

SECTION 22 00 00

PLUMBING WORK

PART 1 - GENERAL

1.1 GENERAL

- A. All work of this Section shall be governed by the requirements of the Conditions of the Contract and the entire Division #1, General Requirements.
- B. Due to the nature of the work and the rigid time schedule required, the utmost cooperation between Contractors must be attained.
- C. Refer to Section 23 50 00 for Supplementary Conditions for Mechanical and Electrical Work. The requirements of which are part of the work.
- D. All electrical components shall bear U.L. labels.
- E. PC shall provide concrete pads for floor mounted equipment in Mechanical Room.
- F. PC shall obtain all permits and pay all fees related to his work.
- G. All work shall be in accord with NY State Plumbing Code and Local Code requirements.
- H. Refer to Section 23 50 00 for coordination drawing requirements.
- I. PC shall be a firm regularly engaged in the installation of Plumbing systems for a period of at least five (5) years and shall have the licenses and certificates required by local, county and state regulations. License/Certificates holder shall be an officer of the firm and have a minimum of five (5) years employment with the firm.
- J. PC shall become familiar with drawings of other trades to understand work of other trades and its impact/effect on the plumbing work.
- K. PC shall provide Owner with invoices and other data required for utility and government rebates and incentives.
- L. PC shall fire-stop openings around piping passing through floors and walls. Refer to penetration fire stopping systems section of the specifications.
- M. The following abbreviations shall apply:
 - GC - Contractor for General Construction
 - PC - Plumbing Contractor
 - FPC - Fire Protection Contractor
 - HC - Heating (HVAC) Contractor
 - EC - Electrical Contractor
 - KEC - Kitchen Equipment Contractors

1.2 QUALITY ASSURANCE

- A. Requirements given herein may be affected by other related requirements of the project specifications. Correlation of contract requirements is the responsibility of the Contractor.
- B. All plumbing work on this project shall be governed by this specification.

1.3 SCOPE OF WORK INCLUDED

- A. PC shall provide all labor, material and appliances required for a complete plumbing installation as shown on drawings and hereinafter specified, including, but not limited to, the following principal items:
 - 1. Work in Connection with other Trades
 - 2. Work in Connection with Kitchen Equipment
 - 3. Identification of Equipment, Piping and Controls
 - 4. Plumbing Fixtures and Trim
 - 5. Water Heater
 - 6. Mixing Valve
 - 7. Recirculating Pump and Controls
 - 8. Drains
 - 9. Water Service
 - 10. Grease Interceptor
 - 11. Hot and Cold-Water Piping
 - 12. Fitting and Valves
 - 13. Waste Soil and Vent Lines
 - 14. Gas Supply
 - 15. Flashing (for plumbing work only)
 - 16. Wall Hydrants and Hose Bibbs
 - 17. Disinfection of Water Systems
 - 18. Drains and Interceptors
 - 19. Cleanouts and Deck Plates
 - 20. Insulation and Covering
 - 21. Hangers
 - 22. Access Doors
 - 23. Sleeves
 - 24. Escutcheons
 - 25. Shop Drawings
 - 26. Testing
 - 27. Permits
 - 28. Guarantees

1.4 WORK IN CONNECTION WITH OTHER TRADES

- A. PC shall provide proper roughing to all equipment requiring plumbing. PC shall provide shut off valves on all services to each item of equipment.
- B. Electric Wiring: PC shall furnish motor starters, controls and other electrical equipment as specified and deliver same to EC at job site for installation and wiring.

- C. PC shall be responsible for correct installation and operation of material furnished under his contract whether or not installed by him.
- D. PC shall be responsible for obtaining roughing dimensions prior to initiating work.

