NOTES

TOP OF GIRDER TO BE FLUSH PLACED AND SHOVED TRANSPARENCY. EXCEPT THE OUTSIDE 2'-0" OF GIRDER, WHICH SHOULDER A SMOOTH FAUX IN THE APPROVED CONCRETE TOOLS SHOWN IN FIGURE 27.14. ALL
CONCRETE SHOULDER THE OUTSIDE 2'-0" OF THE TOP PLANE.

DO NOT ADD CONCRETE TOLERANCE TO CONCRETE TO SURFACES RECEIVING
APPLICATION OF CONCRETE SEALING.

THE GIRDERS SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR
WEIGHTING AND ERECTING. SEE SECTION 503.3.4 OF STANDARD FOR DETAILS.

END OF GIRDER

IN PAIRS

#5 STIRRUPS

OF BEARING & STEEL BRGS.

ELASTOMERIC

DETAIL TYPICAL AT EACH END

12% SLOPE MAX.

ON PALLET

"A"

"B" = ("A" + 3 "C") + 3" MAX.

"B" = ("A" + 3 "C") MIN.

"A" TO BE GIVEN TO THE NEAREST 1"

2"

LOCATION OF DRAPED STRANDS

PLAN VIEW

SIDE VIEW OF GIRDER

SECTION THRU GIRDER

28" PRESTRESSED GIRDER DETAILS

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

DATE: 1-22

STANDARD 19.01

28" PRESTRESSED GIRDER DETAILS

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

DATE: 1-22

STANDARD 19.01
STANDARD STRAND PATTERNS FOR UNDRAPED STRANDS (0.5" DIA.)

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>a (inches)</th>
<th>P(init) x A x f' (KIPS)</th>
<th>f' (K/sq.in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>-10.42</td>
<td>352</td>
<td>2,284</td>
</tr>
<tr>
<td>10</td>
<td>-9.82</td>
<td>439</td>
<td>3,424</td>
</tr>
<tr>
<td>12</td>
<td>-9.25</td>
<td>527</td>
<td>4,564</td>
</tr>
<tr>
<td>14</td>
<td>-8.67</td>
<td>615</td>
<td>5,696</td>
</tr>
<tr>
<td>*16</td>
<td>-8.10</td>
<td>703</td>
<td>6,826</td>
</tr>
<tr>
<td>*18</td>
<td>-7.53</td>
<td>791</td>
<td>7,958</td>
</tr>
</tbody>
</table>

STANDARD STRAND PATTERNS FOR DRAPED STRANDS (0.5" DIA.)

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>a (inches)</th>
<th>P(init) x A x f' (KIPS)</th>
<th>f' (K/sq.in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>-10.42</td>
<td>352</td>
<td>2,284</td>
</tr>
<tr>
<td>10</td>
<td>-9.82</td>
<td>439</td>
<td>3,424</td>
</tr>
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<td>527</td>
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<td>615</td>
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<td>-8.10</td>
<td>703</td>
<td>6,826</td>
</tr>
<tr>
<td>18</td>
<td>-7.53</td>
<td>791</td>
<td>7,958</td>
</tr>
</tbody>
</table>

**DESIGNER NOTES**

ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPEARS TO BE THE STRAND STRUCTURE AND LABEL THE SPAN IT IS USED IN.
36W" GIRDER

- $A = 632 \text{ sq. in.}$
- $r^2 = 158.20 \text{ in}^2$
- $y_r = -16.43 \text{ in}$
- $I = 99,980 \text{ in}^4$
- $S_r = 5,162 \text{ in}^2$
- $S = -6,012 \text{ in}^2$
- $W_T = 658 \#/\text{ft}$

PRE-TENSION

- $f_{\text{init.}} = 0.25 \times 270,000 \times 202,500 P.S.I.$
- $f = 0.75 \times 270,000 = 202,500 P.S.I.$

