SECTION 335216 - GAS HYDROCARBON PIPING

This Section specifies pipe materials, fittings, and valves normally encountered with Site-piped natural gas or propane gas distribution systems, from 5-feet outside building to utility source or on-Site source.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes:

Pipe and fittings.

Valves.

Pressure-regulating valves.

Propane storage tanks.

* + - * 1. Related Requirements:

List other Sections directly related to or affecting Work of this Section. Include Sections specifying information expected to be found in this Section as well as Sections required to describe complete system or assembly requirements.

Section 033000 - Cast-in-Place Concrete: Foundations for storage tanks.

Section 231123 - Facility Natural-Gas Piping: Requirements for gas piping.

Section 310000 - Earthwork: Requirements for excavation, backfill, and trenching as required by this Section.

Section 310001 – Earthwork Materials: Requirements for backfill to be placed by this Section.

Section 330597 - Identification and Signage for Utilities: Underground pipe markers.

* + - 1. REFERENCE STANDARDS

List reference standards included within text of this Section, with designations, numbers, and complete document titles.

LEED requires compliance with specific editions of referenced standards. Consider including publication dates for referenced standards in this Section to ensure the correct standard is used for LEED compliance.

* + - * 1. American Association of State Highway and Transportation Officials:

AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-in. Drop.

* + - * 1. American Water Works Association:

AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems.

* + - * 1. American Welding Society:

AWS D1.1 - Structural Welding Code - Steel.

AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.

* + - * 1. ASME International:

ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300.

ASME B16.11 - Forged Fittings, Socket-Welding and Threaded.

ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.

ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes.

ASME B16.33 - Manually Operated Metallic Gas Valves for Use in Gas Piping Systems up to 175 psi (Sizes NPS 1/2 through NPS 2).

ASME B31.8 - Gas Transmission and Distribution Piping Systems.

ASME - Boiler and Pressure Vessel Code, Section VIII, Division 1: Rules for Construction of Pressure Vessels.

ASME - Boiler and Pressure Vessel Code, Section IX: Welding and Brazing Qualifications.

* + - * 1. ASTM International:

ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

ASTM A234 - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service

ASTM B32 - Standard Specification for Solder Metal.

ASTM B75 - Standard Specification for Seamless Copper Tube

ASTM B88 - Standard Specification for Seamless Copper Water Tube.

ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3) .

ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3).

ASTM D2513 - Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings.

ASTM D2517 - Standard Specification for Reinforced Epoxy Resin Gas Pressure Pipe and Fittings.

ASTM D2683 - Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing.

ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

* + - * 1. National Fire Protection Association:

NFPA 54 - National Fuel Gas Code.

NFPA 58 - Liquefied Petroleum Gas Code.

* + - 1. PREINSTALLATION MEETINGS
         1. Convene minimum [**one week**] [**<\_\_\_\_\_\_\_\_> weeks**] prior to commencing Work of this Section.
      2. SUBMITTALS

Only request submittals needed to verify compliance with Project requirements.

* + - * 1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
        2. Manufacturer’s installation instructions shall be provided along with product data.
        3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
        4. Product Data: Submit manufacturer information regarding pipe materials, pipe fittings, valves, and accessories.

USE PARAGRAPH BELOW WITH EPD REQUIREMENT WHEN PROJECT ESTIMATE IS $1M OR MORE.

* + - * 1. Submit an Environmental Product Declaration (EPD) from the manufacturer for steel pipe within this specification section, if available. A statement of the contractor’s good faith effort to obtain the EPD shall be provided if not available.

Manufacturer-provided EPDs must be Product Specific Type III (Third-Party Reviewed), in adherence with ISO 14025 *Environmental labels and declarations*, ISO 14044 *Environmental management – Life cycle assessment*, and ISO 21930 *Core rules for environmental product declarations of construction products and services.*

* + - * 1. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
        2. Welder Certificates: Certify welders and welding procedures employed on Work[**, verifying AWS qualification within previous 12 months**] [**, according to ASME BPVC, Section IX**].

