

Special Specification 7027

Natural Gas Pipeline



1. DESCRIPTION

Obtain all natural gas pipeline materials from a designated CPS ENERGY Center (a municipal agency of the City of San Antonio), transporting and unloading the CPS ENERGY furnished materials at the project site; and for furnishing all other materials, tools, supplies, labor and equipment necessary for a complete natural gas pipeline in conformance with the details shown on the plans, this Item and as directed by the Engineer. The Engineer will consult with CPS ENERGY in matters concerning the execution of the work, materials, inspection, and testing related to the CPS ENERGY Gas Distribution System.

2. GENERAL

Responsible for the construction of complete facilities, conforming in all respects with the details shown on the plans and as covered by this Item including the design standards, Exhibit GAS-3 and/or Exhibit GAS-4 that are a part of and located at the end of this Item.

No gas service may be cut/turned-off after 2:30 PM each day. All gas services cut/turned-off during the day shall be restored before 4:00 PM that same day. All work must be coordinated with the Engineer and CPS ENERGY.

Locate all existing gas facilities as needed for the construction and installation of new gas facilities. Upon request, the Engineer will provide copies of the appropriate CPS ENERGY gas maps to facilitate locating activities for the existing facilities at the project site; however, the Engineer and CPS ENERGY do not guarantee the accuracy of such gas facilities map information. Use conventional pipe locating equipment and techniques in conjunction with information from the maps to determine the actual location of existing gas facilities and be liable for any damages to existing gas facilities and any other utilities that are incurred by construction activities (see Exhibit GAS-7).

While this Item and the details shown on the plans are intended to be full and complete, the Contractor is considered bound by customary good construction practice whether referred to specifically or not.

3. MATERIALS

CPS ENERGY will provide all natural gas pipe (steel and/or plastic), couplings, valves, valve boxes, stop cocks, anodeless risers, miscellaneous fittings, pipe tracer wire, and any other natural gas pipeline materials necessary to complete the work. These materials will be provided by CPS ENERGY at no cost to the Contractor. Notify the Engineer 10 days prior to scheduling the pick-up of these materials.

All other materials, tools, supplies, equipment, etc., necessary to complete the work will be furnished by the Contractor.

When the materials stored at the CPS ENERGY Centers are issued, they become the Contractor's responsibility. A transfer-of-inventory will be signed as a written record of the materials provided. The Contractor, the Department and CPS ENERGY will jointly inspect and inventory the materials for quantity and quality at the time of loading at the CPS ENERGY Center and will sign the inventory list. After this transfer, the Contractor will be responsible for CPS ENERGY's delivered costs for any materials that have to be replaced due to loss or damage beyond use during the project. "Damaged Beyond Use" will be determined by the Engineer.

Load the materials at one or more CPS ENERGY Centers in San Antonio and transport and unload at the work area. All materials are to be unloaded (not dropped) with proper equipment to prevent damage.

Deliver the materials along the right of way in such a manner as to not cause interference to driveways, streets, other construction operations, sidewalks, etc. Prevent dirt or debris from entering into the pipe, couplings, fittings, etc.

Upon completion of the gas work, promptly return excess or salvaged materials furnished or owned by CPS ENERGY to the designated CPS ENERGY Centers.

4. CONSTRUCTION METHODS

- 4.1. **Excavation.** Excavation (trenching) required to complete the pipeline installation will have sufficient width to allow installation of piping and valves at depths specified on the plans and/or the design standards shown at the end of this Item. Blasting to perform the excavation is not allowed. In cases where shrubbery and trees that are labeled to remain are encountered in any location where in the opinion of the Engineer the use of ditching/trenching equipment may result in unnecessary damage, the Engineer may require the trench to be excavated by hand.

- 4.2. **Dust Suppression.** Whenever trenching activities create significant amounts of dust or other undesirable emissions into the atmosphere, take action to reduce these emissions, as determined by the Engineer.

- 4.3. **Boring.** At the locations shown on the plans, the pipe installation is accomplished with a boring operation using the following methods.

The use of guided or directional boring equipment is acceptable if the Contractor demonstrates such equipment is capable of installing the pipe along a controlled and constant horizontal and vertical alignment. Insure that the pipe is not damaged as it is pulled or otherwise inserted into the bored hole. The bored hole must be at least 1 nominal pipe size larger than the pipe to be installed (i.e. a 4 in. pipe requires at least a 6 in. bored hole). When the bored hole is known to have significant deflections, the bored hole must then be at least 2 nominal pipe sizes larger than the gas pipe.

When boring equipment is used to install plastic pipe, a fusible link will be used between the pull head and the pipe at all times to prevent damage during the pull-back operation. The fusible link should be at least 2 ft. in length and be a section of pipe that is 1 nominal pipe size smaller than the pipe being installed.

The Engineer will inspect the fusible link and the leading edge of the installed pipe for any significant gouges or scrapes in the outside wall of the pipe or excessive change in length of the fusible link. If damages to the fusible link or pipe are found, remove and replace all damaged pipe, and reimburse CPS ENERGY for the cost of the damaged pipe (including CPS ENERGY inventory and handling expenses).

When boring equipment is used to install steel pipe, the Engineer is to inspect the installed pipe for any significant gouges or scrapes in the protective coating on the outside wall of the pipe. If damages to the coating are found and are caused by the Contractor, the Contractor will repair all of the damaged coating at no additional cost.

Whenever service lines are planned for installation along a section of gas main that is being installed with guided or directional boring equipment, excavate at least 1 service tap location to provide an intermediate inspection hole prior to pulling the pipe into the bored hole. The intermediate inspection hole is to be located near the middle of the directional bored section. If several service line connections are planned along the route, the Engineer must approve the location of the service tap that is excavated for the intermediate inspection hole before the pipe insertion process.

Mains and service lines that are installed by guided or directional boring equipment must not be installed at depths greater than 7 ft. unless one of the following conditions applies:

- The plans specifically require installation depths in excess of 7 ft.

- Installation depths in excess of 7 ft. are necessary to achieve acceptable clearance between the pipe and another utility or structure while maintaining the minimum burial depth requirements for the pipe.
- The Engineer's prior approval for such installation when the conditions described above exist are not applicable.
- When guided or directional boring equipment is used to install gas distribution facilities, additional compensation due to extra depth of cover will not apply.
- The method of gas service replacement by insertion involves sliding a new polyethylene pipe of smaller diameter into the existing pipe. This is an acceptable method of installation provided the ends of the existing steel pipe are reamed and fitted with bushings for the pipe to be inserted without damage, and a shrink sleeve is applied to keep components in place and prevent damage thereafter. In order to reduce stress on the service line being inserted from the main, the horizontal distance between the end point of the new service alignment and the point of insertion should be at least, twice the perpendicular distance between the lines (see the Insertion Detail, exhibit GAS-3). Tracer wires will be inserted through the existing service along with the new pipe.
- An electrical continuity test will be conducted by the Contractor on each installed tracer wire to verify that the wire has not been "shorted" against the existing steel service during the installation procedure.

4.4. **Temporary Bridges.** When the trench is excavated where it is necessary to have a passageway across/lower the trench, provide safe, temporary bridges or provide other safe means of crossing the trench as approved by the Engineer.

No streets, alleys or driveways are to be blocked at night, except with the Engineer's prior approval. Trenches/holes left open during non-working periods (overnight, a weekend, etc.) must be protected and with barricades and warning lights.

4.5. **Protection of Pipe Ends.** Keep the pipeline installation clean. At the end of each day's work and at any other times that the ends of the installed pipe are left unattended, the pipe ends must be securely closed to prevent the entrance of water, animals, trash or any other obstructions, and not opened until work is resumed.

If there is an obstruction in a portion of the lines, remove all foreign matter if it is in the lines. The work necessary to assure that foreign matter is not present and/or to remove the foreign matter if it is present is included in the installation cost of the line.

4.6. **Welding.** All welding is in accordance with API Standard 1104, 18th Edition, dated September, 1994 (or the latest edition), as outlined herein, as shown on the plans, and/or as directed/approved by the Engineer.

4.6.1. Welds are to be made with the "shielded metal-arc" process. All welding equipment and materials such as welding rods will be furnished by the Contractor. Brand of welding rods proposed must be approved by the Engineer prior to use.

4.6.2. Where determined by the Engineer to be necessary, back-welding or inside-welding of all tube turns, ells, etc., in the pipeline is to be performed as part of the required work.

4.6.3. All welds to be made with not less than 3 beads. The second or "Hot Pass Bead" should be run on the full circumference of the pipe as soon as practical where the Hot Pass or second bead is run before the Stringer Bead has cooled.

4.6.4. Prior to being allowed to weld, each welder must qualify in accordance with Section 3.0 of API Standard 1104 and must pass the tests listed in paragraph 3.4 of this Standard. Conduct, or make arrangements for, qualification tests for welders. The qualifying tests will be conducted in the presence of the Engineer.

- 4.6.5. Each welder will be assigned a specific number and it will be the welder's responsibility to affix his/her number with a crayon next to each weld for future identification. Steel die stamping is not be used.
- 4.6.6. Welding inspection is in accordance with Section 5.1 of API Standard 1104. Test all welds with soap suds while the line is subjected to an internal air pressure of 90 PSI prior to field coating the joints.
- 4.6.7. Pin holes, leaks, cold laps, rivers, undercutting or any other defects occurring in any weld, are to be repaired by cutting out the entire weld and completely rewelding. Whenever it becomes necessary to remove a weld from the completed line, replacement is made by welding into the line a pup joint having a minimum length of 10 ft.
- 4.7. **Coating of Pipe.** Coating materials for coating field joints and for repairing damaged or defective coating will be furnished by CPS ENERGY.
- 4.7.1. If the pipe furnished by CPS ENERGY is coated and wrapped pipe, the Contractor will be responsible for coating all field joints and repairing damaged and defective coating on the pipe regardless of the nature, extent or cause of damage or defect. However, if the pipe provided had a damaged or defective coating of such magnitude as to require an extra charge to properly coat, first refer this matter to the Engineer and not proceed until authorization to do so has been obtained.
- 4.7.2. For coating field joints of pipes coated with TGF-3 coal tar enamel, the coating on the pipe must be cut back a distance of 8 to 12 in. from the joint. The edge of the enamel and felt wrapping is to be feathered at these points to assure a firm bond between the original coating and the field coating. After the joints are welded and tested, and the welds cleaned and brushed, the bare ends of the pipe are to be thoroughly cleaned, then immediately given a hand-brushed coat of primer to dry surfaces. Exercise care to prevent primer from being applied too heavily, especially at the base of the welds; any runs or sags which have dried or dead primer must be scraped off and the pipe reprimed. After the tape primer has dried to a tacky consistency, apply cold wrap tape with a 30% overlap, taking care not to create any voids between the pipe and tape coating. No primer or coating will be applied to wet or damp pipe.
- 4.7.3. All repairs to damaged coating which exceeds 2 sq. in. will be made by breaking out the old coating, scraping the pipe to bare metal, feathering the edges to assure a firm bond and repriming. After the primer has dried to a tacky consistency, apply cold wrap tape taking care not to create any voids between the pipe and the tape coating. For repairs less than 2 sq. in., the pipe does not have to be scraped to bare metal and primed; however, the good enamel around the damaged portion is to be feathered before the cold wrap is applied.
- 4.7.4. Repairs to Fusion Bonded Epoxy (F.B.E.) and/or Powercrete coated pipe may include the following additional repair procedures.
- For pinhole and small area repair, the pipe surface and small area holidays where repairs by the patching stick method are approved by the Engineer and is a recommended procedure by the coating manufacturer, the original coated surface must be thoroughly cleaned and lightly abraded with sandpaper. Patching stick material is to be compatible with the F.B.E. epoxy coating system and is to be material normally supplied by the manufacturer of the F.B.E. coating system.
- It is to be applied by heating the clean pipe surface until the patching stick begins to melt when it is rubbed over the heated area. Continue heating the coated surface while applying the patching stick like a brazing rod. Build a small puddle of melted compound to obtain a minimum thickness of 0.025 in. Continue heating until the compound flows out smoothly. In all instances the manufacturer's recommendations for the use of the patching stick are to be followed.
- An alternate method, for repairs to small area holidays, is liquid epoxy. The material for patching is to be 100% solids catalytically cured epoxy coating normally supplied by the manufacturer of the F.B.E. coating system. The original coated surface must be thoroughly cleaned and lightly abraded with sandpaper. All dust is to be wiped off before applying the patch coating. This type of repair coating is to be applied by spatula, brush, roller, or spray to attain a uniform minimum thickness of 0.025 in. and is to overlap the surrounding undamaged coating by at least 1 in. The patch coating is not to be applied when pipe temperatures are

below 50°F unless provisions are made for complete heat curing, using methods and temperatures in accordance with procedures recommended by the patch coating manufacturer.

At the option of the Engineer, completely cured coating repairs are to be inspected with the Contractor's holiday detector. A patch-coated area is to be allowed to cure prior to handling as per manufacturer's specifications. Supply necessary equipment to complete repairs to manufacturer's guidelines.

For large area repair, where repairs are approved by the Engineer, the following procedures are to be followed. The pipe is to be cleaned to remove all dirt, scale, rust, damaged or disbonded coating and other foreign material. Areas repaired before surface oxidation or rusting occurs may be prepared by hand sanding, power tool grinding, or surface oxidation or other approved and suitable means. Areas repaired after surface oxidation or rusting occurs are to be cleaned using abrasive blasting prior to coating repairs. The edges of the original coating are to be "feathered out" around the area to be coated and all dust wiped off before applying the patch coating.

The material for patch coating must be 100% catalytically cured epoxy coating supplied by the manufacturer of the F.B.E. coating system. This type of repair coating is to be applied by spatula, brush, roller or spray to attain a uniform minimum thickness of 0.025 in. or as recommended by the manufacturer. The patch compound is to overlap the surrounding undamaged coating by at least 1 in. A patch-coated area is to be allowed to cure prior to handling as per manufacturer's specifications. At the option of the Engineer, completely cured coating repairs are to be inspected with the Contractor's holiday detector. Supply necessary equipment to complete repairs to manufacturer's guidelines.

For coating field joints on fusion bonded epoxy coated pipe, heat shrink sleeves may be employed when approved by the Engineer. Heat shrink sleeves are to be the heat shrinkable wraparound sleeves with either a specially formulated mastic sealant or a solvent free, 2 component liquid epoxy primer designed to prevent corrosion of joints on buried pipelines.

Apply sleeves in compliance with manufacturer's recommendations. In addition, for field joints within bores, heat shrink sleeves may also be employed when approved by the Engineer, provided the sleeves are manufactured for this application. Sleeves for this application are to consist of a combination of the following components: a specially designed wraparound heat shrinkable sleeve, a high shear strength thermoplastic hot melt adhesive, a solvent free, 2 component epoxy, a specially designed wear cone, and optional clamping belts. Supply necessary equipment to install sleeves in accordance to manufacturer's recommendations. This may include, but not be limited to, high intensity gas torches and abrasive blast equipment for pipe surface preparation.

After the field joints have been coated and immediately before the pipe is lowered into the ditch, the entire coating will be tested to locate breaks or pinholes and other flaws in the coating with an approved holiday detector in good working condition capable of producing the testing voltage in pulsating cycles at very low amperage. The voltage used is not to exceed 14,000 volts for pipe coatings of 0.094 in. For fusion bonded epoxy coated pipe, the coating is to be checked for holidays using a dry-type holiday detector. The holiday detector is to be set at 150 volts per mil thickness of coating. All defective places will be plainly marked immediately. Furnish the holiday detector, and check the coating for holidays in the presence of the Engineer.

- 4.7.5. Compression type couplings, valves, welded fittings, etc., will receive a cold applied mastic after the pipe is in the trench and has been tested for leaks. A plastic wrap supplied by CPS ENERGY will be installed over the mastic to protect the coating during backfilling.
- 4.7.6. Handling coated pipe is to be accomplished only with suitable equipment to prevent damage to the coating. The coated pipe is to be placed on skids alongside the trench until it is to be welded and lowered into the trench. The skids are to be of sufficient width or padded with sand bags or resilient pads to prevent the skid edges from cutting the coating and wrapping. The skids are to be arranged to permit the coated pipe to bear on the full width of the skid.

- 4.7.7. Coated and wrapped pipe is to be carefully handled with wide rubber, leather, composition, or canvas slings or belts containing no protruding rivets or belts that may damage the coating. Wire rope, tongs, chains, hooks, and bare cables must not come into contact with the coating. Coated pipe is not to be handled when the temperature is low enough to cause cracking of the enamel.
- 4.8. **Plastic Gas Pipe.** Handle the pipe only with suitable equipment to prevent damage to the pipe such as fracture, kinking, deep gouges or cuts. The pipe is not to be subjected to abuse by dropping, throwing or dragging except over smooth non-scratching terrain or surface.
- Install an insulated copper tracer wire furnished by CPS ENERGY with all pipe for the purpose of locating the pipe after backfilling. This wire is to be installed with 2 to 6 in. of separation from the pipe.
- Fuse pipe joints in accordance with requirements of 49 CFR Part 192, "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards", Paragraphs of 192. 281, 192. 283, 192. 285, 192, and 287.
- Prior to starting production fusing, each employee that will be making fusion joints must qualify according to 49 CFR Part 192, Paragraph 285. Conduct, or make arrangements for the qualification tests. The qualifying tests are to be conducted in the presence of the Engineer.
- Furnish all specialty tools and equipment required to handle, install, butt fuse and squeeze-off the pipe. Insure all specialty tools and equipment are specifically designed for use on plastic piping systems and are in good working condition. The Engineer may inspect all specialty tools and equipment and may disallow the use of any specialty tools or equipment that are not specifically designed for use on high density polyethylene (plastic) piping systems or are deemed to not be in good working condition. CPS ENERGY routinely uses the Steve Vick & Mark II Coil Trailer for handling large diameter coiled pipe, McElroy equipment for making butt fusions on plastic pipe and Mustang Squeeze-off tools for stopping the flow of gas in existing plastic piping systems. Provide copies of the manufacturer's literature for all comparable equipment from other manufacturers and at the discretion of the Engineer, comparable equipment from other manufacturers may be approved.
- All pipe joints are to be soap bubble tested with the line having between 90 and 120 PSIG internal pressure. The test is to be made in the presence of the Engineer.
- 4.9. **Cathodic Protection.** Install packaged anodes, insulating joints and insulating flange sets as provided for by this Item and/or as shown on the plans. Welding machines are not be used to test insulation or otherwise be grounded across insulating devices. Insulation will be checked by the Engineer and declared acceptable only after testing establishes satisfactory performance.
- 4.10. **Installation and Backfill.** All stumps and roots found in the trench are to be cut and removed where they will not come in contact with the pipe. All loose rocks, stones, blocks, heavy clods, tree limbs, etc., which may damage or prevent proper installation of the pipe are to be removed before the pipe is installed. The pipe will not be lowered into the trench until it has been inspected and approved by the Engineer.
- The trench is to be excavated a minimum of 4 in. deeper than the proposed pipe depth so that a commercial sand approved by the Engineer can be placed in the trench before the pipe is installed. The sand placed in the trench to cushion the pipe is to be leveled and tamped so that the weight of the pipe is evenly distributed on the sand cushion.
- Unless the plans or the Engineer requires flowable backfill, backfilling must be conducted in a manner where the trench will be neatly and uniformly backfilled and compacted. Exercise care to prevent hand shovels and tampers from damaging the pipe. Provide 6 in. of sand backfill around and over the pipe to form a protective cushion between the pipe and the materials and equipment used for backfilling. After the pipe has a 6 in. minimum cover of sand, the remaining backfill may contain rocks and gravel, except that large rocks in excess of 4 in. in diameter, width or length, will not be used.

When crossing drainage ditches and minor streams, furnish and install all materials necessary for bank reinforcement. The backfill is to be properly maintained until the work has been completed and accepted. No reimbursement will be made for repairing of backfill due to floods and/or other conditions occurring before final acceptance.

Control the excavation and backfilling operation to have a minimum amount of open trench commensurate with good construction practices. Any surplus material not used for backfilling is to be disposed of properly. Attain the minimum specified cover for the gas piping.

Backfill in public and private thoroughfares must be properly compacted to ninety-five per cent (95%) density to prevent settlement or damage to other buried utilities. CPS ENERGY will strictly enforce this requirement through random visual inspection and the use of standard compaction evaluation methods. The Contractor will not use soil from the right of way except from the spoil bank. The Contractor will dispose of any surplus soil. The Contractor will provide density testing reports to ensure proper compaction when the city, county or state entity having jurisdiction over the project requests such tests.

- 4.11. **Final Piping Connections, Tie-Ins and Purging.** Make all connections of new gas lines to existing gas lines. This includes all necessary preparations for tie-ins and purging for all sections of gas lines installed. Weld short stop fittings and other necessary fittings on existing steel gas lines that will be used by CPS ENERGY to control the flow of gas into the new gas lines. CPS ENERGY will control the flow of gas on all operative gas facilities while the Contractor is making final piping connections and/or tie-ins.

CPS ENERGY will purge the new gas mains, and the Contractor will purge all new and/or existing service lines that have been tied to the new gas mains or otherwise adjusted.

Furnish all necessary equipment and instrumentation that is required to insure that the final tie-in welds and/or fusions between new and existing gas facilities are performed in a safe manner. Such equipment and instrumentation may include pneumatic air movers, combustible gas indicators (CGI's), oxygen monitors, self-contained breathing apparatus and fire retardant clothing for construction personnel, and fire extinguishers.

- 4.12. **Clean-Up.** As soon as backfill is completed on a section of pipeline, clean the right of way, remove and transport all surplus CPS ENERGY issued materials to the designated CPS ENERGY Center(s). Dispose of all refuse such as brush, broken skids, rock, etc. The earth on both sides of the trench which has been disturbed during the construction of the gas line is to be leveled, and the entire area left in a condition satisfactory to the Engineer.

- 4.13. **Gas Facility Access Cover Adjustments.** Install CPS Energy provided riser ring(s) on gas facility access cover assembly in order to raise existing access cover to the same elevation as final grade. Adjustment, excavation, demolition of concrete, and/or replacement of existing gas facility access cover assembly may be necessary if final grade is below existing grade. Any concrete used for gas facility access cover adjustments shall have a minimum compressive strength of 2,000 psi. Adjust all gas facility access covers as directed by authorized CPS Energy personnel. The contractor shall be responsible for damage to other appurtenances and/or structures whether CPS Energy owned or not, and perform the adjustment in accordance with the paving contractor's schedule.

5. TESTS

- 5.1. **Radiographic Inspection.** Applies when radiographic inspection is specified by this Item, by the plans, or CPS Energy Cover Tasks (see Exhibit GAS-7).

- 5.1.1. **Standards and Codes.** The latest editions of the following documents apply when required:

- Department of Transportation, 49 CFR Part 192, "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards."
- Recommended Practice No. SNT-TC-1A, Supplement A "Radiographic Testing Method."
- ANSI B31. 8, "Gas Transmission and Distribution Piping Systems."

- ASME Code Section V, "Nondestructive Examination."
- United States Nuclear Regulatory Commission, Title 10, Chapter 1, CFR - Energy and other federal, state and local regulations for protection against radiation hazards.

