

1010 - Construction Specifications

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FORMS AND REFERENCES

1. GENERAL

1. These specifications apply to construction of gas pipelines and appurtenant facilities. Work covered by these specifications may be performed either by Dominion Energy South Carolina (DESC) construction personnel or by contract personnel.
2. Contractors working under these specifications shall meet all of the DESC insurance requirements and shall be working under a Purchase Order approved by the DESC Management.
3. Where the word "contractor" appears in the specifications it shall also apply to DESC crews performing construction work.
4. All work shall be in accordance with federal, state, county, municipal, and railroad regulations, as well as any other authorities having jurisdiction over the work. Particular attention should be given to railway crossing specifications such as pipeline design, inspection and testing, ditching, etc. as described in the relevant railway operator permit specifications.
5. Before design begins on all projects involving station modifications or pipe replacements within 100 feet of a regulating station; ensure that all facility records are present, verifiable, accurate, and complete as they relate to tie-ins, pressure regulation, and overpressure protection. This includes field verification of drawings, piping, valves, valve position, equipment, equipment set points and control lines.
6. These specifications are to be followed for all coated steel and/or plastic pipe installed as part of DESC's Gas Distribution System.
7. These specifications are intended to be general. Specific specifications for welding, plastic pipe, cathodic protection, etc. are covered in other sections of this manual and the [Operations & Maintenance Manual](#).

2. FURNISHED BY DESC

1. Typically Dominion Energy South Carolina furnishes the following items. Refer to applicable scope of work for exceptions.
 1. All materials remaining as part of the permanent installation - pipe, valves, coating, fittings, etc. will be as specified by Engineering.
 2. Permits - state, county, railroad, and, city
 3. Order of precedence for work to be performed.

3. FURNISHED BY CONTRACTOR

1. The following are generally furnished by contractor. Refer to applicable scope of work for exceptions.
 1. All materials (welding rods, oxygen, acetylene, test gases, etc.) not mentioned above. Any materials required to be furnished by the Contractor shall be paid for by the Contractor unless specified otherwise.
 2. All labor, including Foremen and Superintendent, to properly perform the work. Supervisory personnel may not be removed from the job by the Contractor without notifying the Engineer/Inspector in advance.
 3. All tools and equipment, apparatus, etc., to adequately perform gas distribution work as assigned to him. Such tools, equipment and apparatus to be kept in the best of operating condition in order to adequately meet the Company's construction schedule for the work assigned to the Contractor.

4. All temporary construction zone materials as required by SCDOT, county, city, etc. permitting including construction cones, approved signage, construction entrance materials, etc. See [Reference Drawing 1.04.200 Construction Entrances](#).
5. All site materials required by Dominion Energy South Carolina or SWPPP, DHEC, etc. for environmental protection throughout construction duration including silt fencing, sediment tubing, etc. See Reference Drawings. [1.04.100 Silt Fencing](#); [1.04.110 Sediment Tubes](#).
6. All repairs to other utilities (sewer, water, telephone, etc.) and damages caused by the Contractor in performance of the work shall be paid for by the Contractor. This includes items such as shrubbery, fences, underground structures, etc.

4. WELDING

1. Refer to [Welding Manual](#) for additional requirements.
2. Welding procedures shall conform to the latest edition of API Standard 1104.
3. All pipe sizes, including fittings, and connections to pipe shall be welded by the electric arc process.
4. Steel pipe as furnished shall be beveled 30 degrees for welding, and any field cuts made on same shall be made by means of an approved beveling machine (H & M or equal).
5. Steel pipe ends shall be thoroughly cleaned before tack welding.
6. Coated steel pipe shall have the coating cut back at field-cut pipe ends to approximately the same distance as at the ends of pipe lengths as furnished.
7. All welded joints shall be at right angles to the axis of the pipe. No mitered welds will be tolerated.
8. Approved line-up clamps shall be used for all pipe sizes. Clamps may not be removed until stringer bead is at least 50% complete unless conditions make it difficult to prevent movement in which case the stringer bead shall be completed before releasing clamp tension.
9. All sections of open pipe that have been welded together for installation shall have the ends capped temporarily at the end of each work day.
10. Welded joints that leak under test shall be either cut out or repaired at the discretion of the Engineer or Inspector.
11. Joints that visually appear to be defective shall be cut out and tested by the Qualified Welding Inspector. If the joint is found to be good, the Contractor may be reimbursed for same.
12. Flame cut ends of all field cuts shall be filed in order to give an end bevel as near as possible to the bevel as furnished.
13. The practice of hammering pipe to obtain a proper lineup shall be held to a minimum.
14. Roll welding of 2" and smaller shall be permitted at the discretion of the Engineer.
15. All slag or scale shall be removed from each bead by means of power tool (wire brush, power driven).
16. The completed weld shall have a reinforcement of 1/16" above the pipe surface maximum. The minimum reinforcement shall be not less than 1/32".

