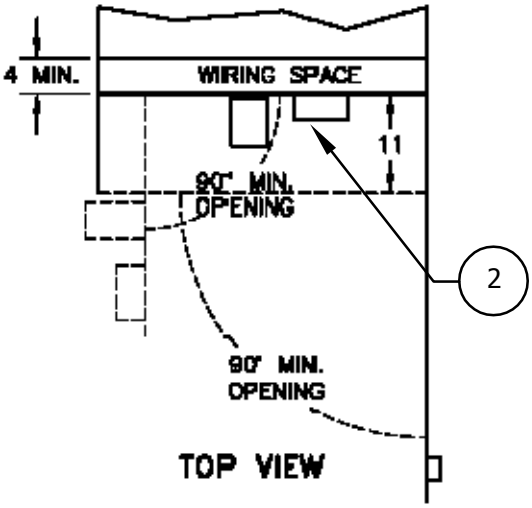


Table 1 Material List

Meter	CT Stock Number	CT Ratio	PT Stock Number	PT Ratio	Test Switch Stock No.
Itron Sentinel Level 2 or Elster A3 or Elster RL	W-1700-000	200:5	W-2300-000	60:1	W3300-000
	W-1710-000	400:5			
	W-1720-000	600:5			
	W-1730-000	800:5			

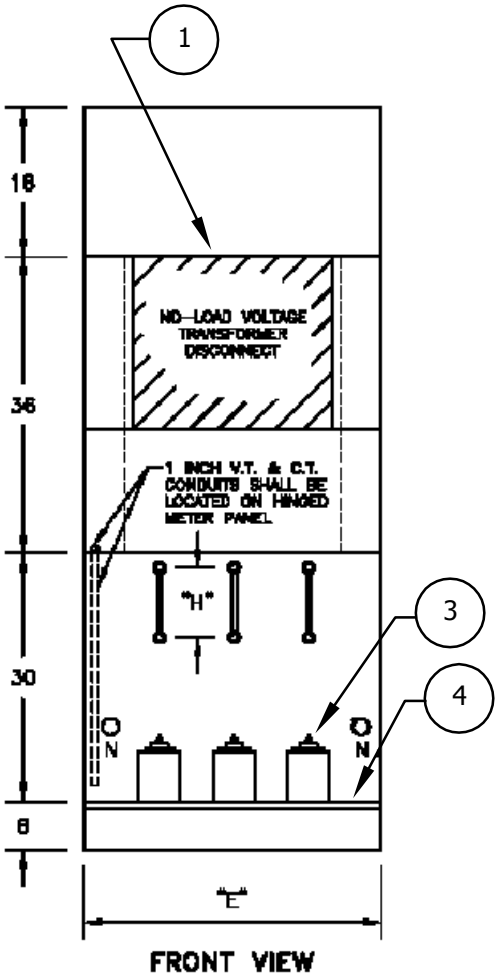
Meters installed after June 1995 are to be solid state multi-function meters with demand, mass memory, and modem. Meters installed before June 1995 might have various options depending on installation.

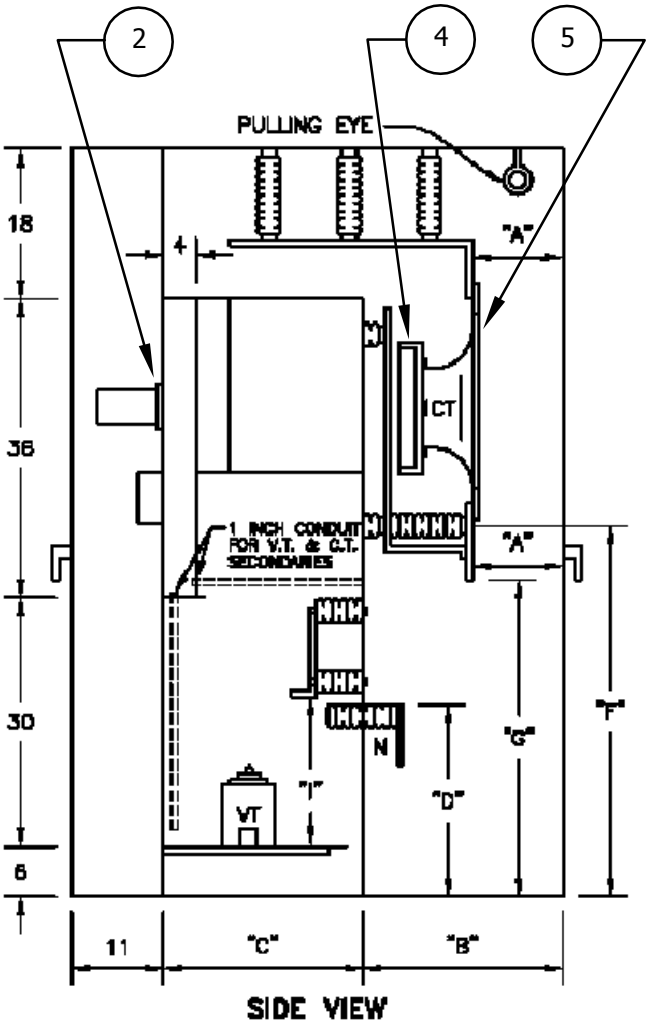


NOTES:

This drawing conforms to EUSERC dwg 401.

1. P.T. disconnect per EUSERC dwg. 400 III A.
2. Meter panel per EUSERC dwg. 403.
3. P.T.'s per EUSERC dwg. 410.
4. P.T. mounting per EUSERC dwg. 402.
5. C.T.'s per EUSERC dwg. 408.
6. Meter may be remoted to outside wall. See developer info booklet.





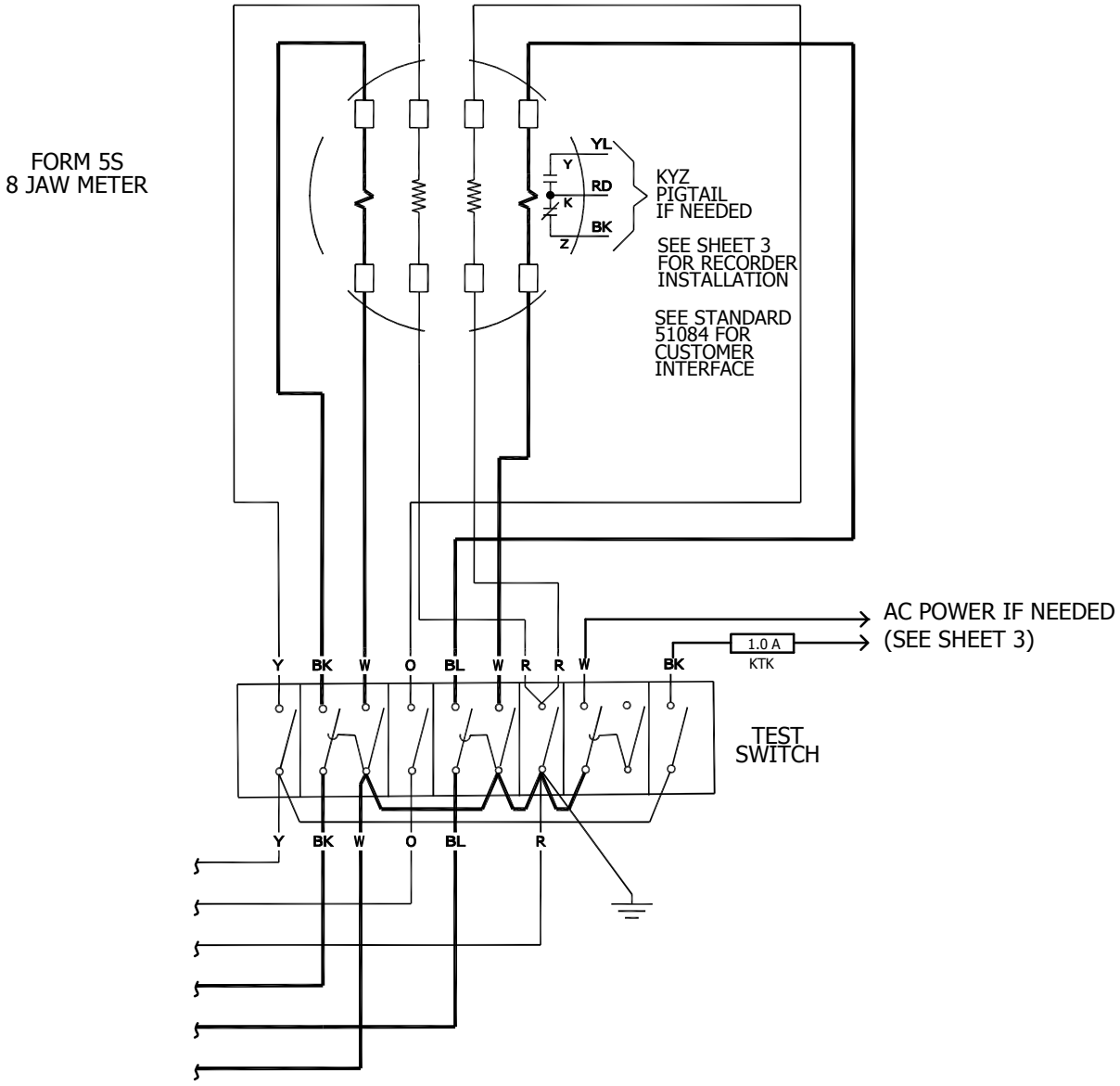
METER WIRING
12 KV PRIMARY METERING

CONSTRUCTION STANDARDS

SHEET		DWG. NO.		PAGE
3 OF 5		**51081**	**E**	96

Customer Requirements:

1. Customers must request and receive approval of 12 kV service in advance and prior to customer's design completion and switchboard purchase. TID shall review and approve service request, location switchboard drawings, and other service parameters. Customer must comply with the provisions of this standard, TID's Developer Information Book, TID rules, rates tariffs and standards, and applicable provisions of the NEC, OSHA requirements, and other applicable codes, regulations and laws.
2. All 12 kV service will be 12,000 Volt nominal 3-wire service.
3. Customers shall provide a breaker as the main protective device (fuses are not acceptable). Main protective device must have adjustable phase and ground trip settings. Customer shall provide settings, protective device details, and time-current curves to TID staff for approval. Phase and ground overcurrent coordination with TID's source-side device is required (except for IT - see item 4 below).
4. Instantaneous Overreach. TID will provide notice of, upon request, the available fault current contribution form TID's system at the point of interconnection. For fault currents above approximately 3,000 amps, it may not be possible to achieve coordination with the customer's relay/breaker protection due to TID's instantaneous trip setting. Customer's protective device must go to lock out (i.e. no reclosing is allowed) until Customer has received approval from TID's Power Control Center.
5. Any on-site generation must comply with separate standards and requirements (please contact TID if on-site generations is considered).
6. TID will specify the cable and conduit from the 12 kV switchgear to the TID facility interconnection (TID to install and terminate cable only - see specific detailed design for the project). If the unprotected length of other factors associated with the facility interconnection result in a substantial exposure (in TID staff's opinion), TID will notify the customer and other measures may be taken to reduce the exposure, including relocation of the switchgear or interconnection point or installation of a TID line recloser (at Customer's cost).
7. Customer shall be obligated to perform industry standard tests by qualified personnel on the main protective device with the approved settings, in TID's presence, and submit test reports to TID. Please allow 1 week notice to TID staff for scheduling attendance.
8. Customer is expected to maintain and keep in good working order the 12 kV switchgear and main protective device. Any main protective device setting changes must be approved in advance by TID. TID may request attendance at the time of setting change and/or that test sheets are provided for TID approval.

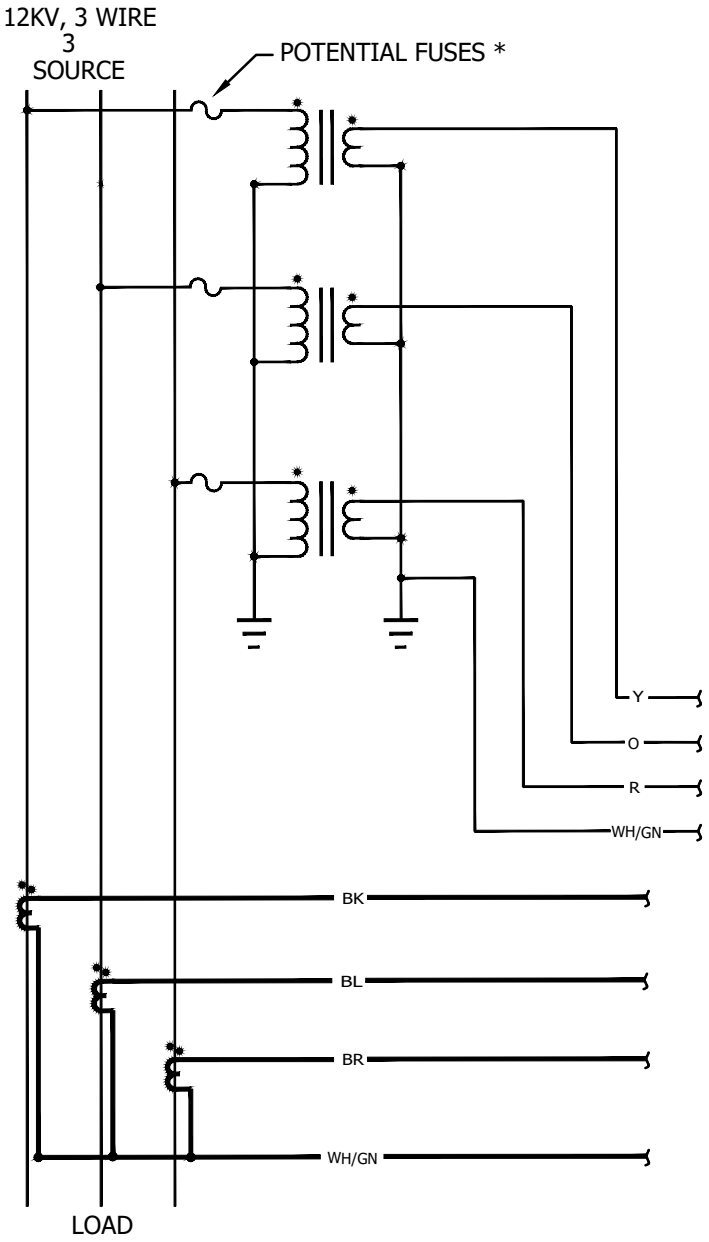


*** 2 ELEMENT - FIELD MAINTENANCE ONLY**

Table 2 Material List

Meter	CT Stock Number	Service Amps	PT Stock Number	PT Ratio	Test Switch Stock No.
Itron Sentinel Level 2 or Elster A3 or Elster RL	W-1600-000	100	W-2300-000	60:1	W3300-000
	W-1610-000	200			
	W-1620-000	400			

Meters installed after June 1995 are to be solid state multi-function meters with demand, mass memory, and modem. Meters installed before June 1995 might have various options depending on installation.



* Potential fuses (TID Stock Number U-7115-000) are required for padmount and indoor metering enclosures. No potential fuses shall be installed on overhead/pole metering installations.

This standard is for all new primary metering services.

All new installations shall use 3 P.T.'s and 3 C.T.'s.

Page 2 shows metering wiring for new installations.

