

MECHANICAL OUTLINE 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 build out.
- 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. 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, vents, 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 diagrams.
 - 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:
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| Sanitary and vent piping | As specified below |
| Domestic water | 100 psig |
| Natural gas piping | Mercury gauge |
| Fire protection | Per NFPA |
- 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.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 at 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 provided per 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, condensate drain and refrigerant piping systems.

- B. Piping and valves shall be as follows:

- 1) **Sanitary drains below grade.**
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| Pipe | Standard weight cast iron uncoated bell and spigot soil pipe. |
| Fittings | Standard weight cast iron bell and spigot uncoated soil pipe fittings. |
| Joints | Neoprene push-lock fittings. |
- 2) **Sanitary wastes and vent piping above floor inside building:**

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| Pipe | Cast iron no-hub soil pipe |
| Fittings | Cast iron no-hub soil pipe fittings |
| Joints | No-hub stainless steel gasketed fittings |

- 3) **Domestic hot and cold water piping:**

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| 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) **Natural gas piping:**
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| Pipe | Above grade - schedule 40 black steel. Below grade - schedule 80 black steel mill wrapped. |
| Fittings | Long radius welding. |
| Flanges | Class 150 welding neck, nibco convoluted flange #271 or approved equal. |
| Gate valves | 2" & smaller shall be bronze solid wedge, union bonnet, threaded ends, rising stem. Nibco #1-174-a, 2-1/2" & larger shall be iron body, bolted bonnet, osdy, bronze mounted. Nibco #F-687-0. |

- 5) **Fire protection:** Piping and fittings as required by NFPA regulations and as hereinafter specified.
- C. Copper pipe shall be reverse, anacoda, or chase 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 hereinbefore 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 return air ductwork throughout and all domestic piping systems shall be insulated with plenum rated fiberglass insulation.
- B. Pipe insulation shall be 1" premoled fiberglass insulation with an oil service jacket, Owens Corning fiberglass CSI-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 75 with foil faced vapor barrier. Insulation shall be neatly installed. Any insulation damaged during construction shall be properly fixed. Ductwork only for RTU-1 and RTU-2 shall be insulated with 2" flexible duct wrap.

4. Section 15300 - Fire Protection

- A. All work, materials, equipment, and accessories shall comply with the standards of the National Fire Protection Association and all state and local regulations.
- B. The sprinkler contractor shall extend the wet pipe sprinkler system to properly cover/protect the new tenant layout. Final density flow per square foot shall be determined by Fire Marshall.
- C. The installation shall include, but are not limited to valves, flow switches, sprinkler heads and escutcheons, piping, fittings, hangers and signs and other identification markings, as required.
- D. The sprinkler contractor shall carefully examine all documents during the bidding period. He shall familiarize himself with project conditions such as building construction and pipe and ductwork locations and elevations.
- E. Sprinkler heads shall be installed to properly cover and protect the new tenant layout. Sprinkler heads shall be installed to protect the entire structure. Any sprinkler heads installed in finished ceilings shall be brushed chrome semi recessed type.
- F. The contractor shall arrange for approval of the sprinkler systems, and conduct tests in accordance with NFPA 13.

- G. The sprinkler contractor shall provide a detailed shop drawing showing piping layout, head locations, elevations and coordination with all building structure, electrical and plumbing trades. The contractor shall submit detailed sprinkler shop drawings with actual heads for architect approval prior to any fabrication.
- H. The sprinkler contractor must submit one set of sprinkler shop drawings and hydraulic calculations to county fire department/Fire Marshall prior to any fabrication or construction.

5. 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. Fixtures P-1, P-1A AND P-2 shall be American Standard or approved equal as follows:

- P-1 **Water closet (handicapped):** #2377100 Cheet, 16-1/2" high elongated toilet, water saver 1.6 gallon flush with vitreous china construction, pressure-assisted siphon jet flush action, close-coupled tank, ball caps, Church open front white seat with cover, rigid supply with angle stop valve. Provide a toilet with alternate configuration #3109.203 to accommodate P-1A in Patient Toilet room only.
- P-1A **Bedroom Cleaning Assembly:** #7880.191 assembly which includes vacuum breaker, nozzle with hook and loose key supply.
- P-1B **Clinic Service Sink:** American Standard model 9504.010, 18" high, 4.5 gallon flush with vitreous china construction, siphon jet action integral flushing rim, provide a Sloan Royal, model 117-0 flush valve with a 2" offset flush connection. Also install a wall mounted service faucet as manufactured by American Standard #K45.115 with lower brace, exposed yoke, stops, cast brass spout, 15" reach from wall to spout outlet. 3/4" hose thread on spout, integral check valves, adjustable union couplings, stop shanks and 30" flexible hose. Prior to install of the service faucet coordinate with the construction manager the exact mounting location in the field.
- P-1C **Wall Hung Sink (handicapped):** #0355.012 Lucerne, vitreous china construction, front overflow, faucet ledge. Lavatory to be fitted with Moon #6810, 8" wrist blade handles, 2.0 gpm laminar flow, complete with offset grid drain, tailpiece, cast brass "p" trap, tubing to wall escutcheon, key operated supply valves with rigid supplies and chair carrier. 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.
- P-2A **Nurse and Clean Work Sink:** #R-1722 by Elkay, 18 gauge-type 302-self rim bowl. Faucet shall be #Z87184 by Zurn, 12-1/8" high gooseneck spout with 6" wrist blade handles and a 2 gpm laminar flow. Sink to be complete with grid drain, tailpiece, cast brass "p" trap, wall escutcheon and supply valves with chrome supplies. Provide check mounted eye wash by Guardian #G5022 with duct covers, internal flow control and filter to remove impurities (eyewash for the one Nurse Work sink only - refer to note 11 on sheet P-101.00 for water temperature control).

- P-2B **Lounge Sink:** #RECR3321 by Elkay, 20 gauge-type 302-self rim bowl double bowl sink # 14"x15-3/4"x5-5/8" each, overall 33"x22-1/4", 4-hole, faucet #K2318H5 by Elkay with 4" handles, swinging hi-spout and retractable hose/spray and water flow restrictor (2.2 gpm max.). Sink to be complete with grid drain, tailpiece, cast brass "p" trap, tubing to wall escutcheon, key operated supply valves with rigid supplies.
- P-2C **Scrub Sink:** #Z5460 by Zurn, (No substitutes), wall mounted vitreous china surgeon sink, low front rim with large deep basin, single faucet hole, complete with concealed front mounted arm carrier/support brackets. Faucet shall be polished chrome plated sensor activated, solid brass solenoid valve with built in filter solenoid valve with serviceable "Y" strainer filter and 2.2 gpm laminar flow. Metal jacketed wire protection for sensor and solenoid leads. Gooseneck faucet shall have a surgical bend spout, 8" trim plate and plug-in transformer. Faucet will be Sloan, model # FT-700-S-85, (No substitutes). Sink to be complete flat metal grid drain with 1-1/2"x4" tailpiece. Also include P trap, tubing to wall escutcheon and supply valves with chrome supplies.
- P-2D **Solled Work Sink:** #DLR-2222-12 by Elkay, 19"x16"x12" DEEP BOWL, (3-hole), 18 gauge-type 302-self rim bowl. Faucet shall be #Z87184 by Zurn, 12-1/8" high gooseneck spout with 6" wrist blade handles and 2 gpm laminar flow. Sink to be complete with grid drain, tailpiece, cast brass "p" trap, tubing to wall escutcheon, key operated supply valves with rigid supplies.

- P-2E **Prep/Holding Sink:** #R-1722 by Elkay, 18 gauge-type 302-self rim bowl. Faucet shall be #Z87184 by Zurn, 12-1/8" high gooseneck spout with 6" wrist blade handles and a 2 gpm laminar flow. Sink to be complete with grid drain, tailpiece, cast brass "p" trap, wall escutcheon and supply valves with chrome supplies.
- P-2F **Patient Recovery Hand Sink:** Briggs Milton #6820, vitreous china 20"x18" wall hung lavatory, front overflow, 4" ea., faucet Delta 274835. Gooseneck faucet with deck plate, 6" wrist blade handles; 2.2 gpm aerator, 4" cover plate, complete with grid drain, tailpiece, cast brass "p" trap, tubing to wall escutcheon, key operated supply valves with rigid supplies and chair carrier. 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.
- P-3 **Janitor's Sink:** #MSB-2424 by Fiat, 24" X 24" X 10" deep molded stone mop service basin color white. The factory installed drain body shall be stainless steel and designed to provide for a lead couk or QDC-3 joint to a 3" drain pipe. Service faucet Fiat #B30.AA with top brace, stops, 10-1/2" spout, 3/4" hose thread on spout, integral vacuum breaker, adjustable union couplings, stop shanks and 30" flexible hose.

- P-4 **Refrigeration Ice Maker:** Contractor shall provide wall mounted recessed box with shut off valve for connection to refrigerator ice maker by others. Extend 1/4" water line to unit with in-line cartridge filter. Verify exact line size. Box shall be Gately Model S2K with chrome ball valve.
- P-5 **Drinking Fountain (handicapped):** Oasis, model PFACSL, barrier free bi-level, wall-hung unit. Unit shall be constructed of non corrosive series stainless steel with brush satin finish and push pad activation on the front of each fountain. Drinking fountain must be mounted per ADA requirements.

- Elcag Drain Zurn Z-415-B Round cast iron body with flashing collar, 3" rounded nipple bronze adjustable strainer head with secured square hole grate, bottom waste outlet and trap primer connection. Automatic trap primer manufactured by P.P.P or Proset Trap Guard drain. Proset only if code allows.
- C. 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.

6. 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.

C. Rooftop heating and cooling units.

- Rooftop unit shall be factory assembled, piped, internally wired and fully charged with R-410a refrigerant. Cooling and heating capacities shall be rated in accordance with ARI standards.
- All cooling units shall be Underwriters' Laboratory listed. All units shall be designed for outdoor rooftop level installation. Exterior surfaces of all units shall be phenolized, zinc-coated steel with epoxy resin primer and baked enamel finish.
- All casing panels shall be 20 gauge steel, gasketed and insulated with one (1) inch, one (1) pound density foil-faced glass fiber. Insulation shall be on the heat exchanger and evaporation section.
- ** Aeon unit scheduled on sheet M-105.00 will be Aeon unit. No substitutes. Refer to sheet M-105.00 Aeon rooftop unit schedule for factory requirements.

7. 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, ashrae standards and boca 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 vanned. 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.

- Square ductwork air devices:
- 1) Supply air diffusers shall have all steel construction, Titus model TMS with vane face and finished with #26 off-white enamel. Air device to come with factory optional mold-insulation blanket.
 - 2) Return air grille shall have all steel construction, Titus model 25R with louvered face and finished with #26 off-white enamel.
 - 3) Exhaust air grille shall have all steel construction, Titus model 25R with louvered face and finished with #26 off-white enamel.
 - 4) Supply air devices for the Procedure Room shall be laminar flow diffuser panels (LFD) with diffuser dampers. Air device shall be of aluminum construction as manufactured by Price to make up a complete isolation system through controlled air patterns for the Procedure Rooms. Supply air device to come with factory optional insulation blanket on the back side of the air device.
 - 5) Return air grille shall be of stainless steel construction, Price model 700R with louvered face. For Procedure Room only.

- ** The supply and exhaust air devices to be located in the Team Mate Toilet is to be of aluminum construction.
- B. Section 15950 - Controls
- 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. Existing 15 ton Rooftop hvac unit (Trane) shall be controlled by a single motorized/heating/cooling programmable thermostat, as needed, with seven (7) day twenty-four (24) hour program clock control as manufactured by Trane 27 equo.
- * Controls contractor to provide/install a differential pressure sensor in the ductwork before and after the MERV filter rack and interlock at the thermostat to provide a "dirty filter" signal for the existing rooftop unit.
- C. New Rooftop hvac unit (Aeon) wall mounted heating/cooling thermostat. Refer to sheet M-105.00 for more information on Aeon unit controls.
- * Controls contractor to provide/install a differential pressure sensor in the ductwork before and after the filter rack housing the MERV (pre-filter) and the HEPA and interlock with the Magnetic Mount in Storage Room in plain view for the maintenance contractor to see.
- D. 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 atc contract or not less than sixty (60) days prior to start of atc 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.
- E. Refer to drawing, sheet M-105.00, sequence of operations.
- F. All control wiring installed above the ceiling is to be approved for ceiling/plenum installation.

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- 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 atc contract or not less than sixty (60) days prior to start of atc 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.

E. Refer to drawing, sheet M-105.00, sequence of operations.

F. All control wiring installed above the ceiling is to be approved for ceiling/plenum installation.

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