Include separate Paragraphs for additional certifications.

* + - * 1. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
        2. Qualifications Statement:

Coordinate following Subparagraph with requirements specified in QUALIFICATIONS Article.

Submit qualifications for manufacturer.

Remove paragraph if not a LEED project.

* + - 1. SUSTAINABLE DESIGN SUBMITTALS
         1. Section 018113 - LEED Documentation Requirements: Requirements for sustainable design submittals.
         2. Manufacturer's Certificate:

Certify that products meet or exceed specified sustainable design requirements.

Insert material certifications list below to suit products specified in this Section and Project sustainable design requirements. Specific certificate submittal and supporting data requirements are specified in Section 018113.

Materials Resources Certificates:

Certify source and origin for [**salvaged**] [**and**] [**reused**] products.

Certify recycled material content for recycled content products.

Certify source for regional materials and distance from Project Site.

* + - * 1. Product Cost Data:

Submit cost of products to verify compliance with Project sustainable design requirements.

Exclude cost of labor and equipment to install products.

Provide cost data for following products:

Edit list of material cost data below to suit products specified in this Section and Project sustainable design requirements. Specific cost data requirements are specified in Section 018113.

Salvaged, refurbished, and reused products.

Products with recycled material content.

Regional products.

<**\_\_\_\_\_\_\_\_**>.

* + - 1. CLOSEOUT SUBMITTALS
         1. Project Record Documents:

Record actual locations of piping mains, valves, and connections.

Record actual [**invert**] [**or**] [**centerline**] elevations.

* + - * 1. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.
      1. QUALITY ASSURANCE

Include this Article to specify compliance with overall reference standards affecting products and installation included in this Section.

* + - * 1. Welding Materials and Procedures: Comply with [**AWS D1.1/D1.1M**] [**, AWS A5.8/A5.8M**] [**, ASME BPVC, Section VIII**] [**, ASME BPVC, Section IX**] [**, and**] [**applicable regulations**].
        2. Comply with [**NFPA 54**] [**, NFPA 58**] [**, and**] [**ASME B31.8**].

Include following Paragraph if gas company or applicable code dictates requirements.

* + - * 1. Perform Work according to [**applicable code**] [**<\_\_\_\_\_\_\_\_> code**] [**and**] [**local gas company requirements**].
        2. Furnish valves with manufacturer's name and pressure rating marked on valve body.

Include following Paragraph only when cost of acquiring specified standards is justified.

* + - * 1. Maintain <**\_\_\_\_\_\_\_\_**> [**copy**] [**copies**] of each standard affecting Work of this Section on Site.
      1. QUALIFICATIONS

Coordinate following Paragraphs with requirements specified in SUBMITTALS Article.

* + - * 1. Manufacturer: Company specializing in manufacturing piping system products specified in this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience.
        2. Welders: [**AWS qualified within previous 12 months**] [**According to ASME BPVC, Section IX**] for employed weld types.
      1. DELIVERY, STORAGE, AND HANDLING
         1. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
         2. Handling: Support each assembly with nylon slings.
         3. Storage:

Store materials according to manufacturer instructions.

Provide wooden shipping braces between layers of stacked pipe.

Stack piping lengths no more than three layers high.

* + - * 1. Protection:

Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.

Provide temporary end caps and closures on piping and fittings, and maintain in place until installation.

Protect piping [**system pieces**] [**systems**] from entry of foreign materials and water by temporary covers, by completing sections of Work, and by isolating parts of completed system.

Cover piping system during storage with light-colored or opaque tarpaulin to prevent jacket discoloration that may be caused by UV rays.

Provide additional protection according to manufacturer instructions.

* + - 1. EXISTING CONDITIONS
         1. Field Measurements:

Verify field measurements prior to fabrication.

Indicate field measurements on Shop Drawings.

* + - 1. WARRANTY
         1. Furnish [**one**] <**\_\_\_\_\_\_\_\_**>-year manufacturer's warranty for valves [**and**] <**\_\_\_\_\_\_\_\_**>.

