2017

NYC Buildings

Flood Protection & NYC Gas Work

Course Number SW0817

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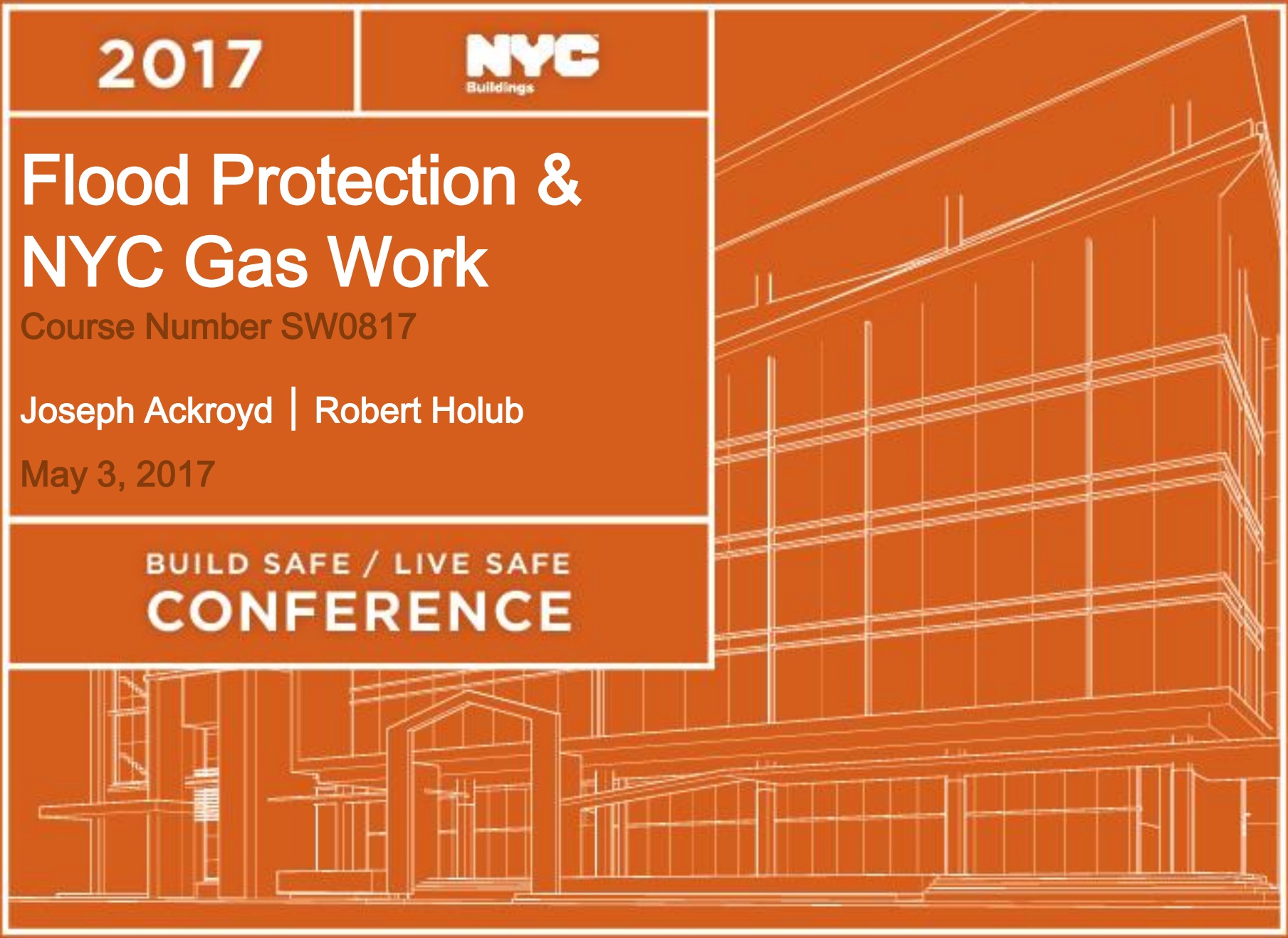
May 3, 2017

BUILD SAFE / LIVE SAFE
CONFERENCE



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NYC™ Buildings

Course Description

This course covers dry floodproof building design in flood zones as well as safety of fuel gas building piping systems. The course will focus on dry floodproofing considerations for exterior walls, opening protection, egress requirements and emergency action plans.

Additionally, the course will focus on fuel gas safety. It will provide an overview of local legislation, requirements for gas work, gas work inspections, leak detection and hazard procedures. The discussion will also review a Departmental bulletin outlining the acceptable testing of altered gas piping systems.

Learning Objectives

At the end of the this course, participants will be able to:

1. Describe the requirements of the 2014 NYC Building Code applicable to the design of exterior wall opening protection and specific egress requirements to maintain occupant safety in dry floodproofed buildings.

2. Apply the NYC building code requirements for dry floodproofed buildings to emergency action plans.

3. Explain how recent local laws, intended to provide greater protection of public safety and welfare, impact contractors, plumbers, and building owners.

4. Explain the extent of pressure testing required after an alteration to an existing gas piping system.

FLOOD PROTECTION

ASCE 24, 2005

All site development activities, including grading, filling, utility installation and drainage modification, and all new construction and substantial improvements (including the placement of prefabricated buildings and manufactured homes) are designed and constructed with methods, practices and materials that minimize flood damage and that are in accordance with this code and ASCE 24; and all other required state and federal permits have been obtained. (2014 NYC BC, G103.1)

- Applicable to both building design and construction
- Covers new construction and substantial improvements to existing buildings
- Contains minimum requirements and expected performance

FLOODPROOFING: WET

A floodproofing method designed to permit parts of the structure below the design flood elevation that are used for parking, storage, building access, or crawl space to intentionally flood, by equalizing hydrostatic pressures and by relying on the use of flood damage-resistant materials and construction techniques. (2014 NYC BC, G201.2)

- Applicant **must** certify that the design provides automatic entry/exit of water
- Wet floodproofed spaces are described as being subject to flooding on C of O
- Elevators providing access to wet floodproofed spaces **must** be equipped with controls to prevent the cab from descending into floodwater

