TYPICAL CONCRETE BARRIER DETAIL

FOR DECK TOP REINFORCEMENT WITH TRANSVERSE BARS SHOWN ON TOP. SIMILAR WHEN LONGITUDINAL BARS ON TOP.

SPLIT CONCRETE GLARE SCREEN

MEDIAN BARRIER DETAIL

TO BE USED WHEN CONCRETE GLARE SCREEN IS SPECIFIED IN APPROACH ROADWAY. FOR DECK TOP REINFORCEMENT WITH TRANSVERSE BARS SHOWN ON TOP. SIMILAR WHEN LONGITUDINAL BARS ON TOP.

ALTERNATE CONCRETE BARRIER DETAIL

FOR DECK TOP REINFORCEMENT WITH TRANSVERSE BARS SHOWN ON TOP. SIMILAR WHEN LONGITUDINAL BARS ON TOP.

ALTERNATE SPLIT CONCRETE MEDIAN BARRIER DETAIL

TO BE USED WHEN CONCRETE MEDIAN BARRIER IS SPECIFIED IN APPROACH ROADWAY. FOR DECK TOP REINFORCEMENT WITH TRANSVERSE BARS SHOWN ON TOP. SIMILAR WHEN LONGITUDINAL BARS ON TOP.

NOTES:

1. FOR ADDITIONAL NOTES, SEE SHEET 1.
2. BARRIER LAP SPLICE LENGTH 2'-4" NO BARS

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
CONCRETE DECK SLAB
DESIGN & DETAILS
FOR BEAM BRIDGES

PRESENTED APR. 29, 2016
RECOMMENDED APR. 29, 2016
STANDARD SHEET 0 OF 15
RECOMMENDED SHEET 0 OF 15
BD-601M
CONCRETE MEDIAN BARRIER DETAIL

- For deck slab reinforcement, see typical slab panel details, Sheet 1.
- To be used only for bridges without longitudinal joints and when concrete median barrier is specified in approach structure.
- For deck top reinforcement with transverse bars shown on top, similar when longitudinal bars on top.

SPLIT CONCRETE DIVISOR DETAIL

- For deck slab reinforcement, see typical slab panel details, Sheet 1.
- See BC-788M for open joint detail.
- Not for use as a median barrier, see RC-65M.

CONCRETE GLARE SCREEN MEDIAN BARRIER DETAIL

- For deck slab reinforcement, see typical slab panel details, Sheet 1.
- To be used only for bridges without longitudinal joints and when concrete median barrier is specified in approach structure.
- For deck top reinforcement with transverse bars shown on top, similar when longitudinal bars on top.

NOTES:

1. For additional notes, see Sheet 1.
2. For drip notch details, see BC-775M.
3. For deck slab reinforcement, see typical slab panel details, Sheet 1.
4. For deck top reinforcement with transverse bars shown on top, similar when longitudinal bars on top.

LEGEND:

1. Thin line 7 on both sides of an expansion joint to the barrier and at the end of the deck barrier, denote spacing of reinforcement bars to the slab edge. The slab edge is at the top of the expansion joint and the slab face is perpendicular to the expansion joint.
2. Extend the bars listed at ST in the reinforcement tables to each S2 bar.
3. Design and bar size at location of design section for negative moment.
4. Use Sheet 9 for locations!
5. For reinforcement, see Sheet 6.
6. If the barrier is positioned directly above a girder, the S1 bar, if required must extend the design length to the adjacent girder.
7. Deck slab lap splice length normal weight concrete 2'-10" S2 bars
   Lightweight concrete 2'-14" S2 bars

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
CONCRETE DECK SLAB
DESIGN & DETAILS
FOR BEAM BRIDGES

APR. 29, 2016

SHEET 3 OF 11
ANCHOR BOLT BAR DETAIL
MECHANICAL SPLICE AS PER BULLETIN 15

ANCHOR BOLT BAR DETAIL
MECHANICAL SPLICE AS PER BULLETIN 15

KEY:
- 2" CLR.
- 6" MIN.
- 8" MIN.
- 10" MIN.
- 15" MIN.

