

# MECHANICAL AND PLUMBING SPECIFICATION

## 1. Section 15010 - Basic Mechanical Requirements

- A. The work of each of the mechanical sections includes furnishing and installing the material, equipment and systems complete as specified and/or indicated on the drawings. The mechanical installations, when finished, shall be complete and coordinated, ready for satisfactory service of the building.
- B. All work under this contract shall be done in strict accordance with all applicable municipal, state, NFPA, BOCA, International codes and County/City Public Work, that govern each particular trade.
- C. The contractor shall make applications and pay all charges for all necessary permits, licenses and inspections as required under the above codes. Upon completion of the work, the customary certifications of approval shall be furnished.
- D. No materials or equipment shall be used in the work until approved. Before submission of the shop drawings, and not more than fifteen (15) days after award of the contract, the contractor shall submit for approval a complete list of materials and equipment which he intends to furnish, giving manufacturer and catalog numbers.
- E. The contractor shall examine all drawings and specifications and shall inspect the existing conditions of the site. Failure to comply with this requirement will not relieve the contractor of responsibility for complying with the intent of the contract documents.
- F. The drawings indicate the general arrangement of the mechanical installations. Details of proposed departures due to actual field conditions or other causes shall be submitted for approval prior to installation. Reworking of completed items due to improper field coordination shall be at the contractor's expense.
- G. Provide sufficient access and clearance for all items of equipment requiring servicing and maintenance, such as valves, drains, etc.
- H. The contractor shall prepare three (3) copies of a record and information booklet. The booklet shall be bound in a three-ring loose-leaf binder. Provide the following data in the booklet:
  - 1) Catalog data on each piece of equipment furnished.
  - 2) Approved shop drawings on each piece of equipment furnished.
  - 3) Maintenance, operation and lubrication instruction on each piece of equipment furnished.
  - 4) Simplified temperature control diagram.
  - 5) Manufacturer's and contractor's guarantees.
  - 6) Air balancing reports.
  - 7) Commissioning reports.
  - 8) Schedule/description of all service work/maintenance inspections required by paragraphs P, Q and R of this section.
- I. The entire new plumbing system shall be tested hydrostatically before insulation covering is applied and proved tight under the following gauge pressures:
  - Sanitary and vent piping . . . . . As specified below
  - Domestic water . . . . . 100 psig
  - Refrigeration liquid and suction piping . 225 psig/400 psig
- J. All sanitary and vent piping shall be tested by the contractor. The entire new drainage system and venting system shall have all necessary openings plugged and filled with water to the level of ten (10) feet above the main or branch being tested. The system shall hold this water for thirty (30) minutes without showing a drop greater than four (4) inches.
 

Note: If any code or public utility requires testing which is different than the test listed above, the more stringent test shall be performed.
- K. All parts of the heating, ventilating, air conditioning and exhaust systems shall be adjusted, checked, balanced and tested by an A.B.C. certified testing & balancing contractor. The contractor shall put all systems and equipment into full operation and shall test and balance all devices to within ten (10) percent of capacities indicated on the drawings. Submit copies of the balancing reports as required by the contract. Permanently mark the position of each balancing damper and valve.
- L. Upon completion of the mechanical installations, the contractor shall provide a complete set of prints of the mechanical contract drawings which shall be legibly marked in red pencil to show all changes and departures of the installation as compared with the original design. They shall be suitable for use in preparation of record drawings.
- M. All piping systems shall be identified with labels. Materials shall be as manufactured by seton name plate corporation.
- N. All mechanical installations, including all materials and labor shall be guaranteed for a period of one (1) year from date of owner acceptance. The above shall not in any way void or abrogate equipment manufacturer's guarantee or warranty. Certificates of guarantee shall be delivered to the owner.
- O. After roughing in the entire water main with future stubs the entire potable water systems shall be disinfected prior to use. The method to be followed shall be that prescribed by the local health authority/code requirements.
- P. Contractor shall also provide one (1) year free service to keep the equipment in operating condition. This service shall be performed on the following schedule and rendered upon request when notified of any equipment malfunction.
- Q. In addition to the first year warranty period, the contractor shall provide, at no additional cost to the owner, a minimum of four (4) service calls and maintenance inspections. A complete outline of the required maintenance and the proposed schedule shall be included in the "Record and Information Booklet" detailed in section 15010-basic mechanical requirements, paragraph I, for review and acceptance by the owner/representative and engineer. The inspections are to be performed at three (3) month intervals for a total of four (4) service calls and inspections during the first year warranty period (three (3) times during the year plus the original system start-up commissioning).
 

