Scope

This standard describes the excavation and backfill requirements for joint utility trench for residential developments

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Purpose

The purpose of this standard is to show the excavation requirements of multiple utilities installed within a common trench. The arrangements have been approved by the coordinating utilities within Pierce County.

It is intended that this standard be used in conjunction with Tacoma Power **Standard C-UG-1100 "Conduit & Vault Systems"** when the customer/developer will be installing the **electrical** and **data** conduit and enclosure system for Tacoma Power.

Design Requirements

The process described below is intended to ensure a coordinated installation of the following utilities within a common trench:

- Power & Tacoma Power Data
- Telephone
- CATV
- Natural Gas

Water, Sewer, and Roof Drains are installed within separate trenches outside of the joint utility easement.

Design Requirements (continued)

System Design

Detailed engineering drawings of the project shall be submitted to the utilities involved 2 to 3 months prior to installation. Please provide these drawings in the AutoCad 12 or later format with separate layers identified to Tacoma Power.

The information required on the drawings are:

Utilities, with Stub-out Locations	Road and Land Features
• Water	• Curb
• Sanitary Sewer	• Road with centerline
• Storm Drain	• Slope
• Storm Water Retention	• Property & right-of-way lines
• Roof Drain	• Survey monuments
	• Easements

Easements

A ***minimum*** 10-foot unobstructed easement is required parallel to, and on both sides of, the road right-of-way.

The maximum slope from back to front shall be 2%.

The easement shall be clear of all obstructions of construction including:

- Sidewalks
- Drainage systems
- Dry wells
- Fire hydrants
- Storm systems
- Sewer stubs
- Water meters
- Permanent structures
- Street light poles

Trenches 48" or Greater in Depth

Trenches that are 48 inches or greater in depth shall meet the requirements of ***Part N of WAC 296-155***, "Excavation, Trenching, and Shoring". Qualified workers shall determine the required safety mitigation methods as allowed by state law. Side sloping of the trench is the most common method of mitigation.

Staking Requirements

Coordination Meeting

A meeting will be required between the developer and the joint utility representative to coordinate the setting of survey stakes, marks and location of road crossings.

Stakes

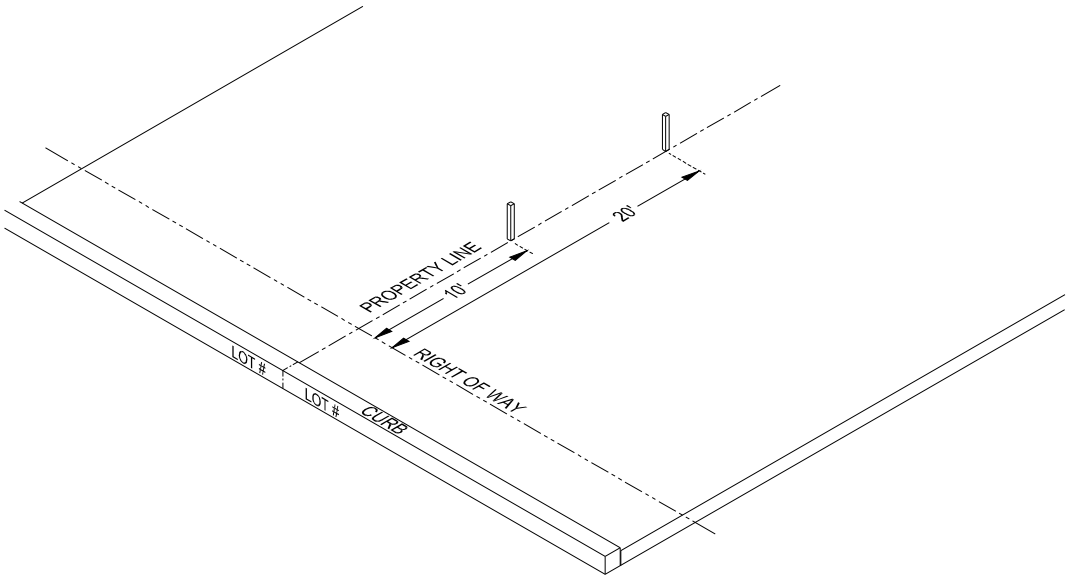
Survey stakes shall include:

- Lot numbers
- Grade adjustment
- Offset distance
- Radius points at intersections involving road crossings

Additional staking may be required as determined during the coordination meeting.