17. No two beads shall be started at the same location.
18. All position welds shall be made with the pipe resting on pipe rollers, sand bags, or padded skids.
19. The width of the cap shall be 1/8" greater than the original groove.
20. Repairs to any welded joint must meet with the approval of the Engineer.
21. Each welder shall be qualified in the presence of the Engineer or his representative in accordance with Dominion Energy South Carolina Welding Procedures.
22. One weld from each welder may be cut out of the line in a six-month period and tested.
23. If a welded joint is tested and fails or if a welded joint leaks while the line is being pressure tested, the welder will be disqualified. Welders that are disqualified must pass the appropriate welding test in order to regain their qualification. Any welder that has two or more joints fail in a 12-month period shall be disqualified for at least six months.

5. HAULING AND STRINGING GAS DISTRIBUTION MATERIALS

1. Gas distribution materials shall be located on storage yards provided by DESC or delivered directly to an approved area on the job site at the discretion of the Engineer or his representative.
2. All materials removed from or returned to the Company storage yard, all pipe delivered directly to the job site, and all materials transferred from one job site to another shall be properly accounted for and reconciled with appropriate records (i.e., packing lists, shipping papers, material requisitions, invoices, etc.) Records that account for pipe shipments delivered directly to the job site should include, at a minimum, the total number of pipe joints and the total footage of pipe received.
3. Pipe shall be removed from the storage yard for installation as directed by the Engineer or his representative in order that the older pipe may be utilized first.
4. Coated steel pipe shall be handled with proper equipment including padded pipe calipers and other necessary padded equipment. In no case shall pipe be dragged to the work location, or rolled off a truck when unloaded, or handled in any manner that may result in damage to the pipe or any coating(s).
5. All pipe returned to DESC's storage yards shall be stored in a manner approved by the Engineering Manager or his/her representative.
6. Contractor is responsible for all materials released to him for installation until such time as they are incorporated as part of the finished job, and if such materials are misplaced, the Contractor will be responsible for payment to Company of same.
7. Loss of materials or damage thereto resulting from the lack of protection, therefore, shall be considered unnecessary and excessive damages and shall be the Contractor's responsibility.

6. CUTTING AND REMOVING HARD SURFACE PAVEMENTS

1. Refer to detail drawings:
 1. [1.02.100 Concrete Repair - Trench](#)

2. [1.02.200 Asphalt Repair - Low Volume - Trench](#)

3. [1.02.220 Asphalt Repair - High Volume - Trench](#)

2. Pavements shall be cut only at those locations along paved streets, highways or driveways where the Engineer or his representative so specifies.
3. The width of cuts in pavement shall be two neat lines of required ditch for the pipe size being installed.
4. Asphalt and/or concrete surfaces shall be saw cut prior to patching.
5. Excavations should be properly backfilled and tamped to condition of adjacent non- disturbed soil prior to re- surfacing.

7. DITCHING

1. Open ditches left overnight shall be held to a minimum. Any ditch left open at night shall be properly barricaded.
2. All ditches are to be backfilled or plated with Engineering approval over the weekend.
3. No more than 1,000 feet of ditch may be opened at any one time.
4. Water pumped from ditches shall be disposed of so as not to disfigure adjoining property.
5. The normal depth for gas mains (top of pipe) in SCDOT right of way will be 36" when pipe is located off-shoulder, 42" when pipe is on road shoulder (between pavement and bar ditch). The normal depth for gas mains (top of pipe) in non-SCDOT right of way will be 36".
6. The minimum cover on all mains in non-SCDOT R/W shall be 24", unless an underground structure prevents this depth in which case it can be installed with less cover if it is provided with additional engineer approved protection to withstand anticipated external loads. Gas mains will not be installed over 48" deep (bottom of ditch) unless approved by the Engineer or designee.
7. The normal depth for gas services will be 24". The minimum cover on all services shall be 18" in private property and at least 18" in streets and roads. However, where an underground structure prevents installation at those depths, the service line must be able to withstand any anticipated external load.
8. The spoil bank from ditching operations shall not be allowed to fall on loose debris or foreign matter that might become mixed with the soil to be used in backfilling the ditch line.
9. Along approaches to highway or railroad crossings, the depth of ditching shall be increased to the extent considered necessary to allow gradual change in the bottom of the ditch in order to hold bending or fitting to a minimum.
10. Construction shall comply with all railroad and highway or county permits showing the required location, depth of ditches, and required flowable fill.
11. Ditches should be excavated for each size of pipe within minimum widths as specified in accordance with the following table:

