



Description This procedure provides guidance for excavation, installation and backfilling to prevent damage to all pipelines including service lines.

Regulatory Applicability Regulated Transmission Pipelines
 Regulated Gathering Pipelines
 Regulated Distribution Pipelines

Frequency As needed

Reference

49 CFR 192.319	<i>Installation of Pipe in a Ditch</i>
49 CFR 192.321	<i>Installation of Plastic Pipe</i>
49 CFR 192.325	<i>Underground Clearance</i>
49 CFR 192.327	<i>Cover</i>
49 CFR 192.329	<i>Installation of plastic pipelines by trenchless excavation</i>
49 CFR 192.361	<i>Service Lines: Installation</i>
49 CFR 192.363	<i>Service Lines: Valve Requirements</i>
49 CFR 192.365	<i>Service Lines: Location of Valves</i>
49 CFR 192.367	<i>Service Lines: General Requirements for Connections to Main Piping</i>
49 CFR 192.371	<i>Service Lines: Steel</i>
49 CFR 192.375	<i>Service Lines: Plastic</i>
49 CFR 192.379	<i>New Service Lines Not in Use</i>
49 CFR 192.381	<i>Service Lines: Excess Flow Valve Performance Standards</i> WTG P.192.605(b)(9) <i>Trench Safety</i>
WTG P-192.243	<i>Non-Destructive Testing of Welds</i>
WTG P-192.501	<i>Steel Pipeline Pressure Test Requirements</i>
WTG P-192.513	<i>Plastic Pipe Pressure Test Requirements</i>
OSHA 1926.651(c)(2)	<i>Specific Excavation Requirements</i>

Forms / Record Retention WTG-1400 Project Report / Life of Pipeline



**Related
Specifications**

None

**OQ Covered
Task**

- 0301 *Manually Open & Close Valves*
- 0311 *Adjust & Monitor Flow or Pressure / Manual Valve Operation*
- 0641 *Visually Inspect Pipe & Components Prior to Installation*
- 0811 *Visually Inspections of Welding & Welds*
- 0861 *Installation of Steel Pipe in a Ditch*
- 0871 *Installation of Steel Pipe in a Bore*
- 0901 *Installation of Plastic Pipe in a Ditch*
- 0911 *Installation of Plastic Pipe in a Bore*
- 0941 *Installation of Tracer Wire*
- 0951 *Installation of Above Grade Pipe*
- 0971 *Installation and Maintenance of Casings, Spacers, Vents & Seals*
- 0981 *Backfilling*
- 1341 *Provide Or Assure Adequate Pipeline Support
During Operator Initiated Excavation Activities*

(In order to perform the tasks listed above, personnel must be qualified in accordance with West Texas Gas's Operator Qualification program or directly supervised by a qualified individual.)



Procedure Steps

NOTE: Lowering or relocating a main or lateral of a piping system under pressure will not be permitted unless a written plan is submitted and approved by senior management.

Prior to Excavating

1. Refer to your state specific Damage Prevention Plan located at www.westtexasgas.com for WTG approved procedures regarding excavation and damage prevention.
2. Refer to (P-192.605(b)(9) Trench Safety and P-192.69 Storage and Handling of Pipe
3. Ensure pipe is placed on padded blocks, wedges, etc to prevent movement during the fitting and welding process.
4. Inspect all equipment to be used such as side booms, track hoes, backhoes, rollers, calipers, lifting devices, etc for any defects that could harm the pipe.
5. Ensure that the trench is stable and can withstand vibration from heavy machinery.
6. If pipeline will encroach any underground facility, P-192.325 must be reviewed.

Installation of Plastic Pipe

1. Prior to beginning work in the trench and on a periodic basis while work is being performed, test the air in the trench with a certified CGI for concentrations of a combustible gaseous atmosphere which could cause an oxygen deficient atmosphere.
2. Visually inspect ditch.
 - a) Make sure the ditch is free of rocks and/or debris that can damage the pipeline.
 - b) Verify proper depth and width of the ditch.
 - c) Ensure that the ditch is padded and levelled properly to give good support to the pipe as well as not to add any stress to the line.
3. Lower piping and tracer wire into ditch in a manner that minimizes stress to the pipe.
4. In the event of installation by trenchless excavation
 - a) Ensure sufficient clearance from all other underground utilities and/or structures to allow for installation and maintenance activities going forward.
 - b) Utilize device or method (weak link) to protect the plastic pipe and components from excessive force and exceeding the maximum tensile stress during the pulling process.
5. Pressure test according to WTG P-192.513 for plastic.



