

e-Notification No. 79,
dated June 21, 2021

CHANGE 3

(Note: Change 2
revisions not
highlighted)

GENERAL NOTES:

- DESIGN SPECIFICATIONS:
 - AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND COMMENTARY
 - PENNDOT DESIGN MANUAL PART 4
- MATERIAL STRENGTH:
 - REINFORCEMENT STEEL $f_y = 60$ KSI
 - CONCRETE $f'_c = 4$ KSI (CLASS AAAP CONCRETE) FOR DECK SLABS AND TYPICAL SIDEWALKS AND $f'_c = 3.5$ KSI (CLASS AA CONCRETE) FOR BARRIERS AND RAISED SIDEWALK OR ALTERNATE SIDEWALK WITH 42" VERTICAL WALL CONCRETE BARRIER.
- DEAD LOAD:
 - MODULAR RATIO (E_c/E_s) $N = 8$
 - NORMAL WEIGHT CONCRETE = 150 LB./FT³
 - LIGHTWEIGHT CONCRETE = 115 LB./FT³
 - PERMANENT METAL DECK FORMS = 15 LB./FT²
 - FUTURE WEARING SURFACE = 30 LB./FT²
- DESIGN CONTROLS:
 - CONCRETE COVER:

| | |
|-----------------------------------|----------|
| DECK TOTAL TOP COVER | = 2 1/2" |
| DECK BOTTOM COVER | = 1" |
| BARRIER | = 2" |
| SIDEWALK TOP COVER | = 2 1/2" |
| ALTERNATE SIDEWALK DETAIL BARRIER | = 2" |
 - MIN. VERTICAL CLEAR DISTANCE BETWEEN LONGITUDINAL REINFORCEMENTS IN TOP MAT AND LONGITUDINAL REINFORCEMENTS IN THE BOTTOM MAT = 2"
 - MIN. VERTICAL CLEAR DISTANCE BETWEEN TRANSVERSE REINFORCEMENTS IN TOP MAT AND TRANSVERSE REINFORCEMENTS IN THE BOTTOM MAT = 2"
 - BAR SIZE:

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| MAXIMUM BAR SIZE: #6, EXCEPT FOR BARS DESIGNED TO MEET 18 | |
| MINIMUM BAR SIZE: S1, S2, S5, AND S6 BARS: #5 | |
| S4, S3, S3', AND S7 BARS: #4 | |
 - BAR SPACINGS:

| | |
|--|----------|
| MAXIMUM SPACING IN SLAB AND BARRIERS | = 12" |
| MINIMUM TRANSVERSE REINFORCEMENT SPACING | = 5 1/2" |
| SPACING INCREMENTS | = 1/2" |
 - THE TOP 1/2" OF THE SLAB IS CONSIDERED TO BE AN INTEGRAL WEARING SURFACE.
 - STAGGER LONGITUDINAL REBARS SUCH THAT NO REBAR IN THE TOP MAT IS DIRECTLY ABOVE A REBAR IN THE BOTTOM MAT.
 - DECK THICKNESS: MINIMUM THICKNESS INCLUDING 1/2" INTEGRAL WEARING SURFACE = ((DISTANCE BETWEEN DESIGN SECTIONS FOR NEGATIVE MOMENT + 120") / 30 + 1/2") ≥ 8 ", THICKNESS INCREMENTS = 1/2"
 - Z FACTOR FOR CRACK CONTROL = 130 KIPS/IN.
- USE ONLY FUSION BONDED EPOXY COATED REINFORCEMENT IN ACCORDANCE WITH PUBLICATION 408, SECTION 709.
- FOR ALL BARRIER REINFORCEMENT AND FOR HOOKED OR BENT BARS IN THE DECK SLAB, DO NOT USE RAIL STEEL (A 996). SEE DESIGN MANUAL PART 4, SECTION D5.4.3.1.
- DESIGN TABLES ARE VALID FOR NORMAL WEIGHT CONCRETE DECKS. FOR LIGHTWEIGHT CONCRETE DECKS, INCREASE LENGTH L LISTED IN REINFORCEMENT TABLES SHEETS 10 AND 11 BY 13".
- DETAIL ALL BARS ON THE CONTRACT DRAWINGS.
- ALL DETAILS SHOWN ALSO APPLY TO P/S I-BEAMS, PA BULB-TEE AND P/S SPREAD BOX BEAMS EXCEPT AS NOTED.
- FOR HAUNCH DETAILS, SEE SHEET 9.
- FOR SKEW ANGLES 75° AND MORE, PLACE TRANSVERSE REINFORCEMENT IN DECK SLAB PARALLEL TO CENTERLINE OF BEARINGS.
- SEE BC-767M AND BD-656M FOR ADDITIONAL REINFORCEMENT AT END OF DECK.
- FOR TRANSITION OF LONGITUDINAL REINFORCEMENT FROM POSITIVE MOMENT AREA TO NEGATIVE MOMENT AREA, USE AASHTO ARTICLES 5.12.3.3 AND 6.10.1.7 AS MODIFIED BY DESIGN MANUAL PART 4, SECTIONS D5.12.3.3 AND D6.10.1.7.
- DESIGN IS BASED ON DECKS SUPPORTED ON 3 OR MORE BEAMS.
- THE STRENGTH DESIGN OF THE OVERHANG IS BASED ON THE ASSUMPTION THAT THE ENTIRE OVERHANG HAS A MINIMUM THICKNESS OF T + 1". THE BEAM HAUNCH MAY BE CONSIDERED AS EFFECTIVE IN CONTRIBUTING TO THIS THICKNESS FOR THE OVERHANG DESIGN ONLY.
- THE 42" AND 45" F-SHAPE CONCRETE BARRIERS AND DECK SLABS, INCLUDING OVERHANGS, ARE DESIGNATED AS MASH TL-5. THE 42" F-SHAPE CONCRETE BARRIER IS DESIGNATED AS TL-4 WHEN AN OVERLAY IS PLACED ON THE STRUCTURE AND REDUCES THE HEIGHT OF THE BARRIER BELOW 42". THE ALTERNATE SIDEWALK WITH 42" VERTICAL WALL CONCRETE BARRIER IS DESIGNATED AS MASH TL-2. THE 50" SPLIT CONCRETE MEDIAN BARRIER AND 50" CONCRETE MEDIAN BARRIER ARE DESIGNATED AS MASH TL-4. THE 32" SPLIT CONCRETE MEDIAN BARRIER, 32" F-SHAPE CONCRETE BARRIER AND 32" CONCRETE MEDIAN BARRIER ARE DESIGNATED AS MASH TL-3.
- DECK DESIGN TABLES ARE BASED ON THE EQUIVALENT STRIP METHOD AS PER AASHTO, ARTICLE 4.6.2.1.
- FACTORED MOMENT = 1.25 (SLAB AND BARRIER MOMENT) + 1.5 (FWS MOMENT) + 1.75 (1+IM/100)(L.L. MOMENT)
- DYNAMIC LOAD ALLOWANCE (IM) = 50%
- SEE TABLES ON SHEETS 10 AND 11 FOR VALUES OF S, T, S1, S2, S3, S3', S6, S7, S0, AND L.
- FOR DECK SLAB AND BARRIER DETAILS AND REINFORCEMENT FOR ADJACENT PRESTRESSED CONCRETE BOX BEAMS, SEE BD-660M AND BD-661M.
- FOR BARRIER REINFORCEMENT DETAILS, SEE SHEETS 7 AND 8.
- OVERHANG LENGTH MUST NOT EXCEED THE REQUIREMENTS OF DESIGN MANUAL PART 4, SECTION D9.7.1.5.1P.
- THE SLAB REINFORCEMENT SHOWN ON SHEETS 10 AND 11 IS APPLICABLE FOR THE BARRIERS SHOWN ON SHEET 2, 3, 4 AND 5, PA TYPE 10M, PA BRIDGE BARRIER AND CONCRETE VERTICAL WALL BRIDGE BARRIERS AND BARRIERS WITH FENCES AND HANDRAILS. REDESIGN OF THE DECK IS REQUIRED WHEN OTHER ATTACHMENTS SUCH AS LIGHT POLES AND SIGN STRUCTURES ARE USED. SEE NOTE 25 FOR MODIFICATIONS REQUIRED WHEN SOUND BARRIERS ARE USED.
- CONCRETE SOUND BARRIER SHOWN ON BC-779M AND BD-679M MAY BE MOUNTED ON THE TOP OF BARRIER AS DETAILED ON SHEET 2. STANDARD REINFORCEMENT MAY BE USED AS FOLLOWS:

LIMITATIONS

 - HEIGHT OF SOUND BARRIER (ABOVE TOP OF BARRIER) $\leq 10'$.
 - WEIGHT OF SOUND BARRIER PLUS THE WEIGHT OF BARRIER AND DECK SLAB MINUS 650 LB. MAY NOT BE IN EXCESS OF 600 LB. PER FOOT OF LENGTH.

DECK DESIGN PROCEDURE

 - USING THE TABLES AND NOTES ON SHEETS 10 AND 11, ESTABLISH STANDARD DECK THICKNESS, REINFORCEMENT AND THE DESIGNATED MAXIMUM ALLOWANCE OVERHANG LENGTH BASED ON THE BEAM SPACING, S.
 - INCREASE THE DESIGNATED DECK THICKNESS BY 1/2", AND USE THIS THICKNESS ACROSS FULL WIDTH OF BRIDGE.
 - DECREASE THE DESIGNATED MAXIMUM ALLOWABLE OVERHANG LENGTH, S0, BY 7".
 - INCREASE THE LENGTH OF S7 BARS BY 9".

WHERE CONDITIONS EXCEED THE ABOVE LIMITATIONS, PERFORM SPECIAL DECK DESIGN.
- FOR DEAD LOAD CALCULATIONS, THE WEIGHT OF BARRIERS/DIVISORS SHOWN ON BD-601M ARE AS FOLLOWS:

| | |
|--|-------------|
| 45" F-SHAPE CONCRETE BARRIER | 700 LB./FT. |
| 42" F-SHAPE CONCRETE BARRIER | 650 LB./FT. |
| 32" F-SHAPE CONCRETE BARRIER | 520 LB./FT. |
| 50" SPLIT CONCRETE MEDIAN BARRIER | 750 LB./FT. |
| 32" SPLIT CONCRETE MEDIAN BARRIER | 520 LB./FT. |
| 50" CONCRETE MEDIAN BARRIER | 960 LB./FT. |
| 32" CONCRETE MEDIAN BARRIER | 700 LB./FT. |
| CONCRETE MOUNTABLE DIVISOR TYPE A | 260 LB./FT. |
| TYPE B | 280 LB./FT. |
| SPLIT CONCRETE MOUNTABLE DIVISOR TYPE A | 130 LB./FT. |
| TYPE B | 140 LB./FT. |
| 42" VERTICAL WALL CONCRETE BARRIER ON ALTERNATE SIDEWALK (WITHOUT RAILING) | 530 LB./FT. |
- TABLES 1-4 PROVIDED ON SHEET 10 CONSIDER THE TOP MAT TRANSVERSE BAR AS THE TOP BAR AND ARE ONLY APPLICABLE TO SIMPLE SPAN SUPERSTRUCTURE PROJECTS. TABLES 1-4 PROVIDED ON SHEET 11 CONSIDER THE TOP MAT LONGITUDINAL BAR AS THE TOP BAR AND SHALL BE USED FOR CONTINUOUS SPAN SUPERSTRUCTURE PROJECTS AND ARE OPTIONAL FOR USE IN SIMPLE SPAN SUPERSTRUCTURE PROJECTS.
- MECHANICALLY GRIND BRIDGE DECKS WITHOUT OVERLAYS ON INTERSTATE, LIMITED ACCESS AND NHS ROUTES UNLESS EXEMPTED BY THE DISTRICT BRIDGE ENGINEER. INCLUDE MECHANICAL GRINDING SPECIFICATION IN CONTRACT. TO ACCOMMODATE MECHANICAL GRINDING, DECK SLAB SHALL BE PLACED WITH AN ADDITIONAL 1/4" THICKNESS (T + 1/4") AND A TOP CLEAR COVER INCREASED BY 1/4".
- FOR BRIDGE DECKS WITH AN EPOXY, LATEX MODIFIED CONCRETE (LMC), OR POLYESTER POLYMER CONCRETE (PPC) OVERLAY, THE 1/2" INTEGRAL WEARING SURFACE MAY BE ELIMINATED WITH DISTRICT BRIDGE ENGINEER APPROVAL, THEREBY REDUCING THE CONCRETE DECK SLAB THICKNESS AND TOP CONCRETE COVER BY 1/2".

LEGEND:

- WITHIN 10' ON BOTH SIDES OF AN EXPANSION JOINT IN THE BARRIER AND AT THE END OF THE BRIDGE BARRIER, REDUCE SPACING OF REINFORCEMENT BARS TO HALF THE SHOWN SPACING. FOR BARRIER END TRANSITION TO GUIDE RAIL FOLLOW DETAILS SHOWN ON BD-622M AND BD-624M.
- EXTEND ONE HALF OF THE S1, BOTTOM TRANSVERSE BARS, ACROSS THE FULL WIDTH OF THE OVERHANG. THE ALTERNATE BARS WHICH DO NOT EXTEND INTO THE OVERHANG SHALL EXTEND 6" MINIMUM BEYOND THE INTERIOR EDGE OF THE FLANGE OF THE FASCIA BEAM.
- BUNDLE THE BARS LISTED AS S7 IN THE REINFORCEMENT TABLES TO EACH S2 BAR.
- BEGIN S3 AND S3' BARS AT LOCATION OF DESIGN SECTION FOR NEGATIVE MOMENT, SEE SHEET 9. S3 AND S3' BARS DO NOT NEED TO BE PLACED OVER THE BEAM FOR SPREAD BOX BEAM BRIDGE.
- FOR EMBEDMENT INTO THE CONCRETE BARRIER, SEE SHEET 7.
- FOR DRIP NOTCH DETAILS, SEE BC-775M.
- UNDERSIDE OF DECK SLAB MAY BE CONSTRUCTED LEVEL.
- FOR DECK TOP REINFORCEMENT MAT: TRANSVERSE BARS SHOWN ON TOP, SIMILAR WHEN LONGITUDINAL BARS ON TOP. (SEE NOTE 24)
- FOR DECK SLAB REINFORCEMENT, SEE TYPICAL SLAB PANEL DETAILS, SHEET 2.
- IF THE BARRIER IS POSITIONED DIRECTLY ABOVE A GIRDER THE S7 BAR, IF REQUIRED, MUST EXTEND THE DISTANCE "L" BEYOND THE ADJACENT BEAMS ON EACH SIDE.
- DECK SLAB LAP SPLICE LENGTH:

| | | |
|-------------------------|---------------------------|-------|
| NORMAL WEIGHT CONCRETE: | 2'-10" #5 BARS | 3'-0" |
| | 3'-10" #6 BARS | 3'-7" |
| LIGHT WEIGHT CONCRETE: | 3'-5" #5 BARS | 3'-6" |
| | 4'-6" #6 BARS | 4'-2" |
- DRAIN RUNOFF WITH CURB DRAINS THROUGH CONCRETE BARRIER OR WITH TYPE 2 SCUPPERS IN SIDEWALK SLAB. WHERE CURB DRAINS ARE USED, SET SIDEWALK ELEVATION AT REAR FACE OF BARRIER 1" ABOVE GUTTER LINE ELEVATION. THIS MAY RESULT IN INCREASED COVER FOR S2 & S7 BARS. BEVEL DRAINS AS PER BC-751M.
- WHEN A TRAFFIC BARRIER IS MOUNTED ON THE DECK BETWEEN TWO GIRDERS, PROVIDE TOP AND BOTTOM REINFORCEMENT AREA IN THE DECK IN THE BAY WHERE THE BARRIER EXISTS, AT LEAST EQUAL TO THE OVERHANG TOP REINFORCEMENT AREA AS SHOWN ON SHEETS 10 AND 11. IF S7 BARS ARE REQUIRED THEY SHOULD MATCH THE SPACING OF THE S2 BARS ON THE TOP MAT AND S1 BARS ON THE BOTTOM MAT.
- TO BE USED WHEN MATCHING DETAIL IS SPECIFIED IN APPROACH ROADWAY.
- TO BE USED ONLY FOR BRIDGES WITHOUT LONGITUDINAL JOINTS.
- SPACE BARS S3, S3', S4, S5, AND S6 SYMMETRICALLY ABOUT THE PANEL CENTERLINE.
- PROVIDE HAUNCH TO COMPENSATE FOR IRREGULARITIES IN CAMBER. SEE TABLE 1, SHEET 9 FOR MINIMUM HAUNCH REQUIREMENTS.
- FOR PRESTRESSED CONCRETE BRIDGES MADE CONTINUOUS, DESIGN S5 AND S6 BARS IN ACCORDANCE WITH DM-4 ARTICLE D5.12.3.3.
- USE BEAM HAUNCH DETAILS SHOWN WITH REMOVABLE DECK FORMS. FACE OF HAUNCH IS VERTICAL WHEN PERMANENT METAL DECK FORMS ARE USED IN PLACING THE DECK. BEAM HAUNCH DETAIL SHALL CONFORM TO BC-732M.
- SPLICES SHOULD BE OUTSIDE OF NEGATIVE MOMENT AREA IF POSSIBLE, IF NOT, CENTER BAR LENGTH ON CENTER OF NEGATIVE MOMENT AREA. STAGGER SPLICES AS PER BD-660M.

CONTRACT DRAWING NOTE:

- THE FOLLOWING NOTE IS TO BE PLACED ON THE CONTRACT DRAWINGS WHEN THE 42" F-SHAPE CONCRETE BARRIER IS USED: THE 42" F-SHAPE CONCRETE BARRIER IS DESIGNATED AS MASH TL-4 WHEN AN OVERLAY IS PLACED ON THE STRUCTURE AND REDUCES THE BARRIER HEIGHT BELOW 42".

