BUREAU OF WATER & SEWER OPERATIONS

NEW YORK CITY
CROSS-CONNECTION CONTROL PROGRAM
HANDBOOK

Prepared By:
NYC-DEP

May 2017
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Section 1 | PREVIEW

1. SCOPE

The Cross-Connection Control Program Handbook is developed and optimized by the New York City Department of Environmental Protection (DEP) as general reference guidance of Standard Specifications for Prevention of Water Contamination and made available as a courtesy to the Public.

This Handbook has 8 Sections and 3 Appendices as a reference to the Code (Federal, State and City rules and regulations) and is not a how-to book.

To maintain consistency of the Cross-Connection Control (CCC) system, these guidelines have been clarified in this text.

The purpose of this Handbook is to provide background for the proper use of Backflow Prevention (BFP) Devices and explain the steps required to receive approval for the installation of BFP devices. These guidelines clearly outline what an acceptable design and installation constitutes based on experience in implementing CCC programs and policies set forth by United States Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), University of Southern California for Cross-Connection Control and Hydraulic Research (USC-FCCCHR), American Water Works Association (AWWA) and New York State and Local Health Departments.

The term “shall” indicates a requirement and the term “should” indicates a recommendation for good waterworks practice.

None of the examples are intended to promote any specific manufacturer or device. The mention of trade names and commercial products in this manual are for illustrative purposes only, and does not constitute an endorsement or recommendation.

The Handbook may be amended at any time at the discretion and approval of NYC-DEP. In the event this Program Handbook is found to conflict with Federal and State law, currently or in the future, the Federal or State law will take precedence.
2. **“POLICY”**

**BACKFLOW REGULATIONS**

**Purpose**
- To protect the public potable water supply served by NYC-DEP Water Authority from pollution or contamination which could backflow from customers’ internal water distribution system by containment.
- To promote elimination or control of cross-connections, actual or potential.
- To properly assess the water system to install an appropriate type of BFP device for the properties’ level of hazard.

**AUTHORITY**

Federal Regulations:
In 1974, the United States Congress passed the Safe Drinking Water Act (SDWA) to help ensure that tap water is safe to drink. Under the provisions of the SDWA, the water purveyor is held primarily responsible to ensure water quality meets national standards of safe drinking water established through the EPA. These provisions include a warranty that the water quality provided by the purveyor is in conformance with EPA standards at the source, and that the water is delivered to the customer without compromising its quality.

**DEP POLICY**

To protect public health and the environment by supplying clean drinking water, collecting and treating wastewater; and reducing hazardous substances pollution.

**DEP MISSION**

Water is one of our basic necessities for survival. Living in an environment with a good source of clean potable water is always a top priority as it is highly related to the public health.

We aspire to provide the safest potable water to protect human health and ensure hygienic environment.
3. **GENERAL OVERVIEW OF THE NYC ENVIRONMENTAL PROTECTION CROSS-CONNECTION CONTROL PROGRAM**

For the Protection of the Water Supply System from Contamination

**WHO IS AFFECTED?**

Owners of properties that pose an actual or potential risk of contamination to NYC’s water supply. This includes property with any of, but not limited to, the following facilities or appurtenances:

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<td>BIDETS</td>
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<td>CAR WASH</td>
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<td>DELICATESSEN / COMMERCIAL KITCHENS / RESTAURANTS/ PREMISES WHERE FOOD IS BEING PREPARED, PROCESSED OR SERVED, CANNED AND CONCENTRATED</td>
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See **Typical Significant Risk of Cross-Connection Hazards** Page 47
4. **WHAT IS A CROSS-CONNECTION?**

A cross-connection is any actual or potential physical connection between a potable water line and any pipe, vessel, or machine containing a non-potable fluid, or has the possibility of containing a non-potable fluid, solid or gas, such that it is possible for the non-potable fluid, solid or gas to enter the potable water system by backflow.

**Concept of Backflow**

The term “Cross-Connection Control” is referring to backflow prevention. A cross-connection is an arrangement of piping which could allow undesirable water or contaminants to enter the potable water system as a result of backflow due to a backpressure or backsiphonage situation. All cross-connections are prohibited except where BFP devices as specified by DEP are set. Cross-connections shall be protected to prevent backflow, which can be hard to detect. In any water distribution system, potential cross-connections and sources of contamination can be varied and unpredictable.

**Backflow** means any reversal in the flow of water from its intended direction of flow either by “backsiphonage” or by “backpressure”. When conditions are such that the water ceases to flow toward the customers various fixtures and outlets and begins to flow from the intended outlets toward the source of supply, the water supply can easily become contaminated through unprotected cross-connections.

**Backsiphonage** is caused by a reduced or negative pressure being created in the supply piping. Major causes of backsiphonage are undersized piping and the interruption of the supply pressure. This will allow negative pressures to be created by water trying to flow to a lower point in the system causing a foreign substance to flow into the pipe. The entire potable water supply may become contaminated due to backsiphonage of contaminants into the potable water supply.

Examples of fixtures and equipment requiring back-siphonage protection include:

- **Sinks**
- **Dishwashers**
- **Ice machines**
- **Potato peelers**
- **Garbage grinders**

**Backpressure** may cause backflow to occur where a potable water system is connected to a non-potable system of piping, and the pressure in the non-potable system exceeds that in the potable system. High pressures may be created by means of pumps, boilers, elevated piping, etc. There is a high risk of non-potable water being forced into the potable water system whenever backpressure conditions exist.
5. BFP ASSEMBLY APPROVAL PROCESS

Business Owner hires Professional Engineer or Registered Architect

Applicant researches the facility as per requirements

Applicant (PE/RA) creates Backflow Prevention Plans

Applicant submits Backflow Prevention Plans to DEP-CCC

CCCU Plan Examiner reviews the BFP Plans

Does the Plan Examiner have objections?

YES

Issues letter of objection to Applicant

NO

Plan Examiner approves plans

CCCU mails stamped plans to Business Owner and Applicant

Plan Examiner approves plans

Plumber builds the utility water system with the BFP assembly as per plans

Business Owner hires NYC L.M. Plumber to install the utility water system with the BFP device

Plumber uses the acceptance letter to receive permit for tap or wet connection & all other permits (DOT & DOB)

Applicant certifies BFP device installed as per the approved plans

Tester conducts the Initial Test for the backflow prevention device

Mails in Initial Test Report to DEP-CCC

Business Owner hires State Certified tester to test the backflow prevention device

CCCU closes out the file in Database
6. “HOW TO COMPLY”

Required documents for filing out the BFP Plans by Applicant

Original copies of the following paperwork (unless otherwise noted) is the minimum requirement for any/each water service connection proposal submission to all buildings/facilities, either existing or new, regardless of size of the water service, either existing or proposed; permanent or temporary in the areas of the City of New York:

(A comprehensive cover letter with table of contents for the plan set, if any)

1. Two (2) sets of the Form Gen236 (Application for Approval of Backflow Prevention Devices) and Two (2) sets of BFP plans.
   - Plans show detailed installation shop drawings through: Site (Plot) Plan, Elevation View, Plan View and Notes and shall be in compliance with the latest DEP rules, regulations and water design standards.

2. Two (2) sets of Elaborated Engineering Report to describe the facility, name (if any), state, type of business/occupancy, floors, fixtures, general use of water service, clarify certain issues, and specify justifiable reason(s) for this proposal to sustain all information to get the plans accepted. See Sample Engineering Reports (page 63).

3. Two (2) sets of the Exemption Request proposal, if a premise is qualified for exemption from BFP requirements for a domestic water service line dedicated exclusively to domestic plumbing fixtures.

4. If any change/discrepancy in address or separation/combination (merge)/re-apportionment of lots is proposed, a letter from Borough President and/or RP602 Form (updated) shall be provided to clarify the actual address (house #), block and tentative lot number(s).

5. There is an upfront filing fee to be paid for each water service: a Check or Money Order of $350 per water service connection with every Application for approval of BFP Device, and a review fee of $100 for each Backflow Exemption letter, made payable to NYC Water Board. There are no waivers of the filing fees except for DEP facilities.

6. One self-addressed envelope must be included with all submissions (sized 12” x 9”), no clasps, having the address of the Professional Engineer or Registered Architect (PE/RA) typed on the front. No postage is required. It will be used to mail back the plans when it is approved, incomplete or objections are given. The address should be true and accurate to avoid any delays, lost or undeliverable package.

7. If any major alterations/discrepancies for an on-site condition occurs during installation of the BFP device(s), which contradict the approved plan, or due to objection from any other agency/department. The PE/RA shall provide two (2) sets of application form Gen236 and two (2) sets of rectified/“as-built plans” along with a signed and stamped letter to request that DEP void the previously approved plan. A new filing fee (as per # 5 above) is required with this submission. Examples of major changes:
   a. Type of water service connection.
   b. Size of water service connection.
   c. Size of proposed BFP assembly.
   d. Configuration, orientation or location of device (level to level, etc.).
8. As-built plans that specifies and/or legalizes the on-site condition shall provide all required documents similar to any regular BFP plans and subject to same review process. Complementary plans involving the alteration or addition of water service connection to an existing water system do need to be submitted, shall not be in conflict anywise with the previous approved plans. For the purpose of plan full review requirements, complementary plans shall specify all water services, existing or new, on the “Site Plan” and comply with all rules in effect. Any conflict shall render previous plans reprimanded. Comprehensive amended plans shall be required.

9. A notarized affidavit from the property owner/customer shall be provided along with the plans if a different PE/RA is hired to prepare or amend the previously approved plans for the required facility.

10. By signing, the property owner/customer/common authority representative/juridical name agrees to all the terms and conditions set forth on the Plans/Exemption Letter. New ownership of a property shall recognize the legal conformities as per on-site condition. Grandfathered features are often required to be verified and updated as deemed necessary to conform to applicable regulations. The Property owner/customer should consult with a licensed PE/RA to figure out if amendments are needed. No Grandfather clause exists.

11. A letter originally signed and stamped by the PE/RA shall be provided to supersede, amend or withdraw any previous submitted/approved plans or reinstate to previously approved plans. Plan is valid for Two (2) years from date of approval.

12. Any other supporting documents, useful proof and all pertinent information/details to disclose certain issue(s) (i.e. amendments, affidavits, approved water riser diagram, hydrant flow test report, sign off letters of the disclosed jobs, permits, clarified pictures/illustrations, etc.).

13. If more than one plan (for different sites) is submitted, each plan is subject to the above stipulation.

14. All depicted shop drawings shall be of acceptable standard quality, easily legible in black/blue ink, on 8.5” x 11” and shall not exceed 11” x 17” sheets. Large sheets (full size) are no longer acceptable. However, large sheets (if need be) can be submitted solely for clarification purposes. Application Form Gen230 shall be on 8.5” x 11” sheets only, full page (not miniaturized).

15. Incomplete, incorrect, vague and illegal submissions shall be returned to applicant.

16. All submissions shall be mailed to: NYC-DEP-BWSO
Division of Connections & Permitting
Cross-Connection Control Unit
3rd Floor Low-Rise
59-17 Junction Blvd.
Flushing, NY 11373

• In case of any inquiries, please contact CCCU @ (718-595-5463) for technical assistance.

ALL DOCUMENTS SHALL BE SIGNED ORIGINALS AND STAMPED BY NEW YORK STATE (NYS) PROFESSIONAL ENGINEER OR REGISTERED ARCHITECT IN PERMANENT INK

Property Owner/Customer Signature and Date
Design Engineer/Architect’s Signature, Stamp and Date
(NO Photocopies or Electronic Images are Acceptable)
Section 2

S T A N D A R D S

1. **Degree of Hazard**

Different types of cross-connections constitute different degrees of hazard which are classified as follows, listed with the approved types of devices:

A. **Class 1** - If backflow were to occur, the resulting health significance effect on the water supply would be limited to minor changes in the esthetic quality such as taste, odor, or color. The foreign substance must be non-toxic and non-bacterial in nature and have no significant health effect. Allowed containment devices are safe air gap, double check valve assembly, or reduced pressure zone principle assembly.

B. **Class 2** - If backflow were to occur, the resulting health significance effect on the water supply would be significant change in esthetic qualities. The foreign substance must be non-toxic and non-bacterial in nature. Allowed containment devices are safe air gap, double check valve assembly, or reduced pressure zone principle assembly.

C. **Class 3** - If backflow were to occur, the resulting health significance effect on the water supply could cause illness or death if consumed by humans. The foreign substance may be toxic to humans either from a chemical, bacteriological or radiological standpoint and may result from either long or short-term exposure. Allowed containment devices are safe air-gap or reduced pressure zone principle assembly.

**PROTOTYPE**

**Premises**

- **Residential**
  - RPZA / DCVA / Exemption

- **Non-Residential**
  - RPZA / DCVA

- **Mixed Use**
  - RPZA / DCVA
2. Roles and Responsibilities for Cross-Connection Control

A. Local Authority:

The main purpose/policy of the CCC program is to protect the public water supply from any possible contaminants that may be hazardous to the city's potable water supply from any facility in complete compliance with the NYC rules and regulations. DEP is required to meet standards set by the EPA, NYS, and NYC to obtain, treat and deliver clean water to the public.

B. Property Owner/Customer's liability:

All backflow prevention assemblies are the property of the customer. It is the property owners’ responsibility to purchase, install and maintain the backflow preventer and all accessories (if any) related to the installation of the BFP assembly. DEP shall have no ownership or responsibility for the proper installation, operation, maintenance, repair or replacement of any BFP assembly.

The property owner/customer is totally responsible for:

- Installing special plumbing devices, known as BFP device on the water service pipe(s) that supply their property in compliance with CCC Code.
- Providing DEP with any and all pertinent information concerning facilities, process, water usage, existing BFP devices (if any) and other information as required by DEP.
- Making their premises accessible to DEP authorized representative for inspection.
- Obtaining the approval of plans submitted to DEP before installing the BFP device(s), arranging for periodic testing of all containment BFP devices by a NYS certified BFP device tester, and submitting the Gen215B Form “Report of Test and Maintenance of Backflow Prevention Device” to DEP within 30 days of installation of device(s), and thereafter not exceeding one year from the date of the previous test.
- Legalizing any existing containment BFP device in their premises by submitting as-built plans.
- Installation, operation, modification, maintenance, repair, replacement and testing; as required; any and all containment BFP devices on their premises.
- Attesting to the fact that no cross-connections will be permitted upstream of the BFP devices(s) and not installing an unprotected bypass around any BFP assembly.
- Keeping the private water system in good repair and replace any degraded plumbing connected to the city water supply.
- Notifying DEP of any alterations may be set forth as pertaining to occupancy, water service(s) and BFP device(s)’ status/operation in their facility.
- Installing only those BFP assemblies approved by the USC-FCCCHR and in a manner that is approved by DEP and in compliance with New York City Department of Buildings (DOB) plumbing Code.
- Not modifying any BFP assembly in any way without the approval of DEP.
- Ensuring that all drains and drain ports are clear and operating for all BFP devices.
- Ensuring that all BFP assemblies have adequate security measures.
- Installing all BFP assemblies in an area that provides a safe working environment, easily accessible, away from electrical hazard and free from dirt for testing and maintenance.
- Having the repair immediately if a BFP assembly is in need of repair before the annual test period.
- Repair or replacement any BFP device, which fails a test. Upon completion of repair or replacement, the device(s) shall be retested.
- Correcting any malfunction or re-certifying with Form Gen215B improper installations until acceptable.
- All internal cross-connection control, installation, testing and maintenance of all internal BFP devices as per DOB requirements.
- Working with their plumbing contractors for conducting periodic surveys of water use practices on their premises to detect if there is actual or potential cross-connection either in the utility water system or their potable water system.
- The payment of all costs of design, approvals, permits, installations, maintenance and testing.
- Maintain records for testing and repairs of all containment BFP assemblies on their property.
Note: By signing, the property owner/customer agrees to all the terms and conditions set forth on the plans/Exemption Letter for post connection(s) or removals.

By Law

- A building owner or customer who fails to install a backflow prevention device as directed by the DEP Commissioner shall be subject to the issuance of notices of violation, cease and desist orders, other civil and criminal actions and proceedings, and such fines, penalties and other enforcement measures as may be imposed pursuant to section 24-346 of the Administration Code, including but not limited to the termination of the water supply to the building or to any portion thereof or a facility therein which the Office of Administrative Trials and Hearings or the DEP Commissioner may deem necessary to prevent or alleviate any hazard to the city water supply. The customers shall pay any fees which the DEP may establish in connection with the termination or restoration of Water service to the customer.

- Failure of a building owner or customer to provide an annual test report, at the DEP required frequencies, certifying that an existing backflow prevention device installed pursuant to this section or is properly operating shall be a violation of these rules.

C. Result of Non-Compliance: (Enforcement Unit)

- Any customer failing to comply with the CCC program shall be deemed to be in non-compliance, and water service may be terminated by DEP until required corrective actions are fulfilled and verified.
- If corrective measures are not completed within the specified timeframe, DEP may disconnect water service.
- Any customers having been deemed to be in non-compliance with this program shall pay fees as set by DEP.
- Fees will be assessed to customers regarding actions taken by DEP associated with disconnection or reconnection of service, performance of BFP assembly testing and/or repair, or any other applicable actions.
- Termination of Service: In emergency conditions, when the public potable water supply is being contaminated or is in danger of contamination, water service may be disconnected.
- The property owner/customer allows an authorized DEP representative to survey their existing facility. This would enable DEP to detect areas that would require the installation of a BFP device downstream the master meter(s). Refusal to allow site inspection shall constitute a violation of CCC Program.

D. NYC Licensed Master Plumber (along with their employed NYS Licensed Testers):

The licensed master plumber has the responsibility to:

- Ensure that all their work (as per approved BFP plans) is installed diligently in adhering to the adopted local plumbing code and ordinances as well as DEP Bureau of Customer Service (BCS) requirements and BFP assemblies’ manufacturers’ standards and specifications.
- Notify the owner/customer that the water service will be discontinued temporarily prior to beginning any BFP installation, test or repair.
- Maintain, replace, repair or overhaul BFP assemblies as per procedures outlined by manufacturers.
- Insure that replacement parts are of original quality supplied by the manufacturer of the assemblies being repaired. Replacement assembly shall be installed, operated, and maintained in accordance to DEP policy/ordinance in effect.
- Never change the design, material or operational characteristics of the assemblies during repair, maintenance or testing.
- Include the list of materials or replacement parts being used on the test reports.
- Make the competent and accurate test/repair following the manufacturers’ procedures, and disseminate the results and any critical conditions to customers and DEP within the time frames as required.
- Insure that their licensures are current.
E. Licensed Professional Engineer/Registered Architect (Applicant):

- A single NYS licensed design PE/RA is responsible for the submitted plans. It is incumbent upon the applicant to provide all required data in all respects with the CCC program in effect and shall make sure that the BFP plan does not lack any necessary components.
- The applicant shall survey/assess/evaluate the prevalence of cross-connection in the facility (either existing or new) ensuring that all guidelines herein are applied in a manner consistent with all applicable federal, state and city rules and regulations.
- The applicant is responsible for the entire proposed design and all related calculations. As well as checking that the BFP device(s) is/are installed in conformity with the approved plans (size, type, make and model #, location of device(s) and type of water service), and signing the certification statement with minor installation changes, if any, on the Gen215B form to be submitted to: DEP within 30 days of device initial installation. More in-depth CCC information can be researched for any updates.
- If something goes wrong or incomplete on the submitted plan even after getting the DEP approval, “As-built” plans shall be submitted as appropriate to reflect the proposed/on-site condition.
- The applicant is supposed to have an understandable experience with the BFP requirements and all its prospects and shall find satisfactory technical and practical resolutions for any critical situation in full course of all rules, regulations and ordinances. The applicant shall explain to their customers the CCC requirements in common words and shall be clear and coherent.

Rectification of plans:

- Any proposed amendment, discrepancy or change to an approved plan/on-site condition; shall be provided by the Applicant to determine whether the proposed change constitutes minor or major modification. A major modification is required for changes which include:
  - Additions or deletions.
  - Changes in use/business/occupancy.
  - Changes in water service(s); size, type, location, setting up.
  - Changes in location/configuration/additions/extensions/egress of facility structure.
  - Other modifications that determines to be major when they substantially deviate from an approved plan. Example: change in size/type/configuration/location of BFP assembly.
- Existing approved BFP device(s) can be reused when relocated as deemed operable.
- Any submitted BFP plans shall be in complete compliance with the latest rules and regulations, not according to previous design/rules/regulations/approvals. As-built plans shall reflect an approved setting up and never conflict the rules and regulations.
- The applicant shall verify that the plans conform to applicable codes and regulations.
- The applicant’s signature and stamp (NYS Professional Engineer or Registered Architects only) are required for all applications.

3. Cross-Connection Control Regulations

A. Requirements

1. Dividing and Merging Lots: Builders, developers, architects, engineers, and property owners may request permission from both the NYC Department of Finance (DOF) and the NYC Department of Buildings (DOB) to divide (apportion) or merge (combine) lots. Approval depends on several factors including tax and zoning rules. The DOF Tax Map Office is responsible for processing these requests. If any change in address of facility or separation, combination, re-appointment of lots is proposed, a letter from Borough President and/or RP602 Form (updated) shall be provided to clarify the actual address (house #), block and tentative lot number(s).

2. New building(s)/under construction/major renovation/mobile homes under DOB jurisdiction shall be filed with DOB prior to submittal of BFP plans. Demolition details, address, block and lot #s, both final schedules “A” and “B”, proposed alterations, and zoning diagram to be demonstrated. The “Property Profile Overview” shall be updated on DOB filing to be compatible with the scope of work to facilitate the review of BFP plans. Before submitting proposal, PE/RA/Contractors shall visit the site to familiarize themselves with the on-site condition and verify for any discrepancies or interferences between their work and that of other trades.
3. A separate tap/wet connection and water service shall be set for each building in the lot supplied with the city water except for buildings that have service pipes supplied by internal water mains. A water service connection shall not supply water to more than one substantive tax lot.

4. DEP Local Office Approval is required for all domestic service lines. PE/RA shall check the hydraulics of the domestic system, and water demands, to ensure proper operation in conjunction with the presence of the proposed BFP assembly. (Refer to manufacturers’ head loss curves).

5. DOB Approval is required for all fire water service lines (sprinkler and/or standpipe or any fire suppression system) in either existing or new facilities. PE/RA shall check the hydraulics of the fire protection system, and water demands, to ensure proper selection and operation in conjunction with the presence of the proposed BFP assembly. (Refer to manufacturers’ head loss curves).

6. DOB Approval is required if an existing water service, either domestic, fire or alike will be converted to a different water service type. Water piping shall be an approved Lead-Free type, i.e. ductile iron pipe (DIP), Copper type K or L, etc. A true copy of approved water riser diagram to be submitted along with the BFP plans. Piping/fixtures shall be modified as required.

7. Approved BFP plans (either for existing or new premises/facilities) shall be submitted to DOB for approval and permit. LAA Form for permitting the approved BFP device(s) for existing facility shall be provided to get the DOB approval. No LAA permits are required for facilities that are not under the jurisdiction of DOB (State and Federal Authorities such as Parks, MTA, JFK and alike).

8. To protect the DEP potable water system and BFP assemblies, water hammer arresters, surge protectors or expansion tanks can be used as appropriate. Expansion tank can be used to absorb thermal expansion that will be created by the hot water heater. The installation of a thermal water expansion tank, water hammer device and/or pressure relief valves downstream of the BFP assembly when needed within the closed-loop plumbing system are subject to approval by DOB.

9. If booster/fill pumps are required within the customer’s premises, plans and specifications for their installation should be approved by DOB before installation. Booster pumps should:
   • not be allowed in locations where there is not a satisfactory supply of water to maintain a minimum residual pressure of at least 20 psi at peak demand.
   • only be used to boost the pressure and should never be installed to increase the flow of water in the line supplying the pump.

   If a larger flow rate is needed, it should be obtained by installing larger mains supplying the area, additional supply mains, additional storage, on-site storage, etc. All booster stations, unless supplied directly from a storage tank, should have automatic controls to prevent the suction pressure from being lowered below 20 psi. Notes:
   - All on-site plumbing is under DOB jurisdiction.
   - All internal containment is the responsibility of the customer under DOB authority.
   - The containment BFP assembly shall be installed on the suction side of any booster/fill pump and ahead of any storage tanks that may be connected to the water service line inside the building.

10. Any new construction shall be reviewed by the applicant as appropriate to assess the degree of hazard and ensure that the proper BFP assembly is installed based on facts, not preconceived assumptions.

11. Type of BFP assembly shall be as determined by DEP or its designated representative.

12. DEP considers the Degree of Hazard of any building (facility) according to the type of occupancy (business/activity) and type of plumbing fixtures inside the facility (in the whole lot as well). If the hazard cannot be determined, a reduced pressure zone assembly (RPZ) shall be installed.

