DIVISION 15

SECTION 15C FIRE SUPPRESSION SYSTEM (SPRINKLERS)

15C.01 GENERAL

A. All work under this Section is subject to the Contract Documents, Contract Drawings and the "General Conditions Governing all Contracts," all of which form a part of this Section as if written out in full herein.

B. The contractor for work under this specification is referred to the General Conditions, Special Conditions and all Contract Documents, all of which are hereby made part of this specification.

C. Perform all necessary removals, cuttings, repairs, replacements etc., for the completion of this work and provide all materials, labor, tools and equipment required to perform the work as specified herein.

D. Contractor must carefully examine the site of the proposed work, as well as its adjacent area, and seek other usual sources of information for they will be conclusively presumed to have full knowledge of any and all conditions on, about, or above the site relating to, or effecting in anyway, the performance of the work to be done under this contract which were or should have been indicated to a reasonably prudent bidder.

NOTE: NOTIFY ARCHITECT/ENGINEER BEFORE STARTING WORK. ALL WORK TO BE DONE UNDER THE DIRECTION OF THE ARCHITECT/ENGINEER. NO WORK TO BE PERFORMED ON WEEKENDS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT/ENGINEER.

E. All Plumbing work shall be performed by a Licensed Master Plumber, as specified by NYC Building Department in a neat manner and in accordance with best practices. All work shall comply with all local, state and Federal rules and regulations. The Contractor shall obtain and complete all necessary applications, approvals and pay all fees required to obtain all trade related permits and final sign offs from all agencies having jurisdiction.

F. The Contractor shall perform all necessary removal, cutting, repair, replacement, etc. for the completion of this work, and provide all labor, materials, tools and equipment required to perform the work as specified herein and to comply with New York City Codes, NYC Local Law #10/1999 and N.F.P.A. Rubbish an debris shall be expeditiously removed from the premises.

G. The Contractor shall obtain prior approval from Architect/Engineer for changes, additions, or modifications to the "Scope of Work", specifications, and drawings.

H. Notify Architect/Engineer before starting work. All work is to be done under the supervision and as directed by Architect/Engineer. Prior to completion of Contract,

Architect/Engineer shall coordinate with the Management Group a single authorized punch-list for issuance to the Contractor.

I. Tenants in occupancy (If applicable):

1. It is understood and agreed that the existing tenants in the building may remain in occupancy during the work. The Contractor shall, at all times, be responsible for minimizing inconvenience to the tenants, protecting life and property of tenants, and maintaining the work area in a clean and habitable condition.

2. If the work requires substantial disruption, the Contractor shall be responsible for informing Architect/Engineer of the time and extent of the disruption at least two days in advance and shall obtain approval from Architect/Engineer to proceed with the work.

J. The Contractor shall fully familiarize himself with the job and field conditions before submitting his bid.

K. Substitutions:

1. Reference in the Contract Document to materials, form of construction, products, and equipment by proprietary name, make and catalogue number shall be interpreted as establishing a standard of quality of manufacture, performance, or appearance, and shall not be construed as limited competition.

2. Should the Contractor desire to substitute any item of brand or manufacture other than that specified, he shall submit to Architect/Engineer a written request for approval of the substitutions he proposes and wishes to make. Such requests shall be accompanied by descriptive literature, drawings, samples or such information as the Architect/Engineer will investigate all such requests and render decisions thereon as promptly as is reasonably possible, and such decisions shall be final.

3. Any substitution of material specified shall be equal in quality and value, or credit is due to the Owner.

L. Immediately upon award of this contract, Contractor shall confer with Architect/Engineer prepare a work program schedule. This schedule shall be revised as may be required by Architect/Engineer and when approved, shall establish the order in which the work shall proceed, and the dates when the various parts shall be installed or completed.

M. Provide for all work for a <u>complete, working and approved</u> sprinkler system. Any items or services not indicated in the contract documents and necessary for completion of the system, or required by all codes, must be brought to Architect's/Engineer’s attention prior to bidding. This contractor is responsible for all items or services necessary for a <u>complete</u> installation of an approved sprinkler system.

