

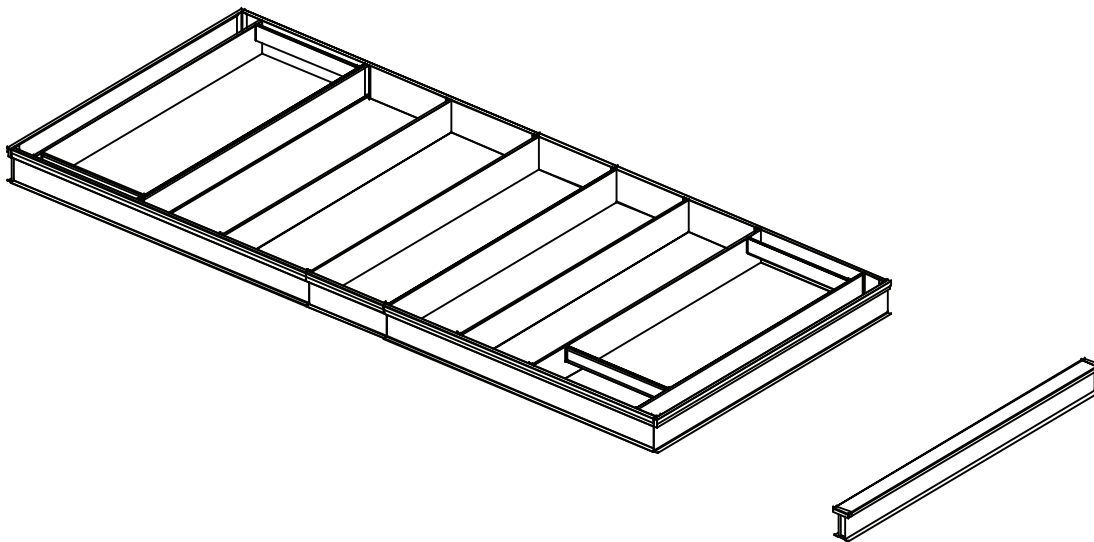


## Installation Instructions

# Intellipak 2 Accessory Roof Curb Kit

Rooftops, 90 - 162Tons

Air Handlers - Casings, A-C



Model Numbers: S\*HJ  
W\*HC

### SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.



# Introduction

Read this manual thoroughly before operating or servicing this unit.

## Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

**⚠ WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**⚠ CAUTION** Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

**NOTICE** Indicates a situation that could result in equipment or property-damage only accidents.

## Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants-including industry replacements for CFCs such as HCFCs and HFCs.

## Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified. The Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

### ⚠ WARNING

#### Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury. All field wiring **MUST** be performed by qualified personnel. Improperly installed and grounded field wiring poses **FIRE** and **ELECTROCUTION** hazards. To avoid these hazards, you **MUST** follow requirements for field wiring installation and grounding as described in NEC and your local/state electrical codes.

### ⚠ WARNING

#### Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, **MUST** follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- Before installing/servicing this unit, technicians **MUST** put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). **ALWAYS** refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.
- When working with or around hazardous chemicals, **ALWAYS** refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labeling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.
- If there is a risk of energized electrical contact, arc, or flash, technicians **MUST** put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, **PRIOR** to servicing the unit. **NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

## Copyright

This document and the information in it are the property of Trane, and may not be used or reproduced in whole or in part without written permission. Trane reserves the right to revise this publication at any time, and to make changes to its content without obligation to notify any person of such revision or change.

## **Trademarks**

All trademarks referenced in this document are the trademarks of their respective owners.

## **Revision History**

Includes running edits to further define this as an IntelliPak 2 document.



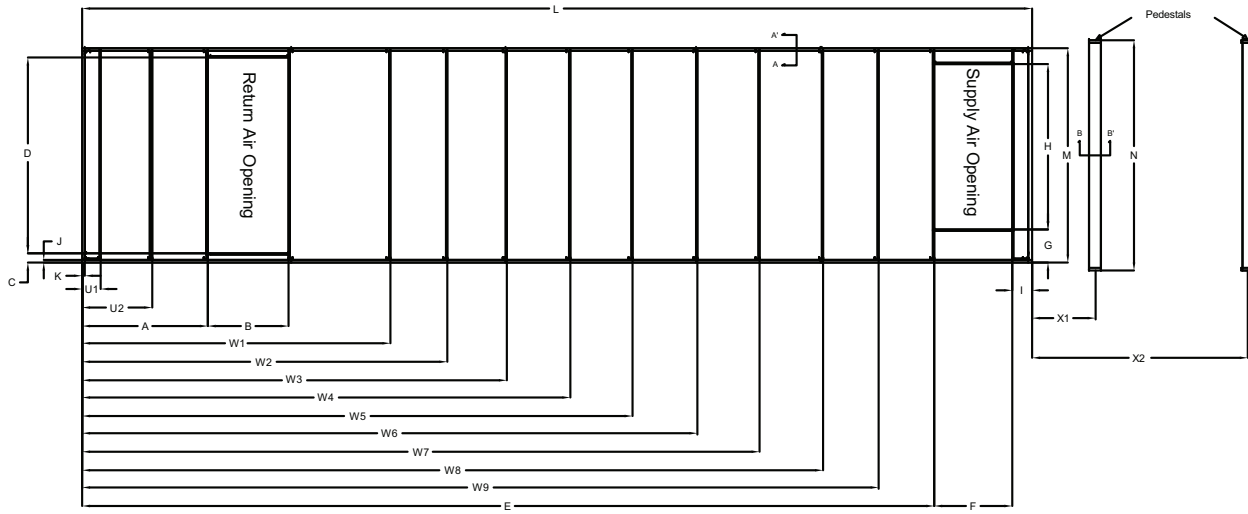
# Table of Contents

- Introduction ..... 2
- General Information ..... 5
  - Roof Curb and Unit Clearance Requirements  
11
  - Roof Support Considerations ..... 14
  - Perpendicular Roof Supports ..... 14
  - Parallel Roof Supports ..... 14
- Assembling the Roof Curb ..... 16
  - Perimeter Curb Rail Assembly ..... 16
  - Curb Pedestal Assembly ..... 16
- Curb Installation ..... 20
  - New Construction ..... 20
  - Existing Building ..... 20
  - Curb and Pedestal Positioning ..... 22
  - Air Handler Units — External Piping Enclosure  
Roof Curb Installation ..... 25
- Sound Attenuation ..... 29
  - Unit Sound Sources May Include: ..... 29
  - Unit Sound Sources and Typical Sound Trans-  
mission Paths ..... 29
    - Sounds Transmitted by Vibration ..... 29
    - Sounds Radiated by Unit Casing ..... 29
    - Sounds Transmitted by Supply Fans ... 29
    - Sounds Transmitted by Return Fans ... 30
    - Aerodynamic Noise ..... 30

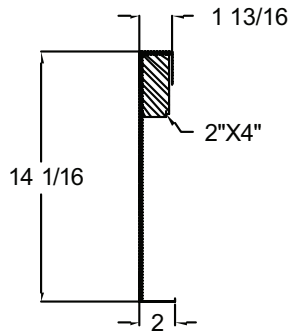
# General Information

**Note:** For sound consideration, cut only the holes in the roof deck for the supply and return duct penetration. Do not remove the roof decking from the inside perimeter of the curb. Do not remove the roof decking from the inside perimeter of the curb.

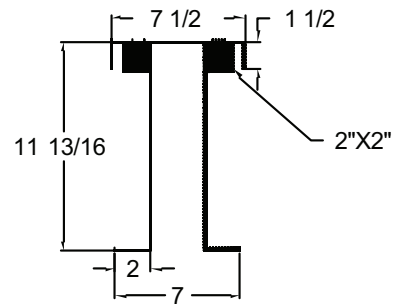
**Figure 1. Typical curb illustration for 90 to 162 ton units**



Note: All dimensions measured from top flange of roof curb



Section AA'



Section BB'



## General Information

**Table 1. Downflow roof curb dimensions one- or two-piece rooftop unit without energy recovery wheel (in.)**

Dimensions											
Tonnage	Blank Section	A	B	C	D	E	F	G	H	I	J
90-118	None	11 15/16	49 8/16	5 15/16	123	253 2/16	49 8/16	20 15/16	104	11 15/16	1 13/16
90-118	4 ft	11 15/16	49 8/16	5 15/16	123	301 5/16	49 8/16	20 15/16	104	11 15/16	1 13/16
90-118	8 ft	11 15/16	49 8/16	5 15/16	123	349 9/16	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162 (All Units Except High Heat Gas Models)	None	11 15/16	49 8/16	5 15/16	123	317 14/16	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162	4 ft	11 15/16	49 8/16	5 15/16	123	366 2/16	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162	8 ft	11 15/16	49 8/16	5 15/16	123	414 5/16	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162 (High Heat Gas Models Only)	None	11 15/16	49 8/16	5 15/16	123	317 14/16	61 8/16	20 15/16	104	11 15/16	1 13/16

Dimensions				
Tonnage	Blank Section	K	L	M
90-118	None	1 13/16	314 9/16	134 14/16
90-118	4 ft	1 13/16	362 12/16	134 14/16
90-118	8 ft	1 13/16	411	134 14/16
120-162 (All Units Except High Heat Gas Models)	None	1 13/16	379 5/16	134 14/16
120-162	4 ft	1 13/16	427 8/16	134 14/16
120-162	8 ft	1 13/16	475 12/16	134 14/16
120-162 (High Heat Gas Models Only)	None	1 13/16	391 5/16	134 14/16

Cross Member Location									
Tonnage	Blank Section	W1	W2	W3	W4	W5	W6	W7	W8
90-118	None	103 6/16	145 11/16	183 6/16	218 4/16	n/a	n/a	n/a	n/a
90-118	4 ft	103 6/16	145 11/16	187 15/16	231 10/16	266 8/16	n/a	n/a	n/a
90-118	8 ft	103 6/16	145 11/16	189 15/16	234 3/16	279 13/16	314 11/16	n/a	n/a
120-162 (All Units Except High Heat Gas Models)	None	103 6/16	145 11/16	179 6/16	213 1/16	248 2/16	289	n/a	n/a
120-162	4 ft	103 6/16	145 11/16	181 11/16	217 12/16	255 3/16	296 6/16	331 4/16	n/a
120-162	8 ft	103 6/16	145 11/16	185 4/16	224 13/16	265 12/16	304 7/16	344 9/16	379 7/16
120-162 (High Heat Gas Models Only)	None	103 6/16	145 11/16	179 5/16	213 1/16	248 2/16	289	n/a	n/a

**Table 2. Downflow roof curb dimensions one- or two-piece rooftop unit with energy recovery wheel (in.)**

Dimensions											
Tonnage	Blank Section	A	B	C	D	E	F	G	H	I	J
90-118	None	79 5/16	50 12/16	5 15/16	123	349 9/16	49 8/16	20 15/16	104	11 15/16	1 13/16
90-118	4 ft	79 5/16	50 12/16	5 15/16	123	397 12/16	49 8/16	20 15/16	104	11 15/16	1 13/16
90-118	8 ft	79 5/16	50 12/16	5 15/16	123	446	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162 (All Units Except High Heat Gas Models)	None	79 5/16	50 12/16	5 15/16	123	414 5/16	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162	4 ft	79 5/16	50 12/16	5 15/16	123	462 8/16	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162	8 ft	79 5/16	50 12/16	5 15/16	123	510 12/16	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162 (High Heat Gas Models Only)	None	79 5/16	50 12/16	5 15/16	123	414 5/16	49 8/16	20 15/16	104	11 15/16	1 13/16

Dimensions				
Tonnage	Blank Section	K	L	M
90-118	None	1 13/16	411	134 14/16
90-118	4 ft	1 13/16	459 3/16	134 14/16
90-118	8 ft	1 13/16	507 6/16	134 14/16
120-162 (All Units Except High Heat Gas Models)	None	1 13/16	476 1/16	134 14/16
120-162	4 ft	1 13/16	524 4/16	134 14/16
120-162	8 ft	1 13/16	572 8/16	134 14/16
120-162 (High Heat Gas Models Only)	None	1 13/16	488 1/16	134 14/16

Cross Member Location												
Tonnage	Blank Section	U1	U2	W1	W2	W3	W4	W5	W6	W7	W8	W9
90-118	None	11 15/16	43 15/16	168 10/16	204 11/16	242 1/16	279 13/16	314 11/16	N/A	N/A	N/A	N/A
90-118	4 ft	11 15/16	43 15/16	168 10/16	204 11/16	242 1/16	284 6/16	328	362 14/16	N/A	N/A	N/A
90-118	8 ft	11 15/16	43 15/16	168 10/16	204 11/16	242 1/16	286 5/16	330 8/16	376 4/16	411 2/16	N/A	N/A
120-162 (All Units Except High Heat Gas Models)	None	11 15/16	43 15/16	168 10/16	204 11/16	242 1/16	275 12/16	309 8/16	344 9/16	385 7/16	N/A	N/A
120-162	4 ft	11 15/16	43 15/16	168 10/16	204 11/16	242 1/16	278 2/16	314 3/16	351 9/16	392 12/16	427 10/16	N/A
120-162	8 ft	11 15/16	43 15/16	168 10/16	204 11/16	242 1/16	281 10/16	321 3/16	362 3/16	400 14/16	N/A	475 14/16
120-162 (High Heat Gas Models Only)	None	11 15/16	43 15/16	168 10/16	204 11/16	242 1/16	275 12/16	309 8/16	344 9/16	385 7/16	N/A	N/A



## General Information

**Table 3. Downflow roof curb dimensions three-piece rooftop unit without energy recovery wheel (in.)**

Dimensions											
Tonnage	Blank Section	A	B	C	D	E	F	G	H	I	J
90-118	None	11 15/16	49 8/16	5 15/16	123	272 7/16	49 8/16	20 15/16	104	11 15/16	1 13/16
90-118	4 ft	11 15/16	49 8/16	5 15/16	123	320 10/16	49 8/16	20 15/16	104	11 15/16	1 13/16
90-118	8 ft	11 15/16	49 8/16	5 15/16	123	368 13/16	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162 (All Units Except High Heat Gas Models)	None	11 15/16	49 8/16	5 15/16	123	343 6/16	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162	4 ft	11 15/16	49 8/16	5 15/16	123	391 9/16	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162	8 ft	11 15/16	49 8/16	5 15/16	123	439 13/16	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162 (High Heat Gas Models Only)	None	11 15/16	49 8/16	5 15/16	123	343 6/16	61 8/16	20 15/16	104	11 15/16	1 13/16

Dimensions				
Tonnage	Blank Section	K	L	M
90-118	None	1 13/16	333 13/16	134 14/16
90-118	4 ft	1 13/16	382 1/16	134 14/16
90-118	8 ft	1 13/16	430 4/16	134 14/16
120-162 (All Units Except High Heat Gas Models)	None	1 13/16	404 13/16	134 14/16
120-162	4 ft	1 13/16	453	134 14/16
120-162	8 ft	1 13/16	501 3/16	134 14/16
120-162 (High Heat Gas Models Only)	None	1 13/16	416 13/16	134 14/16

Cross Member Location												
Tonnage	Blank Section	U1	U2	W1	W2	W3	W4	W5	W6	W7	W8	W9
90-118	None	N/A	N/A	103 6/16	145 11/16	202 11/16	237 9/16	N/A	N/A	N/A	N/A	N/A
90-118	4 ft	N/A	N/A	103 6/16	145 11/16	187 15/16	250 14/16	285 12/16	N/A	N/A	N/A	N/A
90-118	8 ft	N/A	N/A	103 6/16	145 11/16	189 15/16	234 3/16	299 1/16	333 15/16	N/A	N/A	N/A
120-162 (All Units Except High Heat Gas Models)	None	N/A	N/A	103 6/16	145 11/16	179 6/16	213 1/16	273 10/16	314 8/16	N/A	N/A	N/A
120-162	4 ft	N/A	N/A	103 6/16	145 11/16	181 11/16	217 12/16	255 3/16	321 13/16	356 11/16	N/A	N/A
120-162	8 ft	N/A	N/A	103 6/16	145 11/16	185 4/16	224 13/16	265 12/16	304 7/16	370 1/16	404 15/16	N/A
120-162 (High Heat Gas Models Only)	None	N/A	N/A	103 6/16	145 11/16	179 6/16	213 1/16	273 10/16	314 8/16	N/A	N/A	N/A



**Table 4. Downflow roof curb dimensions three-piece rooftop unit with energy recovery wheel (in.)**

Dimensions											
Tonnage	Blank Section	A	B	C	D	E	F	G	H	I	J
90-118	None	79 5/16	50 12/16	5 15/16	123	368 13/16	49 8/16	20 15/16	104	11 15/16	1 13/16
90-118	4 ft	79 5/16	50 12/16	5 15/16	123	417 1/16	49 8/16	20 15/16	104	11 15/16	1 13/16
90-118	8 ft	79 5/16	50 12/16	5 15/16	123	465 4/16	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162 (All Units Except High Heat Gas Models)	None	79 5/16	50 12/16	5 15/16	123	439 12/16	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162	4 ft	79 5/16	50 12/16	5 15/16	123	488	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162	8 ft	79 5/16	50 12/16	5 15/16	123	536 3/16	49 8/16	20 15/16	104	11 15/16	1 13/16
120-162 (High Heat Gas Models Only)	None	79 5/16	50 12/16	5 15/16	123	439 12/16	49 8/16	20 15/16	104	11 15/16	1 13/16

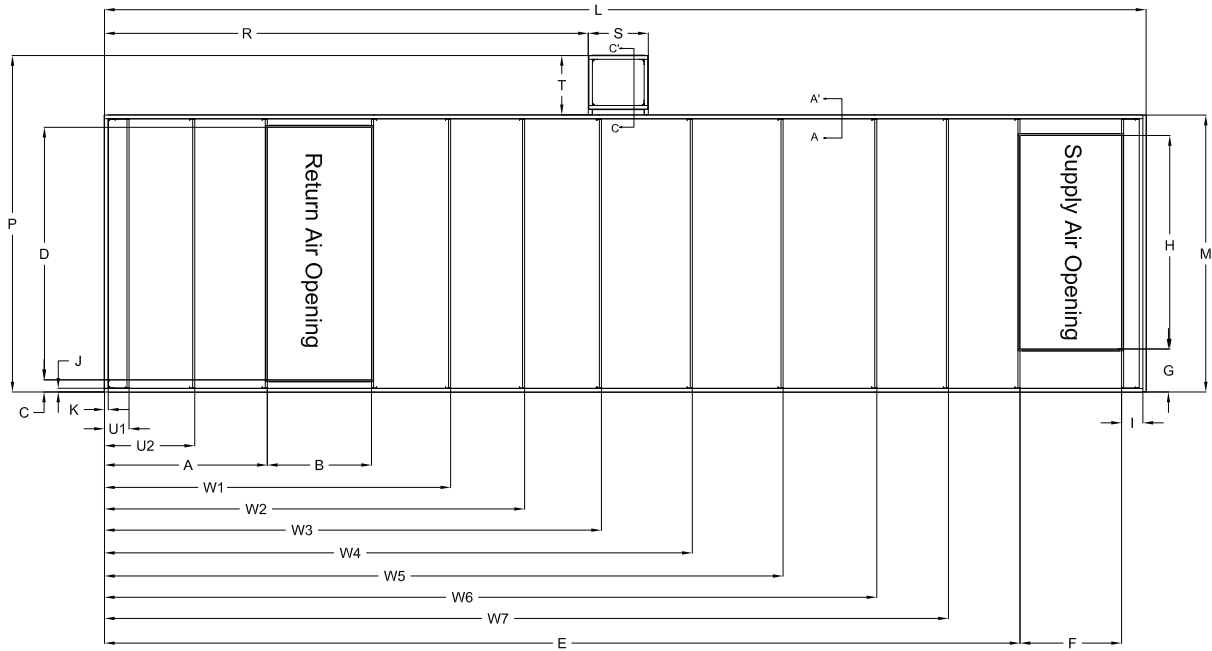
Dimensions				
Tonnage	Blank Section	K	L	M
90-118	None	1 13/16	430 4/16	134 14/16
90-118	4 ft	1 13/16	478 8/16	134 14/16
90-118	8 ft	1 13/16	526 11/16	134 14/16
120-162 (All Units Except High Heat Gas Models)	None	1 13/16	501 8/16	134 14/16
120-162	4 ft	1 13/16	549 12/16	134 14/16
120-162	8 ft	1 13/16	597 15/16	134 14/16
120-162 (High Heat Gas Models Only)	None	1 13/16	513 8/16	134 14/16

Cross Member Location												
Tonnage	Blank Section	U1	U2	W1	W2	W3	W4	W5	W6	W7	W8	W9
90-118	None	11 15/16	43 15/16	168 10/16	204 11/16	242 1/16	299 1/16	333 15/16	N/A	N/A	N/A	N/A
90-118	4 ft	11 15/16	43 15/16	168 10/16	204 11/16	242 1/16	284 6/16	347 5/16	382 3/16	N/A	N/A	N/A
90-118	8 ft	11 15/16	43 15/16	168 10/16	204 11/16	242 1/16	286 5/16	330 9/16	395 8/16	430 6/16	N/A	N/A
120-162 (All Units Except High Heat Gas Models)	None	11 15/16	43 15/16	168 10/16	204 11/16	242 1/16	275 12/16	309 8/16	370 1/16	410 15/16	N/A	N/A
120-162	4 ft	11 15/16	43 15/16	168 10/16	204 11/16	242 1/16	278 2/16	314 3/16	351 9/16	418 4/16	453 2/16	N/A
120-162	8 ft	11 15/16	43 15/16	168 10/16	204 11/16	242 1/16	281 10/16	321 3/16	362 3/16	400 14/16	466 7/16	501 5/16
120-162 (High Heat Gas Models Only)	None	11 15/16	43 15/16	168 10/16	204 11/16	242 1/16	275 12/16	309 8/16	370 1/16	410 15/16	N/A	N/A

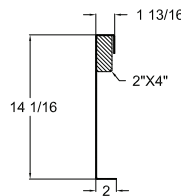
**Table 5. Pedestal dimension - 90 to 162 ton rooftop unit curb**

Tonnage	One, Two, Three-piece Unit	Condenser Type	Pedestal Dimensions		
			N	X1	X2
90	1	Air-Cooled	145 4/16	N/A	93 1/16
90	2 or 3	Air-Cooled	145 4/16	36 3/16	111 3/16
105	1	Air-Cooled	145 4/16	N/A	111 3/16
105	2 or 3	Air-Cooled	145 4/16	36 3/16	129 3/16
120 - 150	1	Air-Cooled	145 4/16	N/A	117 1/16
120 - 150	2 or 3	Air-Cooled	145 4/16	40 3/16	136 3/16
100 - 162	2 or 3	Evaporative-Cooled	145 4/16	36 3/16	129 3/16

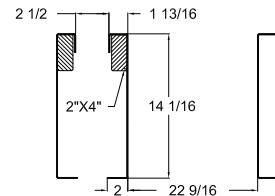
**Figure 2. Typical curb illustration for casings A-C air handler units**



Note: All dimensions measured from top flange of roof curb



Section AA'



Section CC'

**Table 6. Downflow roof curb dimensions air handler unit (in.)**

<b>Dimensions</b>											
<b>Casing</b>	<b>Blank Section</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>
A, B, C	None	11 15/16	49 8/16	5 15/16	123	253 2/16	49 8/16	20 15/16	104	11 15/16	1 13/16
	4 Ft	11 15/16	49 8/16	5 15/16	123	301 5/16	49 8/16	20 15/16	104	11 15/16	1 13/16
	8 Ft	11 15/16	49 8/16	5 15/16	123	349 9/16	49 8/16	20 15/16	104	11 15/16	1 13/16
<b>Dimensions</b>											
<b>Casing</b>	<b>Blank Section</b>	<b>K</b>	<b>L</b>	<b>M</b>	<b>P</b>	<b>R</b>	<b>S</b>	<b>T</b>			
A, B, C	None	1 13/16	314 9/16	134 14/16	163 15/16	139 7/16	28 15/16	29 1/16			
	4 Ft	1 13/16	362 12/16	134 14/16	163 15/16	139 7/16	28 15/16	29 1/16			
	8 Ft	1 13/16	411	134 14/16	163 15/16	139 7/16	28 15/16	29 1/16			
<b>Cross Member Location</b>											
<b>Casing</b>	<b>Blank Section</b>	<b>U1</b>	<b>U2</b>	<b>W1</b>	<b>W2</b>	<b>W3</b>	<b>W4</b>	<b>W5</b>	<b>W6</b>	<b>W7</b>	
A, B, C	None	N/A	N/A	103 6/16	145 11/16	183 6/16	218 4/16	N/A	N/A	N/A	
	4 Ft	N/A	N/A	103 6/16	145 11/16	187 15/16	231 10/16	266 8/16	N/A	N/A	
	8 Ft	N/A	N/A	103 6/16	145 11/16	189 15/16	234 3/16	279 13/16	314 11/16	N/A	

## Roof Curb and Unit Clearance Requirements

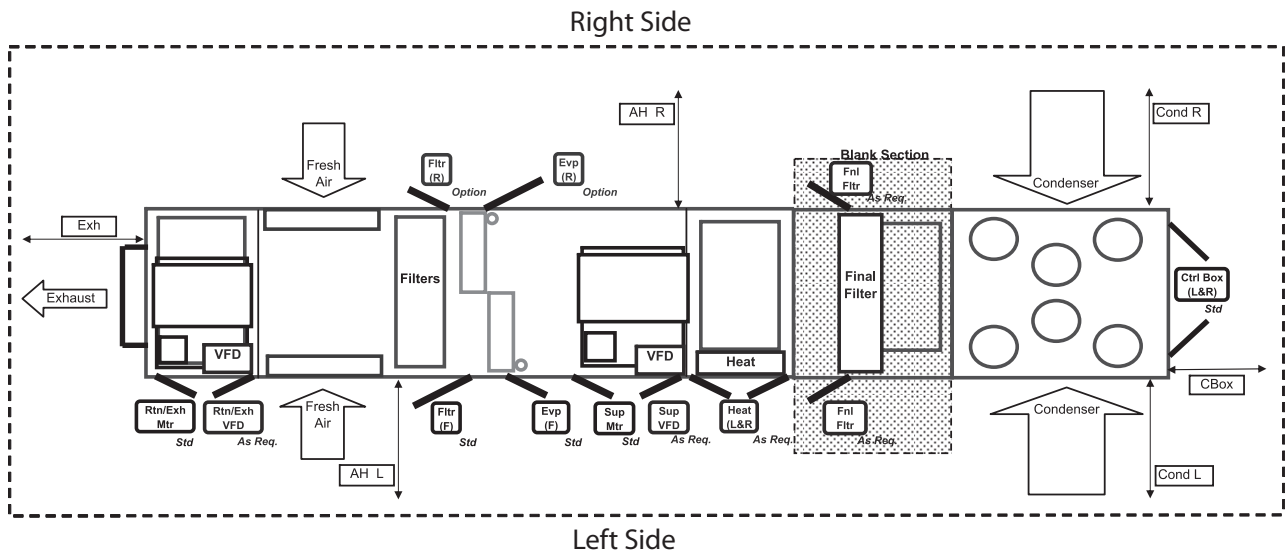
When determining the clearance requirements, the minimum operating and service clearances for a single or multiple unit installation is illustrated in [Figure 3, p. 12](#) and [Figure 4, p. 12](#). These clearances are the minimum distances necessary to assure adequate service accessibility, cataloged unit capacity, and peak operating efficiency. Be sure to provide adequate space for installation and maintenance of the ductwork, piping and electrical connections.

Providing less than the recommended clearances may result in condenser coil starvation, "short-circuiting" of exhaust and economizer airflows, or recirculation of hot condenser air. If the actual clearances available at the job site appear to be inadequate, consult the local Trane sales representative before installing the curb.

The supply air duct opening in the curb is located nearest the pedestal. The return air duct opening is located at the end of the curb farthest from the pedestal.

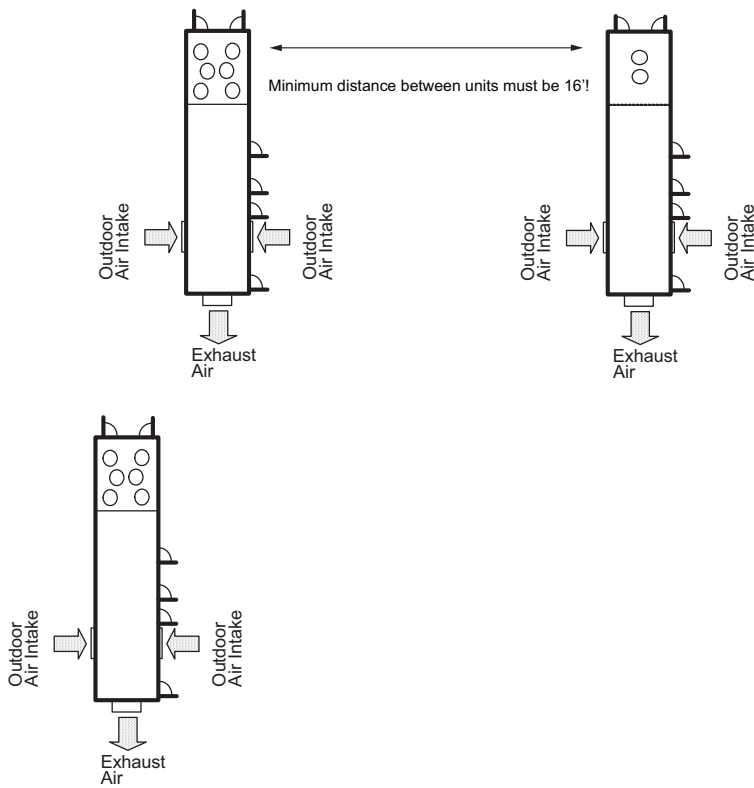
If the unit is installed higher than a typical curb elevation, a field constructed catwalk around the unit is recommended to provide access for unit maintenance and service.

Figure 3. Minimum required clearance<sup>(a)</sup>



(a) Unit drawing is representative only and may not accurately depict all models.

Figure 4. Multiple unit placement



**Table 7. Minimum required clearance — 90-162 tons rooftop**

Door Location	Availability	Unit Option Selection (Ft. and In.)									
		Standard		VFD		Heat	Reheat	Two-side Access		Final Filter	Energy Recovery
		90-118	120-162	Return/Exhaust	Supply	Electric/Hot Water/Steam		90-118	120-162		
Exhaust/ Ret Motor	Std	2' 2"	2' 2"	*	*	*	*	*	*	*	*
Exhaust/ Ret VFD	As Req.	*	*	2' 2"	*	*	*	*	*	*	*
ERW fltr <sup>1.1</sup> . (L & R) (F)	Option	*	*	*	*	*	*	*	*	*	2' 2"
ERW fltr <sup>1.1</sup> . (L & R) (R)	Option	*	*	*	*	*	*	*	*	*	2' 2"
Filter (Front)	Std	2' 8"	2' 8"	*	*	*	*	*	*	*	*
Filter (Rear)	Option	*	*	*	*	*	*	*	2' 2"	*	*
Evap (Front)	Std	2' 2"	*	*	*	*	*	*	*	*	*
Evap (Rear)	Std	2' 8"	*	*	*	*	*	*	*	*	*
or Evap (Rear)	Option	*	*	*	*	*	2' 2"	2' 2"	*	*	*
Supply Motor	Std	2' 8"	2' 8"	*	*	*	*	*	*	*	*
Supply VFD	As Req.	*	*	*	2' 2"	*	*	*	*	*	*
Heat (Left & Right)	As Req.	*	*	*	*	2' 2"	*	*	*	*	*
Final Filter (Front)	As Req.	*	*	*	*	*	*	*	*	2' 2"	*
Final Filter (Rear)	As Req.	*	*	*	*	*	*	*	*	2' 2"	*
Control Box (L & R)	Std	3' 2"	3' 2"	*	*	*	*	*	*	*	*
Minimum Required Clearance (Ft.)											
AH_L	AH_R	Exh	Cond_L	Cond_R	Control Box						
8'	8'	8'	8'	8'	6'						

1. See Unit Dimensions for Energy Recovery Wheel location.

**Table 8. Minimum required clearance — air handler casings A-C**

Door Location	Availability	Unit Option Selection (Ft. and In.)					
		Standard	VFD		Heat	Two-side Access	Final Filter
		A, B, C	Return/Exhaust	Supply	Electric/Hot Water/Steam		
Exhaust Motor	Std	2' 2"	*	*	*	*	*
Exhaust VFD	As Req.	*	2' 2"	*	*	*	*
Filter (Front)	Std	2' 8"	*	*	*	*	*
Filter (Rear)	Option	*	*	*	*	2' 2"	*
Cooling Coil (Front)	Std	2' 2"	*	*	*	*	*
Cooling Coil (Rear)	Std	2' 8"	*	*	*	*	*
or Cooling Coil (Rear)	Option	*	*	*	*	*	*
Supply Motor	Std	2' 8"	*	*	*	*	*
Supply VFD	As Req.	*	*	2' 2"	*	*	*
Heat (Left & Right)	As Req.	*	*	*	2' 2"	*	*
Final Filter (Front)	As Req.	*	*	*	*	*	2' 2"
Final Filter (Rear)	As Req.	*	*	*	*	*	2' 2"
Control Box (L & R)	Std	3' 2"	*	*	*	*	*
Minimum Required Clearance (Ft.)							
AH_L	AH_R	Exh	Cond_R	Control Box			
8'	8'	8'	8'	6'			



## General Information

### Roof Support Considerations

#### **⚠ WARNING**

#### **Mounting Integrity!**

Failure to follow instruction below could result in death or serious injury or possible equipment or property-only damage.

The roof must be capable of adequately supporting the combined weight of the unit and the complete roof curb assembly. Refer to [Table 9, p. 14](#) for the approximate unit and curb weights. If center-of-gravity information is required, utilize TOPPS or contact the local Trane sales office.

Each unit may be set either perpendicular or parallel to the roof support members.

**Note:** When determining roof support member locations, do not block the supply and return air openings in the air handler portion of the roof curb. Refer to [Figure 1, p. 5](#) for opening sizes and locations.

### Perpendicular Roof Supports

If the unit is to be positioned perpendicular to the roof supports, refer to the illustration in [Figure 5, p. 15](#) while proceeding through the following steps:

1. Plan the support at the unit condenser end first; the curb pedestal must rest on a roof support member as illustrated in [Figure 5, p. 15](#).
2. The supply air end of the curb must also rest on a roof support member as illustrated in [Figure 5, p. 15](#).
3. Provide additional roof support members to support the rest of the unit air handler section. The center-to-center distance between roof support members must not exceed 96".
4. The unit return air end may extend (overhang) a maximum of 17" beyond a roof support member.

**Table 9. Approximate operating weights (lbs.)**

Nominal Tons	Unit (Minimum)	Roof Curb (Minimum)
<b>Rooftop with Air-Cooled Condenser</b>		
90	14071	907
105	15198	907
120	17515	1054
130	17828	1054
150	18818	1054
<b>Rooftop with Evaporative-Cooled Condenser</b>		
100	18430	1055
118	18941	1055
128	21362	1194
140	21348	1194
162	21470	1194
<b>Rooftop Air-Handler</b>		
Casing A	8580	1066
Casing B	8782	1066
Casing AC	8910	1066

**Notes:**

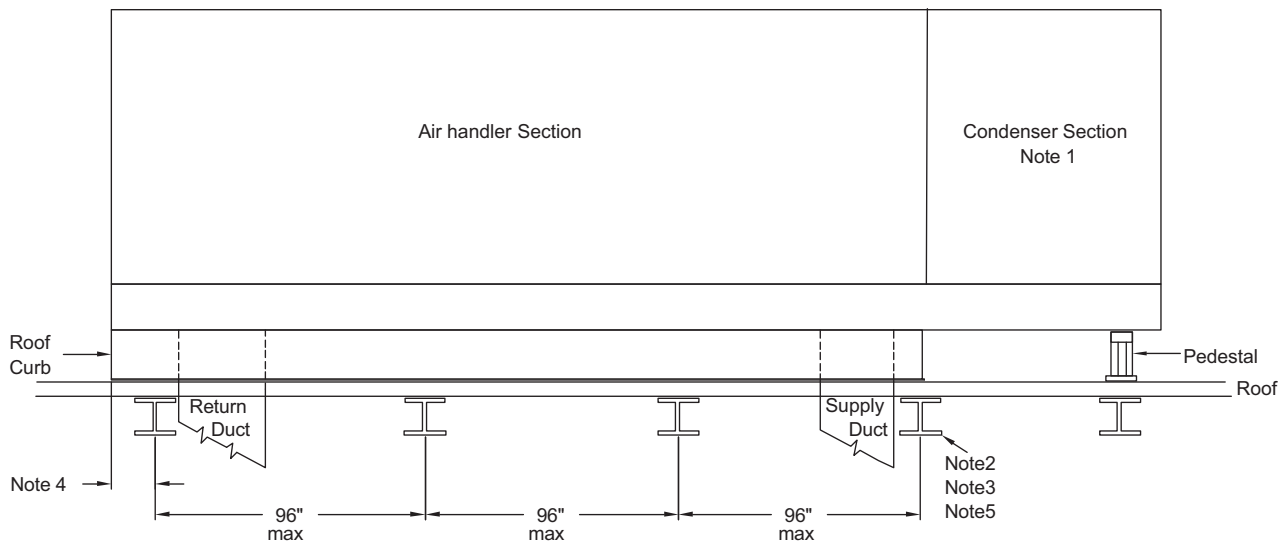
1. Weights shown for air-cooled units include the following features: standard coils, 0-25% Fresh Air, throwaway filters, low cfm supply fan, minimum motor sizes (high efficiency), constant volume, 460 XL, No heat. Weights shown for Evaporative-cooled units include high-capacity evaporator coil and the weight of the extra structure associated with a two piece unit.
2. Weights shown represent approximate operating weights and have a + 5% accuracy. To calculate weight for a specific unit configuration, utilize TOPSS or contact the local Trane sales representative. ACTUAL WEIGHTS ARE STAMPED ON THE UNIT NAMEPLATE.

### Parallel Roof Supports

If the unit is to be positioned parallel with the roof supports, refer to the illustration in [Figure 6](#) while proceeding through the following steps:

1. Refer to [Figure 1, p. 5](#) to determine the appropriate width for the air handler portion of the roof curb (all units).
2. Based on the dimensions found in step 1, determine the distance between the two main roof supports that will bear the combined weight of the unit and curb assembly.
3. To ensure adequate clearance for ductwork, do not allow the inside edges of the roof supports to protrude more than 1" beyond the inside edges of the curb. Refer to the illustration in [Figure 6](#).

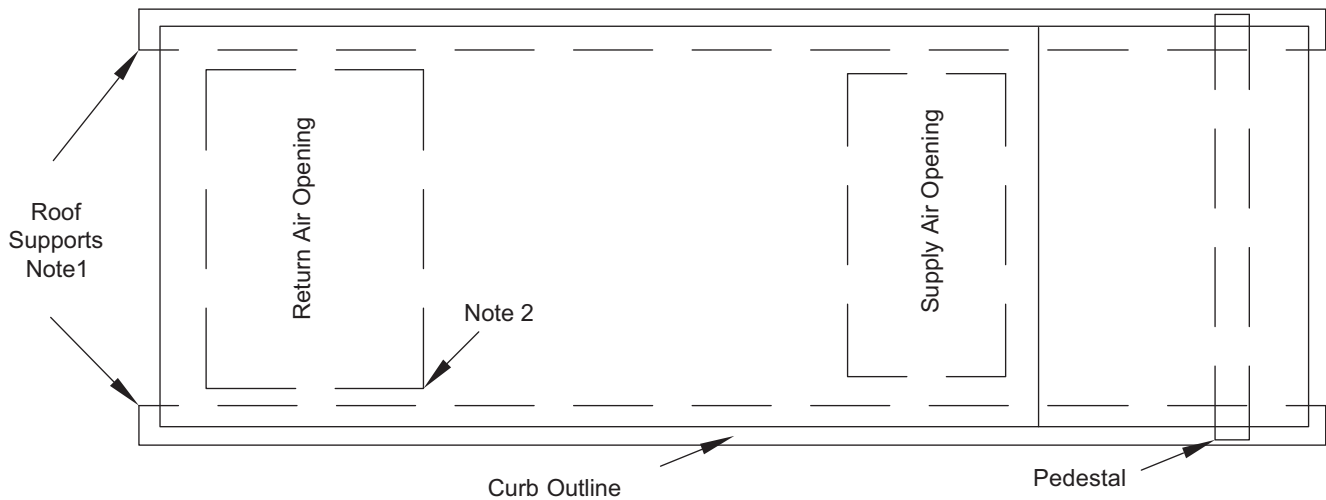
**Figure 5. Unit and curb assembly perpendicular to roof supports**



Notes:

1. Check final layout to ensure adequate clearance for unit operation, ductwork installation and electrical connections for the unit and optional heat section.
2. Roof supports must be strong enough to support the combined weight of the unit, curb and pedestal. Maximum spacing between centers of roof support is 8 feet.
3. Do not allow the roof support to protrude more than 1" beyond the curb inside edge.
4. Maximum allowable overhang for the return air end is 1'-5".
5. Actual number of roof supports varies by unit model, size and center-to-center spacing of the main roof supports.

**Figure 6. Unit and curb assembly parallel to roof supports**



Notes:

1. Determine the required distance between the roof supports based on the curb width
2. To provide adequate clearance for the return air ductwork, do not allow the inside edge of the roof support to protrude more than 1" beyond the inside edge of the curb.



# Assembling the Roof Curb

If the roof curb is being installed on a new building, the curb can be assembled at any convenient location and installed when the roof support members are in place. It is recommended that the curb and pedestal be installed directly on the support members and fastened to the supports using tack welds or other equivalent methods. Properly supported decking should be installed inside the air handler section of the curb when this method is used.

As an alternative, the roof curb and pedestal can be installed on the roof decking. Additional staging must be used directly beneath the curb and pedestal flanges to ensure adequate support and to minimize vibration.

If the roof curb assembly is being installed on an existing building, assembling the roof curb near the unit location may be more convenient.

**Note:** For sound consideration, cut only the holes in the roof deck for the supply and return duct penetration. Do not remove the roof decking from the inside perimeter of the curb.

To simplify the curb assembling process, a roof curb drawing as illustrated in [Figure 7, p. 17](#) and [Figure 8, p. 17](#) is shipped with each curb kit. This drawing identifies the curb and pedestal components by number and illustrates the configuration of the finished curb assembly. The curb components are numbered "(1)" through "(22)" and the pedestal components are numbered "(P1)" through "(P9)".

Arrange the various curb and pedestal components as shown in [Figure 7, p. 17](#) and [Figure 8, p. 17](#).

## Perimeter Curb Rail Assembly

**Note:** Screws should not be tightened until all the pieces are in place and the assembly has been leveled and squared in its installed position.

1. Start the assembly by joining an End Rail (1) to Side Rail (4) with a Corner Angle and 14 sheet metal screws.

**Note:** Screws on the top and bottom are installed from the inside, while those in the center are installed from the outside. Refer to [Figure 7, p. 17](#) and [Figure 8, p. 17](#) for details.

2. Attach the Duct Support Blockoff (17) to End Rail (1) and Side Rail (4). Refer to [Figure 7, p. 17](#), [Figure 8, p. 17](#) and [Figure 12, p. 19](#).
3. Align Side Rail (6) with Side Rail (4) and position a Crossmember (11) perpendicular to the two and join with 10 sheet metal screws. Align Side Rail (8) with Side Rail (6) and join in the same manner. Refer to [Figure 7, p. 17](#), [Figure 8, p. 17](#) and [Figure 10, p. 18](#).

When assembling a 3 piece unit, an extender side rail must be attached between side rails (6) and (8) and side rails (5) and (7) as shown in [Figure 8, p. 17](#) and [Figure 11, p. 18](#) using the attachment bracket and 10 screws. Two piece units will also include these parts. However, they should be discarded.

4. Join the second End Rail (2) to Side Rail (8) with a Corner Angle as in step 1. Attach the Duct Support Blockoff (20) as in step 2.
5. Continue assembling the perimeter rails in their proper order to close the loop as shown in [Figure 7, p. 17](#).
6. Once the perimeter rails are all in place the remaining Crossmembers (9, 10, 13, and 14) can be assembled, similar to the procedure shown in [Figure 10, p. 18](#). Crossmembers 9 and 14 must be assembled with their end flanges pointing towards the center of the roof curb assembly.
7. Assemble the Duct Support Side Rails (15 and 16) between the Duct Support Blockoff (17) and the Crossmember (9) with 8 sheet metal screws. Assemble Duct Support Side Rails (18 and 19) at the supply end in like manner. Refer to [Figure 7, p. 17](#) and the related dimensional tables for the proper positioning of the Duct Support Side Rails.

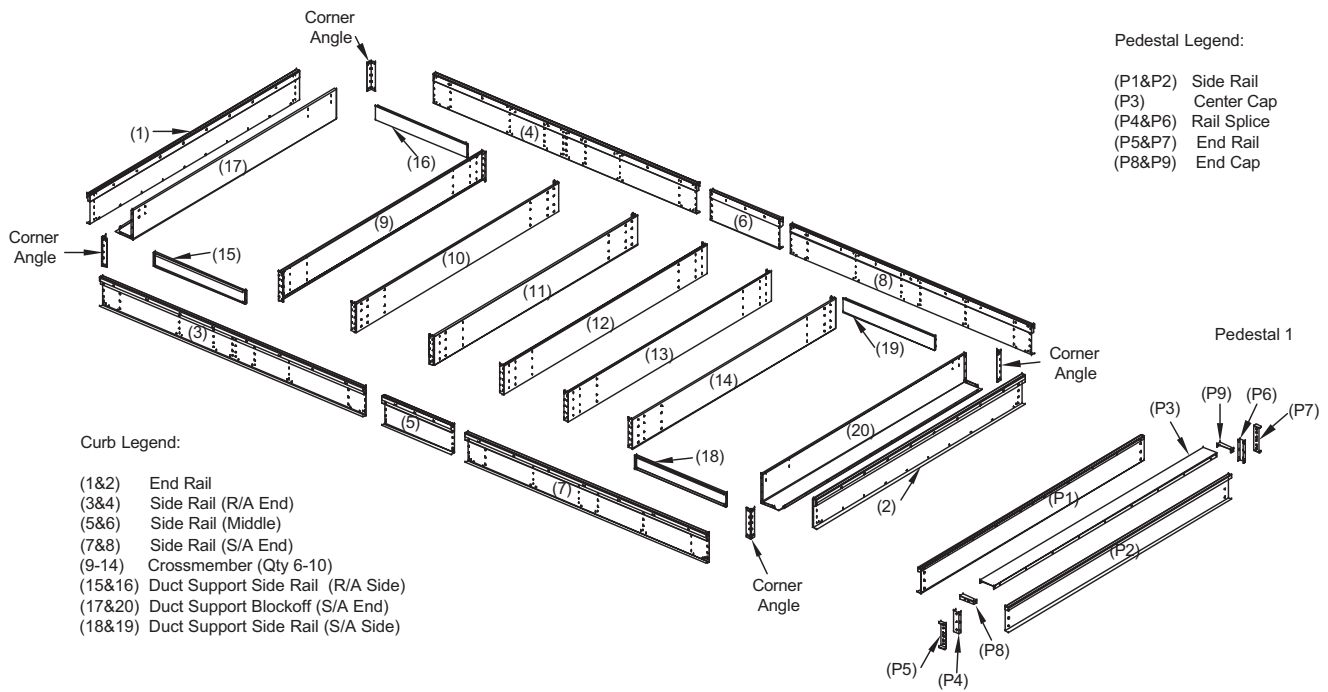
## Curb Pedestal Assembly

**Note:** Torque the screws for the pedestal during each step to 6 ft./lbs.

1. Attach Channel Splice (P4) to one end of Side Rail (P1) using 3 sheet metal screws. Attach Channel Splice (P6) to the opposite end of Side Rail (P1) using 3 sheet metal screws. The Channel Splice flanges must point inward as illustrated in [Figure 7, p. 17](#) and [Figure 8, p. 17](#).
2. Attach Side Rail (P2) to Channel Splice (P4) and (P6) using 3 sheet metal screws at each end. The Side Rail flange must point outward as illustrated in [Figure 7, p. 17](#) and [Figure 8, p. 17](#).
3. Attach End Rail (P5) and (P7), with the flanges outward, to Channel Splice (P4) and (P6) respectfully using 3 sheet metal screws as illustrated in [Figure 7, p. 17](#) and [Figure 8, p. 17](#).
4. Apply the gasket material to the top flanges of Side Rails (P1) and (P2) and End Rails (P5) and (P7).
5. Place Center Cap (P3) over pedestal assembly as illustrated in [Figure 13, p. 19](#).
6. Place End Cap (P8) at one end of Center Cap (P3) and secure it with 1 sheet metal screw as illustrated in [Figure 13, p. 19](#). Do not torque screws at this time.
7. Place End Cap (P9) onto the opposite end of Center Cap (P3) and secure it with 1 sheet metal screw as illustrated in [Figure 13, p. 19](#). Do not torque screws at this time. All remaining screws used to secure the Center Cap and End Caps will be installed during the final installation procedure.

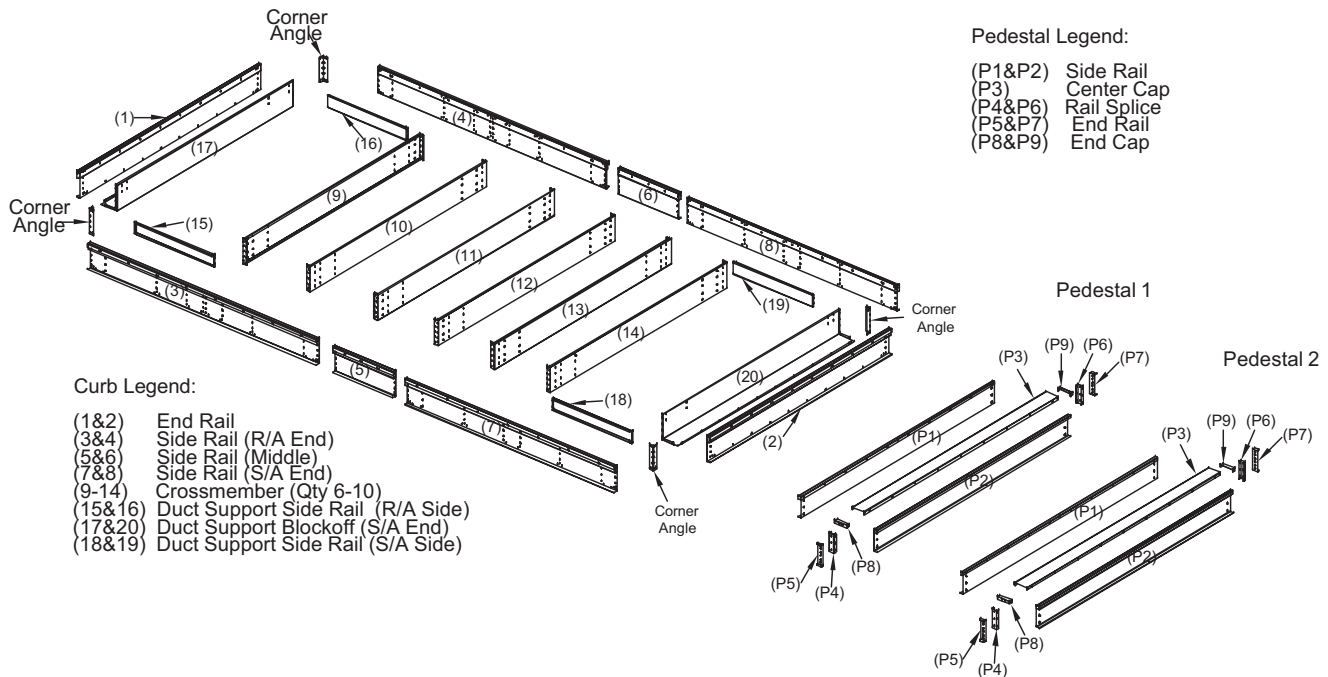


**Figure 7. One-piece unit—curb and pedestal component layout drawing<sup>(a)</sup>**



(a) Note: See curb assembly drawing that shipped with the roof curb kit to assure proper component identification and assembly.

**Figure 8. Two-piece unit—curb and pedestal component layout drawing<sup>(a)</sup>**

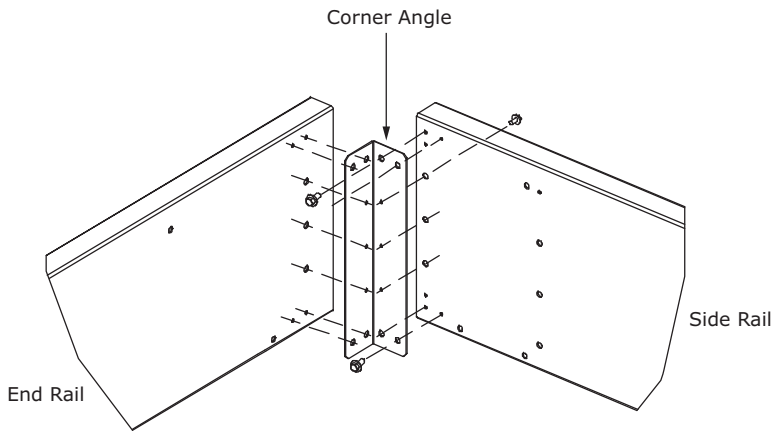


(a) Note: See curb assembly drawing that shipped with the roof curb kit to assure proper component identification and assembly.

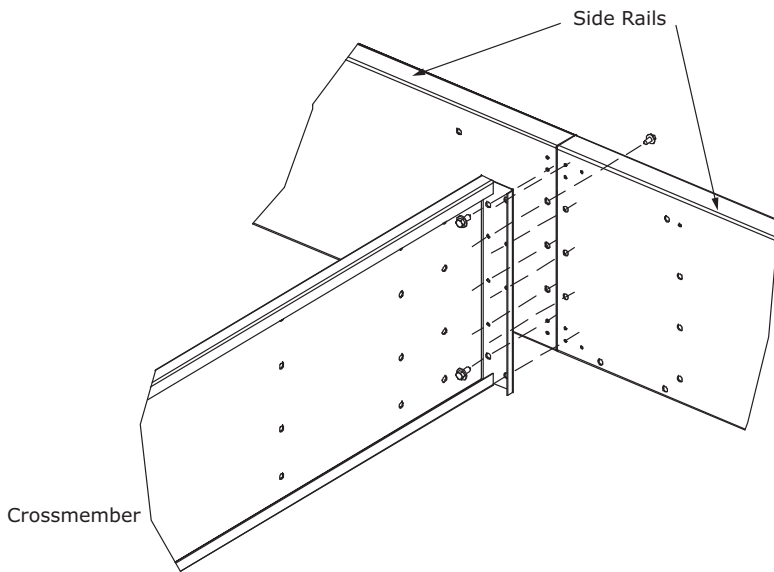
## Assembling the Roof Curb

---

**Figure 9. Typical curb corner assembly**



**Figure 10. Typical curb rail and cross member assembly**



**Figure 11. Typical curb rail and cross member assembly—3-piece units**

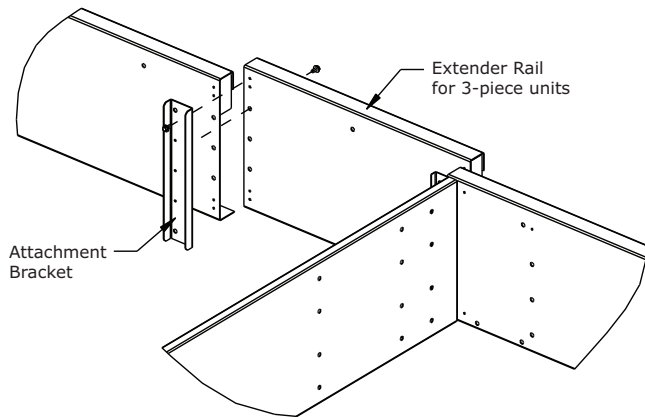


Figure 12. Typical attachment of return air duct assembly with end rail and side rail

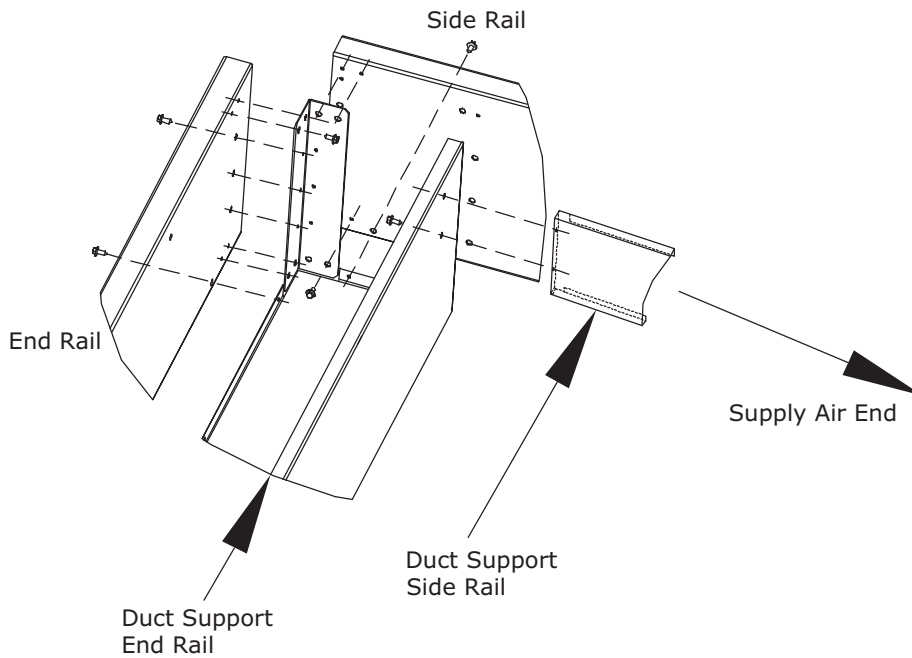
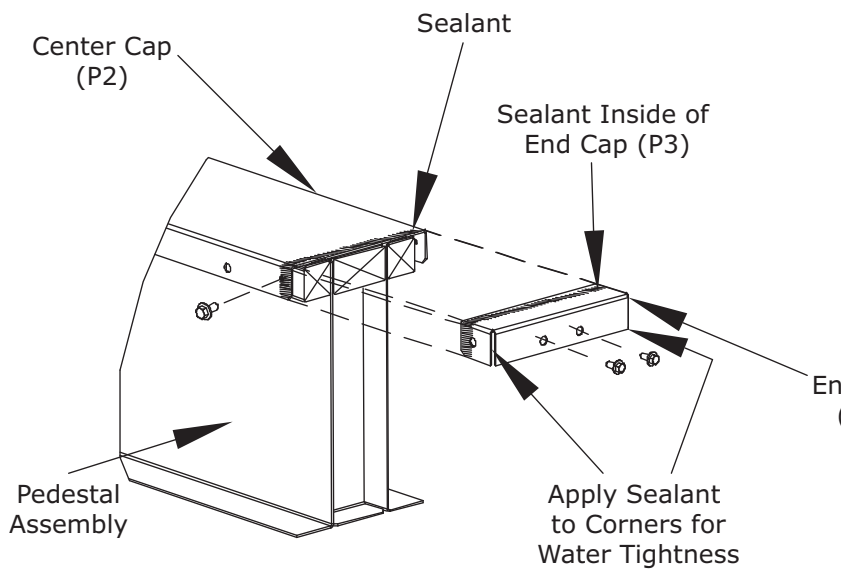


Figure 13. Typical end cap installation



# Curb Installation

## New Construction

To install the assembled roof curb and pedestal on a new building:

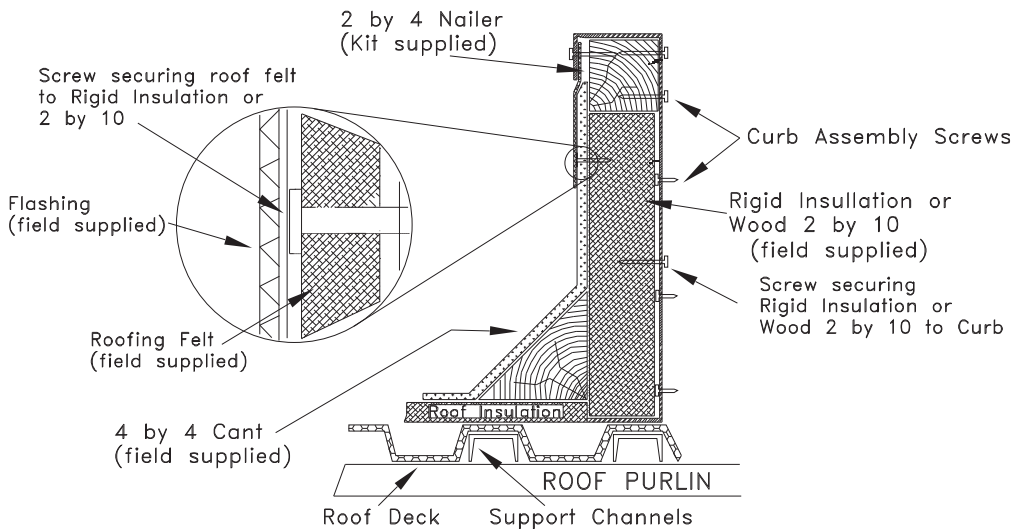
It is recommended that the curb and pedestal be installed directly on the support members and fastened to the supports using tack welds or other equivalent methods. Properly supported decking should be installed inside the air handler section of the curb when this method is used, or; mount the curb and pedestal on a roof deck with additional staging installed directly below the curb and

pedestal flanges as illustrated in [Figure 14, p. 20](#) and [Figure 15, p. 20](#).

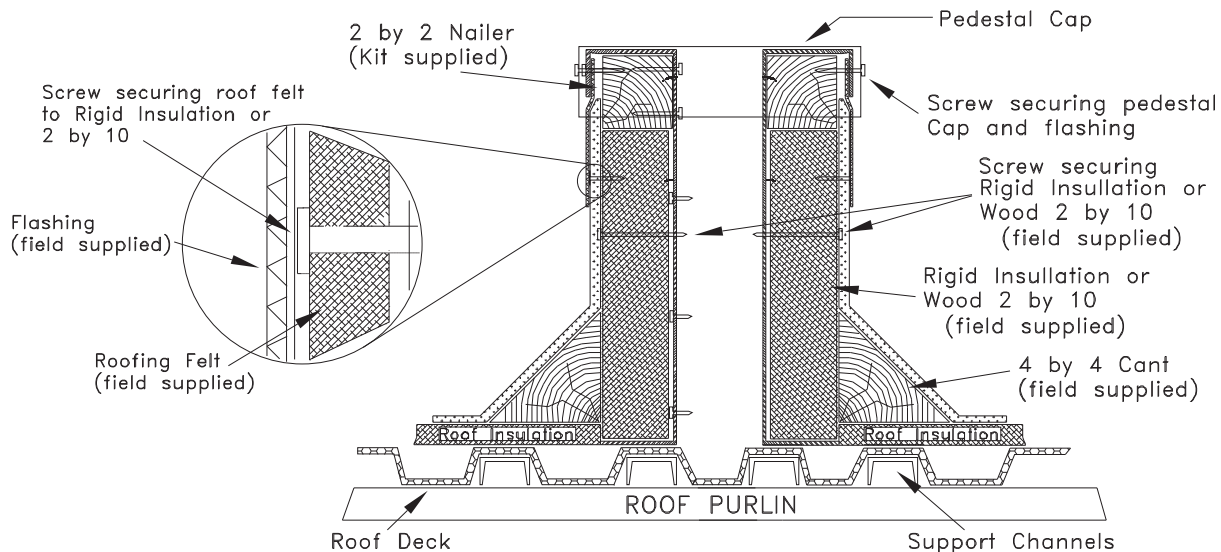
## Existing Building

If the roof curb and pedestal will be installed on an existing building, remove the old roof insulation and roof deck. Then build up the curb foundation with wooden nailer or other rigid supports as shown in [Figure 16, p. 21](#) and [Figure 17, p. 21](#). Do not set the curb or pedestal directly on the existing roof insulation or deck due to the insufficient strength of these surfaces.

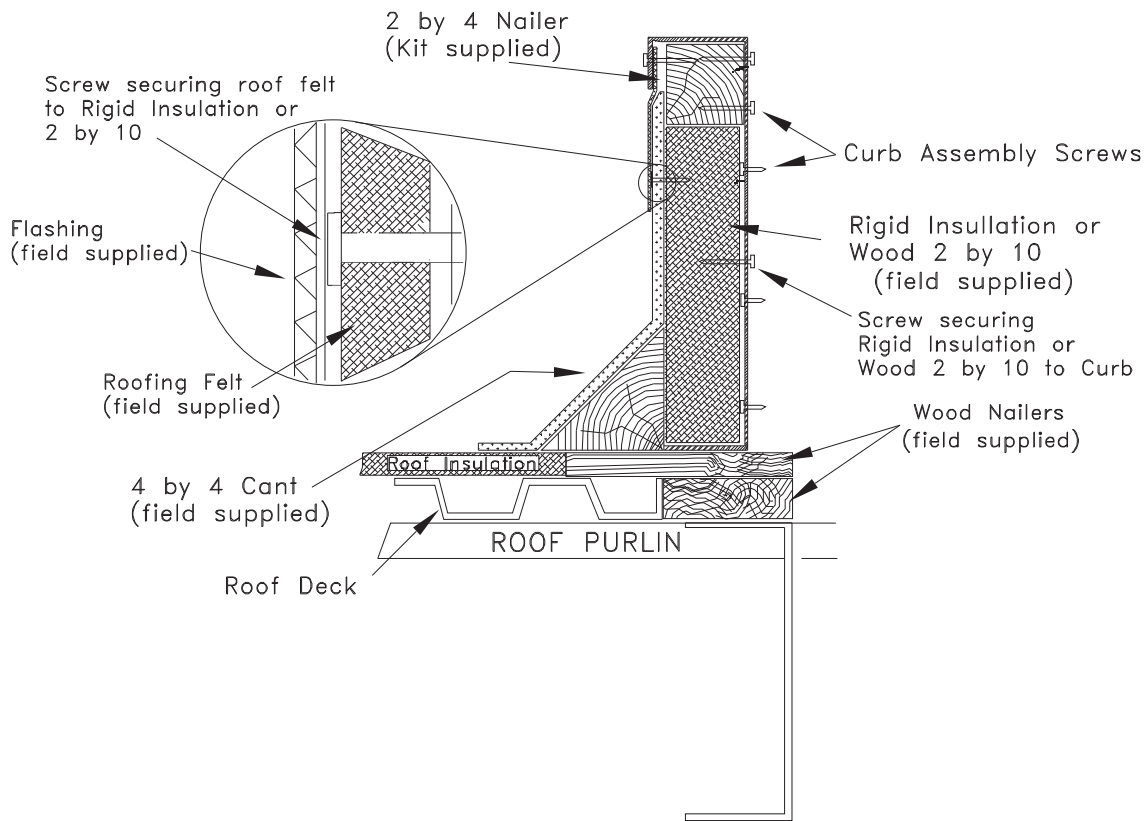
**Figure 14. Cross section of CURB installation—new construction**



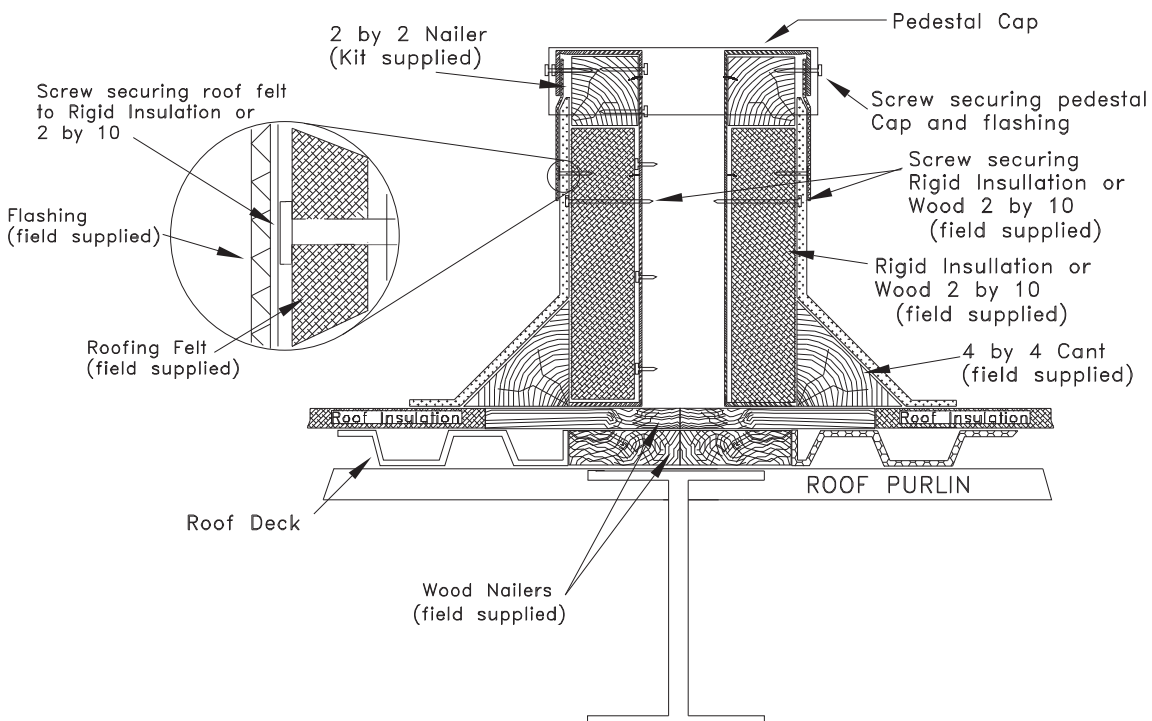
**Figure 15. Cross section of PEDESTAL installation—new construction**



**Figure 16. Cross section of CURB installation—existing construction**



**Figure 17. Cross section of PEDESTAL installation—existing construction**



## Curb and Pedestal Positioning

The pedestal and the curb have a position relationship (both vertically and laterally) that must be maintained. The pedestal must be positioned at a specified distance from the curb. Since the pedestal is wider than the curb, the pedestal ends will extend beyond the curb's sides. To ensure the pedestal and curb are installed and positioned properly, follow these steps.

1. Place the pedestal on the roof support member(s) designated in the building specification.
2. Place the curb the proper distance from the pedestal. Use a tape measure to ensure that the end rail of the curb is parallel to the pedestal. Refer to [Figure 1, p. 5](#) for the specified distances.
3. Center the pedestal with the curb by measuring the diagonals as shown in [Figure 5, p. 15](#). Take precautions not to change the dimension achieved in step 2.
4. Ensure that the curb is not twisted (i.e. one corner higher than another). Stretch lines diagonally between opposite corners of the assembled curb as illustrated in [Figure 19, p. 23](#). The vertical distance between the lines at the point of intersection should not exceed 1/4".

**Note:** *If the lines touch, place the top line on bottom and the bottom on top, and recheck the point of intersection. Place shims under the low corners as required.*

5. Square the curb by measuring diagonally between opposite corners as shown in [Figure 19, p. 23](#). The curb is square when these two measurements are equal.
6. Tighten each screw used to assemble the curb to a torque of 6 ft. lb.
7. Level the curb and pedestal assembly. The best condition is that the assembly be installed level, but an overall slope of up to 4" end to end and 2" side to side is acceptable for most applications.

**Note:** *Steam heat units require a level curb; no slope is allowed.*

8. Position the pedestal vertically so that the top of the pedestal is 2 1/4" below the top of the curb. (The pedestal was purposely designed 2 1/4" shorter than the curb because the unit's base rails rest on the pedestal at one point and on the curb at a different point). One suggestion for positioning the pedestal vertically is given in Steps 9 through 11 and illustrated in [Figure 20, p. 24](#).
9. Run a string between the curb return air end and a pole just beyond the pedestal. Tie the string to the pole as shown in [Figure 20, p. 24](#). Do not tie the string too high or too low as illustrated in [Figure 20, p. 24](#), thus making it a true extension of the curb height.
10. Measure the distance from the string to the top of the pedestal. If this distance is 2 1/4", the pedestal is positioned properly. If not, raise the pedestal or curb

with shims until the distance from the string to the top of the pedestal is 2 1/4". Take precautions to maintain the leveled position of the curb and pedestal if shimming is necessary.

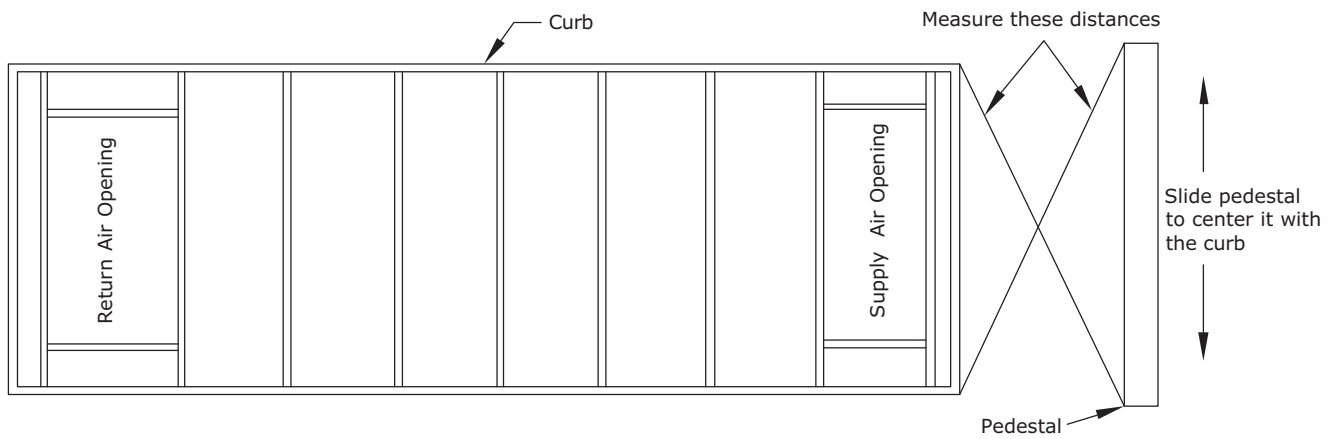
11. Secure the curb and pedestal to the roof support members or the roof deck.

After properly positioning the curb and pedestal, refer to [Figure 14, p. 20](#), [Figure 16, p. 21](#), [Figure 17, p. 21](#) and the following steps to complete the installation.

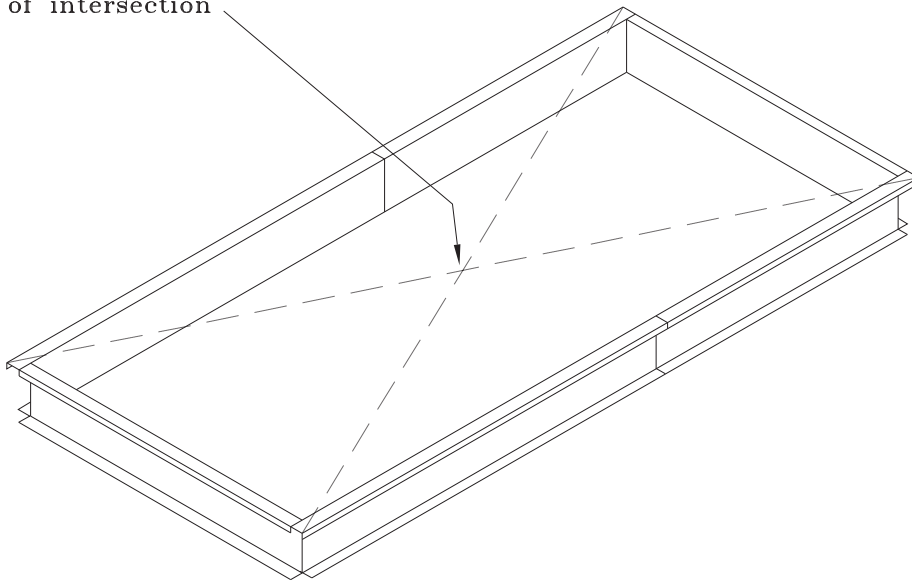
12. Place either 2 x 10 boards or rigid insulation around the curb exterior and fasten them in place from inside the curb.
13. Place either 2 x 10 boards or rigid insulation around the pedestal's exterior and fasten them in place from outside the pedestal.
14. Install cant strips around the outside of the curb and pedestal.

**Note:** *Cant strips may be 4 x 4 wood cut diagonally in half, concrete or rigid insulation.*

15. Bring roofing felt up to the top of the curb's 2 x 10's and the pedestal's 2 x 10's and fasten it into place.
  16. Place flashing under the lip of the curb flanges and over the felt, and secure the flashing as illustrated.
  17. Remove the Center and End Caps from the pedestal and attach flashing over the felt as illustrated. See [Figure 15, p. 20](#) for new construction and [Figure 17, p. 21](#) for existing construction.
  18. Place the Center Cap over the pedestal and secure it with 22 sheet metal screws.
  19. Apply sealant (provided with the curb kit) to the ends of the Center Cap, End Caps and the four corners of each cap to make it watertight as illustrated in [Figure 13, p. 19](#).
  20. Place the End Caps over the pedestal ends and secure them using 4 sheet metal screws per End Cap.
  21. Generously caulk (field-provided) all joints between the curb assembly and the roof to ensure a watertight seal.
  22. Install the gasket material (kit provided) to the entire perimeter top flanges as illustrated in [Figure 21, p. 25](#). The return and supply opening gaskets should be applied such that the bottom of the unit is sealed with the duct work, following industry standards.
- Note:** *To ensure a good gasket-to-metal bond, thoroughly clean the metal curb surfaces where the gasket will be applied.*
23. Fabricate, install and attach all ductwork to the roof curb before the unit is placed onto the curb.
- Note:** *For sound consideration, cut only the holes in the roof deck for the supply and return duct penetration. Do not remove the roof decking from the inside perimeter of the curb.*

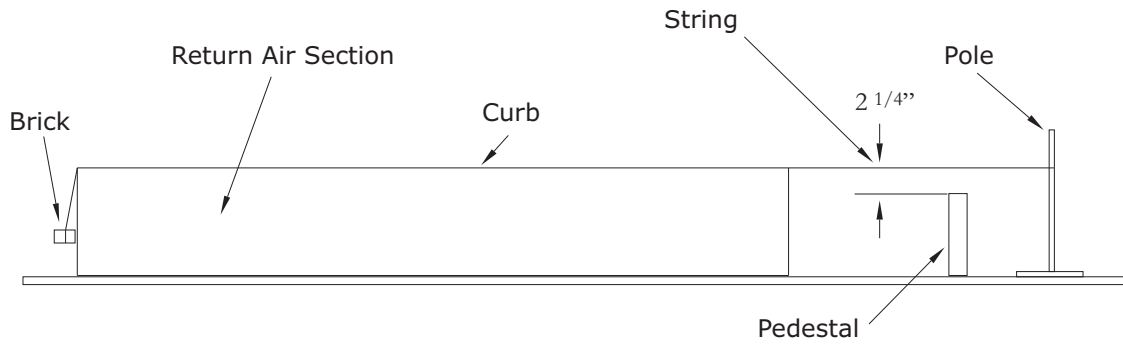
**Figure 18. Centering curb and pedestal (overhead view)****Figure 19. Verifying roof curb is square—not twisted**

Distance from corner-to-corner must be of equal length and lines must be within 1/4" of each other vertically at the point of intersection

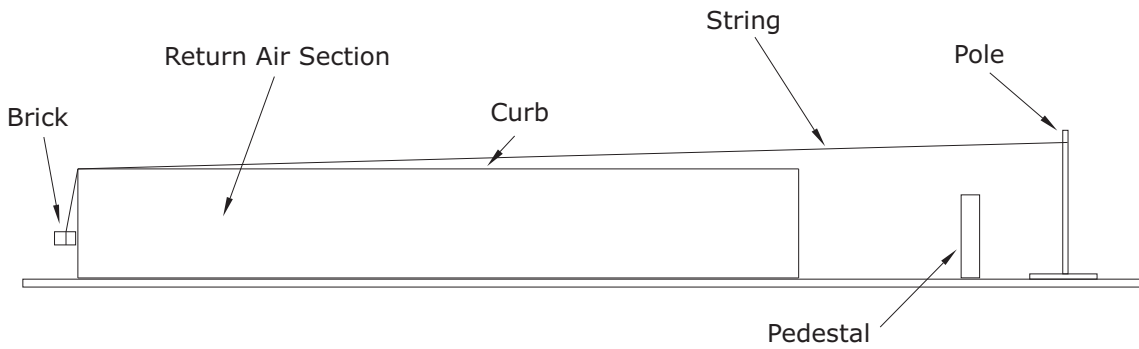


**Figure 20. Vertical alignment of the curb and pedestal**

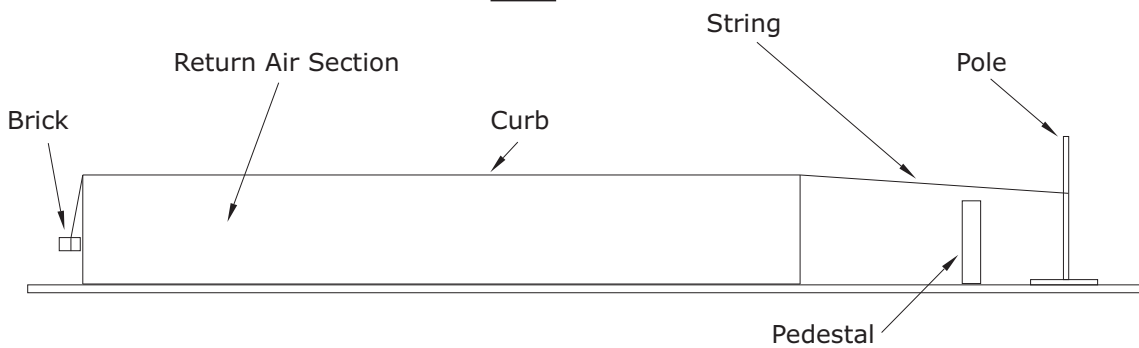
**YES**



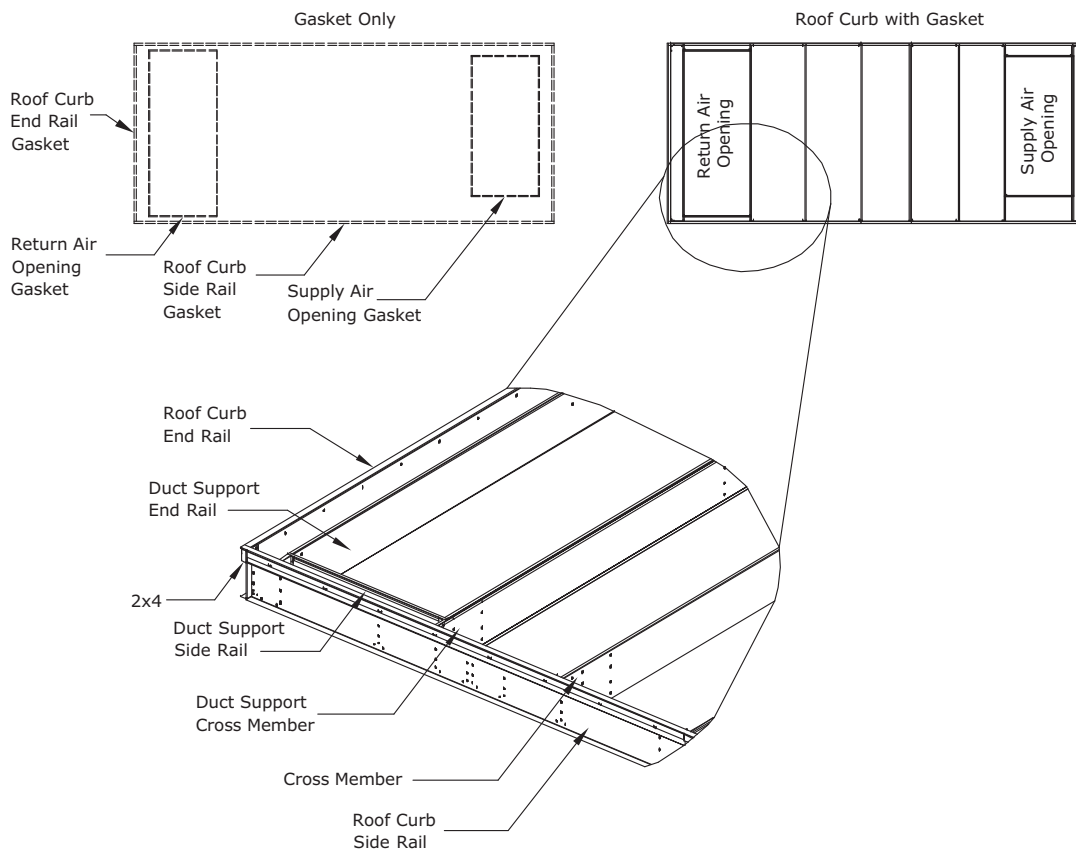
**NO**



**NO**





**Figure 21. Roof curb gasket installation**


## Air Handler Units – External Piping Enclosure Roof Curb Installation

An add on roof curb is required for an air handler with chilled water to mount the external piping enclosure.

**Important:** When the air handler does not have the chilled water option, DO NOT install the external piping enclosure roof curb. Failure to do so will leave a large open hole in the roof.

1. Install two pieces of 0.5" x 1.75" x 8.75" gasket on the bottom of the external piping enclosure roof curb cover. Use Figure 22 as a guide. Gasket should be aligned to the edge of the center bracket.
2. Assemble the external piping enclosure roof curb as shown in Figure 23 with #14 screws.
3. Remove c-shaped brackets from both ends of the roof curb cover. See Figure 22 for bracket location.
4. Attach the external piping enclosure roof curb to the air handler roof curb with #14 self drilling screws. The external piping enclosure roof curb is located 137.5"

from the return end of the air handler roof curb. See Figure 24.

**Important:** Proper location of the external piping enclosure roof curb to the unit roof curb is required for correct mounting of the enclosure to the cabinet. Use all holes in the attachment flanges with #14 drill screws. Attach the external piping enclosure to the air handler roof curb before nailers are in place. Failure to do so will prevent curb fitup.

### NOTICE

#### Water Leakage!

Attach the external piping enclosure to the air handler roof curb before curb gasket is in place. Failure to do so could increase the risk of water leakage which could result in equipment or property damage.

5. Caulk the seams of the external piping enclosure roof curb as described in Figure 24.
6. Install gasket along the perimeter of the external piping enclosure roof curb.

## Curb Installation

- Fasten nailers to the external piping enclosure roof curb after the main air handler roof curb nailers are in place. Use Figure 25 as a guide.

### NOTICE

#### Water Leakage!

The upstream and downstream side piping enclosure curb nailers should fit up tight against the roof curb cover, compressing the cover gasket. Failure to do so could result in water leakage which could result in equipment or property damage.

**Note:** The nailers attached to the main air handler roof curb should fit up tight against both sides of the external piping enclosure roof curb.

- Caulk the seams of the external piping enclosure roof curb as shown in Figure 25.

### NOTICE

#### Water Leakage!

Failure to caulk seams of external piping enclosure roof curb could result in water leakage which could result in equipment or property damage.

- Attach small C-shaped brackets to roof curb cover with provided screws.

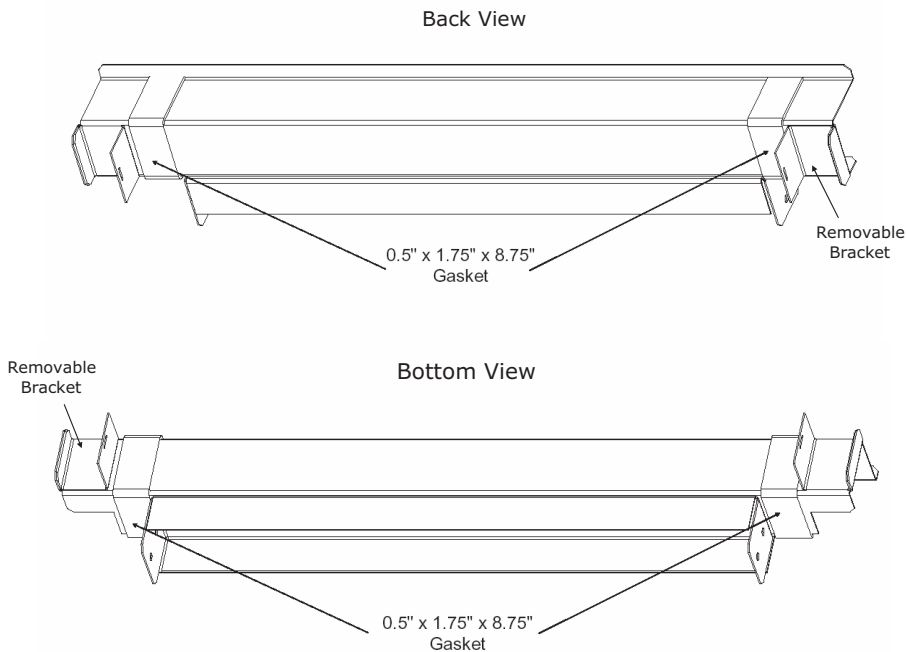
**Note:** The external piping enclosure roof curb cover requires a notch to allow for the air handler base rail which hangs over the main unit curb.

### NOTICE

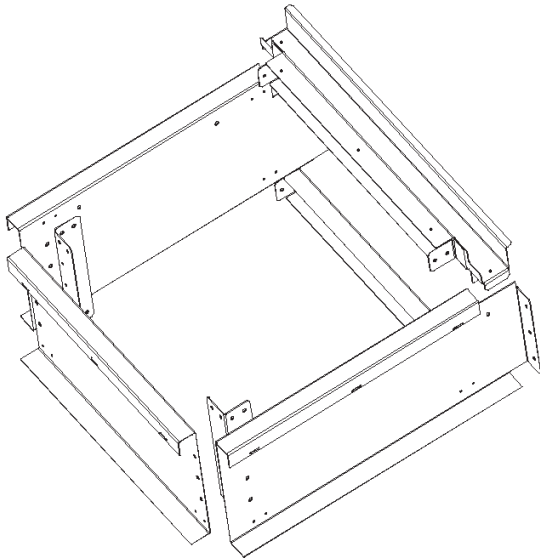
#### Water Leakage!

The external piping enclosure roof curb notch requires a separate nailer piece to aid in roofing. Failure to do so could result in water leakage which could result in equipment or property damage.

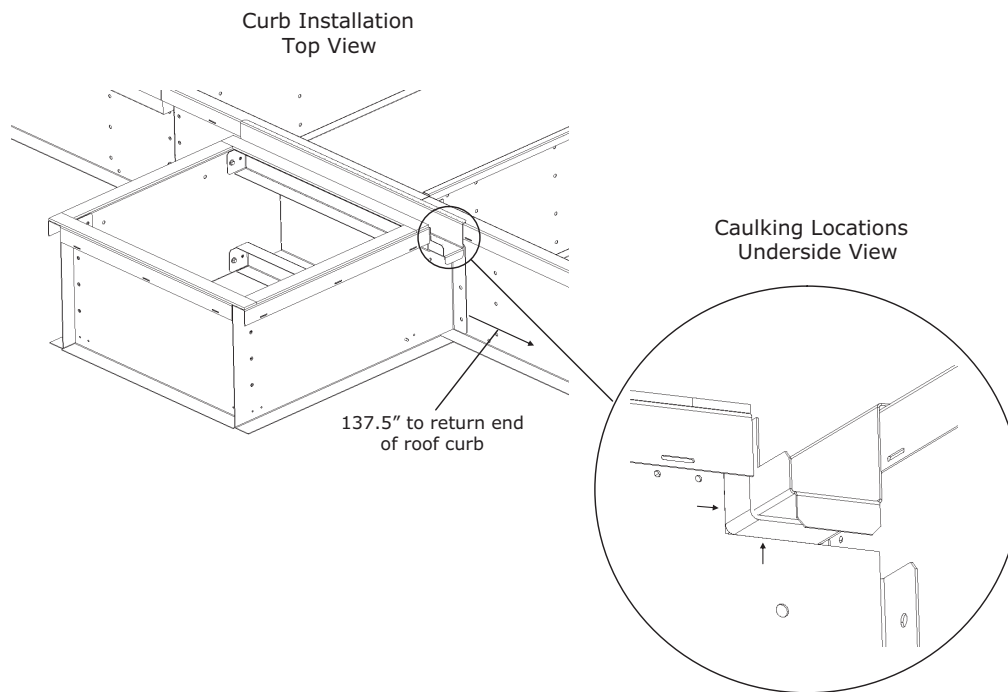
Figure 22. External piping enclosure roof curb cover gasket



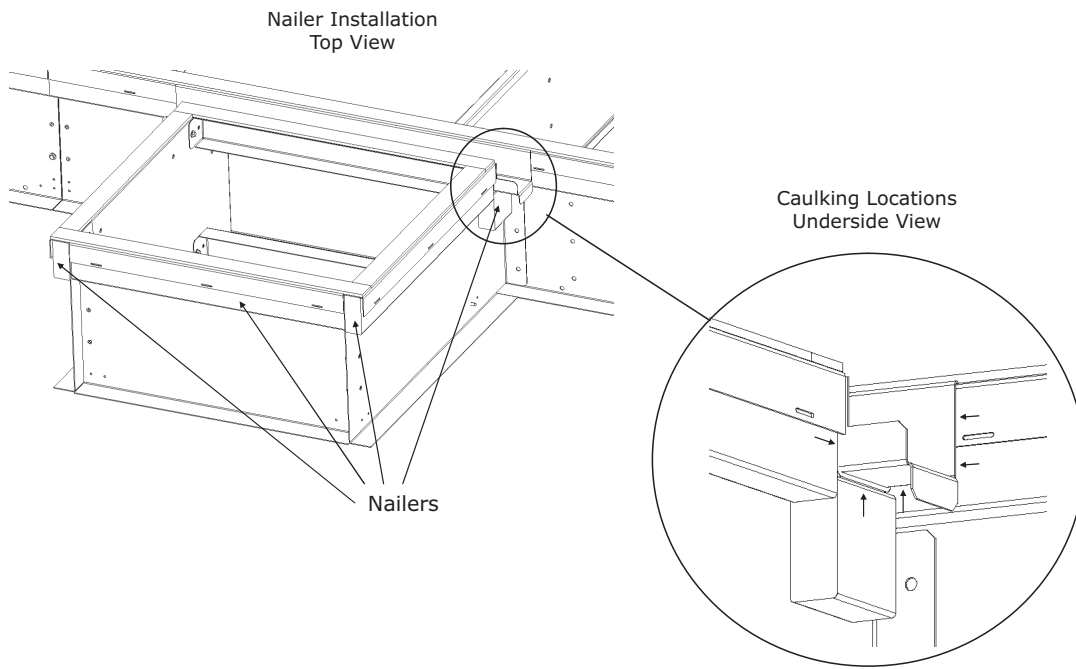
**Figure 23. External piping enclosure roof curb assembly**



**Figure 24. External piping enclosure roof curb installation**



**Figure 25. External piping enclosure nailer installation**





# Sound Attenuation

To ensure adequate sound attenuation (dissipation), it is important to consider every possible sound source associated with large rooftop unit applications.

## Unit Sound Sources May Include:

- The supply fan
- Compressors
- Exhaust fans (optional)
- Condenser fans
- Duct fittings - i.e., "aerodynamic noise" caused by ductwork design
- Vibration - i.e., produced by the unit compressors and fan assemblies

It is also important to consider the four "transmission paths" that allow unit sounds to reach the conditioned space:

- Building Structure (carries sound and vibration produced by the unit compressors and fan assemblies).
- Unit Base (conducts sounds produced by the supply and exhaust fans).
- Supply Duct (conveys sounds originating at the supply fan discharge).
- Return Duct (conveys sounds originating from the inlets of both the supply and exhaust fans; may also transmit compressor and fan vibration).

A summary of the sound sources and sound transmission paths associated with a typical rooftop unit is illustrated in [Figure 26, p. 30](#). Some basic installation guidelines for minimizing unit sound (i.e., vibration-transmitted, casing-radiated, supply and return fan, and aerodynamic sounds) are briefly outlined here.

## Unit Sound Sources and Typical Sound Transmission Paths

### Sounds Transmitted by Vibration

Eliminating unit vibration transmission is only possible if the building structure is rigid enough to serve as an adequate base. However, there are several things the installer can do to reduce the amount of vibration transmitted to the building structure.

1. Do not remove the roof decking within the curb perimeter.
2. Ensure that the unit weight does not crush the roof deck at points where the deck is between the curb and the roof joists. Poured insulation usually adds the needed strength; if rigid insulation is used, add support channels to the decking.
3. Use a solid concrete pad as a base.

4. Set the unit on spring isolation rails to further isolate it from the building structure.
5. Use flexible connections between:
  - a. the unit discharge and the supply duct;
  - b. the supply duct and the building walls and duct chases; and,
  - c. the unit return opening and the return duct.
6. Make sure that the supply duct does not contact any of the building structure.
7. Use flexible connectors when attaching electrical conduits, gas or steam/hot water piping to the unit.
8. Locate the unit over vertical building supports - not at the center of a horizontal beam!

### Sounds Radiated by Unit Casing

To reduce the amount of sound transmitted to the conditioned space through the bottom of the unit casing:

1. Fill the curb with either "lightweight" concrete, or alternating layers of high-density, fiberglass insulation and dry wall (or sheet lead).
2. Fabricate a steel structure to raise the unit several feet above the roof surface.
3. Apply a sealant around all piping penetrations.
4. Cut close tolerance holes in the roof deck for the supply and return ductwork.
5. Seal the penetration holes between the decking and the ductwork with caulk; even a small air leak between the duct and deck destroys most of the attenuation afforded by the steel decking.

### Sounds Transmitted by Supply Fans

Typically, the primary sound source associated with a rooftop unit installation is the supply fan discharge. The low frequency sound produced by the supply fan is readily conveyed to the conditioned space via the ductwork.

1. Carefully review and adhere to the metal gauge and duct installation guidelines sanctioned by the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).

**Note:** *Lightly-constructed ductwork can actually add another sound problem - "oil canning" (i.e., noise produced by the rapid in and out motion of the duct walls).*

2. Include a 15' to 20' outdoor duct run between the unit discharge and the point where the supply duct enters the building.
3. Beginning at the unit discharge, use round, spiral-seam duct for the supply ductwork. A 2" internal acoustic lining is recommended for the first 20' to 30' of the duct.
4. If rectangular supply ductwork is used:

## Sound Attenuation

- a. Construct the first 20' to 30' of duct with heavy-gauge (#14 to #16 gauge) sheet metal.
- b. "Lag" (cover) the duct exterior using one of these media:
  - i. gypsum board (plasterboard) isolated from the duct [Figure 27, p. 31](#);
  - ii. a leaded vinyl barrier; or,
  - iii. gypsum board applied tight to the duct.

### Sounds Transmitted by Return Fans

Sounds originating at the inlets of the supply and optional exhaust fans carries to the conditioned space through the unit return air opening.

To minimize these transmissions in an open plenum return system, use a heavy-gauge, internally-lined boot or "T"; refer to [Figure 27, p. 31](#). For ducted return systems, a 2" internal duct lining is recommended.

### Aerodynamic Noise

"Aerodynamic" sounds associated with rooftop unit installations are related to ductwork design, and is produced at duct fittings (e.g., elbows, dampers, and takeoffs).

The level of aerodynamic sounds produced at these fittings is a function of airflow velocity and turbulence, as well as fitting geometry.

To limit the amount of sounds generated at duct fittings, consider these basic guidelines when designing the ductwork:

1. Size rectangular ductwork for low velocities. (Round ductwork may be sized for either medium or high velocities.)
2. Use straight duct runs between fittings.
3. Avoid abrupt changes in direction.

**Figure 26. Unit sound sources and typical sound transmission paths**

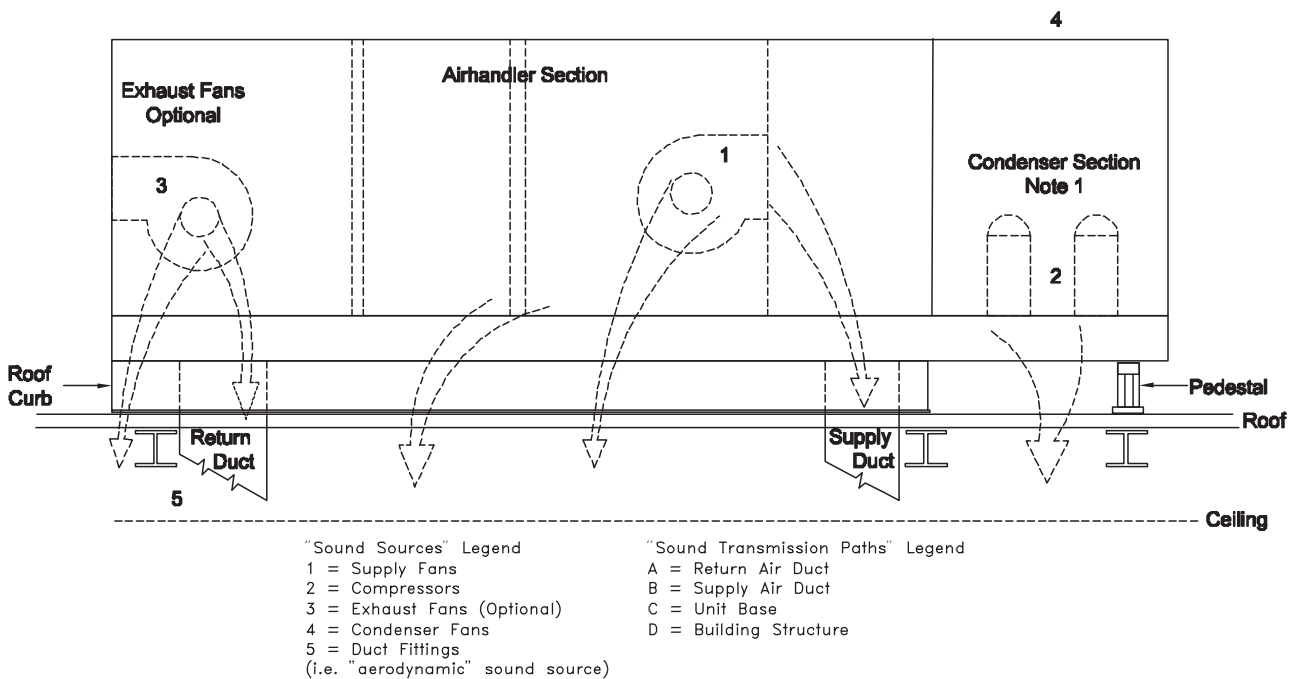
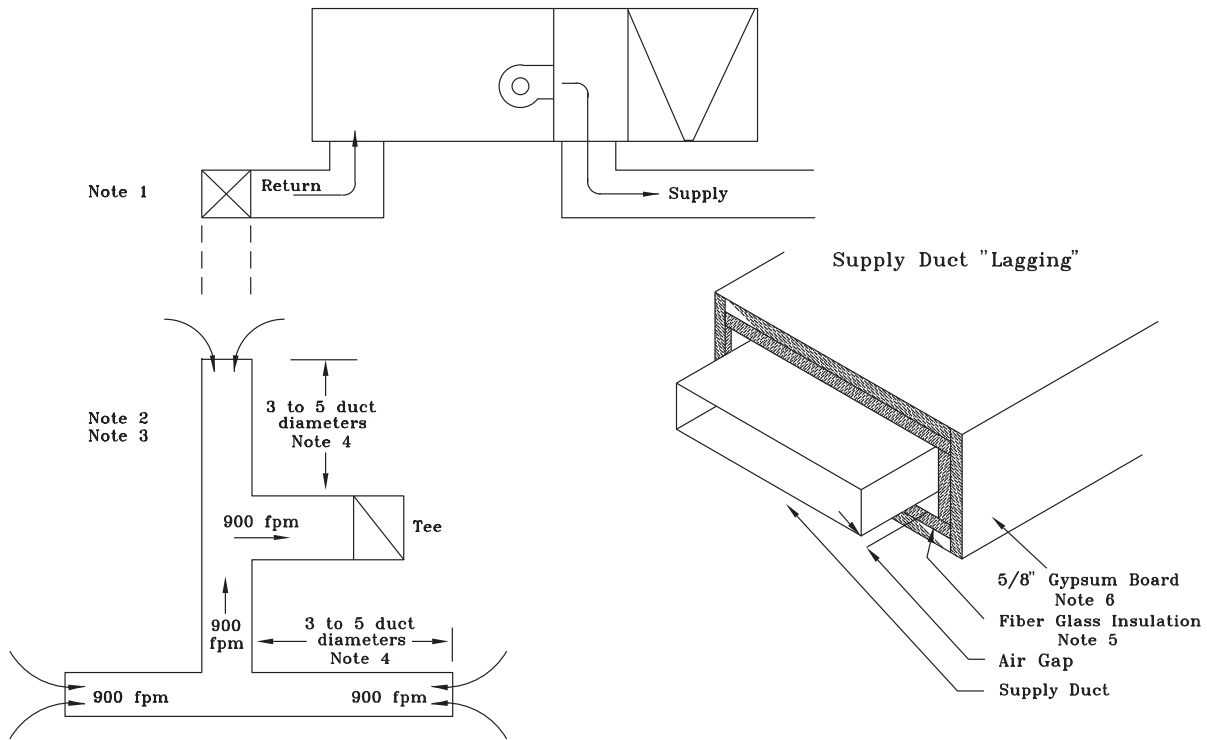


Figure 27. Illustration of attenuating sounds transmitted by supply and return fans



Notes:

1. Use a heavy-gauge, internally-lined boot or tee for "Open Plenum" return systems.
2. Use a 2" minimum internal lining in all ducted returns.
3. Size all return ducts for 900 to 1,000 fpm, maximum.
4. Each Section of the return air duct should be atleast 3 to 5 duct diameters long.
5. If desired, add fiberglass insulation to:
  - a. the interior surface of the gypsum board, or;
  - b. the exterior surface of the supply duct.
 Maintain the air gap when applying the insulation.
6. Use one or two layers of 5/8" gypsum board (plasterboard) as desired. To maintain the vibration isolation property, do not allow the gypsum board to contact the duct.

Trane - by Trane Technologies (NYSE: TT), a global climate innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit [trane.com](http://trane.com) or [tranetechnologies.com](http://tranetechnologies.com).

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice. We are committed to using environmentally conscious print practices.