Page 3 shows EUSERC panel requirements.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
A	INITIAL ISSUE	ADL	MAC	DNP			SSG	10/2022

METER WIRING
12 KV GENERATION METERING

SHEET 1 OF 4

DWG. NO. **51082** **A**

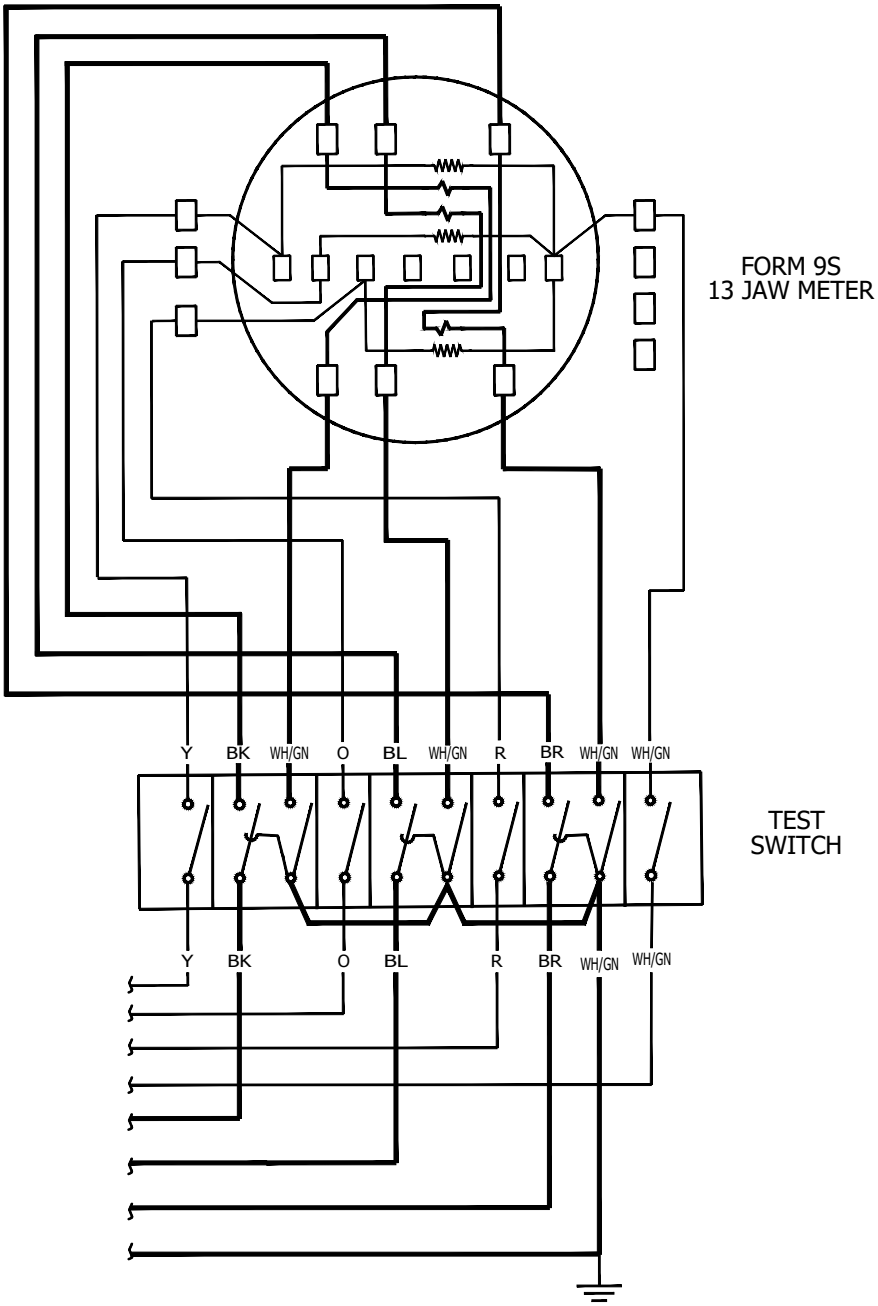
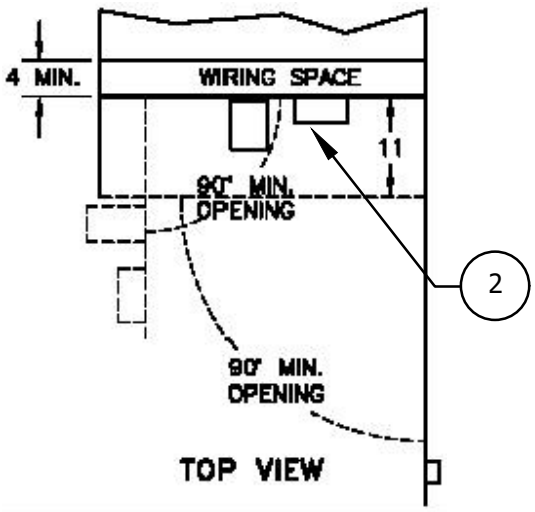


Table 1 Material List

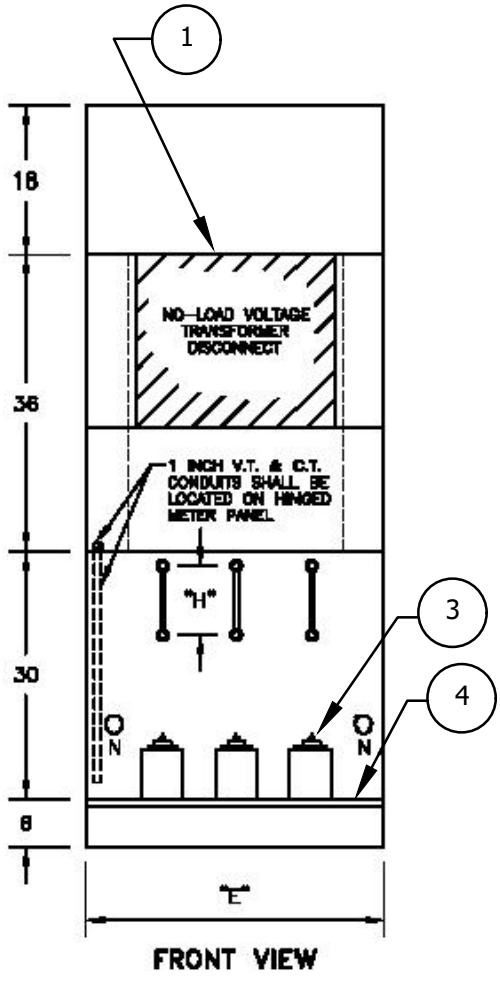
Meter	CT Stock Number	CT Ratio	PT Stock Number	PT Ratio	Test Switch Stock No.
SEL 735	W-1700-000	200:5	W-2300-000	60:1	W3300-000
	W-1710-000	400:5			
	W-1720-000	600:5			
	W-1730-000	800:5			

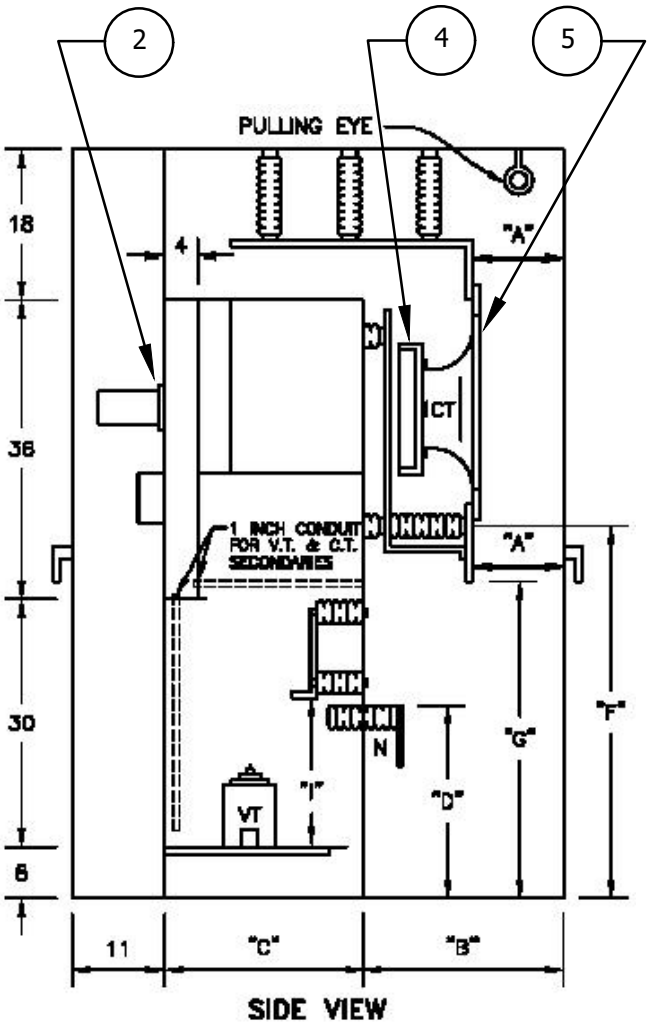


NOTES:

All panels must conform to EUSERC section 400 dwg. 401.

1. P.T. disconnect per EUSERC section 400 III A.
2. Meter panel per EUSERC dwg. 408.
3. P.T.'s per EUSERC dwg. 404.
4. P.T. mounting per EUSERC dwg. 407.
5. C.T.'s per EUSERC dwg. 407.
6. Meter may be remoted to outside wall. See developer info booklet.





METER WIRING
12 KV GENERATION METERING

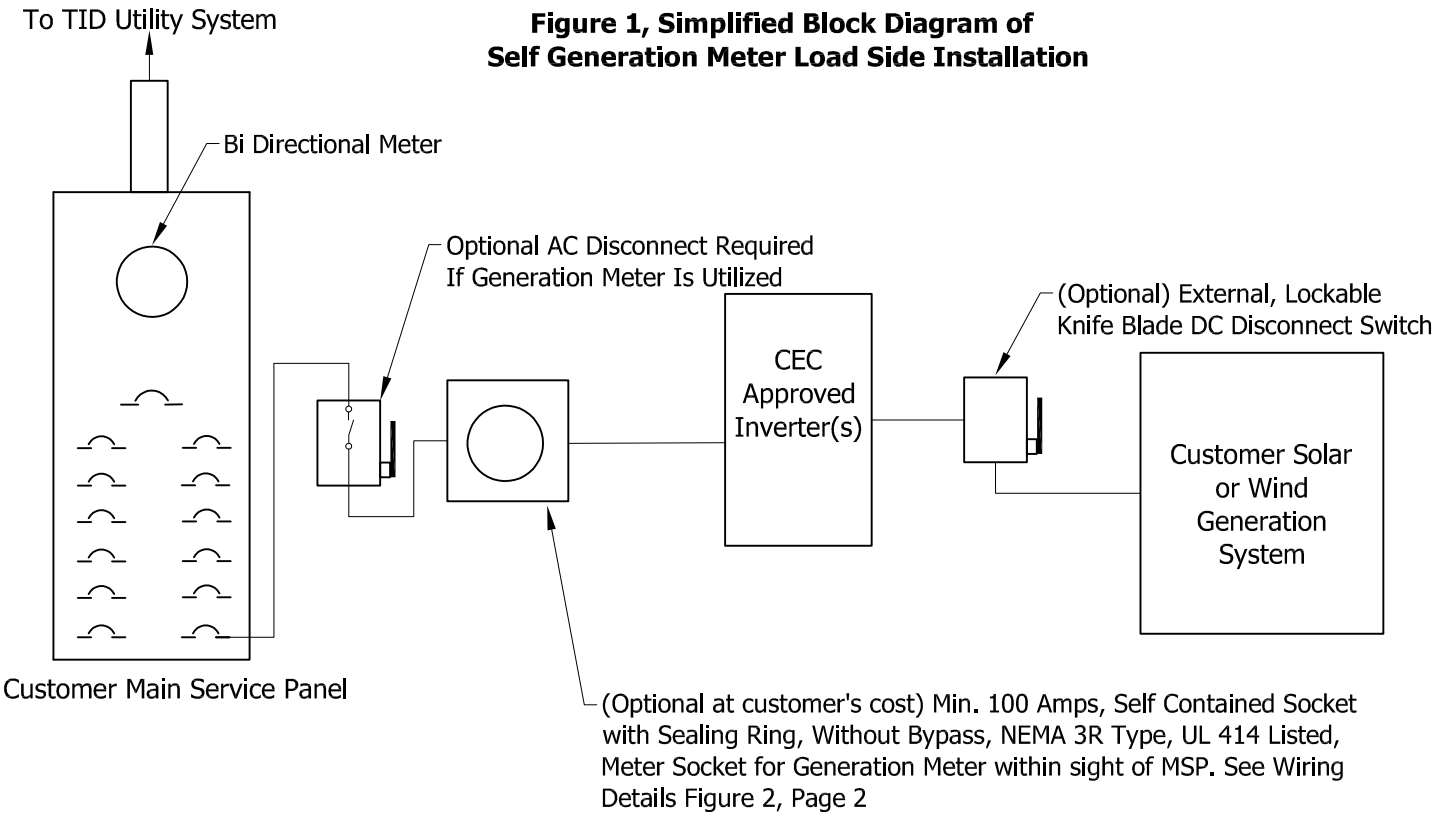
CONSTRUCTION STANDARDS

SHEET	DWG. NO.		PAGE
3 OF 4	**51082**	**A**	101

Customer Requirements:

1. Customers must request and receive approval of 12 kV service in advance and prior to customer's design completion and switchboard purchase. TID shall review and approve service request, location switchboard drawings, and other service parameters. Customer must comply with the provisions of this standard, TID's Developer Information Book, TID rules, rates tariffs and standards, and applicable provisions of the NEC, OSHA requirements, and other applicable codes, regulations and laws.
2. All 12 kV service will be 12,000 Volt nominal 3-wire service.
3. Customers shall provide a breaker as the main protective device (fuses are not acceptable). Main protective device must have adjustable phase and ground trip settings. Customer shall provide settings, protective device details, and time-current curves to TID staff for approval. Phase and ground overcurrent coordination with TID's source-side device is required (except for IT - see item 4 below).
4. Instantaneous Overreach. TID will provide notice of, upon request, the available fault current contribution form TID's system at the point of interconnection. For fault currents above approximately 3,000 amps, it may not be possible to achieve coordination with the customer's relay/breaker protection due to TID's instantaneous trip setting. Customer's protective device must go to lock out (i.e. no reclosing is allowed) until Customer has received approval from TID's Power Control Center.
5. Any on-site generation must comply with separate standards and requirements (please contact TID if on-site generations is considered).
6. TID will specify the cable and conduit from the 12 kV switchgear to the TID facility interconnection (TID to install and terminate cable only - see specific detailed design for the project). If the unprotected length of other factors associated with the facility interconnection result in a substantial exposure (in TID staff's opinion), TID will notify the customer and other measures may be taken to reduce the exposure, including relocation of the switchgear or interconnection point or installation of a TID line recloser (at Customer's cost).
7. Customer shall be obligated to perform industry standard tests by qualified personnel on the main protective device with the approved settings, in TID's presence, and submit test reports to TID. Please allow 1 week notice to TID staff for scheduling attendance.
8. Customer is expected to maintain and keep in good working order the 12 kV switchgear and main protective device. Any main protective device setting changes must be approved in advance by TID. TID may request attendance at the time of setting change and/or that test sheets are provided for TID approval.

Figure 1, Simplified Block Diagram of Self Generation Meter Load Side Installation



Notes:

1. Installation shall meet all applicable safety and performance standards established by the current National Electric Code (NEC), the Institute of Electrical and Electronic Engineers (IEEE), and accredited testing laboratories such as Underwriters Laboratories (UL), and where applicable, rules of the Public Utilities Commission (PUC) regarding safety and reliability, as well as meeting all TID requirements.
2. TID will ensure that the metering at the point of interconnection will accurately measure electricity flow in both directions. If service panel replacement is necessary, the applicant shall be responsible for such cost.
3. Arrangements utilizing transfer switches, or alternatives to the arrangement shown above, will be considered upon submission of a diagram and explanation of the proposed deviation(s).
4. Main service panels rated 400 Amps and above will require CT cabinet, an AC disconnect switch, and need to contact TID Engineering for other requirements.
5. The battery storage should be UL 1741 and IEEE 1547 certified.
6. TID allows parallel battery operation however TID does not allow exporting power back on the grid from battery storage during a power outage.
7. Battery storage can only be connected through smart inverters.

Refer to TID solar installation guidelines for additional requirements.

