CITY OF LAGRANGE
Gas System Installation Specifications
Revised: December 20, 2010

In all cases, work on the City's natural gas system shall comply with the City's Operation and Maintenance Manual, 49CFR192, and DOT Regulations. Minimum ground cover requirements must be maintained. Work areas shall be returned to their original condition or better following the completion of work. Erosion control measures deemed as "best practice" or other methods as required by the City or local authority shall be in place at all times. Existing utilities shall be properly located before proceeding with work.

UNLOADING, HAULING, STRING, AND STORING MATERIALS

- Unloading, storing, and stringing of materials shall be performed to avoid distorting, flattening, denting, scoring, or otherwise damaging pipe and coatings. Pipe shall not be dropped while unloading, and the Contractor shall replace or reimburse the City for the cost of materials damaged while in the Contractor's custody. End hooks used for lifting pipe shall have plates or cups curved to fit the curvature of the pipe. Adequate padding shall be used between stacked pipe and binding chains.

- **All costs incurred that are associated with compliance with this section shall be included in the price bid per lineal foot of pipe. There will be no additional compensation.**

JOINING OF STEEL PIPE

- The contractor shall use qualified welders as defined under DOT Pipeline Safety Regulations Part 192. A certificate of compliance shall be provided to the City before work begins.

- The contractor shall at all times work under the supervision of a designated City inspector.

- Open ends of welded line sections shall be securely closed at the end of each work day and shall not be opened until necessary for the resumption of work.

- Steel gas mains and service piping shall be joined using API Standard 1104 welding specifications and applicable standards of the American Welding Society. The weld area shall be sand, grit blast or cleaned with a motor-assisted brush to "white metal finish" *(SIS-Sa 2 1/2)* removing dirt, rust and loose particles of scale and weld splatter. Burrs or other sharp points shall be removed by filing or peening. Grease or oil shall be removed by naphtha or other oil-removing solvent, and the joint wiped dry.

- Welded joints, fittings and damaged areas of the coating shall be wrapped with a tape coating having a minimum thickness of 35 mils and shall be compatible with the specified plant applied coating. Tape coatings shall be compatible with cathodic protection and resistant to cathodic disbondment. Tape coatings shall be applied with the necessary primer of the type and grade recommended by the tape manufacturer or shall incorporate an integrated primer. The applicator of the tape

coating must demonstrate his abilities to properly apply the selected type of tape coating in the presence of the City. The City may require the applicator to be properly trained by a representative of the tape manufacturer if it is questionable that his work produces acceptable results. The Contractor may select *one* of the following types of tape coatings:

1. Cold applied tape shall be equal to Polyken 930 or 932 with Polyken 927 primer manufactured by Polyken, a division of the Kendall Company of Westwood, Massachusetts.
2. Cold applied primerless tape shall be equal to Tapecoat H35 Gray as manufactured by The Tapecoat Company a division of TC Manufacturing Company, Inc. of Evanston, Illinois.
3. Brush Applied Epoxy shall be equal to the HBE-95 Brush Applied High Build Epoxy as manufactured by Canusa, a division of Shaw Industries Company.
4. Heat shrink sleeves shall be equal to the Wrapid Sleeve as manufactured by Canusa, a division of Shaw Industries Company.

- Primer - A 2" width of tape shall be cigarette-wrapped one and one-third turns around the weld. Wrapping tensions shall be relaxed on the last one-third turn, and the tape firmly pressed in position. If the tape wrap selected for this project exceeds 70 mils in thickness, this step may be deleted.

- Preliminary Joint Wrap - A 2" width of tape shall be cigarette-wrapped one and one-third turns around the weld. Wrapping tensions shall be relaxed on the last one-third turn, and the tape firmly pressed in position.

- Spiral Tape Wrap - Wrapping tape shall be applied with a half overlap under a tension of about five pounds per inch of width starting and finishing about two inches back from the edge of the coating. The start shall always be made at the rear end of the joint as determined by the direction in which pipe laying is proceeded. The first and last turns shall be wrapped one and one-third times squarely ground the pipe. Intermediate turns across the joint shall be spirally overlapped. Angle changes shall be accommodated by increasing the tension on the appropriate tape edge. The last one-third turn shall be applied without tension, the tape end being merely pressed in position.

- Any damaged areas shall be repaired by trimming the frayed areas of the coating, applying a brush coat of tape primer and wrapping the entire circumference of the pipe with tape. "Patching" of the damaged areas will not be acceptable.