STANDARD STRAND PATTERNS FOR UNDRAPPED STRANDS

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>$y_b$ (inches)</th>
<th>$P_{\text{init.}}$ (KIPS)</th>
<th>$f_{\text{init.}}$ (K/sq.in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
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<td>703</td>
<td>2.666</td>
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<td>791</td>
<td>2.796</td>
</tr>
<tr>
<td>20</td>
<td>-11.03</td>
<td>879</td>
<td>3.033</td>
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</table>

STANDARD STRAND PATTERNS FOR DRAPED STRANDS

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>$y_b$ (inches)</th>
<th>$P_{\text{init.}}$ (KIPS)</th>
<th>$f_{\text{init.}}$ (K/sq.in.)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>-14.28</td>
<td>703</td>
<td>2.794</td>
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<td>791</td>
<td>3.003</td>
</tr>
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<td>22</td>
<td>-12.68</td>
<td>879</td>
<td>3.234</td>
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<td>24</td>
<td>-11.88</td>
<td>955</td>
<td>3.461</td>
</tr>
<tr>
<td>26</td>
<td>-11.08</td>
<td>1,030</td>
<td>3.685</td>
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<td>4.276</td>
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<td>-7.88</td>
<td>1,336</td>
<td>4.472</td>
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<tr>
<td>36</td>
<td>-7.08</td>
<td>1,412</td>
<td>4.669</td>
</tr>
</tbody>
</table>

DESIGNER NOTES

ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNED STRUCTURE AND LABEL THE SPAN IT IS USED IN.
45W" PRESTRESSED GIRDER DESIGN DATA

**45W" GIRDER**

- $A = 692$ SQ. IN.
- $f_0 = 270,000$ P.S.I.
- $f_B = 0.75 \times 270,000 = 202,500$ P.S.I.

**PRE-TENSION**

- $\sigma = f_0 + \frac{f_B}{2}$

**STANDARD STRAND PATTERNS FOR UNDRAPED STRANDS**

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>$d_0$ (Inches)</th>
<th>$P_i$ (KIPS)</th>
<th>$f_i$ (KIPS/IN.²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>-8.24</td>
<td>103</td>
<td>2,031</td>
</tr>
<tr>
<td>18</td>
<td>-8.42</td>
<td>119</td>
<td>2,210</td>
</tr>
<tr>
<td>20</td>
<td>-8.60</td>
<td>135</td>
<td>2,404</td>
</tr>
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</table>

**STANDARD STRAND PATTERNS FOR DRAPED STRANDS**

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>$d_0$ (Inches)</th>
<th>$P_i$ (KIPS)</th>
<th>$f_i$ (KIPS/IN.²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>-8.24</td>
<td>103</td>
<td>2,031</td>
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<tr>
<td>18</td>
<td>-8.42</td>
<td>119</td>
<td>2,210</td>
</tr>
<tr>
<td>20</td>
<td>-8.60</td>
<td>135</td>
<td>2,404</td>
</tr>
</tbody>
</table>

**DESIGNER NOTES**

ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNED STRUCTURE AND LABEL THE SPAN IT IS USED IN.

**BUREAU OF STRUCTURES**

APPROVED: Bill Oliva

STANDARD 1914
NOTES

TO THE ORDER TO BE DETAILED AND DESIGNED CONSISTENTLY
EXCEPT THE SPACING OF ORRIPS SHALL BE AS SHOWN IN DETAIL A.
ALL BARS SHALL BE AS CONNECTED AS REQUIRED TO ALL
SMOOTH SURFACES SELECTING THE O/R STRING OF BARS.
DO NOT APPLY CONCRETE SEALER OR EPOXY TO SURFACES RECEIVING
APPLICATION OF CONCRETE STAINING.

THE END GIRDERS SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR
MOVING AND INSTALLING THE REQUIRED SECTION SHOWING STANDARD
SPECIFICATIONS FOR GUIDANCE.

