

SECTION 15010 - BASIC MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including The General Conditions of the Contract for Construction, General and Supplementary Conditions and Division-1 Conditions specification sections apply to the Division 15 specifications and drawings.
- B. Related Sections: Refer to all sections in Division 15. Refer to Division 16 specification section and Division 16 drawings.

1.2 SUMMARY:

- A. This Section specifies the basic requirements for mechanical installations and includes requirements common to more than one section of Division 15. It expands and supplements the requirements specified in Division 1.
- B. The Contractor shall coordinate and co-operate with Owner at all times for all new to existing connections, system shutdowns and restart-up, flushing and filling both new and existing systems.
- C. Provide temporary ductwork and piping services where required to maintain existing areas operable, as shown on the drawings.
- D. Coordinate all services shut-down with the Owner, provide temporary services as shown on the drawings.
- E. The Contractor shall be responsible for the maintenance operation and servicing of all new mechanical systems which are to be used by the Owner during the time of any occupancy and use of any areas within the construction limitations before final completion or acceptance of the systems. A written record of maintenance, operation and servicing shall be turned over to the Owner prior to final acceptance.

NOTE: Below items to be used with existing building remodels and additions or where required.

1.3 PROJECT CONDITIONS:

- A. The Contractor shall be required to attend a mandatory pre-bid walk-thru if designated by LPS and shall make themselves familiar with the existing conditions. No additional costs to the Owner shall be accepted for additional work for these existing conditions.
- B. Field verify all existing conditions prior to submitting bids.
- C. Report any existing damaged equipment or systems to the Owner prior to any work.
- D. Protect all mechanical and electrical work against theft, injury or damage from all causes until it has been tested and accepted.
- E. Be responsible for all damage to the property of the Owner or to the work of other contractors during the construction and guarantee period. Repair or replace any part of the work which may show defect during one year from the final acceptance of all work. Provided such defect

is, is in the opinion of the Architect, due to imperfect material or workmanship and not due to the Owner's carelessness or improper use.

1.4 ACCESSIBILITY:

- A. Install equipment and materials to provide required access for servicing and maintenance. Coordinate the final location of concealed equipment and devices requiring access with final location of required access panels and doors. Allow ample space for removal of all parts that require replacement or servicing.
- B. Extend all grease fittings to an accessible location.
- C. Furnish hinged steel access doors with concealed latch, whether shown on drawings or not, in all walls and ceilings for access to all concealed valves, shock absorbers, air vents, motors, fans, balancing cocks, and other operating devices requiring adjustment or servicing. Refer to Division 1 for access door specification and Division 15 for duct access door requirements.
- D. The minimum size of any access door shall not be less than the size of the equipment to be removed or 12 inches x 12 inches if used for service only.
- E. Furnish doors to trades performing work in which they are to be built, in ample time for building-in as the work progresses. Whenever possible, group valves, cocks, etc., to permit use of minimum number of access doors within a given room or space.
- F. Factory manufactured doors shall be of a type compatible with the finish in which they are to be installed. In lieu of these doors, approved shop fabricated access doors with DuroDyne hinges may be used.
- G. Access doors in fire-rated walls and ceilings shall have equivalent U.L. label and fire rating.

1.5 ROUGH-IN:

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
- B. Refer to equipment shop drawings and manufacturer's requirements for actual provided equipment for rough-in requirements.

1.6 REQUIREMENTS OF REGULATORY AGENCIES:

- A. Refer to Division 1.
- B. Execute and inspect all work in accordance with all Underwriters, local and state codes, rules and regulations applicable to the trade affected as a minimum, but if the plans and/or specifications call for requirements that exceed these rules and regulations, the greater requirement shall be followed. Follow recommendations of NFPA, SMACNA, EPA, OSHA and ASHRAE.
- C. Comply with standards in effect at the date of these Contract Documents, except where a standard or specific date or edition is indicated.
- D. The handling, removal and disposal of regulated refrigerants shall be in accordance with U.S. EPA, state and local regulations.

- E. The handling, removal and disposal of lead based paint and other lead containing materials shall comply with EPA, OSHA, and any other Federal, State, or local regulations.
- F. After entering into contract, Contractor will be held to complete all work necessary to meet these requirements without additional expense to the Owner.

1.7 REQUIREMENTS OF LOCAL UTILITY COMPANIES:

- A. Comply with rules and regulations of local utility companies. Include in bid the cost of all valves, valve boxes, meter boxes, meters and such accessory equipment which will be required for the project.

