PARTIAL TRANSVERSE SECTION
AT DIAPHRAGM PIER
STUDY DRAWN (FINAL TO BE SEEN)

PLAN

CAST-IN-PLACE CONCRETE DETAIL NOTES

CAST-IN-PLACE BEARING BLOCK DETAILS SHALL ONLY BE USED WHEN PLANS INDICATE ALLOWANCE FOR PRECAST BEARING BLOCKS.

RECIPE AND DETAILS REGARDING THE USE OF PRECAST PIER CASTS AND COLUMNS IS BEING DEVELOPED BY THE DEPARTMENT OF STRUCTURES IN CONJUNCTION WITH THE I-94/I-90 PROJECT. SEE PLANS FOR ADDITIONAL INFORMATION.

CONTRACTOR NOTES

THE CONTRACTOR SHALL FOLLOW STANDARDS WHEN PRECAST PIER BLOCKS ARE USED.

AND WHEN CAST-IN-PLACE BEARING BLOCKS ARE USED IN LIEU OF PRECAST BEARING BLOCKS.

SEE STANDARDS FOR ADDITIONAL NOTES AND DETAILS.

CAST-IN-PLACE BEARING BLOCK DETAILS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva
DATE: 7/16

STANDARD T.07
STANDARD ARRANGEMENTS TO RAISE CENTER OF GRAVITY
TO AVOID DRAPING OF 0.5" STRANDS
(0.5" STRANDS MAY ALSO BE USED)

8 STRANDS  10 STRANDS  12 STRANDS  14 STRANDS  16 STRANDS

36" GIRDER
A = 369 SQ. IN,
F = 28,000 PSI
E = 20,171 PSI
V = -15,63 PSI
f = 50.978 PSI
k1 = 2,527 PSI
k2 = -3,220 PSI
Nc = 361 k/pf.

PRE-TENSION

y = 202,000 x 0.02
y = 4,040 x 0.02
F = 202,000 x 0.02 = 4,040
F = 202,000 x 0.02 = 4,040

\( y = \frac{-15.63}{28000} = -0.000556 \text{ in}^2/\text{psi} \)

\( f(ia) = \frac{\Delta y}{b/2} = \frac{-0.000556}{2} \)

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>0.5&quot; (Inches)</th>
<th>f(ia) (inches)</th>
<th>f(ia) (kips)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>-12.63</td>
<td>0.006</td>
<td>0.074</td>
</tr>
<tr>
<td>10</td>
<td>-12.63</td>
<td>0.006</td>
<td>0.074</td>
</tr>
<tr>
<td>12</td>
<td>-12.63</td>
<td>0.006</td>
<td>0.074</td>
</tr>
<tr>
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<td>-12.63</td>
<td>0.006</td>
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<tr>
<td>16</td>
<td>-12.63</td>
<td>0.006</td>
<td>0.074</td>
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<tr>
<td>24</td>
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<tr>
<td>26</td>
<td>-12.63</td>
<td>0.006</td>
<td>0.074</td>
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</table>

DESIGNER NOTES
ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNED STRUCTURE.
36" GIRDERS

Standard Arrangements to Raise Center of Gravity
To Avoid Draping of 0.6" Strands

Pre-Tension

\[ T_0 = 270,000 \text{ lbs}, \]
\[ v = \frac{248,200}{\pi}, \]
\[ y = 19.37 \text{ ft}, \]
\[ y_0 = -0.053 \text{ ft}, \]
\[ I = 99,980 \text{ ft}^4, \]
\[ S = 5,682 \text{ in}^3, \]
\[ S_0 = -40.02 \text{ in}^3, \]
\[ R_{gy} = 658 \text{ kips}. \]