STRANDS SHALL BE PLACED IN EACH END FOR GIRDERS ENDING COMPLETELY IN CONCRETE. END OF STRINGS SHALL BE POINTS OF SUPPORT WITH
NO CONCRETE JOINT SEALER. FOR ORDER, THE END OBSERVE END DETAILED IN DETAIL A.
PLACE AT STIRRUP SPACING.

THE END OBSERVE END DETAILED IN DETAIL A.
PLACE AT STIRRUP SPACING.

THE DESIGNER DETERMINES THE VALUE BASED ON 2`/16, WHICH IS
equivalent to the calculated residual camber. This is
provided in each end of the girder.

PRESTRESSING STRANDS SHALL BE 0.6" DIA.-7-WIRE LOW-RELAXATION
STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

STRENGTH IS 6800 PSI. USE 0.6" DIA. STRAND FOR ALL PATTERNS.

MINIMUM OF 6,000 PSI TO A MAX. OF 8,000 PSI. MAXIMUM RELEASE
SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A
BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 54W-INCH".

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY,
APPLICATION OF CONCRETE STAINING. DO NOT APPLY CONCRETE SEALER OR EPoxy TO SURFACES RECEIVING
APPLICATION OF CONCRETE STAINING.

APPLICATION OF CONCRETE STAINING. DO NOT APPLY CONCRETE SEALER OR EPoxy TO SURFACES RECEIVING
APPLICATION OF CONCRETE STAINING.

PRESTRESSING STRANDS SHALL BE 0.6" DIA.-7-WIRE LOW-RELAXATION
STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

CONCRETE STRENGTH AS REQUIRED BY DESIGN. USE 0.6" DIA. STRAND FOR ALL PATTERNS.

MINIMUM OF 6,000 PSI TO A MAX. OF 8,000 PSI. MAXIMUM RELEASE
SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A
BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 54W-INCH".

TO THE ORDER TO BE DETAILED AND DESIGNED CONSISTENTLY
EXCEPT THE SPACING OF ORRIPS SHALL BE AS SHOWN IN DETAIL A.
ALL BARS SHALL BE AS CONNECTED AS REQUIRED TO ALL
SMOOTH SURFACES SELECTING THE O/R STRING OF BARS.
DO NOT APPLY CONCRETE SEALER OR EPOXY TO SURFACES RECEIVING
APPLICATION OF CONCRETE STAINING.

THE END GIRDERS SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR
MOVING AND INSTALLING THE REQUIRED SECTION SHOWING STANDARD
SPECIFICATIONS FOR GUIDANCE.

STRANDS SHALL BE PLACED IN EACH END FOR GIRDERS ENDING COMPLETELY IN CONCRETE. END OF STRINGS SHALL BE POINTS OF SUPPORT WITH
NO CONCRETE JOINT SEALER. FOR ORDER, THE END OBSERVE END DETAILED IN DETAIL A.
PLACE AT STIRRUP SPACING.
**54" PRESTRESSED GIRDER DESIGN DATA**

**54" GIRDER**

\[ A = \frac{798}{52} \text{ in.}^2 \]
\[ r_f = 402.41 \text{ in.}^2 \]
\[ V_f = 27,700 \text{ lb} \]
\[ S_f = -26.70 \text{ in} \]
\[ f = 0.75 \times 270,000 = 202,500 \text{ P.S.I.} \]
\[ f' = 270,000 \text{ P.S.I.} \]
\[ \theta \text{ PRE-TENSION} \]

**FOR LOW RELAXATION STRANDS**

\[ \gamma = 26.70 \text{ in.} \]
\[ V_f = 0.1 \times 202,500 = 20,250 \text{ P.S.I.} \]