- Welded joints subjected to pullback during boring operations shall be wrapped with heat shrink sleeves specifically designed for such operations with high abrasion and wear resistance. Heat shrink sleeves shall have a minimum applied thickness of 60 ± 2 mils and shall be compatible with the specified plant applied coating. If applicable, heat shrink sleeves shall be applied with the necessary primer of the type and grade recommended by the tape manufacturer. The City may require the applicator to be properly trained by a representative of the tape manufacturer if it is questionable that his work produces acceptable results.

- Field tests shall be conducted immediately after the pipe has been welded and the joints prepared and wrapped in accordance with this section. Field tests shall be conducted by visual and electrical inspection. The coating and joint wrap shall be visually inspected for damage and promptly repaired before electrical inspection. Electrical inspection shall be conducted with a 10,000-volt electric holiday detector and the pipe shall be grounded by mean sufficient to the operation of the holiday detector. The detector shall be equipped with a positive signaling device to indicate flaws, holes, breaks or conductive particles in the plant applied and field wrap coatings. Test voltages shall *not* be less than that used by the coating applicator in accordance with NAPCA Specification and Plant Coating Guide, Bulletins 1-65-87 through 15-83-87. All defects found by visual or electrical inspection shall be repaired in accordance with this section and the pipe again tested before lowering into the trench.

- Before each day's pipe installation, the Contractor shall inspect the condition of the holiday detector and demonstrate that it is properly working with a voltmeter and a high voltage probe. The test voltage must be the voltage as measured grounding to the line pipe and not the measured voltage of the holiday detector output to an earth ground. If at anytime it is questionable that the detector is properly working, it shall be tested and demonstrated that the detector is properly working.

STEEL WELDER QUALIFICATIONS

- All welders shall be competent and experienced in pipeline welding. Only Shielded Metal-Arc Welding *(SMAW)* will be acceptable on pipe 2-3/8" O.D. and larger. Acetylene welding will be allowed on pipe smaller than 2-3/8" O.D. All welders shall have a complete working knowledge of the welding equipment and the procedures and precautions necessary for completing acceptable welds with a maximum of safety. All welders shall be qualified under the requirements set forth in Section 4 of these specifications, *CERTIFICATION, LICENSE AND TEST REQUIREMENTS.*

- Re-qualification tests shall be required if there is some specific reason to question a welder's ability or if the welder is not engaged in a given process of welding *(i.e., arc or gas)* for a period of six months or more.

- Qualification records of the test that establish the qualification of a welding procedure under the requirements of API Standard 1104 *Welding of Pipelines and Related Facilities*, Latest Edition incorporated by reference by the Code of Federal Regulations, *Qualification of Welding Procedures* shall be maintained as long as that procedure is in use. The Contractor shall maintain a record of the welders qualified to weld for this project including the date and results of tests. A copy of the procedure specification and qualifying test shall be furnished to the Citys before production welding is started.

- The welding procedure followed during the qualifying tests shall be recorded in detail and shall be adhered to during subsequent construction. Welding shall not be done when the quality of the completion weld would be likely to be impaired by the prevailing weather conditions including, but not limited to, airborne moisture, blowing sand, or high wind. Wind shields shall be used when practical.

- The line will be welded by the conventional method of roll welding as many sections of pipe as practicable and later joining these roll welded sections by position welds over the ditch or by such methods as the City may approve. The City shall have the right to limit the number of sections of pipe welded ahead of the ditch at any one time.

- The City shall have the right to employ any reasonable means of determining the character of each welder's work, and may from time to time require the Contractor to cut out coupons or test pieces for the purpose of determining whether the welding is satisfactory. The cost of repairs necessary to replace such test pieces shall be borne by the Contractor.

- All coupons suspected of having welds that are unsatisfactory shall be tested in accordance with API Standard 1104 *Welding of Pipelines and Related Facilities*, Latest Edition incorporated by reference by the Code of Federal Regulations, Section 3.4-Visual Examination and Section 3.5-*Destructive Testing*. If the coupons fail to pass these requirements, the Contractor shall be responsible for the costs of testing. Furthermore, if the City, after reviewing the test data, determines that the character of the remaining welds are in question, all of these welds shall be non-destructively tested by radiographic examination. The Contractor shall be responsible for his pro rata share for the cost of radiographic examination. The Contractor's pro rata share shall be the total cost for radiographic examination multiplied by the ratio of the failures to the total examined. Radiographic examination shall meet the requirements of API Standard 1104 *Welding of Pipelines and Related Facilities*, Latest Edition incorporated by reference by the Code of Federal Regulations, Section 6-*Acceptance Standards for Non-destructive Testing*. All testing shall be conducted by a recognized laboratory and the test results shall be furnished to the City.