Compression Is Vertical

<table>
<thead>
<tr>
<th>No. of Strands</th>
<th>x</th>
<th>y</th>
<th>( P_{M} = x^2 y )</th>
<th>( E_y ) (kip/in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>-2.43</td>
<td>109</td>
<td>2,671</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>-2.75</td>
<td>171</td>
<td>2,778</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>-3.0</td>
<td>210</td>
<td>5,054</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>-3.26</td>
<td>255</td>
<td>4,081</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>-3.52</td>
<td>295</td>
<td>4,388</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>-3.97</td>
<td>230</td>
<td>4,706</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>-4.43</td>
<td>178</td>
<td>9,270</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>-4.91</td>
<td>126</td>
<td>5,205</td>
<td></td>
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<tr>
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<td>-5.39</td>
<td>85</td>
<td>5,893</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>-5.97</td>
<td>56</td>
<td>5,945</td>
<td></td>
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</tbody>
</table>

Arrangement at 1/8 Span - For Girders with Draped 0.6" Strands

Designer Notes:
On the Strand Pattern Sheet, place a box around each strand pattern that applies to the designed structure.

36" Prestressed Girder Design Data

State of Wisconsin
Department of Transportation
Structures Development Section

Approved: Bill Oliva

Standard 19.12
45W GIRDERS

PRE-TENSION

45 PRE 0.6° STRANDS: 0.617 x 202,500 = 126,094 KIPS

COMPRESSION IS FORCED

STANDARD STRAND PATTERNS FOR UNDRAPPED STRANDS

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>d_b (Inches)</th>
<th>P/live + wy ( \times 10^6 ) (KIPS)</th>
<th>( E_0 ) (kips/( \text{inch}^2 ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>0.284</td>
<td>728</td>
<td>4,235</td>
</tr>
<tr>
<td>20</td>
<td>0.328</td>
<td>771</td>
<td>3,683</td>
</tr>
<tr>
<td>24</td>
<td>0.358</td>
<td>812</td>
<td>3,460</td>
</tr>
</tbody>
</table>

STANDARD STRAND PATTERNS FOR DRAPPED STRANDS

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<tr>
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<th>P/live + wy ( \times 10^6 ) (KIPS)</th>
<th>( E_0 ) (kips/( \text{inch}^2 ))</th>
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<td>24</td>
<td>0.358</td>
<td>812</td>
<td>3,460</td>
</tr>
</tbody>
</table>

DESIGNER NOTES

ON THE STRAND PATTERN SHEET PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNED STRUCTURE.
**54" Girder**

- $x = 798 \text{ in}$
- $y^2 = 402.64 \text{ in}^2$
- $x' = 27.1 \text{ in}$
- $y' = -24.7 \text{ in}$
- $I = 321,048 \text{ in}^4$
- $E = 10,592 \text{ MPa}$
- $S = -22,005 \text{ in}^3$
- $W = 831.7 \text{ ft}$

**Pre-Tension**

- $t_1: \text{270,000 PSI}$
- $t_2: \text{0.75 x 270,000 = 202,500 PSI}$

  For low relaxation strands:

- $p: \text{0.60 x 43.5 = 26.1 Mips}$

- $p: \text{0.60 x 0.06536 ft/in}^2$

  $n = \frac{559}{43.5}$

**Standard Arrangements to Raise Center of Gravity**

To avoid draping of 0.6" strands

**Arrangement at 6" Span - For Girder with Draped 0.6" Strands**

**Designer Notes**

On the strand pattern sheet, place a box around each strand pattern that applies to the designed structure.

**54" Prestressed Girder Design Data**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

DATE: 1-6
**72W GIRDER**

- \( P = 270,000 \) kips
- \( P' = 0.75 \times 270,000 = 202,500 \) kips
- \( X_p = 37.43 \) in
- \( Y_p = 3.487 \) in
- \( I = 455,426 \) in\(^4\)
- \( S_x = 16,680 \) in\(^3\)
- \( S_y = -20,625 \) in\(^3\)
- \( \omega_{11} = 963 \) kips/in

### Standard Arrangements to Raise Center of Gravity to Avoid Draping of 0.6" Strands

### Pre-Tension

- \( \gamma_1 = 270,000 \) kips
- \( \gamma_0 = 0.75 \times 270,000 = 202,500 \) kips
- \( \gamma_p = 37.43 \) in

#### 18 Strand Arrangement

- \( S_x = 16,680 \) in\(^3\)
- \( S_y = -20,625 \) in\(^3\)
- \( \omega_{11} = 963 \) kips/in

---

**Design Notes**

- Arrange strand pattern per sheet to fit design requirements.