1. PRODUCTS
   * + 1. NATURAL GAS PIPING
          1. Pipe and Fittings:

Some aboveground piping may be associated with service entries or propane storage tanks; edit accordingly. Consider using following Subparagraph if pipe or tubing is specified in another Section.

[**Piping**] [**and**] [**Tubing**]: As specified in Section [**231123 - Facility Natural-Gas Piping**] <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_**>.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Steel Piping [**, Belowground**]:

Pipe:

Type: Black; welding.

Comply with [**ASTM A53, Grade B**] <**\_\_\_\_\_\_\_\_**>.

Schedule: [**40**] [**80**].

Fittings:

Material: Forged steel.

Comply with [**ASME B16.11**] [**ASTM A234**.

Joints: Welded.

Jackets: [**PE; AWWA C105**] [**Double-layer, half-lapped, 10-mil PE tape**] [**Double-layer, half-lapped, <\_\_\_\_\_\_\_\_>-mil PE tape**].

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Steel Piping [**, Aboveground**]:

Pipe:

Type: Black; welding.

Comply with [**ASTM A53, Grade B**] <**\_\_\_\_\_\_\_\_**>.

Schedule: [**40**] [**80**].

Fittings: [**Malleable iron; ASME B16.3**] [**Forged steel; ASME B16.11**] [**Forged steel; ASTM A234**].

Joints: [**Threaded**] [**Welded, for pipe sizes greater than <\_\_\_\_\_\_\_\_> inches**].

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Copper tubing is generally acceptable only in propane systems. However, some local jurisdictions may accept copper piping in natural gas systems, while others may accept copper piping only if internally tinned.

Copper Tubing [**, Belowground**]:

Tube:

Comply with ASTM B88.

Type K.

[**Internally tinned.**]

Fittings:

[**Cast copper; ASME B16.18**] [**Wrought copper; ASME B16.22**].

[**Internally tinned.**]

Joints:

Comply with AWS A5.8.

Classification: BCuP silver brazed.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Copper Tubing [**, Aboveground**]:

Tube:

Comply with [**ASTM B88**] [**ASTM B75**].

Type [**K**] [**L**].

[**Internally tinned.**]

Fittings:

[**Cast copper; ASME B16.18**] [**Wrought copper; ASME B16.22**] [**Cast copper; ASME B16.26**].

[**Internally tinned.**]

Joints: [**Alloy Grade Sb5 tin-antimony solder; ASTM B32**] [**Classification BCuP silver brazed; AWS A5.8**].

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Plastic piping is generally acceptable only in natural gas systems located below grade. Check with local jurisdiction.

PE Piping:

Pipe: Comply with [**ASTM D2513, SDR 11.5**] <**\_\_\_\_\_\_\_\_**>.

Fittings: Comply with [**ASTM D2513**] [**ASTM D2683**] <**\_\_\_\_\_\_\_\_**>.

Joints: [**Mechanical or compression fit**] [**Fusion welded**] <**\_\_\_\_\_\_\_\_**>.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Reinforced Epoxy Resin Piping:

Pipe: Comply with ASTM D2517.

Fittings: Comply with ASTM D2517.

Joints: Bell and spigot with epoxy resin.

* + - 1. VALVES
         1. Plug Valves:

[Manufacturers](http://www.specagent.com/LookUp/?ulid=8812&mf=04&src=wd):

Fisher Control Valves & Instruments.

Sensus.

Approved equivalent.

Insert descriptive specifications below to identify Project requirements and to eliminate conflicts with products specified above.

2 Inches and Smaller:

Comply with ASME B16.33.

Pressure Rating:150-psig WOG.

Body: Bronze.

Plug: Bronze, tapered.

Lubricated.

Packing: PTFE.

End Connections: Threaded.

[**Furnish cast-iron curb box, cover, and key.**]

2-1/2 Inches and Larger:

Comply with ASME B16.33.

