#4 bars to terminate 1'-3" above the top of the bottom slab or 2'-9" below beam notch, whichever is less. #5 bars to terminate to provide 2" min. cover to beam face or 1'-0" below beam notch, whichever is less.

**GENERAL NOTES**

1. **DESIGN**
   - All drawings are considered complete and final.
   - Dimensions are in feet and inches. Increments are in sixteens. Tolerances are in inches. Dimension and title block specific to this sheet.
   - Nails, bolts, and other standard fasteners are not shown. All details are dimensioned.
   - Flange widths and lengths are not used for design calculations. Location and directional limit details are shown.

2. **CONTENT**
   - Notations are shown to clarify details for construction.
   - All notes are intended for the benefit of the contractor. Design and specification are shown for clarity.
   - All details are typical unless otherwise noted on the drawing.

3. **REFERENCES**
   - All details are referenced to the appropriate drawing. No cross-references are necessary.
   - All details are checked and approved by the Bureau of Project Delivery.

4. **REMARKS**
   - All details are checked and approved by the Bureau of Project Delivery.
   - All details are considered complete and final.

5. **DRAWN BY**
   - All details are checked and approved by the Bureau of Project Delivery.

6. **REVISIONS**
   - All details are checked and approved by the Bureau of Project Delivery.
   - All details are considered complete and final.
End Block Reinforcement

Adjacent Box Beam Notes:
1. For alternate end block reinforcement detail, see Sheet 6.
2. #4 Bars, A1, with 21" maximum spacing are shown as interface shear reinforcement. If the design requires a greater shear reinforcement, #5 with 21" maximum spacing may be used, indicating the appropriate minimum lap splice length.
3. Omit shear key on the fascia side of beams.
4. For typical corner blockout detail, see BC-775M.
5. If the 3" spacing of the stirrups at the end of the beam is required to go beyond that shown in the adjacent box beam, a greater shear reinforcement, #5 with a 21" maximum spacing may be used, indicating the appropriate minimum lap splice length.

Legends:
1. SHEAR KEY (TYP.)
2. SHEAR KEY (OMIT ON FASCIA SIDE)
3. END BLOCK REINFORCEMENT
4. #4, A1 (TYP.)
5. #4, A2
6. #4, A3
7. #4 (A2 & A3)
8. #4 (A1 pairs & A3)

1. Minimum lap splice length. Spacing bars may be used indicating the appropriate interface shear reinforcement. If the design requires a greater shear reinforcement, #5 with 21" maximum spacing may be used, indicating the appropriate minimum lap splice length.

Commonwealth of Pennsylvania Department of Transportation Bureau of Project Delivery

Recommended: Aug. 30, 2019

Acting Chief Bridge Engineer
TYPICAL STRAND CONFINEMENT
ALL BEAMS

STRAND CONFINEMENT NOTES:
1. FOR LIMITS OF STRAND CONFINEMENT REINFORCEMENT, REFER TO DESIGN MANUAL, PART 4, D5.10.10.2.
2. DO NOT PLACEMENT MORE THAN ONE COLUMN OF PRESTRESSING STRANDS IN THE WEB.
3. T1 IS DAP THICKNESS AT END OF BEAM FOR HIGHER CONFINEMENT IN BEAM SEAT AND BOTTOM OF BEAM (WITHOUT BEARING). 1.5" MINIMUM IS RECOMMENDED.
4. BEAM SEAT AND BOTTOM OF BEAM BEARING AREA REQUIREMENTS AS PER DESIGN MANUAL PART 4, SECTION 14.7.6.3.9d.)
5. MAXIMUM GRADE FOR USE OF DAPPING IS BASED ON LIMITING THE MAXIMUM DAP THICKNESS TO 1/16" AND MAINTAINING A MINIMUM CLEARANCE OF 1/4" FOR DRIP NOTCH DETAILS, SEE BC-775M.
6. FOR BEAM DAPPING, A MINIMUM CLEARANCE OF 1/4" MUST BE PROVIDED BETWEEN THE BOTTOM OF THE BEAM (WITHOUT BEARING) AND THE TOP OF BEAM SEAT TO ENSURE INSPECTABILITY OF BEARING PAD.
7. PARTIAL-WIDTH BEAM DAPS ARE NOT PERMITTED.
8. THE MAXIMUM DAP THICKNESS IS 1/8".
9. ENSURE THAT ALL CONCRETE COVER REQUIREMENTS OF STEEL CONFINEMENT REINFORCEMENT IS SATISFIED WHEN USING BEAM DAPS TO MODIFY THE BOTTOM OF CONFINEMENT REINFORCEMENT AND PRESTRESSING STRANDS ARE BOUND TO MEET THE PROPOSED CONCRETE COVER.
10. WHEN BEAM DAPS ARE USED AND THE BEAM (AND BEARING PAD) IS ON THE SKEW, THE BEAM SEAT MUST SLOPE TO THE SLOPE OF THE BEAM DUE TO THE GRADE AND CAMBER.