REINFORCEMENT BAR DETAILS
MECHANICAL SPLICE AS PER BULLETIN 15

VERTICAL REINFORCEMENT
ALL VERTICAL REINFORCEMENT

SECTION A-A
CURB REINFORCEMENT SHOWN FOR CLARITY
FOR DECK TOP REINFORCEMENT WITH TRANSVERSE BARS SHOWN ON TOP, SIMILAR LENGTH/LOCATION BARS ON TOP.

NOTES:
1. MODIFIED STRUCTURE MOUNTED GUIDE RAIL BARRIER GRANTED TO
DESIGNATION BY FHWA.
2. FOR PA STRUCTURE MOUNTED GUIDE RAIL DETAILS SEE BD-609M.
3. FOR DRAIN SEWER DETAILS SEE BC-775M.

CHIEF BRIDGE ENGINEER
RECOMMENDED

APR. 29, 2016

APR. 29, 2016
** BARRIERS, SPILT GLARE SCREEN AND SPLIT MEDIAN BARRIERS FOR DIMENSIONS "B" AND "C", SEE TABLE 1

<table>
<thead>
<tr>
<th>B and C Dimensions</th>
<th>T</th>
<th>4&quot;</th>
<th>5&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.0&quot;</td>
<td>1&quot;-8&quot;</td>
<td>1&quot;-11&quot;</td>
<td></td>
</tr>
<tr>
<td>9.0&quot;</td>
<td>1&quot;-9&quot;</td>
<td>2&quot;-9&quot;</td>
<td></td>
</tr>
<tr>
<td>10.0&quot;</td>
<td>1&quot;-11&quot;</td>
<td>2&quot;-11&quot;</td>
<td></td>
</tr>
<tr>
<td>11.0&quot;</td>
<td>1&quot;-11&quot;</td>
<td>2&quot;-11&quot;</td>
<td></td>
</tr>
<tr>
<td>11.5&quot;</td>
<td>2&quot;-9&quot;</td>
<td>2&quot;-11&quot;</td>
<td></td>
</tr>
</tbody>
</table>

| BARRIERS, SPILT GLARE SCREEN AND SPLIT MEDIAN BARRIERS WITH SPLIT MEDIAN BARRIERS AND ALUMINUM PROTECTIVE BARRIER FOR DIMENSIONS "M", "N", "P", "Q" AND "S", SEE TABLE 2

<table>
<thead>
<tr>
<th>M, N, P, Q AND S Dimensions</th>
<th>T</th>
<th>4&quot;</th>
<th>5&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot;-5½&quot;</td>
<td>2½&quot;</td>
<td>3½&quot;</td>
<td>2&quot;-13&quot;</td>
</tr>
<tr>
<td>ALTERNATE SIDEWALK BARRIERS AND SPILT MEDIAN BARRIERS 4&quot; (TYP.) INSIDE RAD. = 2&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot;-11½&quot;</td>
<td>4½&quot;</td>
<td>2½&quot;</td>
<td>4&quot;-9½&quot;</td>
</tr>
<tr>
<td>2&quot;-9½&quot;</td>
<td>4½&quot;</td>
<td>2½&quot;</td>
<td>4&quot;-9½&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REINFORCEMENT BAR NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. REINFORCEMENT BARS SPANNING ARE OUT TO OUT BARS.</td>
</tr>
<tr>
<td>2. SPANNING ALONG CURVED PORTIONS OF BAR ARE MEASURED ALONG THE OUTSIDE EDGE.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOTES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOR NOTES, SEE SHEET 1.</td>
</tr>
</tbody>
</table>
**REINFORCEMENT BAR NOTES**

1. REINFORCEMENT BAR DIMENSIONS ARE OUT TO OUT OF BAR.
2. DIMENSIONS ALONG CURVED PORTIONS OF BAR ARE MEASURED ALONG THE OUTSIDE EDGE.

