GENERAL SPECIFICATIONS - NOT ALL MAY APPLY

DIVISION 15 - MECHANICAL STANDARDS SECTION 15010 - GENERAL PROVISIONS

- 1.1 These Standards include guidelines and specifications that establish a level of quality, as well as standard industry accepted practices for the design of respective mechanical systems.
- .2 The Standards shall be the basis for the mechanical equipment and material selection, and system design and layout - but only as applicable to this specific building project. Existing building mechanical equipment and systems shall be thoroughly reviewed. Building management and operations personnel shall be contacted to document the existing equipment and system conditions, as well as Owner standard requirements. Equipment and system specifications and guidelines that are not applicable to this project shall be disregarded.
- Fire safe all mechanical penetrations through non-masonry, fire rated walls, floors, and ceilings. Provide pre-fabricated, sleeves when penetrating fire rated, masonry surfaces. **SECTION 15020 - DEMOLITION**
- 1.4 All cutting, demolition, removal, patching, leveling and restoration work necessary to accomplish and complete all work under the Contract to be included in the Division 15 contractor's scope of work. This shall include any relocation or reuse of existing materials, equipment, systems, or other work, as well as the disposition of salvaged materials or debris.
- SECTION 15030 MOTORS Motors shall conform with:
- NEMA standard enclosures, voltages and mounting configurations. B. Construction and installation requirements of National Electrical Code 1.2 Motor electrical characteristics shall be as follows unless constrained by this Project's base
- building services: Smaller than 1/2 HP - 1 phase, 60 hertz.
- B. 1/2 HP and larger 3 phase, 60 hertz. Motors are to be drip-proof design with NEMA service factors of at least 1.15.
- Motors one (1) horsepower and larger shall be NEMA premium efficient type which exceed the Energy Independence and Security Act of 2007, with the following minimum full load efficiencies, and comply with the NEMA MG1-2007:

I.			
P 1	6-pole 1200 RPM	4 pole 1800 RPM	2 pole 3600 RPM
1	82.5	85.5	77.0
1.5	86.5	86.5	84.0
2	87.5	86.5	85.5
3	88.5	89.5	85.5
5	89.5	89.5	86.5
7.5	90.2	91.0	88.5
10	91.7	91.7	89.5
15	91.7	93.0	90.2
20	92.4	93.0	91.0

- Bearings shall be air handling quality, heavy duty grease lubricated ball or roller type. Bearings shall be selected for a Basic Rating Life, (L10) of 40,000 hours at maximum operating speed and horsepower for each construction level.
- .4 Power factor correction capacitors for motors 3 horsepower or larger. Capacitors shall be selected so that they do not overcorrect the power factor beyond 99.99% throughout the range of
- 5 V-belt drives for equipment with motors smaller than 3 horsepower shall be rated for 150% of rated horsepower of the driven equipment with matched pulleys and belts. V-belt drives for equipment with motors 3 horsepower and larger shall be rated for 200%.
- I.6 Belt driven equipment shall include an adjustable motor base for adjusting belt tension. **SECTION 15040 - IDENTIFICATION**
- 1.1 Circular, machine printed, identification labels with 1/2 inch high text shall be provided to denote equipment concealed within a ceiling space. The markers shall be placed on ceiling access panels and on the tee-bars of accessible ceilings to identify the location of the following
- A. VAV Boxes: The VAV box tag nomenclature denoted on the drawings over a gold sticker
- B. Fans: The fan tag nomenclature denoted on the drawings over a gold sticker
- Valves: The letter "V" over a blue sticker.
- D. Life safety dampers: 1. Combination fire / smoke damper: "FS" over a red sticker
- Smoke damper: "S" over a red sticker
- 3. Fire damper: "F" over a red sticker
- .2 Piping labels complying with the most recent version of ANSI Standard A13.1 shall be provided. If a label color scheme exists within this Projects' building it shall be matched in lieu of following the ANSI Standard.
- A. Labels to be equal to Brady Model B-946, self sticking, vinyl, rated for -40°F to 180°F and
- be provided on the following piping systems:
- Chilled water 2. Hydronic heating
- Domestic water
- Storm, Sanitary, and Vent Condenser (Core) water
- Provide piping labels denoting the system type and direction of flow at the following 1.10 Plumbing equipment:
- 1. Straight runs: Every 20 feet 2. Elbows and tees: Adjacent to every elbow and/or tee
- 3. Penetrations: On each side of a wall, floor, and/or ceiling penetration.
- **SECTION 15050 HEATING, VENTILATING AND AIR CONDITIONING**