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
H	ADDED BREAKER TO AC DISCONNECT	ADL	ADD	MAC			GSS	11-2022
G	REMOVED AC DIS. SW. & PV GEN. METER AN OPTION	SSG		BAP	MAC	MH	EDJ	05-2020
F	ADD NOTE 6 & 7 FOR BATTERY BACKUP	SSG		BAP	MAC	EKR	EDJ	12-2017
D	REPLACE TITLE BLOCK	ELJ					MSG	09-2016
E	REPLACE TITLE BLOCK	JRS	MSG	JSA	MLH	SDP	EDJ	06-2013

SELF GENERATION
LOAD SIDE CONNECTION
WIRING & METER INSTALLATION

SHEET 1 OF 2

51092 DWG. NO.

H

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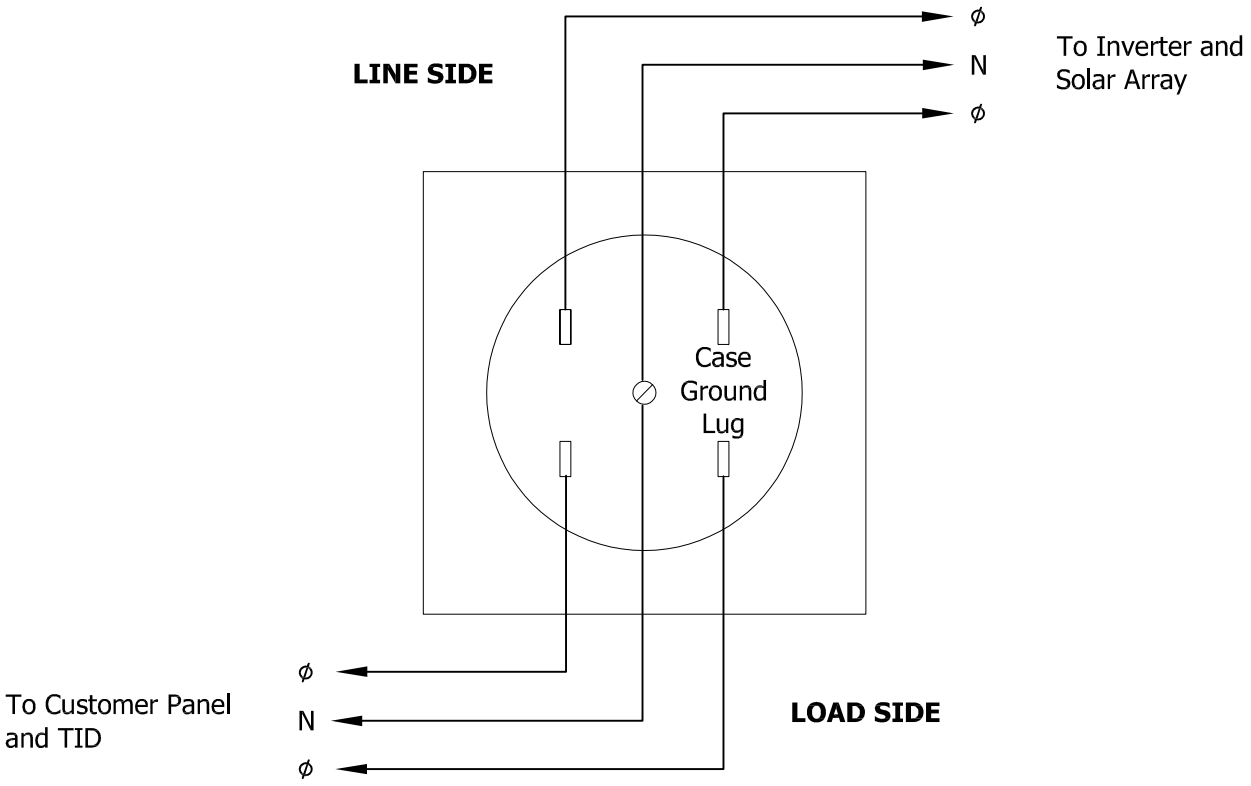


Figure 2
Simplified Detail of
Generation Meter Wiring

SELF GENERATION
LOAD SIDE CONNECTION
WIRING AND METER INSTALLATION

CONSTRUCTION STANDARDS

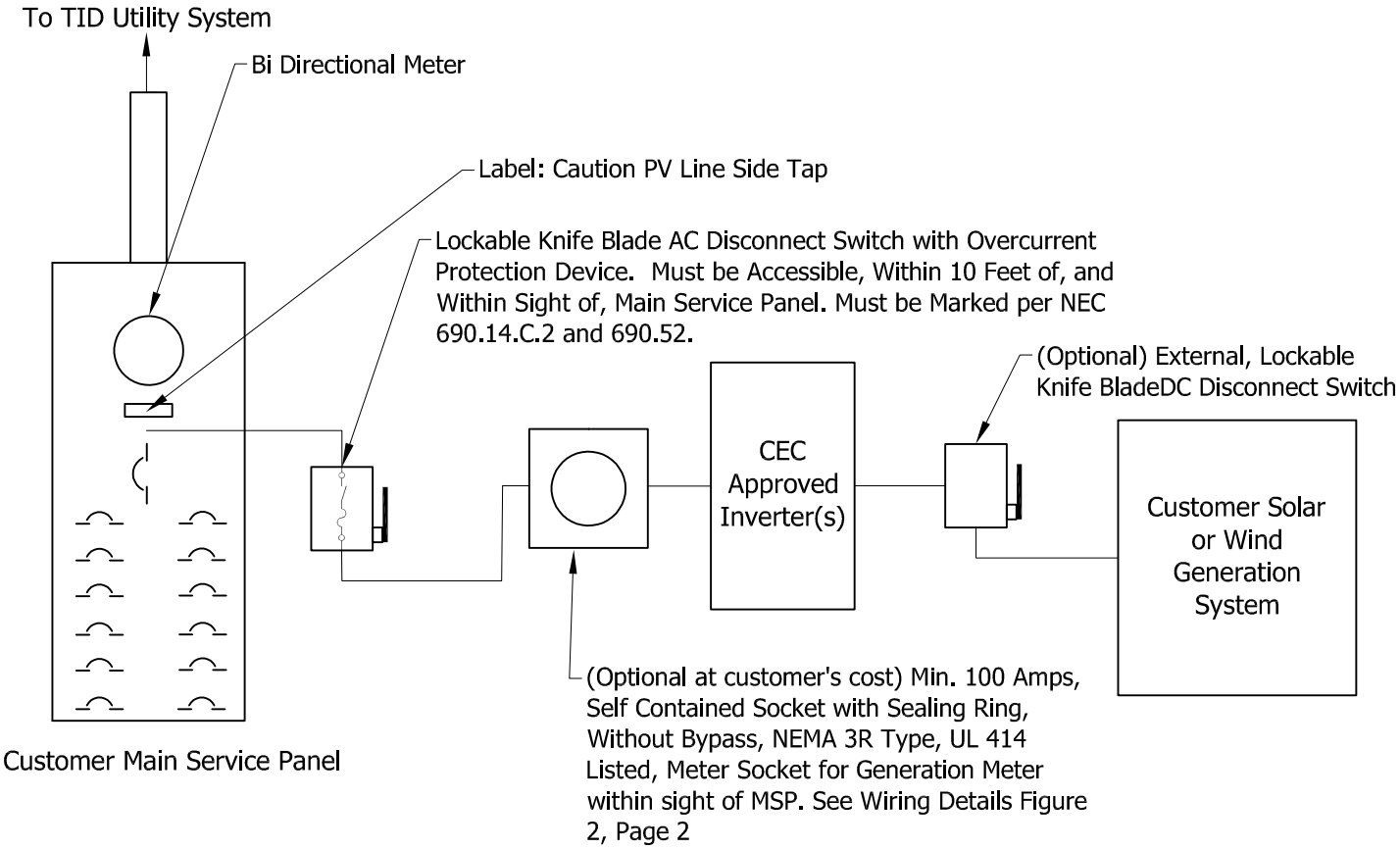


Figure 1, Simplified Block Diagram of Line Side Connection Installation

Notes:

1. Installation shall meet all applicable safety and performance standards established by the National Electric Code, the Institute of Electrical and Electronics Engineers, and accredited testing laboratories such as Underwriters Laboratories, and where applicable, rules of the Public Utilities Commission regarding safety and reliability, as well as meet all TID requirements.
2. TID will ensure that the metering at the point of interconnection will accurately measure electricity flow in both directions. If service panel replacement is necessary, the applicant shall be responsible for such cost.
3. Arrangements utilizing transfer switches or alternatives to the arrangement shown above will be considered upon submission of a diagram and explanation of the proposed deviation(s).
4. Main service panels rated 400 Amps and above will require CT cabinet, an AC disconnect switch, and need to contact TID Engineering for other requirements.
5. Line side connection must be downstream of TID metering and not located within sealed TID compartment.
6. Line side connection shall not void UL listing on customer main service panel.
7. Customer must receive local jurisdiction approval for a line side connection.
8. The battery backup panel should be UL 1741 and IEEE 1547 certified.
9. TID allows parallel battery operation however TID does not allow exporting power back on the grid from battery storage during a power outage.
10. The battery storage can only be connected through smart inverters.

Refer to TID solar installation guidelines for additional requirements

TURLOCK IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
D	ADDED FUSE AND BREAKER IN AC DISCONNECT	ADL	ADD	MAC			GSS	11-2022
C	MADE PV GEN. METER REQ. AS AN OPTION	SSG		BAP	MAC	EKR	EDJ	05-2020
B	REPLACE TITLE BLOCK	ELJ					MSG	09-2016
A	REPLACE TITLE BLOCK	JRS	MSG	JSA	SDP	MLH	EDJ	06-2013
--	INITIAL ISSUE	MSG	JRS	MLH	SDP	JSA	EDJ	01-2013

SELF GENERATION
LINE SIDE CONNECTION
WIRING & METER INSTALLATION

SHEET 1 OF 2

51093 DWG. NO.

D

105 PAGE

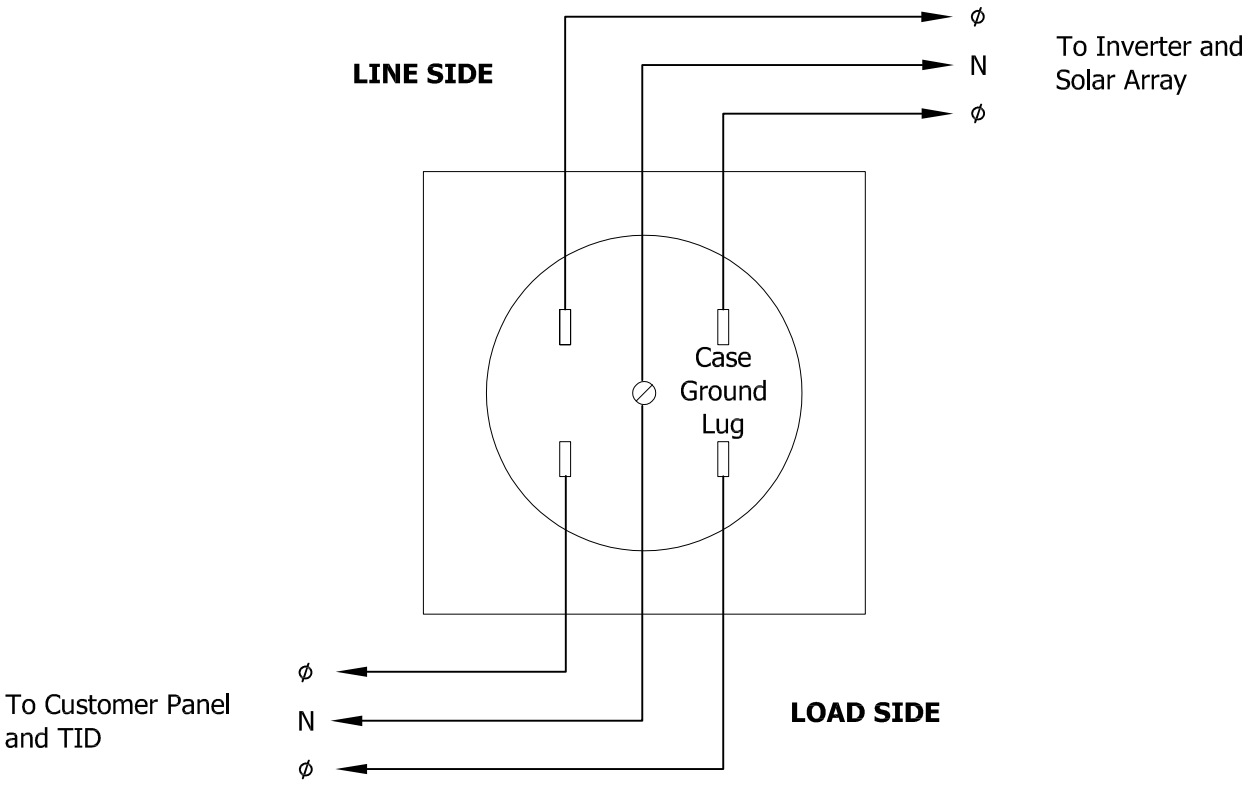


Figure 2
Simplified Detail of
Generation Meter Wiring

SELF GENERATION
LINE SIDE CONNECTION
WIRING & METER INSTALLATION

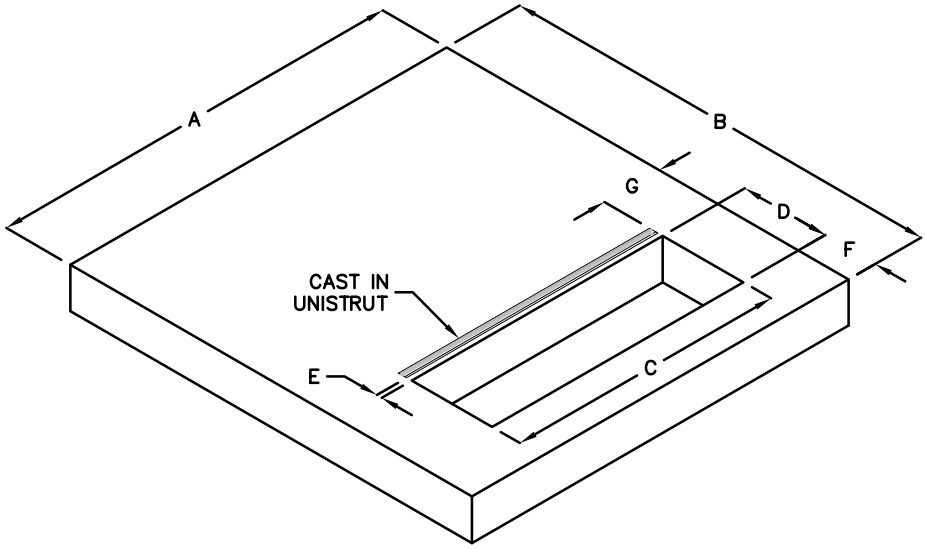
CONSTRUCTION STANDARDS

SHEET			DWG. NO.		PAGE
2	OF	2	**51093**	**D**	106

Section IV: Materials

1. Material Drawings
2. Developer Provided Material Used in Underground Construction

THREE PHASE TRANSFORMER PAD



- Pad shall be constructed of reinforced plastic mortar, concrete or approved equal.
- Material shall be ultra-violet radiation resistant.
- Pad finish shall include a non-skid surface.
- Provisions for mechanical lifting and leveling.
- Pads to be gray in color.
- Non-corrosive 1 5/8" channel shall be placed behind opening, running length of opening (reference dimension 'E').
- Pad thickness shall be a minimum of 4". Must be capable of holding designated weight capacity.
- Lengths (A) and widths (B) may vary by +8" and -2".