FLOODPROOFING: DRY

For buildings and structures that are nonresidential (for flood zone purposes), a combination of design modifications that results in the building's or structure's being water tight to the design flood elevation, including the attendant utility and sanitary facilities, with walls substantially impermeable to the passage of water and with structural components having the capacity to resist loads as identified in ASCE 7. (2014 NYC BC, G201.2)

- Prohibited for dwelling units, patient care areas, sleeping areas
- Dry floodproofed spaces are described on the building's certificate of occupancy
- Measures requiring human intervention are subject to additional conditions

DRY FLOODPROOFING

Dry floodproofed areas of structures shall be designed… with walls that are substantially impermeable to the passage of water… (2014 NYC BC, G304.1.2, ASCE 24, 6.2.2,)

Floodproofing components for an individual building may also include floodwalls, small localized levees, or berms around buildings. However, such components, because they are not part of the building itself, are generally not credited for the flood insurance rating of a building under the NFIP and are therefore not detailed within this bulletin. (FEMA, TB 3)

DRY FLOODPROOFING

Substantial impermeable to the passage of water requires strict adherence to material and construction requirements for dry floodproofing. Designers and encouraged to specify testing of dry flood proofing measures as part of construction to identify potential problems or leaks…(ASCE 24-14, C6.2)

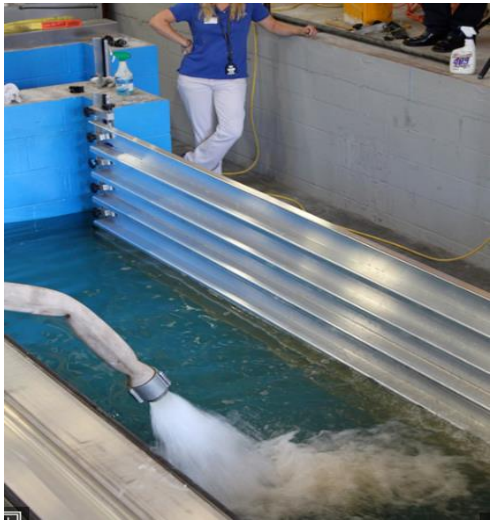
Existing Acceptance Criteria

Approval Standard for Flood Abatement Equipment, 2510

- Approval criteria may include…components and system testing performance requirements, marking requirements, examination of manufacturing facilities, audit of quality assurance procedures and follow-up program
- Standard encompasses the design and performance requirements for flood abatement equipment for use in controlling riverine conditions at depths not greater than 3 ft.

DRY FLOODPROOFING

Substantially Impermeable—use of *flood damage resistant materials* and techniques for *dry floodproofing* portions of a *structure,* which result in a space free of through cracks, openings, or other channels that permit unobstructed passage of water and seepage during flooding, and which result in a maximum accumulation of 4 in. of water depth in such space during a period of 24 hours (ASCE 24-05)



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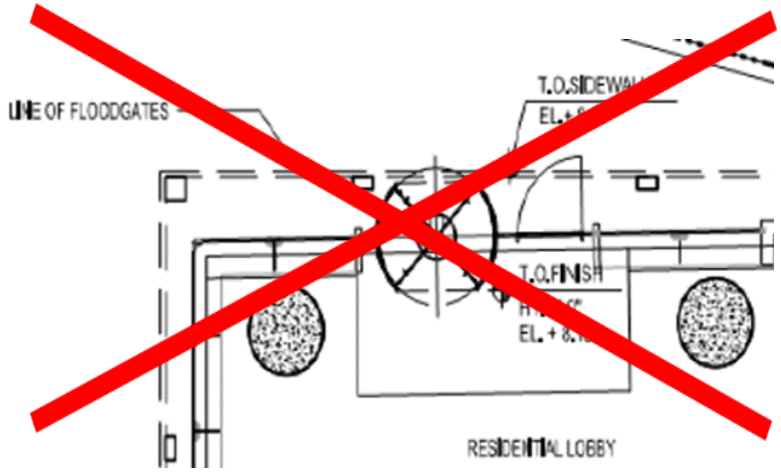
BUILDING FAÇADE

Walls that are substantially impermeable to the passage of water

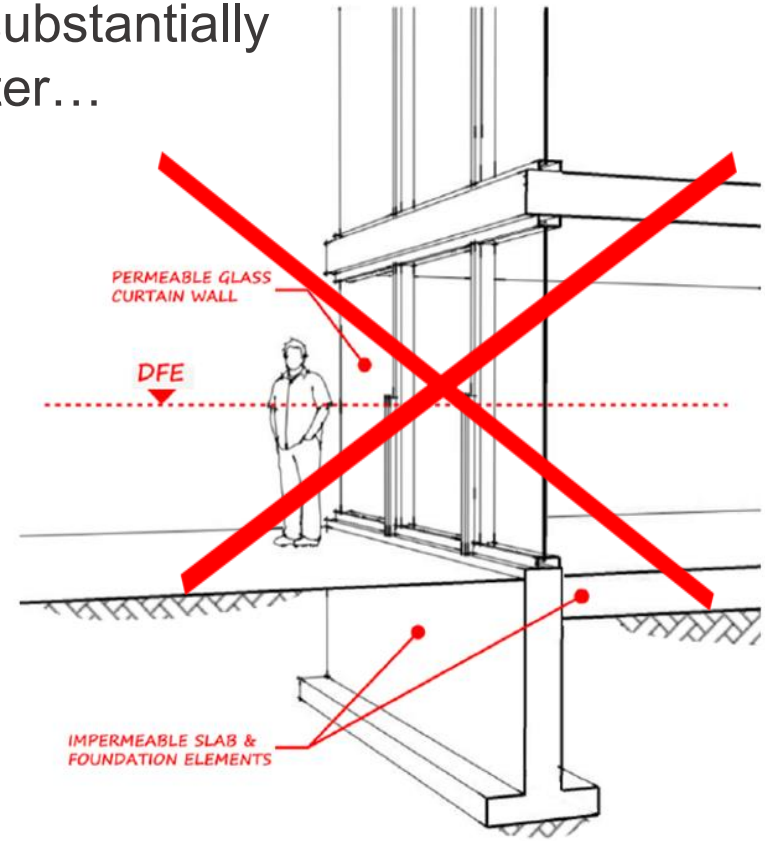
- Use of flood walls exterior to a building with permeable exterior walls is currently not recognized by FEMA as dry floodproofing



