TYPICAL HEADWALL ELEVATION - FLARED SAFETY WING

NOTE: HOLES ON BARS EXTENDING BEYOND BARRIER TRANSITION INTO THE COLLAR MAY BE TURNED IN ANY DIRECTION.

TYPICAL HEADWALL ELEVATION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
R.C. BOX CULVERT
CAST-IN-PLACE

NOTE: FOR TYPICAL WING DETAILS SEE SHEET 5.

TYPICAL CULVERT HEADWALL DETAILS

Legend:
- $\theta$: Skew Angle
- $\phi_1$: 30° for $\theta \leq 45°$
- $\phi_2$: 30° for $\theta > 45°$
- $\phi_3$: 30° for $\theta > 45°$

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
R.C. BOX CULVERT
CAST-IN-PLACE

NOTE: HOOKS ON BARS EXTENDING FROM BARRIER TRANSITION INTO THE COLLAR MAY BE TURNED IN ANY DIRECTION.
1. Provide grade 60 deformed reinforcing bars that meet the requirements of ASTM A 416, a box or a torsion deformed reinforcing steel, do not use flat steel. Select bars in accordance with the requirements of AASHTO LRFD, Part 4, Structures.
2. Use epoxy coated reinforcing and epoxy or galvanized reinforcing and fabric in the following conditions:
   - In the cast-in-place deck and sidewalks if a peak is used.
   - In the top slab and side railings of grates in 8’-0” by either a cast in place deck or is not used.
   - Throughout the culvert when stippled clay liner plates are used.
3. If epoxy coated reinforcing is used it must meet the requirements of ASTM A 444, Type 1, Class A.
4. Refer to specifications installed and design specification as outlined in the design manual, Part 4, Structures.
5. Provide materials and workmanship in accordance with the appropriate specifications as outlined in the design manual, Part 4, Structures.
6. Do not leak-inclination of 3.5 P.S.F. for future bearing surface for bodies of water.
7. Provide minimum lap and embedment length of reinforcement in accordance with LRFD specifications. See BC-798M.
8. Provide all concrete covers on reinforcement bars except as noted in instructions below.
10. For low flow fish passage design refer to design manual, Part 3, and see sheets 10, 11, and 12.
11. Indicate allowable and maximum foundation pressure on plans.
12. Place and maintain reinforcement in plain depth of 2’-0”, minimum, which ever is greater.
13. Provide 2’-0” min. rebar of reinforcing minimum at the end of anchor bolt and when anchor bolt is at 4’-0” or below. Part 4, Structures.
14. Use 5’-0” furnished welds at every other segment placed at a minimum 1’-0” above the grating rail. Where plain, welds for. Traction elements, the permissible location way from the grating rail, which ever is greater. Do not cut rebar reinforcement. Additional weld reinforcement will be required if the weld is not made. Do not cut or weld reinforcement, which ever is greater. Do not apply weld reinforcement to the weld reinforcement to the weld reinforcement.
STANDARD R.C. BOX CULVERT

FOR DETAILS SEE NOTE 19, SHEET 1.

RECOMMENDED LOCATIONS (TYP.)

THREADED INSERTS AND #5 @ 9"

#6 (TYP.)

2-#3 (TYP.)

#4 EQ. SP.

3" 6"

4" CLR.

6"

8" END BAFFLE

IF REQ'D.

BUREAU OF PROJECT DELIVERY

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF TRANSPORTATION

BUREAU OF PROJECT DELIVERY

STANDARD

R.C. BOX CULVERT

PRECAST

RECOMMENDED AUG. 30, 2019

RECOMMENDED AUG. 30, 2019

BD-632M

SHEET 5 OF 15

ACTING CHIEF BRIDGE ENGINEER

ACT. DIR., BUR. OF PROJECT DELIVERY

PREFORMED DRAIN DETAIL

PREFORMED DRAIN

WEEP HOLE

NOTE 11, SHEET 1

VARIES, SEE SHEET 4 FOR DETAILS.

