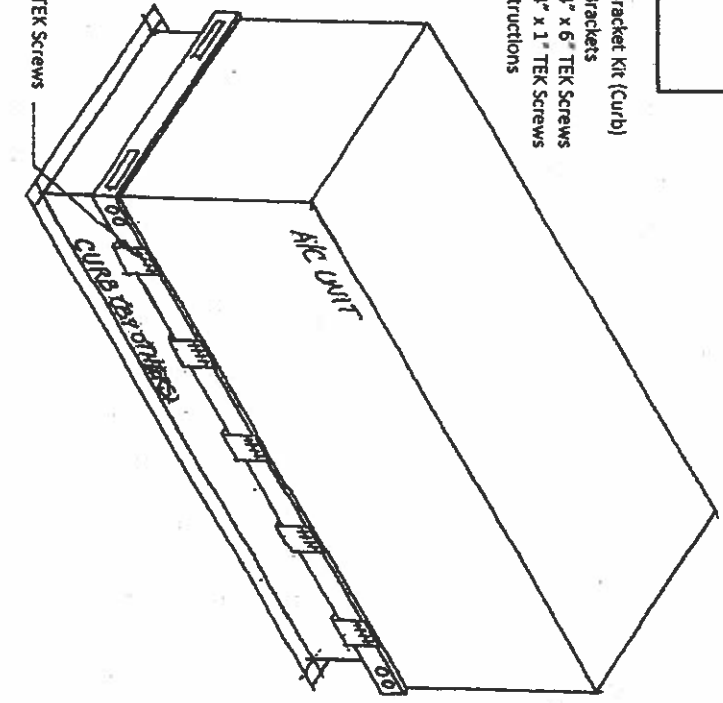## Curb Mounting

Part Number BRK-CRBHOLD-01: Z-Bracket Kit (Curb)
One Kit Contains:
Qty. 4 -   Z-Brackets
Qty. 16 - 1/4" x 6" TEK Screws
Qty. 8 -   1/4" x 1" TEK Screws
Qty. 1   Instructions

Three Kits Required per Unit

Z-Bracket Installed on Roof Curb prior to installation of seal strip & RTU

Z-Bracket with
Qty. 4 - 1/4" x 6" TEK Screws
10 Places

A/C UNIT

CURB (by others)

BRYANT Chassis 6, 7, 8, and 9:

