

SECTION 09510  
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Performance: Fire, structural, and seismic performance meeting requirements of building code and local authorities. Acoustical performance based on project requirements.

PART 2 PRODUCTS

2.1 MATERIALS

A. Mineral Fiber Acoustical Ceilings: see finish schedule on architectural plans.

1. Panel Size: 24 by 24 inches.

2. Panel Size: 24 by 48 inches.

3. Panel Edge: Square.

4. Suspension System: Intermediate duty.

5. Auxiliary Materials:

a. Edge molding and trim.

b. Hold-down clips and impact clips.

c. Concealed electrical wiring.

PART 3 INSTALLATION

3.1 INSTALLATION

A. Install materials and suspension systems in accordance with manufacturer's instructions and recommendations, and ASTM C 636. Coordinate installation with location of mechanical and electrical work to ensure proper locations and anchorage.

B. Level ceilings with 1/8 inch in 10 feet in both directions. Scribe and cut panels to fit accurately. Measure and layout to avoid less than half panel joints.

C. Remove and reinstallation of existing ceilings: Remove and store materials for reuse when allowed. Handle with white gloves and avoid damaging corners and edges. Clean tiles and grid system, which have been removed, and provide additional materials to complete the work and to replace damaged existing materials. New materials shall match existing materials as approved.

D. Ceiling areas shall be measured to establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at border.

E. Grid layout shall be symmetrically laid out in each space. Coordinate work with other trades so that lighting fixtures, grilles and other ceiling fixtures work with grid layout.

F. Support for suspension system shall be from structure above, not from ductwork, metal deck, equipment, or ceiling bars.

G. Wall moldings shall be installed at the perimeter of each acoustical ceiling area and at locations where end joints would otherwise be exposed.

H. Field out acoustical panels as required, in accordance with manufacturer's recommended procedures and equipment.

I. Adjust, clean, and touch-up all system components.

SECTION 09910  
PAINTS

PART 1 GENERAL

1.1 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Regulations: Compliance with VOC and environmental regulations.

PART 2 PRODUCTS

2.1 MATERIALS

A. Painting

1. Manufacturers: Sherwin-Williams, ProMar 200

2. Application: Interior unfinished surfaces.

3. Primary Coating System: Latex based paints.

4. Primer/Sealant System: Primer plus two finish coats.

PART 3 EXECUTION

3.1 INSTALLATION

A. Inspect surfaces, report satisfactory conditions in writing; beginning work means acceptance of substrate.

B. Comply with manufacturer's instructions and recommendations for preparation, priming and coating work. Coordinate with work of other sections.

1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

C. Surface Preparation: All surfaces to be painted, removed of peeling paint to sound substrates. Remove chalk deposits and mildew and wash all surfaces with mild detergent. Perform related minor preparation including cut and glazing compounds. Spot prime bare areas before priming and sanding of surfaces.

D. Match approved mudding and color, texture, and pattern. Re-coat or remove and replace work which does not match or shows loss of adhesion. Clean up, touch up and protect work.

PREPARATION - GENERAL

A. Do not start work until surfaces to be finished are in proper condition to produce finished surfaces of uniform, satisfactory appearance.

2. Stains and Marks: Remove completely, if possible, using materials and methods recommended coating manufacturer; cover stains and marks which cannot be completely removed with coating primer or sealer recommended by coating manufacturer to prevent bleed-through.

3. Remove Mildew, Algae, and Fungus using materials and methods recommended by coating manufacturer.

4. Remove or protect adjacent hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixtures, trim, and other items not indicated to receive coatings.

5. Move or protect equipment and fixtures adjacent to surfaces indicated to receive coatings to allow application of coatings.

6. Protect adjacent surfaces not indicated to receive coatings.

7. Prepare surfaces in accordance with manufacturer's instructions for specified coatings and indicated materials, using only methods and materials recommended by coating manufacturer.

SURFACE PREPARATION - CONCRETE AND MASONRY

A. Concrete and Concrete Masonry: Clean surfaces free of loose particles, sand, efflorescence, laitance, form oil, curing compounds, and other substances which could impair coating performance or appearance.

2. Existing Coatings:

a. Remove surface irregularities by scraping or sanding to produce uniform substrate for coating application; apply one coat primer of type recommended by coating manufacturer for maximum coating adhesion.

b. If presence of lead in existing coatings is suspected, cease surface preparation and notify Architect immediately.