1.8 PERMITS AND FEES:

- A. Refer to Division 1.
- B. The Owner/Contractor shall pay all tap, development, meter, etc., fees required for connection to municipal and public utility facilities.
- C. Contractor shall arrange for and pay for all inspections, licenses and certificates required in connection with the work.

1.9 MECHANICAL INSTALLATIONS:

- A. Drawings are diagrammatic in character and do not necessarily indicate every required offset, valve, fitting, etc.
- B. Drawings and specifications are complementary. Whatever is called for in either is binding as though called for in both.
- C. Drawings shall not be scaled for rough-in measurements or used as shop drawings. Where drawings are required for these purposes or have to be made from field measurement, take the necessary measurements and prepare the drawings.
- D. Before any work is installed, determine that equipment will properly fit the space; that required piping grades can be maintained and that ductwork can be run as contemplated without interferences between systems, with structural elements or with the work of other trades.
- E. Coordinate the installation of mechanical materials and equipment above and below ceilings with suspension system, light fixtures, and other building components.
 - 1. Coordinate ceiling cavity space carefully with all trades. In the event of conflict, install mechanical and electric systems within the cavity space allocation in the following order of priority.
 - a. Plumbing waste, vent piping and roof drain mains and leaders.
 - b. Supply, return and exhaust ductwork.
 - c. Fire sprinkler mains and leaders.
 - d. Electrical conduit.
 - e. Domestic hot and cold water.
 - f. BAS Control Piping or Wiring.
 - g. Fire sprinkler branch piping and sprinkler runouts.
- F. Verify all dimensions by field measurements.

- G. Arrange for chases, slots, and openings in other building components to allow for mechanical installations.
- H. Coordinate the installation of required supporting devices and sleeves to be set in poured in place concrete and other structural components, as they are constructed.
- I. 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.
- J. Coordinate the cutting and patching of building components to accommodate the installation of mechanical equipment and materials.
- K. Where mounting heights are not detailed or dimensioned, install mechanical services and overhead equipment to provide the maximum headroom possible.
- L. Install mechanical equipment to facilitate maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
- M. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
- N. The Contractor shall provide all labor and material necessary but not limited to the starting/stopping of all mechanical equipment, opening/closing of all valves, draining/refilling all mechanical systems and operating/verifying the operation of all mechanical systems controls as required to accomplish all work necessary to meet construction document requirements.

1.10 BELTS, SHEEVES, IMPELLERS:

- A. The Mechanical Contractor shall coordinate with the Test and Balance Contractor and supply correctly-sized drive belts, sheeves, and trimmed impellers.

1.11 EXCAVATING AND BACKFILLING:

- A. General:
 - 1. Provide all necessary excavation and backfill for installation of mechanical work in accordance with Division 2.
 - 2. In general, follow all regulations of OSHA as specified in Part 1926, Subpart P, "Excavations, Trenching and Shoring." Follow specifications of Division 15 as they refer specifically to the mechanical work.
- B. Contact Owners of all underground utilities to have them located and marked, at least 2 business days before excavation is to begin. Also, prior to starting excavation brief employees on marking and color codes and train employees on excavation and safety procedures for natural gas lines. When excavation approaches gas lines, expose lines by carefully probing and hand digging.
- C. Provide all necessary pumping, cribbing and shoring.
- D. Walls of all trenches shall be a minimum of 6 inches clearance from the side of the nearest mechanical work. Install pipes with a minimum of 6 inches clearance between them when located in same trench.

