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ENGINEERING + DESIGN

Wind Calculations
for
York CDR Prestige Series (Small Chassis)
Rooftop Equipment

Kit #80-265-45**

2017 Florida Building Code requirements



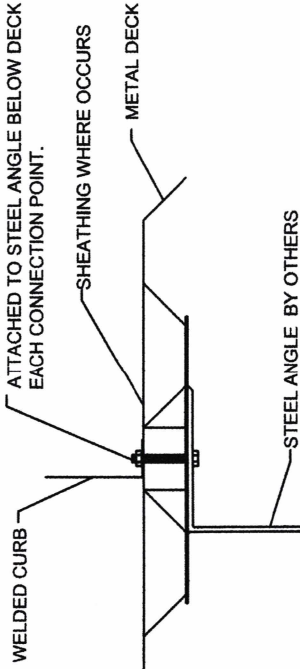
Prepared for:

PROVENT / RRS
3847 Wabash Drive
Mira Loma, CA 91725

Date: January 25, 2019
Project Number: PV1807

STEEL ATTACHMENT

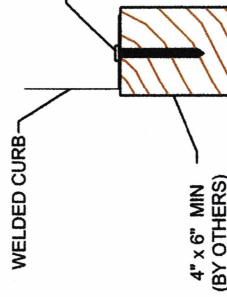
CENTER ON CURB FLANGE. SEE TABLE FOR QUANTITY OF EVENLY SPACED 5/8" Ø A307 BOLTS ATTACHED TO STEEL ANGLE BELOW DECK AT EACH CONNECTION POINT.



CURB KIT	NO. OF ANCHORAGE BOLTS REQUIRED		UNIT
	LONG SIDE *	SHORT SIDE *	
80-265-49	2 @ 34.5" o.c.	2 @ 19" o.c.	LXS
80-265-50	2 @ 34.5" o.c.	2 @ 29" o.c.	LXL
80-265-13	2 @ 61" o.c.	2 @ 25.3" o.c.	SUNLINE 3-6 TON
80-265-45	2 @ 58.4" o.c.	2 @ 28.2" o.c.	PRESTIGE SMALL
80-265-46	2 @ 72" o.c.	2 @ 41" o.c.	PRESTIGE LARGE
80-265-29	3 @ 34.7" o.c.	2 @ 39.5" o.c.	PREDATOR
80-265-19	3 @ 51.6" o.c.	2 @ 72" o.c.	SUNLINE ULTRA
80-265-18	4 @ 38.1" o.c.	3 @ 36" o.c.	SUNLINE MAGNA

WOOD ATTACHMENT

CENTER ON CURB FLANGE. SEE TABLE FOR QUANTITY OF EVENLY SPACED 5/8" Ø WOOD LAG SCREWS (3.5" MIN. EMBED. INTO WOOD FRAMING)



CURB KIT	NO. OF ANCHORAGE SCREWS REQUIRED		UNIT
	LONG SIDE	SHORT SIDE	
80-265-49	5 @ 9.6" o.c.	3 @ 11.5" o.c.	LXS
80-265-50	5 @ 9.6" o.c.	5 @ 8.3" o.c.	LXL
80-265-13	8 @ 9.3" o.c.	4 @ 9.8" o.c.	SUNLINE 3-6 TON
80-265-45	6 @ 12.5" o.c.	3 @ 16.1" o.c.	PRESTIGE SMALL
80-265-46	6 @ 15.2" o.c.	4 @ 15" o.c.	PRESTIGE LARGE
80-265-29	14 @ 5.6" o.c.	7 @ 7.3" o.c.	PREDATOR
80-265-19	15 @ 7.7" o.c.	12 @ 6.9" o.c.	SUNLINE ULTRA
80-265-18	23 @ 5.4" o.c.	14 @ 5.8" o.c.	SUNLINE MAGNA

FOUR INCHES FROM EACH CORNER EVENLY SPACED.

WIND LOAD ROOF ANCHORAGE DETAIL

Meets wind requirements for the following codes:
FBC 2017
based on ASCE 7-10.

Wind:

190 mph exposure D category III or IV building, max BLDG height: 60 ft
Kzt=1.00 max

CONCRETE ATTACHMENT

CENTER ON CURB FLANGE. SEE TABLE FOR QUANTITY OF EVENLY SPACED 3/4" Ø THRRD ROD IN HILT HIT-HY 200 EPOXY, 4" MIN. EMBED INTO CONCRETE.