- All welding shall be completed in accordance with the requirements of API Standard 1104 *Welding of Pipelines and Related Facilities*, Latest Edition incorporated by reference by the Code of Federal Regulations.

RADIOGRAPHIC INSPECTION OF WELDS

- The Contractor shall employ radiographic inspection to determine the acceptability of welds. This inspection shall conform with API 1104, Section 8.0 “Procedures for Nondestructive Testing.” The number of butt welds to be inspected shall comply with Part 192 of Pipeline Safety Regulations or a higher number as specified by the City.

JOINING OF PLASTIC PIPE

- Plastic pipe shall be joined by thermosetting per 49CFR192.

PIPE LAYING

- All work must be inspected by the City prior to covering up.

- Steel casing shall be required when crossing under streets and railroads with any pipe size above 2” or where required by DOT or CSX regulations. Plastic pipe spacers shall be used.

- Minimum depth of cover shall be 36” unless otherwise specified in the construction drawings. At least 72” of cover shall be provided at water pipe and railroad crossings.

- Minimum depth of cover for service lines shall be 12” on private property and 18” on city or state right of way unless otherwise specified in the construction drawings.

- The maximum pipeline deflection at any point must be within manufacturer guidelines.

- Pipe shall be bedded on fine, dry material free of rocks; and the trench backfilled with fine, dry material to a level of at least 18” above the top of the pipe. Thereafter, backfilling shall be conducted in 6-inch lifts (12-inch lifts are adequate if using heavy tamping equipment) and adequately compacted using approved mechanical tampers in accordance with AASHTO Designation T99. Backfill and pavement repair within the DOT right-of-way must comply with the “Utility Accommodation Policy and Standards” of the Georgia DOT.

- In rock excavation, the bottom of the trench to a point one foot above the top of the pipe shall be finely pulverized soil, free from rocks and stones. The remainder of the backfill shall not contain over 75% broken stones, and the maximum stone size placed in the trench shall not weigh more than 50 pounds each. Excess rock and fragments shall be disposed of in a satisfactory manner off of the project site.

- The compaction of backfill in bore pits shall not be less than 100% of theoretical maximum density. If additional water is necessary to obtain the optimum moisture content in the backfill, the Contractor shall add such water at no additional cost. If special backfill material is necessary to achieve compaction of 100% of theoretical maximum density, the Contractor shall add such material at no additional cost.

- Pipe and fittings shall be cleaned and carefully examined for cracks and other defects prior to installation. Under no circumstances shall defective materials be installed.

- A continuous vinyl warning tape with aluminum backing and a #8 copper tracer wire for mains or a #12 for service lines shall be buried above all plastic pipe.

- A horizontal separation of at least 3 feet must be maintained between the gas main and any existing or proposed other utility mains.

- Materials shall be stored and protected as recommended by the manufacturer before and during installation.

- Completed pipe work shall not be left exposed in a trench for an extended period of time. Each day at the close of work, the exposed end of the pipeline shall be closed with an approved head. If it becomes necessary to backfill over the end of an uncompleted pipeline, a mechanical joint plug shall be used.

HORIZONTAL DIRECTIONAL DRILLING

- Contractors shall have a written emergency plan in place for inadvertently boring into active power lines, gas lines, water mains, sewers, fiber optic cables, or other utility facilities that may be in conflict with the proposed gas lines.

- PE mains and services shall be pulled with #8 THHN or PE tracer wire in place. Wire shall be tested for continuity when installed and all below ground connections sealed to prevent moisture penetration. No wire splices shall be allowed along the bore.

- Contractor shall contain and dispose of all drilling fluids in accordance with regulations and environmentally sound practices. All bore entrance and exit pits shall fully comply with OSHA and EPD regulations.