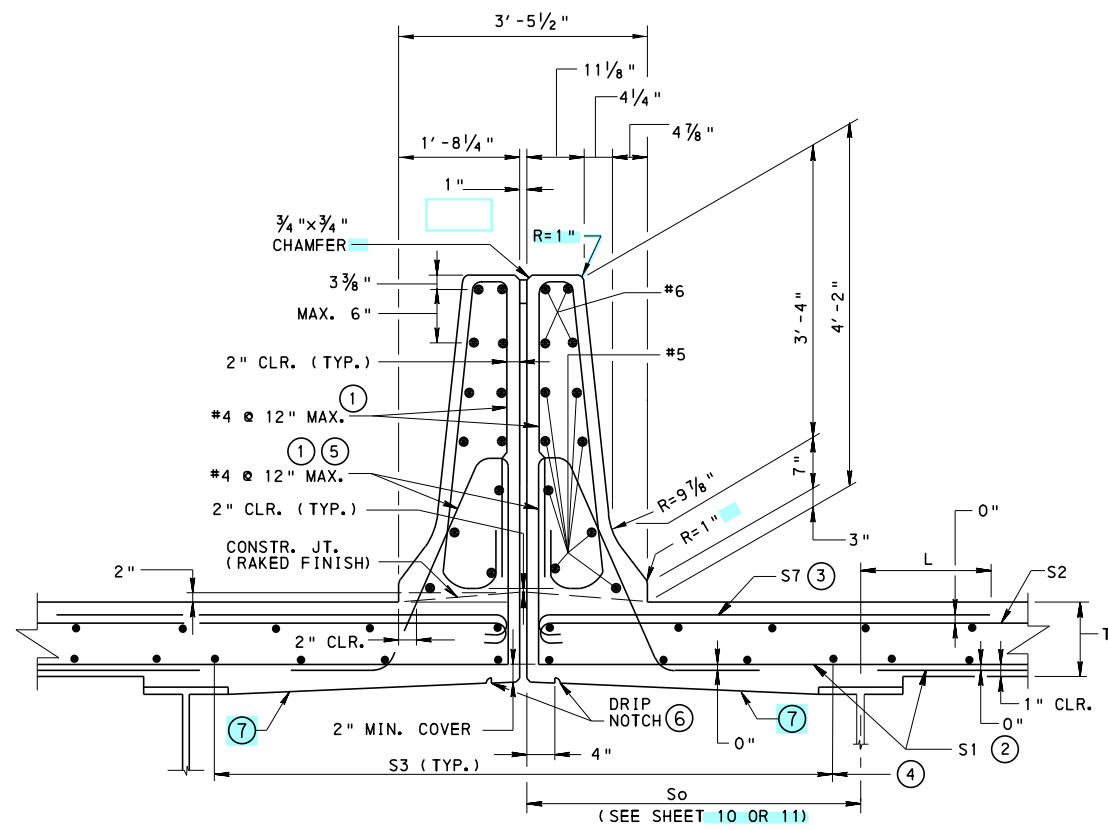
| | |
|---------|---|
| RC-50M | GUIDE RAIL TO BRIDGE BARRIER TRANSITIONS |
| RC-65M | CONCRETE MOUNTABLE CURBS |
| BD-609M | PA STRUCTURE MOUNTED GUIDE RAIL |
| BD-622M | R.C. ABUTMENTS WITH BACKWALL |
| BD-624M | R.C. ABUTMENTS WITHOUT BACKWALL |
| BD-656M | TYP. LONGITUDINAL SECTIONS I-BEAM AND BOX BEAM BRIDGES |
| BD-660M | DECK SLAB AND STEEL REINFORCEMENT PLACEMENT |
| BD-661M | BOX BEAM REINFORCEMENT DETAILS |
| BD-662M | I-BEAM AND PA BULB-TEE BEAM REINFORCEMENT DETAILS |
| BD-679M | STRUCTURE MOUNTED SOUND BARRIER WALLS |
| BC-701M | PROTECTIVE FENCE |
| BC-706M | PA STRUCTURE MOUNTED GUIDE RAIL BARRIER MISCELLANEOUS DETAILS |
| BC-711M | ALUMINUM PROTECTIVE BARRIER |
| BC-716M | ALUMINUM PEDESTRIAN RAILING |
| BC-719M | BRIDGE DECK TEMPORARY BARRIERS |
| BC-720M | ALUMINUM OR STEEL BRIDGE HAND RAILING |
| BC-722M | LIGHTING POLE ANCHORAGE |
| BC-732M | PERMANENT METAL DECK FORMS |
| BC-734M | ANCHOR SYSTEMS |
| BC-751M | BRIDGE DRAINAGE |
| BC-752M | CONCRETE DECK SLAB DETAILS |
| BC-762M | TOOTH EXPANSION DAM |
| BC-767M | NEOPRENE STRIP SEAL DAM |
| BC-775M | MISCELLANEOUS PRESTRESS DETAILS |
| BC-779M | STRUCTURE MOUNTED SOUND BARRIER WALLS |
| BC-788M | TYPICAL WATERPROOFING AND EXPANSION DETAILS |

REFERENCE DRAWINGS

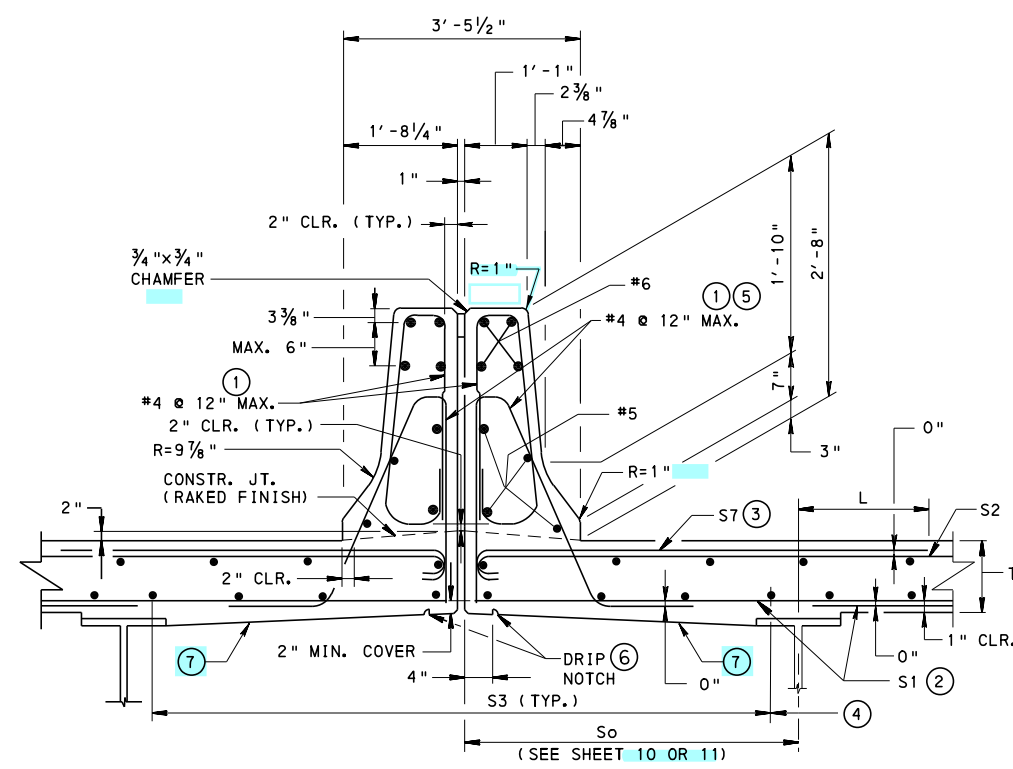
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STANDARD
CONCRETE DECK SLAB
DESIGN & DETAILS
FOR BEAM BRIDGES

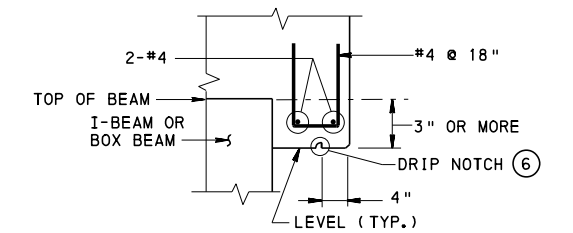
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| RECOMMENDED FEB.19, 2021 <i>Thomas P. Mociore</i> CHIEF BRIDGE ENGINEER | RECOMMENDED FEB.19, 2021 <i>Bruce B. Thompson</i> DIRECTOR, BUR. OF PROJECT DELIVERY | SHEET 1 OF 12 BD-601M |
|---|--|--------------------------|



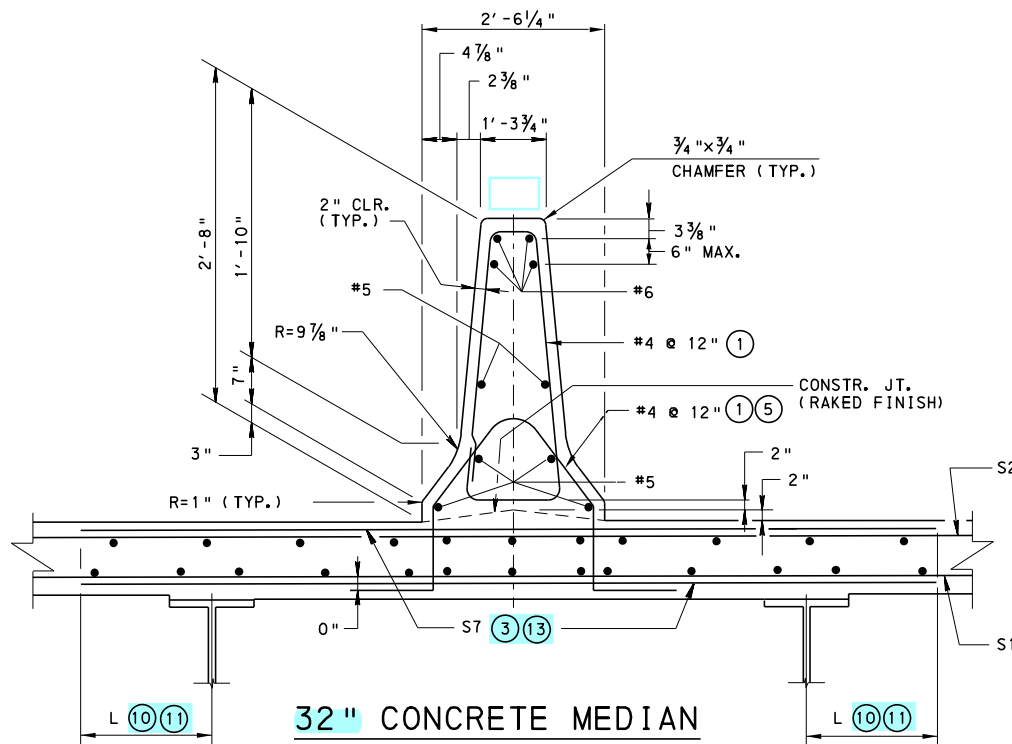
**50" SPLIT CONCRETE
MEDIAN BARRIER DETAIL** (8) (9) (14)
(SEE BC-788M FOR OPEN JOINT DETAIL)



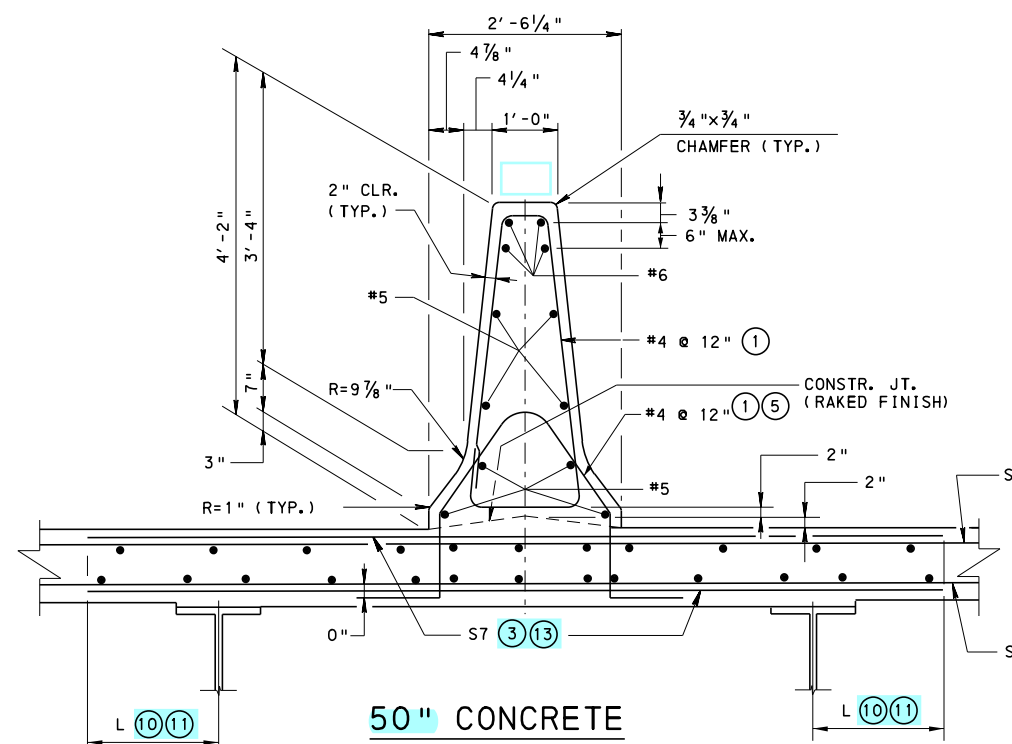
**32" SPLIT CONCRETE
MEDIAN BARRIER DETAIL** (8) (9) (14)
(SEE BC-788M FOR OPEN JOINT DETAIL)



**TYPICAL
OVERHANG REINFORCEMENT**
(TO BE USED WHEN THE OVERHANG IS 3" OR MORE IN DEPTH)



**32" CONCRETE MEDIAN
BARRIER DETAIL** (8) (9) (14) (15)



**50" CONCRETE
MEDIAN BARRIER DETAIL** (8) (9) (14) (15)

NOTES:

1. FOR ADDITIONAL NOTES AND LEGEND, SEE SHEET 1.
2. BARRIER LAP SPLICE LENGTH: 3'-7" #5 BARS
4'-4" #6 BARS

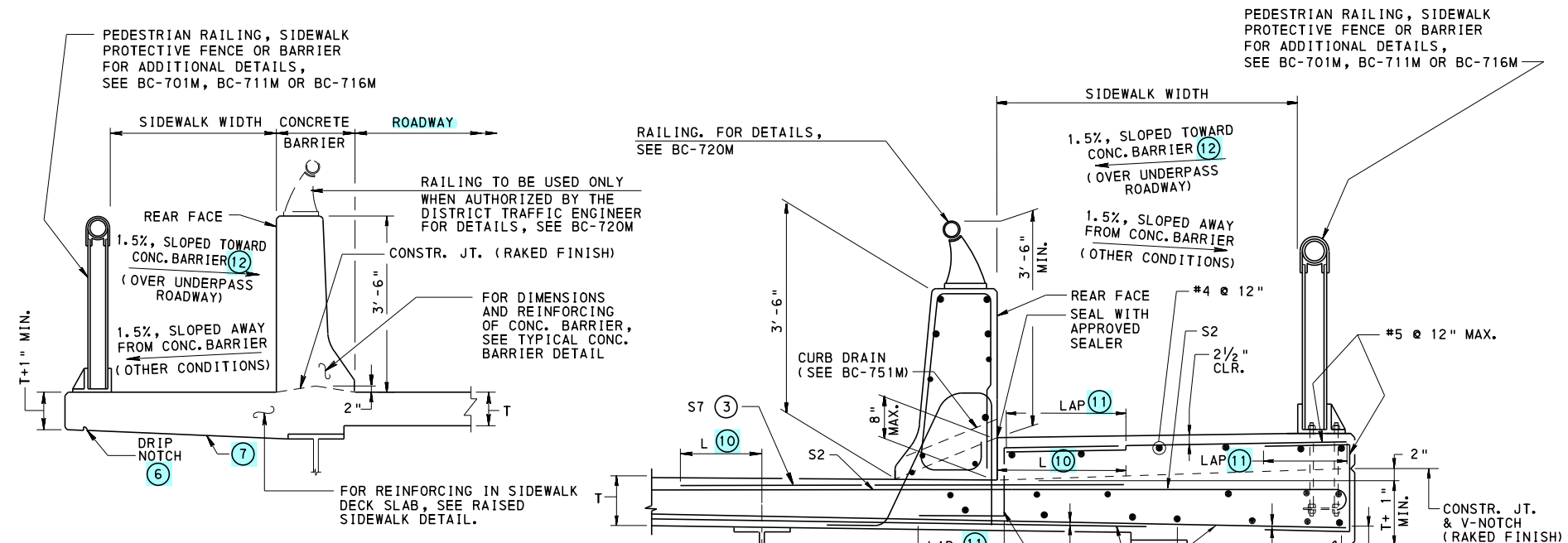
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STANDARD
CONCRETE DECK SLAB
DESIGN & DETAILS
FOR BEAM BRIDGES

RECOMMENDED FEB. 19, 2021
Thomas P. Mociore
CHIEF BRIDGE ENGINEER

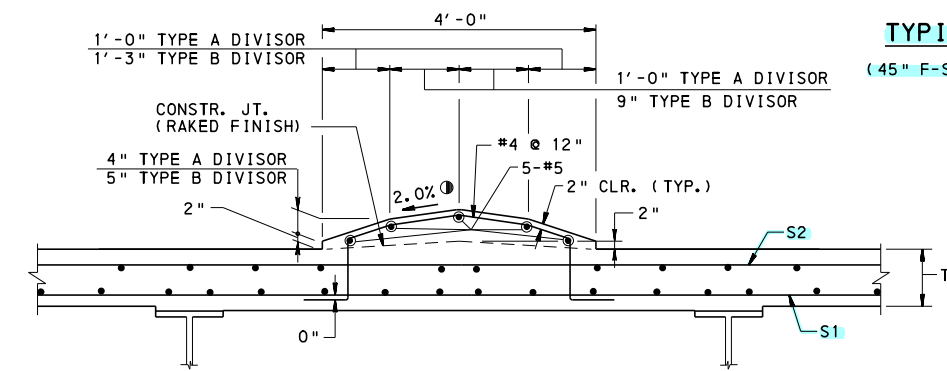
RECOMMENDED FEB. 19, 2021
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DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 3 OF 12
BD-601M

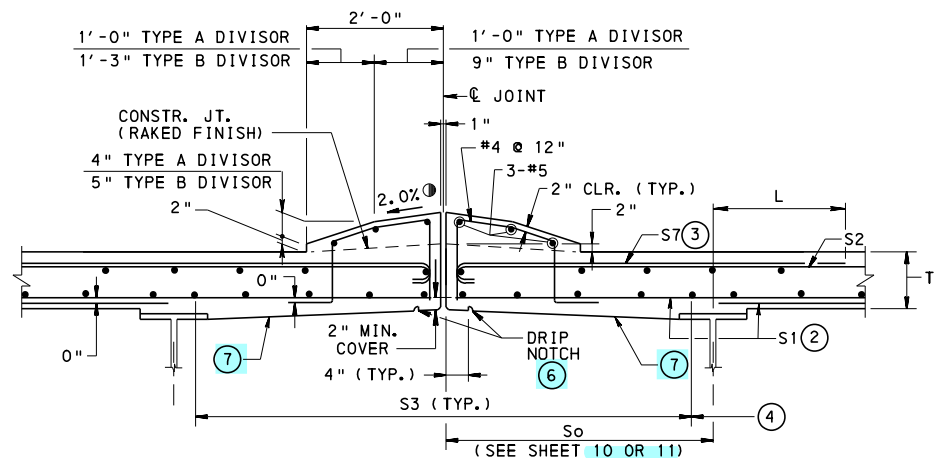


TYPICAL SIDEWALK DETAIL
(45" F-SHAPE CONCRETE BARRIER SIMILAR)

RAISED SIDEWALK DETAIL
(SEE SHEET 2 FOR BARRIER REINFORCEMENT)
(42" F-SHAPE CONCRETE BARRIER SHOWN, 32" AND 45" F-SHAPE CONCRETE BARRIER SIMILAR)

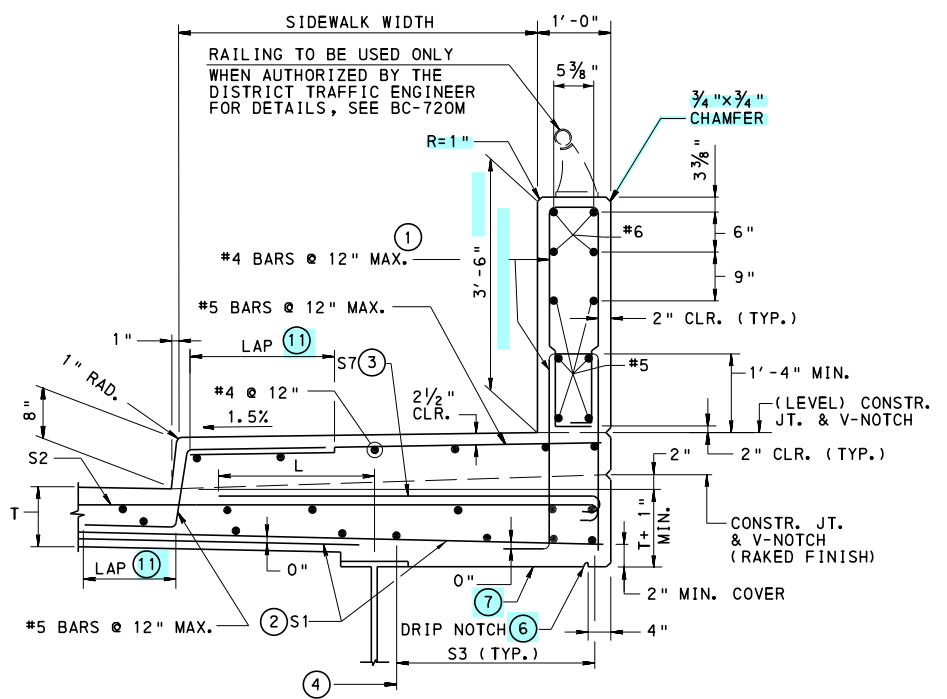


CONCRETE MOUNTABLE DIVISOR DETAIL
(NOT FOR USE AS A TRAFFIC BARRIER, SEE RC-65M.)



SPLIT CONCRETE MOUNTABLE DIVISOR DETAIL
(SEE BC-788M FOR OPEN JOINT DETAIL)
(NOT FOR USE AS A TRAFFIC BARRIER, SEE RC-65M.)

PROTECTED SIDEWALKS
REQUIRED FOR BRIDGES WITH A POSTED VEHICULAR SPEED GREATER THAN 45 MPH OR A STRUCTURE LENGTH LONGER THAN 200 FEET, UNLESS WAIVED BY THE DEPARTMENT (SEE DM-4 DC2.3.2.2.2).



ALTERNATE SIDEWALK WITH 42" VERTICAL WALL CONCRETE BARRIER DETAIL
(SEE SHEET 10 OR 11)

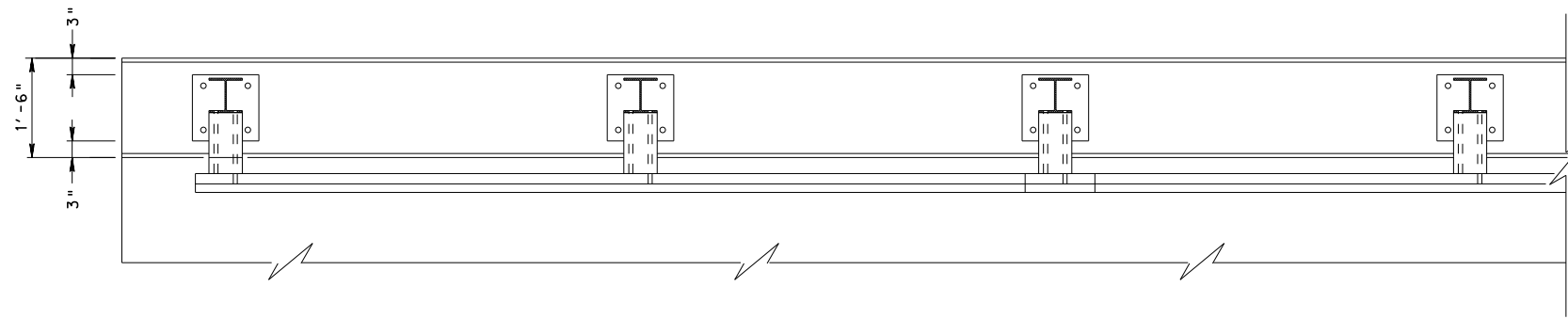
- NOTES:**
- FOR ADDITIONAL NOTES AND LEGEND, SEE SHEET 1.
 - BARRIER LAP SPLICE LENGTH: 3'-7" #5 BARS
4'-4" #6 BARS

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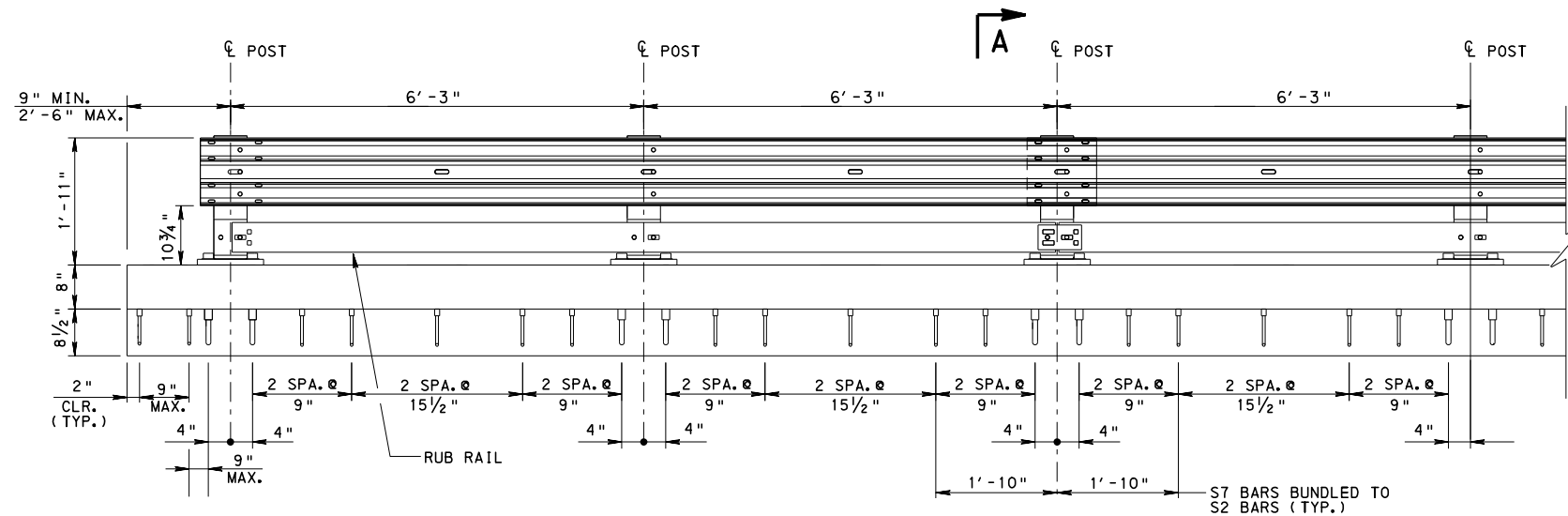
STANDARD
CONCRETE DECK SLAB
DESIGN & DETAILS
FOR BEAM BRIDGES

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| RECOMMENDED FEB. 19, 2021 <i>Thomas P. Mociore</i> CHIEF BRIDGE ENGINEER | RECOMMENDED FEB. 19, 2021 <i>Bruce S. Thompson</i> DIRECTOR, BUR. OF PROJECT DELIVERY | SHEET 4 OF 12 BD-601M |
|--|---|---------------------------------|

PERMITTED FOR BRIDGES WITH A POSTED VEHICULAR SPEED LESS THAN OR EQUAL TO 45 MPH AND A STRUCTURE LENGTH LESS THAN OR EQUAL TO 200 FEET, SEE DM-4 DC2.3.2.2.2.

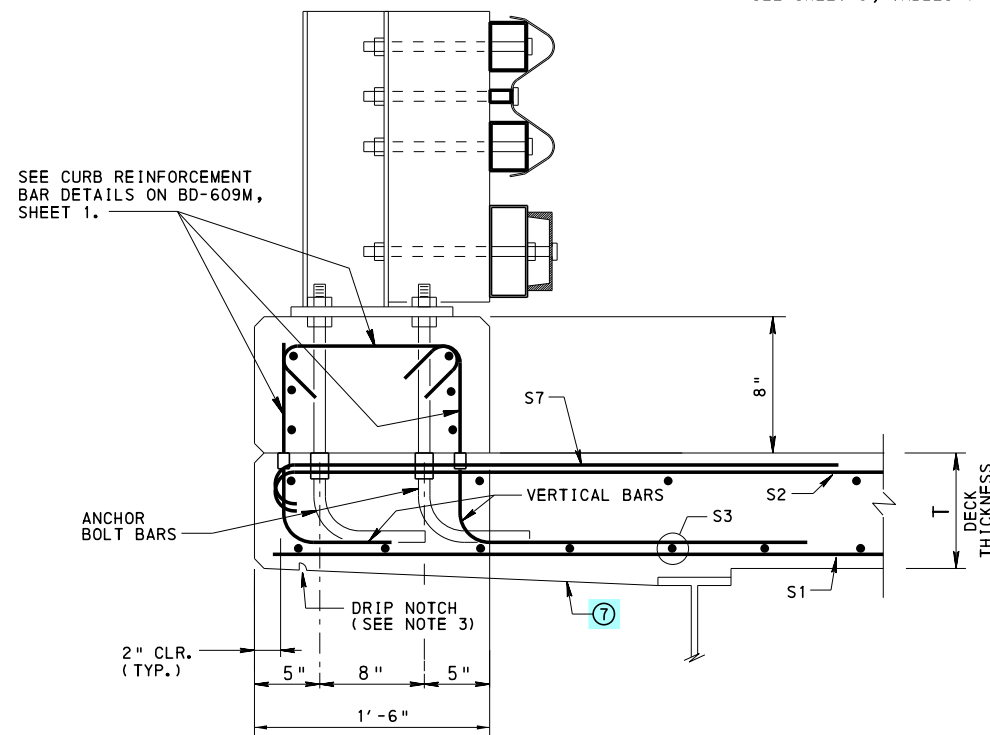


PLAN



ELEVATION

FOR SLAB AND OVERHANG REINFORCEMENT
SEE SHEET 9, TABLES 1 THRU 4.



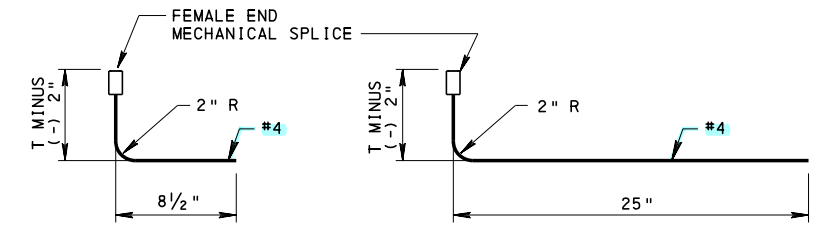
SECTION A-A

NOTE:
PRIOR TO CONSTRUCTING CURB AND DECK,
ANCHOR BOLTS SHALL BE INSTALLED WITH
EITHER A TEMPLATE OR ACTUAL POST
W/BASEPLATE INSTALLED TO ENSURE PROPER
ANCHOR BOLT ALIGNMENT & PLACEMENT

CURB REINFORCEMENT SHOWN FOR CLARITY
FOR DECK TOP REINFORCEMENT MAT: TRANSVERSE BARS SHOWN
ON TOP, SIMILAR WHEN LONGITUDINAL BARS ON TOP.

NOTES:

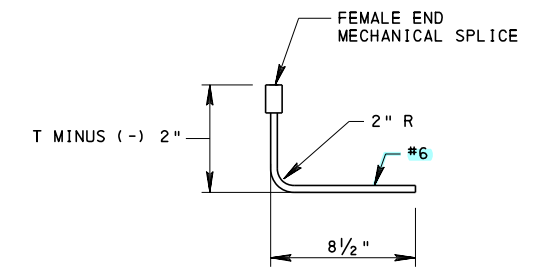
1. MODIFIED STRUCTURE MOUNTED GUIDE RAIL BARRIER GRANTED TL3 DESIGNATION BY FHWA.
2. FOR PA STRUCTURE MOUNTED GUIDE RAIL DETAILS SEE BD-609M.
3. FOR DRIP NOTCH DETAILS, SEE BC-775M.



VERTICAL REINFORCEMENT
ALL VERTICAL REINFORCEMENT #4

CURB REINFORCEMENT BAR DETAILS

MECHANICAL SPLICE AS PER BULLETIN 15



ANCHOR BOLT BAR DETAIL

MECHANICAL SPLICE AS PER BULLETIN 15

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STANDARD
CONCRETE DECK SLAB
PA STRUCTURE MOUNTED
GUIDE RAIL
FOR BEAM BRIDGES

RECOMMENDED FEB. 19, 2021

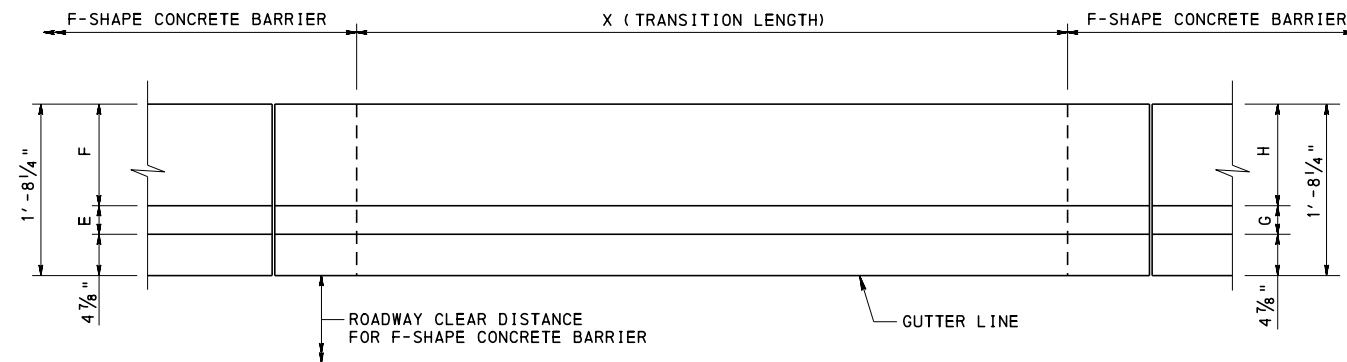
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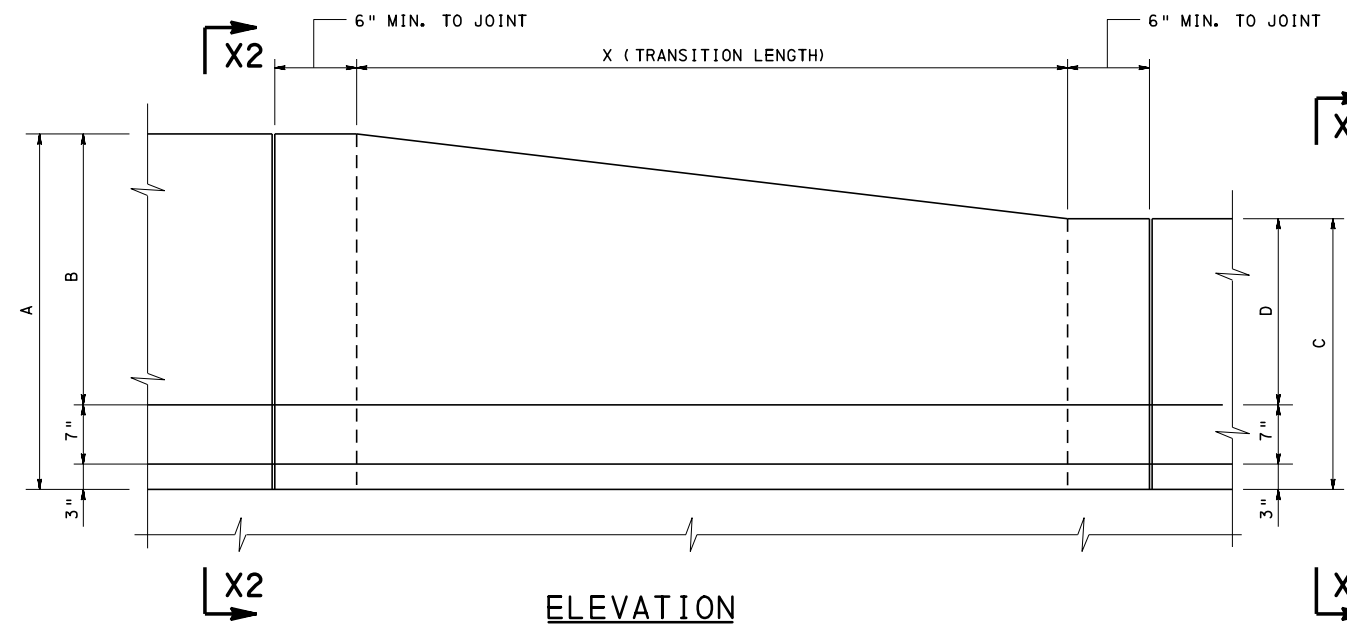
Bruce S. Thomas
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 5 OF 12

BD-601M



PLAN



ELEVATION

F-SHAPE TO F-SHAPE CONCRETE BARRIER TRANSITION

NOTES:

- FOR SECTIONS X1-X1 AND X2-X2, SEE SPECIFIC F-SHAPE CONCRETE BARRIER DETAIL, SHEET 2.

| TRANSITION | A | B | C | D | E | F | G | H | X |
|----------------------------|---------|----------|---------|----------|--------|---------|--------|---------|--------------|
| 45" F-SHAPE TO 32" F-SHAPE | 3' - 9" | 2' - 11" | 2' - 8" | 1' - 10" | 3 3/8" | 1' - 0" | 2 3/8" | 1' - 1" | 6' - 6" MIN. |
| 42" F-SHAPE TO 32" F-SHAPE | 3' - 6" | 2' - 8" | 2' - 8" | 1' - 10" | 3 3/8" | 1' - 0" | 2 3/8" | 1' - 1" | 5' - 0" MIN. |
| 45" F-SHAPE TO 42" F-SHAPE | 3' - 9" | 2' - 11" | 3' - 6" | 2' - 8" | 3 3/8" | 1' - 0" | 3 3/8" | 1' - 0" | 2' - 0" MIN. |

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BUREAU OF PROJECT DELIVERY

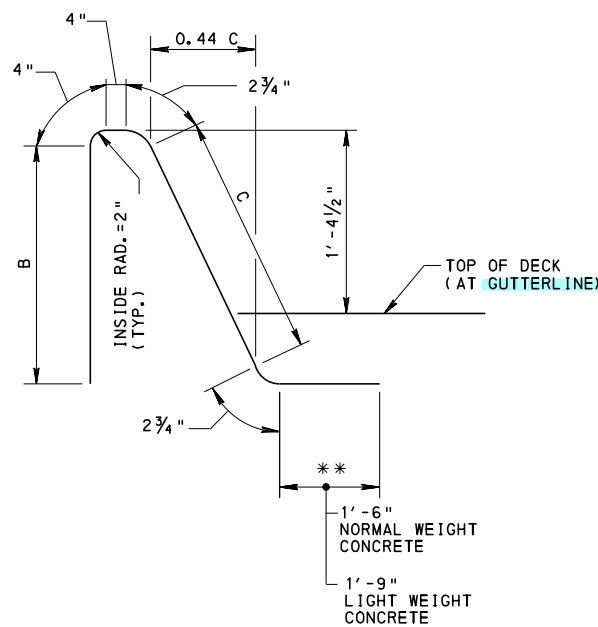
STANDARD
CONCRETE DECK SLAB
F-SHAPE CONCRETE
BARRIER TRANSITIONS

RECOMMENDED FEB. 19, 2021
Thomas P. Mociore
CHIEF BRIDGE ENGINEER

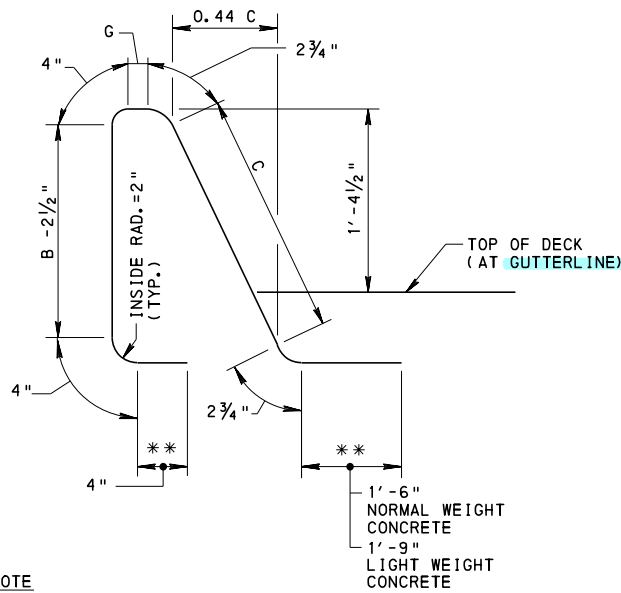
RECOMMENDED FEB. 19, 2021
Brian J. Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 6 OF 12
BD-601M

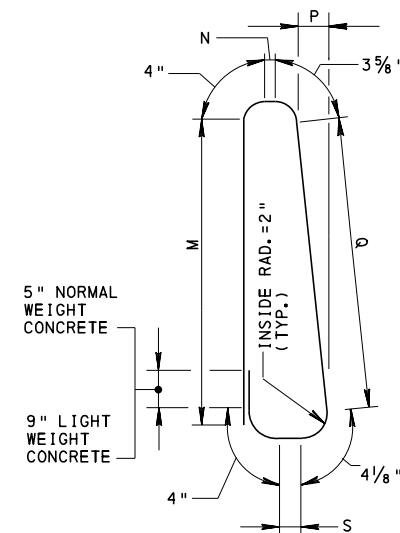
** WHEN THE DECK IS SLOPED AWAY FROM THE GUTTERLINE
SLOPE LEG TO MATCH DECK CROSS-SLOPE. DESIGNER TO
PROVIDE NECESSARY DIMENSIONS.



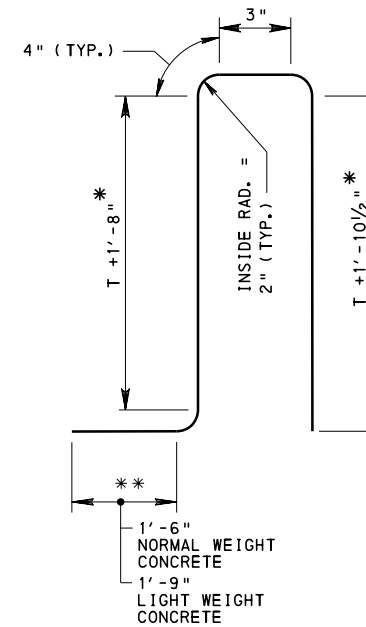
**F-SHAPE BARRIERS
AND SPLIT MEDIAN BARRIERS**
(FOR DIMENSIONS "B" AND "C", SEE TABLE 1)



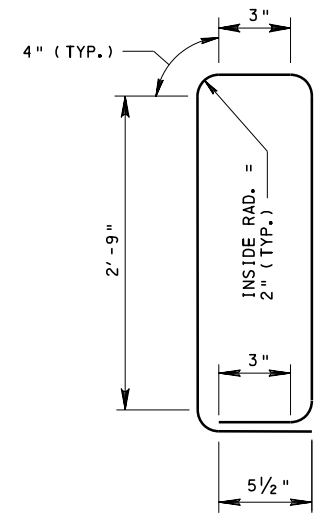
**F-SHAPE BARRIERS WITH SOUND BARRIERS
AND ALUMINUM PROTECTIVE BARRIER**
(FOR DIMENSIONS "B" AND "C", SEE TABLE 1)



**F-SHAPE BARRIERS
AND SPLIT MEDIAN BARRIERS**
(FOR DIMENSIONS M, N, P, Q AND S, SEE TABLE 2)
(DETERMINE DIMENSIONS N AND S FOR BARRIER
WITH SOUND BARRIER)



**ALTERNATE SIDEWALK WITH 42"
VERTICAL WALL CONCRETE BARRIER**
* DETAILED FOR SIDEWALK DEPTH OF 8"



| TABLE 1 | | |
|--------------------|--|--------------|
| B AND C DIMENSIONS | | |
| T | F-SHAPE BARRIERS AND SPLIT MEDIAN BARRIERS | |
| | B | C |
| 8.0" | 1' - 9" | 1' - 11" |
| 8.5" | 1' - 9 1/2" | 1' - 11 1/2" |
| 9.0" | 1' - 10" | 2' - 0" |
| 9.5" | 1' - 10 1/2" | 2' - 0 1/2" |
| 10.0" | 1' - 11" | 2' - 1 1/4" |
| 10.5" | 1' - 11 1/2" | 2' - 1 3/4" |
| 11.0" | 2' - 0" | 2' - 2 1/4" |
| 11.5" | 2' - 0 1/2" | 2' - 2 3/4" |

| TABLE 2 | | | | | |
|--|--------------|--------|--------|--------------|--------|
| M, N, P, Q AND S DIMENSIONS | | | | | |
| | M | N | P | Q | S |
| 45" F-SHAPE CONCRETE BARRIER | 3' - 0 1/2" | 3 3/8" | 3 3/8" | 2' - 10 3/4" | 6 3/4" |
| 42" F-SHAPE CONCRETE BARRIER | 2' - 9 1/2" | 3 3/8" | 3 3/8" | 2' - 7 3/4" | 6 3/4" |
| 32" F-SHAPE CONCRETE BARRIER AND 32" SPLIT MEDIAN BARRIER | 1' - 11 1/2" | 4 1/2" | 2 1/4" | 1' - 9 3/4" | 6 3/4" |
| 50" SPLIT CONCRETE MEDIAN BARRIER | 3' - 5 1/2" | 2 1/2" | 4 1/8" | 3' - 3 3/4" | 6 3/4" |

REINFORCEMENT DETAILS

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.

NOTES:

FOR NOTES, SEE SHEET 1.

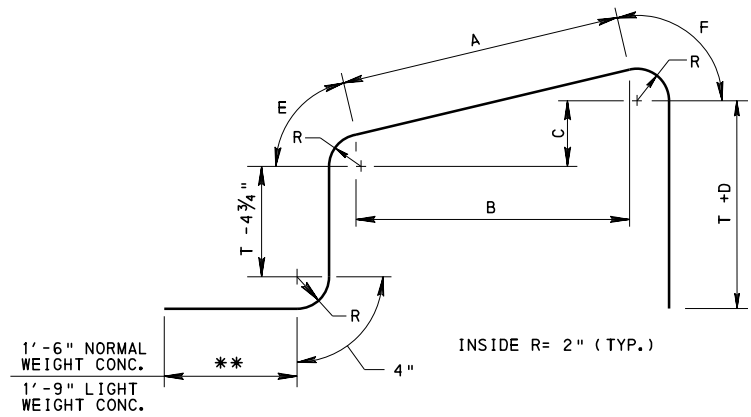
**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY**

**STANDARD
CONCRETE DECK SLAB
DESIGN & DETAILS
FOR BEAM BRIDGES**

RECOMMENDED FEB. 19, 2021
Thomas P. Mociore
CHIEF BRIDGE ENGINEER

RECOMMENDED FEB. 19, 2021
Bruce S. Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

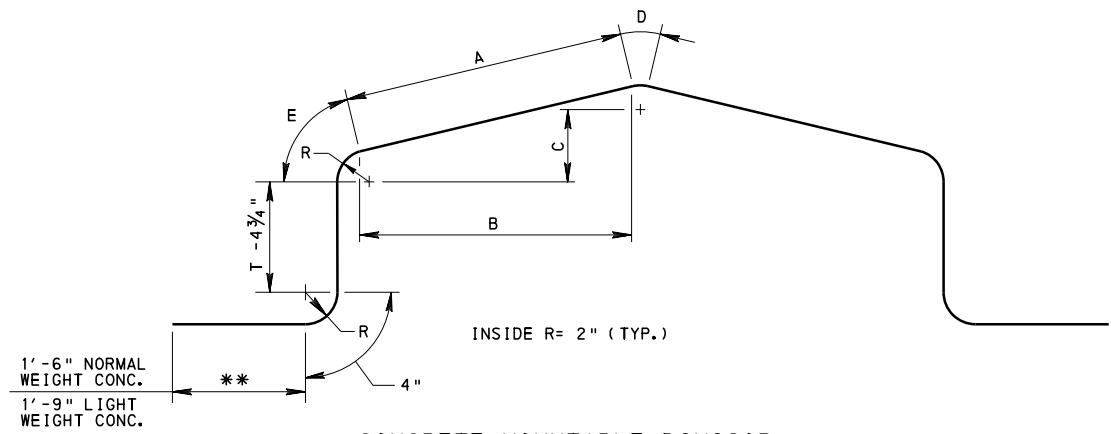
SHEET 7 OF 12
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SPLIT CONCRETE MOUNTABLE DIVISOR
(FOR DIMENSIONS A, B, C, D, E AND F, SEE TABLE 3)

| TABLE 3 | | | | | | |
|--------------------------------|---------|---------|--------|--------|--------|--------|
| A, B, C, D, E AND F DIMENSIONS | | | | | | |
| SPLIT DIVISORS | A | B | C | D | E | F |
| TYPE A | 15 1/4" | 15" | 3" | 5/8" | 3 1/2" | 4 1/4" |
| TYPE B | 15 3/4" | 15 1/4" | 4 1/4" | 1 1/2" | 3 1/4" | 4 1/2" |

(WHERE WIDER THAN SHOWN DIVISORS ARE USED, PROVIDE WIDTH AND A, B, C AND D DIMENSIONS)



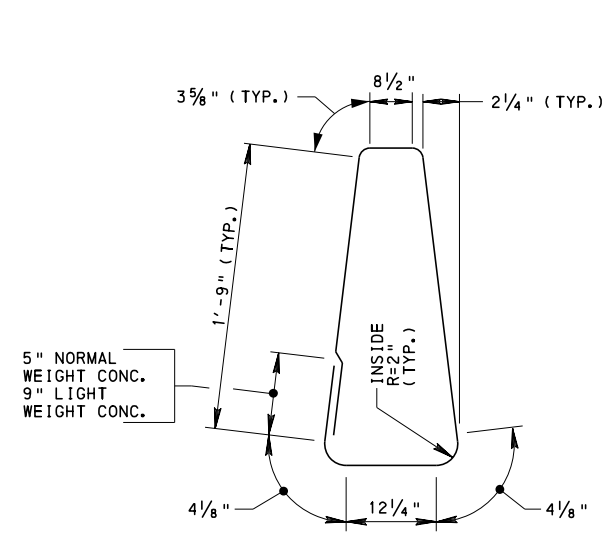
CONCRETE MOUNTABLE DIVISOR
(FOR DIMENSIONS A, B, C, D, AND E, SEE TABLE 4)

| TABLE 4 | | | | | |
|------------------------------|---------|---------|--------|------|--------|
| A, B, C, D, AND E DIMENSIONS | | | | | |
| DIVISORS | A | B | C | D | E |
| TYPE A | 19 3/4" | 19 1/2" | 4 1/4" | 1/2" | 3 1/2" |
| TYPE B | 20 1/4" | 20" | 5 1/4" | 1/2" | 3 3/8" |

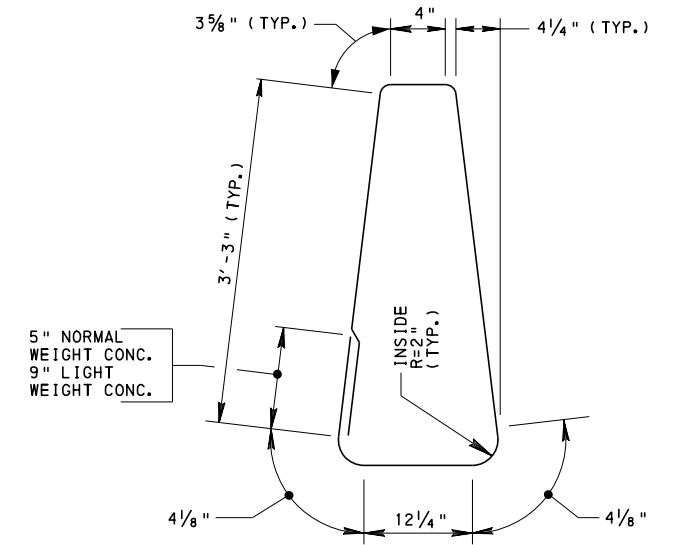
(WHERE WIDER THAN SHOWN DIVISORS ARE USED, PROVIDE WIDTH AND A, B, AND C DIMENSIONS)

REINFORCEMENT DETAILS

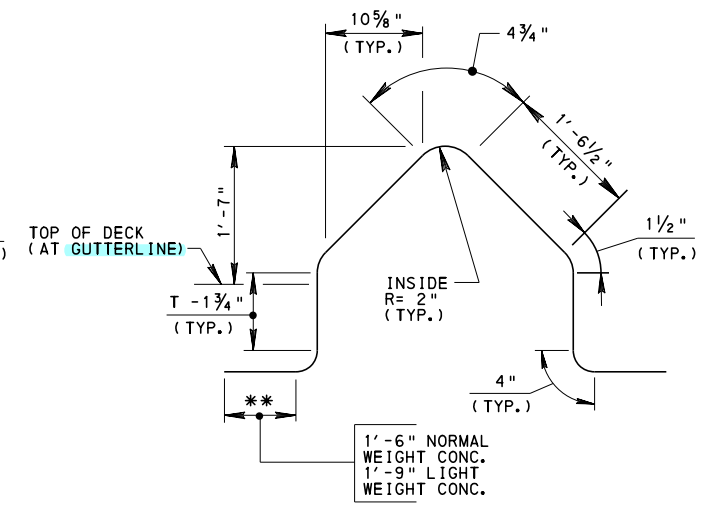
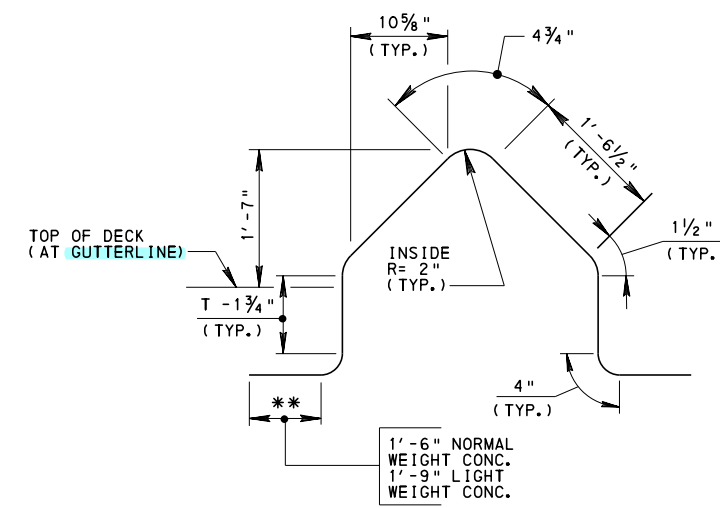
** WHEN THE DECK IS SLOPED AWAY FROM THE GUTTERLINE SLOPE LEG TO MATCH DECK CROSS-SLOPE. DESIGNER TO PROVIDE NECESSARY DIMENSIONS.



32" CONCRETE MEDIAN BARRIER



50" CONCRETE MEDIAN BARRIER



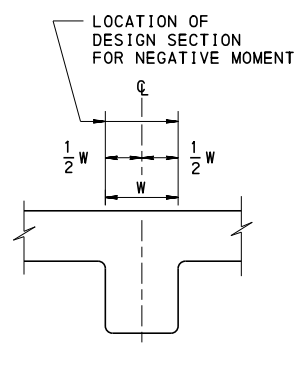
NOTES:
FOR NOTES, SEE SHEET 1.

- 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.

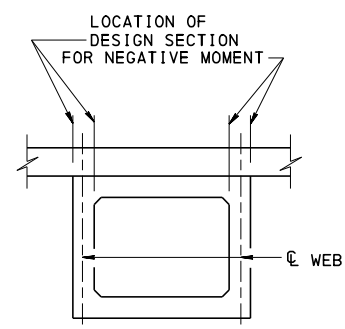
COMMONWEALTH OF PENNSYLVANIA
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STANDARD
CONCRETE DECK SLAB
DESIGN & DETAILS
FOR BEAM BRIDGES

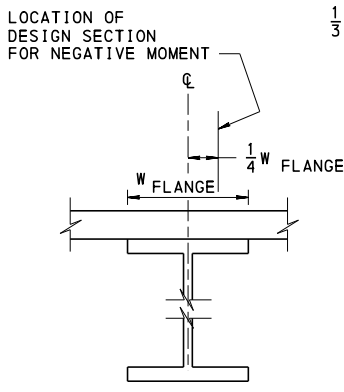
| | | |
|--|---|---------------------------------|
| RECOMMENDED FEB. 19, 2021 <i>Thomas P. Mociore</i> CHIEF BRIDGE ENGINEER | RECOMMENDED FEB. 19, 2021 <i>Bruce S. Thompson</i> DIRECTOR, BUR. OF PROJECT DELIVERY | SHEET 8 OF 12 BD-601M |
|--|---|---------------------------------|



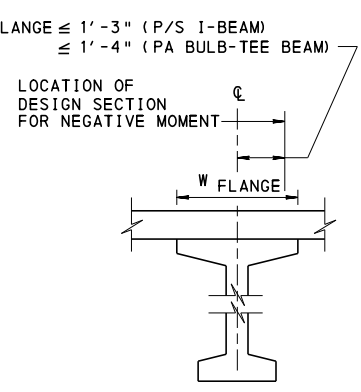
MONOLITHIC CONSTRUCTION



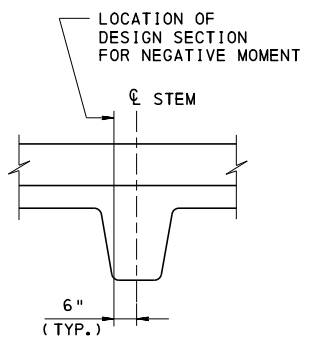
P/S CONCRETE BOX BEAMS*
*TREAT EACH WEB OF A BOX BEAM AS A SEPARATE RECTANGULAR BEAM.



STEEL BEAMS



P/S CONCRETE I BEAMS & PA BULB-TEE BEAMS



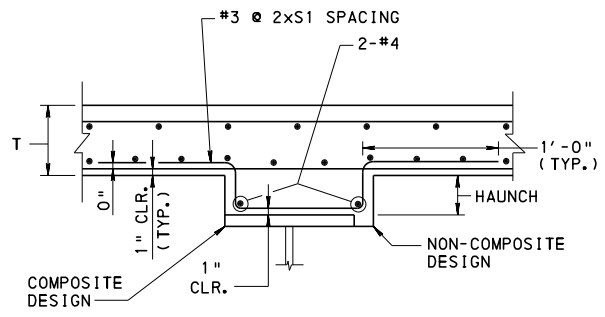
NEXT BEAMS

LOCATION OF DESIGN SECTION FOR NEGATIVE MOMENT IN DECK SLABS

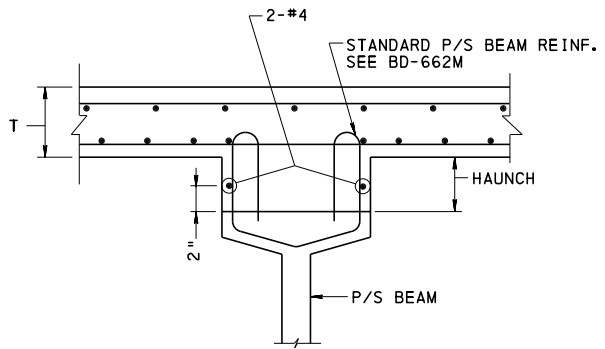
| TABLE 1: MINIMUM HAUNCH THICKNESSES | |
|---|------|
| STEEL I-BEAMS AND PLATE GIRDERS | |
| PLAN CAMBER | H |
| UP TO 1/2" | 1/2" |
| OVER 1/2" TO 3" | 3/4" |
| OVER 3" | 1" |
| P/S CONC. I-BEAMS, PA BULB-TEE AND SPREAD BOX BEAMS | |
| PLAN CAMBER | H |
| ALL | 1/2" |

1. "T" IS THE DECK THICKNESS AS INDICATED ON SHEETS 2, 3 AND 4.
 2. PROVIDE THE SPECIFIED MINIMUM HAUNCH THICKNESSES ALONG THE FULL LENGTH OF BEAMS, INCLUDING SPLICE PLATE REGIONS OF STEEL BEAM BRIDGES.
 3. "A" IS THE DIMENSION FROM TOP OF DECK TO TOP OF BEAM AT THE CENTERLINE OF BEAM. INCLUDE THE FOLLOWING WHEN DETERMINING DIMENSION "A":

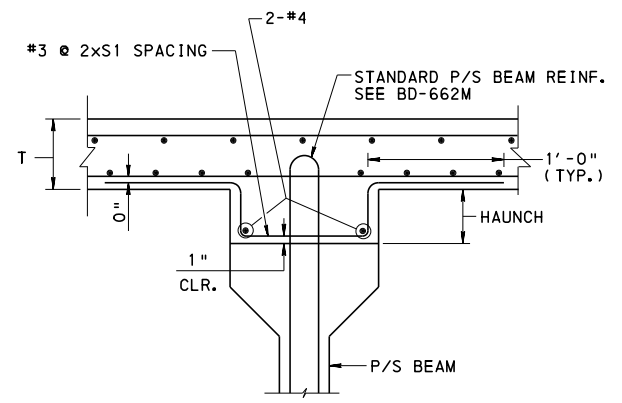
- DECK THICKNESS, "T"
- MINIMUM HAUNCH THICKNESS, "H"
- EFFECT OF DECK CROSS SLOPE



STEEL BEAMS
 PROVIDE WHEN HAUNCH THICKNESS IS 3" OR GREATER ANYWHERE ACROSS WIDTH OF HAUNCH
 FOR DECK TOP REINFORCEMENT MAT: TRANSVERSE BARS SHOWN ON TOP, SIMILAR WHEN LONGITUDINAL BARS ON TOP.



AASHTO TYPE P/S CONC. I-BEAM (P/S SPREAD BOX BEAM SIMILAR)
 PROVIDE WHEN HAUNCH THICKNESS IS 5" OR GREATER ANYWHERE ACROSS WIDTH OF HAUNCH
 FOR DECK TOP REINFORCEMENT MAT: TRANSVERSE BARS SHOWN ON TOP, SIMILAR WHEN LONGITUDINAL BARS ON TOP.



P/S CONC. PA I-BEAM & PA BULB-TEE BEAMS
 PROVIDE WHEN SIP FORMS ARE PRESENT AND HAUNCH THICKNESS IS 5" OR GREATER ANYWHERE ACROSS WIDTH OF HAUNCH OR WHEN SIP FORMS ARE NOT PRESENT AND THE HAUNCH THICKNESS IS 3" OR GREATER ANYWHERE ACROSS WIDTH OF HAUNCH.
 FOR DECK TOP REINFORCEMENT MAT: TRANSVERSE BARS SHOWN ON TOP, SIMILAR WHEN LONGITUDINAL BARS ON TOP.

HAUNCH REINFORCEMENT DETAILS

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/GIRDER ON THE SLAB PLAN OR ON ANOTHER APPROPRIATE DETAIL.
4. INCLUDE ONE OF THE FOLLOWING NOTES ON THE PLANS:

WHEN HAUNCH REINFORCEMENT IS REQUIRED

"THE HAUNCH REINFORCEMENT QUANTITY SHOWN ON THE REINFORCEMENT BAR SCHEDULE PROVIDES THE AMOUNT NECESSARY TO COVER THE LIMITS SHOWN ON SHEET **. PROVIDE ADDITIONAL HAUNCH REINFORCEMENT IN OTHER REGIONS ALONG THE LENGTH OF THE BEAM WHERE ACTUAL HAUNCHES EXCEED THE THICKNESSES SPECIFIED IN BC-752M."

** PROVIDE APPROPRIATE SHEET NUMBER(S).

WHEN HAUNCH REINFORCEMENT IS NOT REQUIRED BASED ON COMPUTED BEAM CAMBERS

"BEAM HAUNCH REINFORCEMENT WAS NOT DETERMINED TO BE REQUIRED FOR THE COMPUTED BEAM CAMBERS. HOWEVER, PROVIDE HAUNCH REINFORCEMENT IN ACCORDANCE WITH BC-752M WHERE IRREGULAR BEAM CAMBERS OR OTHER CONSTRUCTION CONDITIONS PROVIDE ACTUAL HAUNCHES THAT EXCEED THE THICKNESSES SPECIFIED IN BC-752M."

NOTES:
 FOR NOTES, SEE SHEET 1.

COMMONWEALTH OF PENNSYLVANIA
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF PROJECT DELIVERY

STANDARD
 CONCRETE DECK SLAB
 DESIGN & DETAILS
 FOR BEAM BRIDGES

RECOMMENDED FEB. 19, 2021
 Thomas P. Mociore
 CHIEF BRIDGE ENGINEER

RECOMMENDED FEB. 19, 2021
 Bruce Thompson
 DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 9 OF 12
 BD-601M

TABLE 1: DISTANCE FROM DESIGN SECTION FOR NEGATIVE MOMENT TO CENTERLINE OF BEAM = 0 IN.

USE FOR:
 * PRECAST PRESTRESSED SPREAD BOX BEAMS
 * PLANK BEAMS
 * STEEL I-BEAMS WITH TOP FLANGE WIDTH < 12"

| S | T (in.) | S1 | S2 | S3 | S7+ | So | L | NOTES |
|--------|---------|-----------|------------|------------|------|--------|--------|-------|
| 4'-3" | 8 | #5 @9-1/2 | #5 @11-1/2 | #4 @9 | 1 #6 | 2'-8" | 3'-1" | |
| 4'-7" | 8 | #5 @9-1/2 | #5 @10 | #4 @9 | 1 #5 | 2'-10" | 3'-1" | |
| 4'-11" | 8 | #5 @9 | #5 @9 | #4 @9 | 1 #5 | 3'-1" | 2'-10" | |
| 5'-2" | 8 | #5 @9 | #5 @8 | #4 @9 | 1 #4 | 3'-3" | 2'-10" | |
| 5'-6" | 8 | #5 @9 | #5 @7-1/2 | #4 @8-1/2 | 1 #4 | 3'-5" | 2'-10" | |
| 5'-10" | 8 | #5 @9 | #5 @7 | #4 @8-1/2 | 1 #4 | 3'-8" | 2'-5" | |
| 6'-2" | 8 | #5 @8-1/2 | #5 @6-1/2 | #4 @8 | 1 #4 | 3'-10" | 2'-6" | |
| 6'-6" | 8 | #5 @8 | #5 @6 | #4 @7-1/2 | 1 #4 | 4'-1" | 2'-4" | |
| 6'-10" | 8 | #5 @8 | #5 @5-1/2 | #4 @7-1/2 | 1 #4 | 4'-3" | 2'-3" | |
| 7'-2" | 8 | #5 @7-1/2 | #5 @5-1/2 | #5 @11 | 1 #4 | 4'-5" | 2'-3" | |
| 7'-6" | 8 | #5 @7 | #5 @5-1/2 | #5 @11 | 1 #4 | 4'-5" | 2'-3" | |
| 7'-10" | 8 | #5 @7 | #5 @7 | #5 @10 | --- | 3'-9" | --- | B,C |
| 8'-2" | 8 | #5 @7 | #5 @7 | #5 @10 | --- | 3'-9" | --- | B,C |
| 8'-6" | 8 | #5 @7 | #5 @7 | #5 @10 | --- | 3'-9" | --- | B,C |
| 8'-10" | 8 | #5 @6-1/2 | #5 @6-1/2 | #5 @9-1/2 | --- | 3'-10" | --- | B,C |
| 9'-2" | 8-1/2 | #5 @6-1/2 | #5 @7 | #5 @9-1/2 | --- | 3'-11" | --- | B,C |
| 9'-6" | 8-1/2 | #5 @6-1/2 | #5 @7 | #5 @9-1/2 | --- | 3'-11" | --- | B,C |
| 9'-10" | 8-1/2 | #5 @6 | #5 @6-1/2 | #5 @9 | --- | 4'-0" | --- | B,C |
| 10'-2" | 9 | #5 @6-1/2 | #5 @6-1/2 | #5 @9-1/2 | --- | 4'-3" | --- | B,C |
| 10'-5" | 9 | #5 @6 | #5 @6 | #5 @9 | --- | 4'-5" | --- | B,C |
| 10'-9" | 9 | #5 @6 | #5 @6 | #5 @9 | --- | 4'-5" | --- | B,C |
| 11'-1" | 9-1/2 | #5 @6 | #5 @6 | #5 @9 | --- | 4'-7" | --- | B,C |
| 11'-5" | 9-1/2 | #5 @6 | #5 @5-1/2 | #5 @9 | --- | 4'-10" | --- | B,C |
| 11'-9" | 9-1/2 | #5 @6 | #5 @5-1/2 | #5 @9-1/2 | --- | 4'-10" | --- | B,C |
| 12'-1" | 9-1/2 | #5 @6 | #5 @5-1/2 | #5 @9-1/2 | --- | 4'-10" | --- | B,C |
| 12'-5" | 10 | #5 @6 | #5 @5-1/2 | #5 @9-1/2 | --- | 5'-2" | --- | B,C |
| 12'-9" | 10 | #5 @6 | #5 @5-1/2 | #5 @10 | --- | 5'-2" | --- | B,C |
| 13'-1" | 10-1/2 | #5 @6 | #5 @5-1/2 | #5 @10 | --- | 5'-5" | --- | B,C |
| 13'-5" | 10-1/2 | #5 @6 | #5 @5-1/2 | #5 @10 | --- | 5'-5" | --- | B,C |
| 13'-9" | 11 | #5 @6 | #5 @5-1/2 | #5 @10-1/2 | --- | 5'-8" | --- | B,C |
| 14'-1" | 11-1/2 | #5 @6-1/2 | #5 @5-1/2 | #5 @11 | --- | 6'-0" | --- | |
| 14'-5" | 11-1/2 | #5 @6 | #5 @5-1/2 | #5 @10-1/2 | --- | 6'-0" | --- | |
| 14'-9" | 11-1/2 | #5 @6-1/2 | #5 @5-1/2 | #5 @11 | --- | 6'-0" | --- | |
| 15'-1" | 11-1/2 | #5 @6 | #5 @5-1/2 | #5 @11 | --- | 6'-0" | --- | |

TABLE 2: DISTANCE FROM DESIGN SECTION FOR NEGATIVE MOMENT TO CENTERLINE OF BEAM = 3 IN.

USE FOR:
 * PRECAST PRESTRESSED I-BEAMS WITH TOP FLANGE WIDTH < 18"
 * STEEL I-BEAMS WHEN: 12" ≤ TOP FLANGE WIDTH < 24"

| S | T (in.) | S1 | S2 | S3 | S7+ | So | L | NOTES |
|--------|---------|-----------|------------|------------|------|--------|--------|-------|
| 4'-3" | 8 | #5 @9-1/2 | #5 @11-1/2 | #4 @9 | 1 #6 | 2'-8" | 3'-0" | |
| 4'-7" | 8 | #5 @9-1/2 | #5 @11 | #4 @9 | 1 #6 | 2'-10" | 3'-2" | |
| 4'-11" | 8 | #5 @9 | #5 @10 | #4 @9 | 1 #5 | 3'-1" | 2'-10" | |
| 5'-2" | 8 | #5 @9 | #5 @9 | #4 @9 | 1 #5 | 3'-3" | 2'-11" | |
| 5'-6" | 8 | #5 @9 | #5 @8-1/2 | #4 @8-1/2 | 1 #4 | 3'-5" | 3'-0" | |
| 5'-10" | 8 | #5 @9 | #5 @8 | #4 @8-1/2 | 1 #4 | 3'-8" | 2'-9" | |
| 6'-2" | 8 | #5 @8-1/2 | #5 @7-1/2 | #4 @8 | 1 #4 | 3'-10" | 2'-8" | |
| 6'-6" | 8 | #5 @8 | #5 @7 | #4 @7-1/2 | 1 #4 | 4'-1" | 2'-8" | |
| 6'-10" | 8 | #5 @8 | #5 @7 | #4 @7-1/2 | 1 #4 | 4'-2" | 2'-8" | A,C |
| 7'-2" | 8 | #5 @7-1/2 | #5 @6-1/2 | #5 @11 | 1 #4 | 4'-4" | 2'-6" | A,C |
| 7'-6" | 8 | #5 @7 | #5 @6 | #5 @11 | 1 #4 | 4'-6" | 2'-6" | A,C |
| 7'-10" | 8 | #5 @7 | #5 @5-1/2 | #5 @10 | 1 #4 | 4'-8" | 2'-6" | A,C |
| 8'-2" | 8 | #5 @7 | #5 @5-1/2 | #5 @10 | 1 #4 | 4'-8" | 2'-6" | A,C |
| 8'-6" | 8 | #5 @7 | #5 @5-1/2 | #5 @10 | 1 #4 | 4'-8" | 2'-6" | A,C |
| 8'-10" | 8 | #5 @6-1/2 | #5 @5-1/2 | #5 @9-1/2 | 1 #4 | 4'-8" | 2'-4" | A,C |
| 9'-2" | 8 | #5 @6 | #5 @5-1/2 | #5 @9 | 1 #4 | 4'-8" | 2'-4" | A,C |
| 9'-6" | 8-1/2 | #5 @6-1/2 | #5 @5-1/2 | #5 @9-1/2 | --- | 4'-0" | --- | B,C |
| 9'-10" | 8-1/2 | #5 @6 | #5 @5-1/2 | #5 @9 | --- | 4'-0" | --- | B,C |
| 10'-2" | 8-1/2 | #5 @6 | #5 @6 | #5 @9 | --- | 4'-2" | --- | B,C |
| 10'-5" | 9 | #5 @6 | #5 @7 | #5 @9 | --- | 4'-4" | --- | B,C |
| 10'-9" | 9 | #5 @6 | #5 @6-1/2 | #5 @9 | --- | 4'-6" | --- | B,C |
| 11'-1" | 9 | #5 @5-1/2 | #5 @6 | #5 @8-1/2 | --- | 4'-8" | --- | B,C |
| 11'-5" | 9-1/2 | #5 @6 | #5 @6-1/2 | #5 @9 | --- | 4'-8" | --- | B,C |
| 11'-9" | 9-1/2 | #5 @6 | #5 @6 | #5 @9 | --- | 4'-11" | --- | B,C |
| 12'-1" | 9-1/2 | #5 @5-1/2 | #5 @5-1/2 | #5 @9 | --- | 5'-2" | --- | B,C |
| 12'-5" | 9-1/2 | #5 @6 | #5 @5-1/2 | #5 @9-1/2 | --- | 5'-2" | --- | B,C |
| 12'-9" | 9-1/2 | #5 @5-1/2 | #5 @5-1/2 | #5 @9 | --- | 5'-2" | --- | B,C |
| 13'-1" | 9-1/2 | #5 @5-1/2 | #5 @5-1/2 | #5 @9 | --- | 5'-2" | --- | B,C |
| 13'-5" | 10 | #5 @5-1/2 | #5 @5-1/2 | #5 @9 | --- | 5'-6" | --- | B,C |
| 13'-9" | 10-1/2 | #5 @6 | #5 @5-1/2 | #5 @10 | --- | 5'-9" | --- | B,C |
| 14'-1" | 10-1/2 | #5 @5-1/2 | #5 @5-1/2 | #5 @9-1/2 | --- | 5'-9" | --- | B,C |
| 14'-5" | 11 | #5 @6 | #5 @5-1/2 | #5 @10-1/2 | --- | 6'-0" | --- | |
| 14'-9" | 11 | #5 @5-1/2 | #5 @5-1/2 | #5 @9-1/2 | --- | 6'-0" | --- | |
| 15'-1" | 11-1/2 | #5 @6 | #5 @5-1/2 | #5 @10-1/2 | --- | 6'-0" | --- | |

TABLE 3: DISTANCE FROM DESIGN SECTION FOR NEGATIVE MOMENT TO CENTERLINE OF BEAM = 6 IN.

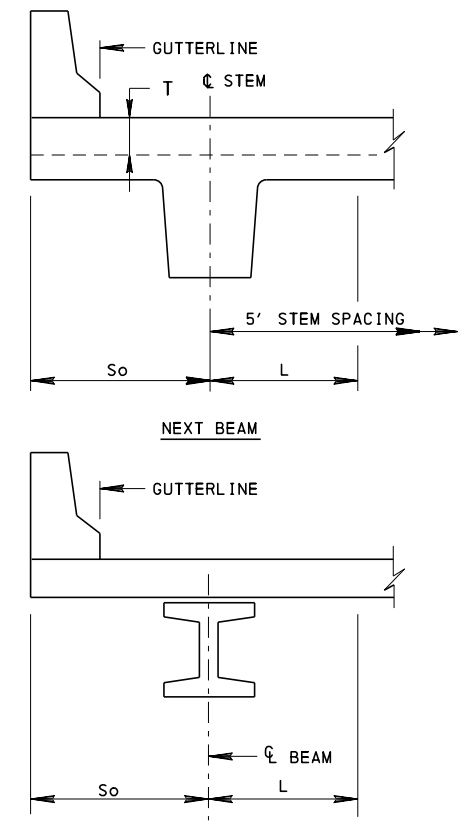
USE FOR:
 * PRECAST PRESTRESSED I-BEAMS WHEN: 18" < TOP FLANGE WIDTH < 36"
 * STEEL I-BEAMS WHEN: 24" ≤ TOP FLANGE WIDTH < 48"
 * NEXT BEAMS

| S | T (in.) | S1 | S2 | S3 | S7+ | So | L | NOTES |
|--------|---------|-----------|------------|-----------|------|--------|--------|-------|
| 4'-3" | 8 | #5 @9-1/2 | #5 @11-1/2 | #4 @9 | 1 #6 | 2'-8" | 3'-3" | |
| 4'-7" | 8 | #5 @9-1/2 | #5 @11-1/2 | #4 @9 | 1 #6 | 2'-10" | 3'-3" | |
| 4'-11" | 8 | #5 @9 | #5 @11-1/2 | #4 @9 | 1 #6 | 3'-1" | 3'-4" | |
| 5'-2" | 8 | #5 @9 | #5 @11 | #4 @9 | 1 #6 | 3'-3" | 3'-6" | |
| 5'-6" | 8 | #5 @9 | #5 @10 | #4 @8-1/2 | 1 #5 | 3'-5" | 3'-2" | |
| 5'-10" | 8 | #5 @9 | #5 @9 | #4 @8-1/2 | 1 #5 | 3'-8" | 3'-2" | |
| 6'-2" | 8 | #5 @8-1/2 | #5 @9 | #4 @8 | 1 #5 | 3'-10" | 3'-2" | |
| 6'-6" | 8 | #5 @8 | #5 @8-1/2 | #4 @7-1/2 | 1 #4 | 4'-0" | 3'-1" | |
| 6'-10" | 8 | #5 @8 | #5 @8 | #4 @7-1/2 | 1 #4 | 4'-2" | 3'-0" | |
| 7'-2" | 8 | #5 @7-1/2 | #5 @7-1/2 | #5 @11 | 1 #4 | 4'-3" | 3'-0" | A,C |
| 7'-6" | 8 | #5 @7 | #5 @7 | #5 @11 | 1 #4 | 4'-5" | 3'-0" | A,C |
| 7'-10" | 8 | #5 @7 | #5 @7 | #5 @10 | 1 #4 | 4'-5" | 3'-0" | A,C |
| 8'-2" | 8 | #5 @7 | #5 @7 | #5 @10 | 1 #4 | 4'-5" | 2'-11" | A,C |
| 8'-6" | 8 | #5 @7 | #5 @6-1/2 | #5 @10 | 1 #4 | 4'-7" | 2'-9" | A,C |
| 8'-10" | 8 | #5 @6-1/2 | #5 @6-1/2 | #5 @9-1/2 | 1 #4 | 4'-7" | 2'-11" | A,C |
| 9'-2" | 8 | #5 @6 | #5 @6 | #5 @9 | 1 #4 | 4'-10" | 2'-9" | A,C |
| 9'-6" | 8 | #5 @6 | #5 @5-1/2 | #5 @9 | 1 #4 | 5'-0" | 2'-9" | A,C |
| 9'-10" | 8 | #5 @5-1/2 | #5 @5-1/2 | #5 @8-1/2 | 1 #4 | 5'-0" | 2'-9" | A,C |
| 10'-2" | 8-1/2 | #5 @6 | #5 @5-1/2 | #5 @9 | --- | 4'-3" | --- | B,C |
| 10'-5" | 8-1/2 | #5 @5-1/2 | #5 @5-1/2 | #5 @8-1/2 | --- | 4'-3" | --- | B,C |
| 10'-9" | 8-1/2 | #5 @5-1/2 | #5 @6 | #5 @8-1/2 | --- | 4'-5" | --- | B,C |
| 11'-1" | 9 | #5 @5-1/2 | #5 @6 | #5 @8-1/2 | --- | 4'-7" | --- | B,C |
| 11'-5" | 9 | #5 @5-1/2 | #5 @6-1/2 | #5 @8-1/2 | --- | 4'-9" | --- | B,C |
| 11'-9" | 9 | #5 @5-1/2 | #5 @6-1/2 | #5 @8-1/2 | --- | 4'-9" | --- | B,C |
| 12'-1" | 9-1/2 | #5 @5-1/2 | #5 @6 | #5 @8-1/2 | --- | 5'-3" | --- | B,C |
| 12'-5" | 9-1/2 | #5 @5-1/2 | #5 @6-1/2 | #5 @9 | --- | 5'-6" | --- | B,C |
| 12'-9" | 9-1/2 | #5 @5-1/2 | #5 @6-1/2 | #5 @8 | --- | 5'-6" | --- | B,C |
| 13'-1" | 9-1/2 | #5 @5-1/2 | #5 @6-1/2 | #5 @9 | --- | 5'-6" | --- | B,C |
| 13'-5" | 9-1/2 | #5 @5-1/2 | #5 @6-1/2 | #5 @8-1/2 | --- | 5'-6" | --- | B,C |
| 13'-9" | 9-1/2 | #5 @5-1/2 | #5 @6-1/2 | #5 @8-1/2 | --- | 5'-6" | --- | B,C |
| 14'-1" | 10 | #5 @5-1/2 | #5 @6-1/2 | #5 @9 | --- | 5'-10" | --- | B,C |
| 14'-5" | 10 | #5 @5-1/2 | #5 @6-1/2 | #5 @9 | --- | 5'-10" | --- | B,C |
| 14'-9" | 10-1/2 | #5 @5-1/2 | #5 @6-1/2 | #5 @9 | --- | 6'-0" | --- | B,C |
| 15'-1" | 10-1/2 | #5 @5-1/2 | #5 @6-1/2 | #5 @9 | --- | 6'-0" | --- | |

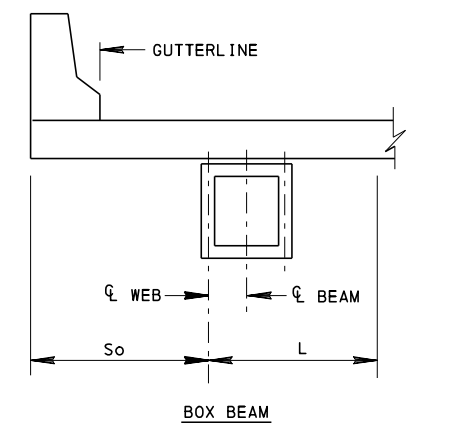
TABLE 4: DISTANCE FROM DESIGN SECTION FOR NEGATIVE MOMENT TO CENTERLINE OF BEAM = 12 IN.

USE FOR:
 * PRECAST PRESTRESSED PA BULB-TEE AND I-BEAMS WITH TOP FLANGE WIDTH ≥ 36"
 * STEEL I-BEAMS OR STEEL CLOSED BOXES WITH TOP FLANGE WIDTH ≥ 48"

| S | T (in.) | S1 | S2 | S3 | S7+ | So | L | NOTES |
|--------|---------|-----------|------------|-----------|------|--------|--------|-------|
| 4'-3" | 8 | #5 @9-1/2 | #5 @11-1/2 | #4 @9 | 1 #6 | 2'-8" | 3'-9" | |
| 4'-7" | 8 | #5 @9-1/2 | #5 @11-1/2 | #4 @9 | 1 #6 | 2'-10" | 3'-9" | |
| 4'-11" | 8 | #5 @9 | #5 @11-1/2 | #4 @9 | 1 #6 | 3'-1" | 3'-9" | |
| 5'-2" | 8 | #5 @9 | #5 @11-1/2 | #4 @9 | 1 #6 | 3'-3" | 3'-9" | |
| 5'-6" | 8 | #5 @9 | #5 @11-1/2 | #4 @8-1/2 | 1 #6 | 3'-5" | 3'-9" | |
| 5'-10" | 8 | #5 @9 | #5 @11-1/2 | #4 @8-1/2 | 1 #6 | 3'-8" | 3'-10" | |
| 6'-2" | 8 | #5 @8-1/2 | #5 @11-1/2 | #4 @8 | 1 #6 | 3'-10" | 3'-11" | |
| 6'-6" | 8 | #5 @8 | #5 @11-1/2 | #4 @7-1/2 | 1 #6 | 4'-1" | 4'-1" | |
| 6'-10" | 8 | #5 @8 | #5 @11 | #4 @7-1/2 | 1 #6 | 4'-3" | 4'-0" | |
| 7'-2" | 8 | #5 @7-1/2 | #5 @11 | #5 @11 | 1 #5 | 4'-6" | 4'-0" | |
| 7'-6" | 8 | #5 @7 | #5 @10 | #5 @11 | 1 #5 | 4'-8" | 3'-10" | |
| 7'-10" | 8 | #5 @7 | #5 @9-1/2 | #5 @10 | 1 #5 | 4'-10" | 3'-10" | |
| 8'-2" | 8 | #5 @7 | #5 @9 | #5 @10 | 1 #5 | 4'-11" | 3'-10" | |
| 8'-6" | 8 | #5 @7 | #5 @9 | #5 @10 | 1 #5 | 4'-11" | 3'-10" | |
| 8'-10" | 8 | #5 @6-1/2 | #5 @8-1/2 | #5 @9-1/2 | 1 #4 | 4'-8" | 3'-9" | |
| 9'-2" | 8 | #5 @6 | #5 @8 | #5 @9 | 1 #4 | 4'-10" | 3'-8" | |
| 9'-6" | 8 | #5 @6 | #5 @7-1/2 | #5 @9 | 1 #4 | 4'-11" | 3'-5" | A,C |
| 9'-10" | 8 | #5 @5-1/2 | #5 @7 | #5 @8-1/2 | 1 #4 | 5'-1" | 3'-5" | A,C |
| 10'-2" | 8-1/2 | #5 @5-1/2 | #5 @7 | #5 @8-1/2 | 1 #4 | 5'-1" | 3'-4" | A,C |
| 10'-5" | 8 | #5 @5-1/2 | #5 @6-1/2 | #5 @7-1/2 | 1 #4 | 5'-4" | 4'-0" | A,C |
| 10'-9" | 8-1/2 | #5 @5-1/2 | #5 @6 | #5 @7-1/2 | 1 #4 | 5'-6" | 4'-0" | A,C |
| 11'-1" | 8-1/2 | #5 @5-1/2 | #5 @6 | #5 @7-1/2 | 1 #4 | 5'-10" | 4'-0" | A,C |
| 11'-5" | 8-1/2 | #5 @5-1/2 | #5 @5-1/2 | #5 @7-1/2 | --- | 4'-10" | --- | B,C |
| 11'-9" | 8-1/2 | #5 @5-1/2 | #5 @5-1/2 | #5 @7-1/2 | --- | 4'-10" | --- | B,C |
| 12'-1" | 9 | #5 @5-1/2 | #5 @5-1/2 | #5 @7-1/2 | --- | 5'-0" | --- | B,C |
| 12'-5" | 9 | #5 @5-1/2 | #5 @7 | #5 @7-1/2 | --- | 5'-3" | --- | B,C |
| 12'-9" | 9 | #5 @7 | #5 @7 | #5 @7 | --- | 5'-3" | --- | B,C |
| 13'-1" | 9-1/2 | #5 @5-1/2 | #5 @7 | #5 @8 | --- | 5'-5" | --- | B,C |
| 13'-5" | 9-1/2 | #5 @5-1/2 | #5 @6-1/2 | #5 @8 | --- | 5'-8" | --- | B,C |
| 13'-9" | 9-1/2 | #5 @7 | #5 @6 | #5 @7 | --- | 5'-10" | --- | B,C |
| 14'-1" | 9-1/2 | #5 @5-1/2 | #5 @6 | #5 @8-1/2 | --- | 5'-10" | --- | B,C |
| 14'-5" | 9-1/2 | #5 @7 | #5 @6 | #5 @7-1/2 | --- | 5'-10" | --- | B,C |
| 14'-9" | 9-1/2 | #5 @7 | #5 @5-1/2 | #5 @7-1/2 | --- | 6'-0" | --- | B,C |
| 15'-1" | 10 | #5 @7 | #5 @6 | #5 @7-1/2 | --- | 6'-0" | --- | |



STEEL I-BEAM, P/S I-BEAM AND PA BULB-TEE



BOX BEAM

THESE DESIGN TABLES ARE APPLICABLE TO SIMPLE SPAN SUPERSTRUCTURE PROJECTS ONLY.

DESIGN NOTES:

- BEAM SPACING, "S"
 - ALL EXCEPT SPREAD BOX BEAMS AND NEXT BEAMS:
 - SPREAD BOX BEAMS:
 - S = MAXIMUM BEAM SPACING, CENTERLINE TO CENTERLINE OF ADJACENT BEAMS
 - S = MAXIMUM BEAM SPACING - 2'-7" [36" WIDE BEAMS]
 - S = MAXIMUM BEAM SPACING - 3'-7" [48" WIDE BEAMS]
 - NEXT BEAMS:
 - S = 4'-3" FOR BEAM SPACING ≤ 10'-0" (BEAM WIDTH)
 - S = BEAM SPACING - 6'-0" FOR BEAM SPACING > 10'-0" (BEAM WIDTH)
 - WHERE S < 4'-3", USE S = 4'-3"
- "T" = TOTAL SLAB THICKNESS, INCLUDES 1/2" INTEGRAL WEARING SURFACE.
- OVERHANG LENGTH, "So"
 - FOR DEFINITION OF "So", SEE DETAILS THIS SHEET.
 - THE So VALUES SHOWN IN THE TABLES INDICATE THE MAXIMUM ALLOWABLE OVERHANG LENGTHS UTILIZING THE SPECIFIED REINFORCEMENT.
 - FOR SPLIT MEDIAN BARRIERS, REDUCE THE So VALUES LISTED IN THE TABLES BY 1".
 - SEE NOTES 24, 25 AND 26 ON SHEET 1 FOR ADDITIONAL LIMITATIONS.
- FOR LOCATION OF REINFORCEMENT BARS, SEE SHEETS 2, 3 AND 4. FOR LOCATION OF DIMENSION "L", SEE SHEETS 2, 3 AND 4.</

TABLE 1: DISTANCE FROM DESIGN SECTION FOR NEGATIVE MOMENT TO CENTERLINE OF BEAM = 0 IN.

USE FOR:
 * PRECAST PRESTRESSED SPREAD BOX BEAMS
 * PLANK BEAMS
 * STEEL I-BEAMS WITH TOP FLANGE WIDTH < 12"

| S | T (in.) | S1 | S2 | S3 | S3' | S6 | S7 | So | L | NOTES |
|--------|---------|-----------|-----------|------------|-------|---------|--------|--------|-------|-------|
| 4'-3" | 8 | #5 09-1/2 | #5 08-1/2 | #4 09 | #4 06 | #5 1 #6 | 2'-8" | 3'-5" | | |
| 4'-7" | 8 | #5 07 | #5 07-1/2 | #4 09 | #4 06 | #5 1 #5 | 2'-10" | 3'-1" | | |
| 4'-11" | 8 | #5 09 | #5 07 | #4 08-1/2 | #4 06 | #5 1 #5 | 3'-1" | 3'-0" | | |
| 5'-2" | 8 | #5 09 | #5 07 | #4 08-1/2 | #4 06 | #5 1 #5 | 3'-3" | 2'-11" | | |
| 5'-6" | 8 | #5 09 | #5 06-1/2 | #4 08-1/2 | #4 06 | #5 1 #5 | 3'-5" | 2'-11" | | |
| 5'-10" | 8 | #5 09 | #5 06-1/2 | #4 08-1/2 | #4 06 | #5 1 #5 | 3'-8" | 2'-11" | | |
| 6'-2" | 8 | #5 08-1/2 | #5 06 | #4 08 | #4 06 | #5 1 #5 | 3'-10" | 2'-11" | | |
| 6'-6" | 8 | #5 08 | #5 06 | #4 07-1/2 | #4 06 | #5 1 #5 | 4'-1" | 2'-11" | | |
| 6'-10" | 8 | #5 08 | #5 05-1/2 | #4 07-1/2 | #4 06 | #5 1 #5 | 4'-3" | 2'-11" | | |
| 7'-2" | 8-1/2 | #5 07-1/2 | #6 06-1/2 | #5 011 | #5 06 | #5 1 #5 | 4'-5" | 2'-11" | | |
| 7'-6" | 8-1/2 | #5 07 | #6 06-1/2 | #5 010 | #5 06 | #5 1 #5 | 4'-5" | 2'-11" | | |
| 7'-10" | 8-1/2 | #5 07 | #6 06 | #5 010 | #5 06 | #5 1 #4 | 3'-9" | 2'-5" | A,B,C | |
| 8'-2" | 8-1/2 | #5 07 | #6 06 | #5 010 | #5 06 | #5 1 #4 | 3'-9" | 2'-5" | A,B,C | |
| 8'-6" | 8-1/2 | #5 07 | #6 06 | #5 010 | #5 06 | #5 1 #4 | 3'-9" | 2'-5" | A,B,C | |
| 8'-10" | 8-1/2 | #5 06-1/2 | #6 06 | #5 09-1/2 | #5 06 | #5 1 #4 | 3'-10" | 2'-5" | A,B,C | |
| 9'-2" | 8-1/2 | #5 06-1/2 | #6 06 | #5 09-1/2 | #5 06 | #6 1 #4 | 3'-11" | 2'-5" | A,B,C | |
| 9'-6" | 8-1/2 | #5 06-1/2 | #6 06 | #5 09-1/2 | #5 06 | #6 1 #4 | 3'-11" | 2'-5" | A,B,C | |
| 9'-10" | 8-1/2 | #5 06 | #6 05-1/2 | #5 08-1/2 | #5 06 | #6 1 #4 | 4'-0" | 2'-5" | A,B,C | |
| 10'-2" | 9 | #5 06-1/2 | #6 06 | #5 09-1/2 | #5 06 | #6 1 #4 | 4'-3" | 2'-5" | A,B,C | |
| 10'-5" | 9 | #5 06 | #6 05-1/2 | #5 08-1/2 | #5 06 | #6 1 #4 | 4'-5" | 2'-5" | A,B,C | |
| 10'-9" | 9 | #5 06 | #6 05-1/2 | #5 08-1/2 | #5 06 | #6 1 #4 | 4'-5" | 2'-5" | A,B,C | |
| 11'-1" | 9-1/2 | #5 06 | #6 05-1/2 | #5 09 | #5 06 | #6 1 #4 | 4'-7" | 2'-5" | A,B,C | |
| 11'-5" | 9-1/2 | #5 06 | #6 05-1/2 | #5 09 | #5 06 | #6 1 #4 | 4'-10" | 2'-5" | A,B,C | |
| 11'-9" | 10 | #5 06 | #6 05-1/2 | #5 09 | #5 06 | #6 1 #4 | 4'-10" | 2'-5" | A,B,C | |
| 12'-1" | 10 | #5 06 | #6 05-1/2 | #5 09 | #5 06 | #6 1 #4 | 4'-10" | 2'-5" | A,B,C | |
| 12'-5" | 10-1/2 | #5 06 | #6 05-1/2 | #5 09-1/2 | #5 06 | #6 1 #4 | 5'-2" | 2'-5" | A,B,C | |
| 12'-9" | 10-1/2 | #5 06 | #6 05-1/2 | #5 09-1/2 | #5 06 | #6 1 #4 | 5'-2" | 2'-5" | A,B,C | |
| 13'-1" | 10-1/2 | #5 06 | #6 05-1/2 | #5 09-1/2 | #5 06 | #6 1 #4 | 5'-5" | 2'-5" | A,B,C | |
| 13'-5" | 11 | #5 06 | #6 05-1/2 | #5 09-1/2 | #5 06 | #6 1 #4 | 5'-8" | 2'-5" | A,B,C | |
| 13'-9" | 11 | #5 06 | #6 05-1/2 | #5 010 | #5 06 | #6 1 #4 | 5'-8" | 2'-5" | A,B,C | |
| 14'-1" | 11-1/2 | #5 06-1/2 | #6 05-1/2 | #5 011 | #5 06 | #6 1 #4 | 6'-0" | 2'-5" | A,B,C | |
| 14'-5" | 11-1/2 | #5 06 | #6 05-1/2 | #5 010 | #5 06 | #6 1 #4 | 6'-0" | 2'-5" | A,B,C | |
| 14'-9" | 12 | #5 06-1/2 | #6 05-1/2 | #5 011 | #5 06 | #6 1 #4 | 6'-0" | 2'-5" | A,B,C | |
| 15'-1" | 12 | #5 06 | #6 05-1/2 | #5 010-1/2 | #5 06 | #6 1 #4 | 6'-0" | 2'-5" | A,B,C | |

TABLE 2: DISTANCE FROM DESIGN SECTION FOR NEGATIVE MOMENT TO CENTERLINE OF BEAM = 3 IN.

USE FOR:
 * PRECAST PRESTRESSED I-BEAMS WITH TOP FLANGE WIDTH < 18"
 * STEEL I-BEAMS WHEN: 12" ≤ TOP FLANGE WIDTH < 24"

| S | T (in.) | S1 | S2 | S3 | S3' | S6 | S7 | So | L | NOTES |
|--------|---------|-----------|-----------|------------|-------|---------|--------|-------|-------|-------|
| 4'-3" | 8 | #5 09-1/2 | #5 09-1/2 | #4 09 | #4 06 | #5 1 #6 | 2'-8" | 3'-8" | | |
| 4'-7" | 8 | #5 09-1/2 | #5 09 | #4 09 | #4 06 | #5 1 #6 | 2'-10" | 3'-8" | | |
| 4'-11" | 8 | #5 09 | #5 08 | #4 08-1/2 | #4 06 | #5 1 #5 | 3'-1" | 3'-2" | | |
| 5'-2" | 8 | #5 09 | #5 08 | #4 08-1/2 | #4 06 | #5 1 #5 | 3'-3" | 3'-2" | | |
| 5'-6" | 8 | #5 09 | #5 07-1/2 | #4 08-1/2 | #4 06 | #5 1 #5 | 3'-5" | 3'-2" | | |
| 5'-10" | 8 | #5 09 | #5 07 | #4 08-1/2 | #4 06 | #5 1 #5 | 3'-8" | 3'-2" | | |
| 6'-2" | 8 | #5 08-1/2 | #5 06-1/2 | #4 08 | #4 06 | #5 1 #5 | 3'-10" | 3'-2" | | |
| 6'-6" | 8 | #5 08 | #5 06-1/2 | #4 07-1/2 | #4 06 | #5 1 #5 | 4'-1" | 3'-2" | | |
| 6'-10" | 8 | #5 08 | #5 06 | #4 07-1/2 | #4 06 | #5 1 #5 | 4'-3" | 3'-2" | | |
| 7'-2" | 8 | #5 07-1/2 | #5 05-1/2 | #5 011 | #5 06 | #5 1 #5 | 4'-5" | 3'-2" | | |
| 7'-6" | 8 | #5 07 | #5 05-1/2 | #5 010 | #5 06 | #5 1 #6 | 4'-6" | 3'-8" | | |
| 7'-10" | 8 | #5 07 | #5 05-1/2 | #5 010 | #5 06 | #5 1 #6 | 4'-8" | 3'-8" | | |
| 8'-2" | 8-1/2 | #5 07 | #5 05-1/2 | #5 010 | #5 06 | #5 1 #5 | 4'-8" | 3'-2" | | |
| 8'-6" | 8-1/2 | #5 07 | #5 05-1/2 | #5 010 | #5 06 | #5 1 #5 | 4'-8" | 3'-2" | | |
| 8'-10" | 8-1/2 | #5 06-1/2 | #5 05-1/2 | #5 09-1/2 | #5 06 | #5 1 #5 | 4'-8" | 3'-2" | | |
| 9'-2" | 8-1/2 | #5 06 | #5 05-1/2 | #5 08-1/2 | #5 06 | #5 1 #5 | 4'-8" | 3'-2" | | |
| 9'-6" | 9 | #5 06-1/2 | #5 05-1/2 | #5 09-1/2 | #5 06 | #6 1 #4 | 4'-0" | 2'-8" | A,B,C | |
| 9'-10" | 9 | #5 06 | #6 06-1/2 | #5 08-1/2 | #5 06 | #6 1 #4 | 4'-0" | 2'-8" | A,B | |
| 10'-2" | 9 | #5 06 | #6 06-1/2 | #5 08-1/2 | #5 06 | #6 1 #4 | 4'-2" | 2'-8" | A,B | |
| 10'-5" | 9 | #5 06 | #6 06 | #5 08-1/2 | #5 06 | #6 1 #4 | 4'-4" | 2'-8" | A,B,C | |
| 10'-9" | 9 | #5 06 | #6 06 | #5 08-1/2 | #5 06 | #6 1 #4 | 4'-4" | 2'-8" | A,B,C | |
| 11'-1" | 9 | #5 05-1/2 | #6 05-1/2 | #5 08 | #5 06 | #6 1 #4 | 4'-8" | 2'-8" | A,B,C | |
| 11'-5" | 9-1/2 | #5 06 | #6 06 | #5 09 | #5 06 | #6 1 #4 | 4'-8" | 2'-8" | A,B,C | |
| 11'-9" | 9-1/2 | #5 06 | #6 05-1/2 | #5 09 | #5 06 | #6 1 #4 | 4'-11" | 2'-8" | A,B,C | |
| 12'-1" | 10 | #5 05-1/2 | #6 05-1/2 | #5 08-1/2 | #5 06 | #6 1 #4 | 5'-2" | 2'-8" | A,B | |
| 12'-5" | 10 | #5 06 | #6 05-1/2 | #5 09-1/2 | #5 06 | #6 1 #4 | 5'-2" | 2'-8" | A,B,C | |
| 12'-9" | 10 | #5 05-1/2 | #6 05-1/2 | #5 08-1/2 | #5 06 | #6 1 #4 | 5'-2" | 2'-8" | A,B,C | |
| 13'-1" | 10-1/2 | #5 05-1/2 | #6 05-1/2 | #5 09 | #5 06 | #6 1 #4 | 5'-2" | 2'-8" | A,B,C | |
| 13'-5" | 10-1/2 | #5 05-1/2 | #6 05-1/2 | #5 09 | #5 06 | #6 1 #4 | 5'-6" | 2'-8" | A,B,C | |
| 13'-9" | 10-1/2 | #5 06 | #6 05-1/2 | #5 010 | #5 06 | #6 1 #4 | 5'-9" | 2'-8" | A,B,C | |
| 14'-1" | 11 | #5 05-1/2 | #6 05-1/2 | #5 09 | #5 06 | #6 1 #4 | 5'-9" | 2'-8" | A,B,C | |
| 14'-5" | 11 | #5 06 | #6 05-1/2 | #5 010 | #5 06 | #6 1 #4 | 6'-0" | 2'-8" | A,B,C | |
| 14'-9" | 11-1/2 | #5 05-1/2 | #6 05-1/2 | #5 09-1/2 | #5 06 | #6 1 #4 | 6'-0" | 2'-8" | A,B,C | |
| 15'-1" | 11-1/2 | #5 06 | #6 05-1/2 | #5 010-1/2 | #5 06 | #6 1 #4 | 6'-0" | 2'-8" | A,B,C | |

TABLE 3: DISTANCE FROM DESIGN SECTION FOR NEGATIVE MOMENT TO CENTERLINE OF BEAM = 6 IN.