BEAM DAP NOTES:
1. T1 IS DAP THICKNESS AT END OF BEAM FOR HIGHER CONFINEMENT IN THE PROPOSED BEAM DAPPING AREA.
2. T2 IS DAP THICKNESS AT CENTERLINE OF BEARING.
3. T3 IS DEFINED AS THE DAP THICKNESS BASED ON THE SLOPE OF THE BEAM DUE TO THE GRADE AND CAMBER.
4. MAXIMUM GRADE FOR USE OF DAPPING IS BASED ON LIMITING THE MAXIMUM DAP THICKNESS TO 1/16" AND MAINTAINING A MINIMUM CLEARANCE OF 1/4" FOR DRIP NOTCH UNDER LOCATION ONLY (AVOID PLACING DRIP NOTCH.
5. ENSURE THAT ALL CONCRETE COVER REQUIREMENTS OF STEEL CONFINEMENT REINFORCEMENT IN THE PROPOSED BEAM DAPPING AREA.

STANDARD BOX BEAM REINFORCEMENT DETAILS
STRAND PATTERN AND BEAM DAP

**BOX BEAM DAP DESIGN PARAMETERS**

<table>
<thead>
<tr>
<th>MAXIMUM DAP Thickness (in)</th>
<th>Diameter of Strands (in)</th>
<th>Spacing (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8</td>
<td>#4</td>
<td>3</td>
</tr>
<tr>
<td>3/16</td>
<td>5/16</td>
<td>3</td>
</tr>
<tr>
<td>1/4</td>
<td>7/16</td>
<td>3</td>
</tr>
</tbody>
</table>

*USE BEVELED SOLE PLATE, SEE BC-755M.*
STANDARD BD-661M
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

OVERHANG LIMITED
ADJACENT BOX BEAMS
SUPPORTING BARRIER

CONCRETE DECK
INCREASE THICKNESS AS REQUIRED TO PROVIDE MINIMUM REQUIRED COVER (RAKED FINISH)
& V-NOTCH CONSTR. JT.

LEGEND
1. FOR BEAM DIMENSIONS AND BEAM REINFORCEMENT, SEE SHEET 2.

36" & 48" COMPOSITE ADJACENT BOX BEAMS SUPPORTING BARRIER
NOTES:
- TYPICAL BARRIER SHOWN. ALTERNATE BARRIER AND CURB ARE SIMILAR.
- OR/1/4" ABOVE BOTTOM SLAB THICKNESS OF BEAM

REINFORCEMENT DETAIL FOR BARRIERS WITH TYPICAL SIDEWALK

NOTES:
1. FOR GEOMETRIC AND REINFORCEMENT DETAILS OF THE BRIDGE BARRIERS NOT SHOWN, SEE BC-788M.
2. FOR WATERPROOFING DETAIL AT SHEAR LEGS OF THE BARRIER BAR TO BE EMBEDDED ENTIRELY WITHIN ONE BEAM.
3. USE ONLY WHEN ROADWAY AND SIDEWALK WIDTHS PERMIT THE HORIZONTAL SPACING SHOWN.