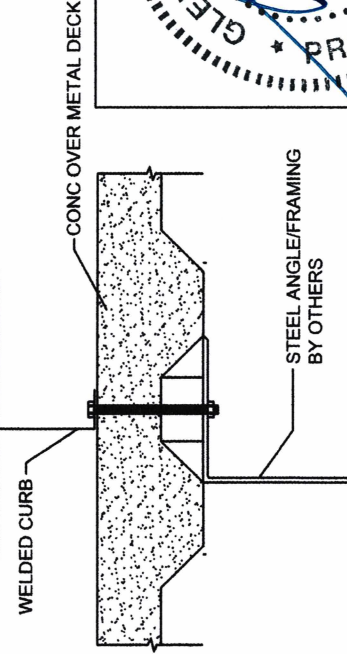
- NORMAL WEIGHT CONC SLAB
- f_c=4000 PSI MIN
- 6" MIN THICK CONC.
- SPECIAL INSPECTION REQUIRED (ESR-3187)

NO. OF ANCHORAGE BOLTS REQUIRED

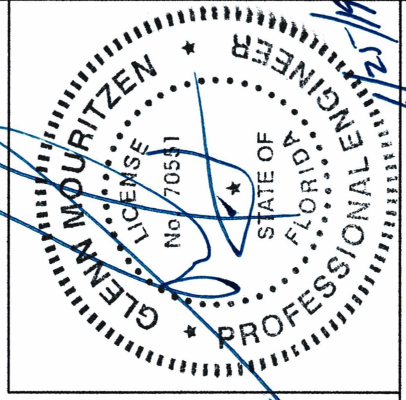
CURB KIT	NO. OF ANCHORAGE BOLTS REQUIRED		UNIT
	LONG SIDE *	SHORT SIDE **	
80-265-49	5 @ 8.6" o.c.	4 @ 6.3" o.c.	LXS
80-265-50	5 @ 8.6" o.c.	5 @ 7.25" o.c.	LXL
80-265-13	9 @ 7.63" o.c.	6 @ 5.1" o.c.	SUNLINE 3-6 TON
80-265-45	6 @ 11.7" o.c.	4 @ 9.4" o.c.	PRESTIGE SMALL
80-265-46	6 @ 14.4" o.c.	5 @ 10.25" o.c.	PRESTIGE LARGE
80-265-29	16 @ 4.63" o.c.	10 @ 4.4" o.c.	PREDATOR
80-265-19	15 @ 7.4" o.c.	12 @ 6.5" o.c.	SUNLINE ULTRA
80-265-18	22 @ 5.4" o.c.	17 @ 4.5" o.c.	SUNLINE MAGNA

STEEL AND CONCRETE ANCHORS ARE 6" FROM EACH CORNER EVENLY SPACED

CONCRETE OVER METAL DECK



NOTE: FOR CONC OVER METAL DECK OVER STEEL FRAMING USE STEEL ATTACHMENT



SUBMITTED TO:
COMPANY:
JOB NAME:
EQUIPMENT:
NOTES:

1625 DIPLOMAT DRIVE
CARROLTON, TX 75006
PHONE (972) 247-7447
FAX (972) 243-0940

FORM NO:
CB-25A

DATE: 01/07/19
REV: 1
DRAWN BY: FMM

RRS ROOFTOP SYSTEMS

ProVent P/N	A	WEIGHT
80-265-4514	14"	117 Lbs
80-265-4518	18"	141 Lbs

Meets wind requirements for the following codes:
FBC 2017
based on ASCE 7-10.

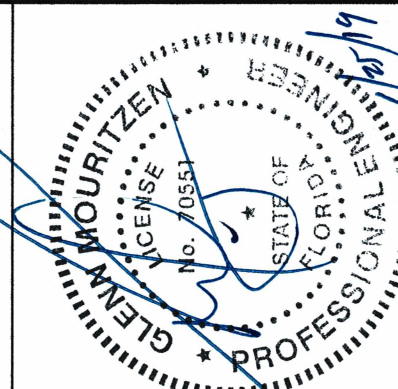
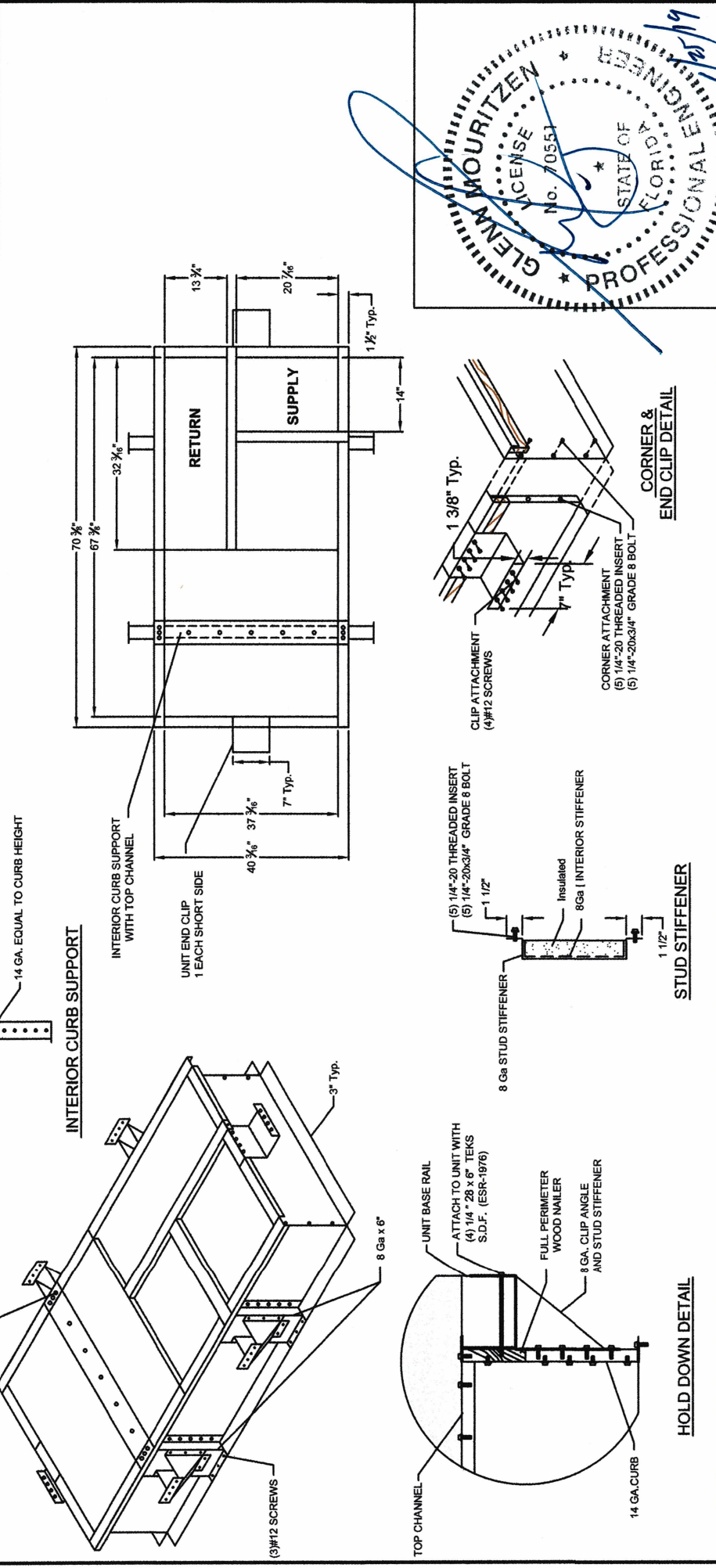
Wind:
190 mph exposure D category III or IV building, max BLDG height: 60 ft
Kzt=1.00 max

For wood, concrete and steel attachments see Roof Anchorage Detail, Form No. CB-25A.

Will conform to wind load code requirements for knock-down or pre-assembled application. (Contact factory for assembled version.)