- E. Pipe Trenching:
1. Dig trenches to depth, width, configuration, and grade appropriate to the piping being installed. Dig trenches to 6 inches below the level of the bottom of the pipe to be installed. Install 6 inches bed of pea gravel or squeegee, mechanically tamp to provide a firm bed for piping, true to line and grade without irregularity. Provide depressions only at hubs, couplings, flanges, or other normal pipe protrusions.
- F. Backfilling shall not be started until all work has been inspected, tested and accepted. All backfill material shall be reviewed by the soils engineer. In no case shall lumber, metal or other debris be buried in with backfill.
1. Provide warning tape for marking and locating underground utilities. Tape shall be specifically manufactured for this purpose and shall be polyethylene film, 6 inches wide, 0.004 inches thick and have a minimum strength of 1750' psi. Tape shall carry continuous inscription naming the specific utility.
 - a. Tape shall have magnetic strip and be used for exterior underground system only.
- G. Trench Backfill:
1. Backfill to 12 inches above top of piping with pea gravel or squeegee, the same as used for piping bed, compact properly.
 2. Continue backfill to finish grade, using friable material free of rock and other debris. Install in 6 inch layers, each properly moistened and mechanically compacted prior to installation of ensuing layer. Compaction by hydraulic jetting is not permissible.
- H. After backfilling and compacting, any settling shall be refilled, tamped, and refinished at this contractor's expense.
- I. This contractor shall repair and pay for any damage to finished surfaces.
- J. Complete the backfilling near manholes using pea gravel or squeegee, installing it in 6 inch lifts and mechanically tamping to achieve 95 percent compaction.
- K. Use suitable excavated material to complete the backfill, installed in 6 inch lifts and mechanically compacted to seal against water infiltration. Compact to 95 percent for the upper 30 inches below paving and slabs and 90 percent elsewhere.
- 1.12 CUTTING AND PATCHING:
- A. This Article specifies the cutting and patching of mechanical equipment, components, and materials to include removal and legal disposal of selected materials, components, and equipment.
 - B. Refer to Division 1.
 - C. Do not endanger or damage installed work through procedures and processes of cutting and patching.
 - D. Arrange for repairs required to restore other work, because of damage caused as a result of mechanical installations.

- E. No additional compensation will be authorized for cutting and patching work that is necessitated by ill-timed, defective, or non-conforming installations.
 - F. Perform cutting, fitting, and patching of mechanical equipment and materials required to:
 - 1. Uncover work to provide for installation of ill-timed work;
 - 2. Remove and replace defective work;
 - 3. Remove and replace work not conforming to requirements of the Contract Documents;
 - 4. Remove samples of installed work as specified for testing;
 - 5. Install equipment and materials in existing structures;
 - 6. Upon written instructions from the Owner/Architect/Engineer, uncover and restore work to provide for Owner/Architect/Engineer observation of concealed work.
 - G. Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated, including, but not limited to removal of mechanical piping, heating units, plumbing fixtures and trim, and other mechanical items made obsolete by the new work.
 - H. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
 - I. Provide and maintain an approved type of temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas. Temporary partitions must not impede access to building egress.
 - J. Locate identify, and protect mechanical and electrical services passing through remodeling or demolition area and serving other areas required to be maintained operational. When services must be interrupted, provide temporary services for the affected areas and notify the Owner prior to changeover.
- 1.13 TEMPORARY FACILITIES:
- A. Light, Heat, Power, Etc.:
 - 1. Responsibility for providing temporary electricity, heat and other facilities shall be as specified in Division 1.
 - B. Use of Permanent Building Equipment for Temporary Heating or Cooling:
 - 1. Permanent building equipment shall not be used without written permission from the Owner. If this equipment is used for temporary heating or cooling, it shall be adequately maintained per manufacturer's instructions and protected with filters, strainers, controls, reliefs, etc. Steam and hydronic systems shall be flushed and chemically treated. All filters required for the construction period shall be equivalent to the filters required for the final installation. All filters shall be replaced at the time of substantial completion. The guarantee period of all equipment used shall not start until the equipment is turned over to the Owner for his use.
- 1.14 PRODUCT OPTIONS AND SUBSTITUTIONS:
- A. Refer to the Instructions to Bidders and Division 1. "PRODUCTS, OPTIONS AND SUBSTITUTION".
 - B. Materials and equipment of equivalent quality may be substituted for those scheduled or identified by name on the drawings if so reviewed by the Owner/Architect/Engineer prior to bidding. This may be done by submitting to the Owner/Architect/Engineer at least seven (7)

working days prior to the bid date a letter in triplicate requesting prior review. This submittal shall include all data necessary for complete evaluation of the product.