Figure #1 Stake locations

Before Curbs, and Asphalt Base, or Paving	Stakes shall be installed in 10 foot and 20 foot offsets of each lot corner for accurate locating of road crossings. Additional offset stakes may be required by the Tacoma Power Field Coordinator.
After Curbs, and Asphalt Base, or Paving	Lot lines with lot numbers shall be painted on the curb. Also, an arrow shall be painted in the middle of the road that aligns with the property line and the offset stakes. Additional offset stakes may be required by the Tacoma Power Field Coordinator.



Road Crossings

Road Crossings will be identified by the joint utilities. They shall be installed prior to paving and curb as identified in the coordination meeting.

Depth

Road Crossings must be installed with a minimum of ***36" of cover***, measured from finished surface grade to top of highest conduit, or in a ***minimum 42" deep trench***, whichever is deeper. The conduit shall be terminated and capped at a point usually 5 feet from the back of road asphalt as shown in Figure 2.

Any variations in depth of the crossings must be approved by the participating joint trench utilities.

Conduits

All conduits shall be installed per joint utility requirements and capped with approved devices. Tacoma Power requires plastic pipe caps or plugs, ***not tape***. Install ***one inch minimum*** spacers or shims between conduits to allow conduit couplers later.

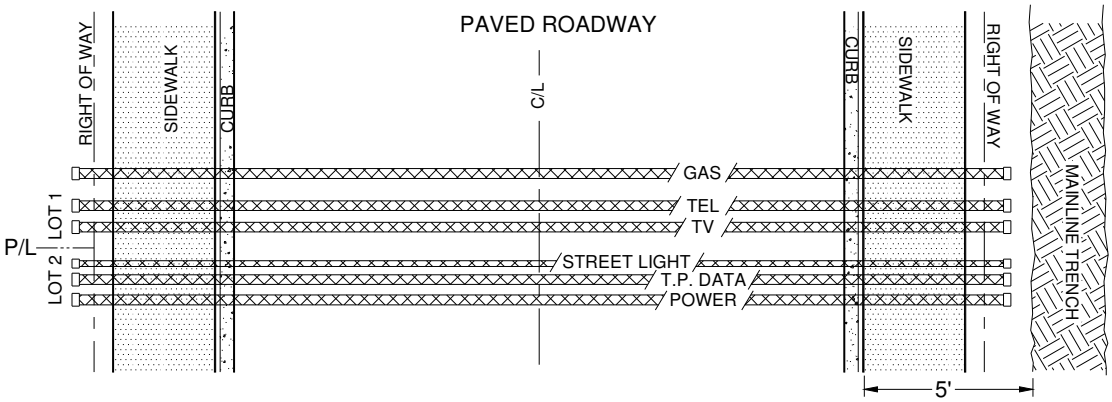
Tacoma Power - Electrical	**Gray** Schedule 40 PVC in either 2½", 4", or 5" sizes
Tacoma Power - Data	**Green** Schedule 40 PVC in 2 or 4 inch

Marking

Both ends of road crossings shall be marked with conduit markers.

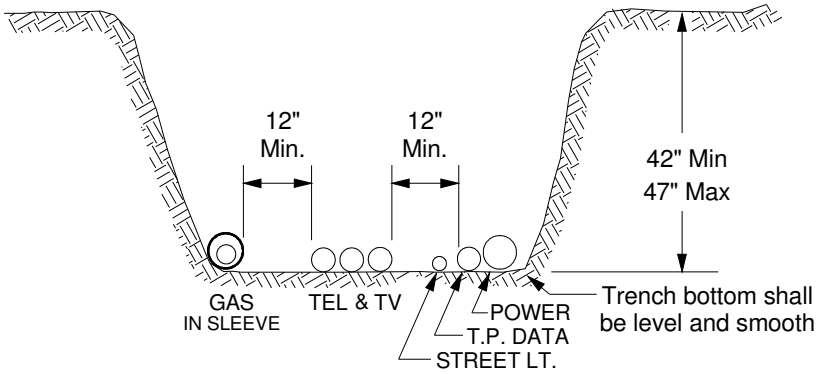
Figure #2

Plan View of Typical Utility Road Crossing



Road Crossings (continued)

Figure #3 Typical Cross Section View of Utility Road Crossings



(looking toward mainline trench)

Joint Trench Requirements

The following shall be followed in the installation of joint utilities.

Coordination

- The joint trench utilities will share facility designs in order to achieve the best common design for the project.
- A meeting will be required between the developer and the joint utility representative to coordinate the route of the trench and locations of transformers, junction boxes, and secondary service boxes.

Fire Hydrants and Water Meters

Fire hydrants and water meters shall maintain a distance from the utility trench as required by the serving water utility and fire department.