CALCULATED WIND ROOF CURBS FOR YORK UNITS

ZX 04-07, XX A7
ZY, ZQ, XY, XQ 04-06



RRS ROOFTOP SYSTEMS	1625 DIPLOMAT DRIVE CARROLLTON, TX 75006 PHONE (972) 247-7447 FAX (972) 243-0940	SUBMITTED TO: COMPANY: JOB NAME: EQUIPMENT: NOTES:	FORM NO: CBKD-162A	PART NUMBER: 80-265-45	DATE: 01/23/19	REV: 2	DRAWN BY: ALL
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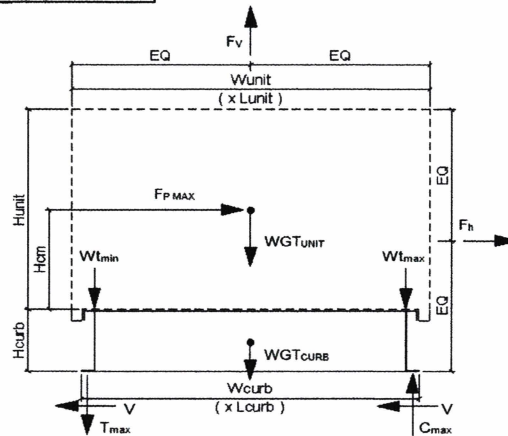
Client: **ProVent PV1807**
Description: **80-265-45****
Unit: **York CDR Presige Series (Small Chassis) Rooftop Equipment**

Curb Information

Hcurb = 18 in (Height of curb)
Lcurb = 70.375 in (Length of curb)
wcurb = 40.1875 in (Width of curb)
WGTcurb = 141 lbs (Weight of curb)

Unit Information

WGTunit = 636 lbs (Weight of Unit)
Wtmax = 176 lbs (Maximum corner weight)
Wtmin = 151 lbs (Minimum corner weight)
Hunit = 40.56 in (Height of unit above curb)
Hcm = 20.28 in (Height to center of mass)
Lunit = 74.05 in (Length of unit)
Wunit = 48.875 in (Width of unit)



Seismic Loading - 2017 FBC/2015 IBC

Ss = 0.15 (Worst Case for state of Florida)
Fa = 2.5 (Worst case Site class E from Table 11.4-1 ASCE 7-10)
Sms = 0.375 (Fa*Ss)
Sds = 0.250 (2/3*Sms)
Ip = 1.5 (Importance Factor Category III or IV Building)
Fpmax = 0.6000 Wp (1.6*Sds*Ip)*Wp
FpmaxASD = 267 lbs (0.7*Fpmax)
FpmaxASD = 326 lbs (unit and curb)

Wind Loading - 2017 FBC/2015 IBC

*** Exposure Category D ***

Kz = 1.31 (For 60 ft roof height, Exposure D - Table 29.3-1 ASCE 7-10)
Kzt = 1.0 (No topographic effects assumed for rooftop mounted units)
Kd = 0.85 (Directionality factor Table 26.6-1 ASCE 7-10)
V = 190 (Wind velocity, mph for Occupancy Cat III-IV bldgs Exp. Cat D)
GCr[horiz] = 1.9 (Refer Sect 29.5.1 ASCE 7-10)
GCr[vert] = 1.5 (Refer Sect 29.5.1 ASCE 7-10)
qz = 102.9 psf
Fh ASD trans = 3533 lbs
Fh ASD long = 2332 lbs
Fvert ASD = 2328 lbs

Curb Loading

Transverse:

Compression_{SEISMIC} = 499 lbs = [FpmaxASD*Hcm+2*[1+0.14S_{DS}]*Wtmax*wcurb]/wcurb
Tension_{SEISMIC} = 140 lbs = Comp_{SEISMIC}-(0.6-0.14S_{DS})*WGTunit
Compression_{WIND} = 830 lbs = [F_{h transASD}*Hcm+2*0.6*Wtmax*wcurb-F_{vertASD}*wcurb/2]/wcurb
Tension_{WIND} = 2776 lbs = Comp_{WIND}+Fvert-0.6*WGTunit

----> Negative values indicate Compression load rather than Tension.

Longitudinal:

Compression_{SEISMIC} = 441 lbs = [FpmaxASD*Hcm+2*[1+0.14S_{DS}]*Wtmax*Lcurb]/Lcurb
Tension_{SEISMIC} = 82 lbs = Comp_{SEISMIC}-(0.6-0.14S_{DS})*WGTunit
Compression_{WIND} = -281 lbs = [F_{h transASD}*Hcm+2*0.6*Wtmax*Lcurb-F_{vertASD}*Lcurb/2]/Lcurb
Tension_{WIND} = 1665 lbs = Comp_{WIND}+Fvert-0.6*WGTunit

----> Negative values indicate Compression load rather than Tension.

Governing Reactions:

Transverse:	Comp _{MAX} = 830 lbs	----> Along long edge of curb.
(on long edge)	Tens _{MAX} = 2776 lbs	----> Along long edge of curb.
Longitudinal:	Comp _{MAX} = 441 lbs	----> Along short edge of curb.
(on short edge)	Tens _{MAX} = 1665 lbs	----> Along short edge of curb.

----> Negative values indicate Compression load rather than Tension.



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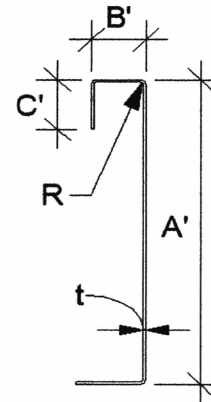
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Curb Design

F_y = 50 ksi F_u = 65 ksi t = 0.0713 **14 Gauge**
E = 29500 ksi

Calculate Section Properties of Curb

A' = 18.000 in a = 17.644 in = A' - (2r+t)
B' = 3.000 in a' = 17.929 in = A' - t
C' = 1.000 in (0 if no lips) b = 2.644 in = B' - [r+t/2+a(r+t/2)]
α = 1.000 (0 - no Lip; 1 w/ lip) b' = 2.929 in = B' - (t/2+αt/2)
R = 0.1069 (Inside bend radius) c = 0.822 in = α[C' - (r+t/2)]
t = 0.0713 in c' = 0.964 in = α[C' - t/2]
r' = 0.143 in = R+t/2 u = 0.224 in = πr/2
x = 0.544 in (Distance between centroid and web centerline)
I_x = 76.324 in⁴ (Moment of Inertia about X-Axis)
I_y = 1.759 in⁴ (Moment of Inertia about Y-Axis)
A = 1.82 in²
r_x = 6.48 in
r_y = 0.984 in
r_{min} = 0.984 in



Axial Compression

P_u = 1.766 k (Max Axial Comp) Ω_c = 1.80
P_n/Ω_c = 38.894 k
F_e = 80.48 ksi If λ_c ≤ 1.5; F_n = (0.658<sup>λ_c²) F_y
λ_c = 0.79 If λ_c > 1.5; F_n = $\frac{0.877}{\lambda_c^2} F_y$ λ_c = $\sqrt{\frac{F_y}{F_e}}$ F_e = $\frac{\pi^2 E}{(kl/r)^2}$
F_n = 38.55 ksi
L_y = 74 in Lateral unbraced length
k_yL_y/r_y = 60 (assume k=0.8)</sup>

Compression Check = O.K.

Check Web Crippling

h = 18 in -- Check limits: C = 4.00
t = 0.0713 in h/t = 252.45 ≤ 200 C_R = 0.14
N = 7.00 N/t = 98.18 ≤ 210 C_N = 0.35
Ω_w = 1.75 N/h = 0.388889 ≤ 2.0 C_h = 0.02
P_n = 2.296 k R/t = 1.50 ≤ 9.0
P_n/Ω_w = 1.312 k P_n = C t² F_y sin(90) $\left(1 - C_R \sqrt{\frac{R}{t}}\right) \left(1 + C_N \sqrt{\frac{N}{t}}\right) \left(1 - C_h \sqrt{\frac{h}{t}}\right)$
Long side: P_{uTrans} = 0.415 k **O.K.** # clips = 2
Short side: P_{uLong} = 0.441 k **O.K.** # clips = 1

***h/t > 200; use web stiffeners

Check Web Stiffener

16Ga x 3/4" x 7" (C-channel)
width of stiffener = 7.000 in t_s = 0.0566 **16 Gauge**
web of stiff. w = 6.717 in R_s = 0.0849 in
***Check w/ts ≤ 1.28VE/F_y Ω_c = 1.70
w/ts = 118.675
1.28V(E/F_y) = 31.091 --> w/ts over limit Use C3.7.2
P_n = 0.7(P_{wc} + A_eF_y) ≥ P_{wc} A_e = 0.380 in²
P_{wc} = 2.296 k P_n/Ω = 8.773 k
P_n = 14.913 k

Not Req'd

Corner Connections

1/4" φ SAE Grade 8 bolts w/ 1/4-20-UNC Threaded inserts

T_{crnmax} = 883 lbs Max[F_omaxASD/4 -OR- F_hASDtrans/4 corner connections]
V_{crnmax} = 1388 lbs (Max Ten/2 corner connections per side)
Bolt: Tall = 2480 lbs Vall = 1096 lbs
Threaded Insert: Tall = 2860 lbs Vall = 1714 lbs
of Bolts required for Tension = 0.4
of Bolts required for Shear = 1.3
of Bolts Used = **2.0**
Check Combined Stress in Bolts & Inserts: 0.811 **O.K.** StressComb = 0.541 **O.K.**

***If combined fails:
USE --> 3.0

Check 1/8" welded connection

<--- USE WELD

Ω = 2.35

Assume L/t > 25: 25*t = 1.783 in P_n/Ω = $\frac{1}{\Omega} 0.75 t L F_u \geq V_{req}$ L_{req'd} = $\frac{V_{req} \Omega}{0.75 t F_u}$
L_{req'd} = 0.938 in



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Connection Unit to Curb Clip

#12 SMS screw

$\Omega = 3.0$

$t_1 = 0.0713$ in

$F_u1 = 65$ ksi

$t_2 = 0.1017$ in (unit base rail thickness)

$F_u2 = 65$ ksi

$d = 0.216$ in (screw diameter)

$dw = 0.375$ in (nom. washer diameter)

$t_2/t_1 = 1.4$

For $t_2/t_1 \leq 1.0$:

Shear: $P_{ns} = 4.2F_{u2}\sqrt{t_2^3d}$ 4.12 k

$P_{ns} = 2.7t_1dF_{u1}$ 2.70 k

$P_{ns} = 2.7t_2dF_{u2}$ 3.86 k

$P_{ns}/\Omega = 901$ #

$P_{ss}/\Omega = 840$ # <- Controls

Tension: $P_{not} = 1.214$ k (screw pull-out strength)

$P_{nov} = 2.607$ k (screw pull-over strength)

$P_{ts}/\Omega = 405$ # <- Controls

$P_{ts}/\Omega = 845$ #

For $t_2/t_1 \geq 2.5$:

$P_{ns} = 2703$ #

$P_{ns} = 2.7t_1dF_{u1}$ 2.70 k

$P_{ns} = 2.7t_2dF_{u2}$ 3.86 k

$P_{not} = 0.85t_c d F_{u2}$

$t_c = \min(t_1, t_2)$

$P_{nov} = 1.5t_1 d_w F_{u1}$

(full tensile screw capacity)

	Shear (k)	# clips	V_{clip} (k)	V_{allow} (lb)	# screws	spacing
Long side:	3.533	2	1.77	840 #	3	3.00 in
Short side:	2.332	1	2.33	840 #	3	3.00 in

clip width (in) = 7.00

min spacing = 0.65 in

clip height = 2.5 in

edge distance = 0.5 in (min. 1.5d)

thinnest part = 0.0713 AISI BSR applies

$\Omega = 2.22$ bolt/screw connection

$A_{gv} = 0.463$ in²

$A_{nv} = 0.425$ in² $A_{nt} = 0.081$ in²

$R_n/\Omega = 8.647$ k

$R_n = 0.6F_y A_{gv} + F_u A_{nt} \leq 0.6F_u A_{nv} + F_u A_{nt}$

(AISI Sect. E5.3)

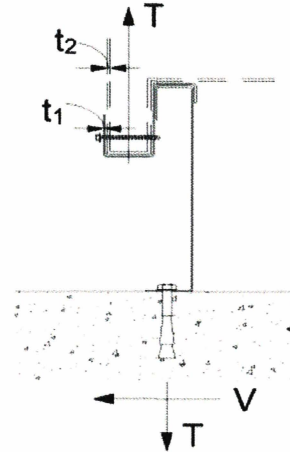
Check Block shear rupture: O.K.

$F_y = 50$ ksi

$A_{gv} = 0.463$ in²

$R_n/\Omega = 8.647$ k

BSR O.K.



Connection of Curb to Supporting Structure

Roof Loading SEISMIC: (0.6-0.14SDS)D + 0.7E

WIND: 0.6D + W

Transverse: Uplift_{MAX} = 4296 lbs Shear_{MAX} = 1766 lbs

Compression_{SEISMIC} = 713 lbs = $[F_{pmaxASD}*(H_{cm}+H_{curb})+(1+0.14S_{DS})*(WGT_{unit+curb}/2)*w_{curb}]/w_{curb}$

Tension_{SEISMIC} = 274 lbs = $Comp_{SEISMIC}-(0.6-0.14S_{DS})*(WGT_{unit+curb})$

Compression_{WIND} = 2434 lbs = $[F_{htransASD}*(H_{cm}+H_{curb})+0.6*(WGT_{unit+curb}/2)*w_{curb}-F_{vertASD}*w_{curb}/2]/w_{curb}$

Tension_{WIND} = 4296 lbs = $[F_{htransASD}*(H_{cm}+H_{curb})-0.6*(WGT_{unit+curb}/2)*w_{curb}+F_{vertASD}*w_{curb}/2]/w_{curb}$

Longitudinal: Uplift_{MAX} = 2199 lbs Shear_{MAX} = 1166 lbs

Compression_{SEISMIC} = 580 lbs = $[F_{pmaxASD}*(H_{cm}+H_{curb})+(1+0.14S_{DS})*(WGT_{unit+curb}/2)*L_{curb}]/L_{curb}$

Tension_{SEISMIC} = 141 lbs = $Comp_{SEISMIC}-(0.6-0.14S_{DS})*(WGT_{unit+curb})$

Compression_{WIND} = 338 lbs = $[F_{htransASD}*(H_{cm}+H_{curb})+0.6*(WGT_{unit+curb}/2)*L_{curb}-F_{vertASD}*L_{curb}/2]/L_{curb}$

Tension_{WIND} = 2199 lbs = $[F_{htransASD}*(H_{cm}+H_{curb})-0.6*(WGT_{unit+curb}/2)*L_{curb}+F_{vertASD}*L_{curb}/2]/L_{curb}$

Wood Attachment: Use 5/8" ϕ wood lag screws w/ 3.5" Min. Embed

Tall_{metal} = 946.67 lbs

Vall_{metal} = 1043.33 lbs

Transverse: Tall_{wood} = 1195.95 lbs

Vall_{wood} = 1024 lbs

of Screws Req'd for Uplift = 4.54

of Screws Req'd for Shear = 1.72

Total # of screws Required = 6

COMBINED LOADING: 0.886 O.K.

Screw Spacing = 12.5 in o.c.

Use 5/8" ϕ wood lag screws @ 12.5 in o.c. along long side of curb

Longitudinal:

of Screws Req'd for Uplift = 2.3

of Screws Req'd for Shear = 1.1

Total # of screws Required = 3

COMBINED LOADING: 0.992 O.K.

Screw Spacing = 16.1 in o.c.

Use 5/8" ϕ wood lag screws @ 16.1 in o.c. along short side of curb

Steel Deck Attachment: Use 5/8" ϕ A307 Bolts attached to steel angle below deck

Tall_{bolt} = 6903 lbs

Vall_{bolt} = 3682 lbs

Transverse: Tall_{bolt} = 6903 lbs

Vall_{bolt} = 3682 lbs

of Bolts Req'd for Uplift = 0.62

of Bolts Req'd for Shear = 0.48

Total # of Bolts Required = 2

COMBINED LOADING: 0.235 O.K.

Bolt Spacing = 58.4 in o.c.

Use 5/8" ϕ A307 Bolts attached to steel angle below deck @ 58.4 in o.c. along long side of curb

Longitudinal:

of Bolts Req'd for Uplift = 0.32

of Bolts Req'd for Shear = 0.32

Total # of Bolts Required = 2

COMBINED LOADING: 0.093 O.K.

Req'd Min Spacing = 28.2 in o.c.

Use 5/8" ϕ A307 Bolts attached to steel angle below deck @ 28.2 in o.c. along short side of curb



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For Concrete anchorage: SEISMIC $[0.6-0.14S_{DS}]D + 0.7\Omega_o E$ ($\Omega_o = 2.5$)

Concrete Attachment: 3/4" ϕ Hilti Hit-HY 200 adhesive anchors w/ 4" embed

$$T_{all,LRFD} = 1722 \text{ lbs} \quad V_{all,LRFD} = 2032 \text{ lbs} \quad \alpha = (1 + 0.2SDS)D + 2.5E = 1.87$$

$$T_{all,ASD} = T_{all,LRFD}/\alpha = 920.9 \text{ lbs} \quad V_{all,ASD} = V_{all,LRFD}/\alpha = 1086.6 \text{ lbs} \quad (D = 0.465, E = 0.535)$$

