SECTION 15010 - MECHANICAL BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general mechanical requirements for work specified in all other sections of Division 15, the drawings, schedules and by the requirements of this Section.

B. Division 1: Refer to Division 1 General and Special Conditions for requirements.

C. Without restricting volume or generality of above, work to be performed under this division shall include, but not limited to, the following:

1. Supervision of all mechanical work at all times during the work
2. Small Air handling units with chilled water coils and electric heater
3. Motor starters
4. Chilled water supply and return piping, valves and insulation.
5. Air distribution ducts, diffusers, registers and grilles
6. Sanitary sewer and domestic water
7. Domestic cold and hot water piping and insulation.
8. Air filtering equipment.
9. Exhaust fans
10. Three-way auto control valve
11. Automatic Temperature Control and Building Management System
12. Sprinkler system modification.
13. Plumbing fixtures

14. Coordination for cutting, patching and scheduling of work

15. Compliance with all National, State and local Codes, laws and ordinances and obtaining and paying for all inspections and permits.

16. Doing all required testing and balancing, furnishing of service and instruction books and warranty and submittal data.

1.2 QUALITY ASSURANCE

A. The materials, appliances and equipment provided shall meet the requirements of the Underwriter's Laboratories, Inc. (UL) and other standards organizations.

B. National Fire Protection Association (NFPA): All work provided under this Contract shall meet the requirements of the NFPA.

C. Current Models: All work shall be as follows.

1. Manufactured items furnished shall be the current, cataloged product of the manufacturer.
2. Replacement parts shall be available.

D. Compliance with Codes and Standard but shall not be limited to the following:

1. Local Parish Building Code.
2. Local Parish Plumbing Code
3. International Building Code.
4. Louisiana State Building Code.
5. ASHRAE Publications
6. Louisiana State Fire Marshal Act.
7. NFPA-101, Life Safety Code and Publication.
8. SMACNA Sheetmetal and Air Conditioning Contractors National Association.
9. NFPA-90A, Air Conditioning and Ventilating System.
10. NFPA-70, National Electric Code.
11. NFPA-13, Sprinkler systems

1.3 SUBMITTALS

A. Division 1: Conform to the requirements of Division 1, and requirements of this division.

B. Submittal List: Items for which submittals are required are included in each section of Division 15.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Refer to individual section of Division 15 and Division 1 for the requirements of material and products to be delivered to the project site.

B. Storage: Materials stored at the project site which become soiled with construction dirt, concrete or earthwork shall be washed, cleaned and dried to the satisfaction of the Architect or removed from the project site and replaced with new. Do not install soiled material.

C. Protection: Protect and store material and equipment in such a manner as to effectively prevent damage from climatic conditions.

1.5 LABELS AND NAMEPLATES

A. Manufacturer's Nameplates: Nameplates on manufactured items shall be aluminum or Type 304 stainless steel sheet, riveted or bolted to the manufactured item, with nameplate data engraved or punched to form a non-erasable record of equipment data.

B. Field Installation: Field-installed nameplates shall be engraved melamine plastic laminate, 1/8-inch thick, engraved in block capital lettering to expose white lettering on black face. Screw or bolt to equipment. Adhesive attachment will not be permitted.

1.6 MAINTENANCE AND OPERATING MANUALS

A. Division 1: Conform to the requirements of general requirement of division 1 for all manuals and operating information required under Division 15. Furnish maintenance and operating manuals prior to substantial completion awarded of project.

1.7 SUBSTITUTIONS

A. Names of manufacturers or catalog numbers are mentioned herein in order to establish a standard as to design and quality. Other products similar in design and of equal quality may be used if submitted to the Engineer and found acceptable by him. Refer to General Conditions for additional information.

B. Where alternate equipment manufacturers named as acceptable, are proposed for use by the Contractor, the Contractor shall be responsible to coordinate the change with all trades affected. The Contractor shall also pay for all additional work required under this Division as well as any other Division if the alternate equipment is used.

C. If required by Engineer because of substitutions, the Contractor shall submit for review ¼ inch scale working drawings of equipment areas with plan and section views.

1.8 TEMPORARY FACILITIES

A. Division 1: Refer to general conditions "Temporary Facilities," article, "Temporary Utilities", for the requirements of temporary water and sewer for construction and safety.

B. Damage: Where pipe, ductwork, insulation or equipment to remain is inadvertently damaged or disturbed, cut out and remove damaged section and provide new pipe, ductwork, insulation or equipment of equal capacity and quality.

C. Temporary Disconnection: Equipment required to be temporarily disconnected and relocated shall be carefully removed, stored, cleaned, reinstalled, reconnected and made operational.

1.9 SIZING

A. Capacity: Provide equipment and material of sizes, capacities, horsepowers, power ratings and dimensions indicated on the drawings, in the schedules and as specified.

B. Fit and Clearance: All equipment, such as pumps, air handling units, VAV boxes, filters, etc., shall fit the space shown on the project drawings. Provide access for servicing, repairing and inspecting apparatus at least equal to that shown. Each item of equipment shall be installed without damage to the building, building equipment, or the item itself. Verify building access constraints before delivery of equipment to the project site.

1.10 COORDINATION

A. General: Coordinate mechanical work with that of other trades in order to:

1. Avoid interferences between general construction, mechanical, electrical, structural and other specialty trades.
2. Maintain clearances and advise other trades of clearance requirements for operation, repair, removal and testing of mechanical equipment.
3. Indicate aisleways and accessways required on coordinated shop drawings for mechanical equipment on roof and in mechanical rooms.

1.11 MANUFACTURER'S RECOMMENDATIONS

A. General: Where installation procedures or any part thereof are required to be in accordance with manufacturer's recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not proceed until recommendations are received. Failure to furnish recommendations shall be cause for rejection of the equipment or material.

1.12 REVIEW PERMITS AND INSPECTIONS

A. Contractor shall apply for and pay for all governmental reviews and permits. he shall arrange for and pay all inspection and service connection fees incidental to the mechanical work.

B. No work shall be concealed until approved by the local inspector and the Architect. All local regulations shall be adhered to.

C. Upon completion, a certificate of approval from the appropriate regulatory agency shall be furnished by the contractor.

1.13 VISITING SITE

A. The bidder shall visit the site of proposed work that he may understand the facilities, difficulties, and restrictions attending the execution of the Contract. He will be allowed no additional compensation for failure to be so informed.

1.14 WORK IN OTHER DIVISIONS

A. All power wiring for equipment including furnishing and installing of power disconnect switches, will be provided under DIVISION 16 - ELECTRICAL. Power wiring for controls shall be as specified under this division.

B. Structural support for equipment will be provided under this Division. These supports must be checked and coordinated with requirements of equipment to insure that they suit the equipment which is to be installed.

1.15 GUARANTEE AND SERVICE

A. Contractor shall guarantee all equipment, materials and workmanship for one year after beneficial use of a particular system, beneficial occupancy of the building or final acceptance of entire project, except that where specifically indicated, extended warranties shall be provided. Date of guarantee will be considered only after written request is received by the Architect from the Contractor, and agreed upon by the Engineer, stating the date the system(s) was turned over to the Owner for beneficial use or occupancy.

B. During the one year period of guarantee, any defects in equipment, materials, or workmanship shall be promptly corrected by the Contractor without cost to the Owner. Mechanical and associated electrical equipment shall be services and adjusted without cost during the guarantee period. Servicing and adjusting shall include all labor, material, parts, etc. required during the first year.

C. See individual section for compressor(s) warranty.

1.16 SPECIAL CONDITIONS

A. No piping, ducts or other mechanical equipment foreign to electrical equipment shall pass through spaces dedicated to, or rooms that contain panelboards, distribution panels, switchboards, battery charging panels.

1.17 DRAWINGS

A. The drawings are diagrammatic and are intended to show the general arrangement and approximate physical sizes of equipment, piping and ductwork. Every nut, bolt, brace, hanger, etc., is not necessarily indicated or specified; all such items as may be required, necessary or incidental for the proper and dependable operation of each system shall be required under this Division whether specifically referred to or not.

PART 2 - PRODUCTS

2.1 MANUFACTURERS: Listed under individual section of this division.

2.2 DIVISION 15 SECTIONS

A. General: Conform to the requirements of Division 15 sections for all products furnished under this Contract.

2.3 MATERIALS AND WORKMANSHIP

A. All equipment and materials shall be new and shall be listed by Underwriter's Laboratories, Inc. in categories for which standards have been set by that agency. Methods of installation shall be in full accord with the latest and best electrical and mechanical engineering practices. Pressure vessels, as called for by respective codes, shall be stamped ASME and National Board Commission.

2.4 ACCESS DOORS

A. Doors in gypsum board or masonry construction; Karp type DSC-214M or Milcor Style M-Standard, 16 gauge steel frame and 14 gauge steel door construction, continuous piano hinge and a zinc chromate prime coat.

B. Doors in glazed or ceramic tile construction shall be same type as above except all stainless steel construction.

C. Doors in inaccessible acoustical tile ceilings, or walls with wall covering, Karp type DSC-210, or Milcor style AT 16 gauge steel frame and 18 gauge steel panel construction, recessed door for acoustical tile or gypsum board covered with matching

wall covering, concealed hinge with a zinc chromate prime coat, and exposed edges painted white when installed in acoustical tile ceiling.

D. Doors in fire rated partitions or ceilings (up to 1-1/2 hour rating) shall carry the Underwriters' Laboratories' "B" label; Karp style KRP-150FR or Milcor style.

E. Doors required in types of construction not hereinbefore specified shall have door furnished to suit the type and style of material in which installed.

F. Doors in non-security areas shall have screwdriver operator locks; locks in security areas shall be cylinder type, master keyed and furnished with two keys per door.

1. Acceptable manufacturers: Milcor, Boicor, Karp or approved equal.

2.5 ENCLOSURES

A. All control equipment enclosures such as, but not limited to, starters, data gathering panels, temperature control panels, etc. furnished and installed on this project or furnished as part of a packaged piece of equipment shall meet the following minimum standards unless specified otherwise in other Sections of this Division.