- 5.1.2. **Radiographic Procedure.** Perform all radiographic inspections in accordance with Section 8.2 of API Standard 1104. The Contractor is to provide a copy of the written procedure to the Engineer for acceptance.
- 5.1.3. **Personnel Qualifications.** Radiographic certification will be through a qualification and certification program that incorporates the requirements of Recommended Practice No. SNT-TC-1A, Supplement A in accordance with Section 8.7 of API Standard 1104.
- 5.1.4. **Equipment and Material.** Furnish all equipment and materials necessary for the performance of the radiographic inspection. The materials and equipment include all film and supplies for the processing, film identification, recording, filing and storage. Provide all barriers, warning systems, film badges, documentation and records necessary for the protection and personnel monitoring of every person near a radiation source.
- 5.1.5. **Production Radiography Procedures.** Notify the Engineer if any welds fail to meet the radiographic inspection. All welds or welded joints that are repaired or replaced are to be radiographed again.
- 5.1.6. **Film Identification Procedure.** Film identification is in accordance with Section 8. 6 of API Standard 1104. The method of identification will be as approved by the Engineer prior to the start of radiographic inspection.
- 5.1.7. **Radiographic Reports and File.** Furnish the Engineer a report for each calendar day the unit is on the project. All radiographs made are to be delivered to the Engineer and become the property of CPS ENERGY.
- 5.2. **Pressure Testing.** Demonstrate to the satisfaction of the Engineer, by performing a pressure test, that the mains and/or services installed do not leak and will operate safely at the desired maximum allowable operating pressure. Pressure tests will be performed to verify satisfactory workmanship and the strength of materials. To the extent practical, the test is to be conducted to the entire pipeline to minimize the number of untested tie-in connections. All joints used to tie-in a test segment of pipeline after the test are to be soap bubble tested at not less than its operating pressure. Repair any leaks or failures which are revealed by the test.
- Furnish all supervision, labor, materials and equipment to perform the pressure test, including but not limited to, pumps, compressors, pigs, test instrumentation and water. Pressure test requirements will be as indicated on the plans. The requirements indicate the minimum and maximum test pressure, test fluid and test duration, as appropriate.
- Conduct the test in accordance with the applicable requirements of 49 CFR Part 192 and take all necessary safety precautions to protect construction personnel and the general public during the test. Obtain all permits necessary to conduct the test except for the Railroad Commission of Texas test water discharge permit that is required for a hydrostatic pressure test.
- 5.2.1. **Standard Air Test.** Gas mains and services to be operated at pressures of 60 PSIG or less. This test will be indicated in Exhibit GAS-6 without a test duration period. The test pressure is to be a minimum of 90 PSIG and a maximum of 120 PSIG. The test duration is to be sufficient to ensure discovery of all leaks. At the minimum, each weld, butt fusion and any other fitting and connection is to be soap bubble tested at the specified test pressure. The test pressure is to be measured with a dial type gauge and monitored during the course of the test to detect leakage. Upon completion of the test, furnish the Engineer with a written statement to indicate successful completion of the test. Pending acceptance of the test by the Engineer, the Engineer must also sign the statement.
- 5.2.2. **High Pressure Test.** When the plans specify a test pressure greater than 90 PSIG or if a specific test duration period is specified, the following applies.

- 5.2.2.1. Prior to initiating any work required for a High Pressure Test, hold a pre-test meeting with the Engineer to discuss all aspects of plans for conducting the High Pressure Test. The key points of discussion for hydrostatic pressure tests will include the following: 1) optimum direction and injection rate for filling the pipe section with water while minimizing air entrapment; 2) optimum direction and discharge location for safely and completely draining the pipe section; 3) the type, quantity and condition of pipeline pigs; 4) installation and use of temporary pig launchers and/or receivers; 5) capacities of water pumping equipment; 6) pressurization procedures; 7) written test documentation; 8) limitations on refilling and/or discharging test water during the pressure test without invalidating the test and causing the test to be restarted; 9) test water stabilization period after filling the pipe section; 10) appropriate procedures for dewatering the pipe section to minimize the amount of water that remains in the pipe; 11) any other aspects of High Pressure Test.

The test medium may be either air or water as shown on the plans. A hydrostatic test is to be conducted in general conformance with API Recommended Practice (RP) 1110. Conduct air tests in conformance with API RP 1110 with regard to safety and instrumentation.

- 5.2.2.2. All filling and pressurization procedures are subject to the approval of the Engineer. When a hydrostatic test is performed, fill the pipeline in a manner that no air is entrapped, making use of pipeline pigs as necessary. Furnish all pipeline pigging equipment, including appropriate styles and types of pipeline pigs and temporary pig traps and launchers. The Engineer will inspect all pigging equipment, and the equipment is to be acceptable to the Engineer prior to use. Allow a suitable time for temperature stabilization of the test fluid.

The stabilization period is to be a minimum of 24 hours after the filling operation is complete for a hydrostatic test or, for an air test, 8 hours after the pipeline is pressurized to the minimum test pressure. The stabilization period may be reduced by the Engineer for short sections such as offsets, etc.

- 5.2.2.3. Note each significant step or event during the filling, pressurization and testing operation and comments are to be added for any incidents which may affect the results of the test. Where the specified test duration is 2 hours or less deadweight pressure, pipe temperature and ambient temperature measurements are to be recorded at 15 min. intervals. For tests whose duration is greater than 2 hours, these measurements are to be recorded at 30 min. intervals.

- 5.2.2.4. Upon completion of the test, obtain the approval of the Engineer prior to depressurizing the pipeline. Depressurize, de-water, clean and dry the pipeline to the satisfaction of the Engineer. Dispose water in the manner required by (if any) permits.

- 5.2.3. **Test Records.** Submit to the Engineer all documentation associated with all the tests, including a completed Form I, "Hydrostatic Test Record and Certification" of Appendix I, API RP 1110, (or substantially similar documentation), testing logs and all recorder charts. All documentation is to be labeled to identify the pipeline section that was tested, signed, and dated by the Contractor. Provide written confirmation to indicate successful completion of the test for the Engineer's approval.

- 5.3. **Pipeline Availability (Test Period).** The gas main installation including the backfill will not receive final acceptance until all gas main construction has been completed and the main has been in satisfactory operation. This date will be established by the Engineer in writing. If it is determined by the Engineer that adjustments, repairs, replacements or other correction measures are needed, promptly perform the correction or replacement and retesting work necessary at contractor's expense including all work damaged by the correction or replacement of the defective work. Upon completion of the gas work, all subsequent test periods will be at the discretion of the Engineer.

6. MEASUREMENT

Measurement of completed and accepted work as described herein is as follows:

- 6.1. New service stubs for 1/2 in. through 4 in. diameter pipes placed in an open trench will be measured as each location shown on the plans and as directed by the Engineer. A service stub connected to the gas main located along the same side of the street as the property being serviced is referred to as a short side service

stub. A service stub connected to the gas main located along the opposite side of the street from the property being serviced is referred to as a long side service stub. The following conditions apply for service stubs:

- 6.1.1. Service stubs installed from an existing gas main to 1 ft. inside property line for short side or long side service.
- 6.1.2. Service stubs installed from a new gas main to 1 ft. inside property line for short side or long side service.
- 6.2. Re-running and lowering service lines for 1/2 in. through 4 in. diameter pipes will be measured as each location shown on the plans and as directed by the Engineer. The conditions for service lines shown in Sections 6.(1)(a) and (b) will apply for re-running and lowering service lines.
- 6.3. Extending, connecting and pump testing an existing service line for 1/2 in. through 4 in. diameter pipe to a new gas main will be measured as each location shown on the plans and as directed by the Engineer.
- 6.4. Shortening, connecting and pump testing an existing service line for 1/2 in. through 4 in. diameter pipe to a new gas main will be measured as each location shown on the plans and as directed by the Engineer.
- 6.5. When there is a need for a new welded steel service tee or a steel ball valve to be welded, the new welded steel service tee or the steel ball valve will be measured for the welding required to install each fitting for a 1-1/4 in. steel tee or a 2 in. or 4 in. steel ball valve. In most instances, the existing service tee and/or valve will be utilized when re-running a service line off an existing steel gas main.
- 6.6. Uncovering and capping service lines at the gas main will be measured as each location shown on the plans and as directed by the Engineer.
- 6.7. Installing a gas main of the size and type shown on the plans in an open trench will be measured by the foot along the top of the trench.
- 6.8. Installing a gas main of the size and type shown on the plans in a joint trench will be measured by the foot along the top of the trench.
- 6.9. Installing a steel pipe casing for a service line or a gas main of the size shown on the plans in an open trench will be measured by the foot along the top of the trench. The size of the steel pipe casing will be larger than the size of the service line or gas main, such as, using 2 in. casing for a 3/4 in. pipe, 3 in. casing for 1 in. or 1-1/4 in. pipe, 4 in. casing for a 2 in. pipe, etc. This does not include the pipe installed in the casing.
- 6.10. Boring for a service line or a steel pipe casing of the size specified on the plans will be measured by the foot of pipe installed in the bore. The size of the steel pipe casing will be larger than the size of the service line or gas main to be installed.
- 6.11. Installing a service line or gas main of the type and size shown on the plans into a previously installed casing will be measured by the foot of pipe installed in the casing. The size of the pipe will be a 3/4 in. pipe into a 2 in. casing, a 1 in. or 1-1/4 in. pipe into a 3 in. casing, a 2 in. pipe into a 4 in. casing, a 4 in. pipe into a 6 in. casing, a 6 in. pipe into a 8 in. casing, a 8 in. pipe into a 12 in. casing, a 12 in. pipe into a 16 in. casing or a 16 in. pipe into a 20 in. casing.
- 6.12. Flowable backfill will be measured in accordance with Item 401, "Flowable Backfill", for the locations shown on the plans and locations directed by the Engineer.
- 6.13. Trench excavation protection will be measured in accordance with Item 402, "Trench Excavation Protection", for the locations shown on the plans and locations directed by the Engineer.
- 6.14. Excavation and backfill (except flowable backfill) and the work for cutting and restoring pavement will be measured in accordance with Item 400, "Excavation and Backfill for Structures." The sand used as part of the

backfill will be considered subsidiary to this Item. All testing of the gas main installations will not be measured for payment but is to be considered subsidiary to the various natural gas pipeline pay items.

- 6.15. Mobilization (Equipment and Materials) will be measured in accordance with "NGP Mobilization," for one time mobilization to and from the job site. Any additional mobilization requested by CPS Energy that requires an extra charge for mobilization, first refer this matter to the Engineer and do not proceed until authorization to do so has been obtained, in which event the provisions of Item 9, "Measurement and Payment," will be used to pay for this work.
- 6.16. The 12 in. and larger stopple fittings and the work for stopping the flow of gas will be measured in accordance with "NGP Stopple". The cost of the fitting(s) used as part of the line stop will be included this Item and provided by the contractor.
- 6.17. Adjustment of a gas facility access cover to final/proposed grade will be measured as each location shown on the plans and as directed by the Engineer.

7. PAYMENT

The work performed and materials furnished for the installation of the natural gas pipeline in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for the Items of work hereinafter described. These prices will be full compensation for hauling all CPS ENERGY furnished materials, preparation, excavation and backfill, for shaping and fine-grading the trench, for placing and connecting pipes, for coating the steel pipe, for installing all necessary fittings, for building and painting risers, for meter set-ups, furnishing materials not provided by CPS ENERGY, for all testing, disposition of surplus material and for all manipulations, labor, tools, equipment and incidentals necessary to complete the work.

- 7.1. Payment for new service stubs for 1/2 in. through 4 in. diameter pipe placed in an open trench will be at the unit price bid for "Natural Gas Pipeline (New Short or Long Service)(Existing Main to Property Line)" and "Natural Gas Pipeline (New Short or Long Service) (New Main to Property Line)", complete in place.
- 7.2. Payment for re-running and lowering service lines for 1/2 in. through 4 in. diameter pipe placed in an open trench will be at the unit price bid for "Natural Gas Pipeline (Short or Long Service)(Existing Main to Property Line)", "Natural Gas Pipeline (Short or Long Service)(Existing Main to Meter)" "Natural Gas Pipeline (Short or Long Service)(New Main to Property Line)" and "Natural Gas Pipeline (Short or Long Service)(New Main to Meter)", complete in place. Removal of existing service lines will be subsidiary to this Item.
- 7.3. Payment for extending and connecting a service line for 1/2 in. through 4 in. diameter pipe to a new gas main will be at the unit price bid for "Natural Gas Pipeline (Service)(Extend to New Main)", complete in place.
- 7.4. Payment for shortening and connecting a service line for 1/2 in. through 4 in. diameter pipe to a new gas main will be at the unit price bid for "Natural Gas Pipeline (Service)(Shorten to New Main)", complete in place.
- 7.5. Payment for the welding required to install each fitting for a 1-1/4 in. steel tee or a 2 in. or 4 in. steel gate valve will be at the unit price bid for "Natural Gas Pipeline (Service)(Welded Fitting)(Tee)" or "Natural Gas Pipeline (Service)(Welded Fitting)(Valve)", complete in place.
- 7.6. Payment for uncovering and capping an existing service line at the gas main will be at the unit price bid for "Natural Gas Pipeline (Capping Service at Main)", complete in place.
- 7.7. Payment for installing a new gas main will be at the unit price bid for "Natural Gas Pipeline (Main)" of the type and size specified on the plans, complete in place. This includes the placement of a tracer wire in the trench when plastic pipe is specified.

- 7.8. Payment for installing a new gas main in a joint trench with another utility will be at the unit price bid for "Natural Gas Pipeline (Joint Trench)" of the type and size specified on the plans, complete in place. This work includes appurtenances, additional padding, and the placement of a tracer wire in the trench when plastic pipe is specified.
 - 7.9. Payment for installing steel pipe casing in an open trench for a service line or gas main will be at the unit price bid for "Natural Gas Pipeline (Casing)" of the type and size specified on the plans, complete in place. This work includes the installation of casing vent pipes, insulators and end seals.
 - 7.10. Payment for boring the installation of a service line or a casing for a service line or a gas main will be at the unit price bid for "Natural Gas Pipeline (Boring)" of the type and size specified on the plans, complete in place.
 - 7.11. Payment for inserting a service line or a gas main inside a casing will be at the unit price bid for "Natural Gas Pipeline (Insert)" of the type and size specified on the plans, complete in place.
 - 7.12. Payment for flowable backfill used to backfill the trench will be at the unit price bid for "Flowable Backfill" under Item 401, "Flowable Backfill."
 - 7.13. Payment for trench excavation protection will be at the unit price bid for "(Trench Excavation Protection)" under Item 402, "Trench Excavation Protection."
 - 7.14. Payment for excavation and cutting and restoring pavement will be at the unit price bid under Item 400, "Excavation and Backfill for Structures."
 - 7.15. Payment for mobilization will be at the lump sum price bid for "(Gas Construction Contractor Mobilization)" under "NGP Mobilization."
 - 7.16. Payment for stopping gas flow on 12 in. diameter or larger pipelines will be at the unit price bid for "(Stoppings)" under "NGP Stopple."
 - 7.17. Payment for adjusting a gas facility access cover to final/proposed grade will be at the unit price bid for "Adjust Gas Facility Access Cover", complete in place. Excavation, demolition, or replacement of concrete pad for gas facility access cover assembly shall be subsidiary to item "Adjust Gas Facility Access Cover" as deemed necessary by authorized CPS Energy personnel.
- Testing the natural gas pipeline for leakage, including all labor, materials and equipment necessary to perform the tests, will not be paid for directly but is to be subsidiary to the various natural gas pipeline pay items.

ADDITIONS TO THE PROJECT BID DOCUMENTS

1. MINIMUM REQUIREMENTS FOR BIDDING ON CPS WORK

A. Contractor used for the gas pipeline work must have performed utility gas pipeline work within the past (3) three years of similar technical scope and magnitude as the services to be performed under this contract. With their bid, Contractor shall provide evidence of qualifications in this regard and of any licenses, permits or registrations possessed that pertain to the services or are required in the specifications. Contractor may contact CPS Energy prior to the letting of this project to determine if their previous experience meets this requirement.

B. The Contractor shall have a program complying with 49 CFR Part 199, "Control of Drug Use in Natural Gas, Liquefied Natural Gas, and Hazardous Liquid Pipeline Operations" and 49 CFR Part 40, "Procedures for Transportation Workplace Drug and Alcohol Testing Programs" to test employees for the presence of prohibited drugs as prescribed and to provide an employee assistance program. The Contractor agrees to provide CPS Energy with an affidavit prior to the date of execution of the Contract which states that Contractor and its employees have complied with all applicable laws, statutes, and regulations pertaining to ensuring a drug free workplace including, but not limited to, the requirements of Part 199 and Part 40. Furthermore, the Contractor agrees to allow CPS Energy Human Resources personnel periodic on-site access to Contractor's records documenting compliance with Part 199 and Part 40. Contractor will provide the name and contact person for the agency or consortium used by the Contractor to comply with this requirement prior to the date of execution of the Contract.

C. The Contractor agrees to provide CPS Energy with an affidavit prior to the date of execution of the contract which states that Contractor and its employees have complied with all applicable laws, statutes, and regulations pertaining to ensuring a drug free workplace including, but not limited to, the requirements of 49 CFR as amended by the Research and Special Programs Administration (RSPA).

D. CPS Energy requires the following to verify Contractor and Sub-Contractor compliance with all applicable laws, statutes and regulations pertaining to the qualification of pipeline personnel including, but

not limited to the applicable requirements of 49 CFR Part 192 – Subpart N -“Qualification of Pipeline Personnel” as adopted by the Railroad Commission of Texas (RCC) within the Pipeline Safety Rules.

1. ***A Notarized Affidavit that states the company placing the bid and its sub-contractors are in compliance with 49 CFR 192 and RRC Pipeline Safety Rules pertaining to the qualification of pipeline personnel.***
2. ***A current copy of its Operator Qualification Plan, unless currently on file, and approval of its plan by a CPS Energy Gas Operation’s Representative. A copy of CPS Energy Covered Tasks is shown in Exhibit Gas-7 - CPS Energy Covered Tasks Regulated by 49 CFR Part 192.***
3. ***Current listing of employees and qualifications.***

E. The Contractor shall submit a copy of SMWBA Form 101 to CPS Energy prior to date of execution of the contract.

F. Prospective Contractors bidding on the Project shall submit to CPS Energy through the Texas Department of Transportation (TxDOT) a properly executed Certificate of Insurance from its insurance agent or carrier of such insurance coverages as required and set forth in the Project Contract Documents prior to award of the contract. Failure to provide proof of insurance will result in TxDOT’s Contractor not being approved for award of the CPS Energy utility work on the Project.

ADDITIONS TO THE PROJECT CONTRACT DOCUMENTS

1. DEFINITION OF TERMS

Add to the City of San Antonio Article I. Contract Definitions: 49. CPS – CPS Energy Board, a municipal agency of the City of San Antonio.

2. LAWS TO BE OBSERVED

The Contractor shall make himself familiar with and at all times shall observe and comply with all Federal, State, and local laws, ordinances, and regulations which in any manner affect the conduct of the work and shall indemnify and save harmless CPS Energy and its representatives against any claim arising from the violation of any such law, ordinance, or regulation, whether by himself or by his employees.

3. PERMITS, LICENSES AND TAXES

The Contractor and his subcontractors shall procure all permits and licenses, pay all charges, fees, and taxes, and give all notices necessary and incident to the due and lawful prosecution of the work and upon request by the City Engineer give evidence of the same.

4. RESPONSIBILITY FOR DAMAGE CLAIMS

The Contractor agrees to indemnify and save harmless CPS Energy, its agents, and employees from all suits, action or claims and from all liability and damages for any and all injuries or damages sustained by any person or property of any character in consequence of any neglect in the performance of the contract by the Contractor and from any claims or amounts arising or recovered under the "Workers' Compensation Laws"; Chapter 101, Texas Civil Practice and Remedies Code (Texas Tort Claims Act), or any other laws. He shall further so indemnify and be responsible for all damages or injury to property of any character occurring during the prosecution of the work to the extent resulting in whole or in part from any act, omission, neglect or misconduct on his part in the manner or method of executing the work; or from failure to properly execute the

work; or from defective work or materials purchased by Contractor, except those claims for damages caused solely by the negligence of CPS Energy. Contractor shall not be released from these responsibilities until all claims have been settled and suitable evidence to the effect furnished to CPS Energy. The indemnification provided herein shall survive the termination of this Contract.

5. CONTRACTOR REQUIREMENT

A. The Contractor shall abide by the regulations promulgated in 49 Code of Federal Regulations Part 40 and 49 Code of Federal Regulations Part 199 and any modifications thereto listed below in this Article. CPS Energy will require such compliance to be a part of this Contract and will immediately terminate this Contract if Contractor is found to not be in compliance with said regulations. Contractor shall indemnify CPS Energy against any fines, penalties, damages, costs or attorney fees based upon any violation by Contractor of the same.

B. The Contractor shall abide by the regulations promulgated by the Federal Highway Administration (FHWA) which states that contractors subject to FHWA mandates shall be in compliance with those parts of 49 Code of Federal Regulations (CFR) which relate to the illegal use of alcohol and controlled substances.

6. PROSECUTION AND PROGRESS

All workers or subcontractors employed by the Contractor shall have such skill and experience as will enable them to properly perform the duties assigned them.

7. WARRANTY

The Contractor shall warrant all components, materials and workmanship for a period of at the least one (1) year from the date of final completion of gas pipeline work by Contractor. The Contractor warrants the title and guarantees the equipment, materials and workmanship furnished under this Contract to be specified and to be free from defects in design, workmanship and materials. If within the warranty period the work fails to meet the provisions of this guarantee, CPS Energy shall notify the Contractor thereof immediately and the Contractor shall promptly correct any defects, including nonconformance with the Contract Documents, by adjustment, repair or replacement F.O.B. the Project site of all defective work at its sole costs.

8. INSURANCE

The Contractor agrees to keep in full force during the performance of services hereunder insurance sufficient to fully protect CPS Energy from all damages, claims, suits and/or judgements, caused or claimed to have been caused by or in connection with the performance or failure to perform any services undertaken by Contractor, his subcontractor, or their agents, or employees.

9. COORDINATION

All questions about the gas construction shall be addressed to Brad Carr, CPS Energy Gas Construction, at (210) 353-4251. Design and engineering questions may be addressed to the CPS Energy Gas Engineering Division, Civic Improvements Section, at (210) 353-2430.

CPS ENERGY
EXHIBIT GAS-2
SPECIFICATIONS FOR CONSTRUCTION OF
NATURAL GAS DISTRIBUTION FACILITIES

1. GENERAL

The work to be done includes mobilization and clearing right-of-way where necessary; receiving, transporting and unloading all materials from a designated CPS Energy center; stringing pipe, welding steel pipe and pipe fittings, and fusing high density polyethylene gas pipe and pipe fittings; excavating trenches and ditching for the burial of the gas piping facilities; installation of gas piping into the excavation along with required appurtenances such as anodes, anodes lead wires, and tracer wires; backfilling of ditches, repair of damage to any street, road, highway, sidewalk, drainage structures, driveways, signs, other utilities, fencing, or other existing structures; clean-up of right-of-way and any other item enumerated in these specifications.

The work shall conform with Title 49 of the Code of Federal Regulations, Part 192, "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards" and to the CPS Energy design standards attached to this document as Exhibits GAS-3 and GAS-4, as applicable.