N. Provide for coordination for installation of the water flow detector as required for fire alarm system; see section 16C for detector information.

15C.02 WORK INCLUDED

A. Provide all labor, materials and equipment necessary or incidental to perform the work of this Section and related work as indicated in the Contract Documents. Refer to "Division Scope of Work" section: 15C for complete scope of work for this section, which form a part of the contract specifications. A complete operational sprinkler system in conformance with New York City Plumbing Code, NYC Local Law # 10/1999 and N.F.P.A. # 13 is required by this contract.

15C.03 WORK EXCLUDED

A. Electric wiring for all controllers and motors to conform to Code, By Section 16A.

B. Removal of friable asbestos insulation.

15C.04 SUBMISSION REQUIREMENTS

A. BEFORE WORK COMMENCES, ARCHITECT/ENGINEER APPROVAL REQUIRED

1. Submit four (4) catalog cuts for sprinkler heads, piping, pumps, valves and all alarm/control devices. See section 15C.01k

B. Must Accompany Final Payment Request

1. New York City Department of Buildings Final Sign-off for all work under this section and DOB approved FP-85 form.

2. New York City Fire Department Certified Form FP-100 – Residential Sprinkler System Flow Test Report.

3. Operation and service manuals and warrantee information for all equipment and devices installed.

15C.05 SCOPE OF WORK

A. This contractor must only refer to the appropriate sections of the specification as requested in the Scope of Work and/or contract drawings.

B. Provide complete Fire Suppression system in accordance with New York City and N.F.P.A. codes including heads, piping, pumps, controllers, drainage system, street service connections, valves, etc.

C. This contractor to perform sprinkler flow test in presence of New York City Fire Department, HPD and building owner representatives. File form FP-100 with the Fire Department, and pay all required fees.

15C.06 CODES, RULES AND CERTIFICATES

A. The complete installation of the fire suppression system and all other items of the work shall be in strict accordance with all laws and with latest rules and regulations of all Municipal and other Public Agencies, and the National Board of Fire Underwriters. Should there be a conflict between any items or requirements, specified herein and/or shown on the contract drawings, all pertinent rules, regulations and legal requirements shall apply.

D. This contractor is responsible to complete all necessary applications, pay all fees, give all notices, file all necessary drawings (if required) and obtain all permits and final sign-offs from Dept. of Buildings for all work under this contract. Comply with all laws, ordinances, rules and jurisdiction over this work and the standards of the Fire Underwriter's Association. If any discrepancies exist between the contract documents and prevailing code requirement, the contractor shall comply with code criteria.

15C.07 CONTRACT DRAWINGS

A. The contract drawings show the approximate location of all required equipment and the diagrammatic arrangement of piping. Piping runs have been shown with the intention of most clearly indicating the routing. Actual runs may differ if kept within the requirements and provisions of these specifications, and providing that all modifications have been shown in the shop drawings. Exact location of all equipment will be determined in the field and the contractor must secure exact dimensional data before laying out any work.

B. This contractor must submit shop drawings only if the final field installation will differ from architect's/Engineer’s proposed drawings.

1. Five (5) copies of each drawing shall be submitted to Architect/Engineer before any work begins.

2. Drawing shall be 1/4" = l' - 0" scale blueprint indicating exact location and size of all equipment and piping. Plans to include cellar layout, first floor layout, typical floor layout, riser diagram, and any drawings Architect/Engineer may request. Drawings will not be accepted unless a complete list of deviations from Architect's/Engineer’s proposed plans is included.

15C.08 REMOVAL OF RUBBISH

A. This contractor shall remove at all times from the building, waste materials or rubbish accumulated resulting from this work. Upon completion of the work, clean all heating materials and equipment to the satisfaction of Architect/Engineer.

15C.09 ACCESSIBILITY

A. Ascertain that all equipment, such as valves, and such other apparatus as may be necessary to be reached from time to time for operation and maintenance, is made easily accessible.

B. The location of equipment may conflict with the building construction and may disclose the fact that the location for this work does not make its position easily and quickly accessible. In such cases, call Architect's/Engineer’s attention to this fact before installing this work and contractor shall be guided by Architect's/Engineer’s instructions.