- Construction exits shall be located at all points where traffic exits the construction area to a public or private right-of-way, street, alley or parking area. Construction exit pad shall be constructed over a geotextile liner with National Stone Association R-2 or Department of Transportation No. 3 size coarse aggregate *(1-1/2"-3-1/2")*. Construction exit pad shall be a minimum of 20 feet wide by 50 feet in length and a minimum thickness of 6" and shall be excavated 3" below existing grade. Construction exits shall be maintained in such condition that will prevent tracking or the flow of mud onto public or private right-of-ways, streets, alleys or parking areas. Construction exits shall be periodically dressed with 1-1/2"-3-1/2" stone and any mud or debris tracked or spilled onto public or private right-of-ways, streets, alleys or parking areas shall be removed immediately.

- Pipe rollers, skates, straightners and other protective devices should be used to prevent damage to the pipe during pulling. Drill paths shall be as straight as possible.

- The leading edge of the carrier pipe shall be inspected for coating damage caused by rock or solid objects in the bore hole. If coating damage is evident, it shall promptly be reported to the City and, at their discretion, the bore may be abandoned and an alternate site chosen. Temporary or permanent sleeves or casings will not be permitted.

- Contractor shall continuously monitor the longitudinal pulling forces on the pipe and limit it to a force of no more than 75% SMYS. If pipe yield strength is exceeded during pullback, the pipe shall be removed and replaced with new pipe. A weak link segment shall be used to ensure compliance with this section. The allowable pulling loads and lengths for medium density PE pipe are:

    - ¾" SDR 11 372 lbs 190'

o	2”	SDR 11	2,000 lbs	430’
o	4”	SDR 11.5	6,566 lbs	780’
o	6”	SDR 11.5	14,230 lbs	1,150’

BENDING STEEL PIPE

- As necessary, the bending of steel pipe shall be done cold. Wrinkle bending will not be acceptable. Each bend must not impair the serviceability of the pipe and must be free from buckling, cracks or any other mechanical damage. Bending of steel pipe shall be accomplished with only those tools made specifically for this purpose and be within the minimum bending radius provided by the pipe manufacturer. The longitudinal weld must be as near as practical to the neutral axis of the bend. If the coating becomes disbonded during the bending process, the Contractor shall remove the coating and prepare and wrap the area as required. Complete bends must pass the specified sizing pig.

- When ditching across roads or in digging approaches to crossings of highways, streams, railroads, drainage ditches, ravines or other irregular ground, changes in vertical or horizontal alignment shall be made with pipe bends unless natural flexure is permitted by manufacturer specifications and the City.

TRENCH EXCAVATION

- Pipe trenches shall be excavated on lines shown on the plans. The bottom of the trenches shall be hand dressed so that the pipe has even bearing on solid, undisturbed earth throughout its length. Trenches shall be of sufficient width to provide ample working space on each side of the pipe and for maintaining a straight line of pipe. The City shall have the right to limit the amount of trench open at any one time. All excavated material shall be so placed as not to interfere with public travel on the roadway along which the lines are laid. Lines shall be constructed with 36" of cover below finished, proposed grade. The depth of cover beneath roadways shall be 48". Lines shall be placed at greater depths when shown on the plans or as directed by the City. All grade changes shall be made gradually. In laying pipe across water courses or depressions of any kind, the minimum depth herein specified shall be maintained at the bottom of the depression.

- Minimum depth of cover for service lines shall be 12” on private property and 18” on city or state right of way unless otherwise specified in the construction drawings.

CONNECTION TO EXISTING GAS MAINS

- All work must be inspected and approved by the City prior to “covering up” or making tie-ins to existing gas mains. Authorization and a minimum 24 hour notification is required before any work is performed on the City gas system to tie-in a new main to an existing main.

- Connections to existing piping shall be completed at the locations called for in the plans after it has been determined that no unharnessed mechanical coupling exists at the connection location. If an unharnessed mechanical coupling exists, it

shall be harnessed before the facility is disturbed. Connections to existing piping shall be completed with the flow of gas interrupted. The connection to existing piping shall be completed by welding. Connections to existing piping while gas is being vented to the atmosphere is strictly prohibited.

- Taps into mains under pressure without the interruption of gas flow shall be made at the locations shown on the plans. Taps shall be made by the installation of a stopper fitting with outlet. The Contractor shall have all materials on hand and shall conduct the work in a manner to insure the installation of the stopper fittings in a safe manner and in the minimum of time. The Contractor shall utilize only those persons who are fully qualified and knowledgeable in the tapping of mains under pressure. The Contractor shall furnish and install only those materials designed for making taps under pressure. The Contractor shall furnish the City all coupons cut out of the existing main during the tapping operation.