2. ROUTE OF THE GAS LINE

Construction of the gas line will, in general, follow the route shown on Exhibit GAS-6 (CPS Energy Job Sketch). Gas services to be installed, relocated or adjusted are also indicated on Exhibit GAS-6, as applicable.

CPS Energy reserves the right to make any changes in the routing which may be deemed necessary and such changes shall in no manner alter the terms or compensations payable under this contract except as they are affected by linear measurements of work completed.

All gas lines shall be installed in a separate trench apart from any other utility lines unless joint trenching with other utilities is specifically required on the CPS Energy Job Sketch or prior written approval is obtained from the CPS Energy representative allowing joint trench construction.

3. RIGHT-OF-WAY

The CPS Energy Job Sketch will indicate the planned route of the gas lines to be installed. The construction plans will show as much information as can be reasonably obtained by CPS Energy regarding the location of other existing buried utilities and structures in/or crossing the rights-of-way, but CPS Energy assumes no responsibility for the correctness or completeness of this information. Contractor will be held responsible for locating all such utilities and structures and for avoiding damage to them and for making repairs or paying for any damage thereto. CPS Energy will provide and furnish all necessary right-of-way, federal, state, county and city roadway crossing permits, which shall be necessary for the construction.

Most of CPS Energy's gas facilities are constructed within public rights-of-way; however, CPS Energy may acquire easements on private property for construction of gas distribution facilities when public rights-of-way are not available or unusable. When gas facilities are planned for construction within easements on private property, the exact boundaries of such easements will be shown on the CPS Energy Job Sketch, and CPS Energy will survey and stake the easement boundaries in the field. Contractor shall preserve such field staking of easement boundaries. If the Contractor's construction activities disturb the field survey stakes, then the Contractor shall be responsible for resurveying the easement boundary when necessary. Contractor shall comply with all reasonable requirements of landowners, tenants or lessees which are designed to reduce interference of construction. It will be the Contractor's responsibility to limit traffic on the right-of-way to only such vehicles as may be necessary for construction. Contractor will be held liable for damage claims arising from grass and brush fires that may be set during his operations.

In addition, the term "right-of-way" shall also apply to those portions of public streets, roads or highways in which sections of the utility lines will be constructed. The Contractor working in any public right-of-way is responsible for the safe movement of traffic (pedestrian and/or vehicular) through the construction area. The Contractor shall meet all requirements for barricading and traffic control as specified in the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

4. MATERIALS TO BE FURNISHED BY CPS

CPS Energy agrees to furnish all steel pipe, polyethylene (plastic) gas pipe, casing pipe, valves, valve boxes, stop cocks, service risers, couplings, casing insulators, casing end seals, steel pipe insulating joints, miscellaneous pipe fittings, anodes, cathodic protection test lead boxes, pipeline warning signs, gas pipe tracer wire, tracer wire clamps, pipe coating primer, and pipe coating tape and/or shrink sleeves necessary to complete the job except when these materials are to be specifically provided by the Contractor in accordance with written requirements of the Compensation Schedule (Exhibit GAS-5) or CPS Energy Job Sketch (Exhibit GAS-6).

5. CLEARING, GRADING AND PREPARATION OF RIGHT-OF-WAY

The Contractor shall clear and grade right-of-way sufficiently for his need and for hauling and stringing pipe and other material but not to exceed the width of right-of-way. Contractor shall be responsible for any damages outside of right-of-way limits. Contractor shall perform all necessary grading and compaction at road, stream, and gully crossings and at other locations where needed to permit the passage of equipment, cars, and trucks. Before any brush or timber is cut to clear right-of-way, approval from CPS Energy in writing must be obtained. All brush and timber cut to clear right-of-way must be removed from the right-of-way and disposed of to the satisfaction of the CPS Energy representative. Any trimming of an oak tree will require the contractor to follow **oak wilt suppression procedures**:

- Avoid pruning or wounding any oaks unless absolutely necessary.
- If pruning is required, request assistance as soon as possible from the CPS Energy Tree & ROW Maintenance Section or one of the Inspectors listed below.
- Any pruning wounds or damage caused by equipment (trucks, diggers, trenchers, backhoes, etc.) must be painted immediately, within a minimum of one hour. This includes any cracked or ripped limbs and wounds to trunks, limbs or root flares which may have been damaged by passing equipment.
- Within a known infection center, all tools must be disinfected with a 10% clorox and water solution or Lysol spray before using these tools on any other oak tree.

Requests for Assistance From the Tree & ROW Maintenance Section

When assistance is required, please provide as much notice as possible or call as soon as damage occurs. Contact names and numbers are listed below:

Office	Radio#	Cellular	Pager#
Section Office 353-3593	2400		
James F. Koenig 353-3798	2401	844-5457	1336

Terri Minnia	353-5218	2405	394-3580	2241
Margie Regalado	353-5243	2403	394-3579	2428
Clyde Stroud	353-5218	2404	394-3578	2301
Ed Scott	353-5243	2402	275-6935	2852

The Contractor shall promptly repair all bridges, private roads, fences, buildings or other property damaged by him in the progress of the work. Permission must be secured from owner before private roads or bridges are used or blocked.

The Contractor will be notified prior to construction of all known requirements or restrictions of right-of-way by CPS Energy.

The Contractor will be responsible for all preparation of right-of-way. This will include construction operations by removing and disposing of all obstructions from the right-of-way and/or gas easement where removal of such obstructions is not otherwise provided for in the plans and specifications.

Such obstructions shall be considered to include, but not be limited to, remains of houses not completely removed by others, foundations, floor slabs, concrete, brick, lumber, plaster, cisterns, septic tanks, basements, abandoned utility pipes or conduits, equipment or other foundations, fences, retaining walls, outhouses, shacks, and all other debris, as well as buried concrete slabs, curbs, driveways and sidewalks.

This item shall also include the removal of trees, stumps, bushes, shrubs, brush, roots, vegetation, logs, rubbish, paved parking areas, miscellaneous stone, brick, drainage structures, manholes, inlets, abandoned railroad tracks, scrap iron and all debris, whether above or below ground, except live utility facilities.

It is the intent of this specification to provide for the removal and disposal of all obstructions to the new construction, together with other objectionable materials, not specifically provided elsewhere by the plans and specifications.

Unless otherwise shown on the plans, all fences along the right-of-way and/or easement which are damaged or temporarily removed by the Contractor shall be replaced by the Contractor to an equal or better condition at no additional cost to CPS Energy.

Unless otherwise indicated on the plans, all underground obstructions shall be removed to in areas to be excavated to 2 feet below the lowest elevation of the excavation.

Holes remaining after removal of all obstructions, objectionable material, vegetation, etc., shall be backfilled and tamped as directed by the inspector, and the entire area shall be bladed to prevent ponding of water and to provide drainage.

All asphaltic material shall be deposited of or recycled at a facility authorized to accept the asphalt for such purposes.

If the contractor encounters hazardous substances, industrial waste, other environmental pollutants, underground storage tanks, or conditions conducive to environmental damage, Contractor shall immediately stop work in the area affected and report the condition to the Owner's representative in writing. Contractor shall not be responsible for or required to conduct any investigation, site monitoring, containment, cleanup, removal, restoration or other remedial work of any kind or nature (the "remedial work") under any applicable level, state or federal law, regulation or ordinance, or any judicial order. If the contractor agrees in writing to commence and/or prosecute some or all of the remedial work, all costs and expenses, to include any extension of the contract time, of such remedial work shall be paid by Owner to Contractor as additional compensation.

6. UNLOADING, HAULING, AND STRINGING MATERIALS

The Contractor shall unload from trucks and string on the right-of-way, as needed, all gas pipe and other materials in such manner as to prevent damage to same. Pipe shall be unloaded with proper equipment, and not dropped from trucks.

When materials in storage are issued to the Contractor, such materials shall become the responsibility of the Contractor, and adequate methods of inventory and material transfer will be set up by the Contractor. The Contractor and CPS Energy jointly shall inspect materials, which have been stockpiled

by CPS Energy prior to hauling. After this inspection, the Contractor shall pay CPS Energy delivered cost of any materials lost or damaged beyond use during the construction operation.

Under no circumstances shall pipe be strung in advance of right-of-way clearing operations.

Stringing of pipe on right-of-way shall be done in such a manner as to cause minimum interference with the normal use of driveways, streets, roads, highways, and land crossed. The Contractor shall prevent entrance of dirt or debris into pipe during stringing.

7. LOCATING EXISTING CPS GAS FACILITIES

The Contractor shall be required to locate all existing gas facilities as needed for the construction and installation of new gas facilities. Upon request by the Contractor, the CPS Energy inspector will provide copies of the appropriate gas maps to facilitate locating activities for the existing gas facilities at the job site, however; CPS Energy does not guarantee the accuracy of such gas facilities map information. The Contractor shall use conventional pipe locating equipment and techniques in conjunction with information from the gas facilities maps to determine the actual location of existing gas facilities. The Contractor shall be solely liable for any damages to existing gas facilities and any damages to other infrastructure such as the street, drainage structures or other utilities, that are incurred by the Contractor.

8. TRENCHING (CONVENTIONAL OPEN EXCAVATION)

A. Equipment and General Methods - Contractor shall use such equipment and methods that may be required to excavate the trench or ditch along the route specified on the CPS Energy Job Sketch, regardless of the type of soil or rock encountered and regardless of the depth of excavation necessary. Contractor shall furnish all equipment, materials and supplies that may be necessary for the completion and maintenance of the trench or ditch, including water control, shoring, coffer dams and sheet piling.

B. Survey Stakes - Contractor shall carefully preserve all survey stakes set by CPS Energy, CPS Energy representatives, or consulting engineers and shall be liable for any extra expense due to Contractor's failure to maintain such stakes.

C. Trench Specifications - The trench or ditch shall have sufficient width and be of such depth to allow installation of piping and valves at depths specified on the CPS Energy Job Sketch and/or the CPS Energy Design Standards. When surfaced streets are cut, the paving shall be cut in neat lines defining the width of the trench to be excavated. The cut shall extend entirely through the asphaltic surfacing and shall break the base material to a sufficient depth to assure the removal of the surfacing and base without breaking beyond the lines of the trench. Concrete saws, pneumatic paving chisels, or mechanically operated drop blades may be used for asphalt surface cutting as approved by the governmental authority exercising jurisdiction. A concrete saw must be used to cut concrete driveways, streets, or other concrete surfaces.

D. Blasting - No blasting will be permitted by CPS Energy.

E. Hand Ditch Requirement - In all cases where shrubbery, trees, or valuable growing timber is encountered in the right-of-way, and in any location where, in the opinion of the CPS Energy representative, the use of ditching equipment may result in unnecessary damage or injury to property crossed by the right-of-way, CPS Energy may require the Contractor to excavate the trench or ditch by hand or other approved method.

F. Temporary Bridges - When the trench or ditch is excavated where it is desirable for a property owner, tenant or other pedestrians to have a passageway across the excavation, the Contractor shall provide safe, temporary bridges or provide other safe means of crossing the ditch.

No streets or driveways shall be blocked at night, except with owner's permission, and any street or driveway opened shall be provided with a strong temporary bridge to allow traffic to move safely. Open trenches and test holes shall be properly marked by means of barricades and warning lights.

G. Additional Depth of Trench - Where trenching across or adjacent to, or within the right-of-way of roads or highways, railroads, drainage ditches, creeks, ravines, and other water courses and also at points where the contour of the earth may require extra depth, Contractor shall excavate to such additional depth as may be necessary to meet the requirements of CPS Energy and any public or private authority having jurisdiction over same.

H. Dust Suppression - Whenever trenching activities create significant amounts of dust or other undesirable emissions into the atmosphere, then the Contractor may be required, at the sole discretion of the CPS Energy inspector, to take necessary action to reduce such emissions.

I. Trench Excavation Safety - The Contractor must comply with 29 CFR Part 1926, Occupational Safety and Health Standards; Subpart P - Excavations. Contractor and/or Contractor's independently retained employee or safety consultant, if any, shall review the construction plans and any available geotechnical information and the anticipated installation sites within the project work area in order to develop the Contractor's trench excavation safety plan and procedures. The plans and procedures shall, at a minimum, comply with OSHA's standards for trench excavations. Specifically, the Contractor and/or the Contractor's independently retained employee or safety consultant shall develop and implement a trench safety program in accordance with OSHA's standards governing the presence and activities of individuals working in and around trench excavation.

9. TRENCHLESS CONSTRUCTION METHODS

The use of guided or directional boring equipment to install new gas distribution facilities is acceptable to CPS Energy provided that the Contractor demonstrates to the satisfaction of the CPS Energy representative that such equipment is capable of installing the gas pipe along a controlled and relatively constant horizontal and vertical alignment for the specific soil conditions that are encountered at each job site. Special provisions must be made to insure that the gas pipe is not damaged as it is pulled or otherwise inserted into the bored hole. The bored hole must be at least one nominal pipe size larger than the gas pipe that is to be installed (i.e. a 4-inch gas pipe requires at least a 6-inch bored hole). When the bored hole is known to have significant deflections, the bored hole must then be at least two nominal pipe sizes larger than the gas pipe.

When such equipment is used to install polyethylene gas pipe, a fusible link shall be used between the pull head and the gas pipe at all times to prevent damage to the gas pipe during the pull-back operation. The fusible link shall be at least 2 feet in length and it shall be a section of CPS Energy polyethylene pipe that is one nominal pipe size smaller than the gas main being installed. The CPS Energy representative shall inspect the fusible link and the leading edge of the installed gas pipe for any significant gouges or scrapes in the outside wall of the pipe or excessive change in length of the fusible link. If such damages to the fusible link or pipe are found to exist, then the Contractor shall remove and replace all of

the damaged pipe at the Contractor's expense, and the Contractor shall reimburse CPS Energy for the cost of the damaged pipe (including CPS Energy inventory and handling expenses).

When such equipment is used to install steel gas pipe, the CPS Energy representative shall inspect the installed gas pipe for any significant gouges or scrapes in the protective coating on the outside wall of the steel pipe. If such damages to the coating are found to exist, then the Contractor shall repair all of the damaged coating at the Contractor's sole expense.

Whenever gas service lines are planned for installation along a section of gas main that is being installed with guided or directional boring equipment, the Contractor shall excavate at least one service tap location prior to pulling the gas main into the bored hole. The purpose of this excavation is to provide the CPS Energy representative with an intermediate inspection hole where the gas pipe can be inspected during the pipe insertion process. Preferably, the intermediate inspection hole shall be located near the middle of the directionally bored section. If several gas service connections are planned along the insertion route, then the CPS Energy representative shall select the location of the service tap that the Contractor must excavate for the intermediate inspection hole before the gas pipe insertion process.

Gas mains and services that are installed by guided or directional boring equipment shall not be routinely installed at depths greater than seven (7) feet unless one of the following conditions apply:

- 1) The CPS Energy Job Sketch (Exhibit Gas - 6) specifically requires installation depths in excess of seven (7) feet.
- 2) Installation depths in excess of seven (7) feet are the shallowest depths necessary to achieve acceptable clearance between the gas pipe and another buried utility or structure while maintaining the minimum burial depth requirements for the gas pipe.
- 3) The CPS Energy representative approves such installations even though conditions described in Items 1) and 2) above are not applicable.

When guided or directional boring equipment is used to install gas distribution facilities special provisions (if any) in the Compensation Schedule (Exhibit Gas-5) for additional compensation due to extra depth of cover shall not apply.

The method of gas service replacement by Insertion involves sliding a new polyethylene service pipe of smaller diameter into the existing steel service pipe. This is an acceptable method of installation provided that the ends of the existing steel pipe are reamed and fitted with bushings for the pipe to be inserted without damage, and a shrink sleeve is applied to keep components in place and prevent damage thereafter. In order to reduce stress on the service line being inserted from the main, the horizontal distance between the end point of the new service alignment and the point of insertion should be, at least, twice the perpendicular distance between the lines (See Insertion Detail, page 19 of 20, exhibit Gas-3). Tracer wires will be inserted through the existing service along with the new pipe. An electrical continuity test will be conducted on each installed tracer wire to verify that the tracer wire has not been "shorted" against the existing steel service during the installation procedure.

10. STORM WATER POLLUTION PREVENTION PLAN

The gas utility construction work shall be performed in accordance with the City of San Antonio Storm Water Pollution Prevention Plan (SWPPP).

11. PROTECTION OF GAS PIPE ENDS

During the course of construction, diligent care shall be exercised to keep the gas pipelines clean. At the end of each day's work and at the other times that the ends of the installed pipe are left unattended, the pipe ends shall be securely closed to prevent the entrance of water, animals, trash or any other obstructions, and shall not be opened until work is resumed.

If there is reasonable cause to believe that water, trash or other obstruction is in a portion of the lines, the Contractor shall take whatever steps are necessary to assure CPS Energy that there is no water, trash or other obstruction in the line or to remove the water or other foreign matter if it is in the lines. Any and all work required to assure CPS Energy that the gas pipes are clear of debris and other such matter or to remove such obstructions shall be at the Contractor's expense.

12. WELDING

Welding shall be in accordance with API Standard 1104, 17th Edition, dated September, 1994.

Welds shall be made the "shielded metal-arc" process. All equipment and welding rods will be furnished by the Contractor. Brand of welding rods proposed to be used by the Contractor shall be approved by CPS Energy prior to use.

Where determined by the CPS Energy representative to be necessary, back-welding or inside-welding of all tube turns, ells, etc., in the pipe lines shall be required by the Contractor as part of the work covered by the Contract. Back-welding shall be performed at the sole expense of the Contractor.

All welds shall be made with not less than three (3) beads. The second or "Hot Pass Bead", should be run on the full circumference of the pipe as soon as practical. The intent of the above is that the Hot Pass or second bead shall be run before the Stringer Bead has cooled.

Prior to being permitted to weld on the line, each welder shall qualify in accordance with Section 3.0 of API Standard 1104 referred to previously and shall pass the tests listed in paragraph 3.4 of the API Standard. The Contractor will conduct, or make arrangements for, and stand the expense of the qualification tests of the welders. The qualifying tests will be conducted in the presence of the CPS Energy representative.

Each welder will be assigned a specific number and it shall be his duty to personally affix such number in crayon on each weld for future identification. Steel die stamping shall not be used.

CPS Energy rights of welding inspection shall be as given in Section 5.1 of API Standard 1104. Unless otherwise directed, the Contractor will test all welds with soapsuds while subjected to an internal air pressure of 90 psig prior to field coating the joints.

Pin holes, leaks, cold laps, rivers, undercutting or any defects whatsoever occurring in any weld shall, at the discretion of the CPS Energy representative, be repaired by cutting out the entire weld and completely rewelding at no additional expense to CPS Energy. Whenever it thus becomes necessary to remove a weld from the completed line, replacement shall be made, at the sole expense of the Contractor, by welding into the line a pup joint having a minimum length of ten (10) feet.

13. RADIOGRAPHIC INSPECTION

This Section applies when radiographic inspection is specified in the contract documents.

A. Standards and Codes - The latest available edition of the following referenced documents shall be applied when required:

1. Department of Transportation, Title 49, Part 192 - "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards."
2. Recommended Practice No. SNT-TC-1A, Supplement A - "Radiographic Testing Method."
3. ANSI B31.8, "Gas Transmission and Distribution Piping Systems."
4. ASME Code Section V, "Nondestructive Examination."
5. United States Nuclear Regulatory Commission, Title 10, Chapter 1, CFR - Energy and other federal, state and local regulations for protection against radiation hazards.

B. Radiographic Procedure - All radiographic inspections shall be performed in accordance with written procedures per Section 8.2 of API Standard 1104. Contractor shall provide a copy of the written procedure to the CPS Energy representative who shall determine the acceptance of the procedure.

C. Personnel Qualifications - Radiographic certification shall be the result of a qualification and certification program that incorporates the requirements of Recommended Practice SNT-TC-1A, Supplement A in accordance with Section 8.7 of API Standard 1104.

D. Equipment and Material - Contractor shall furnish all equipment and materials necessary for the performance of the radiographic inspection. Such materials and equipment include all film and supplies for the processing, film identification, recording, filing and storage of same. Also, Contractor shall provide all barriers, warning systems, film badges, documentation and records as is necessary for the protection and personnel monitoring of every person near a radiation source.

E. Production Radiography Procedures - Contractor will notify the CPS Energy representative if any welds fail to meet the specification. All repaired welds or welded joints, which have been completely replaced, shall be radiographed.

F. Film Identification Procedure - Film identification shall be in accordance with Section 8.6 of API Standard 1104. The exact method of identification will be approved by the CPS Energy representative prior to the start of radiographic inspection.

G. Radiographic Reports and File - Contractor shall be responsible for furnishing the CPS Energy representative with a report for each calendar day the unit is on the project. All radiographs made by Contractor shall be delivered to the CPS Energy representative and shall become the property of CPS Energy.

14. PRESSURE TESTING

A. General - The Contractor shall demonstrate to the satisfaction of the CPS Energy representative, by performing a pressure test, that the mains and/or services installed do not leak and that they will operate safely at the desired maximum allowable operating pressure. Pressure tests are performed to verify satisfactory workmanship and the strength of materials. To the extent practical, the test shall be conducted to the entire pipeline so as to minimize the number of untested tie-in connections. All joints used to tie-in a test segment of pipeline after the test shall be soap bubble tested at not less than its operating pressure. The Contractor shall be responsible for locating and repairing any leaks or failures, which are revealed by the test.

The Contractor shall furnish all supervision, labor, materials and equipment to perform the pressure test required, including but not limited to, pumps, compressors, pigs, test instrumentation and water. Pressure test specifications will be indicated on the CPS Energy Job Sketch (Exhibit GAS-6). The specifications will indicate the minimum and maximum test pressure, test fluid and test

duration, as appropriate. The Contractor shall conduct the test in accordance with the applicable requirements of Title 49 CFR 192 and shall take all necessary safety precautions to protect construction personnel and the general public during the course of the test. The Contractor shall be responsible for obtaining all permits necessary to conduct the test except for the Railroad Commission of Texas test water discharge permit that is required for hydrostatic pressure tests.

B. Standard Air Test - A standard air test will generally be specified for gas mains and services to be operated at pressures of 60 psig or less. This test will be indicated on the CPS Energy Job Sketch without a test duration period. The minimum test pressure shall be 90 psig and shall not exceed 120 psig. The test duration shall be a time sufficient to insure discovery of all potentially hazardous leaks. At the minimum, each weld, butt fusion and any other fitting and connection shall be soap bubble tested at the specified test pressure. The test pressure shall be measured with a dial type gauge and shall be monitored during the course of the test to detect leakage. Upon completion of the test(s), the Contractor shall sign and date, in the appropriate location, the "as built" job sketch to indicate successful completion of the test. Pending acceptance by the CPS Energy representative, the CPS Energy representative shall also sign the "as built" job sketch at the appropriate location.

C. High Pressure Test - When the CPS Energy Job Sketch specifies a test pressure greater than 90 psig or if a specific test duration period is specified, then the following requirements for a High Pressure Test shall also apply.

