

RFI 00188

RFI 00188 Request to change the material used in the walk ways and Access to  $F_y = 36$  ksi from  $F_y = 50$  ksi

HSS 12x2x1/4

From Catwalk Design:

$$\phi V_n = 18.18 \text{ k}$$

$$V_u = 2.35 \text{ k}$$

Multiply  $V_u$  by 1.2 =  $(\frac{30}{25})$  for the max diaphragm spacing changing from 25' to 30'

And Multiply  $\phi V_n$  by  $\frac{36}{50} = 0.72$

$$\therefore \phi V_n = 18.18(0.72) = 13.09 \text{ k}$$

$$V_u = 2.35(1.2) = 2.82 \text{ k}$$

$$13.09 > 2.82 \quad \text{OK}$$

Also from Catwalk Design

$$\phi M_n = 7458 \text{ #}\cdot\text{ft}$$

$$M_u = 3280 \text{ #}\cdot\text{ft}$$

Multiply  $M_u$  by 1.2 and  $M_n$  by 0.72

$$\therefore \phi M_n = 7458(0.72) = 5370 \text{ #}\cdot\text{ft}$$

$$M_u = 3280(1.2) = 3936 \text{ #}\cdot\text{ft}$$

$$5370 > 3936 \quad \text{OK}$$

OK to Change HSS 12x2x1/4 to  $F_y = 36$

From the Catwalk Design and Delta girder Catwalk Design

Threaded Rods, hand Rails, and the C10x25 Channel that supports the Delta Walk way at the Access ladder were designed as  $F_y = 36$  ksi.

W8x18 Walkway Support Beam

From NDC 0027 Unit 2 Inspection walkway beam and hanger system Design.

$$\text{Stress from torsion and bending} = 25.82 \text{ ksi}$$

$$\text{Web shear Stress} = 8.45 \text{ ksi}$$

$$\text{Flange Shear Stress} = 9.38 \text{ ksi}$$

Stress is less than 36 ksi OK

RFI 00188 (cont.)

WT 4x24 walk way support on Bot. Flng.

From: Original Design By MMC  
dated 4-16-11

$$M_u = 15,750 \text{ in}\cdot\text{k}$$

$$\phi M_n = 197 \text{ in}\cdot\text{k}$$

$$197 \times \frac{36}{50} = 141.8 \text{ in}\cdot\text{k} > 15.75 \quad \text{OK}$$

From Original Design:

$$V_u = 2 \text{ k}$$

$$\phi V_n = 49.3 \text{ k}$$

$$49.3 \times \frac{36}{50} = 35.5 \text{ k} > 2 \quad \text{OK}$$

 $\therefore$  OK to change WT 4x24  
to  $F_y = 36 \text{ ksi}$ Access laddersladders were designed  
as  $F_y = 36 \text{ ksi}$ 4x4 Angles connecting walkway  
support beam to Girder web.Refer to NDC 0027 calcs performed  
by SJL and DJG on 9/28/11 - 10/3/11Replace:  $F_u = 65 \text{ ksi}$  with  $58 \text{ ksi}$   
 $F_y = 50 \text{ ksi}$  with  $36 \text{ ksi}$ Block Shear

$$\phi R_n = 0.8(0.9) \left[ (0.58)(58 \text{ ksi})(2.84) \left( \frac{5}{16} \right) + (1)(58)(0.66) \left( \frac{5}{16} \right) \right]$$

$$\leq (0.8)(0.9) \left[ (0.58)(36)(4.25) \left( \frac{5}{16} \right) + (1)(58)(0.66) \left( \frac{5}{16} \right) \right]$$

$$\phi R_n = 30.1 \leq \underline{28.6}$$

From Design  $P_u = 6.3 \text{ k}$ 

$$28.6 > 6.3 \text{ k} \quad \text{OK}$$

Shear Yielding

$$52.1^k \times \frac{36}{50} = 37.5 > 6.3 \quad \text{OK}$$

Shear Rupture

$$32.9^k \times \frac{58}{65} = 29.4 \text{ k} > 6.3 \quad \text{OK}$$

Bending

$$\sigma = 11 \text{ ksi} < 36 \text{ ksi} \quad \text{OK}$$

OK to Change to 36 ksi