

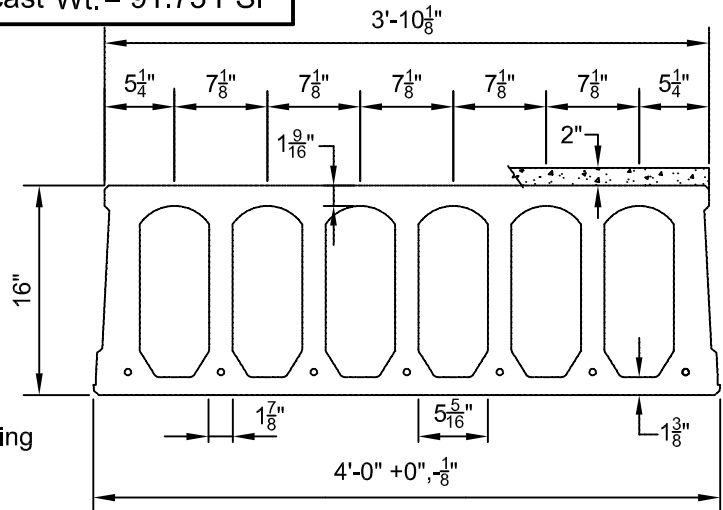
Prestressed Concrete 16"x4'-0" NiCore Plank

3 Hour Fire Resistance Rating With 2" Topping

PHYSICAL PROPERTIES Composite Section	
$A_c = 418 \text{ in.}^2$	Precast $b_w = 14.25 \text{ in.}$
$I_c = 15498 \text{ in.}^4$	Precast $S_{bcp} = 1653 \text{ in.}^3$
$Y_{bcp} = 9.38 \text{ in.}$	Topping $S_{tct} = 2542 \text{ in.}^3$
$Y_{tcp} = 6.62 \text{ in.}$	Precast $S_{tcp} = 2340 \text{ in.}^3$
$Y_{tct} = 8.82 \text{ in.}$	Precast Wt. = 367 PLF
	Precast Wt. = 91.75 PSF

DESIGN DATA

- Precast Strength @ 28 days = 6000 PSI
- Precast Strength @ release = 3800 PSI
- Precast Density = 150 PCF
- Strand = 1/2"Ø and 0.6"Ø 270K Lo-Relaxation.
- Strand Height = 1.75 in.
- Ultimate moment capacity (when fully developed)..
7-1/2"Ø, 270K = 323.1 k-ft at 60% jacking force
7-0.6"Ø, 270K = 441.9 k-ft at 60% jacking force
- Maximum bottom tensile stress is $10\sqrt{f'_c} = 775 \text{ PSI}$
- All superimposed load is treated as live load in the flexural strength analysis. To determine the allowable live load if the amount of superimposed dead load is known use the following conversion method...



$$\text{Allowable Live Load} = \frac{(1.6)(\text{Load Table Value}) - (1.2)(\text{Superimposed Dead Load})}{1.6}$$

- If the above conversion is used then allowable stress limits must be checked so they are not exceeded.
- Flexural strength capacity is based on stress/strain strand relationships.
- Deflection limits were not considered when determining allowable loads in this table.
- Topping Strength @ 28 days = 3000 PSI. Topping Weight = 25 PSF.
- These tables are based upon the topping having a uniform 2" thickness over the entire span. A lesser thickness might occur if camber is taken into account during design, thus reducing the load capacity.
- Span/strand combinations to the left of and below the solid line require 3/8"Ø top strands.
- Some load values are controlled by ultimate web shear strength per ACI Equation 11-1 and Section 11.4.6.1(b). Shear capacity can be increased by partially filling cores in order to achieve flexural capacity.
- Camber is inherent in all prestressed hollow core slabs and is a function of the amount of eccentric prestressing force needed to carry the superimposed design loads along with a number of other variables. Because prediction of camber is based on empirical formulas it is at best an estimate, with the actual camber usually higher than calculated values.
- At 3 hours the calculated strand temperature is 925 degrees Fahrenheit @ 32% of yield strength.

SAFE SUPERIMPOSED SERVICE LOADS		SPAN (FEET)																		
Strand Pattern		14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50
7 - 1/2"Ø	LOAD (PSF)	570	478	409	355	312	276	240	191	151	119	92	69	50	34	20	X			
7 - 0.6"Ø	LOAD (PSF)	570	478	409	355	312	276	246	221	199	180	164	143	117	94	74	57	42	29	18