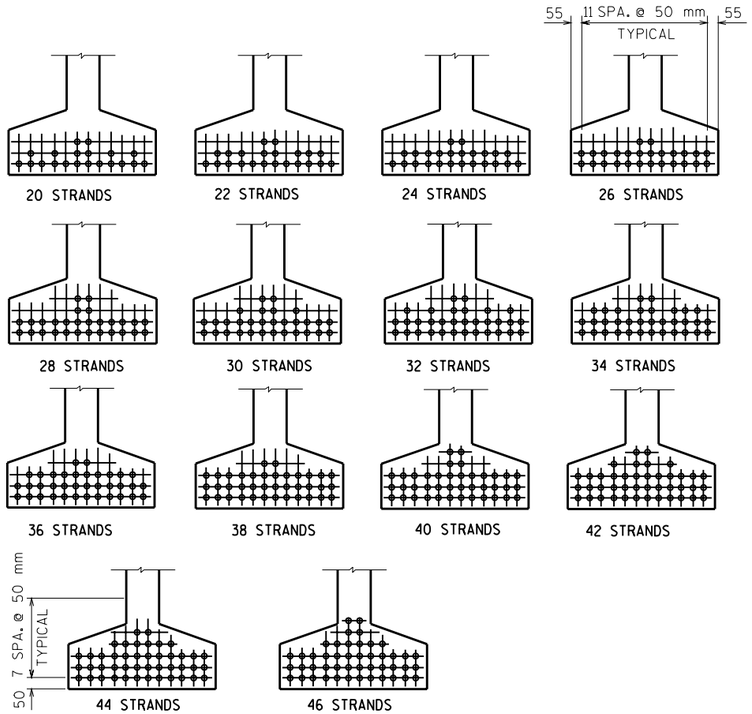
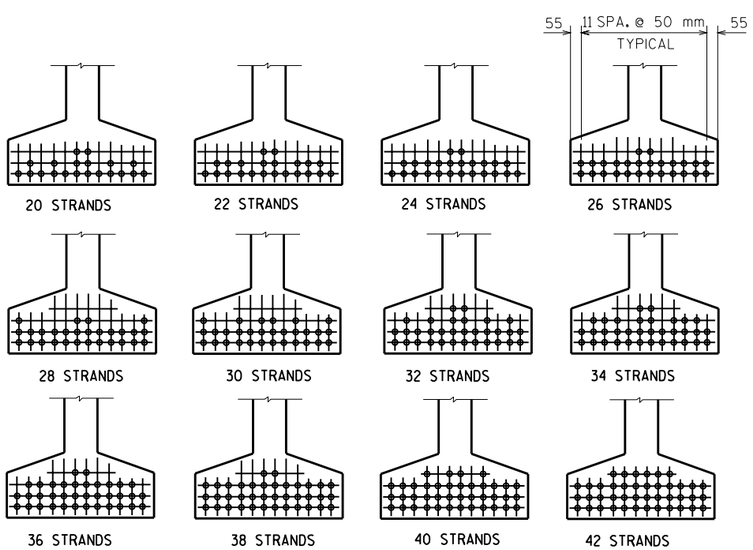



**ARRANGEMENT AT ℄ SPAN FOR GIRDERS WITH DRAPED 0.5" ϕSTRANDS**




**ARRANGEMENT AT ℄ SPAN FOR GIRDERS WITH DRAPED 0.6" ϕSTRANDS**

## 1780 mm GIRDER

$A = 0.499\ m^2$

$I = 212.533 \times 10^{-3}\ m^4$

$r^2 = 42.592 \times 10^{-2}\ m^2$

$y_T = 0.900\ m$

$y_B = 0.880\ m$

$S_T = 23.647 \times 10^{-2}\ m^3$

$S_B = 24.172 \times 10^{-2}\ m^3$

WT. = 11.76 kN/m + 30 kN FOR BOTH END BLOCKS

## PRE-TENSION

$f_s^I = 1860$ 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 $= 13.999 \times 10^{-5}\ m^2 \times 1395$ MPa $=$ 195.3 kN