Table 1 Dimensions

TID Stock Number	A	B	C	D	E	F	G	Weight Capacity
U-2056-001	75"	80"	50"	16"	1"	10"	11"	10,000 lb
U-2056-005	105"	112"	58"	16"	1"	10"	11"	20,000 lb

TURLOCK IRRIGATION DISTRICT

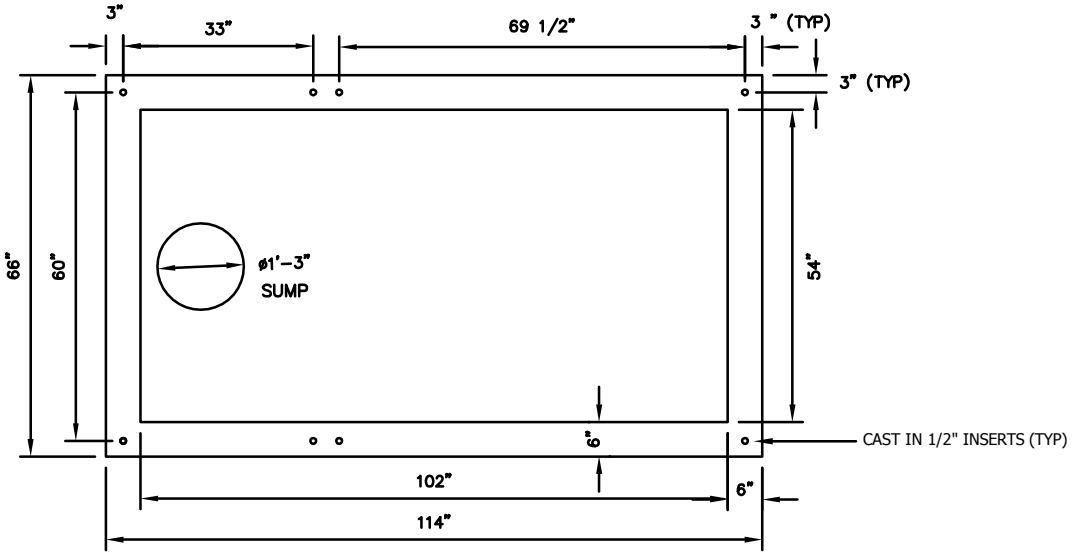
MATERIAL STANDARDS

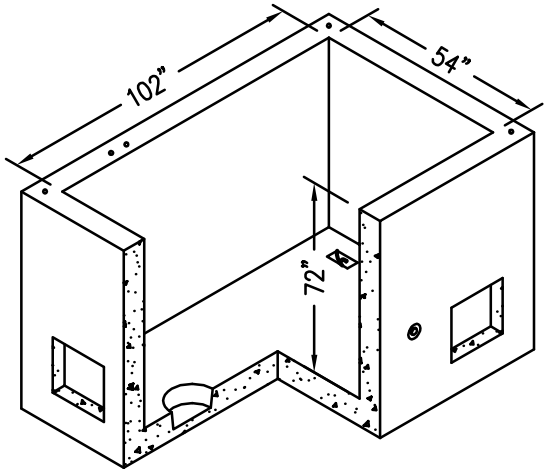
REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
B	UPDATED BORDER AND TABLE	ELJ					MSG	09-2016
A	REDRAWN IN AUTOCAD		SDC	PJO	KJO	LBG	BLL	04-2003
--	INITIAL ISSUE		ETE	BB	JC	LBG	RA	07-1994

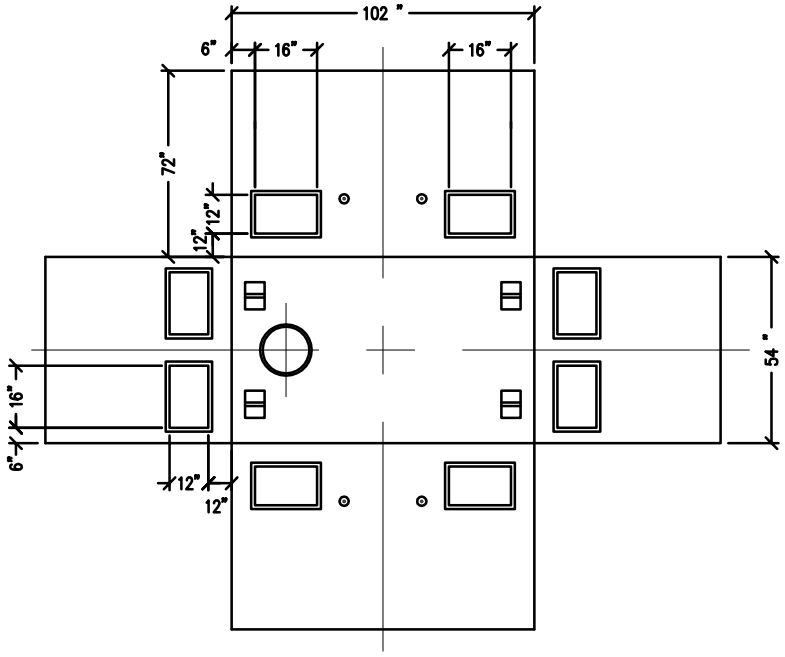
SPECIFICATION
THREE PHASE
TRANSFORMER PAD

SHEET 1 OF 1

2017 DWG. NO. **B**







FOR COVER PLATE AND DETAILS
SEE SHEET 2

TURLOCK IRRIGATION DISTRICT

MATERIAL STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
E	UPDATE TITLEBLOCK	ELJ					MSG	09-2016
D	CHG KNOCKOUTS TO WIN STYLE, DEPTH 72"	SDC	DBM				BLL	06-2009
C	CHANGE DEPTH OF BOX TO 60"	SDC					BLL	06-2005
B	CORRECT COVER PLATE DIMENSIONS	SDC					BLL	10-2004
A	REDRAWN IN AUTOCAD	SDC	KJO				BLL	04-2003

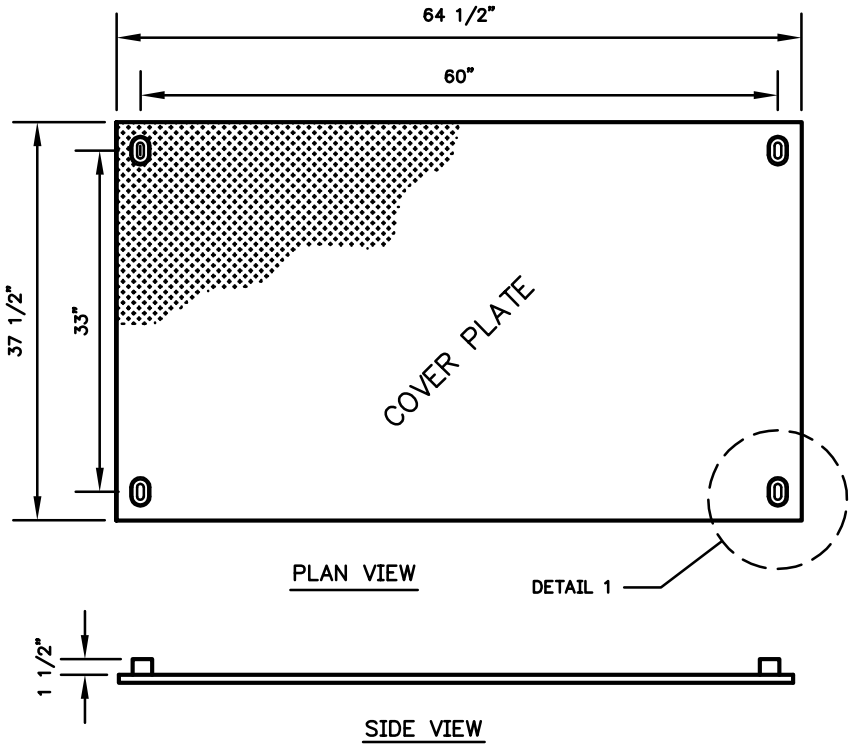
SPECIFICATION
PADMOUNTED
SWITCH STRUCTURE

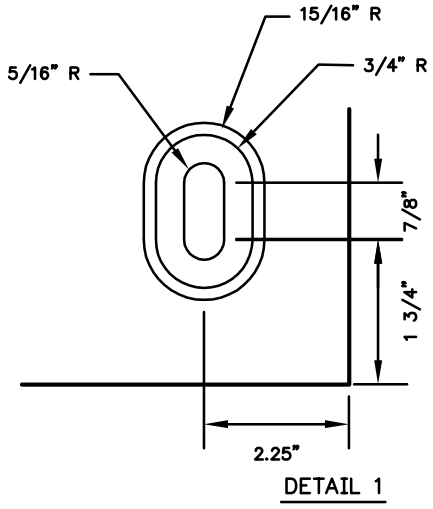
SHEET 1 OF 2

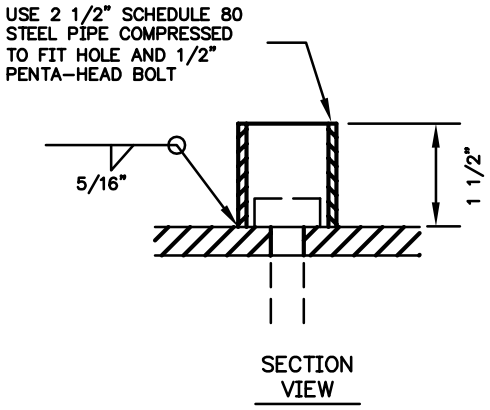
2018 DWG. NO.

E

109 PAGE







Nominal Box Size (inside dimensions)
Length = 102"
Width = 54"
Depth = 72"

Constructed of reinforced concrete

Knock-outs shall be thin wall per drawing

Box shall have a solid bottom with sump provided as shown

Four pulling eyes are requred for installation of conductors

Box shall be per ASTM C857

Cover shall be bolted into position using Penta head bolts

Penta head bolts shall be ½ x 13 NC

Cover shall be skid resistant

Cover shall be plate steel per ASTM A829

T.I.D. Stock # U-2095-001

SPECIFICATION
PADMOUNTED
SWITCH STRUCTURE

MATERIAL STANDARDS

Single Phase Transformer Pad Box

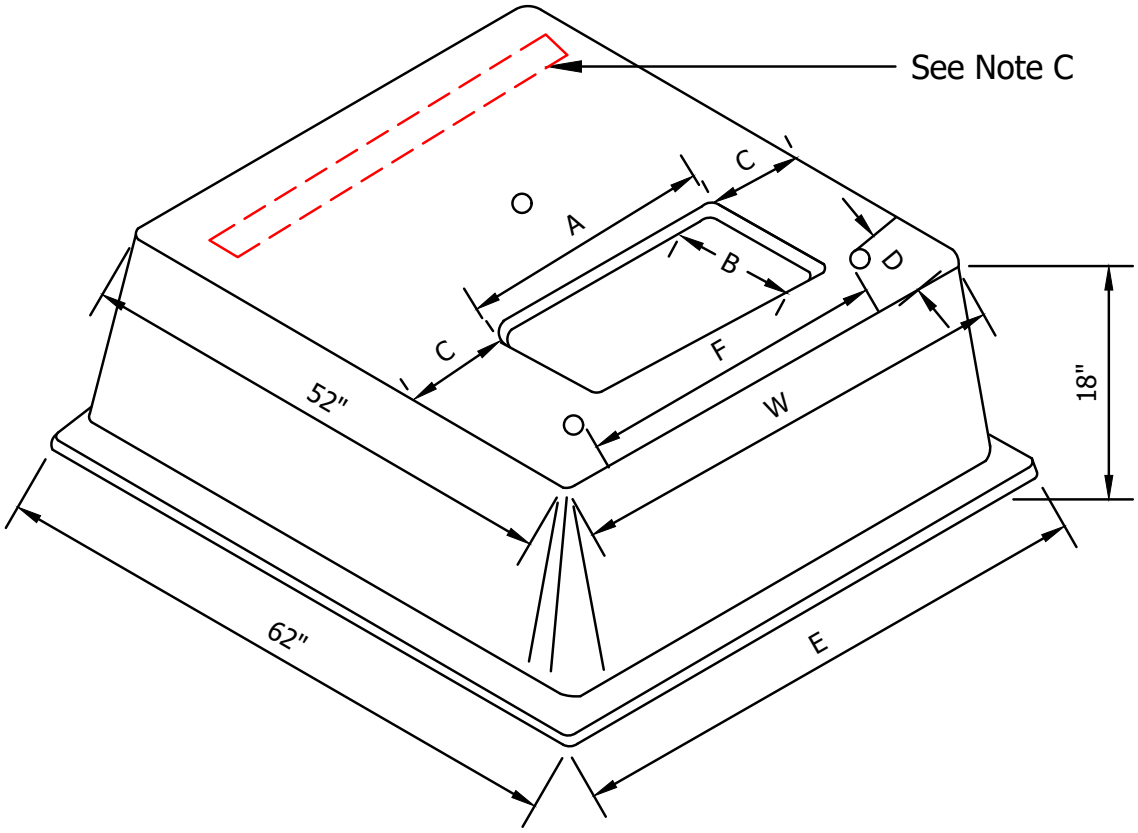


Figure 1

Notes

A. Box-pads are designed to fully encompass the transformer, including any radiators.

B. Each pad shall hold the full KVA range of the indicated style.

C. The pads shall be permanently identified with manufacturer's name, month, and year of fabrication, nominal weight and TID stock number.

D. The pads shall be designed to support transformer weighing 3000 pounds.

E. Two1/ 2" -13 UNC inserted for securing the transformer cabinet shall be provided as indicated. One 5/8" -11 UNC insert shall be provided at the center of gravity for lifting the pad.

F. The insert shall be installed flush with the surface of the pad.

G. The edges and corners shall be rounded.

Table 1 Pad Box Dimensions (3 Wire, 6 Bushing Style)

Item	Stock Number	A	B	C	D	E	F	W
1	U-2054-002	37"	15"	6.5"	4"	60"	40"	50"

SMALL PULL BOX

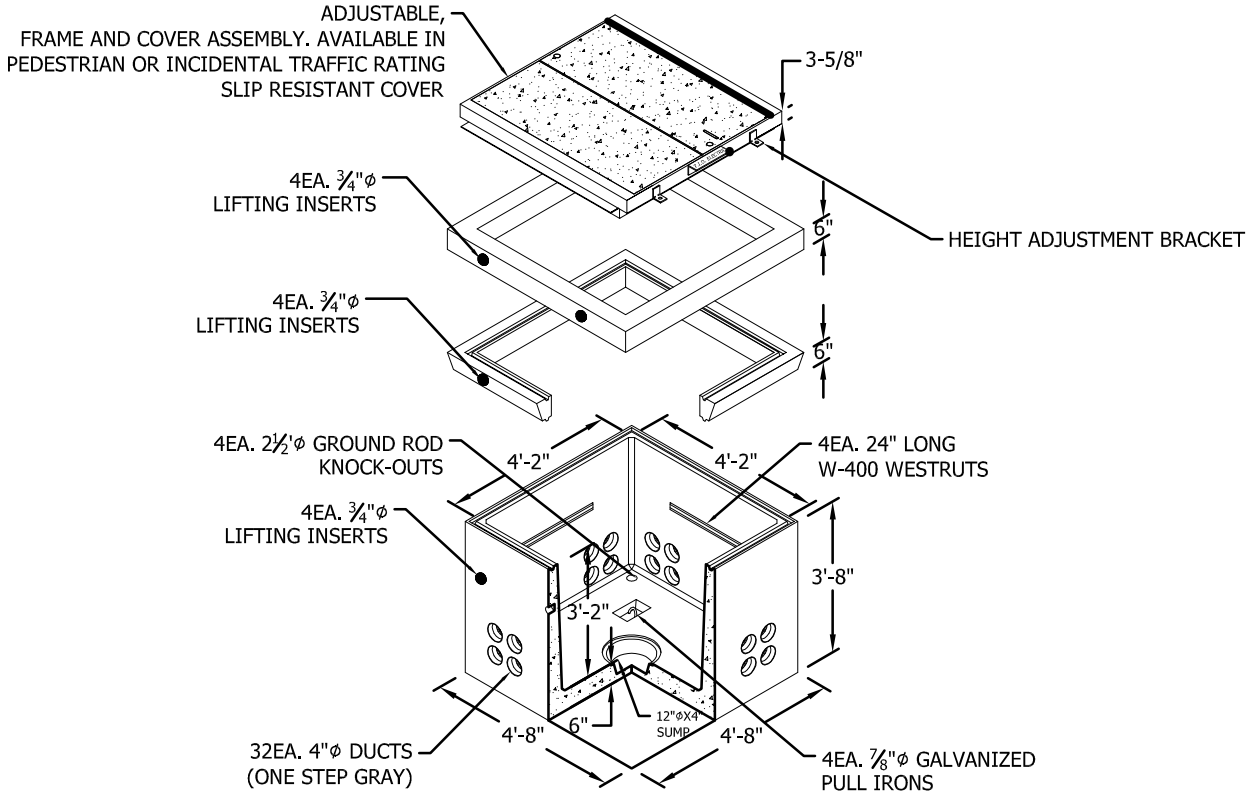


FIGURE 1

COVER

1. Rated for incident traffic.
2. Quick release.
3. Covers shall be skid resistant.
4. Aluminum plate and frame
5. Cover shall be bolted or locked into postion using penta head bolts.
6. Penta head bolts shall be 3/8 x 16 UNC x 2.75.
7. Cover shall have two blank plates with Plexiglass covers.
8. Cover shall be marked "T.I.D." "ELECTRIC"
9. Cover shall be torsion hinged or spring assist with hold open latches.