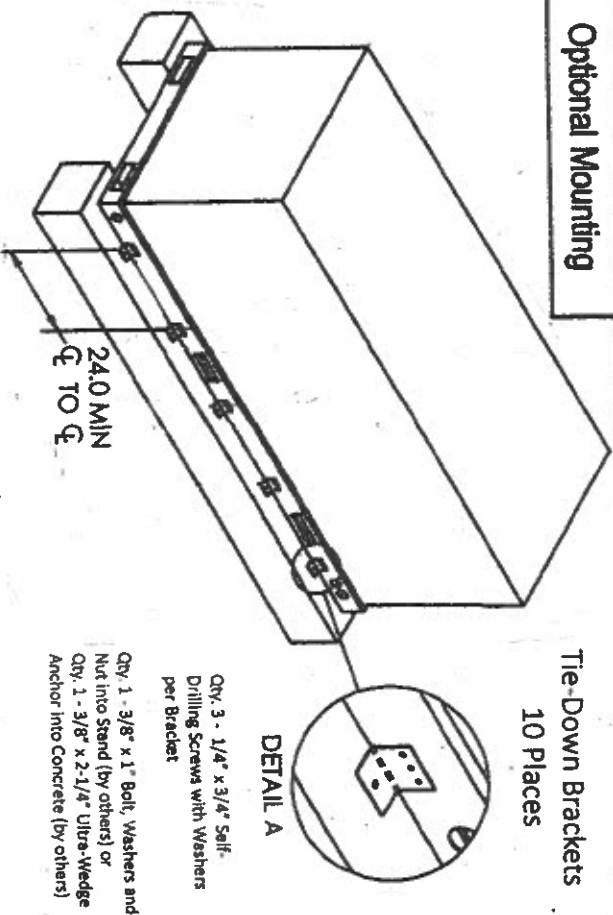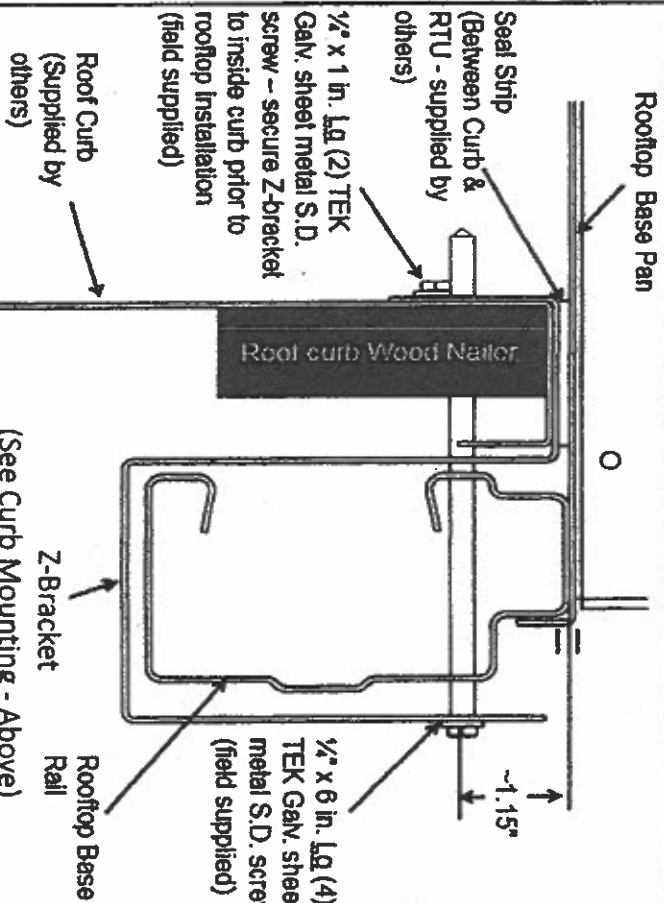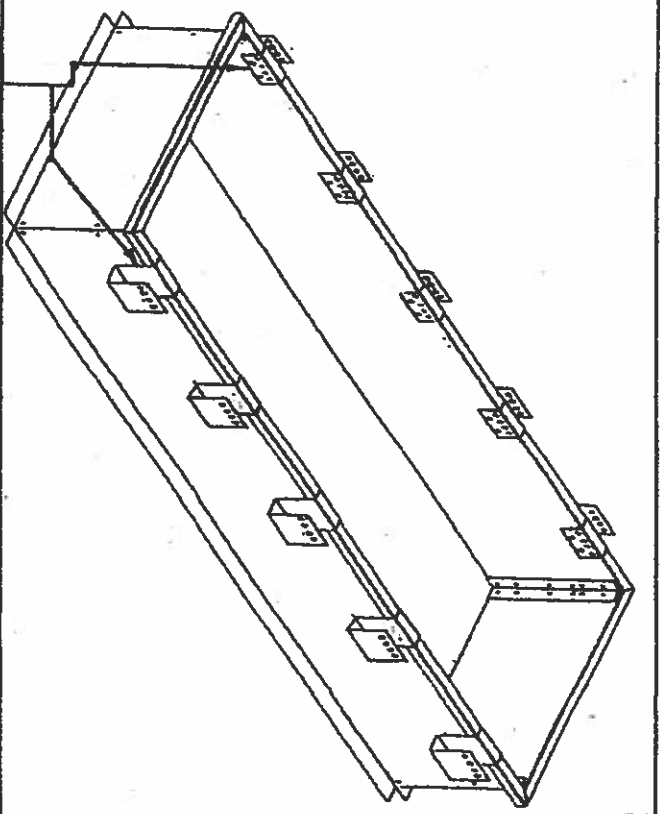Models: 580J/588J size 17 (min) through 30 (max), 548J size 17 and 24, 581J/551J size 17 (min) through 28 (max)

