SECTION 23 81 03 - PACKAGED ROOFTOP AIR CONDITIONING UNITS – NON-CUSTOM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Packaged rooftop air conditioning unit (5 tons and smaller).
2. Roof curb.

1.2 REFERENCES

A. Air-Conditioning and Refrigeration Institute:

1. ARI 210/240 - Unitary Air-Conditioning and Air-Source Heat Pump Equipment.
2. ARI 270 - Sound Rating of Outdoor Unitary Equipment.
3. ARI 340/360 - Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment.

B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:

1. ASHRAE 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings.

1.3 SUBMITTALS

A. Product Data: Submit data indicating:

1. Cooling and heating capacities.
2. Dimensions.
3. Weights.
4. Rough-in connections and connection requirements.
5. Duct connections.
6. Electrical requirements with electrical characteristics and connection requirements.
7. Controls.
8. Accessories.

B. Test Reports: Submit results of factory test at time of unit shipment.

C. Manufacturer's Installation Instructions: Submit assembly, support details, connection requirements, and include start-up instructions.

D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

E. Manufacturer’s Field Reports: Submit start-up report for each unit.

1.4 WARRANTY

A. Furnish five year manufacturer's warranty for compressors, heat exchangers and condenser coils.

1.5 MAINTENANCE SERVICE

A. Furnish service and maintenance of equipment for one year from Date of Substantial Completion. Include maintenance items as shown in manufacturer's operating and maintenance data, including filter replacements, fan belt replacement, and controls checkout and adjustments.

B. Furnish 24-hour emergency service on breakdowns and malfunctions for this maintenance period.

PART 2 - PRODUCTS

2.1 ROOFTOP AIR CONDITIONING UNITS

A. Manufacturers:

1. Carrier
2. Trane
3. York

B. Product Description: Self-contained, packaged, factory assembled and wired, consisting of roof curb, cabinet, supply fan, refrigerant cooling coil, compressor, refrigeration circuit, condenser, gas-fired heating section, air filters, mixed air casing, controls, and accessories.

C. Roof Mounting Curb: 14 inch high, galvanized steel, channel frame with gaskets, nailer strips. Full perimeter type for mounting under entire unit.

D. Cabinet:

1. Designed for outdoor installation with weatherproof construction.
2. Panels: Constructed of galvanized steel with baked enamel finish meeting salt spray test in accordance with ASTM B117. Furnish access doors or removable access panels.
3. Insulation: Factory applied to exposed vertical and horizontal panels. Minimum one inch thick neoprene coated glass fiber with edges protected from erosion.

E. Supply Fan: Forward curved centrifugal type, resiliently mounted with direct drive or V-belt drive, adjustable variable pitch motor pulley high efficiency motor. Motor permanently lubricated with built-in thermal overload protection.

F. Evaporator Coil: Constructed of copper tubes expanded onto copper fins. Stainless steel drain pan with piping connection. Factory leak tested under water.

G. Compressor: Hermetically sealed, resiliently mounted with positive lubrication, and internal motor overload protection. Furnish internal vibration isolators, short cycle protection.

H. Refrigeration circuit: Furnish the following for each circuit thermal expansion valve, filter-drier, suction, discharge, and liquid line service valves with gauge ports, high and low pressure safety controls. Dehydrate and factory charge each circuit with oil and refrigerant.

I. Condenser:

1. Coil: Copper tube copper fin coil assembly and coil guard. Factory leak tested under water.
2. Condenser Fan: Direct drive propeller fans statically and dynamically balanced. Wired to operate with compressor. Motor permanently lubricated with built-in thermal overload protection. Furnish high efficiency fan motors.

J. Gas-Fired Heating Section:

1. Fuel: Natural gas if so scheduled.
2. Heat Exchangers: Stainless steel, welded construction.
3. Gas Burner: Induced draft type burner with adjustable combustion air supply, pressure regulator, gas valves, manual shut-off, intermittent spark or glow coil ignition, flame sensing device, and automatic 100 percent shut-off pilot. Require unit fan operation before allowing gas valve to open.

K. Air Filters: 2 inch thick glass fiber disposable media in metal frames. 25 to 30 percent efficiency based on ASHRAE 52.1.

L. Mixed Air Casing:

1. Economizer:
   a. Factory installed fully modulating motorized outside air and return air dampers controlled by dry bulb controller with minimum position setting.
   b. Outside air damper normally closed and return air damper normally open.
   c. Furnish barometric relief damper capable of closing by gravity.
   d. Furnish rain hood with screen.
   e. Provide economizer components and controls.

M. Controls:

1. Furnish control to provide low ambient cooling to 0 degrees F.
2. Furnish low limit thermostat in supply air to close outside air damper and stop supply fan.
3. Furnish terminal strip on unit for connection of operating controls to remote panel.
4. Thermostat: 365 days programmable electronic space thermostat with 1 stage heating and 2 stage cooling with manual changeover and heating setback and cooling setup capability.
5. Furnish interface to Building Automation System.
6. Microprocessor Based Controls:
   a. Factory mounted with the following features:
      1) Monitor each mode of operation.
      2) Evaporator fan status.

3) Filter status.
4) Indoor air quality.
5) Supply air temperature.
6) Outdoor air temperature.

b. Diagnostics for thermostat or temperature sensor commands for staged heating, staged cooling, fan operation, and economizer operation.

c. Zone space temperature sensor to interface with microprocessor controls with Automatic programmable with night setback.

N. Accessories:

1. Convenience Outlet: Factory installed, 115 volt, 15 amp, GFCI type, internally mounted.
2. Roof Curb Adaptor Package: Furnish duct support hardware to adapt unit to existing roof curb.
3. Factory installed ultraviolet C light located downstream of cooling coil.

2.2 ELECTRICAL CHARACTERISTICS AND COMPONENTS

A. Disconnect Switch: Factory mounted, non-fused type, interlocked with access door, accessible from outside unit, with power lockout capability.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Roof Curb:

1. Assemble roof curb.
2. Install roof curb level.
3. Coordinate curb installation and flashing with other trades.
4. Install units on roof curb providing watertight enclosure to protect ductwork and utility services.
5. Install gasket material between unit base and roof curb.

B. Connect units to supply and return ductwork with flexible connections.

C. Install components furnished loose for field mounting.

D. Install electrical devices furnished loose for field mounting.

E. Install control wiring between unit and field installed accessories.

3.2 INSTALLATION - NATURAL GAS HEATING SECTION

A. Connect natural gas piping to unit, full size of unit gas train inlet. Arrange piping with clearances for burner service.

B. Install the following piping accessories on natural gas piping connections.

1. Strainer.
2. Pressure gage.
3. Shutoff valve.
4. Pressure reducing valve.

C. Install natural gas piping accessories above roof and readily accessible.

3.3 MANUFACTURER'S FIELD SERVICES

A. Furnish initial start-up and shutdown during first year of operation, including routine servicing and checkout.

3.4 CLEANING

A. Vacuum clean coils and inside of unit cabinet.

B. Install new throwaway filters in units at Substantial Completion.

C. Install temporary filters during construction period. Replace with permanent filters at Substantial Completion.

3.5 TRAINING

A. Train LAWA Maintenance personnel to adjust, operate and maintain the packaged rooftop air conditioning unit – non custom.

B. Provide a minimum of 12 hours (3 hours) of classroom and hands on training to LAWA Maintenance personnel.

END OF SECTION 23 81 03