# Prestressed Concrete
# 12"x4'-0" NiCore Plank
## 1 Hour Fire Resistance Rating With 2" Topping

### PHYSICAL PROPERTIES
#### Composite Section

$A_c$ = 361 in.$^2$   Precast $b_w$ = 14.25 in.
$I_c$ = 7840 in.$^4$   Precast $S_{bcp}$ = 1081 in$^3$.
$Y_{bcp}$ = 7.26 in.   Topping $S_{tct}$ = 1644 in$^3$.
$Y_{tcp}$ = 4.74 in.   Precast $S_{tcp}$ = 1653 in$^3$.
$Y_{tct}$ = 6.74 in.   Precast Wt. = 308 PLF
                       Precast Wt. = 77.00 PSF

## DESIGN DATA

1. Precast Strength @ 28 days = 6000 PSI
2. Precast Strength @ release = 3800 PSI
3. Precast Density = 150 PCF
4. Strand = 1/2"Ø 270K Lo-Relaxation.
5. Strand Height = 1.75 in.
6. Ultimate moment capacity (when fully developed)..
   6-1/2"Ø, 270K = 205.4 k-ft at 60% jacking force
   7-1/2"Ø, 270K = 235.4 k-ft at 60% jacking force
7. Maximum bottom tensile stress is $10\sqrt{f'c}$ = 775 PSI
8. 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...
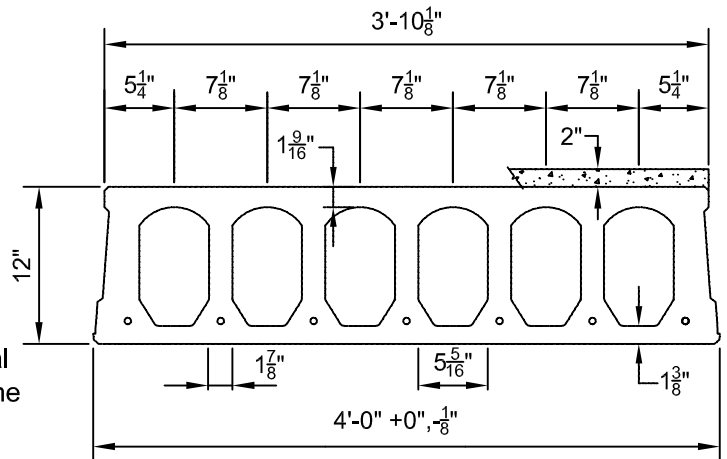


$$\text{Allowable Live Load} = \frac{(1.6)(\text{Load Table Value}) - (1.2)(\text{Superimposed Dead Load})}{1.6}$$

9. If the above conversion is used then allowable stress limits must be checked so they are not exceeded.
10. Flexural strength capacity is based on stress/strain strand relationships.
11. Deflection limits were not considered when determining allowable loads in this table.
12. Topping Strength @ 28 days = 3000 PSI.   Topping Weight = 25 PSF.
13. 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.
14. Load values to the left of the solid line are controlled by ultimate shear strength.
15. Load values to the right are controlled by ultimate flexural strength or allowable service stresses.
16. 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.

### SAFE SUPERIMPOSED SERVICE LOADS

| Strand Pattern | | SPAN (FEET) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 |
| 6 - 1/2"ø | LOAD (PSF) | 303 | 275 | 251 | 228 | 208 | 190 | 174 | 159 | 145 | 133 | 121 | 111 | 101 | 92 | 83 | 76 | 69 | 61 | 52 |
| 7 - 1/2"ø | LOAD (PSF) | 342 | 322 | 299 | 273 | 250 | 229 | 211 | 193 | 177 | 163 | 150 | 138 | 127 | 116 | 107 | 98 | 87 | 78 | 69 |

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