

## **DIVISION 15 MECHANICAL**

### **15500 HEATING AND VENTILATION**

#### Part 1 – General

##### 1.1 WORK

- A. Provide and install heating and ventilation systems as listed in the **Scope** and as specified herein.
- B. Mechanical systems include:
  - Forced warm air: Furnace, ductwork, and air outlets.
  - Hydronic: Boiler, water pumps, water distribution system and radiators.
- C. Mechanical equipment and fittings shall include all trim and related construction as required.
- D. Work involving the removal of asbestos or asbestos containing material shall be in accordance with [Section 02080 Asbestos Removal](#).

##### 1.2 QUALITY STANDARDS

- A. Provide licensed, experienced, well-trained workers competent to complete the work as specified.
- B. Unless approved by the **Inspector**, provide all related products and accessories from one manufacturer.
- C. All work shall comply with manufacturer's instructions and the Wisconsin Uniform Dwelling Code.

##### 1.3 SUBMITTALS

- A. Submit a copy of the heating or boiler permit from the City of Milwaukee to the **Agency** prior to replacing any heating system.
- B. Provide manufacturer's specifications and other data to prove compliance with these **Specifications**.
- C. Submit a list of materials to be provided for this work.
- D. **Contractor** is responsible for informing owner about the safe operation and routine maintenance of the equipment at time of installation.
- E. At the completion of this work, provide copies of manufacturer's installation, maintenance, and any warranty information to the property owner.
- F. **Contractor** shall leave information on, or near the equipment which identifies the **Contractor**, **Contractor's** address, phone number, and date of installation.
- G. Owner Selection Sheet:
  - Do not start work until **Owner** has approved product/type/trim selections in writing (See Appendix A).
  - Provide **Agency** with a completed and signed Owner Selection Sheet.

##### 1.4 MATERIALS HANDLING

- A. Provide all materials required to complete the work as listed on the **Scope** and specified herein.
  - Deliver, store, and transport materials to avoid damage to the product or to any other work.
  - Reject and return any products or materials in a damaged or unsatisfactory condition.
  - Materials and products delivered will be new and certified by the manufacturer to be as specified.
- B. Store materials indoors, protected from dirt, moisture, contaminants, and weather.

##### 1.5 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
  - Maintain an up-to-date copy of the **Scope** on site.
  - Confirm that there is no conflict between this work and the work of other trades.
  - Confirm that there is no conflict between this work and the governing building code.
  - Confirm that the work of other trades that must precede this work has been completed.
  - Meet all requirements to secure warranty.
- B. When the work involves the disturbance of asbestos or asbestos containing material work shall be done in accordance with [Section 02080 Asbestos Removal](#).

## PART 2 – MATERIALS

### 2.1 GAS FIRED-FORCED AIR HEATING

- A. All gas fired-forced air furnaces shall be new and have a 90% minimum AFUE rating unless otherwise specified in the **Scope**.
- Sizing of the unit shall be the responsibility of the **Contractor**.
  - The installation shall comply with all applicable building codes.
  - **Contractor** is responsible for ensuring that the chimney flue is properly sized to ensure adequate draft of other existing appliances, i.e. water heaters, etc.
  - Provide a sheet metal outside mounted filter track with only one open end to install filter.
  - Provide and install compatible thermostat and all necessary wiring.
  - Provide a concrete pad or bricks to raise furnace above basement floor.
  - Provide three (3) properly sized replacement filters.
  - No return air grilles shall be mounted in basement, attic, or other storage areas.
- B. Ductwork.
- Sheet metal ducts shall be galvanized as per ASHRAE and SMACNA standards.
  - Branch ducts must have manually operated dampers.
  - Flexible ductwork shall have a seamless vapor barrier and a minimum of 1 inch fiberglass insulation.
  - Flexible ducts shall be installed as directed by the manufacturer, without sags or kinks.
- C. Forced air system outlets.
- Diffusers and registers shall be replaced as listed in the **Scope**.
  - New diffusers and registers shall match size and configuration of existing duct opening, but still allow for required air flow.
  - Color to be selected by **Owner** in writing see Owner's Selection Sheet (Appendix A).
  - Exterior exhaust and fresh air intake vents shall be as listed by manufacturer.

### 2.2 HYDRONIC HEAT SYSTEMS

- A. All boilers shall be new, designed and tested for a minimum of 82% (gas fired) and/or 84% (oil fired) combustion efficiency based on I=B=R testing procedure.
- The installation shall be in accordance with all manufacturer specifications.
  - The installation shall comply with all applicable building codes.
  - **Contractor** is responsible for ensuring that the chimney flue is properly sized to ensure adequate draft of the boiler and other existing appliances, i.e. water heaters, furnaces, etc.
  - Provide and install compatible thermostat and all necessary wiring.
  - Provide a concrete pad or bricks to raise boiler above basement floor.
- B. Hot water piping system shall be tested to assure proper operation in accordance with boiler manufacturer specifications.
- Replace any defective piping, valves, etc. to assure proper operation of system.
  - Piping systems shall be in compliance with applicable building codes.
  - Piping systems shall be installed per manufacturer's specifications.
  - Piping with exterior covering suspected of containing asbestos shall be left undisturbed. In the event repairs or replacement is necessary to piping covered with material suspected of containing asbestos, the **Contractor** shall notify the **Agency** immediately upon the discovery of the defect.
- C. All radiators shall be new, designed and tested for proper operation in accordance with manufacturer specifications.
- New radiators shall be sized according to manufacturer specifications.
  - Defects found by the **Contractor** in the existing radiators shall be immediately reported to the **Agency**.

### 2.3 GAS SUPPLY PIPING

- A. Gas supply piping shall be steel, Schedule 40 black, malleable iron or forged steel fittings, screwed or welded.
- B. Gas supply piping materials and installation shall comply with all applicable building codes and the standards of the National Fuel Gas Code.
- C. Provide clearly marked, easily accessible, and tested shut off valves as required by the building code.

## 2.4 MATERIALS DELIVERY AND STORAGE

- A. Deliver and transport materials to avoid damage to the product or to any other work.
  - All materials shall be delivered new, in labeled and unopened containers.
  - Material quality shall be as specified on the **Scope** or as specified herein.
  - Reject and return any products or materials delivered in a damaged or unsatisfactory condition.
- B. Store materials indoors, protected from damage, dirt, moisture, contaminants, and weather.

## PART 3 – CONSTRUCTION AND INSTALLATION

### 3.1 INSTALLATION

- A. Install products as per the **Scope**, state building code and as stated herein.
- B. Vents and related support construction for mechanical equipment must be as required by the building code.
- C. Upon completion, secure all required tests, inspections, and approvals of the completed system. Make all required adjustments and corrections at the **Contractor's** expense.
- D. Provide for maintenance of this work for one year following final permit approval by the **Inspector**.

### 3.2 REPAIR AND CLEANUP

- A. After installation, inspect all work for improper installation or damage.
- B. Heating systems shall operate smoothly and provide sufficient heat to all habitable rooms within dwelling.
- C. Repair or replace any defective work as directed by the **Inspector** at the **Contractor's** expense. Repair work shall be undetectable.
- D. Clean the work area and remove all scrap and excess material from the site.

END OF SECTION – 15500 HEATING AND VENTILATION