At the time of installation, or during storage on the construction site and until final startup

1.1 Covering of duct openings and protection of mechanical equipment during construction:

of the heating and cooling equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of dust and debris which may collect in the

SECTION 15200 - MECHANICAL INSULATION

- 1.1 Fire Rating: Inside the building, unless noted otherwise, provide insulation, jacketing, adhesives, mastics, tapes and related materials with a flame-spread index of 25 or less and with a smoke-developed index of 50 or less when tested according to ASTM E 84. Insulation, jacket materials, adhesives, mastics, tapes and cement material containers shall be labeled with appropriate markings of applicable testing and inspecting agency.
- Installation: Install all materials in strict accordance with the manufacturer's recommendations, with applicable building codes, and with MICA standards. Only skilled insulators who are regularly engaged in this type of work may install the products.
- .3 Acceptable manufacturers:
- Fiberglass Duct and Equipment Insulation: Johns Manville, Owens Corning, Knauf, Certainteed, or approved equal
- B. Fiberglass Pipe Insulation: Johns Manville, Owens Corning, Knauf, or approved equal
- Pre-fabricated Insulated Pipe Saddles: Buckaroos, Advanced Thermal Systems, Value Engineered Products, or approved equal
- 1.4 Piping insulation: Equal to Johns Manville Model Micro-Lok HP with factory applied all service jacket. Provide on the following systems with minimum thicknesses described or as required by local jurisdiction; whichever is greater:
- A. Domestic Cold Water: 1 inch thick
- Circulating Hot and Domestic Hot Water (Below 150 °F): 2 inch pipe and smaller: 1 inch thick fiberglass, 2-1/2 inch and larger pipe: 1-1/2 inch thick fiberglass
- Cooling Coil Condensate Drains: 1 inch thick
- D. Chilled Water: All sizes, 1-1/2 inch thick
- E. Condenser or Core Water: 1 inch thick
- Hydronic Heating (Below 200 °F): 1-1/2 inch thick; Option to reduce to 1/2 inch thick on 2 inch and smaller piping within 12 feet of a reheat coil.
- Rainwater: 1 inch thick; All horizontal piping and the first 3 feet after the pipe changes from horizontal to vertical
- Roof Drain Bodies: 1 inch thick elastomeric foam or 2 inch thick fiberglass equipment
- Refrigerant Suction and Hot Gas Piping: 1 inch thick for hard copper; 1 inch thick
- 1.5 Piping valves and fittings: Insulate valves and fittings with the same type of material as the pipe
- insulation. Use one of the following methods:
- 1. Pre-formed fitting insulation with PVC fitting covers.
- 2. Mitered sections of pipe insulation sealed with insulating cement for a smooth and
- 3. Blanket insulation inserts with PVC fitting covers. Insulating cement.
- Pre-fabricated insulated piping saddles: Equal to Buckaroos Model Tru-Balance 2550FS. Provide at all piping hangers on systems requiring external insulation to ensure the vapor barrier is maintained through the hanger. Hangers on insulated piping shall encompass the pipe and its insulation. Insulating over piping hangers is not acceptable.
- A. Vapor barrier: Provide a vapor barrier facing over the entire length of the saddle with self-sealing acrylic adhesive tape.
- Insulation: 2.5 lb/ft3 density phenolic, 9 inches long, up to 3-1/2 inch diameter piping; use 12 inch long systems from 4 inch up to 8 inch piping.
- Shield: 20 gauge, G-90 galvanized steel, 6 inches long up to 6 inches long; use 9 inch long, 18 gauge shields from

- 1.7 External Ductwork Insulation: Equal to Johns Manville Model Micro-Lok XG, 1 pound density with factory applied foil-scrim-kraft facing and 2 inch stapling flange. Provide on the following systems with minimum thicknesses described or as required by local jurisdiction; whichever is greater:
- A. Supply air within return air ceiling plenum: 1-1/2 inch thick Return air not located within a return air ceiling plenum: 1-1/2 inch thick Exhaust air: 2 inch thick within 10 feet of termination to the outdoors 1.8 Internal Ductwork Insulation: Equal to Johns Manville Model Linacoustic RC for square ducts. Johns Manville Model Spiracoustic Plus for round ducts with acrylic surface coating applied to a reinforced glass matt and a factory applied edge coating. Provide on the
- SECTION 15300 WET PIPE SPRINKLER SYSTEMS

following systems:

A. Transfer Air: 1 inch thick

- 1.1 Contractor shall revise existing, overhead wet sprinkler system piping and sprinklers, and add new piping, fittings, sprinklers, and equipment necessary to provide adequate coverage for the revised partition and ceiling layout per NFPA Standard 13, and State, and Local codes. Add and relocate existing sprinklers immediately adjacent to the remodeled areas indicated as required to provide adequate protection. New sprinklers are to match the existing sprinklers in type, finish, temperature, and response.
- accordance with NFPA Standard 13 for the occupancy of that room. 1.3 Pipe, fittings, and materials are to match the existing systems within the Project's building. New and / or relocated sprinkler heads shall be centered in the ceiling tile. In a 'Second Look' style ACT, the new and/ or relocated heads shall be centered in the virtual 2' x 2' tile. Sprinkler system materials shall be U.L. listed for fire protection use and have a minimum

1.2 The sprinkler system design density and sprinkler spacing in each room shall be in

- working pressure of 175 psi. 1.4 Submit shop drawings and hydraulic calculations to the appropriate State and Local Code Authorities, the Owner's insurance underwriter, and the Engineer for review. Submit final, approved shop drawings to the Owner upon completion of the Project.
- 1.5 Perform applicable tests as referenced in NFPA Standard 13 for "The Contractor's Material and Test Certificate for Aboveground Piping". SECTION 15400 - PLUMBING SYSTEMS
- 1.1 Products, installation methods, disinfection requirements, and testing criteria shall comply with the plumbing code dictated by the Project's local jurisdiction. 1.2 All products installed above return air plenum ceilings shall be provided with a flame-spread index of 25 or less and with a smoke-developed index of 50 or less when tested according to ASTM E 84. Products shall be labeled with appropriate markings of
- applicable testing and inspecting agency. 1.3 All products included as part of the potable, domestic water system shall comply with NSF/ANSI 61-G and bear the associated label.
- 1.4 Support all horizontal plumbing piping per ASME B31.3 and MSS SP-69; whichever is more stringent. Use clevis style or trapeze hangers. A. On insulated systems, provide pre-fabricated piping saddles where piping comes in contact with the hanger. Insulating over a hanger, thus compromising the insulation's
- vapor barrier, is prohibited 1.5 Piping, tubing, and fittings for above grade systems: A. Domestic Water and Condensate Drainage: Type "L" hard temper copper tubing with wrought copper fittings, assembled with non-lead bearing solder. Provide soft copper tubing with compression fittings at connections to Owner
- furnished break room equipment (coffee, water cooler, and ice machines) B. Sanitary Waste and Vent, Rainwater: Hubless, CISPI stamped cast iron piping with couplings equal to Clamp-All Hi Torque 80.
- 1.6 Piping, tubing, and fittings for below grade systems: A. Sanitary Waste: Schedule 40 PVC with solvent welded fittings installed per the most
- current edition of ASTM D2321. B. For municipalities that do not allow PVC provide hubless, CISPI stamped cast iron with couplings equal to Clamp-All Hi Torque 80. Apply one heavy coat of a coal tar bituminous material, equal to Bitumastic 50, to stainless steel, aluminum, cadmium plated or galvanized steel bolts, rods, banding and other items constructed of these
- materials that will be buried. 1.7 Plumbing valves: Two piece, lead free ball valves equal to Nibco 685-66-LF. Valves shall be full port and include PTFE seats and 316 stainless steel trim. Cold working pressure rating shall be 600 psi.
- 1.8 Plumbing specialties: A. Backflow preventers: Provide level of protection required by the plumbing code dictated by the Project's local jurisdiction.
- B. Escutcheons: Provide chrome plated escutcheons at all exposed plumbing penetrations including below counter mounted sinks. Seal around the inner and outer circumferences of each escutcheon with silicon based caulk. C. Shock absorbers: Provide where more than three flush valve equipped toilets or
- solenoid valves are installed on domestic cold water piping. Utilize bellows style absorbers equal to Josam 75000 series sized in accordance with the Plumbing Drainage Institute.