1.15 MECHANICAL SUBMITTALS:

- A. Refer to the Conditions of the Contract (General and Supplementary), Division 1.
 - 1. All mechanical submittals shall be submitted by specification section submitted at one time. "Piece-Meal" or "Partial" submittals will be returned, unless prior approval from the Engineer has been obtained.[Exception-multiple bid pack process].
 - 2. The Contractor shall identify any "long lead time" items which may impact the overall project schedule. If these submittal requirements affect the schedule, the Contractor shall identify the impacts and confer with the Engineer within two weeks of entering into the contract.
 - 3. At least one copy of the first submittal package shall be provided in expandable, 3 post, hard back binders, sized to fit all future submittals for this job. The cover shall be identified with the job name, Owner's project number, date, prime contractor's name, etc.
 - 4. Each submittal shall be tabbed by the mechanical specification section it is specified in.
 - 5. An index shall be provided which includes:
 - a. Product
 - b. Plan Code (if applicable)
 - c. Specification Section
 - d. Manufacturer and Model Number
 - 6. Fire protection and coordination drawings do not apply to the above. These drawings may be submitted in a separate submittal.
- B. The manufacturer's material or equipment listed in the schedule or identified by name on the drawings are the types to be provided for the establishment of size, capacity, grade and quality. If alternates are used in lieu of the scheduled names, the cost of any changes in construction required by their use shall be borne by Contractor.
- C. All equipment shall conform to the State and/or local Energy Conservation Standards.
- D. Submittal of shop drawings, product data, and samples will be accepted only when submitted by and stamped by the Contractor. Data submitted from subcontractors and material suppliers directly to the Engineer will not be processed unless prior written approval is obtained by the Contractor.
- E. Before starting work, prepare and submit to the Architect/Engineer six (6) sets of all shop drawings and descriptive equipment data required for the project. Unless each item is identified with specification section and sufficient data to identify its compliance with the specifications and drawings, the item will be returned "Revise and Resubmit". Where an entire submittal package is returned for action by the Contractor, the Engineer will mark up two sets, keep one, and return the rest. Continue to submit six (6) sets of any individual shop drawings, product data or samples which were returned without a "make corrections noted" or "no exceptions taken" action, until they are so marked. When a "Make Corrections Noted" is received, make the required corrections for inclusion in the operation and maintenance manual. Submittals marked "Make Corrections Noted" shall not be resubmitted during the submittal process.
- F. The Design Professionals review and appropriate action on submittals, such as shop drawings, product data, samples and other data, as required by the Design Professional, is only for the limited purpose of checking for conformance with the design concept and the information expressed in the contract documents. This review shall not include review of the accuracy or completeness of details, such as quantities, dimensions, weights or gauges, fabrication

processes, construction means or methods, coordination of the work with other trades or construction safety precautions, all of which are the sole responsibility of the Contractor. The Design Professional's review shall be conducted with reasonable promptness while allowing sufficient time in the Design Professional's judgment to permit adequate review. Review of a specific item shall not indicate that the Design Professional has reviewed the entire assembly of which the item is a component. The Design Professional shall not be responsible for any deviations from the contract documents not brought to the attention of the Design Professional in writing by the Contractor. The Design Professional shall not be required to review partial submissions or those for which submissions of correlated items have not been received.

1.16 SPECIFIC CATEGORY SUBMITTAL REQUIREMENTS:

A. Product Data:

1. Where pre-printed data covers more than one distinct product, size, type, material, trim, accessory group or other variation, mark submitted copy with black pen to indicate which of the variations is to be provided.
2. Delete or mark-out portions of pre-printed data which are not applicable.
3. Where operating ranges are shown, mark data to show portion of range required for project application.
4. For each product, include the following:
 - a. Sizes.
 - b. Weights.
 - c. Speeds.
 - d. Capacities.
 - e. Piping and electrical connection sizes and locations.
 - f. Statements of compliance with the required standards and regulations.
 - g. Performance data.
 - h. Manufacturer's specifications.

B. Shop Drawings:

1. Shop Drawings are defined as mechanical system layout drawings prepared specifically for this project, or fabrication and assembly type drawings of system components to show more detail than typical pre-printed materials.
2. Prepare Mechanical Shop Drawings, except diagrams, to accurate scale, min 1/8"-1'-0", unless otherwise noted.
 - a. Show clearance dimensions at critical locations.
 - b. Show dimensions of spaces required for operation and maintenance.
 - c. Show interfaces with other work, including structural support.

C. Test Reports:

1. Submit test reports which have been signed and dated by the firm performing the test.
2. Prepare test reports in the manner specified in the standard or regulation governing the test procedure (if any) as indicated.

D. Required submittals:

1. Provide submittals for each item of equipment specified or scheduled in the contract documents. See table at the end of this section.

E. If more than two submittals (either for product data, shop drawings, record drawings, or test and balance reports) are made by the contractor, the Owner reserves the right to charge the contractor for subsequent reviews by their consultants. Such extra fees shall be deducted from payments by the Owner to the contractor.