Pressure Rating: 125-psig WOG.

Body: [**Steel**] [**Cast iron**].

Plug: Tapered.

Lubricated.

Packing: PTFE.

End Connections: Threaded.

[**Furnish cast-iron curb box, cover, and key.**]

* + - * 1. Pressure-Regulating Valves:

[Manufacturers](http://www.specagent.com/LookUp/?ulid=13281&mf=04&src=wd):

Fisher Control Valves & Instruments.

Pietro Fiorentini.

Baker Hughes Valves (Mooney).

Approved equivalent.

Insert descriptive specifications below to identify Project requirements and to eliminate conflicts with products specified above.

Description:

Corrosion-resistant pressure regulator with atmospheric vent and elevation compensator.

Type: Single stage.

Body: Malleable iron.

End Connections:

Valves 2 Inches and Smaller: Threaded.

Valves 2-1/2 Inches and Larger: Flanged.

Capacity: Inlet and outlet gas pressures, specific gravity, and flow rate as indicated on Drawings.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Capacity:

Inlet Gas Pressure: [**125**] <\_\_\_\_\_\_\_\_> psig.

Outlet Gas Pressure Range: From [**8**] <\_\_\_\_\_\_\_\_>-inch wg to [**15**] <\_\_\_\_\_\_\_\_>-inch wg.

Specific Gravity: <**\_\_\_\_\_\_\_\_**>.

Flow Rate: <\_\_\_\_\_\_\_\_> cu. ft./h.

* + - 1. PROPANE STORAGE TANKS
         1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=13282&mf=04&src=wd):

Modern Welding Co of Kentucky, Inc.

Ventower Industries, LLC.

Quality Manufacturing Group.

Approved equivalent.

Insert descriptive specifications below to identify Project requirements and to eliminate conflicts with products specified above.

* + - * 1. Description:

[**Comply with NFPA 58.**]

Type: Closed.

Material: Welded steel.

Certification: Tested and stamped according to ASME BPVC, Section VIII.

Minimum Pressure Rating: 250 psig.

Coatings: Cleaned and prime coated with one coat of rust-inhibitive paint [**and two coats of high-gloss enamel**].

Furnish steel support saddles, pressure gage, tapping for installation of piping, and standard manufacturer's accessories.

* + - * 1. Performance and Design Criteria:

Capacity: [**500**] [**1,000**] [**2,000**] <\_\_\_\_\_\_\_\_> gal.

Diameter: <\_\_\_\_\_\_\_\_> inches.

Overall Length: <\_\_\_\_\_\_\_\_> inches.

* + - * 1. Vaporizer:

Description: Heating cable embedded in [**1**] <\_\_\_\_\_\_\_\_> inch of glass-fiber insulation and covered by flexible stainless-steel plate.

Size: [**1,000**] <**\_\_\_\_\_\_\_\_**> W.

Thermostat:

Furnish within weatherproof box.

Set to energize at minus 13 degrees F.

Furnish manual ON-OFF switch.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Vaporizer: Direct fired.

Remove paragraph if not a LEED project.

* + - 1. SUSTAINABILITY CHARACTERISTICS

Insert sustainable design characteristics in this Article to suit content of this Section and Project sustainable design requirements as specified in Section 018113.

* + - * 1. Section 018113 - LEED Documentation Requirements: Requirements for sustainable design compliance.
        2. Material and Resource Characteristics:

Recycled Content Materials: Furnish materials with maximum available recycled content [**including:**] [**.**]

Insert list of materials specified in this Section required to have recycled content.

<**\_\_\_\_\_\_\_\_**>.

Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles of Project Site [**including:**] [**.**]

Insert list of materials specified in this Section required to be regional materials.

<**\_\_\_\_\_\_\_\_**>.

* + - 1. MATERIALS

Select bedding and cover material type based on Project conditions. If more than one type is required, edit following Paragraph. Consider using material "Type" coding from Section 310001 in this Section for uniformity of reference.