5" MIN. FOR T > 15"

3" MIN. FOR T < 15"

NOTE: DESIGN TO MODIFY AMOUNT OF COMPACTED NO. 2A COARSE AGGREGATE OR FLOWABLE BACKFILL TO PROVIDE ADEQUATE PROTECTION AGAINST PIPING OF STREAM BEDDING AT INLET END OF CULVERT.

NOTE: POST TENSION BOTTOM SLAB OF END SECTION PRIOR TO INSTALLATION OF CUTTER WALL.

SEE NOTE 12, SHT. 1.

NOTE: POST TENSION BOTTOM SLAB OF END SECTION PRIOR TO INSTALLATION OF CUTTER WALL.

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.

8" END BAFFLE

FOR #5 REINF. BAR, EACH 2-THREADED INSERTS

#5 @ 9"

2" CL.

FOR #5 REINF. BAR @ 9"

2'-0" MAX.

1'-6"

#6 6"

6" END BAFFLE

IF REQ'D.
ALTERNATIVE CUTOFF WALL WITH GROUTED ROCK

FILL TOP 6" OF ROCK WITH NATURAL STREAMBED MATERIAL
CONCRETE 6" BELOW STREAMBED TO BOTTOM OF ROCK.
VOIDS IN ROCK WITH VIBRATED CLASS A CEMENT
PRECAST LINING WHICHEVER IS DEEPER (3'-6" MIN.).

DETAIL A (WITHOUT APRON)
ALTERNATIVE CUTOFF WALL WITH GROUTED ROCK

DETAIL B (WITH APRON)

CELLULOSE INSULATION

NOTE: SEE DETAIL B THIS SHEET.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
R.C. BOX CULVERT
PRECAST

PRECAST CULVERT WITH CAST-IN-PLACE WINGWALLS

PLAN
COLLAR OR BARRIER CURB NOT SHOWN

SECTION Q-Q

COMMONWEALTH OF PENNSYLVANIA
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PRECAST CULVERT WITH CAST-IN-PLACE WINGWALLS

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PRECAST CULVERT WITH CAST-IN-PLACE WINGWALLS

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BUREAU OF PROJECT DELIVERY

STANDARD
R.C. BOX CULVERT
PRECAST

PRECAST CULVERT WITH CAST-IN-PLACE WINGWALLS

PLAN
COLLAR OR BARRIER CURB NOT SHOWN

SECTION Q-Q
General Notes:
1. Every cast-in-place segment must be post-tensioned as per R.C. Box Culvert Design.
2. Reinforcement shall be in accordance with the design and spacing as per the design.
3. Wire reinforcement can be adjusted to accommodate restraints. Do not cut reinforcement.
4. Cast-in-place concrete is permitted in any portion of the precast end sections, only if weight or size of end sections are restricted due to shipping restraints.

Post-Tensioning Notes:
1. Extend bottom row of post-tensioning strands through the bottom slab of precast concrete inlet and outlet end sections.
2. Box segments and end sections are post-tensioned in stages. The contraction is requisitioned to submit a plan for post-tensioning sequence to the Department for approval prior to setting any segments.
3. Post-tensioning end sections first, then proceed.
4. Mechanical splinters on bottom strands to connect with the penetrable end sections and post-tension bottom strands through the end sections.
5. Straps on sides of end section as shown on BC-798.
6. Provide full contact of the joint sealing material around the entire joint between the inlet and outlet end sections.
7. Post-tensioning is approved, cut strands to provide a minimum of 2 inches from outside face of concrete and coat recess with epoxy bonding compound and fill with non-shrink grout.
8. The number of post-tensioning strands may be increased and their locations may be adjusted by the manufacturer.
9. Precast concrete segment lengths to be determined by the manufacturer.
10. Spacing, spacing and post-tension force to be shown on fabricator's shop drawing.
11. See BC-798 for additional post-tensioning notes.