BOX

1. Constructed of reinforced concrete.
2. Box shall have solid bottom with drain holes provided.
3. All metal parts used shall be corrosion resistant.
4. Strut type channels, as close as practical to the sides of the box for equipment mounting purposes. They shall be mounted horizontally, and located 16" from top lip of box.
5. Knockout type openings shall be provided on all four sides.
6. Knockouts shall be located within 6" of bottom and 6" of sidewall.
7. Knockouts as shown in drawing.
8. Four pulling eyes are required for installation of conductors.
9. All segments of the design box shall be rated at a live load of 5000 lbs per AASHTO and ASTM C-857 (most recent version).

Table 1 Small Pull Box

Stock Number	Description	Dimensions (Internal)
U-2146-001	Small Pull Box	50" X 50 " X 38"
U-2146-006	Small Pull Box Lid	48" X 48"

TURLOCK IRRIGATION DISTRICT

MATERIAL STANDARDS

SPECIFICATION
PULL BOX

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
K	ADD SMALL BOX DIMENSIONS, UPDATE STOCK No.	SSG					EDJ	09-2017
J	UPDTAED TITLEBLOCK, MODEL	ELJ					MSG	09-2016
I	CHG DEPTH-005 TO 72", DELETE-001	SDC	DBM	KJO	GKT	BS	BILL	04-2008
H	INCREASED DEPTH TO 60", CHG LID	SDC					BILL	04-2005
G	REDRAW BOXES	SDC					BILL	04-2004

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LARGE PULL BOX

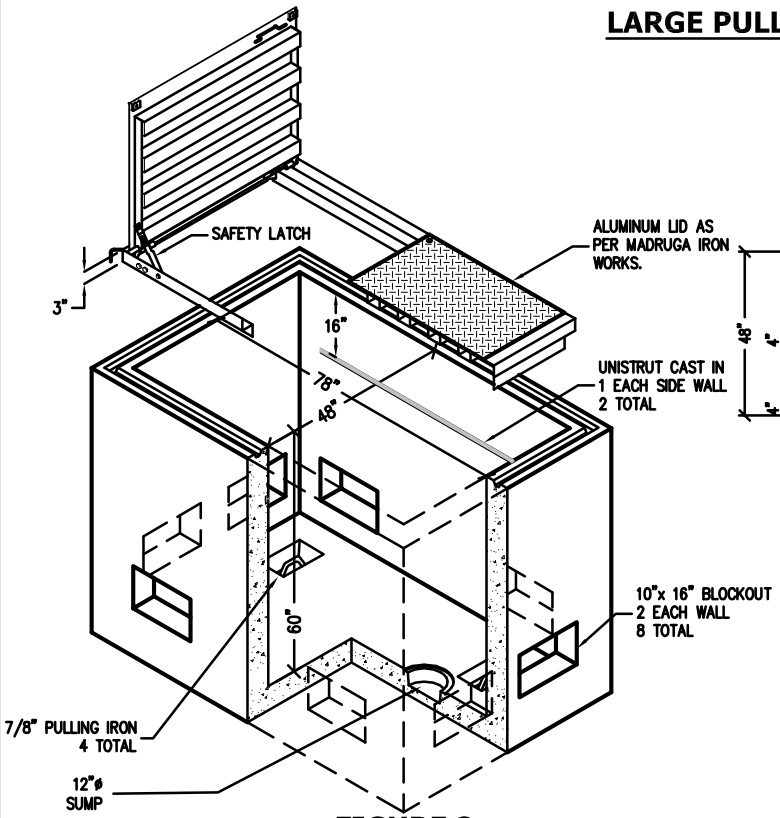


FIGURE 2

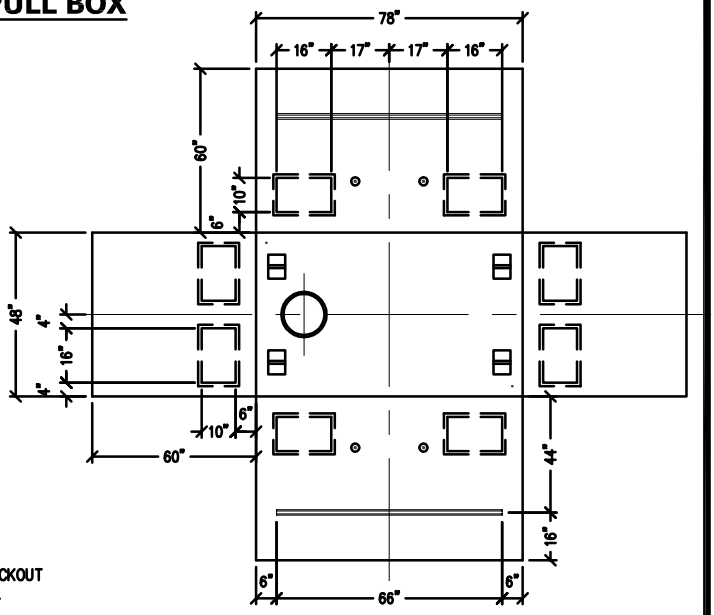


FIGURE 3

COVER

1. Rated for incident traffic.
2. Quick release.
3. Covers shall be skid resistant.
4. Aluminum plate and frame.
5. Cover shall be bolted or locked into postion using penta head bolts.
6. Penta head bolts shall be 3/8 x 16 UNC x 2.75.
7. Cover shall have two blank plates with Plexiglass covers.
8. Cover shall be marked "T.I.D." "ELECTRIC".
9. Cover shall be torsion hinged or spring assist with hold open latches.
10. Use Madruga Iron Works #4'x6'6" T.I.D or equivalent.

Table 2 Large Pull Box

Stock Number	Description	Inside Dimensions
U-2146-003	Large Pull Box	48" X 78 " X 60"
U-2146-008	Large Pull Box Lid	48" X 78"

BOX

1. Constructed of reinforced concrete.
2. Box shall have solid bottom with drain holes provided.
3. All metal parts used shall be corrosion resistant.
4. Strut type channels, as close as practical to the sides of the box for equipment mounting purposes. They shall be mounted horizontally, and located 16" from top lip of box.
5. Knockout type openings shall be provided on all four sides.
6. Knockouts shall be located within 6" of bottom and 6" of sidewall.
7. Knockouts as shown in drawing.
8. Four pulling eyes are required for installation of conductors.
9. All segments of the design box shall be rated at a live load of 8,000 lbs per AASHTO and ASTM C-857 (most recent version).

EXTRA LARGE PULL BOX

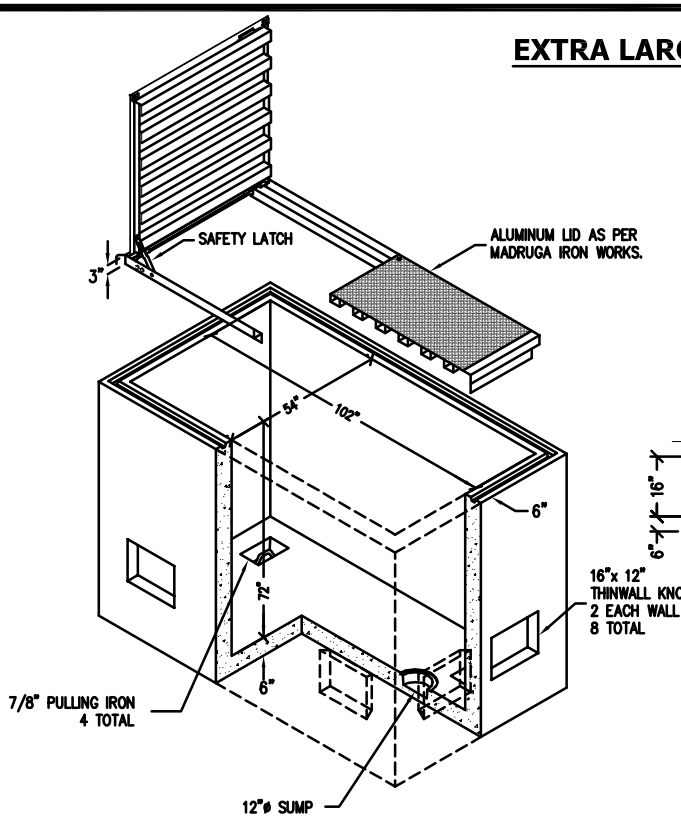


FIGURE 4

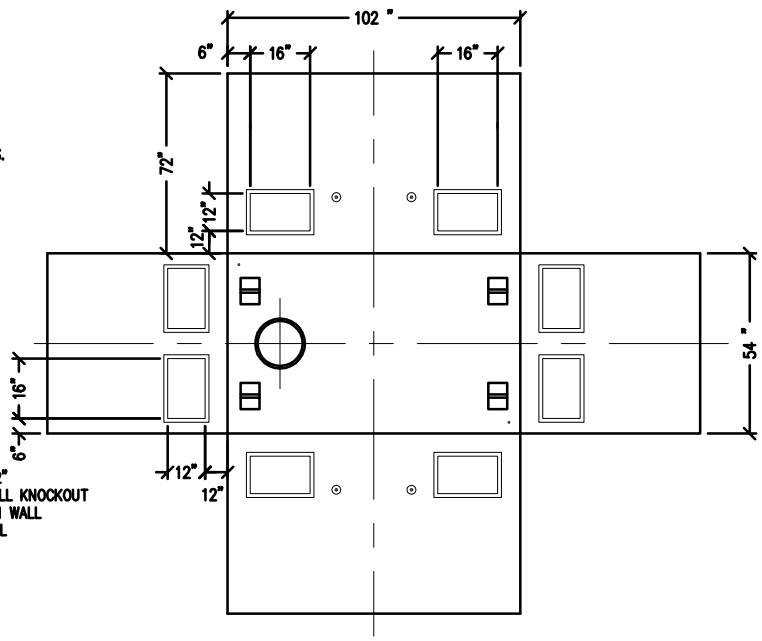


FIGURE 5

COVER

1. Rated for incident traffic.
2. Quick release.
3. Covers shall be skid resistant.
4. Aluminum plate and frame
5. Cover shall be bolted or locked into postion using penta head bolts.
6. Penta head bolts shall be 3/8 x 16 UNC x 2.75.
7. Cover shall have two blank plates with Plexiglass covers.
8. Cover shall be marked "T.I.D." "ELECTRIC"
9. Cover shall be torsion hinged or spring assist with hold open latches.
10. Use Madruga Iron Works #4'-8"x6'6" T.I.D or equivalent.

BOX

1. Constructed of reinforced concrete.
2. Box shall have solid bottom with drain holes provided.
3. All metal parts used shall be corrosion resistant.
4. Knockout type openings shall be provided on all four sides.
5. Knockouts shall be located within 12" of bottom and 6" of sidewall.
6. Knockouts as shown in drawing.
7. Four pulling eyes are required for installation of conductors.
8. All segments of the design box shall be rated at a live load of 12,000 lbs per AASHTO and ASTM C-857 (most recent version).

Table 3 Extra Large Pull Box

Stock Number	Description	Dimensions (Internal)
U-2146-005	Extra Large Pull Box	54" X 102" X 72"
U-2146-009	Extra Large Pull Box Lid	54" X 102"

TW=TOP WIDTH
TL=TOP LENGTH
BW=BOTTOM WIDTH
BL=BOTTOM LENGTH

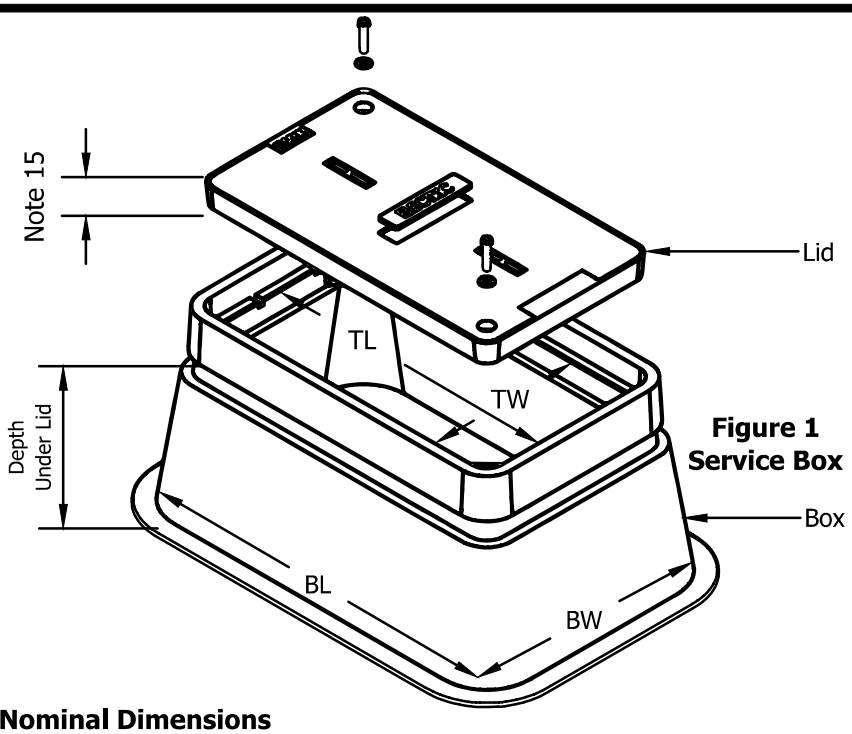


Figure 1
Service Box

Table 1 Nominal Dimensions

Stock Number	Size	Trade Size	Minimum Interior Dimensions (Inches)			
			Length		Width	Depth
U-1346-008	Small	13"x24"	Top	21	12	16
			Bottom	29	20	
U-1366-002	Large	17"x30"	Top	28	15	16
			Bottom	37	24	
U-1376-001	X-Large	24"x36"	Top	33	21	16
			Bottom	41	30	

Notes:

1. Assembly to consist of box with cover.
2. Meets WUC Guide 3.6 (latest revision) unless otherwise specified.
3. Boxes and lids to meet loading requirements of Designation A-16 of ASTM C 857 (latest revision), including the "live load increase".
4. Cover shall be marked "ELECTRIC".
5. Cover provided with lifting provisions.
6. Cover shall be gray in color.
7. Cover shall be lockable using (2) penta head bolts.
8. Penta head bolts shall be 1/2-6 coil x 2.50".
9. Non-corrosive materials to be used on locking device.
10. Materials shall be ultra-violet radiation resistant.
11. Box shall be constructed of polymer based material or have a polymer ring to assist in controlling sidewall and backfill deflections.
12. Box shall have adequate soil bearing surfaces to prevent settling in firm soils at the specified loading.
13. Box to be without bottom.
14. Use X-Large box for 8 position secondary connectors
15. X-Large box 3" lid. Small and large box 2"

TURLOCK IRRIGATION DISTRICT

MATERIAL STANDARDS

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
J	ADDED TRADE SIZE COLUMN	ADL					SSG	02-2025
K	ADDED INTERIOR DIMENSIONS	ADL					SSG	03-2023
J	ADDED SIZE COLUMN FOR SERVICE BOXES	ADL					SSG	11-22
I	TRAFFIC RATED SECONDARY BOX	MSG		EJ	PAM		MSG	07-15
H	REPLACE TITLE BLOCK	JRS	JSA	SDP	MLH	MSG	EDJ	06-13

SPECIFICATION
SERVICE BOX

SHEET 1 OF 4

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Table 2 Replacement WUC Cover

Stock Number	Box Size (in.)
U-1347-001	13 x 24
U-1367-001	17 x 30
U-1377-001	24 x 36

Replacement Cover per WUC Guide 3.6 (latest revision)

