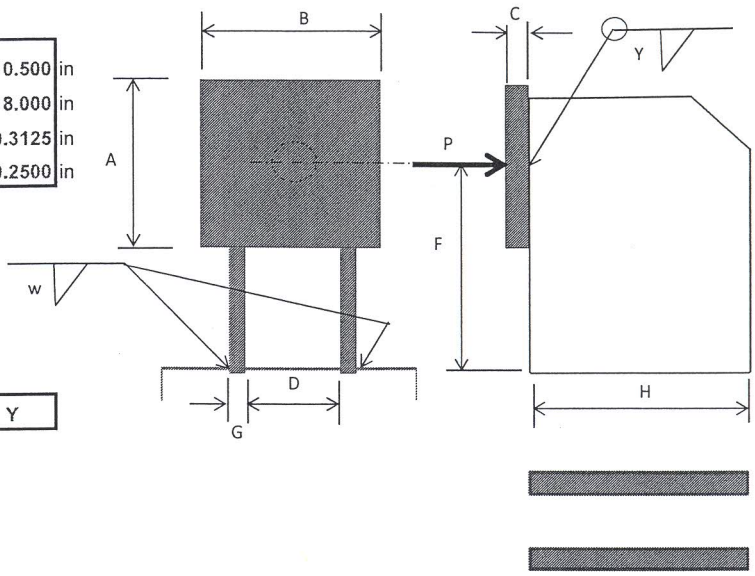
RUNWAY ENDSTOP DESIGN

A =	6.000	in	G =	0.500 in
B =	6.000	in	H =	8.000 in
C =	0.750	in	W =	0.3125 in
P =	4.50	kips (unf, static)	Y =	0.2500 in
D =	6.188	in		
F =	4.000	in		
RAIL SIZE =	2" SQ BAR			
WNAY BEAM WIDTH =	12.000	in		
Fy (steel) =	50	ksi		
Xu (weld) =	70	ksi		
Stop used regularly (Y) or travel limits exist (N) =	Y			



1. dimensional

1a. Beam width >= D + 2*G + 2* W + 0.25

12.000 > 8.063 in

1b. Weld size (for simplicity.. Rule of thumb)

for G>1/2 W>= 5/16"
for G<= 1/2" W>= 1/4"

min W = 0.25 in

1c. Rail fit

Rail Width = 3 in
Rail room availa 5.1875 in

2. base material

2a. vertical members

Sx =	6.667	in^3	(use leg length of weld if less than thickess)		
Vfac =	8.438	kips	(includes 1.875 factor for live load and dynamic)		
Mxfact =	33.8	k in	(includes 1.875 factor for live load and dynamic)		
V area =	4.00	in^2	use 50% of weld area due to localized affects		
Vstress =	2.1	ksi		max stress =	33.3 ksi
Mstress =	5.1	ksi		max stress =	45.0 ksi
combined =	5.5	ksi		max stress =	45.0 ksi

2b. vertical member weld to runway beam

Aw =	3.54	in^2	(two sides)		
Sx weld =	4.713	in^3			
Vr =	111.0803	kips			
Aw (shear) =	1.77	in^2	use 50% of weld area due to localized affects		
Vstress =	4.8	ksi		max stress =	31.42 ksi
Mstress =	7.2	ksi		max stress =	47.13 ksi
combined =	8.6	ksi		max stress =	47.13 ksi

2c. Impact plate

height = 6.000 (use 1.5xD or A which ever is less)

thickness =	0.750			
Sx =	4.500			
Mxfac =	14.106	k in	(includes 1.875 factor for live load and dynamic)	
Stress =	3.13	ksi	max stress =	45.00 ksi

2d. Weld check for impact plate

Vfac =	8.4	kip	(includes 1.875 factor for live load and dynamic)	
Aw =	4.24	in^2		
Vstress =	1.99	ksi	max stress =	31.42 ksi

3. fatigue

ignored if travel limits exist (bridge travel)

2b stress =	3.66	ksi	Allowable =	17.0 ksi
2d stress =	1.33	ksi	Allowable =	17.0 ksi