**STANDARD ARRANGEMENTS TO RAISE CENTER OF GRAVITY**

**TO AVOID DRAPEING OF 0.6" DIA. STRANDS**

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>SPAN (inches)</th>
<th>PRE-TENSIONS (KIPS)</th>
<th>( \gamma \text{ (inches)} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>-24.25</td>
<td>703</td>
<td>2.07</td>
</tr>
<tr>
<td>8</td>
<td>-24.25</td>
<td>703</td>
<td>2.07</td>
</tr>
<tr>
<td>20</td>
<td>-20.70</td>
<td>870</td>
<td>2.09</td>
</tr>
<tr>
<td>22</td>
<td>-23.39</td>
<td>941</td>
<td>3.05</td>
</tr>
<tr>
<td>24</td>
<td>-23.39</td>
<td>941</td>
<td>3.05</td>
</tr>
<tr>
<td>26</td>
<td>-23.39</td>
<td>941</td>
<td>3.05</td>
</tr>
<tr>
<td>28</td>
<td>-23.39</td>
<td>941</td>
<td>3.05</td>
</tr>
<tr>
<td>30</td>
<td>-23.39</td>
<td>941</td>
<td>3.05</td>
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<tr>
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</tr>
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<td>36</td>
<td>-23.39</td>
<td>941</td>
<td>3.05</td>
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<td>-23.39</td>
<td>941</td>
<td>3.05</td>
</tr>
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<td>40</td>
<td>-23.39</td>
<td>941</td>
<td>3.05</td>
</tr>
<tr>
<td>42</td>
<td>-23.39</td>
<td>941</td>
<td>3.05</td>
</tr>
</tbody>
</table>

**DESIGNER NOTES**

ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNED STRUCTURE AND LABEL THE SPAN IT IS USED IN.
NOTES

- Top of 72W-Inch Prestressed Girder shall be finished with a smooth surface including the outer 15 inches of the top flange.
- Do not apply concrete sealer on epoxy to surfaces needing application of concrete sealer.
- The girder shall be provided with a suitable lifting device for handling and erecting the girder.
- Strands shall be flush with each other and bonded as described in the notes for the construction.
- The girder shall be provided with a suitable lifting device for handling and erecting the girder.

DESIGNER NOTES

- Design of girder shall be approved by the designer.
- All girder details shall be submitted electronically to the Bureau of Structures.
- All sections shall be cast full length as shown.

SECTION THRU GIRDER

- The girder shall be designed to accommodate the maximum number of draped 0.6" diameter strands, which is 8.

STANDARD 72W" PRESTRESSED GIRDER DETAILS

- The girder shall be designed to accommodate the maximum number of draped 0.6" diameter strands, which is 8.
- All strands shall be flush with the end of the girder.
- Special attention shall be given to the design of the girder, especially at the ends.

LOCATION OF DRAPED STRANDS

- The girder shall be provided with a suitable lifting device for handling and erecting the girder.
- All sections shall be cast full length as shown.

