

# C17-26 GODLEY STATION SCHOOL HVAC REPLACEMENT

## PROJECT MANUAL

### Part 1 — General

#### 1.01 SYSTEM DESCRIPTION

- A. The heat pump system consists of individual water source heat pump units connected to a common water loop. Heat rejection is through a Plate Heat Exchanger connected to Cooling Towers. Install water source heat pump, as indicated on the specifications with capacities and characteristics as listed in the schedule and the specifications that follow. Units shall be horizontal configurations.
- B. Unit shall be supplied completely factory built and capable of operation with an entering water temperature range from 60 to 95 F.
- C. Unit shall be individually packaged with wooden skid covered with protective corner posts and plastic stretch wrapping for maximum protection.

#### 1.02 QUALITY ASSURANCE

- A. A. *Trane* is the Basis of Design manufacturer. Equivalent equipment manufactured by *Daikin* and *Climate Master* that meets performance, capacity, space and other requirements of the design documents shall be acceptable. Compatibility with existing components is key to final selection.
- B. Industry Standards:
  - 1. Comply with applicable provisions of NFPA Standards 90A pertaining to construction and installation of air conditioning units.
  - 2. Provide units which shall comply with applicable portions of UL 465, and with electrical components that bear UL labels.
  - 3. Units shall be rated and certified in accordance with ARI Standard 320-76.
  - 4. Comply with installation requirements of ANSI/ASHRAE 15; *Safety Code for Mechanical Refrigeration*.
  - 5. All equipment listed in this section must be rated in accordance with AHRI/ASHRAE/ISO 13256-1 performance standard, latest edition, and CSA. The units shall have AHRI/ISO, NRTL, and CSA labels.
- C. Units shall be factory tested under normal operating conditions at nominal water flow rates. This testing shall generate a report card to be shipped with each unit stating performance in

both Heating and cooling modes.

- D. Serial numbers will be recorded by factory and furnished to contractor for ease of unit warranty status. Units that are tested without water flow rates are not acceptable.

### 1.03 SUBMITTALS

- A. Submit shop drawings including the following information: specific manufacturer and model numbers, dimensional and weight data, required clearances, materials of construction, capacities and ratings, stages of unloading capacity achievable without hot gas bypass (and with hot gas bypass if applicable), refrigerant type and charge, component information, size and location of piping connections.
- B. Submit unit performance data including: capacity, nominal and operating performance
- C. Submit data on electrical requirements and connection points. Include recommended wire and fuse sizes or MCA, sequence of operation, safety and start-up instructions
- D. Submit manufacturer's installation and start-up instructions, maintenance data, troubleshooting guide, parts lists, controls and accessories
- E. At substantial completion, submit warranty certificate and copy of start-up report.

## Part 2 — Product

### 2.01 EQUIPMENT

#### A. General:

- 1. The horizontal heat pump shall be fabricated from heavy gage galvanized sheet metal with powder coated paint finish on front access panels. All interior surfaces shall be lined with 1/2 in. thick, 11/2 lb. acoustic type fiberglass insulation. All fiberglass shall be coated and have exposed edges tucked under flanges to prevent the introduction of glass fibers into the airstream. All insulation must meet NFPA 90A, UL-181 (air erosion and mold growth), ASTM-C1071, and ASTM 621 and 622.
- 2. Units shall be prewired and pre-charged in factory.

#### B. Unit Cabinet:

- 1. Casing: Unit casing shall be constructed of rigid steel frame with galvanized metal exterior panels attached to framework. The cabinet shall be fully insulated internally with 1/2 inch thick, 1 1/2 pound density fibrous glass secured and coated to prevent detachment and erosion of fibers. Provide a stainless steel IAQ drain pan. : Provide unit factory assembled and pre-wired with filter rack to accommodate 2" thick throwaway filters.
- 2. Units must be field convertible from side to back or back to side discharge with no additional parts or unit structure modification. Units will have factory-installed hanger brackets and isolation grommets.

3. Horizontal units shall have one of the following airflow arrangements: right-discharge/left-return; left-discharge/right-return; back-discharge/left-return; or back-discharge/right-return as shown on the plans.
4. If unit with these arrangements are not used, the contractor is responsible for any extra costs incurred by other trades.
5. Cabinets shall have separate openings and knockouts for entrance of line voltage and low voltage control wiring. Contractor must ensure that units can be easily removed for servicing and coordinate locations of electrical conduit and lights with the electrical contractor.
6. All units must have a minimum of three access panels for serviceability of compressor compartment. If other arrangements make servicing difficult, the contractor must provide access panels and clear routes to ease service. Architect must approve any changes in layout.
7. All units must have an insulated panel separating the fan compartment from the compressor compartment.
8. Units with the compressor in the airstream are not acceptable.

C. Fan and Motor Assembly:

1. Blower Assembly: Blowers shall be direct drive, centrifugal type. Motors shall be ECM type with thermal overload protection. Motors shall have a normal 2-year lubrication capacity and shall be initially lubricated at factory. Provide removable inlet ring to facilitate motor removal.
2. The fan motor shall be 3-speed, permanently lubricated, PSC (permanent split capacitor) type with internal thermal overload protection.
3. Blower shall have inlet rings to allow removal of wheel and motor from one side without removing housing.
4. Units supplied without permanently lubricated motors must provide external oilers for easy service.
5. The fan motor shall be isolated from the fan housing by torsionally flexible isolation grommets. The fan and motor assembly must be capable of overcoming the external static pressures as shown on the schedule.
6. The cfm/static pressure rating of the unit shall be based on a dry coil and a clean filter in place.

D. Refrigerant Components:

Refrigeration Circuit: Compressor shall be 3500 RPM hermetic type with internal and external vibration isolators and overload protection. Provide for a 5 minute delay between compressor start to prevent damage due to short cycling. Expansion device capillary tubes shall meter refrigerant flow between the air and water coils. Pilot-operate 4-way reversing valve shall be hermetic construction with replaceable external solenoid, energized only during cooling season. Air coil shall be seamless copper tubes with aluminum fins. Water to refrigerant heat exchanger shall be the tube-in-tube type designed for 600 PSIG working refrigerant pressure and 400 PSIG working water pressure. Interior water tube shall be copper with a steel outer shell.

E. Drain Pan:

The drain pan shall be constructed of galvanized steel to inhibit corrosion and be fully insulated. Drain outlet shall be located on pan to allow complete and unobstructed drainage of condensate. Vertical units will have a factory-installed trap inside of cabinet. The standard unit will have solid-state electronic condensate overflow protection. A mechanical float switch will be used with the WSHP Open multiple protocol controller option.

F. Filter:

- A. Filters: Shall be 2" pleated minimum MERV 8. Access to filters shall be unrestricted. Provide 3 sets of filters with each unit.

G. Controls and Safeties:

- a. All controls shall be full DDC furnished and installed. A control box shall be located within the unit compressor compartment and shall contain a 50-v transformer, 24-v activated, 2 or 3 pole compressor contactor, terminal block for thermostat wiring and solid-state controller for complete unit operation. Electro-mechanical operation is not acceptable.
- b. Units shall be nameplated for use with time-delay fuses or HACR circuit breakers. Unit controls shall be 24-v and provide heating or cooling as required by the remote thermostat/ sensor.

2. Piping:

- a. Supply and return water connections shall be copper FPT fittings and shall be securely mounted flush to the cabinet corner post allowing for connection to a flexible hose without the use of a back-up wrench.

- b. All water connections and electrical knockouts must be in the compressor compartment corner post as to not interfere with the serviceability of unit. Contractor shall be responsible for any extra costs involved in the installation of units that do not have this feature.

H. Special Features:

Provide the following options and accessories for each unit: fluid differential pressure switch, energy management switch, blower monitor relay, compressor monitor relay, fire alarm relay, phase monitor, fault LED light, 50 VA control transformer, disconnect switch, motorized 2-way / 2-position water control valve, stainless steel hose kits with ball valves, P/T ports, wye strainers with blowdown valves, and automatic flow control valves

**WARRANTY**

Provide Whole Unit, parts and labor, Warranty for the duration of one year from start-up. Warrant that all products are free from defects in material and workmanship and have the capacities and ratings set forth in manufacturer's catalogs and bulletins.

Provide a five year parts warranty on the compressor beginning upon substantial completion of project.