DRY FLOODPROOFING

6.2.2 Dry floodproofed areas of structures shall:

1. Be designed… with walls that are substantially impermeable to the passage of water…



Building Façade w/o Flood Shields

DRY FLOODPROOFING

6.2.2 Dry floodproofed areas of structures shall:

1. Be designed… Walls, floors, and flood shields designed and constructed to resist hydrostatis, hydrodynamic, and other flood-related loads…

https://www.usatoday.com/story/news/nation/2012/10/30/new-york-city-sandy-flooding/1668331/, *Downloaded 4/17/2017*

http://www.manhattanscout.com/blog/exclusive-post-hurricane-sandy-pictures, downloaded *Downloaded 4/6/2013*

Dry Floodproofing and Egress

BC G501 modifies the egress requirements of **ASCE 24, 6.2**. when egress to the exterior is blocked by shields:

- Must provide at least one elevated door located in close proximity to each required means of egress to the exterior that is to be blocked by flood shields or flood control devices, such that the face of the elevated door itself, and not merely its directional signage, is clearly visible to a person approaching the blocked egress door(s).
- Door(s) shall be elevated to at or above the applicable DFE specified in Table 6-1, capable of providing human ingress and egress during the design flood. Such door(s) shall meet all New York City Building Code requirements for a required means of egress to the exterior of the structure including hardware and signage.

Dry Floodproofing and Egress

BC G501 *(continued)*

- Door required to comply with the occupant load calculations unless intended for occupancy during the design flood
- Door may be accessed by open steps and not be required to comply with Chapter 11 of the New York City Building Code if its only purpose is to provide supplemental egress and ingress during conditions of flooding and to provide emergency egress at other

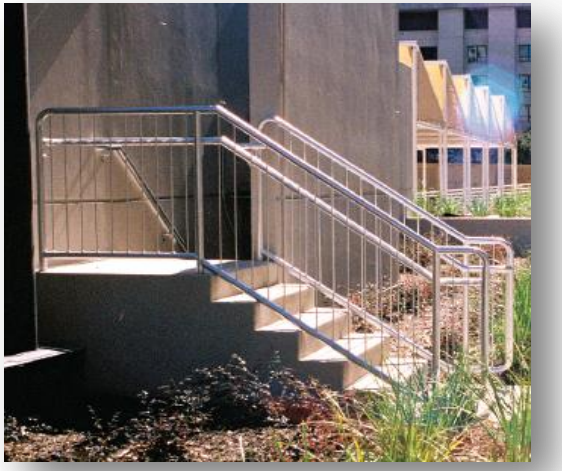
Dry Floodproofing and Egress

- “A sufficient number of emergency exits must be available so that anyone in the garage will not be trapped by rising floodwaters, and a warning and evacuation plan must be developed and tested so that it can be readily implemented when a flood threatens.” (FEMA, TB 6)

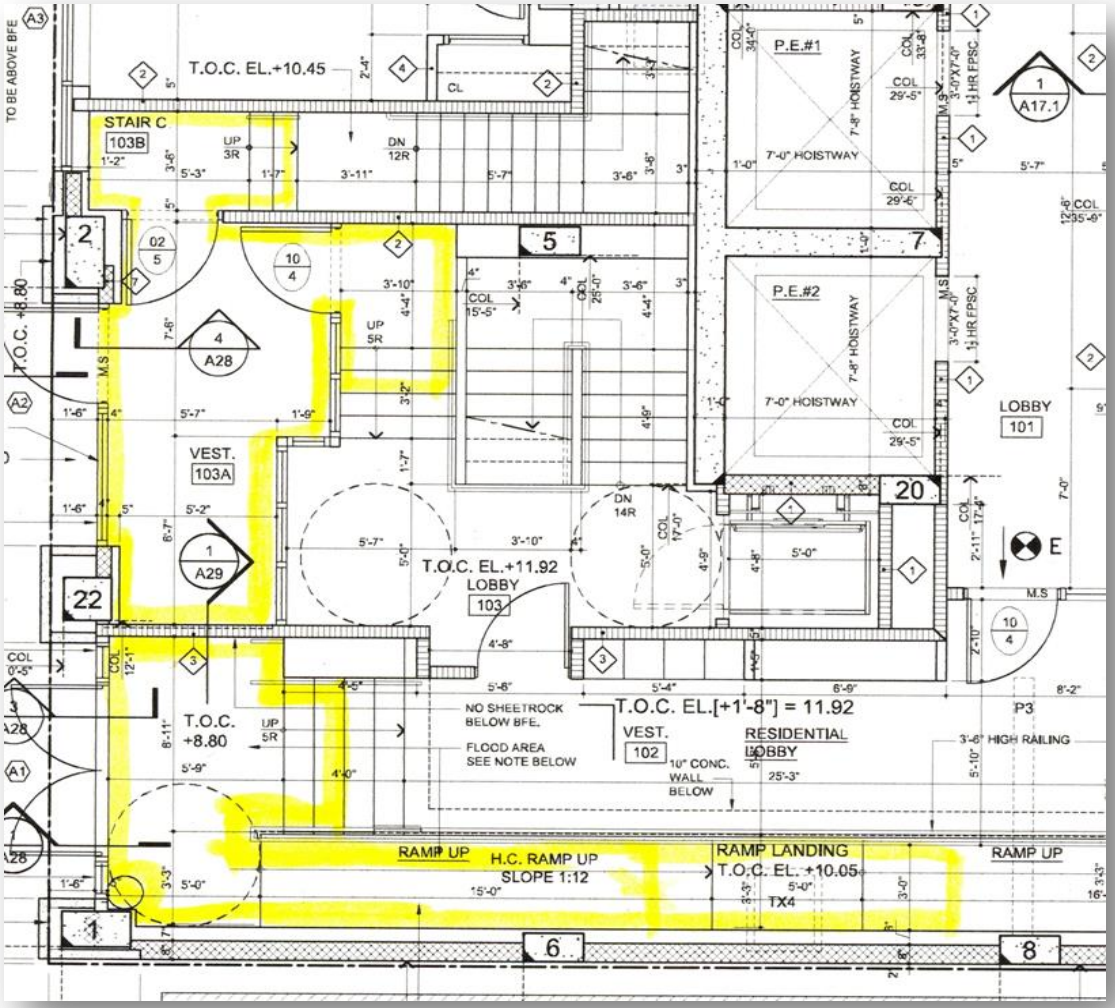
FEMA, P-936

BC G501.1 Section 6.2.2 Item 3.2

- At least one elevated door located in close proximity to each required means of egress to the exterior that is to be blocked by flood shields or flood control devices…