- D. Dielectric unions: Steel body with insulating gasket and copper connections. Provide when connecting piping of dissimilar metallic materials. E. Cleanouts: Provide at every change in direction on sanitary waste systems and
- where required by governing codes. Where cleanouts are installed in finished walls and floors provide brass cleanouts with secured round covers equal to Josam F. Grease interceptors: Provide where required by the code of the Project's local
- iurisdiction 1.9 Plumbing fixtures: A. Breakroom sink (P-1): Elkay Lustertone LRAD-2222-55-2, 19 inches long by 16 inches wide, by 5-1/2 inches deep bowl, single compartment, countertop sink. 18 gauge, stainless steel, self-rimming, fully undercoated underside, satin finish, with two faucet holes. Elkay LK-3050 concealed mount, single lever mixing faucet with
- 10 inch high-arc swing spout. Elkay LK-35 drain. Provide Plumberex Pro-Extreme insulation kit on waste and water piping below sink B. Supply box (P-2): Guy Gray Model 88133 recessed, 20 gauge, powder coated, no-lead galvanized steel wall box with 1/4 inch, 1/4 turn ball valve, copper sweat.
- C. Undercounter water filter (P-3): Aqua Pure Model AP717. Provide isolation valves upstream and downstream of filter to allow for convenient filter replacement. A. Water heaters: For Break rooms that do not have a dishwasher, provide an under
- counter, tankless, electric, instantaneous water heater equal to Eemax Model SP80 (277 volt, 1 phase, 29 amps, 8 KW) or SP8208 (208 volt, 1 phase, 40 amps 8.3 KW). If 3 phase power is not available in the Project's building, provide Eemax Model SP75 (240 volt, 1 phase, 32 amps, 7.5 KW). Provide a shut off valve on the cold water upstream of the unit to allow for servicing. Also provide stainless steel braided hose connections from water heater to sink faucet.
- 1. When a dishwasher is used or tankless water heaters are not allowed by the code of the Project's local jurisdiction due to the omission of a temperature and relief valve, provide an above ceiling, or in the base cabinets if not allowed above the ceiling by code, electric water heater equal to A.O. Smith Model DEL-6. Unit shall have a glass lined tank and a single, 2500 watt element. Provide with an ASME labeled temperature and pressure relief valve piped as required by the code of the Project's local jurisdiction. Provide shut off valve on the cold water inlet and hot water outlet piping as well as dielectric unions at the points of connection to the unit. Provide the highest voltage allowed by the Project's electrical service.
- SECTION 15500 GENERAL HVAC SYSTEMS DESIGN CRITERIA 1.11 The following criteria shall be used as a baseline for satisfying the Owner's environmental requirements for providing a comfortable and functional workspace. The Engineer (Contractor on a design build project) shall incorporate any design elements required for a
- specific Project's locale to satisfy these requirements. 1.12 Design standards: summer indoor temperature: 74°f to 76°f
- summer outdoor temperature: ashrae 1 percent mean dry and wet bulb temperature winter indoor temperature: 70°f winter outdoor temperature: ashrae 1 percent mean heating dry bulb temperature ventilation requirements: meet minimum requirements denoted in latest edition of ashrae 62.1. on vav systems, minimum 30% of total airflow settings must achieve minimum ventilation. coordinate with base building air handling systems to determine
- 1.2 Maximum area per HVAC zone:
- 1.3 Rooms requiring a dedicated HVAC zone: A. Individual offices over 180 square feet

minimum outside air volume available.

- Executive or specialty offices denoted on Architectural drawings Conference, meeting, or training rooms 220 SF or larger
- Telecommunication rooms (TR) Refer to Sections 15510 and 15650 for specific requirements
- 1.4 Open office spaces: Minimum of 1 supply air terminal per 300 square feet of office area
- 1.5 Acoustical requirements:
- A. Private offices and conference rooms: Noise Criteria (NC) of less than 25 Open office: Noise Criteria (NC) of less than 30
- Internal duct lining is not allowed on supply and return ductwork. Focus acoustical mitigation practices on suitable locations of noise producing equipment, ductwork
- velocities, and equipment sizing. D. Provide speech baffles on return air grilles for all private offices and conference rooms not isolated with partitions to the deck.

