

## SECTION 15410

### PLUMBING - GENERAL PURPOSE

#### PART1 GENERAL

##### 1.01 SUMMARY

Furnish all labor, equipment, materials, and tools and perform all operations in connection with the installation of a complete plumbing system. Comply with all codes and authorities having jurisdiction, preparation of Record Drawings and Owner's Manuals, guarantees and warranties, protection of work and quality assurance of workmanship.

##### A. Section Includes:

1. All inside sanitary, indirect waste, acid-resistant waste, storm drainage, cold water, hot water, hot water return and natural gas piping.
2. Cold water to the exterior building wall and connect to piping provided under other sections of these specifications.
3. Natural gas piping to outside the building and connect to meter provided by local gas supplier.
4. Plumbing fixtures.
5. Provide valves, faucets, strainers, tailpieces, traps, adapters and make all final connections to fixtures and equipment provided either by the Owner or under other sections of these specifications.
6. Cleaning, sterilizing and testing of the piping systems and all related equipment.

##### B. Related Sections:

1. Section 02200: Earthwork.
2. Section 09900: Painting.
3. Section 15010: Mechanical General Requirements
4. Section 15190: Mechanical Identification.
5. Section 15260: Piping Insulation.
6. Division 16 - Electric.

##### 1.02 SUBMITTALS

##### A. Shop Drawings:

1. Prepare and submit Shop Drawings in accordance with the requirements of Section 01300, and obtain the Architect's approval before proceeding with the fabrication and work.
2. Show plans, elevations, details and job conditions, relationship to other work, and indicate finishes.
3. All fixtures of the same material (china, stainless steel, fiberglass etc.) shall be of the same manufacturer. All sink faucets shall be of the same manufacturer. All floor drains, cleanouts and carriers shall be of the same manufacturer.
4. Shop Drawings and catalog cuts shall indicate Specification Section and paragraph requiring equipment submitted.
  - a. Plumbing fixtures.
  - b. Floor drains.
  - c. Roof Drains.
  - d. Valves.
  - e. Cleanouts.
  - f. Trap Guards.
  - g. Electric Water Heater.
  - h. Domestic hot water circulating pump.
  - i. Elevator Sump Pump.

- B. Samples: Submit all samples as requested by the Architect of materials specified herein in accordance with requirements of the Conditions of Contract, and before ordering materials, obtain written approval from the Architect.
- C. Product Guarantees and Warranties: Provide manufacturers standard guarantee/warranty for all products provided in this section.
  - 1. Electric Water Heater shall have a five-year warrantee.

## PART2 PRODUCTS

### 2.01 MANUFACTURERS

All product model numbers used reference the first manufacturer listed for the appropriate item.

- A. Water Closets: American Standard.
- B. Toilet Seats: Church, Bemis or Beneke.
- C. Lavatories: American Standard.
- D. Shower: Aqua Bath, Aquarius or Lasco.
- E. Sinks:
  - 1. Stainless Steel: Just, Elkay Kindred or Revere.
- F. Mop Receptors and Shower Bases: Fiat, Stern-Williams or equal.
- G. Faucets:
  - 1. Lavatory: Chicago.
  - 2. Sink (SK-1): Sloan.
  - 3. Sink (SK-2): Chicago.
  - 4. Mop Receptor: Chicago Faucet.
  - 5. Wall Hydrants: Zurn, Woodford, J. R. Smith, Josam or Wade.
  - 6. Shower: Powers.
- H. Floor Drains: Zurn, Watts, Josam, or J. R. Smith.
- I. Roof Drains: Froet (contact K Ross Co. at 508-747-4493).
- J. Cleanouts: Zurn, Watts, Josam, or J. R. Smith.
- K. Trap Guard: Trap Guard (trap seal protectors): Trap Guard: ProSet Systems 800-262-5355.
- L. Valves:
  - 1. Ball & ball/drain: Milwaukee, Apollo, Nibco or Crane.
  - 2. Check: Milwaukee, Nibco or Crane.
- M. Thermometers and Pressure Gauges: Trerice, Amtek, Ernst or equal.
- N. Fire Stop Sealant: SpecSeal Firestop Products or equal.
- O. Traps and Supplies
  - 1. SK, L & WC: McGuire.
- P. Electric Water Heater: State or A.O. Smith.