The service work and inspections shall include, but not be limited to the following:

  - Replace all disposable air filters;
  - Lubricate all motor and fan bearings as required;
  - Clean condensate drain lines;
  - Check and tighten all electrical connections;
  - Inspect all belts for adjustment and condition and replace as required;
  - Inspect and clean all water strainers;
  - Check operating pressures and refrigerant charge;
  - Inspect all controls for correct operation and calibrate as required;
  - Perform all maintenance as outlined in the equipment manufacturers operation and maintenance manuals.

Upon completion of each scheduled inspection, the contractor shall deliver to the building owner/owner's representative within forty-eight (48) hours of completion, two (2) copies of the completed inspection report for record purposes.
- R. The mechanical or service contractor shall, at the ninth month, advise the owner of the termination date of the above service. This contractor shall also provide the owner with a detailed proposal, reflecting annual escalation, for the continuation of the service and inspections described above.

## 2. Section 15050 - Basic Mechanical Piping Material & Methods

- A. Provide all labor and materials necessary to furnish and install all piping systems on this project, including sanitary, sanitary vent, domestic water and natural gas piping systems.
- B. Piping and valves shall be as follows:
  - 1) Sanitary drains below grade or under building to points five (5) feet from building line.  
Piping: Schedule 40 PVC DWV pipe.  
Fittings: Solvent weld joints.
  - 2) Sanitary wastes and vent piping above floor inside building.  
Piping: Schedule 40 PVC DWV pipe.  
Fittings: Solvent weld joints.
  - 3) Water service below grade.  
Piping: Awwa class C cast iron pipe, cement lined.  
Fittings: Class D mechanical joints.
  - 4) Domestic hot, cold and recirc. water piping inside building.  
Pipe: All water lines above grade - hard copper type L. All domestic lines below grade - hard copper type K.  
Fittings: Solder type wrought copper - lead free solder.  
Ball valves: Two piece body, 150 lb. chrome plated full port bronze body and stem reinforced the seat rings, Nibco S-585-70.  
Unions: 125 lb. Wrought copper, ground joint solder ends.
  - 5) Refrigerant piping.  
Pipe: Type "L" hard copper refrigerant tube, dehydrated and sealed.  
Fittings: Wrought copper solder type with silfos.
- C. Copper pipe shall be reverse, anaconda, or chose types "T" hard drawn, with approved solder fittings.
- D. Cast iron piping shall be service weight drainage piping and shall conform to the requirements of the C.I.S.P.I. Each length of pipe and each fitting shall be clearly marked with the manufacturer's initials and pipe classifications.
- E. Steel piping shall be similar and equal to national tube company, republic, or Bethlehem black or zinc-coated (galvanized) steel as hereinafter specified. Pipe shall be free from all defects which may affect the durability of the intended use. Each length of pipe shall be stamped with the manufacturer's name.
- F. All hangers for copper piping shall be copper clad, split ring swivel type, having rods with machine threads and threaded copper clad ceiling flange. Cast iron and steel piping supports shall be similar without copper clad and prime paint finish.
- G. Provide dielectric couplings where non-ferrous metal piping is joined to ferrous metal piping. The gasket material shall be capable of withstanding the temperatures and pressures within the piping system in which installed. Submit dielectric coupling and gasket material for approval.

## 3. Section 15250 - Mechanical Insulation

- A. All supply and exhaust air ductwork throughout and all domestic water piping systems shall be insulated with plenum rated fiberglass insulation.
- B. Pipe insulation shall be 1" premoled fiberglass insulation with an all service jacket, Owens Corning fiberglass SSL-II. Fittings shall be insulated and covered with pvc covers.
- C. Ductwork shall be insulated with 1-1/2" flexible duct wrap, Owens Corning fiberglass type 100 with foil faced vapor barrier. Insulation shall be neatly installed. Any insulation damaged during construction shall be properly fixed.

## 4. Section 15400 - Plumbing

- A. The work covered by this section of the specifications consists of furnishing all labor, equipment and materials in connection with the rough-in, final setting and connections to all plumbing fixtures. The contractor shall carefully review the conditions at the site and all of the contract drawings to determine the extent of the plumbing work required.
- B. All plumbing fixtures shall be complete in every detail with all trimmings and connections. All fixtures shall be designed to prevent the backflow of polluted water or waste into the water supply system. All fixtures shall be approved as indicated or equal unless otherwise noted.

**P-1 Treatment, Med. & Patient Prep. "Clean Sink",** Zurn #25364, vitreous china 20"x18" wall hung lavatory, front overflow, 4" a.c., with 4" high back splash. White.  
Zurn model #26913-CP4-F-DC-TM1-1-XL AquaSense battery powered chrome plated faucet with spout module, thermostatic mixing valve, check valves, 4" cover plate and single hole faucet opening.  
Zurn lavatory strainer, #28746-PC open grid, offset tailpiece material of construction cast brass, color finish chrome.  
chrome P-trap, chrome finish wall.  
escutcheon plates, angle stops and flexible tube supply lines. All exposed waste piping and hot and cold water piping shall be insulated with Truebro Handi-Lav-guard model 102 insulation kit with white finish. Carrier Zurn 2-1231 concealed arm carrier.

**P-2 "Dirty" Sink,** Corian model #804, single bowl undermount sink inside bowl dimension 15-11/16"x15-11/16" x 8-3/16" depth. Glacier white.  
Zurn faucets model #2831C4-XL-140-HCT-ICT polished chrome deck mounted 8" widespread faucet with rigid or swing gooseneck spout, provide factory option 8" wrist blade handles, chrome turn ceramic disc cartridges, 2.2 gpm laminar flow outlet. Mounting hardware and 1/2" NPSM coupling nuts for standard lavatory risers.  
Just, J-35, type 304 stainless steel crum cup strainer with removable stainless steel basket strainer.  
Provide PVC waste and trap with chrome finish wall escutcheon.  
McQuire model #2165CC-LK (Zurn or EBC) chrome plated cast brass 1/2"x1/2" compression type - loose key angle valve with 12" flexible supplies and wall flanges.  
McQuire "Trower" (EBC or Truebro) pre-formed insulators with vapor barrier for waste, trap and supplies.

**P-3 Emergency Eye/Face Wash,** Guardian G1814-T, wall mounted bowl type eye/face wash fixture with two gentle spray outlet heads, galvanized steel supply and waste pipes protected with stainless steel bowl, push activated handle with self closing valve. Chrome plated brass tailpiece and trap with 1-1/2" IPS waste connection.

**P-4 Nurse/Med Prep "Clean Sink",** Zurn #25364, vitreous china 20"x18" wall hung lavatory, front overflow, 4" a.c., with 4" high back splash. White.  
Toto model #TEL 155-C20E Eco Power powered chrome plated faucet with spout module, thermostatic mixing valve, check valves, 4" cover plate and single hole faucet opening.  
Zurn lavatory strainer, #28746-PC open grid, offset tailpiece material of construction cast brass, color finish chrome.  
chrome P-trap, chrome finish wall.  
escutcheon plates, angle stops and flexible tube supply lines. All exposed waste piping and hot and cold water piping shall be insulated with Truebro Handi-Lav-guard model 102 insulation kit with white finish. Carrier Zurn 2-1231 concealed arm carrier.

Potable water systems shall be disinfected prior to use. The method to be followed shall be that prescribed by the health authority and code requirements.

## 5. Section 15500 - Heating, Ventilating & Air Conditioning (HVAC)

- A. The work to be performed shall include all labor, materials and equipment necessary to furnish and install complete, all hvac mechanical equipment as shown on drawings and/or hereinafter specified. It is the intent that the systems be installed complete with all items necessary to provide satisfactory service.
- B. All heating, ventilating and air conditioning equipment which contains compressors shall be provided with extended warranties (minimum four (4) years) for the compressors.  
**Ductless Split System cooling only ADD ALTERNATE**
- C. Split System Air Handling Unit shall be indoor mounted, direct expansion, packaged fan coil unit for wall mounted installation. Unit shall consist of a fan, evaporator coil, filter and controls. Unit shall be matched with a factory approved heat pump unit. VRV system with (3) three air handling units and (1) one outdoor heat pump unit.  
Unit shall be Daikin or equal.
- D. Heat Pump Unit shall be outdoor mounted, air to air, split system heat pump unit suitable for roof installation. Unit shall consist of a scroll compressor, an air cooled coil, propeller-type condenser fan, and a control box and shall discharge supply air as shown on contract drawings. The VRV system will have either (2) two and/or (3) three air handling units and (1) one outdoor heat pump unit.  
Unit shall be Daikin or equal.

