6. Length of installed flexible duct shall not exceed 6'-0" in developed length.

E. Flexible Connections

1. Flexible connections shall be provided where a fan connects to a duct or casings to prevent transmission of vibration to ductwork.
2. Flexible connections shall fit tightly around ducts and fans and be securely bolted or clamped in place. Taping shall not be allowed.
3. Flexible duct connections shall be 6" long and made of straight, waterproof, flame retardant fabric having a flame spread rating of not over 25 and a smoke development rating of not over 50

F. Locker Room Exhaust Ducts: Exhaust ductwork downstream of Exhaust Grilles serving locker rooms shall be constructed of Aluminum ASTM B209; aluminum sheet, alloy 3003-H14. Aluminum Connectors and Bar Stock: Alloy 6061- T6 or of equivalent strength. Provide dielectric connections between ductwork of dissimilar metals. All joints and seams shall be sealed watertight with waterproof silicone duct sealant.

G. Existing Ductwork: Any existing ductwork within the area of work or connected to systems within the area of work shall be professionally cleaned by a experienced certified duct cleaning company. Contractor shall submit before/after photographs of each duct system cleaned.

H. Fire Dampers:

1. Provide fire dampers throughout air distribution system as required by applicable codes, standards and authorities. Provide access door for each fire damper of sufficient size to repair internal link. Fire dampers indicated on drawings may not fully represent the exact number required for this project. It is the Contractor's responsibility, at no additional cost to the Owner, to provide all required dampers.
2. Dampers shall be approved fusible-link self-closing spring loaded type, Buckley Model 150B or equal.
3. Dampers shall be dynamic type when serving a system that is not shut down during fire alarm activation.
4. Frame shall be fitted with angle iron stop and stainless steel spring latch, and shall be securely fastened to building construction.
5. Seal spaces between damper frames and walls and between damper frames and floor with approved fire-retardant material.
6. Use of dampers shall NOT reduce net free area of duct below that shown on drawings. Fire dampers shall be Type B with blades of dampers out of air stream.
7. Samples of fire dampers shall be submitted to and approved by local authorities having jurisdiction.
8. Dampers shall bear 1-1/2 hour UL-rating fire damper label and shall be constructed and installed as required by UL-555.
9. Fire dampers shall be Buckley, Ruskin, Nailor Industries or Prefco for use in the proper duct pressure classification.
10. Dampers shall be installed per SMACNA with breakaway connections and nose pieces on duct liner (see SMACNA HVAC Duct Construction Standards).
11. All dampers in ductwork served by equipment not subject to fan shut down upon fire alarm activation shall be dynamic type.

I. Ceiling Radiation Dampers and Fire-Rated Blankets:

1. For fire-rated ceiling assemblies, provide at all ceiling diffusers, registers and grilles: Radiation dampers and Fire Blanket or fire assembly: radiation damper and blanket already assembled.

J. Volume Dampers:

1. Provide Young Regulator manual adjustable rectangular opposed blade dampers for duct heights less than 12" with factory-installed locking hand quadrants extended 2" for all dampers installed in externally insulated duct:
   a) On each supply, return and general duct take-off.
   b) At each take-off to register, grille or diffuser (not all are shown on drawing).
2. Dampers are manufactured approximately 5/16" smaller in width and 1/8" smaller in height than size of duct in which they are installed; e.g., nominal damper size is 24" x 10"; actual size is approximately 23-11/16" x 9-7/8".
3. Damper frame shall be constructed of #6063 extruded aluminum reinforced channel with minimum thickness of .050". Opposed damper blades shall be #6063 extruded aluminum with minimum thickness of .050" and shall include reinforcing ribs. Each blade shall be supported in the damper frame by individual Teflon axle bearings, and shall be driven by stainless steel connecting slide linkage controlled by 3/8" square steel control shaft.
4. Note: All required volume dampers may not be indicated on drawings but dampers shall be provided as necessary for systems balancing.
5. Dampers 12" and larger in height shall be opposed multi-blade equal to Greenheck, Nailor or Vent Products.
6. Where dampers are inaccessible, use Young Rectangular locking type ceiling regulators and miter gear or worm gear for all horizontal dampers. Bearing coupling for bottom duct control may be used for shaft on vertical blade dampers. The 3/8" rod between ceiling regulator and damper shall be provided by Contractor.
7. Where dampers are to be located above hard ceilings Young Regulator Bowden Cable Control Dampers shall be utilized. Controllers (actuators) shall be of the concealed ceiling type. Controller type, finish & locations to be approved by architect prior to purchase & installation. The cable between the damper and controller shall be provided by the contractor.
8. Damper blades shall be two gauges heavier than adjoining ductwork, and shall be riveted to supporting rods. Hem over edges parallel to rods.
9. Brackets shall be galvanized metal, secured to ductwork with sheetmetal screw with locking quadrant arms (see seal class section for additional requirements). Provide 2" handle extension for all dampers on externally insulated ductwork.
10. Note: All required volume dampers may not be indicated on Drawings but dampers shall be provided as necessary for system balancing.