DRY FLOODPROOFING: EGRESS



FLOOD EMERGENCY PLANS

http://www.manhattanscout.com/blog/exclusive-post-hurricane-sandy-pictures,
Downloaded 4/6/2013

FEMA Mitigation Assessment Team (MAT) Report

Conclusion 16. Dry-Floodproofed Buildings

Buildings that are designed to be dry floodproofed, with measures that require action by building managers or occupants in order to function as intended, are not protected if those actions are not carried out properly. New York City Building Code, Appendix G, Section G105.4 requires a “flood shield inspection” during construction. For background, see Appendix G, Section G.3.1 of this report.

FEMA Mitigation Assessment Team (MAT) Report

Recommendation 16. Amend Appendix G of New York City Building Code: The DOB should consider amending Appendix G of the New York City Building Code to require owners of buildings that rely on human intervention to implement dry floodproofing measures to submit periodic inspection reports (e.g. every 3 years) to document:

- Installation and maintenance of flood shields or flood control devices
- Posting of the emergency plan required by ASCE 24, Section 6.2.3
- Performance of periodic practice of shield installation
- That other permit requirements are satisfied

FLOOD EMERGENCY PLAN

BC G501 modifies the egress requirements of ASCE 24, 6.2.3 limiting the amount of human intervention necessary for dry floodproofing, permitted only when:

1. Flood warning time is at least 12 hours (or where a community operated flood warning system provides adequate time to notify, install/activate floodproofing measures, and evacuate occupants)
2. All removable shields/covers , stairs & ramps are designed to resist minimum specified flood loads.
3. An approved flood emergency plan is permanently posted in at least two conspicuous locations.

FLOOD EMERGENCY PLAN, ASCE 24

Where removable shields are to be used, a flood emergency plan shall be approved by the authority having jurisdiction and shall specify:

- Storage location(s) of the shields and temporary stairs and ramps
- Method of installation and removal
- Conditions activating installation and removal
- Maintenance of shields and attachment devices
- Practice of installing shields
- Testing sump pumps and other drainage measures
- Inspecting necessary material and equipment to activate or implement floodproofing.

The flood emergency plan shall be permanently posted in at least two conspicuous locations within the structure. (ASCE 24, 6.2.3)

FLOOD EMERGENCY OPERATIONS PLAN

FEMA P-936 describes the necessary elements of a Flood Emergency Operations Plan:

- Establish a chain of command and assign responsibilities to each person involved in the installation and maintenance of the floodproofing measures.
- Delineate notification procedures for all personnel involved in the floodproofing operation.
- Assign personnel duties and include a description of the locations of floodproofing measures, installation procedures, and repair procedures.
- Evacuation instructions for all personnel who normally occupy the building, and for the personnel who have installed the measures, what to do after the floodproofing measures are accomplished. Evacuation routes should be posted in the floodproofed areas

Flood inspection and maintenance Plan

FEMA P-936 describes the necessary elements of an inspection and maintenance plan. Plan should specify the periodic inspection, repair and maintenance of the following:

- Wall and slab systems and waterproofing coatings inspected for cracks
- Flood shields supports and permanently mounted hardware or gaskets inspected for damage would prevent proper operation of a flood shield.
- Flood shields inspected for damage to attached gaskets, proper labels identifying the proper location, and damage to the actual shield. Inspection should include an inventory of shields and all the hardware required to properly install them.

FLOOD INSPECTION AND MAINTENANCE PLAN

The plan should specify the periodic inspection, repair and maintenance of the following:

- Backflow valves or shutoff valves inspected, to ensure they can properly operate.
- Drainage system and pump systems, to make sure there is no damage to piping or debris that would prevent the pipes from draining properly. Sump pits should be inspected and cleared of any sediment
- Switches and sump pumps should be inspected and tested to make sure they will run properly. If a generator is necessary for operation of the sump pump, it should be tested periodically to verify it will start and run during a flood event.
- Inventory of flood emergency equipment, supplies, and required tools to ensure that all required items are available in the event of a flood. The inventory should include a listing of the tools and where they are stored.

LOOKING FORWARD

- Flood shields and permeable exterior walls
  - ASCE 24 Interpretation and FEMA
- Emergency Action Plans and mandated deployment of shields and gates

NYC Gas Work

NYC Gas Legislation

"Gas safety is important for all New Yorkers, and this legislative package will resolve numerous regulatory oversights. These bills will help protect tenants in the event of an outage, and require greater information sharing between City agencies and gas utilities to enhance safety. Most importantly, these reforms will ensure both property owners and utility companies are accountable for keeping buildings safe." - *Mayor Bill de Blasio*

- 10 pieces of legislation signed into law 12/6/16
- New requirements for plumbers, building owners, and the Department

NYC LL150 OF 2016

Requires all work on gas piping systems must be done by:

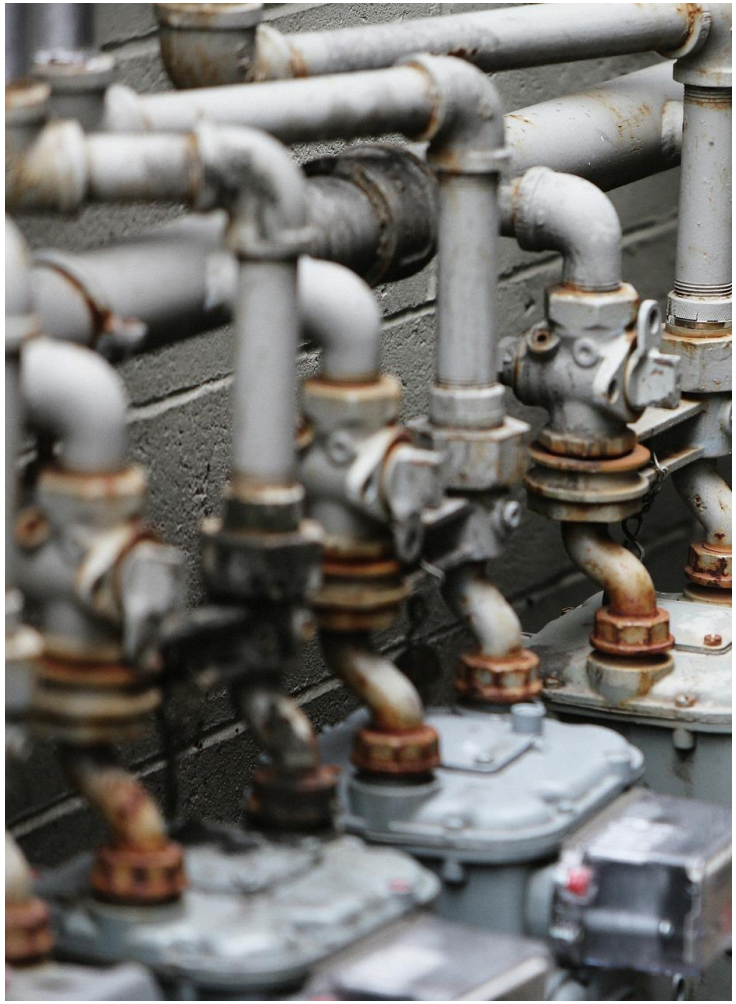
1. Licensed master plumber; or
2. Person with a gas work qualification; or
3. Person with a limited gas work qualification
   - *Effective immediately, 12/6/16*
   - *Department must promulgate a rule establishing qualification criteria*
   - *Training program for limited qualification must be approved*
   - *Procedure established for concurrent journeyman plumber registration & gas work qualification*

NYC LL151 OF 2016

Requires all gas pipe final inspections to be performed by Departmental inspectors in the presence of the permit holder, registered design professional, or construction superintendent.

- Effective 1/1/2018
- Inspection performed after all permit work is completed
- Any defects are to be noted and corrected
- Final inspection report will confirm corrections

NYC LL152 OF 2016



Requires all gas piping systems in all buildings* to be inspected at least once every five years

- Federal regulations have changed the definition of “Service Piping”
  - As newly defined, includes piping up to the gas meter
- NYS Public Service Commission may establish a new requirement related to the inspection of service piping
- Inspections **must** be performed by:
  - Licensed master plumber
  - Individual under direct & continuing supervision of LMP
  - Individual with qualifications established by Department rule

NYC LL152 OF 2016

Inspection scope **must** include:

- All exposed gas lines from point of entry of gas piping into a building, up to individual tenant spaces
  - Includes the gas meter
- Inspectors should identify:
  - Atmospheric corrosion
  - Piping deterioration
  - Illegal connections
  - Non-code compliant installations
- In addition to exposed piping, the following **must** be tested with a portable gas detector:
  - Public spaces
  - Hallways
  - Corridors
  - Mechanical rooms
  - Boiler rooms

NYC LL152 OF 2016

Reporting Requirements

Submitted to the Owner within 30 days

- Inspection report
  - Includes list of unsafe conditions, leaks, non-compliant conditions, & illegal connections
- Certification of licensed master plumber & any individual who performed inspection under LMP's supervision

Submitted to DOB on due date or up to 60 days prior to due date

- Licensed Master Plumber's certification that the inspection has been completed

NYC LL152 OF 2016

Reporting Requirements *(continued)*

Submitted to utility company within 90 days of inspection

- Inspection report

  NOTE: This requirement is subject to DOB rule requiring utility to accept report at no cost.

Submitted to DOB within 120 days of inspection

- Licensed Master Plumber's certification that all conditions previously identified were corrected, or will take addition time to correct
- Building Owner's certification report submitted to the utility company

NYC LL153 OF 2016

Requires residential building owners to provide tenants with a notice of procedures to be followed during suspected gas leaks.

Procedure notice **must**:

1. Be provided with lease and lease renewals
2. Be posted in building common areas

- *Effective 180 days after becoming law on 12/6/16 = **6/4/2017***
- *First Contact – 911*
- *Second Contact – Gas service provider*

NYC LL154 OF 2016

Requires gas service providers and building Owners to notify DOB:

Procedure notice **must**:

1. Within 24 hours of gas service shut-off due to class A or class B condition.
2. Within 24 hours from gas not being restored due to safety

- *Effective 90 days after becoming law on 12/6/16 = 3/6/2017*
- ***Class A conditions (Immediate Hazard)*** *– gas leak which cannot be stopped by repair; heating appliance discharging carbon monoxide; defect, obstruction, or inoperability of flue gas venting system; heat exchangers beyond repair, causing combustion products to enter warm air distribution system*
- ***Class B conditions (Immediate Hazard)*** *– leaking gas appliance which cannot be stopped by repair; gas appliance missing/inoperable safety device; defective/improper appliance wiring; visual indications of improper combustion*

NYC LL157 OF 2016

Requires building Owners to install and maintain natural gas alarms according to standards established or adopted by DOB:

- Alarm locations as per standard
- Requirements mimic those of smoke detectors for:
  1. Power source
  2. Interconnection
  3. Acceptance testing
- *Effective May 1st of the year following DOB promulgated rule*

NYC LL158 OF 2016

Requires DOB to establish a penalty waiver program. The program is intended to encourage owners to bring systems and appliances up to Code when:

1. Gas piping systems or appliances were designed, installed, modified or maintained in violation of NYC Construction Codes
2. Owner, within 6 months after law's effective date, begins work to bring systems and appliances up to Code

- *Effective 120 days after becoming law on 12/6/16 = 4/5/2017*

NYC LL159 OF 2016

Requires the following violations to be classified as *Immediately Hazardous*:

1. Supplying/installing gas without a permit (FGC 105.2)
2. Operating an altered or newly installed gas system without notifying the utility (AC 28-119)
3. Operating an altered or newly installed gas system without a required compliance inspection (FGC 406.6)

- *Effective 120 days after becoming law on 12/6/16 = 4/5/2017*

BUILDINGS BULLETIN 2017-001

Clarifies the extent of testing required for alterations to existing fuel gas piping systems. Such alterations may be limited to a single branch, or may affect the entire system.