Table 3 Extension

Stock Number	Size (in.)
U-1368-008	17 x 30 x 8
U-1378-008	24 x 36 x 8

8" Extension Ring to Raise Box
For Placement Below Box

Table 4 Grade Ring

Stock Number	Size (in.)
U-1348-002	13 x 24 x 2
U-1368-002	17 x 30 x 2
U-1378-002	24 x 36 x 2

2" - 3" Grade Ring
WUC Guide 3.6 (latest revision) Cover Compatible

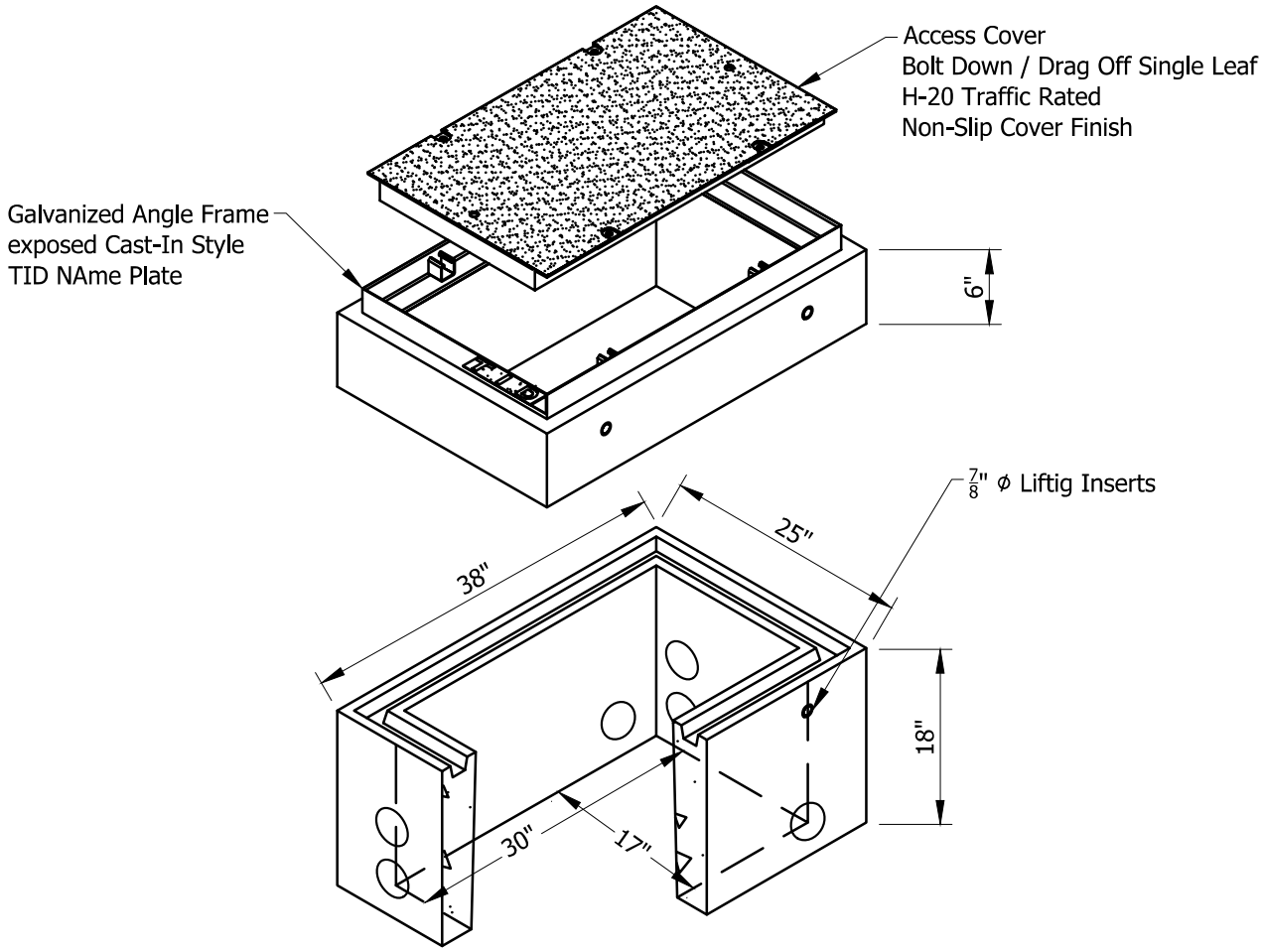


Figure 2
Concrete Box for Full Traffic

Table 5 Traffic Rated Box Dimensions

Stock Number	Size (in.)
U-1366-003	17 x 30 x 20

Notes - Concrete Boxes for Full Traffic:

1. Reinforced Concrete boxes for full traffic (H/20) must meet the requirements of the latest ASTM C-857.
2. Cover shall be lockable using non-corrosive penta head bolts (1/2-6 coil x2.50").
3. Concrete parts shall be interchangeable.
4. Covers shall have a high coefficient of friction (0.65 or better), slip resistant surface.
5. Box covers must have TID identification. The box body, cover, and extension must be labeled with the manufacturer's name and have the TID Stock Number on the inside surface.
6. All concrete parts shall be permanently identified as to the manufacturer on the inside surface.
7. All concrete parts shall be provided with four 7/8 inch diameter, 1-3/4 inch minimum deep inserts with UNC Class 2A threads.

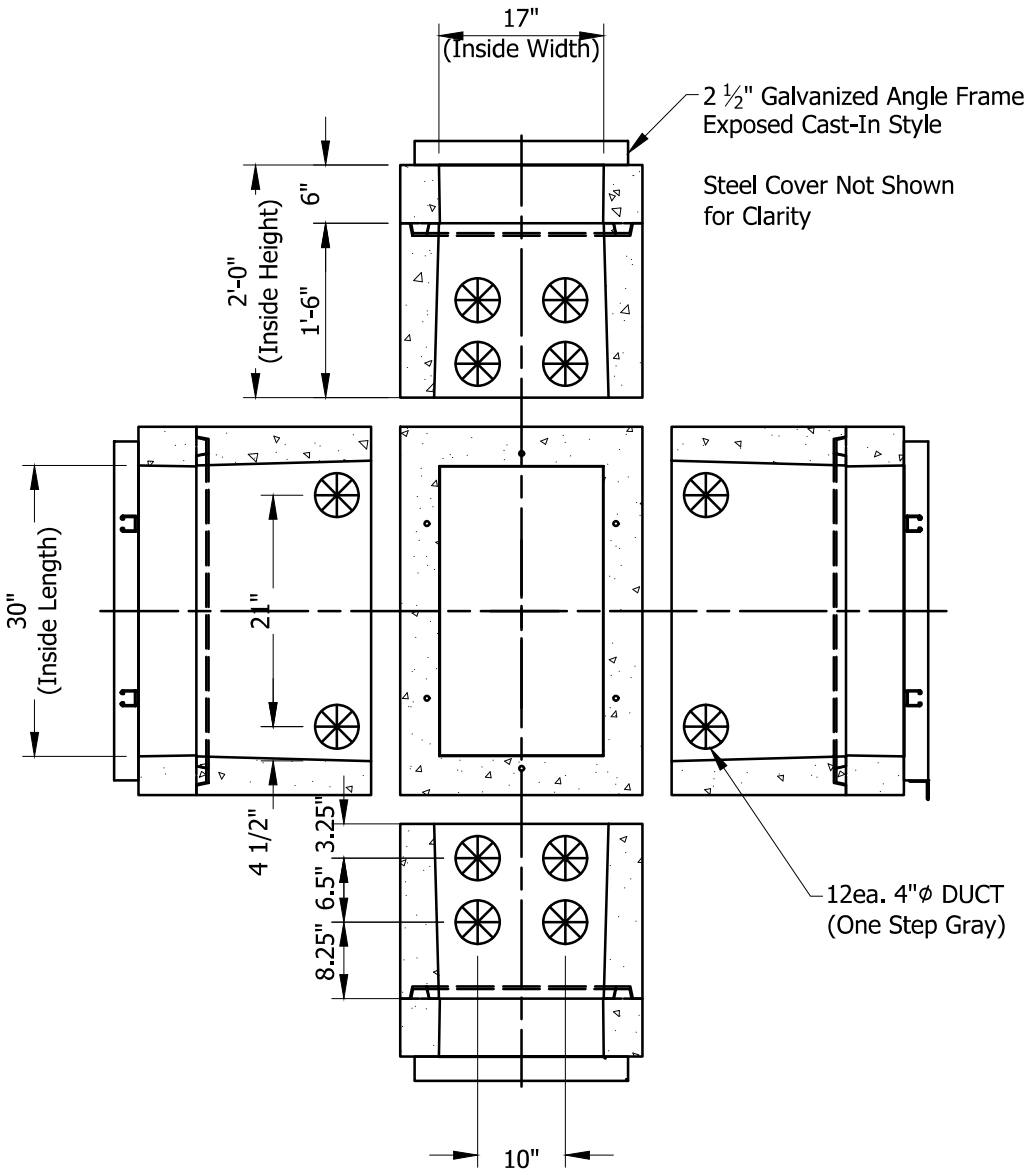


Figure 3
Concrete Box for Full Traffic



Figure 1
PVC Conduit



Figure 2
PVC Coupling



Figure 3
PVC Coupling Swedge

Table 1 PVC Conduit, Schedules 40&80

Stock Number	Description
U-6050-001	1" Schedule 80
U-6050-002	2" Schedule 80
U-6050-003	3" Schedule 80
U-6050-004	4" Schedule 80
U-6050-005	5" Schedule 80
U-6050-006	6" Schedule 80
U-6060-000	½" Schedule 40
U-6060-001	1" Schedule 40
U-6060-002	2" Schedule 40
U-6060-003	3" Schedule 40
U-6060-004	4" Schedule 40
U-6060-005	5" Schedule 40

Notes:
1. Meets NEMA TC-2
2. Meets UL-651
3. 10' length with belled end or coupling attached

Table 2 PVC Coupling

Stock Number	Description
U-6090-000	½" Coupling
U-6090-001	1" Coupling
U-6090-002	2" Coupling
U-6090-003	3" Coupling
U-6090-004	4" Coupling
U-6090-005	5" Coupling
U-6090-006	6" Coupling
U-6092-002	2" Coupling - Swedge
U-6092-003	3" Coupling - Swedge
U-6092-004	4" Coupling - Swedge
U-6092-005	5" Coupling - Swedge
U-6092-006	6" Coupling - Swedge

Notes:
1. For use with schedules 40 or 80
2. Meets all specifications for schedules 40 and 80 conduit

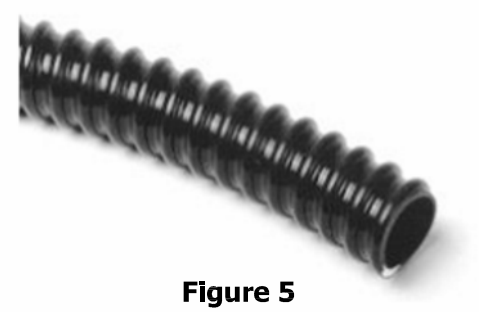


Figure 5
PVC Conduit, Flexible

Table 6 PVC Conduit, Flexible

Stock Number	Diameter (in.)
U-6150-000	½ *
U-6150-001	1 *
U-6150-002	2
U-6150-003	3
U-6150-004	4

* Maintains shape after bending.

Notes:
1. PVC Conduit, flexible, corrugated.

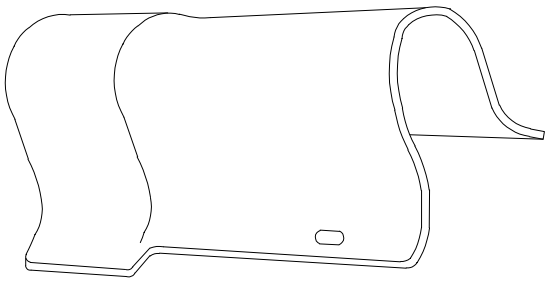


Figure 6
PVC Powermould, Schedule 40

Table 9 PVC Powermould

Stock Number	Diameter (in.)
U-6160-002	2
U-6160-003	3
U-6160-004	4
U-6160-005	5

Notes:
1. Schedule 40.
2. 10' length with belled end.
3. Per NEMA PH41, TC-19.

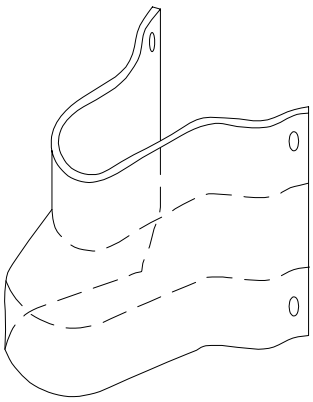


Figure 7
PVC Conduit to Powermould Adapter

Table 10 PVC Conduit to Powermould Adapter

Stock Number	Adapter Size (in.)
U-6170-002	4" conduit to 2" Powermould
U-6170-004	6" conduit to 4" Powermould

Notes:
1. Per NEMA PH41, TC-19.



Figure 4
PVC Elbow

Table 3 PVC Elbow, Schedule 40

Stock Number	Description
U-6065-003	3" 30° elbow, 36" radius, schedule 40
U-6065-004	4" 30° elbow, 36" radius, schedule 40
U-6065-005	5" 30° elbow, 36" radius, schedule 40
U-6075-002	2" 45° elbow, 18" radius, schedule 40
U-6075-003	3" 45° elbow, 36" radius, schedule 40
U-6075-004	4" 45° elbow, 36" radius, schedule 40
U-6075-005	5" 45° elbow, 36" radius, schedule 40
U-6085-001	1" 90° elbow, 5¾" radius, schedule 40
U-6085-002	2" 90° elbow, 36" radius, schedule 40
U-6085-003	3" 90° elbow, 36" radius, schedule 40
U-6085-004	4" 90° elbow, 36" radius, schedule 40
U-6085-005	5" 90° elbow, 36" radius, schedule 40
U-6085-007	2" 90° elbow, 24" radius, schedule 40
U-6085-008	4" 90° elbow, 60" radius, schedule 40
U-6085-009	5" 90° elbow, 60" radius, schedule 40
U-6085-010	6" 90° elbow, 60" radius, schedule 40

Table 4 PVC Elbow, Schedule 80

Stock Number	Description
U-6063-003	3" 30° elbow, 36" radius, schedule 80
U-6063-004	4" 30° elbow, 36" radius, schedule 80
U-6063-005	5" 30° elbow, 36" radius, schedule 80
U-6070-002	2" 45° elbow, 18" radius, schedule 80
U-6070-003	3" 45° elbow, 36" radius, schedule 80
U-6070-004	4" 45° elbow, 36" radius, schedule 80
U-6070-005	5" 45° elbow, 36" radius, schedule 80
U-6080-001	1" 90° elbow, 5¾" radius, schedule 80
U-6080-002	2" 90° elbow, 36" radius, schedule 80
U-6080-003	3" 90° elbow, 36" radius, schedule 80
U-6080-004	4" 90° elbow, 36" radius, schedule 80
U-6080-005	5" 90° elbow, 36" radius, schedule 80
U-6080-007	2" 90° elbow, 24" radius, schedule 80

Notes:
1. For use with schedules 40 or 80 conduit.
2. Meets all specifications for schedules 40 and 80 conduit.

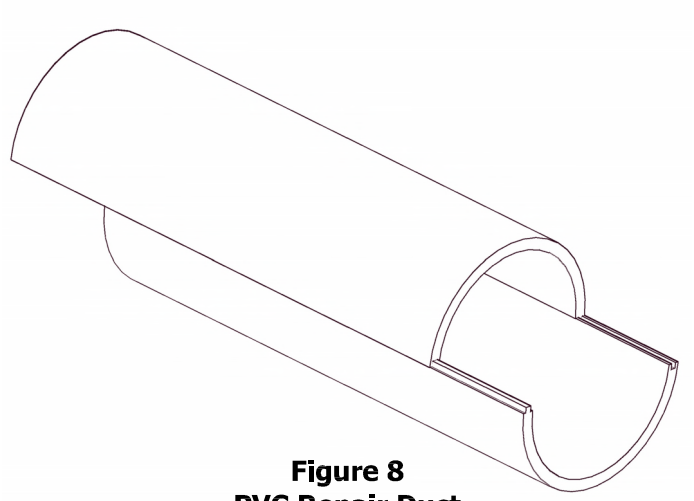


Figure 8
PVC Repair Duct

Table 7 PVC Repair Duct

Stock Number	Diameter (in.)
U-6061-002	2
U-6061-003	3
U-6061-004	4
U-6061-005	5

Notes:
1. Schedule 40.
2. 10' section.
3. Interlock design.
4. Ultraviolet resistant.
5. For repair of schedule 40, schedule 80, and DB 120 conduit.