1.17 MECHANICAL SYSTEMS COORDINATION DRAWINGS:

- A. Prepare and submit a set of coordination drawings as necessary or required by the Engineer showing major elements, components, and systems of mechanical equipment and materials in relationship with other building components.
- B. Prepare drawings to an accurate scale. Indicate the locations of all equipment and materials, including pipe and duct elevations, clearances for installing and maintaining insulation, servicing and maintaining equipment, valve stem movement, and similar requirements. Indicate movement and positioning of large equipment into the building during construction. Prepare ¼" scale drawings where it is necessary to graphically depict the conditions. All mechanical rooms and shafts shall be drawn in ¼" scale drawings.
- C. The contractor shall be responsible for developing 3D collision check drawings. All structural and architectural elements shall be included on the base drawing. The drawing shall include all components outlined within Divisions 15 and 16.
- D. The ceiling space shall not be "layered" it is the contractors responsibility to offset systems as required to allow installation with the identified ceiling cavity.
- E. Prepare 3D modeling and floor plans, reflected ceiling plans, elevations, sections, and details to conclusively coordinate and integrate all installations. Show work of all trades involved in locations where space is limited, and where sequencing and coordination of installations are of importance to the efficient flow of the work, including (but not necessarily limited to) ductwork, pneumatic tube system, piping, fire protection, electrical conduit, switchgear. Provide coordination drawings for the following:
 - 1. Mechanical equipment room layouts;
 - 2. All equipment and duct/piping distribution installations.
- F. The review of the coordination drawings by the Engineer does not constitute a relief of responsibility of the Contractor or a change to the contract documents. The Contractor shall have sole responsibility in developing a fully coordinated and integrated ceiling cavity.
- G. In general, all "static" piping systems shall be routed as high as possible, i.e. fire protection systems. Keep all equipment in accessible areas such as corridors.

1.18 PRODUCT LISTING:

- A. Prepare listing of major mechanical equipment and materials for the project, within (2) two weeks of signing the Contract Documents and transmit to the Architect. A sample schedule is included at the end of this section to complete this requirement.
- B. Unless otherwise specified, all materials and equipment shall be of domestic (USA) manufacture and shall be of the best quality used for the purpose in commercial practice.
 - 1. Provide all information requested.
 - 2. Submit this listing as a part of the submittal requirement specified in Division 1, "PRODUCTS AND SUBSTITUTION."
- C. When two or more items of same material or equipment are required (plumbing fixtures, pumps, valves, air conditioning units, etc.) they shall be of the same manufacturer. Product manufacturer uniformity does not apply to raw materials, bulk materials, pipe, tube, fittings (except flanged and grooved types), sheet metal, wire, steel bar stock, welding rods, solder, fasteners, motors for dissimilar equipment units, and similar items used in work, except as otherwise indicated.

1. Provide products which are compatible within systems and other connected items.

1.19 SCHEDULE OF VALUES:

- A. Within 30 days of award of this contract, submit a schedule of values, based on the contract amount for the following categories:

1. Site Utilities;
2. Plumbing;
3. Fire Protection;
4. HVAC:
 - a. Equipment,
 - b. Sheet Metal,
 - c. Piping,
 - d. Insulation,
 - e. Test and Balancing,
 - f. Specialty Systems,
 - g. Temperature Controls.
5. Demolition;
 - a. Miscellaneous.

1.20 NAMEPLATE DATA:

- A. Provide permanent operational data nameplate on each item of 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.

1.21 DELIVERY, STORAGE, AND HANDLING:

- A. Refer to Division 1.
- B. Deliver products to project properly identified with names, model numbers, types, grades, compliance labels, and similar information needed for distinct identifications; adequately packaged and protected to prevent damage or contamination during shipment, storage, and handling.
- C. Store equipment and materials at the site, unless off-site storage is authorized in writing. Protect stored equipment and materials from damage, dirt, dust and moisture.
- D. Coordinate deliveries of mechanical materials and equipment to minimize construction site congestion. Limit each shipment of materials and equipment to the items and quantities needed for the smooth and efficient flow of installations.
- E. Provide factory-applied plastic end-caps on each length of pipe and tube, except for concrete, corrugated metal, hub-and-spigot, clay pipe. Maintain end-caps through shipping, storage and handling to prevent pipe-end damage and prevent entrance of dirt, debris, and moisture.
- F. Protect stored pipes and tubes. Elevate above grade and enclose with durable, waterproof wrapping. When stored inside, do not exceed structural capacity of the floor.

- G. Protect flanges, fittings, and specialties from moisture and dirt by inside storage and enclosure, or be packaging with durable, waterproof wrapping.