1.5 WORK IN CONNECTION WITH KITCHEN EQUIPMENT

- A. PC to provide all piping, valves, fittings for Kitchen equipment roughing and final connections.
- B. PC shall be responsible for handling of all plumbing fixtures and trim which may be furnished by others, from curb side loading dock to point of use, for setting of same and for final installation.
- C. Food service equipment furnished by equipment suppliers will be set in place by others. PC to have necessary roughing completed so that final connections can be made.
- D. Food service sinks, faucets, strainers, waste outlets and tailpieces will be furnished by equipment supplier unless otherwise noted on drawings.
- E. PC shall provide traps and shut-off valves.
- F. PC shall provide all roughing for equipment and make final connection, including necessary accessories for a complete installation.
- G. Prior to installation, PC shall review food service drawings and shop drawings to verify locations and sizes of plumbing connections, openings for sinks, faucets, outlets, piping space and access and advise Architect of any discrepancies.
- H. PC shall inspect materials furnished by equipment supplier and advise architect, prior to installation, of any shortages or damage to materials or non-code complying items.
- I. All piping mains shall be run concealed. Routing through cabinets or equipment shall not impair use of drawers, shelves or other equipment components.
- J. Exposed piping shall be chrome plated.

1.6 START-UP, TESTS AND ADJUSTMENTS

- A. Unless otherwise specified, all water piping systems shall be hydrostatically tested to 125 psig. Tests shall be of four (4) hour duration, during which time piping shall show no leaks and during time no sealing of leaks shall be permitted.
- B. After completion of roughing work, and before work is covered, open ends of sanitary, storm water and vent systems shall be securely closed except ends of highest openings, and entire system shall be filled to overflow point with water and subjected to a 10 feet pressure test for one (1) hour.
- C. A smoke test shall be applied to entire drainage and vent system after all fixtures have been set.

- D. Refer to gas supply for testing requirements for gas piping.
- E. PC shall furnish and pay for all labor, material and equipment require for testing.
- F. Defects disclosed by tests shall be repaired, if permitted by Architect, or replaced without extra charge so directed. PC shall furnish services of a qualified person, thoroughly familiar with the job, to operate and make all adjustments so that the systems and control equipment shall operate as intended. This man shall make adjustments including balancing of the water, gas and piping systems in cooperation with qualified representatives of mechanical equipment manufacturers and temperature control manufacturer. Architect is to be notified when this balancing is to be performed.

1.7 DISINFECTION OF WATER SYSTEM

- A. Upon completion of all tests and necessary repairs or replacements all new mains and repaired portions of, or extension to, existing water piping system shall be subjected to a disinfection procedure as herein specified. System to be disinfected shall include portions of water piping, and any systems that may be connected to the same supply sources. Disinfection shall be applied to all piping included in contract from main cutoff valve through all appurtenances connected thereto.
- B. These systems shall be thoroughly flushed with water to remove sediment. Following this flushing, they shall be disinfected in accordance with the following methods.
- C. System shall be so chlorinated that a chlorine residue of not less than 10 PPM remains in the water after 24 hours standing. Water from existing distribution system or other source or supply shall be controlled so as to flow slowly during the application of chlorine. Rate of chlorine mixture flow shall be in such proportion to the rate of water entering pipe that chlorine dose applied shall produce 10 PPM, after 24 hours standing. This may be expected with an application of 25 PPM.
- D. In the process of chlorinating the system, all valves and other appurtenances shall be operated while the pipeline is filled with the chlorinating agent.
- E. Following chlorination, all treated water shall be thoroughly flushed from the system at its extremities until the replacement water throughout its length shall upon test proved comparable in quality to the water served the public from the existing water supply system and approved by the Public Health Authority having jurisdiction. This satisfactory quality of water delivered by the new system should continue for a period of at least three (3) full days as demonstrated by laboratory examination of samples taken from a tap located and installed in such a way as to prevent outside contamination. Samples should never be taken from an unsterilized hose or from a fire hydrant because such will seldom meet bacteriological standards. After systems are drained, they shall be thoroughly flushed with fresh water, and returned to service.

1.8 PROTECTION OF MATERIAL AND WORK

- A. Openings left in floors and roofs for passage of lines of soil, drain, waste, vent and supply pipes shall be covered and protected. Set traps shall be sealed with anti-freeze solution.

Precaution shall be taken against freezing during cold weather. Pipes shall be protected with suitable coverings, as soon as set. Open ends of pipes shall be closed by proper fittings, to prevent obstruction and damage. Use of water closets and other plumbing fixtures during the progress of work is strictly prohibited.