- Q. Hot water expansion tank: Amtrol or approved equal.
- R. Domestic hot water circulating pump: Taco.
- S. Elevator Sump Pump: Stancor.

## 2.02 MATERIALS

- A. Soil, Waste and Vent piping located within the ceiling cavity between the upper level parking area and the floor of the occupied third floor:
  - 1. Standard weight cast iron, with size, weight and manufacturer's name on each length and fitting, and shall conform to ASTM Standard Specifications. Joints above ground shall be compression gaskets or no-hub with stainless steel couplings. Joints below ground shall be compression gaskets.
- B. Storm drainage piping:
  - 1. Schedule 40 polyvinyl chloride (PVC) with solvent cement joints. Fittings shall be of the drainage pattern.
- C. Waste and Vent piping located above the finished floor of the occupied third floor:
  - 1. Schedule 40 polyvinyl chloride (PVC) with solvent cement joints. Fittings shall be of the drainage pattern.
  - 2. Double branch drainage connections 2" and smaller shall be made with double wye fittings.
- D. Overflow Storm Drainage Piping:
  - 1. Schedule 40 polyvinyl chloride (PVC) with solvent cement. Fittings shall be of the drainage pattern.
- E. Cold Water, Hot Water and Hot Water Return Piping:
  - 1. Above Ground:
    - a. Shall be type "L" hard-drawn copper tubing with wrought copper, solder-type fittings; immediate exposed piping at fixtures shall be IPS copper, cast brass threaded fittings, all finished and chrome-plated, unless otherwise noted.
- F. Gas Piping System:
  - 1. Piping shall be Schedule 40 black steel. Malleable iron threaded flat band black fittings or welded fittings and joints; all piping of 1 psig or more or 4" ips or larger shall have all welded fittings; "Walco" brass to iron seat malleable unions. Provide shut-offs at each piece of equipment. Provide drain pockets at risers and low points. Gas piping shall be installed in accordance with NFPA Bulletins No. 54.
- G. Cleanouts:
  - 1. Cleanouts shall be installed for drainage piping at base of risers, at changes in direction, where shown, and as required by Code. All cleanouts shall be furnished with bronze plugs.
  - 2. At the completion of the work, remove cleanout covers, flush lines and grease threads.
  - 3. Wall: #Z-1446-BP, cast iron ferrule, plug, with round stainless steel access cover with vandal-proof screw.
  - 4. Floor: ZN-1400-BP round nickel bronze top.
- H. Valves and Fittings: Provide valves for complete operation and drainage. Provide accessible sectionalizing valves where water branches connect to mains. Provide drain valves at the low points.
  - 1. Ball: Bronze body, blowout-proof stainless steel stem, stainless steel ball, teflon seats, stainless steel lever handle with vinyl grip, rated for 600 psi WOG. Use for shut-offs or balancing.
    - a. Threaded Ends: #BA-100S.
    - b. Sweat Ends: #BA-150S.
  - 2. Check: Bronze body and disc, 200 psi WOG, BUNA-N seal.
    - a. Threaded Ends: # 509.
    - b. Sweat Ends: #1509.
  - 3. Drain: Same as 1. or 2. above with 3/4 hose adaptor and hose cap with chain.