1.22 RECORD DOCUMENTS:

- A. Refer to Division 1. The following paragraphs supplement the requirements of Division 1.
- B. Keep a complete set of record document prints in custody during entire period of construction at the construction site. Documents shall be updated on a weekly basis.
- C. Mark Drawing Prints to indicate revisions to piping and ductwork, size and location both exterior and interior; including locations of coils, dampers and other control devices, filters, boxes, and similar units requiring periodic maintenance or repair; actual equipment locations, dimensioned from column lines; actual inverts and locations of underground piping; concealed equipment, dimensioned to column lines; mains and branches of piping systems, with valves and control devices located and numbered, concealed unions located, and with items requiring maintenance located (i.e., traps, strainers, expansion compensators, tanks, etc.); Change Orders; concealed control system devices. Changes to be noted on the drawings shall include final location of any piping or ductwork relocated more than 1foot-0inches from where shown on the drawings.
- D. At the completion of the project, obtain from the Architect a complete set of the Mechanical Construction Documents in the electronic format used by the design team. This set will include all revisions officially issued through the Architect. The Contractor shall transfer all revisions noted on the record document prints to the electronic drawings. The Contractor shall transmit the final record documents in the electronic format used on the project to the Architect. This contract will not be considered completed until these record drawings have been received and reviewed by the Architect/Engineer.

1.23 OPERATION AND MAINTENANCE DATA:

- A. Refer to Division 1.

OR

No later than four (4) weeks prior to the completion of the project, make up a minimum of four sets of operating and maintenance manuals, as specified in Sections of Division 1.

- B. The testing and balancing report shall be submitted and received by the Engineer at least fifteen calendar days prior to the contractor's request for final observation time frame requirements. Include in the O & M Manual after review with "No Exceptions Taken" has been accomplished.
- C. In addition to the information required above / by Division 1 for Maintenance Data, include the following information:
 1. Description of mechanical equipment, function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of all replaceable parts.
 2. Manufacturer's printed operating procedures to include start-up, break-in, routine and normal operating instructions; regulation, control, stopping, shut-down, and emergency instructions; and summer and winter operating instructions.
 3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.

4. Servicing instructions, lubrication charts and schedules, including Contractor lubrication reports.
5. Manufacturer's service manuals for all mechanical equipment provide under this contract.
6. Include the valve tag list.
7. Name, Address and Telephone number of party to be contacted for 24-hour service for each item of equipment.
8. Starting, stopping, lubrication, equipment identification numbers and adjustment clearly indicated for each piece of equipment.
9. Complete parts list.
10. Mechanical warranties.

- D. This contract will not be considered completed nor will final payment be made until all specified material, including testing and balancing report, is received in this operating and maintenance report and the manual is reviewed by the Owner/Architect/Engineer.

1.24 LUBRICATION OF EQUIPMENT:

- A. Refer to Division 1. The following paragraphs supplement the requirements of Division 1.
- B. Contractor shall properly lubricate all mechanical pieces of equipment which he provided before turning the building over to the Owner. He shall attach a linen tag or heavy duty shipping tag on the piece of equipment showing the date of lubrication and the type and brand of lubricant used.
- C. Furnish the Engineer with a typewritten list included in the O and M manuals of each item lubricated and type of lubricant used, no later than two (2) weeks before completion of the project, or at time of acceptance by the Owner of a portion of the building and the mechanical systems involved.

1.25 DEMOLITION:

- A. Refer to Division 1. The following paragraphs supplement the requirements of Division 1.
- B. During the demolition phase of this contract it is the responsibility of this Contractor to carefully remove existing equipment, piping or ductwork and related items either as shown on the demolition drawings as being removed, or as required for the work. These items shall be tagged, protected from damage, and stored as directed by the Architect. A list of all items stored shall be turned over to the Architect. At the completion of the remodeling work or when directed by the Architect, all stored items not reused or wanted by the Owner shall be removed from the premises. Disposition of items not reused is by the direction of the Owner/Architect/Engineer.

1. Return existing thermostats and humidistats to the owner.
2. Return all demolished control valves and devices to the Owner.
3. Return existing humidifiers and control valves to the Owner.
4. Return existing plumbing fixtures to the Owner.
5. Return existing unused/not relocated ceiling diffusers to the Owner.

- C. The location of existing equipment, pipes, ductwork, etc., shown on the drawings has been taken from existing drawings and is, therefore, only as accurate as that information. All existing conditions shall be verified from field measurements with necessary adjustment being made to the drawing information.
- D. If asbestos material, in any form, is discovered by this contractor in the process of his work, he shall report such occurrence to the Architect/Owner immediately. The Architect/Owner will

determine the action to be taken for the asbestos removal, which is not a part of the work to be done under this Division.