2.8 DUCT INSULATION

A. Compliance: Insulation thickness, conductivity and installation shall comply with local Mechanical and Energy Codes.

B. Concealed supply & return ducts for heating, cooling and air intakes:

1. Insulation: ASTM C553; flexible, foil faced, noncombustible blanket.
   a) Interior Concealed/Tempered: R-Value of 8.0 installed.
   b) Interior Ventilated/Untempered: R-Value of 12.0 installed
2. Vapor Barrier Jacket:
   a) Kraft paper with glass fiber yarn and bonded to aluminized film.
      (i) Moisture vapor transmission: ASTM E96; 0.02 perms.
      (ii) Secure with pressure sensitive tape.
3. Vapor Barrier Tape:
   a) Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.

C. Exhaust Ductwork:

1. Interior Concealed/Tempered:
   a) Direct Exhaust: No Insulation Required.
   b) Upstream of an ERV: Refer to Concealed supply & return ducts for heating, cooling and air intakes; Interior Concealed/Tempered:
2. Interior Ventilated/Untempered: Refer to concealed supply & return ducts for heating, cooling and air intakes; Interior Ventilated/Untempered.

D. Exterior Ductwork (All Types)

1. Material: Insulate with R-Value of 12.0 installed.
2. Jacket: Insulation jacket may be integral or field applied and shall be reflective, watertight and listed for this usage.
3. Install per latest installation instructions from the manufacturer.

E. Fire Wrap

1. Provide fire wrap after ductwork penetrates a fire barrier/partition or where proper clearance to combustibles (as required by NFPA 96 and local codes and ordinances) cannot be achieved.
2. Acceptable Manufacturer: Thermal Ceramics; 2102 Old Savannah Rd., Augusta, GA 30906. ASD. Toll Free Tel: (800) KAOWOOL. Tel: (706) 796-4200. Fax: (706) 796-4398. Email: firemaster@thermalceramics.com. Web: http://www.thermalceramics.com.

F. All duct insulation & wrap shall be installed per the manufacturer's application instructions. Provide mechanical fasteners to the bottom of ducts as required by the manufacturer.

2.9 INTERIOR DUCT LINER

A. Polymer Foam insulation (EPFI) equal to IMCOA "IMCOSHEET" Engineered Polymer Foam Insulation, 1 inch thick, R = 4.0, closed cell. Insulation shall be installed as required by the insulation manufacturer. Insulation shall be in compliance with NFPA 90 and 90B. Flame spread shall be less than 25 and smoke density less than 50 per ASTM E-84, NFPA 255, UL 723 Class I and UL 181.

B. Duct lining shall be applied in the following locations:

1. 5' upstream and downstream from all air handling unit of 10 tons or less.

C. Areas provided with interior duct lining shall also be provided with exterior duct insulation as indicated by these specifications.

2.10 PIPING

A. Equipment Drains and Overflows

1. Copper Tubing: ASTM B88, Type L, hard drawn.
   a) Fittings: ASME B16.18, cast brass, or ASME B16.22 solder wrought copper.
   b) Joints: Solder, lead free, 95-5 tin-antimony, or tin and silver, with melting range 430 to 535 degrees F (220 to 280 degrees C) or Victaulic grooved joints.
2. PVC Pipe: ASTM D1785, Schedule 40 and Schedule 80 for sizes 8 inch (200 mm) and larger or ASTM D2241, SDR 21 or 26.
   a) Fittings: ASTM D2466 or D2467, PVC.
   b) Joints: ASTM D2855, solvent weld.

B. Unions, Flanges and Couplings

1. Provide di-electric fittings waterways wherever copper pipe meets steel pipe or other dissimilar metals.

C. Refrigerant Piping Copper Tubing: ASTM B280, Type ACR hard drawn.

1. Fittings: ASME B16.22 wrought copper.
2. Joints: Braze, AWS A5.8 BCuP silver/phosphorus/copper alloy with melting range 1190 to 1480 degrees F.
3. Provide all valves and accessories required for complete installation.

D. Plenum Return Applications

1. Where piping is installed in a return air plenum piping shall be plenum rated.
2. PVC and/or PEX piping shall not be allowed in return air plenums.

2.11 PIPING INSULATION

A. Insulation

1. Hydronic Piping: Preformed glass fiber meeting ASTM C547, "k" value of 0.24 @ 75°F with all service jacket (ASJ). Service temperature 0°F to +850°F, 25/50.
2. Refrigerant Piping: Flexible closed cell insulation.
3. Plenum Return Applications: All insulation, jackets and accessories shall be rated for use in return air plenums.

B. Compliance: Insulation thickness, conductivity and installation shall comply with local Mechanical and Energy Codes.

C. Minimum Pipe Insulation:

1. Cold Condensate/Refrigerant: 1-1/2" Thick, ≤ 1-1/2" Nominal Pipe Diameter
2. Cold Condensate/Refrigerant: 1-1/2" Thick, > 1-1/2" Nominal Pipe Diameter

D. Condensate Piping

1. All condensate piping, regardless of temperature, shall be provided with insulation.
2. Condensate generated by cooling coils shall be considered Low Temperature Fluid.

E. Fittings: Factory precut insulation inserts, thickness to be same as adjacent. Enclose in premolded, PVC fitting covers.

1. Low Temperature Applications: Fittings and valves shall be wrapped continuously with wicking material prior to installing insulation to ensure a continuous path for removal of condensation.

F. Jackets:

1. Interior: Factory applied, all service jacket of white Kraft bonded to aluminum foil reinforced with fiberglass yarn and suitable for painting. Longitudinal and butt joints shall be made with factory applied pressure sensitive material.
2. Exterior/Exposed (Low Temperature): Field applied, 20 mil, PVC sheet material.
3. Exterior/Exposed (High Temperature): Field applied, Aluminum sheet material.
4. All jackets exposed to the weather shall be reflective, UV resistant and sealed watertight.

G. Preparation

1. Install materials after piping has been tested and approved.

H. Installation

1. Install materials in strict accordance with manufacturer's instructions.
2. Continue all insulation through penetrations.
3. In piping exposed to view, locate insulation and cover seams in least visible locations.
4. On piping that requires condensation control, (i.e. chilled or cold) insulate fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints.
5. On piping not requiring condensation control (i.e. steam, condensate hot water) do not insulate flanges and unions at equipment, but bevel and seal ends of insulation at such locations.
6. Provide pipe insulation with weatherproof jacket on exterior piping that has heat trace.

I. Supports:

1. All piping shall be supported in such a manner that the insulation is not compromised by the hanger or the effects of the hanger. In all cases, hanger spacing shall be such that the circumferential joint may be made outside the hanger. Cover the evaporating holes with contractor supplied VaporWick Sealing Tape for the length of the metal saddle.
2. Piping systems 3" (75 mm) in diameter or less, insulated with fiberglass pipe insulation, may be supported by placing saddles of the proper length and spacing under the insulation as designated in Owens Corning Pub. 1-IN-14210.
3. For hot or cold piping systems larger than 3" (75 mm) in diameter, operating at temperatures less than +200F (93C) and insulated with fiberglass, inserts such as foam or high-density fiberglass with sufficient compressive strength shall be used to support the weight of the piping system.
4. On vertical runs, insulation support rings shall be used.

J. Accessories:

1. Insulation Bands: ¾ inch wide; 0.015 stainless steel
2. Metal Jacket Bands: ½ inch wide; 0.015 thick aluminum.
3. Insulating Cement: ANSI/ASTM C195; hydraulic setting mineral wool.
4. Finishing Cement: ASTM C449.
5. Fibrous Glass Cloth: Untreated; 8oz/sq. yd. Weight.
6. Adhesives: Compatible with insulation.
7. Wick material for wrapping valves and fittings
8. Closure Materials -Sealing Tape, and mastics.
9. Support Materials - Hanger straps, hanger rods, saddles, support high-density blocks, and support rings.
10. All accessory materials shall be installed in accordance with project drawings and specifications, manufacturer's instructions, and/or in conformance with the current edition of "Commercial & Industrial Insulation Standards."

2.12 FIRESTOPPING

A. Provide Firestopping systems for penetrations in fire-resistance-rated assemblies, including both membrane and through penetrations. This contractor shall thoroughly review architectural plans for assembly type and location and shall prepare bid accordingly.