---

**Standard 72W**

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**Bill Oliva**

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**State of Wisconsin**

**Department of Transportation**

**Structures Development Section**

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**Approved:** Bill Oliva

---

**Date:** 1/6

---

**Standard 79.18**
STANDARD ARRANGEMENTS TO RAISE CENTER OF GRAVITY TO AVOID DRAPEING OF 0.6" STRANDS

18 STRANDS
18 STRANDS
20 STRANDS

STANDARD STRAND PATTERNS FOR UNDRAPE STRANDS

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>16</th>
<th>18</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>m&lt;sub&gt;g&lt;/sub&gt; (in lb)</td>
<td>190</td>
<td>210</td>
<td>260</td>
</tr>
<tr>
<td>P&lt;sub&gt;f&lt;/sub&gt; = 405 kips</td>
<td>340</td>
<td>360</td>
<td>420</td>
</tr>
</tbody>
</table>

STANDARD STRAND PATTERNS FOR DRAPE STRANDS

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
<th>26</th>
</tr>
</thead>
<tbody>
<tr>
<td>m&lt;sub&gt;g&lt;/sub&gt; (in lb)</td>
<td>190</td>
<td>260</td>
<td>320</td>
<td>390</td>
<td>450</td>
</tr>
<tr>
<td>P&lt;sub&gt;f&lt;/sub&gt; = 405 kips</td>
<td>340</td>
<td>420</td>
<td>480</td>
<td>540</td>
<td>600</td>
</tr>
</tbody>
</table>

ARRANGEMENT AT 5% SPAN - FOR GIRDERS WITH DRAPED 0.6" STRANDS

DESIGNER NOTES

ON THE ABOVE PATTERN SHEET PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNER STRUCTURE.

82W PRESSTRESSED GIRDER DESIGN DATA

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

THERE IS CURRENTLY A MORATORIUM ON THE USE OF 82W PRESSTRESSED GIRDER.

APPROVED:  Bill Oliva

STANDARD: 79.20
LEGEND

@ Bars not required when used on girder segments.
+ Bars placed parallel to girder, spacing is dependent on the L of the girder.

* When bars are parallel to girder, use standard 12D. Brackets to allow for ease of post-tensioning operation.
** Place at 5' max. spacing until perpendicular to the L of the girder.
*** Place along skew from end of prestressed box girder and all end block bottom strain bars at these locations.

DESIGNER NOTES

For girder details, see Standard 1520 and Standard 1510.

For girders structures east end of prestressed box girder along skew.

PRESSESSED BOX GIRDER DETAILS 1
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

APPROVED:  Bill Oliva

STANDARD 19.52
3. 1/8" x 1/2" stress pocket placed perpendicular to strand holes.

ANCHOR DETAILS TO BE SUBMITTED TO THE STRUCTURES DESIGN SECTION FOR APPROVAL.

SEAL WASHER

May also be round.

STRESS POCKET DETAIL
DESIGNER NOTES

DEEP SUPPORTS SHALL BE PRESTRESSED COUNTRY TYPE 1-15-W-1.

SUPPORTS FOR CONCRETE WIELTAS DE CRETE BAND A MAX. W 1000 PSI FOR CONCRETE.

SUPPORTS WITH STEEL OR ELASTOMERIC BANDS.

SIDE VIEW OF SLAB

#4 ELASTOMERIC BAND, PAD

SUPPORTS TO BE DESIGNED 1ST YEAR 2020 2030.

STRAINS SHOWN IN Diagram AC 2023 2030.

SUPPORTS WITH #4 ELASTOMERIC BAND, PAD

SIDE VIEW OF SLAB

#4 ELASTOMERIC BAND, PAD

SUPPORTS TO BE DESIGNED 1ST YEAR 2020 2030.

STRAINS SHOWN IN Diagram AC 2023 2030.

SUPPORTS WITH #4 ELASTOMERIC BAND, PAD

SIDE VIEW OF SLAB

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