REMARKS OF STEWART O'BRIEN EXECUTIVE DIRECTOR OF THE PLUMBING FOUNDATION OF THE CITY OF NEW YORK, INC. AT A PUBLIC SERVICE COMMISSION STACKHOLDER CONFERENCE REGARDING AMENDING 16 NYCRR PART 255, OCTOBER 21, 2014, NEW YORK CITY

I am Stewart O'Brien, Executive Director of the Plumbing Foundation of the City of New York Inc. The Plumbing Foundation of the City of New York, Inc. is a clearinghouse and educational forum for the plumbing industry. The Plumbing Foundation is a nonprofit association of licensed contracting firms, engineering associations, manufacturers, and suppliers whose mission is to ensure the public health through the enactment and enforcement of safe plumbing codes. In connection with that mission we regularly meet with legislative and regulatory bodies that pass laws and promulgate regulations which affect the plumbing industry.

Thank you for the opportunity to comment on the proposed amendments to 16 NYC RR Part 255. While the proposed amendments would change various procedures, I would like to focus my prepared remarks to just one area – prohibiting licensed firms from doing repairs alterations on the small length of pipe extending from the first accessible fitting after a gas service pipe enters a building to the meter.

First, a little background on how, for decades, gas piping in New York City has been safely installed, repaired and maintained by licensed plumbers, and monitored and inspected by utilities and government agencies. The utility brings the service line from the gas main into the building. At that point, the licensed master plumber installs, maintains and repairs the gas piping from the first accessible fitting inside the building (see Exhibit A, Point B on the attached illustration) to each individual gas fixture throughout the building (Point E on the illustration). The NYC Department of

Buildings has jurisdiction, inspects and monitors all the gas piping from the meter outlet (Point D on the illustration) to gas fixtures. There is a run of pipe, in most cases less than 10 feet, between the first accessible fitting and the meter outlet (from Point B to D) where the licensed plumber installs, repairs, and tests the pipe and provides an affidavit to the utility that it is in compliance with the same Building Code inspection and testing requirements as all the piping from the meter outlet to the rest of the building (see Exhibit B – applicable sections from Con Edison's "Blue Book"). It is that short run of pipe, in most cases less than 10 feet, that is the focus of these amendments.

Adopting the language of Federal Rules on this issue (49 CFR Part 192 – Transportation of Natural And Other Gas By Pipelines – Minimum Federal Safety Standards) the proposed PSC amendment would, for the first time, prohibit licensed master plumbers from repairing and maintaining that short run of pipe unless:

1) they have a contract with the applicable utility
2) they are "operated qualified" by the utility and
3) subject to drug testing

A few comments - -

One, we understand that the PSC is required by federal mandate to expand the definition of service line to include the short length of pipe between the first accessible fitting to the meter outlet. We have no concerns regarding expanding that definition. Rather, our very serious concern is the imposition of very onerous prerequisites regarding who would now be allowed to perform this work. We understand that, while the PSC may be mandated to accept the expanded definition of "service line", the PSC does have the authority to provide alternate safety requirements in lieu of the 3

prerequisites of the federal rule. Shortly, we will discuss why the PSC should adopt such an alternative rule.

Two, the proposed amendment only applies to repair and alteration work, not new construction. If it is safe for the Federal Rule and the PSC to allow the new installation of this short run of piping to be continued to be performed by licensed plumbers, why would that same standard not apply to alteration work?

Three, even if the proposed Rule was adopted as is, almost all the gas piping in the building would still be installed, repaired and altered by licensed master plumbers. As previously stated, if the Rule where adopted it would only impact a very, very short run of gas piping. Is there a legitimate rationale to create two levels of qualifications for gas work inside a building – one for the vast majority of gas work from the meter downstream and a second one for the short run of gas piping inside the building leading to the meter? We suggest that would be an unflattering example of unnecessary bureaucracy.

Four, why is there any need for licensed master plumbers to be in "contract" with a utility? If the people performing the work are adequately qualified, why would a licensed entity need to have a contract with the utility? We respectfully suggest that it is the role of government to decide who is qualified to perform certain work in order to assure safety but mandating business relationships is unnecessary and anti-competitive.

Five, the cost to small businesses would be onerous. The proposed additional requirement that workers be "operator qualified" would cost licensed master plumbers thousands of dollars in fees and

lost time. We understand that the operator qualification course, which is really directed to street gas main and service lines, costs thousands of dollars per enrollee and many days of instruction.

Six, New York City licensed master plumbers already do this piping and continue to be qualified to do so. The New York City Plumbing Code (PC 202) defines "plumbing" as the "...installation, maintenance, extension of all... gas piping within or adjacent to any structure..." The New York City Building Code Section 28-408.1 makes it unlawful for any person to "...perform plumbing work unless such person is a licensed master plumber or working under the direct and continuing supervision of a licensed master plumber." The New York City Building Code Section 28-408.3.1 provides that in order to become a licensed master plumber a person must have 7 years' experience*, two years of such experience must have been as a registered journeyman with the City. Completion of a registered apprenticeship program or 5 years experience under the supervision of a NYC licensed master plumber is required to become a registered journeyman (28-409.1). Attached as Exhibit C are the Work Processes (10,000 hours) and Related Instruction Criteria for New York State Approved Apprenticeship Programs which contain many hours devoted to gas piping work. In addition to the basic experience requirements, applicants for a NYC master plumber license must pass a written exam and then a practical exam, administered by City government. Applicants are then subject to a background investigation by the NYC Department of Investigations and provide significant general liability and workers compensation insurance before any work can proceed.