**REINFORCEMENT DETAILS**

**SPLIT CONCRETE DIVISOR**

FOR DIMENSIONS A, B, C, D, E AND F, SEE TABLE 3

**NOTE:**

For notes, see sheet 1.

**TABLE 3**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A</td>
<td>15/16&quot;</td>
<td>1&quot;</td>
<td>3&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>4/8&quot;</td>
</tr>
<tr>
<td>Type B</td>
<td>15/16&quot;</td>
<td>1/4&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>4/8&quot;</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: WHERE SHOWN DIVISORS ARE USED, PROVIDE WIDTH AND A, B, C AND D DIMENSIONS

**CONCRETE DIVISOR**

FOR DIMENSIONS A, B, C, D, AND E, SEE TABLE 4

**TABLE 4**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A</td>
<td>15/16&quot;</td>
<td>10/16&quot;</td>
<td>1/2&quot;</td>
<td>3/16&quot;</td>
<td>1/2&quot;</td>
<td>3/16&quot;</td>
</tr>
<tr>
<td>Type B</td>
<td>20/16&quot;</td>
<td>3/4&quot;</td>
<td>5/8&quot;</td>
<td>1/4&quot;</td>
<td>3/16&quot;</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: WHERE SHOWN DIVISORS ARE USED, PROVIDE WIDTH AND A, B, AND C DIMENSIONS

**NOTE:**

For notes, see sheet 1.
**Location of Design Section for Negative Moment in Deck Slabs**

**Steel Beams**
- Provide minimum haunch thicknesses of 2" or greater anywhere across the width of the haunch.
- Check for any thicknesses specified in BC-752M.

**Composite Beams**
- Provide steel beam/girder haunch reinforcement details on the construction plans.

**Recommended Concrete Deck Slab Design & Details for Beam Bridges**

### Instructions for Detailing Haunch Reinforcement on Construction Plans

1. Detail haunch reinforcement on the reinforcement bar schedule.
2. Show haunch reinforcement details on the construction plans.
3. Show the limits of haunch reinforcement along the length of each beam, indicated on the plans or in the construction details.
4. Include the following notes on the plans:
   - **LOADING:** The limits shown on the plans are for loading conditions specified in BC-752M.
   - **HAUNCH:** Show the limits of haunch reinforcement as indicated in BC-752M.
   - **LONGITUDINAL BARS:** Maintain 2" min. between the rebar mats. Longitudinal bars can be staggered to avoid increase in deck slab thickness if necessary.
   - **TRANSVERSE BARS:** Provide when haunch thickness is 3" or greater anywhere across the width of the haunch or when SIP forms are not present and the haunch thickness is 3" or greater. Provide additional transverse bars shown on top, similar when longitudinal bars are shown on top.

### Notes:
- For notes, see Sheet 1.

### Table 1: Minimum Haunch Thicknesses

<table>
<thead>
<tr>
<th>Steel</th>
<th>Plan Camber</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 1/2&quot;</td>
<td>1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>Over 1/2&quot; to 3&quot;</td>
<td>3/4&quot;</td>
<td></td>
</tr>
<tr>
<td>Over 3&quot;</td>
<td>1&quot;</td>
<td></td>
</tr>
</tbody>
</table>

**Location of Design Section for Negative Moment in Deck Slabs**

**Steel Beams**
- Provide minimum haunch thicknesses of 2" or greater anywhere across the width of the haunch.
- Check for any thicknesses specified in BC-752M.