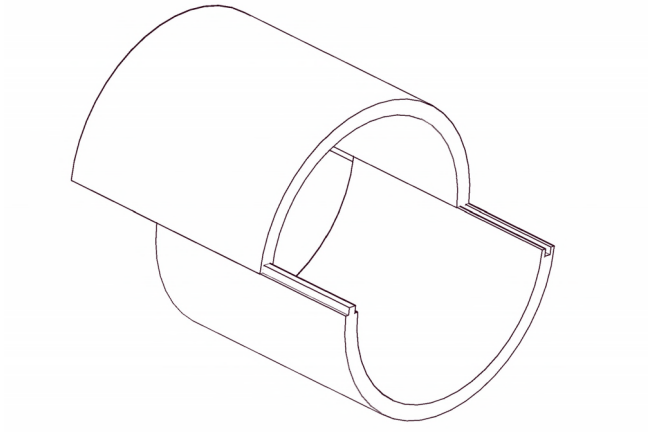


Figure 9
PVC Repair Coupling

Table 8 PVC Repair Coupling

Stock Number	Diameter (in.)
U-6095-002	2
U-6095-003	3
U-6095-004	4
U-6095-005	5
U-6095-006	6

Notes:
1. For use with repair duct.
2. Interlock design.



Figure 10
Conduit Strap

Table 11 Conduit Strap

Stock Number	Diameter (in.)
U-6048-000	$\frac{1}{2}$
U-6048-001	1
U-6048-002	2
U-6048-003	3
U-6048-004	4
U-6048-005	5
U-6048-006	6

Notes:
1. Hot dip galvanized.
2. 2 hole mounting.
3. Mounting tabs bend 90° on 1", 2", and 3" straps.
4. Mounting tabs bend 30° on 4" and 5" straps.



Figure 11
Terminal Adapter

Table 13 Terminal Adapter

Stock Number	Diameter (in.)
U-6180-001	1
U-6180-002	2
U-6180-003	3
U-6180-004	4

Notes:
1. For use with schedules 40 or 80 conduit.
2. Meets all specifications of schedules 40 and 80 conduit.



Figure 12
Female Adapter

Table 14 Female Adapter

Stock Number	Diameter (in.)
U-6185-001	1
U-6185-002	2
U-6185-003	3
U-6185-004	4

Notes:
1. For use with schedules 40 or 80 conduit.
2. Meets all specifications of schedules 40 and 80 conduit.



Figure 13
Access Fitting, Type T

Table 15 Access Fitting, Type T

Stock Number	Diameter (in.)
U-6190-001	1

Notes:
1. For use with schedules 40 or 80 conduit.
2. Meets all specifications of schedules 40 and 80 conduit.

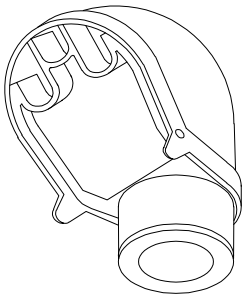


Figure 14
Service Entrance Cap

Table 16 Service Entrance Cap

Stock Number	Diameter (in.)
U-6200-001	1

Notes:
1. For use with schedules 40 or 80 conduit.
2. Meets all specifications of schedules 40 and 80 conduit.



Figure 15
PVC Solvent Cement

Table 17 PVC Solvent Cement

Stock Number	Size (Qt.)
U-6140-002	1

Notes:
1. For use with schedules 40 or 80 PVC conduit.

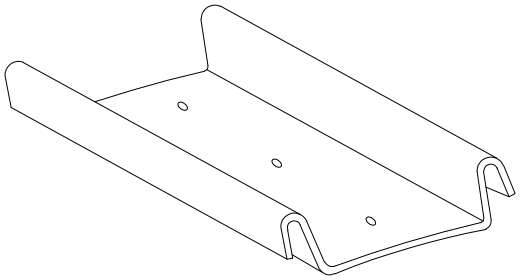


Figure 16
Backing Plate

Table 18 Backing Plate

Stock Number	Size (in.)
U-6165-003	3
U-6165-005	5

Notes:
1. 10' length.

Table 19 Conduit Carrier



Figure 17
Conduit Carrier

Stock Number	Size (in.)
U-7325-001	3 /4 " - 1 - 1 / 4"
U-7325-003	3" - 4"
U-7325-004	4" - 6"
U-7325-008	1-1/2" - 2 - 1/2"

Notes:
1. Heavy-gauge Waterproof woven nylon.
2. Each inflatable line carrier adjusts to fit conduit.

Conductor installed in the District must meet certain requirements. Included in the requirements are the conductor size, type, stranding and insulation. Material not in compliance will be rejected by the District inspectors. Initially, a few select conductors were accepted by the District. In an effort to have underground cable more readily available for contractor through local suppliers, changes have been made to enlarge the list of acceptable cable. Turlock Irrigation District still requires XLP insulation, 1350 aluminum alloy with standard stranding and insulation thickness. The best way to insure compliance is to specify the code name.

An additional change is the acceptance of paralleling the conductor by the contractor. Paralleling is installing three single conductors simultaneously without benefit of the conductors being intertwined; however, the neutral wire must be permanently marked. Color tape (preferably white) or wire ties with labeling is acceptable provided it is determined to be permanent for the neutral.

The following list of conductors with size, stranding, insulation and code names are acceptable for installation at the District



Figure 1
Single Conductor

Table 1 Single Conductor XLP EC Grade per NEMA WC-7 1350 Aluminum

Size	Stranding	SIW Min Standing	Insulation	Code Name
1/0	19	7	80 mils	Harvard
2/0	19	11	80 mils	Yale
4/0	19	17	80 mils	Beloit
350	37	24	95 mils	Rutgers
500	37	30	95 mils	Emory
750	61	53	110 mils	Sewanee
1000	61	53	110 mils	Fordham

Notes:

1. Compacted cable and building wire known as S8000 is NOT acceptable.

Table 2 Triplex/Tri Parallel Conductor XLP EC Grade 1350 Aluminum

Cable Size		Stranding	SIW Min. Stranding	Insulation (mils)	Acceptable Code Names			
Phase	Neutral							
1/0	#2	19, 19, 7	7, 7, 7	80, 80, 60	Queens	Rosary	Marion	Brenau
	1/0	19, 19, 19	7, 7, 7	80, 80, 80	Paterson	Luther	Montchlair	Bergen
2/0	1/0	19, 19, 19	11, 11, 7	80, 80, 80				Shaw
	2/0	19, 19, 19	11, 11, 11	80, 80, 80	Caldwell	Lehman	Bloomfield	Hunter
4/0	1/0	19, 19, 19	18, 18, 7	80, 80, 80			Molloy	Manhattanville
	2/0	19, 19, 19	18, 18, 11	80, 80, 80	Trinity	Belmont	Regis	Sweetbriar
	4/0	19, 19, 19	18, 18, 18	80, 80, 80	Bronx	Glassboro	Manhattan	Monmouth
350	4/0	37, 37, 19	36, 36, 18	95, 95, 80				Wesleyan
500	350	37, 37, 37	36, 36, 33	95, 95, 95	Kings	Trenton	Brooklyn	Rider
	500	37, 37, 37	36, 36, 36	95, 95, 95	Stevens	Jersey City	St. Johns	Westchester

Table 3 Quadplex/Quad Parallel Conductor XLP EC Grade 1350 Aluminum

Cable Size		Stranding	SIW Min. Stranding	Insulation (mils)	Acceptable Code Names			
Phase	Neutral							
1/0	#2	19, 19, 19, 7	7, 7, 7, 7	80, 80, 80, 60	Kent	Cerritos	Piedmont	Notre Dame
	1/0	19, 19, 19, 19	7, 7, 7, 7	80, 80, 80, 80	Carthage	Kellogg	Southern	Purdue
2/0	1/0	19, 19, 19, 19	11, 11, 11 ,7	80, 80, 80, 80				
	2/0	19, 19, 19, 19	11, 11, 11, 11	80, 80, 80, 80	Lycoming	Itasca	Brandeis	Lafayette
4/0	2/0	19	18	80	Wake Forest			
	4/0	19	18	80	Earlham			
500	350	37, 37, 37, 37	36, 36, 36, 33	95, 95, 95, 95	Salesian	Berry	Valparaiso	Wofford
	500	37, 37, 37, 37	36, 36, 36, 36	95, 95, 95, 95	Covenant	Citadel	Marshall	Lackawanna

Section IV: Materials

DEVELOPER PROVIDED MATERIAL USED IN UNDERGROUND CONSTRUCTION

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
O-3325-008	**GROUND ROD, 8 FT X 5/8"**	
	COOPER POWER SYSTEMS	DN3C8
	ERICO	615880
	NEHRING	NCC588
	MACLEAN POWER SYSTEMS	J8338
	KORTICK	K5428
	HUBBELL POWER SYSTEMS	C615880
O-5505-001	**WIRE, BARE COPPER 1/0 AWG**	
	SERVICE	
	SOUTHWIRE	
	GENERAL CABLE	
	NEHRING	
O-5505-002	**WIRE, BARE COPPER, 2/0 AWG**	
	SERVICE	
	SOUTHWIRE	
	GENERAL CABLE	
	NEHRING	
O-5965-001	**WIRE, COVERED AAC, 1000 MCM XLP**	
	Code Name: FORDHAM	
	ALCAN	
	PRYSMIAN	
	NEXANS	
	SOUTHWIRE	
	GENERAL CABLE	
	KINGWIRE	

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
O-5985-005	**WIRE, COVERED AAC, 750 MCM XLP**	
	Code Name: SEWANEE	
	ALCAN	
	PRYSMIAN	
	GENERAL CABLE	
	SOUTHWIRE	
	NEXANS	
	KINGWIRE	
O-7189-002	**SCREWS, LAG, WASHER HEAD 1/4 x 2 OR 2 1/2 IN**	
	JOSLYN	J26486.2
	EMC	105
O-7370-001	**GROUND ROD CLAMP FOR 5/8 ROD**	
	PENN UNION	CAB-2
	BLACKBURN	JAB58H
	JOSLYN	J8492H
	KORTICK	K4672
	CMC	WB58
	ERITECH	HDC58R
	BURNDY	GRC58
U-1346-008	**SERVICE BOX (SMALL) 13” x 24”**	
	NEW BASIS	FCA132418T-90012
	ARMORCAST	A6001618TA-TID
U-1366-002	**SERVICE BOX (LARGE) 17” x 30”**	
	NEW BASIS	FCA173018T-90016

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-1376-001	**SERVICE BOX (EXTRA LARGE) 24" x 36"**	
	New Basis	FCA243618T-90016
U-2054-002	**Transformer Pad - Single Phase**	
	JENSEN PRECAST	100008588
U-2056-001	**TRANSFORMER PAD – THREE PHASE (75 – 500 KVA)**	
	Jensen Precast	100002227
	Oldcastle	270302
U-2056-005	**TRANSFORMER PAD – THREE PHASE (750 KVA & larger)**	
	NEW BASIS	By Description & Spec
	Jensen Precast	
	Oldcastle	
U-2095-001	**PADMOUNTED SWITCH SUBSTRUCTURE**	
		By description & Spec
	JENSEN PRECAST	4686 SWITCH VAULT
	Oldcastle	

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-2146-003	**Pull Box - Large (12,000 lb loading) (48" x 78" x 60")**	
	JENSEN PRECAST	PB466_4878_TID
	Oldcastle	TID-4878
U-2146-005	**Pull Box – X-Large (12,000 lb loading) (54" x 102" x 72")**	
	JENSEN PRECAST	PB4686_54102_TID
	Oldcastle	TID-4686
U-2178-001	**Concrete Transformer Vault (48" x 48" x 78")**	
	UTILITY VAULT	By Description & Spec.
U-2178-002	**Concrete Transformer Vault Complete Lid Assembly**	
	UTILITY VAULT	By Description & Spec.
U-2178-003	**Concrete Transformer Vault 6" Extension Ring**	
	UTILITY VAULT	By Description & Spec.
U-2179-001	**Horizontal Transformer Vault (36" x 60" x 54")**	
	JENSEN PRECAST	35 TRANSFORMER VAULT
	Oldcastle	TID-3546
U-6045-001	**Conduit Brace**	
	SHERMAN RILEY	KC-1
	CONTINENTAL	CRB396

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-6048-001	**Conduit Strap – 1”**	
	INWESCO	50A10
	L.H DOTTIE	HW403
U-6048-002	**Conduit Strap – 2”**	
	INWESCO	50A14
	L.H DOTTIE	HW406
U-6048-003	**Conduit Strap – 3”**	
	INWESCO	50A18
	L.H DOTTIE	HW408
U-6048-004	**Conduit Strap – 4”**	
	INWESCO	50A22
	L.H DOTTIE	HW410
U-6048-005	**Conduit Strap – 5”**	
	INWESCO	50A26
U-6048-006	**Conduit Strap – 6”**	
	INWESCO	50A30
U-6050-001	**Conduit – 1” Schedule 80**	
	CARLON	49408
	JM EAGLE	80100
	CANTEX	A53BA12
U-6050-002	**Conduit – 2” Schedule 80**	
	CARLON	49411
	JM EAGLE	80200
	CANTEX	A53CA12

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-6050-003	**Conduit – 3” Schedule 80**	
	CARLON	49413
	JM EAGLE	80300
	CANTEX	A53DA12
U-6050-004	**Conduit – 4” Schedule 80**	
	CARLON	49415
	JM EAGLE	80400
	CANTEX	A53EA12
U-6050-005	**Conduit – 5” Schedule 80**	
	CARLON	49416
	JM EAGLE	4705000102
	CANTEX	A53FA12
U-6050-006	**Conduit – 6” Schedule 80**	
	CARLON	49417-010
	JM EAGLE	80500
	CANTEX	A53GA12
U-6060-002	**Conduit – 2” Schedule 40**	
	CARLON	49011
	JM EAGLE	80600
	CANTEX	A52CA12
U-6060-003	**Conduit – 3” Schedule 40**	
	CARLON	49013
	JM EAGLE	4603000103
	CANTEX	A52DA12

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-6060-004	**Conduit – 4” Schedule 40**	
	CARLON	49015
	JM EAGLE	4604000103
	CANTEX	A52EA12
U-6060-005	**Conduit – 5” Schedule 40**	
	CARLON	49016
	JM EAGLE	4605000103
	CANTEX	A52FA12
U-6063-003	**Conduit - Elbow 3” 30° 36” Radius Schedule 80**	
	CARLON	UB6FL
	CANTEX	5123759
	JM EAGLE	3303680
U-6063-004	**Conduit - Elbow 4” 30° 36” Radius Schedule 80**	
	CARLON	UB6FN
	CANTEX	5123760
	JM EAGLE	4303680
U-6063-005	**Conduit - Elbow 5” 30° 36” Radius Schedule 80**	
	CARLON	UB6FP
	CANTEX	5123761
	JM EAGLE	5303680
U-6070-002	**Conduit - Elbow 2” 45° 18” Radius Schedule 80**	
	CARLON	UB7CJ
	JM EAGLE	2451880

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-6070-003	**Conduit - Elbow 3” 45° 36” Radius Schedule 80**	
	CARLON	UB7FL
	CANTEX	5121077
	JM EAGLE	3453680
U-6070-004	**Conduit - Elbow 4” 45° 36” Radius Schedule 80**	
	CARLON	UB7FN
	CANTEX	5119821
	JM EAGLE	4453680
U-6070-005	**Conduit - Elbow 5” 45° 36” Radius Schedule 80**	
	CARLON	UB7FP
	CANTEX	5119820
	JM EAGLE	5453680
U-6075-002	**Conduit - Elbow 2” 45° 18” Radius Schedule 40**	
	CARLON	UA7CJ
	CANTEX	5133797
	JM EAGLE 2	2451840
U-6075-003	**Conduit - Elbow 3” 45° 36” Radius Schedule 40**	
	CARLON	UA7FL
	CANTEX	5133779
	JM EAGLE	3453640
U-6075-004	**Conduit - Elbow 4” 45° 36” Radius Schedule 40**	
	CARLON	UA7FN
	CANTEX	5133777
	JM EAGLE	4453640