ABANDONMENT OF PIPELINES

- Abandoned pipes shall be physically disconnected from the distribution system, purged according to 49CFR192, and the open ends sealed with cement or other approved means. Vaults and pits to be abandoned shall be filled with compacted clean fill dirt.

CONTRACTOR PERSONNEL

- Contractor shall be in full compliance with 49CFR199 requirements for Alcohol and Drug Testing and a copy of this plan available for City inspection.

- Contractor personnel shall be “qualified” to perform covered tasks under the requirements of 49CFR192 Subpart N, as established by the City of LaGrange Operator Qualification Plan, which is available for review.

RECORDS AND DRAWINGS

- Contractors shall keep detailed drawings and measurements showing the as-built location of mains, services, and valves. GPS coordinates shall be provided in 100’ increments along the route of the gas main.

- The length, location, and depth profile of directional bores shall be recorded.

- Photographs of key and/or complicated tie-ins should be taken prior to backfill.

BARRICADES, WARNING SIGNS AND FLAGMEN

- The Contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient warning lights, danger signals and signs, provide sufficient number of watchmen and take all necessary precautions for the protection of the work and the safety of the public. If lanes of traffic are to be closed, the Contractor shall provide necessary certified flagmen. Certification shall be obtained from the Georgia Department of Transportation. Traffic control devices and placement shall be in accordance with the Georgia Utilities Coordinating Committee 1994 Manual

on Traffic Control Procedures for Utilities as approved by the Georgia Department of Transportation.

CLEARING, LANDSCAPING, AND CLEANUP

- **All costs incurred that are associated with compliance with this section shall be included in the price bid per lineal foot of pipe. There will be no additional compensation.**

- Landscaping features such as grass, bushes, mailboxes, and signs shall be repaired following the installation of gas piping and fittings. Sod will be required in some areas as determined by the City.

- Unless specified otherwise, the entire area for the pipeline or other appurtenances shall be cleared and grubbed and all of the debris, trees, brush and stumps shall be disposed of by burning on the right-of-way if permitted by local ordinance. If burning is not permitted, then disposal shall be by other acceptable methods off of the project site. Burying of the debris, trees, brush and stumps will *not* be acceptable. Care shall be taken not to damage the areas adjacent to the right-of-way nor shall debris, trees, brush and stumps be pushed outside the right-of-way. Any damage to areas outside the right-of-way shall be immediately restored by the Contractor to as near original condition as possible and the Contractor shall be responsible for all necessary restitution.

- Pre and post construction photographs should be taken to record existing conditions and in order to be prepared to respond to customer complaints.

- The Contractor shall take down fences on or crossing the right-of-way for such periods of time only as are necessary to prosecute the work of clearing, grubbing, trenching, pipe laying, backfilling and cleanup. Gaps made in fences shall be closed in a substantial manner at night and during any suspension of work. All existing fences shall be restored to as good condition as before disturbed.

- After the work is completed, the right-of-way and surrounding areas shall be cleaned of all rubbish and other debris and the premises left in a neat and presentable condition. Extra materials delivered upon the right-of-way by the Contractor and not actually used for the construction of the pipeline or appurtenances shall be removed by the Contractor at his own expense. Clean-up work shall follow closely behind and shall be considered a part of the normal operations. Clean-up work along the pipeline routes will not be permitted to lag behind the construction operations.

- It is the intent of this specification to require the Contractor to deliver a satisfactory stand of perennial grass before final payment will be made for any of the items herein described. If it is necessary to repeat any or all of the work, including plowing, fertilizer, seeding, and watering the Contractor shall never-the-less repeat these operations until a satisfactory stand is obtained. For this purpose, a satisfactory stand of grass is here defined as a full cover, over the areas to be seeded, with grass that is alive and growing, leaving no bare spots larger than one foot square.

GUARANTY

- All workmanship and material shall be guaranteed by the Contractor for one year after final acceptance and any defective workmanship, material, or equipment detected during this one year period shall be replaced by the Contractor at no cost to the City. Final acceptance of the project will be made only after all equipment is placed in operation by the Contractor and is operating in the proper manner.