Installing Steel Pipe

1. Prior to beginning work in the trench and on a periodic basis while work is being performed, test the air in the trench with a certified CGI for concentrations of a combustible gaseous atmosphere which could cause an oxygen deficient atmosphere.
2. Visually inspect ditch. Make sure the ditch is free of rocks and/or debris that can damage the pipeline.
 - a) Verify proper depth and width of the ditch.
 - b) Ensure that the ditch is padded and levelled properly to give good support to the pipe as well as not to add any stress to the line. For trenches with significant amount of rock, the bottom of the trench shall be padded with sand or other approved padding material. Recommendation of 6" of soft padding shall be in place on the bottom of the trench to prevent projections damaging the pipe or coating.
 - c) A rock shield can be used to line the ditch and/or wrap the pipe during installation to prevent coating damage.
 - d) Protective shields shall be placed along the trench walls to prevent damage to the coating during lowering-in if necessary. The shields shall be removed only after the pipe is in place and subject to no further movement.
3. Welds must be X-Rayed according to WTG P-192.243 and coated prior to installation.
4. Coating must be jeeped prior to lowering into ditch and holidays repaired.
5. Install pipeline into the ditch in a manner that minimizes stress to the coating. After lowering pipe into the ditch make sure that there is adequate support. If needed use sandbags and padding dirt.

Prior to Backfilling

1. Ensure the pipe in the ditch has adequate support. If needed use sandbags and padding dirt.
2. Ensure that there is adequate sidewall clearance for proper compaction.
3. Check that desired depth identified below is met.
4. Ensure that initial backfill material is free of rocks and debris capable of damaging coating or pipe. Use sand if needed.
5. If applicable, run gauge plate pig to ensure no damage has occurred and that there are no foreign objects in pipe.
6. Pressure test according to WTG P-192.501 for steel or WTG P-192.513 for plastic



Backfilling

1. Initial Backfilling
 - a) Prior to initial backfill, ensure that all damage to the protective coating and wrapping has been repaired before allowing the pipeline to be backfilled.
 - b) Prior to initial backfill, ensure the pipe is adequately supported along its entire length to avoid undue stresses and backfill material does not include any stones, rock or other material which may damage the pipe or the coating.
 - c) The best backfill material shall be used as soft surround for the installed pipe. Carefully place this material around the pipe and thoroughly compact until the level is 8 inches above the crown of the pipe across the full width of the trench.
2. Final Backfill
 - a) The remaining excavated material of suitable quality, together with any imported material, shall be returned to the trench. The backfill material shall be heaped up along the trench line to leave a crown of 8-12 inches above adjacent ground level unless otherwise specified in the job plan.
 - b) Remove surplus excavated subsoil, if any, from site or spread over the right-of-way on exposed subsoil. Do not spread surplus subsoil on topsoil.
3. Provide erosion protection if necessary.
 - a) On steep slopes or any other sections of the pipeline subject to erosion where there is danger of the backfill being washed out of the trench, place sandbags in position prior to backfilling.
 - b) Provide diversionary furrows if necessary to direct the flow of water into natural drainage courses and away from the pipeline trench.
4. Support against Settlement
 - a) Where the pipeline emerges above ground, take special care to ensure that the buried section of the pipeline is adequately supported against settlement.
5. Backfilling of Made Roads, Footpaths and Paved Areas
 - a) Backfill across highway and road cuts shall be made with selected moist backfill material which is placed in layers, thoroughly compacted by mechanical tamping unless otherwise specified in job plan.
 - b) Verify that compaction has been achieved by testing crossing to permit or agreement.
6. Backfill in Irrigation and Draining Areas
 - a) After backfilling the pipe trench across irrigated fields, make furrows across the backfill crown and pipeline right-of-way to maintain or reinstate the flow of irrigation or drainage water into its normal flow pattern.
 - b) Where the sides of drainage or irrigation ditches are cut by the pipe trench, the ground shall be backfilled and suitably compacted so as to provide a good bond between the undisturbed sides of the drainage or irrigation ditch and the new backfill material.