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-6075-005	**Conduit - Elbow 5” 45° 36” Radius Schedule 40**	
	CARLON	UA7FP
	CANTEX	5133780
	JM EAGLE	5453640
U-6080-002	**Conduit - Elbow 2” 90° 24” Radius Schedule 80**	
	CARLON	UB9CJ
	CANTEX	5121099
	JM EAGLE	2901880
U-6080-003	**Conduit - Elbow 3” 90° 36” Radius Schedule 80**	
	CARLON	UB9FL
	CANTEX	5121081
	JM EAGLE	3903680
U-6080-004	**Conduit - Elbow 4” 90° 36” Radius Schedule 80**	
	CARLON	UB9FN
	CANTEX	5121023
	JM EAGLE	4903680
U-6080-005	**Conduit - Elbow 5” 90° 36” Radius Schedule 80**	
	CARLON	UB9FP
	CANTEX	5121083
	JM EAGLE	5903680
U-6085-002	**Conduit - Elbow 2” 90° 24” Radius Schedule 40**	
	CARLON	UA9CJ
	CANTEX	5133844
	JM EAGLE	2901840

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-6085-003	**Conduit - Elbow 3” 90° 36” Radius Schedule 40**	
	CARLON	UA9FL
	PW PIPE	By Description
	CANTEX	5133820
	JM EAGLE	3903640
U-6085-004	**Conduit - Elbow 4” 90° 36” Radius Schedule 40**	
	CARLON	UA9FN
	CANTEX	5133821
	JM EAGLE	4903640
U-6085-005	**Conduit - Elbow 5” 90° 36” Radius Schedule 40**	
	CARLON	UA9FP
	CANTEX	5133841
	JM EAGLE	5903640
U-6085-006	**Conduit - Elbow 6” 90° 60” Radius Schedule 40**	
	CARLON	UA9IR
	CANTEX	5133886
	JM EAGLE	By Description
U-6090-002	**Conduit – 2” Schedule 40/80 Coupling**	
	PRIME CONDUIT	E940J
	JM EAGLE	60010200
	KRALOY	JM-240CPL
	CANTEX	6141628
U-6090-003	**Conduit – 3” Schedule 40/80 Coupling**	
	CARLON	E640L
	JM EAGLE	60010300
	KRALOY	JM-340CPL
	CANTEX	6141630

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-6090-004	**Conduit – 4" Schedule 40/80 Coupling**	
	CARLON	E940N
	JM EAGLE	60010400
	KRALOY	E13140
	CANTEX	6141632
U-6090-005	**Conduit – 5" Schedule 40/80 Coupling**	
	CARLON	E940P
	JM EAGLE	60010500
	KRALOY	E13150
	CANTEX	6141633
U-6090-006	**Conduit – 6" Schedule 40/80 Coupling**	
	CARLON	E940R
	JM EAGLE	60010600
	CANTEX	6141634
U-6092- 002	**Conduit – 2" Schedule 40 Long Line Coupling**	
	CARLON	E941J
	CANTEX	6121623
	JM EAGLE	240FABCPL
U-6092- 003	**Conduit – 3" Schedule 40 Long Line Coupling**	
	CARLON	E941L
	CANTEX	6202005
	JM EAGLE	340FABCPL
U-6092- 004	**Conduit – 4" Schedule 40 Long Line Coupling**	
	CARLON	E941N
	CANTEX	6202010
	JM EAGLE	440FABCPL

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-6135-002	**Conduit – 2" Plug (Cap)**	
	CARLON	P258J
	PW PIPE	61800200
	KRALOY	E35020A
	CANTEX	5315248
U-6135-003	**Conduit – 3" Plug (Cap)**	
	CARLON	P258LT
	PW PIPE	61800300
	KRALOY	E35030A
	CANTEX	5315260
U-6135-004	**Conduit – 4" Plug (Cap)**	
	CARLON	P258N
	PW PIPE	61800400
	KRALOY	E35040A
	CANTEX	5315252
U-6135-005	**Conduit – 5" Plug (Cap)**	
	CARLON	P258P
	PW PIPE	61800500
	KRALOY	E35050A
	CANTEX	5315253
U-6140-002	**Solvent Cement for Conduit - 1 qt PVC All Weather**	
	CARLON	VC9982
	WELD ON	DUIT 427
	T-CHRISTY	RH-RHBV-QT-12

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
6220-000	**Compression Terminal Lug for #2 Wire**	
	ANDERSON	AHL-2-BN-TP
	BLACKBURN	AL4P
	HOMAC	SA2 NTN
	DOSSERT	DPL 6-2N-D2-EC-SN N
	ASK PRODUCTS	ALM212/1.75TP
U-6220-001	**Compression Terminal Lug for 1/0 Wire**	
	PENN UNION	BLUA-1/0D3
	ANDERSON	AHL-1/0-BN-TP
	BLACKBURN	AL6P
	HOMAC	AL1/0-NTN
U-6220-002	**Compression Terminal Lug for 2/0 Wire**	
	PENN UNION	BLUA-2/0D
	ANDERSON	AHL-2/0-BN-TP
	BLACKBURN	AL8P
	HOMAC	AL2/0-NTN
U-6220-003	**Compression Terminal Lug for 4/0 Wire**	
	PENN UNION	BLUA-4/0D
	ANDERSON	AHL-4/0-BN-TP
	BLACKBURN	AL12P
	HOMAC	AL4/0-NTN
U-6220-004	**Compression Terminal Lug for 350 MCM Wire**	
	PENN UNION	BLUA-035D
	ANDERSON	AHL-350-BN-TP
	BLACKBURN	AL18P
	HOMAC	AL350-NTN

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-6220-005	**Compression Terminal Lug for 500 MCM Wire**	
	PENN UNION	BLUA-050D2
	ANDERSON	VACL-500-12BN
	BLACKBURN	ALS4P
	HOMAC	2081-500
	MAC	MUH 500
U-6220-006	**Compression Terminal Lug for 750 MCM Wire**	
	ANDERSON	AHL-750-BN-TP
	BLACKBURN	AL44P
	HOMAC	AL750-NTN
	PENN UNION	KWL-079D1-P1C
	BURNDY	YA39A5
U-6220-007	**Compression Terminal Lug for 1000 MCM Wire**	
	BURNDY	YCAK44A-2G2
	PENN UNION	KWL-100D1-TN
	BLACKBURN	AL60P
U-6225-004	**WIRE, COVERED AAC, 4/0 AWG XLP**	
	Code Name: BELOIT	
	ALCAN	
	PRYSMIAN	
	NEXANS	
	SOUTHWIRE	
	CENTELSA	
U-6225-007	**WIRE, COVERED AAC, 500 MCM XLPE**	
	Code Name: EMORY	
	ALCAN	
	PRYSMIAN	
	NEXANS	
	SOUTHWIRE	
	CENTELSA	

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-6229-001	**CABLE, COVERED AAC, TRIPLEX 1/0 XLPE**	
	Code Name: BRENAU, MARIAN, QUEENS, ROSARY, PATERSON, LUTHER, MONTCHLAIR,BERGEN	
	ALCAN	
	PRYSMIAN	
	NEXANS	
	SOUTHWIRE	
	CENTELSA	
U-6229-002	**CABLE, COVERED AAC, TRIPLEX 2/0 XLPE**	
	Code Name: SHAW, CALDWELL, LEHMAN, BLOOMFIELD, HUNTER	
	ALCAN	
	PRYSMIAN	
	NEXANS	
	SOUTHWIRE	
	CENTELSA	
U-6229-004	**CABLE, COVERED AAC, TRIPLEX 4/0 XLPE**	
	Code Name; MOLLOY, MANHATTANVILLE, TRINITY, BELMONT, REGIS, SWEETBRIAR	
	ALCAN	
	PRYSMIAN	
	NEXANS	
	SOUTHWIRE	
	CENTELSA	
U-6229-006	**CABLE, COVERED AAC, TRIPLEX 350 XLPE**	
	Code Name: WESLEYAN	
	ALCAN	
	PRYSMIAN	
	NEXANS	
	SOUTHWIRE	
	CENTELSA	

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-6229-007	**CABLE, COVERED AAC, TRIPLEX 500 XLPE**	
	Code Name : RIDER, BROOKLYN, KINGS, TRENTON, STEVENS, JERSEY CITY, ST. JOHNS, WESTCHESTER	
	ALCAN	
	PRYSMIAN	
	NEXANS	
	SOUTHWIRE	
	CENTELSA	
U-6232-001	**CABLE, COVERED AAC, QUADPLEX 1/0 XLPE**	
	Code name : NOTRE DAME, PIEDMONT, CERRITOS, KENT, CARTHAGE, KELLOGG, SOUTHERN PURDUE	
	ALCAN	
	PRYSMIAN	
	NEXANS	
	SOUTHWIRE	
U-6232-002	**CABLE, COVERED AAC, QUADPLEX 2/0 XLPE**	
	Code Name: LYCOMING, ITASCA, BRANDEIS, LAFAYETTE	
	ALCAN	
	PRYSMIAN	
	NEXANS	
	SOUTHWIRE	
U-6232-007	**CABLE, COVERED AAC, QUADPLEX 500 XLPE**	
	Code Name: WOFFORD, VALPARAISO, BERRY, SALESIAN, MARSHALL, CITADEL, LACKAWANNA, COVENANT	
	ALCAN	
	PRYSMIAN	
	NEXANS	
	SOUTHWIRE	
U-6290-000	**CABLE PULLING COMPOUND 1 GALLON**	
	ARNCO	HL B1005P
	POLYWATER	A-640
	DCD	35000-410

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-6290-000	**Cable Pulling Compound 1 Gallon**	
	ARNCO	HL B1005P
	POLYWATER	A-640
	DCD	35000-410
U-6360-001	**CABLE PROTECTOR**	
	VIRGINIA PLASTICS	LG-345
	ELECRICAL MATERIALS CO.	27-1
	CONDUX	0804 2300
	EMCO	27-1G
U-6390-001	**Heat Shrink Cap (0.75” - 1.50”)**	
	T&B	HSC300-600
	SIGMAFORM	SSC-150
	MAC	ISC 150
	UTILCO	HSC-2
	3M	ICEC 031A
	RAYCHEM	ESC-3/A
U-6390-002	**Heat Shrink Cap (1.25” - 2.50”)**	
	T&B	HSC250
	SIGMAFORM	SSC-250
	MAC	ISC 250
	UTILCO	HSC-3
	3M	ICEC 061A
	RAYCHEM	ESC-5/A
U-6390-003	**Heat Shrink Cap (1.75” - 3.60”)**	
	T&B	HSC360
	SIGMAFORM	SSC-360
	MAC	ISC 360
	3M	ICEC 161A
	RAYCHEM	ESC-6/A

TID Stock Number	***Description***	
	Manufacturer	*Part Number*
U-6440-001	**Telecom- Ball**	
	3M	1401-XR
U-6440-002	**POWER MARKER – BALL**	
	3M #	1402-XR
U-6470-001	**STREET LIGHT FUSE HOLDER**	
	BUSS	TRON HEB-JJ
U-6471-001	**STREET LIGHT FUSE HOLDER BOOTS**	
	BUSS	1A0512
U-7145-010	**STREET LIGHT FUSE 10 AMP**	
	BUSS	BAF10
U-7145-015	**STREET LIGHT FUSE 15 AMP**	
	BUSS	BAF15
U-7145-025	**STREET LIGHT FUSE 25 AMP**	
	BUSS	BAF25
U-7145-030	**STREET LIGHT FUSE 30 AMP**	
	BUSS	BAF30
U-8200-04	**PULL ROPE – 3/4"**	
	NEPTCO	WP2500P
	ARNCO	DLWP25
	HERCULINE	P2500W
	WELLINGTON	N303

Section V: Locating Materials

The following is a list of suppliers who have indicated that they stock materials required by TID. Please note that **not all materials are available from all suppliers**. If you have any questions or problems sourcing materials required by TID, please contact the TID Purchasing Division at (209) 883-8401.

Acme Electric
1025 S. Kilroy Rd.
Turlock, CA 95380
(209) 667-2851
Contact: Buster Lucas

All-Phase Electric
2250 Cooper Ave
Merced, CA 95340
(209) 384-0777

Champion Wire and Cable
822 W. 22nd St
Tempe, AZ 85282
(800) 329-1900
(602) 736-1525
Contact: Jeremy Scott

Consolidated Electric Distributors (CED)
1343 N. Emerald Avenue
Modesto, CA 95351
(209) 545-1324
Contact: Steve Miller

Alameda Electric
1466 N. Carpenter Rd
Modesto, CA 95351
(209) 550-2510

Graybar Electric
630 N. 9th St
Modesto, CA 95350
(209) 574-1488

Independent Electric Supply, Inc.
1565 Venture Lane
Turlock, CA 95380
(209) 668-4702
Contact: David Crew

Kingwire
6335 N. Hollywood Blvd. Suite 100/105
Las Vegas, NV 89115
(702) 368-7597
(702) 368-7598 (fax)
Contact: Bob

One Source Distributors
2001 Marina Blvd.
San Leandor, CA 94577
(510) 441-2411
Contact: Eric Rose/Bob Rich

Platt Electric
1431 Freitas Pkwy
Turlock, CA 95380
(209) 656-1063
Contact: Deeann Harmon

Rexel Norcal Valley
919 N. Emerald Avenue
Modesto, CA 95351
(209) 577-6611
Contact: Alex Ceja

Willie Electric Supply
101 S. 7th Street
Modesto, CA 95333
(209) 527-6800
Contact: Gary Bird/Todd Wilson

Azco Supply
2250 Stewart St. #9
Stockton, CA 95205
(209) 943-2452

The following list of companies have material on hand, have access to material, or will provide you with additional sources to locate materials required by the District. Order materials in advance as some may have a lead time.

COMPANY	BRAND NAME
New Basis 11501 Dublin Blvd Ste. 200 Dublin, CA 94568 (925) 551-5019	New Basis
Teichert Brooks 2441 Charter Way Stockton, CA 95206 (209) 464-7696	Teichert Brooks
ElectriGroup 4600 Pell Dr. Sacramento, CA 95838 (916) 922-5550	Carlon
GEXPRO General Electric Supply Company 4608 Roseville Rd North Highlands, CA 95660 (916) 339-4521	Carlon Cantex
Intraline 379 Beach Rd. Burlingame, CA 94010 (650) 340-9133	Polywater Cantex J-M Eagle
Kortick Manufacturing Co. 2230 Davis St. Hayward, CA 94545 (510) 856-3600	Kortick

COMPANY	BRAND NAME
Neptco P.O. Box 2323 Pawtucket, RI 02861-0323 (800) 354-5445	Neptco
Maydwell & Hartzell 2236 Davis Ct. Hayward, CA 94545 (510) 780-1700	Strongwell/Quazite
Pacific Utilities 2475 Estand Way Pleasant Hill, CA 94523 (925) 674-1600	Virginia Plastics Utilco
Anixter Power Solutions - Benicia 6350 Goodyear Rd Benicia, CA 94510 (800) 670-7746	Fargo Homac Inwesco Burndy
Anixter Power Solutions - Portland 9151 S.E. McBrod Portland, OR 97222 (800) 547-9	Alcan Cantex Carlon Polywater
Westchem Equipment Co. 28301 Industrial Blvd. Hayward, CA 94545 (510) 782-3675	Inwesco

TID Contact List

TID Service Division

(209)-883-8301

TIDservicedivision@tid.org

TID Line Engineering Department

(209)-883-8415

LineEngineering@tid.org

TID Customer Service

(209)-883-8222

CSworkorders@tid.org

TID Underground Inspector

(209)-606-0136

TIDuderground@tid.org

TID Line Scheduler

(209)-883-8660

jobscheduling@tid.org