ADJACENT BOX BEAM SUPPORTING BARRIER/SIDEWALK NOTES:
1. FOR BAR DIMENSIONS AND BARRIER/SIDEWALK, SEE SHEET 2.
2. REINFORCEMENT BARS PROVIDING FROM THE BOX BEAM TO THE BARRIER MUST RESIDE IN ONE BEAM.
3. REINFORCEMENT BAR DIMENSIONS ARE OUT TO OUT OF BAR.
4. EXAMPLE USING COVER PORTIONS OF BARRIERS ARE MEASURED ALONG創出的 KIN.
5. ALL REINFORCEMENT SHOULD BE EPOXY COATED IN ACCORDANCE WITH PUBLICATION 408, SECTION 709.

STANDARD BOX BEAM REINFORCEMENT DETAILS
ADJACENT BOX BEAM

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

ACTING CHIEF BRIDGE ENGINEER

M. I N.

M. I N.

M. I N.
1. FOR DIMENSIONS AND BEAM REINFORCEMENT, SEE SHEET 2.

2. DIMENSIONS ALONG CURVED PORTIONS OF BAR ARE OUT TO OUT OF BAR.

3. ALL REINFORCEMENT SHOULD BE EPOXY COATED IN ACCORDANCE WITH PUBLICATION 408, SECTION 709.

4. FOR REINFORCEMENT BAR DETAILS OF THE SIDEWALK BARRIER, SEE BD-601M.

5. FOR OVERHANGS 1" MIN. FOR SIDEWALKS, PROVIDE 1" CLR.

6. FOR BRIDGES MADE CONTINUOUS FOR LIVE LOAD PER DM-4 DC5.12.3.3.8.


8. PROVIDE 1" CLR. FOR OVERHANGS 1" MIN.

9. ACTING CHIEF BRIDGE ENGINEER

AUG. 30, 2019

ACT. DIR., BUR. OF PROJECT DELIVERY

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
BOX BEAM REINFORCEMENT DETAILS
ADJACENT BOX BEAM

1. REINFORCEMENT BAR DIMENSIONS ARE OUT TO OUT OF BAR.
2. DIMENSIONS ALONG CURVED PORTIONS OF BAR ARE DETERMINED ALONG THE OUTSIDE EDGE.
3. ALL REINFORCEMENT SHOULD BE EPOXY COATED IN ACCORDANCE WITH PUBLICATION 408; SECTION 709.

ALTERNATE SIDEWALK
REINFORCEMENT DETAIL
PLAN - SPREAD BOX BEAM REINFORCEMENT

SPREAD BOX BEAM WITH BEAM NOTCH

SPREAD BOX BEAM WITHOUT BEAM NOTCH

END BLOCK REINFORCEMENT

VIEW E-E

VIEW F-F

END ELEVATION WITH BEAM NOTCH

END ELEVATION WITHOUT BEAM NOTCH

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD BOX BEAM REINFORCEMENT DETAILS

SPREAD BOX BEAM

RECOMMENDED AUG. 30, 2019
RECOMMENDED AUG. 30, 2019
SHEET 6 OF 8
BD-661M

SPREAD BOX BEAM NOTES:
1. SEE THIS SHEET FOR ALTERNATE END BLOCK REINFORCEMENT DETAIL.
2. #4 BARS, A1, WITH 21" MAXIMUM SPACING ARE SHOWN AS INTERFACED BEAM REINFORCEMENT. IF THE DESIGN REQUIRES A CONNECTED BEAM REINFORCEMENT, #4 WITH A 23" MAXIMUM SPACING MAY BE USED INDICATING THE APPROPRIATE MINIMUM LAP SPLICE LENGTH.
3. FOR TYPICAL CORNER BLOCKOUT DETAIL: SEE RC-710S.
4. IF THE 3" SPACING OF THE STIRRUPS AT THE END OF THE BEAM IS REQUIRED TO GO BEYOND THAT SHOWN IN THE END BLOCK REINFORCEMENT DETAIL TO SATISFY THE SPLITTING RESISTANCE REQUIREMENT IN DM-4 D5.10.10.1, ALTERNATE A1 AND A2 WITH A3 TO THE END OF THE 3" SPACING.
5. FOR LEGEND NOTES: 1, 2, 3, 4, 5, 6, 7, AND 8 SEE LEGEND ON SHEETS 1 AND 2.