Pipe Sizes	Minimum Width of Ditch
3/4"	3"
1-1/4"	4"
2"	6"

3"	8"
4"	10"
6"	12"
8"	14"
10"	16"
12"	18"
16"	24"

12. Where gas mains are to parallel other utilities (water mains, cables, sewer lines, etc.), the ditch line should be located in such a manner as to provide at least 12" clearance between gas main and other utilities.
13. Where gas main crosses other utilities as outlined above, the ditching should be of such a nature to provide at least 6" vertical clearance between the gas main and other utilities. This vertical clearance shall not be obtained by reducing the minimum cover on the gas main.
14. Before ditching along any highway, roadway or street, the Engineer shall determine and inform the Contractor's representative as to whether or not it is necessary to remove and replace sod, furnishing him with locations of same. Sod should be removed and replaced at all bell hole locations.
15. Before ditching along the route of any gas distribution line, the Contractor shall determine the location of existing underground utilities facilities by notifying the Palmetto Utility Protection Service (PUPS) and/or by contacting the owner's thereof.

8. BORING AND DIRECTIONAL DRILLING

1. For each pipeline section, plastic pipe and components that are pulled through the ground must use a weak link to ensure the pipeline will not be damaged by any excessive forces during the pulling process.
2. Refer to D&I [1015 - Horizontal Directional Drilling \(HDD\)](#) for detailed specifications for Directional Drilling.
3. When the length of a tail ditch must be restricted, it will be necessary for steel pipe to be inserted in the bored hole in more than one section with welding and coating at each joint.
4. When pulling pipe into a bored hole, cable should not be stretched across open highways, streets or railroads.
5. Pipe used as drill stems for boring purposes shall not be left in place and used as the carrier pipe for installed mains or services.
6. Mains installed by trenching, boring, plowing, or directional drilling should stay within one foot either side of a predetermined route (i.e. 3' from edge of pavement +/- 1').
7. Contractor and Inspector should verify depth at intervals.
8. Sufficient effort should be made to locate any unmarked facilities with particular attention toward sewer lines. The locations of sewer clean-outs and other signs may be helpful in locating these lines. Excavator should hand dig to confirm location of utility lines. Care should be taken to ensure bore path does not intersect sewer line resulting in a sewer cross bore.

9. CASING INSTALLATIONS

1. For crossings that require a casing, the installation shall be effected by boring, drilling or ditching.

2. The length of casing will be governed by requirements contained in the crossing permits.
3. Pipe shall be drawn into casing in a manner so as to avoid contacting the casing.
4. Mechanical spacers and seals will be used for all casing installations.
5. Vents shall be carried to locations as designated by the Engineer or his representative.
6. Electrical tests made upon completion of the casing installations showing electrical connection between casing and pipe shall be cleared by the Contractor at his expense.
7. No water, mud or other foreign materials shall be inside casing when seals are placed.

10. LAYING COATED STEEL PIPE

1. Required bends in the line shall be cold bent using an approved type of bending device.
2. Wrinkles or wrinkle bending will not be tolerated.
3. Before joining lengths of pipe together in a continuous section, all lengths of steel pipe shall be swabbed with an approved swabbing device or pigged. An approved swab is to be made of canvas, wire brushes, scraper cups or leather. No burlap materials or rags are to be used.
4. Coated pipe must successfully pass an electrical holiday detection test, using an approved detector, immediately before it is lowered into the ditch.
5. Where it may be necessary to pull sections of pipe into place in the ditch line in order to clear other utilities, the pipe shall be protected in such a manner as to prevent damage to the pipe or any coating. The length of any "pull" section shall be approved by the Engineer.
6. Pipe shall be handled in a manner to prevent damage to the pipe wall, and in all cases an approved lowering-in device must be used for lowering pipe into ditch. An endless belt type sling is an approved device; chains or cables shall not be used for this purpose.
7. Any open ends lowered in shall have water tight seals installed on them, and any sections found open or not water tight shall, at the discretion of the Engineer, be swabbed or pigged in a manner satisfactory to him before that section is tied into the line.
8. The ditch shall be free from all foreign objects including welding rods before the pipe is lowered in.
9. No pipe shall be lowered into the ditch until the Dominion Engineer/Inspector has been notified and his approval obtained.
10. All coated pipe shall be checked for electrical connections to foreign lines upon completion of a specific job, and any electrical contacts that are found shall be cleared at the expense of the Contractor.
11. All over-bends and sags shall fit the vertical slope of the ditch. Side bends shall not contact the ditch on the inside but shall ride the outside of the bend.

