



Installation and Maintenance Manual

IM 770-3

Group: Applied Air Systems

Part Number: IM 770-3

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Skyline® Outdoor Air Handler

Roof Curb



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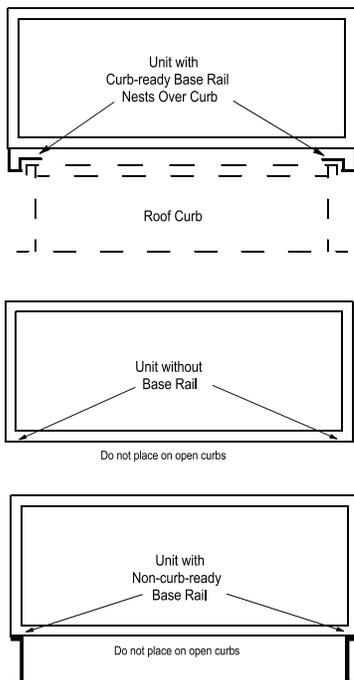
General Description

Curb-Ready Air Handler

The Skyline® outdoor air handler unit can be equipped with a base assembly that provides a mechanical fit and seal to the building's Island Roof Curbing. Skyline outdoor air handlers must be ordered from the factory with one of two possible options in order to mount the unit on a roof curb. The first options are the curb ready base option where the unit will be delivered in multiple pieces and will have to be assembled on the roof curb. The second option is the unitized base option where the unit will be delivered, lifted, and installed on the roof curb as a single piece. Neither base is available for field application to the air handler.

Figure 1 shows various base rail options for Skyline outdoor air handlers. Units that do not have base rails and units with standard base rails must NOT be used with open curbs of any type.

Figure 1: Base Rail Options



The information provided in these instructions describes the curb kits that are ordered and provided with the Skyline outdoor air handler. The curb kits are intended to be installed as described and are not intended to be modified or used in conjunction with other curb mounting features or apparatus.

The dimensional and support requirements are outlined to provide a basis for field designed and applied roof curbs. It is important that the weight and strength factors be carefully followed when applying this roof curb and any curbs that may be field designed.

The curbing must support the air handler uniformly to keep the cabinet square and true. Uneven curbing support can cause distortion of the cabinet and the door openings.

Unit location

The structural engineer should be involved to verify that the roof has adequate strength and ability to minimize deflection. Extreme caution should be taken when using a wooden roof structure. Units should also be located away from building flue stacks or exhaust ventilators to prevent possible entry of contaminated air through the outside air intake. Sufficient space should also be allowed around the unit for service clearance.

Locating the unit away from occupied spaces and over utility areas, corridors, and auxiliary spaces will help reduce the transmission of sound and vibration to occupied spaces. A concrete deck or pad is recommended when the unit is located over an occupied space where good acoustics are essential.

See the installation instructions (IM 777) for more details on locating units.

Curbing Kit

The Skyline air handler roof curb kit is shipped unassembled and requires field assembly and attachment to the field designed building structural support. The building structural supports for curb mounted units must be approved by qualified individuals. It is important to follow all building codes and roofing standards.

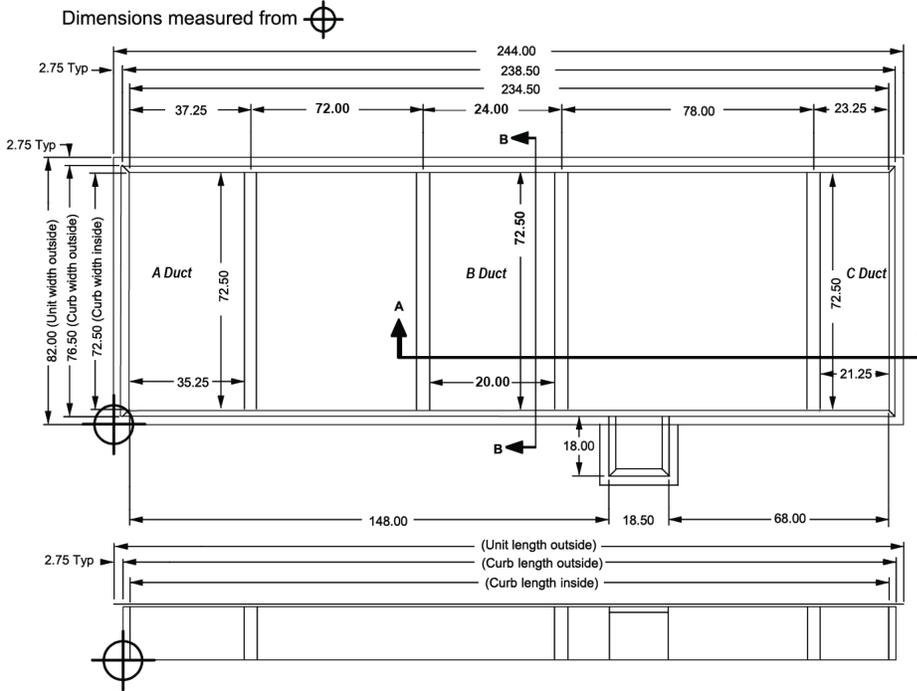
The unit dimensions, weights and component details are provided within the submittal documents and are unique for each unit. The submittal documents also indicate the functional components within the air handler. While the total weight of each unit section is shown in the submittal documents, the locations of coils, motors and fans can cause part of the load to be concentrated in one area of an air handler section. Appropriate safety factors should be used to account for the weight distribution in determining structural load.

Allowance must be made for routing the air ducts through the roof curb. Refer to the submittal data for each unit for the proper dimensions of duct openings prior to installing ductwork. Figure 2 shows a typical submittal drawing for a curb-ready Skyline air handler. The unit submittal drawing illustrates the roof curb layout of the unit. The drawing shows the outline of the air handler unit, the outside dimension of the curbing top flange and the inside dimension of the curbing. The Skyline units may have piping vestibule sections included as part of the unit selection and the roof curb will also have a vestibule curbing section attached to it. The submittal drawing shows the location and dimensions for the piping vestibule.

The submittal drawings also show the locations and dimensions of the air duct passages in the roof curb. The roof curb may be ordered as a unit option or it can be field supplied. View A shows a side view of the cabinet and View B shows an end view. If the unit is ducted in the middle (not adjacent to the curb), no allowances are required (View C).

Figure 2: Typical Submittal Drawing and Air Duct Allowances through the Roof Curb

| Opening | X | Y | W (Width) | H (Height) |
|---------|------|------|-----------|------------|
| A Duct | 4.75 | 4.75 | 78 | 38 |
| B Duct | 116 | 4.75 | 78 | 20 |
| C Duct | 218 | 4.75 | 78 | 24 |



View A - Abridged Side view of "B Duct" and "C Duct"

Note that the inside of the curbing is 4.75 inches from the side of the unit.

View B - End View of "B Duct"

Note that the inside of the curbing is 4.75 inches from the outside of the unit on both sides.

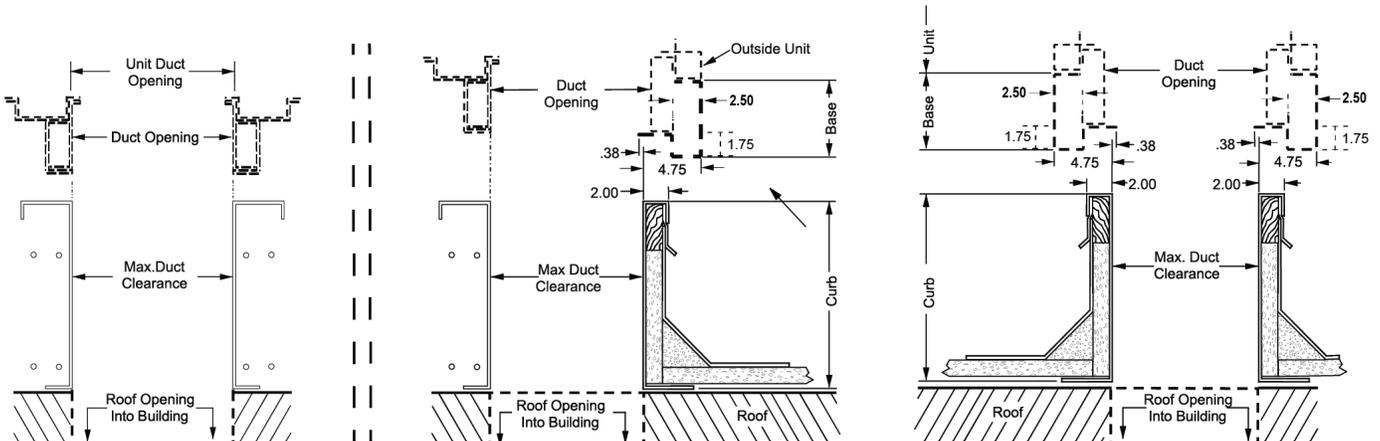


Figure 3: Curb-ready Base Mounted on Curb - Cabinet Duct End Custom Opening (Side View)

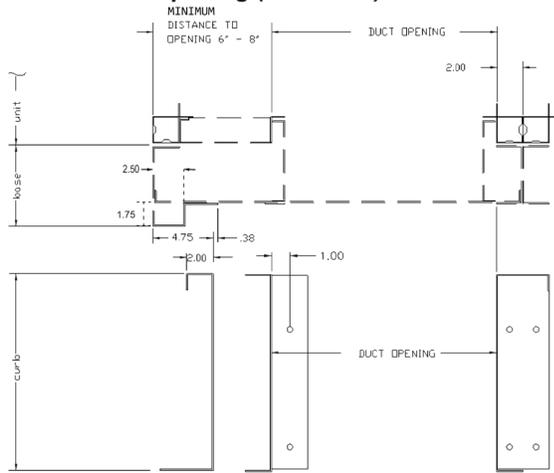


Figure 5: Curb-ready Base Mounted on Curb - Cabinet Duct Width Custom Opening (Side View)

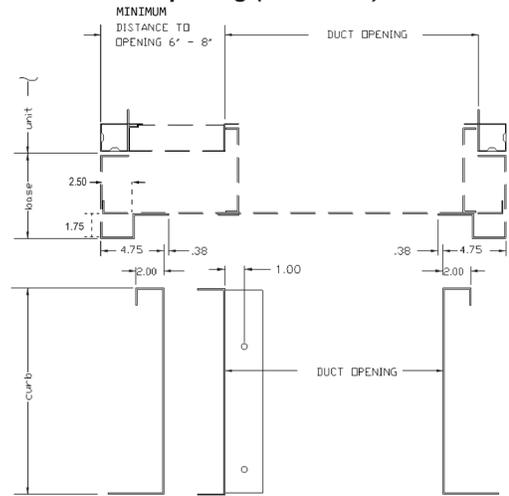


Figure 4: Curb-ready Base Mounted on Curb - Cabinet Duct Center Custom Opening (Side View)

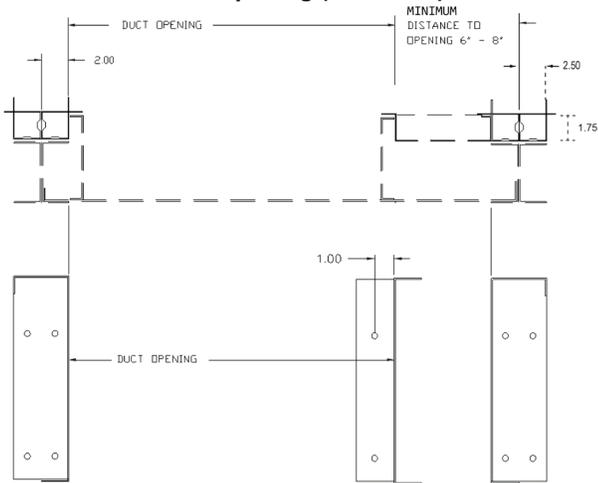
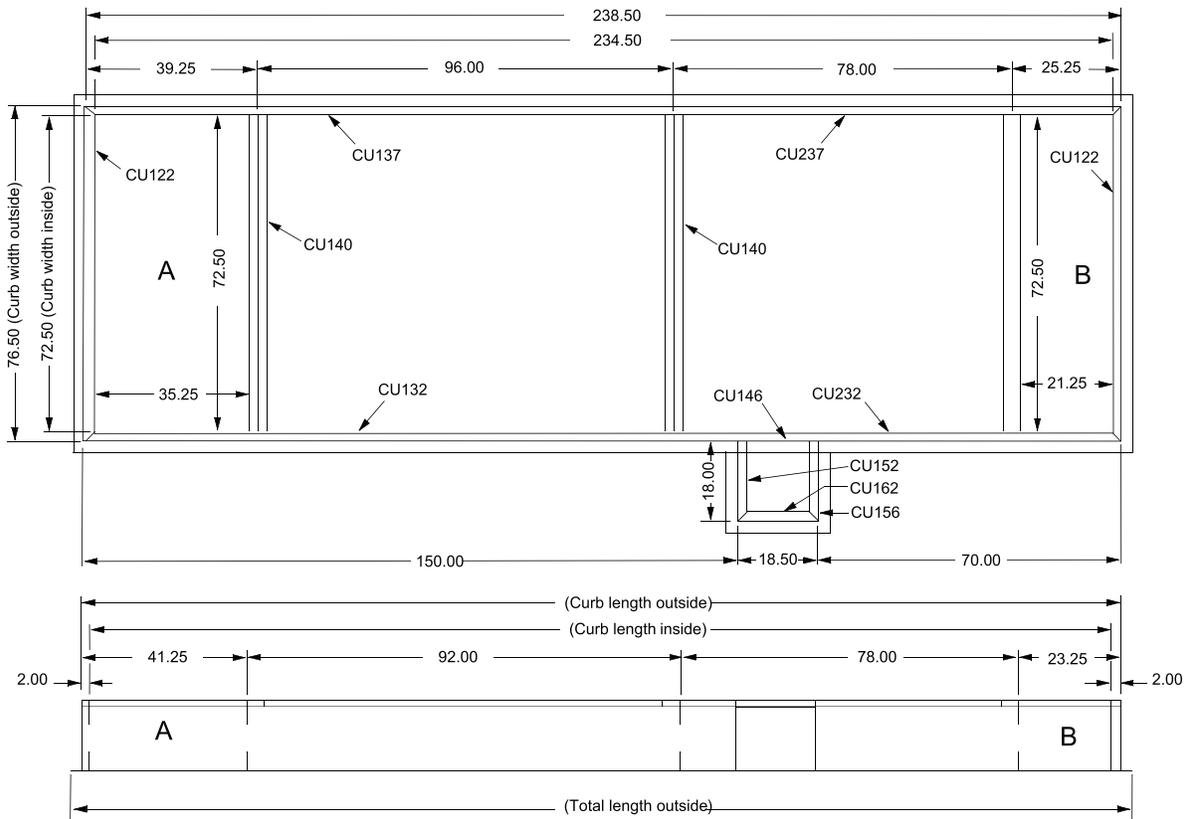
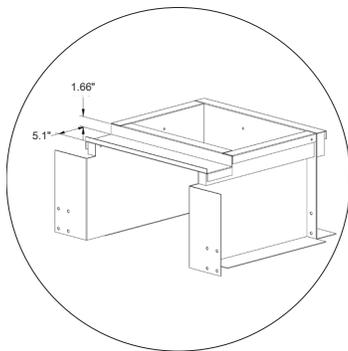


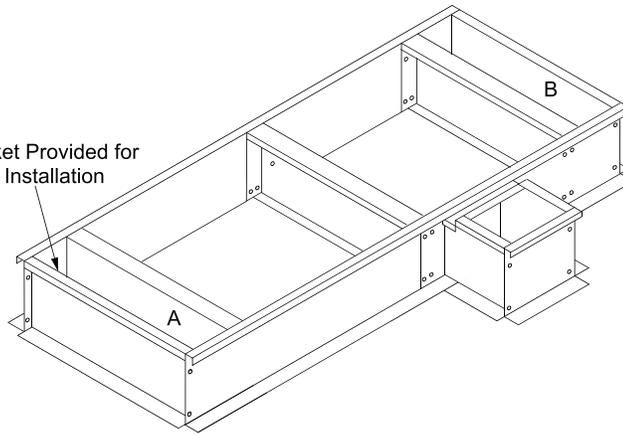
Figure 6: Roof Curb Features



Unitized Base Vestibule Assembly



Gasket Provided for Field Installation



Curb-ready Base Vestibule Assembly

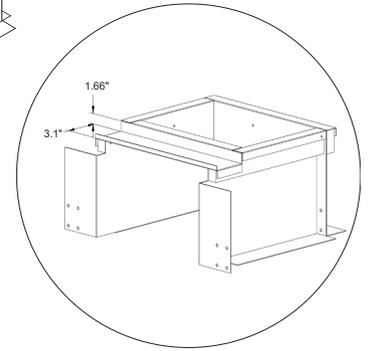


Figure 6 illustrates the features of the roof curb. Intermediate support channels are provided for support of the supply and return air ducts. If the curbing is field supplied, the duct supports can be provided in accordance with the installation requirements.

Intermediate supports are provided in the curb assembly at all points where the curb rails require two sections to be joined. For field provided roof curbs, it is recommended that intermediate supports be incorporated as appropriate for lateral rigidity of the roof curbs.

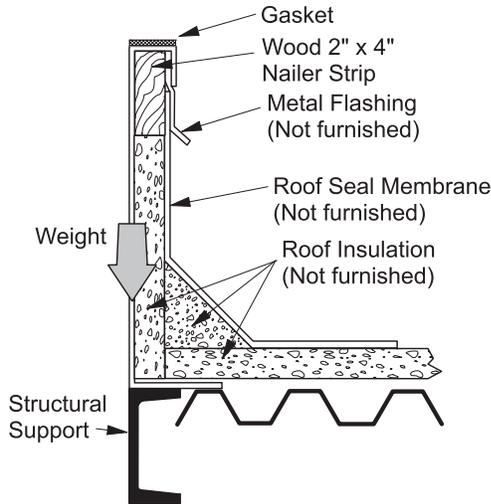
Intermediate supports are also provided on roof curbs that are over 107 inches wide. These supports are required at all points where the roof curb sides are joined. Support is also required at the entering and leaving edges of cooling coil sections, fan sections, and heat wheel sections. These intermediate supports are required on all wide unit curbs to provide support to the unit across the open span of the curb.

Installation

Curbing Kit Assembly

The weight of the unit is concentrated and supported at the inside wall of the roof curb. The structural system of the building and the interface with the curb must provide support at the points of concentrated loads. See Figure 7.

Figure 7: Weight of unit on roof curb



Each curb kit contains a hardware package. The package contains 3/8–16 × 1" bolts and nuts for assembly of the curb. Two 1/4–20 × 1/2" screws are included when the unit has a vestibule. Rolls of gasket are included to cover the top surfaces of the curb and supports.

The hardware kit includes a layout and assembly drawing of the curbing with a sketch of the assembly.

Compare the curb layout drawing to the submittal documents for the air handler to confirm that the details match.

Figure 6 illustrates a typical layout drawing of the roof curb. Note that each air handler will have a dedicated drawing that corresponds with the features that are included in the unit.

The curbing parts should be laid out according to the assembly drawing. The drawing shows dimensions of the parts and locations of intermediate cross members. The curb parts have labels attached that correspond with the locations of the parts. Parts that are identical have the same part numbers. End parts have number CU122 and center supports have number CU140.

The side supports are shown with sequential numbers CU137, CU 237 and so on for parts on one side of the drawing. Likewise, parts on the other side have sequential numbers CU 132, CU 232 in progression. The curb parts for the vestibule are marked with labels CU 152, CU 156 and CU162.

The dimensions for the locations of all parts are shown and should be checked carefully for proper assembly order.

Assemble the curb with the 3/8 inch diameter bolts and nuts

that are provided. Always check the dimensions of the curb before final installation to the roof and building structure. Also check to be sure the curb is square and level.

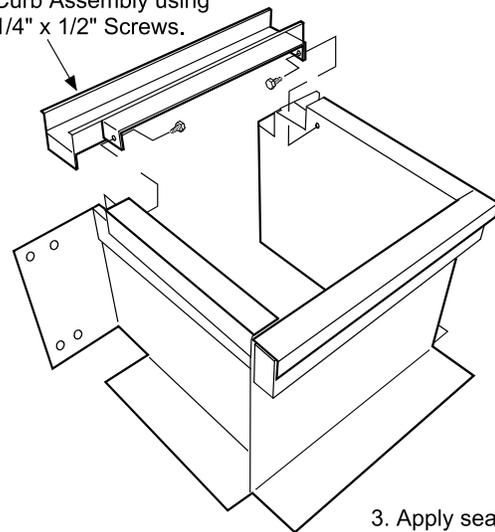
Roof curbs with a Vestibule Assembly

NOTE: The vestibule assembly channel, part number CU146 must be attached to the vestibule curb assembly before the vestibule assembly is attached to the main roof curb. Use two 1/4 × 1/2 screws to attach the channel.

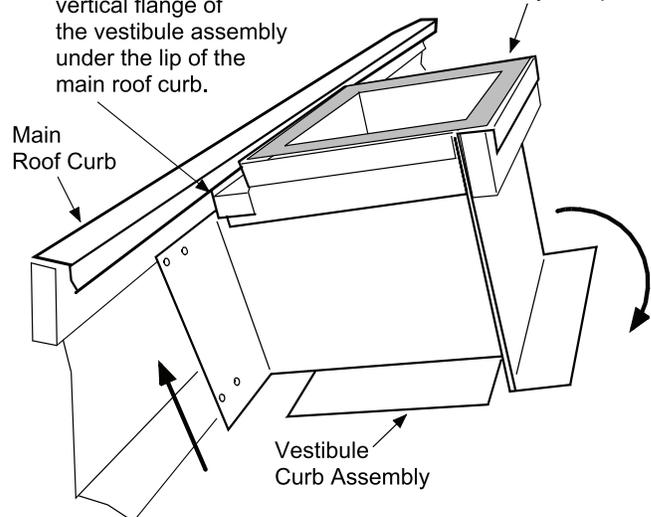
The vestibule assembly is then attached to the main roof curb by sliding the rear vertical flange of the vestibule curb under the lip of the main roof curb. Apply sealant and gasket material after the vestibule curb is in place. See Figure 8.

Figure 8: Install Vestibule Assembly on Main Roof Curb

1. Assemble Channel CU146 to Vestibule Curb Assembly using 1/4" x 1/2" Screws.



2. Slide the rear vertical flange of the vestibule assembly under the lip of the main roof curb.
3. Apply sealant and gasket after Vestibule Curb Assembly is in place.

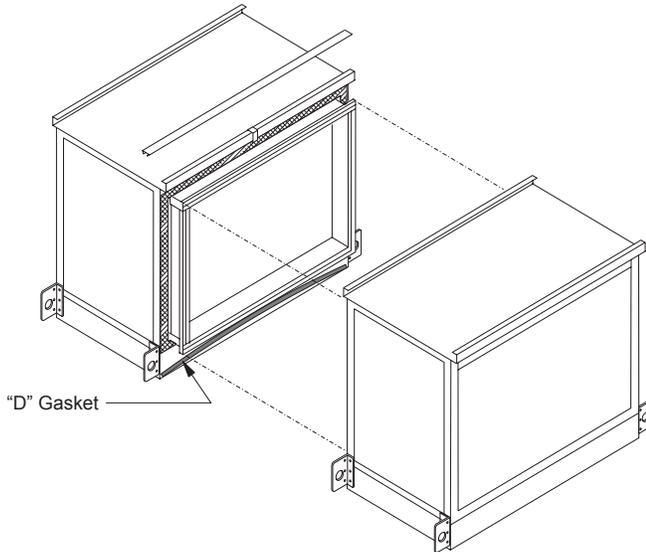


Prepare Unit for Installation on Curb-ready Base

THE UNIT MUST BE LIFTED AS INDIVIDUAL SECTIONS ONLY. Some sections require removal of the lifting bracket to allow mating of the adjacent section(s). See [Figure 13](#).

A length of "D" gasket is attached to each section. This gasket MUST be installed to the unit base section as shown in [Figure 9](#).

Figure 9: Attaching "D" Gasket

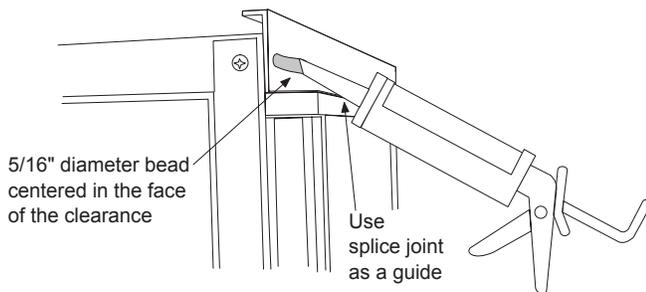


⚠ CAUTION

The gasket is to be installed in an arc shape with the ends lower than the center so that any moisture that may reach the gasket will be drained to the outside of the unit.

Apply a bead of sealant to the complete perimeter of the mating surface that has the splice collar projecting from the frame. Use the frame as a guide as illustrated in [Figure 10](#)

Figure 10: Applying Sealant



A hardware package is included in each unit section that contains the bolts and nuts for fastening the unit sections together. Be sure to locate the hardware before the unit is placed over the open roof curb.

Fasten each section at both the bottom and the top using the bolts and hardware before setting the next section in position. Refer to [Figure 11](#) and [Figure 12](#).

Figure 11: Fasten Bottom of Section

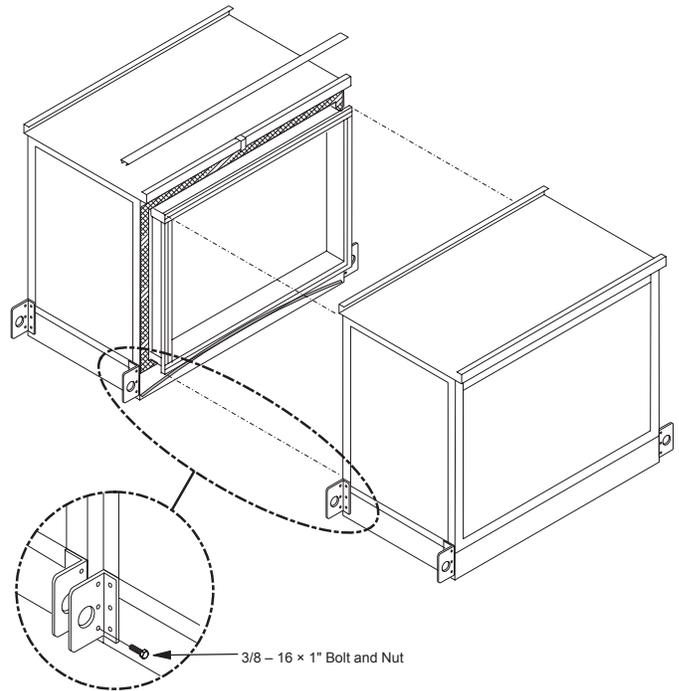
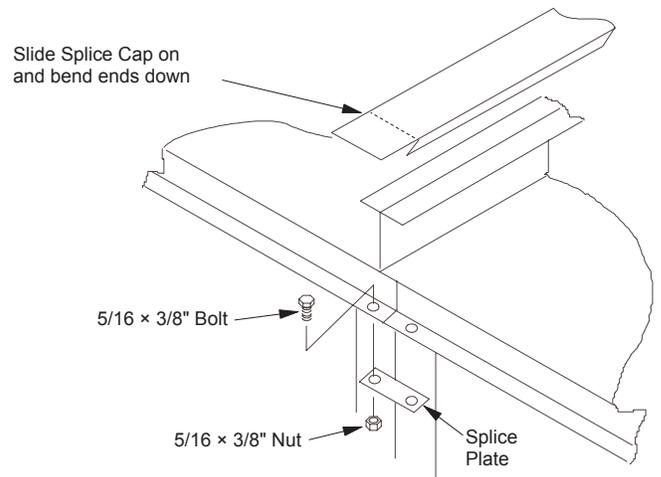


Figure 12: Fasten top of unit



Install Unit On Roof Curb

Check to see that all lifting brackets are secure and that the rigging cables and straps are clear of door handles or any other appendages of the unit.

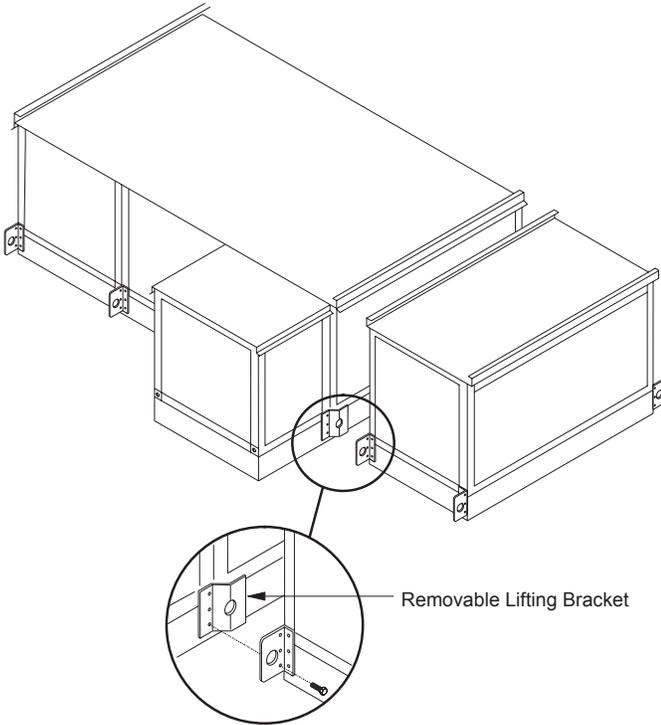
The units have two inch interlocking splice collars at each mating face. Care must be used so that the flanges engage as the unit sections are mounted together. The units must be set tightly together during lifting as the curb gasket will grip the unit base and make moving the unit difficult.

Units with vestibules must be handled so that the lifting bracket can be removed after the unit is placed on the curbing. Remove the lifting bracket that projects inward over the curbing. Save the self tapping bolts. When the adjacent section is placed in position, use self tapping bolts to secure the bases together as illustrated in [Figure 13](#).

Complete cabinet by placing sealant over any areas that appear to have remaining gaps. Install the cabinet top strips as indicated in [IM 672](#) that is included with the air handler.

Assemble and install all air hoods in accordance with the instructions that are provided with hood.

Figure 13: Remove Vestibule Lifting Bracket



Installation of Piping and Wiring

⚠ CAUTION

The base section of each cabinet has a drip pan installed below every panel that drains to the outside frame trough. Any holes cut through the bottom of the unit must also penetrate the drip pan. If holes are cut in the drip pan, they must be sealed to prevent moisture leakage.

Be sure that all piping, wiring and control penetrations that are made through the unit panels and floors are thoroughly sealed on both the inside and outside of the cabinet.

A single metal thickness pan is provided in the bottom of the vestibule. The pan can be removed if necessary. If holes are cut into the pan for piping passage, the holes must be sealed to prevent moisture leakage.



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