Each package unit air conditioner listed above conforms to the Florida Building Code 7th Edition (2020) requirements for installation including High Velocity Hurricane Zone (HVHZ), Risk Category III (V = 186 MPH), exposure category "D", and installation height up to and including 65 feet above grade. Worst case is -29 (chassis 9) 157-3/4" x 86-3/8" x 57-3/8" tall.

ALLOWABLE DESIGN PRESSURES FOR THE UNIT ITSELF:

Design Lateral Pressure = 197.2 lb/ft²
Design Uplift Pressure = 95.4 lb/ft²

Unit itself will withstand wind loads imposed by 197.2 PSF lateral and 95.4 PSF uplift design pressures provided the 16 gage galvanized base rails are properly fastened to a suitable slab, curb, curb adapter, or other suitable mounting arrangement and all factory supplied assembly fasteners are in place.

Z-Bracket Wind Load Fastening to RTU to Roof Curb

Seal Strip (Between Curb & RTU - supplied by others)

Rooftop Base Pan

½ x 1 in. Lg (2) TEK Galv. sheet metal S.D. screw – secure Z-brackct to inside curb prior to rooftop Installation (field supplied)

Roof curb Wood Nailer

Roof Curb (Supplied by others)

Z-Bracket (See Curb Mounting - Above)

Rooftop Base Rail

¼" x 6 in. Lg (4) TEK Galv. sheet metal S.D. screw (field supplied)

~1.15"

Optional Mounting

Tie-Down Brackets
10 Places

24.0 MIN
₵ TO ₵

Part Number CRTDC-XGR: Tie-Down Bracket Kit (Concrete or Stand)
One Kit Contains:
Qty. 2 - Tie-Down Brackets
Qty. 6 - 1/4" x 3/4" Self-Drilling Screws with Washers
Qty. 2 - 3/8" x 2-1/4" Ultra-Wedge Anchors (Concrete)
Qty. 1 - Instructions
Qty. 2 - 3/8" x 1" Bolts, Washers and Nuts (Stand)

Five Kits Required per Unit

DETAIL A

Qty. 3 - 1/4" x 3/4" Self-Drilling Screws with Washers per Bracket

Qty. 1 - 3/8" x 1" Bolt, Washers and Nut into Stand (by others) or Qty. 1 - 3/8" x 2-1/4" Ultra-Wedge Anchor into Concrete (by others)

Chassis 6, 7, 8, and 9	Job No.:	Bryant Rooftop Units
S1	Date: 01/12/21	Title
	Created by: J. Buerosse	Model List and Details

Rational Analysis: Worst case is - 24 (Chassis 9) 157-3/4" x 86-3/8" x 57-3/8" tall.

Design Pressures complying to FBC Building 1620.6 (HVHZ):
V = 186 mph (Risk Cat. III). For Exp.Cat. "D" and Z = 65 ft, K_z = 1.33, K_{zt} = 1.0, K_d = 0.90
Using 1620.6,
q = .00256$K_zK_{zt}K_dV^2$ = 106.01 lb/ft²

Lateral Wind Pressure = W_t = q(3.1) = 328.64 lb/ft²
Uplift Wind Pressure = U_t = q(1.5) = 159.02 lb/ft²
Factoring in the required Load Combination factor (0.6):

Design Lateral Pressure = W_t(0.6) = 197.18 lb/ft²
Design Uplift Pressure = U_t(0.6) = 95.41 lb/ft²

Since positive pressure acts toward the surface being considered and negative pressure acts away, only the uplift pressure will remove a panel from the machine. The design lateral pressure is considered to act toward the windward surface and toward the windward and leeward surfaces. Figure 27.3-1 may be used to distribute the Design Lateral Pressure into positive and negative components acting on the windward and leeward surfaces, respectively.