HIGHWAY CROSSINGS

- Where lines cross highways under the jurisdiction of the Georgia Department of Transportation, the City shall secure the necessary permits and permission from the Department before any work commences within such rights-of-way. After the Contractor has been notified by the Cityr that the permits have been granted and permission obtained, the Contractor shall coordinate his activities and construction procedures with the proper authority of the DOT. All construction practices and procedures within such rights-of-way shall be conducted in accordance with the Department's Utility Accommodation Policy and Standards.

INFORMATION CONCERNING CONDITIONS

- The accuracy of information furnished by the City and/or the plans and specifications as to underground and surface structures, foundation conditions, character of soil, position and quantity of ground and subsoil water, etc., are not guaranteed by the City. Contractors must satisfy themselves by personal examination and by such other means as they desire with respect to actual conditions in the nature of the ground and subsoil water and in regard to the locations of existing underground or surface structures. Unforeseen conditions shall not constitute a claim for increased compensation under the terms of the contract, nor constitute a basis for the cancellation thereof.

INTERFERENCE WITH EXISTING STRUCTURES

- All existing utilities, pipes, drains or other structures on, above or below ground shall be carefully avoided, supported, and protected from damage as required. If any such structures are damaged, they shall be restored to their original condition by or at the expense of the Contractor. All costs incurred in meeting this requirement, including extra depth, shall be included in the price bid per linear foot of pipe and there will be no additional compensation.

- It shall be the Contractor's responsibility to have all utilities located prior to excavating. The Contractor shall request the location of all utilities by calling the Utilities Protection Center at 1-800-282-7411. The Contractor shall be aware of and familiar with all local, State and Federal Laws governing utility protection and conduct all excavation practices in accordance therewith.

ORDER SEQUENCE OF WORK

- To insure completion within the allotted time, the City will designate the starting point or points for construction and the sequence in which the work shall be

constructed, completed and placed in operation. The Contractor shall observe and comply with the detail plans and all instructions from the City pertaining to the sequence of work.

PAVEMENT REMOVED AND REPLACED

- Pavement removed and replaced shall be completed at the locations shown in the plans as shown on the details in the plans. Pavement removed and replaced shall be completed in a fashion where disruption of traffic will be minimal. The use of traffics bearing plates will be necessary to meet this requirement. All pavement replaced in accordance with these specifications shall meet the approval of the State of Georgia Department of Transportation and the requirements of the Standard Specifications for Road and Bridge Construction, Latest Edition and the Utility Accommodation Policy and Standards, latest Edition, there of.

INTERNAL CLEANING OF PIPE AND TUBING

- Before placing the facility into operation, the Contractor shall ensure that all pipe and tubing is internally free from welding icicles, rust, moisture, scale and any foreign particles. The Contractor shall remove all such material by propelling cleaning pigs through all line pipe and tubing installed for this project with compressed air or inert gas. This shall be repeated as many times as necessary to ensure removal of any such defects. Wire brush type cleaning pigs and standard cleaning pigs in succession shall be used for steel line pipe and cleaning pigs specifically designed for use with polyethylene internal diameters shall be used for polyethylene pipe and tubing. Foam drying pigs shall be used to dry line pipe and tubing where significant amounts of moisture are present. In such cases, it may be necessary to introduce a drying agent into the line to completely remove any moisture.

- Where line valves will be included in the pressure testing of the facility in accordance with these specifications, internal cleaning of all pipe and tubing shall be completed prior to performing the pressure test.

PRESSURE TESTING

- All piping, associated valves and fittings, and appurtenances shall be pressure tested in sections chosen by the City unless specified otherwise by these specifications. All tests shall be conducted in the presence of the City. The City shall be given 48 hours notice before any pressure testing is conducted. The Contractor shall furnish suitable testing plugs or caps for the pipe, necessary compressors, pipe connections, gauges and other equipment and labor required. All breaks, leaks or defects in the pipe, valves, fittings or appurtenances shall be repaired and made good by the Contractor at his own expense. Following any necessary repairs, the section shall be re-tested until the test requirements have been successfully fulfilled. The test medium shall be water, air or inert gas as specified by the City. If the test medium chosen is water, the Contractor shall pass dewatering pigs through the line as often as necessary to completely dry the line of all moisture. If necessary, a dewatering agent shall be added to the line to satisfy this requirement.

- Where line valves will be included in the pressure testing of the facility in accordance with these specifications, internal cleaning of all pipe and tubing shall be completed prior to performing the pressure test.

