



MOUR GROUP
ENGINEERING + DESIGN

6593 Riverdale St.
San Diego, CA 92120

619-727-4800

Structural Calculations

for

CBKD-91 Roof Curb

Kit #80-266-18**

2017 Florida Building Code requirements



Prepared for:

PROVENT

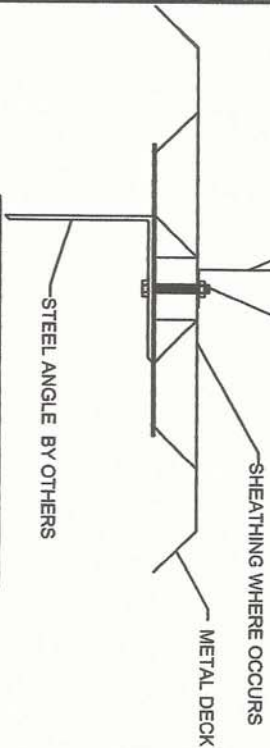
3847 Wabash Drive
Mira Loma, CA 91725

Date: June 15, 2018

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	LONG SIDE *	SHORT SIDE *	UNIT
80-266-49	2 @ 34.5" o.c.	2 @ 19" o.c.	LXS
80-266-50	2 @ 34.5" o.c.	2 @ 29" o.c.	LXL
80-266-13	2 @ 61" o.c.	2 @ 25.3" o.c.	SUNLINE 3-6 TON
80-266-45	2 @ 58.4" o.c.	2 @ 28.2" o.c.	PRESTIGE SMALL
80-266-46	2 @ 72" o.c.	2 @ 41" o.c.	PRESTIGE LARGE
80-266-29	3 @ 34.7" o.c.	2 @ 39.5" o.c.	PREDATOR
80-266-19	3 @ 51.6" o.c.	2 @ 72" o.c.	ULTRA
80-266-18	4 @ 38.1" o.c.	3 @ 38" o.c.	SUNLINE 15-25 TON

WIND AND SEISMIC LOAD ROOF ANCHORAGE DETAIL

Meets wind, seismic 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

Seismic:
 Sds=0.30 max
 Sd1=0.187 max
 Site Class D
 Importance Factor: Ip=1.5

CONCRETE ATTACHMENT

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

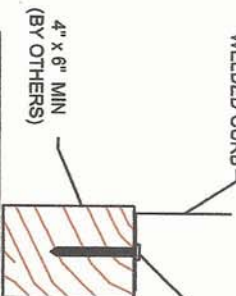


- NORMAL WEIGHT CONC SLAB
- f'c=4000 PSI MIN
- 6" MIN THICK CONC.
- SPECIAL INSPECTION REQUIRED (ESR-3187)

CURB KIT	LONG SIDE *	SHORT SIDE **	UNIT
80-266-49	5 @ 8.6" o.c.	4 @ 6.3" o.c.	LXS
80-266-50	5 @ 8.6" o.c.	5 @ 7.25" o.c.	LXL
80-266-13	9 @ 7.63" o.c.	6 @ 5.1" o.c.	SUNLINE 3-6 TON
80-266-45	6 @ 11.7" o.c.	4 @ 9.4" o.c.	PRESTIGE SMALL
80-266-46	6 @ 14.4" o.c.	5 @ 10.25" o.c.	PRESTIGE LARGE
80-266-29	16 @ 4.63" o.c.	10 @ 4.4" o.c.	PREDATOR
80-266-19	15 @ 7.4" o.c.	12 @ 6.5" o.c.	ULTRA
80-266-18	22 @ 5.4" o.c.	17 @ 4.5" o.c.	SUNLINE 15-25 TON

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)