FGC 406.1 requires gas piping systems to be tested as a complete unit. This Bulletin provides an interpretation on test units, but is limited to:

- existing buildings; and
- distribution pressures of ½ psig or less.

Branch – a section of gas piping downstream from a riser, leading to appliances or equipment on no more than two consecutive floors

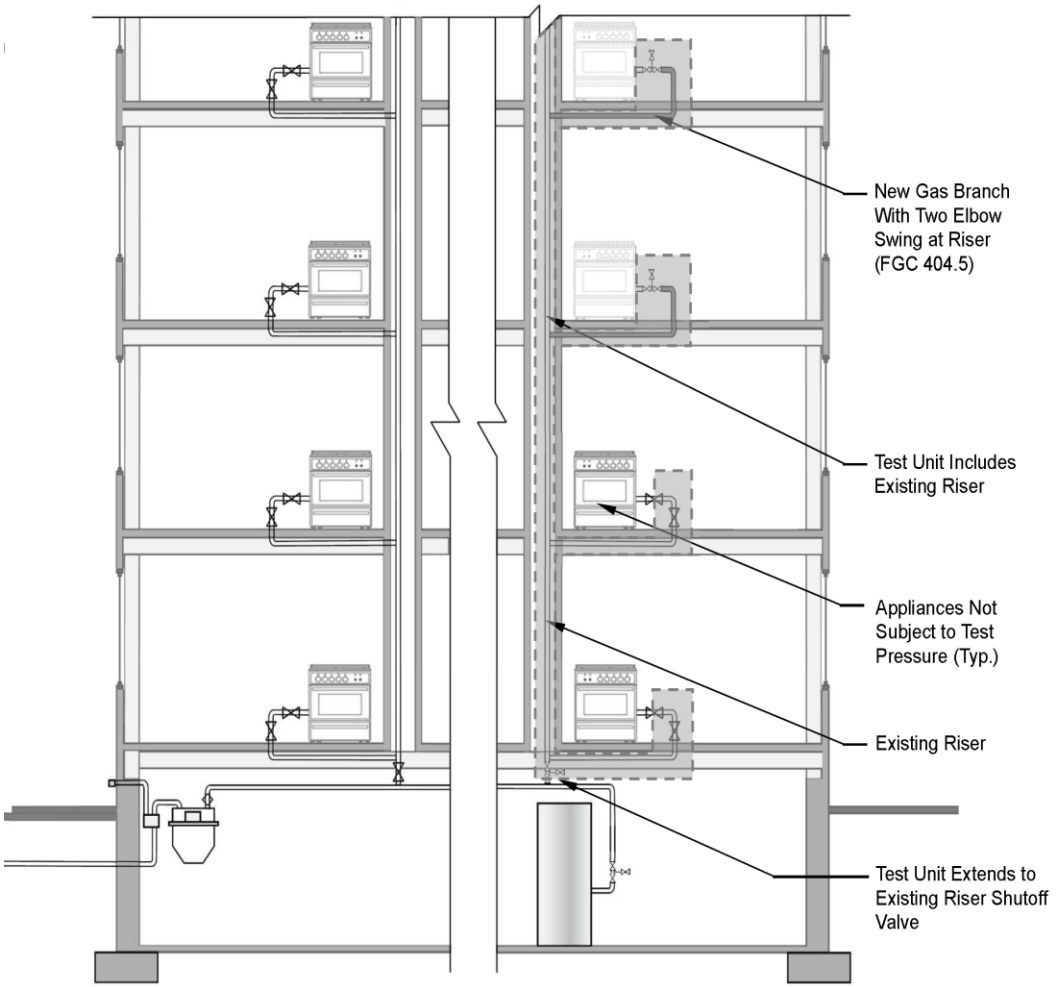
BUILDINGS BULLETIN 2017-001

Example #1

Connecting a New Branch

A new branch line is directly connected to an existing riser:

Test Unit - new pipe and any section of existing pipe which was compromised, or shut off.