L/B = 86.375/157.75 = 0.55 for wind on long (157-3/4") side
L/B = 157.75/86.375 = 1.83 for wind on short (86-3/8") side

Worst case positive pressure coefficient is 0.8 for windward wall which has a corresponding negative pressure coefficient of 0.5 on the leeward wall. The worst case negative pressure coefficient is 0.7 for the sidewall (side parallel to wind). Since the windward and leeward wall pressures act in the same direction, the distributed pressures are computed as follows:

Lateral Positive Design Pressure = 197.18 (0.8)/(0.8 + 0.5) = 121.34 lb/ft² (Worst Case Positive)
Lateral Negative Design Pressure = 197.18 (0.5)/(0.8 + 0.5) = 75.84 lb/ft²
Sidewall Negative Design Pressure = 197.18 (0.7)/(0.8 + 0.5) = 106.17 lb/ft² (Worst Case Negative)

22, 20, and 18 ga. panels and columns are fastened together and to 16 ga. base rails using #10 serrated washer head self tapping screws having 0.425" head diameter, 0.19" nominal diameter, and 0.14 minor diameter. These screws are expected to exhibit the following properties based upon ICC-ES Report ESR-2196.

Pullout Strength in 22 ga. = 306 lbs (ultimate)
Pullover Strength of 22 ga. = 828 lbs (ultimate)
Shear Strength in 22 ga. = 684 lbs (ultimate)

Pullout Strength in 20 ga. = 351 lbs (ultimate)
Pullover Strength of 20 ga. = 993 lbs (ultimate)
Shear Strength in 20 ga. = 684 lbs (ultimate)

Pullout Strength in 18 ga. = 450 lbs (ultimate)
Shear Strength in 16 ga. = 927 lbs (ultimate)

For Top Panel Assembly (50HE500275 and 50HE500276 joined using 6 screws):
85.0" x 82.5" draw formed 20 ga. assembly anchored at edges and through top to 16 ga. control box. This portion is over air handler section and is worst case since condenser section has three large holes in the top causing internal and external pressure to be equal.

A = 85.0(82.5)/12(12) = 48.70 ft²
Load = 48.70 (95.41) = 4646.3 lbs
For 8 (min) screws each 85.0" side into 18 ga. (min) panels and 12 screws each 82.5" side into 20 ga. (min) side panels,
Screw Load = 4646.3/2(8 + 12) = 116.2 lbs
Safety Factor = 684/116.2 = 5.9 OK

For End Panel Assembly (50HE500719 and 50HE500762 joined together using 7 screws):
73.0" x 53.5" draw formed 18 ga. panel anchored at edges with 5 screws through top panel into face at top, 5 screws each vertical edge into 22 ga. (min) corner posts, and 5 screws at 3/8" inch above bottom edge through panel into base rail.

A = 73.0(53.5)/12(12) = 27.12 ft²
Load = 27.12(106.17) = 2879.5 lbs
Screw Load = 2879.5/2(5+5) = 143.97 lbs
Safety Factor = 306/143.97 = 2.1 OK for Components and Cladding

For Access Panel (50HE500423):
53.30" x 25.61" draw formed 22 ga. panel anchored with 3 screws through face each vertical side, 2 screws through face at bottom edge into 16 ga. base rail, and top edge fits inside top panel (trapped).

A = 53.5(26.4)/12(12) = 9.81 ft²
Load = 9.81(106.17) = 1041.4 lbs
Screw Load = 1041.4/2(3 + 3) = 86.78 lbs
Safety Factor = 306/86.78 = 3.5

For connection of upper frame and panels to base rails:
12 screws each long side fasten frame posts and 20 ga. (min) panels to the long 16 ga. base rails. 8 screws fasten inside panel to short base rail at air handler end. Opposite end is louvered and has a large opening in the top and mesh over cooling coils.