Prior to initiating any work required for a High Pressure Test, the Contractor must hold a pre-test meeting with the CPS Energy representative and a CPS Energy engineer from the Gas Engineering Division. At this meeting, the Contractor will be required to discuss all aspects of plans for conducting the High Pressure Test. The key points of discussion for hydrostatic pressure tests will include the following: 1) optimum direction and injection rate for filling the pipe section with water while minimizing air entrapment; 2) optimum direction and discharge location for safely and completely draining the pipe section; 3) the type, quantity and condition of pipeline pigs; 4) installation and use of temporary pig launchers and/or receivers; 5) capacities of water pumping equipment; 6) pressurization procedures; 7) written test documentation; 8) limitations on refilling and/or discharging test water during the pressure test without invalidating the test and causing the test to be restarted; 9) test water stabilization period after filling the pipe section; 10) appropriate procedure for dewatering the pipe section to minimize the amount of water that remains in the pipe; 11) any other critical aspects of the High Pressure Test.

The test medium may be either air or water and will be specified on the CPS Energy Job Sketch. A hydrostatic test shall be conducted in general conformance with API Recommended Practice 1110. Air tests shall also be conducted in conformance with API RP 1110 with regard to safety and instrumentation.

All filling and pressurization procedures are subject to the approval of the CPS Energy representative. When a hydrostatic test is to be performed, the Contractor shall fill the pipeline in such a manner that no air is entrapped, making use of pipeline pigs as necessary. The Contractor shall be required to furnish all pipeline pigging equipment, including appropriate styles and types of pipeline pigs and temporary pig traps and launchers. The CPS Energy representative must inspect all pigging equipment, and such equipment must be acceptable to the CPS Energy representative prior to use by the Contractor.

The Contractor shall allow a suitable time for temperature stabilization of the test fluid. The stabilization period shall be a minimum of twenty-four (24) hours after the filling operation is complete for a hydrostatic test, and the stabilization period shall be a minimum of eight (8) hours after the pipeline is pressurized to the minimum test pressure for all High Pressure Tests performed with air or other compressed gases. At the sole discretion of the CPS Energy representative, the stabilization period may be reduced for short sections of pipe such as offsets and valve complexes.

The Contractor shall note each significant step or event during the filling, pressurization and testing operation and comments shall be added for any incidents which may affect the results of the tests. Where the specified test duration is two hours or less, deadweight pressure, pipe temperature and ambient temperature measurements shall be recorded at 15 minute intervals. Where the specified test duration is greater than two hours, these measurements shall be recorded at 30 minute intervals.

Upon completion of the test, the Contractor shall obtain the approval of the CPS Energy representative prior to depressurizing the pipeline. The Contractor shall then depressurize, dewater, clean and dry the pipeline to the satisfaction of the CPS Energy representative. Water shall be disposed of in the manner required by any permits and to the satisfaction of the CPS Energy representative.

D. Test Records - The Contractor shall submit to the CPS Energy representative all documentation associated with the test, including a completed Form I, "Hydrostatic Test Record and Certification" of Appendix I, API RP 1110, (or substantially similar documentation), testing logs and all recorder charts. All documentation shall be labeled to identify the pipeline section that was tested, and it must be signed and dated by the Contractor and approved by the CPS Energy representative.

15. COATING OF PIPE

The Contractor will be furnished coated and wrapped pipe in accordance with such specifications as CPS Energy may in its sole discretion determine. The Contractor will be responsible for coating all field joints and repairing damaged and defective coating on the pipe regardless of the nature, extent or cause of such damage or defect in the coating. However, if the damaged or defective coating is of such magnitude as requires an extra or additional charge by the Contractor, then the Contractor shall first refer such matter to the CPS Energy representative and not proceed until the Contractor has obtained prior written authorization from CPS Energy to do so, in which event the provisions of the Contract relating to extra or additional work shall be applicable.

Coating materials for coating field joints and repairing damaged or defective coating will be furnished by CPS Energy.

For coating field joints, the coating on the pipe must be cut back a distance of 8" to 12" from the joint. The edge of the enamel and felt wrapping shall be feathered at these points to assure a firm bond between the original coating and the field coating. After the joints are welded and tested, and the welds cleaned and brushed, the bare ends of the pipe shall be thoroughly cleaned, then immediately given a hand-brushed coat of primer to dry surfaces. Care shall be exercised to prevent primer from being applied too heavily, especially at the base of the welds; any runs or sags which have dried or dead primer shall be scraped off and the pipe reprimed. After the tape primer has dried to a tacky consistency, apply cold wrap tape with a 30 percent overlap taking care not to create any voids between the pipe and tap coating. No primer or coating will be applied to wet or damp pipe.

After the field joints have been coated and immediately before the pipe is lowered into the ditch, the entire coating will be tested to locate breaks or pinholes and other flaws in the enamel with an approved "holiday" detector in good working condition capable of producing the testing voltage in pulsating cycles at very low amperage. The voltage used shall not exceed 14,000 volts for pipe coatings of 3/32. All defective

places will be plainly marked immediately after they are detected. The Contractor will furnish the holiday detector, and will check the coating for holidays in the presence of the CPS Energy representative.

All repairs to damaged coating which exceeds 2 square inches will be made by breaking out the old coating, scraping the pipe to bare metal, feathering the edges to assure a firm bond and repriming. After the primer has dried to a tacky consistency, apply cold wrap tape taking care not to create any voids between the pipe and the tape coating. For repairs less than 2 square inches, the pipe need not be scraped to bare metal and primed; however, the good enamel around the damaged portion shall be feathered before the cold wrap is applied.

Compression type couplings, valves, welded fittings, etc., will receive a cold applied mastic after the pipe is in the ditch and they have been tested for leaks. A plastic wrap supplied by CPS Energy will be placed over the mastic to protect the coating during backfilling.

Handling of Coated Pipe - Coated pipe shall be handled only with suitable equipment in such a manner as to prevent damage to the coating. The coated pipe shall be placed on skids alongside the ditch until it is to be welded and lowered into the ditch. The skids shall be of sufficient width or padded with sandbags or resilient pads to prevent the skid edges from cutting the coating and wrapping. The skids shall be arranged to permit the coated pipe to bear on the full width of the skid.

At all times, coated and wrapped pipe shall be carefully handled with wide rubber, leather, composition, or canvas slings or belts containing no protruding rivets or belts that may injure the coating. Wire rope, tongs, chairs, hooks, and bare cables shall not be permitted to come into contact with the coating. Coated pipe shall not be handled when the temperature is low enough to cause cracking of the enamel.

16. CATHODIC PROTECTION

The Contractor shall install packaged anodes, insulating joints and insulating flange sets as provided for in the exhibits. Welding machines will not be used to test insulation or otherwise be grounded across insulating devices. Insulation will be checked by the CPS Energy representative and declared acceptable only after testing establishes satisfactory performance.

17. POLYETHYLENE GAS PIPE

Polyethylene pipe, which is commonly referred to as plastic, PE or HDPE pipe, shall be handled only with suitable equipment in such a manner as to prevent damage to the pipe such as fracture, kinking, deep gouges or cuts. The polyethylene pipe shall not be subjected to abuse by dropping, throwing or dragging except over smooth non-scratching terrain or surface.

An insulated copper wire shall be installed with all polyethylene pipe for the purpose of locating the pipe after backfilling. This wire shall be installed with 2 to 6 inches separation between the tracer wire and the polyethylene pipe. Under no circumstances shall the tracer wire be taped or otherwise secured against the outside wall of the polyethylene pipe or spirally wrapped around the pipe.

Fusion of polyethylene pipe joints shall be done by the Contractor in accordance with requirements of D.O.T., Title 49, Part 192 - Transportation of Natural Gas by Pipeline: Minimum Federal Safety Standards, Paragraphs 192.281, 192.283, 192.285, 192.287.

Prior to starting production fusing under this contract each Contractor employee that will be making polyethylene fusion joints shall qualify according to Paragraph 192.285 of the D.O.T. code using a CPS Energy approved procedure. Qualifying tests will be conducted in the presence of the CPS Energy representative.

The Contractor shall furnish all specialty tools and equipment that are required to handle, install, butt fuse and squeeze-off polyethylene pipe. The Contractor shall insure that all specialty tools and equipment are specifically designed for use on polyethylene piping systems and are in good working condition. The CPS Energy representative shall be allowed to inspect all specialty tools and equipment furnished by the Contractor. The CPS Energy representative may disallow the use of any specialty tools or equipment that are not specifically designed for use on high density polyethylene piping systems or are deemed to not be in good working condition. CPS Energy routinely uses the Steve Vick 6" Mark II Coil Trailer for handling large diameter coiled pipe, McElroy equipment for making butt fusions on polyethylene pipe and Mustang squeeze-off tools for stopping the flow of gas in existing polyethylene piping systems. The Contractor shall be required to provide copies of the original manufacturer's literature for all comparable equipment from other manufacturers. At the sole discretion of CPS Energy, comparable equipment from other manufacturers may be approved for use by the Contractor.

All polyethylene pipe joints shall be tested with soap and water with the line having an internal pressure of between 90 and 120 psig. All pressure tests on polyethylene pipe must be observed and approved by the CPS Energy representative. It shall be the Contractor's responsibility to coordinate pressure tests on polyethylene pipe so that such test can be performed with a CPS Energy representative present.

18. LOWERING IN AND BACKFILLING

The ditch shall be free of rocks and clods before the pipe is lowered into the ditch. No pipe will be lowered into the ditch until the ditch has been inspected and approved by the CPS Energy representative.

All stumps and roots found in the ditch line shall be cut so that they will not come in contact with the pipe. All loose rocks, stones, blocks, skids, chocks, tools, heavy clods, tree limbs, and other items, which may damage the pipe, shall be removed from the bottom of the ditch before the pipe is lowered in.

The ditch shall be excavated with sufficient depth to allow for a minimum thickness of four (4) inches of pit run sand to be placed in the ditch below the pipe. Pit run sand placed in the ditch to cushion the pipe shall be leveled and tamped so that the weight of the pipe is as evenly distributed as possible on solid ground.

Backfilling shall be so conducted that the ditch shall be neatly backfilled and compacted. Rock, gravel or like materials shall not be backfilled directly onto the pipe. The Contractor shall provide and shall haul sufficient pit run sand to be backfilled around and over the pipe to form a protective padding or cushion between the pipe and the rock, gravel and other such unexcavated materials. After the pipe has a six (6) inch minimum cover of pit run sand, the remaining backfill may contain rocks and gravel, except that large rocks in excess of four (4) inches in diameter, width or length, shall not be backfilled into the ditch. Such rocks shall be removed from the right-of-way and disposed of to the satisfaction of the landowner, tenant, and/or CPS Energy representative. Care shall be exercised to prevent hand shovels and tampers from damaging the pipe.

Trenches in public roadways will be backfilled and paved in accordance with the requirements of the governmental authority having jurisdiction over the street or road.

Where paving is cut, backfilling and finishing of the top of the trench will be in accordance with the requirements of the authority having jurisdiction over the pavement. On state highways, U.S. highways, expressways and freeways and their frontage roads, and any streets or roadways that are being maintained or rebuilt by the Texas Department of Transportation (TxDOT), the TxDOT specifications and requirements for backfilling trenches will apply. On county roads, private roads, streets in incorporated townships, driveways or paved parkways the backfill will be a mixture of concrete or other material mixtures with depths as required by the authority having jurisdiction and shall be placed in trench to within one and one-half (1-1/2) inches of the surface of the existing pavement. The Contractor shall apply final and finishing topping to cuts in paving with hot mix, hot lay asphalt. Inspection and approval by the authority having jurisdiction over the pavement shall be obtained by the Contractor before the job will be accepted as completed by CPS Energy.

Backfill in public and private thoroughfares shall be hydra-tamped with special care to prevent settlement or damage to other buried utilities.

The Contractor shall not use soil from the right-of-way except from the spoil bank. Any surplus soil shall be disposed of by the Contractor.

When crossing drainage ditches and minor streams, the Contractor shall furnish and install all materials necessary for bank reinforcement. Such backfill must be properly maintained by the Contractor until the entire job has been completed and accepted by an authorized representative of CPS Energy. No reimbursement will be made for repairing of backfill due to floods and/or other conditions occurring before final acceptance.

The Contractor shall control the ditching and backfilling so as to have a minimum amount of open ditch commensurate with good construction practices.

As soon as backfill is completed on a section of line, Contractor shall immediately clean up the right-of-way, removing all surplus and defective materials to CPS Energy-designated locations. Disposal of all refuse such as brush, broken skids, rock, etc., shall be to the satisfaction of the CPS Energy representative. Insofar as possible, the earth on both sides of the line ditch which has been disturbed during the construction of the line shall be leveled, and the ditch line shall be left in a condition satisfactory to the CPS Energy representative. All temporary fills and bridges shall be removed and the area cleaned to the satisfaction of the CPS Energy representative. The Contractor shall, at his expense, furnish, haul and install black top soil on the ditch line and right-of-way area where necessary in the opinion of the CPS

Energy representative to leave such area in the same condition as existed prior to the commencement of the work and/or to obtain the minimum required cover for the utility lines as specified.

Upon completion of all backfilling and cleaning of the right-of-way, permanent repairs shall be made to all fences by using equivalent or new fencing materials. All fence repairs must be satisfactory to CPS Energy representative. These repairs are to be made by Contractor at no extra compensation.

19. FINAL PIPING CONNECTIONS AND/OR TIE-INS

The Contractor will make all connections of new gas lines to existing gas lines. This includes all necessary preparations for tie-ins and purging for all sections of gas lines installed by the Contractor. The Contractor will be required to weld short stop fittings and other necessary fittings on existing steel gas lines that will be used by CPS Energy personnel to control the flow of gas into the new gas lines. CPS Energy personnel will control the flow of gas on all operative gas facilities while the Contractor is making final piping connections and/or tie-ins.

The Contractor shall be responsible for insuring that all tie-ins between new and existing gas mains are performed in a safe manner. The Contractor shall furnish all necessary equipment and instrumentation that is required to insure that the final tie-in welds and/or fusions between new and existing gas facilities are performed in a safe manner. Such equipment and instrumentation may include pneumatic air movers, combustible gas indicators (CGI's), oxygen monitors, self-contained breathing apparatus and fire retardant clothing for construction personnel, and fire extinguishers.

20. REMOVAL OF EXISTING PIPE

The asphaltic wrap on pipe removed under this contract may contain asbestos. In handling the pipe (including the excavation, cutting, removal, loading and unloading of such pipe), Contractor shall observe all State and Federal worker protection regulations and standards, and all environmental and public safety standards that are applicable to such work, including the OSHA standard found at 29 CFR Section 1926.1101, and following, that relates to the occupational exposure standard to asbestos for the construction industry.

The Contractor will indicate in its bid the manner in which the pipe shall be managed after removal. For example, Contractor shall indicate whether the pipe will be disposed at a licensed landfill facility, will be recycled as pipe by Contractor, will be sold to and recycled as pipe by a third party, will be recycled by a third party as scrap metal, etc. If dealing with a third party, Contractor shall identify the various third parties Contractor will rely upon to provide the indicated services.

For all pipe removed from the ground under the terms of this contract, Contractor shall place the following notice, beginning approximately two (2), feet from each end of the pipe, in stenciled or comparable lettering, i.e. not attached labels, of not less than 3 inches in height:

PIPE WRAP MAY CONTAIN ASBESTOS

Upon removal of the pipe from the ground, ownership of the pipe is transferred to the Contractor.

21. PURGING NEW GAS FACILITIES

CPS Energy personnel will purge the new gas mains, and the Contractor will purge all new gas service lines or existing gas service lines that have been tied-over to the new gas mains or otherwise adjusted.

22. GOODWILL OF GAS CUSTOMERS & RESIDENTS IN THE WORK AREA

The Contractor shall make reasonable efforts to create goodwill among the property owners, tenants and lessees along the right-of-way of the gas construction project.

For this reason, no gas service shall be cut-off after 2:30 p.m. each day. All gas services that have been cut-off during the day must be restored before 4:00 p.m. that same day. **If the Contractor is consistently late in restoring gas service by 4:00 p.m., the contract may, at CPS Energy's discretion, be adjusted to reflect an earlier cut-off time.**

When customer gas service is to be interrupted, the Contractor must use CPS Energy approved door-hangers to inform the customers of the impending construction activity. The door-hangers must be placed on the front door of each residence at least 48 hours prior to construction, and the Contractor must contact each customer by telephone or in person before the gas service is cut off.

The Contractor shall provide approved sanitary facilities in sufficient quantities and at such locations as may be needed for workers on the job.

24. WORKDAYS, WORKING HOURS AND HOLIDAYS

Normal working hours for this contract shall be from 7:30 a.m. to 4:00 p.m. Work days shall include Monday through Friday, except for holidays. Holidays shall include the following days: New Year's Day, San Jacinto Day (observed on Friday of Fiesta Week), Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, and Christmas Day. If the holiday falls on a Saturday, it will be observed on the preceding Friday. If the holiday falls on a Sunday, it will be observed on the following Monday. Christmas Eve and New Year's Eve will be observed as holidays when Christmas Day and New Year's Day fall on Tuesday through Friday. Exceptions to these working hours and work days will be allowed by CPS Energy when required by the governing entity, mutually agreed upon by both Contractor and CPS Energy or the customer approves or requests work to be performed outside of these established times. **At the sole discretion of CPS Energy, service renewal work can be suspended during periods of extremely cold weather.**

25. ACCEPTANCE

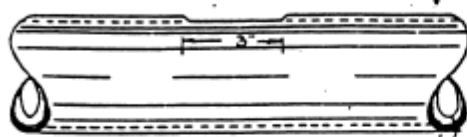
The CPS Energy representative will make all inspections and final acceptance of the work performed by the Contractor for CPS Energy.

As required by CPS Energy, Contractor shall maintain and provide a copy of the "as-built" job sketch and all associated documents once the work is completed.

**CPS
Design Standards
(Steel Gas Pipe)
Exhibit GAS-3**

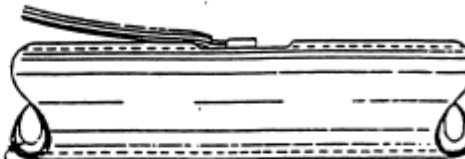
DRAWING DS-31

Remove a section of coating 3" long and file pipe bright so that a space 1" wide and 2" long is clean and dry.



STEP 1

Strip 1 1/2" of insulation from wire and place copper sleeve on #10 and smaller wire.

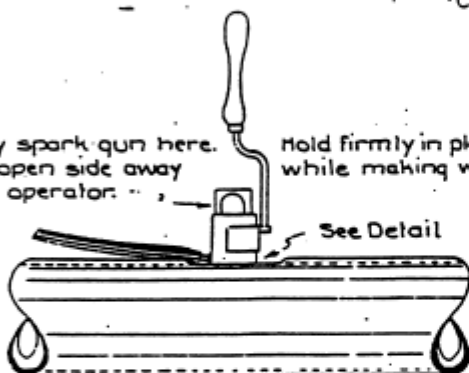


STEP 2

Apply spark gun here. Keep open side away from operator.

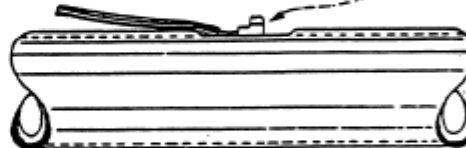
Hold firmly in place while making weld.

See Detail



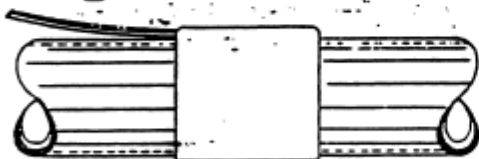
STEP 3

Remove slag with hammer and paint thoroughly with primer.

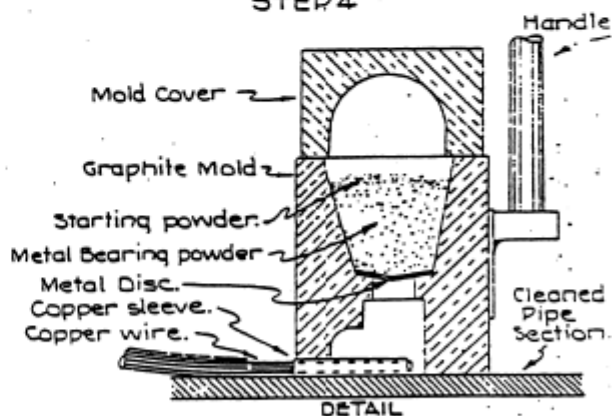


STEP 4

Repair pipe coating with care. Cover entire weld.



STEP 5



IMPORTANT

1. REMOVE RED CAP OF CADWELD CARTRIDGE AND DUMP ALL OF CONTENTS INTO MOLD. THE CHARGE WILL NOT IGNITE WITHOUT THE FINE STARTING POWDER ON TOP.
2. THE CARTRIDGES MUST BE KEPT DRY AT ALL TIMES.

Cadweld mold with sleeve for #10 wire and smaller.

CITY PUBLIC SERVICE BOARD
SAN ANTONIO, TEXAS
GAS DEPARTMENT

COPPER WIRE CONNECTION
TO PIPE USING CADWELD.

DRAWING DS- 32
INSTRUCTION SHEET - TYPE TB-3 WELDER

EXHIBIT DST-1

PREPARATION OF SURFACE:

To obtain a good weld, surface must be bright clean and dry.

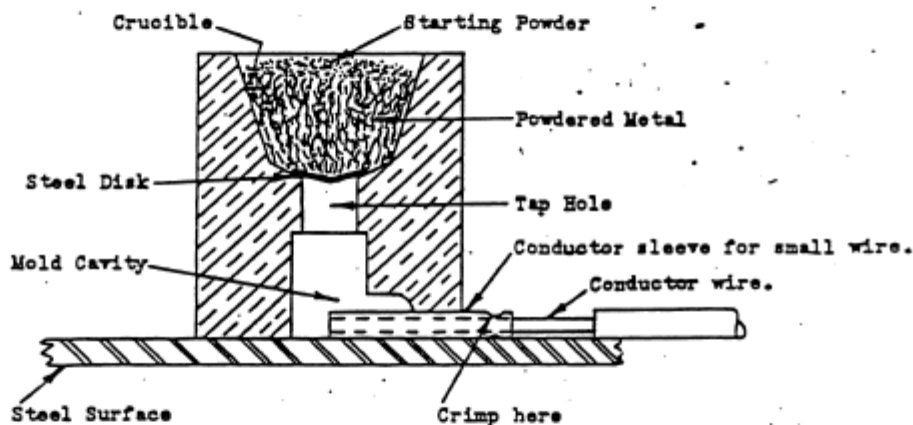
Steel surface should be ground or filed to remove all scale, rust, grease and dirt.

Galvanized steel must be cleaned with emery cloth to remove oxide.

PREPARATION OF WIRE:

Strip the insulation from the conductor and scrape until wire is bright and clean.

For #10 and smaller sizes, place the wire in a copper sleeve, ends flush, and crimp the sleeve tightly to the wire at the insulation to provide additional mechanical strength at the weld.