BILL OLIVA

APPROVED: 1-22
**PRE-TENSION**

<table>
<thead>
<tr>
<th>Strand Pattern</th>
<th>Strand Diameter (in)</th>
<th>Strand Tension (kips)</th>
<th>Strand Stress (ksi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 STRANDS</td>
<td>0.6</td>
<td>43.94</td>
<td>-0.0486 in/in²</td>
</tr>
<tr>
<td>18 STRANDS</td>
<td>0.6</td>
<td>46.45</td>
<td>-0.0470 in/in²</td>
</tr>
<tr>
<td>20 STRANDS</td>
<td>0.6</td>
<td>49.52</td>
<td>-0.0413 in/in²</td>
</tr>
<tr>
<td>22 STRANDS</td>
<td>0.6</td>
<td>52.24</td>
<td>-0.0362 in/in²</td>
</tr>
<tr>
<td>24 STRANDS</td>
<td>0.6</td>
<td>54.65</td>
<td>-0.0320 in/in²</td>
</tr>
<tr>
<td>26 STRANDS</td>
<td>0.6</td>
<td>56.82</td>
<td>-0.0282 in/in²</td>
</tr>
<tr>
<td>28 STRANDS</td>
<td>0.6</td>
<td>58.74</td>
<td>-0.0250 in/in²</td>
</tr>
<tr>
<td>30 STRANDS</td>
<td>0.6</td>
<td>60.44</td>
<td>-0.0221 in/in²</td>
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<tr>
<td>32 STRANDS</td>
<td>0.6</td>
<td>61.95</td>
<td>-0.0195 in/in²</td>
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<tr>
<td>34 STRANDS</td>
<td>0.6</td>
<td>63.23</td>
<td>-0.0172 in/in²</td>
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<td>36 STRANDS</td>
<td>0.6</td>
<td>64.31</td>
<td>-0.0151 in/in²</td>
</tr>
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<td>38 STRANDS</td>
<td>0.6</td>
<td>65.19</td>
<td>-0.0134 in/in²</td>
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<tr>
<td>40 STRANDS</td>
<td>0.6</td>
<td>65.94</td>
<td>-0.0119 in/in²</td>
</tr>
<tr>
<td>42 STRANDS</td>
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<td>66.57</td>
<td>-0.0106 in/in²</td>
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<tr>
<td>44 STRANDS</td>
<td>0.6</td>
<td>67.08</td>
<td>-0.0094 in/in²</td>
</tr>
<tr>
<td>46 STRANDS</td>
<td>0.6</td>
<td>67.57</td>
<td>-0.0084 in/in²</td>
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<tr>
<td>48 STRANDS</td>
<td>0.6</td>
<td>67.96</td>
<td>-0.0075 in/in²</td>
</tr>
</tbody>
</table>

**DESIGNER NOTES**

On the strand pattern sheet, place a box around each strand pattern that applies to the designed structure and label the span it is used in.
82W" GIRDERS
- 980 SQ. IN.
- $r^2 = 924.1 \text{ in}^2$
- $y = -39.68 \text{ in.}$
- $S = 21,396 \text{ in.}^2$
- WT. = 1021 #/FT.

PRE-TENSION
- $f' = 270,000 \text{ P.S.I.}$
- $f = 0.75 \times 270,000 = 202,500 \text{ P.S.I.}$

**STANDARD STRAND PATTERNS FOR UNDRAPPED STRANDS**

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>$r$ (inches)</th>
<th>PRE-TENSION $f'_s$ (KIPS)</th>
<th>$f$ (KIPS/$\text{sq.in.}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>-3.21</td>
<td>703</td>
<td>0.217</td>
</tr>
<tr>
<td>18</td>
<td>-3.24</td>
<td>791</td>
<td>0.213</td>
</tr>
</tbody>
</table>

**STANDARD STRAND PATTERNS FOR DRAPPED STRANDS**

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>$r$ (inches)</th>
<th>PRE-TENSION $f'_s$ (KIPS)</th>
<th>$f$ (KIPS/$\text{sq.in.}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
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<td>0.210</td>
</tr>
<tr>
<td>18</td>
<td>-3.68</td>
<td>819</td>
<td>0.215</td>
</tr>
</tbody>
</table>

DESIGNER NOTES
- ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNED STRUCTURE AND LABEL THE SPAN IT IS USED IN.
- THERE IS CURRENTLY A MORATORIUM ON THE USE OF 82W" PRESTRESSED GIRDERS.

STANDARD 19.20
DECK HAUNCH DETAIL

- 3'-10" MIN. HAUNCH
- 1'-0" CTRS. #4 BARS AT 6" MAX.
- 2'-0" CTRS. #3 BARS AT 6" MAX.

PIILASTER DETAIL AT PIERS

- 2" #4 BARS AT 6" MAX.
- 3'-0" LONG #4 TIE BARS

PILASTER DETAIL AT PIER PILASTERS

- 1'-0" CTRS. #3 BARS AT 6" MAX.