Trench Maintenance

Whoever is providing the trenching shall be responsible for the maintenance of the trench during the installation of the joint utilities. This maintenance will include but is not limited to:

- Removal of any water accumulation in the trench
- Trench depth and width per the standard.

Joint Trench Requirements (continued)

Prior to Excavation

Trench will be allowed to be opened when the following has occurred:

- All required fees have been paid.
- Any required permits have been obtained
- All easements have been obtained
- Curb and asphalt base, or paving, as determined by Joint Utility Group, have been installed
- Lot lines and lot numbers shall be painted on the curb and center of road.
- Lots graded to within 6 inches of finished grade
- Sanitary sewer and water stub-outs have been installed when required

Closing of Trench

Only after all participating utilities have installed and approved their facilities may the trench be backfilled. This may occur in segments at the approval of the joint utilities.

Trench Construction

Joint Utility Trenches shall be provided as listed below.

Dimensions

The trenches shall be of the ***minimum*** dimensions unless approved by Tacoma Power:

Width at bottom	42” minimum, 48” typical
Depth from grade	42” minimum, 47” maximum
Spoils	No closer than 2 feet from edge of trench

Backfill

The trench shall be backfilled with native backfill upon approval by the joint utilities. If the native material is determined to be unsuitable, backfill material will need to be imported.

The backfilling of the trench is to be done with reasonable care so as not to damage the conduit systems and enclosures that were installed. It shall also meet the compaction requirements of the applicable city or county involved.

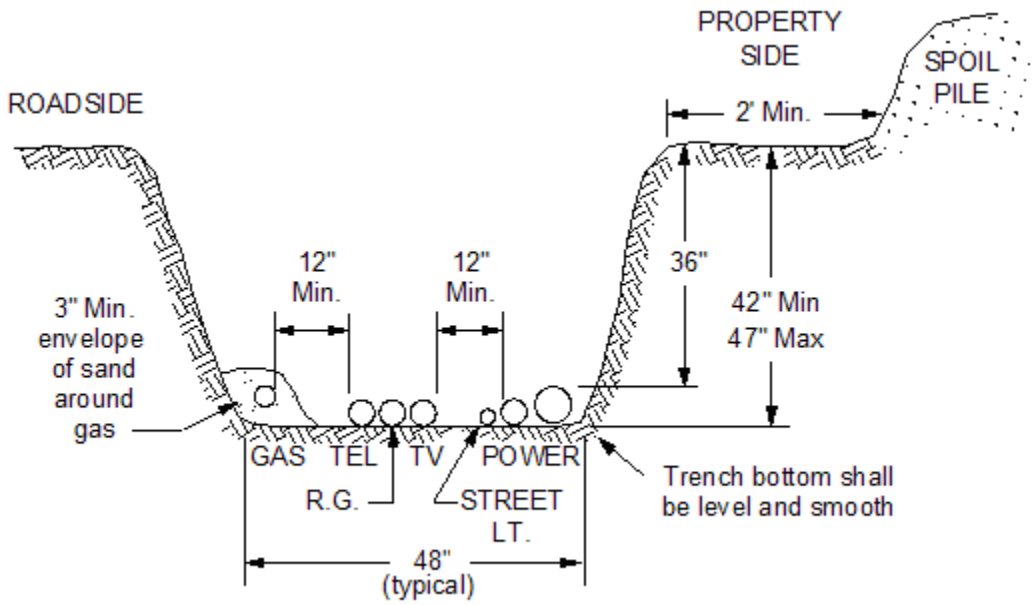
Trench Construction (continued)

Sanding

As required by the natural gas utility, sanding will be needed in the trench to bed the natural gas line.

In rocky conditions other joint utility trench partners may require sanding of the trench prior to conduit installation.