11. COATING

1. Coated pipe shall be handled at all times with equipment designed to prevent damage to protective coating (padded calipers, lowering-in belts, etc.).

2. Coated pipe shall rest on padded skids, pipe rollers or sand bags at all times. If pipe is to be pulled or moved, appropriate action should be taken to ensure pipeline is adequately supported in a manner that allows movement when necessary and will not damage pipe or coating. Steel pipe 2" and larger should be on rollers when pulled or moved.
3. Steel pipe joints shall be properly prepared based on the specifications for the coating being used.
4. Proper disposition shall be made of all coating refuse.
5. Protective coatings should not be applied to wet pipe surfaces unless manufacturer's instructions allow for such applications. Protective coatings not intended for wet pipe surfaces shall not be applied during rainy weather unless the pipe is properly dried and protected from the rain.
6. All sections of coated pipe, including joints, shall be "jeeped" with an approved holiday detector before lowering-in. If three (3) joints of pipe are jeeped without a holiday, one will be created on the pipe and the detector must be able to signal it. If it does not signal, the unit should be checked for proper grounding, re-calibrated and the voltage adjusted until the detector signals the holiday. Care should be taken not to adjust the voltage to a level where the coating will burn.
7. Repairs to all coating damages shall be made to the satisfaction of the Inspector and at the Contractor's expense. The Company will furnish only materials for such repairs.
8. 3M Scotchkote Hot Melt Patch Compound 226P (Patch Sticks) is to be used for repairing minor pinholes and abrasions. It can be used for repairs of holidays up to 2 mm in diameter on fusion bonded epoxy pipe. Follow manufacturers' application instructions.
9. For fusion bonded epoxy pipe where steel is visible, a full circumference wrap based on Operations & Maintenance Manual [Ch 8-C Protective Pipeline Coatings](#) is required.
10. All irregular below grade surfaces (valves, flanges, studs, service cocks, etc.) shall be coated and protected with an approved coating. See O&M [Ch 8-C Protective Pipeline Coatings](#).
11. Coated steel service risers at ground level shall be wrapped for 4" above and below grade with Tape Coat tape or equivalent. All bends in coated and wrapped pipe shall be wrapped with Engineer approved tape after bending.
12. All above grade vents shall be cleaned and primed then painted with two (2) coats of yellow paint.

12. VALVE INSTALLATIONS

1. See D&I Section [1030 - Valves](#).

13. SERVICE INSTALLATIONS

1. See D&I Section [1020 - Service Lines](#)

14. BACKFILLING AND CLEANUP

1. Cleanup along the route of all distribution lines shall be done on a daily basis in order to present to our public as neat a job as is possible.
2. Before backfilling, excavations shall be free of all debris, rags, packaging, plastic, wire, welding rods, trash, etc.

3. When backfilling, warning/caution tape should be used on all main installations. See Construction Detail Manual Drawings [2.02.100](#) and [2.02.200](#) for main installations.
4. Backfilling shall be so conducted that the ditch shall be neatly and compactly backfilled and surplus material shall be disposed of, all in a manner approved by the Engineer.
5. Backfill material, if required, for padding shall be furnished by the Company but hauled and placed by the Contractor.
6. Backfilled ditches where pavement has been removed shall be maintained by the Contractor until permanent repairs have been made.
7. All broken paving, earth and debris resulting from the construction shall be disposed of by the Contractor.
8. Open ditches and "bell holes" shall be held to a minimum each day, and all jobs in progress shall be completely backfilled or plated with Engineering approval and cleaned up prior to any weekend or holiday.
9. Contractor shall not park any equipment or store any materials on any property at any location without approval of the property owner(s).
10. Tamping shall be done at all locations when backfilling. Tamping shall be done with manual tools or automatic equipment designed for such use.
11. Contractor shall be responsible for maintaining all backfill and cleanup along the route of any line constructed by him for a minimum of 90 days.
12. Contractor shall furnish sandbags and rip-rap where required.
13. All portions of the route of the line shall be cleaned up to the extent that upon completion of same, they will be as nearly as possible in the same condition as prior to starting the work.

15. CLEANING AND PURGING

1. Before joining lengths of pipe together in a continuous section, all lengths of steel pipe shall be swabbed with an approved swabbing device or pigged or visually inspected by a worker to make sure no debris is inside the pipe. An approved swab is to be made of canvas, wire brushes, scraper cups or leather. No burlap materials or rags are to be used.
2. All completed sections of steel line for 3" and larger mains are to be pigged at least twice using air and thoroughly cleaned to the satisfaction of the Engineer.
3. Purge points are to be installed at locations as designated by the Engineer.
4. Contractor is to furnish the Company with a complete line(s), or system that is dry and has been cleaned and purged. This is to include the digging of necessary bell holes for purging purposes. After completion of purging, such bell holes are to be backfilled and cleaned up by the Contractor.
5. Any portion of the line(s), system or appurtenant facilities not in operating condition due to faulty installation shall be repaired by the Contractor at his expense (valves, fitting, etc.).
6. All purging using the Vertical Main Outlet Set-Up shall use pipe and fittings sufficiently rated for the pressures for the given project. Reference Drawing [2.07.100](#) for Vertical Main Outlet Purge Stack set up.
7. All purging using the Horizontal Main Outlet Set-Up shall use pipe and fittings sufficiently rated for the pressures for the given project. Reference Drawing [2.07.110](#) for Horizontal Main Outlet Purge Stack set up.

8. All purging through a Temporary Riser Set-Up shall use pipe and fittings sufficiently rated for the pressures for the given project. Reference Drawing [2.07.120](#) for Temporary Riser Purge Stack set up.

16. EXCAVATING SOLID ROCK

1. Where solid rock is a minimum of one foot or less below the surface of the ground then the minimum cover on the pipe shall be 18". The ditch shall be excavated to give 4" of clearance below the bottom of the pipe and this 4" shall be backfilled with 4" of clean soil. Backfill shall be tamped before installing pipe. Solid rock shall be excavated to give 6" lateral clearance on either side of the pipe. Selected backfill material or rock shield shall be used to cover pipe installed in solid rock.
2. Where solid rock is more than one foot below the surface of the ground then the minimum cover of 24" shall be required. The other conditions will apply as in (1) above.

17. INSTALLATION OF PLASTIC MATERIALS

1. The use of plastic materials shall be limited to installations on the distribution system operating at 60 psig or less, unless approved by the System Engineer. Plastic materials may be installed by direct burial, directional boring or insertion, depending upon plans furnished for a specific installation. Plowing of plastic pipe may be done if approved by the Engineer in advance. In general, the installation of plastic materials shall conform in all respects to the manufacturer's specifications. All plastic installations shall be leak tested to at least 100 psig, but no more than 120 psig, using air or nitrogen as the test medium.
2. When installing fittings on a plastic main, sufficient distance should be left between fittings to allow the main to be squeezed off. See O&M [Ch 12-E Repair of Plastic and Steel Pipelines](#) for minimum spacing between squeeze points. Minimum spacing between fittings should double this amount to allow a squeeze point in between.

18. INSPECTION

1. All construction projects are subject to inspection. In order to document the status of each construction site, an [inspector's checklist](#) may be filled out as documentation of field conditions. In the event an unsatisfactory condition is found, a checklist must be completed and uploaded to SharePoint (Engineering > Documents > Inspectors - Contractors > Contractor Performance Data) in the relevant folder. Unsatisfactory conditions should be recognized and addressed accordingly.

19. SEWER CROSS BORE AS-BUILT

1. Each section of main that is installed via conventional bore or HDD shall be identified on the as-built drawing. This includes the dimensions of the entrance and exit pits to a fixed object or GIS Coordinates.
2. All sewer lines, manholes, and clean-outs within the project limits shall be depicted on the as-built drawing to show the proximity to the gas main being installed.
3. The verification method(s) used to locate the sewer main shall be shown on the as-built drawing for all sections of main that are installed via conventional bore or HDD.
 1. The Sewer Cross Bore Information block shall be used to verify no sewer cross bores for the main shown on each as-built drawing.
 2. If contractor has verified no sewer cross bores (checked "YES"), identify which methods were used on the as-built at each sewer crossing.

3. If contractor was not able to verify no sewer cross bores (checked "NO"), add comments to why they could not be verified.

FORMS AND REFERENCES [PDF files]

- [DI 1010 - Inspector's Checklist](#)
- [DI 1010 - SWPPP Inspection Form](#)

(UNCONTROLLED IF PRINTED)