Furthermore, the New York City Building Code Section 28 105.1 makes it unlawful for any gas work to proceed unless and until a permit for such work has been issued by the NYC Department of Buildings. The New York City Fuel Gas Code Chapter 4 provides detailed installation methods and acceptable sizing and materials for gas piping. In particular, Section 406 details that all gas piping be

**fewer years' experience may apply if applicant has other credentials (professional engineer, registered architect, etc.)*

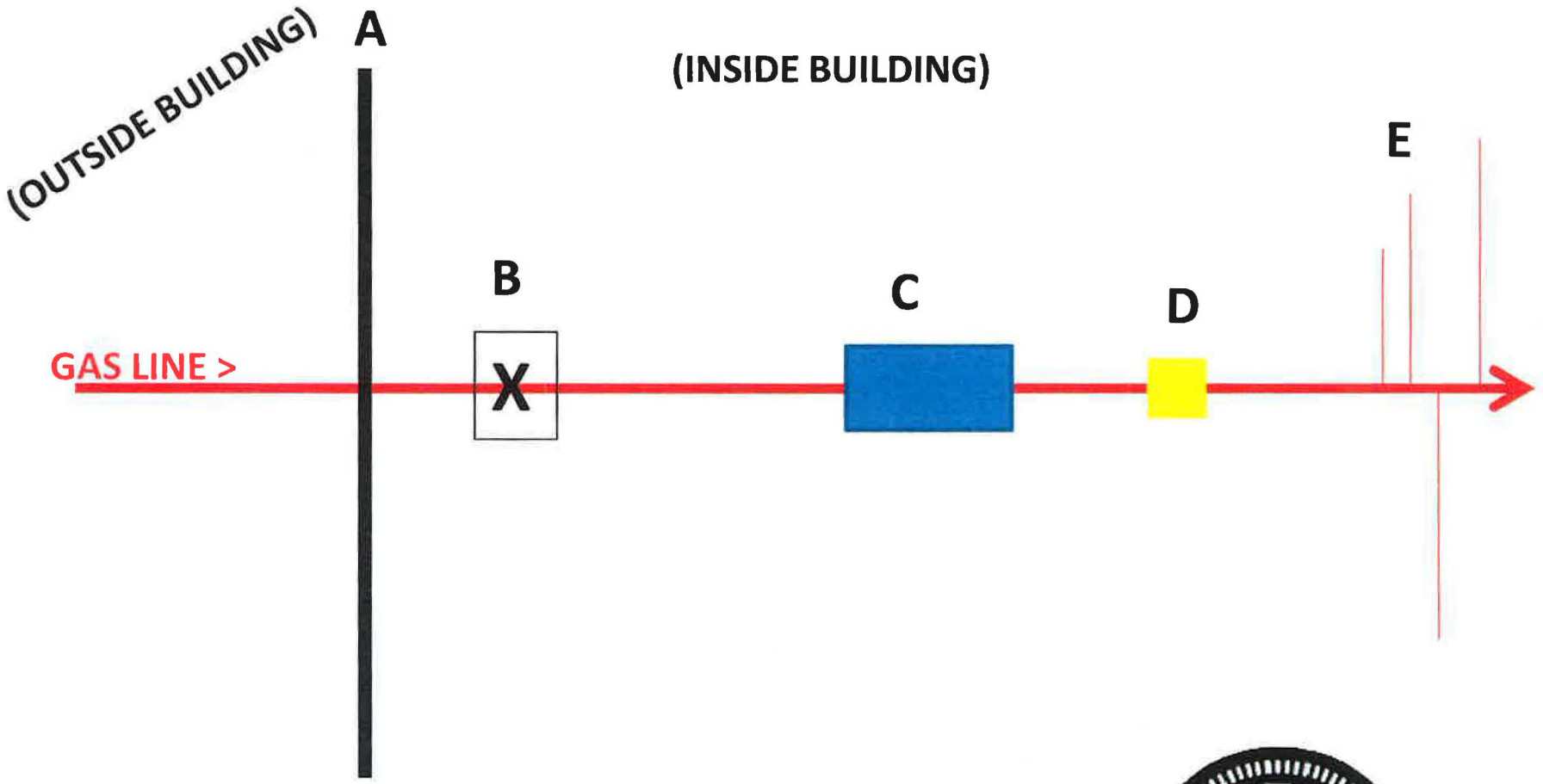
tested, how it is to be tested, which pipe must be welded and subject to radiographic testing, the qualifications of gas welders, etc. (see Exhibit D). The Department of Buildings oversees the inspection of the tests and welds before signing off on the work and authorizing the utility to initiate or restore gas service.

The regulatory and monitoring system over gas work in New York City is simple yet effective. It ensures that the only people who perform the work are highly qualified and that each individual job is checked and inspected before gas is initiated or restored. The system is so effective that we cannot recall any instance in the last 30 years of a gas accident attributed to the work of a licensed master plumber in New York City.

Accordingly, rather than the onerous and unnecessary requirement of operator qualification, drug testing and contractual relationship with a utility, we respectfully suggest that the PSC substitute, as equivalent, that this short run of pipe be repaired, altered and maintained only by licensed master plumbers who are qualified by municipalities to perform gas work.

We are, of course, available to answer any questions or provide further documentation.