PILASTER DETAIL AT DIAPHRAGMS

- 9" MAX. CTRS. #3 BARS

CAMBER & DEFLECTION DIAGRAM

- "A" = PRESTRESS CAMBER
- "B" = DEAD LOAD DEFLECTION
- "C" = RESIDUAL CAMBER

NOTE ON PLAN THAT DIAPHRAGM SPACING IS
OF THE GIRDER LENGTH.

FOR SKEWS > 10°, PLACE INTERMEDIATE DIAPHRAGMS IN A STRAIGHT LINE. REFER TO STANDARD 19.36. PROVIDE OFFSET FOR SKEWS > 10°.

INTERMEDIATE CONCRETE DIAPHRAGMS SHALL BE USED ONLY WHERE THE USE OF STEEL DIAPHRAGMS IS NOT PRACTICAL BECAUSE OF STEEL OR FOR OTHER STEEL STRUCTURES. ONLY ONE TYPE OF INTERMEDIATE DIAPHRAGM SHALL BE SHOWN ON THE DRAWING. INTERMEDIATE CONCRETE DIAPHRAGMS ON THE SAME BRIDGE OR 10" MAX.

NOTE ON PLAN THAT DIAPHRAGM SPACING IS
FROM THE GIRDER END.

DESIGNER NOTES

- PRESENT PRACTICE IS TO USE A MINIMUM HAUNCH HEIGHT AT THE EDGE OF GIRDER PLANE. FOR DESIGN CALCULATIONS, THE MINIMUM HAUNCH (AT EDGE OF GIRDER PLANE) ALLOWED IN CONSTRUCTION IS 2".

- USE THE CALCULATED THEORETICAL AVERAGE HAUNCH HEIGHT AT CENTERLINE OF GIRDER FOR COMPUTING DECK ELEVATIONS AT SUPPORTS.

- INTERMEDIATE CONCRETE DIAPHRAGMS SHALL BE USED ONLY WHERE THE USE OF STEEL DIAPHRAGMS IS NOT PRACTICAL BECAUSE OF STEEL OR FOR OTHER STEEL STRUCTURES. ONLY ONE TYPE OF INTERMEDIATE DIAPHRAGM SHALL BE SHOWN ON THE DRAWING. INTERMEDIATE CONCRETE DIAPHRAGMS ON THE SAME BRIDGE OR 10" MAX.

- FOR SKEWS > 10°, PLACE INTERMEDIATE DIAPHRAGMS IN A STRAIGHT LINE. REFER TO STANDARD 19.36. PROVIDE OFFSET FOR SKEWS > 10°.

- INTERMEDIATE CONCRETE DIAPHRAGMS ON THE SAME BRIDGE OR 10" MAX.

- CONCRETE PILLASTERS ARE TYPICALLY NOT USED, BUT MAY BE USED AS PART OF THE BRIDGE AESTHETIC PACKAGE ON 36", 45", 54" AND 70" PRESTRESSED GIRDERS. PILLASTERS ARE NOT USED ON 8".

- 1'-6" MAX. CTRS. #3 BARS AT 6" MAX.

- 3'-0" LONG #3 BARS AT 6" MAX.

- 1'-0" CTRS. #3 BARS AT 6" MAX.

- 2'-0" CTRS. #3 BARS AT 6" MAX.

- 3'-0" LONG #3 BARS AT 6" MAX.

- 1'-0" CTRS. #3 BARS AT 6" MAX.

- 2'-0" CTRS. #3 BARS AT 6" MAX.

- 3'-0" LONG #3 BARS AT 6" MAX.

- 1'-0" CTRS. #3 BARS AT 6" MAX.

- 2'-0" CTRS. #3 BARS AT 6" MAX.

- 2'-0" CTRS. #3 BARS AT 6" MAX.

- 3'-0" LONG #3 BARS AT 6" MAX.