B. Materials and systems shall be designed to meet the requirements of the intended application and shall be installed per manufacturer's guidelines.

C. Submittals: Provide for review Manufacturer's product literature and tested assembly for each type of fire protection material including product characteristics, typical uses, installation procedures, performance and limitation criteria.

2.13 DRIP PANS & LEAK DETECTION

A. Drip pans shall be provided where indicated on plans and under all new and existing piping within critical spaces.

B. Drip pans shall be constructed of continuously welded sheet metal. Each section shall be provided with a wire type leak detection sensor compatible with fluids present in piping. Leak detection alarms shall be tied back to Building Management System.

C. Provide new leak detection sensors in all existing drip pans. Tie alarms back to Building Management System.

2.14 SECONDARY DRAIN PANS

A. A secondary drain pan shall be provided under each piece of concealed (above ceilings, in closets, etc.) HVAC equipped which produces condensate.

B. The pan shall have a minimum depth of 1.5" and shall not be less than 3" larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion resistant material. Metallic pans shall have a minimum thickness of not less than 0.0276-inch galvanized sheet metal and non-metallic pans shall have a minimum thickness of not less than 0.0625 inch.

C. The secondary drain pan with a separate drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.

D. A secondary drain pan without a separate drain shall be equipped with water level detection device that will shut off the equipment served prior to overflow of the pan

PART 3: EXECUTION

3.1 OPERATING INSTRUCTIONS

A. Instruction to the Owner's Personnel - After completion of all work and all tests and at such times as designated by the Architect, provide the necessary skilled personnel to operate the entire installation until receipt of owners acceptance.

B. During the operating period, instruct the Owner's representative in the complete operation, adjustment, and maintenance of the entire installation.

C. Give at least forty-eight (48) hours advance notice to the Owner to coordinate scheduling of this instructional period.

D. Furnish to the Architect five (5) complete bound sets of typewritten or blueprinted instruction manuals for operating and maintaining all systems and equipment included in the contract. All instruction manuals shall be submitted in draft, for approval, prior to final issue. Manufacturer's advertising literature or catalogs will not be acceptable for operating and maintenance instructions.

E. The above-mentioned instructions shall include the maintenance schedule for the principal items of equipment furnished under this contract.

3.2 MANUFACTURER'S RECOMMENDATIONS:

A. Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Architect prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

3.3 TESTING, ADJUSTING, STARTING UP AND COMMISSIONING

A. Testing: All work must be proved satisfactory. The tests herein specified shall be applied in the presence of, and to the satisfaction of, the Architect before the work is covered, concealed or made inaccessible to testing, repair, correction or replacement. Accommodate the testing operation to the progress of the project as a whole. Correct all defects appearing under test and repeat the tests until all parts of the work have been successfully tested. Apply the specific tests herein described. Present all work for acceptance in clean condition, properly adjusted and in good working order; for instance, all machinery must be quiet, well balanced, and must be in place and reading accurately. All systems, equipment, controls, and devices in this work shall be tested in operation and must prove for their purposes in the judgment of the Architect or his authorized representative. All internal surfaces of all lines and equipment shall be blown or flushed clean. Where pressure tests are specified, the apparatus shall be clean before the tests are applied. Contractor shall provide adequate protection of piping and duct systems to prevent vandalism and/or accidental damage, blockage, etc., that will hinder or prevent proper operation of the finished systems.

1. Provide instruments, pumps, gauges, supplies, equipment, materials, and labor for testing and starting up. Dispose of test water and wastes after test, in a manner approved by all applicable codes.
2. Perform tests which may be required by authorities or agencies in addition to those herein specified.
3. Piping for steam, hot water, chilled water, supply and return, drain, escape and relief valve discharge shall be tested with water and made tight under pressure of 150 pounds per square inch gauge maintained for one hour without pumping or as long as required to inspect all joints. Repair all leaks and retest. Piping shall be made tight without caulking. Apply pressure tests to piping only before connection of equipment. In no case shall piping, equipment or accessories be subjected to a pressure exceeding it's rating. Low-pressure elements shall be isolated or removed before tests are conducted.
4. Test valve bonnets for tightness. Test operate all valves at least once from closed-to-open-to-closed positions while valve is under pressure. Test all automatic valves for proper operation at the settings indicated. Test pressure relief valves at least three (3) times.
5. Test piping specialties for proper operation. Test air vent points to ensure that air has been vented.
6. Furnish certified shop test records for all pressure vessels. After installation, test at full operating pressures and temperatures maintained for one hour. Set and test all pressure control, relief and safety devices.
7. Repair or replace all defective work and repeat tests until the particular system and component parts thereof receive the approval of the Architect.
8. The duration of tests shall be as determined by authorities having jurisdiction, but in no case less than the time prescribed in each section of the specifications.
9. Test equipment and systems, which normally operate during seasons of the year during the appropriate season. Perform tests on individual equipment, systems and their controls. Whenever the equipment or system under test is interrelated with and depends upon the operation of other equipment, systems and controls for proper operation, function, and performance; the latter shall be operated simultaneously with the equipment of system being tested.