- 1.6 Load calculations:
- A. Perform heat loss and heat gain calculations for each Project using locale and building envelope criteria. Utilize a computerized simulation program equal to Trane Trace 700 or perform hand calculations that can be made available to the Owner upon request. As a minimum, use the following design criteria, based upon this
- Owner's typical space layout: Lighting heat gain: At minimum, use a minimum of 1.5 watts per square foot in the Project's cooling calculation. Coordinate with the Electrical Engineer if
- more lighting heat gain is to be included with a particular Project. General office equipment heat gain: At minimum, use a minimum of 2.0 watts per square foot in the Project's cooling calculation. Coordinate with the Electrical Engineer if more equipment heat gain is to be included with a particular Project.
- SECTION 15510 TELECOMMUNICATION ROOM HVAC SYSTEMS DESIGN
- 1.1 The following criteria shall be stringently followed for the Project's Telecommunication Room (TR).
- temperature range of 72°F to 76°F at 20 to 60 percent relative humidity 24 hours per day, 365 days per year. 1.3 Primary cooling method: Provide a dedicated HVAC zone (VAV, Heat Pump, Etc.)

1.2 The TR shall have dedicated and continuous environmental control to maintain a

- from the base building HVAC system to provide conditioning during normal business hours. Set this zone to maintain a room temperature of 72°F. 1.4 Backup cooling method: Provide a precision cooling system described in Section
- the outdoors. Set the backup system to maintain a room temperature of 76°F which will provide a drift range from the base building system. A. The backup system shall be designed to only operate when:
- 1. The base building air handling systems fails or cannot provide adequate 2. During unoccupied hours when the base building system is off. B. Heat rejection options, listed in order of preference, is as follows:

15650 that reject's the room's heat into a condenser / chilled water loop or to

chilled water system with adequate capacity available. Typically this option is only feasible on buildings connected to district energy systems, buildings with free cooling systems, or buildings in especially warm

2. Integral or remote water cooled units - For buildings with an existing.

continuously operated, condenser water system with available capacity

1. Chilled water units - For buildings with an existing, continuously operated,

- for the TR unit. 3. Air cooled, split system units - For buildings without condenser or chilled water systems. Locate the remote condensing unit on grade or on the roof of the building. When locating on grade, size the unit using the ASHRAE 1 percent mean dry bulb temperature for the minimum ambient condition. When locating on a building's roof, add a minimum of ten degrees to the ASHRAE 1 percent mean dry bulb temperature for the
- minimum ambient condition. 1.5 Telecommunications Rooms cannot be located near or in sources of high heat, humidity, water or steam such as a boiler room, kitchens, wash rooms, janitor closets, storage rooms etc. Water containing pipes, building power distribution, floor drains, or clean outs are prohibited from the interior of the TR.
- 1.6 Building core water piping, chilled water piping, condensate piping, or refrigerant piping shall not be installed within the adjacent wall of the Telecommunications Room. These pipes should also not be located directly above the TR except when needed to support supplemental HVAC units supporting the TR.
- SECTION 15600 HYDRONIC SYSTEMS 1.1 Products, installation methods, and testing criteria shall comply with the mechanical code dictated by the Project's local jurisdiction. At minimum, following the latest edition of the
- International Mechanical Code. 1.2 All products installed above return air plenum ceilings shall be provided with a flame-spread index of 25 or less and with a smoke-developed index of 50 or less when tested according to ASTM E 84. Products shall be labeled with appropriate markings of
- applicable testing and inspecting agency. 1.3 Support all horizontal plumbing piping per ASME B31.3 and MSS SP-69; whichever is more stringent. Use clevis style or trapeze hangers. A. On insulated systems, provide pre-fabricated piping saddles where piping comes in contact with the hanger. Insulating over a hanger, thus compromising the
- insulation's vapor barrier, is prohibited. 1.4 Piping, tubing, and fittings: A. Hydronic heating, chilled water, and condenser water: 3 inch and smaller. type "L" hard temper copper tubing with wrought copper fittings, assembled with solder equal
- to Thermacote Welco 5. Hydronic isolation valves: Two piece, bronze bodied, ball valves equal to Milwaukee BA-400 (threaded) or BA-450 (soldered). Valves shall be full port and include RPTFE seats with a chrome plated brass ball and a brass stem. Cold working pressure rating shall be 600 psi. Provide a vinyl covered lever handle and stem extensions for
- insulated services 1. Provide isolation valves at all connections to existing piping and where required to isolate individual hydronic equipment from the remainder of the system. 1.1 Hydronic specialties:
- A. Manual air vents: Provide 1/4 inch ball valves at all high points in the hydronic system and at the return connection on reheat coils. Provide soft copper extensions where air vents are inaccessible Combination balancing valve/flow measuring stations: Provide at all connections to