15C.10 REQUIREMENTS AND PROCEDURES

A. General

1. The new Fire suppression system shall include all a complete Wet Sprinkler System with a drainage system piped to cellar/basement, siamese connection, fire water service with B.F.P and meter, fire booster and jockey pumps, heads, alarms, etc. See drawings for exact system to be used. Each system shall operate rapidly, noiselessly and efficiently throughout.

B. Coordination of Work and Trades

1. All piping and equipment installed under this contract shall be 5'-0" minimum from all electrical equipment.

2. Piping shall be concealed in wall chases, recesses, shafts, and hung ceilings where same are provided. Refer to, and carefully check Architectural, Structural, Plumbing, Electrical and HVAC Drawings and details for locations where walls, partitions, ceilings, beams, columns and other surfaces are furred, locations of shafts and conflicts with work of other trades.

3. Obtain maximum possible headroom to the bottom of exposed piping or covering. In no case shall headroom be less than seven (7) foot six (6) inches above finished floor.

4. The Contractor shall provide offsets as may be required to maintain pitch, elevation or to accommodate routing around obstacles.

5. Should any work installed require subsequent modification to avoid interference, as determined by the Architect/Engineer such changes shall be made without cost to Owner. Architect's/Engineer’s decision where interference or other conditions require the changing of work installed shall be final.

6. Where the work of the Contractor is concealed, the contractor is responsible for its proper installation to assure that it does not project beyond the finished lines of floors, ceilings or walls.

7. The installation of the Waterflow detector shall be under the Fire Alarm System installer. However, this sprinkler contractor must coordinate and revise the piping layout as required for the detector installation.

15C.11 EXCAVATION AND BACKFILL

A. Perform all excavation, backfilling, pumping and sheathing required for installation of all work described herein. Backfilling shall be carefully done and thoroughly compacted. For excavation below 8'-0", fill shall be made in layers not more than one foot deep and each layer tamped. Fill around piping shall be flushed in with water. No large stone or boulders shall be used. All backfill shall be installed as per requirements of Bureau Highways Operations and New York Paving.

B. Contractor is required to obtain a permit from the Department of Highways prior to proceeding with any pavement excavation.

C. All backfill for pavement shall be tested and inspected by an approved testing laboratory and Professional Engineer provided by the contractor in accordance with Bureau of Highways Operations and New York paving requirements.

15C.12 MATERIALS AND WORKMANSHIP

A. Automatic Fire Suppression System

- Provide a complete wet sprinkler system in conformance with the requirements of the N.Y.C. Building Code, N.Y.C. Local Law #10/1999 and N.F.P.A. pamphlet #13. The provisions of the pamphlet (unless otherwise specified) shall be followed in total whether the stipulations listed therein are directed or recommended. The entire system shall be installed according to the D.O.B. approved plans by a Licensed N.Y.C. Plumbing Contractor or Master Fire Suppression Contractor, as specified by NYC Building Department with a letter of fitness from N.Y.C. Fire Department.

1. Furnish all labor, materials, equipment, services, etc., necessary or required to perform the work of this section as indicated on the drawings and/or specified herein. The work shall include but not necessarily be limited to the following:

   a. Provide sprinkler piping complete with heads in spaces from cellar to stair/roof bulkhead as indicated on the drawings. Sprinkler heads shall be ceiling concealed type in all hung ceiling areas (apartments, public halls, commercial spaces) and upright or pendent in unfinished or finished areas without hung ceilings (basement/cellar, laundry rooms, compactor rooms, etc.).

   b. Provide new sprinkler water service complete with all excavation, back fill, patching, service tapping, sleeves and double check detector assembly with by-pass meter.

c. Provide control, check and O.S & Y. valves. Provide steel chain, steel padlock and two keys in order to secure O.S & Y. valves in open position.

d. Provide a sprinkler booster pump and jockey pump at cellar floor to supply Sprinkler system (if indicated on drawings).

e. Provide an approved Fire Department Siamese connection.

f. Provide a drain system from test tee at upper floors.

g. Provide water flow switch and alarm bells.

h. Provide for testing, cleaning and adjusting of sprinkler system.

i. The contractor shall give necessary notices, hydraulic calculation to departments having jurisdiction, obtain permits or licenses necessary to carry out this work and pay all fees therefore.

j. Shop drawings, samples and instructional manuals, tests and adjustments.

k. Supports, hangers, inserts, anchors, guides, sleeves, flashing and similar related items.

l. Tags, charts, signs, drip pans.

m. Provide for all electrical wiring of all sprinkler equipment for complete operation of system. All work to be performed by licensed electrical contractor.

n. Guarantees.

