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Load combinations, LRFD

Date: 22nd March 2019

Given:

$$D = 50 \text{ psf} \quad E = 10 \text{ psf} \quad W = 7 \text{ psf}$$
$$L = 30 \text{ psf} \quad S = 15 \text{ psf}$$

Calculate all load combinations, choose largest

- ① $1.4D = 1.4(50 \text{ psf}) = 70 \text{ psf}$
- ② $1.2D + 1.6L + 0.5(\text{Max}\{Lr/S/R\})$
 $= 1.2(50) + 1.6(30) + 0.5(15) = 115.5 \text{ psf} \rightarrow \text{governs}$
- ③ $1.2D + 1.6(\text{Max}\{Lr/S/R\}) + (\text{Max}\{L/0.8W\})$
 $= 1.2(50) + 1.6(15) + (30) = 114 \text{ psf}$
- ④ $1.2D + 1.6W + L + 0.5(\text{Max}\{Lr/S/R\})$
 $= 1.2(50) + 1.6(7) + (30) + 0.5(15) = 108.7 \text{ psf}$
- ⑤ $1.2D + 1.0E + L + 0.2S$
 $= 1.2(50) + 1.0(10) + (30) + 0.2(15) = 103 \text{ psf}$
- ⑥ $0.9D + 1.6W$
 $= 0.9(50) + 1.6(7) = 56.2 \text{ psf}$
- ⑦ $0.9D + 1.0E$
 $= 0.9(50) + 1.0(10) = 55 \text{ psf}$