1. Coil return: Provide a combination balancing valve with union, drain port, and

- a venturi style measuring station with metering ports. Equal to HCI Terminator Model B. Match metering port style to base building standard. Coil supply: Provide a combination isolation valve with union, PT port, and 20
- mesh strainer. Equal to HCI Terminator Model Y. Match metering port style to base building standard. Control valves: Typically installed by the mechanical contractor, furnished by the building's temperature control contractor. Match existing style (i.e. two way, three way, BACnet, LonWorks, etc) of the existing building. Locate control valves on the upstream side of the coil return combination isolation valve to allow for servicing.
- **SECTION 15610 GENERAL HVAC AIR SYSTEMS** 1.1 Products, installation methods, and testing criteria shall comply with the mechanical code dictated by the Project's local jurisdiction. At minimum, following the latest edition of the International Mechanical Code.
- 1.2 All products installed above return air plenum ceilings shall be provided with a flame-spread index of 25 or less and with a smoke-developed index of 50 or less when tested according to ASTM E 84. Products shall be labeled with appropriate markings of applicable testing and inspecting agency. 1.3 Rigid ductwork: Lock-forming quality G90 galvanized ductwork of appropriate gauge sheet

metal denoted in the most current edition of SMACNA "HVAC Duct Construction

- Standards Metal and Flexible" for each duct's designed pressure rating. A. Seal all rigid ductwork as follows: Seal Class "A": Above 2 inches of water column
- Seal Class "B": Between 1 and 2 inches of water column Seal Class "C": Less than 1 inch of water column B. Ductwork shall be supported in accordance with standards published by SMACNA
- using specified ductwork material straps or aircraft cable style hangers equal to the Ductmate Clutcher. 1.4 Rigid ductwork fittings: A. Elbows: Use radiused elbows unless an unworkable space constraint exist. Mitered
- elbows, where used when radiused elbows are not feasible, shall include turning Takeoffs: Shoe style takeoffs with a 45 degree taper only. Provide a volume damper, either independent or integral to the takeoff at all diffuser runouts.

Fire dampers: Dynamic only, equal to Greenheck Model DSD.

- 1.5 Rigid ductwork accessories: A. Duct access panels: Provide double wall, internally insulated access panels with latches equal to Ventlok Series 100 at all serviceable components internal to the
- Smoke dampers: Multi-blade only, equal to Greenheck Model SMD with actuators, either electric or pneumatic, matching the existing building's standards. Combination fire/smoke dampers: Equal to Greenheck Model FSD with components matching the included specifications for individual smoke and fire dampers. Volume dampers: Constructed per SMACNA Standards with a locking control arm.

Provide at all diffuser runouts and where required to balance the system.

system utilizing plenum rated RJ-11 cable, a terminal gang box, and a battery powered, handheld controller. Aircraft cable style remote regulators are Duct smoke detectors: Typically provided by the Electrical/Engineer Contractor. If they are to be provided as part of the mechanical scope of work, provide ionization

type duct smoke detectors compatible with the base building's fire alarm system.