- I. Thermometers:
1. Model 80742, 4-1/2" diameter case. Thermometers shall be universal angle, dial type, with union hub and separable brass wells. Scale range shall be 0 - 100°F. for the cold water and 30° - 240°F. for the hot water piping. Graduations shall be 2°F.
- J. Pressure Gauges:
1. Water pressure gauges shall be model 600, bourdon tube type, standard pressure design, 4 1/2" diameter face, scaled in pounds per square inch with a 0-100 range, 0.5 increments labeled every 10 psi, ANSI B40.1 Grade A accuracy, cast aluminum case and a 1/4" NPT brass socket.
- K. Dielectric Fittings: Provide dielectric fittings wherever dissimilar metal materials are to be joined. Fittings shall be not less than 175 psi rated and have a maximum temperature rating of not less than 200°F.
- L. Hangers (Individual):
1. All hangers shall be of the adjustable clevis type with shields for plastic piping and all insulated piping. Vertical pipe clamps for copper piping shall be copper, bronze or bronze plated construction; all other vertical clamps and all horizontal pipe hangers shall be all steel construction.
  2. All piping below ground shall be continuously supported on undisturbed bearing soil or on engineered compacted fill.
  3. Horizontal above ground piping shall be supported as follows:
    - a. Cast Iron: At every other joint up to every 5'-0". For single lengths of pipe longer than 5'-0" provide one hanger for each length of pipe up to every 10'-0". Locate hangers within 1'-6" of a hub or a joint. Provide a hanger for each branch take-off within 1'-6" of the connecting main.
    - b. Copper: 1/2" - 1-1/4": Every 6'-0".  
1-1/2" up: Every 10'-0".
    - c. Steel: 1/2" IPS: Every 6'-0".  
3/4" & 1" IPS: Every 8'-0".  
1-1/4"+ IPS: Every 10'-0".
    - d. P.V.C.: All Sizes: Every 4'-0".
  4. Vertical above ground piping shall be supported as follows:
    - a. Cast Iron: At every floor and at the base of every stack.
    - b. Copper: 1/2" - 1-1/4": Every 6'-0".  
1-1/2" up: Every 10'-0".
    - c. Steel: 1/2" IPS: Every 6'-0".  
3/4" & 1" IPS: Every 8'-0".  
1-1/4"+ IPS: At every floor level.
    - d. P.V.C.: All Sizes: Every 4'-0".
  5. Provide hangers within 1'-0" each way of each change of direction except at expansion loops which shall have hangers before, after and at the mid-point of each loop.
  6. All hanging supports shall be attached to the top chord of the building framing system.
- M. Sleeves:
1. Pipes Through Floors: Form with Schedule 40 (galvanized) steel pipe and extend 1" above surrounding floor.
  2. Pipes Through Interior Partitions: Form with steel pipe or 16 gauge galvanized steel.
  3. Pipes Through Exterior Building Walls, Concrete Walls or Footing: Form with Schedule 40 (galvanized) steel pipe.
  4. Size: The minimum sleeve diameter shall be either 2 pipe sizes or 2" in diameter larger than the outside diameter of the pipe. The outside diameter of insulated piping shall be measured at the insulation jacket.
- N. Escutcheon plates shall be installed where piping passes through walls, partitions, floors, ceilings, etc. Escutcheon plates shall be all metal construction and of standard one piece design. In finished areas,

they shall be chrome plated; in unfinished areas, they shall have prime coat of paint. Hangers extended through finished ceilings shall have chrome-plated washers.

O. Solder and Brazing Metals:

1. Solder metal shall be a composite of 95% tin and 5% antimony or 95.5% tin, 4% copper and 0.5% silver.

P. Fire Stop Sealant:

1. Uninsulated piping penetrations: The annular space shall be completely filled with non-combustible, non-expanding cementitious mortar. Sufficient material shall be used to achieve a fire barrier equal to or greater than that of the separation being protected. The installation shall be in complete accordance with all of the manufacturers directions and recommendations.
2. Insulated piping and multiple pipe penetrations: Provide one layer of "wrap strip"; a non-combustible, flexible, high expansion material; on each insulated pipe. Then, the remaining annular space shall be completely filled with non-expanding cementitious mortar. Sufficient quantities of each material shall be used to achieve a composite fire barrier equal to or greater than that of the separation being protected. The installation shall be in complete accordance with all of the manufacturers directions and recommendations.

## 2.03 FIXTURES

A. Water Closets: Vitreous china, elongated bowl, siphon jet, tank type, white No. 9500NC elongated seat with check hinges. Provide # H-159-LK chrome-plated brass, 3/8" loose key supply.

1. WC-1: #Champion Right Height, 2002.012 (left hand trip lever) or #3225.016 bowl and 4260.800 (right hand trip lever) elongated water saver, 16-1/2" high to rim, 3" non-adjustable, flapper-free flush valve, 12" rough-in, 10 year warranty.

B. Lavatories (with exposed trap and supplies): Provide #155-A grid strainer and 1-1/4" tailpiece., #PW2150 prewrapped heavy cast brass 1 1/4" x 1 1/2" adjustable P-Trap, 17 gauge seamless tubular brass wall bend extension to wall, chrome plated box flange with two stop valve, riser tube and wheel handle insulation covers and H-158-LK chrome-plated brass, 3/8" loose key supplies.