3. Gypsum Board: Repair cracks, holes and other surface defects with joint compound to produce surface flush with adjacent surfaces.

4. Masonry Surfaces: Restored: Remove loose particles, sand, efflorescence, cleaning compounds and other substances that could impair coating performance or appearance.

5. Metals - Aluminum, Mill-Finish: Clean and etch surfaces with a phosphoric acid water solution or water based industrial cleaner. Flush with clean water and allow to dry, before applying primer or coating.

6. Metals - Copper: Clean surfaces with pressurized steam, pressurized water, or solvent washing.

7. Metals - Ferritic: Remove rust or scale, if present, by wire brush cleaning; power tool cleaning; sandblast cleaning; remove grease, oil, and other contaminants which could impair coating performance or appearance by solvent cleaning; with phosphoric acid solution cleaning of welds, bolts and nuts; spot-prime repaired welds with specified primer.

8. APPLICATION - GENERAL

1. Apply each coat to uniform coating thickness in accordance with manufacturer's instructions, not exceeding manufacturer's specified maximum spread rate for indicated surface; thin, brush marks, roller marks, orange-peel, or other application imperfections are not permitted.

2. Allow manufacturer's specified drying time, and ensure correct coating adhesion, for each coat before applying next coat.

3. Inspect each coat before applying next coat; touch-up surface imperfections with coating material, feathering, and sanding if required; touch-up areas to achieve flat, uniform surface without surface defects visible from 3 feet (3.0 m).

4. Remove dust and other foreign materials from substrate immediately prior to applying each coat.

5. Where joint application abuts other materials or other coating or, terminate coating with a clean sharp termination line without coating overlap.

6. Where color changes occur between adjoining spaces, through framed openings that are of same color as adjoining surfaces, change color at outside stop corner nearest to face of closed door.

7. Reprimers and tie-coats unsatisfactory finishes; refresh entire area to corners or other natural terminations.

H. CLEANING

1. Clean excess coating materials, and coating materials deposited on surfaces not indicated to receive coatings, as soon as practicable after the section progress; do not allow to dry.

2. Reinstall hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items that have been removed to protect from contact with coatings.

3. Reconnect equipment adjacent to surfaces indicated to receive coatings.

4. Restore to original position equipment and fixtures that have been moved to allow application of coatings.

5. Remove protective materials.

FIRE PROTECTION SPECIALTIES

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Standards: UL and FM listed products, NFPA 10.

C. Regulations: ADAAG.

PART 2 PRODUCTS

2.1 MATERIALS

A. Fire Extinguishers

1. Type: Multipurpose dry chemical type

PART 3 EXECUTION

3.1 INSTALLATION

A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.

B. Install fire extinguishers in mechanical and service areas with wall-hung brackets at locations and heights indicated and acceptable to authorities having jurisdiction.

C. Install fire extinguishers in cabinets in public areas plumb and level at heights acceptable to authorities having jurisdiction.

D. Restore damaged finishes. Clean and protect work from damage.

SECTION 1000  
TOILET ACCESSORIES

PART 1 GENERAL

1.1 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

A. Toilet and Bath Accessories

1. Accessory: Paper towel dispensers.

2. Accessory: Toilet tissue dispensers, single roll.

3. Accessory: Toilet tissue dispensers.

4. Accessory: Soap bars.

5. Accessory: Wall Mirror.

6. Accessory: Soap dispensers, wall mounted.

7. Accessory: Mop and broom holders.

ACCEPTABLE MANUFACTURERS:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering toilet accessories that may be incorporated in the Work include, but are not limited to the following:

a. A. J. Waxroom Accessories.

b. Bobrick Washroom Equip., Inc.

c. Bradley Corporation.

d. McKinney/Parker.

MATERIALS, GENERAL:

1. Stainless Steel: A501 Type 302/304, with polished No. 4 finish, 22 gage minimum, unless otherwise indicated.

2. Brass: Leaded and unleaded. Flat products, ASTM B16, Rods, shapes, forgings, and flat products with finished edges, ASTM B16; castings, ASTM B16.

3. Sheet Metal: Cold-rolled, commercial quality ASTM A366, 20 gage minimum, unless otherwise indicated. Preparation and metal pretreatment as required for applied finish.

4. Chromium Steel: Model: ASTM A527, G66.

5. Galvanized Steel: Galvanized and chrome-plated or base metal, ASTM B465, Type 3; and chrome-plated. Factory applied; gloss white, baked acrylic enamel coating.