7. Ensure each buried Transmission Line is provided with adequate cover.

Transmission Table	Normal soil	Consolidated rock
Class Location:		
Class 1 locations	30"	18"
Class 2, 3, and 4 locations	36"	24"
Drainage ditches of public roads and railroad crossings	36"	24"

(See regulations for exceptions)

8. Ensure each buried Distribution main line is provided with adequate cover.

- a) Except as provided in paragraph (b) of this section, each buried main line must be installed with at least 24 inches of cover.
- b) Where an underground structure prevents the installation of a line or main with the minimum cover, the line or main may be installed with less cover if it is provided with additional protection to withstand anticipated external loads.

9. Upon the completion of backfilling and cleaning up of work site, transmission lines will be subject to an above ground indirect assessment. This assessment will be performed to identify areas of coating damage incurred during the lowering and back filling process. These assessments can be accomplished by Alternating Current Voltage Gradient (ACVG) or Direct Current Voltage Gradient (DCVG) surveys or other technology. Other technologies must be approved by PHMSA per CFR 192.18 paragraph (g). **This requirement does not apply to gas gathering nor gas distribution mains.**

Installation of Service Lines

Note: Disconnected service lines that are being reinstated must be tested in the same manner as new service lines. Service lines that are temporarily disconnected from the main must be tested from the point of disconnection to the service line in the same manner as a new service line, before reconnecting. However, if provisions are made to maintain continuous service, such as installation of a bypass, any part of the original service line used to maintain continuous service does not have to be tested.

1. Ensure service lines are installed as follows:

- a) With at least 12 inches of cover on private property and at least 18 inches of cover in streets and roads. Note: If an underground structure prevents installation at these depths, the service line must be able to withstand any anticipated external loads.
- b) Properly supported on undisturbed or well-compacted soil, and the backfill that is free from materials that could damage the pipe or its coating.



- c) If condensate in the gas might cause interruption in the gas supply to the customer, the service line is graded to drain into the main or into drips at the low points in the service line.
 - d) Minimize anticipated piping strain and external loading.
 - e) WTG will not install a service line through the outer foundation wall of a building.
 - f) WTG will not install a service line under a building.
 - g) Nonmetallic service lines that are not encased are provided with a means for locating them that complies with 49 CFR 192.321(e) (tracer wire installed).
 - h) Plastic pipe that is being encased must be inserted into the casing pipe in a manner that will protect the plastic. The leading end of the plastic pipe must be closed before insertion. In steel casing, plastic pipe must have spacers installed to prevent future damage from friction or pipe movement between the two materials.
2. Ensure that each service line has a service-line valve that meets the applicable requirements of 49 CFR 192 Subpart B and D. Note: Valves incorporated in meter bars, which allow the meter to be bypassed, are not to be used as service-line valves.
- a) This valve may not be a soft seat service line valve if its ability to control the flow of gas could be adversely affected by exposures to anticipated heat.
 - b) Each service-line valve on a high-pressure distribution line, installed aboveground or in an area where the blowing of gas would be hazardous, the valve must be designed and constructed to minimize the possibility of the removal of the core of the valve with other than specialized tools.
3. Valves are to be located as follows:
- a) Service-line valve upstream of the regulator or upstream of the meter if there is no regulator.
 - b) For new construction or replacement of a service line post April 14, 2017, when the installation of an EVF is not feasible, a curb valve will be installed unless the installation would add an inherent safety risk. If underground service valves are installed, they will be located in a covered durable curb box or standpipe that allows ready operation of the valve and is supported independently of the service line. All valves will be maintained consistent with all valve manufacture's specifications.
 - c) Installation of the curb valve, EFV or the justification of the inherent safety risk will be documented on the Project Completion Report.
4. Ensure the following requirements are met for connections to main piping:
- a) Located at the top of the main or, if that is not practical, at the side of the main, unless a suitable protective device is installed to minimize the possibility of dust and moisture being carried from the main into the service line.
 - b) Each compression type service line to main connection must.
 - i. Be designed and installed to effectively sustain the longitudinal pull-out or thrust forces caused by contraction or expansion of the piping, or by anticipated external or internal loading; and



