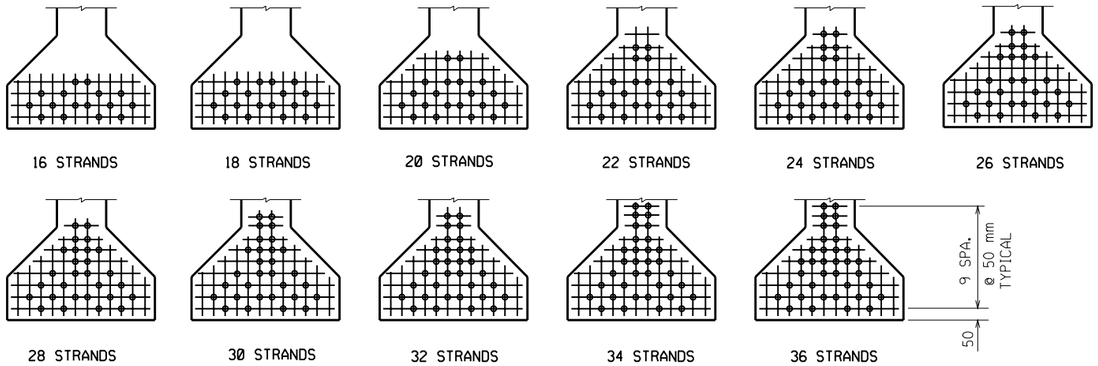
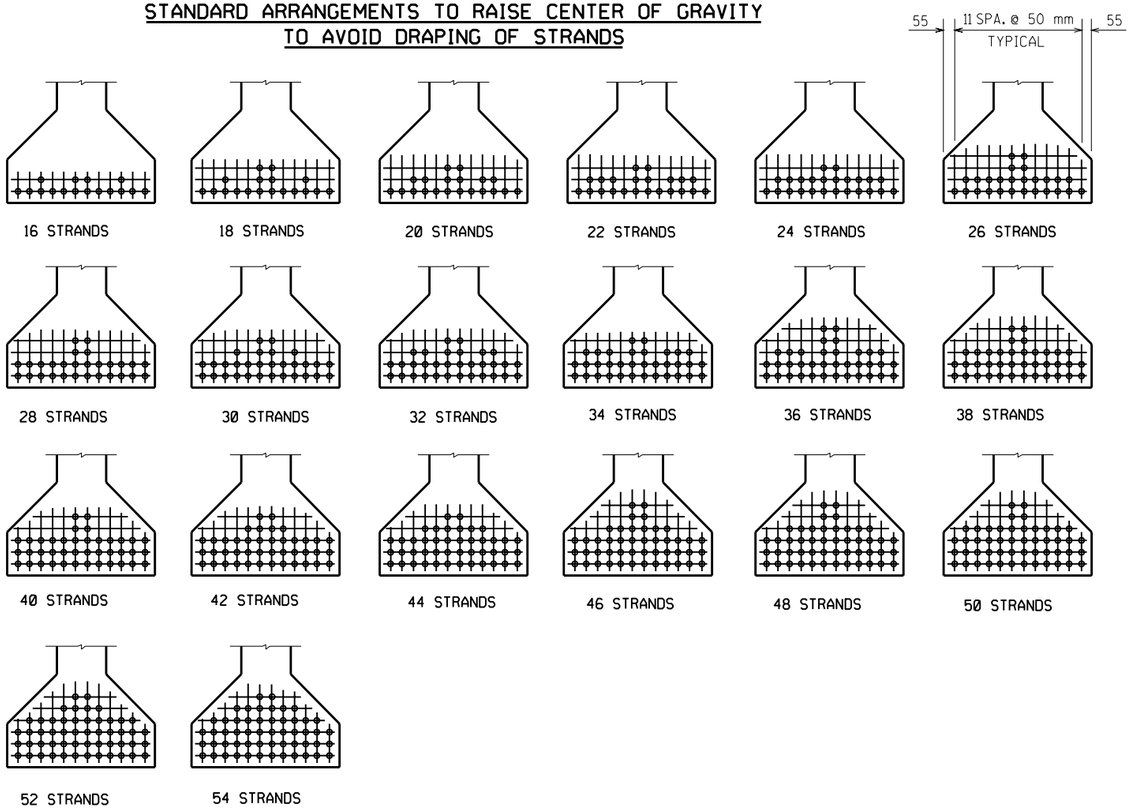


STANDARD ARRANGEMENTS TO RAISE CENTER OF GRAVITY TO AVOID DRAPING OF STRANDS



ARRANGEMENT AT ℄ SPAN - FOR GIRDERS WITH DRAPED STRANDS

1370 mm GIRDER

$A = 0.509\ m^2$

$r^2 = 21.321 \times 10^{-2}\ m^2$

$y_T = 0.743\ m$

$y_B = 0.627\ m$

$I = 108.524 \times 10^{-3}\ m^4$

$S_T = 14.598 \times 10^{-2}\ m^3$

$S_B = 17.277 \times 10^{-2}\ m^3$

WT. = 12.0 kN/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 $= \underline{137.8\ kN}$

$$\frac{y_B}{r^2} = 2.95\ m/m^2$$

(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.)= $A_s f_s$ (kN)	(5) f_B (Init.)= $\frac{(4)}{(3)}$ (MPa)
STANDARD PATTERNS FOR UNDRAPED STRANDS					
16	0.514	2.513	0.203	2205	-10.890
18	0.504	2.484	0.205	2481	-12.110
20	0.486	2.431	0.209	2756	-13.160
22	0.467	2.374	0.214	3032	-14.140
24	0.446	2.313	0.220	3308	-15.030
26	0.436	2.285	0.223	3583	-16.080
28	0.432	2.273	0.224	3858	-17.230
30	0.415	2.222	0.229	4134	-18.050
32	0.412	2.214	0.230	4410	-19.180
34	0.395	2.162	0.235	4685	-19.900
36	0.394	2.159	0.236	4961	-21.040
STANDARD PATTERNS FOR DRAPED STRANDS					
16	0.565	2.663	0.191	2205	-11.540
18	0.555	2.634	0.193	2481	-12.840
20	0.552	2.626	0.194	2756	-14.220
22	0.550	2.619	0.194	3032	-15.600
24	0.548	2.614	0.195	3308	-16.990
26	0.538	2.585	0.197	3583	-18.200
28	0.537	2.583	0.197	3858	-19.580
30	0.533	2.570	0.198	4134	-20.870
32	0.530	2.560	0.199	4410	-22.180
34	0.526	2.551	0.200	4685	-23.480
36	0.518	2.525	0.202	4961	-24.610
38	0.516	2.519	0.202	5236	-25.910
40	0.514	2.514	0.202	5512	-27.220
42	0.510	2.501	0.204	5788	-28.440
44	0.506	2.490	0.204	6064	-29.660
46	0.498	2.467	0.206	6339	-30.720
48	0.495	2.458	0.207	6615	-31.940
50	0.492	2.450	0.208	6890	-33.160
52	0.487	2.436	0.209	7166	-34.300
54	0.483	2.424	0.210	7442	-35.440

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.

1370 mm PRETENSIONED GIRDER DESIGN DATA

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: _____

DATE: 12/99