B. Adjusting, Balancing and Starting Up

1. Flush clean all systems prior to starting up the system. Any damages to the building or system components caused by failure to clean the systems properly shall be corrected to the satisfaction of the Architect or his authorized representative at no additional cost to the Owner.
2. In duct and piping systems, eliminate all noise and vibration and take all measures to secure proper circulation.
3. Run motor-driven equipment continuously for at least two hours in the presence of the Architect. Correct all defects of noise, vibration, alignment and balance. Replace all motors, which overheat or are noisy.
4. Balance systems completely for temperature, volume, and pressure per NEBB performance standards. Balancing subcontractor shall provide proof of certification by NEBB.
5. Air and water volumetric flow rates shall be within ten (10) percent of those specified. Air and water quantities and pressures shall be tested, balanced and recorded at all terminal devices. Volumetric flows and pressures shall be recorded on suitable forms and submitted for approval.
6. Provide any and all labor and equipment necessary to properly balance the installation including but not limited to dampers, valves, flow stations, test ports, sheaves, belts, etc.
7. All sequences of the system shall be checked and all temperature controls operated and commissioned as required to insure that all systems operate per Engineers intent.

C. Commissioning

1. This Contractor shall provide the deliverables to the engineer/owner.
2. Copies of all records shall be provided to the Engineer by this Contractor including, but not limited to:
   a) Equipment manuals including the name of at least one service agency;
   b) Testing and Balancing reports;
   c) Functional performance testing of the equipment, controls, economizers, and lighting control systems.
3. All commissioning shall be performed as indicated here and elsewhere in the specifications and shall comply with provisions of the applicable Energy Conservation Code.

3.4 SEQUENCE OF OPERATIONS

A. Sequence of Operations: This is a performance-based specification intended to convey the control intent of the various systems. The contractor shall provide detailed shop drawings including P&ID diagrams, equipment lists and finalized sequences for review by the Engineer prior to installation. Any questions concerning specific details shall be referred to the engineer for clarification.

B. System: It is the intent of this specification that programmable electronic controls be provided to control occupied/unoccupied modes of all HVAC systems within the facility. Systems shall be provided with all additional required controls including, but not limited to, space mounted monitoring and user interface devices, to provide the specified sequence.

C. Equipment and Wiring: This contractor shall provide all control equipment, and wiring (regardless of voltage) to accomplish the sequence of operations as detailed below.

D. Control and Monitoring: Sensors shall be provided throughout the HVAC systems (hydronic and air) as required to control and monitor their operation. Provide sensors with remote mounted stats where indicated on the drawings. Where multiple space mounted sensors are required for a given unit they shall be located in the same general area.

E. Safety Controls: This contractor shall provide all safety controls required to protect the building and all controlled equipment from damage as well as those controls necessary to signal abnormal operation or malfunction of equipment. These shall include but not be limited to high limits, low limits, freezestats, flow switches, interlocks and relays.

F. Energy Efficiency: All controls and sequences shall be configured to provide maximum energy efficiency while maintaining occupant comfort.

G. Functional Performance Testing: The contractor shall perform complete and thorough Control Functional Performance Test (FPT) and Commissioning of the control systems. Upon completion of the FPT, a report shall be submitted to the engineer for review and comment. The FPT shall include testing of:

1. Safeties in every mode, i.e., in manual run mode as well as auto mode.
2. Signals to and from the fire alarm, security and entry systems.
3. Sequences of operation step by step in every mode and possible situation.
4. The operation of all control loops under actual operating conditions.
5. The interlocked operation of all equipment (i.e., the operation of starters in manual and off modes as well as auto mode, damper end switch interlock, etc.)
6. Commissioning should test every conceivable life safety scenario and every conceivable operational scenario that the system will encounter and document this testing with printed graphs of trend logs.