**Composite Beams**
- Provide steel beam/girder haunch reinforcement details on the construction plans.

**Recommended Concrete Deck Slab Design & Details for Beam Bridges**
### Table 1: Distance from Design Section for Negative Moment to Centerline of Beam

<table>
<thead>
<tr>
<th>Beam Type</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beam A</td>
<td>10'-5&quot;</td>
</tr>
<tr>
<td>Beam B</td>
<td>11'-9&quot;</td>
</tr>
<tr>
<td>Beam C</td>
<td>12'-5&quot;</td>
</tr>
</tbody>
</table>

### Table 2: Distance from Design Section for Negative Moment

<table>
<thead>
<tr>
<th>Beam Type</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beam A</td>
<td>10'-5&quot;</td>
</tr>
<tr>
<td>Beam B</td>
<td>11'-9&quot;</td>
</tr>
<tr>
<td>Beam C</td>
<td>12'-5&quot;</td>
</tr>
</tbody>
</table>

### Table 3: Distance from Design Section for Negative Moment

<table>
<thead>
<tr>
<th>Beam Type</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beam A</td>
<td>10'-5&quot;</td>
</tr>
<tr>
<td>Beam B</td>
<td>11'-9&quot;</td>
</tr>
<tr>
<td>Beam C</td>
<td>12'-5&quot;</td>
</tr>
</tbody>
</table>

### Table 4: Distance from Design Section for Negative Moment

<table>
<thead>
<tr>
<th>Beam Type</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beam A</td>
<td>10'-5&quot;</td>
</tr>
<tr>
<td>Beam B</td>
<td>11'-9&quot;</td>
</tr>
<tr>
<td>Beam C</td>
<td>12'-5&quot;</td>
</tr>
</tbody>
</table>

### Design Notes:

1. Beam spans are 36".
2. All splices shown are staggered.
3. Use moment section table and design section table to determine distances.
4. Beam spacing is 6'-0".
5. For other spans, see other tables.

### Definition of \( So \) (Overhang Length):

- These design tables are applicable to simple span superstructure projects only.

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
CONCRETE DECK SLAB
DESIGN & DETAILS
FOR BEAM BRIDGES

RECOMMENDED JULY 20, 2016
RECOMMENDED JULY 20, 2016
SHEET 9 OF 30
SUMMARY OF DESIGN AND CONSTRUCTION, SHEET 9 OF 30

BD-601M
TABLE 1: DISTANCE FROM DESIGN SECTION FOR NEGATIVE MOMENT
TO CENTROID OF BEAM ± 3/16

<table>
<thead>
<tr>
<th>S7</th>
<th>S6</th>
<th>S3</th>
<th>S2</th>
<th>L</th>
<th>T</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

USE FORM:
- PRECAST Prestressed Open Box Beam
- STEEL Liaisons with Top Flange Width ± 1/4

DESIGN NOTES:
1. **Total Slab Thickness** includes 1/8" external wearing surface.
2. **Overhang Length**, 5", see details on Sheet 3.
3. **Top Reinforcement** placed in the Tables where the maximum allowable.
4. **Notes**: See Sheet 26, 27, and 28 for additional limitations.
5. For other beams not listed under the heading of the Tables above, determine the distance from the design section for negative moment at the centroid of beam using the sections on Sheet 26, 27, and 28 for beams with 12", 24", and 36".

**TABLE 2:**

<table>
<thead>
<tr>
<th>S7</th>
<th>S6</th>
<th>S3</th>
<th>S2</th>
<th>L</th>
<th>T</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

USE FORM:
- PRECAST Prestressed Open Box Beam
- STEEL Liaisons with Top Flange Width ± 1/4

**DEFINITION OF **

**S0** COVERHANG LENGTH

*These design tables are for use in continuous span superstructure projects and may be used for simple span superstructure projects.*
**NOTES:**

1. PROVIDE MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH PUBLICATION 408.

2. SET ANCHOR BOLTS ACCURATELY BY THE TEMPLATE FURNISHED BY THE MANUFACTURER, TO THE CORRECT ELEVATION AND ALIGNMENT AND SECURELY BRACE AGAINST DISPLACEMENT BEFORE THE SURROUNDING CONCRETE IS PLACED. ANCHOR BOLT DIAMETER AS REQUIRED BY LIGHTING POLE MANUFACTURER. (FOR FUTURE LIGHTING PROVISIONS, SEE CHART ON THIS SHEET.)