**WELDING PROCEDURE:**

- (1) PLACE WELDER OVER CLEAN STEEL SURFACE and insert the wire until it is under the CENTER of the tap hole.
- (2) COVER TAP HOLE WITH STEEL DISK.
- (3) DUMP CARTRIDGE IN CRUCIBLE AND CLOSE COVER. (Tap bottom of cartridge to be sure starting powder is emptied). Replace empty cartridge in box to keep remaining cartridges in an upright position.
- (4) HOLD DOWN ON WELDER TO PREVENT LEAKS AND IGNITE WITH FLINT GUN. Jerk gun away to prevent fouling. Should gun become fouled, soak in Spirits of Ammonia.
- (5) DO NOT REMOVE WELDER UNTIL METAL HAS SOLIDIFIED.
- (6) ALL SLAG MUST BE CLEANED FROM MOLD BEFORE MAKING NEXT WELD.

Note: Wet or damp molds produce porous welds. Mold can be dried out by firing a charge before making the desired weld.

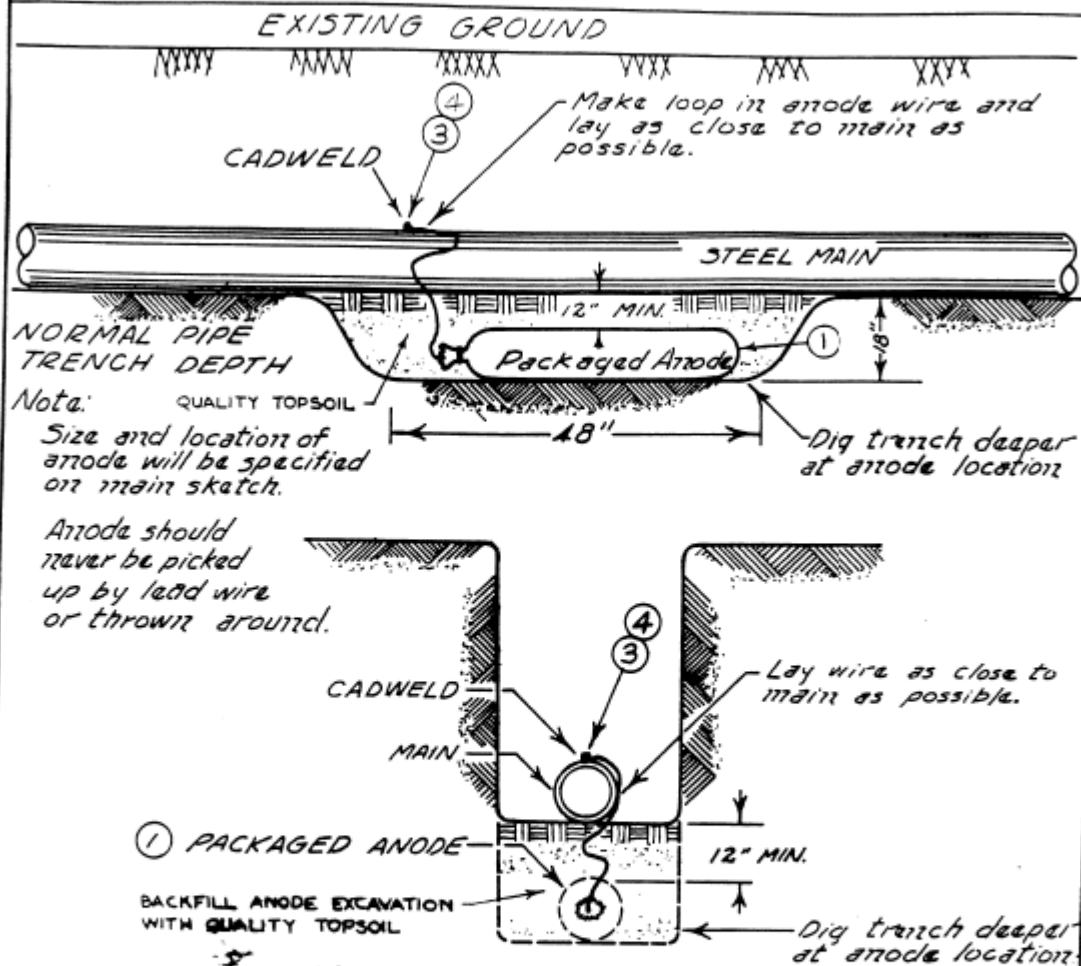
ERICO PRODUCTS, Inc. Cleveland 3, Ohio.

S-278

EXHIBIT DST-3

4.5

PACKAGED ANODES



NOTES:

- Cadweld connection to be primed and coated carefully.
- Packaged anode should be covered with fine soil containing no rocks, clods, or sand.
- Pour 5 gallons of water over anode location and tamp thoroughly.
- Provide test leads when specified. (See test lead standard)
- Anode specification sheet will be attached to main order, and is to be completed by the main construction foreman.

Page 4 of 19

	DATE	APPROVED	CITY PUBLIC SERVICE BOARD	DRAWING DS-33
ISSUED	9-1-70	CJH	CONSTRUCTION STANDARD (GAS)	G-S-171-1-2
REVISED				

EXHIBIT DST-3

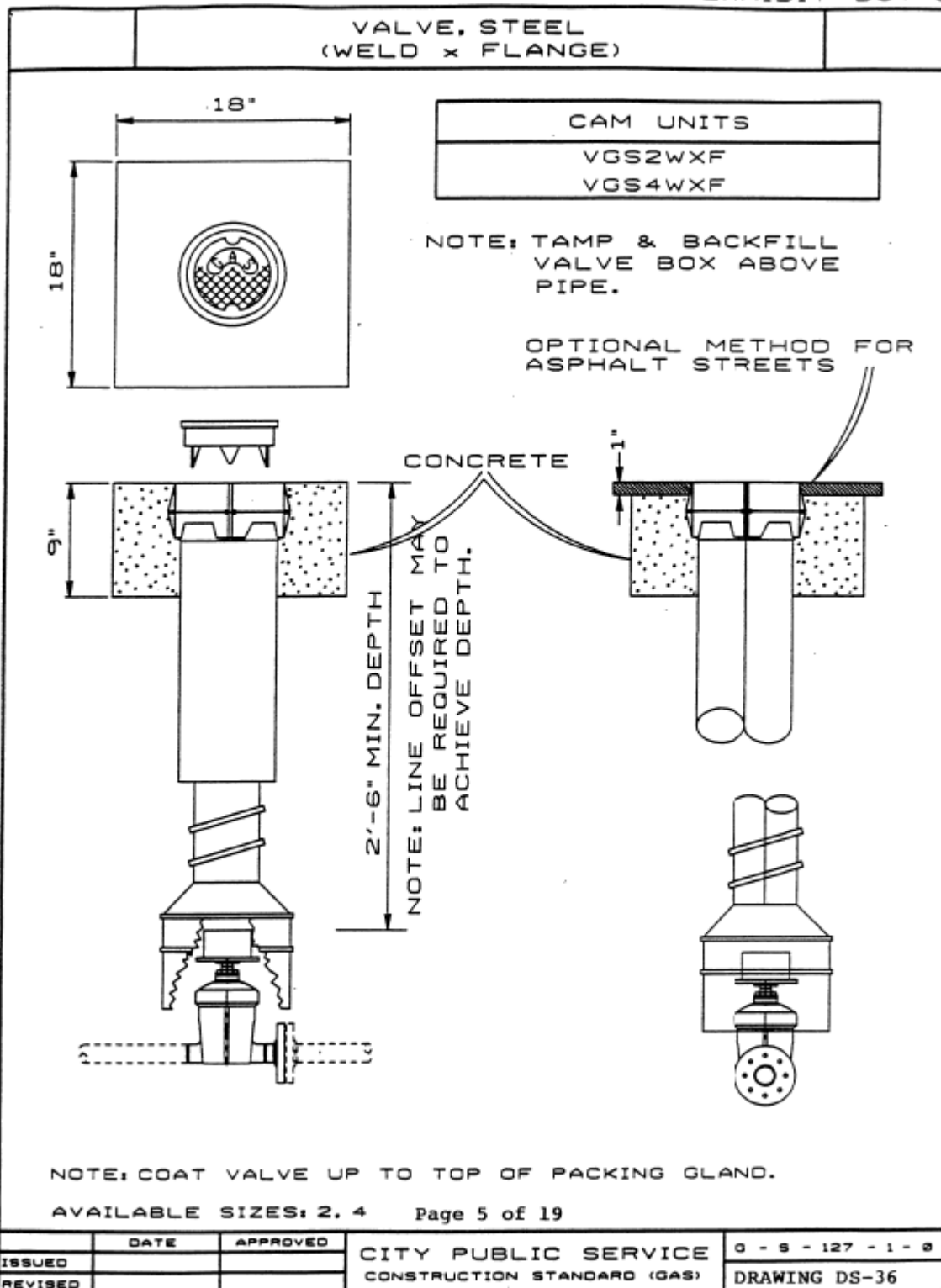
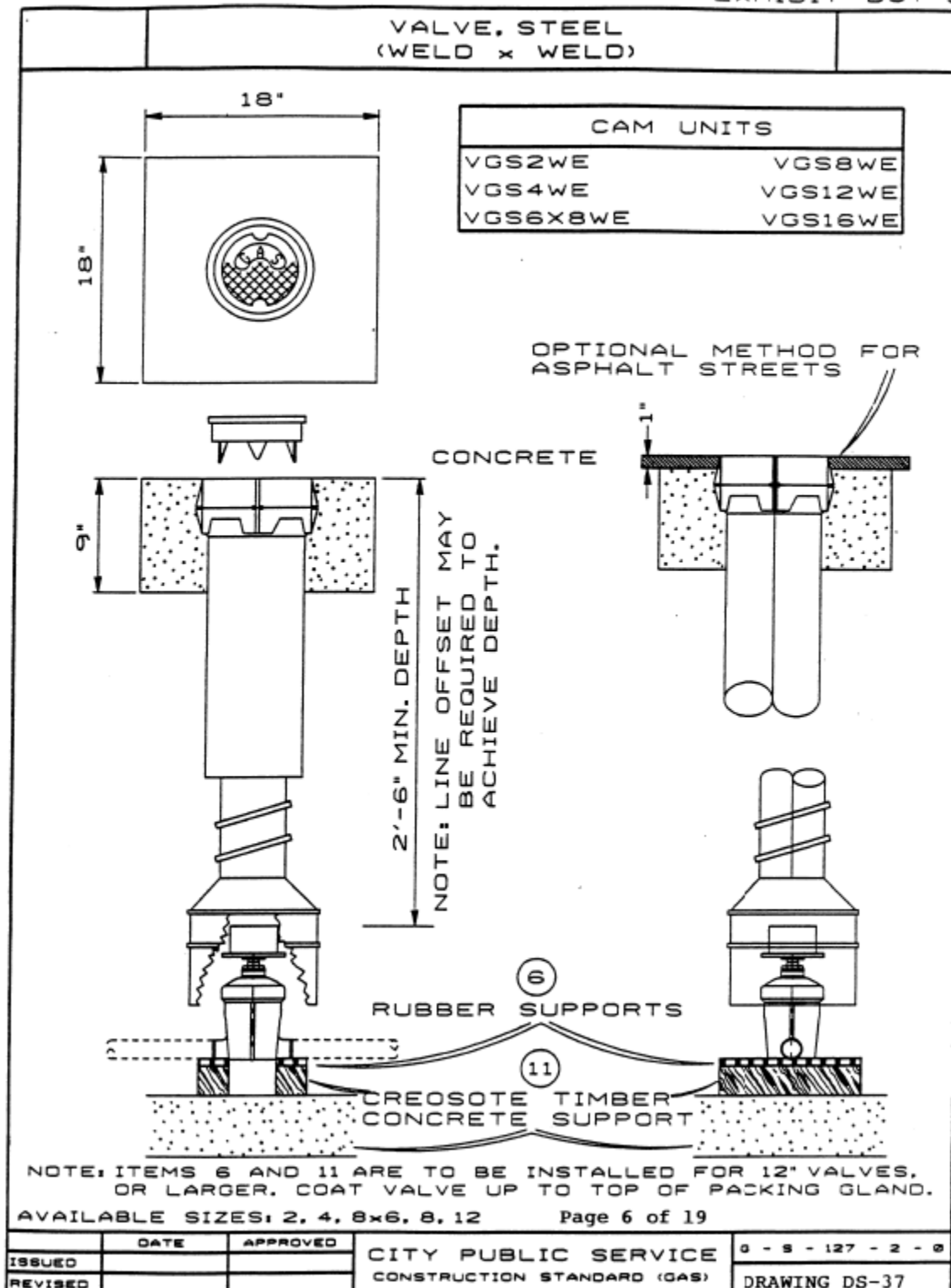
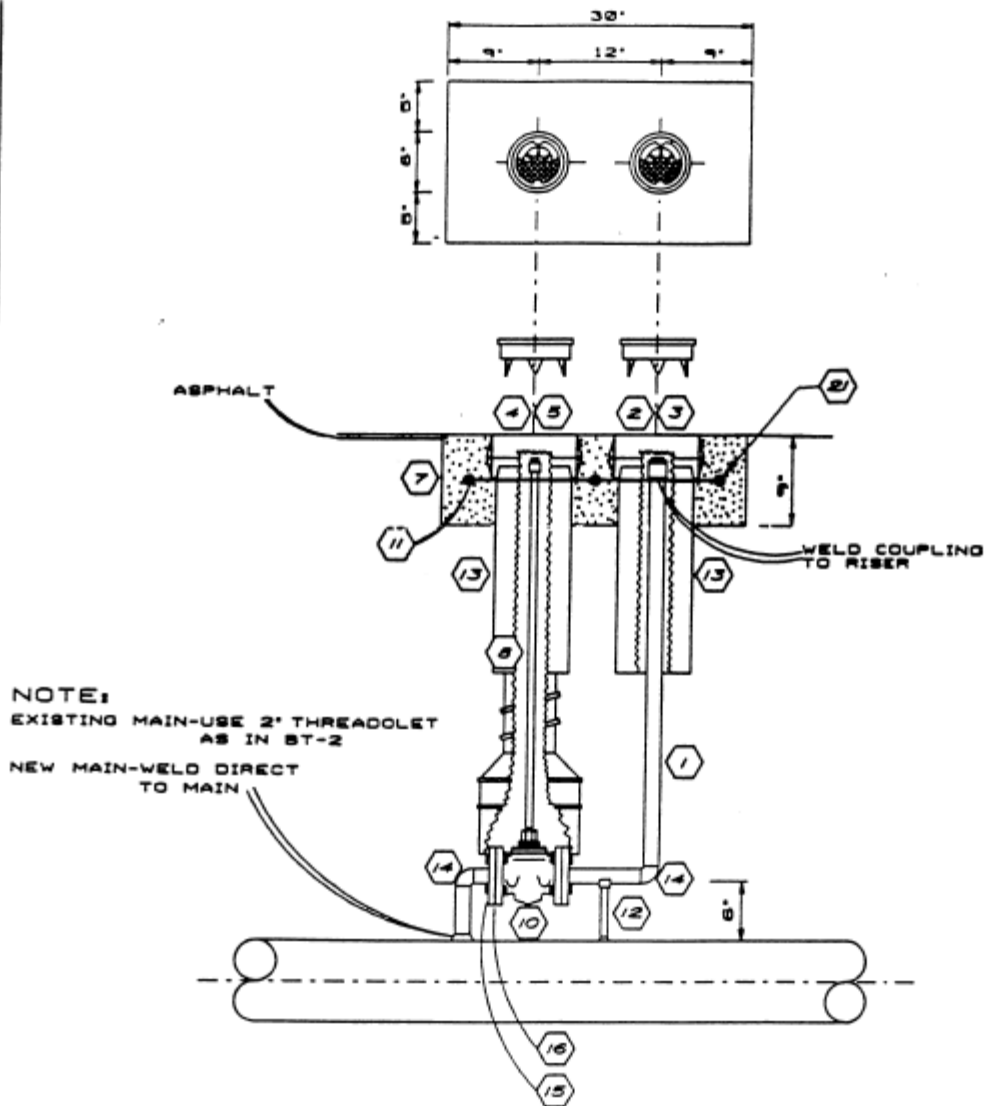


EXHIBIT DST-3



TEST RISER 2 IN.

EXHIBIT DST-3



PAGE 7 OF 19

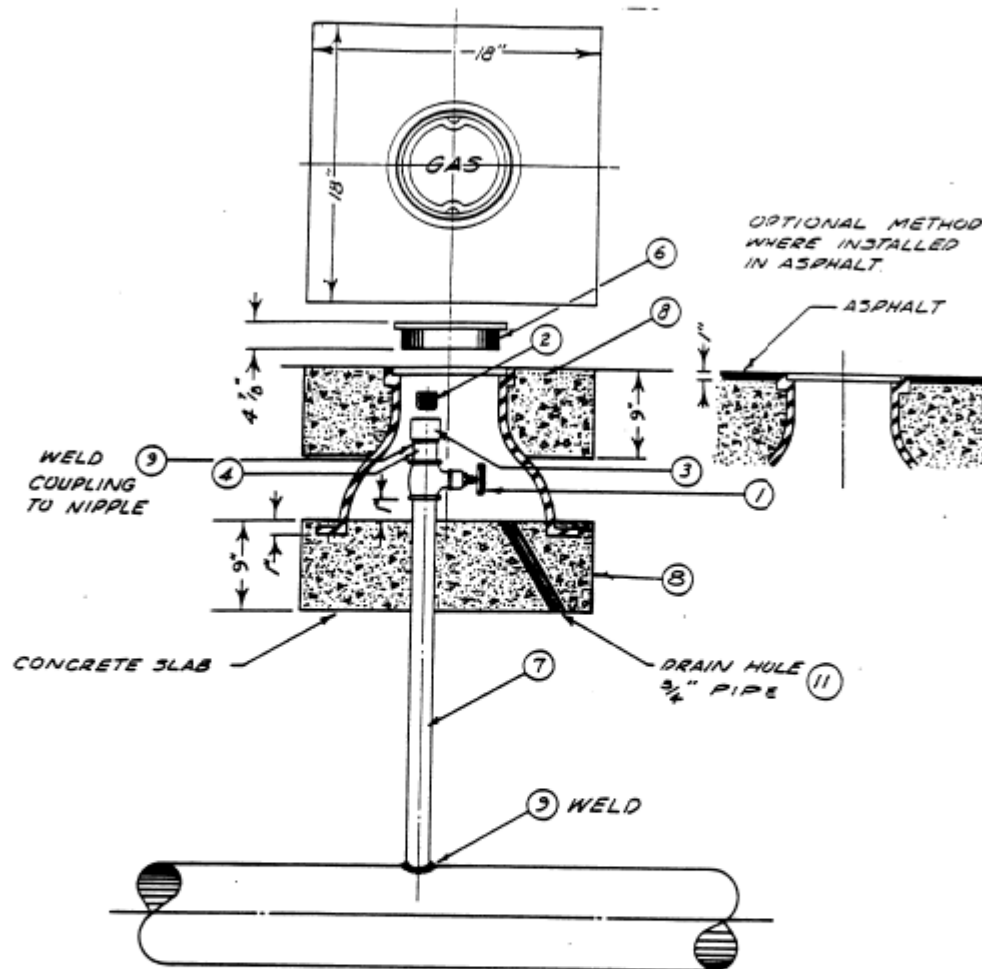
DRAWING DS-38

ISSUED	DATE	APPROVED	CITY PUBLIC SERVICE	0 - 9 - 142 - 1 - 1
REVISED	9/2/92	<i>A. Voge</i>	CONSTRUCTION STANDARD (GAS)	PLANNER: M. BLYTHE

EXHIBIT DST-3

4.5

TEST RISER, 1 IN.



Page 8 of 19

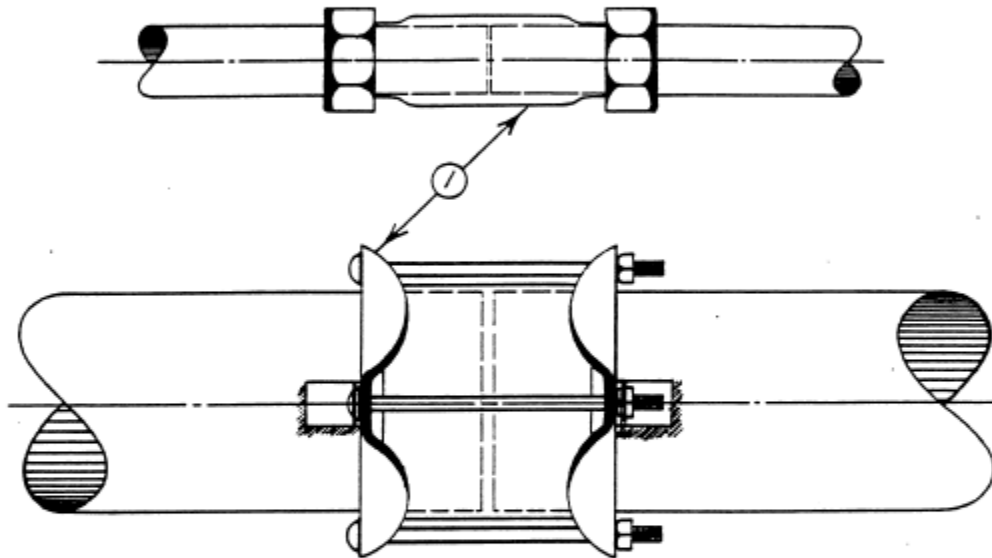
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ISSUED	9-1-70	WJH	CONSTRUCTION STANDARD (GAS)	G-S-141 - 1 - 0
REVISED				

EXHIBIT DST-3

4.5

COUPLING, BONDED

WITH WELD LUGS



- NOTE: 1 All couplings to be centered over pipe joint with minimum spacing between pipe ends. Spacing shall not exceed 1".
2 File pipe to bright finish over areas covered by bonding gaskets. Area should be a minimum of 2-1/2" wide.
3 Lubricate gaskets with soap water before installing.
4 Tighten all bolts on coupling uniformly.