1.9 METHODS OF FASTENING

- A. Except where otherwise specified, where fastenings are made to wood, there shall be used long screw or lag screws; to brick work, cement, stone and marble, approved long expansion bolts; to fireproof block work, approved toggle bolts and to iron work, approved bolts and nuts; to concrete slabs, approved expansion bolts. Use of wood plugs and nailing not permitted. Sundries used in connection with galvanized iron shall be galvanized, those in connection with brass or copper work shall be brass or copper, finished to match the connection work.

1.10 GENERAL INSTALLATION OF PIPE

- A. Run and arrangement of pipes shall be approximately as shown on drawings and as directed during installation, and shall be straight and direct as possible, forming right angles or parallel lines with building walls and other pipes, and be neatly spaced.
- B. No pipe shall be installed where headroom will be interfered with unless conditions are such that it is approved by Architect and unavoidable. Offsets will be permitted only where walls reduce in thickness or beams interfere with direct runs; offsets shall be made at an angle of 45° to the vertical, in no case shall the space between pipes, partitions, walls, etc., exceed 5". Risers shall be erected plumb and true, standing free from but close to walls, and other pipes and neatly spaced. Horizontal runs of piping shall be supported from floor or roof slab or other structural member above, shall be of size and arrangement noted on plans, shall be erected as closely as possible to bottom of floor slabs, ceilings, or beams as the case may be, and shall be so graded as to drain to low points at drawcocks.
- C. Roughing underground or concealed in floor or wall construction shall be properly installed and inspected before any roughing is covered up. Work covered up before being inspected shall be uncovered and recovered at expense of PC. Plugged fittings shall be installed as required and when called for.
- D. Reducer fittings shall be used in making reductions in sizes of pipes, bushings not allowed. Suitable shock arrestors shall be provided as called for in other sections. Shock arrestors to be in accord with ASSE 1010.

1.11 DRIP PANS

- A. Refer to section 23 50 00.
- B. Examine the drawings, and in cooperation with the EC, confirm the final location of all electrical equipment to be installed in the vicinity of piping. Plan arrange all overhead piping no closer than two (2) feet from a vertical line to electric motors and controllers, switchboards, panelboards or similar equipment.

- C. Where the installation of piping cannot comply with the requirements of foregoing paragraph, where feasible, the piping shall be relocated.
- D. Where piping cannot be relocated provide galvanized steel gutters as follows:
 - 1. Provide a gutter of 18-gauge galvanized steel under every pipe which is within 2'-0" of being vertically over any motor, electrical controllers, switchboards, panelboards, or the like.
 - 2. Each gutter shall be welded and made watertight, properly suspended and carefully pitched to a convenient point for draining. Provide a 1" drain to nearest floor drain or map sink, drain termination shall be visible.
 - 3. In lieu of such separate gutters, a continuous, adequately supported and braced, properly rimmed, pitched and drained, may be provided over any such motor, and extending 2'-0" in all directions beyond the motor, over which such piping has to run.
- E. In addition, gutters at electrical equipment, provide gutters under all waste piping which is installed above food preparation, service or storage areas.

1.12 IDENTIFICATION OF EQUIPMENT, PIPING AND CONTROLS

- A. All equipment shall be stenciled or labeled with Lamacoid plates screwed thereon which shall indicate system service, unit designation and area served.
- B. Motor starters shall be provided with Lamacoid plates which indicate system or equipment served.
- C. All valves shall be tagged with 2" brass plated tags and chain and a valve chart schedule framed and wall mounted shall be provided where directed.
- D. Piping Identification, Coding and Painting
 - 1. All piping in Mechanical, Boiler, Fan, Storage and Equipment Rooms and all piping above accessible ceiling shall be coded and identified as herein specified.
 - 2. Apply color-coded polyvinyl chloride pipe bands identifying pipe contents and direction of flow.
 - 3. Apply bands on 15' centers on piping in Equipment Rooms and 25' elsewhere on straight runs; at valve locations at point where piping enters and leaves a partitions, wall, floor or ceiling.
 - 4. Apply bands at exit and entrance points to each vessel, tank or piece of equipment.
 - 5. Bands widths shall be 8" for pipes up to 10" diameter and 16" wide for larger diameter piping. Letter heights stating service shall be preprinted on band, 3/4" high for 16" bands.
 - 6. For insulated pipes, apply bands after insulation and painting work has been completed.
 - 7. Provide ten (10) additional bands of each type for future use by Owner's personnel.
 - 8. Follow manufacturer's instructions for application procedures using non-combustible materials and contact adhesives.
 - 9. All piping shall be color coded in full accordance with ANSI 13.1, 1981 Standards. Pipe markers shall be as manufactured by Seton Name Plate Corp., or equivalent.

10. All piping which is not insulated, tanks and equipment shall be painted. Equipment provided with a factory finished coating shall be cleaned and touched up as necessary. Equipment provided with a factory primer shall be given two (2) coats of enamel paint after installation. Pipe, hangers, support and equipment shall be primed and given two (2) coats of enamel paint. Color for piping and tanks shall be in accordance with ANSI 13.1, 1975 Standard, color of equipment and supports shall be as directed by Architect.

1.13 WATER SERVICE

- A. Provide as shown on drawings.
- B. Piping shall be Type K copper soft temper joined with compression fitting.
- C. Backflow preventer installation shall be in accord with Health Department regulations.
- D. PC shall provide RPZ backflow preventer for the domestic service.

1.14 WATER SUPPLY

- A. Cold Water, Under slab: Shall be PEX-A tubing, with no joints below slab.
- B. Cold, Hot Water and Hot Water Recirculation Piping Above Ground: Cold, hot water and hot water recirculation lines shall be type "L" hard temper, copper. All materials shall be NSF listed for domestic water service.
- C. As an alternative NSF listed Uponor straight length PEX-A, join with Uponor Pro Pex expansion fitting may be used for mains and NFS listed Uponor PEX-A tubing joined with Pro Pex expansion fitting maybe used for branches.
- D. All piping on Mezzanine Level shall be copper.

1.15 DRAINAGE AND VENTS

- A. Below Slab: Soil, waste and vent shall be service weight cast iron, with hub and spigot joints, neoprene rings.
- B. Above Slab: Soil and waste piping, risers and horizontal runs shall be no-hub cast iron with no-hub joints.
- C. Above slab vent piping shall be schedule 40 solid wall PVC with solvent weld joints.
- D. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and be listed by NSF International.
- E. Vent piping on Mezzanine level shall be no hub cast iron.
- F. All couplings for No-Hub cast iron soil pipe and fittings shall conform to CISPI 310 and be certified by NSF International.

1.16 JOINTS

- A. Exposed threads on exposed finished piping in toilet rooms and finished areas or at fixtures will not be acceptable.
- B. Joint compound for intended service shall be used on screwed joints and shall be applied to male thread only. Wicking not permitted.
- C. Joints on copper pipe, shall be made with streamline wrought copper soldering fittings and Silver-Brite lead free solder.

1.17 VALVES

- A. Provide shut-off valves to isolate each item of equipment for maintenance service and replacement, provide balancing valve or cock to adjust flow.
- B. All valves shall be constructed using lead free materials.
- C. Valves for pipe sizes of 2 ½” or less shall be Apollo 70-200 or Milwaukee Series 150, for sizes 3” and larger Milwaukee Series C, lug type butterfly valves shall be provided.
- D. Balancing valves shall be of the square head cock type. Provide custodian with at least two operators for use with balancing valves. Balancing valves shall be the same size as the adjacent piping.
- E. Check valves shall be of the horizontal swing check type with brass or bronze working parts and removable disc except where lift check valves shall be used on the discharge side of circulating pumps.
- F. Dielectric Fittings: Piping connections between dissimilar metals shall be made with dielectric fittings or insulating fittings to prevent electrolytic corrosion. Dielectric fittings shall be of the screwed union type as manufactured by EPCO.
- G. Provide drip valves at low points in various systems. Drip valves shall be lock shield and have threaded hose ends.

1.18 GAS SERVICE (LPG) AND PIPING

- A. General:
 - 1. Provide new gas service as shown on drawings in accordance with gas supplier requirements. Coordinate with gas supplier and obtain certificate for submission to Building Department.
 - 2. New gas service to be extended from the LPG storage tanks as shown on drawings.
 - 3. Meter and regulator furnished by gas supplier, installed by PC in accord with gas supplier requirements.
 - 4. Building distribution piping to be provided as shown.

- B. All work shall be in accord with New York State Fuel Gas Code, NFPA-53, Utility company and Village requirements.
- C. Pipe:
1. Underground piping to be plastic coated soft tempered Type K copper.
 2. Above ground piping: Schedule 40 standard black pipe free from flaws or other defects and of true and uniform section. Minimum size of gas piping shall be ¾”.
- D. Fittings:
1. For exposed pipe 2½” and smaller – threaded heavy malleable iron beaded fittings.
 2. For all piping 3” and larger shall be welded using standard weight, steel joints with welding fittings.
- E. Installation of Pipe:
1. All connections shall be made with fittings. Whenever gas lines are unavoidably trapped, an accessible drip shall be provided. The bottom of all risers and all equipment connections shall be provided with a capped dirt leg. Threaded joints shall be made with approved joint compound. Burrs made in cutting pipe shall be removed.
 2. Where piping of different sizes is joined, reducer fittings shall be used; bushings will not be permitted. All connections shall be taken from top or side of mains and not from bottom.
 3. Provide gas tight metal sleeve, open at each end, to enclose gas piping where it passes through corridors, halls, stairs and vestibules.
 4. Exterior piping at regulators and interior piping shall be cleaned, primed and painted. Color for interior piping to be yellow. Primer and paint shall be Rustoleum or equivalent.
- F. Gas Regulators and Meters:
1. Provide second stage regulators at building connections.
 2. Install appliance regulators as shown on drawings.
- G. Gas Valves:
1. General Use: Rockwell Fig. 143 or equivalent.
 2. Wrenches shall be supplied for all wrench operated valves.
 3. All regulators and reliefs shall be vented to outdoors. Vent lines shall be run full size, with vent line for each regulator or relief run separately and shall terminate in an approved vent cap.
- H. Tests of Gas Systems:
1. Tests shall be paid for PC and shall be made in presence of Architect, Engineer, Owner or their representatives, gas supply company representatives and local authorities having jurisdiction of the work to be tested, and as may be directed, and at least 72 hours advance notice shall be given.

2. Shop tests shall be made of appurtenances and material before delivery to the site. These tests shall not relieve the PC of responsibility for defects discovered after appurtenances and materials are installed.
3. Source of test pressure shall be isolated before pressure tests are performed.
4. Perform all tests as herein specified and as required by the gas supplier company.

I. Gas Piping:

1. Test all new gas piping and connections to existing piping.
2. Aboveground Piping: Test with air at 50 psig for a period of not less than 2 hours without showing any drop in pressure. All joints and fittings shall be soap tested. In addition, piping system shall be tested using gas meter as outlined in NFPA-54.
3. Underground Piping: Test with air at 150 psig. All joints and fittings shall be soap tested. Prior to pressurizing line, back fill straight runs to restrain pipe.
4. After testing is successfully completed, the entire gas distribution system shall be purged, pilot lights on all equipment and appliances shall be lighted and the operation of all equipment and appliances shall be checked.
5. Defects disclosed by tests shall be repaired, if permitted by Architect, or replaced without extra charge if so directed.

1.19 SLEEVES

- A. Provide pipes passing through footings and exterior and masonry walls with steel pipe sleeves, inside diameter of which should be at least 1" greater than the outside of the pipe passing through it. Sleeves in exterior walls shall have space between pipe and sleeve caulked watertight. Sleeves shall be large enough to receive covering on insulated pipes. Sleeves shall be properly arranged to hold in position during construction.
- B. Metal sleeves for insulated pipes passing through floors, walls and partitions shall be sized to permit continuous insulation.

1.20 FLASHING

- A. Vent Terminals: Vent and other plumbing pipes through roof shall be flashed watertight. Flashing shall be 4 lb. lead extending not less than 12" on each side of the pipe, outside the barrel and terminate 1'-0" above the roof with roof fitting.
- B. Provide at top of vent stacks a 4 lb. lead vent cap.
- C. Floor Drains: Flashing shall be 4 lb. lead extending not less than 18" on all sides. Turn down into floor drain flashing clamp.

1.21 PIPE SUPPORTS, HANGERS AND INSERTS

- A. Underground Pipe: Pipes laid underground shall be firmly bedded in solid ground under body of pipe. Where suitable bearing cannot be obtained because of the ground being disturbed by excavation, or for any other reason, pipe shall be supported by concrete piers,

or by approved brackets, or holdfasts secured to the walls, or they shall be supported on ties and planks, or if below structural slab, on hangers tied into slabs.

- B. Overhead Horizontal Pipe: Horizontal drains, vents, supplies or other piping shall be supported at intervals to 12'-0" for 6" and over; 10'-0" for 4" and 5" pipe; 8'-0" for 1 1/2" to 3" pipe; 6'-0" for under 1 1/2" pipe, and where bell and spigot pipe is suspended, a hanger shall be placed ahead of each hub supported at a maximum of 5 feet intervals by adjustable wrought iron, steel or malleable iron hangers; pipe hangers, supports, etc., shall be primed with one coat of red lead and linseed oil before installation. Hangers shall be of the clevis type as manufactured by Grinnell Figure 260 or for heavier leads beyond maximum recommended loads, Grinnell Figure 212 or 216. Provide lead shields where copper tubing is utilized. Do not hang piping or equipment from other trades.
- C. Where Kindorf or Unistrut trapeze hanger systems are used, clamps shall have rubber or plastic inserts so that there is no metal-to-metal contact.
- D. Perforated Strap: Perforated strap iron and temporary wire supports are not permitted.
- E. Provide approved sheet metal shields to protect insulation at areas of contact with hangers and supports. Provide protective saddles as required, installed in approved manner. Shields to be "Insul-Shield" Insul-Coustic Corp.
- F. Hangers used to support copper or brass piping shall be copper coated or brass.

1.22 INSULATION AND PIPE COVERING

- A. General: Insulation work shall be performed under this section and work shall be done in strict accordance with manufacturer's recommendations. All hot, hot water return and cold-water piping shall be insulated.
- B. Joints shall be butted firmly together. Workmanship shall be done as to leave a smooth finish with no raveled edges.
- C. Aboveground horizontal storm piping (including 2'-0" of vertical at each end), cold water, hot water and hot water recirculating piping insulation shall be multi-purpose 4 lb. per cu. ft. density 1" thick molded glass fiber with maximum "K" factor of 0.22 at 75°F. mean temperature, as manufactured by Owens Corning, Knauf or equivalent of Johns Manville. All insulation shall have a factory applied low pressure pipe insulation flame retardant white jacket ASJ. Longitudinal lap and 4" wide flame retardant joint seal strips shall be cemented neatly in place with Insul-Coustic Sure Stik white 210 or equivalent.
- D. All insulation materials adhesives, mastics and jacket assemblies shall be UL rated and classified. Ratings shall not exceed:
 - Flame Spread 25
 - Fuel Contributed 50
 - Smoke Developed 50
- E. Fittings and Valves: Fittings and valves shall be insulated with molded fiberglass to form a smooth outer surface with adjacent insulation. Fittings insulation shall be covered with

white vapor barrier cement followed by glass tape and a finishing coat of cement or lagging adhesive, or Zeston Jackets.

- F. Roof drain sumps shall be insulated with 1" thick blanket and covered with an ASJ jacket. Blanket shall be wired on, joints overlapped, pasted and sealed.
- G. Handicap Lavatory Drain and Supplies: Where not covered with shroud provided with fixture, provide handicap lavatory P-trap and supply assemblies insulated with fully molded, TRUEBRO, Handi Lav-Guard insulation kit, Model #102 or equivalent, white in color with 3-piece interlocking trap assembly and 2-piece interlocking angle valve assemblies. Fasteners shall be nylon-type supplied with kit.

1.23 HYDRANTS AND HOSE BIBBS

- A. Exterior wall hydrants shall be Woodford Model B67 backflow protected (ASSE 1052), non-freeze automatic draining, 3/4" size, mounted 24" above grade. Construction shall be brass.
- B. Interior hose bibbs shall be Woodford Model 26, chrome plated, backflow protected (ASSE 1052) hose bibb mounted 18" above finished floor.
- C. Equivalent of J.R. Smith, Zurn, or Josam.

1.24 CLEANOUTS

- A. Cleanouts shall be provided in following locations: On traps except earthenware traps and traps of drain below slab, at ends of and at points in change of direction of drains and branch drains at offsets, at the ends of branch, soil and waste pipes, at base of stacks and leaders, at intervals of not greater than fifty (50) feet, and at other points indicated on plans. Cleanouts shall be of same nominal size as the pipes up to 6", and such cleanouts shall be at least 6" for 8" and larger pipes.
- B. Cleanouts for cast iron shall consist of tapped extra heavy cast iron ferrules, caulked into cast iron fittings with an extra heavy brass tapered screw plug with raised head; cleanouts for steel or wrought iron pipe shall consist of extra heavy brass screw plug in a drainage fitting.
- C. Cleanouts turning up through floor shall be made by means of long sweep ell or "Y" and 1/8" bend, into which shall be caulked an extra heavy cast iron ferrule with an extra brass tapered screw plug with a raised head. This shall be covered with a non-skid deck type cleanout plate brought up flush with finished floor as manufactured by J. R. Smith #4023 FCG. Cleanouts in walls shall be covered with J. R. Smith #4402. Exposed surfaces of floor cleanouts shall be nickel bronze; wall cleanouts chrome plated. Cleanouts in carpeted areas shall be J. R. Smith #4023 YFCU. Cleanouts in tiled areas shall be J. R. Smith #4208 FCU. Equivalents of Zurn or Josam.

1.25 VACUUM BREAKERS AND BACKFLOW PREVENTERS

- A. Provide where indicated and/or as required by code, vacuum breakers, which shall be installed and set at least 4" above the flood level of equipment or fixture to prevent water contamination.
- B. Provide Watts #909- 3/4" backflow preventers for heating and cooling systems and make-up water line.

1.26 WATER HEATER

- A. Provide water heaters as shown on drawings.
- B. Refer to drawing for details.

1.27 DOMESTIC HOT WATER RECIRCULATION PUMP

- A. Circulating Pump: Provide hot water circulating pump as shown. Pump shall be all bronze, bronze body and cast bronze closed type dynamically balanced impeller, carbon and stainless-steel rotary seals, rubber mounted, overload protected flexible steel spring drive coupling porous bronze stainless-steel shaft.
- B. Pump shall be Bell & Gossett Series 100-3/4" flanged 1/12 HP, 1 phase, 120 volts. Pump shall be tested and made tight at 150 psig internal pressure. Pumps shall be capable of pumping 4 GPM at 10-foot head.
- C. Domestic hot water recirculation pumps shall be controlled by a digital timeclock and Aquastat.

1.28 MIXING VALVE

- A. Provide mixing valve for domestic hot water heaters, Symmons Thermostatic Type, Temperature Control, size as shown on drawings.
- B. Mixing valve shall be automatic, adjustable, thermostatic type, of size shown on drawings.
- C. Hot and cold-water inlets shall have integral stops and checks, outlet shall have a thermometer.
- D. Mixing valve Model and installation to be as detailed on drawings.

1.29 PLUMBING FIXTURES

- A. Provide as indicated and described, set in best workmanlike manner and left in first class condition upon completion.

- B. Numbers used are taken from catalog of companies noted, unless otherwise noted all fixtures to be white.
- C. All escutcheons shall be of similar design, smooth pattern. All exposed parts chromium plated, including parts furnished for fixtures by others.
- D. All trim, stops, etc. shall be vandal resistant.
- E. Mounting heights of fixtures for normal and handicap use shall be as directed by Architect.
- F. Before installing fixtures, blow out water lines to remove any foreign matter. Fixtures shall be provided complete with traps, fittings, vents, etc., and in accordance with local plumbing codes, fixtures left complete, ready for use.
- G. Water Closet (Wall Mounted): American Standard "Afwall" 2257.101 wall mounted, elongated bowl, top spud, vitreous china. Provide with Zurn floor mounted carrier and Sloan Solis Flush Valve 8111,1.28 GPF and Church 9500C seat, mount at height as directed by Architect.
- H. Water Closet (Tank Type)-Single Stall: American Standard "Cadet Pro Right Height" 215BA.104 floor mounted, tank type, elongated bowl, vitreous china. Provide with Church 9500c seat.
- I. Lavatory (Undercounter): American Standard "Boulevard" 0610.00, under counter mount, vitreous china, front overflow. Provide with Hansgroghe Metris S Electronic faucet, 0.5 GPM, long life battery powered, Symmons thermostatic mixing valve for each lavatory, grid strainer, pair of loose key stops and cast brass trap and nipple wall flange.
- J. Lavatory (Wall Mounted): American Standard "Decorum" 9134001EC, wall mounted, vitreous china, rear overflow, concealed with arm wall hanger. Provide with Hangsgroghe Metris S Electronic faucet, 0.5 GPM, long life battery powered, Symmons thermostatic mixing valve for each lavatory, grid strainer, pair of loose key stops and cast brass trap and nipple wall flange.
- K. Mop Sink: Williams HL 1800-BP, 24" x 24" x 12", high/low, precast terrazzo mop sink. Mount Faucet 36" high on wall behind. Faucet to be American Standard 8344.111 service sink fitting with screwdriver stops in shanks, level handles, vacuum breakers, threaded spout with bucket hook and top brace, 3" drain with strainer. Seal at walls with silicone sealant. Provide integral cast stainless steel cap and stainless-steel splash plates for walls.
- L. Electric Water Cooler and Bottle Filler: Elkay Model LZWS-SS8K, electric water cooler with bottle filler. All parts in contact with water to be lead free, refrigerant R-134a. Unit shall have a capacity of 8.0 GPH. Unit to be ADA compliant. Finish to be stainless steel. Mount at height as directed by Architect. Provide with Elkay filter and mounting frame.

1.30 DRAINS AND INTERCEPTORS

- A. Toilet Room Floor Drains: Zurn Z-415 with seepage pan and membrane clamp. In Toilet Rooms provide with deep seal traps and trap seals.

- B. Mechanical Room Floor Drains: Z-507S.
- C. Kitchen Floor Sink: Zurn Z-1901-KC-19-25.
- D. Kitchen Floor Drain: Zurn-Z415H
- E. Provide underground precast concrete grease interceptor. See drawings for details.

1.31 SHOP DRAWINGS

- A. All manufactured items shall be submitted for review before installation of same. Submission shall be in form of manufacturer's standard printed sheets, pamphlets or bulletins and shall be clearly indicated thereon as to size, type, etc.
- B. Review of submission shall mean review of equipment and/or fabrication as to design and performance only.
- C. Contractor shall be responsible for scheduling quantities, physical size to suit allowable space electrical characteristics, etc.
- D. Any additional costs incurred due to substitution of equipment shall be borne by PC.
- E. The following items require a submission of shop drawings:
 - 1. Plumbing fixtures, and all associated trim
 - 2. Cleanouts and Deck plates
 - 3. Backflow Preventers
 - 4. Pipe, fittings, valves and usage
 - 5. Insulation and covering
 - 6. Hangers and supports
 - 7. Drains
 - 8. Grease interceptor
 - 9. Wall hydrants and hose bibbs
 - 10. Water heater
 - 11. Mixing valve
 - 12. Hot water recirculation pumps and controls
 - 13. Pipe identification materials

1.32 GUARANTEE

- A. Refer to Sections 23 50 00.

END OF SECTION 22 00 00