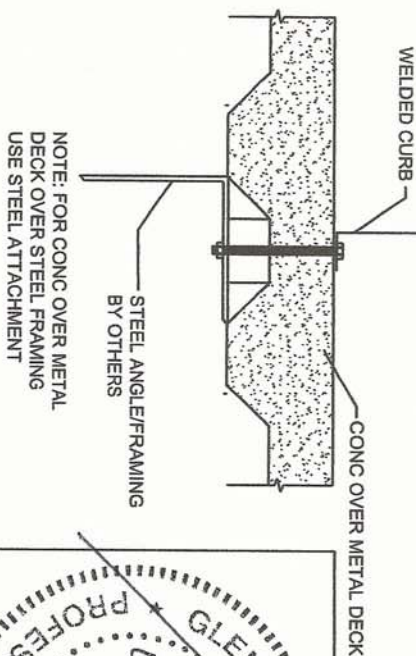


CURB KIT	LONG SIDE	SHORT SIDE	UNIT
80-266-49	5 @ 9.6" o.c.	3 @ 11.5" o.c.	LXS
80-266-50	5 @ 9.6" o.c.	5 @ 8.3" o.c.	LXL
80-266-13	8 @ 9.3" o.c.	4 @ 9.8" o.c.	SUNLINE 3-6 TON
80-266-45	6 @ 12.5" o.c.	3 @ 16.1" o.c.	PRESTIGE SMALL
80-266-46	6 @ 15.2" o.c.	4 @ 15" o.c.	PRESTIGE LARGE
80-266-29	14 @ 5.6" o.c.	7 @ 7.3" o.c.	PREDATOR
80-266-19	15 @ 7.7" o.c.	12 @ 6.9" o.c.	ULTRA
80-266-18	23 @ 5.4" o.c.	14 @ 5.8" o.c.	SUNLINE 15-25 TON

FOUR INCHES FROM EACH CORNER EVENLY SPACED.

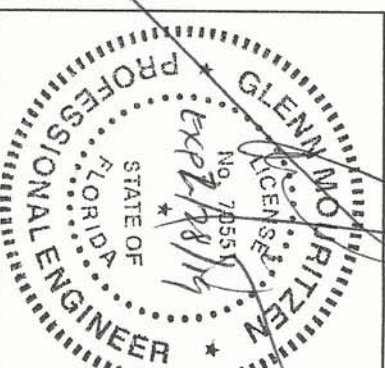
STEEL AND CONCRETE ANCHORS ARE 6" FROM EACH CORNER EVENLY SPACED

CONCRETE OVER METAL DECK



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

FORM NO: CB-25



3847 WABASH DR.
 MIRA LOMA, CA 91725
 PHONE (951) 685-1101
 FAX (619) 872-9799

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

DATE: 06/06/18

REV: 7

DRAWN BY: ALL

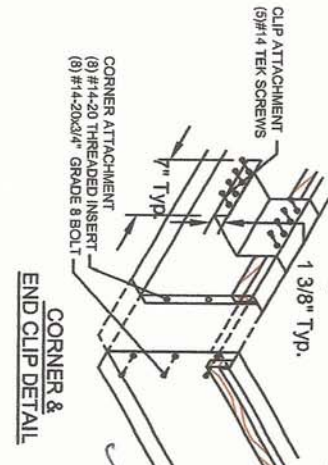
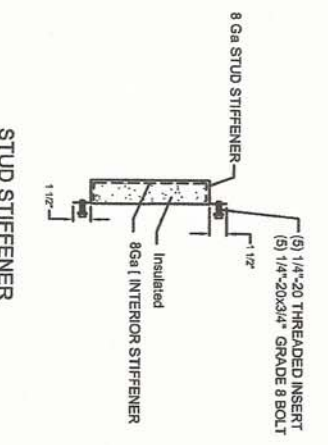
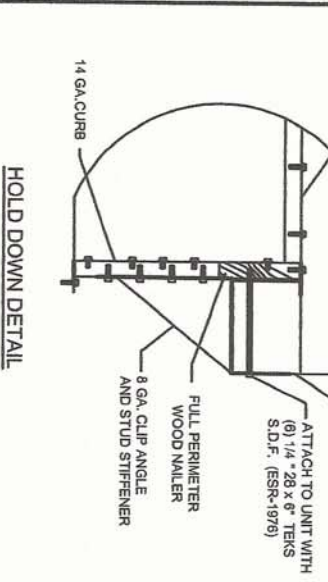
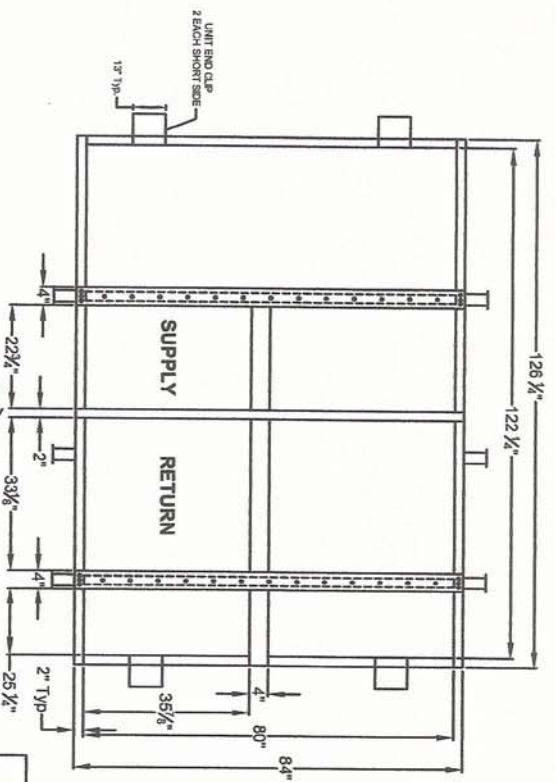
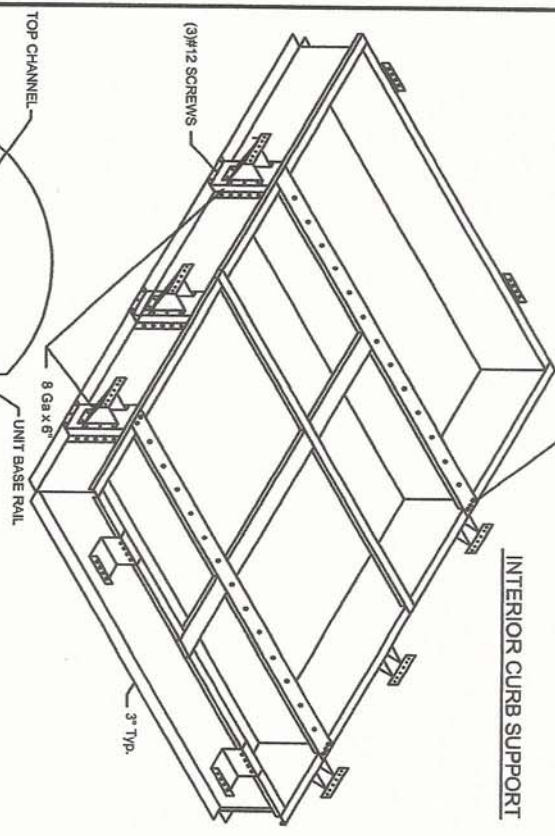
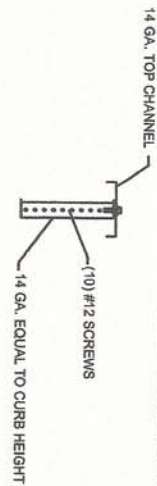
For wood, concrete and steel attachments see Roof Anchorage Detail, Form No. CB-25.

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

CALCULATED WIND AND SEISMIC ROOF CURBS FOR YORK UNITS SERIES 20/ LARGE SUNLINE- LONG RAIL

Z/JZR 180-300: ZF 210-300: XP 180-240

ProVent P/N	A	WEIGHT	CALCULATED KIT P/N	WEIGHT
80-268-1814	14"	243 Lbs	80-268-1814	98 Lbs
80-268-1818	18"	305 Lbs	80-268-1818	136 Lbs



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

Wind:
 185 mph exposure D category III or IV building, max BLDG height: 60 ft
 Kzt=1.66max

Seismic:
 Sds=0.30 max
 Sd1=0.187 max
 Site Class E
 Importance Factor: Ip=1.5



3847 WABASH DR.
 MIRA LOMA, CA 91725
 PHONE (951) 685-1101
 FAX (619) 872-9799

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

FORM NO: CBKD-91
 DATE: 04/20/15
 REV: 4

PART NUMBER: 80-268-18
 DRAWN BY: FMV



Client: ProVent PV1807
Description: CBKD-91 (80-266-18**)

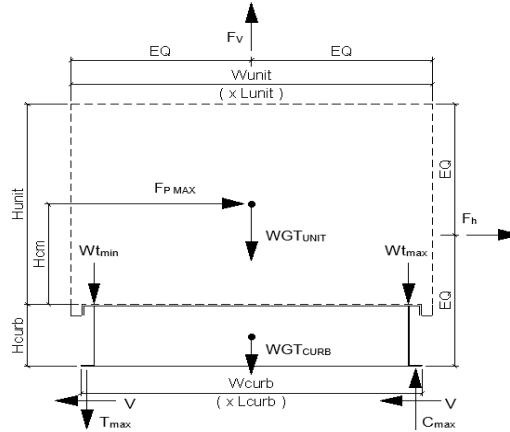
Unit:	YORK ZJ,ZR 180-300 / ZF 210-300 / XP 180-240
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Curb Information

Hcurb = 18 in (Height of curb)
Lcurb = 126.25 in (Length of curb)
wcurb = 84 in (Width of curb)
WGTCurb = 441 lbs (Weight of curb)

Unit Information

WGUnit = 2006 lbs (Weight of Unit)
Wtmax = 534 lbs (Maximum corner weight)
Wtmin = 470 lbs (Minimum corner weight)
Hunit = 52.625 in (Height of unit above curb)
Hcm = 26.3125 in (Height to center of mass)
Lunit = 180.59 in (Length of unit)
Wunit = 92 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 WGUnit (1.6*Sds*Ip)*WGUnit
FpmaxASD = 843 lbs (0.7*Fpmax) FpmaxASD = 1028 lbs (unit and curb)
(unit only)

Wind Loading - 2017 FBC/2015 IBC

*** Exposure Category D ***

Kz = 1.31 (For 60 ft roof height, Exposure D - Table 29.3-1 ACSE 7-10)
Kzt = 1.66 (Max. assumed topographic factor)
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 = 170.8 psf = 0.00256*Kz*Kzt*Kd*V² (Eq. 29.3-1 ACSE 7-10)
Fh ASD trans = 17248 lbs = 0.6*qz*GCr*Lunit*(Hunit+Hcurb) (Eq. 29.5-2)
Fh ASD long = 8787 lbs = 0.6*qz*GCr*Wunit*(Hunit+Hcurb)
Fvert ASD = 17738 lbs = 0.6*qz*GCr*Lunit*Wunit (Eq. 29.5-3)

Curb Loading

Transverse:
Compression_{SEISMIC} = 1369 lbs = [FpmaxASD*Hcm+2*(1+0.14S_{DS})*Wtmax*wcurb]/wcurb
Tension_{SEISMIC} = 236 lbs = Comp_{SEISMIC}-(0.6-0.14S_{DS})*WGUnit
Compression_{WIND} = -2825 lbs = [Fh transASD*Hcm+2*0.6*Wtmax*wcurb-FvertASD*wcurb/2]/wcurb
Tension_{WIND} = 13709 lbs = Comp_{WIND}+Fvert-0.6*WGUnit
----> Negative values indicate Compression load rather than Tension

Longitudinal:
Compression_{SEISMIC} = 1281 lbs = [FpmaxASD*Hcm+2*(1+0.14*S_{DS})*Wtmax*Lcurb]/Lcurb
Tension_{SEISMIC} = 148 lbs = Comp_{SEISMIC}-(0.6-0.14S_{DS})*WGUnit
Compression_{WIND} = -6397 lbs = [Fh transASD*Hcm+2*0.6*Wtmax*Lcurb-FvertASD*Lcurb/2]/Lcurb
Tension_{WIND} = 10138 lbs = Comp_{WIND}+Fvert-0.6*WGUnit
----> Negative values indicate Compression load rather than Tension

Governing Reactions:

Transverse:	Comp _{MAX} = 1369 lbs	----> Along long edge of curb.
(on long edge)	Tens _{MAX} = 13709 lbs	----> Along long edge of curb.
Longitudinal:	Comp _{MAX} = 1281 lbs	----> Along short edge of curb.
(on short edge)	Tens _{MAX} = 10138 lbs	----> Along short edge of curb.

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

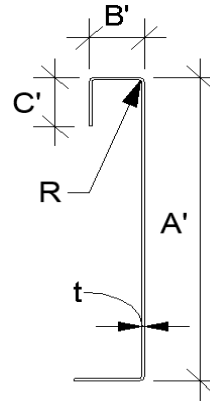


Curb Design

Fy = 50 ksi Fu = 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)]
a = 1.000 in [0 - no Lip; 1 w/ lip]	b' = 2.929 in = B' - (t/2+at/2)
R = 0.1069 (Inside bend radius)	c = 0.822 in = a[C' - (r+t/2)]
t = 0.0713 in	c' = 0.964 in = a[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)	
Ix = 76.324 in (Moment of Inertia about X-Axis)	
Iy = 1.759 in (Moment of Inertia about Y-Axis)	
A = 1.82 in ²	
rx = 6.48 in	
ry = 0.984 in	
rmin = 0.984 in	