Remaining panels are trivial cases of the above due to greater fastener quantity or having openings that limit negative pressure effects. OK for Components and Cladding

Lateral Wind Area = A_v = 156.0(53.625)/12(12) = 58.09 ft²
Lateral Design Load = 58.09(197.18) = 11454.9 lbs
Overturning Moment = 11454.9(53.625)/2 = 307135 in-lb

Uplift Wind Area = A_v = 156.0(85.0)/12(12) = 92.08 ft²
Uplift Design Load = 92.08(95.41) = 8785.7 lbs
Uplift Moment = 8785.7(85.0)/2 = 373391 in-lb

Screw Load = (307135 + 373391)/(16 + 8)(85.0) = 333.6 lbs (shear)
Safety Factor = 927/333.6 = 2.8 OK for Components and Cladding

For connection of unit base rails to properly designed curb, metal stand, or structural concrete (by others):
Lateral Wind Area = A_v = 157.75(57.375)/12(12) = 62.85 ft²
Lateral Design Load = 62.85(197.18) = 12393.5 lbs
Overturning Moment = 12393.5(57.375)/2 = 355537 in-lb

Uplift Wind Area = A_v = 157.75(86.375)/12(12) = 94.6 ft²
Uplift Design Load = 94.6(95.41) - 0.6(2248) = 7679.1 lbs
Uplift Moment = 7679.1(76.875)/2 = 295167 in-lb

For connection of 16 ga. (min) straps, clips, or brackets spaced 30" min apart to unit base rails on long sides using 1/4" (#14) self-drilling screws:

Pullout Strength in 16 ga. = 573 lbs (ultimate)
Shear Strength in 16 ga. = 1389 lbs (ultimate)

Using 4 screws per strap, clip, or bracket, with 5 straps, clips, or brackets each long side
Screw Load = (355537 + 295167)(5)(4)(86.375) = 376.7 lbs (shear) at base rail outer surface
Safety Factor = 1389/376.7 = 3.7 OK for Components and Cladding

For 5 Z-Brackets each long side similar to Micronset design but modified to eliminate hidden structural fasteners anchored to 18 ga. (min) curb (by others):

Shear Strength in 18 ga. = 1218 lbs (ultimate)

Screw Load = (355537 + 295167)(5)(4)(76.875) = 423.2 lbs (shear) at curb inside surface
Safety Factor = 1218/423.2 = 2.9 OK for Components and Cladding

For Brackets 3.25-4.13" wide x 2" x 2-1/2", 16 ga. (min), spaced 24" (min) on center each long side. Using (3) screws per bracket,
(5) brackets each side:
Anchor Load = (355537 + 295167)/15(87.125) = 497.9 lbs (tension)
Anchor Load = 12393.5/20 = 619.7 lbs (shear) at 3/4" beyond base rail outer surface

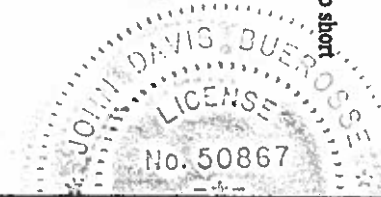For 3/8" SAE Gr. 5 bolts with nuts and washers to steel (by others),
Safety Factor = 3720/497.9 = 7.5 (tension)   OK
Safety Factor = 1937/619.7 = 3.1 (shear)   OK

For 3/8" Power Wedge-Bolt + anchors with 2-1/8" (min) embedment into 2000 psi (min) concrete (by others), 4" (min) thick, 2-3/4" (min) edge distance, and 2-1/2" (min) spacing:
Safety Factor = 3000/746.9 = 4.0 (tension)   OK
Safety Factor = 3100/619.7 = 5.0 (shear)   OK

Chassis 6, 7, 8, and 9	Job No.: Bryant Rooftop Units
S2 — Date: 01/11/21 — Created by: J. Buerosse	Title: Model List and Details