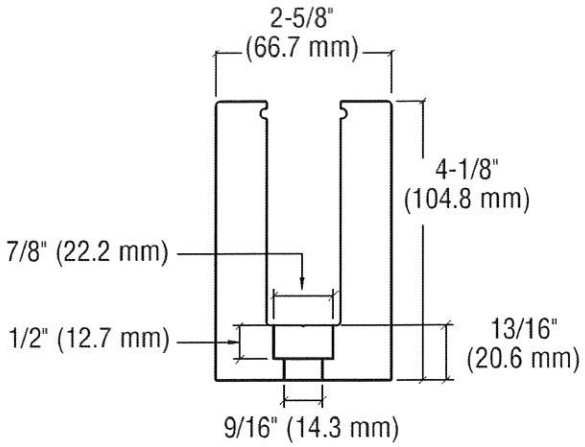
**B6S 2 5/8" X 4 1/8" GLASS BALUSTRADE BASE SHOE**

Heavy Duty Square Base Shoe
6063-T52 Aluminum extrusion
Fully tempered glass glazed in place, either wet glazing cement or Taper-Loc®.




Shoe strength – Vertical legs:
Glass reaction by bearing on legs to form couple. Allowable moment on legs:
$M_a = S_l F_y$
$F_t = F_c = 12.5$ ksi (ADM Table 2-23, Sec 3.4.4 and 3.4.13)
$S_l = 12"*0.75"^2*/6 = 1.125$ in$^3$/ft
$M_a = 12.5$ ksi$*1.125$ in$^3$/ft $= 14{,}062$#"/ft

Leg shear strength @ groove
$t_{min} = 0.343"$
$F_v = 5.5$ ksi (ADM Table 2-23, Sec 3.4.20
$V_{all} = 0.75"*12"/ft*5.5$ ksi $= 49.5$ k/ft

Base shoe anchorage:
Typical rail section: 42" high 50 plf top rail load or 25 psf panel load
$M_t = 50plf*42" = 2{,}100"\#/ft$
$M_w = 25$ psf$*3.5'*21" = 1{,}837.5"\#$

Typical Anchor load – 12" o.c. – $T_a = 2{,}100"\#/1.31" = 1{,}603\#$

Maximum allowable moment for 1/2" cap screws ($T_a = 3{,}592\#$ from B5S calculations) **12" on center spacing and direct bearing of base shoe on steel:**
$M_a = 3{,}592\#*[1.31"-0.5*3{,}592/(30ksi*12)] = 4{,}688"\# = 390.6'\#$ per anchor
Maximum allowable wind loads (ASD):
36" height: $w = 390.6\#'/(0.55*3^2) = 78.9$ psf
42" height: $w = 390.6\#'/(0.55*3.5^2) = 58.0$ psf

**6" on center spacing and direct bearing of base shoe on steel:**
$M_a = 3{,}592\#*[1.31"-0.5*3{,}592/(30ksi*6)] = 4{,}670"\# = 389.14'\#$ per anchor
Maximum allowable wind loads (ASD):
36" height: $w = 2*389.14\#'/(0.55*3^2) = 157.2$ psf
42" height: $w = 2*389.14\#'/(0.55*3.5^2) = 115.5$ psf

required spacing to develop full strength of ⅝" glass:
$s = 4{,}688/6{,}797*12" = 8\ ¼"$ on center average

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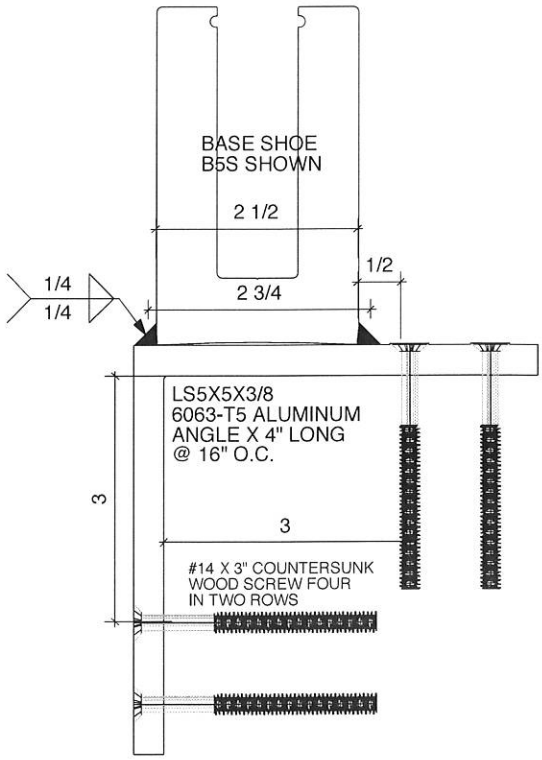
**Surface Mounting Base Shoes to Wood Decks:**
**Aluminum Angle Bracket Welded to Base Shoe Alternative-**

Weld strength calculated in accordance with ADM 7.3.2 Fillet Welds
Base shoe metal - 6063-T52
Angle metal- 6063-T5
Weld metal 4043




Weld size:
¼" fillet, throat = $0.25/\sqrt{2} = 0.177$"

Design strength: ADM 7.3.2.2
$V_w = F_{sw}L_{we}/n_u$
For shear through weld throat:
$F_{sw}$ = 11.5 ksi from ADM Table 7.3-1
$V_{ww}$=11.5ksi*0.177"*12"/1.95 =12,526 plf

For base metal shear failure:
$F_{suw}$ = 11.0 ksi from ADM Table 3.3-2
$V_{wb}$ = 11.0ksi*0.25"*12"/1.95 = 16,922 plf

Moment overturning of base shoe-
Shear strength of weld restrains base shoe rotation about opposite corner:
$M_a$ = 12,526plf* 2.5"*4/12 = 10,438"# per 4" bracket

Check strength of weld affected angle:
From ADM Table 2-23 for allowable aluminum stresses
bending of flat element - weld-affected
$F_{tw} = F_{cw}$ = 6.5ksi
$S_f = 4*0.375^2/6 = 0.09376in^3$
$M_{aw}$ = 6,500psi* $0.09376in^3$ = 609"#
Maximum allowable anchor force based on outward force (controls)
$R_u$ = 609"#/0.5" = 1,218#
Maximum allowable moment on base shoe per 4" bracket:
$M_{a5"}$ = 1,218#*3"+ 609"# = 4,263"#

Allowable moment per foot for brackets at 16" on center
$M_a$ = 4,263/1.3333' = 3,197"#/ft = 266.44'#/ft

Strength for continuous angle:
$M_{cont}$ = 4,263*12/4 = 12,789"#/ft

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