

# THE STATE OF DELAWARE
## DEPARTMENT OF TRANSPORTATION

# STANDARD CONSTRUCTION DETAILS

**THIS DOCUMENT USES U.S. CUSTOMARY UNITS**

08/20/2020

# SECTION I - BARRIER


| SHEET NO. | NAME |
|---|---|
| B-L (2017) | – BARRIER LEGEND |
| B-1 | – GUARDRAIL APPLICATIONS (TYPES 1-31, 2-31, AND 3-31) |
| (2020) - 1 | PLAN VIEWS |
| (2020) - 2 | ELEVATION VIEWS AND SPLICE DETAIL |
| (2020) - 3 | SECTION VIEWS |
| (2020) - 4 | TYPE 1-31, GUARDRAIL WITH OMITTED POST |
| (2020) - 5 | TYPE 1-31, GUARDRAIL STEEP SLOPE |
| B-2 | – GRADING FOR GUARDRAIL END TREATMENTS (TYPES 1, 2, AND 3) |
| (2020) - 1 | TYPE 1-31 |
| (2020) - 2 | TYPE 2-31 |
| (2020) - 3 | TYPE 3-31 |
| B-3 | – GUARDRAIL OVER CULVERTS (TYPES 1-31, 2-31, AND 3-31) |
| (2020) - 1 | TYPE 1-31 |
| (2020) - 2 | TYPE 2-31 |
| (2020) - 3 | TYPE 3-31 |
| B-4 (2020) | – END ANCHORAGE , TYPE 1-31 |
| B-5 | – RESERVED |
| B-6 | – RESERVED |
| B-7 (2020) | – W-BEAM, TYPE 1-27 TO TYPE 1-31 TRANSITION SECTION |
| B-8 (2020) | – GUARDRAIL TO BARRIER CONNECTION - APPROACH AND EXIT TYPE 1-31 |
| (2020) - 1 | APPROACH TYPE 1-31- PLAN AND ELEVATION VIEWS |
| (2020) - 2 | TYPE 1 HARDWARE |
| (2020) - 3 | BENT PLATE RUB RAIL |
| (2020) - 4 | EXIT TYPE 1-31 |
| B-9 | – RESERVED |
| B-10 | – GUARDRAIL TO BARRIER CONNECTION - APPROACH TYPE 3-31 |
| (2020) - 1 | APPROACH TYPE 3-31- PLAN AND ELEVATION VIEWS |
| (2020) - 2 | POST |
| (2020) - 3 | POST AND OFFSET BLOCK |
| (2020) - 4 | TERMINAL END SHOE AND CONNECTION |
| B-11 | – THRIE-BEAM APPROACH GUARDRAIL TRANSITION (AGT) TO CONCRETE BUTTRESS |
| (2020) - 1 | THRIE-BEAM AGT TO CONNECTION BUTTRESS - ELEVATION AND PLAN VIEWS |
| (2020) - 2 | THRIE-BEAM AGT TO CONCRETE BUTTRESS - PLAN, ELEVATION, AND SECTION REINFORCEMENT VIEWS |
| (2020) - 3 | 36" F- SHAPE TRANSITION |
| (2020) - 4 | 36" F- SHAPE TRANSITION REINFORCEMENT |
| (2020) - 5 | 42" F- SHAPE TRANSITION |
| (2020) - 6 | 42" F- SHAPE TRANSITION REINFORCEMENT |
| (2020) - 7 | 42" SINGLE SLOPE TRANSITION |
| (2020) - 8 | 42" SINGLE SLOPE TRANSITION REINFORCEMENT |
| B-12 | – RESERVED |
| B-13 | – HARDWARE |
| (2020) - 1 | W-BEAM SECTION AND ELEVATION VIEWS |
| (2020) - 2 | W-BEAM STEEL POST AND OFFSET BLOCK |
| (2020) - 3 | W-BEAM TERMINAL CONNECTOR |
| (2020) - 4 | THRIE BEAM AND THRIE BEAM EXPANSION ELEMENT SECTION AND ELEVATION |
| (2020) - 5 | THRIE BEAM STEEL POST AND OFFSET BLOCK |
| (2020) - 6 | ASYMMETRIC AND SYMMETRIC W-BEAM TO THRIE BEAM TRANSITION SECTION |
| (2020) - 7 | WOOD OFFSET BLOCKS, SOIL PLATE, STEEL TUBE AND WOOD BREADAWAY POSTS |
| (2020) - 8 | END ANCHORAGE HARDWARE |
| (2020) - 9 | REFLECTOR AND W-BEAM BEARING PLATE |
| (2020) - 10 | GUARDRAIL MOUNTED RAIL |
| (2020) - 11 | DOWNSTREAM ANCHORAGE SYSTEM - GROUND STRUT & ANCHOR BRACKET |
| (2020) - 12 | GUARDRAIL TO BARRIER CONNECTION - THRIE BEAM TERMINAL CONNECTOR |

# SECTION I - BARRIER (CONT'D)


| SHEET NO. | NAME |
|---|---|
| B-14 | – RESERVED |
| B-15 | – GUARDRAIL APPLICATIONS, 27" |
| (2020) - 1 | PLAN VIEWS |
| (2020) - 2 | ELEVATION VIEWS AND SPLICE DETAIL |
| (2020) - 3 | SECTION VIEWS |
| B-16 | – RESERVED |
| B-17 (2020) | – GUARDRAIL END TREATMENT, TYPE 4-27 |
| B-18 (2020) | – CURVED GUARDRAIL SECTION, TYPE 1-27 |
| B-19 | – RESERVED |
| B-20 | – BURRIED IN BACK SLOPE END TERMINAL, TYPE 1-31 |
| (2020) - 1 | PERSPECTIVE AND ELEVATION VIEWS |
| (2020) - 2 | SECTION VIEWS |
| (2020) - 3 | HARDWARE |
| (2020) - 4 | POSTS |
| B-21 | – RESERVED |
| B-22 | – RESERVED |
| B-23 | – RESERVED |
| B-24 | – RESERVED |
| B-25 | – CONCRETE ROADSIDE BARRIER, 36" |
| (2020) - 1 | TYPICAL SECTIONS, TYPE 1, TYPE 2, AND TYPE 3 |
| (2020) - 2 | ELEVATION AND REINFORCEMENT |
| B-26 | – CONCRETE ROADSIDE BARRIER, 42" |
| (2020) - 1 | TYPICAL SECTIONS, TYPE 1, TYPE 2, AND TYPE 3 |
| (2020) - 2 | ELEVATION AND REINFORCEMENT |
| B-27 | – CONCRETE ROADSIDE BARRIER, 32" F-SHAPE |
| (2020) - 1 | ELEVATION AND REINFORCEMENT |
| B-28 | – CONCRETE ROADSIDE BARRIER, 36" F-SHAPE |
| (2020) - 1 | ELEVATION AND REINFORCEMENT |
| B-29 | – CONCRETE ROADSIDE BARRIER, 42" F-SHAPE |
| (2020) - 1 | ELEVATION AND REINFORCEMENT |
| B-30 | – CONCRETE ROADSIDE BARRIER, 42" SINGLE SLOPE |
| (2020) - 1 | ELEVATION AND REINFORCEMENT |


# SECTION II - CURB & GUTTER


| SHEET NO. | NAME |
|---|---|
| C-1 | – PCC CURB |
| (2020) - 1 | PCC CURB |
| (2020) - 2 | INTEGRAL PCC CURB & GUTTER |
| (2020) - 3 | INTEGRAL PCC CURB & GUTTER (FOR USE AT PEDESTRIAN CONNECTIONS ONLY) |
| (2020) - 4 | PCC ROUNDABOUT CURB AND GUARDRAIL MEDIAN CURB |
| C-2 | – PEDESTRIAN CONNECTION |
| (2020) - 1 | TYPE 1 |
| (2020) - 2 | TYPE 2, 3, AND 4 |
| (2020) - 3 | TYPE 5 |
| C-3 (2020) | – ENTRANCES |
| C-4 (2020) | – CURB OPENING |
| C-5 (2020) | – CURB/ SIDEWALK OPENING |
| C-6 (2017) | – CURB RETAINING WALL |

# SECTION III - DRAINAGE


| SHEET NO. | | NAME |
|---|---|---|
| D-1 | – | CONCRETE 6:1 SAFETY END STRUCTURE |
| (2018) - 1 | | PLAN AND SECTION VIEWS |
| (2018) - 2 | | SCHEDULES |
| D-2 | – | CONCRETE 10:1 SAFETY END STRUCTURE |
| (2018) - 1 | | PLAN AND SECTION VIEWS |
| (2018) - 2 | | SCHEDULES |
| D-3 | – | SAFETY GRATES |
| (2020) - 1 | | SAFETY END STRUCTURE GRATE AND ASSEMBLY |
| (2020) - 2 | | PERSONNEL SAFETY GRATE FOR PIPE INLET |
| D-R (2020) | – | DRAINAGE INLET REFERENCE SHEET |
| D-4 (2020) | – | INLET BOX |
| D-5 | – | DRAINAGE INLET DETAILS |
| (2020) - 1 | | DRAINAGE INLET ASSEMBLY |
| (2020) - 2 | | DRAINAGE INLET FRAME AND GRATES |
| (2020) - 3 | | DRAINAGE INLET TOP UNITS |
| (2020) - 4 | | DRAINAGE INLET COVER SLAB |
| (2020) - 5 | | DOUBLE INLET COVER SLAB |
| (2020) - 6 | | 34" X 24" DRAINAGE INLET AND COVER SLAB |
| (2020) - 7 | | 34" X 18" DRAINAGE INLET |
| (2020) - 8 | | DRAINAGE INLET TOP UNIT, TYPE S |
| (2020) - 9 | | DOGHOUSE INLET BOX |
| D-6 | – | MANHOLE DETAILS |
| (2020) - 1 | | BOX MANHOLE ASSEMBLY |
| (2020) - 2 | | ROUND MANHOLE ASSEMBLY |
| (2020) - 3 | | MANHOLE, GRADE RING, TOP UNIT, FRAME AND COVER |
| (2020) - 4 | | BOX MANHOLE COVER SLAB |
| (2020) - 5 | | ROUND MANHOLE COVER SLAB |
| D-7 | – | RESERVED |
| D-8 (2020) | – | PIPE BEDDING AND PIPED FLARED END SUPPORT |
| D-9 (2020) | – | PERFORATED PIPE UNDERDRAIN |
| D-10 (2020) | – | PIPE PLUGGING |
| D-11 | – | RESERVED |


# SECTION IV - EROSION


| SHEET NO. | | NAME |
|---|---|---|
| E-1 (2020) | – | CONCRETE WASHOUT |
| E-2 | – | SILT FENCE |
| (2020) - 1 | | SILT FENCE |
| (2020) - 2 | | SUPER SILT FENCE |
| E-3 (2020) | – | SEDIMENT TRAP |
| E-4 (2020) | – | INLET SEDIMENT CONTROL, DRAINAGE INLET |
| E-5 (2020) | – | INLET SEDIMENT CONTROL, CULVERT INLET |
| E-6 (2020) | – | PORTABLE SEDIMENT TANK |
| E-7 (2014) | – | SUMP PIT |
| E-8 (2020) | – | SKIMMER DEWATERING DEVICE |
| E-9 | – | CHECK DAM |
| (2020) - 1 | | STONE CHECK DAM |
| (2020) - 2 | | COMPOST FILTER LOG CHECK DAM |
| E-10 (2020) | – | TEMPORARY SLOPE DRAIN |

## SECTION IV - EROSION (CONT'D)

SHEET NO. NAME

E-11 – RESERVED
E-12 – RESERVED
E-13 – RESERVED
E-14 (2014) – STABILIZED CONSTRUCTION ENTRANCE
E-15 (2014) – SANDBAG DIKE
E-16 (2014) – SANDBAG DIVERSION
E-17 (2020) – GEOTEXTILE-LINED CHANNEL DIVERSION
E-18 (2014) – TURBIDITY CURTAIN
E-19 (2020) – STILLING WELL
E-20 (2014) – RIPRAP ENERGY DISSIPATOR
E-21 (2020) – STONE OUTLET

## SECTION V - LANDSCAPING

SHEET NO. NAME

L-1 – PLANT DETAILS
(2017) - 1 ROADSIDE SHRUB PLANTING
(2017) - 2 TREE PLANTING
(2017) - 3 PERENNIAL/GROUND COVER PLANTING

## SECTION VI - MISCELLANEOUS

SHEET NO. NAME

M-1 (2020) – RIGHT-OF-WAY FENCE
M-2 (2017) – RIGHT-OF-WAY MONUMENTATION
M-3 (2020) – SHARED-USED PATH AND SIDEWALK
M-4 (2011) – BIKE RACK LAYOUT
M-5 (2020) – WOOD RAIL FENCE
M-6 (2011) – PATTERNED HOT-MIX OR CONCRETE & BRICK PAVER
M-7 (2020) – CHAIN LINK FENCE
M-8 (2014) – PCC PARKING BUMPER
M-9 (2020) – BUS STOP PAD
(2020) - 1BUS STOP PAD, TYPES 1, 2, & 3
(2020) - 2BUS STOP PAD WITH SHELTER, TYPES 1 & 2
M-10 – BRIDGE SAFETY FENCE
(2014) - 1 BRIDGE SAFETY FENCE, TYPE 1
(2014) - 2 BRIDGE SAFETY FENCE, TYPE 2
(2017) - 3 HARDWARE
M-11 (2020) – STEEL PLATE
M-12 (2020) – DRIVEWAY TRANSVERSE SLOPE GRADING
M-13 (2020) – TEMPORARY PEDESTRIAN PATHWAY

## SECTION VII - PAVEMENT

SHEET NO. NAME

P-1 – PCC PAVEMENT
(2020) - 1 SLAB PLAN (WITH DOWEL AND TIE LOCATIONS)
(2020) - 2 JOINT AND SEALANT
(2020) - 3 W BOLT, HOOK BOLT, DOWEL AND TIE BAR
(2020) - 4 DOWEL SUPPORT BASKET
(2020) - 5 DOWEL AND TIE BAR PLACEMENT TOLERANCES

# SECTION VII - PAVEMENT (CONT'D)


SHEET NO. NAME

P-2 – PCC PAVEMENT PATCHING
(2020) - 1 FULL DEPTH PATCH, PLAN VIEWS
(2020) - 2 FULL DEPTH PATCH, SECTION VIEWS
(2020) - 3 FULL DEPTH PATCH, SEALANT DETAILS, GROUT RETENTION DISK, AND DOWEL BAR
(2020) - 4 FULL DEPTH PATCH, DOWEL AND TIE BAR PLACEMENT TOLERANCES
(2020) - 5 PARTIAL DEPTH PATCH, PLAN AND SECTION VIEWS
P-3 (2014) – BUTT JOINTS
P-4 (2020) – PERMANENT CROSS-ROAD PATCH OVER PIPE TRENCH
P-5 (2018) – RUMBLE STRIPS
(2020) - 1 CONTINUOUS EDGELINE AND CONTINUOUS SHALLOW DEPTH
(2020) - 2 BIKE FRIENDLY EDGELINE AND CENTERLINE
P-6 (2020) – PAVEMENT SAFETY EDGE


# SECTION VIII - TRAFFIC


SHEET NO. NAME

T-1 – CONDUIT JUNCTION WELLS
(2020) - 1 TYPE 1
(2020) - 2 TYPE 4
(2020) - 3 TYPE 5
(2020) - 4 TYPE 7
T-2 (2011) – JUNCTION WELL, GROUNDING & BONDING FOR STEEL FRAMES & LIDS
T-3 – RESERVED
T-4 – CABINET BASES
(2020) - 1 TYPES M, K, & F
(2020) - 2 TYPES "P & R"
T-5 – POLE BASES
(2017) - 1 ROUND BASE & ROUND BASE WITH SQUARE FOUNDATION HEADER
(2020) - 2 TYPICAL SECTION AND INSTALLATION (BASES 1, 2, 2A, 2B, 3, 3A, AND 3B)
(2020) - 3 TYPICAL SECTION (BASES 6) AND POLE BASE DATA CHART
(2020) - 4 TYPICAL SECTION (BASE 4A AND 4B), ANCHOR , AND BREAKAWAY COUPLING
T-6 – RESERVED
T-7 – RESERVED
T-8 – LOOP DETECTOR LEAD-IN WIRE INSTALLATION
(2020) - 1 JUNCTION WELL BEHIND CURB OR CURB AND GUTTER WITH GRASS STRIP
(2020) - 2 JUNCTION WELL BEHIND CURB OR CURB & GUTTER WITH SIDEWALK AND JUNCTION WELL DIRECTLY BEHIND CURB OR CURB & GUTTER
(2020) - 3 JUNCTION WELL IN CONCRETE ISLAND
(2020) - 4 JUNCTION WELL WITHOUT CURB OR CURB & GUTTER WITH SIDEWALK AND GRASS STRIPS AND JUNCTION WELL DIRECTLY ADJACENT TO PAVED SURFACE
T-9 – LOOP DETECTOR
(2020) - 1 LOOP DETECTOR SAWCUT TYPICAL, HOT MIX SURFACE TYPICAL SECTION, AND SPLICE KIT
(2020) - 2 TYPICAL INTERSECTION LAYOUT
(2020) - 3 PEDESTRIAN CROSSING TYPICAL LAYOUT
(2020) - 4 WIRING COLOR CODES
T-10 – RESERVED
T-11 – MESSENGER WIRE ATTACHMENT
(2020) - 1 INTERMEDIATE MESSENGER WIRE ATTACHMENT ON WOOD POLES
(2020) - 2 ANGULAR INTERMEDIATE MESSENGER WIRE ATTACHMENT
T-12 – SPAN WIRES
(2020) - 1 ATTACHMENT BETWEEN POLES
(2020) - 2 DEAD END MESSENGER WIRE ATTACHMENT
(2020) - 3 SPAN WIRE ASSEMBLY
T-13 – RESERVED

# SECTION VIII - TRAFFIC (CONT'D)

SHEET NO. NAME


T-14 – EMERGENCY PREEMPTION RECIEVER
(2020) - 1 UPRIGHT MOUNT
(2020) - 2 INVERTED MOUNT
T-15 (2013) – BREAKAWAY SIGN POST AND PIN ASSEMBLY DETAILS
T-16 (2020) – PERMANENT WOOD BARRICADE
T-17 – ELECTRICAL SERVICE PEDESTAL - LIGHTING, SIGNAL & 'ITMS' COMPONENT INSTALLATIONS
(2020) - 1 100 AMP (3+ DEVICES)
(2020) - 2 100 AMP (CONDENSED)
(2020) - 3 100 AMP (UP TO 2 DEVICES)
(2020) - 4 200 AMP - STANDARD LIGHTING COMPONENT INSTALLATIONS
(2020) - 5 LIGHTING COMPONENT INSTALLATIONS (12 OR LESS FIXTURES)
T-18 – PEDESTRIAN PUSHBUTTON LOCATION
(2020) - 1 PUSHBUTTON ASSEMBLY LOCATION ON POLE
(2020) - 2 SIGN ATTACHMENT

SCALE : NTS

# BARRIER LEGEND

| ITEM NO. | DESCRIPTION |
|---|---|
| 1 | W-BEAM |
| 2 | W6 X 9 STEEL POST |
| 3A 3B | 3A - 6" x 12" x 14" OFFSET BLOCK<br>3B - 6" x 8" x 14" OFFSET BLOCK |
| 4 | SPLICE - REQUIRES EIGHT(8) ⅝" GUARDRAIL BOLTS (L=1¼") WITH RECESS NUTS |
| 5 | W-BEAM TERMINAL CONNECTOR |
| 6 | ⅝" GUARDRAIL BOLT (L=1¼") AND RECESS NUT |
| 7A 7B | 7A - ⅝" GUARDRAIL BOLT (L=14") AND RECESS NUT<br>7B - ⅝" GUARDRAIL BOLT (L=10") AND RECESS NUT |
| 8 | ⅝" GUARDRAIL BOLT (L=10"), STEEL WASHER, AND RECESS NUT |
| 9 | ⅞" HIGH STRENGTH STRUCTURAL HEX BOLT (L=VARIES) AND HEX NUT |
| 10 | ⅝" CARRIAGE BOLT (L=VARIES), STEEL WASHER, AND HEX NUT |
| 11 | BEARING PLATE |

DELAWARE
DEPARTMENT OF TRANSPORTATION

BARRIER LEGEND

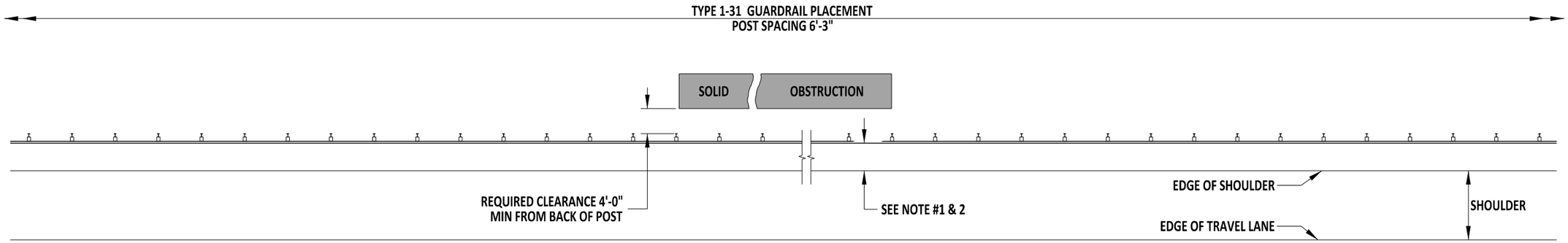
STANDARD NO. B-L (2017) | SHT. 1 OF 1

APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 5/31/2017 (DATE)

RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 5/18/2017 (DATE)

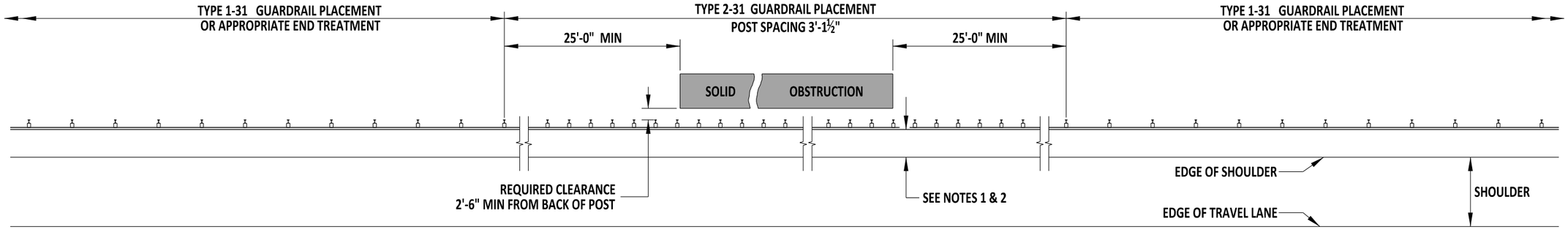
5/10/2017

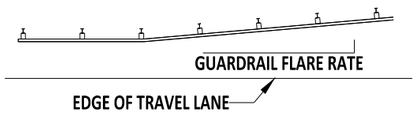
SCALE : NTS




## TYPE 1-31 GUARDRAIL

TYPICAL GUARDRAIL TREATMENT WHEN THE REQUIRED
4'-0" CLEARANCE TO THE OBSTRUCTION IS AVAILABLE
MASH COMPLIANT SYSTEM - FHWA ELIGIBILITY LETTER B-212

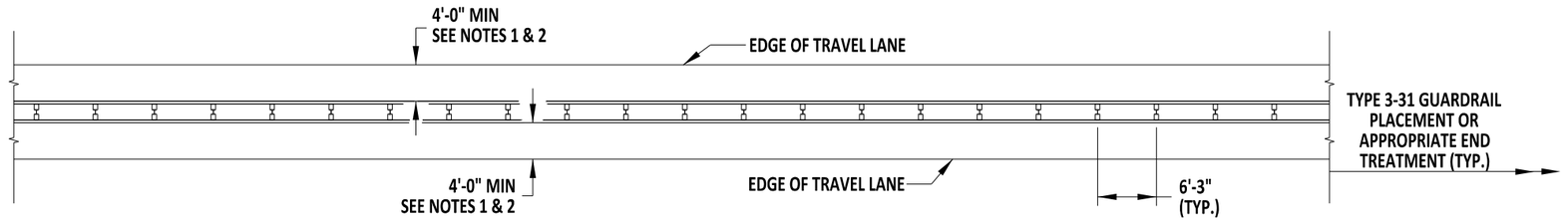



| FLARE RATES | |
|---|---|
| DESIGN SPEED | FLARE RATE |
| 70 MPH | 15:1 |
| 60 MPH | 14:1 |
| 55 MPH | 12:1 |
| 50 MPH | 11:1 |
| 45 MPH | 10:1 |
| 40 MPH | 8:1 |
| 30 MPH | 7:1 |

## TYPE 2-31 GUARDRAIL

TYPICAL GUARDRAIL TREATMENT WHEN 2'-6" TO 4'-0"
OF CLEARANCE TO OBSTRUCTION IS AVAILABLE
NCHRP-350 COMPLIANT SYSTEM UTILIZE CURRENT DETAIL UNTIL FURTHER NOTICE.