6. Mirror or Glass: ASTM C1036, Type 1, Quality opt., 1/4" thick, (0.23-inch), with silvering, electro-plated copper coating, and protective organic coating.

8. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.

9. Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

D. SANITARY WAPIN DISPOSALS:

1. Surface mounted satin stainless steel, with self-closing door and tumbler lock retention of the receptacle.

a. Provide Disposable Liners, (Bobrick 353-12) minimum quantity of twelve per each unit.

E. TOILET TISSUE DISPENSER:

1. Surface mounted double roll toilet tissue holder of satin finish stainless steel, 1/8 inch wall thickness, at each water closet.

F. TOILET GRAB BARS:

1. Stainless Steel: Type 304 satin finish with wall thickness not less than 18 gage and as follows:

a. Mounting: Exposed, manufacturer's standard 1/8 inch thick flanges and vaneal resistant end caps.

b. Clearance: 1/2" clearance between wall surface and inside face of bar.

c. Gripping Surfaces: Smooth, satin finish.

d. Medium-Duty Size: Outside diameter of 1-1/4"

e. Lengths and Spacing as indicated on the drawings, capable of supporting 250 lb. concentrated load in any direction, per ASTM F446.

G. LIQUID SOAP DISPENSER (public)

1. Type 304, satin finish stainless steel, 40 lb. or capacity. Concealed wall fastening shall be visible and spaced as indicated on the drawings.

2. Valve operates with less than 5 lb. of force.

H. WALL MIRRORS:

1. Stainless Steel Channel Frame Mirror: One piece type 304 channel frame 3/4 inch x 3/4 inch, Satin finish and chrome plated. Welded, ground and polished mirror.

2. Floor/Gate glass mirror, 1/4 inch thick, plated, mirror.

3. Mounting: Install on concealed wall hanger and lock in place with theft-resistant screws.

4. Sizes as indicated.

I. PAPER TOWEL DISPENSER:

1. Surface Mounted Towel Dispensers: Fabricate of stainless steel with hinged front equipped with tumbler lockset. Provide pierce slots at sides as refill indicators.

2. Capacity: Not less than either 300 Cold or 400 multi-fold paper towels without special adapters.

3. Surface mount stainless steel. Satin finish 5/8" x 5" brackets.

SECTION 1510  
PLUMBING

PART 1 GENERAL

1.1 SUMMARY

A. Work shall include but not be limited to the following: Provide all labor, materials, services, equipment and appliances required for the fabrication and installation of the plumbing system, as indicated on the design drawings and as outlined in these specifications.

B. Equipment and design of systems indicated on the design drawings and within these specifications shall be considered as "specified standard" quality. Substitutions shall be equal quality.

C. The entire system and all components listed herein shall meet all state, county and local codes and ordinances in every respect. The contractor shall obtain all required permits, inspections and pay all fees.

D. All equipment, etc., shall be new unless otherwise noted, and as specified free of defects as shown on the drawings and as indicated in these specifications. All electrical powered equipment shall be UL or ETL listed.

E. All materials shall be fabricated and installed in a neat and professional manner with the coordination of all involved trades to avoid interference and delay due to lack of coordination. No allowances will be made for rework due to coordination difficulties or interferences between involved trades.

F. Obtain all permits and inspections required by law for the completion of the work. Cost of the required permits and inspections shall be paid by the contractor. The contractor shall obtain and pay for all Certificates of Approval, which must be obtained prior to final acceptance of the job. All materials and labor furnished by the Contractor shall be in strict accordance with the rules and regulations of the state and municipality, utility companies, Florida Building Code Plumbing Code, National Electric Code (NEC) and the National Fire Protection Association (NFPA).

1.2 QUALITY ASSURANCE

A. Materials and Workmanship

a. Products and materials shall meet or exceed the quality or requirements specified or shown on the drawings.

b. Provide products and materials, which the manufacturer has certified as appropriate to the applications shown on the drawings and specifications.

c. Provide products and materials, which are supported by convenient, parts availability and servicing.

d. Workmanship shall be in all respects of the highest quality and all construction shall be done according to the best practice of the trade. All systems shall be made complete and operational in first class working order. Furnish all necessary labor and materials to construct a complete system.