AVAILABLE SIZES: 3/4", 1", 1-1/4", 1-1/2"
 2", 4", 8", 12", 16", 18", 20", 24", 30"

Page 9 of 19

	DATE	APPROVED	CITY PUBLIC SERVICE BOARD	DRAWING DS-40
ISSUED	9-1-70	CJH	CONSTRUCTION STANDARD (GAS)	G-S-051-1-1
REVISED				

EXHIBIT DST-3

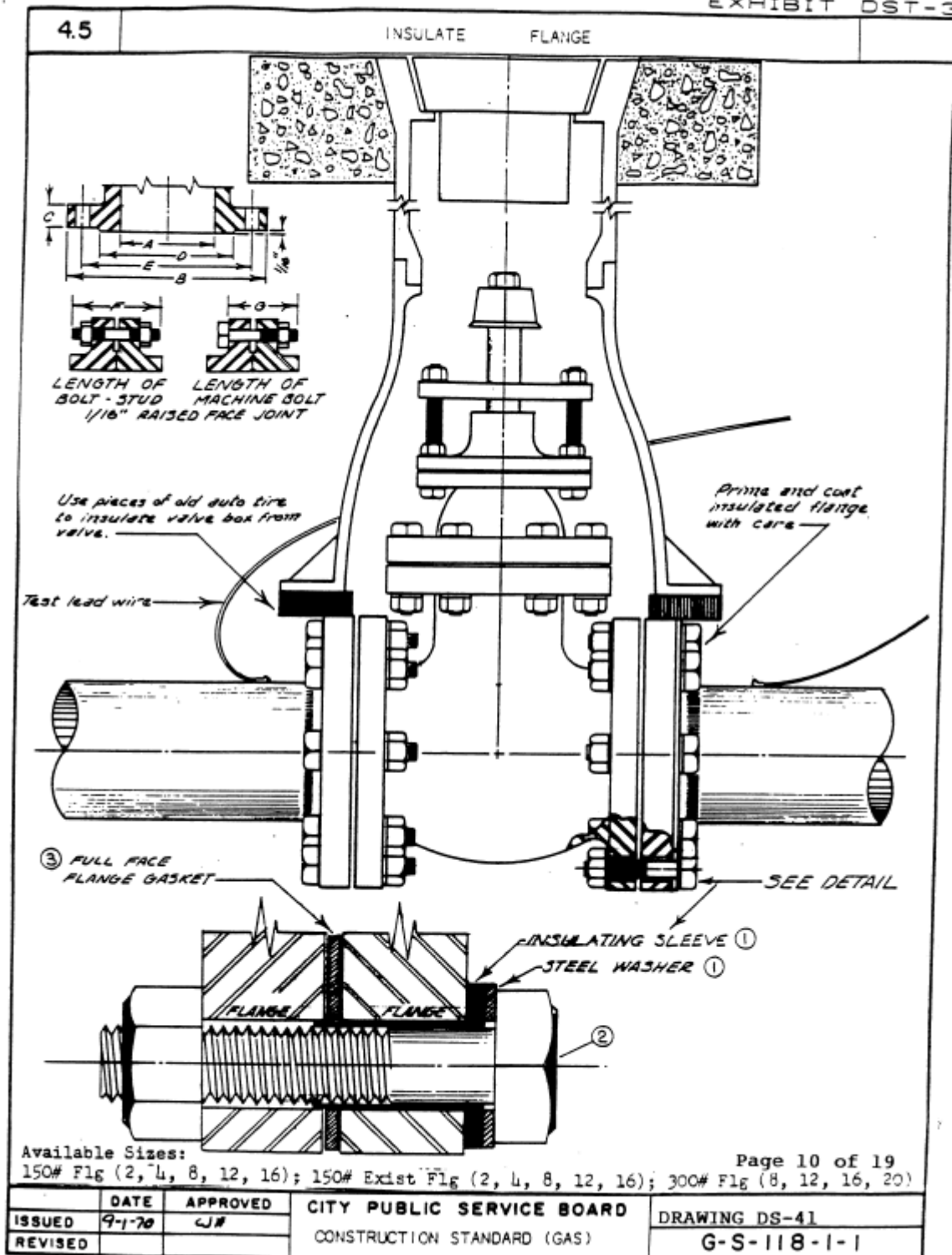


EXHIBIT DST-3

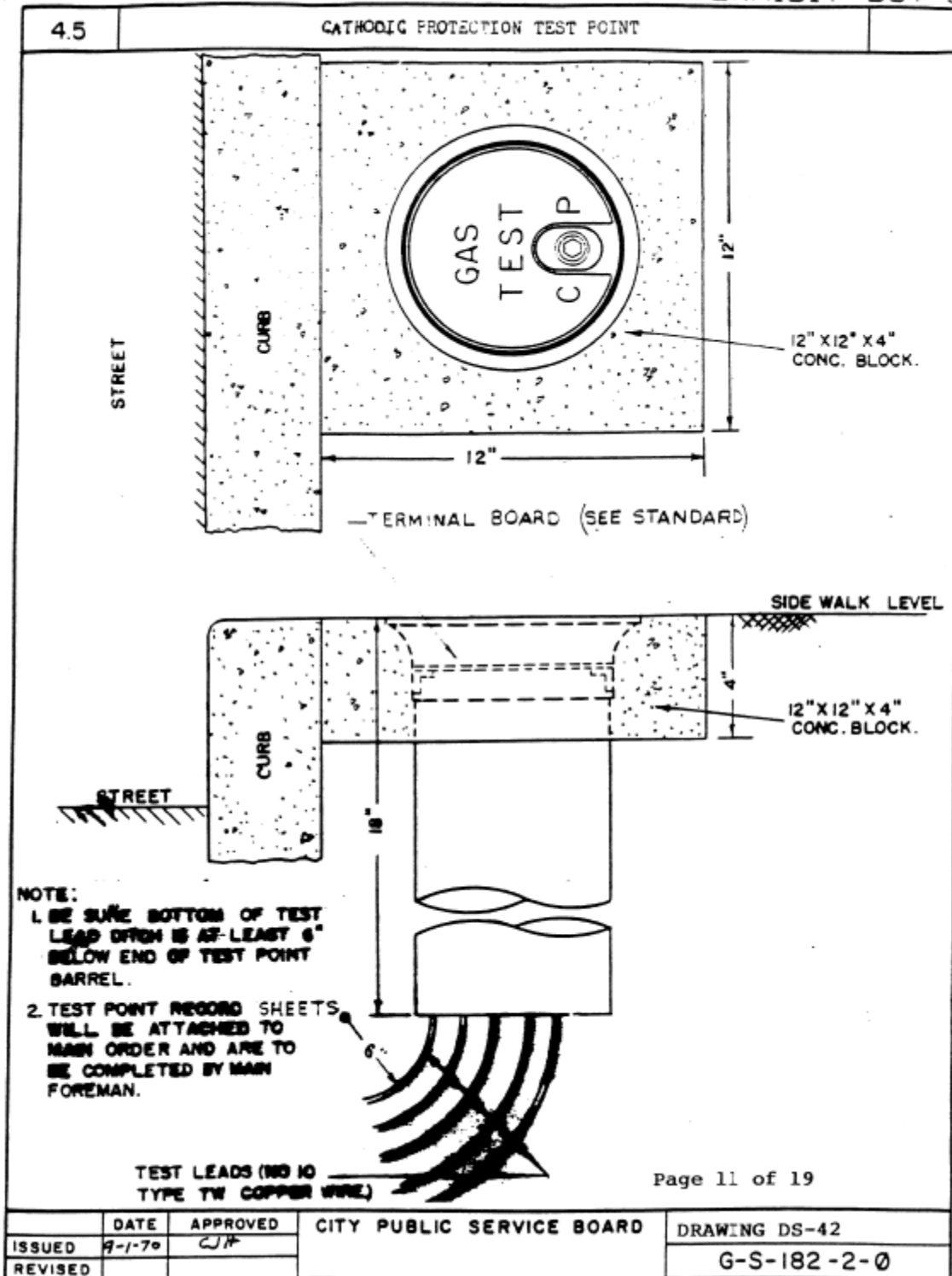
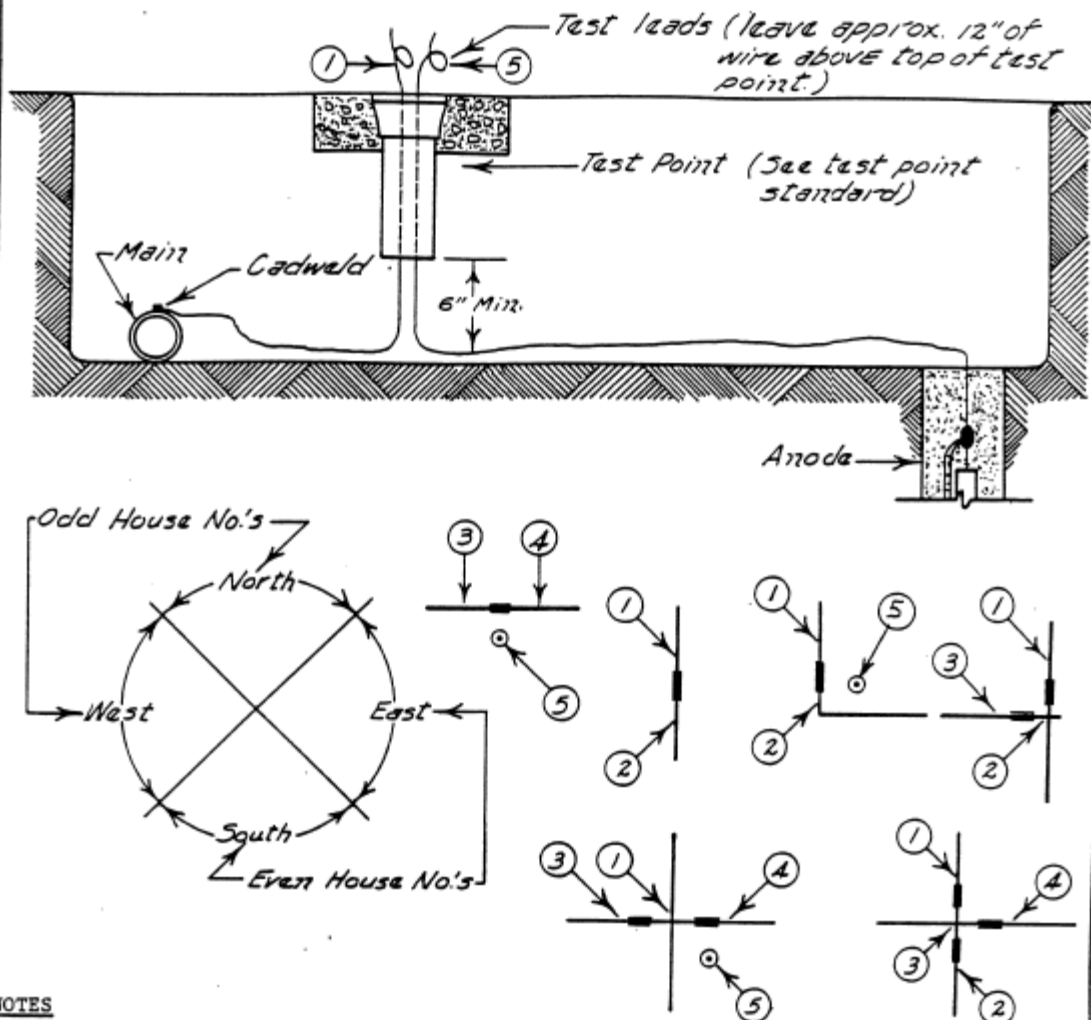


EXHIBIT DST-3

4.5

CATHODIC PROTECTION TEST LEAD CONNECTION TO MAIN



NOTES

1. All test leads to be No. 10 type TW solid copper wire.
2. Test point record cards will be attached to main order, and are to be completed by the main foreman.
3. All test leads should be tagged with a metal tag about 6" from end of lead according to the following numbering code:
 - 1 North
 - 2 South
 - 3 West
 - 4 East
 - 5 Anode

Page 12 of 19

	DATE	APPROVED	CITY PUBLIC SERVICE BOARD	DRAWING DS-43
ISSUED	9-1-70	CJH		
REVISED				G-S-182-1-0

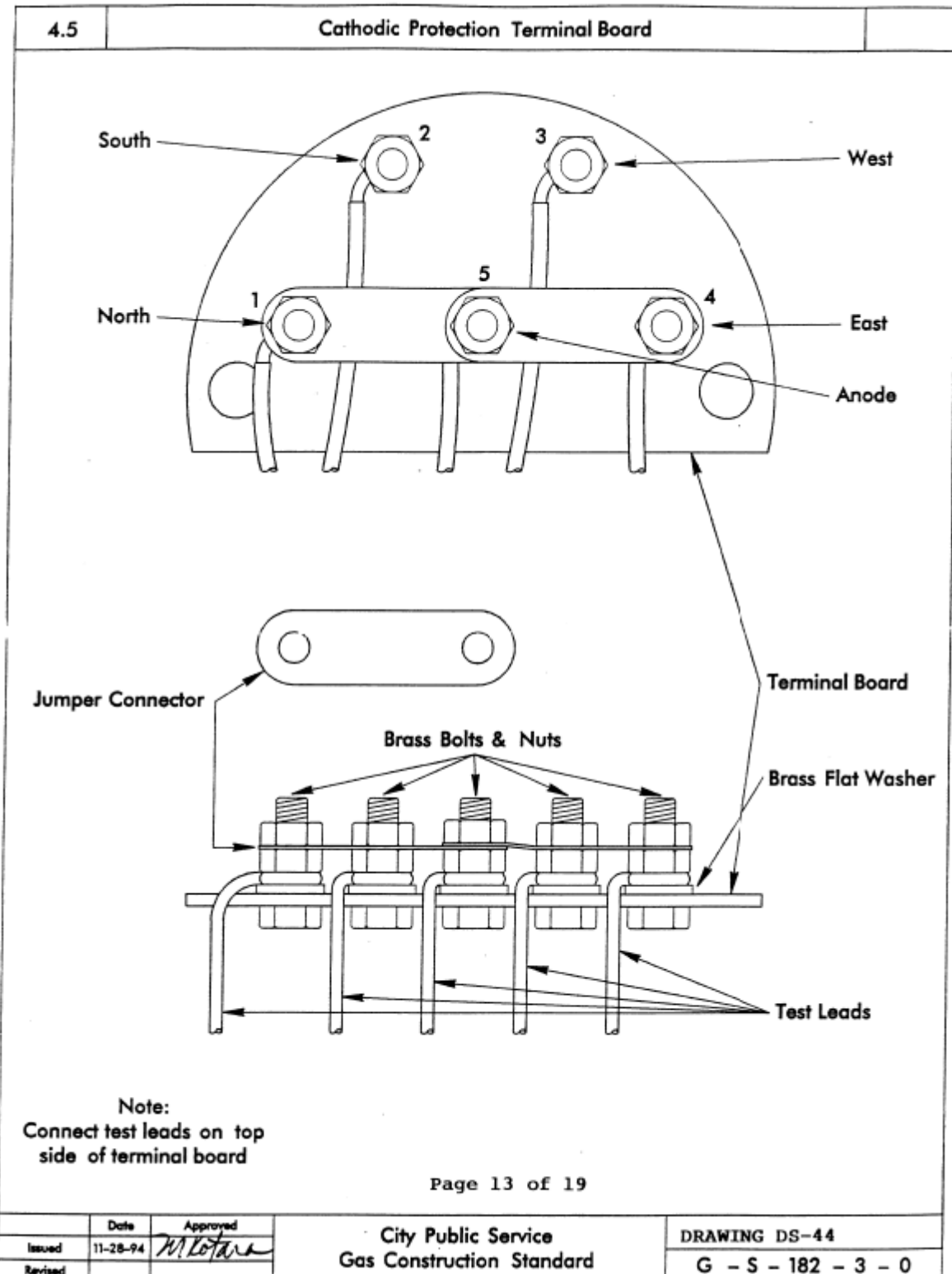
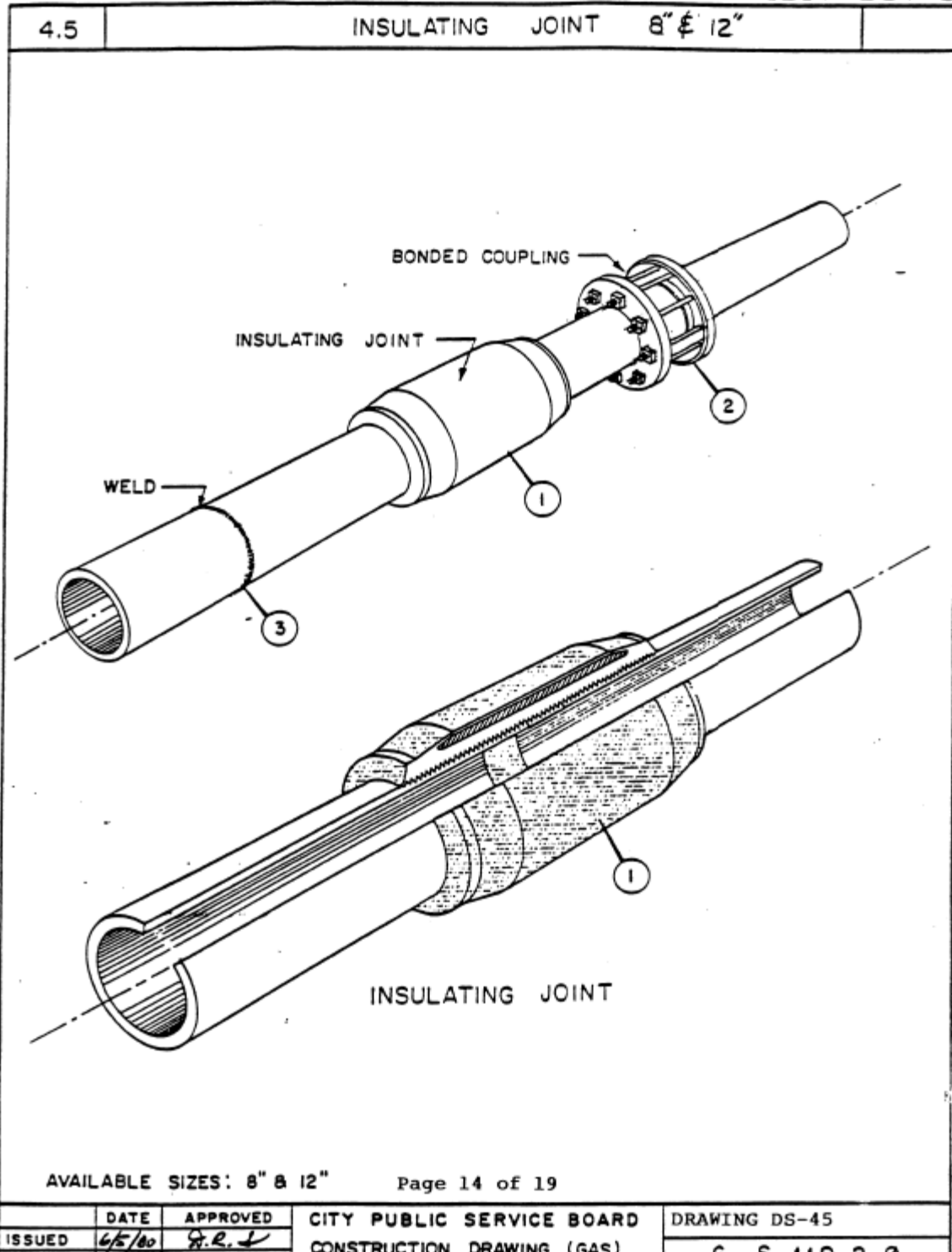
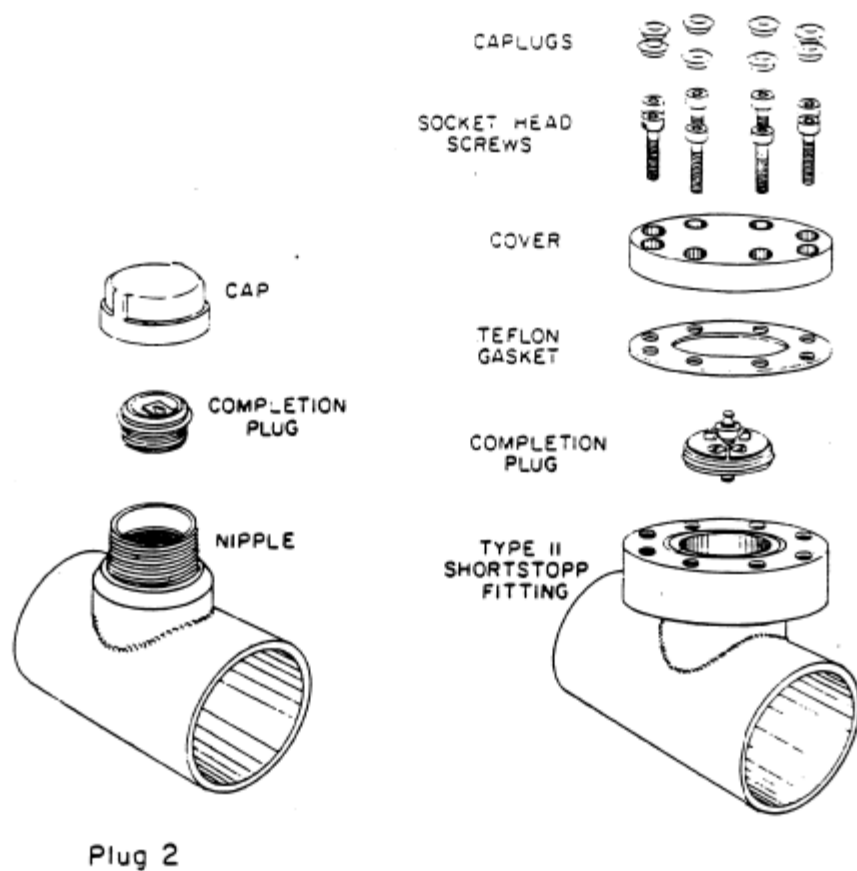


EXHIBIT OST-3



DRAWING DS-46
PLUGGING EQUIPMENT FITTINGS

EXHIBIT DST-3



NOTE:
4" YELLOW BALL MARKERS
(PASSIVE ANTENNA) TO BE
BURIED DIRECTLY ABOVE 8" and 12"
SHORTSTOP FITTINGS AT A
MAXIMUM DEPTH OF 4 FEET.