SPREAD BOX BEAM SECTION
PLANK BEAM (COMPOSITE)

PLAN - 12" DEEP PLANK BEAM

TYPICAL STRAND PATTERN

PLAN BEAM NOTE:
1. IF THE 3" SPACING OF THE STIRRUPS AT THE END OF THE BEAM IS REQUIRED TO BE MORE THAN SHOWN TO SATISFY THE SPLINTER RESISTANCE REQUIREMENT IN DM-4 20.10.10.1, CONTINUE THE 3" STIRRUP SPACING.

PLANK BEAM

MIN. LAP (FASCIA SIDE) (Omit on Fascia Side)

SHEAR KEY (TYP) (COMPOSITE)

VIEW J-J

VIEW H-H

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
BOX BEAM REINFORCEMENT DETAILS
PLANK BEAM

ACT. DIR., BUR. OF PROJECT DELIVERY
AUG. 30, 2019

ACTING CHIEF BRIDGE ENGINEER
TABLE A
BEAM NOTCH DEPTHS FOR COMPOSITE ADJACENT BOX BEAMS

<table>
<thead>
<tr>
<th>APPROACH SLAB TYPE</th>
<th>BACKWALL</th>
<th>BEAM NOTCH DEPTH</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>4&quot; For 17&quot; beam depth</td>
<td>6&quot; For beam depth &gt; 17&quot;</td>
<td>SEE NOTE 1</td>
</tr>
<tr>
<td>NO</td>
<td>6&quot; For beam depth &gt; 24&quot;</td>
<td>135° For beam depth 27&quot; and greater</td>
<td>SEE NOTE 2</td>
</tr>
</tbody>
</table>

TABLE B
BEAM NOTCH DEPTHS FOR SPREAD BOX BEAMS

<table>
<thead>
<tr>
<th>APPROACH SLAB TYPE</th>
<th>BACKWALL</th>
<th>BEAM NOTCH DEPTH</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>4&quot; For 17&quot; beam depth</td>
<td>6&quot; For beam depth &gt; 17&quot;</td>
<td>SEE NOTE 1</td>
</tr>
<tr>
<td>NO</td>
<td>6&quot; For beam depth &gt; 24&quot;</td>
<td>135° For beam depth 27&quot; and greater</td>
<td>SEE NOTE 2</td>
</tr>
</tbody>
</table>

BEAM NOTCH NOTES:
1. REFER TO BD-628M FOR APPROACH SLAB DETAILS.
2. SUPPORT APPROACH SLAB ON ABUTMENT FOR 17", 21", 24" And 27" DEEP BEAMS.
3. SUPPORT APPROACH SLAB ON ABUTMENT FOR 17", 21", 24" And 27" DEEP BEAMS.
4. BACKWALL PLACED UNDER APPROACH SLAB.
5. TYPE 3 AND 4 APPROACH SLABS ARE NOT PERMITTED FOR BEAM DEPTHS LESS THAN 33".
6. PROVIDE APPROACH SLAB IN ACCORDANCE WITH RC-23M FOR BEAM DEPTHS.
7. OMIT BEAM NOTCH FOR PLANK BEAMS AND PIER ENDS FOR BEAMS MADE CONTINUOUS.
8. BEAM NOTCH MAY BE OMITTED WHEN PAVING NOTCH IS NOT REQUIRED.
9. ADJUST BEAM NOTCHES AS REQUIRED TO ACCOMMODATE EXPANSION DAMS.