Figure #4 Typical Trench Cross Section of Mainline Trench

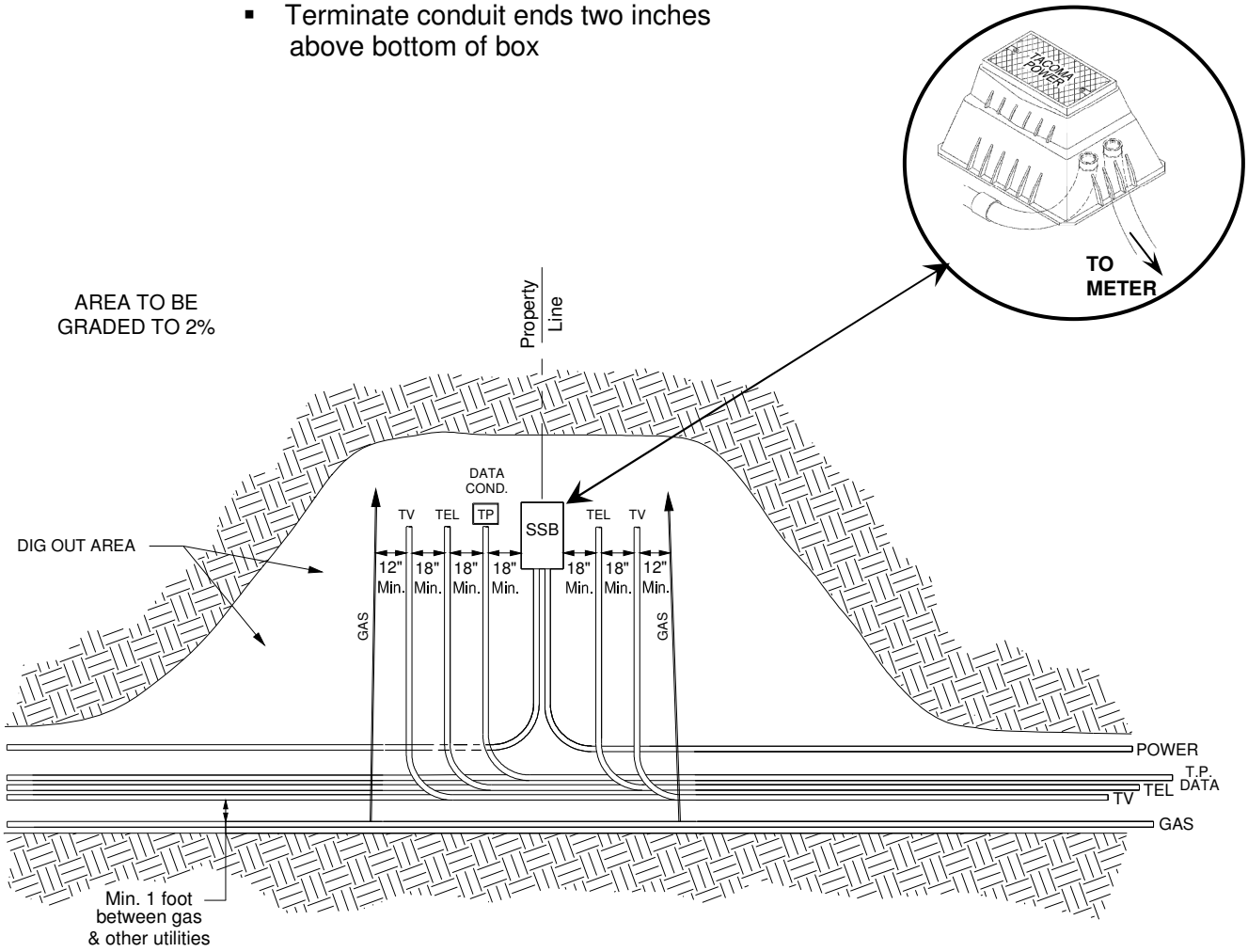


Trench Construction (continued)

Figure #5 Services Layout

Tacoma Power Service Box (SSB)