Transverse:	Uplift _{MAX} =	4296 lbs	Shear _{MAX} =	1766 lbs
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$$\text{Compression}_{SEISMIC} = 1179 \text{ lbs} = [2.5 \cdot F_{pmaxASD} \cdot (H_{cm} + H_{curb}) + (1 + 0.14S_{DS}) \cdot (WGT_{unit+curb}/2) \cdot w_{curb}] / w_{curb}$$

$$\text{Tension}_{SEISMIC} = 740 \text{ lbs} = \text{Comp}_{SEISMIC} - [0.6 - 0.14S_{DS}] \cdot (WGT_{unit+curb})$$

$$\text{Shear}_{SEISMIC} = 408 \text{ lbs} = 2.5 \cdot F_{pmaxASD} / 2$$

$$\text{Min Bolts Req'd Uplift} = 4.66 \text{ spacing} = 11.59 \text{ in o.c.} \quad T_{applied} = 716.0 \text{ lbs}$$

$$\text{Min Bolts Req'd Shear} = 2.00 \text{ spacing} = 46.375 \text{ in o.c.} \quad V_{applied} = 294.4 \text{ lbs}$$

Try using 6 bolts spaced at 11.68 in o.c.	COMBINED LOADING = $\frac{T_{applied}}{T_{allow,ASD}} + \frac{V_{applied}}{V_{allow,ASD}} \leq 1.2 = 1.05$
--	--

Use 6 - 3/4" ϕ Hilti Hit-HY 200 adhesive anchors @ 11.7 in o.c. max. along long side of curb w/ 4" embed

Longitudinal:	Uplift _{MAX} =	2199 lbs	Shear _{MAX} =	1766 lbs
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$$\text{Compression}_{SEISMIC} = 846 \text{ lbs} = [2.5 \cdot F_{pmaxASD} \cdot (H_{cm} + H_{curb}) + (1 + 0.14S_{DS}) \cdot (WGT_{unit+curb}/2) \cdot L_{curb}] / L_{curb}$$

$$\text{Tension}_{SEISMIC} = 407 \text{ lbs} = \text{Comp}_{SEISMIC} - [0.6 - 0.14S_{DS}] \cdot (WGT_{unit+curb})$$

$$\text{Shear}_{SEISMIC} = 408 \text{ lbs} = 2.5 \cdot F_{pmaxASD} / 2$$

$$\text{Min Bolts Req'd Uplift} = 2.39 \text{ spacing} = 8.09375 \text{ in o.c.} \quad T_{applied} = 549.8 \text{ lbs}$$

$$\text{Min Bolts Req'd Shear} = 2.00 \text{ spacing} = 16.1875 \text{ in o.c.} \quad V_{applied} = 441.6 \text{ lbs}$$

Try using 4 bolts spaced at 9.40 in o.c.	COMBINED LOADING = $\frac{T_{applied}}{T_{allow,ASD}} + \frac{V_{applied}}{V_{allow,ASD}} \leq 1.2 = 1.00$
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Use 4 - 3/4" ϕ Hilti Hit-HY 200 adhesive anchors @ 9.4 in o.c. max. along short side of curb w/ 4" embed

CURB DESIGN SUMMARY: 80-265-45**			
CURB RAIL THICKNESS: 0.0713 in 14 Gauge			
UNIT CLIP THICKNESS: 0.0713 in 14 Gauge			
# OF CLIPS (LONG SIDE) - 2 clips with 3 - #12 SMS screws each clip			
WEB STIFFENER: 16Ga x 3/4" x 7" (C-channel) stiffener at each clip			
# OF CLIPS (SHORT SIDE) - 1 clips with 3 - #12 SMS screws each clip			
WEB STIFFENER: 16Ga x 3/4" x 7" (C-channel) stiffener at each clip			
CORNER CONNECTION: Use 3 - 1/4" ϕ SAE Grade 8 bolts w/ 1/4-20-UNC Threaded inserts			
CURB ANCHORAGE	WOOD	STEEL	CONCRETE
	5/8" ϕ lag screw w/ min. 3.5" embed (SGmin=0.43)	5/8" ϕ A307 bolts	3/4" ϕ thrd'd rod in Hilti HIT-HY 200 epoxy, min. 4" embed
	LONG DIRECTION	2 @ 58.38 in o.c.	6 @ 11.68 in o.c.
SHORT DIRECTION	3 @ 16.09 in o.c.	2 @ 28.19 in o.c.	4 @ 9.4 in o.c.