2. Source of Water Supply for Sprinkler System

<u>- Provide an automatic water supply service for sprinkler system as indicated on drawings.</u>

a. <u>Single (Separate) Fire Water Services</u>: At least one automatic source of water supply shall be provided for sprinklers installed in Residential Occupancies up to and including six stories or seventy-four feet in height.

1) The direct connection of sprinklers to the city water main shall be acceptable as an automatic water supply, provided the main is capable of maintaining a pressure of at least fifteen psig at the top of the highest sprinkler riser, with five hundred gpm of water flowing from a two and one-half inch hydrant outlet located at the street level within two hundred fifty feet of the building.

2) Provide a separate fire water service for sprinkler system from the street with control valve in flush mounted sidewalk box, check and O.S & Y. valves, backflow prevention device, etc., as indicated on drawings including excavation, backfilling, repairing sidewalk, meter, etc.

b. Dual Fire and Domestic Services: All domestic water lines tapped off the fire service must conform to the N.Y.C. Building Code, N.F.P.A. 13 standards and "Rules and Regulations Governing and Restricting the Use and Supply of Water" Section 121.B.

1) Only one connection of the domestic water supply to the sprinkler water supply shall be permitted, and no shut-off valve shall be placed on the sprinkler supply line other than the main shut-off valve for the building on the street side of the house service water supply connection. The diameter of the house service water supply connection shall not exceed one-half the diameter of the sprinkler water supply connection.

2) The common supply main to the building, serving both sprinklers and domestic uses, may be used if provision is made to automatically shutoff the water flow on domestic water system upon operation of sprinklers and divert the available water supply to the fire sprinkler system.

3. Sprinkler Fire Booster Pump and Jockey Pump. (If required in Scope of Work and/or drawings)

a. Sprinkler Fire Booster Pump

1) Provide an automatic electric fire pump rated at 250GPM minimum or as indicated on the drawings. The pump shall deliver 150% of rated capacity at not less than 65% of rated head. Shut-off head shall not exceed 140% of the rated head. The pump shall be in-line construction with cast iron casting, bronze enclosed impeller, bronze casing wear ring, steel shaft, bronze shaft sleeve, stuffing box with adjustable bronze packing gland and braided packing. Pump manufacturer Peerless Pump Company vertical in-line models, type PVF series or approved equal.

2) All components on discharge side of the pump shall have a rated working pressure greater than pump shut-off head plus maximum suction pressure. The following accessories and fittings shall be provided: Eccentric suction reducer-if required, concentric discharge increaser (if required), automatic air release valve, casing relief valve, etc.

3) The pump shall be close-coupled to a HI/NEMA frame, vertical, electrical motor rated as indicated on the drawings with 1.15service factor. Locked rotor current shall not exceed then values specified in the NFPA Pamphlet # 20. The pump and motor shall be mounted on cast iron pedestal.

4) The Fire Pump Controller shall be Torna-Tech, model FPL, or approved equal. The enclosure shall be a NEMA type 2. The controller shall be combined manual and automatic limited service across-the-line type for HP specified and including voltage surge arresters. The controller shall be capable of interrupting a short circuit current at least equal to the available short current in the controller supply circuit. Provide disconnect switch in controller with a interrupting capacity as indicate on the drawings. Unit must be UL and FM approved for fire pump service, approved for use in New York City, and must comply with N.F.P.A. Pamphlet 20.

5) The controller shall include “Power failure” and “Pump Running” dry contacts for remote alarm wiring to alarm control panel and indicator lights for these conditions.

