SECTION 23 11 26

FACILITY LIQUEFIED-PETROLEUM FLEXIBLE GAS PIPING

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\*\* NOTE TO SPECIFIER \*\* Omega Flex, Inc.; Flexible Metallic Piping.
This section is based on the products of Omega Flex, Inc., which is located at:
451 Creamery Way
Exton, PA 19341
Toll Free Tel: 800-355-1039
Tel: 610-524-7272
Fax: 610-524-7282
Email: [request info (tracpipe@omegaflex.net)](https://arcat.com/rfi?action=email&company=Omega%252BFlex%252C%252BInc.&message=RE%253A%2520Spec%2520Question%2520(15190ogf)%253A%2520&coid=47600&spec=15190ogf&rep=&fax=610-524-7282)
Web: <https://www.omegaflexcommercial.com>
 [ [Click Here](https://arcat.com/company/omega-flex-inc-47600) ] for additional information.
Commercial solutions for all your gas piping needs including natural gas and propane, diesel, gasoline, biofuels, and medical gas. Applications include backup generators, boilers, commercial laundries and restaurants, high rise apartments and condos, hospitals, assisted living and dental.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Corrugated StainlessSteel Tubing (CSST) for use in Natural Gas Piping Systems.
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 22 63 13 - Gas Piping for Piping for Laboratory and Healthcare Facilities.
		2. Section 23 11 13 - Facility Fuel Oil Piping.
		3. Section 23 11 23 - Facility Natural Gas Piping.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. ASTM International (ASTM):
			1. ASTM A240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
			2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
		2. American National Standards Institute (ANSI).
			1. CSA/ANSI LC-1 / CSA 6.26 - Standard for Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing.
		3. American Society of Mechanical Engineers (ASME).
		4. Canadian Standards Association:
			1. CSA Certificate of Compliance No.1082441.
			2. CSA/ANSI LC-1 / CSA 6.26 - Standard for Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing.
		5. International Association of Plumbing and Mechanical Officials (IAPMO):
			1. IAPMO- IGC-201 Polyethylene Sleeved Corrugated Stainless Steel Tubing for use in Fuel Gas Piping Systems.
			2. IAPMO- ES 3682 - Gas Piping Corrugated Stainless Steel Tubing System; OmegaFlex.
			3. IAPMO- ES 4665 - Polyethylene Sleeved-Corrugated Stainless Steel Tubing For Use In Fuel Gas Piping Systems; OmegaFlex.
			4. IAPMO- ER 0227 - CounterStrike Conductive Jacket Corrugated Stainless Steel Tubing; OmegaFlex Evaluation Report.
			5. IAPMO- Uniform Plumbing Code.
			6. IAPMO- Uniform Mechanical Code.
		6. International Code Council (ICC):
			1. ICC- ES LC-1024 - Conductive Jacketed Corrugated Stainless Steel Tubing.
			2. ICC- ES LC-1023 - Polyethlene Sleeved Corrugated Stainless Steel Tubing.
			3. ICC- PMG 1046 - Product Certificate. TracPipe Corrugated Stainless Steel Tubing Flexible Fuel Gas Piping System
			4. ICC- PMG 1052 - Product Certificate. TracPipe PS II Polyethylene-Sleeved Flexible Fuel Gas Piping System. For use aboveground, belowground, and underground beneath buildings.
			5. ICC- PMG 1058 - Product Certificate;TracPipe Counterstrike Conductive Jacketed Corrugated Stainless Steel Tubing.
			6. ICC-ES ESR-4565 Evaluation Report for Seismic Performance.
			7. ICC- International Fuel Gas Code:
				1. IGC-201 - Polyethylene Sleeved-Corrugated Stainless-Steel Tubing for use in Fuel Gas Piping Systems.
			8. ICC- International Mechanical Code.
			9. ICC- International Residential Code.
		7. National Fire Protection Association (NFPA):
			1. NFPA-54 / ANSI Z223.1 - National Fuel Gas Code
			2. NFPA-58 - Liquefied Petroleum Gas Code
			3. NFPA-70 National Electrical Code
			4. NFPA-501 Manufactured Housing Code
		8. Underwriters Laboratories (UL):
			1. UL- Through Penetration Firestop Systems
			2. UL 723 - Surface Burning Characteristic of Building Materials Test
		9. Massachusetts Product Approval
		10. Michigan Product Approval
		11. City of L.A. Product Approval RR 5495
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. Product Data:
			1. Manufacturer's data sheets on each product to be used.
			2. Preparation instructions and recommendations.
			3. Storage and handling requirements and recommendations.
			4. Typical installation methods.