B. Provide the owner with the following prior to final acceptance:

a. Parts list for each piece of equipment.

b. One bound set of approved shop drawings.

c. One bound set of operating instructions and maintenance schedules for each piece of equipment.

d. Copies of all warranties for each piece of equipment.

C. Guarantees and Warranties:

a. Guarantee all labor and material furnished for a period of one year extending from the time of final acceptance of the building. The guarantee shall cover the repair or replacement without additional cost to the owner for any defective material or faulty workmanship.

b. Provide warranties for each piece of major equipment. Warranties shall be included with the owner's final documents.

PART 2 PRODUCTS

2.1 MATERIALS

A. Access Panel:

1. Contractor shall provide hinged access doors (min. 12"x24") for valves, etc. where floors, walls and ceiling must be penetrated to access mechanical systems. Finish shall be coordinated through the architect to match surrounding finishes.

B. Cleaning, Testing and Adjusting:

a. The contractor, at his expense, shall clean, repair, adjust, check, A. balance, and place in service the various systems herein specified with their respective equipment, accessories and piping. The contractor shall furnish all labor, materials, equipment, and tools required to perform tests required by these specifications and by the governing authorities.

b. Work shall be covered or concealed until properly inspected & tested.

c. All domestic water piping systems shall be tested for absolute C. tightness by subjecting the system to a hydrostatic pressure of 150 PSI gauge or 50 PSI over working pressure, whichever is greater for a period of not less than eight (8) hours. All leaks shall be repaired and the hydrostatic test repeated until, for an eight (8) hour period, no leaks can be found while the system is subject to the test pressure. Soil pipe and condensate drains shall be tested by temporarily plugging all outlets and filling the system with water to the level of the highest vent stack. The system shall be inspected and all leaks repaired and the test repeated until the water level does not decrease for a period of 24 hours.

C. Hangers and Supports:

a. Provide all necessary supports, hangers, rods, clamps and attachments to properly install and support piping and equipment from the building structure.

b. Provide any angle iron or unistrut and suspension rods required to install equipment and piping.

D. Water Supply Systems:

1. Expand water supply as indicated on design drawings. Provide shock absorbers and vacuum breakers where required.

2. Pipe and fittings:

l. Above ground - Schedule 40 CPVC.

ll. Below ground - Schedule 80 CPVC.

3. Furnish supply air diffusers and return air grills as scheduled on the design drawings.

4. Chloramine: Before being placed in service all water distribution systems shall be sterilized with chlorine in accordance with FPC 610.1 standard procedure for disinfecting potable water piping. Disinolate: Insulate all hot water lines with 1" of insulation having a conductivity not exceeding 0.27 BTU per inch.

l. Connections to Miscellaneous Equipment:

a. Rough-in and connect water, waste, and vent to complete the installation of equipment listed on the construction documents.

b. Adjustable gages and dampers shall be installed in every split and branch duct and shall be provided with locking quadrants on exposed or in accessible areas of the duct for ease of operation. Elbows or changes in duct direction greater than 45 degrees shall be fitted with air turns consisting of curved radial blades or vanes, which will permit the air to slide about turns without appreciable turbulence.

3. Flexible duct work shall be acoustical low pressure type with interior liner, metal helix, fiberglass insulation with an R-value of 5.0 or greater, and copolymer seamless exterior sleeve. The entire flexible duct assembly shall be listed in accordance with UL-181 class I air duct material. Flexible ductwork shall meet the energy efficiency code.

4. All exhaust ductwork shall be galvanized steel.

E. FIRE SAFETY CONTROLS

1. Install smoke detector furnished by division 16 in supply and return air ducts. Detector shall shut unit off when activated.

F. VIBRATION ISOLATION

1. All lower units and vibrating type equipment shall be properly fitted with mason industries vibration isolation equipment installed in accordance with equipment weight and load.

2. Provide flexible connectors at all supply and return connections to air conditioning equipment consisting of heavy canvas or neoprene fabric with airtight seams and connections to the equipment.

G. AIR FILTERS

1. Filters shall be 2" fiberglass media 303 throwaway type in a rigid frame with a supporting maze across both entering and leaving surfaces. Supply one complete set of filters after owner's final acceptance. Fair 39/39 or equal.

H. ACCESS DOORS

1. Furnish ductwork as indicated and wherever necessary for proper access to all instruments, controls, fire dampers motorized dampers and equipment, and for convenient inspection, maintenance and replacement of same. Size to be ample for usage. Opening to be reinforced on all sides with material or ductwork as which doors are installed.