13. BFP plans shall involve all water services (either existing or new) of the same facility, in the same lot, and shall be protected and listed on one application. Exempted domestic water service line (if any) of the same facility shall be shown and specified conspicuously on plans.
14. Not-in-use active water service(s), which may be capped for future use, shall be protected with approved BFP device(s).

15. Existing piping/service/location of BFP assembly shall be modified as required to provide an approved system/setting up. A variance/waiver shall be obtained from BCS for size, locations, etc. of water meter, meter test tee (T.T.) and meter outlet control valve (MOCV) if irregular proposal presents itself. Existing fixtures may remain as if deemed acceptable.

16. Looping the city water mains inside a building/facility is prohibited. Multiple water services shall be interconnected inside a property immediately downstream of the meter outlet control valves or BFP assemblies on the fire protection services (if need be).

17. In a building with existing water service(s) to be destroyed/capped and abandoned, it/they shall be represented as a dashed line on the plot plan and labeled as: Existing size, type of water service; to be destroyed and abandoned in the street as per local code. Clear “Note” can be demonstrated if location will be verified in the field.

18. Any proposed water service connection shall be extended and dedicated to the building or facility not to any of the tenant(s). If a tenant needs the water utility account in their name, the tenant shall provide the information to the property owner who will complete and sign the application. DEP is limited to customer relationship with owners/customers, not with tenants. The minimum acceptable sizes of taps/wet connections and service pipes that provide water service shall be determined by DEP sizing tables. (See Chapter 20, Appendix Tables # 1, 2 and 3). Reuse of demolished water connections shall be in compliance with DEP Code.

19. In buildings with multiple stores, all facilities (existing or new) shall be shown, specified (activity) and addressed, showing all water services (to which facility), on the plot plan.

20. As-built plans shall be provided to legalize the on-site condition:
   a. Although the non-Lead-Free BFP device is reprimanded, however, it is acceptable as-built only because it is already USC-FCCCHR listed and installed before the amended Federal Law, (SDWA). All items on drawings shall be labeled as “existing” with all required details (size, type, make and model #, and serial #).
   b. Existing BFP assemblies installed before the effective date of these rules which was approved at the time of installation but is not on the current USC-FCCCHR list of approved assemblies shall be permitted to remain in service provided that it is:
      • properly maintained.
      • commensurate with the degree of assessed health hazard.
      • tested at least annually, and functions satisfactorily.
   c. When assemblies of this type are removed, or require more than minimum maintenance, or are on services that are modified, altered in size or remodel, they shall be replaced with assemblies on the current USC-FCCCHR approved list.

21. When changing out an old/damaged backflow prevention device:
   a. It shall be already approved by DEP, and records are demonstrated in CCC Database/filing.
   b. It shall be of the same size, type, installation orientation, make and model # and location.
   c. It shall be a Lead-Free type if installed on a domestic water service (or combined water service which is domestic with fire takes off) for human consumption. For Fire service, it can be either Lead-Free or non-Lead-Free type. RPZ shall maintain similar or acceptable submersion calculations.
   d. It shall be of the same make and model # if still in production or the substitute can be selected (verified with manufacturer) and shall maintain similar or less head loss and discharge rate (RPZ).
   e. After the initial installation of the newly replaced device, Annual Test Report shall be submitted and:
      • Information of the new device shall be specified on Part “A”.
      • Information of old device shall be specified in the blank space on Part “B” to describe repairs, parts and materials used. Example: Replaced old/damaged/beyond repair 2” RPZ, Watts 009, serial # -----
        with a new 2” RPZ, Watts LF009M2QT, serial # ------. Test report shall be provided to DEP.
Note: A true copy of the approved “Annual Test Report” can be filed with DOB for updating. If a new proposal is required, new BFP plans shall be submitted by PE/RA to DEP. The new proposal includes alteration(s) in: size, type, installation orientation, configuration, make and model #, actual location (floor/level) of BFP device and all other pertaining details.

22. Complex/disapproved setting up of an on-site condition shall be clarified on shop drawings along with the proposed installation so that it may be of sufficient distinctness and easily perceived to the plumbing contractor.

23. The water system may require the installation of parallel BFP devices if the facility:
   - cannot readily accommodate interruptions of water service for periodic testing, repairs and malfunctions of the devices. One assembly is left on while the other is off.
   - is unwilling to schedule a shutdown promptly for testing or maintenance during normal hours worked by plumbing/contractor personnel.
   - Manifold installations may also be utilized on any water line larger than 10 inches.

24. In a building with multiple domestic services/lines, if a facility is rated as hazardous and water service shall be protected with RPZ device; all other domestic services/lines shall be equally protected also with RPZ devices.

25. Parallel Installation:
   In a building with a water service equipped with multiple master water meters, provisions shall be made for “Parallel Installation” of BFP assemblies. A BFP assembly of same protection shall be installed on each service line to each tenant. All master meters may be relocated and converted to sub-meters to each of the tenants. A new master meter, NYC-approved as per water service size, may be set and provision for a single BFP assembly shall be installed upon the mere discretion of the property owner/customer. Affidavit letter from property owner/customer along with prior written approval from BCS are required.

26. Pre-assembled stations that are utilizing any combination of approved integral BFP assemblies (along with strainers, pressure reducing valve (PRV), Meters, automatic control valve (ACV), shut off valve (SOV) as needed to suit specific applications) may be proposed to meet project requirements. They shall ensure uninterrupted flow for critical demands during maintenance and emergency conditions. They may be utilized in schools, universities, campuses, hospitals and other similar activities that must provide water 24/7. They shall comply with approved installation stipulation and meets OSHA safety standards.

27. By-passing a recognized BFP assembly/take off piping is not permitted unless the by-pass piping is equipped with an approved BFP assembly similar to the main line assembly. In many instances it will be necessary to install parallel BFP assemblies in order that water service will not be interrupted during the testing or repair of the assembly. As a general rule, BFP device shall be of the same size of water meter or larger. Then, the combined flow rate of the assemblies shall equal or exceed the flow rate of a single assembly setting. (Split sizes are the minimum). Examples:
   - 2” can be split into (2) 1-1/2”;
   - 3” can be split into (2) 2-1/2”;
   - 4” can be split into (2) 3”;
   - 6” can be split into 4” & 6”;
   - 8” can be split into (2) 6”;
   - 10” can be split into (2) 8”.

28. BFP plans shall be demonstrated on lot by lot basis, not building by building. If a building or facility is pervaded across two substantive lots and water services are allotted amongst OR multiple buildings on adjacent lots that have water services that feed each other:
   - Two (2) separate BFP plans, for each lot distinctly, shall be submitted.
   - Identical plot plan shall be developed for both lots on both plans.
   - Each plan shall specify the particular water service(s) dedicated to the pertaining lot.
   - Notes can be defined if any water service may be suffused to feed another location.
Notes:
- Separation of multiple buildings (on same lot) into substantive lots invalidates any/all previous approvals.
- Merging of multiple lots invalidates any/all previous approvals for each substantive lot.
- All related buildings under the same ownership/occupancy/business sharing heating system or interconnected water systems shall be considered part of the facility. A DCV assembly is the minimum requirement on each domestic water service.

29. For multiple buildings/sites in the same lot:
- All buildings, attached or detached, existing or new, shall be specified and clarified on the plot plan: exact location, configuration, and address along with all water service connections extended from the main.
- All water services shall be protected with approved BFP assemblies and listed on one application. No exemption from BFP requirements is allowed.
- Same level of protection shall be utilized for all similar type of water service lines.
- If the buildings are detached and no interconnection of water services, each building can be assessed individually and approved BFP device will be determined accordingly.
- For community colleges, JFK, MTA, Parks and alike, partial approval can be allowed.

30. For multiple lots that are fed from a particular water service: a BFP plans shall be processed for the lot that belongs to the incoming water service and specifically where the master water meter is located. Plot Plan shall show all pertaining lots and further note shall be defined if any water service feeds another locations.

31. All appurtenances shall be furnished, purged of deleterious matter, disinfected and installed to meet the specified and approved BFP plan by DEP. Most test failures on new installations are the result of debris fouling one of the check valves or the relief valve. Debris laden water systems require frequent cleanings. BFP devices shall be dismantled, cleaned and repaired whenever needed.

32. All items on the drawings shall be labeled and specified conspicuously:
- State (Existing or New).
- Size (either Existing or New).
- Type of water service (in complete description).
- Serial number(s) of the EXISTING master water meter(s) and sub-meter(s) if any.
- Specify state, size and serial # to each of the occupancies (tenants). What is each meter covering?
- Type, make, and model # of the proposed BFP device(s).
- Type of control valves, house control valve (HCV), meter inlet control valve (MICV) and MOCV.

33. All devices shall be installed, repaired and overhauled only by a NYC licensed master plumber. All devices shall be tested only by a tester who has received a “Certificate of Award” as a BFP device tester by NYS approved training program. STATE OF NEW YORK DEPARTMENT OF HEALTH Certified Backflow Prevention Device Testers: [www.nyc.gov/html/dep/pdf/water_sewer/nys-backflow-testers.pdf](http://www.nyc.gov/html/dep/pdf/water_sewer/nys-backflow-testers.pdf)

34. Plumbing permits are required to be obtained prior to the installation, relocation or replacement (swapping) of BFP devices. Failure of the testing company to get permits may result in future backflow prevention test forms (Report on Test and Maintenance of Backflow Prevention Device, Form Gen215B.) not being accepted by the DEP.

35. All BFP assemblies’ installations are subject to unrestricted inspection and verification by DEP.

B. Water System

1. The water system shall be considered as made up of two parts:

   - The utility water system shall consist of the facilities (production, treatment, storage and water distribution system) under the complete control of the water utility (DEP), up to the point where the customer’s water system begins, generally downstream of the water meter at the property.
The customer water system shall include those parts of the facilities which feed domestic/fire water to points of use beyond the termination of the utility water system. The term “customer water system” is that of any user whether or not a due charge is made. The customer water system is under the jurisdiction of DOB and shall comply with the DOB’s plumbing code.

2. Internal Water Main (IWM) Approval:
   - A Water Main which is constructed by a private entity within private property and not in a mapped street, record street or a street for which an opinion of dedication has been issued.
   - It is required solely for mains installed inside private property when the city water main (CWM) does not front the buildings (lots) which are located in private property.
   - It shall be a minimum of 8 inches in diameter, connected to CWM, where fire hydrants are required.
   - It shall be sized as per sizing Appendix Table # 3 (Chapter 20) or as approved by DOB.
   - It is the main supply line and a water service line is individual water service line extended for a building.
   - IWMs are under the jurisdiction of DEP up to and including the water meter and remain the responsibility of the private owner for their maintenance and repair.
   - IWM plans approval shall be obtained from DEP-Site Connection Plan Review.
   - Approval of water meter(s) shall be obtained from DEP-BCS.
   - Approval of BFP settings shall be obtained from DEP-CCC unit.
   - IWMs shall have in addition to any meters, an approved BFP device in a meter vault or above ground enclosure (Hot Box) installed inside the property within Two (2) feet of the property line.
   - After installation, such meters at the property line will be owned, maintained and repaired by the DEP. The meter at the property line shall be used solely for monitoring purposes and any individual meters in the development shall be used for billing unless the lot contains only one building.

3. Private Water Main (PWM) Approval:
   - A water Main which is private water service installed by a developer/property owner in the bed of a final mapped street or record street at their cost to provide water supply to building(s) situated far from the reticulated CWM.
   - A PWM can be installed to service either just one property, or a number of properties may wish to install a private water main together to minimize the cost.
   - The PWMs are connected to city water mains by wet connections.
   - The PWMs remain private under the ownership of the developer/property owner.

C. Types of Water Services
   (See Sketch for Types of Water Services Page 34)

1. As widely and commonly used terminology for major types of water services:
   - Separate water service; which can be either:
     - Domestic water service: Water consumed for purposes other than extinguishing fire, dedicated exclusively to domestic water system, or
     - Fire protection water service: A service pipe that supplies water exclusively to a fire protection system (sprinkler and/or standpipe or Hydrants).
   - Combined Water Service for combination of water systems which can be either:
     - Fire service with a domestic takes off, or
     - Domestic service with fire line takes off.

Combined water service is a service whose primary purpose is to supply water for general usage, but also supplies water for fire protection purposes as well:
- An approved BFP device shall be installed immediately downstream of the master meter in a combination service line with one connection from the water main serving the domestic water service and fire system regardless of how the system is running/connected inside the building (directly after the MOCV or indirectly via booster pumps, or even suction/roof tanks sized by DOB, etc.)
• The domestic water service may be connected to and supplied with water from the fire service. The size of
the fire service shall be determined by hydraulic calculations based on combined domestic and fire
protection demands as per DOB requirements. Immediately downstream the meter, on the domestic line,
an approved BFP device shall be installed. Otherwise, Exemption can be requested if the domestic water
system is qualified for waiver from BFP requirements. Fire line shall be protected with approved BFP device.

2. Materials for water service piping: (See RCNY Title 15 Chapter 20, Appendix Tables # 5, 6 and 7)
• All new service pipes shall have a lead content that shall not exceed 0.25%.
• New service pipes 2” size or less shall be brass or seamless copper piping.
• New service pipes larger than 2” can be either Red Brass or DIP, except the above-ground portion of
piping up to 4” size may be type K or L copper tubing.
• New service pipes 3” and larger shall be DIP.
• No black or lead pipe shall be used on domestic water services.
• Minimum size of the new water service pipes, corporation stops (Taps) and wet connections can be
verified through Chapter 20, Appendix Table # 3.

D. On-Site Auxiliary (Untreated) Water Source

1. The following types of cross-connections are specifically prohibited unless BFP devices are installed as
required:
• A cross-connection between a city water supply and a secondary water supply (well, spring, etc.).
• A private water storage tank (roof tank, holding tank) fed from the city water supply shall be deemed a
secondary water supply unless it is designated and approved for potable water usage.
• A cross-connection made by submerged inlet such as piping immersed in a tank, vessel, cistern or any
receptacle which may contain non-potable water or any contaminant or other liquid.
• A cross-connection between a city water supply and piping which may contain sanitary waste, a chemical
contaminant, other hazardous liquid, or any other non-potable piping systems.

2. Where there is a secondary water source or other piping system which can be cross-connected with the
potable water service, the water supply shall be protected by RPZ assembly on the incoming service line at the
service connection in a manner acceptable to DEP. Exposed piping should be identified by distinguishing
colors, labels, or tags, and be maintained so that each pipe can be readily traced in its entirety.

3. Interconnections with uncertified water supplies is PROHIBITED:
DEP shall not permit any physical connection of any other water supply and DEP’s water distribution system
unless an approved BFP assembly is installed and maintained at the service connection.

DEP will immediately discontinue water service to any premises or customer where such a condition occurs
until such time as the cross-connection is eliminated or the required BFP assembly is installed.

Customers using DEP’s potable water supply and any other uncertified water supply on the same premises
shall install and maintain a separate plumbing system for DEP’s water supply which shall be verified by
inspection, and install an approved RPZ at the service connection (directly downstream of the master water
meter) to protect against potential or inadvertent cross-connections between the two systems.

4. Private Wells and Auxiliary (untreated) Water Supplies:

1. Policies and requirements for customers with private wells and auxiliary water supplies are as follows:

a) Unless a facility’s degree of assessed hazard requires an approved containment device, no backflow
protection is required if the auxiliary source is verified to be permanently inactivated by removing the
well pump and associated plumbing, and welding the well casing closed. In such cases, formal
abandonment in accordance with DEP’s requirements should be pursued by the property owner. Visual
inspection of a weld sealed well casing is required to determine the installation of backflow protection.
b) If the well remains active, an approved RPZ is required at the water service connections extended from the city water main. The RPZ shall be installed as per current rules and regulations.

2. A new service to any premise with an active well or other auxiliary water supply on-site shall be locked off until the approval of a RPZ is verified by DEP.

3. An existing service to any premise with an active well or other auxiliary water supply on-site shall be required to be retrofitted with a RPZ at the service connection when a well is determined to be on the premises.

4. The piping of a non-potable water system shall be durably identified so that it is readily distinguishable from piping that provides potable water.

E. Characteristics of the BFP Assemblies

1. The primary BFP device installation shall be located directly downstream of the master water meter(s) and upstream of all branches or connections to the facility's water piping system. BFP assemblies shall be protected against freezing, flooding and mechanical damage. All BFP assembly internal parts shall be replaceable in line.

2. Single type, make and model # of any proposed BFP device shall be specified on the Application Form Gen236, item # 6, and on plans. "OR Approved Equal" is not acceptable. BFP device make and model # shall be specified accurately. Any missing/vague information shall render the test report unacceptable.

Examples:
   * Watts 757DCDA, BFG
   * Watts LF009M2QT
   * Wilkins 375XL
   * Conbraco RPLF4A etc.

3. Proper selection of a BFP device to prevent backflow into the city water main shall be commensurate with the degree of assessed health hazard that will exist on the water customer’s premises. When selecting a BFP device, whether it is used for a cross-connection at the water system connection or a cross-connection at the point of use, the following concerns will assist in determining which device will be most appropriate:

   a. Is it an indirect or direct cross-connection?
      An indirect cross-connection is subject to backsiphonage only, while a direct cross-connection is a connection which is subject to backpressure.

   b. What is the degree of assessed hazard?
      A “low hazard” shall mean a substance which is rated only as aesthetically objectionable (i.e. unusual taste, odor, stagnant water, etc.).
      A “high hazard” shall mean a substance that can cause illness or death if ingested (i.e. toxic chemicals, radioactive materials, etc.).

   c. What hydraulic conditions will the BFP device experience at the point of connection?
      BFP assemblies are to be used within their rated operating conditions. A BFP device which is over specified will increase the cost unnecessarily. Engineering data from the manufacturer should be consulted when selecting a BFP device.

4. The following considerations should be taken into account before selecting a BFP assembly:
   • The operating performance of BFP devices varies among manufacturers; therefore, it is suggested that the manufacturer be contacted to assist in selecting an appropriate device for the system. Refer to manufacturers’ operational characteristics of BFP devices.
   • All DEP and DOB plumbing rules and regulations shall be adhered to.
   • BFP manufacturer’s installation instructions shall be strictly adhered to.
   • If a manufacturer markets a prefabricated manifold series it will be approved as long as all of the BFP assemblies in the manifold are USC-FCCCHR approved.
F. Location/Installation/Requisites of BFP Assemblies

1. All BFP assemblies, required to protect the public water supply, shall be installed inside the premises at a location and in a manner approved by DEP unless an alternate location is approved. BFP assemblies shall not be installed in areas containing corrosive, toxic or poisonous fumes or gases which could render the assembly inoperable or pose a safety hazard to personnel. The installation of all BFP assemblies shall meet or exceed the minimum standards adopted by DEP. All BFP devices shall be installed and utilized in accordance with the manufacturer’s instructions as well as meet all applicable DOB and DEP codes. Test cocks shall be positioned to facilitate testing. Provisions shall be made to protect the assemblies from freezing and vandalism. BFP device shall not be used for any purpose other than that for which it is placed and not be installed so as to create a safety hazard, for example: above electric panels, steam pipes, boilers, etc.

2. A BFP assembly shall be installed immediately downstream of the master water meter (as close as possible) prior to any other connection. If the water meter is located in a pit outside the building, then, the BFP shall be installed immediately upon the service piping entering the building. A BFP device shall be of the same size as the water meter or larger. BFP assembly’s inlet and outlet shut-off valves are not interchangeable. The use or replacement of BFP shut-off valves other than those USC listed invalidates the Foundation’s approval.

3. The BFP assembly shall be installed where the units can be easily accessible with adequate space to facilitate handling, testing and maintenance/repair as to eliminate any obstructions and ensure safety to personnel and the assembly. Ideally, the installation should not require platforms, ladders or lifts for access. Adequate clearances from floors, ceilings and walls shall be provided to access the test cocks and to allow the repair, replacement and/or removal of the relief valve and check valves.

   All containment BFP assemblies shall be installed (in compliance with DEP and DOH requirements) with:
   - A centerline height minimum of 30” above the tread floor.
   - A centerline height maximum of 60” above the tread floor, provided that the 66” maximum clearance from shut-off valves’ handles above the tread floor shall be maintained. Any installation at a greater height shall be provided with a fixed platform, a portable scaffold, ladder or a lift meeting OSHA standards.
   - Large RPZ device shall have an 18” min. clearance between the bottom of the relief valve and the floor to prevent submersion and provide access for servicing the relief valve.
   - A min. of 12” inches of clear space shall be maintained above the entire highest point of the BFP assembly to allow for serving check valves and for operation of shut-off valves.
   - A min. of 30” of clear space shall be maintained between the front side of the device and the nearest wall or any obstruction. No bends, jumps or cross-overs are allowed. The by-pass on double check detector assembly (DCDA)/Reduced pressure detector assembly (RPDA) and device horizontally positioned shut-off gate valves (if any) are considered the front side of assembly. The full space is required to encompass one device to the opposite device or any obstruction.
   - A min. of 8” clearance shall be maintained from the entire back side of the device to the nearest wall or obstruction. 12” min. clearance for models that have mounted test cocks or relief valves that would be facing the back wall or any obstruction shall be maintained.

4. The water service pipe between the point of entry (POE) and the meter outlet control valve (MOCV), including the meter setting(s), BFP device(s) and control valves shall be kept visible. No fittings, devices, or equipment shall be permitted in the section of pipe upstream or downstream of the meter that interferes with the required laminar flow through the meter as per BCS requirements.

5. All depicted (pictorial) drawings (on Elev. and Plan views) of the BFP device(s) shall represent the same type, make and model # of the proposed device(s). Examples:
   - No Watts for Wilkins or vice versa and such like.
   - No RPZ for DCV or vice versa and such like.
   - No outside stem & yoke (OS&Y) valves for ball valves, which are often indicated on BFP devices of up to and including 2” size. This is due to the discrepant clearances.
6. Direction of flow in the BFP device shall be consistent with the normal direction of flow from the water main due to the discrepant clearances. Direction of flow shall be shown in all views.

7. DEP always prefers the RPZ device to be installed above grade level. However, some situation may present difficulties to installing the RPZ above grade and it is more appropriate to be installed below grade, to meet the minimum requirements:
   • for 2” size or less, the basement/cellar shall maintain a gravity drainage and min. drainage area of 2000 Cu. Ft. (below relief port) in case of catastrophic failure.
   • for larger than 2” size, the basement/cellar shall maintain a gravity drainage and min. 8 hours flooding time for full failure of RPZ relief valve.
   • if for any reason the building does not maintain gravity drainage, and the sewer sump/ejector pumps are utilized to fully accommodate a relief valve failure, the sump/ejector pumps shall be connected to a permanent emergency power supply in case of power failure.

   **Note:** Proper selection of RPZ assembly that maintains less discharge rate can be checked.

8. RPZ/RPD assemblies shall be installed so that the relief port will never become submerged. This prohibits installation in a pit or vault that cannot be drained by gravity to the surface of the ground. In addition to that, the submersion calculations will never be fulfilled.

9. Building(s) which is/are located in the Federal Emergency Management Agency (FEMA) designated flood/deluge plain will have: (Local Law 100 of 2013) (5.4, 5.4.1, 5.4.2):
   • All BFP devices shall be installed so that they are not subject to flooding (no part can be submerged).
   • RPZ/RPDA shall generally be installed one (1) foot above the 100 year flood plain elevation.
   • RPZ/RPDA shall be installed above grade level on the maximum possible height in a safe place.
   • Water meter(s) installation requirements to be requested directly from the BCS.
   • House Control Valve (HCV) shall be located within 2’ from point of entry (POE) and the whole setting up shall be elevated above grade level.

10. If the BFP is proposed to be installed remotely from the water meter, so:
    • Exposed piping shall be readily accessible for inspection by DEP.
    • Piping shall be stenciled: “FEED TO BFP, DO NOT TAP OR CONNECT TO THIS LINE”.
    • Piping after the MOCV can be connected to the existing/proposed water system.
    • Additional control valves (OS& Y or ball type) are optional.
    • Eventual setting up of water service(s) is/are acceptable by DEP and DOB.

11. For all installations of BFP assemblies; where the distance between the point of entry/water meter and BFP device is greater than 10’, all exposed piping shall be stenciled “FEED TO BFP, DO NOT TAP OR CONNECT TO THIS LINE” at 5’ intervals, at all wall and floor penetration:
    • The lettering shall be two (2) inches high, in a bold, condensed, sans serif, gothic font, using capitals only.
    • Labels shall be stenciled onto a prepared background using an acceptable permanent paint. Labels shall be rot and water-proof. Self-adhesive labels shall have a permanent water proof adhesive. Non-adhesive labels shall be attached using a permanent adhesive. A sample shall be submitted to the PE/RA for approval.
    • **Color:**
      - For domestic water lines, black letters on a white or light blue background.
      - For fire water lines, white letters on a red background.