\*\* NOTE TO SPECIFIER \*\* Delete if not applicable to product type.

* + 1. Verification Samples: Two representative units of each type, size, pattern and color.
		2. Shop Drawings: Include details of materials, construction and finish. Include relationship with adjacent construction.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
		2. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
			1. Each installer must meet applicable state and local requirements established by the Authority Having Jurisdiction (AHJ) and must be successfully trained through the TracPipe CounterStrike manufacturer's installation program.
		3. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

\*\* NOTE TO SPECIFIER \*\* Include mock-up if the project size or quality warrant the expense. The following is one example of how a mock-up might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
			1. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
			2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
			3. Retain mock-up during construction as a standard for comparison with completed work.
			4. Do not alter or remove mock-up until work is completed or removal is authorized.
	1. PRE-INSTALLATION CONFERENCE
		1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
	2. DELIVERY, STORAGE, AND HANDLING
		1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
		2. Protect from damage due to weather, excessive temperature, and construction operations.
	3. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
	4. WARRANTY
		1. Manufacturer's standard limited warranty unless indicated otherwise.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Omega Flex, Inc., which is located at:
		451 Creamery Way
		Exton, PA 19341
		Toll Free Tel: 800-355-1039
		Tel: 610-524-7272
		Fax: 610-524-7282
		Email: [request info (tracpipe@omegaflex.net)](https://arcat.com/rfi?action=email&company=Omega%252BFlex%252C%252BInc.&message=RE%253A%2520Spec%2520Question%2520(15190ogf)%253A%2520&coid=47600&spec=15190ogf&rep=&fax=610-524-7282);Web: <https://www.omegaflexcommercial.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* 1. FLEXIBLE GAS PIPING - LIQUIFIED PETROLEUM
		1. Basis of Design: Above ground piping applications.
			1. TracPipeCounterStrike CSST Flexible Gas Piping System as manufactured by OmegaFlex. CSST with an arc resistant, conductive black jacket. Fuel gas piping system of corrugated, flexible, semi-rigid, 300 type stainless steel tubing with brass mechanical attachment fittings terminating in NPT pipe threads for easy attachment to traditional black iron pipe systems and direct connections to gas appliances.
		2. Basis of Design: Below ground and underneath building slab piping applications.
			1. TracPipe PS-II CSST Flexible Gas Piping System as manufactured by OmegaFlex. Underground piping shall consist of 300 type stainless steel conforming to ASTM 240 with an integral polyethylene sleeve. The piping system shall be designed to withstand superimposed loads. The sleeve shall have internal vent channels running lengthwise to direct any leakage along the pipe to the vent-capable end fittings.
		3. Standards Compliance:
			1. CSA/ANSI LC-1 / CSA 6.26 Standard for Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing.
			2. ICC- ES LC-1024 PMG Listing Criteria for Stainless Steel Tubing.
			3. ICC- ES LC-1023 - Polyethlene Sleeved Corrugated Stainless Steel Tubing.
			4. IAPMO- IGC-201 The interim Guide Criteria for polyethylene Sleeved Corrugated Stainless Steel Tubing for use in Fuel Gas Piping Systems.
			5. Listings:
				1. ASTM E84 Compliant.
				2. CSA Certificate of Compliance No. 1082441.
				3. ICC- PMG 1046.
				4. ICC- PMG 1052.
				5. ICC- PMG 1058.
				6. ICC-ES ER-4565.
				7. IAPMO- ES 3682.
				8. IAPMO- ES 4665.
				9. IAPMO- ER 0227.
				10. UL- Through Penetration Firestop Systems.
			6. Model Codes:
				1. NFPA-54 / ANSI Z223.1 - National Fuel Gas Code.
				2. NFPA-58 LP Gas Code.
				3. NFPA-70 National Electrical Code.
				4. NFPA-501 Manufactured Housing Code.
				5. ICC- International Fuel Gas Code.
				6. ICC- International Mechanical Code.
				7. ICC- International Residential Code IAPMO- Uniform Plumbing Code.
				8. IAPMO- Uniform Mechanical Code.
			7. Other:
				1. Massachusetts Product Approval
				2. Michigan Product Approval
				3. City of L.A. Product Approval RR 5495

