DIVISION 15

SECTION 15B PLUMBING

15B.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, replace- mend 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 PREFORMED 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 the New York City Plumbing Code. Rubbish and 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.

3. Temporary heat and hot water services must be provided during construction phase for the heating season; and hot water should be available year round. Heat and/or hot water cannot be shut off for more than 24 hours without proper notification and scheduling with tenants.

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 should 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 Owner.

L. Immediately upon award of this contract, Contractor shall confer with Architect/Engineer to 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 complete and working plumbing 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 complete installation of the plumbing system.

15B.02 WORK INCLUDED

A. ***Refer to "Supplement of Requirements for Adaptable Apartments, "Division 1, Section 1E and/or Requirements for Public Areas" Division 1 Section 1F. for Handicapped if Applicable and provide systems as indicated in all A.D.A adaptable apartments and public areas.***

B. 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: 15B for complete scope of work for this section, which form a part of the contract specifications.

15B.03 WORK EXCLUDED

A. Electric wiring for all controllers and motors, see section 16A.

B. Painting, except as noted herein.

C. Removal of friable asbestos insulation.

D. Gas Ranges - by Section 11A.

15B.04 SUBMISSION REQUIREMENTS

A. Before Work Commences Architect's/Engineer's Approval is Required

Submit four (4) catalog cuts for water closets, lavatories, bathtubs, kitchen sinks, janitor sink, all faucets, drains, shower controls, floor, yard and roof drains, piping and hose bib valves.

B. Must Accompany Final Payment Request

1. New York City Department of Buildings Final Sign-off for all work under this section.

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

3. Approval Certificate from D.E.P. for installation and "sealing" of water meter.

15B.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 Plumbing system in accordance with New York City Code including drainage systems, domestic water system, gas system, fixtures, valves, street service connections, etc.

15B.06 CODES, RULES AND CERTIFICATES

A. The complete installation of the plumbing systems 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.

B. This contractor is responsible to complete all necessary applications, pay all fees, give all notices, file all drawings (if required) and obtain all permits and final sign-offs from The Department of Buildings for work under this contract. Adhere to controlled inspection requirements and furnish Certificates of Inspection by all Agencies requiring them.

15B.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, schematic of boiler room indicating all equipment valves and piping, 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.

15B.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.

15B.09 ACCESSIBILITY

A. Ascertain that all equipment, such as valves, traps, cleanouts 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.

15B.10 REQUIREMENTS AND PROCEDURES

A. General

1. The new Plumbing systems shall include separate dual drainage systems (sanitary and storm), hot and cold domestic water system with hot water recirculation piping, domestic water service with B.F.P and meter, gas distribution system with new service, fixtures, 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, Sprinkler, 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.

15B.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.

15B.12 MATERIALS AND WORKMANSHIP

A. Drainage Systems (sanitary and storm)

NOTE 1: ALL ABOVE AND BELOW GRADE WASTE, VENT, SEWER AND STORM CAST IRON SOIL PIPING AND FITTINGS MUST CONFORM TO THE REQUIREMENTS OF CISPI STANDARD 301-97, ASTM A-888 (UNDERGROUND) AND ASTM A-74 (ABOVE GROUND). APPROVED MANUFACTURERS ARE: CHARLOTTE PIPE, TYLER PIPE, STAR PIPE PRODUCTS, LEO INTERNATIONAL, INC. EACH LENGTH OF PIPE AND ALL FITTINGS MUST BEAR THE IDENTIFICATION OF THE MANUFACTURE AS REQUIRED BY PLUMBING CODE SECTION 303.

NOTE 2: (IF APPLICABLE) NEW DRAINAGE SYSTEM SHALL BE INSTALLED, TESTED AND READY FOR HOOK-UP PRIOR TO DISCONNECTION OF EXISTING PLUMBING OR FIXTURES. IN SPECIAL CASES, THE CONTRACTOR HAS THE OPTION TO PROVIDE A TEMPORARY SYSTEM SUBJECT TO ARCHITECT'S/ENGINEER'S APPROVAL.

1. When required in the scope of work, the entire underground house sewer shall be snaked and flushed to city street sewer to remove all obstructions. No chemical cleaners shall be used for pipe cleaning.

2. The new combined house drain shall connect to the existing house sewer unless otherwise noted on drawings and/or Scope of Work. This new connection shall be made 3 linear feet pass the exterior building line.

3. Sanitary and storm drainage piping above ground shall be service weight cast iron with no hub joints made up of neoprene gasket and stainless steel couplings. Couplings must conform to CISPI-310, ASTM C-564-03 (rubber gasket) and ASTM C-1277-97. Approved manufactures shall include Amko Company.

4. Sanitary and storm drainage piping below ground shall be service weight cast iron hub and spigot with push-on neoprene gasket compression joints. Joints must conform to ASTM C-564. Approved manufactures shall include Amko Company.

5. Provide cleanouts at the ends of all drains, soil lines, waste lines, traps, at changes of direction, at base of all stacks, and as required by Plumbing Code section 708.

6. Yard and floor cast iron drains shall be Josam 30000-C series, Wade 1100STD or approved equal with sediment bucket. Provide strainer with vandal proof screws. Top of all drains shall be coordinated with finish slab elevations to assure proper drainage.

7. Roof drains shall be Josam 21500 series, Wade 3000 series or approved equal. Units shall be cast iron and provided with a deck clamp, drain receiver and vandal proof dome.

8. Provide control valves and swing type check valves in discharge pump, cellar drainer and ejector pumps. Control valves shall be installed on downstream side of check valve.

9. Where pipes pass through poured concrete floor construction, iron sleeves shall be provided full depth of penetration required under Plumbing Code section 305.

10. Provide suds pressure zone vents as required under Plumbing Code section 704.6.

11. Roof vents:

    a. Provide extra heavy cast iron sleeve with seamless 4 lb. lead roof flashing with poured and caulked joint above cap flashing on all pipes extending through roofs to form a watertight roof coupling and allow for expansion. Provide flashing for drains extending 12" beyond clamping collar in all directions

b. All pipes through roof shall be located at least 12" from parapet or bulkhead walls, 24" from roof drains and fans to allow for suitable flashing. No vent shall be located 10’ from any opening. Were required, offset pipe below roof level.

c. All new vent lines shall be extended through roof to height of 7'-0" above roof, and shall be the same diameter as the stack, but in no case less than 4" diameter.

12. Access Doors in Finished construction:

a. Access doors and frames shall be formed from sheet steel and shall have expanded or perforated metal wings where adjacent to plastered surfaces. The frames shall be No. 16 U.S Standard Gauge steel sheet and the doors shall be formed from not less than No. 14 U.S. Camlock and concealed hinges. Doors and frames shall be given a shop coat of an approved rust inhibitive primer. Access doors shall be furnished by this Contractor and installed by the General Contractor.

b. Access doors 12" x 12" shall be of the following types as manufactured by Inryco/Milco Inc., or approved equal:

13. Sump Pump

a. Sump pumps to be submersible type. Minimum capacity shall be 1500 G.P.H. at a total head of 15 feet. Pump housing shall be of cast iron construction, with a stainless steel shaft and cast iron impeller. Pump to have a 1 1/2" N.P.T. discharge. Motor shall be 1/3 H.P. at 1500 R.P.M., 115 volts, 60 HZ, 1 phase. Pump to work automatically with a submersible float switch. Approved manufactures are Little Giant, Dayton, Zoeller, or approved equal.

b. Provide connections from pump outlet to sanitary line complete with check valve and appropriate fittings.

c. Electrical connection to be provided under electrical section.

d. Sump pump pit supplied under concrete section 3a.

14. Hangers, Anchors and Supports

a. All piping shall be supported by means of approved hangers and supports. Piping shall be supported to maintain required grading and pitch to prevent vibration and to secure piping in place.

b. Horizontal piping shall be supported as follows:

1) Cast iron sanitary/storm piping at 5 ft. intervals.

c. Vertical piping shall be supported as follows:

1) Cast iron sanitary/storm at each floor.

d. A dielectric connection shall be installed at all clamps, anchors and hanger.

e. Approved type trapeze hangers may be used instead of separate clevis hangers with suspension rods having double nuts and securely attached to the construction in an approved manner.

f. Maximum weights on hanger rods assuming a maximum operating temperature 450 degrees F shall be such that stress in tension shall not exceed 9000 pounds per square inch, using root area of threaded portion. In no case shall hanger size be less than 3/8 inch for pipe up to 2 inch, 1/2 inch for pipe 2-1/2 inch, 5/8 inch for pipe 4 inch to 5 inch, 3/4 inch for pipe 6 inch.

g. All piping shall be supported from existing concrete ceiling by utilizing existing hanger inserts or split shields and angle iron.

h. All horizontal runs of piping shall be supported on adjustable clevis type and/or group trapeze type hangers. Pipe hangers shall be installed outside of the insulation and prefabricated 20 gauge sheet metal protective saddles 6 inches long and up 1/2 diameter of pipe shall be installed between insulation and inside of hanger. No temporary means of support will be permitted.

i. Chains, straps, perforated bars, wire hangers or expansion shields are not permitted.

j. Pressure treated 2” x 3” wood blocking shall be provided under all pipe clamps supporting vertical piping between floors. Provide adequate space for proper fire stopping at floor penetration.

15. Testing and cleaning

a. A water test shall be applied to the drainage system either in its entirety or in sections after rough piping has been installed as per New York City Code.

b. Air pressure test, if authorized as substitution for the above, shall be applied with a force pump and measured with a non-mercury column

gauge. Specified pressure shall be maintained for 15 minutes. System shall be retested if pressure of air rises or falls during test.

c. After tests, all piping shall be cleaned and flushed. Flushing shall be done with the same medium used for the test. No debris shall be flushed into the public street sewer, but shall be removed from the site.

d. When directed by Architect/Engineer's clean fixtures, equipment, and other exposed work. Do cleaning work in stages if so ordered to facilitate work of other contracts. Traps, wastes, and supplies shall be free and unobstructed. Plated, polished, bronzed, or painted work shall be bright and clean.

B. Domestic Water System and Plumbing Fixtures

1. When required in the Scope of Work, provide a complete new water service connection from meter outlet control shut-off valve to the street water main. Installation shall include excavation, back fill, patching, service tapping, sleeves, new main gate shut-off valves with section of brass-threaded pipe, brass threaded union, new water meter with proper support, test tee and B.F.P. device. This contractor is responsible for all required fees and filings with Dept. of Buildings, DEP, Dept. of Highways, etc.

2. Curb valves and boxes must be provided on all services.

3. Provide a drip valve on the house side of main gate valve.

4. Provide a new domestic cold water distribution system commencing at water meter and including all overhead mains, branches, risers, run outs, valves, and all connections to domestic water heater(s), boiler and all plumbing fixtures.

5. Provide a complete new domestic hot water supply and recirculation distribution system from domestic water heater(s) to each plumbing fixture. System shall include all overhead mains, branches, vertical risers to apartments, and thermal expansion tank(s). Provide all fittings and valves necessary for complete installation.

6. A shut-off valve and drain cock with vacuum breaker shall be required at the base of all hot and cold-water risers and recirculation risers. In addition, a check valve shall be required at the base of each hot water return riser.

7. Provide new domestic cold, hot, and recirculation water risers for each line of apartments. Each recirculation water riser shall connect to hot water riser below fixtures on top most floors. Hot water and recirculation risers shall have expansion loop at mid-point of riser.

8. Provide an air chamber at least 24 inches long and at least the size of the supply pipe at the top of each hot water and cold-water riser

9. Provide all cold and hot water crotons and branches to all bath and kitchen fixtures. Each fixture shall be provided with individual shut-off valves.

10. Provide a direct 1" boiler cold-water feed line from the new cold water main to the automatic water feed at the boiler. Provide an approved pressure relief valve with overflow piped to floor.

11. All water piping shall be arranged to drain to low points and to provide for air elimination at high points. Mains, risers, and branch connection to same shall be arranged to permit expansion and contraction without strain by means of elbow swings as required by the New York City Building Code.

12. All hot water supply and re-circulation piping must be provided with "U" bends for proper pipe expansion. Expansion bends will be provided on all horizontal and vertical piping, and for each fifty (50) foot increments. See detail sheet.

13. All new piping shall be concealed within a pipe chase behind the wall where plumbing fixtures are located, or concealed with furring. Provide protective steel shield plates to cover the area where wall structure members are notched or bored as required under Plumbing Code section 305.

14. All piping passing through bath and kitchen walls shall be fitted with escutcheons.

15. Pipes and Fittings:

    a. All aboveground piping and fittings for cold, hot, and hot water circulation lines shall be type "L" seamless copper tubing for use with soldering, using 95-5 tin antimony solder as per Section P103.1k Building Code.

    b. Hot and Cold Water Distribution Piping

        - pipe size shall follow plans any changes shall reported to Architect/Engineer in the form of shop drawings. See section 15A.07.
        - hot and cold water piping shall be separated by at least 6".
        - no water piping shall run under bathtubs, in bath floors, or in adjoining rooms.
        - all pipe ends shall be reamed and all burrs removed before being joined to fittings.
        - provide expansion swing joints for connections between hot water riser and fixtures.
        - the use of street elbows, street 45 and close nipples is prohibited. (Only on I.P.S. water piping).

c. Underground piping 2" or smaller shall be type "K" copper, piping 2 1/2" shall be brass, and piping 3" or more shall be ductile iron with dielectric connections. Fittings up to 2" shall be brass, fittings 2 1/2" or more shall be galvanized steel.

d. Pipe sizes shall be as indicated on drawings. Contractor shall be responsible for verifying that all pipe sizes comply with New York City Plumbing Code. In the event that Code requires sizes, which exceed sizes indicated on drawings, then the Code (as determined by a Licensed Plumber) shall govern, and the larger size shall be installed at no additional cost to Owner. In the event that a size is not indicated on drawings, the Code (as determined by a Licensed Plumber) shall govern, and the appropriate size shall be installed at no additional cost to Owner.

e. All seamless copper water tubing must conform to NSF ANSI Standard 61 and ASTM B88-02 standards

f. All solders and fluxes for joining copper tubing must conform to ASTM B32 and ASTM B813 standards.

16. Domestic Hot Water Expansion Tank

a. The pressurization system shall include a diaphragm or bladder type expansion tank which will accommodate the expanded water of the system generated within the normal operating temperature range, limiting this pressure increase at those components in the system to the maximum allowable pressure at those components. It shall maintain minimum operating pressure.

b. The expansion tank shall be welded steel, constructed, tested and stamped in accordance with Section VIII, Division 1 of the ASME Code for a working pressure of 150 PSIG, factory air pre-charged and field adjustable. All internal parts must comply with FDA regulations and approvals. The tank shall be supported by steel legs or a base (integral ring mount) for a vertical installation.

c. Each tank shall have a steel shell and an internal butyl/EPDM diaphragm or butyl bladder with code approvals ANSI/NSF 61 used to isolate the air charge from fluid.

d. The manufacturer shall have at least five years experience in the fabrication of bladder / diaphragm-type expansion tanks.

e. Unit as manufactured by Amtrol Inc., Therm-X-Trol ST- Series, Arrow Industries BackStop series or approved equal.

17. Hot Water Recirculation Pump:

    a. Provide new in-line quiet operating hot water circulating pump. Construction shall be bronze radially split body so unit can remain in line during repair and maintenance. The impeller assembly shall be non-metallic, shaft shall be stainless steel with proper sealing material. Drive motor shall have automatic reset thermal protection and shield ball bearings locked onto shaft end and entire unit shall be assembled for in-line installation. Power shall be 115V/1 Phase, 60 HZ.

    b. Provide aquastat on the cellar/basement re-circulation return piping to shut-down pump operation at 100 degrees F.

    c. Pump shall produce 6 G.P.M. at 12 feet T.D.H. 1/25 H.P. Manufacturers include Taco, B & G, Alyan or approved equal.

    d. Taco, model # 008 or approved equal.

18. Valves:

    a. Apartment plumbing fixtures:

        1) Each kitchen faucet, lavatory faucet, and water closet shall be provided with individual shut-off valves.

        2) Valves shall be ball valve type, 90 degrees angle, chrome plated solid brass.

        3) Units shall be ½" copper inlet x 3/8" OD compression outlet.

        4) Units must comply with NSF-61 standards and be IAPMO certified.

        5) Units shall be manufactured by Dahl or approved equal.

    b. Distribution system and equipment:

        1) All valves 2" and smaller shall be non-ferrous. Valves 2 ½ inches and larger shall be iron body bronze mounted or all bronze.

        2) Gate valves shall be solid wedge type and shall be provided with gland and packing boxes, and have top seat for pocking under pressure when wide open. Unit as manufactured by Hammond, Model 668, or approved equal.

3) Globe valves shall be as manufactured by Hammond, Model IB423, or approved equal.

4) Check valves must have working pressure and direction of flow cast on exterior. Unit as manufactured by Hammond, Model 968, or approved equal.

5) Hose-end valves shall be as manufactured by Hammond, Model 1048, or approved equal.

6) All valves must comply with MSS SP-80, ASTM and NSF-60 Standards, and must be UL listed.

7) All valves must have a minimum 150 PSI rating.

8) At the completion of work there shall be attached to each valve, except those on fixtures, a 2” round metal tag for location identification. Include a valve chart, which shall be framed, and mounted.

9) Approved manufactures include United Brass Works and NIBCO

c. Underground service control valves;

1) All services shall be provided with a curb type valve with valve box.

2) Curb valves shall be hub-end, double disk type, with square spindle nut, 200 psi wwp, manufactured by Kennedy # 571x (mechanical joint), or approved equal. Provide with adjustable tar coated cast iron extension shaft and flush box with lock type extra heavy cast iron cover marked “WATER”.

3) Provide valve box with locking cover manufactured by Clow Corporation figure # F-2450 size as required, or approved equal. Provide two operating wrenches of proper length and size required to operate valve.

4) All valves must comply with AWWA Standard C-500 and NSF-60 Standards.

19. Hangers, Anchors, and Supports

a. All piping shall be supported by means of approved hangers and supports. Piping shall be supported to maintain required grading and pitch to prevent vibration and to secure piping in place. Piping shall be arranged as to provide for expansion and contraction. Provide rubber insulation between hangers and copper piping.

b. All lines shall be supported as to allow for expansion.

c. Horizontal piping shall be supported as follows:

1) Copper tubing 1 ¼" and smaller at 6 ft. intervals

2) Copper tubing 1 ½" and larger at 10 ft. intervals

d. Vertical piping shall be supported as follows:

1) Copper tubing at each floor.

e. A dielectric connection shall be installed at all clamps, anchors and hanger.

f. Approved type trapeze hangers may be used instead of separate clevis hangers with suspension rods having double nuts and securely attached to the construction in an approved manner.

g. Maximum weights on hanger rods assuming a maximum operating temperature 450 degrees F shall be such that stress in tension shall not exceed 9000 pounds per square inch, using root area of threaded portion. In no case shall hanger size be less than 3/8 inch for pipe up to 2 inch, 1/2 inch for pipe 2-1/2 inch, 5/8 inch for pipe 4 inch to 5 inch, 3/4 inch for pipe 6 inch.

h. All piping shall be supported from existing concrete ceiling by utilizing existing hanger inserts or split shields and angle iron.

i. All horizontal runs of piping shall be supported on adjustable clevis type and/or group trapeze type hangers. Pipe hangers shall be installed outside of the insulation and prefabricated 20 gauge sheet metal protective saddles 6 inches long and up 1/2 diameter of pipe shall be installed between insulation and inside of hanger. No temporary means of support will be permitted.

j. Chains, straps, perforated bars, wire hangers or expansion shields are not permitted.

20. Backflow prevention device (B.F.P.)

a. Double check valve (D.C.V.) - Main case shall be cast bronze, springs shall be stainless steel and valve discs shall be rubber. Main bodies to consist of two check valves. The check valves are spring-loaded and operate independently. Wilkins, Model # 950XL for services ¾" to 2"; and Model # 350 for services 2 ½" or larger.

b. Reduced Pressure Zone Device (R.P.Z.)
- Main case shall be cast bronze, springs shall be stainless steel and valve discs shall be rubber. Main bodies to consist of two check valves and connecting external pressure differential relief valve. The check valves are spring-loaded and operate independently. The relief valve functions automatically be sensing the pressure differential across the check valves and discharging the backflow to atmosphere. Wilkins, Model # 975XL for service ¾" to 2" and Model # 375 for services 2 ½" or larger.

c. Testing

1) Backflow prevention devices must be tested and inspected to insure continued reliability.

2) Double check valve (D.C.V.) and/or reduced pressure zone device (RPZ) must be checked for tightness against reverse flow under all pressure differentials.

3) This contractor shall test this device after initial installation and submit the test report (NYC-GEN 215B) to New York City Department of Environmental Protection within 30 days of testing of device.

4) The testing procedures for DCV and RPZ shall be completed in accordance with cross-connection control unit instruction.

21. Water Pressure Booster Pump

a. Provide a simplex, variable speed domestic water booster pump system. Unit shall be pre-piped and pre-wired with on/off switch, CB disconnect panel and low suction cut-off switch. Pump shall operate as required to meet building flow requirements while maintaining pressure at controller set point. Pump shall shut down under no-flow conditions. A small expansion tank shall be installed to maintain system pressure during pump shutdown.

b. Pump shall be rated for 175 PSI WP; horizontal CIBF end suction construction trimmed to design conditions, with mechanical seal, close coupled to a non overloading NEMA high efficiency motor.

c. Unit shall be skid mounted with a 5-gallon tank, pressure gages, tank pressure relief valve, a thermal over temperature purge valve, and non-slam suction check valve.

d. Complete, pre-packaged unit shall be VSPP series (variable speed pressure PAC) as manufactured by Alyan Pump Company or approved equal. Approved manufactures shall include Federal and Grundfos Pump Companies.

e. Contractor shall install a three-valve bypass for uninterrupted service.

22. Water Meter

a. House domestic water meter shall be all bronze compound meter for high and low flows with a current mainline meter and positive displacement by-pass meter, hermetically sealed registers and test outlet.

b. Commercial areas meters shall be all bronze positive displacement disc meter with hermetically sealed registers and test outlets.
Water meter units must be approved by D.E.P.

d. Contractor must obtain an approved D.E.P. approved water meter. After installation, meter must be inspected and properly "sealed" by D.E.P. A copy of all certifications must be submitted to H.P.D. or building owner.

23. System Testing

a. Prior to concealment, the entire water supply system shall be tested for four consecutive hours by a hydrostatic pressure of 25 percent over building working pressure at the lowest point of the system. During this period there must be no sign of leakage.

24. Fixtures:

- All fixtures shall be white, free from stains, craze warpage and shall be set square and true relative to finished surfaces. All plumbing fixtures shall be acid resistive type as manufactured by American Standard, Crane, Gerber, Eljer, Western or an approved equal by Architect/Engineer. Submit five catalog cuts of the proposed fixtures to the Architect/Engineer for approval.
- All fixtures to be installed complete with faucets, traps, valves, stops, escutcheons and fittings to soil, vent and supply lines. All the above brass parts

shall be chrome plated. Each fixture shall be provided with individual shut-off valves.

- The fixtures shall be assembled in accordance with the manufacturer's assembly instructions and all work shall be completed in a neat and workmanlike manner, free from dents, stains, chips etc.

- Approved faucet manufactures include American Standard, Delta, Kohler, Moen, AK Faucets or Symmons.

- ***All ADA handicapped and/or adaptable apartments and public spaces are to comply with RS4-6. Refer to Section 1E and 1F for handicapped fixtures and installation requirements.***

a. Bathroom lavatory - Lavatory shall be self-rimming drop-in vitreous china type. Lavatory to be 20" x 17" and basin to be 16 1/2" x 10 1/2" with 4" faucet centers. Unit must be ADA compliant. Crane "Model # 1287V" Galaxy series or approved equal.

b. Lavatory Faucet with metal Pop-up Drain - Faucet shall be Delta - single handle model 520 MPU; Symmons - Model S-20-2-LST or Approved Equal. Units shall be provided with 3/8" copper tubing inlets on 4" centers, aerator, pop-up drain and 1 1/4" tailpiece. Faucet shall have chrome finish. Each faucet shall be provided with a 0.5 GPM chrome plated brass faucet aerator, Niagara Conservation, model# N3205N or approved equal.

c. Water Closet - Water closet shall be round front tank type, vitreous china, free standing close-coupled complete with bowl, tank, cover, seat and seat cover. Unit shall be a high efficiency dual flush unit with water usage of 1.1/1.6 gpf, gravity type and not require an auxiliary pump to operate. Water closet shall meet or exceed ANSI Standards A112.19.2M and A112.19.6 (1990) and be on the New York State Department of Environmental Conservation Approved Fixture List. Crane Plumbing, Eco Saratoga, Model #31972 or approved equal. Seat with cover shall be molded wood with painted white finish, unit shall be white. Unit shall be manufactured by Centoco, Economy series model# HP2400 or approved equal.

d. Bathtubs:

1) 5’-0”x14”Deep–Porcelain enameled steel over a composite structure, Crane – San Marcos, Armon Plus # 2206X, Princeton Americast Series # 2390.202 or 2391.202 as manufactured by American Standard, UltraTuff Biscay V Series 2030 or 2031 as manufactured by Briggs.

2) All bathtubs must have a slip-resist surface.

3) All substitutions are subject to HPD's and Architect/Engineer approval.

e. Shower Body Valve - Single handle pressure-balancing mixing valve, with solid bronze housing. Assembly to have built-in choke and adjustable stop screw to limit handle turn. All packages to be provided with diverter spout, arm, flange and low flow shower head. All finishes shall be chrome. Delta model R10000-UNWS valve assembly with #T13420 shower/tub trim kit, Symmons Temptrol model S-96-2-X-L, or approved equal. Each showerhead shall be replaced with a 1.6 GPM chrome plated showerhead, Delta #RP46384 H2O series or approved equal.

f. Sink - Counter Top Type (kitchen) Sink dimensions shall be 25" x 22" x 7", 20 gauge 304-18A stainless steel, with 3-hole construction. Revere model SLS-2522D7SN3, Elkay model PSR-25223, or equal.

g. Kitchen Sink Strainer - Strainer shall be American Standard Model 4331.013 with stainless steel crumb cup with 3 1/2" outlet. Tail piece shall be 20 gauge 1 1/2"x4" with brass lock nut and coupling nut.

h. Kitchen Faucet - Faucet shall be Delta single handle washer less design Model 100-WF, Symmons Model S-23-LST or approved equal. Faucets shall have chrome finish with lever handle and 3/8" copper tubing inlets. Additional features shall be adjustable 6" spread, swing spout and aerator. Faucet shall have chrome finish. Each faucet shall be provided with a 1.5 GPM chrome plated brass faucet aerator, Delta model # 060642A, Niagara Conservation model # N3104-15 or approved equal.

i. Utility Sink - Utility sink shall be enameled cast iron American Standard Model #7692.000 or approved equal.

j. Utility Sink Faucet - Faucet shall be American Standard Heritage Service Sink Faucet Model 8344.112 or approved equal Faucets shall be provided with the following: aqua seal valves with renewable seats, 3/4" hose outlet, vacuum breaker in spout, bucket hook, brass 4-arm handles, 1/2" female adjustable union coupling and stop in shank. Faucet shall have stainless steel finish.

k. Utility Sink P-Trap with Strainer – P-Trap shall be 3" enameled cast iron with cleanout and strainer, American Standard, Model # 7798.030 or approved equal. Finish shall be chrome.

l. Exterior Hose Bibb - Hose Bibb shall be Josam Model# 71000 Freeze less Automatic Draining Box Wall Hydrant. Bibb shall be provided with the

following vacuum breaker, hardened stainless steel stem, and tee keys that operate both locked box door and hydrant. Installation of unit shall be flush with all existing surface and refer to plans for locations.

m. Bathtub Waste Drain - Trip-level type 20 gauge construction with chrome finish and pop-up drain with Brass-Plated Slip Nut 1 1/2" diameter. Gerber Model 41-818

n. Laundry machine connector box- Connector box shall be Jameco Industries Model 170-WM or approved equal. Unit shall have two valve assemblies, faceplate, and be capable of being mounted directly to studs. Box to be constructed of molded high-density styrene. All connector boxes to be mounted behind or adjacent to laundry machine with bottom of box at 48” A.F.F.

25. Thermometers

a. 3-1/2 inch diameter stainless steel case, chrome plated brass ring with heavy glass, vapor pressure or liquid actuated bronze spring Bourdon tube, rotary precision movement. Similar to Weksler ASD Form 2, (30 degrees to 240 degrees F.). Set in oversized tee and nipple. Locate on each hot water tank and where noted on drawings.

26. Pressure Gauges

a. 3-1/2 inch diameter, black enamel, cast iron or cast aluminum case, threaded chrome plated brass ring with heavy glass, bronze single spring Bourdon type, stainless steel rotary precision movement, micrometer adjustment pointer. Dial with adjustable range and tee handle cock. Locate on water services, suction and discharge of house pumps, pressure-reducing valves.

27. Sleeves

a. Where pipes pass through poured concrete floor construction, iron sleeves shall be provided full depth of penetration required under Plumbing Code section 305.

b. Where pipe sleeves occur in exposed locations, pipe sleeves shall terminate 1 inch above the finished floor.

c. Sleeves shall be of ample size to contain pipe and covering where pipes are covered.

d. Where pipes pass through exterior masonry walls and foundations, cast iron sleeves shall be furnished and installed by this trade and space

between pipe and sleeves be packed with hemp and caulked watertight with lead.

e. Where copper pipes pass through interior wall or wood flooring, steel pipe sleeves shall be provided.

28. Insulation

a. All cold water mains, branches, and risers, and all hot and re-circulation branches shall be insulated with sectional fiberglass insulation. Provide insulation thickness of 1” on cold, hot and re-circulation mains and risers up to 2” diameter, and insulation thickness of 1½” on cold, hot and recirculation mains and risers greater then 2” diameter. A self-sealing strip shall seal the longitudinal joint jacket flap.

b. All fittings and valves shall be covered with one-piece pre-molded covers with fiberglass inserts and accessories.

c. All butt-end joints between sections shall be completely covered with 2" wide insulating tape.

d. Any piping exposed to freezing shall be insulated with 3 inch thick sectional fiberglass insulation. If multiple layers are applied, joints on each layer shall be completely sealed with 2" wide insulating tape. Longitudinal and circumferential joints between layers must be staggered. The outer most layers shall have a factory applied aluminum jacket cover of 0.016 inch thickness.

e. All pipes running through walls, floors, partitions, and beams shall have continuous insulation. Insulation shall be installed only after all tests of the piping system have been completed. All insulation shall fit snugly. All surfaces shall be clean and dry when insulation is applied. Longitudinal joints shall be on least conspicuous side of the pipe. Valves shall be insulated up to the packing nut.

f. Approved manufacturers include Certaineed Corp., Manville, Owens-Corning.

g. All products must meet fire and smoke safety requirements of Federal, State and City Codes; and all ASTM standards

C. Gas System

NOTE 1: GAS SERVICE AND EQUIPMENT LOCATIONS, INDICATED ON THE DRAWINGS, SHALL BE USED FOR BIDDING PURPOSES ONLY, AND SHALL NOT BE INSTALLED WHERE INDICATED

UNTIL FINAL APPROVAL IS RECEIVED FROM UTILITY COMPANY. BEFORE ANY GAS WORK HAS COMMENCED, THIS CONTRACTOR IS RESPONSIBLE TO FILE A GAS LOAD LETTER AND SERVICE WORK REQUEST WITH THE UTILITY COMPANY TO DETERMINE FINAL DEVICE LOCATIONS. THIS CONTRACTOR MUST COMPLY WITH ALL FINAL LOCATIONS AS DETERMINED BY UTILITY COMPANY AT NO ADDITIONAL EXPENSE TO BUILDING OWNER. PROVIDE WRITTEN NOTIFICATION TO BUILDING OWNER OF ALL REQIURED CHANGES.

NOTE 2: BUILDINGS SHALL BE PROVIDED WITH AN APPROVED GAS METERING SYSTEM AS REQUIRED BY UTILITY COMPANY INDIVIDUAL APARTMENT GAS METERS AND MASTER BOLIER ROOM METER IS RECOMMENDED, HOWEVER THIS INSTALLATION MUST BE VERIFIED WITH UTILITY COMPANY PRIOR TO FINAL DESIGN.

NOTE 3: THIS CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION OF ALL PROPOSED WORK TO UTILITY COMPANY PRIOR TO CONSTRUCTION**.**

1. Locations

   a. The location of fixtures and appliances as specified in all cases are to be adjusted to the surrounding conditions. Take all measurements at the building and should the space allotted for any appliance be in-adequate, contractor is to immediately notify the Architect/Engineer in writing and should he fail to do so, he must bear the expense necessary to correct the conditions. Coordinate with other trades in this building so as to prevent any individual deviations required to meet the same. Make all deviations required to meet the structural conditions and to suit job conditions.

   b. Install a complete new gas pipe system to apartments and boiler room. Schematic and physical layouts, including all piping from meters shall be submitted for approval to both the cognizant Utility Company and Architect/Engineer. This shall include pipe sizes.

   c. Coordinate with Utility Company regulations governing gas service installation. All work shall be in strict accordance with such regulations and requirements. Risers from meter bars to apartments shall not be less than 3/4 inch.

   d. Exact location of gas service point of entry (POE) at property line shall be secured from the Utility Company.

e. A meter(s) for boiler room equipment and other meters for apartments shall be furnished by the Utility Company. Contractor shall provide any additional equipment and materials not furnished by the Utility Company required to make this service complete.

f. Unless otherwise specified, gas service lines shall pitch toward street mains where possible. Otherwise, they shall be pitched toward the building and provided with drip leg capped outlets.

g. Gas piping inside building shall be schedule 40 black steel pipe with malleable iron fittings. Exterior piping shall be extra heavy black steel pipe. Buried tees and elbows shall be of extra heavy black steel with welded mitered joints.

h. Individual or master meters will be furnished by the Utility Co. and shall be erected as part of the work of this contract, on approved supports furnished under this Contract as directed by the Utility Company. From the meters, furnish and install gas piping with valves and branch connections to all fixtures and equipment requiring gas.

i. All gas fired fixtures and equipment shall be provided with individual stop valves.

j. All piping shall be supported by means of approved hangers and supports. Piping shall be supported to prevent vibration and to secure piping in place and shall be so arranged as to provide for expansion and contraction.

k. Hangers, Sleeves Etc.

1) Horizontal piping shall be supported with Clevis- type or Trapeze-type hangers, not more than 8 feet intervals; branch piping shall be secured to wall framing.

2) Vertical piping shall be supported at the base and at every other story by clamp type hangers.

3) All hangers and clamps shall have rubber insulation between the hanger and piping.

4) Galvanized steel sleeves with rubber insulation shall be installed for all piping passing through walls, partitions and masonry floors.

l. Testing of Gas Systems:

1) Gas piping inspections, testing and purging shall be in accordance with Fuel Gas Code section 406. Additional testing shall be as per Utility Company requirements.

m. Plumbing contractor shall provide gas lines with shut off valves to positions of dryers as indicated on plans.

n. Shut-off valves shall be bronze ball valve type as manufactured by Hammond corp. model 875 or equal. Units must conform to ASME B 16.33.

o. All gas risers shall be provided with a shut-off valve and capped drip leg at each base.

15B.13 PLUMBING SYSTEM TESTING

A. Gas piping inspections, testing and purging shall be in accordance with Fuel Gas Code section 406.

B. Complete plumbing system testing and distribution balancing shall be performed with written verifications of results submitted to HPD and Architect/Engineer.

C. 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.

D. All piping shall be tested before any covering is applied and being concealed with in partitions.

E. Clean interior of piping and flush until clean.

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

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

H. Fuel for tests shall be furnished by this contractor

15B.14 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.

15B.15 TEMPORARY WORK

A. Install, maintain and when directed remove all work listed below.

1. Temporary water system of each size and capacity as to adequately supply the complete construction needs.

2. Facilities shall be protected against freezing.

3. Construction Water Meter shall be provided. All paper work including permits and fees for the use of this meter and water consumption is included as part of the general construction contractor's responsibility. Removal at the end of all work shall be under this contract.

NOTE: IF PERMISSIBLE BY THE COGNIZANT CITY AGENCY, THE PERMANENT WATER METER REQUIRED UNDER THE CONTRACT, MAY BE USED FOR CONSTRUCTION WATER METERING.

a. In locations where no City water is available to the contract building, the requirement for a new water main shall be implemented on a priority basis to make water available to the site via the construction water meter.

15B.16 GUARANTEES

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.

15B.17 MAINTENANCE AND OPERATING INSTRUCTIONS

A. Submit three comprehensive sets of typewritten maintenance and operating instructions for all equipment to building owner or tenant group.

B. Give full instructions to building owner or tenant group regarding operation and maintenance of all machinery, apparatus, and other work installed by Contractor including functions of all valves.

END OF SECTION