Where volume dampers are to be located above an inaccessible ceiling,

provide remote regulators equal to United Enertech Model i-3 Power/Balance

- 1.6 Flexible ductwork: Equal to Thermaflex Model M-KE with an inner duct supported with a coated steel wire helix and a fiberglass scrim reinforced alumunized polyester film vapor barrier wrapped over a minimum of R4.2 fiberglass insulation.
- A. Flexible ductwork shall only be used to connect duct runouts to air terminals (grilles, registers, and diffusers). It is prohibited in lengths over 5 feet or as a substitution for rigid ductwork at connections to VAV boxes.
- 1.7 Grilles, Registers, and Diffusers (GRD's): Provide GRD's to match base building standards where they exist. If base building GRD standards do not exist, provide diffusers
- equal to the following:
- A. Type "A" Titus TMSA, supply, lay-in ceiling, 24x24, steel, white
- B. Type "B" Titus 50F, return, lay-in ceiling, with internally insulated sound elbows
- attached to the grille Type "C" - Titus ML39, supply, 48 inch long, linear Type "D" - Titus MLR39, return, 48" inch long, linear
- Type "E" Titus 300RL, supply, surface mounted in gypsum board ceilings only F. Type "F" - Titus 350RL, return/exhaust, surface mounted in gypsum board ceilings
- 1.8 Pinch down VAV boxes: Equal to Titus Model ESV. Boxes shall be pressure independent, with an averaging type velocity sensing device and 1-1/2 pound, fiber free, elastomeric foam lining. Minimum and maximum air flows shall be factory set, but allow for field adjustment. Temperature control contractor shall ship VAV controllers to terminal unit manufacturer for factory mounting.
- A. Where used as the heating source for the zone, provide either hydronic water coils or SCR electric heating coils (variable staging) on the discharge of the box. Provide access panels in the bottom of the box for coil cleaning access. 1.9 Fan Powered VAV boxes (Series): Equal to Titus Model TQS. Boxes shall be pressure independent with an averaging type velocity sensing device and 1-1/2 pound, fiber free,
- elastomeric foam lining. Minimum and maximum air flows shall be factory set, but allow for field adjustment. Temperature control contractor shall ship VAV controllers to terminal unit manufacturer for factory mounting. Fan shall include an ECM motor with SCR fan speed A. Where used as the heating source for the zone, provide either hydronic water coils
- or SCR electric heating coils (variable staging) on the induced air inlet. 1.10 Fan Powered VAV boxes (Parallel): Equal to Titus Model TQP. Boxes shall be pressure independent, with averaging type velocity sensing device. Minimum and maximum air flows shall be factory set, but allow for field adjustment. Temperature control contractor
- shall ship VAV controllers to terminal unit manufacturer for factory mounting. Fan shall include a SCR fan speed controller for balancing. A. Where used as the heating source for the zone, provide either hydronic water coils
- or SCR electric heating coils (variable staging) on the induced air inlet. 1.11 Water to water heat pumps: Equal to McQuay Model WCCH utilizing R-410A refrigerant. Provide with an optional ECM motor and fiber free internal lining. SECTION 15650 - TELECOMMUNICATION ROOM BACKUP COOLING SYSTEMS
- 1.1 Backup cooling unit to be a Stulz, no exceptions. 1.2 Evaporator section: A. Basic unit to be a wall mounted packaged precision conditioner for spot-cooling. Configuration to be upflow supply, floor return.
- B. Service access to be through the front of the unit. C. The air distribution system shall be constructed with a quiet, direct-drive fan assembly equipped with multiple double-inlet blowers, self-aligning sleeve bearings, and lifetime lubrication. Fan motor shall be permanent-split capacitor, high efficiency type, equipped with two speeds for air flow modulation. Dehumidification shall utilize the lower fan speed. D. Electrical components, including contactors, relays, control transformers and capacitors shall be prewired. Terminal blocks shall be provided for both control and power connections. A factory installed non-fused disconnect shall be provided with
- E. The refrigeration system shall consist of either a hermetic or scroll] compressor with vibration isolating springs, a high pressure safety switch, liquid line filter/drier, and a compressor crankcase heater. Refrigeration components shall be located in a remote or close-coupled condensing unit. F. Controls: The microprocessor based integral control system shall be factory assembled, wired into the system cabinet and tested prior to shipment. Controls shall be easily accessible from the front of the system. The controls shall include an LCD
- custom display providing a continuous display of operating status and alarm condition. An 8 key membrane keypad for setpoint/program control, unit on/off, and fan speed shall be located below the display. 1. Additional 3rd party controls: Security vendor will provide a remote temperature monitoring device to allow for remote monitoring at Ameriprise's central control

G. Electric Reheat: An electric reheat element shall maintain dry bulb temperature

- conditions during dehumidification, complete with temperature control and safet devices as required H. Filters: Air filters shall be the cleanable foam type. They shall be easily removable from the front of the system by means of quarter-turn fasteners and shall not require system shutdown for service. I. Humidifier: Humidifiers shall be provided in locales with yearly humidity levels below Ameriprise standards as designated in Section 15510. Where required, provide an electronically controlled, steam-generating humidifier factory piped, mounted and wired to the integral control system. The steam generator shall provide dry steam to
- shall include: High and low humidity setpoints, automatic water feed and drain valves. Capacity shall be denoted on the mechanical drawings. Condensate Pump: Provide condensate pump to dispose of condensate from cooling coil, where gravity drainage is not possible. 1. Route discharge through copper piping to a drain location allowed by the
- Project's plumbing code. Plastic tubing is not acceptable for condensate K. Heat Rejection options listed in order of Owner's preference: 1. Chilled water: Provide a three row cooling coil with copper tubes, aluminum

fins, and a galvanized steel drain pan integral to the evaporator section.