- 1'-0" CTRS. #3 BARS AT 6" MAX.

- 2'-0" CTRS. #3 BARS AT 6" MAX.

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- 3'-0" LONG #3 BARS AT 6" MAX.

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- 3'-0" LONG #3 BARS AT 6" MAX.

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- 2'-0" CTRS. #3 BARS AT 6" MAX.

- 2'-0" CTRS. #3 BARS AT 6" MAX.

- 3'-0" LONG #3 BARS AT 6" MAX.

- 1'-0" CTRS. #3 BARS AT 6" MAX.

- 2'-0" CTRS. #3 BARS AT 6" MAX.

- 2'-0" CTRS. #3 BARS AT 6" MAX.

- 3'-0" LONG #3 BARS AT 6" MAX.
**TOP OF DECK**

**SEE DETAIL B**

**A**

**DIM.**

**B**

**DIM.**

**TYP.**

`GIRDERS`

`DIAPHRAGM`

`GIRDERS`

`BOLT ANCHORAGE`

`DIAPHRAGM`

`FOR EXTERIOR ATTACHMENT`

**DIM.**

**DIM.**

**TYP.**

**DIM.**

**DIM.**

**CENTER OF DIAPHRAGM**

**GIRDER STIRRUPS**

2" 3"

**EXTERIOR GIRDER**

**PART TRANSVERSE SECTION AT DIAPHRAGM**

**SECTION AT INTERIOR GIRDERS THRU DIAPHRAGM FOR SKEW ANGLES > 10°**

**SECTION THRU DIAPHRAGM**

**NOTE**

**DESIGNER NOTES**

FOR SPANS LESS THAN 80'-0" PLACE THE DIAPHRAGM AT MIDDLE OF SPAN, FOR SPANS 80'-0" AND LARGER, PLACE AT 1/3 POINT.

ON THE PLANS, SHOW LOCATION OF INSERTS/HOLES FOR DIAPHRAGM AND 2/3 POINTS AT MID-LENGTH OF GIRDER. FOR SPANS OVER 80'-0", PLACE AT 1/3 FOR SPANS EQUAL TO OR LESS THAN 80'-0", PLACE ONE DIAPHRAGM BETWEEN GIRDERS.

**TABLE**

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<thead>
<tr>
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**NOTES**

ALL DIAPHRAGM MATERIAL NOT EMBEDDED IN THE CONCRETE ORDER SHALL BE PAID FOR AT THE UNIT PRICE FOR "STEEL DIAPHRAGMS".

EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A36 GR. 36.

ALL DIAPHRAGM MATERIAL INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AFTER FABRICATION.

EACH DIAPHRAGM TO DIAPHRAGM CONNECTION SHALL BE EMBEDDED IN CONCRETE AT 2" TURN UNLESS NOTED OTHERWISE. HIGH STRENGTH BOLTS FOR STEEL DIAPHRAGM TO CONCRETE WEB CONNECTION SHALL BE SNUG-TIGHT.

SHALL BE GALVANIZED AFTER FABRICATION.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GR. 36.

EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

**B-_-", EACH.**

**SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "STEEL DIAPHRAGMS".**

**ALL DIAPHRAGM MATERIAL NOT EMBEDDED IN THE CONCRETE GIRDER**

DIAPHRAGM FOR SKEW ANGLES > 10°

INTERM. STEEL DIAPHS. FOR 28", 36", 45", 45W" 54" & 54W" PRESTRESSED ORDERS

**BUREAU OF STRUCTURES**

**STANDARD 15-36**

**Approved**

**Bill Oliva**

**DATE:**

1-19
**Part Transverse Section at Diaphragm**

**Detail C**

- Exterior beam
- Center of diaphragm
- Web with pipe sleeve
- 1" dia. hole in bent plate
- 1" hole in bent plate

**Detail B**

- Center of diaphragm
- Exterior beam
- Web with pipe sleeve
- 1" dia. hole in bent plate
- 1" hole in bent plate

**Notes**

- All diaphragm materials, not embedded in the concrete girder, shall be paid for at the unit price for steel diaphragms.
- Each diaphragm between girder shall constitute one unit.
- All diaphragm structural steel shall be ASTM A709 Grade 36.
- All diaphragm materials, including bolts, nuts, and washers shall be galvanized after fabrication.