H. Furnace A/C Units:

1. Occupied winter: The supply fan and gas furnace shall be cycled to maintain thermostat set point.
2. Unoccupied winter: Upon a drop in space temperature below the setback temperature, the supply fan and gas furnace shall be cycled to maintain thermostat setback temperature.
3. Occupied summer: Supply fan and cooling circuits shall energize as required to maintain the thermostat set point. The gas furnace shall be de-energized.
4. Unoccupied summer: Upon a rise in the space temperature above the setback temperature, the supply fan and cooling circuits shall be cycled to maintain the thermostat set point temperature.

I. Zone Dampers:

1. Provide unit control panel with time clock as required to serve as the central source of communications and decision making between the individual zone dampers and the gas furnace A/C units.
2. Changeover: Boxes shall changeover from heating to cooling mode automatically based upon system controls and system temperature sensor.
3. Cooling: Upon a rise in space temperature, the Zone Damper shall open to allow maximum cooling flow to the zone. Once the space is satisfied and a drop in space temperature occurs the reverse shall occur.
4. Heating: Upon a drop in space temperature, the Zone Damper shall open to allow maximum heating flow to the zone. Once the space is satisfied and a rise in space temperature occurs the reverse shall occur.
5. Bypass Control: The bypass boxes shall be staged open based upon the input of the duct mounted Static/Velocity Pressure Sensor. As zone dampers close, the bypass boxes will open to maintain constant airflow.

J. Ductless Split Systems:

1. Cooling: In the cooling mode, the supply fan shall run and the refrigeration circuit shall be energized and cycle to maintain the cooling setpoint of the space/unit mounted temperature sensor. When the cooling setpoint is reached, the reverse shall occur.
2. Heating: In the heating mode, the supply fan shall run and the heating circuit shall energize to maintain the heating setpoint of the space/unit mounted temperature sensor. When the heating setpoint is reached, the reverse shall occur.
3. Provide low ambient controls.
4. Provide all interlocking control wiring and devices between indoor & outdoor units.

K. Energy Recovery Ventilators:

1. Occupied: Supply & exhaust fans shall run continuously in the occupied mode.
2. Unoccupied: Supply and exhaust fans shall be de-energized in the unoccupied mode.

L. Garage Ventilation:

1. Garage exhaust fan (EF-1), exhaust motorized damper and intake motorized damper shall be controlled by packaged gas detection system. System controller shall be capable of taking input from all the CO & NO2 sensors located in the garage.
2. Upon detection of carbon monoxide (CO) or Nitrogen Dioxide (NO2) the packaged detection system, the associate exhaust fan (EF-1) shall be energized and the associated fresh air intake/exhaust dampers shall open.
3. ERV-1 shall run continuous to provide the minimum space ventilation rate.

M. Exhaust Fans:

1. Toilet Exhaust Fans: Fan shall run continuously on low speed. Fan shall cycle to high speed (boost mode) when the wall mounted switch is set to the ON position.
2. Purge Exhaust Fan: Fan shall be energized by a wall mounted switch.

N. Electric Heaters:

1. Provide single temperature unit or room mounted thermostat to cycle electric heating coil and fan motor to maintain constant space temperature.

O. Dehumidifiers:

1. Dehumidifier shall be provided with factory controls & unit mounted humidistat.

P. Gas Fired Unit Heater:

1. Provide single temperature space temperature thermostat to cycle heater & fan motor to maintain constant space temperature (adj).

Q. Overflow cut-off switches:

1. Provide an overflow cut-off switch in each secondary drain pan to shut down the associated unit and provide an alarm prior to overflow.

CERTIFICATION :

WILLIAM T. MAYER III
STATE OF RHODE ISLAND
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

THIS DRAWING IS A PART OF AN INTEGRATED SET OF CONSTRUCTION CONTRACT DOCUMENTS. REFER TO ALL DRAWINGS AND SPECIFICATIONS INCLUDING BUT NOT LIMITED TO "GENERAL CONDITIONS" "SUMMARY OF WORK", AND ANY APPLICABLE MANUFACTURERS TECHNICAL SPECIFICATIONS.

REFER TO ALL DRAWINGS FOR COMPLETE SCOPE OF WORK.

THIS DRAWING IS NOT TO BE SCALED OR USED AS AN AS-BUILT.

REV. NO.	DATE	DESCRIPTION

ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Slatersville, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:
SCITUATE POLICE STATION

SHEET TITLE:
MECHANICAL SPECIFICATIONS

JOB NO.: 19349MU
DRAWN BY: KB
CHECKED BY: WM
DATE ISSUED: 03.12.2020
SCALE: AS NOTED

SHEET NO.:
M5