6) The controller must be capable of performing or contain the following features: pressure switch, automatic start on low pressure, timing relay for automatic stop, to field changeable or manual stop.

b. Jockey Pump

1) The jockey pump shall be vertical multi-stage cast iron stainless steel fitted manufactured by Grundfos, series CR1 (or approved equal) with a rated capacity as indicated on the drawings. The pump shall be close coupled to an ODP motor with 1.15-service factor.

2) The jockey pump controller shall be Torna-Tech model JP, or approved equal. Unit shall be in a NEMA 3 and 3R enclosure with one main disconnect switch with door interlock and padlock provision, one Hand-Off-Auto (HOA) switch, one magnetic contactor HP rated, one thermo magnetic motor protector with short circuit and overload protection, adjustable pressure switch, control transformer with fused secondary and running period timer.

c. General

1) The fire pump shall be hydrostatically tested and run tested prior to shipment, by the pump manufacturer. The pump shall be

hydrostatically tested at a pressure of not less than one and one half times no flow (Shutoff) head of the pump's maximum diameter impeller plus the maximum allowable suction head, but in no case less than 250 psig. A characteristic curve of pump performance, efficiency, and brake horsepower shall be drawn from the test results and furnished to the Engineer for approval.

2) The pump manufacturer shall provide the service of manufacturer's representative for the fire pump installation start-up and test run supervision.

3) Pumps shall be guaranteed for five (5) years.

4. Fire Service Backflow Prevention Devices.

a. Double check detector assembly with bypass meter (DCDA): Epoxy coated cast iron check valve body, bronze seat and disk holder; stainless steel trim and durable, tight-seating rubber check valve discs, UL/FM listed OS&Y gate valves, CFM meter and ball type test cocks. Model 709 double check detector assembly with bypass meter as manufactured by Watts Industries Inc., or approved equal.

5. Pipe, Fittings and Valves

a. All piping, fittings, valves, etc. shall be of materials and weights required by the New York City Building Code and the N.F.P.A. standards and FM approved. Approved equals include Globe Fire sprinkler Corp., Shurjoint Piping Products.

b. Sprinkler piping inside of the building shall be of standard weight schedule 40 black steel suitable for 175-psig minimum working pressures. All pipe opening shall be capped plugged during construction. When system piping pierces a foundation wall clearances and a pipe sleeve shall be provided to prevent breakage of pipe. In no case shall the contractor substitute pipe sizes without notifying the Architect/Engineer.

c. Piping shall be installed to be clear of any and all conduits, lighting fixtures, plumbing and heating piping. This Contractor shall consult with Contractors of the other trades to facilitate the erection of the system.

d. Sprinkler piping shall be located to clear structural members platforms and equipment. (No cutting of structural members shall be permitted unless approval in writing by Architect/Engineer).

e. All horizontal piping shall be installed as high as possible (except where concealed in construction) to slab, beam, etc., to maintain headroom.

f. Horizontal sprinkler mains and branch piping to be installed as follows:

1) Piping for top floor- Sidewall sprinkler heads shall be provided. Piping to be installed and concealed within wall soffit enclosure below finished ceiling and adjacent wall. In no case shall the centerline of any horizontal piping exceed 6 inches from finished drywall ceiling. See sidewall sprinkler head detail on sprinkler drawings.

2) Piping for intermediate floors- Concealed pendant sprinkler heads shall be provided. Piping to be concealed and mounted above drop ceiling. Piping perpendicular to the joists must be mounted within one inch from bottom joists. Piping parallel to joists shall run within joist cavities. Notching or cutting of structural members is not permitted. See sprinkler head detail on sprinkler drawings.

3) Piping for commercial/community spaces- Concealed pendant sprinkler heads shall be provided. Piping to be concealed and mounted above drop ceiling and below fire rated ceiling. Penetration of fire rated ceiling is not permitted, unless directed by Architect/Engineer of Record.