Verify bedding requirements for corrugated PE pipe with pipe manufacturer.

* + - * 1. Bedding: As specified in Section [**310001 – Earthwork Materials**] <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_**>.
        2. Aggregate Backfill to 6 Inches above Pipe: As specified in Section [**310001 – Earthwork Materials**] <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_**>.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Soil Backfill to 12 Inches above Pipe: As specified in Section [**310001 - Earthwork Materials**] <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_**>.
        2. Soil Backfill from above Pipe to Finish Grade: As specified in Section [**310001 – Earthwork** **Materials**] <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_**>.
        3. Subsoil: No rocks more than 6 inches in diameter, frozen earth, or foreign matter.
      1. ACCESSORIES
         1. Underground Pipe Markers: As specified in Section 330597 - Identification and Signage for Utilities.

1. EXECUTION
   * + 1. EXAMINATION
          1. Verify that connection [**to existing piping system**] <**\_\_\_\_\_\_\_\_**>, sizes, locations, and [**inverts**] [**or**] [**centerlines**] are as indicated on Drawings.
       2. PREPARATION
          1. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.
          2. [**Bevel plain end ferrous pipe, 2-1/2 inches in diameter and larger**] [**Thread ferrous pipe, 2 inches in diameter and smaller**].
          3. Remove scale and dirt on inside and outside of piping before assembly.
          4. Prepare piping connections with [**flanges**] [**threading**] [**and**] unions.

Type of correcting materials (for example, fine aggregate, coarse aggregate, or lean concrete) depends on type of subsoil, percolation characteristics, and compaction requirements. Consult geotechnical report.

* + - * 1. Correct over-excavation with [**fine aggregate**] [**coarse aggregate**] [**lean concrete**].
        2. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction.
      1. INSTALLATION
         1. Excavation, Trenching, and Bedding:

Excavate pipe trench as specified in Section [**310000 - Earthwork**] <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_**>.

Excavate for [**manholes**] <**\_\_\_\_\_\_\_\_**> as specified in Section [**310000 - Earthwork**] <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_**>.

Place bedding material at trench bottom.

Level fill materials in continuous layers not exceeding [**6**] [**8**] <\_\_\_\_\_\_\_\_> inches in depth, and compact to [**95**] <**\_\_\_\_\_\_\_\_**> percent maximum density.

Backfill around sides and to top of pipe with cover fill, tamp in place, and compact to [**95**] <**\_\_\_\_\_\_\_\_**> percent maximum density.

Maintain optimum moisture content of bedding material to attain required compaction density.

* + - * 1. Piping:

Maintain separation of gas line from [**sewer**] [**water**] <**\_\_\_\_\_\_\_\_**> piping, as indicated on Drawings.

Group piping with other Site piping Work whenever practical.

Route piping in straight line.

Install piping to conserve space and to not interfere with use of Site space.

Install piping to allow for expansion and contraction without stressing pipe or joints, as approved by Director’s Representative.

Install valves and other fittings as indicated on Drawings.

Establish elevations of buried piping with not less than [**24**] [**36**] <\_\_\_\_\_\_\_\_> inches of cover in non-traveled areas, and [**48**] <\_\_\_\_\_\_\_\_> inches of cover in driveways and parking areas.

Wrap couplings and fittings of steel pipe with PE tape and heat-shrink over pipe.

* + - * 1. Backfilling and Compacting:

As specified in Section [**310000 - Earthwork**].

Do not displace or damage pipe while compacting.

* + - * 1. Pipe Markers: As specified in Section 330597 - Identification and Signage for Utilities.
        2. Valve Boxes:

Center and plumb valve boxes over valves.

Set box cover flush with finished ground surface.

Prevent shock or stress from being transmitted through valve box to valve.

Consider using following Subparagraph only for steel or cast-iron valves and boxes.

[**Wrap valve and valve box with PE tape and heat shrink**] [**Paint valves and valve boxes with rust-inhibitive primer and one coat of epoxy paint**].