Post-Tension End Section

Span > 12 Feet

Post-Tension End Section

Span ≤ 12 Feet

Typ. Box End Section

Showing Strand Locations

Commonwealth of Pennsylvania
Department of Transportation
Bureau of Project Delivery

Standard
R.C. Box Culvert
PreCast
Post-Tensioned End Sections

Recommended: Aug. 30, 2019
Recommended: Aug. 30, 2019

Sheet 7 of 15
BD-632M
**ALTERNATE BAFFLE DETAIL**

- **Typical Baffle**: Precast reinforcement shown. Cast-in-place reinforcement similar except as noted in this standard.

**Stream Grades**: 4%

**Design Notes**:
- Typical baffle spacing and openings should be based on the average normal stream width and direction of the structure. Where the channel is skewed relative to the structure, the first set of opposing baffles should be set at least 1/3 the average normal width of the stream.
- Additional twin cell details are shown on Sheet 12.
- Baffles may be skewed relative to the direction of flow in order to be parallel to the section ends.
- Wingwall footings or rock lining whichever is deeper should connect to the wingwalls at each side of the culvert.
- The first interior baffles should connect to the wingwalls at each side of the culvert. The first set of opposing baffles are required to be set at the distance from the end baffles to the face of the wingwall.

**Stream Bed and Apron**: Streambed elevation should be calculated accordingly from that point to the inlet.

**Design Guidance During Preliminary Design**: Additional twin cell details are shown on Sheet 12.

**Notes**:
- Additional twin cell details are shown on Sheet 12.
- Baffles may be skewed relative to the direction of flow in order to be parallel to the section ends.
PLAN VIEW

2" CLR. (TYP.)

CELL

AUG. 30, 2019

ACTING CHIEF BRIDGE ENGINEER

ACT. DIR., BUR. OF PROJECT DELIVERY

BD-632M

SIMILAR EXCEPT AS NOTED ON THIS STANDARD.

PRECAST REINFORCEMENT SHOWN, CAST-IN-PLACE REINFORCEMENT RECOMMENDED

SHEET 11 OF 15

CAST-IN-PLACE BOX CULVERT

STREAM GRADES 4%

2-#5

1'-0"

MISCELLANEOUS DETAILS

TIP. RC. BOX CULVERT

Bureau of Project Delivery

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF TRANSPORTATION

RECOMMENDED REC. 2011

STANDARD

R.C. BOX CULVERT

MISCELLANEOUS DETAILS

STREAM GRADES > 4%

APRON BAFFLE OPENING DETAIL

APRON BAFFLE TYPICAL TO INTERIOR BALE. SEE DETAILS ON SHEET 12.

APRON BAFFLE OPENING DETAIL

APRON BAFFLE TYPICAL TO INTERIOR BALE. SEE DETAILS ON SHEET 12.

APRON BAFFLE OPENING DETAIL

APRON BAFFLE TYPICAL TO INTERIOR BALE. SEE DETAILS ON SHEET 12.

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APRON BAFFLE OPENING DETAIL

APRON BAFFLE TYPICAL TO INTERIOR BALE. SEE DETAILS ON SHEET 12.
**STANDARD BD-632M**

**COMMONWEALTH OF PENNSYLVANIA**

**DEPARTMENT OF TRANSPORTATION**

**ALL STREAM GRADES**

3 - #5 @ 4" 6" @ 6" "TYP." (AS REQ'D.)

**CONCRETE PLUG**

**BOX CULVERT**

**PRELIMINARY DESIGN.**

FISH AND BOAT COMMISSION MUST PROVIDE SPECIFIC DESIGN GUIDANCE DURING PROFESSIONAL DESIGN.

WILL NOT ADEQUATELY ACCOMMODATE FISH PASSAGE. IN THESE CASES, THE PENNSYLVANIA FISH AND BOAT COMMISSION MUST PROVIDE SPECIFIC DESIGN GUIDANCE DURING PROFESSIONAL DESIGN.

**NOTE:**

There may be unusual circumstances in which the standard layout for supplies will not adequately accommodate fish passage. In these cases, the Pennsylvania Fish and Boat Commission must provide specific design guidance during preliminary design.