Plug 4, 8 & 12

Page 15 of 19

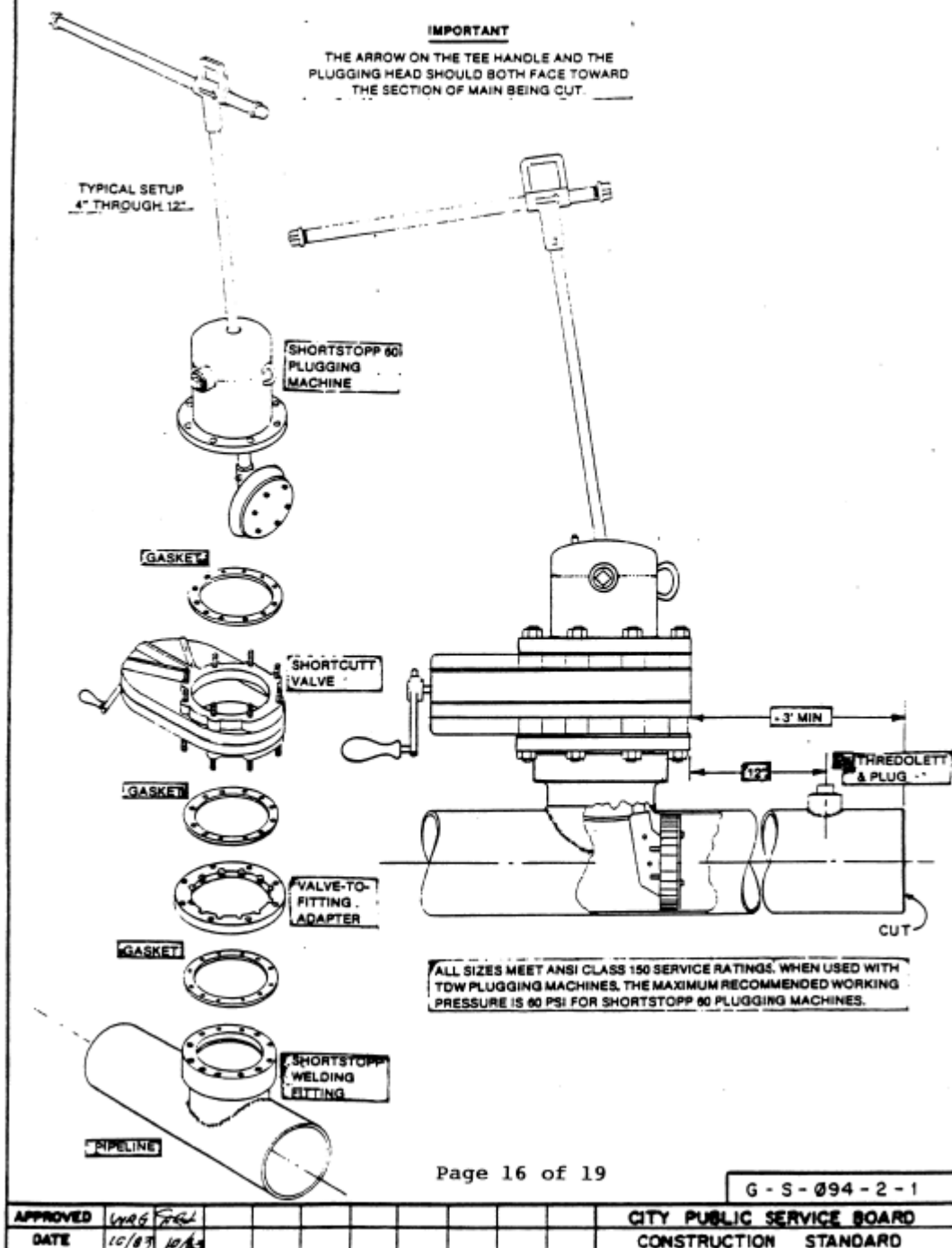
G-S-094-1-2

APPROVED	WAG	BKJ								CITY PUBLIC SERVICE BOARD
DATE	10/8/93	10/6/93	9/90							CONSTRUCTION STANDARD

DRAWING DS-47

EXHIBIT DST-3

PLUGGING EQUIPMENT INSTALLATION



INSTALLATION INSTRUCTIONS TYPE II SHORTSTOP® FITTING

1. Remove completion plug from inside fitting before welding.
2. Clean all weld edges thoroughly — remove all paint, dirt, rust, oil, etc.
3. Apply grease to machined surface inside fitting to protect machined surface from weld spatter.
4. Center and level fitting. Flange centerline should intersect centerline of pipe, and flange gasket surface parallel to pipe.
5. Maintain 1/16" to 1/8" gap between fitting and pipe surface for proper penetration. DO NOT WELD INSIDE of fitting to avoid tapping problems.
6. Place white Teflon gasket on face of fitting.
7. Position reusable valve adapter flange on fitting so that the flow arrow stamped on flange adapter is in line with the pipe. Be sure that fitting and valve adapter flange bores are concentric.
8. Attach valve adapter flange to face of fitting; use socket head screws furnished with the fitting. A minimum torque on socket head screws assures a leak-tight joint.

4" fitting...40 to 60 ft. lbs.

8" fitting...80 to 90 ft. lbs.

12" fitting...60 to 90 ft. lbs.

CAUTION

Excessive overtorquing can break socket head screws. Broken socket head screws can be difficult to remove and could allow gasket to leak.

9. Place a standard ANSI flange gasket on face valve adapter flange. Then install T.D.W. Shortcut[®] Valve on the valve adapter flange.
10. Proceed and use standard T.D.W. Shortstop[®] equipment.
11. After completion plug has been set and Shortcut Valve has been removed, remove reusable valve adapter flange.
12. Install cover (blind flange) on fitting with use of socket head screws and Teflon gasket. Use minimum torque values as shown in Item 8.
13. Insert plastic Caplugs into hex holes of socket head screws on cover. Caplugs help protect fitting from dirt and other foreign matter.

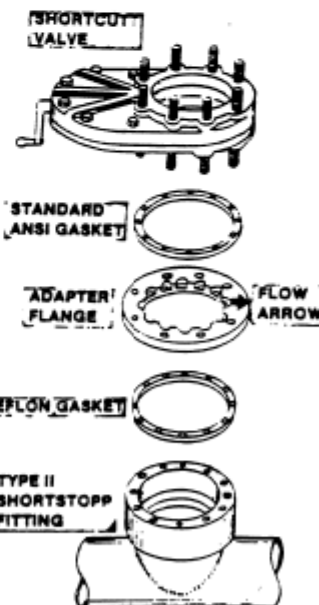
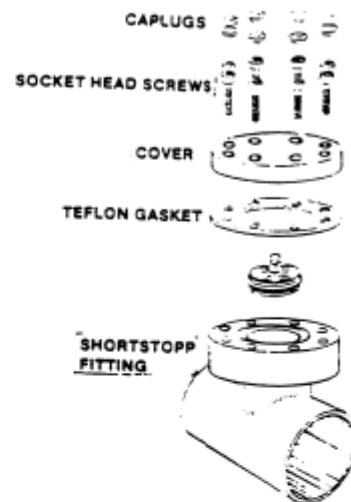
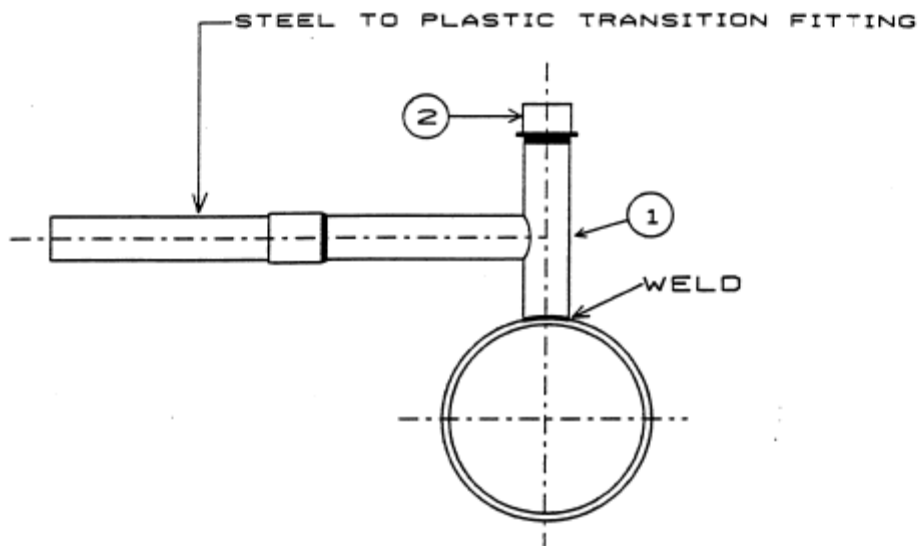


EXHIBIT DST-3

TEE SERVICE WELDED TRANSITION
STEEL TO PLASTIC



SIZE SERVICE	DRILL SIZE
1"	$\frac{7}{8}$ "
1- $\frac{1}{4}$ "	1- $\frac{1}{8}$ "

TEE SERVICE WELDED TRANSITION STEEL TO PLASTIC 1"
C.P.S. STOCK #520700204
TEE SERVICE WELDED TRANSITION STEEL TO PLASTIC 1- $\frac{1}{4}$ "
C.P.S. STOCK #520700220

Page 18 of 19

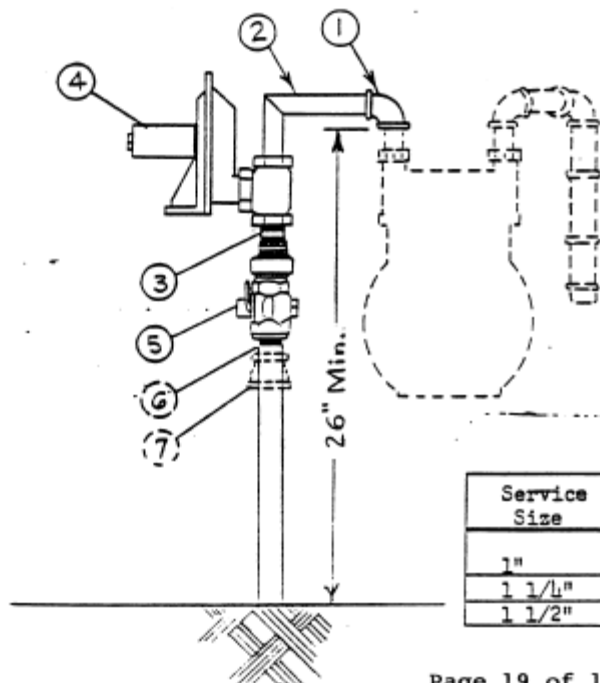
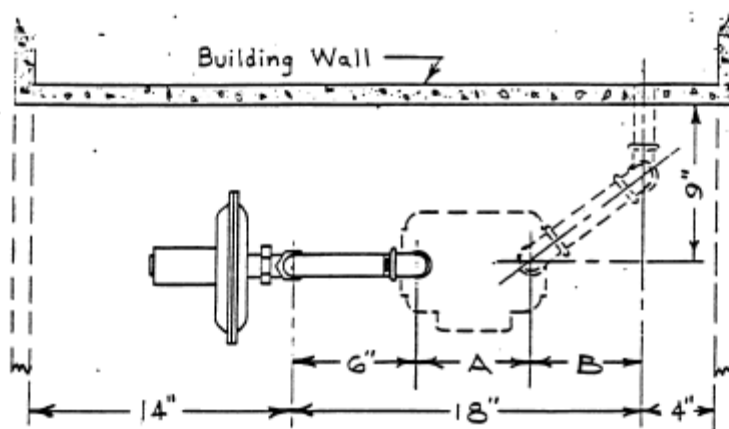
	DATE	APPROVED	CITY PUBLIC SERVICE	5 - 8 - 127 - 2 - 5
ISSUED			CONSTRUCTION STANDARD (GAS)	DRAWING DS-49
REVISED				

EXHIBIT DST-3

4.5

RISER AND REGULATOR FOR 5, 10, 30 & 35 LT. METERS

NOTE: FOR DIMENSIONS OF METERS REFER TO EXHIBIT 8-1
IN THE PLANNING INSTRUCTIONS.



Available Sizes: ●

Service Size	Size of Meter Connection		
	1"	1 1/4"	1 1/2"
1"	●	●	●
1 1/4"	●	●	●
1 1/2"			●

Page 19 of 19

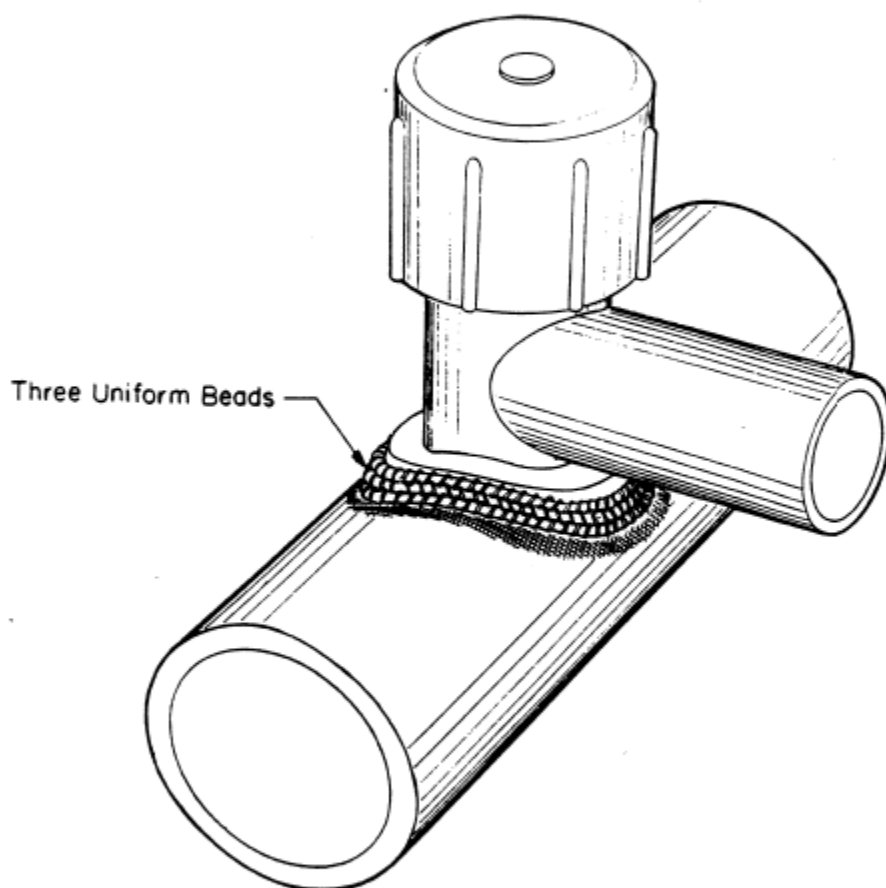
	DATE	APPROVED	CITY PUBLIC SERVICE BOARD	DRAWING DS-50
ISSUED			CONSTRUCTION STANDARD (GAS)	G-S-222-1-1
REVISED				

**CPS
Design Standards
(Plastic Gas Pipe)
Exhibit GAS-4**

EXHIBIT DST-2

4.5

PLASTIC PIPE, TAPPING TEE



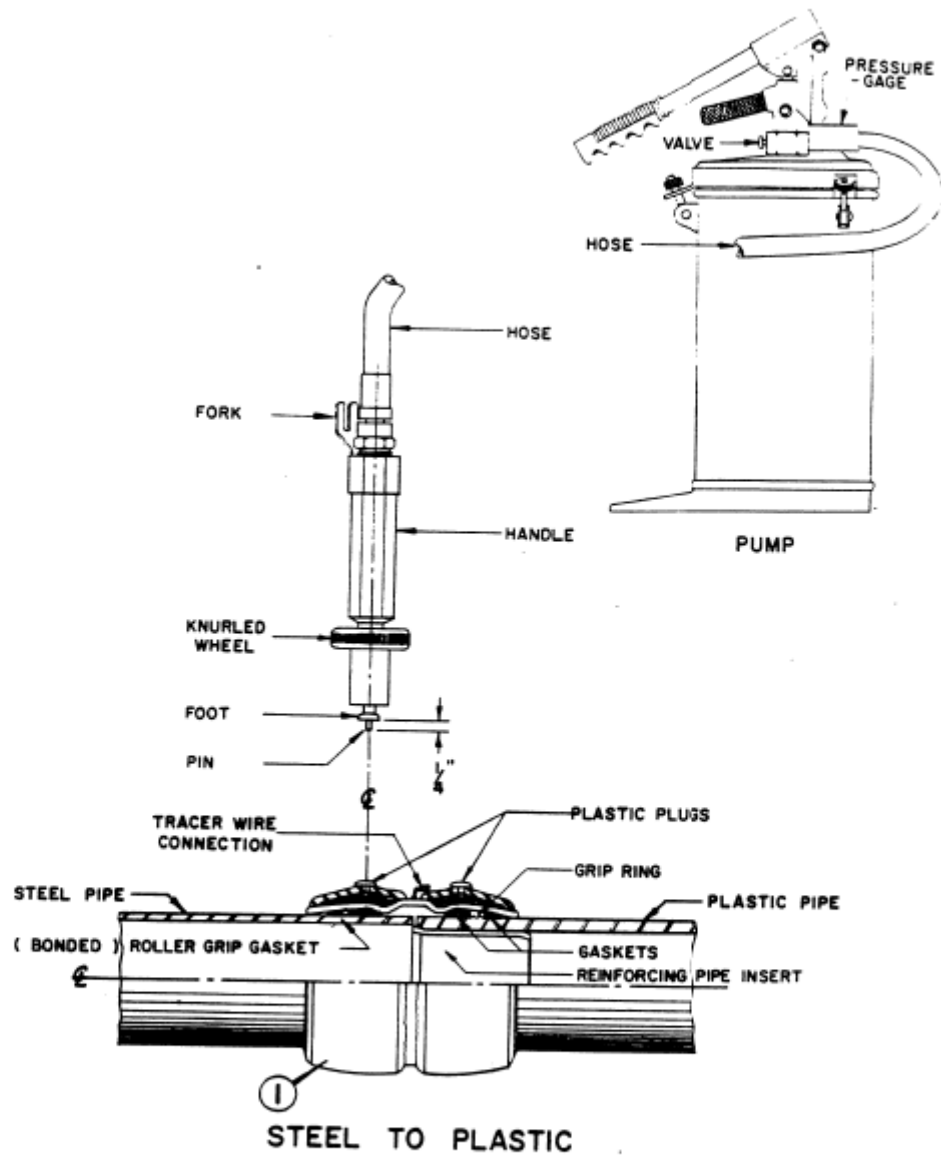
Page 2 of 13

	DATE	APPROVED	CITY PUBLIC SERVICE BOARD	DRAWING DS-21
ISSUED	3/1/1	OK	CONSTRUCTION STANDARD (GAS)	G-S-505-6-0
REVISED				

EXHIBIT DST-2

4.5

POSI-HOLD COUPLING INSTALLATION



Page 3 of 13

	DATE	APPROVED	CITY PUBLIC SERVICE BOARD	DRAWING DS-24
ISSUED	5/10	DAK	CONSTRUCTION DRAWING (GAS)	G-S-507-8-0
REVISED				

DRAWING DS-26

EXHIBIT DST-2

4.5	PLASTIC PIPE & TRACER WIRE	
------------	---------------------------------------	--

NOTE: THERE IS TO BE 2" TO 6" OF SEPARATION BETWEEN PIPE AND TRACER WIRE.

Page 4 of 13

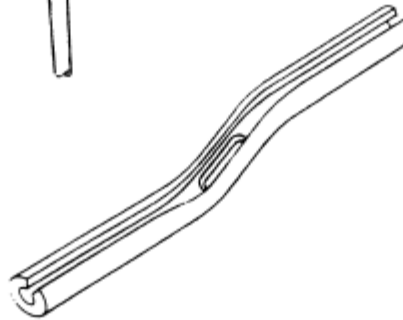
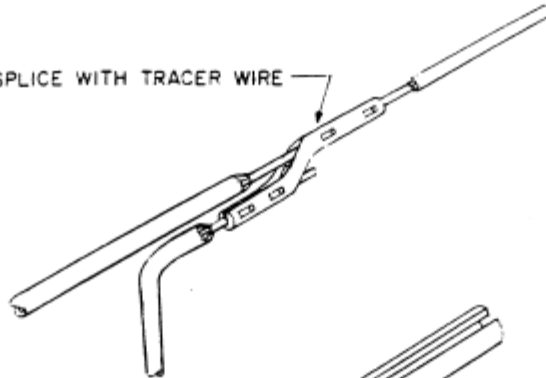
	DATE	APPROVED	CITY PUBLIC SERVICE	G-S-501-2-1
ISSUED	6-6-80	D.R.S.	CONSTRUCTION STANDARD	
REVISED				DATE: 18-Dec-82 12:47

EXHIBIT DST-2

4.5

TEE SPLICE

TEE SPLICE WITH TRACER WIRE



TEE SPLICE

NOTE:

1. APPLY PIPELINE TAPE WRAP PRIMER (ALLOW TO DRY UNTIL TACKY)
2. USE PIPELINE TAPE WRAP ONLY (CIGARETTE WRAP)

Page 5 of 13

	DATE	APPROVED	CITY PUBLIC SERVICE BOARD	DRAWING DS-27
ISSUED	6/5/00	R.L.S.	CONSTRUCTION DRAWING (GAS)	G - S - 541 - 1 - 0
REVISED				

94829700F

DRAWING DS-28
 EXAMPLES FOR ANODELESS RISERS
 (Page 1 of 2)

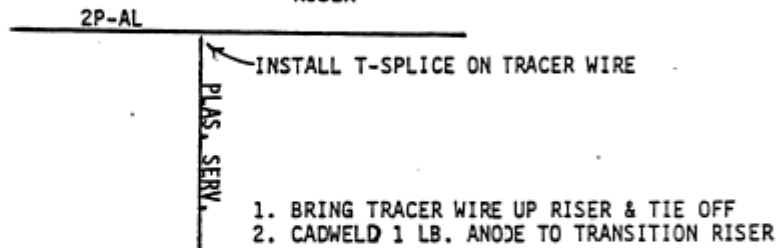
EXHIBIT DST-2

4/1/03

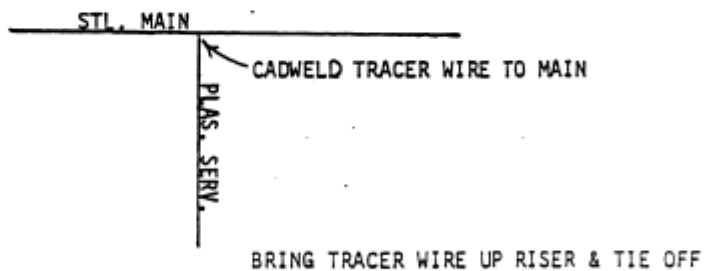
- ① ANODELESS TRACER WIRE ON PLASTIC MAIN - PLASTIC SERVICE WITH ANODELESS RISER



- ② ANODELESS TRACER WIRE ON PLASTIC MAIN - PLASTIC SERVICE WITH STEEL TRANSITION RISER



- ③ STEEL MAIN - PLASTIC SERVICE WITH ANODELESS RISER - ALSO RERUNS



- ④ STEEL MAIN - PLASTIC SERVICE WITH STEEL TRANSITION RISER

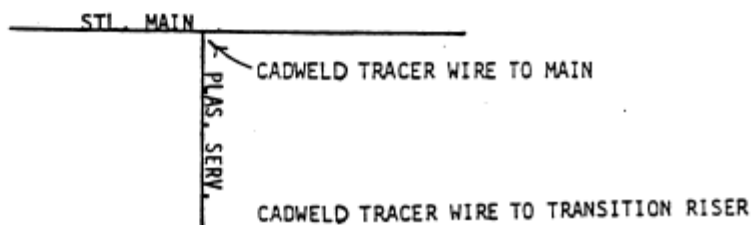


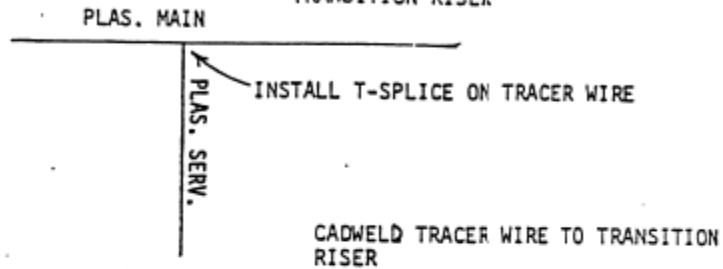
EXHIBIT DST-2

DRAWING DS-28

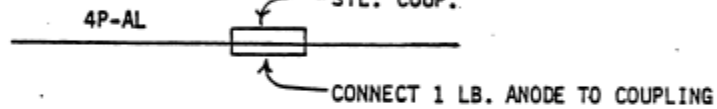
2/1/83

(Page 2 of 2)

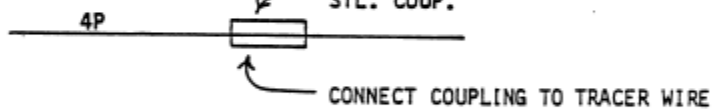
- ⑤ PROTECTED TRACER WIRE ON PLASTIC MAIN - 2" OR 4" PLASTIC SERVICE WITH STEEL TRANSITION RISER