EXHIBIT A



A: BUILDING WALL
B: FIRST ACCESSIBLE FITTING
C: METER
D: OUTLET
E: BRANCH LINES

PLUMBING FOUNDATION CITY OF NEW YORK

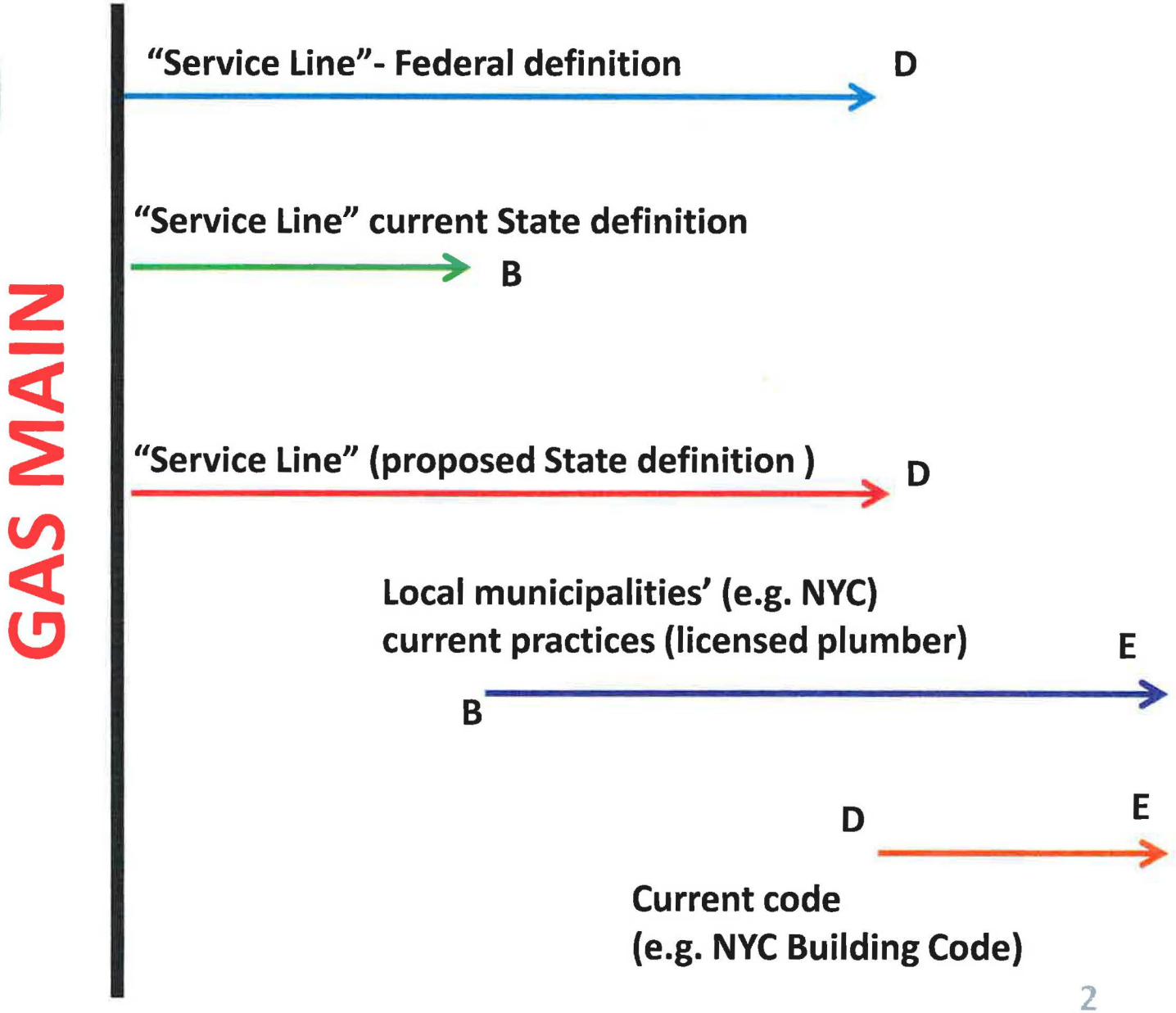

GAS MAIN
"Service Line"- Federal definition
D
"Service Line" current State definition
B
"Service Line" (proposed State definition)
D
Local municipalities' (e.g. NYC)
current practices (licensed plumber)
E
B
D
E
Current code
(e.g. NYC Building Code)

EXHIBIT B

J. Responsibilities

The Customer, his/her Agent and/or Contractor bears the responsibility of maintaining all gas piping and associated equipment in a safe operating condition.

K. Customer Pipe Size and Adequacy

Proper sizing of customer pipe and ensuring adequacy for current and future use is the sole responsibility of the customer. The customer's Engineer or Licensed Plumbing Contractor should assist the customer in determining that the natural gas piping installation will have adequate capacity for future use.

L. Un-Metered Connection (Flat)

Un-Metered (Flat) connections are prohibited and can result in a termination of service.

M. Piping Certification and Permit(s)

Gas service installations require municipal certification that the gas piping system has been pressure tested and permit documentation that the building's gas service is authorized for fuel supply. It is the owner /contractor's responsibility to make the appropriate arrangements and notify Con Edison when such action has been acceptable for gas turn-on appointment. In order to avoid a delay to the gas service completion date, please obtain and conform to the following:

a) Installation must comply with the current applicable Con Edison Specifications.
b) The following are examples of the service work requiring city and local certification permits:

1. In New York City

- **Distribution Piping** - Gas Service Authorization: NYC-Buildings Information System (BIS) aka "Blue Card"
- **Meter Piping** – A NYC Meter Piping Pressure Test Verification Affidavit will be required for the following:

  i. The installation of any new, alteration of existing, or complete replacement of gas piping.

  ii. Installation of new gas appliances and the replacement of a gas water heater or a gas fired boiler with the capacity of 350,000 BTU or less where the existing gas appliance gas wing valve is not moved and no gas piping is required. No gas permit is needed. A written report is due to the DOB in 30 days.

  iii. Restoration of service discontinued (cut-off) due to a fire or other conditions or where all the gas service to a building has ceased for over six (6) months.

The NYC Gas Meter Pressure Test Verification Affidavit form can be found on the Con Edison Energy Services Resource web-site located at http://www.coned.com/es/resources.asp or refer to Exhibit - B **(pg. 74)**.