1.26 WARRANTIES:

- A. Refer to the Division 1 for procedures and submittal requirements for warranties. Refer to individual equipment specifications for warranty requirements. In any case the entire mechanical system shall be warranted no less than one year from the time of acceptance by the Owner.

NOTE: Verify with Owner his preference for Paragraph 1.23,B.

- B. Compile and assemble the warranties specified in Division 15, into a separated set of vinyl covered, three ring binders, tabulated and indexed for easy reference / the operating and maintenance manuals.
- C. Provide complete warranty information for each item to include product or equipment to include date or 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.

1.27 CLEANING:

- A. Refer to Division 1.
- B. Refer to Division 15, "TESTING, ADJUSTING AND BALANCING" for requirements for cleaning filters, strainers, and mechanical systems prior to final acceptance.

1.28 PROJECT CLOSEOUT:

- A. In addition to the requirements specified in Division 1, complete the requirements listed below.
- B. The Contractor shall be responsible for the following Mechanical Checklist either by performing and/or coordinating such items prior to applying for certification of substantial completion.
 - 1. Refer to individual specification sections for additional requirements.

C. Mechanical Checklist

EDIT NOTE: Edit matrix carefully and include X's in boxes where needed especially closeout items.

SPEC SECTION	ITEM	REQUIREMENTS										
		SUBMITTALS			SUPPLEMENTAL		FACTORY REP SUPERVISION AT SITE	**TRAINING REQ=D AT SITE	**EXTRA MATERIAL	At completion of project obtain owners sign off that has received the following:		
		Shop drawings	Product Data	Include in O & M	TEST	REPORT				Training of Product	Extra Materials	Document
15010	SCHEDULE OF VALUES			X		X						
15010	EQUIPMENT WARRANTIES			X								
15010	O&M MANUALS											
15010	COORDINATION DRAWINGS	X										
15010	RECORD DRAWINGS	X	X	X								
15040	MOTORS, STARTERS AND DRIVES	X	X	X	X ⁴	X	X ⁵					
15040	VARIABLE SPEED DRIVES	X	X	X	X	X	X	X	X			
15050	MECHANICAL FIRE STOPPING		X	X				X				
15055	PIPE		X	X	X	X						
15055	PIPE FLUSH/CLEAN			X	X	X						
15055	PIPE DISINFECTION (POTABLE H ₂ O)		X	X	X	X						
15070	SPECIAL PIPING SYSTEMS	X	X	X	X	X	X					
15080	SPECIAL PIPING SYSTEMS	X	X	X	X	X	X					
15100	VALVES		X	X								
15120	PIPING SPECIALTIES		X	X								
15125	PIPE EXPANSION JOINTS		X	X								
15135	METERS AND GAUGES		X	X		X ⁶			X			
15140	SUPPORTS AND ANCHORS	X	X	X								
15190	MECHANICAL IDENTIFICATION		X	X					X			
15241	VIBRATION CONTROL	X	X	X	X	X						

SPEC SECTION	ITEM	REQUIREMENTS										
		SUBMITTALS			SUPPLEMENTAL		FACTORY REP SUPER-VISION AT SITE	**TRAINING REQ=D AT SITE	**EXTRA MATERIAL	At completion of project obtain owners sign off that has received the following:		
		Shop drawings	Product Data	Include in O & M	TEST	REPORT				Training of Product	Extra Materials	Document
15250	MECHANICAL INSULATION		X	X								
15300	FIRE PROTECTION	X	X	X	X	X		X	X			
15320	FIRE PUMPS	X	X	X	X	X		X				
15411	WATER DISTRIBUTION PIPING		X	X	X	X			X			
15420	DRAINAGE & VENT SYSTEMS		X	X	X	X						
15440	PLUMBING FIXTURES		X	X					X			
15453	PLUMBING PUMPS		X	X								
15455	STORAGE TANKS		X	X	X							
15456	WATER TREATMENT	X	X	X	X	X		X	X			
15456	TREATMENT			X				X				
15456	TREATMENT CHEMICALS			X					X			
15456	WATER SOFTENER			X	X	X			X			
15456	SYSTEM CLEANING ¹			X	X	X						
15456	BOILER CLEANING			X		X						
15458	WATER HEATERS		X	X				X				
15459	INTERCEPTORS	X	X	X								
15470	PURE WATER SYSTEMS	X	X	X	X	X	X	X	X			
15483	FUEL OIL SYSTEMS	X	X	X	X			X				
15485	MEDICAL GAS SYSTEMS		X	X	X	X						
15488	NATURAL GAS SYSTEMS		X	X	X	X			X			
15493	LABORATORY DRAINAGE SYSTEMS	X	X	X	X	X	X					
15517	GLYCOL SYSTEMS		X	X	X	X		X	X			
15520	STEAM PIPING	X	X	X	X							
15521	MEDIUM & HIGH TEMP. HOT WATER PIPING	X	X	X	X	X						
15525	STEAM SPECIALTIES		X	X								
15526	CONDENSATE PUMP & REC. SETS		X	X								