12. Provisions should be made to protect the assemblies from freezing. Location where BFP assemblies are installed shall be sufficiently lit and heated. Insulating materials should not restrict the RPZ relief valve discharge or accessibility to any BFP assembly’s test cocks or name plate.
13. All BFP assemblies shall be adequately supported and/or restrained to prevent lateral movement. Pipe hangers, braces, saddles, stanchions, piers, etc., should be used to support the device and shall be placed in a manner that will not obstruct the function of or access to RPZ relief valve.

14. Due to the inherent design of a RPZ assembly, fluctuating supply pressure on an extremely low flow or static flow conditions may cause nuisance dripping and potential fouling of the assembly. While not effective in all cases, the installation of a soft seated check valve immediately ahead of the RPZ will often hold the pressure constant to the assembly in times of fluctuating supply pressure.

15. DEP, in any event, anywise, never recommends or disfavors the installation or dismantling of any fixtures of any kind inside any facility (existing or new) including private wells, coin/card operated washing machines and such like. DEP is not responsible, authorized or allowed to get involved in design, re-design, remodeling, rectifying, or troubleshooting any technical problem/dilemma of any kind in any facility. It is entirely the responsibility of the designer of records (PE/RA) and subject to approval by DOB.

16. Department of Parks and Recreation Vaults:
   - Vaults and lids shall be approved pre-cast concrete structure type. All vaults shall be well drained, constructed of suitable materials, impervious so that it will not flood and sized to allow for the minimum clearances required. Separate sections of pre-cast concrete structures shall be Two (2) feet apart.
   - Vaults, lids, and the BFP assembly are owned and maintained by the property owner, and they incur all responsibility and liability of all items.
   - Vaults shall be provided with access a ship-ladder or step irons (meeting OSHA standards) and adequate natural or artificial lighting to facilitate maintenance, inspection and testing.
   - Vaults shall be provided with a sump pump when in potential groundwater installations.
   - Vaults shall have 6'-6" minimum height and maintain approved water service setting up. Water service piping shall be extended underground up to the concrete vault.
   - Vaults shall maintain all safety precautions, when entering confined spaces.
   - Winterizing connection upstream of the BFP assembly is not allowed. It is recommended that the assembly is removed and the system drained during winter time.
   - Brass or plastic plugs are required in all assembly test ports in vault installations.

G. Approved BFP Assemblies

1. DIFFERENT TYPES OF MECHANICAL BACKFLOW PREVENTION DEVICES
   Most backflow preventers fall into one of three categories:
   - The vacuum breaker: prevent backflow due to backsiphonage on the downstream side of an internal system, which will overcome the pressure on the supply side. They are installed in the supply system that feeds internal fixtures where there is a possibility of backflow.
   - The double check valve (DCV), or
   - The reduced-pressure principle valve (RPZ),
   Both containment devices prevent backflow due to superior pressure, or back pressure on the downstream side of a system, which will overcome the pressure on the supply side. They are installed in the main supply system where there is a possibility of backflow. Unless otherwise specified by the manufacturers, all assemblies are to be installed on cold potable water applications below 110°F.

2. NYC approved types of BFP devices are: Air Gap, DCV or RPZ. DCDA and RPDA (either type I or II) are outgrowth of DCV and shall be installed only on the fire protection service lines. Air Gap shall not be altered, by-passed or voided in any way without prior approval from DEP Review Unit and shall be available for inspection at all reasonable times.

3. Containment BFP device on a domestic water service, or combined water service which is domestic with fire take off, can be DCV or RPZ and on a Fire service can be DCDA or RPDA (all either existing or new). Fire Siamese Connection Piping on the inlet side of the main HCV is prohibited. Any fixture shall be tapped downstream of the BFP assembly. Test cocks shall not be used as service connections.
4. A RPZ device will be required where a DCV is not acceptable as per AWWA-M14 requirements. The BFP assembly shall be appropriate with the evaluated degree of health hazard.

5. Proposed BFP device(s) shall be USC-FCCCHR approved, currently produced by the manufacturer, adequately supported/restrained (to prevent lateral movement), have shut-off valves on both ends as one assembly, and indicated on the drawing. Change/alteration/reconfiguring of any part on the whole device shall result in invalidating the whole assembly. Use of spare parts other than those of the original manufacturer invalidates the approval of the whole assembly. Retrofit units that manipulate the assembly invalidate the approval. All of the assemblies are approved for the indicated orientation(s) only. Rotation of BFP assemblies on either axis will invalidate the USC-FCCCHR approval. Rotation of shut-off valves of one bolt hole only is permitted for the 2-1/2" and larger flanged assemblies. No rotation is allowed for the grooved shut-off valves-assemblies.

6. Effective January 4th, 2014, all proposed installation/repair of BFP device(s) to be utilized on all domestic water services for human consumption (Drinking, Food Preparation), shall be Lead-Free in compliance with the amended Federal Law (SDWA). Lead-Free BFP devices on fire protection services are optional.

7. All BFP devices’ manufacturers reserve the right to keep, re-design, re-model, revamp or discontinue their own models without any prior notice or incurring any obligation to any customer/client. Consequently:
   - DEP makes practical and effective use of USC-FCCCHR approved list of BFP devices.
   - Engineers, Contractors, Plumbers, or any person engaged in the business of Plumbing, etc. are required to recognize and utilize the USC-FCCCHR approved list of BFP devices in compliance with DEP Program.

8. All BFP devices on the approval list shall be equipped with either full port ball valves or resilient wedged gate valves integral to the assembly. Butterfly valves/ PIV gate valve are acceptable on the BFP devices as long as they are approved by USC-FCCCHR. OS&Y gate valve(s) or any other approved indicating valve(s) by DOB shall be installed on the water services that feed any fire protection system.

9. The discontinued BFP devices;
   - Previously approved assemblies that are out of phase, i.e. no longer in production or for which only spare parts are available should not be acceptable when proposed. Where such assemblies are currently installed, however, they may remain in service provided that they are appropriate for the degree of hazard. When these assemblies demonstrate repeated test failures, require frequent maintenance or if spare parts cannot be readily obtained, they shall be replaced by any of the currently approved equivalent assemblies.

10. Unacceptable backflow prevention devices:
    - As the prevention of backflow in pipelines is a critical problem that requires the tight closing of valves under all conditions of service when flow ceases in the normal direction, therefore, when a potable water system shall be protected against contamination from backflow, it is essential that the BFP device be fully adequate, well-constructed, properly installed and carefully maintained.
    - Currently DEP recognizes only BFP devices that have been approved by USC-FCCCHR. So, unacceptable devices (as containment) include, but are not limited to the following:
        - Single or Dual Check Valve.
        - Detector Check Valve.
        - Atmospheric (Non-Pressure) type Vacuum Breaker (AVB).
        - Pressure Vacuum Breaker (PVB).
        - Slip-Resistance Pressure Vacuum Breaker, Hose Bibb Vacuum Breaker (HBVB).

11. DCDA/RPDA (Type I) is approved as one assembly with the by-pass meter along with small DCV/RPZ. DCDA/RPDA has been evaluated with a specific meter as the detector meter of the assembly. The by-pass meter on the DCDA/RPDA is not a mere Fire-Rate Meter. It must register any flow (e.g. 3 to 5 Gal.) that occurs through the assembly (main line or by-pass). However, it is not necessary that the meter accurately register the flow. DCDA/RPDA-by-pass meter is USC-FCCCHR approved. The installation of the by-pass water meter with remote sensing capability (if required) shall be acceptable by BCS. The use of any other meter or modified bypass piping invalidates the approval. http://usclist.com/meters.aspx
12. All proposed installations shall be approved by DEP prior to the start of system construction. All installations shall comply with the drainage specifications, clearance dimensions and other requirements as determined by DEP. No change or rearrangement unless an approval for the same is obtained. Due to space restrictions, no substitution is allowed for a certain approved device unless an approval is obtained.

13. It is unlawful to decommission or swap the placed BFP device for any reason unless DEP is notified. No unauthorized modifications to the approved design are allowed, unless re-approved by DEP.

14. Current manufacturers of approved BFP assemblies:
   - Ames (division of Watts): http://www.amesfirewater.com/
   - Apollo/Conbraco: http://www.apollovalves.com/
   - Backflow Direct (Deringer): http://backflowdirect.blogspot.com/
   - Cash Acme: http://www.cashacme.com/
   - Febco (division of Watts): http://www.febcoonline.com
   - Flomatic (Danfoss): http://www.flomatic.com/
   - Watts: http://www.watts.com/
   - Wilkins: zurn.com

Manufacturers that are no longer producing BFP devices:
** Bruckner   ** Cla-Val   ** Grinnel   ** Hersey   ** Orion

Note:
These companies have ceased manufacturing BFP assemblies and parts. Parts have become increasingly hard to obtain, and replacement of a whole assembly needing repair is the best option.

H. Orientation of BFP Assemblies

1. All BFP devices shall be installed in a horizontal position (conventional in line) unless they are specifically approved for vertical installation or any other USC-FCCCHR approved orientation.

2. Installation, orientation of the BFP assembly is a factor in USC-FCCCHR performance test approval: Horizontal, Vertical, N-Pattern, Z-Pattern or L-Pattern. (H, HVD, VUH, VD, VU, VUVU, VUVD, VDVU, or VVDV).
Rotation of assemblies on either axis will invalidate the USC-FCCCHR’s approval.

I. Metering and Strainer

1. Actual location of water meter(s) and BFP device(s) shall be specified on the plans. A vertical cross section of the proposed installation with elevations from floor, ceiling, outside grade level and all nearby objects (if any) shall be demonstrated.

2. All water services shall be metered at the utility system. NYC approved water meter(s) shall be utilized. The master water meter shall be set as close as possible from point of entry of the service pipe through the building or vault wall. All metering requirements (size, model, type: trade or brand name, installation/orientation, location (pit/vault/building, etc.), relocation, replacement, removal, by-pass, direction of flow, setting up, sub-meters, protection, registration, etc.) shall be obtained immediately from the BCS. The plumbing contractor shall co-ordinate all permits of tap/wet connection/plug (if any) and water meter with BCS. After installation of the water meter and remote reading device, no person other than authorized DEP personnel shall disturb, break, alter relocate, interfere with the seal, or interfere in any way.

3. No strainer is allowed upstream of the BFP device. It shall be set immediately upstream of the water meter if required. It shall be NYC approved Flat or Z Plate type only from the water meter’s manufacturer. A basket strainer and a Y-strainer are not allowed as per BCS requirements. No strainer is to be used in a fire line without the approval of the insurance underwriters or the authority having jurisdiction.
However, a strainer shall not be installed when the BFP is called upon for emergency deluge or used on a fire sprinkler system and/or individual sprinkler feed. No fittings capable of a branch connection shall be permitted in the section of the pipe upstream of the meter or meter setter except an approved strainer or PRV as per BCS code.

**J. Control Valves**

1. House control valves (HCV), which shall be made of material similar to the corresponding service pipes, shall be gate type with the exception of those between the sizes of \(\frac{3}{4}''\) and 2'', which may be full port ball valves. The lead content of such valves shall not exceed 0.25% by weight. The house control valve shall be placed in the service pipe inside the building/housing within two (2) feet of the building wall, and shall be located where it is accessible at all times. For fire, sprinkler, and standpipe service pipes, and for any service pipe which supplies sprinkler heads, the house control valve shall be an OS\&Y valve or an indicating valve approved by the DOB. Notwithstanding the preceding sentence, for fire or combined service pipes two inches or smaller, the house control valve may be an OS\&Y valve or a UL/FM-approved full-port ball valve approved by the DOB.

2. Butterfly Gate Victaulic Valve (BVGIC or BFG) can be used as a HCV on the fire service(s) as it is equipped with an indicating flag. But ensure if the following fixtures are required if need be and the BFG can be equipped with:
   - **Tamper switch.**
   - **Chain Lock.**

3. Control valves: MICV, Meter T.T. and MOCV, all belong to the water meter. As per BCS requirements for all new installations:
   “Meter settings shall have an inlet valve immediately upstream of the meter and any strainer and an outlet valve downstream of the meter. For meters two inches in size or smaller, the valves shall be full-port ball valves. For meters larger than 2" in size, the valves shall be rising stem, resilient wedge seated, and epoxy-coated gate valves”. BFP devices' shut-off valves shall not be used as the inlet or outlet control valve of the water meter.

4. MICV, Meter T.T. and MOCV are required for all new installations of RPZ or DCV devices. Meter T.T. and MOCV shall be installed downstream of the BFP device for all existing services which do not have any of them. For major renovations, re-locating or installing new water meter(s), all are subject to same stipulation as “NEW INSTALLATIONS”.

5. Master Water Meter T. T. shall be:
   - Installed within the same meter room with the HCV and/or MICV.
   - Plain-Tip (End Faucet) for meters up to 1" size.
   - 1.5" for meters 1.5" size, with valve, capped.
   - 2" for meters 2" size or larger, with valve, capped.

   **Note:** Test Tee may face up, down or sideways. Any proposed discrepancy is subject to approval by BCS.

6. Tamper Switches (TS) on Control Valves:
   - TS is just an electro/mechanical switch that can be installed on the valves’ indication mechanism (lever, stem, flag, etc.) to detect the operation condition of the valve(s) in open or close position.
   - TS may be required/recommended by DOB/ Fire Department to signal the state (Open/Close position) of the control shut-off valve(s).
   - Generally, the control valves (manual/automatic) that can be used on the fire service(s) shall be of indicating type. Consequently, the TS can be utilized.

**K. Fire Protection System**

1. Fire protection water service (extended from the CWM) shall be protected with an approved BFP device based upon AWWA-M14 guidelines. Effective October 1, 2009, DEP mandated to enforce all fire services
For Combined Water Services:
- If a domestic water service is taken off a fire service, then the minimum required installation on the fire service is a DCDA.
- If a fire service is taken off/fed by a domestic water service, then the minimum required installation on the combined service is a DCVA.

Note: size of the fire line shall not exceed the size of the water service.

2. High hazard fire sprinkler systems shall include, but not limited to: antifreeze systems, foam systems, systems charged from or tied into ponds, lakes, streams, or any water source other than the approved (treated) public water supply.

3. Fire service(s) shall be protected with RPDA if there is/are:
   - Chemical provisions used in the fire system (antifreeze, rust-inhibitors).
   - Fire siamese connection(s) located within 700 ft. from an uncertified source of water, (river, creek, bay, lake, fire cistern, pond, etc.).
   - Domestic and fire water risers interconnect at any point on the house side of the BFP devices.
   - Fire wells in the premises.

4. If there is a private fire hydrant on site, fire service shall be protected with an approved BFP device. Note: Fire hydrant in the public right of way (ROW) does not require BFP device.

5. BFP device for fire hydrant use:
   Fire hydrants are installed primarily to provide a water supply for fire-fighting purposes. Fire hydrants are used for purposes other than fire-fighting, e.g. for construction water, dust control, water hauling, jumper connections for super chlorination of mains, pressure testing, and temporary service. These uses prevent the potential for many different types of cross-connection hazards to occur. Construction contractors/customer using the public fire hydrant shall follow safe connection procedures to prevent backflow. Temporary service from a fire hydrant requires installation of RPZ assembly and water meter. This will ensure that the potable water supply is protected from unknown materials, chemicals, and other non-potable substances that are contained in, or that have been in contact with, hoses, pipes, tanks, etc. The applicant is required to provide adequate support and protection against freezing weather conditions. BCS shall approve the installation, testing, permitting and removal of such equipment. Customers shall abide by the permit instructions.

6. Reducing/diminution the diameter on the fire service(s) is not DEP jurisdiction.
   - As a general rule: no reduction is allowed on the fire service(s).
   - An approved BFP device(s) [DCDA or RPDA], shall be installed downstream of the HCV and shall be of the same size as the service & HCV (or larger, if need be). However, the reducer (if any) may be proposed, shall be located after the BFP device, and subject to approval by DOB.
   - Reducing the diameter on the Fire service(s) is not the decision of the designer.
   - If reduction is required on the fire service(s), written approval from DOB shall be provided. The DOB shall approve the reduction of the diameter of a fire service based on the condition and hydraulic requirements of the facility’s fire systems demands.

7. DOB shall approve all replacement, upgrades, or discontinuance of fire protection service(s) in active buildings/facilities. It is the responsibility of the property owner/customer to notify the DOB upon the termination and activation of fire protection service.

8. The DOB shall determine the size of all fire service pipes to be installed. The size of corporation stops (taps) or wet connections for fire service pipes shall be subject to the approval of the DOB. This requirement determines the size of the fire service from the “tap” up to fire system inside the facility. This service determines the size of all fittings: shut-off valves and control valves including and not impeding the backflow prevention valve.
L. **Drainage**

1. Drainage for BFP assemblies shall be provided for all installations of DCV or RPZ to accommodate discharge during testing, maintenance, or draining of the unit without creating a safety hazard or a nuisance problem. Drainage is greatly needed for the protection of the foundation/footing/walls of building(s) utilizing the BFP assemblies, in case of leak, damage, failure of device(s) such as break, crack, etc. Drains, to facility drainage system, shall not be subject to flooding.

2. Property owner/customer shall ensure that all drains and drain ports are clear and operating for all BFP devices. Acceptable permanent means of drainage connected to facility sewer system shall be provided in strict compliance with local plumbing code. Any discrepancies can be verified with DOB as needed.

3. Details as to where and how water will be disposed of to satisfy the drainage needs for RPZ/RPD devices shall be shown and specified on the plan. Drainage for all installations of DCV and DCDA devices shall be maintained to accommodate discharge during testing, maintenance, draining of the unit, or even failure of device (damage, crack, etc.). In any cases, the property owner shall be made aware of the potential for water damage in the event of a discharge.

4. Drainage capacity of RPZ devices shall be sized to accommodate both intermittent discharges and a catastrophic failure of the relief valve. Drain is capable of exceeding the discharge rate of the relief valve. Refer to the manufacturer’s flow curves to determine maximum discharge rate based on the supply pressure or actual on-site pressure; whichever is greater.

**Notes:**
- Drains shall be sized properly. DEP shall not be responsible for damage caused by the deficiency of a drain or an undersized drain.
- Floor drain capacities are established by the floor drain manufacturers and are not recommended by DEP. Drain specifications/installations shall be in compliance with DOB plumbing local codes’ requirements.

5. Drainage from RPZ/RPDAs’ relief ports shall be by gravity drains. Relief valve port shall never be plugged, restricted or solidly piped to drain. Sump/Ejection pumps are not allowed for these devices’ installations unless they are sized to accommodate the maximum discharge rate and permanently connected to an emergency power supply and/or high water level alarm, if facility is yield 24/7, is provided. Otherwise, if there is no gravity drainage, RPZ/RPDA shall be installed above grade level. An alarm shall not be used as a substitute for drainage. Sump interior measurements and requirements shall be in compliance with DOB code.

6. In a building with sewer ejection pump(s), that may be used for all plumbing fixtures located on the underground floor (basement/cellar, etc.), in addition to floor drain(s) by gravity to city sewer, this shall be shown, specified and clarified on the drawings: “The floor drains that are being used for the RPZ device will not be connected to the sewer ejection pump, they will be gravity drained to the waste line out to NYC sewer by gravity.”

7. Discharge from RPZs’ relief valves shall be readily detectable to maintenance personnel either visually or by means of a water level alarm, flow indicator light, or acceptable equivalent. An alarm system shall be implemented by licensed electrician as per DOB code.

8. Discharge piping from RPZ/RPD devices’ relief valves using manufacturer’s air gap fitting or a funnel drain to be terminated a 2” Min. above any floor drain or any other receiving receptacle. Drainage from RPZ/RPDA to storm sewer is not allowed, only to a sanitary or combined sewer. Air gap fitting shall maintain a proper air gap and does not enclose or cover the relief valve.

9. Discharge piping shall not be connected to sewers, catch basins, or below the flood rim of river banks/swales.
10. No reduction shall be made in the size of the relief port drain line. Air gap drain fitting/funnel drain is designed to funnel relief valve discharge safely to a drain.

11. Drain line below air gap fitting or funnel drain can be any acceptable standard piping material. Sizes of air gap fitting or equivalent funnel and underneath drain lines are similar. Sizes of drain lines shall be specified on drawings.

12. An air gap shall be maintained between the RPZ relief valve opening and any receiving discharge piping. The air gap shall be at least twice the dimension of the effective opening of the valve; but in no case shall an air gap be less than 2 inches.

13. Discharge piping connected to a sanitary or combined sewer shall be trapped (P-trap) and equipped with a backwater check valve (BWV). The connection shall be to house sewer before house trap or to the house standpipe sewer (soil stack).

![P-Trap Diagram]

Note: “S” trap is not approved. Water filling the downstream vertical portion of the S trap will cause siphoning and loss of trap seals. Trap seals shall be maintained to prevent sewer gases and vermin from entering the facility.

14. The PE/RA shall verify if house trap pit drains to a dry well. The drain shall be connected to house sewer connection before the house trap. A house trap (cleanouts) cannot be used as a floor drain as it should be tightly plugged to prevent gases and vermin from entering the facility. Fresh air intake vents (FAI) cannot be used for drainage.

15. For Port Authority of New York and New Jersey/Metropolitan Transit Authority (MTA)/ John F. Kennedy Airport (JFK), or alike (as per DOB plumbing code):
   “Spilling of the clear water drain from the backflow preventer devices, can be within the property lines in an area with low or no pedestrian traffic. This area is not within the DOB’s jurisdiction”.

16. Discharge piping from RPZs’ relief valves shall be terminated above grade in an area not subject to flooding (generally 1' above the 100 year flood elevation). The terminal end of the discharge piping shall be equipped with a rodent screen and should be supported by a headwall (lower rim 6” min. above grade). Flap valves should also be considered to prevent entry of cold air as deemed necessary.

17. All exterior drains that shall be kept free of ice and snow during cold temperatures are not allowed unless approved by DOB. Exterior drains; inside the property; to back yards, gravel or grass areas may be acceptable and are subject to approval by DOB as well.

18. RPZ/RPDA assemblies shall not be installed in any areas subject to possible flooding. This includes pits or vaults which are not provided with a gravity drain to the ground’s surface that is capable of exceeding the discharge rate of the relief valve.
19. The RPZ can be positioned at an elevation high enough in the basement/cellar/etc. (below grade level) so that the RPZ discharge nozzle clears the sidewalk exterior grade so that there is no possibility of the discharge water ever blocking the RPZ discharge nozzle.

20. The RPZ can be positioned at an elevation high enough in the basement/cellar (or any underground Level) so that the RPZ discharge nozzle clears the house sewer connection before the house trap so that there is a possibility of the discharge water flowing by gravity to the NYC sewer.

21. The submersion calculation is required for all installations of RPZ/RPDA below grade level. It is an 8 hour calculation as a backup to add a fails safe to guarantee the RPZ relief valve won’t end up under water.

22. Air Gap Fitting and drain pipe sizes (for RPZ Assemblies):

   The air gap fitting is designed to funnel moderate discharges from a RPZ’s relief valve due to line pressure fluctuations and/or minor check valve fouling, into the drainage system or terminating above a floor drain. It reduces the amount of water splashing in the area around RPZ assemblies. Under certain conditions relief valves can discharge water at rates greater than the drain capacity. The air gap drain is not designed to catch the maximum discharge possible from the relief valve. It will handle any normal discharge or nuisance spitting through the relief valve. However, floor drain size should be designed to prevent water damage caused by a catastrophic failure condition. DOB's plumbing code should be followed.

   Drain piping is easily attached to the air gap device threaded bottom (NPT Thread). The size of the drain line from the air gap fitting shall not be reduced.

Notes:
- The air gap fitting is NOT designed to collect the full discharge capacity of the relief valve. Refer to the manufacturers’ charts for RPZ relief valve full discharge rates. The appropriate air gap fitting should be selected for each specific make and model # of reduced pressure backflow prevention assembly as outlined by manufacturers.
- The design of the air gap allows water to overflow through the cutouts on the side if the flow through the attached drain pipe is not able to satisfy the drainage requirements.
- Air gap fitting or drain funnel is not designed to support the drainpipe weight. The drain piping should be supported by other appropriate means.
- Alternative funnel drain and drain piping can be utilized applying same stipulation of air gap fitting module sizes.

M. Status of BFP Assemblies

1. The status of a BFP assembly is determined by a performance evaluation in which the assembly meets all minimum standards set forth by the approved testing procedure:

   *** RPZ:
   a. Relief valve must have an opening point of 2.0 psid or greater.
   b. Backpressure on 2nd check valve must hold tight.
   c. Static pressure drop across 1st check valve must be 5.0 psid or greater (3.0 psid or greater than relief valve opening point).
   d. Outlet shut-off valve must hold tight.
   e. Static pressure drop across 2nd check valve must be 1.0 psid or greater.

   *** DCV:
   a. Static pressure drop across 1st check valve must be 1.0 psid or greater.
   b. Backpressure on 2nd check valve must hold tight.
   c. Outlet shut-off valve must hold tight.
   d. Static pressure drop across 2nd check valve must be 1.0 psid or greater.
2. RPZ/RPDA shall provide a minimum of: A 5 PSI static pressure drop across 1st check valve and 2 PSI static pressure drop across relief valve.

3. A RPZ uses a stiffer 1st check valve spring in the main line assembly than is utilized in a DCV assembly. This is to insure that low flows will pass through the bypass meter on DCDA. Therefore, the 1st check valve spring will not be interchangeable with the 2nd check valve spring, contrary to the normal practice for a double check valve assembly.

4. Once a containment device (external only) has been approved and installed, the plumber should review the initial testing requirements with each customer, including frequency of testing (a yearly test shall be considered a minimum), and how to report the testing results. The NYC Test and Maintenance of Backflow Prevention Device Gen215B form shall be used. (http://www.nyc.gov/html/dep/pdf/water_sewer/10.pdf).

5. Backflow prevention assemblies shall be tested immediately after installation and at least once a year thereafter. If a serious defect is detected at the time of the first installation, the device should be promptly repaired or replaced. BFP assemblies should be rebuilt or overhauled every five (5) years, after the initial installations, as per DOH requirements. Pending plans shall render the initial test report(s) unacceptable when utilizing previously approved plans.

6. Devices required to be tested annually (on the due date) will be at the customer's expense and results forwarded to DEP on a GEN215B form. A BFP assembly that fails a test or does not meet the standards is required to be repaired or replaced by the property owner/customer to correct any deficiencies or problems with the assembly. The customer shall be responsible for any and all repairs/replacement necessary to maintain proper working condition of BFP assembly. All tests shall be performed by a NYS certified backflow prevention device tester who holds all proper licensing under NYS law regarding backflow testing.

7. Existing BFP assemblies shall be allowed to remain in service provided that they:
   • are deemed adequate and effective for the on-premises degree of assessed hazard.
   • are in good condition and functioning properly with cut valves in a workable position.
   • maintain approved setting up, size and clearances, are testable and reasonably accessible.
   • have information readable (size, type, make and model #, and serial #).
   • are legalized by DEP.
   • have records of all periodic testing and maintenance available with DEP.
   Note: installation inside of a locked building is prohibited.

8. Any existing backflow preventer shall be allowed to remain in service unless the degree of hazard is such as to supersede the effectiveness of the present BFP, or result in an unacceptable risk to the public health. Where the degree of hazard has increased, as in the case of a residential installation converting to a hazardous business establishment, any existing BFP assembly shall be upgraded to RPZ device, or RPZ device shall be installed in the event that no BFP device is present.

9. Decommission/Swap of RPZ assembly:
   In General: BFP devices shall not be by-passed, made ineffective/inoperative or removed without authorization from DEP.
   A premises having no auxiliary (untreated) water system is eligible to decommission the containment RPZ device that may not be required by current DEP regulations and local codes provided that:
   • The premises shall be surveyed by DEP authorized inspectors to determine the presence and prevalence of potential hazards.
   • A PE/RA shall inspect the customer's plumbing system(s), to confirm that no cross-connections are present, and submit an elaborated decommission report and plans on the BFP assembly will be physically replaced with proper containment that is deemed adequate and effective for the ongoing degree of hazard.

10. The backflow prevention assemblies have been evaluated with a specific set of shut-off valves as an integral part of the assembly. The use of any shut-off valve on a specific assembly, other than those listed for that specific assembly invalidates the USC-FCCCCHR approval.
N. Actions and Procedures

1. A full review of the plans shall be adopted upon receipt in a timely manner. DEP’s procedure is to provide plans processing results in 3-4 weeks. Sign off letters may be delayed when substantial problems are encountered during the process. In such cases, the DEP will notify the applicant that a problem was encountered that has resulted in a delay and plans will be released once the problems have been corrected. An applicant shall allow sufficient time for BFP plans submission, processing, review, approval, sign off and mail out.

2. Plans shall be returned to PE/RA if additional information is required or they have been disapproved.

3. Plans may be kept on hold (pending) for additional requirements to get the plans approved.
   Examples:
   - Additional information requested of the applicant
   - Missing filing fee
   - Requesting inspection report
   - Scheduling a meeting for plans’ open discussion

4. “As-built Plans” that are legalizing the on-site condition supersede all previous submissions and/or approvals. A new “Approval #” will be initiated. Initial Test Report(s) shall be required utilizing the approval # on the updated or revised plans.

5. Approved plans shall be for the intended installations. Approved plans will not be partially voided or superseded. New plans shall be provided and the whole previous plans shall be nullified. New “Approval #” will be initiated.

6. Approved plans will supersede/void/nullify any Exemption request (either previously approved or recently provided).

7. Approval of plans’ submissions is solely for BFP devices (external containment) and shall not constitute approval of the meter setting or any other aspects of the water service design. This approval is valid only for Two (2) years from approval date of the sign off letter. New plans shall be submitted along with the filing fee to update the expired approval. Any unauthorized cross-connection upstream of the BFP device(s) shall render the approval void. Partial approval (if request is acceptable) shall be admitted only for same types of water services, all domestic or all fire. Other services shall comply within 60 days of approval.

8. If the applicant requests the withdrawal of an already approved plans, an affidavit letter from the property owner/customer shall be provided. New submission may be requested.

   Note: DEP will grant approvals only and never void, supersede, withdraw, reinstate or discard any plans, either approved or rejected, unless otherwise requested officially by the applicant (PE/RA) and/or the property owner/customer.

9. When plans are approved, a sign off letter will be issued. A true copy of the approved plans along with the sign off letter will be mailed out to the Applicant’s attention and a copy of the sign off letter will be mailed to the property owner/customer as well (as per given addresses).

10. If needed, meetings can be conducted with applicants, customers, inspection personnel, licensed plumbers or others who will be involved in the design, installation, inspection, or testing and repair of backflow prevention assemblies to discuss the various aspects of the proposed implementation plan.

11. DEP will not recommend any engineer, architect, plumber, tester to any customer ever.

12. DEP will not participate in the design of the water system, or any other aspects of the water service. Suggestions can be proposed and verified if favored by designer of records.
4. DEP POLICIES

The Federal Safe Drinking Water Act (SDWA) of 1974, as amended in 1986 and again in 1996, states that the water supplier has the primary responsibility to protect the public water system by containing potential contamination within the premises of the customer through cross-connection control by containment.

OBJECTIVE
The objective of DEP is to assure the safety of water delivered to all users. An active, ongoing effort to control cross-connections is necessary under all foreseeable circumstances. It is, therefore, imperative that everything possible be done to protect against the degradation of water quality within the distribution system. To maintain and accomplish this objective, the following continuing program goals of DEP are designed to systematically and effectively control all actual and potential cross-connections.

A. Types of Water Service Connections
B. Types of BFP Assemblies Installations
C. BFP Assemblies Installation Criteria:
   I. AIR GAP
   II. RPZA
   III. DCVA
   IV. DCDA
   V. RPDA

Plan Review:
D. Application Form NYC GEN 236
E. Plot Plan (Site Plan)
F. Elevation View (Riser Plan)
G. Plan View (Floor Plan)
H. Time Calculation before RPZ/RPDA Floods
A. **Types of Water Service Connections**

**COMBINED SERVICE**

- **Domestic Service**
- **Fire Service**
  - (A.K.A. Fire with Domestic Take Off)
- **Fire Service (Sprinkler and/or Standpipe)**
  - (A.K.A. Domestic with Fire Take Off)

**SEPARATE SERVICES**

- **Domestic Service**
- **Fire Service**

**Notes:**
- DOB Approval is required for all fire water service connection lines.
- DEP Approval is required for all domestic water service connections.
- Control Valves can be either OS&Y or ball type based on size.

**SKETCH FOR TYPES OF WATER SERVICE**
B. Types of BFP Assemblies Installations

• Single Line:

“RPZ” or, “DCV”

• Dual, Triple, etc. (Manifold):
Parallel installations are effective means of insuring uninterrupted water service and strongly recommended when requiring such continuity:
➢ Where continuous flow is required during backflow assembly servicing or testing:
Then, 2 or more BFP assemblies connected in parallel will be required (followed by T.T. & MOCV).
➢ Where multiple service lines are required to feed multiple tenants:
Then, 2 or more BFP assemblies connected in parallel will be required (followed by T.T. & MOCV).

Note: combined flow rate of the assemblies shall equal or exceed the flow rate of a single assembly setting.

• Tandem (Separate Lines):

and
C. **BFP Assemblies Installation Criteria**

Only BFP assemblies approved for vertical installation by USC-FCCCHR, including the proper direction of flow, can be installed vertically.

1. **AIR GAP (AG):**
   - It provides maximum protection from backflow hazards and may be utilized at premises where the substance which may backflow is hazardous to health.
   - It shall be at least twice the diameter of the supply pipeline measured vertically above the flood rim of the receiving receptacle, but in no case less than one (1) inch.
   - It shall be located as close as practical between the premises water connection and the receiving tank.
   - It shall not be altered or voided without prior approval from DEP and shall be accessible for inspection at all reasonable times.
   - Using hoses or a by-pass that entirely destroys the effectiveness of an AG, is not allowed.

2. **RPZA:**

   RPZ shall be utilized at premises where the substance which may backflow is hazardous to health. The RPZ is normally used in locations where an air gap is impractical and is effective against both backsiphonage and backpressure. Head loss through the device ranges between 10 and 30 psi depending on the size and flow rate. RPZ shall be sized to provide an adequate supply of water and pressure for the premises being served. Flow characteristics and manufacturer’s specifications for specific performance data shall be considered.

   Premises where interruption of the water demand is critical should be provided with two similar assemblies installed in parallel. They should be sized in such a manner that either assembly will provide the minimum water requirements while the two together will provide the maximum flow required.

   Bypass lines are not permitted. Pipe fittings which may be used for connecting a bypass line shall not be installed.

   Water service lines should be thoroughly flushed prior to installation.

   The assembly shall be readily accessible for testing and maintenance and shall be located in an area where water damage to building or furnishings would not occur from relief valve discharge. An approved air gap fitting or funnel will be used to direct minor discharges away from the assembly. The air gap funnel will not control flow in a continuous relief situation. Drain lines to accommodate full relief valve discharge flow should be considered. Relief valves shall not be plugged or extended (piping affixed to the pressure differential relief valve port). The property owner/customer shall be made aware of all responsibility for foundation or basement wall penetration, leaks and damage.

   RPZs are typically installed above grade in well drained areas, but may be installed below grade if an adequate daylight drain and sufficient submersion calculation are provided. The RPZ shall be installed above the 100-year flood plain elevation.

   The RPZ assembly shall be protected from freezing and other severe weather conditions. Enclosures shall be designed for easy access and sized to allow for the minimum clearances. Daylight drain port shall be provided to accommodate full pressure discharge from the RPZ assembly.

   Maximum height of installation:
   - from centerline to floor shall not exceed 5 feet,
• from hand wheels of shut-off valves to floor shall not exceed 5.5 feet, unless there is a permanently installed platform meeting OSHA standards to facilitate servicing the assembly.

All RPZs shall be tested upon installation and at least once per year thereafter by an approved NYS certified tester to ensure that: both check valves are drip-tight under all pressure differentials; and the pressure differential relief valve will maintain pressure in the center chamber of at least two (2) psi below that of the inlet chamber. Records of such tests and repairs will be maintained by DEP, and it is the responsibility of any BFP assembly tester performing tests and maintenance to submit records of such tests and repairs to DEP.

Variance from these regulations will be evaluated on a case by case basis. Any deviations shall have prior written approval from DEP.

III. DCVA:

DCVs shall be installed at premises where the substance which may backflow is objectionable but not hazardous to health. The head loss through the device ranges between 3 and 11 psi, depending on the size and flow rate of the device.

DCV shall be sized to provide an adequate supply of water and pressure for the premises being served. Flow characteristics and manufacturer’s specifications for specific performance data can be considered.

DCV shall be located directly downstream of the master water meter.

Premises where an interrupted flow of water is critical should be provided with two similar assemblies installed in parallel. They should be sized in such a manner that either assembly will provide the minimum water requirements while the two together will provide the maximum flow required.

Bypass lines are not permitted. Pipe fittings which may be used for connecting a bypass line shall not be installed.

Water service lines should be thoroughly flushed prior to installation.

The assembly shall be readily accessible with adequate room for testing and maintenance.

DCVs may be installed below grade in a vault, provided water-tight brass or plastic plugs are installed on the test cocks. The assembly shall not, however, be subject to immersion. All vaults shall be well drained, meet vault standards, and be sized to allow for the minimum clearances.

Maximum height of installation:
• from centerline to floor shall not exceed 5 feet,
• from hand wheels of shut-off valves to floor shall not exceed 5.5 feet, unless there is a permanently installed platform meeting OSHA standards to facilitate servicing the assembly.

DCV can be installed vertically as well as horizontally provided that the assembly is approved for vertical installation by USC-FCCCHR, including the proper direction of flow.

The assembly shall be protected from freezing and other severe weather condition.

The property owner shall be made aware of all responsibility for foundation or basement wall penetration, leaks, and damage. The owner shall also verify that the vault is kept reasonable free of silt and debris. Check vault installations regulations.

All DCVs shall be tested upon installation and at least once per year thereafter by an approved NYS certified tester to ensure that both check valves are drip-tight under all pressure differentials. Records of such tests and repairs will be maintained by DEP, and it is the responsibility of any BFP assembly tester performing tests and maintenance to submit records of such tests and repairs to DEP.

Variance from these regulations will be evaluated on a case by case basis. Any deviations shall have prior written approval from DEP.
IV. DCDA:

DCDAs shall be utilized in all installations requiring a double check valve assembly and detector metering (that allows the visual inspection of flow through the assembly) on fire protection services only. Bypass meters for DCDAs shall be USC-FCCCHR approved. DCDAs shall comply with the installation requirements applicable for DCV assemblies.

V. RPDA:

RPDAs shall be utilized in all installations requiring a reduced pressure backflow assembly and detector metering on fire protection services only. Bypass meter for RPDAs shall be USC-FCCCHR approved. RPDAs shall comply with the installation requirements applicable for RPZ assemblies.

Note: RPDAs are not acceptable for the vertical orientation unless approved by USC-FCCCHR.

Plan Review

Plans and specifications for the backflow prevention installation shall be submitted to DEP for approval prior to the installation of the BFP device(s)

D. Application Form NYC GEN236

The applicant must follow the instructions on the back of the Application Form (See Page 50).

- Applicant shall verify the actual address of the related premise:
  - Where the water service comes in and the water meter or meter setting located, no matter what it feeds.
  - To be as specific as possible along with the related Block and Lot numbers, tentative lot (if any) to coincide with New York City Department of Finance (DOF) and DOB records. "AKA" address to be specified as well.
  - In a lot that maintains multiple addresses, stores/buildings, shall provide the address as per DOF records (as a leading address).

- When locations/properties have no specific profile (Address/Block #/Lot #):
  - A temporary Block # and Lot # will be created and provided by DEP and shall be kept upon request and utilized, by customers, on all submissions and test reports.
  - MTA: specific address (if any) or the tracking #.
  - Parks, JFK, Bridges, Tunnels, Temporary Sites, and alike: specific address (if any) or actual locations with cross streets.
  - Example: St. Johns Avenue between 10th Street and 11th Street, Intersection of ----- Street and ------ Avenue.
  - New Developments/Compounds (for multiple addresses and lot #s) that requires IWM: a leading address with the related lot # shall be provided.

E. Plot Plan (Site Plan)

The plot plan shall be consistent with the records of DOB, DOF, digital tax map (DTM), oasis map, etc.

- It shall show/identify the following information:
  - Name of the project, if any.
  - Site plan for the entire facility (lot) with the closed property line. Clear vicinity map to location of project. Key map for the site location (if any).
  - Dimensions of the lot, to verify state: the combination or sub-division of lot(s).
  - All streets fronting the lot/cross streets.
  - North arrow.
  - Mains, and all water service lines (existing & new), specifying state (existing or new), type (material) and size. An exempted domestic water service shall be identified.
  - Type of water service: Domestic, Fire Sprinkler (SP), Fire Standpipe (SD), Combination Fire SP/SD, Combined water service (Domestic with Fire SP/SD Take Off), Combined water service (Fire SP/SD with Domestic Take Off).
Similar water services cannot be extended from the same water main source. Utilizing roof tank(s), as a second (treated) water source, can be verified with DOB. It is subject to approval by the Local DEP office.

Specifying the water main (existing or new): City Water Main (CWM), (IWM) or Private Water Main (PWM). Specify the Water Loop in the huge facilities such as: Collages, JFK, Botanic Gardens, Parks, etc.

Accurately shows tie-in to the existing/new water system (Main).

Abandoned and destroyed/capped water service(s), if any

Location of BFP device(s).

Identify hydrants which will be private. (Typically fire hydrants not in the public right of way which only benefit a single property are private).

For multi stores/addresses building, all facilities (existing/new) shall be specified (activity) and addressed.

Address, Block # and Lot # (on the plot plan and on every submitted drawing/sheet).

Scale (if any), or with dimensions of the lot.

Date (also include revision dates), if any.

Legend for all symbols used on drawing, if any.

Easements labeled and dimensioned, if any.

Any known conflicting utilities, if any.

Any other appropriate details consistent with water standard specifications.

Bound and numbered pages.

Notes:

If multiple applicants share the same project in one location for different water service connection(s), all water services shall be shown and specified conspicuously on the Plot Plan of each substantive applicant.

Example:

- New 4” Domestic Water Service (Filed by others)
- New 6” Fire Sprinkler Service (In this Application)

Multiple applicants are not allowed on one plans.

F. **Elevation View (Riser Plan)**

Existing piping shall be modified as required to provide an approved system.

Existing fixtures shall remain as is as deemed acceptable and approved.

New piping shall be consistent with the approved setting up of the water system.

The approved system is the correct setting up of the piping that shall show:

- Combined Water Service:
  1. Fire with Domestic Take Off.
  2. Domestic with Fire Take Off. (No protection is required on the fire line take off).
- Separate Water Services:
  1. Domestic Service Line, dedicated exclusively to domestic plumbing fixtures.
  2. Fire Service Line, dedicated exclusively to fire system (SP/SD)

1. This is to show the front configuration [Vertical Cross Section(s)] of the proposed installation of the water service rig(s), specifying and labeling all items indicated conspicuously with all elevations from device floor, ceiling, underneath levels, outside grade and all nearby objects.

2. The acceptable setting up: (See Sketch for Types of water Services Page 34), Examples:

   - For either the domestic water service or combined water service which is domestic with fire take off: HCV, MICV, Accessories, if any (strainer, PRV), Water Meter, ACV (if any), BFP device, Meter Test Tee, MOCV, and pressure gauge (PG) (if any). Additional SOV or control valve(s) is/are optional.

   - For the fire protection service: Downstream of the HCV, OS&Y/BFG: DCDA: Double Check Detector Valve Assembly and PG (if any). [If deemed Aesthetically Objectionable] RPDA: Reduced Pressure Detector Valve Assembly and PG (if any). [If deemed Hazardous]. Additional (SOV-OS&Y) control valve(s) is/are optional. The Siamese or other connections, including hydrants, shall be installed downstream of the said device.
3. Specify all Control Valves: HCV, MICV, MOCV and additional SOV (if any): state, size and type.
   Ex.: * New 3” HCV, OS& Y  * New 2” MOCV, Ball Valve.  * Existing 4” MOCV, OS&Y, etc.

4. Specify all accessories that may be located before the master water meter either existing or proposed such as: SOV, strainer and PRV, if any. PG is not allowed before the meter.

5. Specify all accessories that may be located behind the master water meter either existing or proposed such as: ACV, additional shut-off valve and such like, if any.

6. Specify all accessories that may be located behind the BFP assembly either existing or proposed such as: trap seal primer, additional shut-off valve and etc. (if any).

7. Water Meter (and accessories) Information:
   - State (existing/new).
   - Meter size, type, make and model (if any).
   - Serial Number for the master meter and all sub-meters, if any, to each of the occupancies (tenants). What is each meter covering? Serial # of the water meters are used for tracking the actual location of the pertaining premises, where the water service comes in.
   - MICV, meter T. T., MOCV and other accessories if any (ex. PRV and/or strainer).
   - Meters larger than 2”: 5x and 3x the diameter of the straight piping shall be maintained before and after the meter respectively (for Turbine and Compound meters).

8. BFP assemblies shall be located on the facility side of the master water meter, upstream of any connection points to the water service line and shall be of the same size as meter or larger. In no case shall there be any connections to the water service upstream of the backflow prevention assembly.

9. Proposed BFP assemblies shall be USC-FCCCHR approved, currently produced/on the market, adequately supported, and have shut-off valves (upstream shut-off valve (USSOV) and downstream shut-off valve (DSSV) on both ends (as one assembly); all are indicated on the drawings. Shut-off gate valves shall be specified conspicuously as no OS&Y for ball valve or butterfly gate victaulic valve (BGVIC/BFG) and vice versa.

10. BFP assemblies shall be set as one assembly, no split, dislocation or reconfiguration to any part included, that can invalidate the USC-FCCCHR approval of the whole assembly.

11. The water service shall have no outlet, tee, tap or connection of any sort between the water meter and the protective assembly. No by-pass/take off piping is permitted, upstream of the BFP assembly, unless it is equipped with an assembly similar to the main line assembly.

12. Same level of protection shall be utilized for all similar types of water service lines located in the same facility.

13. Specifying and labeling the actual location of the BFP device(s); i.e. Cellar, Sub-Cellar (number if any), Basement, Pit, Vault, 1st Floor, 2nd Floor, Hot Box, etc. Grade level shall be shown and specified how far to the floor level where the BFP device is located.

14. If a domestic water service may be exempted as part of the submitted BFP plans:
   - Two (2) sets of the exemption request shall be provided. If approved, an exemption approval letter will be issued.
   - The exempted domestic water service shall be shown and specified on all drawings.

15. As a general rule, for any BFP device, regardless of size, type, configuration, make and model #, orientation and location of device, the clearances shall maintain:
   - 30” Min. clearance from centerline of the device to floor
   - 60” Max. clearance from centerline of the device to floor
   - 66” Max. clearance from hand-wheels of the shut-off valves of the device to floor.
   - 18” Min. clearance from the relief port of the large RPZ device to floor.
• 12" Min. clearance from highest point of the device to the ceiling or any obstruction.
• Air gap between the RPZ’s relief port & the drain receptacle shall be Minimum of:
  ➢ 2” – for device size of 0.75” to 1”
  ➢ 3” – for device size of 1.25” to 1.50”
  ➢ 4” – for device size of 2” or larger

Note: Where the BFP assemblies are to be installed in an over and under arrangement, both rigs shall be subject to the above stipulation. Fixed ladder/platform (if any) shall not obstruct any assembly.

16. Drainage details for all BFP assemblies shall be shown, specified and clarified conspicuously.
Destination of drainage shall be shown. Examples:
• Existing/New 4” Floor Drain to House sewer connection, to City Sewer by gravity.
• Existing/New 6” Floor Drain to House sewer Ejection Pump, permanently wired to Emergency Power Supply.
• Existing/New 4” Floor Drain to House Sewer Ejector, with “Alarm”.

Note: A high water level alarm for leak (flow) detection shall be monitored 24/7 to alert maintenance, security or concierge personnel will be provided. Detector (Sensor) can be installed on the wall reasonably above the finished floor, close to the device. The building/facility shall have personnel supervision around the clock. Detector can be connected to building monitor system (BMS), if any, annunciators, strobes, buzzers or combination of any. The alarm shall not be used as a substitute for drainage.

17. If RPZ device is required to be installed in an approved quoted and sized protective enclosure:
• It shall be above ground, have suitable freeze protection (with electric heaters or heat trace for any water service may be used year around), not subject to flooding, and shall be kept free from any debris.
• It shall be installed on a concrete pad, 6” minimum height revealed on grade with dimensions.
• The enclosure type (Hot Box), Make and Model #, with dimensions shall be specified on plans.
• Approved enclosures use standard detail with provisions for natural or artificial light.
• Full flow gravity drain shall be emitted to the atmosphere above the flood plain elevation. The bore-sight drain shall never be connected to sewer, catch basin, sumps, dry wells, etc.
• Full opening hatch to much encompass centerline of device, providing adequate clearances around the device to access the shut-off valves, check valves, test cocks and relief valve.
• Provisions shall be made to protect the device from vandalism with security measures such as locking doors and panel, flow alarms or flow indicator lights, power indicator lights, etc.

Note: Approved types of prefabricated insulated enclosures can be: “Hot Box” and Safe-T-Cover by “HydroCowl” that provide heat, gravity drainage and removable access panels for servicing and testing. Alternate wood frame, fiberglass, steel, masonry or precast concrete structure may be utilized.

18. No RPZ in Pit/Vault:
A RPZ can never be installed below grade in a pit or vault. Every manufacturer of USC-FCCCHR approved RPZs in the U.S. prohibits installation of this assembly below ground. If RPZ device is outside, vaults are not allowed and it would be better if water service goes unprotected. RPZ shall be installed inside a protective enclosure above grade level, within the property.

19. If an ACV, controlled by a Flow Switch, Sensor, EST, MS, etc. is required upon the Engineer’s request or the property owner’s discretion, it shall be installed between the master meter and RPZ device. The property owner will be fully responsible for this additional control device (installation, test, maintenance and possible troubleshooting). This automatic control valve cannot be installed upstream of the master water meter according to BCS rules, as no obstruction is allowed before the water meter. ACV is not recommended or disfavored by DEP and shall not be in conflict with the DEP’s rules and regulations.

20. If a PRV is required:
A PRV is usually recommended (either globe or angle style body) on domestic water systems whereas the water supply pressure exceeds 80 PSI. A higher pressure may rupture piping and damage fixtures. Moreover, it reduces the water consumption, saves energy and increases the system’s performance. PRV installation is subject to approval by BCS.
21. If trap seal primer is proposed (either recommended by PE/RA or required by DOB plumbing code), it shall be set downstream of the containment BFP device.

22. Time from full RPZA/RPDA failure to submersion of discharge port shall be no less than 8 Hours. Otherwise, device shall be installed on the maximum possible height (maintaining the appropriate clearances) or above grade level.

23. The height limitations for the installation of a RPZA in N or Z patterns shall maintain:
   • 18” Min. clearance from the lowest point of the device to floor.
   • 30” Min. clearance from centerline of the device to floor.
   • 60” Max. clearance from centerline of the device (N-shape) or highest point of the device (Z-shape) to floor provided that: an OSHA approved ladder or platform shall be provided if highest point of device exceeds 60”.
   • 12” Min. clearance from highest point of device to the ceiling or any obstruction.

24. DCDA with by-pass meter on a dedicated fire service can be installed Horizontally/Vertically up orientation. DCDA can be equipped with OS&Y or BGVIC shut-off valves, indicating type only. Consequently, the height limitations for the installation of a DCDA on a Fire Service shall be as follows:
   
a. DCDA, if installed Horizontally (conventional in line) shall maintain:
      • 30” Min. clearance from centerline of the device to floor.
      • 60” Max. clearance from centerline of the device to floor provided that: an OSHA approved ladder or platform shall be provided if centerline of the device exceeds 60” height and/or the hand wheels of the shut-off valves exceed the 66” height.
      • 12” Min. clearance from highest point of the device to the ceiling or any obstruction.

   b. DCDA, if installed Vertically (orientation up) shall maintain:
      • 18” Min. clearance from the lowest point of the device to floor.
      • 30” Min. clearance from centerline of the device to floor.
      • 30” Min. clearance on the front side of the by-pass to any obstruction.
      • 30” Min. clearance from the nose of the OS&Y to any obstruction.
      • 60” Max. clearance space from highest point of the device to floor provided that: an OSHA approved ladder or platform shall be provided if highest point of the device exceeds 60”.
      • 8” Min. clearance from both back sides to the wall or any obstruction.
      • 12” Min. clearance from highest point of device to the ceiling or any obstruction.

   c. DCDA can be in different configuration: N-Pattern or Z-Pattern shall maintain:
      • 18” Min. clearance from the lowest point of the device to floor.
      • 30” Min. clearance from centerline of the device to floor.
      • 60” Max. clearance space from centerline of the device (N) and highest point (Z) to floor provided that: an OSHA approved ladder or platform shall be provided if highest point of the device exceeds 60”.
      • 30” Min. clearance on the front side of the by-pass to any obstruction.
      • 30” Min. clearance from the nose of the OS&Y to any obstruction.
      • 8” Min. clearance from back side of the device to the wall or any obstruction.
      • 12” Min. clearance from highest point of the device to the ceiling or any obstruction.

25. On the Elevation View, if minimum height limitation from centerline of assembly is specified, maximum height also shall be specified. Example: Min. 30”, Max. 48”. All specified dimensions shall not be in conflict.

26. Attempts to modify a DCV assembly by adding a bypass line containing a meter and a small double check valve assembly usually results in a unit that will not function properly. USC-FCCCHR cautions against attempts to convert a DCV assembly to a DCDA assembly and vice versa. USC-FCCCHR carefully evaluates each make, model, and size before approving the units.
27. DCDA/RPDA (Type I) usually maintains a bypass containing a water meter and approved exclusive DCV/RPZ assembly specifically designed for such application. The meter shall register accurately for very low flow rates of flows up to 3 gallons per minute and shall register for all flow rates. Attempts to use/manipulate this DCV/RPZ on the by-pass as a substantive containment device is not approved and prohibited.

28. DCDA/RPDA require greater horizontal clearance to allow adequate room for testing and maintenance of both the main line and the bypass DCV/RPZ assemblies.

29. BFP assemblies (DCV/RPZ/DCD/RPD) can be installed in a Hot Box above grade level either solely or with the whole rig.

30. DCV, DCDA can be installed in a pit or vault (in the property) provided that:
   - Pits or vaults shall be constructed of impervious materials with manholes or access doors extending a minimum of 6 inches above grade and located to allow natural light into the pit during testing and maintenance. Vaults shall not be installed in any street/alley, parking area, driveway or sidewalk.
   - The pit can be uncovered and shall be easily accessible with no obstruction.
   - Constructed so that it will not flood, with adequate horizontal and vertical clearances to allow access to the device. Pits or vaults shall vent to the atmosphere.
   - Pit shall be with full flow screened drained. Floor shall be pitched to the drain.
   - The pit is designed with a sump and pump if subject to ground water accumulation.
   - An access stairway, ladder or step irons (meeting OSHA standards) and adequate natural or artificial lighting shall be provided to facilitate maintenance, inspection and testing.
   - Crane access for installing and removing large assemblies, if need be.
   - Test cocks of BFP assemblies should be protected with watertight plugs.
   - Min. Height of the vault is 6'-6".
   - Dual devices within same location shall have full opening hatch to allow easy access from the centerline of one device to centerline of the opposite device or any obstruction.
   - The pit has adequate ground cover to prevent freezing.
   - The pit has surface grading to divert runoff away from the entrance way.
   - Semi-buried pits or berm installations may be necessary to satisfy gravity drainage.
   - Insulation shall not restrict or cover up test cocks, shut-off valves or name plates on device.
   - All safety precautions should be applied scrupulously when entering confined spaces.

31. In a building with an underground vault, extended along with the cellar floor under the sidewalk, the point of entry and curb valve shall be shown and specified along with the whole setting up of the water service.

32. Where it is not feasible to install the BFP assembly inside the building, it will be required to be installed at or near the property line in a heated enclosure (Hot Box); above ground; or vault; underground.

33. In a building with existing roof tank(s) that may feed all domestic and/or fire systems, it shall be specified:
   - They are filled by the house pump(s) and equipped with an approved (safe) air gap.
   - There are no water connections to any fixtures in the building after the MOCV to the house pump(s).
   - All domestic plumbing fixtures and fire system(s) are fed directly from the roof tank(s). DCV installation behind the master water meter is the minimum requirement. Riser diagram to be provided.

34. Legalization: As-built plans shall be provided similar to a new regular plan, specifying the on-site condition and labelling all items depicted on drawings as EXISTING with all other pertaining details:
   - Size, type of the water service connection(s)
   - Size and serial # of the meter(s), and all sub-meters (if any)
   - Size, type, make, model #, and serial # of BFP device(s)
   - Size, type of all control valves (HCV, MICV, Meter T. Tee and MOCV)
   - All clearances, dimensions of limited spaces (rooms) and actual locations (floor level) of device(s).
   - RPZ submersion computations, drainage details, etc.
Notes:

- Piping shall be modified in conformity with an approved system in full compliance with all rules and regulations in effect. Existing BFP device(s) shall be commensurate with the current degree of hazard.

- If the serial # of any BFP assembly is unreadable or removed, a new Name Plate with a new serial # can be created by the manufacturer only; otherwise new device shall be installed.

35. All BFP assemblies shall be adequately supported and/or restrained to prevent lateral movement. Supports shall be placed where they will not obstruct the function of or access to RPZ/RPDA relief valve. Enclosures shall be quoted and sized according to either designer’s specifications or equipment located inside.

36. Specified dimensions on the drawings shall take precedence over scaled dimensions.

37. Plans are consistent with information provided in all water services.

38. Clear space shall be maintained for DEP approval stamps.

G. Plan View (Floor Plan)

1. Generally, this is to show the plumbing floor plan or partial floor plan specifying and labeling all items indicated conspicuously:
   - All water services (either existing or new).
   - Water meter layout and all accessories if any.
   - Proposed BFP device(s).
   - Booster/Fill pump system, (if any).
   - Floor drain(s).
   - All nearby objects such as: electrical panels, boilers, chillers, storage tanks, fire pumps, fire sprinkler risers, etc.
   - Name (if any), address, block and lot #s of facility/building.

2. The plan view shall be drawn to scale or with dimensions indicated from walls and all nearby objects. It shall be consistent with information provided in all water services.

3. All water service connections shall be shown and specified on one Plan View if located in the same room (area) to clarify the clearances and how they are related to each other.

4. The exempted domestic water service (if any) shall be shown and specified with clearances side by side with other water service(s).

5. Showing the clearances on back and front sides of the BFP device(s) as required:
   - Provide 30” min. clearance from entire front side of the device to the farthest wall or any obstruction. No bends, jumps or cross-overs are allowed. A minimum of 30” clearance is required to encompass one device to the opposite device or any obstruction.
   - Provide 30” Min. clearance from the nose of the OS&Y (if rotated) to any obstruction.
   - Provide 8” min. clearance from entire back side of the device to the closest wall or any obstruction. 12” min. clearance for models that have mounted test cocks or relief valves that would be facing the wall or from the closest obstruction shall be maintained.

6. By-pass on the DCDA and RPDA shall be shown to specify clearances, as indicated on # 5 above. Direction of flow in the BFP device shall be consistent with the normal direction of flow from the water main.

7. Showing and labeling the floor drain (state and size) and specifying how far from the BFP device. The floor drain shall be located within 5′ of the RPZ device’s relief port.
8. The plan view shall identify and label the actual location (Floor/Level) of the BFP device(s); i.e. cellar, sub-
cellar (number if any), basement, sub-basement, vault, 1st floor, 2nd floor, hot box (above grade level), etc.

9. The plan view shall comply with the installation needs applicable as for the elevation view.

10. The plan view shall reflect the details of the corresponding elevation view of all water services.

H. **Time Calculation before RPZA/RPDA Floods**

\[ \text{Time} = \frac{V}{F} \]

\( V: \) volume of floor(s) below the relief port of the “RPZ” (in cubic foot)

\[ = \text{Area of floor (in square foot) } \times \text{Ht. of Device to Relief Port (in feet), actual or proposed Min.} \]

\[ = \text{----- Cubic Foot } \times 7.49 = \text{----- Gallons} \]

Gallons per Cubic Foot (conversion) is \( 7.49 \) (constant)

\( F: \) flow (discharge) rate – from manufacturer’s chart (curves) of device (in gallons/min.)

(Get the maximum pressure from item #11 on the Application Form–Gen 236, based on the hydrant flow
test performed by DEP).

Note: These curves represent catastrophic (worst case) discharge rates. These curves were developed by
pressurizing the outlet of the backflow preventer with the 1st or 2nd check valve’s internals or relief valve removed
from the body or lodged wide open.

**EXAMPLE:**

Time = \( V \) (in C. Ft) \( \times 7.49 / F \) (in G/MIN) \( \times 60 = \) -- Hr. \( \geq 8 \) Hours, O.K.

**Rules of the Submersion Calculation before the “RPZ” device floods**

- For “RPZ” devices up to and including 2” size, required:
  
  Area of the floor(s) \( (A) \) = \( \text{........ S.F} \)

  Volume of the floor(s) \( (V) \) = \( A \times H = \text{........ C.F} \) \( \geq 2000 \) C.F., O.K.

  Where:

  \( H = \) Height of the relief port of the “RPZ” device to the Floor.

- For “RPZ” devices larger than 2” size, required:

  Area of the floor(s) \( (A) \) = \( \text{........ S.F} \)

  Volume of the floor(s) \( (V) \) = \( A \times H = \text{........ C.F} \) \( \times 7.49 = \text{...... GPM} \)

  Relief valve discharge rate \( (F) \) – From Chart = \( \text{...... GPM} \)

  Time = \( V \) (in GPM) \( / F \) (in GPM) \( \times 60 = \text{........ Hours} \) \( \geq 8 \) Hours O.K.

Notes:

- The submersion calculations is always required for all RPZ or RPD devices when installed only below grade
  level (ex. in cellar or basement) which shall have gravity drainage. The drain shall be sized properly. DEP
  shall not be responsible for damage caused by the deficiency of a drain or an undersized drain.

- If RPZ is located in a building with multi floors below grade, “V” can be computed as combination of all
  floors below the relief port: Total “\( V \)” = \( A1 \times H1 + A2 \times H2 \), and so on.

- If multiple RPZ/RPDAs are located in same room/area, computations shall be based on:
  
  * device of lowest relief port \( (H) \) and
  * device of largest discharge rate \( (F) \)

- If non-gravity drainage is detected, refer to the DEP approved **OPTIONS** below.
• Drainage details shall be shown on the drawings, only for how water will be disposed of during testing, maintenance, and draining of the unit or failure of device.
• These calculations are required because the RPZ/RPDA may be submerged if inundated because the floor drain is clogged or the sewer backs up.
• Drain pipe should be sized according to manufacturers’ flow curves to determine maximum discharge rates. The typical flow rates can be verified with the floor drain manufacturers.
• Hydrant flow test results: item # 11 on the Application Form-GEN236 (that establishes the hydraulic calculations).

Note: DEP performs the “Hydrant Flow Test” and issues the Report.

OPTIONS

Options for installation of RPZ or RPD device(s) below grade level, for example: in basement or cellar, with non-gravity drainage. (Selection of device features that maintain the less discharge rate can be checked).

➢ Alternate # 1
Device(s) can be installed above grade level, (Ex.: on 1st floor, in hot box, etc.) with full flow gravity drains according to drainage requirements.

Otherwise:
Installation of RPZ or RPD devices below grade, in basement or cellar, with no gravity or undersized drainage, is permissible and shall be installed on the maximum possible height (keeping proper clearances) provided that one or more of the following conditions shall be maintained and applied scrupulously:

➢ Alternate # 2
High water level alarm for leak (flow) detection monitored 24 Hours a day - 7 Days a week to alert maintenance, security or concierge personnel shall be provided to reduce the risk of water damage. The high water detector should be installed on the wall reasonably above the finished floor and as close as possible to the device. The building/facility shall have personnel supervision around the clock. The high water detector/sensor can be connected to a building monitor system (BMS), if any, annunciators, strobes, buzzers or combination of any are used. The alarm shall not be used as a substitute for drainage.

➢ Alternate # 3
As sump or ejector pumps are not allowed (for non-gravity drainage) unless they are sized to accommodate both intermittent discharges and catastrophic failure of the relief valve, the pumps shall be permanently connected to an emergency power supply.

➢ Alternate # 4
The device can be positioned at an elevation high enough in the cellar/basement so that:
• the discharge nozzle clears the sidewalk exterior Grade, or
• the discharge nozzle clears the house sewer connection by gravity (before the house trap).
• there is no possibility of the discharge water ever blocking the device discharge nozzle.

Notes:
• An OSHA approved ladder or platform shall be provided if centerline of the device exceeds 60” and/or the hand wheels of the shut-off valves exceed the 66” above the floor.
• RPZ/RPDA shall generally be installed 1 foot above the 100 year flood plain elevation.
• Other proofed option is to be discussed if ensure accommodating discharge from a relief valve failure.
• In any of the above cases, the property owner shall be made aware of the potential for water damage in the event of a discharge.
### Section 3

**Typical Significant Risk of Cross-Connection Hazards**

**Building:** Any multi-story building, hotel, apartment house, public or private structure where the top floor is high above the elevation of the water main or when a booster pump is used that furnishes water to all or part of the property, or there is the actual/potential for a cross-connection to a high hazard, or there is a sewage pumping facility on the premises or it is expected that a piping or equipment change might be made that could result in a cross-connection to a High Hazard.

**Establishments:** those handle, process, or have extremely toxic or large amounts of toxic chemicals or use water of unknown or unsafe quality extensively.

First priority types such as, but not limited to the following that contain or may contain a high hazard to the public water system and require installation of RPZ device for the premises isolation:

<table>
<thead>
<tr>
<th>Buildings/Operations/Processing Facilities</th>
<th>Establishments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture/Farming Operations/Processing Facilities</td>
<td>Coin/Card-Operated Laundries</td>
</tr>
<tr>
<td>Air Conditioning Cooling Towers</td>
<td>Cold Storage Facilities</td>
</tr>
<tr>
<td>Aircraft and Missile Plants</td>
<td>Colleges (Labs)</td>
</tr>
<tr>
<td>Aircraft Modification and Storage Facilities</td>
<td>Compressed Gas Handling and Storage Facilities</td>
</tr>
<tr>
<td>Airports and Airlines</td>
<td>Condensers</td>
</tr>
<tr>
<td>Apartment, Condominiums (Bidets, Cooling Towers, chillers, Boilers, Laundry Machines)</td>
<td>Concrete Mixing Plants</td>
</tr>
<tr>
<td>Asphalt Plants</td>
<td>Concrete Products Manufacturer and Storage Facilities</td>
</tr>
<tr>
<td>Aspirators</td>
<td>Convenience Stores (with Gasoline and Food Facilities)</td>
</tr>
<tr>
<td>Auto Garages</td>
<td>Crime Laboratories</td>
</tr>
<tr>
<td>Autoclaves and Sanitizers</td>
<td>Dairies, Creameries and Milk Distributors</td>
</tr>
<tr>
<td>Automotive Dealers/Plants</td>
<td>Day Care Facilities (with Food Processing)</td>
</tr>
<tr>
<td>Automotive Radiator Shops</td>
<td>Delicatessen (with Food Preparation)</td>
</tr>
<tr>
<td>Automotive Paint, Body Repair Facilities</td>
<td>Dental Facilities/Laboratories</td>
</tr>
<tr>
<td>Automotive Repair Facilities</td>
<td>Display Fountains (Ornamental)</td>
</tr>
<tr>
<td>Autopsy Facilities</td>
<td>Doctors’ Offices and Clinics</td>
</tr>
<tr>
<td>Auxiliary Water Systems</td>
<td>Dry Cleaners (Commercial, Excluding Drop off Facilities)</td>
</tr>
<tr>
<td>Baking Facility</td>
<td>Ejectors (Steam, Water)</td>
</tr>
<tr>
<td>Battery Manufacturer, Processor, Sales or Warehouse Facility</td>
<td>Embalming</td>
</tr>
<tr>
<td>Beauty Salon, Barber Shops, Beauty Parlors, Beauty and, Barber Schools</td>
<td>Equipment using Water Producing Pressure</td>
</tr>
<tr>
<td>Beverage Bottling Plants</td>
<td>Exterminating Companies</td>
</tr>
<tr>
<td>Blood/Plasma Collection Facilities</td>
<td>Facilities using Water in Manufacturing/Processing</td>
</tr>
<tr>
<td>Boilers (More than 350,000 BTU)</td>
<td>Farms and Feedlot Operations</td>
</tr>
<tr>
<td>Booster/Circulating Pumps on Domestic/Fire Systems</td>
<td>Fertilizers Plants, (Liquids and Spray Distributors)</td>
</tr>
<tr>
<td>Bottled Water Manufacturing Facilities</td>
<td>Film Processing Facilities (including One Hour Processing)</td>
</tr>
<tr>
<td>Breweries</td>
<td>Fish Store/Market/Tanks</td>
</tr>
<tr>
<td>Bus and Truck Terminals</td>
<td>Food and Beverage Processing Facilities</td>
</tr>
<tr>
<td>Butchers</td>
<td>Frost Proof Drain Down type Hydrants (including Soda &amp; Waste Valves)</td>
</tr>
<tr>
<td>Car Wash</td>
<td>Fuel/Oil Handling or Processing Facilities</td>
</tr>
<tr>
<td>Camp Grounds</td>
<td>Funeral Homes/Parlors, Morgues and Mortuaries</td>
</tr>
<tr>
<td>Canneries</td>
<td>Facilities using Water in Manufacturing/Processing</td>
</tr>
<tr>
<td>Car and Truck Wash Facilities including Detail Services</td>
<td>Farms and Feedlot Operations</td>
</tr>
<tr>
<td>Cellar drains of the water ejector type (Water Powered)</td>
<td>Fertilizers Plants, (Liquids and Spray Distributors)</td>
</tr>
<tr>
<td>Cemetery (Excluding Office Facilities)</td>
<td>Film Processing Facilities (including One Hour Processing)</td>
</tr>
<tr>
<td>Chemical Plants (Processing, Manufacturing, Compounding, Treatment)</td>
<td>Fish Store/Market/Tanks</td>
</tr>
<tr>
<td>Chemical Storage Facilities</td>
<td>Food and Beverage Processing Facilities</td>
</tr>
<tr>
<td>Chemical Injection Equipment</td>
<td>Frost Proof Drain Down type Hydrants (including Soda &amp; Waste Valves)</td>
</tr>
<tr>
<td>Chemically Contaminated Water Systems</td>
<td>Fuel/Oil Handling or Processing Facilities</td>
</tr>
<tr>
<td>Church/Religious Facilities (Baptisteries and Kitchens)</td>
<td>Funeral Homes/Parlors, Morgues and Mortuaries</td>
</tr>
<tr>
<td>Civil Works</td>
<td>Gas Stations (and/or Mini Marts with Soda Dispensing Machines or Coffee Lines)</td>
</tr>
<tr>
<td>Coffee Urns</td>
<td>Golf Courses/Driving Ranges</td>
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<td></td>
<td>Grease Traps/Sewage Ejectors</td>
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<td></td>
<td>Grocery Stores (Raw Meats and Vegetables)/ Food Preparation/Coffee Urns</td>
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<tr>
<td></td>
<td>Hazardous Waste Processing or Storage Facilities</td>
</tr>
<tr>
<td></td>
<td>Health Care Facilities</td>
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<tr>
<td></td>
<td>Health Clubs, Fitness Centers and Spas</td>
</tr>
</tbody>
</table>

NYC: Cross-Connection Control Program Handbook
Heat Exchangers/Solar Heating System
Home Improvement Stores
Hospitals
Hotels and Motels
Ice Processing and or Manufacturing Facilities
Incineration Facilities
Industrial Plants
Irrigation Systems (Agricultural and Lawn)
Jails and Penal Institutions
Kennels and Pet Facilities (Animal Hospitals and Clinics)
Laboratories and Research Facilities (Industrial, Commercial, Medical Research Schools / Colleges)
Landfills
Laundries/Laundromats (Commercial, Excluding Drop Off Facilities)
Livestock and Animal Holding Facilities
Lumber Yards/Processing Facilities
Manufacturing Plants
Marina Equipment Repair Facilities
Meat Markets and or Meat Processing Facilities
Medical Facilities/Offices/Labs, (that administer medication)
Metal Manufacturing, Plating, Etching, Anodizing, Passivation or Pickling Plants
Mines and Quarries
Mobile Home/RV Parks or Campgrounds
Motion Picture Productions
Nail Salon
Natural Gas Handling Facilities
Nursery, Shrubbery or Garden Centers and Greenhouses
Nursing Homes or Convalescent (Rehabilitation) Homes
Oil or Gas (Production, Storage or Transmission) Facilities
Oil Refineries
Packing Houses and Rendering Plants
Paper and Paper Product Plants
Parks and Ball Fields
Pesticide, Herbicides Distributors, Processors or Applicators
Pharmacy
Piers and Boat Docks
Petroleum Processing and Storage Plants
Poultry Operations
Power Plants
Power Cleaning Equipment (High Pressure or Steam)
Premises with Industrial Piping Systems or Auxiliary Water Supplies
Pressure Vessel (Tanks) Repair, Testing and Maintenance Facilities
Printing Facilities (Excluding Copy Centers)
Private Wells
Propane, Butane Gas Handling Facility
Radioactive Material Plants and Handling Facilities
Railroad Yards
Recreational Areas (Swimming Pools, Water Slides)
Recycling Facility (Water Re-use)
Reduction Plants (to produce Direct Reduced Iron)
Restaurants (All types), and Food Handlers
Retirement/Assisted Living Centers
Restricted, Classified or Other Closed Facilities
Rubber Manufacturing Plants
Sand and or Gravel Processing Plants
Sanitariums (sanatorium)
Schools with Athletic Facilities, Laboratories, Pools, Spas
Service Stations
Sewage Pumping Stations/Treatment Plants
Showers, Telephone Type Shower Heads
Shopping Centers
Slaughter Houses and or Meat Processing Facilities
Soda Dispensing Machine (Vending machine)
Stable for Horses
Steel Processing Facilities
Storage Facilities with hazardous materials
Storm Water Pumping Stations
Supermarkets
Swimming Pools (Including Multi-Tenant Facilities), Ponds and Fountains and Water Slides
Tank Repair, Cleaning, Testing and Maintenance Facilities
Tanneries (All Types)
Tavern/Pub/Bar
Tattoo/Piercing Parlors
Taxidermist
Therapeutic Tanks, Spas and Hot Tubs
Urinals
Vacuum Systems (Water-Operated with Water Seal)
Vending machines
Vegetable Processing Facilities
Veterinary Clinics/Offices/Labs
Warehouse Facilities with hazardous materials (Toxic Chemicals)
Wastewater Plants and Pumping Stations
Water Front Facilities and Industries
Water Jacketed Tanks, Vats, Cookers
Water Treatment Plants and Pump Stations
Water Troughs
Wells (Ground Water)/Private
Water Cooled Equipment or Chillers
Water Storage Tanks/Cisterns
Zoos

The above list of facilities is to be used as a reference and should not be construed as a complete list.