4) Piping for cellar or basement areas- Exposed pendant or upright sprinkler heads shall be provided and all piping to be exposed. See Section "Piping between apartments floors", if basement apartments are provided.

g. See "Sprinkler Heads" Section # 6.

h. A Riser Check Valve with Riser Check Valve Trim shall be installed for use in conjunction with the vane-type water flow alarm detector. The Riser Check Valve Trim shall include approved water supply and system pressure gauges, as well as a test connection and main control and drain valves appropriately sized to meet the requirements of the N.F.P.A. 13 standards.

6. Sprinkler Heads

a. In areas with drop ceilings, apartments, public hall, lobby/vestibule and commercial spaces provide concealed pendent sprinkler heads (top floor to be provided with sidewall heads). All heads must be UL listed, N.Y.C M.E.A. listed, and FM approved. All concealing cover plates shall be flush mounted with finished ceiling and with manufacturer's applied white finish, unless otherwise noted. Field painted cover plates are not acceptable. Approved equals include Globe Fire Sprinkler Corp.

b. Apartments - Provide residential concealed pendent sprinkler heads on intermediate floors, Series LFII – Model # TY2596 as manufactured by Tyco Fire Products. Units to be 175 max. working pressure, 160 deg. F.

-Provide horizontal sidewall heads at top floor only, Series LFII – Model # TY1334 as manufactured by Tyco Fire Products. Sidewall heads must be installed within 6 inches of finished ceiling. NYC M.E.A. #44-03-E.

c. Public Halls, Lobby/Vestibule and Commercial Areas- Provide quick response concealed pendent sprinkler heads, Series RFII – Model # TY3531 as manufactured by Tyco Fire Products. Units to be 175 max. working pressure, 155 deg. F., 5.6K – factor. NYC M.E.A. #353-01-E.

d. Cellar/Basement Areas- In areas where sprinkler piping is exposed, provide upright or pendent sprinkler heads, Series LFII – Model # TY2234 as manufactured by Tyco Fire Products. Units to be chrome plated, 175 max. working pressure, 155 deg. F., 4.9K – factor. In areas where heads are subject to being struck or disrupted, protective cages shall be installed

e. Sprinkler head locations shall be coordinated with ceiling types and lighting. Sprinkler shall be minimum 12” from lighting fixtures.

f. The sprinkler heads subject to freezing shall be of the dry pipe type or piping heat traced and insulated.

g. Any and all sprinkler heads placed in location where they are liable to be accidentally hit in the normal course of events shall be provided with heavy wire guards.

h. The minimum number of sprinkler heads in the compactor room shall be two (2) plus one additional head in the hopper with mechanism removed. The sprinkler head in the hopper shall be activated by a heat sensor and solenoid valve.

i. Provide one (1) sprinkler head on every second floor within the compactor chute. Heads shall be protected as specified in NFPA 13/ 5-21.3.1 & 5-21.5.

j. Provide sprinkler in laundry when two or more dryers have been installed. Sprinklers to cover area five feet in front rear sides of dryers.

7. Water Flow Detectors

a. The installation of the Waterflow detector shall be under the Fire Alarm System installer. However, this sprinkler contractor must coordinate and revise the piping layout as required for the detector installation.

8. The contractor shall refer to accompanying drawings for location of sprinkler heads. Installation is subject to field conditions and contractor shall visit site to determine dimensional data. No compensation will be given for minor routing changes.

9. The entire system shall be installed so that the system may be drained. Drips and drains shall be installed at low pressure points at the base of each riser and at low point of each horizontal main.

10. A test connection not less than 1" in diameter providing a flow equivalent to one sprinkler head shall be provided to test each riser and water flow alarm. The test connection shall be readily accessible and in a location where it is not practical to terminate the test connection, a sight glass may be used. The discharge shall be to a drain connection capable of accepting full flow under system pressure. The test connection shall be located at the highest most remote point.

11. Hangers:

    a. Provide ferrous hangers in accordance with NFPA 13 Chapter 6. Sprinkler hangers shall not be used to support non-system components. The base of vertical pipe shall be rigidly anchored and supported to relieve any undo stress on the horizontal sections.

    b. The maximum distance between hangers shall be as follows:

Pipe size:	Distance (ft)
1” to 1 ¼”	12’-0”
1 ½” to 5”	15’-0”

12. Provide identification sign of standard design fastened securely at designated locations.

13. The system shall be arranged and equipped so that accidental flow alarms due to surges or related conditions will be prevented.

