GENERAL:

This section provides criteria for the design and installation of air to air energy recovery units.

DESIGN GUIDELINES:

A. Design General

1. General Criteria
   1.1 Consultant shall provide calculations to determine whether high pressure seals are required.
   1.2 Ductwork shall be configured to allow all four airflows to be measured per the airflow device's manufacturer's recommendations.

2. Location
   2.1 For new construction, and existing buildings where possible, locate all heat recovery units inside the building or in a penthouse. Rooftop locations are not preferred.
   2.2 Exterior units will be designed specifically for outdoor installation.
   2.3 Where exterior equipment is to be located above a roofing system, adequate space shall be provided below equipment to allow for roof maintenance as specified by NRCA Roofing Manual. Avoid multiple rooftop penetrations.
   2.4 Vibration and sound transmission from mechanical equipment will not exceed ASHRAE sound criteria.

3. Filters
   3.1 Outside and return air inlets shall have galvanized steel filter racks
   3.2 Provide 2" disposable-type pleated air prefilters rated at MERV 7 as a minimum.
   3.3 Provide filter gauges at each filter bank.

4. Internal Access
   4.1 All units shall be provided with access sections to enable inspection, cleaning and repair of individual components.
   4.2 **MINIMUM WIDTH OF ACCESS SECTION SHALL BE 24".**

5. External Maintenance Access Requirements
   5.1 Access and service space shall comply with International Mechanical Code, section 306.
   5.2 All HVAC equipment will be located to facilitate accessibility, maintainability and replacement. Minimum clearance on the side for wheel access, filter access or coil access is 48". All other sides must have a minimum of 24" to walk around the unit.
   5.3 All coils within energy recovery units, will be capable of being pulled without obstruction of equipment, pipes, conduit, etc. Two units may share the same

coil pull space. Coil pull space may utilize a double-wide mechanical room door if the mechanical room is not large enough.

5.4 Mechanical contract drawings shall show the access areas as a hatched area adjacent to the unit. Access doors shall also be shown at all required locations. A plan and elevation view of each air handling unit is required.

5.5 All mechanical equipment/systems will be installed on a 4" minimum concrete housekeeping pad, and where required, steel support framing as required to allow for proper housekeeping.

5.6 Future replacement of the entire unit shall be considered.

SPECIFICATION REQUIREMENTS:

A. The following statements shall be included in the contract specification:

1. Access limitations on replacement units: Replacement Energy Recovery Units may be restricted to existing size limitations. Units which exceed these limitations cannot be considered as they will not fit in the existing locations. The size limitations are indicated on the attached data sheets.

2. Unit Construction
   2.1. Unit casing panels shall consist of formed and reinforced exterior 18 gage galvanized steel panels, 2 inch thick, 3.0 lb/cu ft density, fiberglass insulation and an interior 20 gage G90 solid galvanized steel liner. Internal partition shall shall be constructed in the same manner as the unit cabinet.
   2.2. Access doors shall be insulated double wall construction. Latch handles, Ventlock 310 or equal, shall provide positive closure to prevent leakage. Door hinges shall be securely fastened to unit casing. Tack welds are not acceptable. Door gaskets shall be a minimum of 3/8 inch around the entire door perimeter.
   2.3. Unit sections with access doors shall be provided with floors capable of supporting maintenance personnel.
   2.4. Provide a service light in all accessible sections and the fan cabinet.
   2.5. Provide a double wall, internally insulated, sloped stainless steel drain pan.

3. Wheel
   3.1. Wheel assembly shall be ARI Certified (Standard 1060) and tested in accordance with ASHRAE 84-91.
   3.2. An access section shall be provided both upstream and downstream of the wheel for servicing.
   3.3. All surfaces shall be permanently bonded with a non-migrating desiccant specifically developed for water vapor transfer.
   3.4. Wheel shall transfer heat between airstreams in a counter flow configuration.
   3.5. Wheel cleaning shall be with low pressure air or vacuum cleaner.
   3.6. Dry particles up to 1,200 microns shall pass through the wide angle media minimizing air pressure drop.

4. Frost Control
   4.1. Provide hot water heating coil for frost protection.

5. Coils
   5.1 All coils shall have a minimum of .025" tube wall thickness and 5/8" O.D. minimum diameter. All coils shall have copper coils, aluminum fins, and non-ferrous headers.
   5.2 Coils shall be a maximum of 8 rows and a maximum of 10 fins/in.

Schedule to be Included in the Drawings

TAG NO.		
MANUFACTURER/MODEL #		
WHEEL PERFORMANCE	**Supply Side**	**Exhaust Side**
ENTERING AIRFLOW (CFM)		
PURGE AIRFLOW (CFM)		
LEAVING AIRFLOW (CFM)		
SUMMER PERFORMANCE		
FACE VELOCITY (FPM)		
AIR PRESS DROP (IN. W.G.)		
ENT. AIR TEMPERATURE DB/WB (°F)		
LV. AIR TEMPERATURE DB/WB (°F)		
SUMMER SENSIBLE EFF (%)/MBH SAVED		
SUMMER LATENT EFF (%)/MBH SAVED		
SUMMER TOTAL EFF (%)/MBH SAVED		
WINTER PERFORMANCE		
FACE VELOCITY (FPM)		
AIR PRESS DROP (IN. W.G.)		
ENT. AIR TEMPERATURE DB/WB (°F)		
LV. AIR TEMPERATURE DB/WB (°F)		
WINTER SENSIBLE EFF (%)/MBH SAVED		
WINTER HUMIDITY RECOVERED (LB/HR)		

HEATING COIL TYPE		
CFM		
MAX FACE VEL. (FPM)		
AIR PRESS DROP		
MIN. CAPACITY, TOTAL (BTUH)		
FLUID TYPE		
ENT. AIR TEMP DB/WB (°F)		
LV. AIR TEMP DB/WB (°F)		
ENT WATER TEMP (°F)		
LV WATER TEMP (°F)		
WATER PRESS DROP (FT)		
WATER FLOW (GPM)		
FILTER SECTION		
FILTER TYPE / DEPTH		
FILTER PRESS DROP - CLEAN/DIRTY		
FILTER EFFICIENCY/ARRESTANCE		

REFERENCES