2. Hardware - use vent lock hardware throughout. All doors to be hinged with brass pin hinges and with quad opening latches as follows:

i. 1/2" x 1/2" x 1/2" hinges W/ One 90° latch.

ii. Two (2) #10 x 1 1/2" hinges W/ One 90° latch.

3. Access doors (hard surface) contractor shall provide hinged access doors (min. 12"x24") for dampers, valves, etc. where floors, walls, and ceilings must be penetrated to access mechanical systems. Finish shall be coordinated through the architect or owner's representative to match surrounding finishes. Fire rated access doors in fire rated walls or ceilings shall bear a U.L. Label for fire rating requirement.

I. ULTRAFANS

1. Contractor shall furnish and install centrifugal fans of size and type called for on drawings.

2. Fans shall be rated and constructed to be capable of operating at static pressures of 0.5" above atmospheric air (if new equipment is shown on drawings).

3. Units shall be furnished in single increments of sufficient structural strength to be supported from both ends without intermediate support. Multiple units shall not be permitted. Unit casing shall be a minimum of 18 gage 304 stainless steel in a number three finish.

4. Galvanized fans shall be forward curved centrifugal type, double inlet design, with zinc plated hubs. Tangential type blowers and coupling construction shall not be permitted. Inlet screen shall be perforated stainless steel powder coated mesh.

5. Discharge nozzle shall be high efficiency discharge plenum, designed so that the air leaves on a 6 degree plane. Air curtain shall create a positive air seal with directional air foil vane. The unit shall facilitate deflection of air stream ±20 degrees. Unit shall have multiple speed motor(s) to control air column down from maximum speed.

4. All air curtains shall consist of a stainless steel casing, centrifugal fan, raised stainless steel inlet cones, discharge nozzle, motor(s) and an optional 2" inch fire cleanable filter.

5. Motors at 1/2 HP 1075 rpm each shall be heavy duty type equipped with permanently lubricated, shielded Yee bearings of equal size at each end and double extended shafts requiring no outdoor bearings.

K. INSULATION

1. Shall be as manufactured by Owen-Corning, Manville, Pittsburgh Corning, Armstrong, or approved equal insulation and adhesives shall be manufactured by Benjamin Foster, Chiles, Vinsco, or approved equal.

2. Insulate all sheet metal ductwork except exhaust ductwork externally with 2" thick (±6 minimum) Manville or Owens Corning type 108 insulation or approved equal. Insulation to have 50% facing and U.L. fire listed classification of flames spread 25, smoke developed 50, and fuel contributed 50. Install per energy efficiency code and manufacturer's recommendations.

3. Contractor shall be responsible for furnishing and installing adequate and proper insulation and testing.

L. TESTING

1. Condensate drains shall be tested to temporarily plug all outlets and filling the system with water to the level of the highest vent stack. The system must be inspected and all leaks repaired and the test repeated until the water level does not decrease for a period of 24 hours.

2. Adjust the air conditioning systems, ventilating systems, fans, etc. to deliver not less than the required air quantity with quantities in excess to be subject to the approval of the engineer if found not having objectionable effects such as noise, drafts, or motor overload.

3.1 EXECUTION

3.1 INSTALLATION

A. All locations of equipment, piping, etc. indicated on the drawings are diagrammatic and shall be followed as closely as possible to the plans, subject to building construction and interferences with other trades. All work shall be installed to ensure a minimum headroom, balanced operation and suitable aesthetic appearance. Contractor is responsible for any field measurements required to provide an approved and final installation.

B. Not all components required for a complete installation are shown on these drawings. Refer to equipment installation instructions, schedules and applicable codes for additional information, including required connection locations, types and sizes.

C. Provide isolation valves and unions at all equipment and as indicated on drawings.

D. Contractor shall be responsible for furnishing and installing adequate and proper insulation and moisture seal in a manner that will permanently prevent the accumulation of any objectionable moisture on the interior of condensate drain piping, or other parts of the system. The contractor shall correct the cause of any condensation and fully repair, without cost to the owner, any damages to building surfaces, furnishings or equipment caused by condensation from this system, for the full period of the guarantee.

E. Perform a full work necessary to prepare the structure for the zinc plating of the work.

F. All holes, openings and damaged materials created during construction shall be repaired and finished by experienced workman. Provide all roof, wall and floor penetrations required and seal joints of all involved trades to avoid interference and delay due to lack of coordination. No allowances will be made for rework due to coordination difficulties or interferences between involved trades.