2. In Westchester County

- **Distribution Piping** – Gas Service Authorization. For Municipalities that do not issue formal Gas Blue Cards, a Westchester County Distribution Piping Pressure Test Verification Affidavit will be substituted.
- **Meter Piping** – Requires a Westchester County Gas Meter Piping Pressure Test Verification Affidavit.

New York City
Gas Meter Piping
Pressure Test Verification

(**Note:** This Affidavit does NOT replace a Blue Card)

Exhibit-B

AFFIDAVIT

This certifies that the gas meter piping installed between the gas service head valve and the gas meter connection.

Located at:_____

Lot No:_____

Block No:_____

Owner:_____

Has successfully passed a leakage test for _____ hour(s) at pressure of _____ psig

On _____
(Date)

TEST PERFORMED BY

Plumber's Signature:_____

License No.:_____

Plumber Contractor:_____

Accepted for Con Edison By: _____

Date:_____

Note: Form is to be used for company documentation by the performing plumber of record for all oil-to-gas conversion, natural gas generators, upgrades and or swing over work, certification.

EXHIBIT C

STATE OF NEW YORK
DEPARTMENT OF LABOR

APPENDIX A

PLUMBER
D.O.T. CODE 862.381.030

This training outline represents a minimum standard for work processes and related instruction. Changes in technology and regulations may result in the need for additional on-the-job or classroom instruction.

WORK PROCESSES

		Approximate Hours
A.	Proper Use and Care of all Tools Connected with the Trade	500
B.	Rigging and Material Handling 1. Safe unloading of material. 2. Use of ladders, scaffolding. 3. Use of power lifts, personnel lifts.	200
C.	Identification of Grades, Types and Appropriate Uses of Various Piping Materials	300
D.	Installation of Piping for Waste, Soil, Sewage, Vent, Leader Lines, Hot Water Lines, Hot and Cold Water for Domestic Purposes and Gas for Domestic Purposes 1. Planning and marking layout. 2. Cutting structural openings as required 3. Cutting and threading pipe. 4. Pipe bending. 5. Pipe joining. 6. Caulking of joints. 7. Connection to outside water, gas and sewage lines. 8. Inspection of pipe system with pressure gauges.	3,500
E.	Soldering of Piping System 1. Soft soldering (various types) 2. Hard soldering (silver-bearing solders) 3. Brazing.	600
F.	Welding Connected With the Trade	600
G.	Assembly, in Position, and Connection of Fixtures and Appliances Used in Plumbing and Drainage Systems	700

Plumber – continued		Approximate Hours
H.	Water Purification and Sewage Disposal	600
I.	Familiarization With all Tools, Equipment and Replacement Parts Used in Repair and Service; Maintenance of Proper Inventory	500
J.	Maintenance and Repair of Plumbing Systems (Including Lead and Tin Pipe Repair)	2,000
K.	Temperature Controls: Installation, Service and Repair (optional)	400
L.	Gas Piping	50
M.	Water Heaters	50
	Total Hours	10,000

Apprenticeship work processes are applicable only to training curricula for apprentices in approved programs. Apprenticeship work processes have no impact on classification determinations under Article 8 or 9 of the Labor Law. For guidance regarding classification for purposes of Article 8 or 9 of the Labor Law, please refer to http://www.labor.state.ny.us/workerprotection/publicwork/PDFs/Article8FAQS.pdf

APPENDIX B
PLUMBER
RELATED INSTRUCTION

Safety and Health
- OSHA Construction Safety
- OSHA 10-Hour Construction Course – if required for Public Work
- Scaffold Safety
- Drug and Alcohol Awareness
- Material Safety Data Sheet (MSDS)
- First Aid-Minimum 6.5 hours every 3 years

Asbestos Awareness – minimum 4 hours (see attachment)

Industrial History and Labor Relations (20 hours)
- History and background (6 hours, 1st year)
- Current laws and practices (14 hours, 2nd year)

History of Plumbing

Organization of Plumbing Industry

Mathematics Applied to Plumbing

Elementary Drawing/Drafting for Plumbers

Building Plan and Blueprint Reading for Plumbers: Fundamentals and Advanced

Basic Building Construction

Trade Theory and Science
- Physics Applied to Plumbing
- Chemistry Applied to Plumbing
- Bacteriology for Plumbers
- Basic Electricity*
- Plumbing Laws, Regulations and Ethics
- Plumbing Materials
- Fixtures and Appliances
- Water Supply
- Sewage Disposal
- Water Pollution in Plumbing Systems (including back-flow prevention and cross-connection control devices)
- Soil and Waste Lines
- Venting

Plumber Related Instruction – continued

Trade Theory and Science – continued
- Welding
- Gas Installations
- Business Aspects of Plumbing
- Sexual Harrassment Prevention Training –minimum 3 hours

Other Related Courses as Necessary

A Minimum of 216 Hours of Related Instruction are Required for Each Apprentice for Each Year.

*If Work Processes "K" is chosen.

ATTACHMENT TO APPENDIX B

Asbestos Awareness

This course must be delivered by one of the following:

1. A provider currently approved by the New York State Department of Health to deliver asbestos safety training.
2. A person holding a current Asbestos Handler certificate from the New York State Department of Labor in the title of: Inspector, Supervisor, Project Monitor, Management Planner, or Project Designer.
3. Anyone otherwise approved by the New York State Education Department.

Minimum course contents must include the following:

1. Definition of asbestos
2. Types and physical characteristics
3. Uses and applications
4. Health effects:
   - Asbestos-related diseases
   - Risks to families
   - Cigarette smoking
   - Lack of safe exposure level
5. Employer-specific procedures to follow in case of potential exposure, including making a supervisor or building owner immediately aware of any suspected incidental asbestos disturbance so that proper containment and abatement procedures can be initiated promptly.