* + - * 1. Service Connections:

Install sleeve in [**foundation**] <**\_\_\_\_\_\_\_\_**> wall for gas service main, and seal enlarged sleeve watertight.

Anchor service main to [**interior**] [**exterior**] surface of [**foundation**] <**\_\_\_\_\_\_\_\_**> wall.

Install service regulator adjacent to building wall as indicated on Drawings.

Install pressure-regulating valve and riser pipe as to prevent undue stress upon service pipe.

[**For plastic service pipe, use steel pipe riser from below ground to regulator.**]

Install regulator vent with rain- and insect-proof opening, terminating away from building openings.

Following Subparagraph may be required by code. Confirm with gas company requirements.

Install [**medium-pressure**] gas-pressure regulator with tee fitting between regulator and upstream shutoff valve, and cap or plug one opening of tee fitting.

Install [**medium-pressure**] gas-pressure regulator with tee fitting not less than 10 pipe diameters downstream of regulator, and cap or plug one opening of tee fitting.

Install gas service to within <\_\_\_\_\_\_\_\_> feet of building, and connect to building gas service as specified in Section 231123 - Facility Natural-Gas Piping.

[**Locate gas meter and pressure-reducing valve at building.**]

* + - * 1. Propane Tank:

Edit following Subparagraphs for Project conditions.

Excavate for tank foundation as specified in Section [**310000 - Earthwork**] <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_**>.

Place tank legs on concrete footings, and level within tolerance of [**2**] <\_\_\_\_\_\_\_\_> inches.

Provide footings as specified in Section [**033000 - Cast-in-Place Concrete**] <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_**>.

Prepare and grade area outside tank perimeter for distance of [**6**] <\_\_\_\_\_\_\_\_> feet.

Grade, place, and compact Type [**A1**] <**\_\_\_\_\_\_\_\_**> gravel fill to compacted depth of [**3**] <\_\_\_\_\_\_\_\_> inches.

Compact to [**95**] <**\_\_\_\_\_\_\_\_**> percent maximum density.

Install relief valve, shutoff valve, pressure regulator, pressure gage, and removable protection cover.

Install piping, shutoff valve, and pressure gage to underground piping.

Set tank regulator to outlet pressure of [**10**] [**15**] [**20**] psig.

Vaporizer:

Install vaporizer to underside of tank and secure to tank with tray and two straps.

Install weatherproof control box for vaporizer [**40**] <\_\_\_\_\_\_\_\_> inches above ground surface, on 4-by-4-inch [**cedar**] <**\_\_\_\_\_\_\_\_**> post driven into ground [40] <\_\_\_\_\_\_\_\_> inches.

Install wiring as specified in Section [**260583 - Wiring Connections**] <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_**>.

Install wiring from vaporizer to control box [**20**] <\_\_\_\_\_\_\_\_> inches below ground surface.

Install service wiring [**24**] <\_\_\_\_\_\_\_\_> inches belowground, from control box to building.

* + - 1. FIELD QUALITY CONTROL
         1. Testing:

Pressure Test:

Installed Gas Piping: To <\_\_\_\_\_\_\_\_> psig.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Comply with NFPA 54.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

LPG Piping: Comply with NFPA 58.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Include one of following Subparagraphs if applicable code or gas company dictates requirements.

Inspect, test, and purge gas piping according to [**Uniform Code**] [**and**] [**local gas company requirements**].

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Inspect, test, and purge LPG piping according to [**Uniform Code**] [**and**] [**local gas company requirements**].

Compaction Testing:

Select from among test standards referenced in following Subparagraph as appropriate for fill materials and Project requirements.

Consult geotechnical report to select compaction test method appropriate to fill materials being used and Project requirements.

Comply with [**ASTM D1557**] [**ASTM D698**] [**ASTM D6938**].

Testing Frequency: <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Equipment Acceptance: Adjust, repair, modify, or replace components failing to perform as specified and rerun tests. Coordinate with Director’s Representative.

END OF SECTION 335216