the bypass air around the evaporator coil. Controls for the humidification system

- a. If this option is chosen, the Engineer (Contractor on a design build project) shall provide the Owner with a letter describing the operation of the Building's chilled water system describing its continuous, year round operation prior to issuing construction documents.
- 2. Water cooled, integral: The water/glycol cooled condensing unit shall include the compressor and the water/glycol cooled condenser. An adjustable water regulating valve shall be included. All components shall be factory assembled, charged with R-410A refrigerant and sealed 3. Water cooled, remote: The water/glycol cooled condensing unit shall include the compressor and the water/glycol cooled condenser, and shall be remote from the evaporator module. An adjustable water regulating valve shall be
- refrigerant, sealed and be capable of being connected to the evaporator section using pre-charged refrigerant line sets. a. Locating the remote condensing unit above the Telecomm Room is

defined in these standards such as the break room.

included. All components shall be factory assembled, charged with R-410A

4. Air cooled, outdoor: The condenser coil shall be constructed of copper tubes and aluminum fins with a direct drive propeller fan and scroll compressor. All components shall be factory assembled, charged with R-410A refrigerant and sealed. Connect the evaporator section to the outdoor section using pre-charged, quick connect line sets. If distance between the sections exceeds the maximum length offered, connect using brazed type L hard copper, cleaned and capped for refrigerant duty. Condensing unit shall be capable of operation to -30°F. A hot gas bypass circuit shall be provided to ensure operation under

prohibited. Locate in an adjacent room where noise criteria are not

EXISTING TEMPERATURE CONTROLS SYSTEMS

SECTION 15800 - TESTING, ADJUSTING AND BALANCING (TAB)

outside the scope of work to one of the following standards:

Pneumatic controls by Johnson Controls Inc.

- SECTION 15700 TEMPERATURE CONTROLS 1.1 New temperature controls shall match Landlord's temperature control system. Engineer and Contractor shall verify control requirements with Landlord prior to issuing construction
- documents or bidding the project. 1.2 Sequence of controls: In general, match the control functionality of existing equipment (VAV boxes, heat pumps, etc) 1.3 Temperature sensors: Provide wall mounted temperature sensors/thermostats with locally adjustable temperature control where allowed by the Landlord.

1.1 The TAB Contractor performing the work on this Project must be an independent

- company from the Mechanical Contractor. TAB contractors must be certified by AABC, NEEB, or TABB. 1.2 Balance all air and water systems included in this Project's scope of work including the entire AMPF suite's existing air handling units or VAV boxes partially serving areas
- A. AABC National standards for total systems balance. B. NEBB - Procedural standards for TAB of environmental systems. C. TABB - HVAC Testing, Adjusting, and Balancing International Standards.

SECTION 15900 - MECHANICAL DETAILS

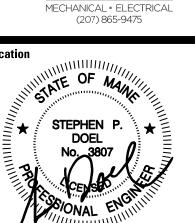
Project. A CAD drawing of the details will be provided to the Engineer (Contractor on design build projects) for inclusion in the construction documents. Modify details as required to comply with the building codes dictated by the Project's local jurisdiction.

1.1 Include the following mechanical details as part of the construction documents for the

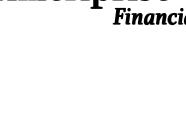


RSP Architects, Ltd 1220 Marshall Street NE 612.677.7499 fax Minneapolis MN 55413-1036 www.rsparch.com PROJECT CONTACT: 612-677-7245 Bob Pick, Job Captain

ENGINEERING



Signing Date



AMPF Project #

176210080281

AMPF Cost Center #

AMPF Project Name

PORTLAND

TENANT

AMERIPRISE FINANCIAL 2 PORTLAND SQUARE 7TH FLOOR SUITE # 701

PORTLAND, ME 04101

Project No. 17621008028 Drawn By Checked By SPD 9/16/16 NOTICE: The designs shown and described herein including all technical drawings, graphics, and models

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Revisions

|No.| Date |

9/16/16 PERMIT BID SET

MECHANICAL **SPECIFICATIONS**