

Roof attachment design for Casey Civil

Assume all DL transfers to existing Vulcraft 20ga deck and str. stl. below.

Fasteners: (for z-shape to deck)

Try using 4'x10' Insul. panels oriented as shown

$$LL = 32.6 \text{ psf} [\sin 5^\circ] = 2.84 \text{ psf vert.}$$

$$P_u = [10' \times 4'] 2.84 \text{ psf} = 113.6 \text{ lbf. } \uparrow$$

R_n , pullout for #12 screw attached to 20ga. stl.

$$R_n = 93 \text{ lb/screw (AISI 2001, 2004 Supp.)}$$

$$R_n = 93 \text{ lb (6 screws)} = 558 \text{ lbf.}$$

$$P_u < R_n \quad \underline{OK} \quad \text{use } 2 \times \left[\#12 \times 16 - \frac{5}{8}'' \text{ HWH SD} \right]$$

Z-shape:

Try using z-shape @ 10' o.c. continuous and check for bolt tear-out failure of z-shape.

one bolt

$$R_n = 0.6 F_u (2 L_c) t = 0.6 (33 \text{ ksi}) (2 (1.25'')) (0.0474'') = 2.346 \text{ kips}$$

$$P_u < R_n \quad \underline{OK} \quad 18 \text{ ga. Z-shape @ } 10' \text{ o.c. acceptable}$$

Due to constructability use z-shape @ 5' o.c. max.