\*\* NOTE TO SPECIFIER \*\* Delete tubing type not required.

* + 1. Available Tubing Sizes: TracPipeCounterStrike Corrugated Stainless Steel 300 Series with Black Conductive Polyethylene Jacket Gas Tubing.

\*\* NOTE TO SPECIFIER \*\* Other lengths available. Consult factory for price and lead time. Delete size options not required.

* + - 1. Tubing Size: 3/8 inch. Reel Length: 100 ft (30.480 m).
			2. Tubing Size: 3/8 inch. Reel Length: 250 ft (76.200 m).
			3. Tubing Size: 1/2 inch. Reel Length: 100 ft (30.480 m).
			4. Tubing Size: 1/2 inch. Reel Length: 250 ft (76.200 m).
			5. Tubing Size: 1/2 inch. Reel Length: 500 ft (152.400 m).
			6. Tubing Size: 3/4 inch. Reel Length: 50 ft (15.240 m).
			7. Tubing Size: 3/4 inch. Reel Length: 100 ft (30.480 m).
			8. Tubing Size: 3/4 inch. Reel Length: 250 ft (76.200 m).
			9. Tubing Size: 1 inch. Reel Length: 50 ft (15.240 m).
			10. Tubing Size: 1 inch. Reel Length: 100 ft (30.480 m).
			11. Tubing Size: 1 inch. Reel Length: 180 ft (54.864 m).
			12. Tubing Size: 1-1/4 inch. Reel Length: 150 ft (45.720 m).
			13. Tubing Size: 1-1/4 inch. Reel Length: 250 ft (76.200 m).
			14. Tubing Size: 1-1/2 inch. Reel Length: 150 ft (45.720 m).
			15. Tubing Size: 1-1/2 inch. Reel Length: 250 ft (76.200 m).
			16. Tubing Size: 2 inch. Reel Length: 150 ft (76.200 m).
		1. Available Tubing Sizes: TracPipe PS-II Corrugated Stainless Steel 300 Series with an integral, vented, polyethylene sleeve.

\*\* NOTE TO SPECIFIER \*\* Other lengths available. Consult factory for price and lead time. Delete options not required.