All details are subject to change by DEP as related to any proposed project.
Section 4

Activities that a customer engages in may easily jeopardize the quality of the potable water supply if backflow incident occurs

PROGRAM FORMS, LETTERS AND RISK ASSESSMENT CHARTS

- Review Form for BFP Plan

Assessment of Water Systems
1. Assessment of Fire Protection Water System
2. Assessment of Domestic Water System
3. Methods of Backflow Protection for premises isolation
4. Cross-Connection Control Risk Assessment Charts:
   A. General Fire Sprinkler/Standpipe System
   B. General Domestic Water System

For elaborations, see next pages
# DEPARTMENT OF ENVIRONMENTAL PROTECTION
**BUREAU OF WATER AND SEWER OPERATIONS**

**APPLICATION FOR APPROVAL OF BACKFLOW PREVENTION DEVICES**

ATTACH FEE TO FORM: $350 PER SERVICE CONNECTION

PRINT OR TYPE ALL ENTRIES EXCEPT SIGNATURES

Please complete items 0 through 13

<table>
<thead>
<tr>
<th>Item</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.</td>
<td>Block #</td>
</tr>
<tr>
<td>1.</td>
<td>Name of Facility</td>
</tr>
<tr>
<td>2.</td>
<td>County; 0b. Tent. Lot</td>
</tr>
<tr>
<td>3.</td>
<td>Exact Location of Facility; i.e., Street Address</td>
</tr>
<tr>
<td>3a.</td>
<td>City</td>
</tr>
<tr>
<td>3b.</td>
<td>State</td>
</tr>
<tr>
<td>3c.</td>
<td>ZIP</td>
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<tr>
<td>4.</td>
<td>Contact Person</td>
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<tr>
<td>4a.</td>
<td>Phone Number(s)</td>
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<tr>
<td>5.</td>
<td>Location of Device(s); (Attach additional sheets if required)</td>
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<tr>
<td>5a.</td>
<td># of Fire Services</td>
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<tr>
<td>5b.</td>
<td># of Domestic Services</td>
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<tr>
<td>5c.</td>
<td># of Combined Services</td>
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<tr>
<td>5d.</td>
<td>Total # of Services</td>
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<tr>
<td>5e.</td>
<td>Total # of Buildings</td>
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<tr>
<td>6.</td>
<td>Manufacturer, Model No. and Size of Device(s)</td>
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<tr>
<td>7.</td>
<td>Name, Title &amp; Phone No. of Property Owner</td>
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<tr>
<td>7a.</td>
<td>Full Mailing Address</td>
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<td>7b.</td>
<td>Owner's Signature</td>
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<td>8.</td>
<td>Type of Submission</td>
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<td>8a.</td>
<td>As Built</td>
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<td>8b.</td>
<td>Initial Device Installation</td>
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<td>8c.</td>
<td>Replace Existing Device</td>
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<td>9.</td>
<td>Print Name and Address of Design Engineer or Architect</td>
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<tr>
<td>9a.</td>
<td>New Service</td>
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<tr>
<td>9b.</td>
<td>New Building</td>
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<tr>
<td>9c.</td>
<td>New Extension</td>
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<tr>
<td>9d.</td>
<td>Major Renovation</td>
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<td>9e.</td>
<td>Existing Building</td>
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<tr>
<td>9f.</td>
<td>Other</td>
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<td>10.</td>
<td>NYS License #</td>
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<td>10a.</td>
<td>Telephone #</td>
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<tr>
<td>10b.</td>
<td>Date</td>
</tr>
<tr>
<td>11.</td>
<td>Water System Pressure (psi) at Point of Connection</td>
</tr>
<tr>
<td>11a.</td>
<td>MAX</td>
</tr>
<tr>
<td>11b.</td>
<td>AVG</td>
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<tr>
<td>11c.</td>
<td>MIN</td>
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<td>12.</td>
<td>Estimated Installation Cost</td>
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<tr>
<td>13.</td>
<td>Degree of Hazard</td>
</tr>
<tr>
<td>13a.</td>
<td>Hazardous</td>
</tr>
<tr>
<td>13b.</td>
<td>Non-Hazardous with Hazardous Fixtures</td>
</tr>
<tr>
<td>13c.</td>
<td>Aesthetically Objectionable</td>
</tr>
<tr>
<td>14.</td>
<td>Public Water Supply Name: NEW YORK CITY</td>
</tr>
<tr>
<td>14a.</td>
<td>Mailing Address:</td>
</tr>
<tr>
<td>14b.</td>
<td>Telephone No.: (718) 595-5463</td>
</tr>
</tbody>
</table>

NOTE: Two copies of this form, two copies of all plans, engineering reports and supporting materials must be submitted to:
New York City, Dept of Environmental Protection, Bureau of Water & Sewer Operations, Cross-Connection Control Unit, 3rd Floor Low-Rise, 59-17 Junction Boulevard, Floral Park, NY 11373.

NYC DEP Gen236 Version 02/2016 BWSO-ALL-FRM-23-03-2016

NYC Cross-Connection Control Program Handbook
INSTRUCTION FOR GEN236 FORM (NYC-DEP VERSION)
APPLICATION FOR APPROVAL OF BACKFLOW PREVENTION DEVICES
(Valid for Two [2] years from the Approval Date)

Please fill in All items from 0 through 13. No missing or incorrect entries for any field. If an item is not applicable to the proposed plans, N.A. must be inserted for not applicable. Print or Type All except signatures. Submit 2 sets.

0 to 4a) Fill in as appropriate. Be sure to include the block and lot(s)/tentative lot numbers, if any. Failure to provide correct information will result in delayed approval process.

5) Be as specific as possible. (e.g. “8’ N of Elm Street and 12’ South of Main Street”) and specify actual location of BFP device(s), (e.g. 1st Floor, Basement, Cellar, Sub-Cellar Floor, Hot Box, Vault, etc.).

5a, b, c) Fill in the number of water services for the entire lot.

5d) This is the total of 5 a, b, and c, either existing or new.

5e) Fill in the total number of buildings in the entire lot. All adjacent buildings under the same ownership, occupancy or operation are considered part of the lot. Distant buildings with the same water, heating or other shared, common or interconnected systems are considered part of the same lot. In case of uncertainties, elaborate at length on additional sheets.

6) Note Manufacturer, model # & size of each backflow prevention device.

7) Indicate name, mailing address & phone number and signature of property owner/customer. Be sure this information is precise and active. Failure to provide correct property owner/customer mailing address will result in delayed notification. **Be sure to use original ink signatures on both forms.**

8, a, b) Check the applicable boxes, either separate or combination.

9) Print name & company (if any) of the design engineer or architect. (Do not use the name of the firm in place of the P.E.’s or R.A.’s name). **Fill in the complete active mailing address.** Failure to provide correct mailing address will result in delayed notification. **Be sure to use original ink stamp & sign on both submitted forms.**

10) Include NYS License number in blank. Check appropriate category.

10 a, b, c) Be sure to enter the applicable phone number, date application is signed and E-mail address.

11) Make sure that utility water system pressure at point of connection is included, as per performed Hydrant Flow Test.

12) Be sure to include these estimates. No blank is permitted. Use fair market value if work is free of charge.

13) Check the Degree of Hazard and list the justifiable reasons which lead to the level of hazard checked.

14) **To be completed by Department only.**

For additional information, use the back or attach additional sheets. If so, please indicate “Continued on back” or “See Additional Sheets” as appropriate. Additional sheets must be labeled, originally signed and stamped.
Form for Report on Test and Maintenance of Backflow Prevention Device

Public Water Supply: NYC-DEP  County:  Block:  Lot:  Department Use Only:
Name & Address of Facility:  
Make & Model of Device:  
Size & Serial # of Device:  
Location (Floor) of Device:  

Part A: TO BE COMPLETED IN ALL CASES
Initial Test Complete All Parts for Initial Test
Complete Part A & B Only for Annual Test Annual Test

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Check Valve No. 1</th>
<th>Check Valve No. 2</th>
<th>Differential Pressure Relief Valve (RPZ only)</th>
<th>Line Pressure psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Before Repair</td>
<td>Pressure drop across first check valve, psi</td>
<td>Leak</td>
<td>Closed tight</td>
<td>Opened at psi</td>
</tr>
<tr>
<td>Describe repairs, parts and materials used.</td>
<td>Name of Repairer:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Test</td>
<td>Pressure drop across first check valve, psi</td>
<td>Closed tight</td>
<td>Opened at psi</td>
<td>Date: <em><strong>/</strong></em>/___</td>
</tr>
</tbody>
</table>

Water Meter Number:  
Water Meter Reading:  
Completion Time of Test (e.g. 3:15 pm):  
Type of Service (Please Circle One): Domestic  Fire  Combined  Irrigation

Question 1: Are there any connections between the point of entry and the backflow prevention device, or other deficiencies? NO ( ) YES ( ) YES, please explain in detail in the space provided or on an additional paper.

CERTIFICATION: This device meets the requirements of an acceptable containment device at time of testing. I hereby certify the foregoing data to be correct.

Signature  
Date  

CERTIFICATION: This device does NOT meet the requirements.

Signature  
Date  

Part C: TO BE COMPLETED BY NYS PE OR REG. ARCHITECT

Professional Engineer’s or Registered Architect’s Certification: I have personally checked this installation and I certify that it is in accordance with the approved plans.

NYC-DEP Backflow Prevention Device Approval #:  

[ ] I am the Designer of Record.  [ ] I am NOT the Designer of Record.

PEORA Printed Name:  
Company:  
Address:  
Telephone #:  
Signature, Seal & Date:  

Minor Installation Changes (describe):  

Catch additional sheets if required.

NOTE: Send one completed form, within 30 days of installation and/or testing, with original ink signatures and original ink or impressed seals to NYC DEP, Division of Connection & Permitting, Cross Connection Control Unit, 59-17 Junction Blvd., 3rd Fl. Low-Rise, Flushing, NY 11373

NYC - GEN215B  
Rev. 11/2016 | DCN: BWSO-FRM-46-00-2016

Part D: TO BE COMPLETED BY NYC LICENSED MASTER PLUMBER

Master Plumber’s Certification: [ ] I am  [ ] I am NOT the Licensed Master Plumber of Record. I have personally checked this installation and I certify that it is in accordance with the Building Department’s Requirements.

Building Department Number:  
Plumber’s Printed Name:  
Plumber’s License #:  
Telephone #:  
Signature, Seal and Date:  

NOTE: Send one completed form, within 30 days of installation and/or testing, with original ink signatures and original ink or impressed seals to NYC DEP, Division of Connection & Permitting, Cross Connection Control Unit, 59-17 Junction Blvd., 3rd Fl. Low-Rise, Flushing, NY 11373

NYC - GEN215B  
Rev. 11/2016 | DCN: BWSO-FRM-46-00-2016
INSTRUCTION FOR COMPLETION OF
“Report on Test and Maintenance of Backflow Prevention Device”
(FORM GEN-215B)

Use a separate form for each device

Indicate Initial Test or Annual Test by checking the appropriate choice.
Initial Test and Certification: Complete all 4 parts.
Annual Test/Re-Certification: Complete parts A and B only

Part A: To be completed in ALL cases for the current address, block and lot #s, the tested device and exact location of the tested device (floor/level).

Part B: Certified Backflow Prevention Device Tester must fill out this portion in All cases:
- Include the line pressure (taken at number 1 test cock with shutoff valve number 1 closed).
- Include the pressure drop across the first check valve (the pressure differential between the second and the third test cocks).
- Describe repairs, parts and materials used, replacement and details of procedures (if any).
- Indicate the water meter # and reading.
- Completion time of test refers to the time of day (e.g. 8:00 am) and test date.
- Circle actual type of the water service.
- Be sure to answer Question 1. If the answer is “YES”, explain in the space provided. A connection for a properly installed and certified parallel device should not be construed as a connection. Hose cocks and spigots must be considered as connections. Tees must be removed completely and hard pipe. Cross connections upstream of the devices are prohibited except otherwise allowed and approved for the parallel devices’ installations.
- Then clearly print, type or rubber stamp: Date, Name, Phone #, Certified Tester # and Certified Tester Expiration Date.

Part C: Complete for INITIAL TEST Only!
The NYS Licensed Professional Engineer or Registered Architect (PE/RA) must complete Part C.
- Be sure to fill in the “NYC-DEP Backflow Prevention Device Approval #”
- Indicate whether you are the designer of record or not
- Indicate minor changes if any. Use back or additional pages as required. Indicate “See Back” or “See Additional Pages” as appropriate. If a different make and model # of device is used, the PE or RA must certify that the submission is acceptable and will not cause any adverse hydraulic effects on the system. Also satisfy the submersion calculations (for RPZ devices only).
- If the installation changes meet DEP requirements while deviating from the approved plans, the job may be resubmitted for re-approval or an As-built plans may be submitted to legalize the on-site condition.
- When the installation deviates from the approved plans and minimum requirements are not satisfied, the job should NOT be certified.

Part D: To be completed by the NYC Licensed Master Plumber. Be sure to fill in the following:
- Check whether you are the Licensed Master Plumber of record or not
- The Building Department Number (ARA #, ALT#, NB#, LAA #, etc). Use of sticker is preferred.
- Licensed Master Plumber’s Name.
- Licensed Master Plumber’s License #.
- Licensed Master Plumber’s Telephone Number.
- Original Ink Signature raised impression Seal of Licensed Master Plumber & Date.

The PE or RA and the Licensed Master Plumber should sign the same form for each particular device.

For each of the completed forms, USE ORIGINAL INK SIGNATURES & ORIGINAL INK OR RAISED IMPRESSION SEALS.
Mail one completed Form to:
NYC Department of Environmental Protection
Division of Connections and Permitting
Cross Connection Control Unit
59-17 Junction Boulevard, 3rd Fl. Low-Rise, Flushing, NY 11373-5108

NYC - GEN215B
Rev. 11/2016 | DCN: BWSO-FRM-46-00-2016
Review Form for BFP Plan

To:

Address:

Block: __________  Lot: __________  County: __________

Comments
- 2 Original sets of Plans & GEN 236 application forms required along with
  Elaborated Eng. Report. Bldg. description, type of business, general use of
  water served(s) within facility, brief description water supply system, etc.
- Require PE / R. A's signature and stamp/seal (original) on every Application
  Form (NYC, GEN 236-#: 9), every Plan and also the Engineering Report
- Drawings must be of acceptable standard quality/legible in black/blue
  ink on 8 1/2" x 11" or 11" x 17" sheets. Large sheets are not acceptable.
- Need to provide Plot Plan (for the entire lot), Elev. Plan, Floor Plan, and Notes
- Leave adequate space on plans for NYC DEP-CCCU approval stamps
- Need Address of building/facility, Block, Lot, and County indicated on plan
  (every submitted drawing sheet)
- Require labeling all items, (either existing or new) in the drawings
  - Show/sw/verify state (existing/new) size of all items on the drawings
  - Show the state (existing/new), size & # of the meter(s) & all sub-meters if any
  - Show state (existing/new), size, type, single/make, and model # of device on plans
  - Show/verify the cleanliness and direction of flow on the Elevations & Plans views
  - Show/verify the exact location (floor) of the water meter and "BFP" device(s)
  - Show every BFP (RFP/DCV) in conjunction with the HCV, MCV, water
    meter, T.T., and MOVC, HCV and DCDA/RPDA only on the fire service(s)
  - No strainers are allowed between Water Meter and BFP. If required, Strainer
    should be approved type (Platz/Plate) and installed on street side of the Meter
  - Bypass around the "BFP" take-offs on the street side of the "BFP" are not
    allowed (except where installation of similar BFP's in parallel is provided)
  - Pipes not installed within 2 feet of device must be exposed and be readily
    accessible for inspection by landscaping
  - Existing piping must be modified as required to provide an approved system
  - BFP/DCV must be installed between the Meter Meter(s) & Meter Test Tee
  - RFP/DCV devices must be of the same size as the water meter or larger
  - RFP/DCV on the domestic service which is dedicated to human consumption
    must be Lead-Free approved type
  - RFP/DCV must be utilized on the domestic water service (For Fire only)
  - RFP/RPDA must be installed 1 foot above 100 year floodplain elevation. All
    "BFP" devices must be installed so that they are not subject to flooding
  - From point of entry inside the facility, House Control Valve should be
    installed within 2 feet, and Water Meter should be installed within 5 feet
  - Meter Test Tee, MCV and MOVC must be located near the master watermeter
    (NYC-BCS-Approved) and installed within the same meter room with the
    HCV. MOVC must be installed on the HOUSE SIDE of test tee. Plato-Tip Test
    Tee for meters up to 1", 1 1/2" Test Tee or meter 1.5" size, and 2" size Test Tee
    is required for water meters 2" or larger, and it must be CAPPPED
  - For water meters larger than 2", 5x and 3x Dia. of pipe must be maintained
    before and after the Meter respectively (for Turbine and Compound meters)
  - Calculate time for full device failure to subtraction of device discharge post
    (detected), it must exceed 18hrs. Otherwise device must be installed above grade
  - Water service lines cannot be interconnected anymore before "BFP" devices
  - All water service lines (existing or new) of the same facility(s) in the same
    location must be protected and listed on one application
  - Same level of protection must be utilized for all similar type of water services
  - "BFP" device(s) must be USC/CCHCR approved, adequately supported, have
    slotted valves on both ends (as one assembly) and indicated on the drawings

Other

GEN236 (Application Form)
- Need to fill all the blanks from form 0 to 13
- Need the owner's name, signature (original) & phone if on item #7 only
- Lack original ink signatures and stamps on both copies
- Have missing / incorrect entries for certain fields
- Valid reason/justification must be given, in box 13 Gen 236 form, which
  lead to degree of hazard checked
- Other

---

**We are sending you:**
- Gen 236  □ Plans  □ Samples  □ Other
- DISAPPROVED  □ RETURNED FOR ADDITIONAL INFORMATION

---

Notes
- Print the drainage area in sq. ft. if "RIPZ" is installed below Grade Level
- If the BFP is installed more than 60" from venturi(es) or highest point of
  Device if vertical, to above finished floor, an OSHA approved platform, and
  scissor or ladder must be provided for maintenance and testing. Height
  above finished floor for platform should be between 24"-66" to handle
  - Where the distance between point of entry/meter/DCV is greater than 10',
    all exposed piping must be bracketed "FEED TO & DO NOT TAP OR
    CONNECT TO THIS LINE" at 5 intervals, at wall & floor penetrations
  - Fire service must be protected with approved "BFP" device(s)
  - Specify the characteristics of the fire service(s)
  - 2 similar water services cannot be extended from the same water main source
  - New/Major Renovated Building(s) must be filed with "DOB", to point out
    schedules A & B with zoning diagram, prior to submittal of "BFP" plans
  - Filing Fee/Additional $350 per water service connection, and $100 per
    exemption request, must be provided
  - Provide void/withdraw letter by Applicant/Owner to nullify previous plans
  - Provide one plain self-addressed envelope/no charges, sized 12" x 9", with
    all submissions. No postage required
  - File other comments on plans & annedex sheets, verify, rectify & resubmit
  - Other

---

THESE ARE MINIMUM REQUIREMENTS. PLANS WILL BE REJECTED IF INFORMATION AND MATERIAL ARE NOT GIVEN.
PLEASE RESUBMIT 2 SETS OF ORIGINAL PLANS WITHIN 30 DAYS OF THE BELOW DATE.

Reviewer: Mr. ___________________________ (Tel 718 – 595 - ) ___________________________ Date: / / 20 Rev. 09/2016

NYC- Cross-Connection Control Program Handbook
Assessment of Water Systems

1. **Assessment of Fire Protection Water System**

All fire sprinkler and/or standpipe water service(s), either existing or new, shall be protected with an approved BFP device(s), depending on the system degree of assessed hazard. The approved BFP device(s), that is/are used on the fire service(s) only, can be either DCDA or RPDA (Type I or II) with by-pass meter. Shut-off gate valves on both ends can be either OS& Y or BGVIC/BFG.

DCDA shall be installed on the fire service which has been deemed “Aesthetically Objectionable”.

RPDA shall be installed on the fire service which has been deemed “Hazardous”.

*If the Fire Sprinkler and/or Standpipe system is characterized as follows:
  1. No chemical provisions used in the fire line (e.g. antifreeze, rust inhibitors).
  2. Fire siamese connection (if any) is located more than 700 Ft. of an uncertified source of water (e.g. bay, creek, river, lake, fire cistern, pond, etc.).
  3. Domestic and fire water risers do not interconnect at any point on the house side of the BFP devices.
  4. No fire wells in the premises.

So,
The fire system deemed “Aesthetically Objectionable” and:
- A DCDA with by-pass meter shall be installed.

*If the Fire SP/SD system has one or more of the above specified 4 cases, one or more,

So,
The fire system deemed “Hazardous” and:
- A RPDA with by-pass meter shall be installed.

Note: The 6 classifications of the fire-suppression systems have been eliminated as per AWWA-M14. To clarify and simplify the selection of appropriate BFP protection, refer to the Risk Assessment Chart (see page 57).

2. **Assessment of Domestic Water System**

- An assessment shall be done to determine the potential impact area.
- If a known contaminant has been identified, it can be introduced into the water system.
- If it cannot be determined that containment has been identified, RPZ assembly shall be introduced into the water system in complete compliance with all regulations run the full course.
- Hazardous cross-connection shall be promptly eliminated, controlled by containment.
- An investigation/survey of the cross-connection shall be performed to identify the potential or actual contaminant and the degree of health hazard.
- DEP policy requires a degree of protection commensurate with the degree of health hazard regardless of whether the hazard is immediate or potential.
- DEP shall rate the cross-connection by the “Degree of assessed Hazard” for commonly encountered equipment, plumbing fixtures, buildings/facilities (in the whole lot) and their use to ensure that the proposed BFP device provides the proper protection.
3. **Methods of Backflow Protection for premises isolation**

The following is a minimum:

<table>
<thead>
<tr>
<th>Degree of Hazard of Facility</th>
<th>Appropriate Protection Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous (High Health CC Hazard)</td>
<td>Either an Air Gap or RPZ Device</td>
</tr>
<tr>
<td>Non-Hazardous w/Hazardous Fixtures</td>
<td>Internal Plumbing Control with AG/RPZ + (Cont. DCV)</td>
</tr>
<tr>
<td>Aesthetically Objectionable</td>
<td>Double Check Valve Assembly (DCV)</td>
</tr>
<tr>
<td>Non-Hazardous</td>
<td>Internal Plumbing Control</td>
</tr>
</tbody>
</table>

**Notes:**

1. As internal plumbing control (RPZ on boilers and cooling towers only as per DOB code or even an approved AG on the roof tank/holding tank) is necessary for the protection of the on premise user, it is not equivalent to containment; it is a necessary adjunct to a totally protective system. A DCV installation behind the master water meter is the minimum requirement.