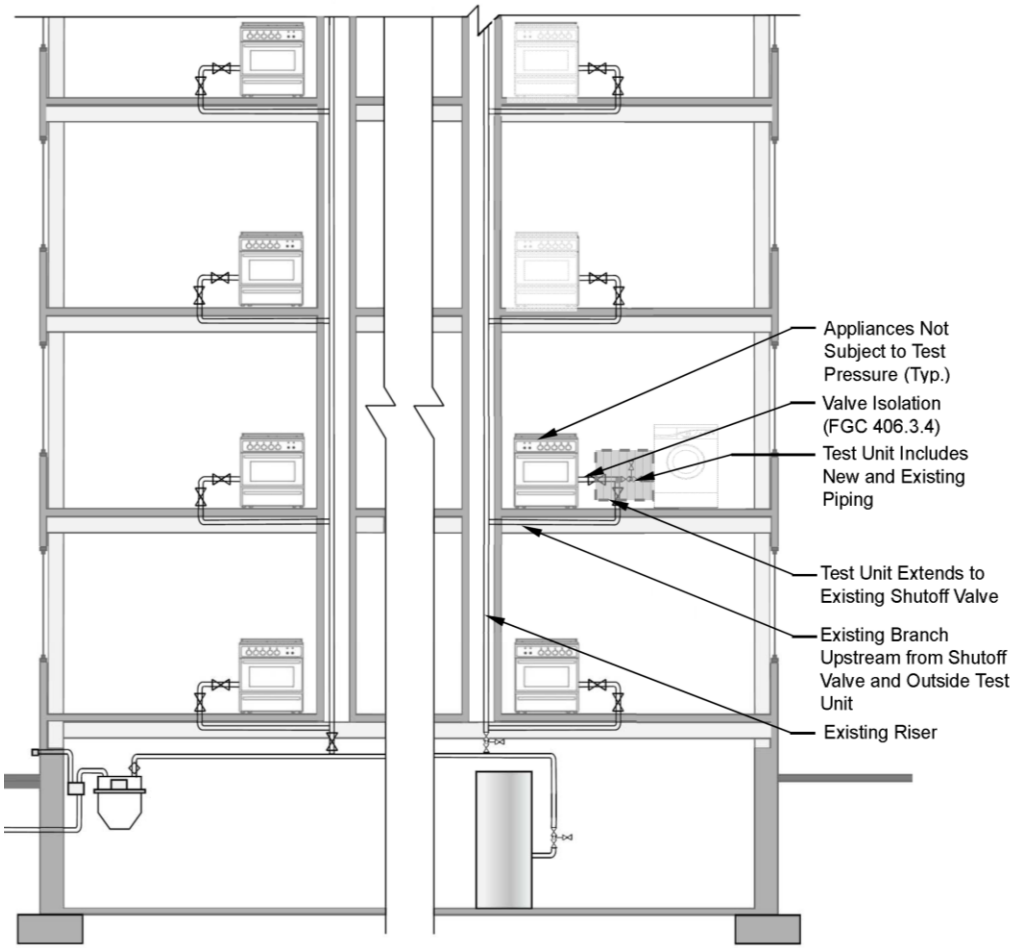
BUILDINGS BULLETIN 2017-001

Example #2

Extension of Existing Branch Piping

An existing branch has been extended within a single tenant space, downstream of a shut-off valve:

Test Unit - both the new and existing piping within the tenant space, up to the shut-off valve.