Notwithstanding the above course requirement, employers are advised that they must also be in compliance with New York State Department of Labor Industrial Code Rule 56 at all times.

Employers are further advised, and must advise all apprentices, that completion of the above course requirement does not authorize any person to remove, encapsulate, enclose, repair, disturb, or abate in any manner, any friable or non-friable asbestos, asbestos containing material, presumed asbestos containing material, or suspect miscellaneous asbestos containing material.

the building, the space between the conduit and the gas piping shall be sealed to prevent the possible entrance of any gas leakage. The conduit shall extend not less than 2 inches (51 mm) beyond the point where the pipe emerges from the floor. Where the end sealing is capable of withstanding the full pressure of the gas pipe, the conduit shall be designed for the same pressure as the pipe. Such conduit shall extend not less than 4 inches (102 mm) outside of the building, shall be vented above grade to the outdoors and shall be installed so as to prevent the entrance of water and insects.

404.12.2 Conduit with both ends terminating indoors. Where the conduit originates and terminates within the same building, the conduit shall originate and terminate in an accessible portion of the building and shall not be sealed. The conduit shall extend not less than 2 inches (51 mm) beyond the point where the pipe emerges from the floor.

404.13 Outlet closures. Gas outlets shall be permitted only under the following conditions:

1. Valved and capped gas tight outlets for single appliance outlets as approved.
2. Valved and capped outlets on each floor in nonproduction laboratory buildings for future laboratories.
3. Listed and labeled flush-mounted-type quick disconnect devices and listed and labeled gas convenience outlets installed in accordance with the manufacturer's installation instructions.

404.14 Location of outlets. The unthreaded portion of piping outlets shall extend not less than 1 inch (25 mm) through finished ceilings and walls and where extending through floors or outdoor patios and slabs, shall not be less than 2 inches (51 mm) above them. The outlet fitting or piping shall be securely supported. Outlets shall not be placed behind doors. Outlets shall be located in the room or space where the appliance is installed.

Exception: Listed and labeled flush-mounted-type quick disconnect devices and listed and labeled gas convenience outlets shall be installed in accordance with the manufacturer's installation instructions.

404.15 Reserved.

404.16 Prohibited devices. A device shall not be placed inside the piping or fittings that will reduce the cross-sectional area or otherwise obstruct the free flow of gas.

Exceptions:

1. Approved gas filters.
2. An approved fitting or device where the gas piping system has been sized to accommodate the pressure drop of the fitting or device.‡

404.17 Testing of piping. Before any system of piping is put in service or concealed, it shall be tested to ensure that it is gas tight. Testing, inspection and purging of piping systems shall comply with Section 406.

SECTION FGC 405
PIPING BENDS AND CHANGES IN DIRECTION‡

405.1 General. Changes in direction of pipe shall be permitted to be made by the use of fittings.

405.2 Reserved.‡

405.3 Reserved.‡

405.4 Elbows. Factory-made welding elbows or transverse segments cut therefrom shall have an arc length measured along the crotch at least 1 inch (25 mm) in pipe sizes 2 inches (51 mm) and larger.

405.5 Pipe movement. Stainless steel flexible multiple leg hose assemblies listed and labeled as an assembly per UL 536 shall be installed for low pressure flammable and combustible gas piping systems where pipe movement resulting from thermal changes and random seismic shifts can occur in the piping systems.

405.5.1 Seismic requirements. Stainless steel flexible multiple leg hose assemblies shall be designed to withstand seismic force and displacement in accordance with Section 1613 of the *New York City Building Code.*

405.5.2 Inspection. The installation of stainless steel flexible multiple leg hose assemblies shall be subject to special inspections in accordance with Chapter 17 of the *New York City Building Code.*

SECTION FGC 406
INSPECTION, TESTING AND PURGING

406.1 General. Prior to acceptance and initial operation, all piping installations shall be inspected and pressure tested to determine that the materials, design, fabrication, and installation practices comply with the requirements of this code.

406.1.1 Inspections. Inspection shall consist of visual examination, during or after manufacture, fabrication, assembly, or pressure tests as appropriate. Supplementary types of nondestructive inspection techniques, such as magnetic-particle, radiographic, ultrasonic, etc., shall not be required unless specifically listed herein or in the engineering design.

406.1.1.1 Welder's qualifications. Welders installing gas piping within buildings at any pressure shall comply with the following:

1. Welders shall be qualified for all pipe sizes, wall thicknesses and all positions in accordance with the *ASME Boiler and Pressure Vessel Code,* Section IX. Requalification of welders is required on an annual basis and when requested by the commissioner.
2. Welder qualification testing shall be performed by an approved agency and the inspector witnessing the test shall be an authorized AWS Certified Welding Inspector. Radiographic test specimens shall be evaluated by a radiographic inspector having a minimum radiography qualification of Level II in accordance with the ASNT, Document No. SNT-TC-1A, Supplement A.

3. Copies of the certified welder qualification reports shall be maintained by both the approved agency and the licensed master plumber employing the welder(s) for at least six years and shall be made available to the department upon request.

4. The approved agency shall submit certified welder qualification reports to the department upon successful qualification of a welder and when requested by the commissioner.

5. The licensed master plumber employing the welder(s) shall submit a statement to the department including who welded the gas piping along with a copy(s) of the certified welder qualification report(s) witnessed by a representative of the licensed master plumber, at the time of the first roughing inspection.

406.1.1.2 Welding requirements. All welded gas distribution and meter piping main and branch supplies to customer equipment operating in excess of 5 psig (34.5 kPa gauge) inside buildings shall be welded; and shall be subject to special inspection in accordance with Chapter 17 of the *New York City Building Code*. All piping $2^1/_2$ inches (63.5 mm) or greater in diameter shall be butt-welded, and piping less than $2^1/_2$ inches (63.5 mm) in diameter may be socket-welded or butt-welded.