1. L-1: No. 0355.012 "Lucerne" 20" x 18" vitreous china, 3 faucet holes. Faucet shall be Sloan model #EAF-100-P-ISM with optional 10' extension cord, Sensor operated electronic hand washing faucet for tempered water operation, 2.2 gpm aerator. Provide plug-in transformer and ETF-607-A trim plate for 4" centers. Contractor shall set the outlet temperature to 105 degrees and remove the adjustable temperature lever, cap the hole with the provided cap and turn the handle over to the owner.

C. Shower Enclosures: One piece acrylic fiberglass construction with molded-in soap dish, grab bars, drain and white anti-bacterial curtain.

1. SH-1: #C4136BF-FUS 3/4"-R (R = valve on the right, seat on the left) 36" x 36" x 78" high inside dims. 41" x 37" x 84" high over all dims. with a fold up seat and 3/4" threshold dome ceiling and built-in light.

D. Shower Valves:

1. SH-1: #e710000800, e700 Series HydroGuard T/P, thermostatic and pressure balancing, concealed valve, metal lever handle, integral service checkstops, 24" chrome plated slide bar, chrome 90 degree vacuum breaker, 5 foot flexible metal hose with vinyl hand spray, 2.5 gpm maximum flow.

E. Counter Sinks: Sinks shall be all 18-8, Type 304, stainless steel construction; self-rimming counter type; the underside shall be provided with a sound-deadening coating; number of faucet holes to agree with associated faucet. Provide #151-A stainless steel basket strainer with 1-1/2" tailpiece, #8912 chrome-plated brass "P" trap with extension to wall and H2158-LK chrome-plated brass, 1/2" loose key supplies; traps and supplies to be covered with safety insulation may be un-chromed brass.

1. SK-1: #SL-1921-A-GR 18 gauge, single bowl, 19" front to back by 21" left to right overall, 14" x 18" x 7-1/2" deep bowl, one faucet hole. Faucet shall be Sloan model #ETF-700-P-BDT, Sensor operated electronic hand washing faucet for tempered operation, thermostatic mixing valve below the sink, 2.2 gpm laminar flow spray head. Provide model ETF-233, plug-in transformer. Set the faucet to provide 105 degree hot water.
  2. SK-2: #DL-2133-A-GR 18 gauge, double bowl, 21" front to back by 33" left to right overall, 2 - 16" x 14" x 8" deep bowls, 4 faucet holes, 8" centers. Faucet shall be Chicago model #2301-8-CP, single handle, adjustable temperature limit stop, chrome plated, 2.0 gpm aerator, 8" cover plate and hand spray.
- F. Mop Receptor: #MSB-3624, 36" x 24" x 10" molded stone receptor with a stainless steel drain. Chicago model #897-XX faucet with vacuum breaker, ceramic disc cartridges, spout with pail hook, hose thread end and wall brace. Provide check valves in supplies.
- G. Floor Drains: Dura-coated cast iron body with cast iron traps.
1. FD-1: #ZN-415-6S, dura-coated cast iron body, 6" x 6" square, Type "S" strainer and polished nickel bronze top.
  2. FD-2: #ZN-1900-KC, 12" square, acid resistant epoxy coated cast iron body with a nickel-bronze extra heavy duty half grate and internal dome strainer.
- H. Roof Drains:
1. Froet Model 100C4-DEX-4-FR-DC-OFS, 14" diameter roof drain with integrated overflow drain and strainer, Dura-Coated cast iron body with combination membrane flashing clamp/gravel guard, 5" high cast iron dome strainer, deck clamp, finishing ring, 4" ring extension and overflow strainer.
- I. Exterior wall hydrant (in parking areas): #Z-1320-4-10-13 self-draining non-freeze type faucet with integral vacuum breaker, 3/4" hose thread outlet, 3/4" sweat inlet, 90 deg. inlet elbow, wall clamp, loose key operation, polished nickel-bronze finish. Stop and drain valve inside building.
- J. Vacuum Breaker: Where required, provide and install vacuum breakers. Breaker shall be chrome-plated where used with chrome trim and installed in accordance with manufacturer's directions.
- K. Trap Guard: Elastomeric flow through drain insert. Model TG34IP for 4" floor drains and model TG22P for 2" floor drains. Install per manufacturers instructions.
- L. Trim: All trim supplies and all immediately exposed piping at fixtures & equipment shall be chrome-plated on finished brass or on copper except where safety insulation is installed. All faucets shall have removable units and removable seats. All hot and cold water supplies to fixtures and equipment shall be fitted with stops in addition to branch shut-offs.
- 2.04 ELECTRIC WATER HEATER
- A. "Patriot" Model PCE-40-20RTA, 40 gallon storage, 2 - 4500 watt elements (non-simultaneous operation), 208 volt, 1 phase, 28 GPH recovery @ 90°F temperature rise; glass-lined steel tank, 150 psi working pressure; baked enamel foam insulated jacket; magnesium anode. Set to deliver 120 degree hot water.
  - B. Provide all necessary trim for proper installation of heater, including Watts Model No. 36A vacuum relief valve, a Watts temperature and pressure relief valve, and thermometers with a 4-1/2" round face and a range of 30°F to 240°F.
- 2.05 HOT WATER EXPANSION TANK
- A. "Therm-X-Trol" Model ST-5, approved for potable water use, 2 gallon total volume, 0.45 gallon maximum acceptance volume, welded steel shell, polypropylene liner, butyl diaphragm; charged to the same pressure as downstream of the backflow preventer at the water entrance.

## 2.06 CIRCULATOR PUMP

- A. In-line, electric motor-driven, bronze housed and fitted, centrifugal type, 125 psi rated. Provide overload protection and an "on" - "off" switch. Pump shall operate 24 hours a day. Power wiring to the pump shall be provided under other sections of these specifications; control wiring from the aquastat to the pump shall be in accordance with the manufacturers recommendations and provided under this section of the contract.
1. DP-1: Taco Model 007-B, 1/25 HP, 120 volts, single phase, 6 gpm at 9 feet of head minimum capacity.

## 2.07 ELEVATOR SUMP PUMP

- A. Elevator Sump Pump: Model SE50, 0.5 HP, 115Volts, 3600 PRM, stainless steel motor and housing, non-clog cast iron vortex impeller, mechanical seals with secondary lip seals, can pass solids up to 1 ½", built-in thermal protection.
1. Elevator Oil Minder Control System allows water to be pumped from elevator pits without danger of ejecting potentially harmful oily substances into sewers.
  2. All pump and control cables are factory wired into a wall mountable NEMA 4X junction box. Between the junction box and the control panel are multi-pin quick control connectors. This single cable, 8-pin system allows the electrical cable between the junction box and control panel to be run through conduit and interconnected up to 200 feet long. The main control shall be located out of the hoist-way with the pump supplied junction box located in proximity of the pump.

## 2.08 BACKFLOW PREVENTER

- A. Reduced pressure principle, all bronze body with integral unions inlet and outlet, bronze and stainless steel relief valve and check module assemblies, bronze strainer, full port ball valve shut-offs and test connections. Maximum working pressure of 175 PSIG. and a maximum working temperature of 140°F.
1. Entrance: 909QT-S, 1" Size, 20 gpm at 10 psi pressure drop. Provide air gap fitting.

## PART3 EXECUTION

### 3.01 EXAMINATION

- A. Study all drawings and specifications, visit the site and become acquainted with existing conditions and the requirements of the plans and specifications. No claim will be recognized for extra compensation due to failure to become familiarized with the conditions and extent of proposed work.

### 3.02 ERECTION, INSTALLATION AND APPLICATION

- A. Piping shall be run concealed in walls or above ceilings. Where two or more pipes are to be run parallel, they shall be located as close as practical to each other.
1. All water piping shall be run at a minimum pitch of 1" per 50'-0" to drain valves, and all piping shall be run within the heated space of the building.
  2. All vent piping shall be run at a positive pitch to drain back to the drainage connections.
  3. Sanitary drainage piping under 4" size shall be run at 1/4[...]" per foot (two[...] percent) pitch.
  4. Sanitary drainage piping 4" and larger shall be run at 1/8[...]" per foot (one[...] percent) pitch.
  5. Storm drainage piping shall be run at 1/8[...]" per foot (one[...] percent) pitch.
  6. Indirect Waste drainage piping under 4" size shall be run at 1/4[...]" per foot (two[...] percent) pitch.
  7. Indirect Waste drainage piping 4" and larger shall be run at 1/8[...]" per foot (one[...] percent) pitch.