14. Upon completion of the work sprinkler heads and trimmings shall be cleaned and polished free from any marks and left in first class condition. Damaged heads will be replaced at no additional cost.

15. Siamese Connection:

    a. The fire department Siamese connection shall be of an approved type and shall be equipped with listed plugs or caps, properly secured and arranged for easy removal by fire departments.

b. Siamese connections shall be of the flush or free standing type, and with the exception of the swivel caps, shall not project beyond the street property line. The riser pipe to a freestanding Siamese connection shall be red brass. When Siamese connections are installed in wall recesses, the recesses shall be of ample size to permit the convenient hose attachment.

d. Siamese Connection shall be brass.

e. Siamese connection shall be installed as required under Building Code Sections 27-940, 27-941, 27-959 and 27-960

16. Provide locking enameled steel sprinkler cabinet with approved number of heads (minimum 6 heads) of all types and rating, and two (2) sprinkler wrenches. Cabinet shall be securely fastened to wall in water meter room.

17. The entire system shall be flushed and tested by the contractor in the presence of and to the satisfaction of the inspectors of all agencies having jurisdiction.

18. Upon completion of the piping system the contractor shall submit the entire system to a 2-hour hydrostatic test during which a system pressure of 175 psi shall be maintained.

19. Pipe Insulation

a. Insulate all pipes, fittings and valves in areas subject to freezing with heavy density fiberglass insulation with vapor retarder jacket.

b. Material to meet ASTM C547 Class 1 & 2, and fire safety requirements ASTM E84, UL 723

c. All pipe insulation shall be 3” thick.

d. Pipe insulation shall be Owens Coming fiberglass ASJ/SSL H - II, Certainteed 500 Snap-On or approved equal.

20. Sprinkler Pipe Color Coding

a. All dedicated sprinkler piping shall be painted “red” as required under Local Law 58/09, and Building Code section BC903.6.

b. All sprinkler piping shall be appropriately labeled as required under Local Law 58/09, and Building Code section BC903.6.

c. All dedicated sprinkler valve handles shall be painted “green” as required under Local Law 58/09, and Building Code section BC903.6.

15C.13 SYSTEM TESTING

A. Complete fire suppression system testing as required under Local Law 63/09 and distribution balancing shall be performed with written verifications of results submitted to HPD and Architect/Engineer.

B. All of the testing work shall be done when and as directed before the system is accepted. Place the system in operation and make all required corrections and adjustments.

C. All piping shall be tested with water and made tight to the minimum test pressure before any covering is applied and being concealed with in partitions.

D. Clean interior of piping and flush until clean.

E. Supply all apparatus material and labor, including hydraulic pump and any temporary connections required for making tests.

E. Examine joints and pipe carefully for leaks and repair or replace same without resorting to caulking. Carefully note expansions and see that they are amply provided for.

F. This contractor to perform sprinkler flow test in presence of New York City Fire Department, HPD and building owner representatives. File form FP-100 with the Fire Department, and pay all required fees.

15C.14 GUARANTEES

NOTE: ANY CHANGE FROM THE ORIGINAL INTENT (SCOPE OF WORK) MUST BE APPROVED BY ARCHITECT/ENGINEER.

A. Upon completion of all work to be performed under this Contract and acceptance of same by Architect/Engineer, this contractor shall guarantee that all workmanship and materials used in the performance of this contact, shall remain free from defects for a period of one (1) year, in addition to manufacturer's standard warranties. All guarantees to be from the date, when **Final Certificate of Occupancy** is issued from Department of Buildings. This contractor shall guarantee to repair or replace, as determined by Architect/Engineer, any defective portions of the various systems described herein the guarantee period.

15C.15 MAINTENANCE AND OPERATING INSTRUCTIONS

A. Submit three sets of typewritten maintenance and operating instructions for all equipment furnished in building.

B. Give full instructions to Architect/Engineer and management group as to the location, operation and maintenance of all machinery, apparatus and other work installed by him.

END OF SECTION