B. All control equipment enclosures installed within a building or an accessible space shall be equivalent to or greater than NEMA 1 type construction.

C. All control equipment enclosures installed outside of a building, a non-enclosed area or in an accessible space under a building shall be equivalent to or greater than NEMA 3R type construction with drain and breather.

D. All control equipment enclosures, installed within hazardous areas, controlling explosion-proof equipment shall be NEMA 7 or 9 type construction.

E. Where indicated on the drawings flush mounted enclosures shall be installed.

2.6 COMBINATION STARTER & DISCONNECT

A. Unless noted otherwise all magnetic starters shall be across-the-line type rated per NEMA standards. Starters shall have undervoltage protection when used with momentary-contact push button stations and shall have undervoltage release when used with maintained contact push button stations. Starter enclosures shall be as hereinbefore specified. Provide fused primary disconnect with Class R rejection feature. Fuses shall be buss low-peak, Type RK-1, current limiting and time delay, rejection type. **Starters shall be furnished by mechanical contractors and installed by electrical contractor.**

B. Each starter shall be complete with integrally fused 120 volt control transformer,

hand-off-auto switch and pilot light, where indicated, or as required for control and equipment. Starters shall have hand-off-auto switch. It shall be wired so as not to by-pass safety controls when in the "hand" position.

C. Starter contacts shall be of silver alloy, and shall be of the double break type. The movable magnet and contact assembly, an arc hood in which the fixed contacts are mounted, solenoid cell, and three thermal overload relays shall be assembled and mounted on a heavy steel back plate. The only moving part shall be the magnet and contact assembly which shall move up and down. Each pole shall be enclosed in an individual arc chamber.

D. Overload protective devices shall be selected in accordance with the motor nameplate, and shall be of the thermal inverse time limit type and shall include a manual reset type push button on the outside of the cover. Overloads shall operate on the melting alloy principle.

E. Each starter shall have normally open or closed external electrical interlocks as required to suit equipment controlled. Starters shall be single or multi-speed as required to operate equipment specified or scheduled.

F. Acceptable manufacturers: Furnas Class 14, G.E. or Square D Class 8536, Siemens or approved equal.

PART 3 - EXECUTION

3.1 SERVICES

A. Connection Points :Contractor shall verify the location of sewer, water and fire water Piping connections in the field and connect by extending the pipes to complete the installation. Contact utility companies for necessary service and connection.
Pay necessary fee for the connection. Provide reduced pressure back flow preventer in water main as required and type approved by local authority of Water Board.

3.2 PAINTING AND FINISHING

A. Damage and Touch-Up: Repair all marred or damaged factory painted finishes with materials and procedures to match original factory finish.

3.3 CUTTING AND PATCHING

A. Cutting: Provide cutting, channeling, chasing and drilling of floors, walls, partitions, ceilings and other surfaces necessary for installation of mechanical work. All cutting shall be performed by skilled mechanics of the trades involved.

B. Patching: Repair cut surfaces to match adjacent surfaces in accordance with the requirements of the general conditions.

3.4 FIRESTOPPING

A. Firestopping: Unused slots, sleeves and other penetrations in floors, walls or other general construction shall be closed and sealed with an approved firestopping material.

1. Firestopping material shall be UL listed and tested silicone elastomer specifically formulated for use in horizontal and vertical applications. The material shall possess intumescent characteristics; upon exposure to heat above 250 degrees F. shall expand to not less than five times its original volume to form a fireproof envelope UL rated for 2- and 3-hour protection, when applied in accordance with the manufacturer's recommendation.
2. Floor slots and openings shall be closed with 16 gauge galvanized steel sheet supported on 1-inch by 1-inch by 1/8-inch structural angle drilled or supported with power-driven studs into the building structure. Firestop with a layer of silicone elastomer not less than 1-inch thick which completely fills the opening. The top surface of the silicone elastomer shall be approximately 1-inch below the finished floor slab.
3. Openings in walls shall be closed with 16 gauge galvanized steel sheet securely attached at the midpoint of the wall thickness and firestopped on both sides of steel sheet with not less than 1/8-inch thick layer of non-sagging silicone elastomer to fully cover the opening.
4. Single or multiple pipes passing through walls and floors shall have the annular space between pipes or between pipes and structure filled with silicone elastomer to provide a 3-hour rated firestop for floors and walls.

B. Pipe and Ducts: The annulus between exposed pipe and ductwork and walls or floors in finished spaces shall be filled, sealed, and painted to match adjacent surfaces.

3.5 PREPARED OPENINGS

A. All piping installed through masonry walls or concrete floors above grade shall pass through a pipe sleeve as hereinafter specified.

B. All ducts installed through masonry walls or concrete floors above grade shall pass through a 20 gauge galvanized sheet metal sleeve.

C. Ducts installed through partitions, walls or floors which are smoke rated or have afire rating of one hour or greater shall be installed in sheet metal sleeve.

D. Exposed piping passing through masonry walls shall be fitted with chromium plated escutcheons on each side of the wall. Exposed ductwork passing the masonry walls