**R.C. BOX CULVERT**

**MISCELLANEOUS TWIN CELL DETAILS**

**CAST-IN-PLACE BOX CULVERT**

**TYPICAL WEIR DETAIL**

**ALL STREAM GRADES**

**SYMMETRICAL**

**TYP. PRECAST SECTION (NORMAL)**

**UNSYMMETRICAL - OPTION TO WEIR**

**TYP. PRECAST SECTION (NORMAL)**

**SECTION N-N**

CONCRETE PLUG

**R.C. BOX CULVERT**

**ALTERNATE WEIR DETAIL**

**TYP. PRECAST SECTION (NORMAL)**

**PRECAST BOX CULVERT**

**TYPICAL WEIR DETAIL**

**ALL STREAM GRADES**

**SYMMETRICAL**

**PRECAST BOX CULVERT**

**TYPICAL WEIR DETAIL**

**ALL STREAM GRADES**

**SYMMETRICAL**

**NOTE:**

Threaded inserts may be used as an alternate to similar except as noted on this standard.

**BUREAU OF PROJECT DELIVERY**

**ACT. DIR., BUR. OF PROJECT DELIVERY**

**AUG. 30, 2019**

**SUCCESS**

**COMMONWEALTH OF PENNSYLVANIA**

**DEPARTMENT OF TRANSPORTATION**

**BUREAU OF PROJECT DELIVERY**

**STANDARD**

**R.C. BOX CULVERT**

**MISCELLANEOUS TWIN CELL DETAILS**

**ACTING CHIEF BRIDGE ENGINEER**

**SHEET 12 OF 15**

**BD-632M**
OPPOSING BAFFLES LESS THAN 1'-0"

OPPOSING BAFFLES LESS THAN 2'-0"

TWIN CELL BOX CULVERTS

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

R.C. BOX CULVERT WITHOUT APRONS
MISCELLANEOUS DETAILS

STANDARD

STREAM GRADES ≤ 4%

DESIGN NOTES


2. THE OPENING IN THE INTERIOR BAFFLES SHOULD BE A DISTANCE EQUAL TO THE AVERAGE NORMAL WIDTH OF THE STREAM.

3. THE OPENING IN THE INTERIOR BAFFLES SHOULD BE A DISTANCE EQUAL TO THE AVERAGE NORMAL WIDTH OF THE STREAM.

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9. THE OPENING IN THE INTERIOR BAFFLES SHOULD BE A DISTANCE EQUAL TO THE AVERAGE NORMAL WIDTH OF THE STREAM.

10. THE OPENING IN THE INTERIOR BAFFLES SHOULD BE A DISTANCE EQUAL TO THE AVERAGE NORMAL WIDTH OF THE STREAM.

11. THE OPENING IN THE INTERIOR BAFFLES SHOULD BE A DISTANCE EQUAL TO THE AVERAGE NORMAL WIDTH OF THE STREAM.

MISCELLANEOUS DETAILS

1. PRECAST REINFORCEMENT SHOWN, "8" X "8" LENGTHS "1'-6" ALTERNATING "#5 90° HOOK BARS, ROTATE "8" LONG "#5 BARS TIED TO ALTERNATING "#5 U-BAR"

2. FOR OPPOSING BAFFLES LESS THAN 1'-0", CAST U-BAR INSERTS "2'-0" ON NOTES FOR "5'-0" ELEVATION.

3. FOR OPPOSING BAFFLES LESS THAN 2'-0", USE "1'-0" ALTERNATING "#5 90° HOOK BARS, ROTATE "8" LONG "#5 BARS TIED TO ALTERNATING "#5 U-BAR"

OPPOSING BAFFLE NOTES


2. FOR OPPOSING BAFFLES LESS THAN 1'-0", CAST U-BAR INSERTS "2'-0" ON NOTES FOR "5'-0" ELEVATION.

3. FOR OPPOSING BAFFLES LESS THAN 2'-0", USE "1'-0" ALTERNATING "#5 90° HOOK BARS, ROTATE "8" LONG "#5 BARS TIED TO ALTERNATING "#5 U-BAR"

OPPOSING BAFFLES LESS THAN 1'-0"

OPPOSING BAFFLES LESS THAN 2'-0"

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

R.C. BOX CULVERT WITHOUT APRONS
MISCELLANEOUS DETAILS

STANDARD

STREAM GRADES ≤ 4%

DESIGN NOTES


2. FOR OPPOSING BAFFLES LESS THAN 1'-0", CAST U-BAR INSERTS "2'-0" ON NOTES FOR "5'-0" ELEVATION.

3. FOR OPPOSING BAFFLES LESS THAN 2'-0", USE "1'-0" ALTERNATING "#5 90° HOOK BARS, ROTATE "8" LONG "#5 BARS TIED TO ALTERNATING "#5 U-BAR"

OPPOSING BAFFLE NOTES


2. FOR OPPOSING BAFFLES LESS THAN 1'-0", CAST U-BAR INSERTS "2'-0" ON NOTES FOR "5'-0" ELEVATION.

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OPPOSING BAFFLES LESS THAN 1'-0"

OPPOSING BAFFLES LESS THAN 2'-0"
**DESIGN INSTRUCTIONS:**

**SKewed Joint Option**

### Culvert Skew 2 75°
- Wall faces top slab faces and bottom faces along the joint are skewed with culvert skew angle.

### Culvert Skew < 75°
- Wall faces top slab faces and bottom faces along the joint are skewed with culvert skew angle.

### Culvert Skew > 75°
- Wall faces top slab faces and bottom faces along the joint are skewed with culvert skew angle.

**Squared Joint Option**

- Wall faces, top slab faces, and bottom faces along the joint are skewed with culvert skew angle.

**Commonwealth of Pennsylvania Department of Transportation**

**Recommended by:**

**ACT. DIR., BUR. OF PROJECT DELIVERY**

**AUG. 30, 2019**

**Box Culvert (Steel Form) - Minimum Skew Angle**

- Wall sizes 8 ft. and 10 ft.

### Design Example:

- **CULVERT**
  - **WALL**
    - **1-WALL**
    - **5-WALL** (STEEL WOOD)

**Intermediate Segment (Typ.)**

**End Segment (Typ.)**

**Skew Angle**

- **Skew Angle < 75°**
- **Skew Angle > 75°**

### Design Instructions:

**Box Culvert (Steel Form) - Minimum Skew Angle**

- **Wall sizes** 8 ft. and 10 ft.

**COMMONWEALTH OF PENNSYLVANIA**

**DEPARTMENT OF TRANSPORTATION**

**STANDARD**

**R.C. BOX CULVERT**

**PRECAST CONCRETE SEGMENT JOINT DETAILS**

**Recommended by:**

**BD-632M**

**e-Notification No. 75, dated April 29, 2020**
DESIGN NOTES:
1. The layout of the concrete slope transitions should be based on the required grading around the wing walls.
2. Construct concrete slope transitions using Class A cement concrete.
3. Use this detail in coordination with DIP and PAFBC during pre-app meeting.

SECTION Q-Q
- Normal Stream Width
- #5 Tie Bar Detail
- Bend Line

SECTION R-R
- Typical Plan
- Normal Stream Width

PRECAST BOX CULVERT WITH APRONS
C.I.P. CONCRETE WEDGE TRANSITION (TYP.)

#5 Tie Bar Detail
- #5 Tie Bar Detail
- 4" Thru-Hole

NOTES:
- Normal Stream Width
- #5 Tie Rebar @ 18" Max
- #5 Tie Rebar
- Flare Angle @ 1/8" Max (TYP.)
- #5 Tie Rebar

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
PRECAST BOX CULVERT WITH APRONS
C.I.P. CONCRETE WEDGE TRANSITION

AUG. 30, 2019
ACTING CHIEF BRIDGE ENGINEER