- The following test shall run continuously for 24 hours and each test shall be recorded on a chart recorder. The recording chart shall be 12" in diameter and shall not span more than 1.5 times the test pressure. A pressure manifold shall be constructed to allow for recording of pressure up/pressure down segments of the test. The test pressure shall be verified by an accurate spring gauge and the recording chart shall show no drop in pressure during the test. If the recording chart shows a drop in pressure due to a temperature variation, the test shall exceed the 24 hours until the drop has recovered to the original test pressure. A test record shall be prepared for each completed test. A copy of the accepted record appears in Appendix A at the end of this section and may be reproduced for use on this project. The test chart and test record for each completed test shall be acceptable to the City before the test pressure is purged from the pipe section under test.

- After backfilling, the steel line pipe and associated valves and fittings designated as part of the "high pressure" distribution system shall be tested in sections chosen by the City to a pressure of **1200 psi.**

PLACING FACILITY INTO OPERATION

- After all fabrication, backfilling, and testing is completed and acceptable to the City, the Contractor shall purge the newly constructed facility. Purge tees shall be provided and installed by the Contractor at no expense to the Owner. Purge tees shall be located at locations to ensure all piping and appurtenances are purged of all air. The City shall be given 48 hours notice before the purging begins.

PREVENTION OF ACCIDENTAL IGNITION

- The Contractor shall take the necessary precautions to prevent the accidental ignition of natural gas when cutting into and/or removing a section of pipe. These precautions shall include, but not be limited to, grounding and bonding. The cutting into of a section of pipe shall not commence until that section is isolated and the pressure in the section has been reduced to atmospheric. Only mechanical cutters will be allowed when cutting into a pipe section.

PROTECTION OF FINISHED WORK

- The Contractor will be held responsible for all work installed and shall be required to replace or repair any work damaged by any source or cause whatsoever until final acceptance of the work done by the City.

ALTERNATING CURRENT (AC) MITIGATION

- Where steel pipelines run parallel to high voltage electric lines, AC mitigation shall be employed. A mitigation cable shall be installed in the pipeline trench along with

the pipeline or trenched in beside the pipeline. The mitigation cable will be a # 2/0 stranded bare copper cable. The mitigation cable will be placed up against the trench wall closest to the power line supports or separately trenched in beside the pipeline closest to the power line supports. The ideal separation between the pipeline and the copper cable is twenty-four (24) inches. The **absolute minimum separation is eighteen (18) inches.** The copper cable shall be installed at the same depth as the pipe. The lengths of cable will be continuous runs of cable spliced together except with breaks at roads and any other bore locations where a continuous run is impractical. The cable shall be installed the entire length of the 230 kV power right of way except for those areas that are bored and extend 2500 ft before and past the extent of the power right of way. Solid State Decouplers (SSDs) in pedestal mounts shall be installed at a maximum interval of 3000ft apart. The connection from the pipe to the SSDs shall be two (2) #6 HMWPE wires CAD welded to the pipeline. The connection from the bare copper #2/0 wire to the SSDs shall be one #2 HMWPE wire splice to the bare copper wire.

- If magnesium or zinc wire is utilized, connection may be made directly to the pipeline without a SSD.

CITY OF LAGRANGE, GEORGIA
PRESSURE TEST RECORD

Test Medium *(Check One)*: ___ Air ___ Nitrogen ___ Water ____ Other

Length of Test: _____ Hours _____ Minutes

Test Beginning: _____ , 20 ___ at _____ am / pm *(Circle One)* ____Owner's Initials

Test Ending: _____ , 20 ___ at _____ am / pm *(Circle One)* ____Owner's Initials

Name of Owner's Representative: _____ Title: _____

Test Section From: Sta. _____ Right / Left *(Circle One)*, _____

_____

_____ *(Location, Type of Fitting, Etc.)*

Test Section To: Sta. _____ Right / Left *(Circle One)*, _____

_____

_____ *(Location, Type of Fitting, Etc.)*

Contractor: _____ , _____ , ___ *(Name, City, State)*

Name of Superintendent/Foreman: _____

Pipe Supplier: _____ , _____ , ___ *(Name, City, State)*

Pipe Manufacturer: _____ , _____ , ___ *(Name, City, State)*

Pipe Size: ____ " O.D. ____" W.T./DR Grade: _____

____ " O.D. ____" W.T./DR Grade: _____

Joining Method: Shielded Metal Arc Welding *(SMAW)* / Fusion *(Circle One)*
Attach additional sheets as necessary.