**Designer Notes**

- For spans over 80'-0", place the diaphragm at mid-length of span. For spans over 80'-0", place at 1/3 points.
- When planning, show location of inserts/holes for diaphragm and bent plate, not only from the bottom of the girder on the plans, but also from the back of each girder.

**Web Connection**

- Shall meet the requirements for ASTM A325 or ASTM A449.

**Steel Diaphragm to Concrete Web Connection**

- High-strength bolts for steel diaphragm to concrete web connection shall be snug-tight.
- All diaphragm structural steel shall be ASTM A709 Grade 36.

**Diaphragm Material**

- All diaphragm material including bolts, nuts, and washers shall be paid for at the unit price bid for "Steel Diaphragms."

**Approved:** Bill Oliva

**Date:** 7-19

**Standard:** 19.36

**Bureau of Structures**
PRESTRESSED BOX GIRDER DETAILS 3

POST-TENSIONING DETAILS - ONE DUCT PER DIAPHRAGM

POST-TENSIONING DETAILS - TWO DUCTS PER DIAPHRAGM

STRESS POCKET DETAIL

SEAL WASHER

SPONGE NEOPRENE

SEAL WASHER (SEE DETAIL)

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

SEAL WASHER

SECTION A-A

SECTION B-B

SHEAR KEY DETAIL

STANDARD 19.54

PRESTRESSED BOX GIRDER DETAILS 3

BILL OLIVA

APPROVED

DATE: 1-18
DESIGNER NOTES

BOX GIRDER
OF PRESTRESSED EXTERIOR EDGE

CAST-IN-PLACE DECK
OUTSIDE EDGE OF BOX GIRDER
OF PRESTRESSED EXTERIOR EDGE

PARAPET
BACK FACE OF PARAPET

5" BAR SHOWN, TYP.
PARAPET 42SS SINGLE SLOPE
SLOPE PARAPET
TOP OF SINGLE SLOPE PARAPET
ABUTMENTS.
DETAILS TO BE MODIFIED FOR GRS
DETAILS SHOWN ARE APPLICABLE FOR CONCRETE PARAPET DETAILS.
SEE CHAPTER 30 STANDARDS FOR SINGLE SLOPE PARAPET DETAILS.

NOTE
BAR TO BE PAID AS PART OF BID ITEM
PRESTRESSED BOX GIRDER TYPE XX-INCH.

PLAN
SHOWING REINFORCEMENT CAST INTO PRESTRESSED BOX GIRDER
PARAPET AND DECK ARE SHOWN FOR CLARITY

OUTSIDE ELEVATION
SHOWING REINFORCEMENT CAST INTO PRESTRESSED BOX GIRDER
PARAPET AND DECK ARE SHOWN FOR CLARITY

LEGEND
PL - CONNECTION - STRIKE OFF AS SHOWN.

EPOXY COAT BARS
#4 AT 2'-0" MAX.

TOP OF DECK OVERHANG
BOTTOM OF BOX GIRDER
END OF DECK
LONGITUDINAL BARS
SINGLE SLOPE PARAPET - HOSS SHOWN, TYP.

NOTE
DETAILS SHOWN ARE APPROPRIATE FOR CONCRETE PARAPETS, DETAILS TO BE MODIFIED FOR GRS PARAPETS.

PRESTRESSED BOX GIRDER DETAILS 5

BUREAU OF STRUCTURES

APPROVED: Bill Oliva
DATE: 7-16

STANDARD 19.56