3. SEAL CONDUIT AND PROTECT THREADS FOR FUTURE LIGHTING 1. PROVIDE MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH PUBLICATION 408.

4. CONFORM ANCHOR MATERIALS TO 1101.4 PUB.408, ANCHOR ANGLES PERMITTED TO BE CALCULATED.

5. PROVIDE 2" CLEAR ON ALL REINFORCEMENT UNLESS NOTED.

6. SET LIGHTING POLES TRULY VERTICAL WITH BASES LEVEL USING LEVELING NUTS.

7. PROVIDE 2" CLEAR ON ALL REINFORCEMENT UNLESS NOTED.

8. FOR GEOMETRIC AND REINFORCEMENT DETAILS OF THE BARRIER SUPPORT DETAIL. LIGHTING POLE SUPPORT, IF NEEDED, TO BE DESIGNED BY THE ENGINEER TO DISTRIBUTE LOAD TO BOTH FASCIA AND FIRST INTERIOR BEAM.

9. PROVIDE A MINIMUM OF 2½" CONCRETE COVER UNLESS NOTED.

10. FOR LIGHTING POLE LOCATIONS WITHIN A SPAN, THE LUMINARE DEFORMATION MUST BE EVALUATED FOR DYNAMIC EFFECTS.

---

**REINFORCEMENT DETAILS**

**REINFORCEMENT BAR NOTES**

1. Dimensions along curved portions of bar are measured along the outside edge.

2. Set anchor bolts accurately by the template furnished by the manufacturer, to the correct elevation and alignment and securely brace against displacement before the surrounding concrete is placed. Anchor bolt diameter as required by lighting pole manufacturer. (For future lighting provisions, see chart on this sheet.)

3. Seal conduit and protect threads for future lighting 1. Provide materials and workmanship in accordance with publication 408.

4. Conform anchor materials to 1101.4 pub. 408, anchor angles permitted to be calculated.

5. Provide a minimum of 2½" concrete cover unless noted.


7. For geometric and reinforcement details of the barrier support detail. Lighting pole support, if needed, to be designed by the engineer to distribute load to both fascia and first interior beam.

8. Provide 2" clear on all reinforcement unless noted.

9. Provide a minimum of 2½" concrete cover unless noted.

10. For lighting pole locations within a span, the luminaire deflection must be evaluated for dynamic effects.

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**COMMONWEALTH OF PENNSYLVANIA**

**DEPARTMENT OF TRANSPORTATION**

**BUREAU OF PROJECT DELIVERY**

**STANDARD**

**CONCRETE DECK SLAB**

**LIGHTING POLE ANCHORAGE DETAILS FOR BEAM BRIDGES**

**REINFORCEMENT TABLE**

<table>
<thead>
<tr>
<th>MARK</th>
<th>SIZE</th>
<th>LENGTH</th>
<th>DIAMETER</th>
<th>NUMBER TYPE</th>
<th>TOTAL LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>404</td>
<td>6</td>
<td>2'-0&quot;</td>
<td>3/8&quot;</td>
<td>6</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>406</td>
<td>6</td>
<td>2'-0&quot;</td>
<td>3/8&quot;</td>
<td>6</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>501</td>
<td>6</td>
<td>3'-0&quot;</td>
<td>3/8&quot;</td>
<td>5</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>502</td>
<td>6</td>
<td>3'-0&quot;</td>
<td>3/8&quot;</td>
<td>6</td>
<td>3'-0&quot;</td>
</tr>
</tbody>
</table>

---

**PROVISIONS FOR FUTURE LIGHTING**

- **MINIMUM HEIGHT:** 10'
- **MINIMUM DIAMETER:** 6"