SECTION 1500  
MECHANICAL

PART 1 GENERAL

1.1 SUMMARY

A. Materials and Workmanship

1. Products and materials shall meet or exceed the quality or requirements specified or shown on the drawings.

2. Provide products and materials, which the manufacturer has certified as appropriate to the applications shown on the drawings and specifications.

3. Provide products and materials, which are supported by convenient, parts availability and servicing.

4. Workmanship shall be in all respects of the highest quality and all construction shall be done according to the best practice of the trade. All systems shall be made complete and operational in first class working order. Furnish all necessary labor and materials to construct a complete system.

5. The HVAC contractor shall coordinate all electrical, ATE, and plumbing requirements with those subcontractors.

B. Obtain all permits and inspections required by law for the completion of the work.

C. Cost of the required permits and inspections shall be paid by the contractor. The contractor shall obtain and pay for all certificates of approval, which must be obtained prior to final acceptance of the job.

D. All materials and labor furnished by the contractor shall be in strict accordance with the rules and regulations of the state and municipality, utility companies, building code - 2001, national electric code (NEC) and the national fire protection association (NFPA).

C. Provide all labor, materials, services, equipment, and appliances required for the fabrication and installation of mechanical systems including heating, ventilating, air-conditioning, and various systems as indicated on the design drawings and as outlined in these specifications.

D. Equipment and design of systems indicated on the design drawings and within these specifications shall be considered as "specified standard" of quality. Substitutions shall be of equal quality.

E. The entire system and all components listed herein shall meet all state, county, and local codes and ordinances in every respect. The contractor shall obtain all required permits, inspections and pay all fees.

F. All equipment, etc., shall be new unless otherwise specified, free of defects as shown on the drawings, and as indicated in these specifications.

G. All materials shall be fabricated and installed in a neat and professional manner with the coordination of all involved trades to avoid interferences and delay due to lack of coordination. No allowances will be made for rework due to coordination difficulties or interferences between involved trades.

1.2 QUALITY ASSURANCE

A. Provide to the owner with the following prior to final acceptance:

1. Parts list for each piece of equipment.

2. One bound set of approved shop drawings.

3. One bound set of operating instructions and maintenance schedules for each piece of equipment.

4. Copies of all warranties for each piece of equipment.

B. Guarantees and Warranties:

1. Guarantee all labor and material furnished for a period of one year extending from the time of final acceptance of the building. The guarantee shall cover the repair or replacement without additional cost to the owner for any defective material or faulty workmanship.

2. Provide warranties for each piece of major equipment. Warranties shall be included with the owner's final documents.

C. Training Services:

1. Thoroughly instruct the owner's personnel during normal working hours on start-up and shut-down procedures, troubleshooting procedures, servicing and preventative maintenance schedules and procedures. Review with the owner's personnel the data contained in the operating and maintenance manuals. Schedule the training with the owner. Provide at least 7 days prior notice to architect/engineer.

D. System Identification

1. Provide identification labels on or near each piece of major equipment and each operational device and disconnect. The labels shall be constructed of engraved plastic laminate sign or plastic equipment marker permanently secured to equipment. The lettering shall be a minimum of 1/2 inch high for equipment name and 3/8 inch for equipment information.

2.1 MATERIALS

A. Hangers and Supports

1. Provide all necessary ductwork, pipe supports, hanger rods, clamps and attachments to properly support ductwork, piping and equipment from the building structure. Provide any angle iron or unistrut and suspension rods required to install equipment, piping and ductwork.

2. All supports exposed to outdoors shall be cleaned, primed and painted to prevent rusting. Finish color to be selected by the owner.

3. The use of baling wires or perforated metal strapping is not acceptable for supports.

4. Air-Conditioning Equipment (if any new equipment is shown)

1. New units shall be air-on-air electric air scheduled on the design drawings. Units with integral electric resistance heaters shall have a minimum of 1000 BTU/hr capacity. Units with electric units shall be as scheduled on drawings. Unit cabinets shall be constructed of galvanized steel, bonded and coated with baked enamel. Cabinet insulation shall comply with local energy code.

2. The units shall contain hermetic compressor and condenser coils. The units shall have dual compressors and dual refrigeration circuits or capacity reduction stages where indicated on equipment schedule.

3. The indoor air fans shall be of the forward-curved centrifugal class 1 type. The outdoor air fans shall be of the propeller type, each driven directly by an inherently protected motor. Motor and drive to provide higher fan output when job requirements exceed standard fan capacity shall be provided.

4. Cooling system shall be designed for charge protection, high and low pressure safety, compressor motor overload, and a timing device which will prohibit the compressor motor from being subjected to a starting current more than once every five minutes. Three phase units shall have phase loss protection. The unit will have an ambient air compressor lock-out at 55 degrees. Controls - provide wall mounted, heat/cool on-off thermostat. 1.0kts. Locations shall be provided by division 16, installed by division 15 and wired by division 51. Smoke detectors for smoke detectors are indicated on HVAC plans.

5. Provide air conditioning unit with slab cooling coil and gas reheat option.

C. Air Distribution Equipment

1. Furnish supply air diffusers and return air grills as scheduled on the design drawings.

I. Metal-air or Prinx or be substituted as an equal.

2. Grills registers and diffusers shall be furnished as scheduled on the design drawings.

D. DUCTWORK

1. 618" fiber duct board with anti-microbial treated inner lining, equal to "tough-duct". Inner lining shall be sealed in accordance with the manufacturer's recommendations. Duct board shall be 1-1/2" thick, ±4. All field joints shall be sealed with glass fabric and mastic.

2. Adjustable gages and dampers shall be installed in every split and branch duct and shall be provided with locking quadrants on exposed or in accessible areas of the duct for ease of operation. Elbows or changes in duct direction greater than 45 degrees shall be fitted with air turns consisting of curved radial blades or vanes, which will permit the air to slide about turns without appreciable turbulence.

3. Flexible duct work shall be acoustical low pressure type with interior liner, metal helix, fiberglass insulation with an R-value of 5.0 or greater, and copolymer seamless exterior sleeve. The entire flexible duct assembly shall be listed in accordance with UL-181 class I air duct material. Flexible ductwork shall meet the energy efficiency code.

4. All exhaust ductwork shall be galvanized steel.

E. FIRE SAFETY CONTROLS

1. Install smoke detector furnished by division 16 in supply and return air ducts. Detector shall shut unit off when activated.

F. VIBRATION ISOLATION

1. All lower units and vibrating type equipment shall be properly fitted with mason industries vibration isolation equipment installed in accordance with equipment weight and load.

2. Provide flexible connectors at all supply and return connections to air conditioning equipment consisting of heavy canvas or neoprene fabric with airtight seams and connections to the equipment.

G. AIR FILTERS

1. Filters shall be 2" fiberglass media 303 throwaway type in a rigid frame with a supporting maze across both entering and leaving surfaces. Supply one complete set of filters after owner's final acceptance. Fair 39/39 or equal.

H. ACCESS DOORS

1. Furnish ductwork as indicated and wherever necessary for proper access to all instruments, controls, fire dampers motorized dampers and equipment, and for convenient inspection, maintenance and replacement of same. Size to be ample for usage. Opening to be reinforced on all sides with material or ductwork as which doors are installed.

2. Hardware - use vent lock hardware throughout. All doors to be hinged with brass pin hinges and with quad opening latches as follows:

i. 1/2" x 1/2" x 1/2" hinges W/ One 90° latch.

ii. Two (2) #10 x 1 1/2" hinges W/ One 90° latch.

3. Access doors (hard surface) contractor shall provide hinged access doors (min. 12"x24") for dampers, valves, etc. where floors, walls, and ceilings must be penetrated to access mechanical systems. Finish shall be coordinated through the architect or owner's representative to match surrounding finishes. Fire rated access doors in fire rated walls or ceilings shall bear a U.L. Label for fire rating requirement.

I. ULTRAFANS

1. Contractor shall furnish and install centrifugal fans of size and type called for on drawings.

2. Fans shall be rated and constructed to be capable of operating at static pressures of 0.5" above atmospheric air (if new equipment is shown on drawings).

3. Units shall be furnished in single increments of sufficient structural strength to be supported from both ends without intermediate support. Multiple units shall not be permitted. Unit casing shall be a minimum of 18 gage 304 stainless steel in a number three finish.

4. Galvanized fans shall be forward curved centrifugal type, double inlet design, with zinc plated hubs. Tangential type blowers and coupling construction shall not be permitted. Inlet screen shall be perforated stainless steel powder coated mesh.