Radiographic testing shall be performed on all butt welds in gas meter and gas distribution piping operating at pressures exceeding 5 psig (34.5 kPa gauge) within buildings, in accordance with *ASME Boiler and Pressure Vessel Code*, Section IX.

406.1.1.3 Welding records. The licensed master plumber employing the welder(s) shall assign to each welder an identification symbol or number to identify the welds performed by that particular welder. The welder shall identify all welds with his or her symbol or number. The licensed master plumber shall maintain records identifying the weld(s) made by each welder for at least six years and shall make such records available to the department upon request.

406.1.2 Repairs and additions. In the event repairs or additions are made after the pressure test, the affected piping shall be tested.

406.1.3 New branches. A piping system shall be tested as a complete unit.

406.1.4 System testing. A piping system shall be tested as a complete unit.

406.1.5 Regulators and valve assemblies. Regulator and valve assemblies fabricated independently of the piping system in which they are to be installed shall be permitted to be tested with inert gas or air at the time of fabrication.

406.2 Test medium. The test medium shall be air, nitrogen, carbon dioxide or an inert gas. Oxygen shall not be used. Fresh water may be used as the test medium only where the required test pressure exceeds 100 psig (689 kPa).

406.3 Test preparation. Pipe joints, including welds, shall be left exposed for examination during the test.

Exception: Covered or concealed pipe end joints that have been previously tested in accordance with this code.

406.3.1 Expansion joints. Expansion joints shall be provided with temporary restraints, if required, for the additional thrust load under test.

406.3.2 Appliance and equipment isolation. Appliances and equipment that are not to be included in the test shall be either disconnected from the piping or isolated by blanks, blind flanges, or caps. Flanged joints at which blinds are inserted to blank off other equipment during the test shall not be required to be tested.

406.3.3 Appliance and equipment disconnection. Where the piping system is connected to appliances or equipment designed for operating pressures of less than the test pressure, such appliances or equipment shall be isolated from the piping system by disconnecting them and capping the outlet(s).

406.3.4 Valve isolation. Where the piping system is connected to appliances or equipment designed for operating pressures equal to or greater than the test pressure, such appliances or equipment shall be isolated from the piping system by closing the individual appliance or equipment shutoff valve(s).

406.3.5 Testing precautions. All testing of piping systems shall be done with due regard for the safety of employees and the public during the test. Bulkheads, anchorage, and bracing suitably designed to resist test pressures shall be installed if necessary. Prior to testing, the interior of the pipe shall be purged to flush out all foreign material, including weld splatter, dirt, rags, and other debris left inside the pipe during welding operations and piping installation.

406.4 Test pressure measurement. Upon completion of the installation of a section of a gas system or of the entire gas system, and before appliances are connected thereto, the completed section or system shall be verified as to materials, and tested and proven tight as follows:

1. Gas distribution piping shall comply with the following:

   1.1. Distribution pressures up to $^1/_2$ psig (3.5 kPa gauge). The completed piping is to be tested with a nonmercury gauge at a pressure of 3 psig (20 kPa gauge) for a minimum of 30 minutes.

   1.2. Distribution pressures over $^1/_2$ psig (3.5 kPa gauge) through 5 psig (34.5 kPa gauge). The completed piping is to be tested at 50 psig (340 kPa gauge) for a minimum of 30 minutes.

   1.3. Distribution pressures over 5 psig (34.5 kPa gauge) through 15 psig (100 kPa gauge). The completed piping is to be tested at 100 psig (689 kPa gauge) for a minimum of 1 hour.

   1.4. Distribution pressures above 15 psig (100 kPa gauge). The completed piping is to be tested to

twice the maximum allowable operating pressure, but not less than 100 psig (689 kPa gauge), for a minimum of 1 hour.

1.5. Where the test pressure exceeds 125 psig (862 kPa gauge), the test pressure shall not exceed a value that produces a hoop stress in the piping greater than 50 percent of the specified minimum yield strength of the pipe.

2. Meter piping shall be pressure tested in accordance with the requirements of the serving utility. These requirements shall be either the same as those for testing distribution piping in numbered paragraph 1 of this section or, if different, the piping shall be certified by the local utility as being tested in compliance with their requirements.

3. Notwithstanding the above, all factory applied coated and wrapped pipe shall be pressure tested at a minimum of 90 psig (621 kPa gauge). For testing, the piping shall be filled with air or an inert gas, and the source of pressure shall be isolated before the pressure readings are made. All test duration time periods are to be measured after stabilization of testing medium. Fresh water may be used as the test medium only where the required test pressure exceeds 100 psig (689 kPa gauge).

406.4.1 Minimum standards for nonmercury gauges.

1. This section establishes minimum standards for nonmercury gauges to test gas piping, drainage and vent systems.

2. Each gauge shall meet the following requirements:

2.1. The gauge shall be manufactured and used in accordance with ASME B40.100, which incorporates ASME B40.1 and ASME B40.7, and the manufacturer shall provide with the gauge a written statement that the gauge is manufactured in accordance with such ASME standard;

2.2. The gauge shall be labeled with the name of the manufacturer;

2.3. The gauge shall be kept in a padded separate rigid box and the manufacturer's instructions for use and protection of the gauge shall be complied with;

2.4. The units of measurement "psig" shall appear on the face of the gauge; and

2.5. The gauge shall be kept in good working order.

406.4.2 Analog gauges used to measure pressure in the magnitude of 3 psig (20 kPa gauge). Each analog gauge used to measure pressure in the magnitude of 3 psig (20 kPa gauge) shall meet the following requirements in addition to satisfying the minimum requirements set forth in Section‡ 406.4.1:

1. The face of the gauge shall not be smaller than $2^1/_4$ inches (57 mm) in diameter;

2. The gauge shall have a minimum of 270 degree (5 rad) dial arc;

3. The gauge shall be calibrated in increments of not greater than one-tenth of a pound;

4. The range of the gauge shall not exceed 5 psig (34.5 kPa gauge) when a $2^1/_4$-inch (57 mm) diameter gauge is used;

5. The 1/10 psig (0.69 kPa gauge) interval on the gauge shall not be smaller than one-tenth of an inch (2.5 mm) of arc;

6. The gauge shall be provided with an effective stop for the indicating pointer at the zero point;

7. The gauge shall be protected from excessive pressure with a shutoff valve and prior to using the 5 psig (34.5 kPa gauge) the snifter valve shall be tested with a tire gauge to determine the magnitude of pressure; and

8. The gauge shall have a calibration screw.

406.4.3 Analog gauges used to measure pressure in the magnitude of 5 psig (34.5 kPa gauge). Each analog gauge used to measure pressure in the magnitude of 5 psig (34.5 kPa gauge) shall meet the following requirements in addition to satisfying the minimum requirements set forth in Section 406.4.1:

1. The face of the gauge shall not be smaller than $2^1/_4$ inches (57 mm) in diameter;

2. The gauge shall have a minimum of 270 degree (5 rad) dial arc;

3. The gauge shall be calibrated in increments not greater than one-fifth of a pound;

4. The range of the gauge shall not exceed 10 psig (69 kPa gauge) when a $2^1/_4$ inch (57 mm) diameter gauge is used;

5. The one-fifth interval on the gauge shall not be smaller than one-tenth of an inch (2.5 mm) of arc;

6. The gauge shall be provided with an effective stop for the indicating pointer at the zero point;

7. The gauge shall be protected from excessive pressure with a shutoff valve and prior to using the 10 psig (69 kPa gauge) the snifter valve shall be tested with a tire gauge to determine the magnitude of pressure; and

8. The gauge shall have a calibration screw.

406.4.4 Digital gauges used to measure pressure in the magnitude of 3 psig (20 kPa gauge) and higher. Each digital gauge used to measure pressure in the magnitude of 3 psig (20 kPa gauge) and higher shall meet the following requirements in addition to satisfying the minimum requirements set forth in Section 406.4.1:

1. The gauge shall have a minimum reading of 1/100 of a psig (69 Pa), and

2. An extra charged battery shall be readily available for immediate use with the gauge.

406.4.5 Witnessing tests of gas-piping systems. Tests of gas piping systems in accordance with this code shall be witnessed by department plumbing inspectors, or

approved agencies. The department shall prescribe qualifications for individuals who are authorized to witness such tests on behalf of approved agencies, including but not limited to the requirement that such individuals shall be licensed master plumbers or registered design professionals with not less than 5 years' experience in the inspection and testing of gas piping systems. Such tests may be conducted without any verifying inspection of tests by the department, provided that verified statements and supporting inspectorial and test reports are filed with the department within one working day of such tests.

406.4.6 Notification. The holder of the plumbing permit shall give at least 2 days prior written notice to the commissioner that the plumbing work covered by the permit is ready for inspections and test.

406.5 Detection of leaks and defects. The piping system shall withstand the test pressure specified without showing any evidence of leakage or other defects. Any reduction of test pressures as indicated by pressure gauges shall be deemed to indicate the presence of a leak unless such reduction can be readily attributed to some other cause.

406.5.1 Detection methods. The leakage shall be located by means of an approved gas detector, a noncorrosive leak detection fluid, or other approved leak detection methods. Matches, candles, open flames, or other methods that could provide a source of ignition shall not be used.

406.5.2 Corrections. Where leakage or other defects are located, the affected portion of the piping system shall be repaired or replaced and retested.

406.6 Piping system and equipment leakage check. Leakage checking of systems and equipment shall be in accordance with Sections 406.6.1 through 406.6.4.

406.6.1 Check gases. Leak checks using fuel gas shall be permitted in piping systems that have been pressure tested in accordance with Section 406.

406.6.2 Before turning gas on. During the process of turning gas on into a system of new gas piping, the entire system shall be inspected to determine that there are no open fittings or ends and that all valves at unused outlets are closed and plugged or capped.

406.6.2.1 Establishing gas supply. It shall be unlawful for any utility company to supply gas to a building, place or premises in which new meters other than replacement are required until a certificate of approval of gas installation from the department is filed with such utility company. When new gas service piping has been installed it shall be locked-off by the utility either by locking the gas service line valve or by installing a locking device on the outside gas service line valve. The lock shall not be removed until the gas meter piping (other than utility-owned) and gas distribution piping has been inspected and certified as required by the department as being ready for service.

406.6.2.2 Alterations to gas piping systems. When alterations, extensions or repairs to existing gas meter piping or gas distribution piping requires the shutoff of gas flow to a building, the utility shall be notified by the owner or his or her authorized representative.

406.6.3 Leak check. Immediately after the gas is turned on into a new system or into a system that has been initially restored after an interruption of service, the piping system shall be checked for leakage. Where leakage is indicated, the gas supply shall be shut off until the necessary repairs have been made.

406.6.4 Placing appliances and equipment in operation. Gas utilization appliances and equipment shall be permitted to be placed in operation after the piping system has been checked for leakage in accordance with Section 406.6.3 and determined to be free of leakage and purged in accordance with Section 406.7.2.

406.6.4.1 Requirements for placing equipment in operation. The following will be required prior to placing equipment in operation as applicable:

1. Required fire protection system (sprinkler or standpipe) are completed, inspected and ready for service.
2. Such equipment and related gas piping are inspected by the department or authorized inspector.
3. Associated fire suppression system is inspected and approved by the Fire Department.

