SECTION 335100

NATURAL-GAS DISTRIBUTION

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***NOTE TO SPECIFIER***

*Use this Specification Section for Mail Processing Facilities.*

***This is a Type 1 Specification with completely editable text; therefore, any portion of the text can be modified by the A/E preparing the Solicitation Package to suit the project.***

*For Design/Build projects, do not delete the Notes to Specifier in this Section so that they may be available to Design/Build entity when preparing the Construction Documents.*

*For the Design/Build entity, this specification is intended as a guide for the Architect/Engineer preparing the Construction Documents.*

*The MPF specifications may also be used for Design/Bid/Build projects. In either case, it is the responsibility of the design professional to edit the Specifications Sections as appropriate for the project.*

*Text shown in brackets must be modified as needed for project specific requirements.* *See the “Using the USPS Guide Specifications” document in Folder C for more information.*

*The last date that USPS revised this standard specification section occurs in two places, at the end of this section and in the Table of Contents. If the date in this section matches the date in the Table of Contents, then you are using the latest version. Do not delete or revise the “last revised” date at the end of the section during the development of the Project Manual.*

*The footer in this section should be edited to replace the text, “USPS MPF SPECIFICATION” with the project name, and the blank date in the center should be replaced with the submission date, for interim design reviews, or the issue date of the completed Project Manual.*

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1. GENERAL
	1. SUMMARY
		1. Section Includes:

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**NOTE TO SPECIFIER**

Edit below for type of gas used for this Project.

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* + - 1. Pipe and fittings for site utility [natural] [propane] gas distribution.

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**NOTE TO SPECIFIER**

Use PROPANE STORAGE TANKS for Propane System.

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* + - 1. Propane storage tanks.
		1. Related Documents: The Contract Documents, as defined in the General Conditions, apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other Documents.
		2. Related Sections:
			1. Section 312300 - Excavation and Fill: Earthwork for utilities.
	1. REFERENCES
		1. American Association of State Highway and Transportation Officials (AASHTO):
			1. AASHTO T180 ‑ Moisture‑Density Relations of Soils Using a 10 pound Rammer and an 18 inch Drop.
		2. American Society of Mechanical Engineers (ASME):
			1. ASME B16.18 ‑ Cast Copper Alloy Solder Joint Pressure Fittings.
			2. ASME B16.22 ‑ Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
			3. ASME B16.26 ‑ Cast Copper Alloy Fittings for Flared Copper Tubes.
			4. ASME Sec. 8D ‑ Pressure Vessels.
			5. ASME Sec. 9 ‑ Welding and Brazing Qualifications.
			6. ASME Boiler and Pressure Code.
		3. American Society for Testing and Materials (ASTM):
			1. ASTM B 32 ‑ Specification for Solder Metal.
			2. ASTM D 1557 ‑ Test Methods for Moisture‑Density Relations of Soils and Soil‑Aggregate Mixtures Using 10 Pound Rammer and 18 inch Drop.
			3. ASTM A 53 ‑ Specification for Pipe, Steel, Black and Hot‑Dipped, Zinc Coated (Galvanized) Welded and Seamless, for Ordinary Uses.
			4. ASTM A234 ‑ Specification for Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
			5. ASTM B75 ‑ Specification for Seamless Copper Tube.
			6. ASTM B88 ‑ Specification for Seamless Copper Water Tube.
			7. ASTM D2513 ‑ Specification for Thermoplastic Gas Pressure Pipe, Tubing and Fittings.
			8. ASTM D2517 ‑ Specification for Reinforced Epoxy Resin Gas Pressure Pipe and Fittings.
			9. ASTM D2683 ‑ Specification for Socket Type Polyethylene Fittings For Outside Diameter Controlled Polyethylene Pipe and Tubing.
			10. ASTM D2922 ‑ Test Methods for Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth).
			11. ASTM D3017 ‑ Test Methods for Moisture Content of Soil and Soil‑Aggregate in Place by Nuclear Methods (Shallow Depth).
		4. American Welding Society (ASTM):
			1. AWS A5.8 ‑ Brazing Filler Metal.
		5. American Water Works Association (AWWA):
			1. AWWA C105 ‑ Polyethylene Encasement for Ductile Iron Piping for Water and Other liquids.
		6. American National Standards Institute (ANSI):
			1. ANSI B16.3 ‑ Malleable Iron Threaded Fittings.
			2. ANSI B16.11 ‑ Forged Steel Fittings, Socket Welding and Threaded.
			3. ANSI B31.2 ‑ Fuel Gas Piping.
			4. ANSI B31.8 ‑ Gas Transmission and Distribution Piping Systems.
		7. National Fire Protection Association (NFPA):