5. Discharge nozzle shall be high efficiency discharge plenum, designed so that the air leaves on a 6 degree plane. Air curtain shall create a positive air seal with directional air foil vane. The unit shall facilitate deflection of air stream ±20 degrees. Unit shall have multiple speed motor(s) to control air column down from maximum speed.

4. All air curtains shall consist of a stainless steel casing, centrifugal fan, raised stainless steel inlet cones, discharge nozzle, motor(s) and an optional 2" inch fire cleanable filter.

5. Motors at 1/2 HP 1075 rpm each shall be heavy duty type equipped with permanently lubricated, shielded Yee bearings of equal size at each end and double extended shafts requiring no outdoor bearings.

K. INSULATION

1. Shall be as manufactured by Owen-Corning, Manville, Pittsburgh Corning, Armstrong, or approved equal insulation and adhesives shall be manufactured by Benjamin Foster, Chiles, Vinsco, or approved equal.

2. Insulate all sheet metal ductwork except exhaust ductwork externally with 2" thick (±6 minimum) Manville or Owens Corning type 108 insulation or approved equal. Insulation to have 50% facing and U.L. fire listed classification of flames spread 25, smoke developed 50, and fuel contributed 50. Install per energy efficiency code and manufacturer's recommendations.

3. Contractor shall be responsible for furnishing and installing adequate and proper insulation and testing.

L. TESTING

1. Condensate drains shall be tested to temporarily plug all outlets and filling the system with water to the level of the highest vent stack. The system must be inspected and all leaks repaired and the test repeated until the water level does not decrease for a period of 24 hours.

2. Adjust the air conditioning systems, ventilating systems, fans, etc. to deliver not less than the required air quantity with quantities in excess to be subject to the approval of the engineer if found not having objectionable effects such as noise, drafts, or motor overload.

SECTION 1500  
MECHANICAL

PART 1 GENERAL

1.1 SUMMARY

A. Materials and Workmanship

1. Products and materials shall meet or exceed the quality or requirements specified or shown on the drawings.

2. Provide products and materials, which the manufacturer has certified as appropriate to the applications shown on the drawings and specifications.

3. Provide products and materials, which are supported by convenient, parts availability and servicing.

4. Workmanship shall be in all respects of the highest quality and all construction shall be done according to the best practice of the trade. All systems shall be made complete and operational in first class working order. Furnish all necessary labor and materials to construct a complete system.

5. The HVAC contractor shall coordinate all electrical, ATE, and plumbing requirements with those subcontractors.

B. Obtain all permits and inspections required by law for the completion of the work.

C. Cost of the required permits and inspections shall be paid by the contractor. The contractor shall obtain and pay for all certificates of approval, which must be obtained prior to final acceptance of the job.

D. All materials and labor furnished by the contractor shall be in strict accordance with the rules and regulations of the state and municipality, utility companies, building code - 2001, national electric code (NEC) and the national fire protection association (NFPA).

C. Provide all labor, materials, services, equipment, and appliances required for the fabrication and installation of mechanical systems including heating, ventilating, air-conditioning, and various systems as indicated on the design drawings and as outlined in these specifications.

D. Equipment and design of systems indicated on the design drawings and within these specifications shall be considered as "specified standard" of quality. Substitutions shall be of equal quality.

E. The entire system and all components listed herein shall meet all state, county, and local codes and ordinances in every respect. The contractor shall obtain all required permits, inspections and pay all fees.

F. All equipment, etc., shall be new unless otherwise specified, free of defects as shown on the drawings, and as indicated in these specifications.

G. All materials shall be fabricated and installed in a neat and professional manner with the coordination of all involved trades to avoid interferences and delay due to lack of coordination. No allowances will be made for rework due to coordination difficulties or interferences between involved trades.

1.2 QUALITY ASSURANCE

A. Materials and Workmanship

a. Products and materials shall meet or exceed the quality or requirements specified or shown on the drawings.

b. Provide products and materials, which the manufacturer has certified as appropriate to the applications shown on the drawings and specifications.

c. Provide products and materials, which are supported by convenient, parts availability and servicing.

d. Workmanship shall be in all respects of the highest quality and all construction shall be done according to the best practice of the trade. All systems shall be made complete and operational in first class working order. Furnish all necessary labor and materials to construct a complete system.

SECTION 1500  
MECHANICAL

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SECTION 1500  
MECHANICAL

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D.