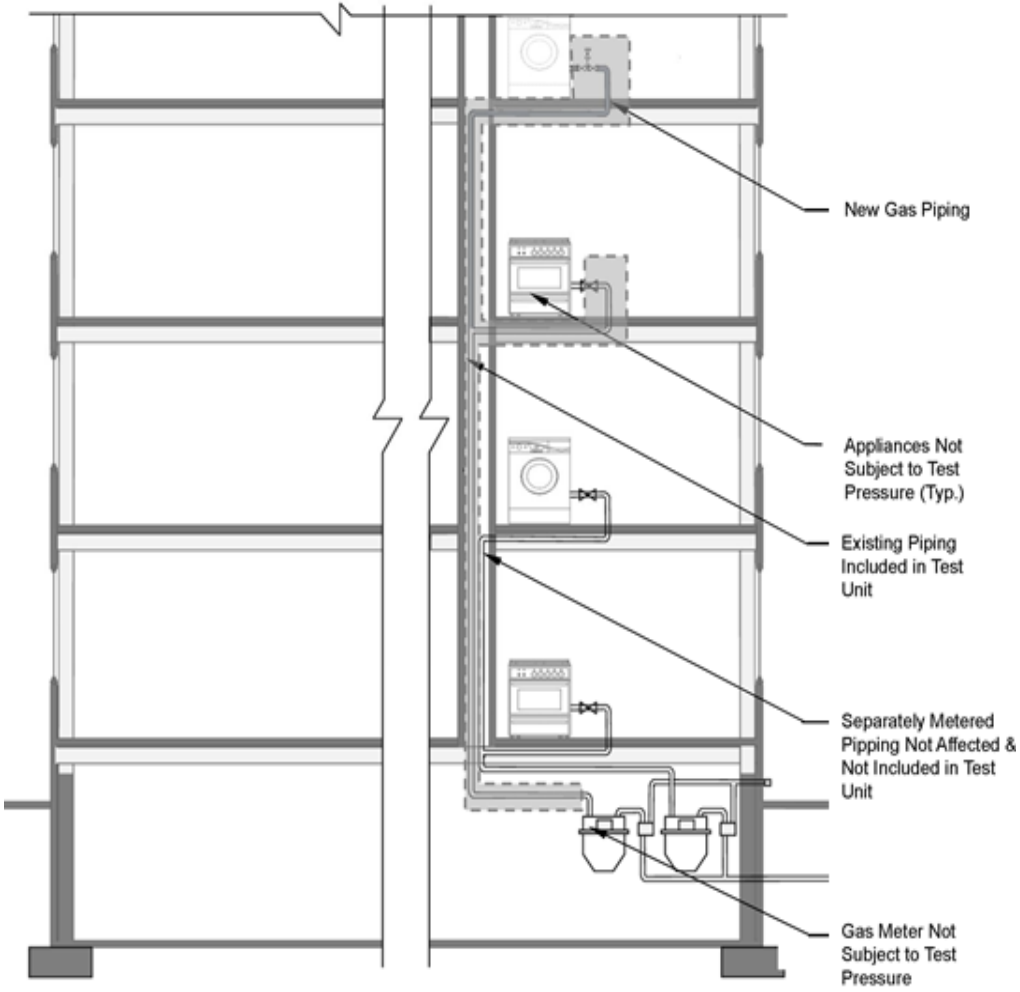
BUILDINGS BULLETIN 2017-001

Example #3

Addition to Existing Piping – Individual Meter

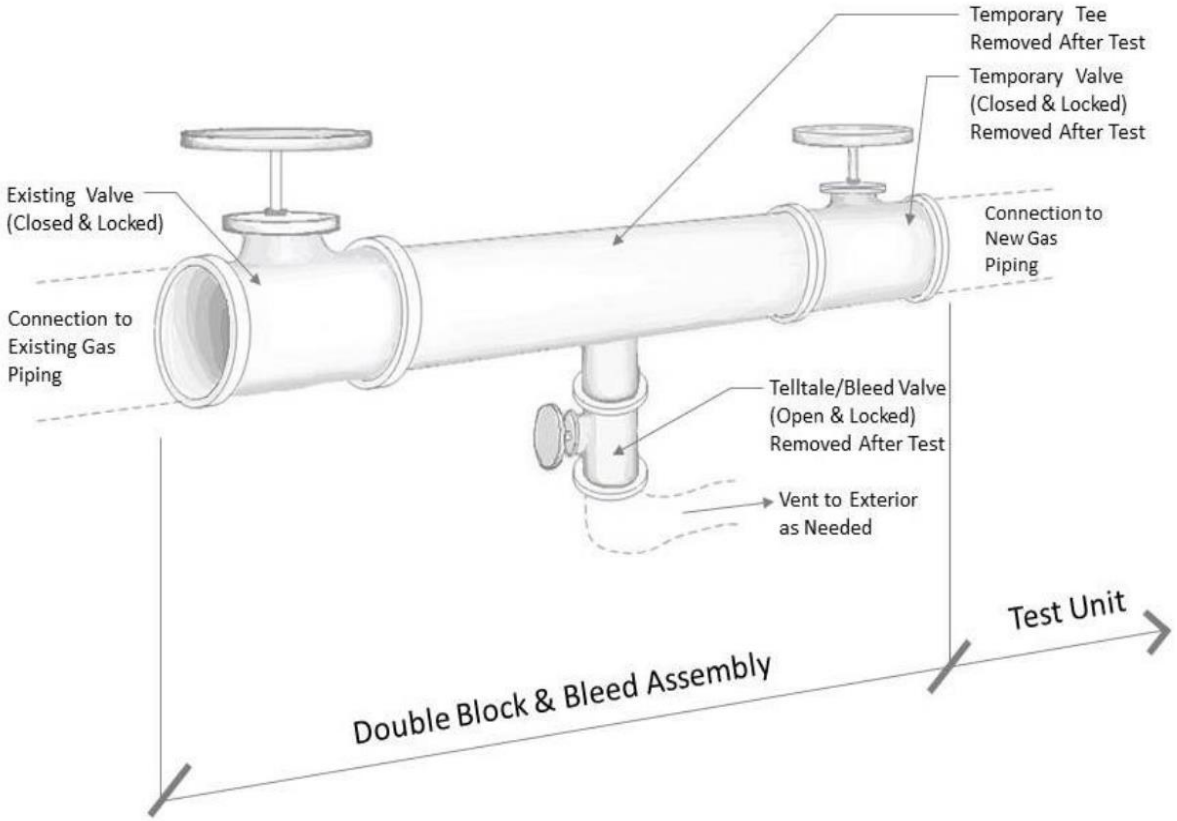
An alteration is made within a tenant space with an individual gas meter:

Test Unit - new and existing piping from the tenant space back to the outlet side of the meter.



BUILDINGS BULLETIN 2017-001

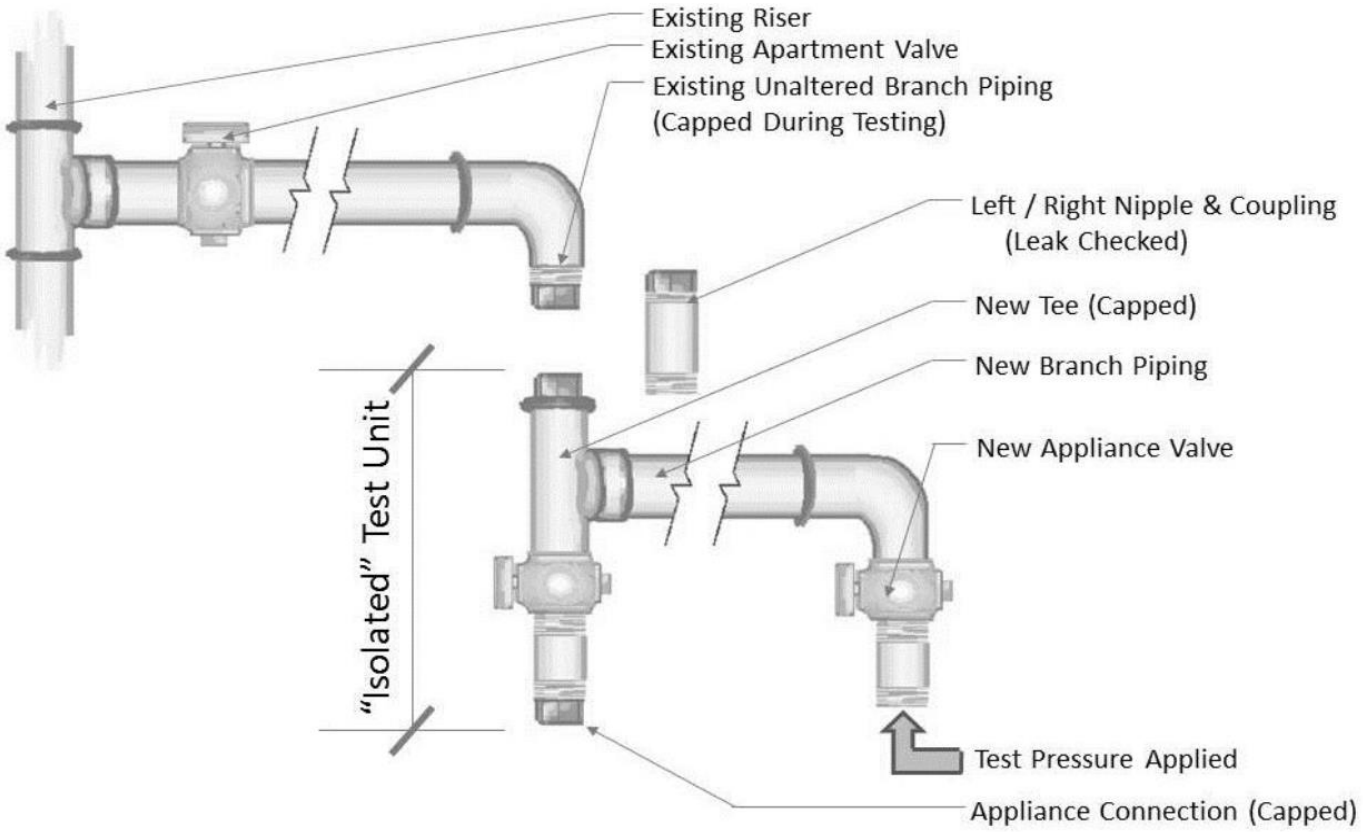
Isolation Method #1 – Double Block & Bleed



Either a fabricated or single manufactured assembly may be used

BUILDINGS BULLETIN 2017-001

Isolation Method #2 – Cap



This concludes the **American Institute of Architects Continuing Education Systems Course**.

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