* + - 1. Tubing Size: 3/8 inch. Reel Length: 250 ft (76.200 m).
			2. Tubing Size: 1/2 inch. Reel Length: 100 ft (30.480 m).
			3. Tubing Size: 1/2 inch. Reel Length: 250 ft (76.200 m).
			4. Tubing Size: 3/4 inch. Reel Length: 100 ft (30.480 m).
			5. Tubing Size: 3/4 inch. Reel Length: 250 ft (76.200 m).
			6. Tubing Size: 1 inch. Reel Length: 100 ft (30.480 m).
			7. Tubing Size: 1 inch. Reel Length: 250 ft (54.864 m).
			8. Tubing Size: 1-1/4 inch. Reel Length: 150 ft (45.720 m).
			9. Tubing Size: 1-1/2 inch. Reel Length: 150 ft (45.720 m).
			10. Tubing Size: 2 inch. Reel Length: 150 ft (76.200 m).
		1. Tubing: 300 series Stainless Steel conforming to ASTM A240. Rating: 25 psi. Elevated Pressure Rating: Sizes up to 1-1/4 inch (32 mm): 125 G. For 1-1/2 and 2 inch (38 and 51 mm): 25 G.
			1. Do not subject tubing to heat treating or annealing after the corrugation forming operation.
		2. Arc-Resistant, Conductive Jacket (Above ground piping only): Fire-retarded engineered polymer. Enhances energy dissipating properties of the flexible gas piping. Conforms to ASTM E84 (UL723): Flame spread rating not to exceed 25 and ASTM-E84 (UL723) smoke density rating shall not exceed 50. Conductive jacket shall be resistant to UV.
		3. Integral Vent-Capable Sleeve (Under ground and under building slab only): The polyethylene sleeve shall have internal vent channels running lengthwise to direct any leakage along the pipe to the end fitting.
		4. Fittings: Yellow brass.
			1. Tested and listed by CSA International for use in concealed locations. Provide a metal to metal seal. Brass fittings shall not contain gaskets or O-rings to facilitate the seal between the tubing and the fitting.
			2. AutoSnap Fittings shall have an integral snap ring requiring no disassembly or reassembly of the fitting for attachment to the tubing. The fittings shall provide a metal to metal seal. Brass fittings shall not contain gaskets or O-rings to facilitate the seal between the tubing and the fitting.
			3. AutoFlare Fittings shall have a removable split ring for attachment to the tubing. The fittings shall provide a metal to metal seal. Brass fittings shall not contain gaskets or O-rings to facilitate the seal between the tubing and the fitting.
			4. TracPipe PS-II fittings used with TracPipe PS-II tubing for underground applications shall be of the AutoFlare type listed above and shall be designed with vent ports to allow integral venting from the piping sleeve.
				1. Seismic Performance - CSST Flexible Gas Piping must be listed by ICC for Seismic Performance. Flexible gas piping shall be rated for installation in Seismic Design Categories C, D, E and F and structures assigned an Ip of 1.5. Evaluation should be in accordance with Section 13.2.5 of ASCE/SEI 7-16
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until substrates have been properly constructed and prepared.
		2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
	2. PREPARATION
		1. Clean surfaces thoroughly prior to installation.
		2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
	3. INSTALLATION
		1. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
			1. The installation shall be in compliance with the TracPipe CounterStrike Design Guide and Installation Instructions.
			2. Appliance Terminations: Termination Mount fittings are to be used for the tubing at all movable appliance locations and other stub-out points. The tubing may be run directly to the manual shut-off valve on fixed appliances.
			3. Regulators: Regulators must be listed to a recognized national standard for pressure regulators. Line Pressure Regulators listed to ANSI Z21.80 and equipped with a vent limiter do not require a vent line to be run outdoors.
			4. Protection: Striker plates shall be used where necessary and marked with the symbol of the Manufacturer and CSA International. Striker Plates shall be made from carbon steel, heat treated to greater than RB75 and less than RB85. Floppy type RW galvanized steel electrical conduit shall be used for additional protection.
		2. Identification - TracPipe CounterStrike and PS-II shall be marked with the manufacturer's name or symbol, approving agencies, pressure rating and manufacturing date code. The piping system shall be marked by the manufacturer with the word "GAS" in black letters every two feet. Do not paint, stencil, or apply unapproved labels to the piping system.
		3. Electrical Bonding - Flexible gas piping shall be bonded in accordance with the National Electrical Code NFPA 70 Article 250.104 and the National Fuel Gas Code NFPA 54, and any local requirement which may exceed the national codes.
		4. If bonding is required, a bonding clamp must be attached to the brass fitting or to a black pipe component in the same electrically continuous gas piping system. The corrugated stainless steel portion of the gas piping shall NOT be used as a bonding attachment under any circumstance.
		5. Underground and Under Slab Gas Piping:
			1. Installation: For gas piping under building slabs, requirements for Plumbing, Mechanical and Fuel Gas Codes shall be followed for encasement in non-metallic conduit with venting to the atmosphere. The construction of TracPipe PSII pre-sleeved system does provide the encasement and venting capabilities required by codes. No additional conduit is required for TracPipe PS-II.
			2. Joints: Underground fittings are not permitted under a building slab.
	4. FIELD QUALITY CONTROL
		1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Delete if not required.

* + 1. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.
	1. CLEANING AND PROTECTION
		1. Clean products in accordance with the manufacturer's recommendations.
		2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION