SECTION 15010

BASIC MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS: Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

A. This Division of the Specifications is divided into the following Sections which, with their respective sub-sections, are for convenience only and not intended th establish limits of work:

Section 15010 – Basic Mechanical Requirements

Section 15015 – Heating, Ventilating, and Air Conditioning: General

Section 15020 – Plumbing Work General

Section 15100 – Valves

Section 15140 – Supports and Anchors

Section 15250 – Piping Insulation / Mechanical Insulation

Section 15300 – Fire Protection

Section 15320 – Suppression Equipment

Section 15325 – Viking Preaction Sprinkler System

Section 15400 – Plumbing

Section 15410 – Plumbing Piping

Section 15450 – Plumbing Equipment

Section 15510 – Hydronic Piping

Section 15682 – Air Cooled Water Chillers

Section 15763 – Air Handling Unit with Coils

Section 15775 – Computer Room Air Conditioning Units

Section 15810 – Ductwork Accessories

Section 15820 – Fans

Section 15840 – Air Distribution

Section 15850 – Air Terminal Units – Variable Volume

Section 15890 – Ductwork

Section 15900 – Facility Management System

Section 15990 – Testing, Adjusting and Balancing

1.2 RELATED SECTIONS

A. Cutting and Patching specified in Division 2.

B. Painting of Mechanical equipment, piping, etc. specified in Division 9.

C. Electrical requirements specified in Division 16.

1.3 SUMMARY: This section specifies the basic requirements for mechanical installations and includes requirements common to more than one section at Division 15. It expands and supplements the requirements specified in sections of Division 1.

1.4 CUTTING AND PATCHING

A. Refer to Division l Section: CUTTING AND PATCHING for general requirements for cutting and patching.

B. Do not endanger or damage installed Work through procedures and processes at cutting and patching.

C. Arrange for repairs required to restore other Work, because of damage caused as a result of mechanical installations.

D. No additional compensation will be authorized for: cutting and patching Work that is necessitated by ill-timed, defective, or non-conforming installations.

1.5 MECHANICAL SUBMITTALS

A. Refer to the Conditions of Contract and Division 1 for submittal definitions, requirements, and procedures.

B. Submit complete shop drawings covering: equipment, duct work, field fabricated equipment, pipe work and any other drawings required.

C. Include construction details and materials of Construction.

D. Note equipment weights on the shop drawings. Submit:

1. Manufacturers' specifications and other data required to demonstrate compliance with the specified requirements.

2. Manufacturers' recommended installation procedures. The Manufacturers' recommended installation procedures when approved by the Architect, will

become the basis for inspecting and accepting or rejecting actual installation procedures used on the work.

E. Boldly note any deviation from the requirements of the contract documents at the front of submittals.

F. Indicate specific items and options when submittal documents include more than the product being submitted.

G. Contractor shall stamp, sign and date the cover of each submittal indicating the submittal has been reviewed and complies with the Contract Documents prior to submittal for review by the Architect. Failure to do so might result in return of the submittal without review. Delay claims caused by such rejections will also be rejected.

1.6 SUBSTITUTIONS: Refer to the Instructions to Bidders and Division 1 for requirements in selecting products and requesting substitutions.

1.7 NAMEPLATE DATA: Provide permanent operational data nameplate on each item of power operated mechanical equipment indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.

1.8 WARRANTIES

A. Refer to Division I for procedures and submittal requirements for warranties.

Refer to individual equipment specifications for warranty requirements.

B. Compile and assemble the warranties specified into a separated set of vinyl covered, three ring binders, tabulated and indexed for easy reference.

C. Provide complete warranty information for each item to include product or equipment to include date of beginning of warranty or bond; duration of warranty or bond; and names, addresses, and telephone numbers and procedures for filing a claim and obtaining warranty services.

D. Guarantee materials and equipment provided and/or installed under this Division against defects in materials or workmanship for a period of one year from the date of acceptance of the Work by the Owner unless specified otherwise. Furnish necessary labor and material to correct reported defects without cost to owner.