8. Acid Waste drainage piping under 4" size shall be run at 1/4[...] per foot (two[...] percent) pitch.
  9. Acid Waste drainage piping 4" and larger shall be run at 1/8[...] per foot (one[...] percent) pitch.
  10. Compressed Air and [LP] [Natural] Gas shall be run with a positive pitch to accessible drain pockets.
  11. Force main piping shall be run straight, with no dips or sags, having a positive pitch to drain.
- B. All floor drains and floor cleanouts shall be set parallel to and flush with the surrounding floor.
  - C. All fixtures shall be installed level and flush to walls and floors as applicable.
  - D. All fixtures shall be sealed water tight with caulk to all adjacent surfaces. This shall include but not be limited to sealing urinals, shower walls and wall-hung lavatories to walls; water closets, shower bases and tubs to floors and counter sinks and lavatories to counter tops. Caulking shall be of the appropriate type for the given application and shall be installed in accordance with the manufacturers instructions and recommendations.
  - E. All fiberglass tubs and showers shall be supported in a mortar base in strict accordance with the manufacturer's recommendations.
  - F. All Mop Receptors shall be set and leveled in a 1/2" thick mortar base.
  - G. All fixtures and equipment shall be supported in accordance with the manufacturer's recommendations unless otherwise detailed.
  - H. Provide service shut-off valves and unions on all inlets and outlets to all equipment installed under this section.
  - I. All shut-off valves shall be in accessible locations. All valves above ceilings shall be operable within 18" of the ceiling tile plane.
  - J. Provide 3'-0" minimum service space in front of all control panels, access panels, motors and equipment which requires periodic maintenance and/or adjustment.
  - K. The entire plumbing system shall be installed in accordance with the [State of Maine Internal Plumbing Rules] [BOCA Plumbing Code] [Massachusetts Plumbing Code] [International Plumbing Code], and all local Codes.
  - L. The entire gas installation shall comply with NFPA 54 and 58 and all local codes.
  - M. All underground gas piping shall be run in a PVC sleeve which is sealed at its terminal ends and have a 1" vent through roof. Terminate vent 3'-0" above roof with a gooseneck fitting and insect screen.

### 3.03 TESTS

- A. Test and prove tight all piping systems in the building. Invite the local Plumbing Inspector and the Owner's Representative to witness each test a minimum of 2 working days prior to the commencement of the test. Submit to the Architect documentation of each test identifying the system being tested, the starting and finishing day and time of the test, the starting and finishing test pressures, the test liquid or gas used and signed by the party responsible for conducting the test.
  1. Cold water, hot water and hot water return piping shall be tested with potable water to 125 psig.
  2. Rough drainage and venting systems shall be tested with 5 psi air pressure.
  3. Force main piping shall be tested with water to 60 psig.
  4. Gas piping shall be tested with compressed air to 30 psig.
  5. Compressed air piping shall be tested with compressed air to 150 psig.
  6. All tests will be conducted for 2 hours minimum with no pressure drop in the respective systems.



### 3.04 STERILIZATION

- A. After testing, all diaphragms shall be removed from flush valves and all aerators removed from faucets and the faucets opened fully to allow all water piping to be flushed with water until no visibly dirty water appears at the outlets. After flushing all diaphragms and aerators shall be reinstalled.
- B. The piping system shall be completely filled with water containing no less than 50 parts per million (PPM or MG/L) of chlorine. The system shall then be valved off and allowed to stand for no less than 24 hours. An alternative concentration of 200 PPM of chlorine allowed to stand for 2 hours may be used.
- C. At the end of 24 hours (or the alternative time of 2 hours) the entire system shall be flushed with water until no excess chlorine remains in the system.
- D. Notify the Architect a minimum of 2 working days prior to the commencement of the flushing and sterilization procedure. Submit to the Architect documentation of sterilizing procedure identifying the starting and finishing day and time, the type of chlorine concentrate used, the percent of purity of the concentrate, the total volume of concentrate used, the diluted chlorine concentration and signed by the party responsible for sterilizing the system.

### 3.05 CLEANING

- A. At the completion of work all fixtures and equipment shall be cleaned in accordance with the appropriate manufacturer's recommendations. All exposed unchromed piping shall be cleaned of all dirt, grease, oils, etc., suitable to accept a prime coat of paint.

END OF SECTION