2. The water supplier (DEP) shall avoid internal plumbing responsibilities when another local department has jurisdiction.

3. A water service connection that is not readily accessible for inspection because of military or industrial secrecy or any other restrictions/prohibitions shall be categorized as posing a high hazard.

---

**Back flow**

**Major Cause**

- Pressure differential conditions
- Contaminants will flow from zones of higher pressure to zones of lower pressure
- Power loss due to storms, accidents, etc.
- Water main breaks (freezing, rusted piping etc.)
- Temperature (Boilers, Heating systems)

---

Find next the Risk Assessment Charts
4. CROSS-CONNECTION CONTROL RISK ASSESSMENT CHARTS

A. General Fire Sprinkler/Standpipe System

- Are there any provisions for chemicals to be used in the fire system? (Ex. anti-freeze, foam systems, rust inhibitors)
  - YES: Install RPDA
  - NO

- Is the Fire Siamese Connection located within 700 feet of an uncertified water supply? (Ex. Lake, Creek, River, Bay, Fire Cistern, Pond)
  - YES: Install RPDA
  - NO

- Does the Facility have a Fire Well?
  - YES: Install RPDA
  - NO

- Is the fire service cross connected to a hazardous domestic service on the house side of BFP devices?
  - YES: Install RPDA
  - NO

- Install DCDA

**DCDA** = approved “Double Check Detector Assembly”

**RPDA** = approved “Reduced Pressure Detector Assembly”
**Premises**

- **Residential**
  - Does the premise maintain any hazardous fixtures? Ex.: Bidet, Swimming Pool, Irrigation System, Cooling Tower, Large Boiler, Coin-Operated Laundry Machines, well? (See Assessment of Residential Dwelling for more examples and details)
  - **NO**
  - **YES**
    - Install RPZA

- **Non-Residential**
  - Is the Nature of Occupancy Categorically Hazardous? Ex.: Hospitals, Medical Offices, Laundry, Sewage Treatment Plants, Mortuaries and most Industrial Concerns. (See Typical Significant Risk of Hazards for more examples)
  - **NO**
  - **YES**
    - Install DCVA
    - Install RPZA

- **Mixed Use**
  - Is the Premise rated as Aesthetically Objectionable?
    - **Yes**
      - Install DCVA
    - **No**
      - Request an Exemption as per requirements

---

**DCVA** = approved “Double Check Valve Assembly”

**RPZA** = approved “Reduced Pressure Zone Assembly”
Section 5

1. INSTRUCTIONS FOR GETTING A BACKFLOW PREVENTION EXEMPTION

(ONLY for a Domestic Water Service line dedicated to Domestic Plumbing Fixtures)

1. Any cross-connection protected against backflow at the time of this program becomes effective may stay and continue with the same protection unless:
   - The existing protection is deemed inadequate by the Customer or the DEP.
   - DEP officially notifies the Customer that a change shall be made.

2. The exemption will expire at any time that the backflow preventer shall be installed. In such cases, the backflow preventer shall be of the type required by the degree of assessed hazard.

3. The degree of hazard shall be assessed to determine that the "Residential" facility is qualified for an exemption from the DEP BFP requirements.

4. A typed engineering report shall be submitted on PE/RA letter head following the format of the sample letter found on page 65. Two (2) original copies are required.

5. A typed letter on PE/RA letter head following the format of the sample letter found on page 62. Do not omit any of the items. Two (2) original copies are required.

6. Do site plans for the entire facility (address, block and lot #s) indicating the domestic water service (state and size), property line, North arrow, mains, and streets.

7. Describe the building and occupancy in detail (# of floors, # of dwelling units, etc.).

8. Provide information pertaining to the general use of water system (either existing or proposed).

9. If BFP plans are submitted by a PE/RA, the exemption letter shall be signed by the same PE/RA. Exemption letter shall be originally signed by the property owner.

10. Submit TWO (2) ORIGINAL sets to:
    NYC-DEP-BWSO
    Division of Connections & Permitting
    Cross-Connection Control Unit
    3rd Floor Low-Rise
    59-17 Junction Blvd.
    Flushing, NY 11373

11. If the exemption is approved, an exemption approval letter will be issued.

12. If the exemption is denied, the property owner shall be made aware of that. The applicant (PE or RA) shall submit two (2) sets of complete plans to install the appropriate backflow prevention device(s).
2. **DEP Regulations**  
For Residential Facilities

Residential occupancies may contain any of, but not limited to, the following:

Air Conditioning, chilled water **
Air Conditioning, condenser water **
Bidet **
Booster Pump *
Chiller **
Cooling Tower *
Dish washer ***
Drinking Fountain *
Chemically Treated Boiler *
Coin-Operated Laundry Machine **
Hose Bibb ***
Irrigation system **
Large Boiler *
Multiple Water Services *
Pressure Tank **
Private Well **
Swimming Pool **
Urinal, siphon jet blow out **
Washing machine ***
Water Closet (flush tank, ball cock / flush valve, siphon jet) ***
Water Cooled Equipment **
Water Heating System (Tankless Coil, Heat Exchanger) **
Water Softener *
Water Storage Tanks *

As per DEP peremptory request:
Minimum requirement is “Double Check Valve Assembly” *
Otherwise, “Reduced Pressure Zone Assembly” is required. **

Notes:
1. The minimum requirement is determined based on the internal plumbing protection required by DOB’s plumbing Code:
   a. Local RPZ assemblies (large/chemically treated boilers and cooling towers)
   b. Vacuum Breakers (AVB, PVB or Hose Bibb VB) ***
   c. Safe Air Gap is considered

2. Residential buildings that may maintain commercial space(s) are subject to the assessment stipulation.

3. As per DOH:
   • The water supplier DEP should consider all commercial facilities as either hazardous or aesthetically objectionable.
   • DEP shall avoid internal plumbing responsibilities when another local department has jurisdiction.
3. Assessment of Residential Dwellings

DEGREE OF HAZARD

A. A dedicated domestic water service line (either separate or on combined off fire service) for residential dwellings in conformance with the following are considered being non-hazardous and does not require backflow protection:

1. No connections to an auxiliary water supply such as a well, cistern or spring.
2. No booster pump.
3. No water powered sump pump (ejector or siphon pump).
4. No lawn sprinkler or irrigation systems.
5. No other potential high hazards including, but not limited to, boiler feed corrosion inhibitors, antifreeze loops, heat exchanger, tankless coil, bidet, urinal, irrigation system, and swimming pool.
6. No other potential low hazards including, but not limited to, hose bibbs, washing machines, dish washers, ice makers, water closets, small boilers/water heaters, non-residential sinks, small gas boilers/hot water heaters and alike unless they maintain a local plumbing control such as vacuum breakers, etc. as per local plumbing code in effect (in-premise protection). The plumbing should be surveyed to determine if the protection provided is satisfactory.
7. No fire system is fed off the domestic service/system.
8. No commercial uses or agricultural use.
9. No possible future alterations, expansions or extensions in egress, occupancy/activity that affect the water system and fixtures are allowed, unless DEP is notified.
10. The property owner shall be made fully aware that if any of the above conditions change, the installation of appropriate backflow prevention may be required.

B. Private Fire protection services in conformance with the following are considered to be aesthetically objectionable and require a double check detector valve assembly to provide cross-connection control by containment:

1. No chemical provision added in the fire system.
2. No private fire hydrants.
3. No connections to a secondary water supply such as a well, cistern, etc.
4. No interconnection to a hazardous domestic water service.
5. Not within 700 feet of an auxiliary water supply such as a pond, lake, river, creek, etc. where fire siamese connection is located.

C. Combination water services in conformance with the criteria outlined in A and B above are considered to be aesthetically objectionable and require a double check valve assembly to provide cross-connection control by containment. A combination water service is one which provides both domestic and fire protection systems.

D. All other types of domestic water service connections, either separate or off combined (fire with domestic take off), that feeds hazardous plumbing fixtures, are considered hazardous and require a reduced pressure zone backflow preventer to provide cross-connection control by containment.

E. In general, the installation of a BFP device on an existing fire suppression service may have a significant adverse effect on the hydraulic performance of the system. This is relevant when the original design may not have included a BFP device. The applicant shall check the hydraulics of the fire protection system to ensure the proper operation in conjunction with the presence of the proposed BFP assembly.
Form for Backflow Prevention Device Exemption for a Residential Building with One Domestic Line Only

If the residential facility meets ALL of the conditions that are stated in the sample letter below, TYPE a letter on your letterhead giving us all of the information shown on the sample letter. Do not omit any of the points. Submit to the Cross-Connection Control Unit for approval. NOTE: Where we show (bracketed italicized items), you must provide the appropriate information for your facility.

PE / RA L E T T E R H E A D

(Date):

NYC Department of Environmental Protection
Bureau of Water & Sewer Operation
Cross-Connection Control Review Section
59-17 Junction Blvd. 3rd Floor Low-rise
Flushing, NY 11373

Re: Backflow Prevention Device exemption in a Residential Facility for a Domestic Water Service Line only

(Address)____________________________________________________________

Block:                  Lot:           County:

Gentlepeople:
Based on the information provided below we respectfully request a review of the (existing building with existing service, existing building with new service, building being renovated, future building) with regards to backflow prevention requirements.

The referenced location (is/will be) (#) story w/wo (underground levels) (#) residential dwelling units, and (is/will be) supplied by only one domestic service line for domestic plumbing purposes, which is (size) inch. Describe in brief the general use of water system.

The residential building does NOT contain any of the following:

- Air Conditioning, chilled water
- Air Conditioning, condenser water
- Bidet
- Booster Pump/Fill Pump
- Chiller
- Coin/Card-Operated Laundry Machine.
- Commercial Uses
- Cooling Tower
- Chemically Treated Boiler
- Drinking Fountain
- Fire protection system (off/fed by - the domestic)
- Irrigation System
- Large Boiler (≥ 350,000 BTU)
- Multiple Domestic Water Service Lines
- Pressure Tank
- Private Well
- Swimming Pool
- Urinal, siphon jet blow out
- Water Cooled Equipment / Water Softener
- Water Heating System (Tankless Coil, Heat Exchanger)
- Water Powered Sump Pump (Ejector or Siphon)
- Water Storage Tanks

Based on this information and a detailed and thorough inspection/assessment of the (existing/new building), we believe this building is rated as non-hazardous and is qualified for exemption from backflow prevention requirements. We are fully aware that if any of the above conditions change, the installation of an appropriate backflow prevention device may be mandatory.

_________________                   ____________________
Property Owner's Name      PE/RA Name:
Property Owner's Mailing Address     License Number: (if not on letterhead)
Owner's Phone Number       Phone Number: (if not on letterhead)
Owner's Signature                    PE/RA Stamp & Signature
Section 6

SAMPLE ENGINEERING REPORTS

Introduction:

There are three (3) distinct types of approved mechanical assemblies which are considered to be backflow prevention assemblies. Nevertheless, it shall be stressed that these are not all equally acceptable as protection against all types of actual or potential hazards. Premises, having internal cross-connection that are not correctable or intricate plumbing arrangements which make it impractical to ascertain whether or not cross-connection exist, require a protection by containment. The degree of hazard shall be assessed and determined along with the type of cross-connection present to ascertain which type of backflow prevention assembly is the most suitable to the situation.

An Elaborated Engineering Report shall be submitted as part of the BFP Plans/Exemption submittal. The report (on the PE/RA’s letter head) shall describe the project in detail. 

Note: If plans were previously approved, a statement shall be clarified to explain why a re-approval is needed.

Items that should be described in the report include, but are not limited to the following:

- Building/Facility description: state, number of floors within the facility, type of business, activity and occupancy (residential, commercial, mixed use, etc.) either existing or new.
- General use of water supply system within the facility.
- The need of dual backflow prevention device is required. Does the facility need continuous water supply?
- As per the Risk Assessment Chart: description of the characteristics of the firefighting system(s).
- Size and description of all fire and domestic water services (either existing or new).
- Description of the proposed installation of the backflow prevention device(s): indicate the location of backflow prevention device, drainage, lighting, heating, access to unit, square footage of the floor level where the backflow prevention (if RPZ) is to be located.
- The elevation and location of the 100 year flood plain in relation to the facility. A RPZ BFP device shall generally be installed one (1) foot above the 100 year flood plain elevation.
- An inventory of any existing containment devices includes the make, model, size and serial number of the device. The degree of hazard for these services shall be thoroughly assessed to ensure that the planned device provides the appropriate level of protection.
- Actual or estimated maximum flow demand.
- Pressures: existing and after the installation of the BFP device.
- Any other useful proof and all pertinent information to disclose certain issue(s) (i.e. water riser diagram, clarified pictures/illustrations, etc.).

The following samples are to be used as references only.
USAGE / ACTIVITY-VERIFICATION LETTER

To:      NYC-DEP Division of Permitting & Inspections
         Cross-Connection Control Unit
         3rd Floor Low-Rise
         59-17 Junction Blvd.
         Flushing, NY 11373

Re:      Building / Facility Usage verification

Premises: Address: .................. Street,
          Brooklyn, NY 11219
          Block: 999443        Lot: 125
          County: Kings

Dear Plan Reviewer,

The information provided below is to verify the usage of the new building with regards to backflow prevention requirements.

The referenced location is a new two (2) story and cellar, two (2) family residence with no commercial uses, no swimming pool, bidets, irrigation systems, no suction tanks, chemically treated boilers or cooling towers/chillers, and no coin/card operated washing machines. Existing water service will be destroyed and abandoned in the street as per local code.

The 2" fire sprinkler system is characterized as follows:
1. No chemical provisions used in the fire line (e.g. antifreeze, rust inhibitors).
2. Fire Siamese Connection is located more than 700 Ft. of an uncertified source of water.
3. Domestic and fire water risers do not interconnect at any point on the house side of the BFP devices.
4. No fire wells in the premises.

We are proposing a new 2" combined water service, (domestic service with a sprinkler take off).

Based on this information and a detailed thorough inspection of the referenced building and plans, we believe the domestic usage for the building is aesthetically objectionable and requires a double check valve on the domestic as shown on the plans as it will not be a source of contamination on NYC-DEP water system. We propose to install a 2" double check valve, Watts LF007MQQT as required by the NYC-DEP & NYSDOH. I have made the property owner/customer fully aware that if any of the above conditions change, the installation of appropriate backflow prevention may be required.

[Signature]

Dear Plan Reviewer,

The information provided below is to verify the usage of the existing building with regards to backflow prevention requirements.

The referenced location is an existing 3 story and cellar, (number) family residence with no commercial uses, no swimming pool, bidets, irrigation systems, no suction tanks, chemically treated boilers or cooling towers/chillers, and no coin/card operated washing machines.

The new 2" fire sprinkler system is characterized as follows:
1. No chemical provisions used in the fire line (e.g. antifreeze, rust inhibitors).
2. Fire Siamese Connection is located more than 700 Ft. of an uncertified source of water.
3. Domestic and fire water risers do not interconnect at any point on the house side of the BFP devices.

[Signature]
4. No fire wells in the premises.

We are proposing a new 2” combined water service, (domestic service with a sprinkler take off).

Based on this information and a detailed thorough inspection of the referenced building and plans, we believe the domestic usage for the building is aesthetically objectionable. This degree of hazard requires a double check valve (DCV) on the combined water service. However, taking into account future expansion there may be a likelihood that the degree of hazard becomes Hazardous. Therefore, we propose to install a 2” RPZ, Wilkins 975XL2 as shown on the plans as required by the NYC-DEP & NYSDOH. I have made the property owner/customer fully aware that if any of the above conditions change, the installation of appropriate backflow prevention may be required.

Dear Plan Reviewer,

The information provided below is to verify the usage of the existing building with regards to backflow prevention requirements.

The referenced location is an existing 3 story and cellar, (twelve) family residence with no commercial uses, no swimming pool, bidets, irrigation systems, no suction tanks, chemically treated boilers or cooling towers/chillers, and no coin/card operated washing machines. Existing water service will be destroyed and abandoned in the street as per Local Code.

The 3” fire sprinkler system is characterized as follows:
1. No chemical provisions used in the fire line (e.g. antifreeze, rust inhibitors).
2. Fire Siamese Connection is located more than 700 Ft. of an uncertified source of water.
3. Domestic and fire water risers do not interconnect at any point on the house side of the BFP Devices.
4. No fire wells in the premises.

We are proposing a new 3” combined water service, (fire sprinkler with 2” domestic service take off).

Based on this information and a detailed thorough inspection of the referenced building and plans, we believe the domestic usage for the building is non-hazardous and qualified for exemption from BFP requirements as it will not be a source of contamination on NYC-DEP water system as per attached letter. We propose to install a 3” double check detector valve, Watts 757 with by-pass meter as required by the NYCEP & NYSDOH. I have made the property owner/customer fully aware that if any of the above conditions change, the installation of appropriate backflow prevention may be required.

Dear Plan Reviewer,

The information provided below is to verify the usage of the proposed building with regards to backflow prevention requirements.

The referenced location is a new 9 story with basement and cellar, mixed use building for (48) residential apartments with community facility and restaurant on 1st floor. There are 3 coin-operated laundry machines in the cellar. At time of survey, there was evidence that the area of the new building has been affected from tropical storm “Sandy”. So, proposed “RPZ” device is located on the First Floor, above Grade Level.

The new 6” combination fire sprinkler/standpipe system is characterized as follows:
1. No chemical provisions used in the fire line (e.g. antifreeze, rust inhibitors).
2. Fire Siamese Connection is located more than 700 Ft. of an uncertified source of water.
3. Domestic and fire water risers do not interconnect at any point on the house side of the BFP devices.
4. No fire wells in the premises.

We are proposing a new 4” domestic water service and 6” combination fire sprinkler/standpipe service.

Based on this information and a detailed thorough inspection of the referenced building and plans, we believe the domestic usage for the building is hazardous and requires a RPZ valve on the domestic as shown on the plans. We propose to install a 4” RPZ valve Wilkins 375A and 6” double check detector valve Wilkins 350ADA with by-pass meter, as required by the NYC-DEP & NYSDOH. I have made the property owner/customer fully aware that if any of the above conditions change, the installation of appropriate backflow prevention may be required.

Dear Plan Reviewer,

The information provided below is to verify the usage of the proposed building with regards to backflow prevention requirements.

The referenced location is a new 7 story with basement and cellar, mixed use building for (48) residential apartments with community facility and restaurant on 1st floor. There are 3 coin-operated laundry machines in the cellar. At time of survey, there was no evidence of any damage to the area of the new building from tropical storm “Sandy”. The area is fully functional with all services and mechanical intact. So, proposed BFP devices are located on the Cellar Floor, below Grade Level.
The new 4” combination fire sprinkler/standpipe system is characterized as follows:
1. No chemical provisions used in the fire line (e.g. antifreeze, rust inhibitors).
2. Fire Siamese Connection is located more than 700 Ft. of an uncertified source of water.
3. Domestic and fire water risers do not interconnect at any point on the house side of the BFP devices.
4. No fire wells in the premises.

We are proposing a new 4” domestic water service and 6” combination fire sprinkler/standpipe service.

Based on this information and a detailed thorough inspection of the referenced building and plans, we believe the domestic usage for the building is hazardous and requires a RPZ valve on the domestic as shown on the plans. We propose to install a 4” RPZ valve Watts 957 and 6” pressure detector check valve Watts LF957 with by-pass meter, as required by the NYC-DEP & NYSDOH. I have made the property owner/customer fully aware that if any of the above conditions change, the installation of appropriate backflow prevention may be required.

Dear Plan Reviewer,
The information provided below is to verify the usage of the existing building with regards to backflow prevention requirements.

The referenced location is an existing 29 story with basement and cellar, mixed use building for (148) residential apartments with community facility and restaurant on 1st floor. There are 12 coin- operated laundry machines in the cellar. The building maintains large boiler, cooling towers and chillers.
The existing domestic and fire (sprinkler/standpipe) water, supplied directly to all fixtures, is fed by the existing roof tanks. The roof tanks are filled by the existing house fill pumps with approved air gaps. There are no water connections to any fixtures in the building after the meter outlet control valve to the fill pumps.

There is an existing 6” combined water service to remain.

Based on this information and a detailed thorough inspection of the referenced building and plans, we believe the domestic usage for the building is aesthetically objectionable. This degree of hazard requires a double check valve (DCV) on the combined water service as required by the NYC-DEP & NYSDOH. I have made the property owner/customer fully aware that if any of the above conditions change, the installation of appropriate backflow prevention may be required.

Dear Plan Reviewer,
The information provided below is to verify the usage of the existing building with regards to backflow prevention requirements.

The referenced location is an existing 29 story with basement and cellar, mixed use building for (148) residential apartments with community facility and restaurant on 1st floor. There are 12 coin- operated laundry machines in the cellar. The building maintains large boiler, cooling towers and chillers.
The existing domestic and fire (sprinkler/standpipe) water, supplied directly to all fixtures, is fed by the existing roof tanks. The roof tanks are filled by the existing house fill pumps with approved air gaps. There are no water connections to any fixtures in the building after the meter outlet control valve to the fill pumps.

There is an existing 6” combined water service to remain.

Based on this information and a detailed thorough inspection of the referenced building and plans, we believe the domestic usage for the building is aesthetically objectionable. This degree of hazard requires a double check valve (DCV) on the combined water service as required by the NYC-DEP & NYSDOH. I have made the property owner/customer fully aware that if any of the above conditions change, the installation of appropriate backflow prevention may be required.

Dear Plan Reviewer,
The information provided below is to verify the usage of the existing park with regards to backflow prevention requirements.

The referenced location is a park used as a recreational area for the public. The park maintains one building as comfort station. It is not subject to flooding. The park will be supplied with one new 3” domestic water service. The Park has no fire protection system.
The use of the proposed 3” domestic water service will be for supplying water to:
   ** 2 non-freeze ground hydrants for irrigation system.
   ** 3 non-freeze drinking fountains.
   ** 6 pieces of spray equipment and toilet room fixtures within the comfort station.
As per the hydrant flow test performed by NYC-DEP taken on ------- Avenue:
   ** The static pressure was 45PSI.
   ** The residual pressure was 42PSI @ 500 Gal.
The water service shall be shut down and winterized during cold weather.

Based on this information and a detailed thorough inspection of the referenced location and plans, we believe the domestic usage for the park is hazardous and requires a RPZ valve on the domestic water service as shown on the plans. We propose to install a 3” RPZ valve Wilkins 375A, located on 1st floor, as required by the NYC-DEP & NYSDOH. The water meter rig will be located in the basement floor of the comfort station. I have made the property owner/customer fully aware that if any of the above conditions change, the installation of appropriate backflow prevention may be required.

Dear Plan Reviewer,
The information provided below is to verify the usage of the existing park with regards to backflow prevention requirements.

The referenced location is a park used as a recreational area for the public. The park will be supplied with one new 2” domestic water service. The Park has no fire protection system. It is not subject to flooding.
The use of the proposed 2” domestic water service will be for supplying water to:
- **2 non-freeze ground hydrants for irrigation system**
- **3 non-freeze drinking fountains**

As per the hydrant flow test performed by NYC-DEP taken on -------- Avenue:
- **The static pressure was 45PSI.**
- **The residual pressure was 42PSI @ 500 Gal.**

The water service shall be shut down and winterized during cold weather.

Based on this information and a detailed thorough inspection of the referenced location and plans, we believe the domestic usage for the park is hazardous and requires a RPZ valve on the domestic water service. We propose to install a 2” RPZ valve Febco LF825YA and 1.5” DCV Febco LF850 on the branch line to drinking fountains, as required by the NYC-DEP & NYSDOH. The water meter rig, DCV and RPZ will be located in a standard pre-cast concrete structure as shown on the plans. I have made the property owner/customer fully aware that if any of the above conditions change, the installation of appropriate backflow prevention may be required.

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Re: Withdrawal Letter
Premises: Address: ............... Street,
Brooklyn, NY 11219
Block: 999443
Lot: 125
County: Kings
Dear Plan Reviewer,
Please be advised that we wish to withdraw the latest filing for backflow prevention device approval which was received by NYC-DEP-CCCU on 00/00/0000.
We will reinstate and utilize the previous approval which was approved on 00/00/0000, approval # 00000000.

Truly,

........................................, PE/RA
........................................ Street, Suite 102
New York, NY 10003

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Re: Supersede Letter
Premises: Address: ............... Street,
Brooklyn, NY 11219
Block: 999443
Lot: 125
County: Kings
Dear Plan reviewer,
ABCD1234 Holding, LLC is the property owner of the captioned address above.
We are requesting at this time that any previous approved/submitted plans by different Applicant to be null and voided. A New Backflow Preventer Application and Plans is hereby submitted by .........................., P.E. / R.A.,
and is requested for Approval.

Sincerely,

Owner's Name:
Address:
Tel: Notary Public
## NOMENCLATURE (LEGEND)

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Section 8

EXAMPLES

NOTES

• The sample drawings are designed to supply as much information as possible. They are GENERIC PRINTS only.

• One drawing is worth 1000 words. Drawing is the Engineering Language.

• Specified dimensions shall take precedence over scaled dimensions.

• All referenced examples are subject to change by DEP as related to any proposed project.

• Any depicted example does not intentionally represent or promote any manufacturer, specific backflow prevention device, or any other device.
INDICATE THE FOLLOWING ON SITE PLAN:

1. Location, state and type of water main
2. Location of curb line, property line
3. Street name
4. Cross street name(s)
5. Distance from closest Cross Street
6. North Arrow
7. Location, state, type and size of water service(s)
8. Removal/capping of existing water service(s)
9. Location of water meter
10. Location of proposed BFP assembly
11. Multiple buildings, stores and locations with house #s, if any
12. Key Map, if any
13. Address, Block # and Lot #
14. See Site Plan (Page 38) for more requirements if any
SAMPLE ELEVATION and PLAN VIEWS

HOT BOX ABOVE GRADE LEVEL

Elevation View

Plan View

DOUBLE CHECK VALVE IN A CONCRETE VAULT BELOW GRADE LEVEL
TYPICAL INSTALLATION
FOR: REDUCED PRESSURE ZONE ASSEMBLY (RPZ)
(IN BUILDING WITH A BASEMENT or A CELLAR)
(NTS)

ELEVATION VIEW

PLAN VIEW
Typical Installation

For: COMBINED WATER SERVICE, FIRE WITH DOMESTIC TAKE OFF

(IN BUILDING WITH NO BASEMENT OR CELLAR) (NTC)
Elevation Views

Drainage Details where there is a House Sewer Connection is above Floor Slab
**TOP VIEW**

8" MIN. CLR. (AT BACK SIDE OF DEVICE)

↑

→ F

30" MIN. CLR. (AT FRONT SIDE OF DEVICE)

Full space (30" min.) to encompass one device to the opposite device

↓

→ F

8" MIN. CLR. (AT BACK SIDE OF DEVICE)

12" MIN. CLR. (AT BACK SIDE OF DEVICE)

(Relief Valve Facing wall or obstruction)

↑

→ F

30" MIN. CLR. (AT BACK SIDE OF DEVICE)

(For free standing and handiness)

↓

→ F

12" MIN. CLR. (AT BACK SIDE OF DEVICE)

(Test Cocks facing wall or obstruction)

8" MIN. CLR. (AT BACK SIDE OF DEVICE)

"DCDA" (N-Pattern)

30" MIN. CLR. (AT BACK SIDE OF DEVICE)

(For free standing and handiness)

↑

→ F

30" MIN. CLR. (AT FRONT SIDE OF DEVICE)

8" MIN. CLR. (AT BACK SIDE OF DEVICE)

"RPDA" (N-Pattern)

30" MIN. CLR. (AT FRONT SIDE OF DEVICE)

(For free standing and handiness)

↑

→ F

30" MIN. CLR. (AT FRONT SIDE OF DEVICE)
INDICATE THE FOLLOWING FACTS ON ELEVATION AND PLAN VIEWS:

1. All water service lines shall be protected (with approved devices), specified and shown.
2. Same level of protection shall be utilized for all similar types of water service lines.
3. Water service lines shall not be interconnected upstream of BFP devices.
4. All items (fixtures) on the drawing shall be labelled and specified conspicuously.
5. Same type of water service connections cannot be extended from same source of water main.
6. Approved setting up and piping materials shall be utilized.
7. Size of DCV/RPZ shall be equal to or larger than the master water meter. Sudden enlargement is not hydraulically recommended to avoid the head loss due to the turbulent flow.
8. Approved/acceptable clearances shall be specified on all drawings.
9. All connections: Tees, hose bibs, etc. shall be installed downstream of BFP device.
10. Devices shall have USC-FCCCHR approval, and can be installed vertically if approved for vertical orientation. Single make and model of BFP device # shall be demonstrated.
11. Device shall be protected against freezing. Adequate heat and lighting shall be provided where BFP assemblies are located.
12. Ball valves to be on 2" or smaller service, Resilient Wedge Seated valves to be OS&Y on 2-1/2" or larger.
13. A separate shut-off valve may be installed upstream of the BFP assembly.
14. Test cocks shall be positioned to facilitate testing.
15. Device shall be adequately supported to prevent lateral movement. Supports shall be placed where they will not obstruct the function or access to RPZ’s relief valve.
16. Device may not be installed higher than 5’ above the floor or access to an OSHA approved ladder or fixed platform is required all the times. Hand-wheels shall not exceed 5’-6”.
17. Where the distance between the point of entry/water meter and device is greater than 10’, all exposed piping shall be labeled every 5’ displaying the words “FEED TO BACKFLOW PREVENTER DO NOT TAP”.
18. Fire Siamese Connection(s), if any, shall be shown downstream of BFP assemblies.
19. Destination of drainage (details) shall be shown.
20. Drain pipe should be sized according to manufacturers’ flow curves to determine max. discharge rates.
21. Drains shall not be subject to flooding and shall be screened.
22. RPZ assembly below grade installation is only acceptable when the floor area and the volume below the relief port of device is a minimum of 2000 cubic feet, for 2” size or smaller to accommodate discharge from a relief valve failure. 8 Hrs. submersion calculations is required for 2-1/2” and up sizes.
23. Customer shall be aware of the potential for water damage in the event of a discharge.
24. Enclosure to be NYS designation, HOT BOX, HYDROCOWL, SAFE-T-COVER, or approved equivalent.
25. Enclosure shall be anchored to a concrete slab. Concrete slab to be sized according to manufacturer’s recommendations.
26. Enclosure shall have lockable access doors and drain ports to allow for drainage.
27. Devices shall be supported to the concrete slab inside enclosures.
28. Full opening hatch to encompass centerline of device.
29. A minimum of 30” clearance shall be maintained to encompass one device to the opposite device or any obstruction.
30. Length of hatch should be spacious enough to lift larger device thru opening (check to check).

NOTE:

When required, Non-Lead-Free BFP devices can be utilized on the domestic water service only and exclusively:
• DCV, in low hazard non-potable systems (where a potential non-health hazard exists)
• RPZ, in high hazard non-potable systems (where a potential health hazard exists)

Above list should not be construed as a complete list
**Appendix 1**

**GLOSSARY**
Commonly Used Cross-Connection Terms, Definitions, Abbreviations, and Acronyms

**Absolute pressure:** sum of gauge pressure plus atmospheric pressure measured in units of pounds per square inch absolute (psia).

**Aesthetically Objectionable:** A condition which could be objectionable to other water consumers, but would not adversely affect human health. Substances such as food-grade dyes, hot water, and stagnant water from fire lines in which no chemical additives are used may result in aesthetically objectionable conditions.

**Air Gap (AG) Separation:** is a vertical physical unobstructed break through free atmosphere between the free flowing discharge end of any pipe or faucet supplying a potable water and a plumbing fixture or other device and the flood-level rim of an open or non-pressurized receiving receptacle.

**Air Gap Fitting:** is a device designed to be installed under RPZ assemblies to catch moderate relief valve discharge due to pressure fluctuations and/or minor check valve fouling.

**AMR:** “Automatic Meter Reading”, the use of radio or telephone-based technology to read water meters.

**Approved:** is any condition, method, device, or procedure accepted by the DEP Review Unit.

**Approved Air Gap:** is an air gap separation with a minimum distance of at least twice the diameter of the supply line when measured vertically above the overflow rim of the vessel, but in no case less than one (1) inch. Air gap separation is probably the oldest method to prevent cross-connections that result in backflow due to either backpressure or backsiphonage.

**Assembly:** an assemblage of one or more approved body components including approved shut-off valves fitted together.

**Auxiliary Intake:** any piping connection or other device whereby water may be secured from any sources other than from the public water system.

**Auxiliary Water Supply:** any water supply on or available to the facility/premises other than the treated water supplied by DEP.
**Authority having jurisdiction**: the agency, organization, office or individual responsible for approving materials, equipment, work, installation or procedure.

**AWWA**: The American Water Works Association: is the largest nonprofit, scientific and educational association dedicated to managing and treating water.

**Backflow**: is the undesirable reversal of the flow of a liquid, gas, or other substances from its intended direction into any distribution pipeline or plumbing system of a potable water system from any source as a result of cross-connection.

**Backflow Prevention Assembly**: is a mechanical plumbing device (Air Gap, DCV or RPZ) designed to be installed in a plumbing system to prevent water from flowing backward in the system. A properly installed, tested and maintained backflow preventer at the service entrance to a building or property can reliably prevent the backflow of water of an unknown quality from flowing back into the community water system.

**Backpressure**: a pressure in the downstream piping that is higher than the supply pressure.

**Backsiphonage**: negative or Sub-atmospheric pressure in the supply piping.

**Ball Valve**: a valve with a spherical gate providing tight shut-off, ball valves on backflow prevention assemblies shall be fully ported and resilient seated.

**Barometric Loop**: a looped piping arrangement 35’ height in which the water flow goes over the loop at the top.

**Basement**: is a building story that has less than one-half of its floor-to-ceiling height below curb level or the base plane.

**Block**: a tract of land bounded by consecutive intersecting streets.

**Booster pump**: a pumped system used to deliver water to a higher pressure and/or flow within a building.

**Building**: an enclosed structure having a specific block and lot (or tax sub-lot) and a separate entry from the street or an outdoor area.

**Bypass**: any system of piping or other arrangement whereby water may be diverted around a backflow prevention assembly, meter, or any other public water system controlled device for the purpose of providing an emergency supply of water.

**Cellar**: is a building story that has more than one-half of its floor-to-ceiling height below curb level or the base plane.

**Certified backflow prevention assembly tester**: is a person who has demonstrated competence to test, repair and maintain backflow prevention assemblies as evidenced by certification that is recognized by DEP.

**City water**: water supplied by the City of New York.

**City Water Main**: a water main owned and maintained by the City of New York under the jurisdiction of DEP.

**Combined Water Service**: is a water service whose primary purpose is to supply water for general usage, but also supplies water for fire protection purposes.

**Commercial User**: a person whose premises are used to offer services and/or products such as retail and wholesale stores, gasoline stations, restaurants, schools, churches, hotels, motels, nursing homes, private clubs, theaters, office buildings and governmental buildings. The sewage factor is equal to the volume of water used.

**Contaminant**: any substance introduced into the public water system that will cause illness or death.

**Contamination**: impairment of the quality of the potable water system that creates an actual hazard to the public health through poisoning that will cause illness or death.
Critical level: is a reference line representing the level of the check valve seat within a backsiphonage control unit. It is used to establish the height of the unit above the highest outlet or flood level rim. If it is not marked on the backflow preventer, so, the bottom of the assembly is the critical level.

Cross-Connection: a connection or arrangement of piping, valve, fixture, appurtenances, etc., between a drinking water plumbing system and any other source or system that may allow the drinking water through backflow within the system to become contaminated or questionable in quality. Cross-connections can either be eliminated or protected by an air gap or mechanical backflow preventer.

Cross-Connection: any physical arrangement whereby public water supply is connected, directly or indirectly, with any other water system, sewer, drain, conduit, pool, storage reservoir, plumbing fixture or other device which contains, or may contain, contaminated water, sewage, or other waste or liquid of unknown or unsafe quality which may be capable of contaminating the public water supply as result of backflow caused by the manipulation of valves, because of ineffective check valves or backpressure valves or because of any other arrangement.

Cross-Connection Control: is a program to eliminate, monitor, protect and prevent cross-connections from allowing backflow.

Curb Stop (Valve): the shut-off valve, which is part of the water service, located at 18" from the curb in the sidewalk area outside the building.

Customer: any natural or artificial person, owner, operator, business, industry, or governmental entity that obtains water, by purchase or gratis, from NYC-DEP.

DEP: NYC Department of Environmental Protection.

Direct Cross-Connection: an actual or potential cross-connection subject to backsiphonage and backpressure.

Disc: the part of a valve that actually closes off flow.

Distribution piping: all piping downstream of the water meter setting.

Domestic Water Service: a water service line supplying water for all purposes excluding fire protection purposes.

Double Check Detector Assembly (DCDA): a specially designed assembly composed of line size approved double check valve assembly, with a bypass containing a water meter and approved double check valve assembly specifically designed for such application. The meter shall register accurately for very low rates of flow up to 3 GPM and shall show a registration for all rates of flow. This assembly shall only be used to protect against non-health hazards and is designed primarily for use on fire systems.

Double Check Valve Assembly (DCVA): an assembly of two internally loaded check valves, either spring loaded or internally weighted, installed as a unit between tightly closing resilient seated shut-off valves and fitted with properly located resilient seated test cocks. This type of device shall only be used to protect against non-health hazard pollutants.

Downstream: means the direction of flow when only the public water supply is supplying water through the customer water system and backflow is not occurring.

Expansion tank: a tank used for safely controlling the operational and functioning status of a backflow prevention assembly.

Failed: the status of a backflow prevention assembly determined by a performance evaluation based on the failure to meet all minimum standards set forth by the approved testing procedure.

Field Operations: the Division of the DEP responsible for the appropriate inspections, issuance of tapping permits for installation, altering or operation and repair of water mains, valves, fire hydrants, and water service lines; the testing and chlorinating of water mains and appurtenant facilities; the tapping of water mains for water connections and other similar types of work involving system maintenance.

Field testing: a procedure to determine the operational and functioning status of a backflow prevention assembly.
Fire Department Connection (FDC or Siamese Connection): a connection through which Fire Department can introduce supplemental water with or without the addition of other chemical fire-retarding agents by the means of a pump into a fire sprinkler, standpipe or other fire suppression systems.

Fire meter: a water meter used to monitor consumption by sprinklers or other fire protection systems.

Fire Protection Service: a water service line supplying exclusively an automatic sprinkler system and/or standpipe system, hose connection, or hydrant for fire protection purposes.

Flood level rim: that level from which liquid in plumbing fixtures, appliances or vats could overflow to the floor when all drains and overflow openings built into the equipment are obstructed.

Flow Switch: a device to accurately monitor the flow of liquid in pipelines servicing water systems, heating systems, air conditioning and processing installations for industrial and commercial purposes. The flow switch is designed to act as automatic control or safety devices for liquid flow. It shall be installed by Licensed Electrician as per local code and manufacturer’s strict instructions.

Flushometer valve: a device which discharges a predetermined quantity of water to fixtures for flushing purposes and is actuated by direct water pressure.

Gate valve: is a valve which opens by lifting a round or rectangular gate/wedge out of the path of the fluid. Gate valves are actuated by a threaded stem which connects the hand-wheel to the gate. It shall be approved resilient seated wedge gate type.

Gauge Pressure: the pressure at a point of a substance (gas or liquid) above that of the atmosphere.

Globe Valve: is a valve used for regulating flow in a pipeline, consisting of a movable disc-type element and a stationary ring seat in a generally spherical body.

Hazard, Degree of: a term derived from evaluation of the actual or potential risk to public health and the adverse effect of the hazard upon the public water system.

Hazard, Health: a cross-connection or potential cross-connection involving any substance that could, if introduced in the public water supply, cause death, illness, and spread disease also known as a High Hazard.

Hazard, Plumbing: a cross-connection in a customer’s potable water system plumbing that is not properly protected by an approved air gap or BFP assembly.

Hazard, Non-health: a cross-connection or potential cross-connection involving any substance that would not be a health hazard but could constitute a nuisance or be aesthetically objectionable if introduced into the public water supply also known as Low Hazard.

House Tank (Roof Tank): an elevated water tank used to feed domestic and/or fire systems, which is usually located on the roof.

Hydrant flow test: determine the pressure and flow adequacy of the NYC Water Supply System at a specific location. An application must be used to request that a hydrant flow test be conducted by DEP.

Indirect Cross-Connection: an actual or potential cross-connection subject to back-siphonage only.

Industrial Fluid: any fluid or solution that may be chemically or biologically contaminated or polluted in a form or concentration that could constitute a health, system, pollution, or plumbing hazard if introduced into the public water supply. This shall include, but is not limited to: polluted or contaminated water; all type of process water or used water originating from the public water system and that may have deteriorated in sanitary quality; chemicals; plating acids and alkalis; circulating cooling water connected to an open cooling tower; cooling towers, boilers that are chemically or biologically treated or stabilized with toxic substance; contaminated natural water systems; oil, gases, glycerin, paraffin, caustic , and acid solutions, and other liquids or gases used in industrial processes, or for fire purposes.
**Industrial User:** a person who operates a manufacturing or processing facility that is engaged in producing a product. The sewage factor is equal to the volume of water used.

**Inspection:** an on-site assessment of a facility by DEP authorized representatives to determine if BFP assemblies are required by the customer to protect the City Water Main from either actual or potential cross-connections.

**Inspector:** an authorized individual or representative having jurisdiction empowered to ensure code compliance.

**Interconnection:** any system of piping or other arrangement whereby a public water supply is connected directly with a sewer, drain, conduit, or uncertified water source.

**Internal protection:** fixture isolation and/or isolation of an area or zone for protection by installation of an approved backflow prevention assembly at the source of the potential hazard within a specific area. It is located downstream of a containment device which is under jurisdiction of the local plumbing code.

**Irrigation system:** piping used to supply water to vegetation and plant life.

**Lead-Free:** not containing more than 0.2% lead in solder and flux; not more than a weighted average of 0.25% lead in wetted surfaces of pipes, pipe and plumbing fittings and fixtures.

**Licensed Master Plumber:** a plumber licensed by the City agency having jurisdiction over such licenses to perform plumbing work within NYC.

**Lot:** a tax lot as shown on the Tax map of the City.

**Maintenance:** work performed or repairs made to keep equipment operable and in compliance.

**Mapped Street:** is a street that appears on the official map of NYC.

**Meter Maintenance:** BCS is responsible for the installation, reading, replacement, and maintenance of water meters and remote reading devices.

**Meter Setting:** the fittings, connections, and valves adjacent to the water meter including the inlet gate valve, outlet gate valve, and bypass gate valve when required, test tee and the couplings, nipples, and spacers necessary for a complete meter installation, but do not include the meter.

**Non-health hazard:** a cross-connection involving any substance that generally would not be a health hazard but would constitute a nuisance (aesthetically objectionable) if introduced into the potable water supply.

**NYC Water Board:** a corporate municipal instrumentality of the State of New York established by Chapter 515 of the Laws of 1984 which is authorized to establish and collect fees, rates and other service charges for use of, or for services furnished by, the New York City water and sewer systems.

**Occupant:** a person who occupies a premise and causes water and sewer service to be used.

**Owner:** a person who is shown as the taxpayer of record for a particular premise.

**Passed:** is the status of a BFP assembly determined by a performance evaluation in which the assembly meets all minimums set forth by the approved testing procedure.

**Performance Evaluation:** an evaluation of approved BFP assemblies using the acceptable testing procedures in determining the status of the assembly.

**Person:** any individual, firm, partnership, association, public or private- corporation, Limited Liability Company, public agency, municipality or any other entity receiving water/sewer service.

**Pit meter:** a water meter installed in a pit or vault.
**Plumbing system:** all potable water and distribution pipes, fixtures, traps, drainage piping, gas piping, water treating or using equipment, vent pipe including joints, connections, devices, receptacles and appurtenances within the property lines of a premises.

**Pollutant:** a substance in the public water system that would constitute a non-health hazard and would be aesthetically objectionable if introduced into the public water supply.

**Pollution:** the presence of a pollutant or substance in the public water system that degrades its quality so as to constitute a non-health hazard but adversely and unreasonably affect the aesthetic qualities of potable water.

**Potable Water:** treated water that is safe for human consumption as prescribed by DEP.

**Public Water Supply:** entity Water Main furnishing potable water to the public for general use which is recognized as the public water supply by DEP.

**Premises:** each lot, parcel of land, or building having any connection to the Water System and/or Sewer System.

**Pressure Vacuum Breaker Assembly:** an assembly consisting of one or two independently operating spring loaded check valve(s) and an independently operating spring loaded air inlet valve located on the discharge side of the check valve(s), with tightly closing shut-off valve(s) on each side of the check valves and properly located test cocks for testing valves. This assembly is approved for internal plumbing use only (by DOB) and is not used as an approved containment BFP device for premise isolation.

**Reclaimed water:** treated wastewater which is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is not safe for human consumption.

**Record Street:** a street that appears on the Tax Map of the City but may not be a mapped street.

**Reduced Pressure Principle Assembly (RPZA):** an assembly consisting of two independently acting approved check valves together with hydraulically operating, mechanically independent, pressure differential relief valve located between the check valves and below the first check valve. These units shall be located between two tightly closing resilient seated shut-off valves as an assembly and equipped with properly located resilient seated test cocks.

**Reduced Pressure Principle Detector Assembly (RPDA):** a specially designed assembly composed of a line-size approved reduced pressure principle backflow prevention assembly with a bypass containing a water meter and approved reduced pressure principle backflow prevention assembly specifically designed for such application. The meter shall register accurately for very low flow rates of flows up to 3 gallons per minute and shall show registration for all flow rates. This assembly shall be used to protect against health hazards on fire protection services only.

**Relay:** replacement of an entire water service pipe without replacement of the tap or wet connection.

**Residential User:** a person whose premises are domiciles for single or multiple family usages.

**Service Connection, Water:** the point of delivery to the customer’s water system; the terminal end of a potable water service connection from the public water main. Service connection shall include water connections to fire hydrants and all other temporary or permanent water service connections made to the public water main.

**Single check valve:** is a directional flow control valve, but not an approved BFP assembly.

**State:** the State of New York

**Stub Water Service:** any pipe connected to the water main intended for service to a premise that is physically connected to that premises, but rater is capped within the right-of-way or public easement. The stub water service includes the connection to the water main (corporation stop), the shut-off valve or curb stop, as well as the pipe.

**Submersion Calculations:** An 8 hour calculation as a backup: it adds a fails safe to guarantee the RPZ relief valve won’t end up under water.
Submerged inlet: an inlet pipe opening that is below the flood level rim of the receptacle.

Suction (Holding) Tank: a tank used to protect the City distribution system from a large sudden water demand.

Survey/Inspection: an evaluation/assessment process of a facility water system performed for the determination of actual or potential cross-connection hazards and the appropriate BFP devices needed.

Tap: a corporation stop approved by NYC-DEP which controls the flow of water.

Tee-Connection: a 3-way pipe fitting installed in a private water main or internal water main in lieu of a tap or wet connection.

Trap seal primer: is a plumbing valve that:
- adds spurt or small amount of water to sewer traps.
- is typically for a floor drain’s trap to prevent losing their water seal by evaporation.
- keeps the sewer wet by injecting water to prevent gases from entering the building from basement floor drains.
- is connected to the water service and activates when pressure fluctuations are sensed.
- shall be installed in an accessible location where periodic maintenance can be performed.

Union: a 3-part coupling device used to join pipes.

Upstream: means the direction of flow opposite to downstream.

Valve seat: port(s) against or into which a disc or trapped stem is pressed or inserted into the shutdown flow.

Valve, Solenoid Control (ACV): is an automatic control valve to shut off the water supply, to prevent the risk of flooding a building from water discharge caused by catastrophically fouled RPZ relief valve.

VENDING MACHINE, soda dispensing machine: RPZ shall be installed for use in preventing carbon dioxide gas and/or carbonated water from vending machines from entering the water supply system. Carbon dioxide in water lowers the pH to the point that a large amount of copper may be dissolved in water that is standing in copper pipe. Sufficient copper concentrations to cause copper poisoning may result.

Waiver: the act of intentionally relinquishing a right or privilege.

Water Main: the primary and intermediate transmission lines and the local distribution lines of the System.

Water meter setting: water meter inlet and outlet isolation valves, test port or test tee with associated piping and fittings.

Water purveyor: owner or operator of public or private potable water works systems.

Water Service: the pipe connecting the water main with the premises served. The water service includes the connection to the water main (tap/wet connection), the shut-off valve or curb valve, and the pipe leading to the inlet gate valve at the meter setting.

Water System: the potable water system operated, whether located inside or outside, the related limits thereof, shall be considered as made up of two (2) parts: the Utility System and the Customer System.

Wet Connection: a hardware required to install a water connection larger than 2” without interruption of water service. It shall consist of a sleeve and an approved corresponding valve.

Notes:
- SDWA states that water suppliers are only responsible for the water quality delivered to the water consumer’s service connection.
- The DEP ultimate goal is to provide protection for the public water system to maintain the highest quality of drinking water, safe and clean, to the flowing tap.
Appendix 2

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