## 6. Section 15880 - Air Distribution

- A. Furnish all labor and materials necessary to complete the sheet metal work associated with the heating, ventilating, air conditioning and exhaust systems, and other miscellaneous items shown and required.
- B. All ductwork shall be constructed and installed in accordance with the sheet metal and air conditioning contractors national association (smacna) standards, asvrae standards and bcca standards.
- C. Flexible ductwork shall be Hart & Cooley type F218 or approved equal. Flexible duct shall comply with NFPA bulletin 90a and shall be U.L. listed as class 1 air duct and connector, standard 181.
- D. Support horizontal ducts with hangers spaced not more than six (6) feet apart. Use straphangers for ducts up to thirty (30) inches wide, angle hangers or rods for ducts over thirty (30) inches wide. Straphangers to be one (1) inch wide, 20 gauge minimum; fasten to sides and bottom of duct with sheet metal screws.
- E. Ducts shall be straight and smooth on the inside, with joints neatly finished. Ducts shall be suspended from the construction and shall be free from vibration. Curved elbows shall have a center radius equal to one and one-half (1-1/2) times the width of the duct. All square turns shall be vared. Vanes consisting of curved metal blades shall permit the air to make abrupt turns without turbulence.
- F. All joints in the heating, ventilating, air conditioning and exhaust system ductwork shall be sealed.  
Sealant shall be as manufactured by United Inc. or approved equal, sealant shall be smacna and ul approved, with a flame spread of 10 and a smoke developed of 0, non-toxic and non-flammable. Sealant shall be approved for operating temperatures from 0 degrees f. to 200 degrees f.  
Sealant system shall be installed in strict accordance with the manufacturer's recommendations and when applied shall provide a permanent seal without any deterioration.

## 7. Section 15890 - Controls

- 1) Supply air diffusers shall have all steel construction, Titus model TMS with vared face and finished with #26 off-white enamel. Air device to come with factory optional molded insulation blanket.
  - 2) Return air grille shall have all steel construction, Titus model 25R with louvered face and finished with #26 off-white enamel.
- A. The contractor under this heading shall furnish and install all wiring necessary for a complete electric system of automatic temperature control. The system shall include all necessary thermostats, relays, switches, etc. required for successful operation. Electrical work in connection with the temperature control system shall be performed by the control contractor.
  - B. Air Handling HVAC unit shall be controlled by a NEW single wall mounted heating/cooling programmable thermostat with seven (7) day twenty-four (24) hour program clock and dirty filter option as manufactured by Lennox or equal.
  - C. The automatic temperature control contractor shall be responsible for the commissioning of the project to assure a fully functional, fine-tuned hvac system upon occupancy.  
The commissioning of the project shall be performed in accordance with American society of heating, refrigerating and air conditioning engineers, Inc. (ASHRAE) pamphlet 1-1989 guideline for commissioning of hvac systems.  
Commissioning is defined as verification of the proper operation of all equipment, alarms, safeties and control and energy management systems serving mechanical systems installed or modified on this project as defined within the specifications and indicated on the contract drawings.  
Proper operation is defined as the activation of all controls, field or factory installed, to assure the correct sequencing of equipment and systems, including activation of all operating and safety controls, as hereinbefore described.  
The automatic temperature control contractor shall report all system deficiencies to the mechanical contractor. The mechanical contractor shall instruct the proper trade to correct any deficiencies reported by the automatic temperature control contractor so that the project commissioning can be completed.

Prior to the commencement of any commissioning work, the automatic temperature control contractor shall provide the engineer with a commissioning report format for review and approval. The report format shall be delivered to the engineer not more than thirty (30) days after award of the contract or not less than sixty (60) days prior to start of otc work, whichever is earlier.  
Commissioning report format shall include a list of all items to be verified, with the initials of the mechanic who verified the particular item/control and the date on which each item/control operation was verified.  
Three (3) commissioning reports are req'd. The first report shall be completed during the initial commissioning of the project prior to occupancy. The second and third reports shall be completed no more than two (2) months (1 report/month) after occupancy of the building. The final report shall also contain the signature of the owner or owner's representative for each item verified.  
All control wiring installed above the ceiling is to be approved for ceiling/plenum installation.  
After all the work is complete the mechanical contractor to provide instructions/demonstration on to operate the thermostats to the staff.

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PROJECT SUBMITTAL	DATE	DESCRIPTION
1. PERMIT SUBMITTAL	01/15/17	PERMIT SUBMITTAL
2. REVISION - OWNER REQUIREMENTS	01/17/17	REVISION - OWNER REQUIREMENTS
3. REVISION - OWNER REQUIREMENTS	01/17/17	REVISION - OWNER REQUIREMENTS
4. REVISION - OWNER REQUIREMENTS	01/17/17	REVISION - OWNER REQUIREMENTS

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OUTLINE SPECIFICATION

10972

M/P-106.02