406.7 Purging. The purging of piping shall be in accordance with Sections 406.7.1 through 406.7.3.

406.7.1 Piping systems required to be purged outdoors. The purging of piping systems shall be in accordance with the provisions of Sections 406.7.1.1 through 406.7.1.4 where the piping system meets either of the following:

1. The design operating gas pressure is greater than 2 psig (13.79 kPa).
2. The piping being purged contains one or more sections of pipe or tubing that meet(s) the size and length criteria of Table 406.7.1.1.

406.7.1.1 Removal from service. Where existing gas piping is opened, the section that is opened shall be isolated from the gas supply and the line pressure vented in accordance with Section 406.7.1.3. Where gas piping meeting the criteria of Table 406.7.1.1 is removed from service, the residual fuel gas in the piping shall be displaced with an inert gas.

TABLE 406.7.1.1
SIZE AND LENGTH OF PIPING

NOMINAL PIPE SIZE (inches)	LENGTH OF PIPING (feet)
≥ 2 ½ < 3	< 50
≥ 3 < 4	< 30
≥ 4 < 6	< 15
≥ 6 < 8	< 10
≥ 8	Any length

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

406.7.1.2 Placing in operation. Where gas piping containing air and meeting the criteria of Table 406.7.1.1 is

placed in operation, the air in the piping shall first be displaced with an inert gas. The inert gas shall then be displaced with fuel gas in accordance with Section 406.7.1.3.

406.7.1.3 Outdoor discharge of purged gases. The open end of a piping system being pressure vented or purged shall discharge directly to an outdoor location. Purging operations shall comply with all of the following requirements:

1. The point of discharge shall be controlled with a shutoff valve.
2. The point of discharge shall be located at least 10 feet (3048 mm) from sources of ignition, at least 10 feet (3048 mm) from building openings and at least 25 feet (7620 mm) from mechanical air intake openings.
3. During discharge, the open point of discharge shall be continuously attended and monitored with a combustible gas indicator that complies with Section 406.7.1.4.
4. Purging operations introducing fuel gas shall be stopped when 90-percent fuel gas by volume is detected within the pipe.
5. Persons not involved in the purging operations shall be evacuated from all areas within 10 feet (3048 mm) of the point of discharge.

406.7.1.4 Combustible gas indicator. Combustible gas indicators shall be listed and shall be calibrated in accordance with the manufacturer's instructions. Combustible gas indicators shall numerically display a volume scale from zero percent to 100 percent in 1 percent or smaller increments.

406.7.2 Piping systems allowed to be purged indoors or outdoors. The purging of piping systems shall be in accordance with the provisions of Section 406.7.2.1 where the piping system meets both of the following:

1. The design operating gas pressure is 2 psig (13.79 kPa) or less.
2. The piping being purged is constructed entirely from pipe or tubing not meeting the size and length criteria of Table 406.7.1.1.

406.7.2.1 Purging procedure. The piping system shall be purged in accordance with one or more of the following:

1. The piping shall be purged with fuel gas and shall discharge to the outdoors.
2. The piping shall be purged with fuel gas and shall discharge to the indoors or outdoors through an appliance burner not located in a combustion chamber. Such burner shall be provided with a continuous source of ignition.
3. The piping shall be purged with fuel gas and shall discharge to the indoors or outdoors through a burner that has a continuous source of ignition and that is designed for such purpose.
4. The piping shall be purged with fuel gas that is discharged to the indoors or outdoors, and the point of discharge shall be monitored with a listed combustible gas‡ detector in accordance with Section 406.7.2.2. Purging shall be stopped when fuel gas is detected.
5. The piping shall be purged by the gas supplier in accordance with written procedures of the utility company.

406.7.2.2 Combustible gas detector. Combustible gas detectors shall be listed and shall be calibrated or tested in accordance with the manufacturer's instructions. Combustible gas detectors shall be capable of indicating the presence of fuel gas.

406.7.3 Purging appliances and equipment. After the piping system has been placed in operation, appliances and equipment subsequently installed shall be purged before being placed into operation.

SECTION FGC 407
PIPING SUPPORT

407.1 General. Piping shall be provided with support in accordance with Section 407.2. In addition, when earthquake loads are applicable in accordance with the *New York City Building Code*, a detailed piping system stress analysis including seismic analysis shall be performed. The pipe supports and restraints shall be designed and installed to accommodate the resultant seismic forces, moments and displacements from this stress analysis in accordance with the *New York City Building Code*.

407.2 Design and installation. Piping shall be supported with metal pipe hooks, metal pipe straps, metal bands, metal brackets, metal hangers or building structural components suitable for the size of piping, of adequate strength and quality, and located at intervals so as to prevent or damp out excessive vibration. Piping shall be anchored to prevent undue strains on connected appliances and shall not be supported by other piping. Pipe hangers and supports shall conform to the requirements of MSS SP-58 and shall be spaced in accordance with Section 415. Supports, hangers, and anchors shall be installed so as not to interfere with the free expansion and contraction of the piping between anchors. All parts of the supporting equipment shall be designed and installed so they will not be disengaged by movement of the supported piping.

SECTION FGC 408
DRIPS AND SLOPED PIPING

408.1 Slopes. Piping for other than dry gas conditions shall be sloped not less than $^1/_4$ inch in 15 feet (6.3 mm in 4572 mm) to prevent traps. The local gas supplier/utility company should be consulted to determine the type of fuel gas available for the intended service.

408.2 Drips. Where the local gas supplier/utility company requires, a manufactured test fitting or drip leg shall be installed downstream of a lockable supply/riser valve in