## TYPE 3-31 GUARDRAIL

TYPICAL MEDIAN GUARDRAIL TREATMENT
MASH COMPLIANT SYSTEM - DESIGN BASED ON TTI REPORT 9-1002-12-8

NOTES:
1). MAXIMIZE THE DISTANCE FROM THE EDGE OF THE TRAVEL LANE OR SHOULDER TO THE FACE OF GUARDRAIL. THIS AREA SHALL BE GRADED 10:1 OR FLATTER.
2). GRADE THIS AREA 10:1 OR FLATTER.

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ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

TYPES 1-31, 2-31, AND 3-31 GUARDRAIL APPLICATIONS

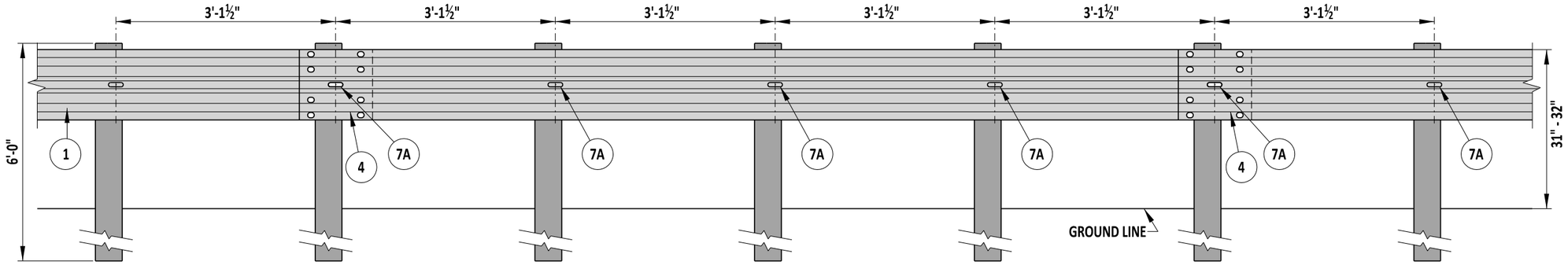
STANDARD NO. B-1 (2020) | SHT. 1 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

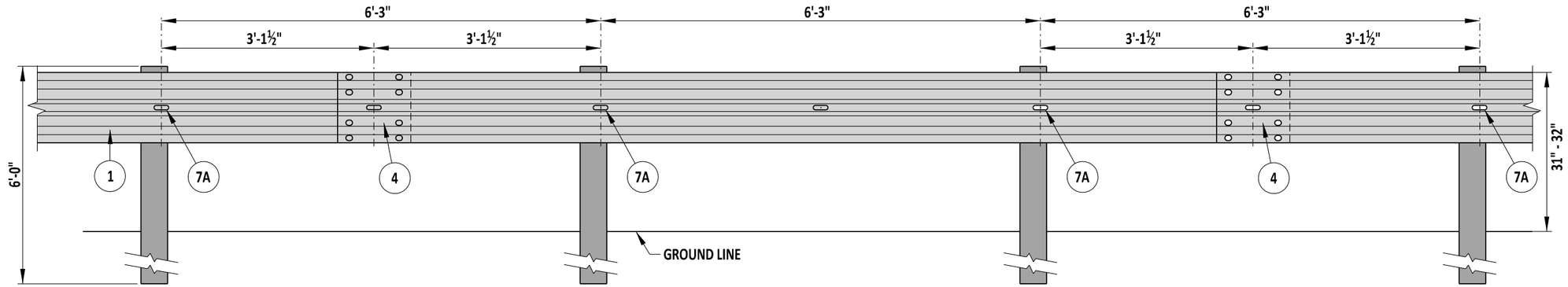
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

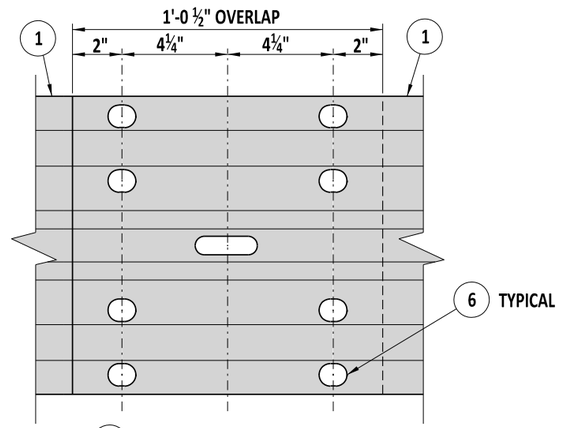
SCALE : NTS




**TYPE 2-31**




**TYPE 1-31 OR 3-31**




4 **SPLICE DETAIL**

**NOTES:**
1). OVERLAP W-BEAMS IN DIRECTION OF TRAVEL.
2). SEE DETAIL B-L, SHEET 1 FOR MORE INFORMATION.

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ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

**TYPES 1-31, 2-31, AND 3-31 GUARDRAIL APPLICATIONS**

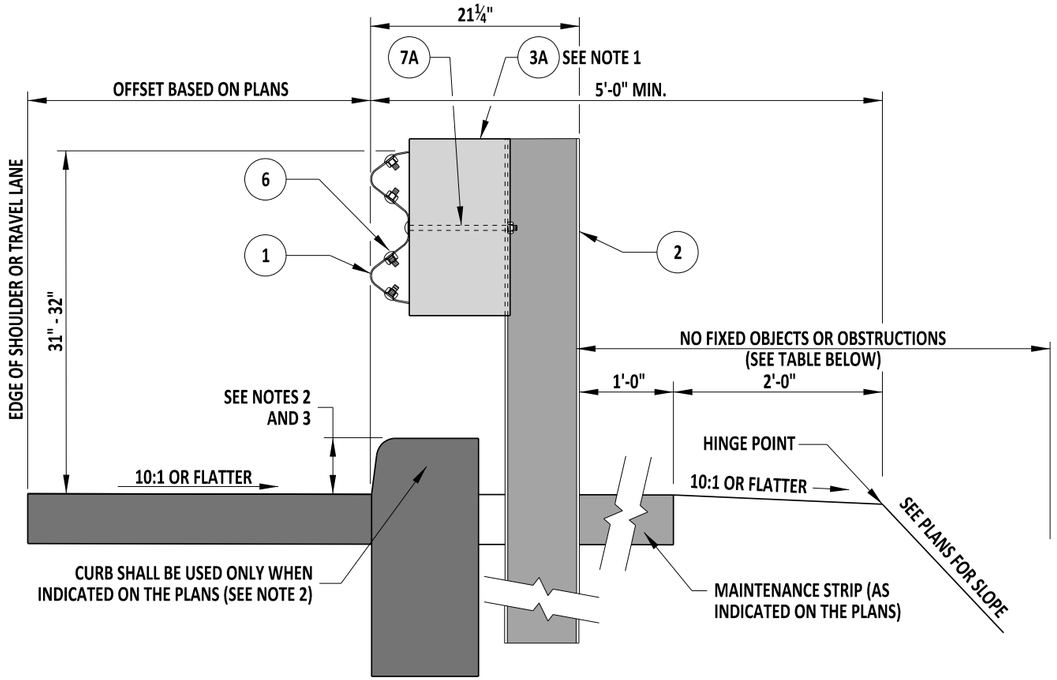
STANDARD NO. B-1 (2020) | SHT. 2 OF 5

REVIEWED
DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

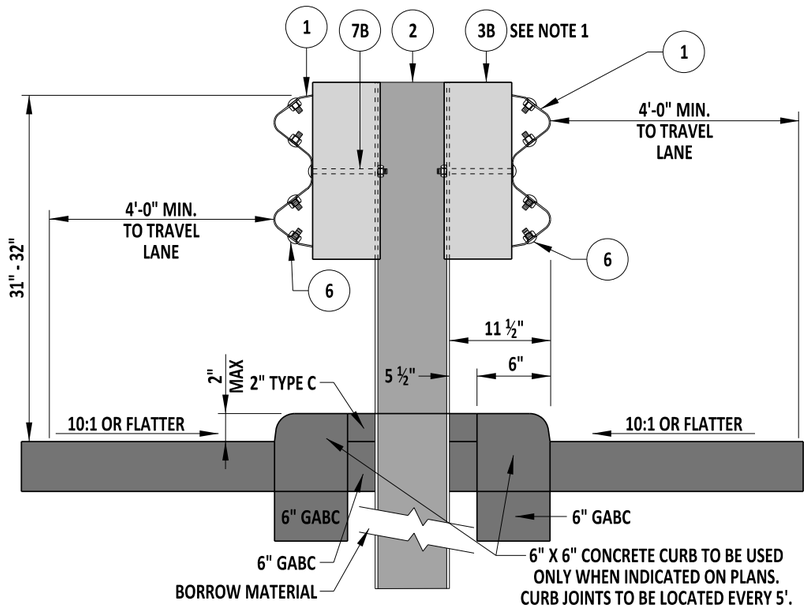
APPROVED
CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

SCALE : NTS



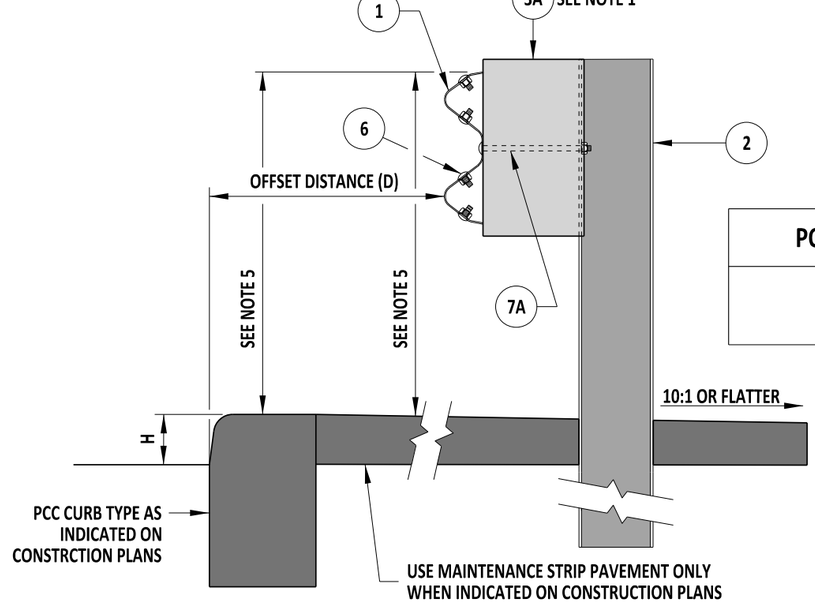

**GUARDRAIL SECTION**
SHOULDER APPLICATION




**GUARDRAIL SECTION**
MEDIAN APPLICATION

| TYPE | POST SPACING | CLEAR AREA BEHIND POST |
|---|---|---|
| 1 | 6'-3" | 4'-0" MIN |
| 2 | 3'-1½" | 2'-6" MIN |

NOTES:
1). SEE STANDARD SPECIFICATION FOR OFFSET BLOCK MATERIALS.
2). ON ROADWAYS WITH A POSTED SPEED LESS THAN OR EQUAL TO 50 MPH, WHERE THE FACE OF THE GUARDRAIL IS TO BE PLACED FLUSH WITH THE FACE OF THE CURB, THE HEIGHT OF THE CURB SHALL BE NO MORE THAN 6 INCHES. THE FACE OF THE GUARDRAIL SHALL BE INSTALLED FLUSH WITH THE FACE OF THE CURB OR NO MORE THAN 6 INCHES BEHIND THE FACE OF THE CURB.
3). ON ROADWAYS WITH POSTED SPEEDS GREATER THAN 50 MPH, WHERE THE FACE OF THE GUARDRAIL IS TO BE PLACED FLUSH WITH THE FACE OF THE CURB, THE HEIGHT OF THE CURB SHALL BE NO MORE THAN 4 INCHES. THE FACE OF THE GUARDRAIL SHALL BE INSTALLED FLUSH WITH THE FACE OF THE CURB OR NO MORE THAN 6 INCHES BEHIND THE FACE OF THE CURB.
4). H IS DEFINED AS THE MAXIMUM CURB HEIGHT FOR THE CURB/ GUARDRAIL APPLICATION.
5). GUARDRAIL HEIGHT MEASURED FROM TOP OF CURB SHALL BE 31"-32". GUARDRAIL HEIGHT MEASURED FROM GROUND SURFACE DIRECTLY ADJACENT TO FACE OF RAIL SHALL BE NO MORE THAN 34".
6). GUARDRAIL BEHIND CURB IS BASED ON MASH CRASH TEST REPORT TRP-03-237-10.




| POSTED SPEED | D | H (SEE NOTE 4) |
|---|---|---|
| < 45 MPH | 4'-0" MIN. - 12'-0" MAX. (SEE NOTE 6) | 6" MAX |

**GUARDRAIL SECTION**
BEHIND CURB APPLICATION

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020
**RECOMMENDED**

**TYPES 1-31, 2-31, AND 3-31 GUARDRAIL APPLICATIONS**

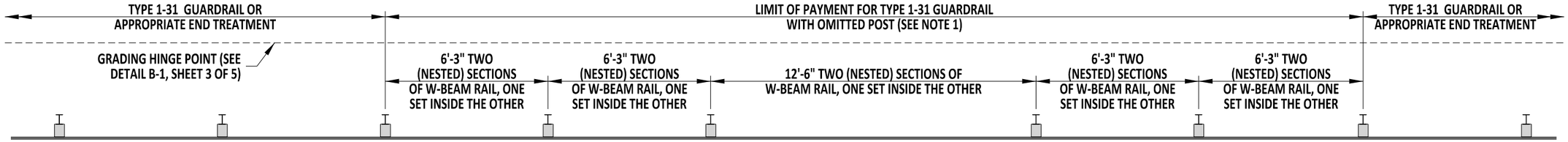
STANDARD NO. B-1 (2020) | SHT. 3 OF 5

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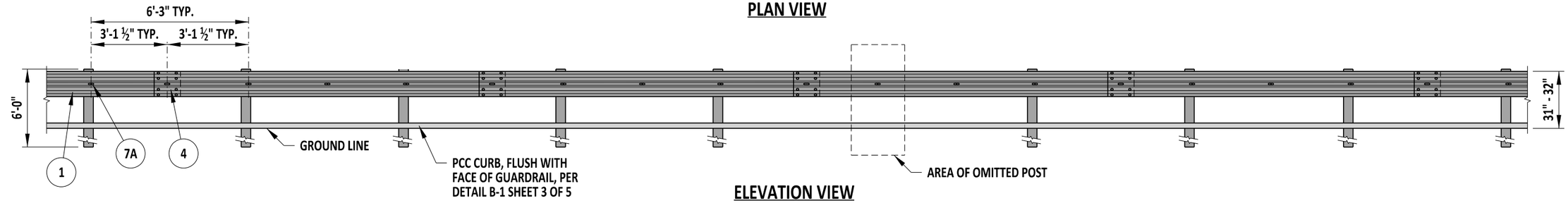
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

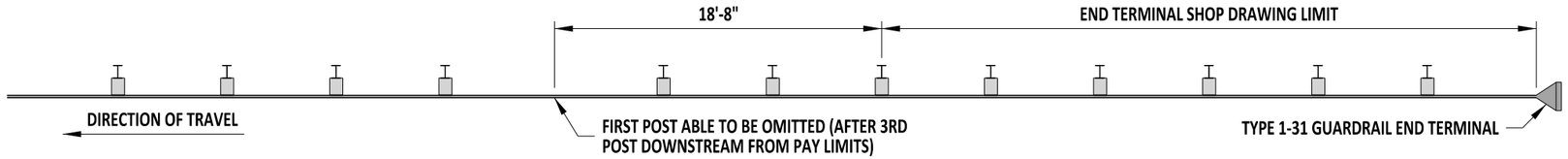
SCALE : NTS



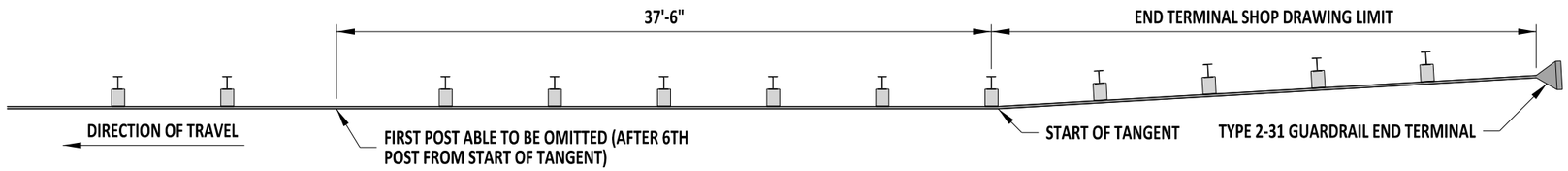

## PLAN VIEW



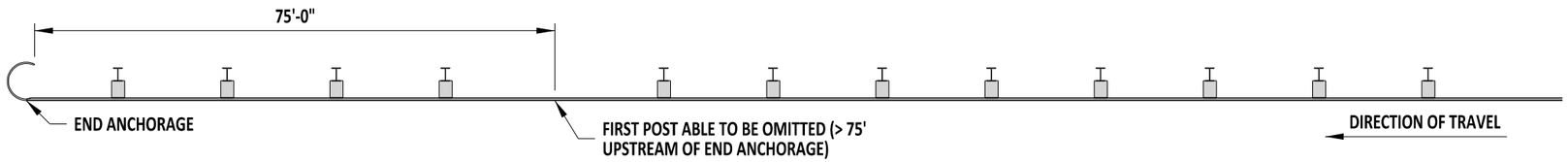

## ELEVATION VIEW




## OMITTED POST WITH A TYPE 1-31 GUARDRAIL END TERMINAL




## OMITTED POST WITH A TYPE 2-31 GUARDRAIL END TERMINAL




## OMITTED POST WITH AN END ANCHORAGE

NOTES:

1). DETAIL SHOWN WITH CURB. IF CURB IS NOT USED, GUARDRAIL WITHIN OMITTED POST LIMIT OF PAYMENT SHALL NOT BE NESTED.

2). GUARDRAIL POSTS WITHIN THE LIMITS OF A GUARDRAIL END TERMINAL SHALL NOT BE OMITTED. THE FIRST POST ELIGIBLE FOR OMISSION IS AS SHOWN TO THE RIGHT.

3). GUARDRAIL POSTS SHALL NOT BE OMITTED WITHIN A TRANSITION SECTION. THE FIRST POST THAT CAN BE OMITTED SHALL BE LOCATED 35 FT OR MORE UPSTREAM OF THE START OF A TRANSITION SECTION.

4). AN OMITTED GUARDRAIL POST SHALL BE NO LESS THAN 43.75 FT (OR 7TH POST) AWAY FROM THE OUTER LONG WOOD BREAKAWAY POST OF A LONG-SPAN SYSTEM (GUARDRAIL-OVER-CULVERTS).

5). MASH COMPLIANT SYSTEM - DESIGN BASED ON MWRSF REPORT TRP-03-326-16 AND TRP-03-393-19.

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**TYPE 1-31, GUARDRAIL WITH OMITTED POST**

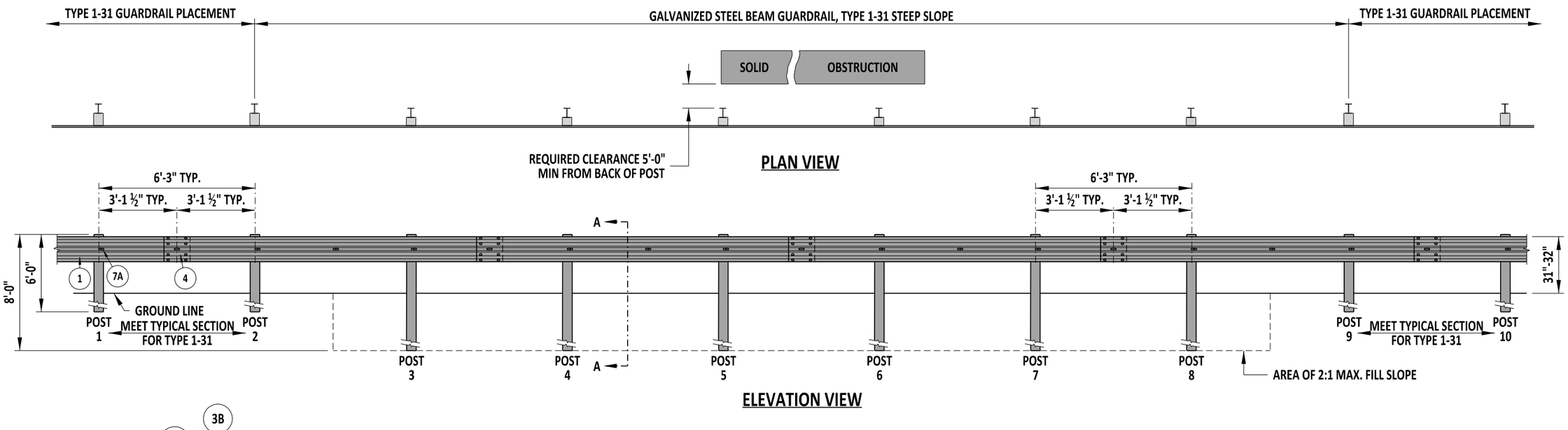
STANDARD NO. B-1 (2020) | SHT. 4 OF 5

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8/19/2020

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## PLAN VIEW




## ELEVATION VIEW




## GUARDRAIL SECTION
SECTION A-A

**NOTES:**

1). MINIMUM OFFSET FROM BACK OF POST TO OBSTRUCTION WITHIN STEEP SLOPE SECTION IS 5'-0".

2). POSTS 1, 2, 9 & 10 ARE W6x9 STEEL POSTS, 6'-0" LONG.

3). POSTS 3-8 ARE W6x9 STEEL POSTS, 8'-0" LONG.

4). ONLY 6"x8"x14" OFFSET BLOCKS SHALL BE USED ON GUARDRAIL POSTS WITHIN THE 2:1 SLOPE AREA.

5). IF CURB IS USED, DEPRESS CURB TO 2" MAX HEIGHT WITHIN LIMITS OF THE TYPE 1-31 STEEP SLOPE GUARDRAIL.

6). MASH COMPLIANT SYSTEM - DESIGN BASED ON TTI REPORT 405160-20.

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GALVANIZED STEEL BEAM GUARDRAIL, TYPE 1-31, STEEP SLOPE

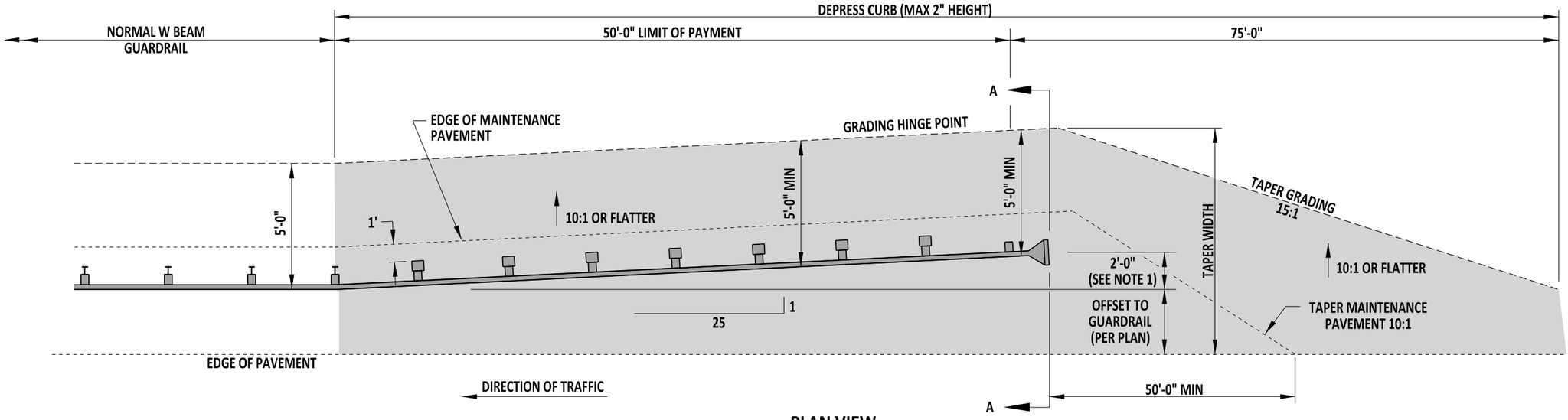
STANDARD NO. B-1 (2020) | SHT. 5 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

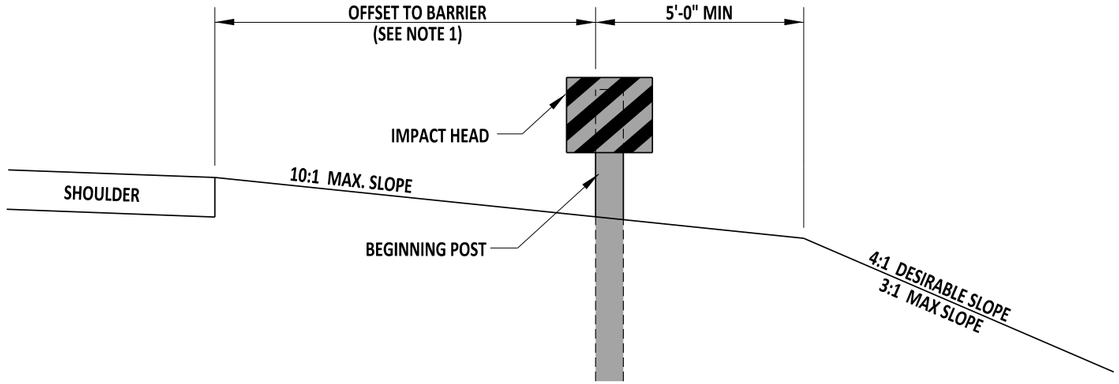
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8/19/2020

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**PLAN VIEW**




**SECTION A-A**

NOTES:
1). FLARE THE END TREATMENT AT 25:1 BEGINNING 50'-0" FROM THE END OF THE IMPACT HEAD, UNLESS THE CONSTRUCTION PLANS OR SPECIFICATIONS SPECIFY A SMALLER FLARE.
2). THIS DETAIL WAS SOLELY CREATED TO SHOW THE GRADING REQUIRED FOR THIS TYPE OF GUARDRAL END TREATMENT AND IS APPLICABLE IN THE ABSENCE OF SPECIFIC GRADING REQUIREMENTS FROM THE GUARDRAIL END TREATMENT MANUFACTURER.
3). THE GUARDRAIL END TREATMENT SHALL BE INSTALLED AS PER THE MANUFACTURER'S REQUIREMENTS.
4). IF CURB IS PRESENT, DEPRESS THE CURB TO A MAXIMUM HEIGHT OF 2" WITHIN THE LIMITS OF THE END TREATMENT AND THROUGHOUT THE LENGTH OF THE TAPER GRADING.
5.) GUARDRAIL REFLECTORS SHALL NOT BE PLACED WITHIN THE LIMITS OF THE GUALRDRAIL END TREATMENT.

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**GRADING FOR GUARDRAIL END TREATMENT ATTENUATOR, TYPE 1**

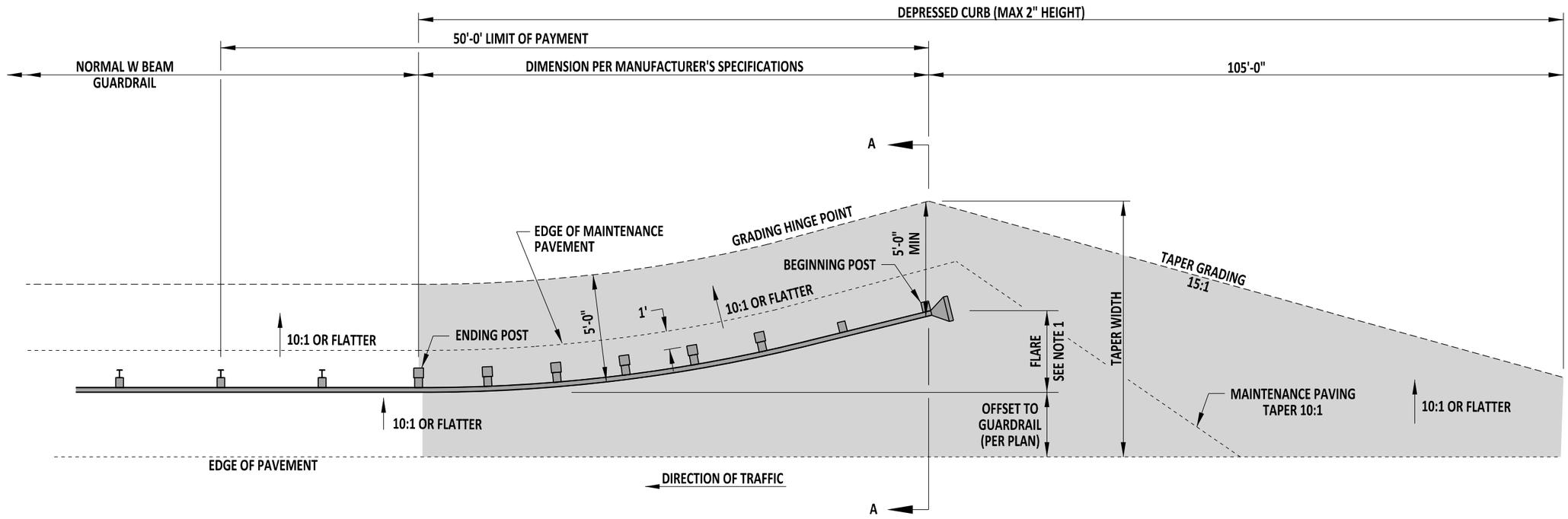
STANDARD NO. B-2 (2020) | SHT. 1 OF 3

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

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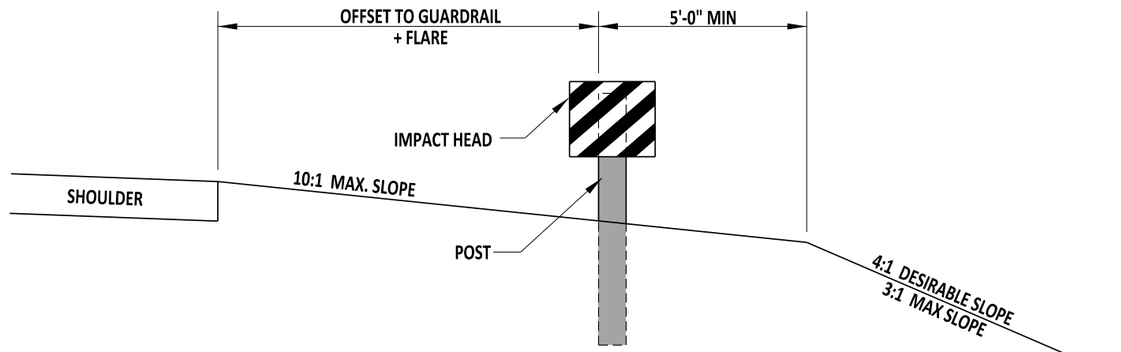
8/19/2020

SCALE : NTS




## PLAN VIEW

= NO OBSTRUCTIONS IN SHADED AREA




## SECTION A-A

NOTES:

1). FLARE SHALL BE BASED ON MANUFACTURER REQUIREMENTS. FLARE MAY BE PARABOLIC OR STRAIGHT BASED ON MANUFACTURER'S SPECIFICATIONS.
2). THIS DETAIL WAS SOLELY CREATED TO SHOW THE GRADING REQUIRED FOR THIS TYPE OF GUARDRAIL END TREATMENT AND IS APPLICABLE IN THE ABSENCE OF SPECIFIC GRADING REQUIREMENTS FROM THE GUARDRAIL END TREATMENT MANUFACTURER.
3). THE GUARDRAIL END TREATMENT SHALL BE INSTALLED AS PER THE MANUFACTURER'S REQUIREMENTS.
4). IF CURB IS PRESENT, DEPRESS THE CURB TO A MAXIMUM HEIGHT OF 2" WITH THE LIMITS OF THE END TREATMENT AND THROUGHOUT THE LENGTH OF THE TAPER GRADING.
5.) GUARDRAIL REFLECTORS SHALL NOT BE PLACED WITHIN THE LIMITS OF THE GUALRDRAIL END TREATMENT.

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**GRADING FOR GUARDRAIL END TREATMENT ATTENUATOR, TYPE 2**

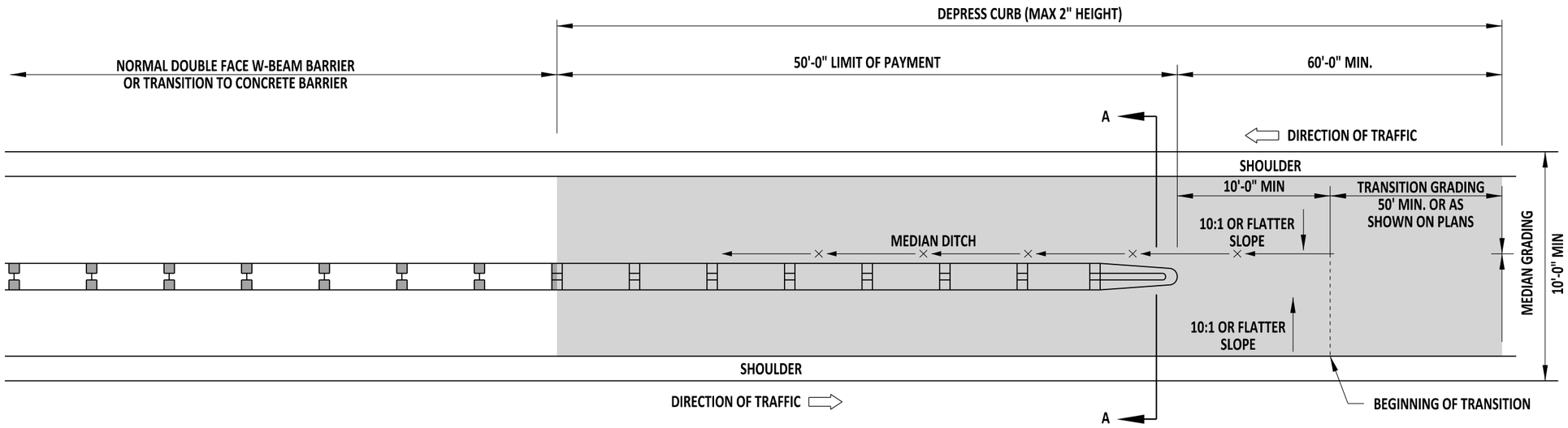
STANDARD NO. B-2 (2020) | SHT. 2 OF 3

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

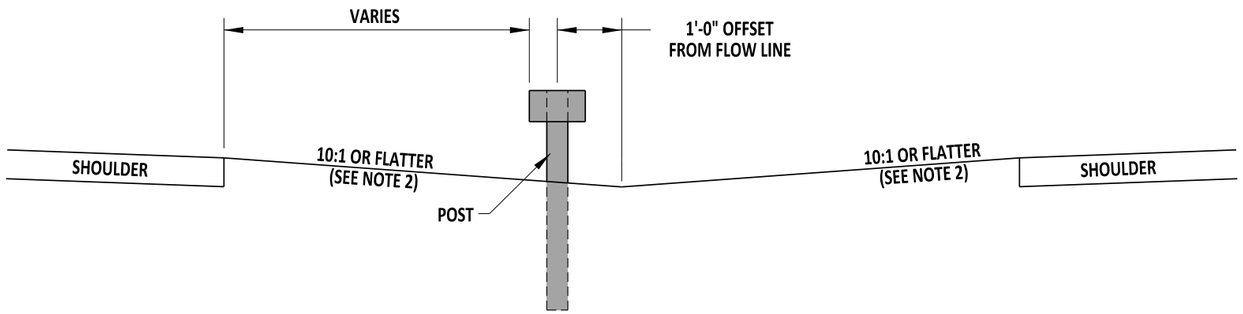
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

SCALE : NTS




## PLAN VIEW




## SECTION A-A

## GRADING FOR END TREATMENT ATTENUATOR, TYPE 3

NOTES:

1). THIS DETAIL WAS SOLELY CREATED TO SHOW THE GRADING REQUIRED FOR THIS TYPE OF GUARDRAIL END TREATMENT AND IS APPLICABLE IN THE ABSENCE OF SPECIFIC GRADING REQUIREMENTS FROM THE GUARDRAIL END TREATMENT MANUFACTURER.
2). 6:1 OR FLATTER GRADING IS ALLOWABLE WHEN THE BARRIER IS LOCATED 12' OR MORE FROM THE OUTSIDE EDGE OF THE SHOULDER.
3). THIS END TREATMENT CAN ALSO BE USED IN RAMP GORES OR OTHER AREAS WHERE TWO RAILS OF W-BEAM COME TOGETHER AND TERMINATE WITH ONE END TREATMENT.
4). WHEN OPPOSING ROADWAYS HAVE EQUAL ELEVATIONS THE TRAFFIC BARRIER SYSTEM SHOULD BE PLACED ON THE OPPOSITE SIDE OF THE DITCH LINE FROM APPROACHING TRAFFIC.
5). THE GUARDRAIL END TREATMENT SHALL BE INSTALLED AS PER THE MANUFACTURER'S REQUIREMENTS.
6). IF CURB IS PRESENT, DEPRESS THE CURB TO A MAXIMUM HEIGHT OF 2" WITHIN THE LIMITS OF THE END TREATMENT AND THROUGHOUT THE LENGTH OF THE TRANSITION GRADING.
7.) GUARDRAIL REFLECTORS SHALL NOT BE PLACED WITHIN THE LIMITS OF THE GUARDRAIL END TERMINAL.

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GRADING FOR GUARDRAIL END TREATMENT ATTENUATOR, TYPE 3

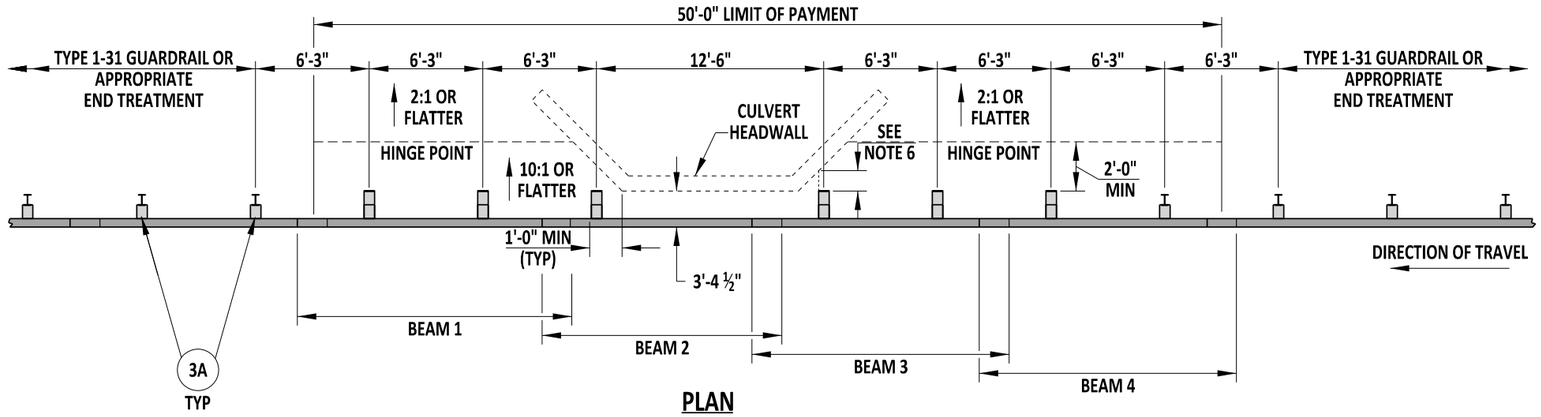
STANDARD NO. B-2 (2020) | SHT. 3 OF 3

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

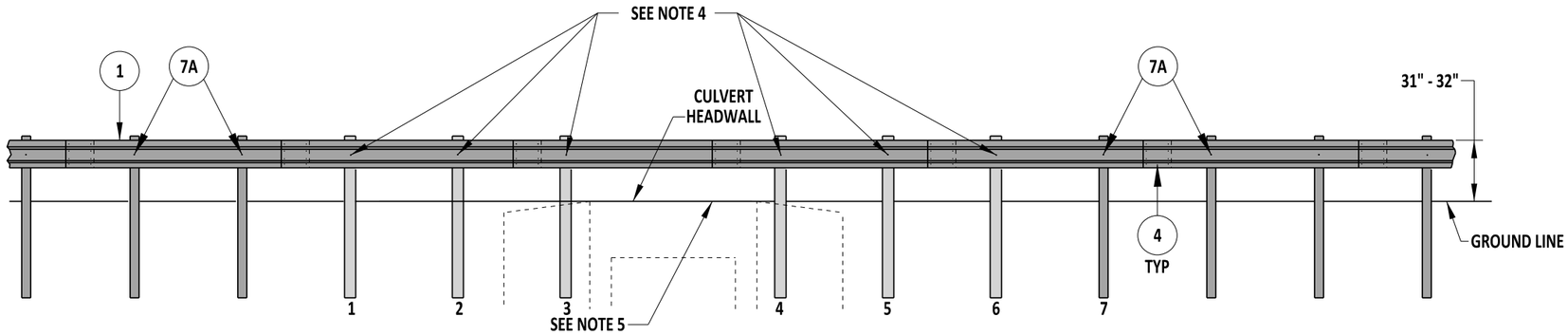
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

SCALE : NTS




PLAN




ELEVATION

NOTES:

1). ALL W-BEAMS ARE 13'-6¼" IN LENGTH.
2). PLACE GUARDRAIL DELINEATORS IN ACCORDANCE WITH DETAIL B-13, SHEET 9.
3). POSTS 1 THROUGH 6 ARE TO BE TYPE 31 LONG, WOOD BREAKAWAY POSTS. POST 7 IS TO BE A W6x9, 6'-0" STEEL POST.
4). THE RAIL SHALL BE ATTACHED AT POSTS 1 THROUGH 6 WITH A ⅝" x 22" GUARDRAIL BOLT, STEEL WASHER, AND RECESS NUT.
5). CULVERT HEADWALL SHALL NOT EXTEND MORE THAN 2" ABOVE GRADE.
6). THERE SHALL BE A MINIMUM OF 12" FROM THE BACK OF POST TO THE CULVERT WINGWALLS.
7). IF CURB IS USED, IT SHALL BE A MAX 2" HEIGHT WITHIN THE LIMIT OF PAYMENT OF THE GUARDRAIL OVER CULVERT.
8). MASH COMPLIANT SYSTEM - FHWA ELIGIBILITY LETTER B-189

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# GUARDRAIL OVER CULVERTS, TYPE 1-31

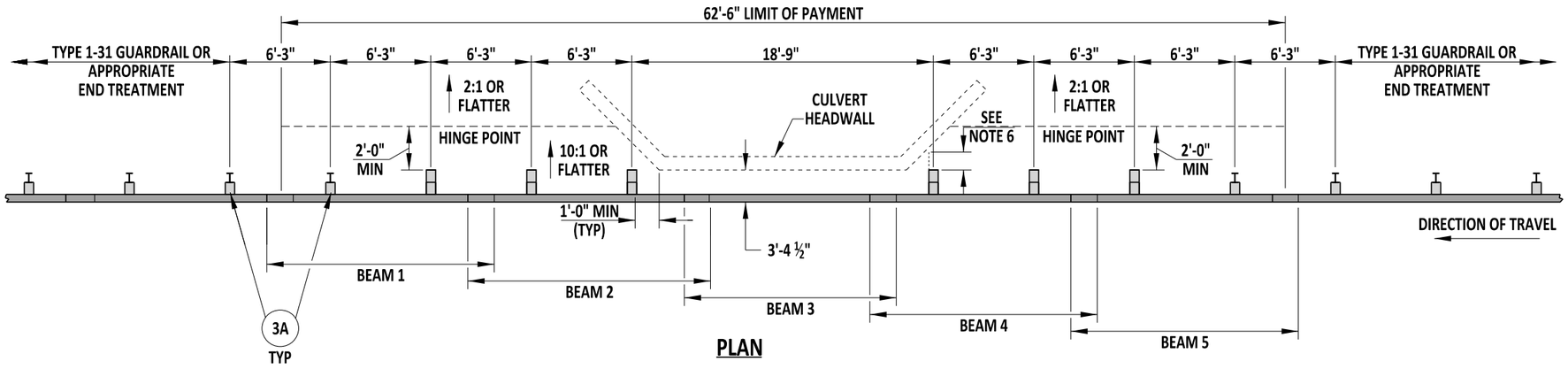
STANDARD NO. B-3 (2020) | SHT. 1 OF 3

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

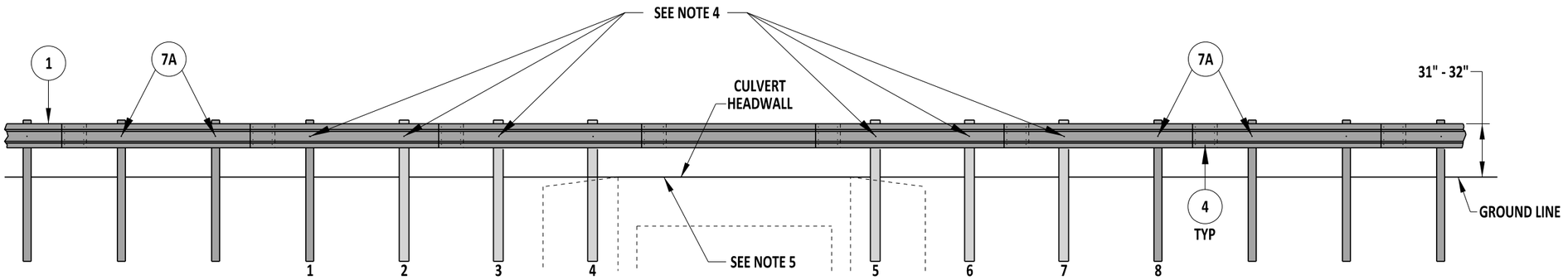
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

SCALE : NTS




**PLAN**




**ELEVATION**

**NOTES:**

1). ALL W-BEAMS ARE 13'-6½" IN LENGTH.
2). PLACE GUARDRAIL DELINEATORS IN ACCORDANCE WITH DETAIL B-13, SHEET 9.
3). POSTS 1 & 8 ARE TO BE W6x9, 6'-0" STEEL POSTS. POSTS 2 THROUGH 7 ARE TO BE TYPE 31 LONG, WOOD BREAKAWAY POSTS.
4). THE RAIL SHALL BE ATTACHED AT POSTS 2 THROUGH 7 WITH A ⅝" x 22" GUARDRAIL BOLT, STEEL WASHER, AND RECESS NUT.
5). CULVERT HEADWALL SHALL NOT EXTEND MORE THAN 2" ABOVE GRADE.
6). THERE SHALL BE A MINIMUM OF 12" FROM THE BACK OF POST TO THE CULVERT WINGWALL.
7). IF CURB IS USED, IT SHALL BE A MAX 2" HEIGHT WITHIN THE LIMIT OF PAYMENT OF THE GUARDRAIL OVER CULVERT.
8). MASH COMPLIANT SYSTEM - FHWA ELIGIBILITY LETTER B-189

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# GUARDRAIL OVER CULVERTS, TYPE 2-31

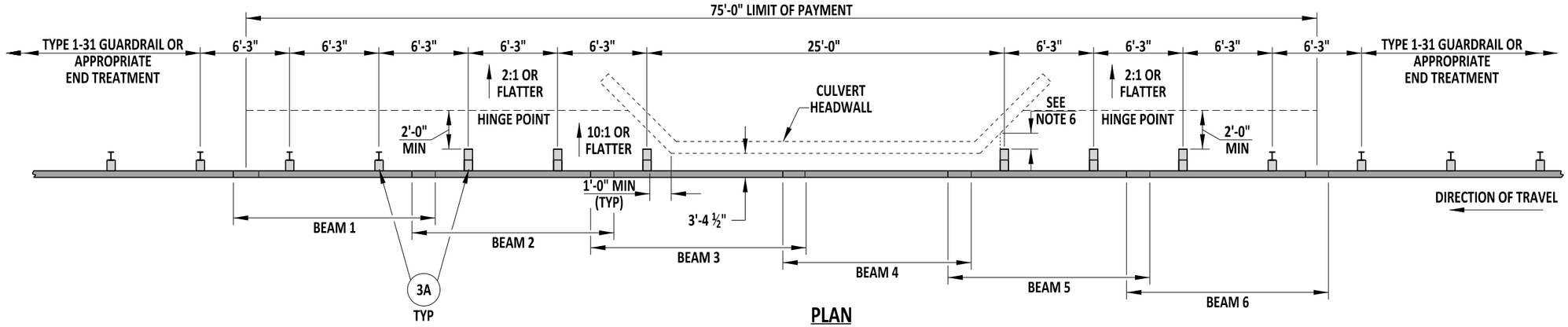
STANDARD NO. B-3 (2020) | SHT. 2 OF 3

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

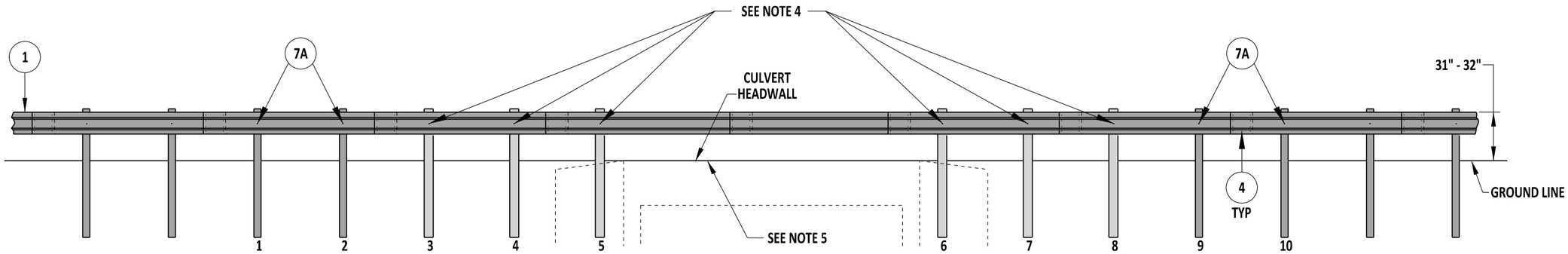
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

SCALE : NTS




**PLAN**




**ELEVATION**

**NOTES:**

1). ALL W-BEAMS ARE 13'-6½" IN LENGTH.
2). PLACE GUARDRAIL DELINEATORS IN ACCORDANCE WITH DETAIL B-13, SHEET 9.
3). POSTS 1, 2, 9, & 10 ARE TO BE W6x9, 6'-0" STEEL POSTS. POSTS 3 THROUGH 8 ARE TO BE TYPE 31 LONG, WOOD BREAKAWAY POSTS.
4). THE RAIL SHALL BE ATTACHED AT POSTS 3 THROUGH 8 WITH A ⅝" x 22" GUARDRAIL BOLT, STEEL WASHER, AND RECESS NUT.
5). CULVERT HEADWALL SHALL NOT EXTEND MORE THAN 2" ABOVE GRADE.
6). THERE SHALL BE A MINIMUM OF 12" FROM THE BACK OF POST TO THE CULVERT WINGWALLS.
7). IF CURB IS USED, IT SHALL BE A MAX 2" HEIGHT WITHIN THE LIMIT OF PAYMENT OF THE GUARDRAIL OVER CULVERT.
8). MASH COMPLIANT SYSTEM - FHWA ELIGIBILITY LETTER B-189

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09/01/2020
ENGINEERING SUPPORT — DATE
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# GUARDRAIL OVER CULVERTS, TYPE 3-31

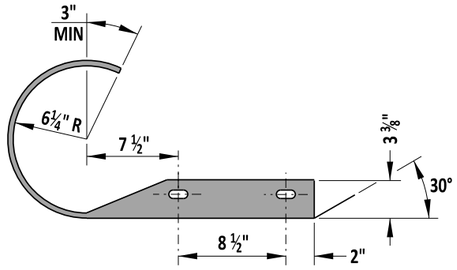
STANDARD NO. B-3 (2020) | SHT. 3 OF 3

REVIEWED
DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

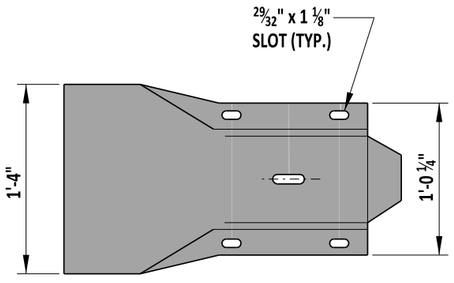
APPROVED
CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

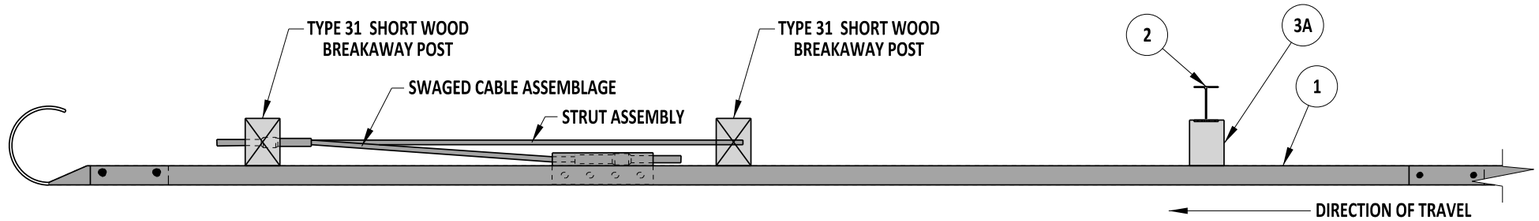
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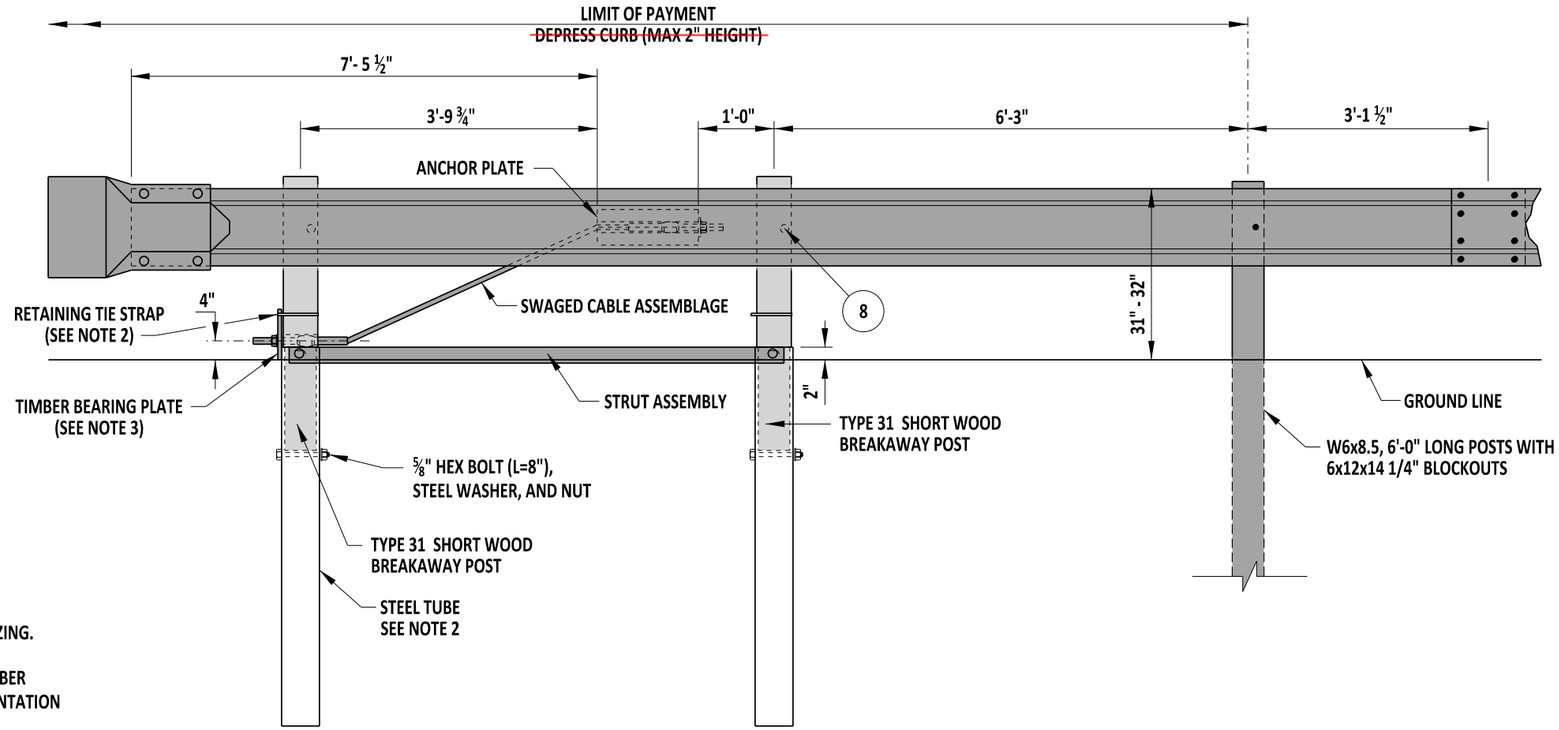

## END SECTION PLAN




## END SECTION ELEVATION




## PLAN VIEW




## ELEVATION VIEW

NOTES:
1). ADDITIONAL HOLES FOR ANCHOR PLATE SHALL BE DRILLED PRIOR TO GALVANIZING. (SEE STANDARD HARDWARE SHEET FOR HOLE SPACING INFORMATION).
2). PLACE A ½" WIDE GALVANIZED RETAINING TIE STRAP AROUND THE SHORT TIMBER BREAKAWAY POST AND TIMBER BEARING PLATE TO ENSURE THE PROPER ORIENTATION OF THE TIMBER BEARING PLATE.
3). CURB SHALL NOT BE INSTALLED WITH THE END ANCHORAGE. IF CURB IS USED ON THE UPSTREAM GUARDRAIL, CURB SHALL BE TERMINATED 56.25 FT UPSTREAM OF THE END ANCHORAGE.
4). REFER TO DETAIL B-13, SHEET 8 OF 10 FOR PROPER TIMBER BEARING PLATE ORIENTATION.
5). MASH COMPLIANT SYSTEM - FHWA ELIGIBILITY LETTER B-256
6). THIS SYSTEM SHALL NOT BE USED WHERE END ON IMPACTS ARE EXPECTED. IT IS SOLELY DESIGNED TO ACT AS A DOWNSTREAM END ANCHOR.

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# END ANCHORAGE, TYPE 31

STANDARD NO. B-4 (2020) | SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED
CHIEF ENGINEER — 09/01/2020 DATE

9/21/2020
~~8/19/2020~~

SCALE : NTS

# B-5 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

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STANDARD NO. B-5 (2020)

SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

SCALE : NTS

# B-6 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

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ENGINEERING SUPPORT _____ DATE _____
RECOMMENDED

STANDARD NO. B-6 (2020)

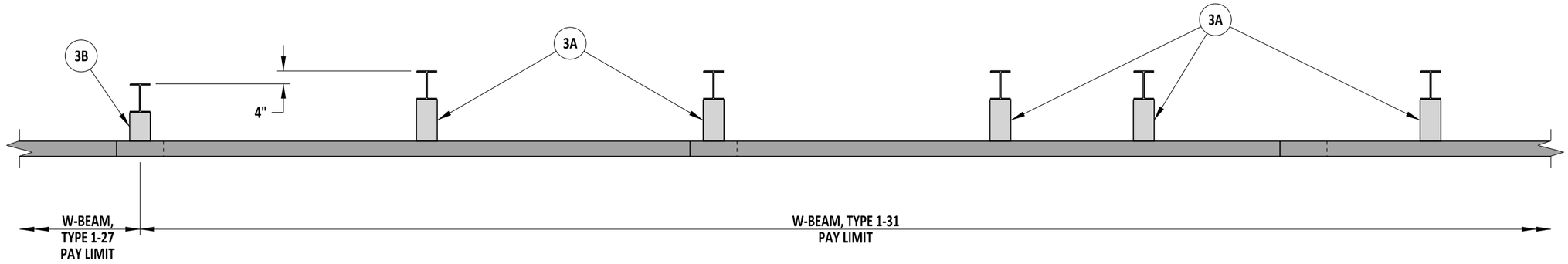
SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

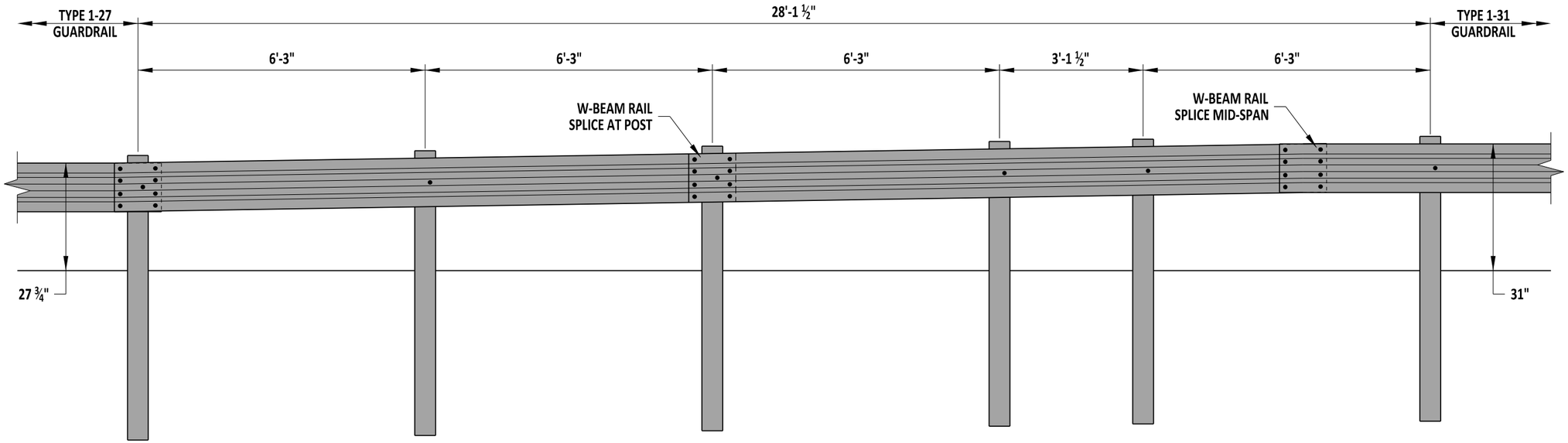
APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

SCALE : NTS




**PLAN**




**ELEVATION**

NOTES:
1). ALL OFFSET BLOCKS WITHIN THE 25' SECTION SHALL BE TYPE 3B (8" OFFSET).
2). IF CURB IS USED, FOLLOW DETAIL B-1, SHEET 3 OF 5 AND DETAIL B-15, SHEET 3 OF 3.

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**W-BEAM, TYPE 1-27 TO TYPE 1-31 TRANSITION SECTION**

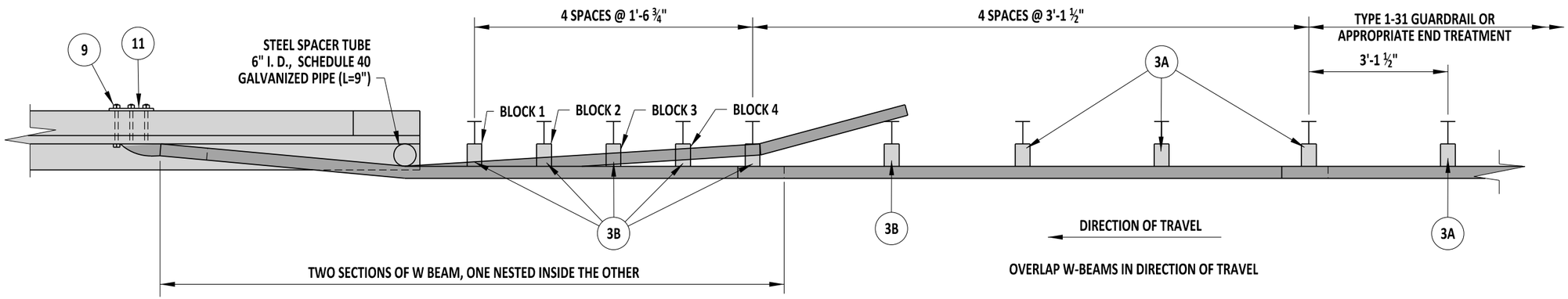
STANDARD NO. B-7 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

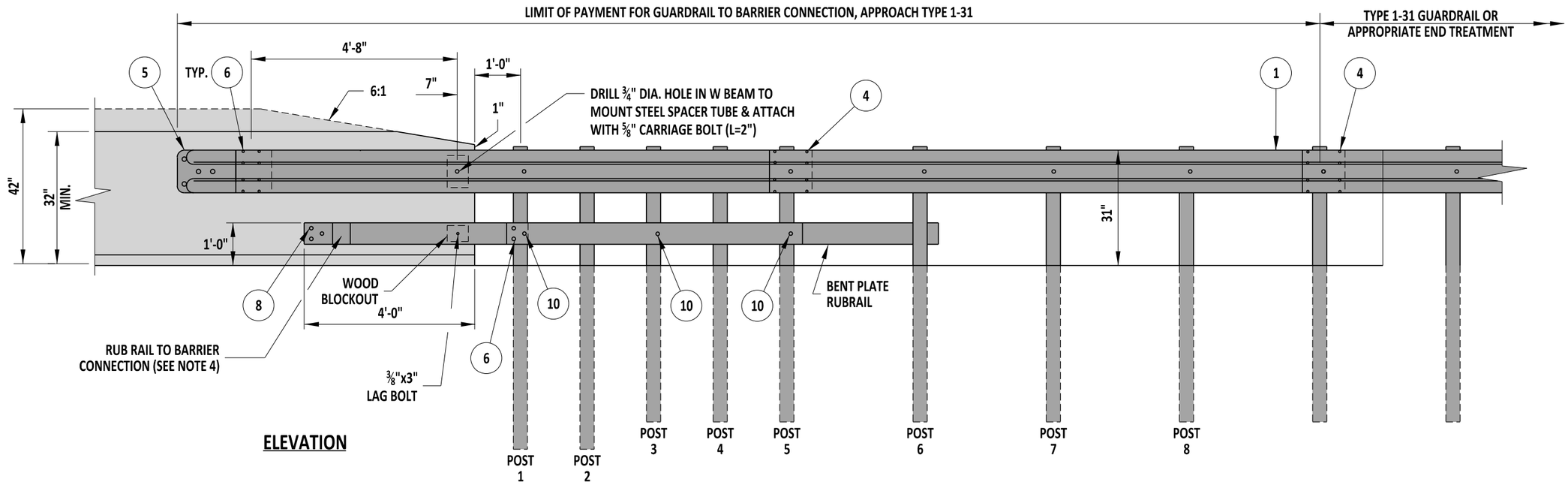
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

SCALE : NTS




## PLAN VIEW




## ELEVATION

**NOTES:**

1). DO NOT ATTACH W-BEAM TO POSTS 2 THROUGH 4.
2). DO NOT ATTACH RUB RAIL TO POSTS 2 AND 4.
3). POSTS 1 THROUGH 6 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER OFFSET BLOCKS AND/OR RUBRAIL AND WOOD BLOCK.
4). USE APPROPRIATE EPOXY BOLT ANCHORS TO REDUCE THE CHANCE OF SPLITTING THE CONCRETE. PLACE STEEL WASHERS (FOR ⅝" BOLT) BETWEEN HEADS AND RUB RAIL.
5). ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.
6). PLACE GUARDRAIL REFLECTOR AS PER THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
7). APPROVED CONCRETE INSERTS MAY BE USED IN NEW CONSTRUCTION TO ATTACH TERMINAL CONNECTOR TO PARAPET.
8). POSTS 1 AND 2 ARE W8x13, 7'-6" LONG. ALL OTHER POSTS IN TRANSITION ARE W6x9, 6'-0" LONG.
9). A 6"x8"x14" OFFSET BLOCK IS USED AT POSTS 1 THROUGH 6 AND A 6"x12"x14" OFFSET BLOCK IS USED AT POSTS 7 THROUGH 9.

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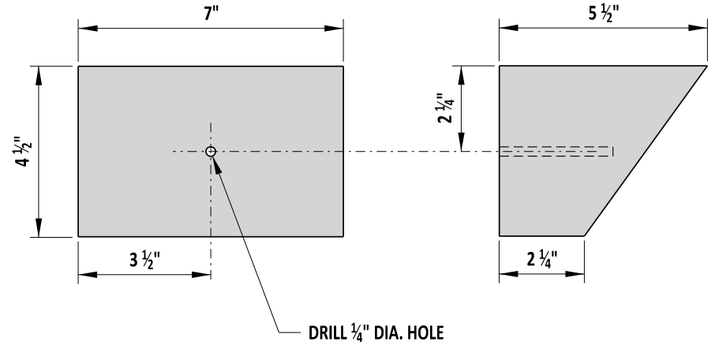
# GUARDRAIL TO BARRIER CONNECTION - APPROACH TYPE 1-31

STANDARD NO. B-8 (2020) | SHT. 1 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

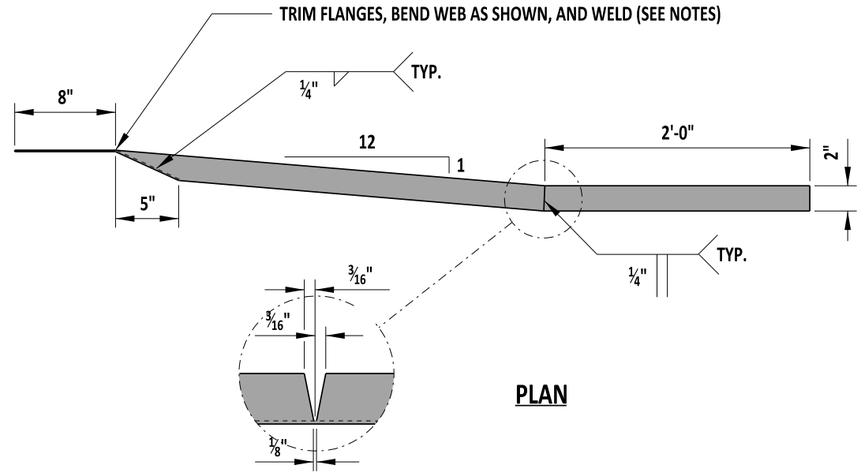
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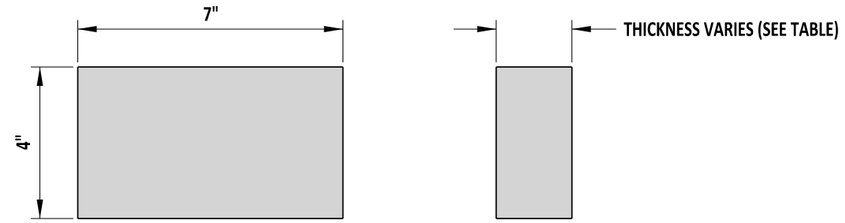

ELEVATION

RIGHT SIDE

OFFSET BLOCK DETAIL



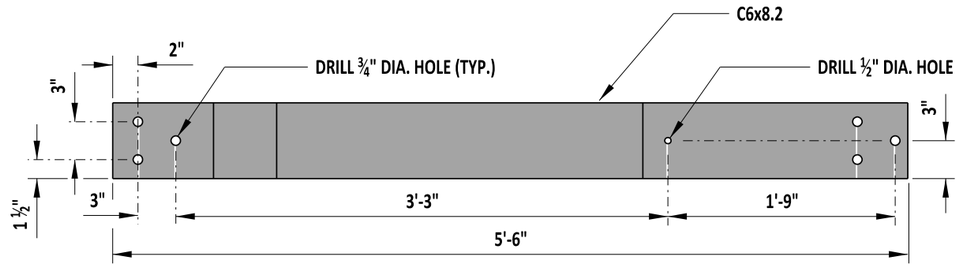

PLAN




ELEVATION

RIGHT SIDE

RUB RAIL OFFSET BLOCKS




ELEVATION

RUB RAIL TO BARRIER CONNECTION

| RUB RAIL OFFSET BLOCKS (7"x4") | | |
|---|---|---|
| POST NO. | THICKNESS | BOLT LENGTH |
| 1 | 4 ¼" | 6" |
| 2 | 3 ¼" | 4" |
| 3 | 2" | 4" |
| 4 | 1" | 2" |

NOTES:
1). THE RUB RAIL TO BARRIER CONNECTION END MUST BE ATTACHED FLUSH WITH THE SLOPED TOE OF THE SAFETY BARRIER. INSTALLATION CAN BE SIMPLIFIED BY FABRICATING OR SHOP TWISTING THE RUB RAIL END TO BE CONSISTENT WITH THE SLOPE OF THE BARRIER, HOWEVER, FIELD BENDING USING HEAT IS PERMITTED.
2). STEEL SPACER TUBE IS SCHEDULE 40 GALVANIZED PIPE, 6"x9".
3). ALL HARDWARE ON THIS DETAIL IS COMPATIBLE WITH GUARDRAIL TO BARRIER CONNECTION, TYPES 1-31 AND 1-27.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

GUARDRAIL TO BARRIER CONNECTION, TYPE 1 HARDWARE

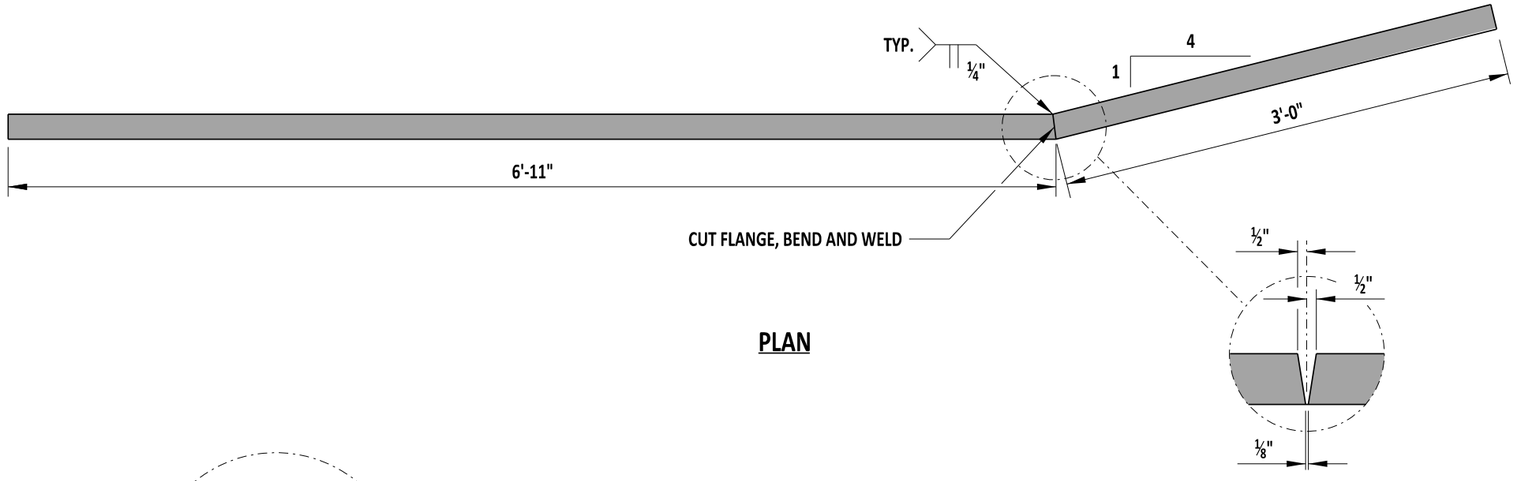
STANDARD NO. B-8 (2020) | SHT. 2 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

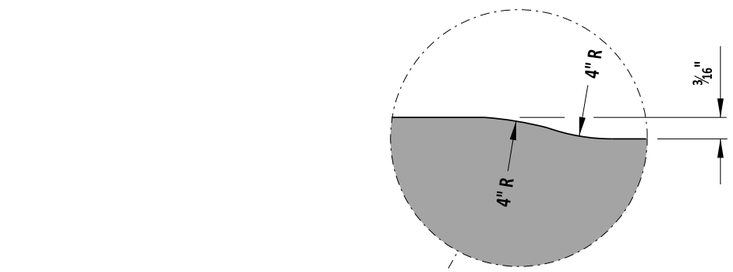
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

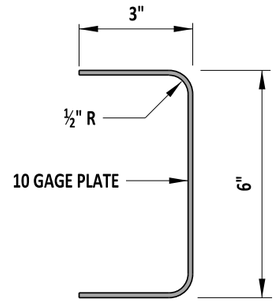
8/19/2020

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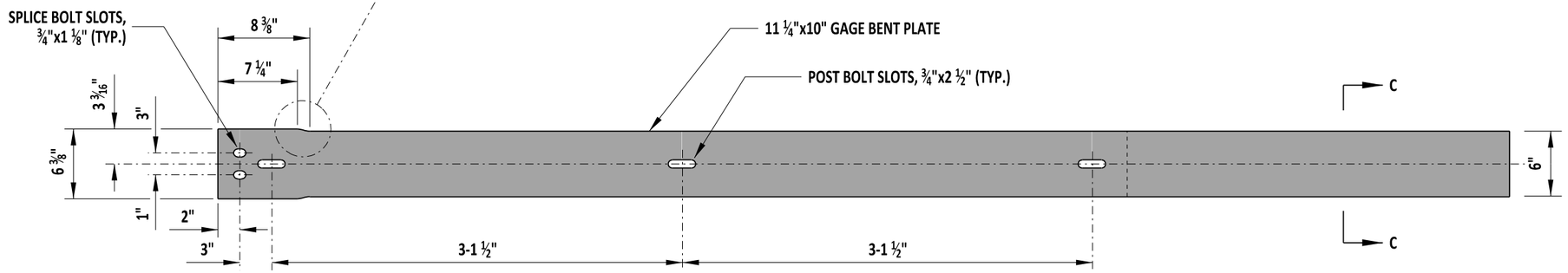



PLAN




SECTION C-C




ELEVATION

NOTE:
1). ALL HARDWARE ON THIS DETAIL IS COMPATIBLE WITH GUARDRAIL TO BARRIER CONNECTION, TYPES 1-31 AND 1-27.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

GUARDRAIL TO BARRIER CONNECTION, BENT PLATE RUB RAIL

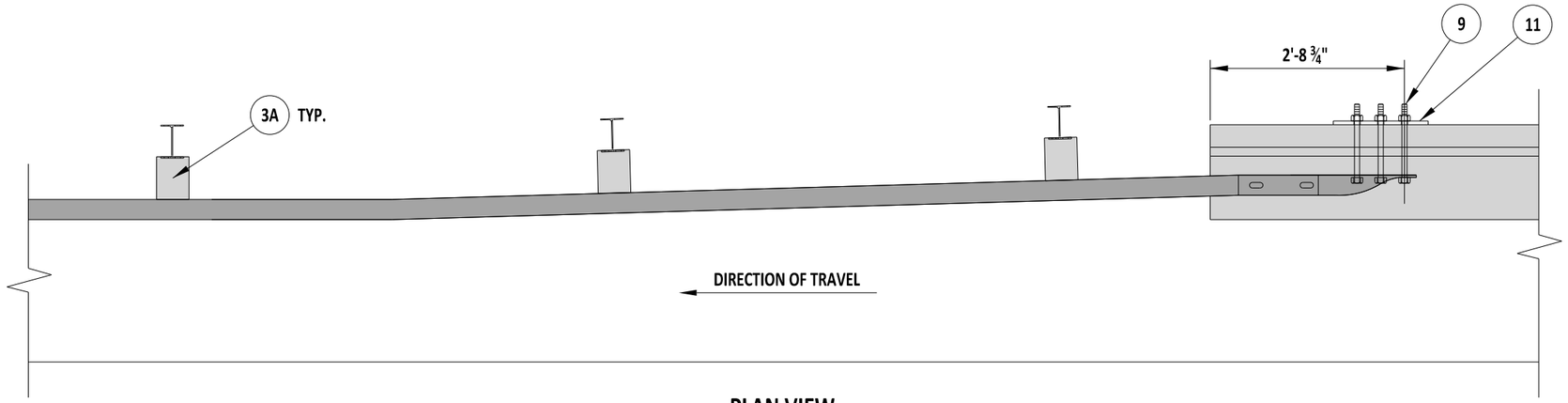
STANDARD NO. B-8 (2020) | SHT. 3 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

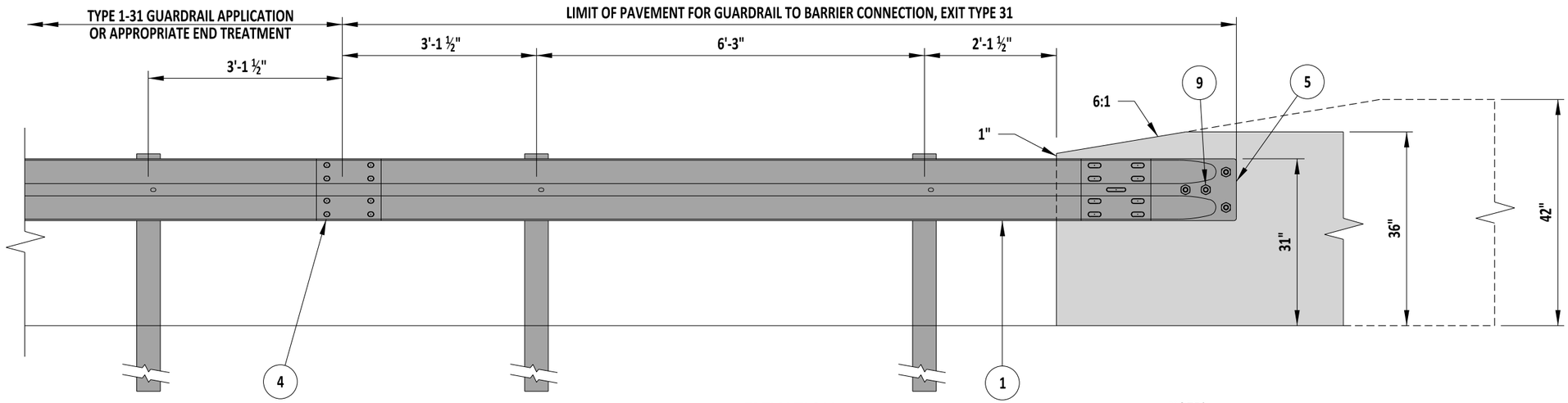
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

SCALE : NTS




## PLAN VIEW




## ELEVATION

**NOTES:**

1). CONCRETE INSERTS MAY BE USED IN NEW CONSTRUCTION TO ATTACH TERMINAL CONNECTOR TO PARAPET.

2). INSTALLATION SHOWN ABOVE WITH AN 'F-TYPE' BARRIER FACE. GUARDRAIL SECTION OF BARRIER CONNECTION SHALL BE ADJUSTED HORIZONTALLY IN ORDER TO MEET FLUSH AGAINST VARIOUS TYPES OF WALLS AND BARRIERS.

3). IF CURB IS USED, IT SHALL BE A MAX 2" HEIGHT WITHIN THE LIMIT OF PAYMENT OF THE GUARDRAIL TO BARRIER CONNECTION - EXIT TYPE 31.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

**GUARDRAIL TO BARRIER CONNECTION - EXIT TYPE 1-31**

STANDARD NO. B-8 (2020) | SHT. 4 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

SCALE : NTS

# B-9 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

DelDOT

ENGINEERING SUPPORT _____ DATE _____
RECOMMENDED

STANDARD NO. B-9 (2020)

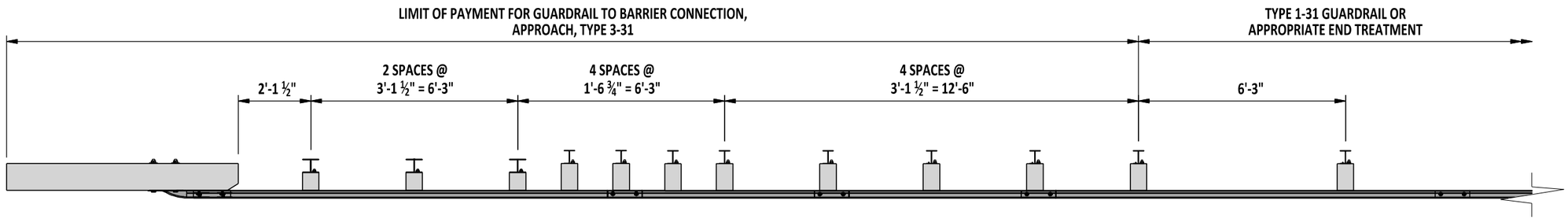
SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

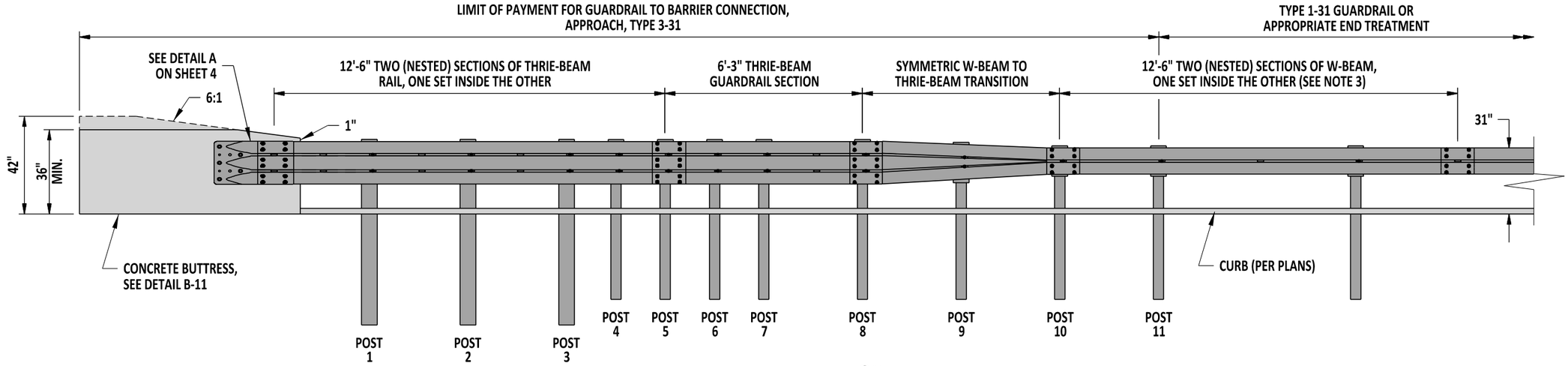
APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

SCALE : NTS




**PLAN VIEW**




**ELEVATION VIEW**

NOTES:
1). THIS GUARDRAIL-TO-BARRIER CONNECTION IS TO BE USED IN COMBINATION WITH DETAIL B-11, ON NEW CONSTRUCTION ONLY.
2). SEE SHEETS 2-4 FOR ADDITIONAL DETAILS.
3). WHEN CURB IS NOT USED, ONLY USE A SINGLE PIECE OF W-BEAM IN THIS SECTION, NESTED W-BEAM NOT REQUIRED IN THE ABSENCE OF CURB.
4). MASH COMPLIANT SYSTEM - DESIGN BASED ON MWRSF TEST REPORT TRP 03-367-19.

DelDOT

ENGINEERING SUPPORT — 10/30/2020 DATE

RECOMMENDED

**GUARDRAIL TO BARRIER CONNECTION, APPROACH, TYPE 3-31**

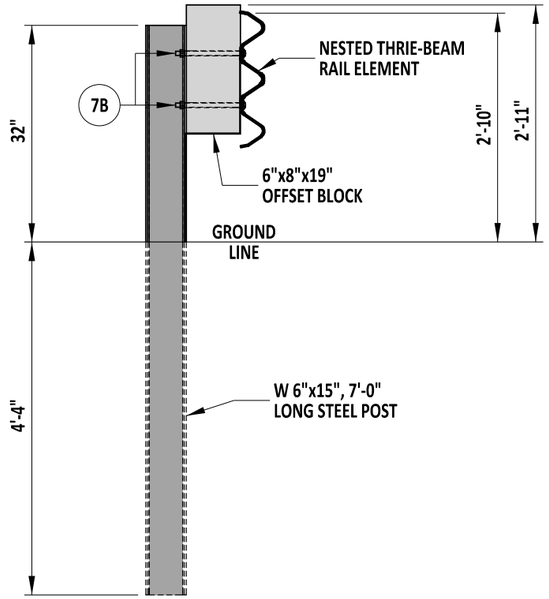
STANDARD NO. B-10 (2020) | SHT. 1 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 11/02/2020 DATE

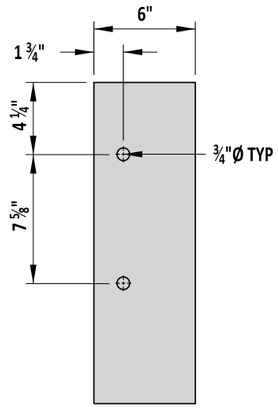
APPROVED — CHIEF ENGINEER — 11/10/2020 DATE

10/20/2020

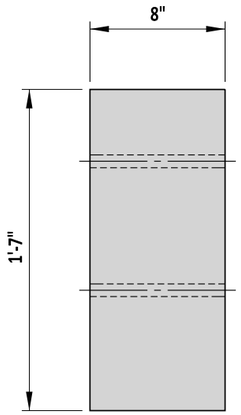
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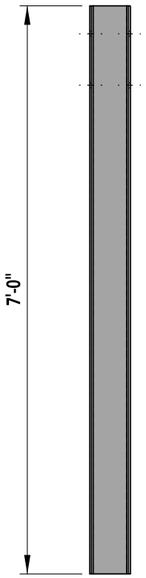

**SECTION**
POSTS 1-3



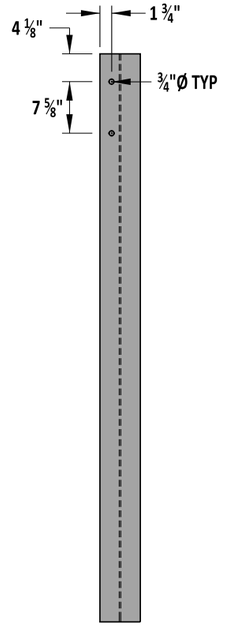

**ELEVATION VIEW**
OFFSET BLOCK FOR
POSTS 1-3




**PROFILE VIEW**
OFFSET BLOCK FOR
POSTS 1-3




**PROFILE VIEW**
POSTS 1-3




**ELEVATION VIEW**
POSTS 1-3

NOTE:
1). ALL OFFSET BLOCKS SHALL BE WOOD (SYP GRADE NO. 1 OR BETTER).

## POST DETAILS

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

GUARDRAIL TO BARRIER CONNECTION, TYPE 3-31

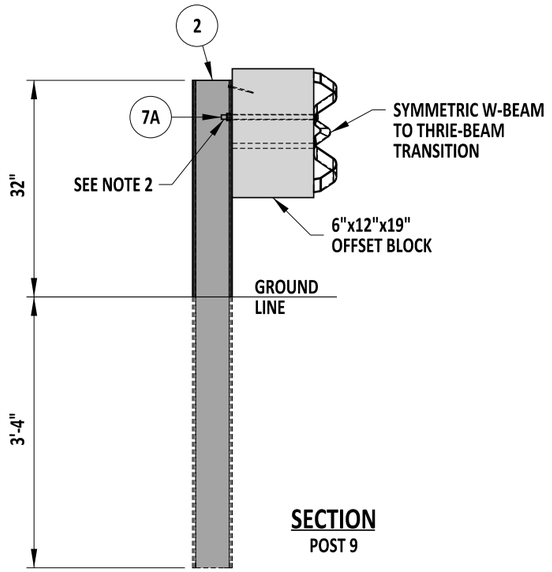
STANDARD NO. B-10 (2020) | SHT. 2 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

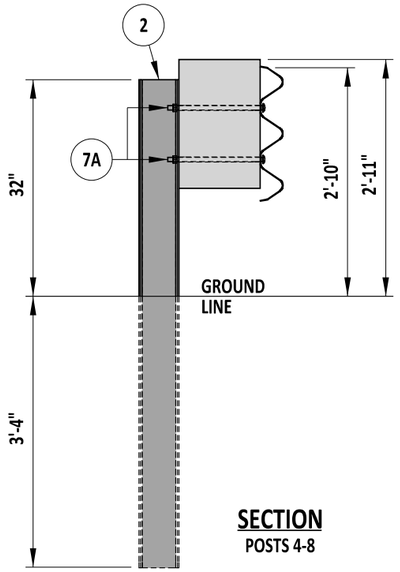
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

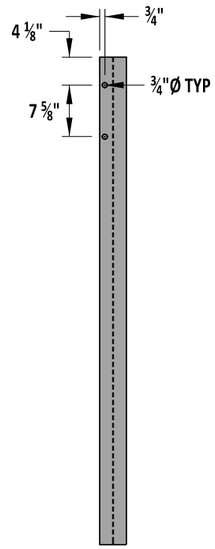
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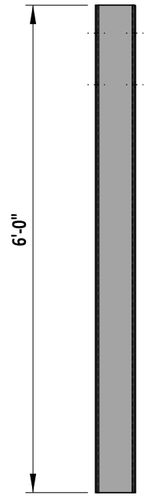

**SECTION**
POST 9



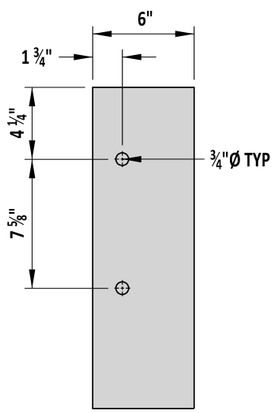

**SECTION**
POSTS 4-8



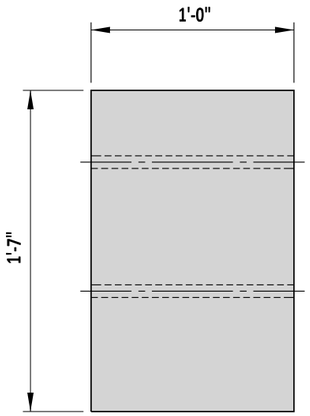

**ELEVATION VIEW**
POSTS 4-8



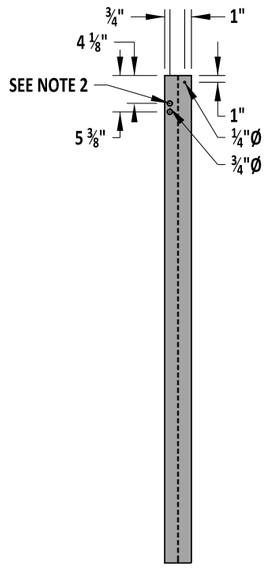

**PROFILE VIEW**
POSTS 4-8



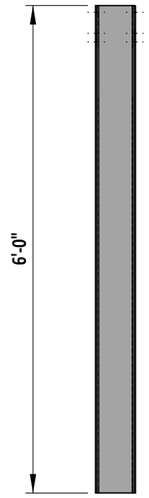

**ELEVATION VIEW**
OFFSET BLOCK FOR
POSTS 4-8




**PROFILE VIEW**
OFFSET BLOCK FOR
POSTS 4-8

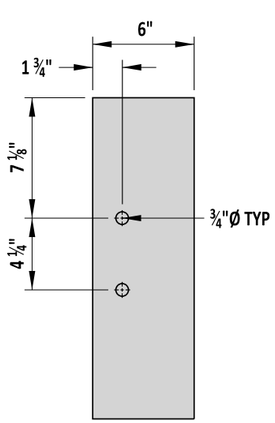



**ELEVATION VIEW**
POST 9

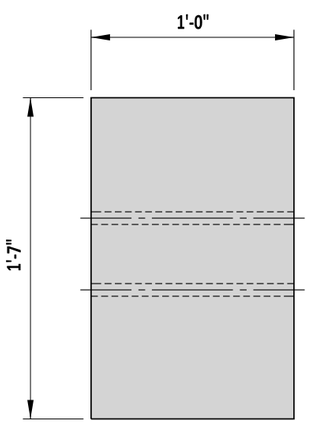



**PROFILE VIEW**
POST 9

**POST DETAILS**




**ELEVATION VIEW**
OFFSET BLOCK FOR
POST 9




**PROFILE VIEW**
OFFSET BLOCK FOR
POST 9

**OFFSET BLOCK DETAILS**

**NOTES:**
1). ALL OFFSET BLOCKS SHALL BE WOOD (STP GRADE NO. 1 OR BETTER).
2). TOP BOLT HOLE IN POST 9 IS FOR USE WITH ASYMMETRIC GUARDRAIL SEGMENT AFTER 3" ROADWAY OVERLAY. NO BOLT PLACED IN LOWER HOLE OF POST NO. 9.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

# GUARDRAIL TO BARRIER CONNECTION, TYPE 3-31

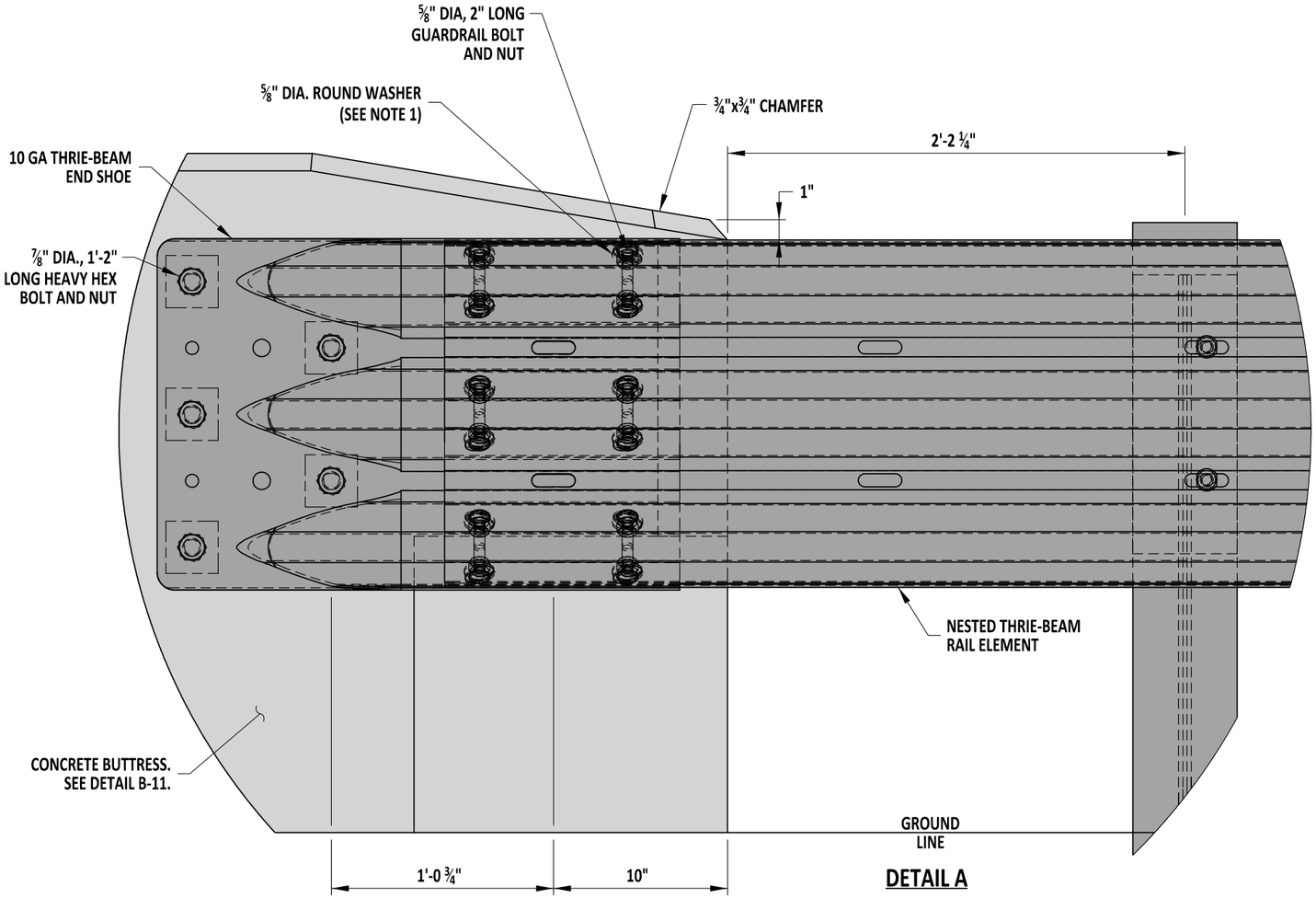
STANDARD NO. B-10 (2020) | SHT. 3 OF 4

REVIEWED
DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

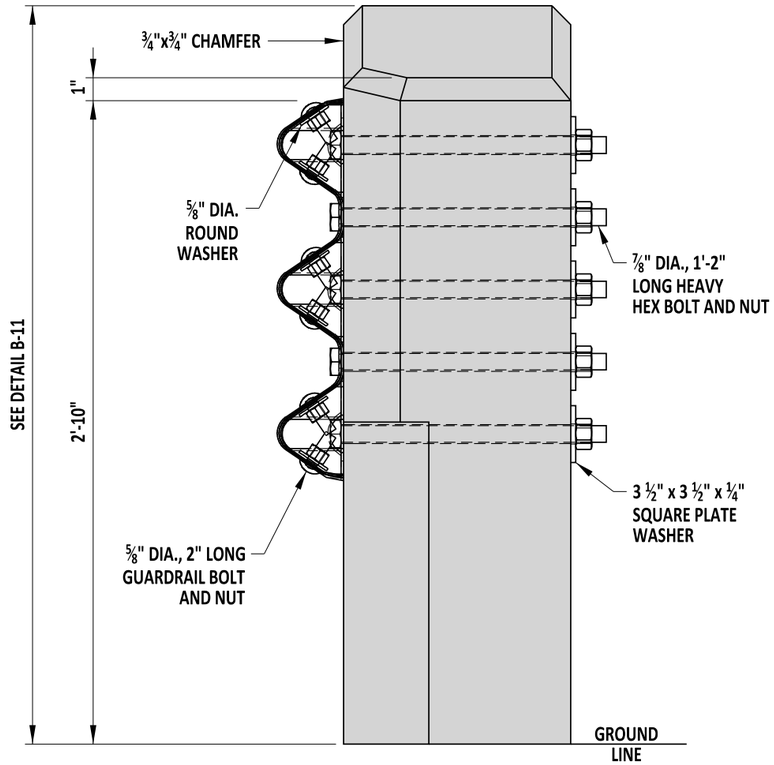
APPROVED
CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

SCALE : NTS




DETAIL A




BUTTRESS END VIEW

NOTES:
1). WASHERS PLACED BETWEEN NUTS AND THRIE BEAM END SHOE CONNECTOR.
2). ALL HARDWARE SHALL BE GALVANIZED.

## TERMINAL END SHOE AND CONNECTION DETAIL

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

GUARDRAIL TO BARRIER CONNECTION, TYPE 3-31

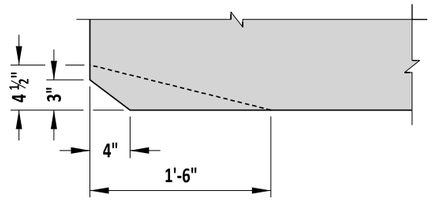
STANDARD NO. B-10 (2020) | SHT. 4 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

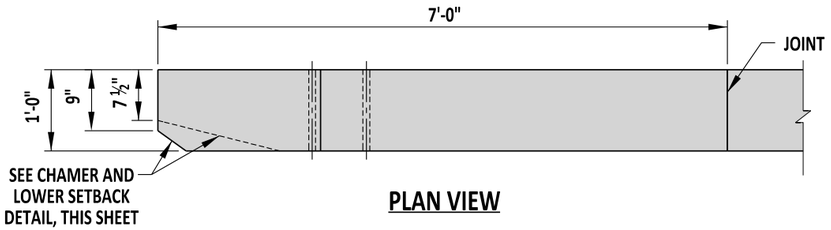
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

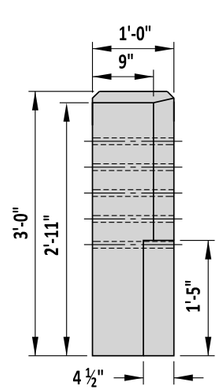
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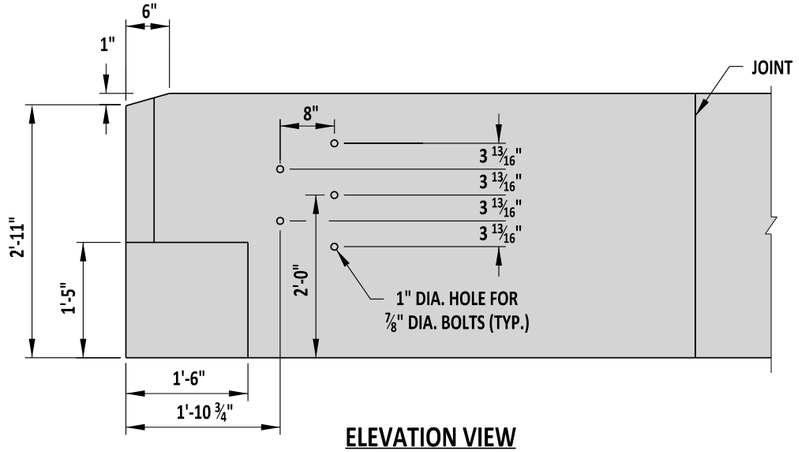

CHAMFER AND LOWER SETBACK DETAIL




PLAN VIEW




END VIEW




ELEVATION VIEW

NOTES:
1). THRIE-BEAM GUARDRAIL NOT SHOWN. SEE STANDARD NO. B-10 FOR MORE INFORMATION ON THRIE-BEAM CONNCECTION.
2). FOUNDATION NOT SHOWN. FOR ROADSIDE BARRIER APPLICATIONS BUTTRESS SHALL BE CONSTRUCTED ON A MINIMUM 2'-0" WIDE x 2'-0" DEEP FOOTING OVER 8" OF GABC.
3). CHAMFER ALL EXPOSED EDGES ¾" x ¾", UNLESS NOTED OTHERWISE.
4). SEE SHEET 2 FOR BUTTRESS REINFORCEMENT.

DESIGNER NOTES:
1). FOR BUTTRESS APPLICATIONS AT BRIDGE APPROACHES, BRIDGE DESIGNER SHALL MATCH GEOMETRY SHOWN ON THIS DETAIL FOR THRIE-BEAM ATTACHMENT. LENGTH SHOWN HERE IS MINIMUM LENGTH FOR THRIE-BEAM ATTACHMENT. BRIDGE DESIGNER IS RESPONSIBLE FOR REINFORCEMENT DESIGN AND CONNECTION TO WINGWALL OR SLEEPER SLAB.

TL-3

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

# THRIE-BEAM APPROACH GUARDRAIL TRANSITION (AGT) TO CONCRETE BUTTRESS

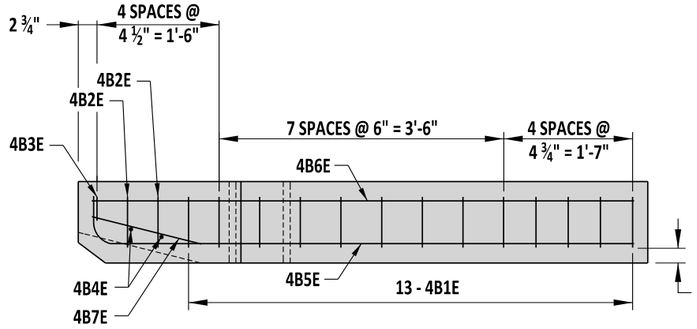
STANDARD NO. B-11 (2020) | SHT. 1 OF 8

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

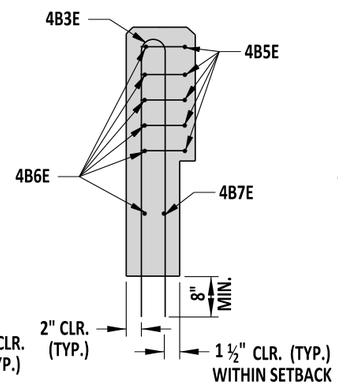
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

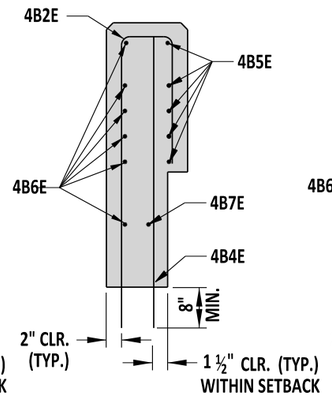
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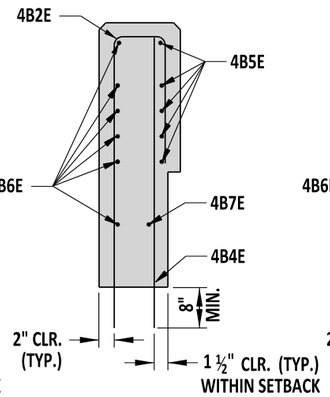

PLAN - REINFORCEMENT



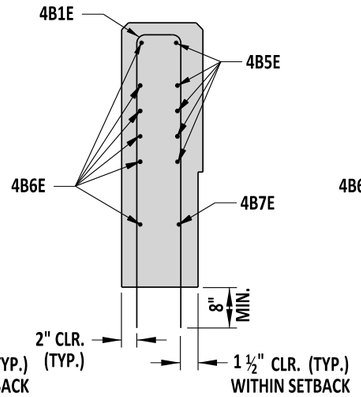

SECTION A-A



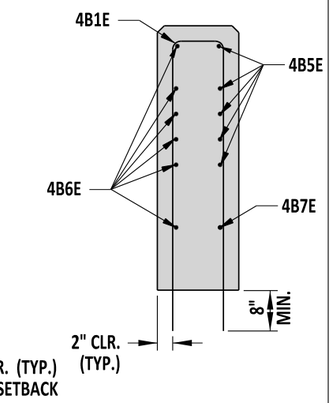

SECTION B-B



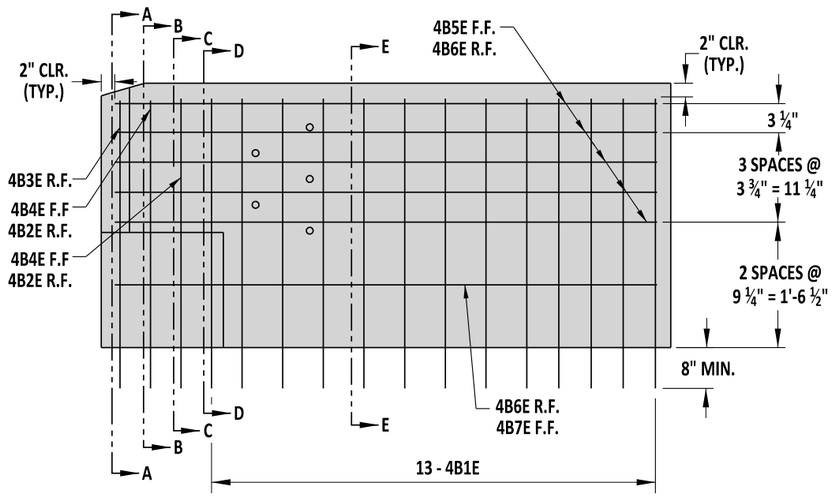

SECTION C-C



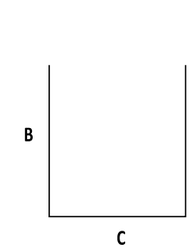

SECTION D-D



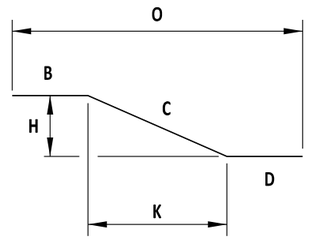

SECTION E-E




ELEVATION - REINFORCEMENT




TYPE 17 BAR




TYPE 31 BAR

| BAR SCHEDULE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MARK | SIZE | QTY. | LENGTH | TYPE | B | C | D | H | K | O |
| 4B1E | 4 | 13 | 7'-8" | 17 | 3'-6" | 8" | 3'-6" | - | - | - |
| 4B2E | 4 | 2 | 5'-5" | 17 | 3'-6" | 8" | 1'-3" | - | - | - |
| 4B3E | 4 | 1 | 7'-4 ¾" | 17 | 3'-6" | 4 ¾" | 3'-6" | - | - | - |
| 4B4E | 4 | 2 | 3'-6" | STR | 3'-6" | - | - | - | - | - |
| 4B5E | 4 | 5 | 7'-3 ½" | 17 | 7 ½" | 6'-8" | - | - | - | - |
| 4B6E | 4 | 6 | 6'-8" | STR | - | - | - | - | - | - |
| 4B7E | 4 | 1 | 6'-8 ½" | 31 | - | 1'-2 ¾" | 5'-5 ¾" | 3 ½" | 1'-2 ¼" | 6'-8" |

NOTES:
1). CONCRETE CLEAR COVER FOR REINFORCEMENT BARS SHALL BE 2" MINIMUM, UNLESS NOTED OTHERWISE.
2). F.F. = FRONT FACE
R.F. = REAR FACE

TL-3

DelDOT

09/01/2020
ENGINEERING SUPPORT DATE
RECOMMENDED

THRIE-BEAM APPROACH GUARDRAIL TRANSITION (AGT) TO CONCRETE BUTTRESS

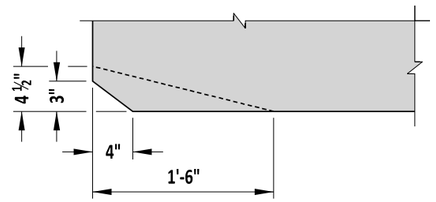
STANDARD NO. B-11 (2020) SHT. 2 OF 8

REVIEWED
DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE

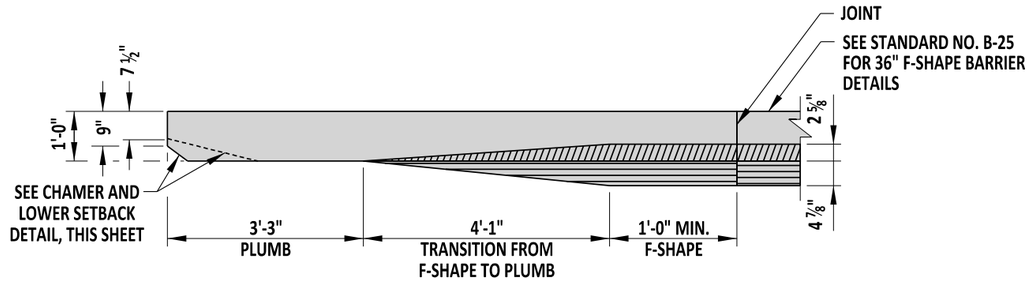
APPROVED
CHIEF ENGINEER 09/01/2020 DATE

8/19/2020

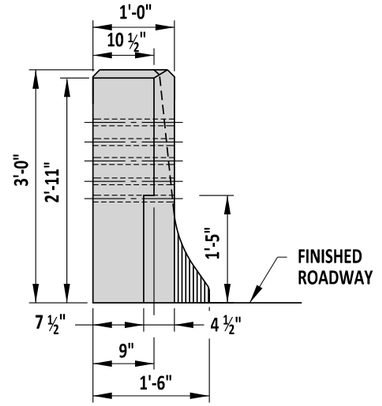
SCALE : NTS



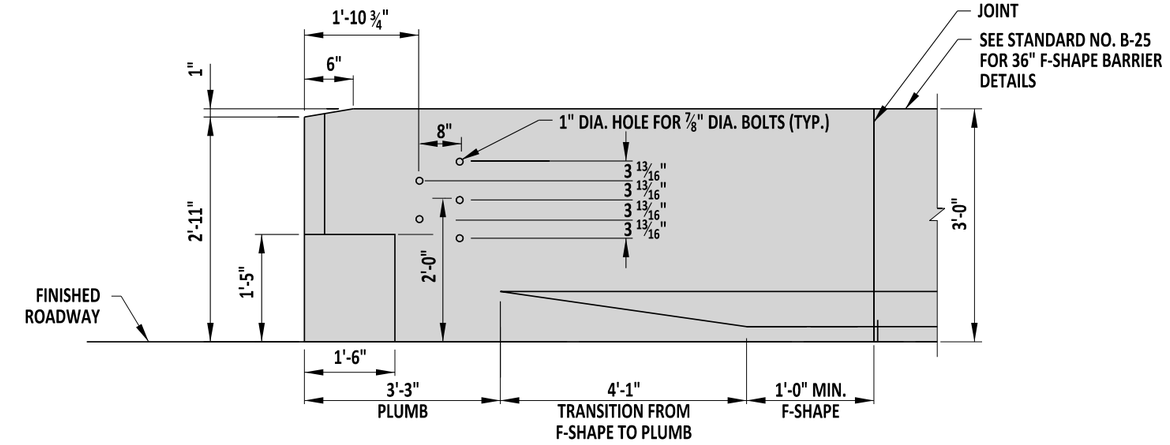

## CHAMFER AND LOWER SETBACK DETAIL




## PLAN




## END VIEW




## ELEVATION

NOTES:
1). THRIE-BEAM GUARDRAIL NOT SHOWN. SEE STANDARD NO. B-10 FOR MORE INFORMATION ON THRIE-BEAM CONNECTION.
2). FOUNDATION NOT SHOWN. BUTTRESS SHALL BE CONSTRUCTED ON A FOOTING THAT MATCHES THE ADJACENT CONCRETE BARRIER FOOTING.
3). CHAMFER ALL EXPOSED EDGES ¾" x ¾", UNLESS NOTED OTHERWISE.
4). SEE SHEET 4 FOR BUTTRESS REINFORCEMENT DETAILS.

DESIGNER NOTES:
1). FOR BUTTRESS APPLICATIONS AT BRIDGE APPROACHES, BRIDGE DESIGNER SHALL MATCH GEOMETRY SHOWN ON THIS DETAIL FOR THRIE-BEAM ATTACHMENT. LENGTH SHOWN HERE IS MINIMUM LENGTH FOR THRIE-BEAM ATTACHMENT. BRIDGE DESIGNER IS RESPONSIBLE FOR REINFORCEMENT DESIGN AND CONNECTION TO WINGWALL OR SLEEPER SLAB.

TL-4

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

# THRIE-BEAM AGT TO CONCRETE BUTTRESS - 36" F-SHAPE TRANSITION

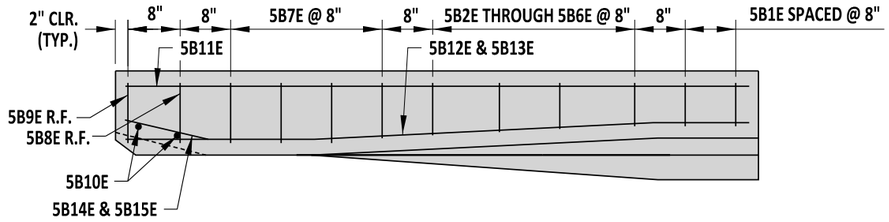
STANDARD NO. B-11 (2020) | SHT. 3 OF 8

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

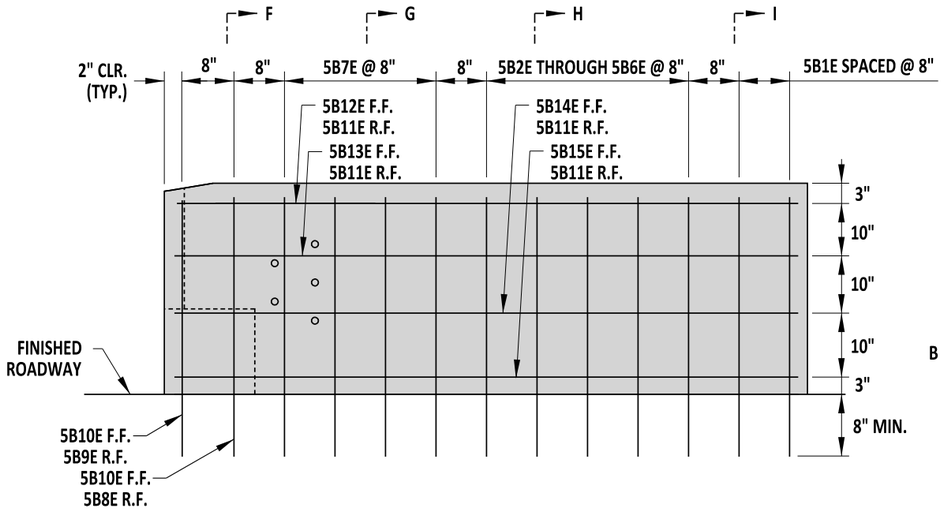
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

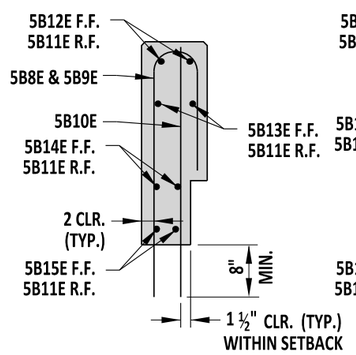
SCALE : NTS



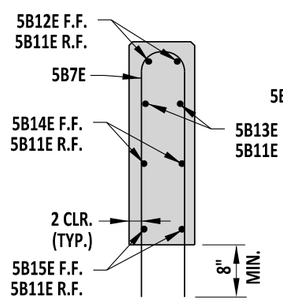

## PLAN - REINFORCEMENT



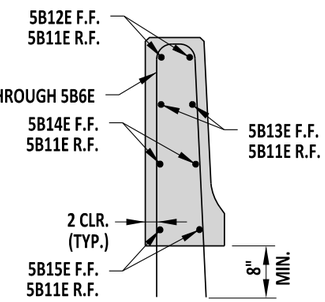

## ELEVATION - REINFORCEMENT



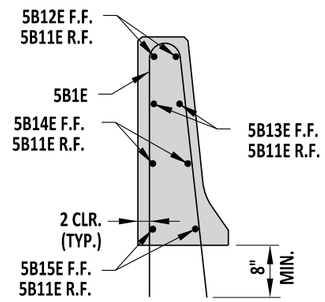

## SECTION F-F



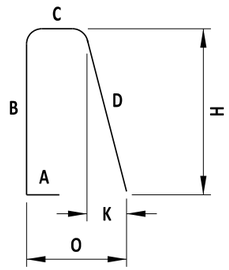

## SECTION G-G



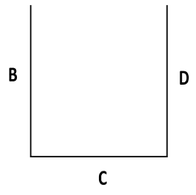

## SECTION H-H



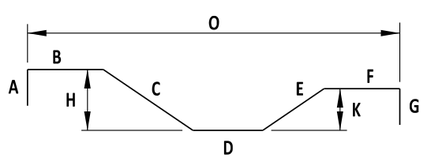

## SECTION I-I



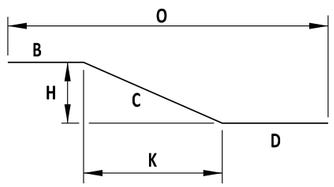

## TYPE 16 BAR



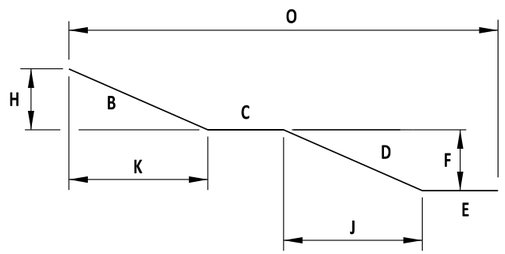

## TYPE 17 BAR




## TYPE 23 BAR




## TYPE 31 BAR




## TYPE SP01 BAR

**NOTES:**

1). CONCRETE CLEAR COVER FOR REINFORCEMENT BARS SHALL BE 2" MINIMUM, UNLESS NOTED OTHERWISE.

2). F.F. = FRONT FACE
R.F. = REAR FACE

**BAR SCHEDULE**

| MARK | SIZE | QTY. | LENGTH | TYPE | B | C | D | E | F | H | J | K | O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5B1E | 5 | 2 | 7'- 6 ¾" | 16 | 3'-6" | 6 ½" | 3'-6 ¼" | - | - | - | 3'-6" | 4 ¼" | 10 ¾" |
| 5B2E | 5 | 1 | 7'-7" | 16 | 3'-6" | 6 ¾" | 3'-6 ¼" | - | - | - | 3'-6" | 3 ½" | 10 ¼" |
| 5B3E | 5 | 1 | 7'-7 ¼" | 16 | 3'-6" | 7" | 3'-6 ¼" | - | - | - | 3'-6" | 2 ¾" | 9 ¾" |
| 5B4E | 5 | 1 | 7'-7 ¼" | 16 | 3'-6" | 7 ¼" | 3'-6" | - | - | - | 3'-6" | 2" | 9 ¼" |
| 5B5E | 5 | 1 | 7'-7 ½" | 16 | 3'-6" | 7 ½" | 3'-6" | - | - | - | 3'-6" | 1 ¼" | 8 ¾" |
| 5B6E | 5 | 1 | 7'-7 ¾" | 16 | 3'-6" | 7 ¾" | 3'-6" | - | - | - | 3'-6" | ½" | 8 ¼" |
| 5B7E | 5 | 4 | 7'-8" | 17 | 3'-6" | 8" | 3'-6" | - | - | - | - | - | - |
| 5B8E | 5 | 1 | 5'-5" | 17 | 3'-6" | 8" | 1'-3" | - | - | - | - | - | - |
| 5B9E | 5 | 1 | 5'-2 ¾" | 17 | 3'-5 ¼" | 6 ½" | 1'-3" | - | - | - | - | - | - |
| 5B10E | 5 | 2 | 3'-6" | STR | - | - | - | - | - | - | - | - | - |
| 5B11E | 5 | 4 | 8'-0" | STR | - | - | - | - | - | - | - | - | - |
| 5B12E | 5 | 1 | 8'-0 ¼" | 23 | - | 8 ¼" | 2'-8" | 4'-0" | 8" | 1 ½" | - | 1 ½" | 8'-0" |
| 5B13E | 5 | 1 | 8'-0 ¼" | 31 | - | 8 ¼" | 7'-4" | - | - | 1 ½" | - | 8" | 8'-0" |
| 5B14E | 5 | 1 | 8'-0 ¼" | SP01 | 1'-4 ¼" | 2'-0" | 4'-0" | 8" | ¾" | 3 ½" | 4'-0" | 1'-4" | 8'-0" |
| 5B15E | 5 | 1 | 8'-0 ½" | SP01 | 1'-4 ½" | 2'-0" | 4'-0" | 8" | 2" | 3 ½" | 4'-0" | 1'-4" | 8'-0" |

TL-4

DelDOT

09/01/2020
ENGINEERING SUPPORT DATE
RECOMMENDED

THRIE-BEAM AGT TO CONCRETE BUTTRESS - 36" F-SHAPE TRANSITION

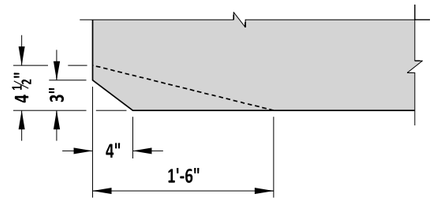
STANDARD NO. B-11 (2020) SHT. 4 OF 8

REVIEWED
DEPUTY DIRECTOR - DESIGN
09/01/2020
DATE

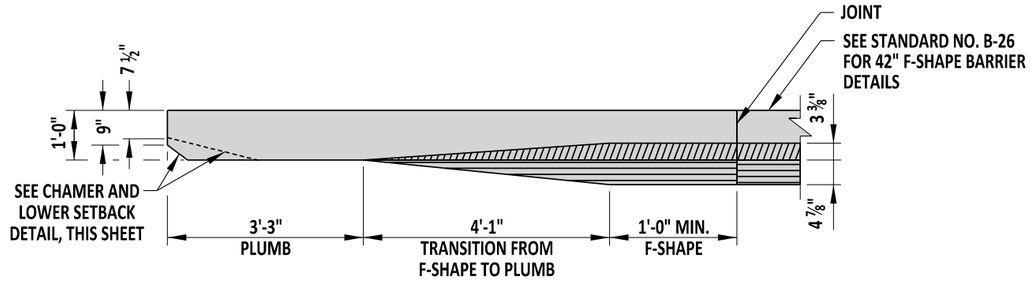
APPROVED
CHIEF ENGINEER
09/01/2020
DATE

8/19/2020

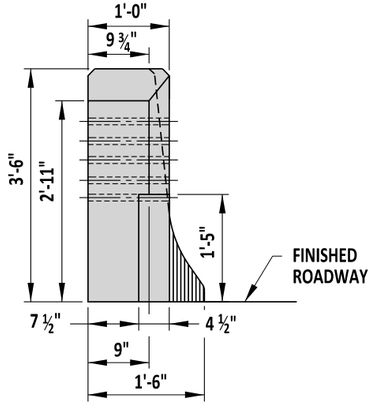
SCALE : NTS



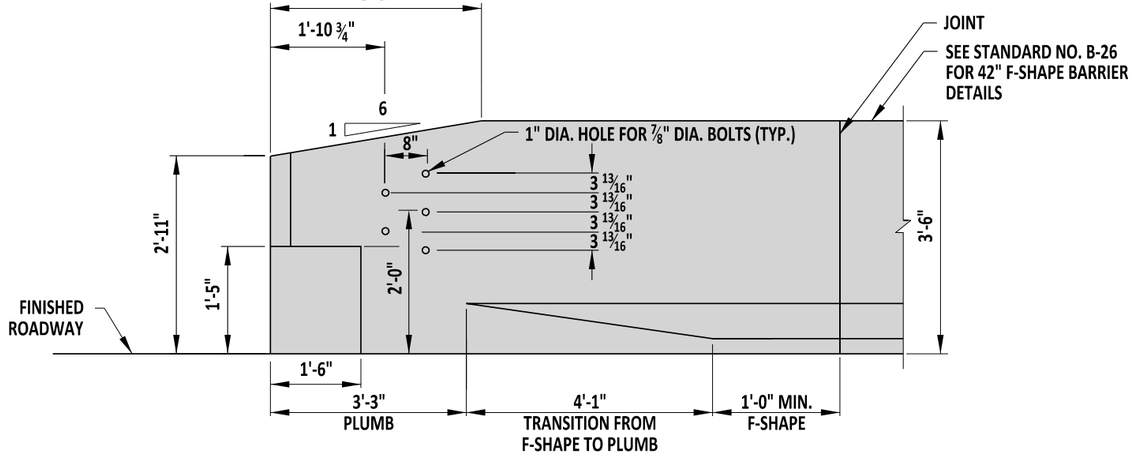

## CHAMFER AND LOWER SETBACK DETAIL




## PLAN




## END VIEW




## ELEVATION

**NOTES:**
1). THRIE-BEAM GUARDRAIL NOT SHOWN. SEE STANDARD NO. B-10 FOR MORE INFORMATION ON THRIE-BEAM CONNECTION.
2). FOUNDATION NOT SHOWN. BUTTRESS SHALL BE CONSTRUCTED ON A FOOTING THAT MATCHES THE ADJACENT CONCRETE BARRIER FOOTING.
3). CHAMFER ALL EXPOSED EDGES ¾" x ¾", UNLESS NOTED OTHERWISE.
4). SEE SHEET 6 FOR BUTTRESS REINFORCEMENT DETAILS.

**DESIGNER NOTES:**
1). FOR BUTTRESS APPLICATIONS AT BRIDGE APPROACHES, BRIDGE DESIGNER SHALL MATCH GEOMETRY SHOWN ON THIS DETAIL FOR THRIE-BEAM ATTACHMENT. LENGTH SHOWN HERE IS MINIMUM LENGTH FOR THRIE-BEAM ATTACHMENT. BRIDGE DESIGNER IS RESPONSIBLE FOR REINFORCEMENT DESIGN AND CONNECTION TO WINGWALL OR SLEEPER SLAB.

