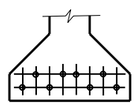
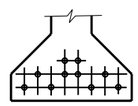
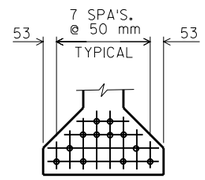


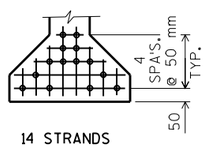
8 STRANDS



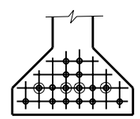
10 STRANDS



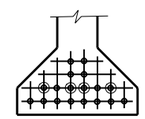
12 STRANDS



14 STRANDS



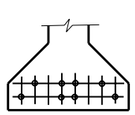
*16 STRANDS



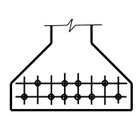
*18 STRANDS

◎ INDICATES STRAND TO BE DEBONDED

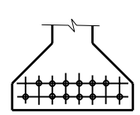
STANDARD ARRANGEMENTS TO RAISE CENTER OF GRAVITY TO AVOID DRAPING OF STRANDS



8 STRANDS



10 STRANDS



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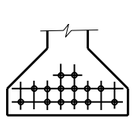
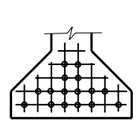
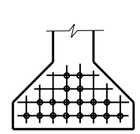


14 STRANDS



16 STRANDS



18 STRANDS

ARRANGEMENT AT ℄ SPAN - FOR GIRDERS WITH DRAPED 13 mm ϕ & 15 mm ϕ STRANDS

710 mm GIRDER

$A = 0.201\ m^2$

$r^2 = 5.932 \times 10^{-2}\ m^2$

$y_T = 0.370$ m

$y_B = 0.340$ m

$I = 11.940 \times 10^{-3}\ m^4$

$S_T = 3.225 \times 10^{-2}\ m^3$

$S_B = 3.504 \times 10^{-2}\ m^3$

WT. = 4.74kN/m

PRE-TENSION

$f'_s = 1860$ MPa

$f_s = 0.75 \times 1860$ MPa $= 1395$ MPa
for low relaxation strands

Pi PER 13 mm ϕ STRAND $= 9.877 \times 10^{-5}\ m^2 \times 1395$ MPa $=$ 137.8 kN.

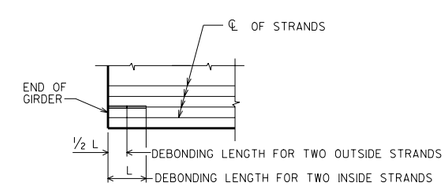
Pi PER 15 mm ϕ STRAND $= 14.000 \times 10^{-5}\ m^2 \times 1395$ MPa $=$ 195.3 kN.

$$\frac{y_B}{r^2} = 5.73\ m/m^2$$

(COMPRESSION IS NEGATIVE)

N NO. STRANDS	(1) e_s (meters)	(2) $(1 + \frac{e_s\ y_B}{r^2})$	(3) (A/(2)) (sq. m.)	(4) $P(init.)=A_s f_s$ 0.5" ϕ STRANDS (kN)	(4) $P(init.)=A_s f_s$ 0.6" ϕ STRANDS (kN)	(5) $f_B(init.)=\frac{(4)}{(3)}$ 0.5" ϕ STRANDS (K/sq. m.)	(5) $f_B(init.)=\frac{(4)}{(3)}$ 0.6" ϕ STRANDS (K/sq. m.)
STANDARD STRAND PATTERNS FOR UNDRAPED STRANDS							
8	0.264	2.51	0.080	1103	1562	-13.78	-19.53
10	0.249	2.43	0.083	1378	1953	-16.60	-23.53
12	0.222	2.27	0.089	1654	2344	-18.57	-26.34
14	0.202	2.16	0.093	1930	2734	-20.74	-29.40
*16	0.239	2.37	0.085	2205	3125	-25.94	-36.76
*18	0.244	2.40	0.084	2481	3515	-29.52	-41.85
STANDARD STRAND PATTERNS FOR DRAPED STRANDS							
8	0.264	2.52	0.080	1103	1562	-13.78	-19.53
10	0.249	2.43	0.083	1378	1953	-16.60	-23.53
12	0.264	2.51	0.080	1654	2344	-20.66	-29.30
14	0.254	2.46	0.082	1930	2734	-23.52	-33.34
16	0.239	2.37	0.085	2205	3125	-25.94	-36.76
18	0.244	2.40	0.084	2481	3515	-29.52	-41.85

* NEEDS BOND BREAKERS AT ENDS.
SEE BOND BREAKER DETAIL.



BOND BREAKER DETAIL

SHOWING LENGTHS OF DEBONDING FROM END OF GIRDER. DEBOND LENGTHS TO BE DESIGNED. STRAND DEVELOPMENT LENGTH IS 760 mm

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.

710 mm PRETENSIONED GIRDER DESIGN DATA

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: _____

DATE: 11/99