- ⑥ ANODELESS TRACER WIRE ON PLASTIC MAIN OR SERVICE WITH STEEL REPAIR COUPLING



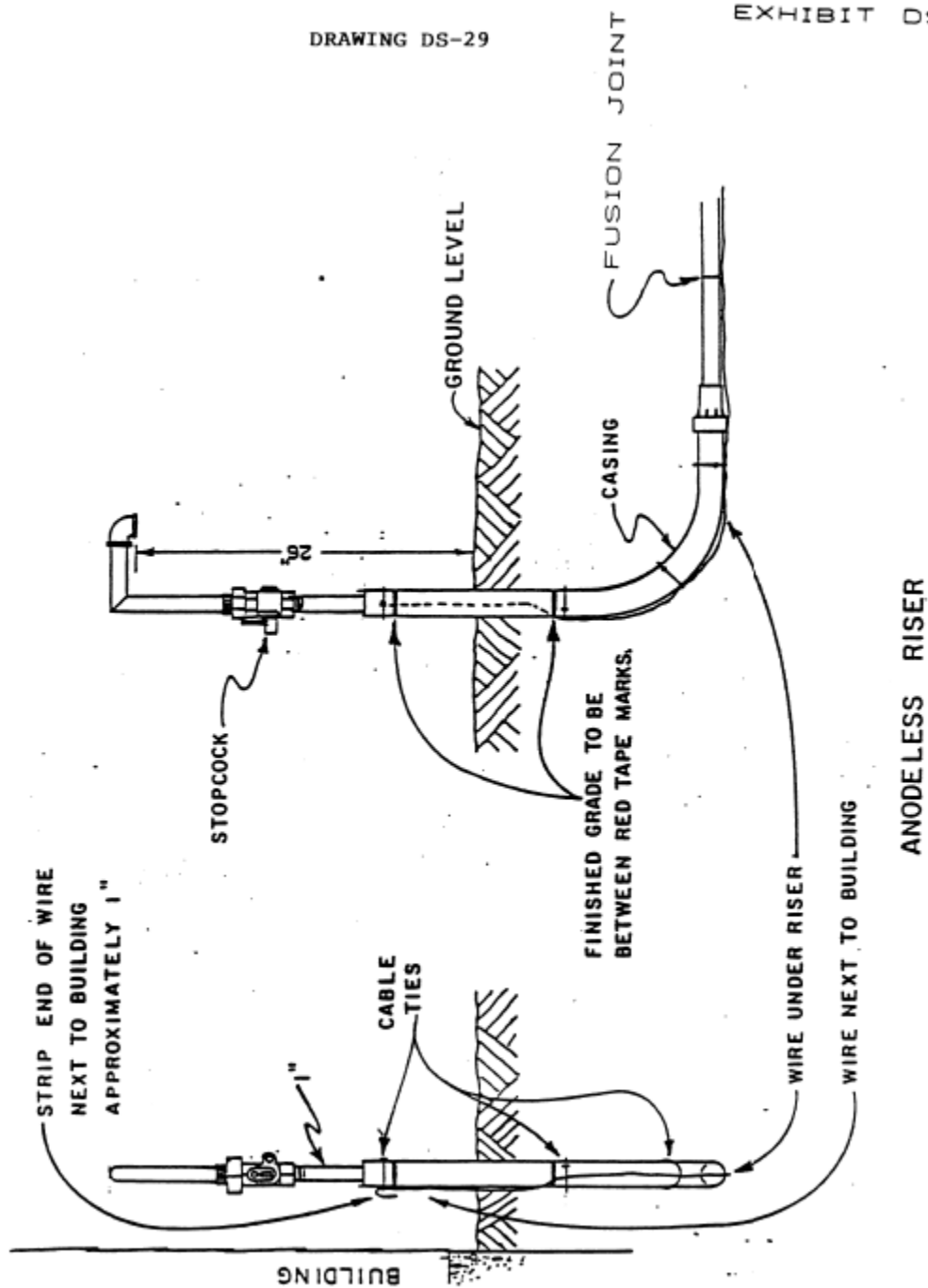
- ⑦ PROTECTED TRACER WIRE ON PLASTIC MAIN OR SERVICE WITH STEEL REPAIR COUPLING



NOTE - NEVER CADWELD TRACER WIRE TO THE NEW ANODELESS SERVICE RISER

DRAWING DS-29

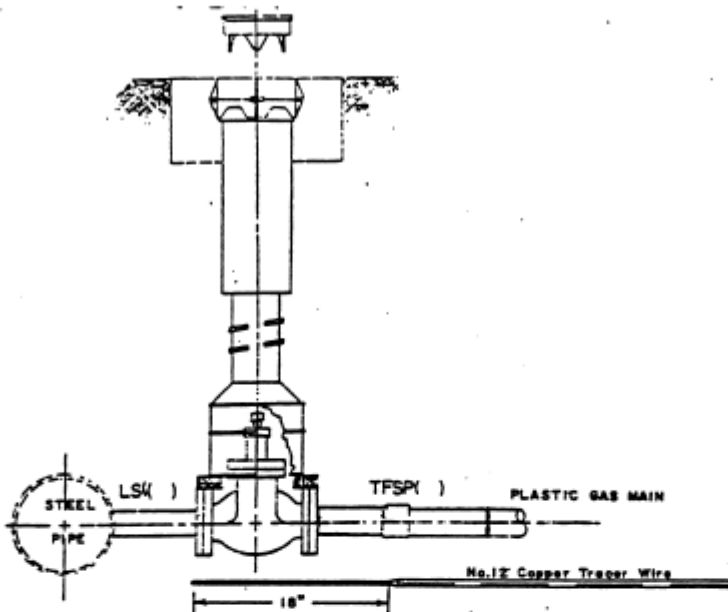
EXHIBIT DST-2



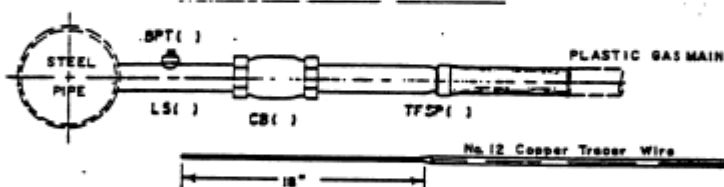
Page 8 of 13

EXHIBIT DST-2

TERMINATION OF TRACER WIRE ON ANODELESS SYSTEMS



REMOVE 18" OF INSULATION AT END OF TRACER WIRE - LEAVE WIRE BARE
DO NOT LET WIRE TOUCH STEEL MAIN OR FITTINGS



REMOVE 18" OF INSULATION AT END OF TRACER WIRE - LEAVE WIRE BARE
DO NOT LET WIRE TOUCH STEEL MAIN OR FITTINGS



REMOVE 18" OF INSULATION AT END OF TRACER WIRE - LEAVE WIRE BARE

Page 9 of 13

DRAWING DS-30

APPROVED

DATE

2-83

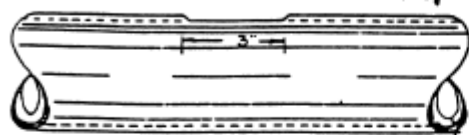
CITY PUBLIC SERVICE BOARD

CONSTRUCTION STANDARDS

EXHIBIT DST-

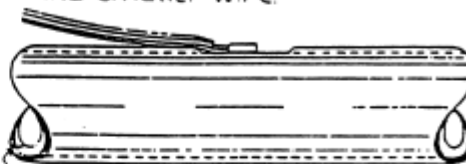
DRAWING DS-31

Remove a section of coating 3" long and file pipe bright so that a space 1" wide and 2" long is clean and dry.



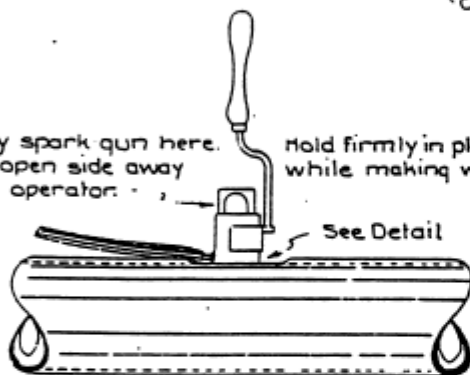
STEP 1

Strip 1 1/2" of insulation from wire and place copper sleeve on #10 and smaller wire.



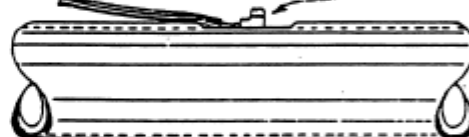
STEP 2

Apply spark gun here. Keep open side away from operator.



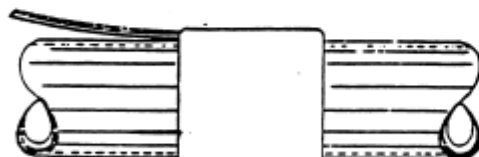
STEP 3

Remove slag with hammer and paint thoroughly with primer.

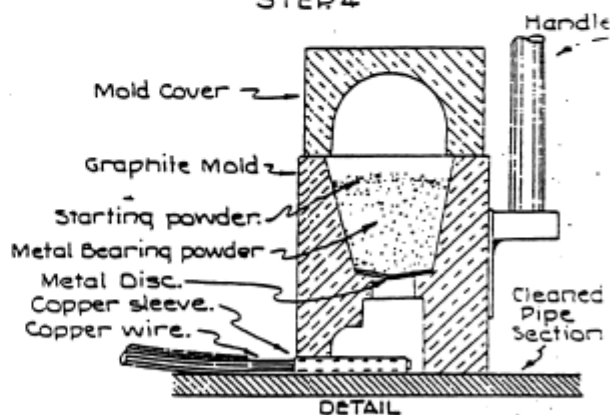


STEP 4

Repair pipe coating with core. Cover entire weld.



STEP 5



DETAIL

IMPORTANT

1. REMOVE RED CAP OF CADWELD CARTRIDGE AND DUMP ALL OF CONTENTS INTO MOLD. THE CHARGE WILL NOT IGNITE WITHOUT THE FINE STARTING POWDER ON TOP.
2. THE CARTRIDGES MUST BE KEPT DRY AT ALL TIMES.

Cadweld mold with sleeve for #10 wire and smaller.

CITY PUBLIC SERVICE BOARD
SAN ANTONIO, TEXAS
GAS DEPARTMENT

COPPER WIRE CONNECTION
TO PIPE USING CADWELD.

Page 10 of 13

SCALE 2" = 1" APPROVED
DRAWN C.W.T. BY W.D.B. FIG. 66

DRAWING DS-32
INSTRUCTION SHEET - TYPE TB-3 WELDER

EXHIBIT DST-

PREPARATION OF SURFACE:

To obtain a good weld, surface must be bright clean and dry.

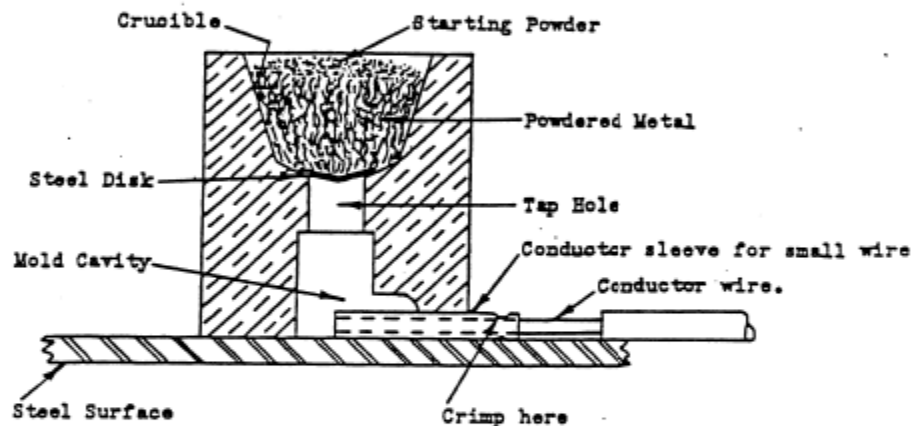
Steel surface should be ground or filed to remove all scale, rust, grease and dirt.

Galvanized steel must be cleaned with emery cloth to remove oxide.

PREPARATION OF WIRE:

Strip the insulation from the conductor and scrape until wire is bright and clean.

For #10 and smaller sizes, place the wire in a copper sleeve, ends flush, and crimp the sleeve tightly to the wire at the insulation to provide additional mechanical strength at the weld.

**WELDING PROCEDURE:**

- (1) PLACE WELDER OVER CLEAN STEEL SURFACE and insert the wire until it is under the CENTER of the tap hole.
- (2) COVER TAP HOLE WITH STEEL DISK.
- (3) DUMP CARTRIDGE IN CRUCIBLE AND CLOSE COVER. (Tap bottom of cartridge to be sure starting powder is emptied). Replace empty cartridge in box to keep remaining cartridges in an upright position.
- (4) HOLD DOWN ON WELDER TO PREVENT LEAKS AND IGNITE WITH FLINT GUN. Jerk gun away to prevent fouling. Should gun become fouled, soak in Spirits of Ammonia.
- (5) DO NOT REMOVE WELDER UNTIL METAL HAS SOLIDIFIED.
- (6) ALL SLAG MUST BE CLEANED FROM MOLD BEFORE MAKING NEXT WELD.

Note: Wet or damp molds produce porous welds. Mold can be dried out by firing a charge before making the desired weld.

ERICO PRODUCTS, Inc. Cleveland 3, Ohio.
Page 11 of 13

S-278

EXHIBIT DST-2

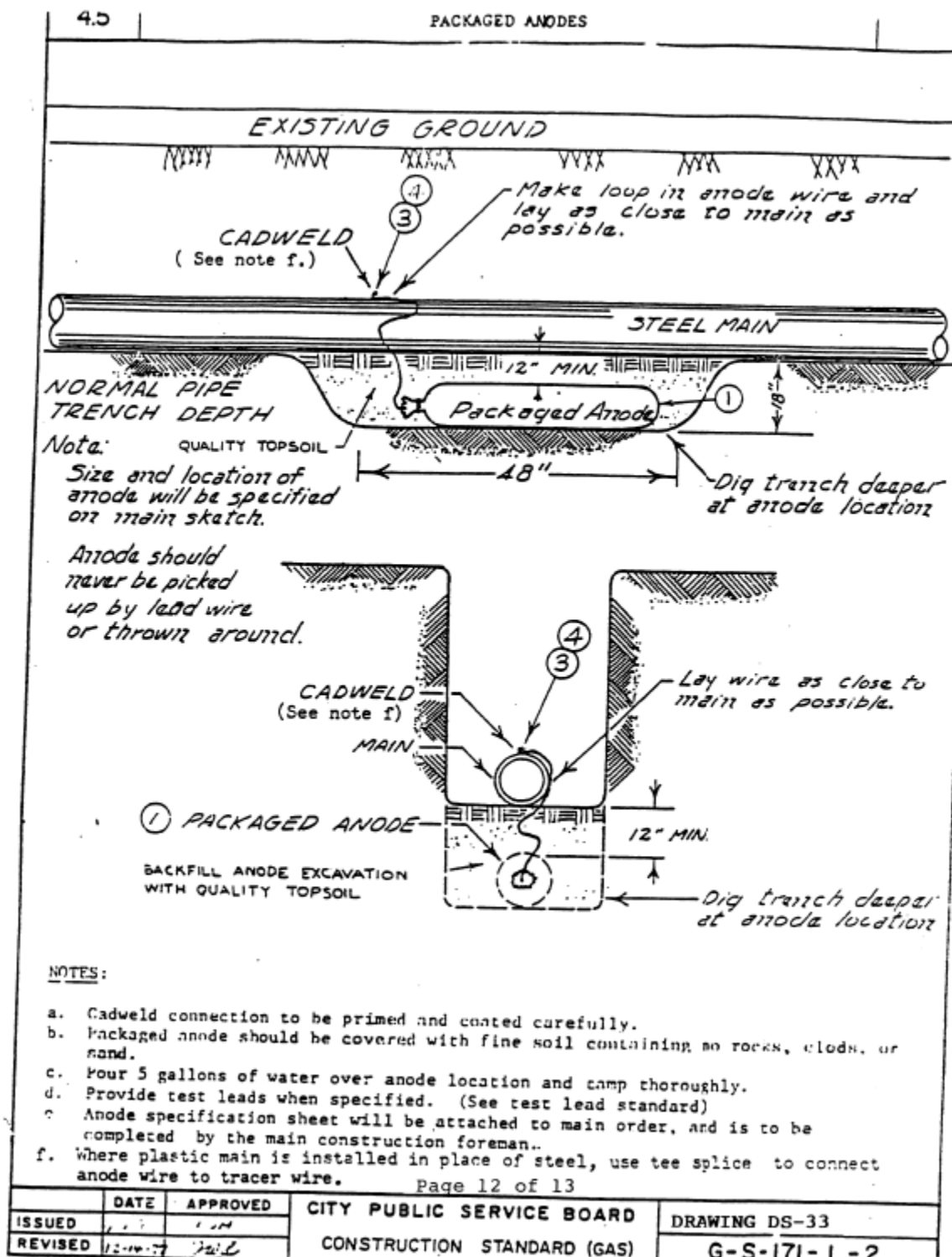
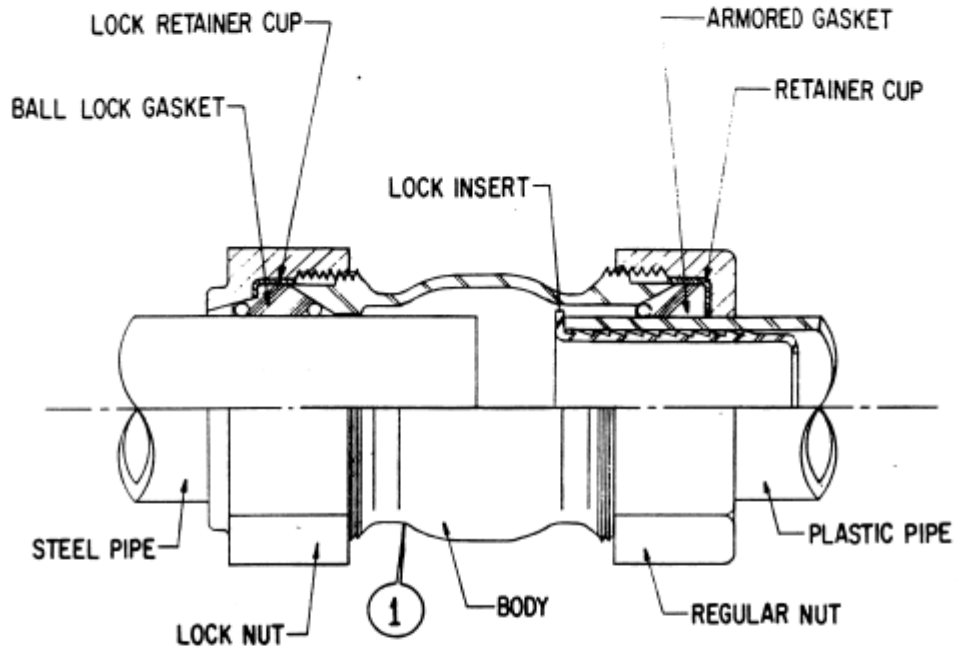


EXHIBIT DST-2

4.5

PLASTI-LOK TRANSITION COUPLING INSTALLED



STEEL TO PLASTIC

Page 13 of 13

AVAILABLE SIZES: 1", 1 $\frac{1}{4}$ ", 2"

	DATE	APPROVED	CITY PUBLIC SERVICE BOARD CONSTRUCTION DRAWING (GAS)	DRAWING DS-34
ISSUED	9/81	GRB		
REVISED				G-S-507-4-0

EXHIBIT GAS-7

CPS Energy Covered Tasks Regulated by 49 CFR Part 192

Tasks Regulated By 49 CFR Part 192	CFR 192	<u>ReQual</u> <u>Interval</u>	Tasks Regulated By 49 CFR Part 192	CFR 192	<u>ReQual</u> <u>Interval</u>
Examining PE pipe for defects	192.59	3 year		192.287	3 year
Visually inspecting metallic components for defects	192.144	3 year		192.305	3 year
Welding	192.225	6 month		192.307	3 year
	192.225	-----		192.309 192.713	3 year
	192.241	3 year		192.311	3 year
	192.243	3 year	Installation of pipe in a ditch	192.319	3 year
	192.243	3 year	Inserting PE pipe into a casing	192.321	3 year
Repair or removal of weld defects	192.245 192.715	6 month	Installing customer meters and regulators	192.357	3 year
Making welded joints	192.273	6 month	Installation of service lines	192.361	3 year
Inspecting welded joints	192.273	3 year	Installation and maintenance of cathodic protection systems	192.453	3 year
Joining PE pipe by heat fusion or mechanical joint	192.281	1 year		192.457	-----

Qualifying PE pipe joining procedures	192.283	1 time		192.457	3 year
	192.285	-----	Inspecting pipe coating	192.459 192.461	3 year
	192.285	-----		192.465	3 year
Testing cathodic protection system with pipe-to-soil reads	192.465	3 year	Line locating and marking pipelines	192.614	3 year
Inspect interference bonds, diodes & reverse current switches	192.465	3 year		192.615	-----
Remedial actions to correct cathodic protection deficiencies	192.465	3 year		192.615	3 year
Connecting test lead wires to the pipeline ^{1,2}	192.471	-----	Making safe a pipeline emergency	192.615	3 year
Taking action to minimize the effect of stray currents	192.473	3 year		192.615	-----
	192.475	3 year		192.619 192.621	3 year
Cleaning and coating pipe for control of atmospheric corrosion	192.479	3 year		192.625	3 year
	192.479	3 year		192.625	3 year
	192.479 192.483	3 year	Tapping pipelines under pressure	192.627	3 year

Pipeline pressure testing	192.503	3 year	Purging of pipelines	192.629	3 year
	192.605	3 year			
	192.605	-----			
²	192.605	-----	Abandoning or deactivating pipeline facilities	192.727	3 year
Starting up and shutting down any part of a pipeline	192.605	3 year			3 year
Taking precautions against hazardous atmospheres in trenches ^{2,3}	192.605	-----			3 year
Recognizing safety-related conditions that require reporting	192.605	3 year			3 year
	192.605	3 year			3 year
	192.605	3 year	Prevention of accidental ignition	192.751	3 year
	192.613	3 year			

¹ Not an operations or maintenance task

² Does not affect the operation or integrity of the pipeline

³ Not an activity performed on the pipeline

⁴ Not required by CFR Part 192

Any Contractor employed by CPS Energy to perform a covered task will have their employees qualified by an approved consortium or training provider. CPS Energy will require Contractor to supply a list of all qualified personnel and may require the Contractor to supply the qualified employee with a qualification card stating tasks that employee is qualified for, the qualification date, qualification method and the name of the qualifier.

CPS Energy will accept qualification of Contractor employees by any approved combination of the following methods:

- (a) approved qualification and training program (i.e. TEEX/TGA)
- (b) approved certifications (i.e. AWS Certified Welding Inspector, ASNT)
- (c) field evaluation
- (d) work performance history (See Note); and
- (e) other forms of assessment approved by CPS Energy

Contractor employee will be subject, at a minimum, to the same requalification intervals as CPS Energy employees. CPS Energy shall have the right to require removal of any employee of Contractor, or of Subcontractors, who in the CPS Energy representative's opinion, may be incompetent or unqualified to perform work.

Note: Work performance history cannot be the sole method for qualifying an employee after October 28, 2002.