1.9 CHANGES TO PIPING: Should the Contractor desire to make changes in the routing or arrangement of the piping, whether for his own convenience, to avoid conflict with the work of other trades, or to conform with codes, such change shall not be made without prior approval of the Architect.

1.10 MATERIALS AND WORKMANSHIP

A. Materials and apparatus required for the work shall be new, of the quality specified, and shall be furnished, delivered, erected, connected and finished in every detail; so selected and arranged as to fit properly into the building spaces. Execute Work in a

thorough, substantial and workmanlike manner, performed by competent workmen. Schedule and perform mechanical work to avoid delays of General Contractor and other Subcontractors.

B. All materials, equipment and accessories installed under this contract, whether submitted or not, shall conform to rules, codes, etc., as recommended or adopted by the National Association governing the manufacture, rating and testing of such material, equipment and accessories. Where directed by the Architect, the Subcontractor shall submit a sample for approval before installation.

1.11 COORDINATION

A. Compare the mechanical drawings and specifications with the drawings and specifications of other trades and report any discrepancies between them to the Architect and obtain from him written instructions for necessary changes in the mechanical work. Install mechanical work in cooperation with other trades installing interrelated work.

B. Before installation, make proper provisions to avoid interferences in a manner approved by the Architect. Changes in the work caused by neglect shall be made at that contractor's expense.

C. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.

D. Coordinate the size and location of concrete equipment pads; anchor bolt inserts, sleeves, and other supports that may be required for Mechanical work.

E. Adjust locations of pipes, ducts, equipment, fixtures, etc., to accommodate the work to avoid anticipated interference and to accommodate structural conditions. Determine the exact route and location of each pipe and duct prior to fabrication.

F. Install Mechanical work to permit removal without damage to other parts of equipment requiring periodic replacement or maintenance. The Contractor shall arrange pipes, ducts and equipment to permit ready access to valves, cocks, traps, starters, motors, control components and to clear the openings of swinging and overhead doors and access panels.

1.12 OPENINGS AND ACCESS

A. Locate equipment which must be serviced, operated or maintained in fully accessible positions. Equipment shall include, but not be limited to, valves, traps, cleanouts, motors, controllers, drain points, dampers, air units and filters. Extend grease fittings to accessible location.

B. Where equipment, valves, damper controls, etc., are concealed in walls or ceilings, furnish access doors and frames. Valves and other devices requiring access above ceiling shall have their locations marked by applying pressure sensitive ½" diameter discs to the T-bar just below the device. Discs are to be color coded to the service.

C. Minor deviations from the Drawings may be made to allow for better accessibility, but changes of magnitude, or which involve extra cost shall not be made without the approval of the Architect.

1.13 GROUNDS, CHASES, SLEEVES AND INSERTS

A. Openings, grounds and curbs will be provided under other Divisions, as directed by this Division, to accommodate the equipment except where noted to be furnished with the equipment. Provide sleeves, inserts and thimbles as required to properly support piping and equipment under this Division.

B. Provide and accurately locate sleeves and inserts in forms prior to concrete placement. Additional cost for cutting of holes as the result of the incorrect location of sleeves shall be the burden of the responsible contractor. Required holes through structural members require approval of the Structural Engineer prior to cutting or drilling.

C. Verify sleeves and openings are properly located prior to casting of concrete and erection of walls, floors and ceilings.

1.14 INSERTS: Adequately fasten supports, guides, brackets and braces to the structures by backing plates, concrete inserts, expansion shields or wedge type devices.

1.15 FLASHING AND COUNTERFLASHING

A. Keep pipes that pass through roofs reasonably distant from walls to permit proper application of base and counterflashing.

B. Flash around pipes passing through roof with sheet lead not less than four (4) pounds to the square foot. The flashing shall extend twelve (12) inches into the waterproofing, run ten (10) inches the pipe and turn over into the pipe cavity, minimum ½".

C. Install appropriately sized pitch pockets with weather flashing around pipes and supports not flashed with lead or other approved weather seal.

1.16 IDENTIFICATION OF PIPING

A. Identify piping by means of colored, waterproof, all-temperature, self-adhering labels and directional arrows.

B. Identify every system by painting with contrasting colors, using minimum 3/4 high stencil letters.

C. Identify every pipe, whether insulated or not. Labels may be omitted from piping in inaccessible chases and furring and where the use is obvious, due to its connection to fixtures and where the appearance would be objectionable in finished rooms.

D. Place identification labels as follows:

1. Near each valve and branch connection

2. Wherever piping emerges or disappears from view when viewed from the floor of the room in which it is installed.

1.17 MARKING STARTERS: Identify each magnetic starter by means of min. 3/16" high letters cut in white laminated phenolic strip to show black letters or the reverse, to best contrast to the color of the starter.

1.18 EQUIPMENT AND CONNECTIONS: Make connections to apparatus, equipment, devices and appliances which normally have such connections or where such are indicated in the Drawings. Provide a stop valve at each such connection, trap drain connections and provide flanges or unions to provide for easy removal.

1.19 CLEANING EQUIPMENT AND SYSTEM

A. Refer to Division 1 for general cleaning requirements. Provide for the safety and good condition of materials and equipment until final acceptance by the Owner. Protect materials and equipment from damage. Provide adequate and proper Storage facilities during the progress of the work. Provide protection to bearings, open connections, pipe coils, pumps, finned heat exchangers, compressors and similar equipment.

B. Remove grease, adhesive labels and foreign materials from fixtures, piping, finished surfaces and equipment.

C. Drain and flush piping of grease and foreign matter. Thoroughly clean pressure regulating assemblies, traps, flush valves and similar items. Remove and thoroughly clean and reinstall liquid strainer screens after the system has been in operation ten (10) days.

D. Clean and purge existing systems as required to restore them to their condition existing prior to the start of work when connections are made to existing systems.

1.20 INSTRUCTIONS

A. Instruct Owner operating personnel on how to start and operate each item of equipment. Point out safety features, particularly the possible troubles which might cause the safety controls not to operate and most probable remedies.

B. Provide written instructions, charts, diagrams, etc. to the Architect as follows:

1. Description of system, including function of each major item of equipment, and its method of control.

2. Detailed operating instructions and instructions for making minor adjustments.

3. Manufacturers' catalog data, service instructions and parts lists for each piece of operating equipment.

4. Approved and corrected wiring and control diagrams.

5. Routine maintenance instructions.

6. Schedule of lubrications.

7. Instructions for emergency action.

1.21 TESTING

A. Pressure test and prove piping systems and equipment tight to satisfaction of the Architect before cover or insulation is applied. Repair or replace piping to correct leaks without additional cost to the Owner. Retest piping after repairs. Perform required tests. Where applicable, schedule tests by the manufacturer. Submit test results for Architect's approval. Hydrostatically test each system as outlined below, but in no case at a pressure less than 50 PSIG unless specifically noted. Maintain test pressure for not less than 2 hours. Do not use tar, grease, paint and other compounds (other than pipe thread compound and Teflon tape applied directly to male threads prior to pipe assembly) to repair leaks.

B. Provide in-service test for equipment to ascertain compliance with specified requirements.

1.22 CHILLED WATER TREATMENT

A. Install ½ NTP treated metering port in chilled water pump return line.

B. Flush and clean complete chilled water system.

C. Pump proper amount of sodium nitrite/borate chemical including a copper corrosion inhibitor into piping system to maintain a sulfite level between 1200 and 2000 PPM. Circulate system for 24 hours. Then begin bleeding off system to remove sludge, silt, etc. Continue until water runs clear. Stop bleed-off at this point and add chemical to maintain nitrite level between 1200 and 1500 PPM.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION