

Project: Cherokee Hotel & Casino Expansion

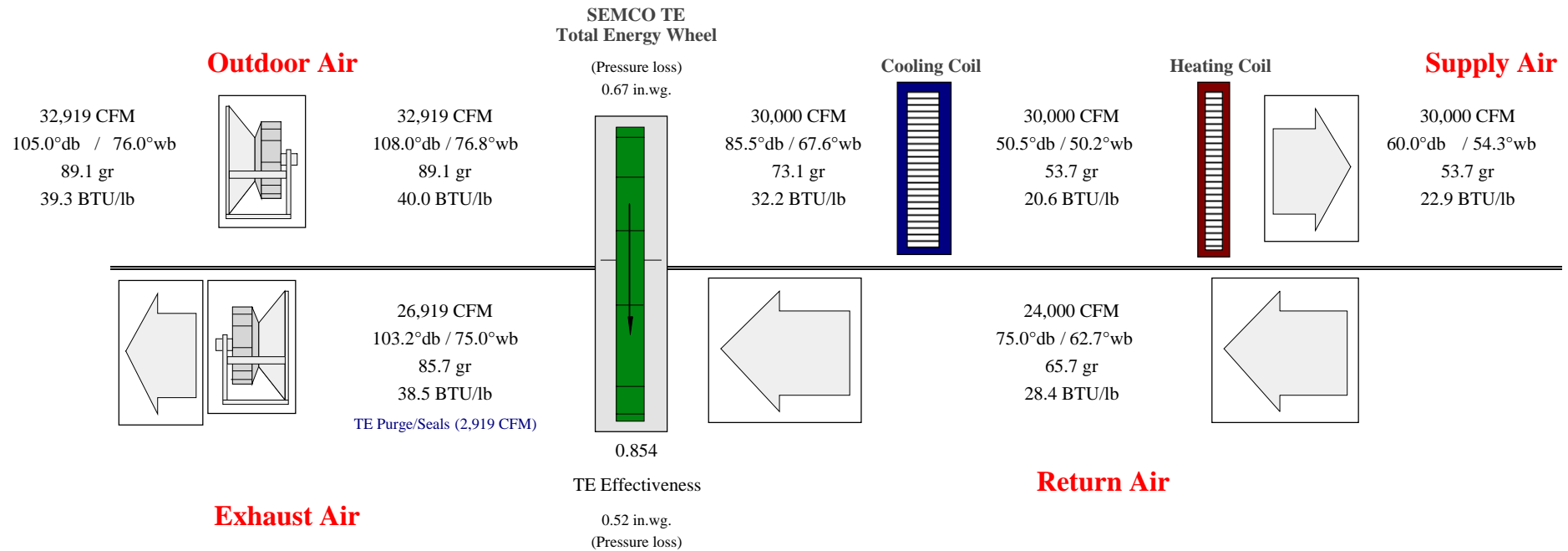
Location: Catoosa, Oklahoma

Model: **EPCH-43**

Operating Mode:

Cooling Season: **Peak Latent**

Unit# **AHU-1,2,3,4**



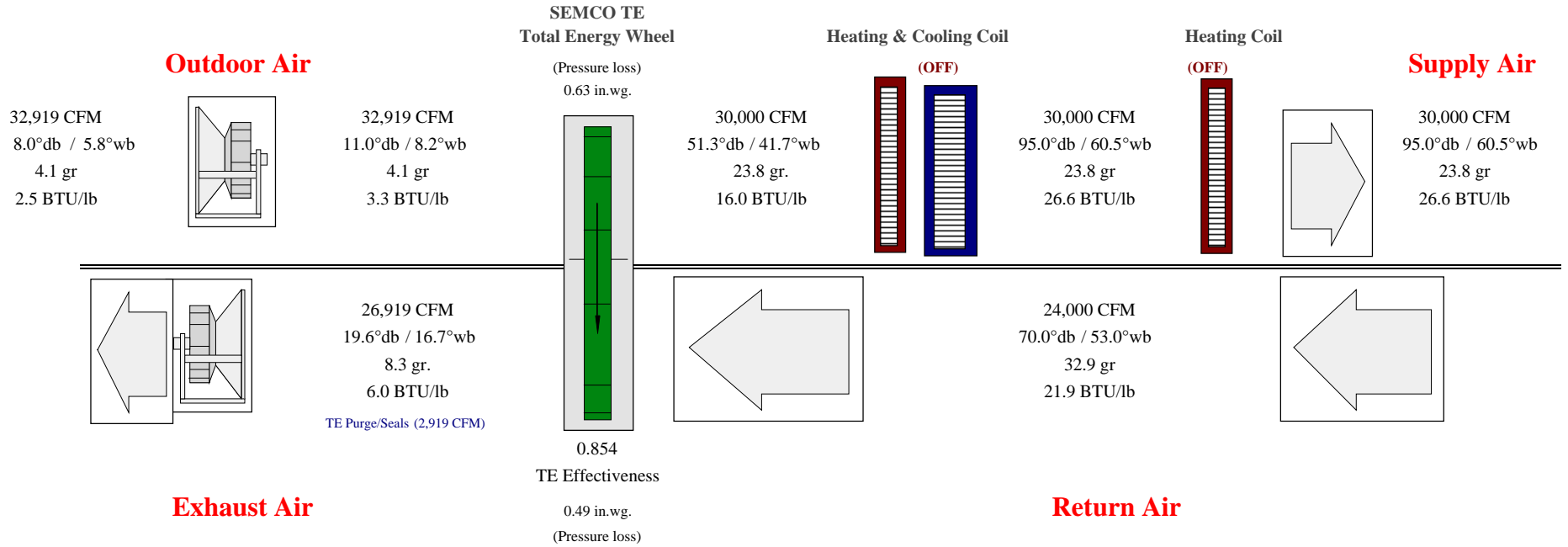
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SPECIFICATIONS

'EP' SERIES ENERGY RECOVERY UNIT

for

Cherokee Hotel & Casino Expansion

Energy recovery units will be SEMCO standard 'EP' series with components as follows:

CASING

Standard panels will consist of 2" thick dual wall 18 gauge galvanized solid exterior skins and 22 gauge galvanized steel solid interior skins enclosing 2 inch thick 3 pcf mineral wool insulation with a U-factor of 0.10 BTU/(hr-sq.ft.-deg). The housing will be supported by a painted structural steel base. The base includes a solid welded floor with 6" thick mineral wool insulation. The bottom face of the insulation will be protected with a 22 gauge galvanized steel cover. The base is to be self flashing when set on a properly sized curb. Floor openings have perimeter lips turned up into unit and are covered by a protective grate. Lifting lugs will be welded to the structural base.

Outdoor installation units will have a factory-installed, 24 gauge galvanized steel sheet metal roof over the casing panel roof. Outdoor air intake and exhaust air discharge openings have galvanized steel sheet metal hoods with openings covered with bird screen. Hoods may ship loose for field installation depending on shipping width restrictions.

Multiple module systems require a U-clip be installed in the roof field joint. The U-clips will be shipped with the unit for field installation over the standing seam at the field joint.

ACCESS

Access will be provided through large hinged, tightly sealed doors or easily removable access panels. Access doors will be constructed of the same materials as the unit casing and use SEMCO's standard hardware. Each door will be provided with two cam type handles and two heavy duty hinges to achieve maximum sealing. Handles are to be internal and external for

opening from the inside or outside of the unit. All doors will be air pressure closing. Removable panels will be provided for heating and cooling coils.

PLENUM FANS

Fan performance is based on tests conducted in accordance with AMCA Standard test code for air moving devices and will bear the AMCA Certified Rating Seal for Air and Sound. Fans have a sharply rising pressure characteristic extending through the operating range and continuing to rise beyond the efficiency peak to ensure quiet and stable operation. Fans will be of the centrifugal PLENUM TYPE, designed without a scroll type housing. Fans will incorporate a non-overloading type backward inclined airfoil blade wheel, heavy gauge reinforced steel inlet plate with removable spun inlet cone, structural steel frame, and shaft and bearings in the AMCA Arrangement 3 configuration to form a heavy duty integral unit.

Wheel - Wheels shall have a spun non-tapered style blade retaining ring on the inlet side to allow higher efficiencies over the performance range of the fan. Sizes 245 and smaller shall have airfoil-shaped extruded aluminum blades. Sizes 270 and larger shall have die-formed airfoil steel blades with the option of extruded aluminum blades. All wheels on direct drive arrangement 4 fans shall have airfoil-shaped extruded aluminum blades. Wheels shall be of welded construction. EPF and EPFN wheels shall have nine blades for high efficiencies. EPQ and EPQN wheels shall have twelve blades for better sound quality. All wheels shall be statically and dynamically balanced on precision electronic balancers to a Balance Quality Grade G6.3 per ANSI/AMCA 204 or better.

Bearings - The fan wheel bearings are heavy duty, grease lubricated, anti-friction ball or roller, self-aligning,

pillow block type and selected for minimum average bearing life (AFBMA L-50) in excess of 200,000 hours at the maximum class RPM.

Fan vibration isolation - Fans assemblies will have adjustable motor bases, motors and V-belt drives mounted with the assembly mounted on spring isolators with flexible connections between fan and fan wall. Drive belts will be designed for a minimum 1.4 service factor. Drives shall be fixed pitch.

Motors - Fan motors will be standard NEMA frame, EPACT compliant, with 1.15 service factor and open drip-proof enclosures.

ENTHALPY RECOVERY WHEEL

The rotor media will be made of aluminum, which is coated to prohibit corrosion. All media surfaces will be coated with a non-migrating solid adsorbent layer prior to being formed into the honeycomb media structure to insure that all surfaces are coated and that adequate latent capacity is provided. The media has a flame spread of less than 25 and a smoke developed of less than 50 when rated in accordance with ASTM E84. In addition to the desiccant coating that is applied to the surfaces of the aluminum substrate, the tow faces of the total energy recovery wheel is covered and sealed with a two part polymer heavy duty coating specifically chosen for chemical resistance.

The desiccant is inorganic and specifically developed for the selective adsorption of water vapor. The desiccant utilizes a 3A molecular sieve certified by the manufacturer to have an internal pore diameter distribution, which limits adsorption to materials not larger than the critical diameter of a water molecule (2.8 angstroms).

Equal sensible and latent recovery efficiencies are documented through a certification program conducted in accordance with ASHRAE 84-78P and the results presented in accordance with ARI 1060 standards. The certification has been conducted by a qualified independent organization.

Independent wheel testing from a credible test laboratory documents that the desiccant material utilized does not transfer pollutants typically encountered in the indoor air environment. The cross-contamination and performance certification reports will be provided upon written request for engineering review.

Media Cleaning - The media shall be cleanable with low pressure steam (less than 5 PSI), hot water or light detergent, without degrading the latent recovery. Dry particles up to 800 microns will freely pass through the media.

Purge Sector - The unit is provided with a factory set, field adjustable purge sector designed to limit cross contamination to less than .04 percent of that of the exhaust airstream concentration when operated under appropriate conditions.

Rotor Seals - The rotor is supplied with labyrinth seals only, which at no time are required to make contact with any rotating surface of the exchanger rotor face. These multi-pass seals will utilize four labyrinth stages for optimum performance.

Rotor Support System - The rotor media is provided in segmented fashion to allow for field erection or replacement of one section at a time without requiring side access. The media is rigidly held by a structural spoke system made of extruded aluminum.

Rotor Housing - The rotor housing is a structural framework, which limits the deflection of the rotor due to air pressure loss to less than 1/32". The housing is made of galvanized steel to prevent corrosion. The rotor is supported by two pillow block bearings

which can be maintained or replaced without the removal of the rotor from its casing or the media from its spoke system.

Drive System - The rotor is driven by a v-belt system. A/C motors are utilized for both constant and variable speed applications.

Wheel Control System - See the wiring schematic and 'Sequence of Operation' for information on wheel control.

PRE-FILTERS (return & outside air)

Filters will be Farr type 30/30. Air filters will be 2" thick, pleated, disposable type. Each filter will consist of a non-woven cotton and synthetic fabric media, media support grid and enclosing frame. The filter media will have an average efficiency of 25-30% on ASHRAE Test Standard. The filter is listed by Underwriters' Laboratories as Class 2. A bank of galvanized universal holding frames will be arranged for upstream access. Provisions will be made on the downstream side of the frames to prevent filter blowout from moisture or overloading.

CHILLED WATER COIL

Primary surface is round seamless 5/8" O.D. by .020" thick copper tube on 1.5" centers, staggered in the direction of airflow. All joints will be brazed.

Secondary surface will consist of .0060" rippled aluminum plate fins for higher capacity and structural strength. Fins will have full drawn collars to provide a continuous surface cover over the entire tube for maximum heat transfer. Bare copper tube will not be visible between fins and the fins will have no openings punched in them to accumulate lint and dirt. Tubes will be mechanically expanded into the fins to provide a continuous primary to secondary compression bond over the entire finned length for maximum heat transfer rates.

Casings will be constructed of continuous galvanized steel. Coil side plates will be of reinforced flange type.

Coils will have equal pressure drop through all circuits. Coils will be circuited for counterflow heat transfer to provide the maximum mean effective temperature difference for maximum heat transfer rates.

Headers on coils will be seamless copper tubing. The headers will have intruded tube holes to provide a large brazing surface for maximum strength and inherent flexibility. Supply and return connections will be steel with male pipe threads.

The complete coil core will be tested with 315 psig air pressure under warm water and be suitable for operation at 250 psig working pressures. Individual tube test and core tests before installation of headers will not be considered satisfactory. Water cooling coils will be circuited for drainability. Use of internal restrictive devices to obtain turbulent flow will not be acceptable. Vents and drains will be furnished on all coils. Coils will be rated in accordance with ARI.

Coils will be mounted in galvanized holding racks. Water coil supply and return connections will be extended to the unit exterior. Water coil drain and vent connections are accessible inside the unit and are not extended. Cooling coils will be mounted in an insulated pitched 304 stainless steel condensate pan. Banks with more than one coil high will have insulated intermediate 304SS condensate pans individually piped to the lower pan.

HOT WATER COIL

Primary surface will be round seamless 5/8" O.D. by .020" thick copper tube on 1.5" centers, staggered in the direction of airflow. All joints will be brazed.

Secondary surface will consist of .0075" rippled aluminum plate fins for higher capacity and structural strength. Fins will have full drawn collars to provide a continuous surface cover over the entire tube for maximum heat transfer. Bare copper tube will not be visible between fins and the fins will have no openings punched in them to accumulate lint and