Axial Compression

Pu = 8.624 k (Max Axial Comp)	Ωc = 1.80
Pn/Ωc = 36.083 k	
Fe = 62.46 ksi	
λc = 0.89	
Fn = 35.76 ksi	
Ly = 84 in	
kyLy/ry = 68	

Lateral unbraced length (assume k=0.8)

$$\lambda_c = \sqrt{\frac{F_y}{F_e}} \quad F_e = \frac{\pi^2 E}{(kl/r)^2}$$

$$F_n = \begin{cases} (0.658^{\lambda_c^2}) F_y & \text{if } \lambda_c \leq 1.5 \\ \frac{0.877}{\lambda_c^2} F_y & \text{if } \lambda_c > 1.5 \end{cases}$$

Compression Check = O.K.

Check Web Crippling

h = 18 in	-- Check limits:	C = 4.00	} (See table C3.4.1-2, fastened to support, one flange, end loading)
t = 0.0713 in	h/t = 252.45 ≤ 200	CR = 0.14	
N = 7.00	N/t = 98.18 ≤ 210	CN = 0.35	
Ωw = 1.75	N/h = 0.388889 ≤ 2.0	Ch = 0.02	
Pn = 2.296 k	R/t = 1.50 ≤ 9.0		

Long side: Pu_{Trans} = 0.456 k **O.K.** # clips = 3
Short side: Pu_{Long} = 0.640 k **O.K.** # clips = 2

$$P_n = Ct^2 F_y \sin(90) \left(1 - C_R \frac{R}{\sqrt{t}} \right) \left(1 + C_N \frac{N}{\sqrt{t}} \right) \left(1 - C_h \frac{h}{\sqrt{t}} \right)$$

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

Check Web Stiffener

16Ga x 3/4" x 7" (C-channel)

width of stiffener = 7.000 in	ts = 0.0566 [16 Gauge]
web of stiff. w = 6.717 in	Rs = 0.0849 in
***Check w/ts ≤ 1.28VE/Fys	Ωc = 1.70
w/ts = 118.675	
1.28v(E/Fys) = 31.091 --> w/ts over limit Use C3.7.2	
Pn = 0.7(Pwc + AeFy) ≥ Pwc	
Pwc = 2.296 k	Ae = 0.380 in ²
Pn = 14.913 k	Pn/Ω = 8.773 k

O.K.

Corner Connections

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

Tcrnmax = 4312 lbs	Max(F _{pmaxASD} /4 -OR- F _{HASDtrans} /4 corner connections)
Vcrnmax = 6855 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 = 1.7	
# of Bolts required for Shear = 6.3	
# of Bolts Used = 7.0	
Check Combined Stress in Bolts & Inserts: 1.142 N.G.	***If combined fails: USE --> 8.0 StressComb = 0.999 O.K.

Check 1/8" welded connection

<--- USE WELD Ω = 2.35

Assume L/t > 25: 25*t = 1.783 in Pn/Ω = 1/Ω * 0.75tLu ≥ Vreq Lreq'd = VreqΩ / (0.75tFu)

Lreq'd = 4.634 in



Connection Unit to Curb Clip

#14 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

$d = 0.242$ in (screw diameter)

$dw = 0.500$ in (nom. washer diameter)

$t_2/t_1 = 1.4$

For $t_2/t_1 \leq 1.0$:

Shear: $P_{ns} = 4.2F_{u2}\sqrt{t_2^3d}$ 3028 # $P_{ns} = 4.36$ k

$P_{ns} = 2.7t_1dF_{u1}$ 3.03 k

$P_{ns} = 2.7t_2dF_{u2}$ 4.32 k

$P_{ns}/\Omega = 1009$ # <- Controls

$P_{ss}/\Omega = 1045$ #

Tension: $P_{not} = 1.360$ k (screw pull-out strength)

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

$t_c = \min(t_1, t_2)$

$P_{nov} = 3.476$ k (screw pull-over strength)

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

$P_{ts}/\Omega = 453$ # <- Controls

$P_{ts}/\Omega = 1220$ #

(full tensile screw capacity)

	Shear (k)	# clips	V_{clip} (k)	V_{allow} (lb)	# screws	spacing
Long side:	17.248	3	5.75	1009 #	6	1.20 in
Short side:	8.787	2	4.39	1009 #	5	1.50 in

clip width (in) = 7.00

clip height = 2.5 in

min spacing = 0.73 in

edge distance = 0.5 in (min. 1.5d)

Check Block shear rupture: O.K.

thinnest part = 0.0713 AISI BSR applies

$F_y = 50$ ksi

$\Omega = 2.22$ bolt/screw connection

$A_{gv} = 0.463$ in²

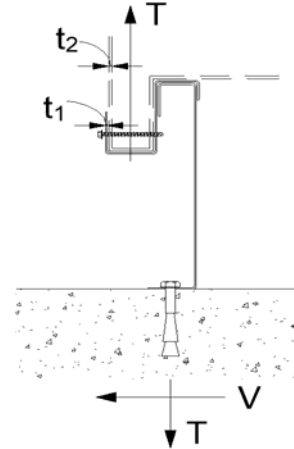
$A_{nv} = 0.369$ in²

$A_{nt} = 0.080$ in²

$R_n/\Omega = 8.620$ 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)

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}	17234 lbs	Shear _{MAX}	8624 lbs
Compression _{SEISMIC}	1808 lbs	= [F _{pmaxASD} *(H _{cm} +H _{curb})+(1+0.14SDS)*(WGT _{unit+curb} /2)*w _{curb}]/w _{curb}		
Tension _{SEISMIC}	426 lbs	= Comp _{SEISMIC} -(0.6-0.14SDS)*(WGT _{unit+curb})		
Compression _{WIND}	964 lbs	= [F _{h transASD} *(H _{cm} +H _{curb})+0.6*(WGT _{unit+curb} /2)*w _{curb} -F _{vertASD} *w _{curb}]/w _{curb}		
Tension _{WIND}	17234 lbs	= [F _{h transASD} *(H _{cm} +H _{curb})-0.6*(WGT _{unit+curb} /2)*w _{curb} +F _{vertASD} *w _{curb}]/w _{curb}		
Longitudinal:	Uplift _{MAX}	11219 lbs	Shear _{MAX}	4393 lbs
Compression _{SEISMIC}	1627 lbs	= [F _{pmaxASD} *(H _{cm} +H _{curb})+(1+0.14SDS)*(WGT _{unit+curb} /2)*L _{curb}]/L _{curb}		
Tension _{SEISMIC}	244 lbs	= Comp _{SEISMIC} -(0.6-0.14SDS)*(WGT _{unit+curb})		
Compression _{WIND}	-5051 lbs	= [F _{h transASD} *(H _{cm} +H _{curb})+0.6*(WGT _{unit+curb} /2)*L _{curb} -F _{vertASD} *L _{curb}]/L _{curb}		
Tension _{WIND}	11219 lbs	= [F _{h transASD} *(H _{cm} +H _{curb})-0.6*(WGT _{unit+curb} /2)*L _{curb} +F _{vertASD} *L _{curb}]/L _{curb}		

Wood Attachment:

Use 5/8" ϕ wood lag screws

w/ 3.5" Min. Embed

Transverse:	Tall _{metal} = 946.67 lbs	Vall _{metal} = 1043.33 lbs
	Tall _{wood} = 1195.95 lbs	Vall _{wood} = 1024 lbs
	# of Screws Req'd for Uplift = 18.20	COMBINED LOADING: 0.993 O.K.
	# of Screws Req'd for Shear = 8.42	Screw Spacing = 5.4 in o.c.
	Total # of screws Required = 23	

Use 5/8" ϕ wood lag screws @ 5.4 in o.c. along long side of curb w/ 3.5" Min. Embed

Longitudinal:

	# of Screws Req'd for Uplift = 11.9	COMBINED LOADING: 0.977 O.K.
	# of Screws Req'd for Shear = 4.3	Screw Spacing = 5.8 in o.c.
	Total # of screws Required = 14	

Use 5/8" ϕ wood lag screws @ 5.8 in o.c. along short side of curb w/ 3.5" Min. Embed

Steel Deck Attachment:

Use 5/8" ϕ A307 Bolts attached to steel angle below deck

Transverse:	Tall _{bolt} = 6903 lbs	Vall _{bolt} = 3682 lbs
		3682 lbs
	# of Bolts Req'd for Uplift = 2.50	COMBINED LOADING: 0.866 O.K.
	# of Bolts Req'd for Shear = 2.34	Bolt Spacing = 38.1 in o.c.
	Total # of Bolts Required = 4	

Use 5/8" ϕ A307 Bolts attached to steel angle below deck @ 38.1 in o.c. along long side of curb

Longitudinal:

	# of Bolts Req'd for Uplift = 1.63	COMBINED LOADING: 0.575 O.K.
	# of Bolts Req'd for Shear = 1.19	Req'd Min Spacing = 36.0 in o.c.
	Total # of Bolts Required = 3	

Use 5/8" ϕ A307 Bolts attached to steel angle below deck @ 36 in o.c. along short side of curb



For Concrete anchorage: SEISMIC (0.6-0.14SDS)D + 0.7Ω_oE (Ω_o = 2.5)

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

Tall_{LRFD} = 1722 lbs Vall_{LRFD} = 2032 lbs α = (1 + 0.2SDS)D + 2.5E = 1.87

Tall_{ASD} = Tall_{LRFD}/α = 920.9 lbs Vall_{ASD} = Vall_{LRFD}/α = 1086.6 lbs (D = 0.465, E = 0.535)

Transverse:	Uplift _{MAX} = 17234 lbs	Shear _{MAX} = 8624 lbs
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Compression_{SEISMIC} = 2622 lbs = [2.5 * FpmaxASD * (Hcm + Hcurb) + (1 + 0.14SDS) * (WGT_{unit+curb}/2) * wcurb] / wcurb

Tension_{SEISMIC} = 1239 lbs = Comp_{SEISMIC} - (0.6 - 0.14SDS) * (WGT_{unit+curb})

Shear_{SEISMIC} = 1285 lbs = 2.5 * FpmaxASD / 2

Min Bolts Req'd Uplift = 18.71 spacing = 5.68 in o.c. T_{applied} = 783.4 lbs

Min Bolts Req'd Shear = 7.94 spacing = 14.60714 in o.c. V_{applied} = 392.0 lbs

Try using 22 bolts spaced at 5.44 in o.c.	COMBINED LOADING = $\frac{T_{applied}}{T_{allow,ASD}} + \frac{V_{applied}}{V_{allow,ASD}} \leq 1.2 = 1.21$
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Use 22 - 3/4" φ Hilti Hit-HY 200 adhesive anchors @ 5.4 in o.c. max. along long side of curb w/ 4" embed

Longitudinal:	Uplift _{MAX} = 11219 lbs	Shear _{MAX} = 8624 lbs
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Compression_{SEISMIC} = 2168 lbs = [2.5 * FpmaxASD * (Hcm + Hcurb) + (1 + 0.14SDS) * (WGT_{unit+curb}/2) * Lcurb] / Lcurb

Tension_{SEISMIC} = 786 lbs = Comp_{SEISMIC} - (0.6 - 0.14SDS) * (WGT_{unit+curb})

Shear_{SEISMIC} = 1285 lbs = 2.5 * FpmaxASD / 2

Min Bolts Req'd Uplift = 12.18 spacing = 5 in o.c. T_{applied} = 659.9 lbs

Min Bolts Req'd Shear = 7.94 spacing = 8.571429 in o.c. V_{applied} = 507.3 lbs

Try using 17 bolts spaced at 4.50 in o.c.	COMBINED LOADING = $\frac{T_{applied}}{T_{allow,ASD}} + \frac{V_{applied}}{V_{allow,ASD}} \leq 1.2 = 1.18$
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Use 17 - 3/4" φ Hilti Hit-HY 200 adhesive anchors @ 4.5 in o.c. max. along short side of curb w/ 4" embed

CURB DESIGN SUMMARY: CBKD-91			
CURB RAIL THICKNESS: 0.0713 in 14 Gauge			
UNIT CLIP THICKNESS: 0.0713 in 14 Gauge			
# OF CLIPS (LONG SIDE) - 3 clips with 6 - #14 SMS screws each clip			
WEB STIFFENER: 16Ga x 3/4" x 7" (C-channel) stiffener at each clip			
# OF CLIPS (SHORT SIDE) - 2 clips with 5 - #14 SMS screws each clip			
WEB STIFFENER: 16Ga x 3/4" x 7" (C-channel) stiffener at each clip			
CORNER CONNECTION: Use 8 - 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	23 @ 5.38 in o.c.	4 @ 38.08 in o.c.	22 @ 5.44 in o.c.
SHORT DIRECTION	14 @ 5.85 in o.c.	3 @ 36 in o.c.	17 @ 4.5 in o.c.