$$\frac{y_B}{r^2} = 2.06\ m/m^2$$

(COMPRESSION IS NEGATIVE)

| N<br>NO. STRANDS | (1)<br>$e_s$<br>13 mm ϕ STRANDS (meters) | (1)<br>$e_s$<br>15 mm ϕ STRANDS (meters) | (2)<br>$(1 + \frac{e_s\ y_B}{r^2})$<br>13 mm ϕ STRANDS | (2)<br>$(1 + \frac{e_s\ y_B}{r^2})$<br>15 mm ϕ STRANDS | (3)<br>(A/(2))<br>13 mm ϕ STRANDS (sq. m.) | (3)<br>(A/(2))<br>15 mm ϕ STRANDS (sq. m.) | (4)<br>P(Init.) = $A_s\ f_s$<br>13 mm ϕ STRANDS (kN) | (4)<br>P(Init.) = $A_s\ f_s$<br>15 mm ϕ STRANDS (kN) | (5)<br>$f_B$ (Init.)=(4)/(3)<br>13 mm ϕ STRANDS (MPa) | (5)<br>$f_B$ (Init.)=(4)/(3)<br>15 mm ϕ STRANDS (MPa) |
|---|---|---|---|---|---|---|---|---|---|---|
| **STANDARD PATTERNS FOR DRAPED STRANDS** | | | | | | | | | | |
| 20 | 0.803 | 0.803 | 2.659 | 2.659 | 0.188 | 0.188 | 2756 | 3906 | -14.660 | -20.777 |
| 22 | 0.801 | 0.801 | 2.655 | 2.655 | 0.188 | 0.188 | 3032 | 4296 | -16.128 | -22.851 |
| 24 | 0.799 | 0.799 | 2.650 | 2.650 | 0.188 | 0.188 | 3308 | 4687 | -17.596 | -24.931 |
| 26 | 0.797 | 0.797 | 2.647 | 2.647 | 0.189 | 0.189 | 3583 | 5077 | -18.958 | -26.862 |
| 28 | 0.789 | 0.792 | 2.630 | 2.637 | 0.190 | 0.189 | 3858 | 5468 | -20.305 | -28.931 |
| 30 | 0.785 | 0.788 | 2.622 | 2.628 | 0.190 | 0.190 | 4134 | 5859 | -21.758 | -30.837 |
| 32 | 0.781 | 0.781 | 2.613 | 2.613 | 0.191 | 0.191 | 4410 | 6249 | -23.089 | -32.717 |
| 34 | 0.778 | 0.778 | 2.607 | 2.607 | 0.191 | 0.191 | 4685 | 6640 | -24.528 | -34.764 |
| 36 | 0.775 | 0.775 | 2.601 | 2.601 | 0.192 | 0.192 | 4961 | 7030 | -25.839 | -36.615 |
| 38 | 0.772 | 0.772 | 2.596 | 2.596 | 0.192 | 0.192 | 5236 | 7421 | -27.271 | -38.651 |
| 40 | 0.765 | 0.767 | 2.581 | 2.585 | 0.193 | 0.193 | 5512 | 7811 | -28.560 | -40.472 |
| 42 | 0.761 | 0.763 | 2.572 | 2.577 | 0.194 | 0.194 | 5788 | 8202 | -29.835 | -42.278 |
| 44 | 0.757 | 0.757 | 2.564 | 2.564 | 0.195 | 0.195 | 6063 | ——— | -31.092 | ——— |
| 46 | 0.749 | 0.749 | 2.547 | 2.547 | 0.196 | 0.196 | 6338 | ——— | -32.337 | ——— |

ALL DIMENSIONS ARE IN MILLIMETERS
UNLESS SHOWN OTHERWISE.

**1780 mm PRETENSIONED GIRDER DESIGN DATA**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: _____ DATE: 3/00