- ii. If gaskets are used in connecting the service line to the main connection fitting, have gaskets that are compatible with the kind of gas in the system; and
 - iii. If service line is connected to a plastic main, a connecting fitting that provides a seal plus resistance to pullout (Category 1) is installed.
- 5. Ensure steel service lines that are operated at less than 100 psi are still constructed of pipe that is designed for a minimum of 100 psi.
- 6. Ensure that plastic service lines installed outside a building are underground unless:
 - a) Risers are installed in accordance with 49 CFR 192.321 and 192.204; and
 - b) The line can terminate above ground level and outside the building if:
 - i. The above ground level part is protected against deterioration and external damage.
 - ii. It is not used to support external loads.
 - iii. Has a minimum wall thickness in accordance with 49 CFR 192.121.
 - iv. Tracer wire installed.
 - v. The riser portion of the service line meets the requirements of 49 CFR 192.204
- 7. Ensure that services lines that are constructed but not placed in service comply with one of the following until the customer is supplied with gas:
 - a) The valve that is closed to prevent the flow of gas to the customer has a locking device or other means designed to prevent the opening of the valve by individuals other than those authorized by Company.
 - b) A mechanical device or fitting that will prevent the flow of gas will be installed in the service line or in the meter assembly.
 - c) The customer's piping is physically disconnected from the gas supply and the ends sealed.
- 8. Ensure excess flow valves (EFV) meet the following requirements:
 - a) If used in a single residence service line that operates continuously throughout the year at a pressure greater than 10 psi gauge, it must be manufactured and tested by the manufacturer according to an industry specification, or the manufacturer's written specification to ensure the valve:
 - i. Functions properly up to the maximum operating pressure it is rated.
 - ii. Functions properly at all temperatures reasonably expected in the operating environment it is installed.
 - iii. At 10 psi gauge:
 - (1) It will close at or not more than 50% above the rated closure flow rate specified by the manufacturer; and
 - (2) Upon closure, reduce gas flow.



- (a) No more than 5% of the manufacturer's specified closure flow rate, up to a maximum of 20 cubic feet per hour if the valve is designed to all pressure to equalize across the valve; or
 - (b) No more than 0.4 cubic feet per hour if the valve is designed to prevent equalization of pressure across it.
- iv. Does not close when the pressure is less than the manufacturer's minimum specified operating pressure and the flow rate is below the manufacturer's minimum specified closure flow rate.
- b) Meets the applicable requirements of 49 CFR Subpart B-Materials and D-Design of Pipeline Components.
- c) Its presence is marked or otherwise identified in the service line.
- d) Is located as near as practical to the fitting connecting the service line to its source of gas supply.
- e) Is not installed in a service line where there has been prior experience with contaminants in the gas stream if they could be expected to cause the valve to malfunction or where it would interfere with necessary operation or maintenance activities on the line, such as blowing liquids from the line.
- f) An excess flow valve (EFV) installation must comply with the performance standards in §192.381. The operator must install an EFV on any new or replaced service line after April 14, 2017, that services:
- i. A single service line to one Single Family Residence (SFR).
 - ii. A branched service line to a SFR installed concurrently with the primary SFR service line (*i.e.*, a single EFV may be installed to protect both service lines).
 - iii. A branched service line to a SFR installed off a previously installed SFR service line that does not contain an EFV.
 - iv. Multifamily residences with known customer loads not exceeding 1,000 SCFH per service, at time of service installation based on installed meter capacity, and
 - v. A single, small commercial customer served by a single service line with a known customer load not exceeding 1,000 SCFH, at the time of meter installation, based on installed meter capacity.
- g) Unless one or more of the following conditions is present, then an EFV is not required:
- i. If the service line operates at a pressure less than 10 psig.
 - ii. The operator has prior experience with contaminants in the gas stream that could interfere with the EFV's operation or cause loss of service to a customer.
 - iii. An EFV could interfere with necessary operations or maintenance activities.
 - iv. An EFV meeting the performance standards in CFR 192.381 is not commercially available.