

## Concrete Deck

### Span 8ft

#### Center Girder

Member length	=	4.00 ft	
Uniform pressure	=	210 psf	
Width	=	4	
Bending moment	=	20160 in-lb	
Assume 2x12 DF-L No. 1			
Check compressive stress			
b	=	1.50 inch	
d	=	9.25 inch	
		1.00	
$A_g$	=	13.875 in <sup>2</sup>	
$F_c$	=	1500 psi	<i>NDS Table 4A</i>
$C_F$	=	1	<i>NDS Table 4A</i>
$C_D$	=	1.15	
Check for bending stress			
$F_b$	=	1000 psi	<i>NDS Table 4A</i>
$C_F$	=	1	
$C_r$	=	1	
$F_b'$	=	1150 psi	
S	=	21.39	
Required bending stress	=	942 psi	<i>OK</i>

#### Edge Girder

Member length	=	4.00 ft	
Uniform pressure	=	210 plf	
Width	=	2	
Bending moment	=	10080 in-lb	
Assume 2x12 DF-L No. 1			
Check compressive stress			
b	=	1.50 inch	
d	=	7.25 inch	
		1.00	
$A_g$	=	10.875 in <sup>2</sup>	
$F_c$	=	1500 psi	<i>NDS Table 4A</i>
$C_F$	=	1	<i>NDS Table 4A</i>
$C_D$	=	1.15	
Check for bending stress			
$F_b$	=	1000 psi	<i>NDS Table 4A</i>
$C_F$	=	1	
$C_r$	=	1	

$F_b'$	=	1150 psi	
S	=	13.14	
Required bending stress	=	767 psi	OK

### Span 10ft

#### Center Girder

Member length	=	5.00 ft	
Uniform pressure	=	210 plf	
Width	=	4	
Bending moment	=	31500 in-lb	

Assume 2x12 DF-L No. 1

Check compressive stress

b	=	1.50 inch	
d	=	11.25 inch	
		1.00	

$$A_g = 16.875 \text{ in}^2$$

$$F_c = 1500 \text{ psi} \quad \text{NDS Table 4A}$$

$$C_F = 1 \quad \text{NDS Table 4A}$$

$$C_D = 1.15$$

Check for bending stress

$$F_b = 1000 \text{ psi} \quad \text{NDS Table 4A}$$

$$C_F = 1$$

$$C_r = 1$$

$$F_b' = 1150 \text{ psi}$$

$$S = 31.64$$

$$\text{Required bending stress} = 996 \text{ psi} \quad \text{OK}$$

#### Edge Girder

Member length	=	5.00 ft	
Uniform pressure	=	210 plf	
Width	=	2	
Bending moment	=	15750 in-lb	

Assume 2x12 DF-L No. 1

Check compressive stress

b	=	1.50 inch	
d	=	9.25 inch	
		1.00	

$$A_g = 13.875 \text{ in}^2$$

$$F_c = 1500 \text{ psi} \quad \text{NDS Table 4A}$$

$$C_F = 1 \quad \text{NDS Table 4A}$$

$$C_D = 1.15$$

Check for bending stress

$F_b$	=	1000 psi	<i>NDS Table 4A</i>
$C_F$	=	1	
$C_r$	=	1	
$F_b'$	=	1150 psi	
S	=	21.39	
Required bending stress	=	736 psi	<i>OK</i>

### Span 12ft

#### Center Girder

Member length	=	6.00 ft	
Uniform pressure	=	210 plf	
Width	=	4	
Bending moment	=	45360 in-lb	
Assume 2x12 DF-L No. 1			
Check compressive stress			
b	=	1.50 inch	
d	=	13.25 inch	
		1.00	
$A_g$	=	19.875 in <sup>2</sup>	
$F_c$	=	1500 psi	<i>NDS Table 4A</i>
$C_F$	=	1	<i>NDS Table 4A</i>
$C_D$	=	1.15	
Check for bending stress			
$F_b$	=	1000 psi	<i>NDS Table 4A</i>
$C_F$	=	1	
$C_r$	=	1	
$F_b'$	=	1150 psi	
S	=	43.89	
Required bending stress	=	1033 psi	<i>OK</i>

#### Edge Girder

Member length	=	6.00 ft	
Uniform pressure	=	210 plf	
Width	=	2	
Bending moment	=	22680 in-lb	
Assume 2x12 DF-L No. 1			
Check compressive stress			
b	=	1.50 inch	
d	=	9.25 inch	
		1.00	
$A_g$	=	13.875 in <sup>2</sup>	
$F_c$	=	1500 psi	<i>NDS Table 4A</i>

$C_F$	=	1	<i>NDS Table 4A</i>
$C_D$	=	1.15	
Check for bending stress			
$F_b$	=	1000 psi	<i>NDS Table 4A</i>
$C_F$	=	1	
$C_r$	=	1	
$F_b'$	=	1150 psi	
S	=	21.39	
Required bending stress	=	1060 psi	<i>OK</i>

### Span 15ft

#### Center Girder

Member length	=	7.50 ft	
Uniform pressure	=	210 plf	
Width	=	4	
Bending moment	=	70875 in-lb	
Assume 2x12 DF-L No. 1			
Check compressive stress			
b	=	1.50 inch	
d	=	11.25 inch	
		2.00	
$A_g$	=	33.75 in <sup>2</sup>	
$F_c$	=	1500 psi	<i>NDS Table 4A</i>
$C_F$	=	1	<i>NDS Table 4A</i>
$C_D$	=	1.15	
Check for bending stress			
$F_b$	=	1000 psi	<i>NDS Table 4A</i>
$C_F$	=	1	
$C_r$	=	1	
$F_b'$	=	1150 psi	
S	=	63.28	
Required bending stress	=	1120 psi	<i>OK</i>

#### Edge Girder

Member length	=	7.50 ft	
Uniform pressure	=	210 plf	
Width	=	2	
Bending moment	=	35438 in-lb	
Assume 2x12 DF-L No. 1			
Check compressive stress			
b	=	1.50 inch	
d	=	11.25 inch	

	=	1.00	
$A_g$	=	16.875 in <sup>2</sup>	
$F_c$	=	1500 psi	<i>NDS Table 4A</i>
$C_F$	=	1	<i>NDS Table 4A</i>
$C_D$	=	1.15	
Check for bending stress			
$F_b$	=	1000 psi	<i>NDS Table 4A</i>
$C_F$	=	1	
$C_r$	=	1	
$F_b'$	=	1150 psi	
S	=	31.64	
Required bending stress	=	1120 psi	<i>OK</i>

### **Plywood Sheathing Deck**

#### **Span 8ft**

Member length	=	4.00 ft	
Joist spacing	=	2 ft	
Joist reaction	=	2752 lb	
Reaction force	=	4128 lb	
Bending moment	=	33024 in-lb	

Assume 2x12 DF-L No. 1

Check compressive stress

b	=	1.50 inch	
d	=	11.25 inch	

	=	1.00	
$A_g$	=	16.875 in <sup>2</sup>	
$F_c$	=	1500 psi	<i>NDS Table 4A</i>
$C_F$	=	1	<i>NDS Table 4A</i>
$C_D$	=	1.15	
Check for bending stress			
$F_b$	=	1000 psi	<i>NDS Table 4A</i>
$C_F$	=	1	
$C_r$	=	1	
$F_b'$	=	1150 psi	
S	=	31.64	
Required bending stress	=	1044 psi	<i>OK</i>

#### **Span 10ft**

Member length	=	5.00 ft	
Joist spacing	=	2 ft	
Joist reaction	=	2752 lb	
Reaction force	=	4953.6 lb	

Bending moment	=	52838 in-lb	
Assume 2x12 DF-L No. 1			
Check compressive stress			
b	=	1.50 inch	
d	=	11.25 inch	
		2.00	
$A_g$	=	33.75 in <sup>2</sup>	
$F_c$	=	1500 psi	<i>NDS Table 4A</i>
$C_F$	=	1	<i>NDS Table 4A</i>
$C_D$	=	1.15	
Check for bending stress			
$F_b$	=	1000 psi	<i>NDS Table 4A</i>
$C_F$	=	1	
$C_r$	=	1	
$F_b'$	=	1150 psi	
S	=	63.28	
Required bending stress	=	835 psi	<i>OK</i>

### Span 12ft

Member length	=	6.00 ft	
Joist spacing	=	2 ft	
Joist reaction	=	2752 lb	
Reaction force	=	5504 lb	
Bending moment	=	66048 in-lb	
Assume 2x12 DF-L No. 1			
Check compressive stress			
b	=	1.50 inch	
d	=	11.25 inch	
		2.00	
$A_g$	=	33.75 in <sup>2</sup>	
$F_c$	=	1500 psi	<i>NDS Table 4A</i>
$C_F$	=	1	<i>NDS Table 4A</i>
$C_D$	=	1.15	
Check for bending stress			
$F_b$	=	1000 psi	<i>NDS Table 4A</i>
$C_F$	=	1	
$C_r$	=	1	
$F_b'$	=	1150 psi	
S	=	63.28	
Required bending stress	=	1044 psi	<i>OK</i>

### Span 15ft

Member length	=	7.50 ft	
Joist spacing	=	2 ft	
Joist reaction	=	2752 lb	
Reaction force	=	6604.8 lb	
Bending moment	=	118886 in-lb	
Assume 2x12 DF-L No. 1			
Check compressive stress			
b	=	1.50 inch	
d	=	13.25 inch	
		3.00	
$A_g$	=	59.625 in <sup>2</sup>	
$F_c$	=	1500 psi	<i>NDS Table 4A</i>
$C_F$	=	1	<i>NDS Table 4A</i>
$C_D$	=	1.15	
Check for bending stress			
$F_b$	=	1000 psi	<i>NDS Table 4A</i>
$C_F$	=	1	
$C_r$	=	1	
$F_b'$	=	1150 psi	
S	=	131.67	
Required bending stress	=	903 psi	<i>OK</i>