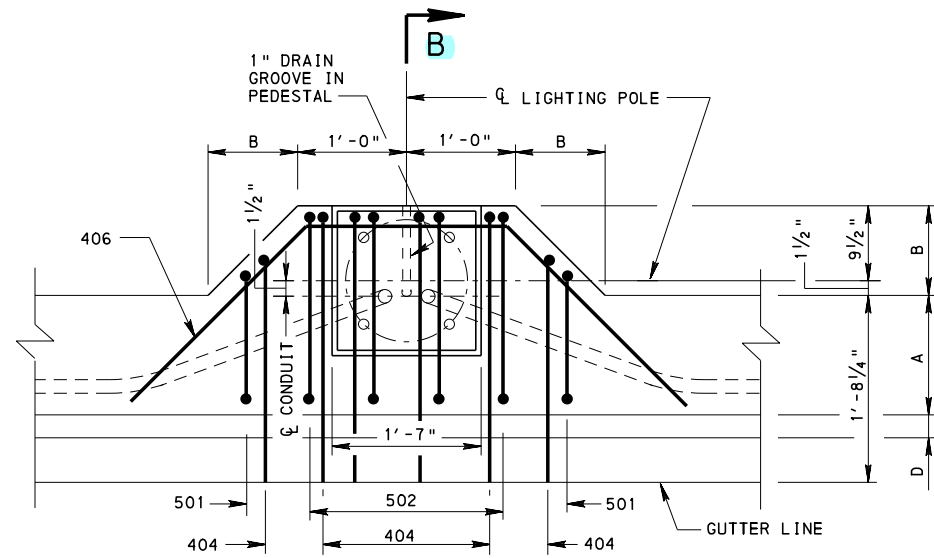
USE FOR:
 * PRECAST PRESTRESSED I-BEAMS WHEN: 18" < TOP FLANGE WIDTH < 36"
 * STEEL I-BEAMS WHEN: 24" ≤ TOP FLANGE WIDTH < 48"
 * NEXT BEAMS

| S | T (in.) | S1 | S2 | S3 | S3' | S6 | S7 | So | L | NOTES |
|--------|---------|-----------|------------|-----------|-------|---------|--------|-------|-------|-------|
| 4'-3" | 8 | #5 09-1/2 | #5 010-1/2 | #4 09 | #4 06 | #5 1 #6 | 2'-8" | 4'-2" | | |
| 4'-7" | 8 | #5 09-1/2 | #5 010 | #4 09 | #4 06 | #5 1 #6 | 2'-10" | 4'-2" | | |
| 4'-11" | 8 | #5 09 | #5 09-1/2 | #4 08-1/2 | #4 06 | #5 1 #6 | 3'-1" | 4'-2" | | |
| 5'-2" | 8 | #5 09 | #5 08-1/2 | #4 08-1/2 | #4 06 | #5 1 #5 | 3'-3" | 4'-2" | | |
| 5'-6" | 8 | #5 09 | #5 08 | #4 08-1/2 | #4 06 | #5 1 #5 | 3'-5" | 3'-8" | | |
| 5'-10" | 8 | #5 09 | #5 08 | #4 08-1/2 | #4 06 | #5 1 #5 | 3'-8" | 3'-8" | | |
| 6'-2" | 8 | #5 08-1/2 | #5 07-1/2 | #4 08 | #4 06 | #5 1 #5 | 3'-10" | 3'-8" | | |
| 6'-6" | 8 | #5 08 | #5 07 | #4 07-1/2 | #4 06 | #5 1 #5 | 4'-0" | 3'-8" | | |
| 6'-10" | 8 | #5 08 | #5 06-1/2 | #4 07-1/2 | #4 06 | #5 1 #5 | 4'-2" | 3'-8" | | |
| 7'-2" | 8 | #5 07-1/2 | #5 06 | #5 011 | #5 06 | #5 1 #5 | 4'-3" | 3'-8" | | |
| 7'-6" | 8 | #5 07 | #5 05-1/2 | #5 010 | #5 06 | #5 1 #5 | 4'-5" | 3'-8" | | |
| 7'-10" | 8 | #5 07 | #5 05-1/2 | #5 010 | #5 06 | #5 1 #5 | 4'-5" | 3'-8" | | |
| 8'-2" | 8 | #5 07 | #5 05-1/2 | #5 010 | #5 06 | #5 1 #5 | 4'-5" | 3'-8" | | |
| 8'-6" | 8 | #5 07 | #5 06 | #5 010 | #5 06 | #5 1 #6 | 4'-7" | 4'-2" | | |
| 8'-10" | 8 | #5 06-1/2 | #5 05-1/2 | #5 09-1/2 | #5 06 | #5 1 #6 | 4'-7" | 4'-2" | | |
| 9'-2" | 8-1/2 | #5 06 | #6 06 | #5 08-1/2 | #5 06 | #5 1 #6 | 4'-10" | 4'-2" | | |
| 9'-6" | 8-1/2 | #5 06 | #6 05-1/2 | #5 08-1/2 | #5 06 | #5 1 #5 | 5'-0" | 3'-8" | | |
| 9'-10" | 8-1/2 | #5 05-1/2 | #6 05-1/2 | #5 08 | #5 06 | #5 1 #5 | 5'-0" | 3'-8" | | |
| 10'-2" | 8-1/2 | #5 06 | #6 05-1/2 | #5 08-1/2 | #5 06 | #6 1 #4 | 4'-3" | 3'-2" | A,B,C | |
| 10'-5" | 8-1/2 | #5 05-1/2 | #6 05-1/2 | #5 08 | #5 06 | #6 1 #4 | 4'-3" | 3'-2" | A,B,C | |
| 10'-9" | 8-1/2 | #5 05-1/2 | #6 05-1/2 | #5 08 | #5 06 | #6 1 #4 | 4'-5" | 3'-2" | A,B | |
| 11'-1" | 9 | #5 05-1/2 | #6 06 | #5 08 | #5 06 | #6 1 #4 | 4'-7" | 3'-2" | A,B | |
| 11'-5" | 9 | #5 05-1/2 | #6 06 | #5 08 | #5 06 | #6 1 #4 | 4'-9" | 3'-2" | A,B | |
| 11'-9" | 9 | #5 05-1/2 | #6 05-1/2 | #5 08-1/2 | #5 06 | #6 1 #4 | 4'-9" | 3'-2" | A,B | |
| 12'-1" | 9-1/2 | #5 05-1/2 | #6 06 | #5 08-1/2 | #5 06 | #6 1 #4 | 4'-9" | 3'-2" | A,B | |
| 12'-5" | 9-1/2 | #5 05-1/2 | #6 05-1/2 | #5 08-1/2 | #5 06 | #6 1 #4 | 5'-6" | 3'-2" | A,B | |
| 12'-9" | 9-1/2 | #5 05-1/2 | #6 05-1/2 | #5 08 | #5 06 | #6 1 #4 | 5'-6" | 3'-2" | A,B | |
| 13'-1" | 10 | #5 05-1/2 | #6 05-1/2 | #5 09 | #5 06 | #6 1 #4 | 5'-6" | 3'-2" | A,B | |
| 13'-5" | 10 | #5 05-1/2 | #6 05-1/2 | #5 08-1/2 | #5 06 | #6 1 #4 | 5'-6" | 3'-2" | A,B | |
| 13'-9" | 10-1/2 | #5 05-1/2 | #6 05-1/2 | #5 08-1/2 | #5 06 | #6 1 #4 | 5'-6" | 3'-2" | A,B,C | |
| 14'-1" | 10-1/2 | #5 05-1/2 | #6 05-1/2 | #5 09 | #5 06 | #6 1 #4 | 5'-10" | 3'-2" | A,B | |
| 14'-5" | 10-1/2 | #5 05-1/2 | #6 05-1/2 | #5 09 | #5 06 | #6 1 #4 | 5'-10" | 3'-2" | A,B | |
| 14'-9" | 11 | #5 05-1/2 | #6 05-1/2 | #5 09 | #5 06 | #6 1 #4 | 6'-0" | 3'-2" | A,B,C | |
| 15'-1" | 11 | #5 05-1/2 | #6 05-1/2 | #5 09 | #5 06 | #6 1 #4 | 6'-0" | 3'-2" | A,B,C | |

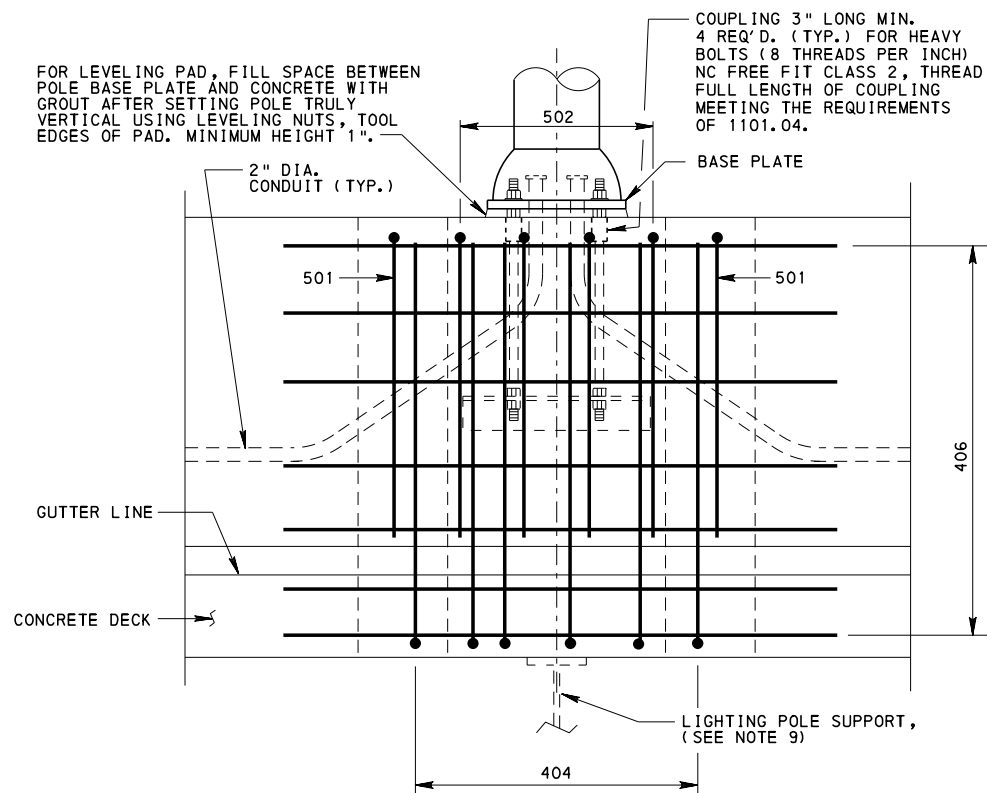
TABLE 4: DISTANCE FROM DESIGN SECTION FOR NEGATIVE MOMENT TO CENTERLINE OF BEAM = 12 IN.

USE FOR:
 * PRECAST PRESTRESSED PA BULB-TEE AND I-BEAMS WITH TOP FLANGE WIDTH ≥ 36"
 * STEEL I-BEAMS OR STEEL CLOSED BOXES WITH TOP FLANGE WIDTH ≥ 48"

| S | T (in.) | S1 | S2 | S3 | S3' | S6 | S7 | So | L | NOTES |
|--------|---------|-----------|------------|-----------|-------|---------|--------|-------|---|-------|
| 4'-3" | 8 | #5 09-1/2 | #5 011 | #4 09 | #4 06 | #5 1 #6 | 2'-8" | 4'-2" | | |
| 4'-7" | 8 | #5 09-1/2 | #5 011 | #4 09 | #4 06 | #5 1 #6 | 2'-10" | 4'-2" | | |
| 4'-11" | 8 | #5 09 | #5 011 | #4 08-1/2 | #4 06 | #5 1 #6 | 3'-1" | 4'-2" | | |
| 5'-2" | 8 | #5 09 | #5 011 | #4 08-1/2 | #4 06 | #5 1 #6 | 3'-3" | 4'-2" | | |
| 5'-6" | 8 | #5 09 | #5 010-1/2 | #4 08-1/2 | #4 06 | #5 1 #6 | 3'-5" | 4'-2" | | |
| 5'-10" | 8 | #5 09 | #5 010 | #4 08-1/2 | #4 06 | #5 1 #6 | 3'-8" | 4'-2" | | |
| 6'-2" | 8 | #5 08-1/2 | #5 09-1/2 | #4 08 | #4 06 | #5 1 #6 | 3'-10" | 4'-2" | | |
| 6'-6" | 8 | #5 08 | #5 08-1/2 | #4 07-1/2 | #4 06 | #5 1 #6 | 4'-1" | 4'-2" | | |
| 6'-10" | 8 | #5 08 | #5 07-1/2 | #4 07-1/2 | #4 06 | #5 1 #6 | 4'-3" | 4'-2" | | |
| 7'-2" | 8 | #5 07-1/2 | #5 06 | #5 011 | #5 06 | #5 1 #6 | 4'-6" | 4'-2" | | |
| 7'-6" | 8 | #5 07 | #5 05-1/2 | #5 010 | #5 06 | #5 1 #6 | 4'-8" | 4'-2" | | |
| 7'-10" | 8 | #5 07 | #5 05-1/2 | #5 010 | #5 06 | #5 1 #6 | 4'-10" | 4'-2" | | |
| 8'-2" | 8 | #5 07 | #5 05-1/2 | #5 010 | #5 06 | #5 1 #6 | 4'-11" | 4'-2" | | |



PLAN

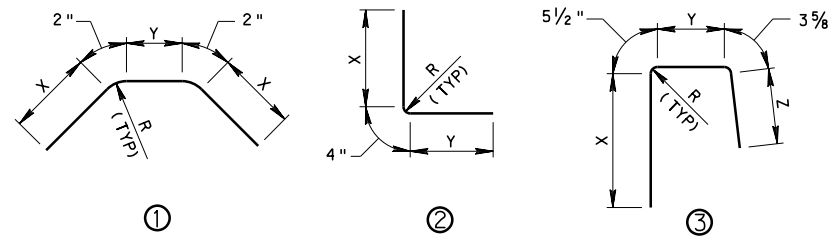


ELEVATION

| BARRIER TYPE | "A" | "B" | "C" | "D" |
|------------------------------|-------|-----|-------|--------|
| 45" F-SHAPE CONCRETE BARRIER | 1'-0" | 11" | 3'-9" | 3 3/8" |
| 42" F-SHAPE CONCRETE BARRIER | 1'-0" | 11" | 3'-6" | 3 3/8" |
| 32" F-SHAPE CONCRETE BARRIER | 1'-1" | 11" | 2'-8" | 2 3/8" |

REINFORCEMENT TABLE

| MARK | SIZE | LENGTH | | | NUMBER | TYPE | X | | | Y | Z |
|------|------|-------------|-------------|-------------|--------|------|-------------|-------------|-------------|---------|-------|
| | | 45" F-SHAPE | 42" F-SHAPE | 32" F-SHAPE | | | 45" F-SHAPE | 42" F-SHAPE | 32" F-SHAPE | | |
| 404 | 4 | 8'-5" | 8'-2" | 7'-4" | 6 | (2) | 4'-1" | 3'-10" | 3'-0" | 4'-0" | ---- |
| 406 | 4 | 5'-11" | 5'-11" | 5'-11" | 7 | (1) | 2'-0" | 2'-0" | 2'-0" | 1'-7" | ---- |
| 501 | 5 | 5'-6 5/8" | 5'-3 5/8" | 4'-7 5/8" | 2 | (3) | 2'-11" | 2'-8" | 2'-0" | 4 1/2" | 1'-6" |
| 502 | 5 | 5'-10 5/8" | 5'-10 5/8" | 5'-2 5/8" | 4 | (3) | 2'-11" | 2'-8" | 2'-0" | 11 1/2" | 1'-6" |

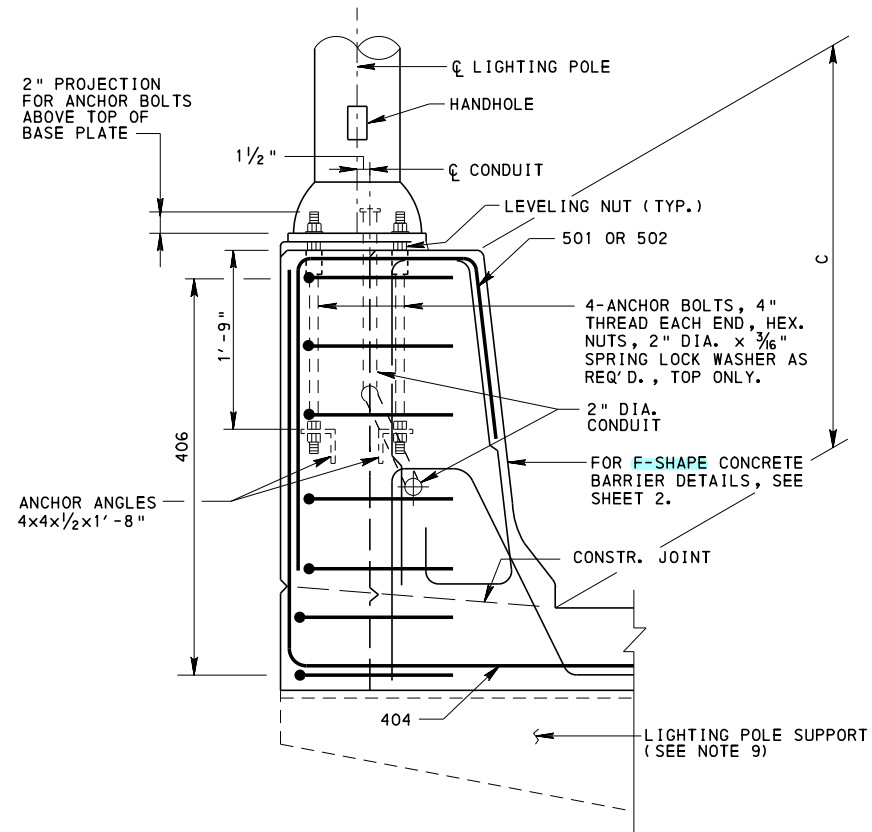


**REINFORCEMENT DETAILS
REINFORCEMENT BAR NOTES**

- DIMENSIONS ALONG CURVED PORTIONS OF BAR ARE MEASURED ALONG THE OUTSIDE EDGE.
- EPOXY COAT ALL REINFORCEMENT STEEL IN ACCORDANCE WITH PUBLICATION 408, SECTION 709.1(c).
- RADIUS, R= 2", FOR #4 BARS AND R= 3", FOR #5 BARS, IS MEASURED TO THE INSIDE EDGE OF THE REINFORCEMENT BAR.

NOTES:

- PROVIDE MATERIALS AND PERFORM WORK IN ACCORDANCE WITH PUBLICATION 408.
- 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.)
- SEAL CONDUIT AND PROTECT THREADS FOR FUTURE LIGHTING INSTALLATIONS.
- CONFORM ANCHOR MATERIALS TO 1101.4 PUB.408, ANCHOR ANGLES ARE PERMITTED TO BE GALVANIZED.
- SET LIGHTING POLES TRULY VERTICAL WITH BASES LEVEL USING LEVELING NUTS.
- PROVIDE 2" CLEAR ON ALL REINFORCEMENT UNLESS NOTED.
- PROVIDE A MINIMUM OF 2 1/2" CONCRETE COVER FOR CONDUIT.
- FOR GEOMETRIC AND REINFORCEMENT DETAILS OF THE BARRIER NOT SHOWN, SEE SHEET 2.
- PREFERRED LOCATION FOR LIGHTING POLES IS AT PIERS AND ABUTMENTS. REFER TO BD-655M FOR ABUTMENT DETAILS AND BD-658M FOR PIER DETAILS TO HELP DEVELOP LIGHT POLE SUPPORT DETAIL. LIGHTING POLE SUPPORT, IF NEEDED, TO BE DESIGNED BY THE ENGINEER TO DISTRIBUTE LOAD TO BOTH FASCIA AND FIRST INTERIOR BEAM.
- FOR LIGHTING POLE LOCATIONS WITHIN A SPAN, THE LUMINAIRE DEFLECTION MUST BE EVALUATED FOR DYNAMIC EFFECTS.



SECTION B-B

PROVISIONS FOR FUTURE LIGHTING

| MOUNTING HEIGHT | ANCHOR BOLT CIRCLE DIA. | ANCHOR BOLT DIAMETER |
|-----------------|-------------------------|----------------------|
| 50'-0" MAX. | 15" | 1" |

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY**

**STANDARD
CONCRETE DECK SLAB
LIGHTING POLE ANCHORAGE DETAILS
FOR BEAM BRIDGES**