SPEC SECTION	ITEM	REQUIREMENTS										
		SUBMITTALS			SUPPLEMENTAL		FACTORY REP SUPER-VISION AT SITE	**TRAINING REQ=D AT SITE	**EXTRA MATERIAL	At completion of project obtain owners sign off that has received the following:		
		Shop drawings	Product Data	Include in O & M	TEST	REPORT				Training of Product	Extra Materials	Document
15535	REFRIGERATION SPECIALTIES		X	X								
15540	HVAC PUMPS		X	X								
15556	BOILERS		X	X		X	X					
15570	BOILER ACCESSORIES		X	X								
15575	BREECHINGS, CHIMNEYS & STACKS	X	X	X								
15580	FEEDWATER EQUIPMENT		X	X			X	X				
15585	DEAERATORS		X	X				X	X			
15620	FUEL-FIRED HEATERS		X	X								
15670	CONDENSING UNITS		X	X		X ¹	X	X				
15675	AIR SOURCE HEAT PUMPS		X	X		X	X	X				
15681	ABSORPTION CHILLERS		X	X	X	X	X	X				
15685	CENTRIFUGAL CHILLER-H ₂ O COOLED			X								
15686	CENTRIFUGAL CHILLERS - AIR COOLED		X	X	X	X	X	X				
15711	COOLING TOWERS		X	X			X	X	X			
15743	AIR COOLED CONDENSERS		X	X		X ¹	X	X				
15755	HEAT EXCHANGERS		X	X					X			
15781	PACKAGED A/C UNITS		X	X					X			
15782	ROOFTOP A/C UNITS		X	X		X ¹		X	X			
15787	COMPUTER ROOM A/C UNITS		X	X		X ¹		X	X			
15810	HUMIDIFIERS		X	X		X ¹						
15830	TERMINAL UNITS		X	X								
15831	ELECTRIC HEATING CABLES		X	X								
15851	AIR HANDLING FANS		X	X				X	X			
15855	AIR HANDLING UNITS	X	X	X				X	X			
15885	AIR CLEANING	X	X	X					X			

SPEC SECTION	ITEM	REQUIREMENTS										
		SUBMITTALS			SUPPLEMENTAL		FACTORY REP SUPER-VISION AT SITE	**TRAINING REQ=D AT SITE	**EXTRA MATERIAL	At completion of project obtain owners sign off that has received the following:		
		Shop drawings	Product Data	Include in O & M	TEST	REPORT				Training of Product	Extra Materials	Document
15891	METAL DUCTWORK	X	X	X	X	X						
15893	NON-METAL DUCTWORK	X	X	X	X	X	X					
15895	HVAC CASINGS	X	X	X								
15910	DUCTWORK ACCESSORIES		X	X		X			X			
15920	SOUND ATTENUATORS		X	X	X							
15932	AIR OUTLETS & INLETS		X	X					X			
15933	AIR TERMINALS		X	X								
15952	CONTROLS AND INSTRUMENTATION - ALARM DEVICES		X	X	X	X		X				
15971	DIRECT DIGITAL CONTROL SYSTEMS	X	X	X		X	X	X				
15972	ELECTRIC CONTROL SYSTEMS	X	X	X		X	X	X				
15973	PNEUMATIC CONTROL SYSTEMS	X	X	X		X	X	X				
15975	SEQUENCE OF OPERATION			X								
15980	REBUILDING OF EXISTING AIR HANDLING UNITS			X								
15990	TESTING ,ADJUSTING AND BALANCING			X		X						
15995	MECHANICAL COMMISSIONING			X		X						

- ¹ Warranty - 5 year
- ² Warranty Report/Warranty
- ³ Kitchen Exhaust Hood
- ⁴ See Specific Specification Section for Test & Certification Requirements
- ⁵ For Soft Starters
- ⁶ Requires Review & Approval from T & B Contractor
- **Requires Owner Sign Off

END OF SECTION 151010