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**NOTE TO SPECIFIER**

OPTION 1: Use NFPA 54 for Natural Gas System.

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* + - 1. NFPA 54 ‑ National Fuel Gas Code.

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**NOTE TO SPECIFIER**

OPTION 2: Use NFPA 58 for Propane System.

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* + - 1. NFPA 58 ‑ National Fuel Propane Code.
	1. DEFINITIONS
		1. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.
	2. SUBMITTALS
		1. Section 013300 - Submittal Procedures: Procedures for submittals.
			1. Product Data: Data for each type of pipe, pipe fitting, valve, and accessory specified.
			2. Assurance/Control Submittals:
				1. Certificates: Manufacturer's certificate certifying that Products meet or exceed specified requirements and standards.
		2. Section 017704 - Closeout Procedures and Training: Procedures for closeout submittals.
			1. Project Record Documents: Accurately record the following:
				1. Locations of piping mains, valves, connections, and top of pipe elevations.
				2. Identify and describe unexpected variations to subsoil conditions and location of uncharted utilities.
	3. QUALITY ASSURANCE
		1. Regulatory Requirements: Perform work in accordance with Utility Company requirements and authority having jurisdiction.

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**NOTE TO SPECIFIER**

Edit below for type of gas used. Use NFPA 54 for Natural Gas. Use NFPA 58 for Propane.

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* + - 1. Conform to [NFPA 54] [NFPA 58], ANSI B31.2 and ANSI B31.8.
		1. Gas Cock: Manufacturer's name and pressure rating marked on valve body.
		2. Welding Materials and Procedures: Conform to ASME Boiler and Pressure Vessel Code and applicable state regulations.
		3. Welders Certification: In accordance with ASME Sec 9.
	1. DELIVERY, STORAGE, AND HANDLING
		1. Section 016000 - Product Requirements: Transport, handle, store, and protect products.
		2. Deliver and store valves in shipping containers with labeling in place.
1. PRODUCTS
	1. PIPE

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**NOTE TO SPECIFIER**

OPTION 1: Use STEEL PIPE Paragraphs A and B or Paragraphs E or F below for NATURAL GAS system.

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* + 1. Steel Pipe Below Ground: ASTM A 53, Schedule 40 black:
			1. Fittings: ANSI B16.11, forged steel, or ASTM A 234 forged steel welding type.
			2. Joints: Welded and seamless.
			3. Jackets: AWWA C 105 polyethylene jacket, double layer, half lapped, 10 mil polyethylene tape.
		2. Steel Pipe Above Ground: ASTM A53 Schedule 40 black:
			1. Fittings: ANSI B16.3, malleable iron, ANSI Bl6.11, forged steel, or ASTM A 234, forged steel welding type.
			2. Joints: Threaded.

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**NOTE TO SPECIFIER**

OPTION 2: Use COPPER TUBING Paragraphs A and B or Paragraphs E or F below for PROPANE system.

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* + 1. Copper Tubing Below Ground: ASTM B 88, Type K , internally tinned:
			1. Fittings: AWWA B16.18, cast copper, or ASME B16.22, wrought copper; internally tinned.
			2. Joint: AWS A5.8 BCuP silver brazed.
		2. Copper Tubing Above Ground: ASTM B 88, Type K, L or ASTM B 75, Type GP ; internally tinned:
			1. Fittings: ASME B6.18 cast copper, ASME B16.22, wrought copper, or ASME B16.26, cast copper, internally tinned.
			2. Joint: ASTM B 32, Solder, Grade 95TA or AWS A5.8, BCuP silver brazed.
		3. Polyethylene Pipe: ASTM D 2513, SDR 11.5 or ASTM F 678 Series 125:
			1. Fittings: ASTM D 2513.
			2. Joints: Mechanical or Compression fit.
			3. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Natural Gas Service" in large letters.
		4. Reinforced Epoxy Resin Piping: ASTM D 2517:
			1. Fittings: ASTM D 2517.
			2. Joints: Bell and spigot with epoxy resin.
			3. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Natural Gas Service" in large letters.
	1. GAS COCKS
		1. 2 Inches and Smaller: 150 psig WOG, bronze body, bronze tapered plug, non‑lubricated, Teflon packing, threaded ends with cast iron curb box, cover, and key.
		2. 2 Inches and Larger: 125 psig WOG, Steel or Cast iron body and tapered plug, non‑lubricated, Teflon packing, threaded ends, with cast iron curb box, cover, and key.
		3. Applications With Line Pressure Greater Than 60 psig, Over 2 Inches: Cast iron body and plug, pressure lubricated, Teflon packing, flanged ends, with cast iron curb box, cover, and key.
	2. PRESSURE REGULATING VALVES
		1. Valves: Single stage, malleable iron body, corrosion‑ resistant, pressure regulator with atmospheric vent, elevation compensator; with threaded ends for 2 inch and smaller, flanged ends larger than 2 inch.
		2. Capacity: For inlet and outlet gas pressures, specific gravity, and flow rate indicated.

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**NOTE TO SPECIFIER**

Use PROPANE STORAGE TANKS for Propane System.

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* 1. PROPANE STORAGE TANKS
		1. Construction: Closed, welded steel, tested and stamped in accordance with ASME Section 8D; minimum 250 psig rating; cleaned, prime coated and painted with two coats of silver anti‑rust paint, and supplied with steel support saddles, pressure gage; tapping for installation of piping and accessories.
		2. Vaporizer: 1000 watts, heating cable bedded in one inch of glass fiber insulation and covered by flexible stainless steel plate, with thermostat in weatherproof box set to turn on at ‑13 degrees F with manual off‑on switch.
		3. Size and Capacity: Diameter and length indicated on Drawings.
1. EXECUTION
	1. EXAMINATION
		1. Section 017300 - Execution: Verification of existing conditions before starting work.
		2. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive Work.
			1. Verify that building service connection and utility gas main size, location, and depth are as indicated.
		3. Report in writing to Contracting Officer prevailing conditions that will adversely affect satisfactory execution of the Work of this Section. Do not proceed with Work until unsatisfactory conditions have been corrected.
		4. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the United States Postal Service.
	2. PREPARATION
		1. Hand trim excavations to required elevations. Correct over excavation with fine aggregate.
		2. Remove large stones or other hard matter which could damage pipe or impede consistent backfilling or compaction.
		3. Cut pipe ends square, ream pipe ends and remove burrs. Bevel plain end ferrous pipe over 2 inches diameter thread ferrous pipe 2 inches diameter and under.
		4. Remove scale and dirt, on inside and outside, before assembly.
		5. Prepare piping connections with flanges or threading and unions.
	3. BEDDING
		1. Excavate pipe trench and place bedding material in accordance with Section 312300 for work of this Section. Provide trench wall shoring as required.
		2. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 6 inches compacted depth, each layer. Place compacted bedding material to elevation of subgrade as indicated on Drawings.
		3. Maintain optimum moisture content of bedding material to attain required compaction density.
		4. Remove excess backfill and excavated material from site.
	4. INSTALLATION ‑ PIPING
		1. Maintain separation of gas line from sewer, water or storm water piping in accordance with state or local code.
		2. Install piping to allow for expansion and contraction without stressing pipe or joints.
		3. Connections with Existing Pipelines: Where connections are made between new Work and existing piping, make connection using suitable fittings for conditions encountered. Make each connection with existing pipe at time and under conditions which least interfere with operation of existing pipeline and in compliance with the local Utility Company.
		4. Install cocks and other fittings as required.
		5. Establish elevations of buried piping in accordance with Section 312300 for Work in this Section.
		6. Wrap couplings and fittings of steel pipe with polyethylene tape and heat shrink over pipe.
		7. Install trace wire continuous buried 10 inches below finish grade, above pipe line. Trace wire shall be in accordance with local utilities standards.
		8. Backfill trench in accordance with Section 312300.
		9. Center and plumb valve box over valve. Set box cover flush with finished ground surface. Prevent shock or stress from being transmitted through valve box to valve.
		10. Wrap valve and valve box with polyethylene tape and heat shrink or paint valves and valve boxes with red anti‑rust primer and one coat of epoxy paint.
	5. SERVICE CONNECTIONS
		1. Provide sleeve in foundation wall for gas service main. Caulk enlarged sleeve watertight.
		2. Anchor service main to interior surface of foundation wall.
		3. Install service regulator adjacent to building wall in specified location.
		4. Install service regulator and riser pipe to prevent undue stress upon service pipe. For plastic service pipe, use steel pipe riser from below ground to regulator.
		5. Provide regulator vent with rain and insect proof opening, terminating not less than five feet away from building openings.

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**NOTE TO SPECIFIER**

Use PROPANE STORAGE TANKS for Propane System.

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* 1. PROPANE STORAGE TANK INSTALLATION
		1. Place tank legs on concrete footings, level within tolerance of 2 inches as indicated on Drawings. Concrete specified in Section 033000.
		2. Prepare and grade an area outside tank perimeter, for a distance of 6 feet. Grade, place and compact gravel fill to a compacted depth of 3 inches. Compact to 95 percent.
		3. Provide tank with relief valve, shutoff valve, pressure regulator, pressure gage and removable protection cover. Install piping, shutoff valve and pressure gage to underground piping.
		4. Set tank regulator to outlet pressure as indicated on Drawings.
		5. Install vaporizer to under side of tank and secure to tank with aluminum tray and two stainless steel straps.
		6. Install weatherproof control box for vaporizer 40 inches above ground surface. Install to 4 x 4 inch cedar post, driven into ground 40 inches.
		7. Install wiring. Install control wire from vaporizer to control box 20 inches below ground surface. Install service wiring 24 inches below ground from control box to building.
	2. FIELD QUALITY CONTROL
		1. Section 014000 - Quality Requirements: Field testing and inspection.
		2. Site Tests:
			1. Compaction:
				1. Perform inspections prior to immediately after placing bedding.
				2. Perform tests as specified in Section 312300.
			2. Piping:
				1. Test, and purge gas piping in conformance with NFPA 54, Part 4 and local Utility Company requirements.
				2. Verify capacities and pressure ratings of gas meters, regulators, and valves.
				3. Verify required pressure settings for pressure regulators.
		3. Inspections: Inspect gas piping in conformance with NFPA 54, Part 4 and local Utility Company requirements.

END OF SECTION

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**NOTE TO SPECIFIER**

DRAWING COORDINATION

Drawings should indicate the following information related to this Section:

1. *Location, size and material of existing natural gas distribution main.*
2. Show new gas distribution main and service piping.
3. Indicate natural gas heating value in Btu per cubic foot specific gravity, and pressure in psig.
4. Show locations of gas meters, gas service pressure regulators, and specialties, drawn to scale.
5. Indicate gas demand in cubic feet per hour for each meter and pressure regulator, pressure regulator settings, and pipe sizes.
6. Show access to service space requirements.
7. Detail or show schematic diagram of gas service.
8. Show manifolds, pressure regulators, meters, specialties, piping, dielectric fittings, unions and flanges, drips, and flexible connections. Include connected gas demand in cubic feet per hour.
9. Indicate exact location of connection to gas utility or other source. Clarify responsibility for gas valves, gas service pressure regulators, meter bars, and gas meters.
10. Show limits of piping with protective coating.
11. Show concrete bases on sections, elevations, and details.

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