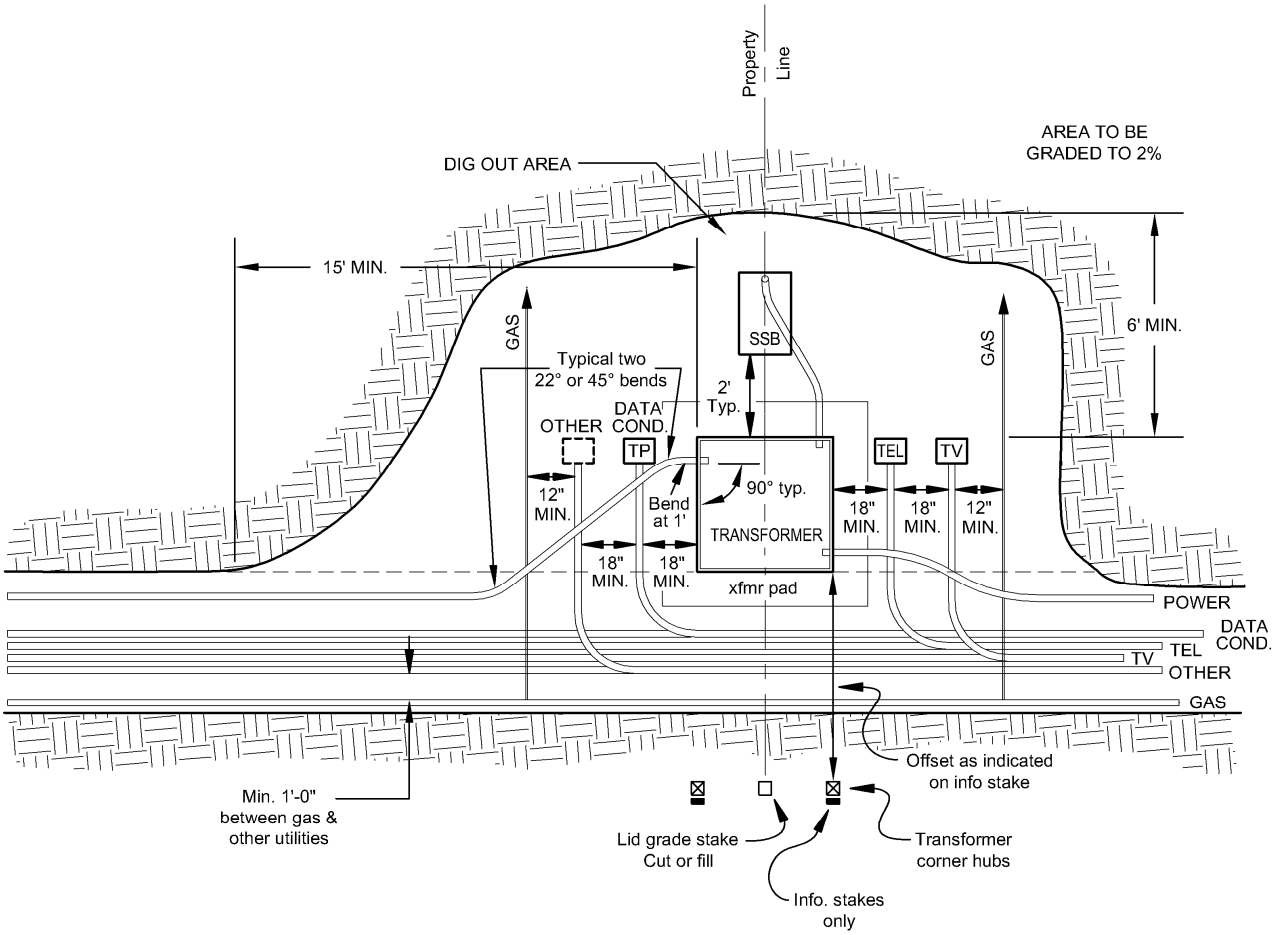
- ***All conduits*** must be grouped at the ***same end*** of the box.
- Terminate conduit ends two inches above bottom of box



This configuration keeps all the utilities in the same planned relationship, minimizes congestion, and digging up the wrong utility.

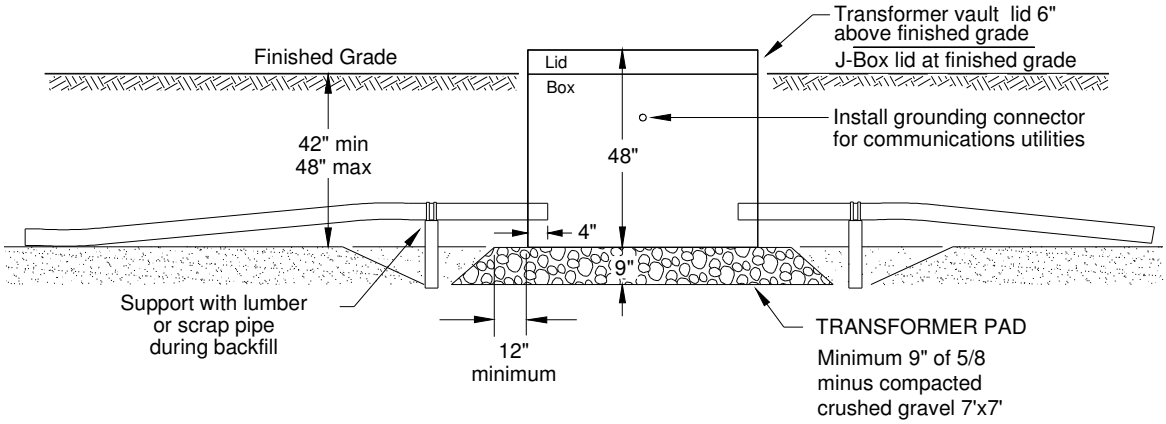
Trench Construction (continued)

Figure #6 Electrical Transformer Layout (Plan View)



Trench Construction (continued)

Figure #7 Electrical Transformer Layout (Cross Section View)



Source

NESC 353 Deliberate Separation
NESC 354D Random Separation

Reference

Tacoma Power standards C-UG-1100 ”Conduit Installations”