TL-4

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

# THRIE-BEAM AGT TO CONCRETE BUTTRESS - 42" F-SHAPE TRANSITION

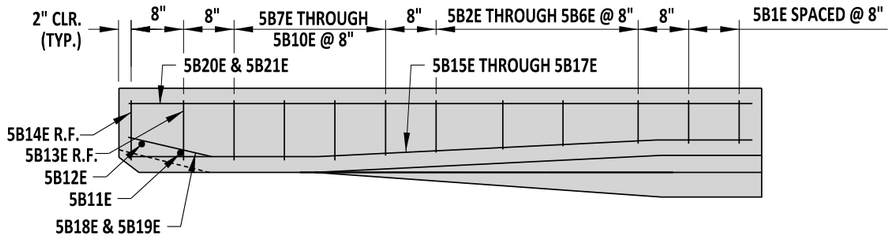
STANDARD NO. B-11 (2020) | SHT. 5 OF 8

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

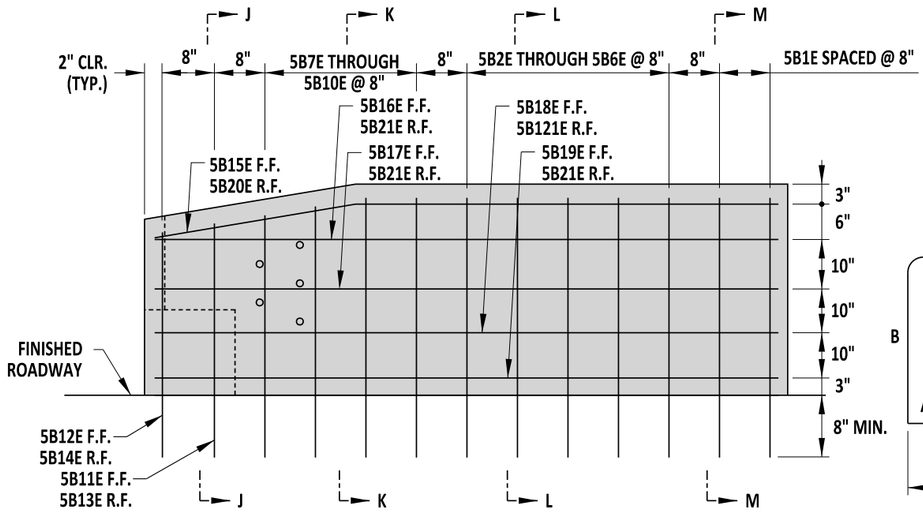
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

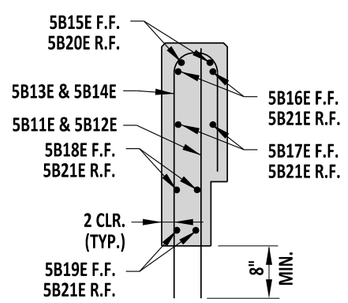
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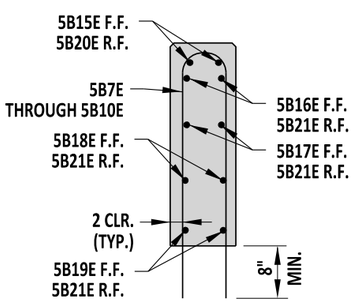

## PLAN - REINFORCEMENT



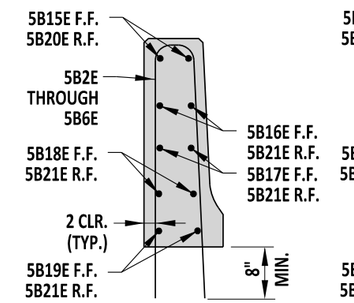

## ELEVATION - REINFORCEMENT



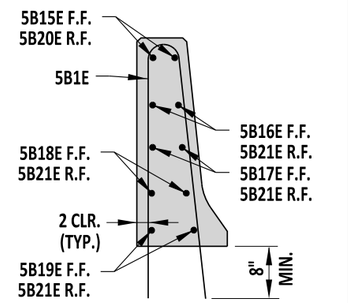

## SECTION J-J



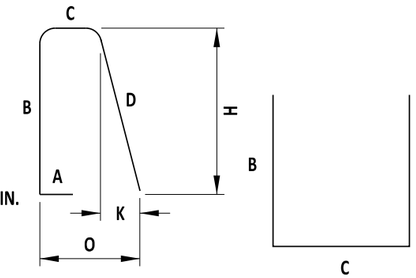

## SECTION K-K




## SECTION L-L



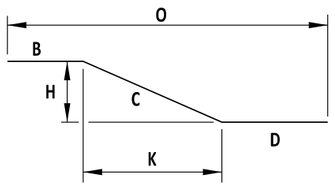

## SECTION M-M



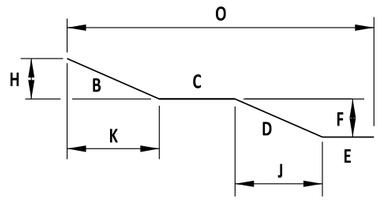

## TYPE 16 BAR



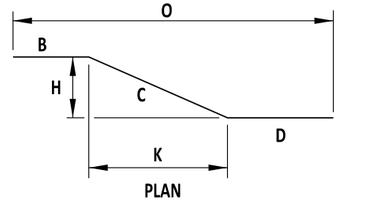

## TYPE 17 BAR

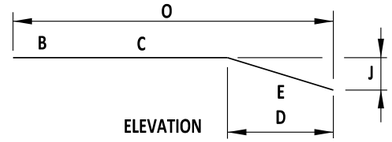



## TYPE 31 BAR




## TYPE SP01 BAR




## TYPE SP02 BAR

**NOTES:**

1). CONCRETE CLEAR COVER FOR REINFORCEMENT BARS SHALL BE 2" MINIMUM, UNLESS NOTED OTHERWISE.

2). F.F. = FRONT FACE
R.F. = REAR FACE

**BAR SCHEDULE**

| MARK | SIZE | QTY. | LENGTH | TYPE | B | C | D | E | F | H | J | K | L | O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5B1E | 5 | 2 | 8'-6" | 16 | 4'-0" | 5 1/2" | 4'-0 1/2" | - | - | 4'-0" | - | 5 3/4" | - | 11 1/4" |
| 5B2E | 5 | 1 | 8'-6" | 16 | 4'-0" | 6" | 4'-0 1/2" | - | - | 4'-0" | - | 4 3/4" | - | 10 3/4" |
| 5B3E | 5 | 1 | 8'-6 1/2" | 16 | 4'-0" | 6 1/2" | 4'-0 1/2" | - | - | 4'-0" | - | 3 3/4" | - | 10 1/4" |
| 5B4E | 5 | 1 | 8'-7" | 16 | 4'-0" | 7" | 4'-0 1/2" | - | - | 4'-0" | - | 2 3/4" | - | 9 3/4" |
| 5B5E | 5 | 1 | 8'-7 1/2" | 16 | 4'-0" | 7 1/2" | 4'-0 1/2" | - | - | 4'-0" | - | 1 3/4" | - | 9 1/4" |
| 5B6E | 5 | 1 | 8'-8" | 16 | 4'-0" | 8" | 4'-0 1/2" | - | - | 4'-0" | - | 3/4" | - | 8 3/4" |
| 5B7E | 5 | 1 | 8'-8" | 17 | 4'-0" | 8" | 4'-0" | - | - | - | - | - | - | - |
| 5B8E | 5 | 1 | 8'-5 1/2" | 17 | 3'-10 3/4" | 8" | 3'-10 3/4" | - | - | - | - | - | - | - |
| 5B9E | 5 | 1 | 8'-3" | 17 | 3'-9 1/2" | 8" | 3'-9 1/2" | - | - | - | - | - | - | - |
| 5B10E | 5 | 1 | 8'-0 1/2" | 17 | 3'-8 1/4" | 8" | 3'-8 1/4" | - | - | - | - | - | - | - |
| 5B11E | 5 | 1 | 3'-6 3/4" | STR | - | - | - | - | - | - | - | - | - | - |
| 5B12E | 5 | 1 | 3'-5 1/4" | STR | - | - | - | - | - | - | - | - | - | - |
| 5B13E | 5 | 1 | 5'-6 1/2" | 17 | 3'-6 3/4" | 8" | 1'-3 3/4" | - | - | - | - | - | - | - |
| 5B14E | 5 | 1 | 5'-2" | 17 | 3'-5 1/4" | 6 1/2" | 1'-2 1/4" | - | - | - | - | - | - | - |
| 5B15E | 5 | 1 | 7'-11" | SP02 | 8" | 4'-0" | 3'-2 1/2" | 3'-3" | - | 2 1/4" | 6 1/2" | 4'-0" | - | 7'-10 1/2" |
| 5B16E | 5 | 1 | 7'-10 1/2" | 31 | 8" | 4'-0" | 3'-2 1/2" | - | - | 1 1/2" | - | 4'-0" | - | 7'-10 1/2" |
| 5B17E | 5 | 1 | 7'-10 1/2" | 31 | 8" | 4'-0" | 3'-2 1/2" | - | - | 1/2" | - | 4'-0" | - | 7'-10 1/2" |
| 5B18E | 5 | 1 | 8'-0 1/2" | SP01 | 1'-4 1/2" | 2'-0" | 4'-0" | 8" | 3/4" | 3 1/2" | 4'-0" | 1'-4" | - | 8'-0" |
| 5B19E | 5 | 1 | 8'-0 1/2" | SP01 | 1'-4 1/2" | 2'-0" | 4'-0" | 8" | 2" | 3 1/2" | 4'-0" | 1'-4" | - | 8'-0" |
| 5B20E | 5 | 1 | 7'-11" | 31 | 4'-8" | 3'-3" | - | - | - | 6 1/2" | - | 3'-2 1/2" | - | 7'-10 1/2" |
| 5B21E | 5 | 4 | 8'-0" | STR | - | - | - | - | - | - | - | - | - | - |

TL-4

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

THRIE-BEAM AGT TO CONCRETE BUTTRESS - 42" F-SHAPE TRANSITION

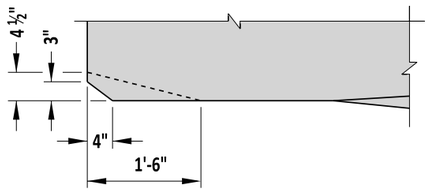
STANDARD NO. B-11 (2020) | SHT. 6 OF 8

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

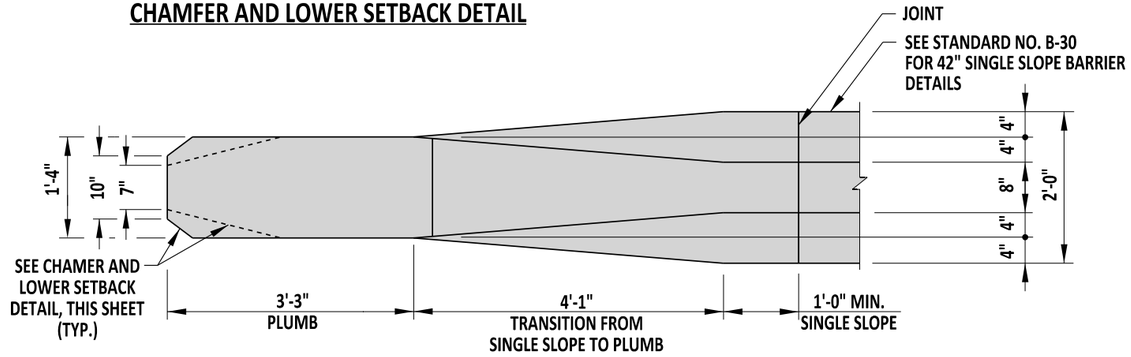
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

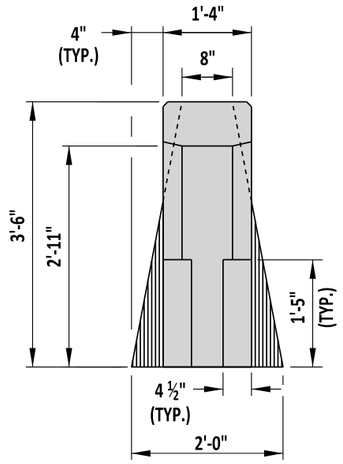
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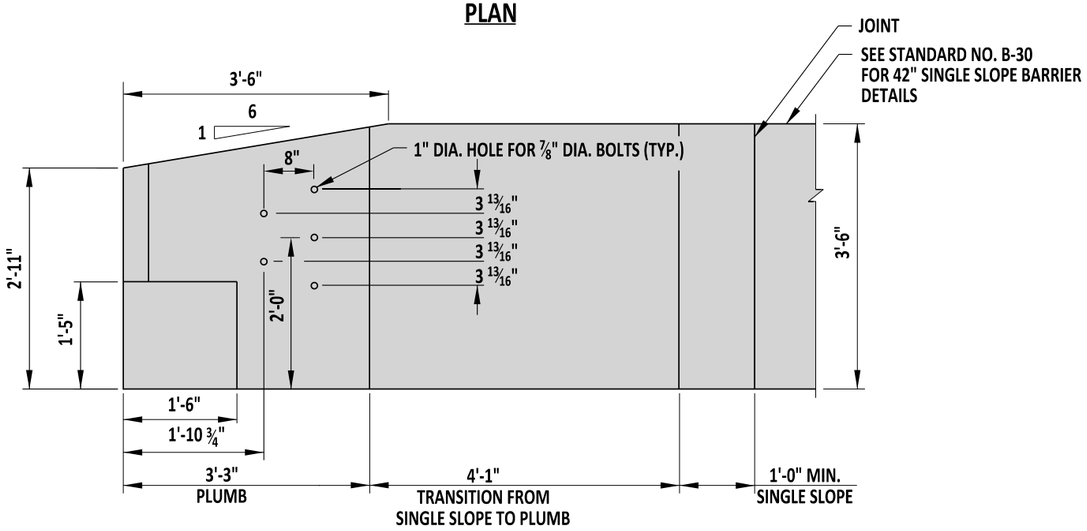

## CHAMFER AND LOWER SETBACK DETAIL




## PLAN




## END VIEW




## ELEVATION

NOTES:
1). THRIE-BEAM GUARDRAIL NOT SHOWN. SEE STANDARD NO. B-10 FOR MORE INFORMATION ON THRIE-BEAM CONNECTION.
2). FOUNDATION NOT SHOWN. BUTTRESS SHALL BE CONSTRUCTED ON A FOOTING THAT MATCHES THE ADJACENT CONCRETE BARRIER FOOTING.
3). CHAMFER ALL EXPOSED EDGES ¾" x ¾", UNLESS NOTED OTHERWISE.
4). SEE SHEET 8 FOR BUTTRESS REINFORCEMENT DETAILS.

DESIGNER NOTES:
1). FOR BUTTRESS APPLICATIONS AT BRIDGE APPROACHES, BRIDGE DESIGNER SHALL MATCH GEOMETRY SHOWN ON THIS DETAIL FOR THRIE-BEAM ATTACHMENT. LENGTH SHOWN HERE IS MINIMUM LENGTH FOR THRIE-BEAM ATTACHMENT. BRIDGE DESIGNER IS RESPONSIBLE FOR REINFORCEMENT DESIGN AND CONNECTION TO WINGWALL OR SLEEPER SLAB.

TL-5

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

# THRIE-BEAM AGT TO CONCRETE BUTTRESS - 42" SINGLE SLOPE TRANSITION

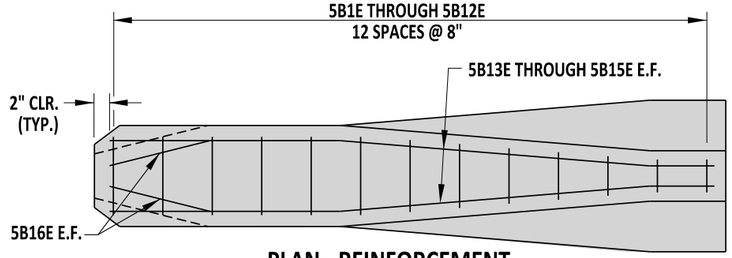
STANDARD NO. B-11 (2020) | SHT. 7 OF 8

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

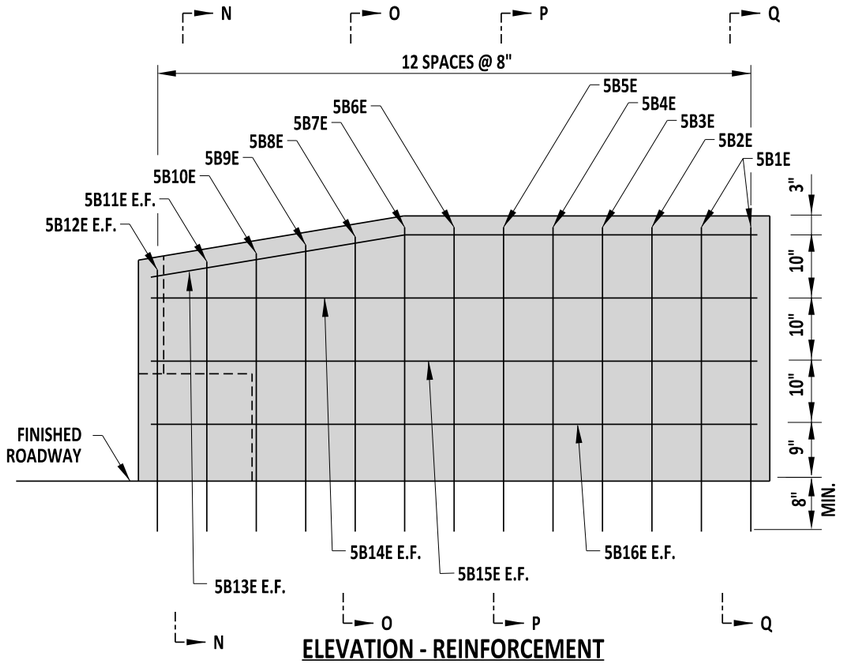
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

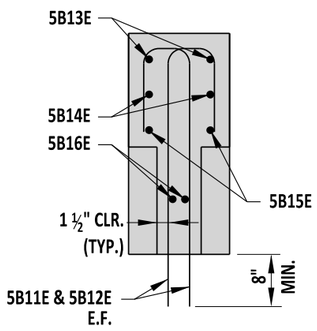
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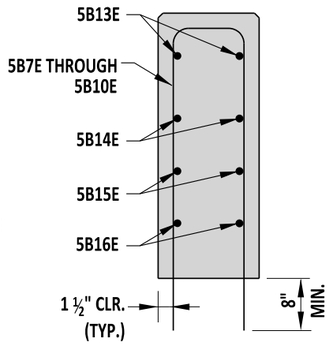

## PLAN - REINFORCEMENT



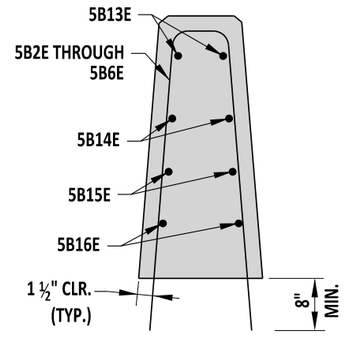

## ELEVATION - REINFORCEMENT



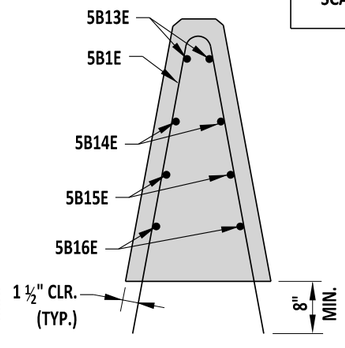

## SECTION N-N



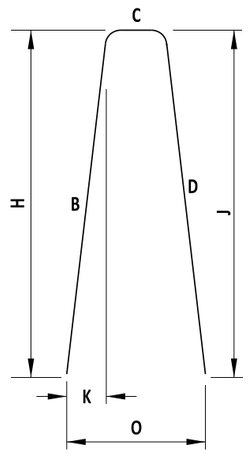

## SECTION O-O



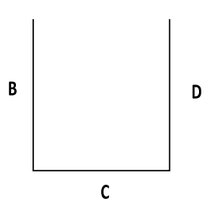

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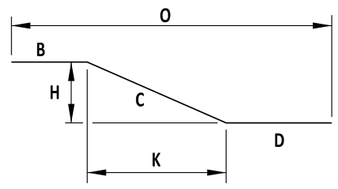

## SECTION Q-Q



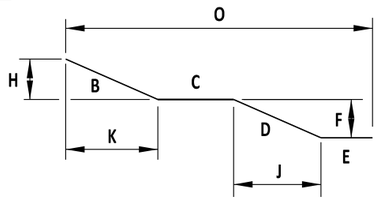

## TYPE DE10 BAR



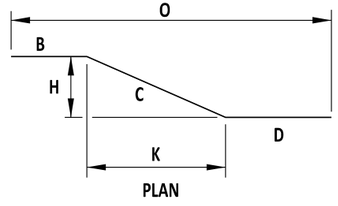

## TYPE 17 BAR

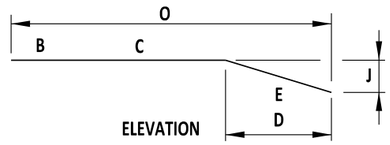



## TYPE 31 BAR




## TYPE SP01 BAR




## TYPE SP02 BAR

**BAR SCHEDULE**

| MARK | SIZE | QTY. | LENGTH | TYPE | B | C | D | E | F | H | J | K | O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5B1E | 5 | 2 | 8'-8 ¾" | DE10 | 4'-1 ½" | 5 ¾" | 4'-1 ½" | - | - | 4'-0 ½" | 4'-0 ½" | 9 ½" | 2'-0" |
| 5B2E | 5 | 1 | 8'-9" | DE10 | 4'-1 ½" | 6" | 4'-1 ½" | - | - | 4'-0 ½" | 4'-0 ½" | 8 ¾" | 1'-11 ¾" |
| 5B3E | 5 | 1 | 8'-10" | DE10 | 4'-1 ¼" | 7 ½" | 4'-1 ¼" | - | - | 4'-0 ½" | 4'-0 ½" | 7" | 1'-9 ½" |
| 5B4E | 5 | 1 | 8'-10 ¾" | DE10 | 4'-1" | 8 ¾" | 4'-1" | - | - | 4'-0 ½" | 4'-0 ½" | 5 ¼" | 1'-7 ½" |
| 5B5E | 5 | 1 | 8'-11 ¾" | DE10 | 4'-0 ¾" | 10 ¼" | 4'-0 ¾" | - | - | 4'-0 ½" | 4'-0 ½" | 3 ½" | 1'-5 ¼" |
| 5B6E | 5 | 1 | 9'-0 ½" | DE10 | 4'-0 ½" | 11 ½" | 4'-0 ½" | - | - | 4'-0 ½" | 4'-0 ½" | 2" | 1'-3 ¼" |
| 5B7E | 5 | 1 | 9'-2" | 17 | 4'-0 ½" | 1'-1" | 4'-0 ½" | - | - | - | - | - | - |
| 5B8E | 5 | 1 | 8'-11 ½" | 17 | 3'-11 ¼" | 1'-1" | 3'-11 ¼" | - | - | - | - | - | - |
| 5B9E | 5 | 1 | 8'-8 ½" | 17 | 3'-9 ¾" | 1'-1" | 3'-9 ¾" | - | - | - | - | - | - |
| 5B10E | 5 | 1 | 8'-6" | 17 | 3'-8 ½" | 1'-1" | 3'-8 ½" | - | - | - | - | - | - |
| 5B11E | 5 | 2 | 5'-9" | 17 | 3'-6 ½" | 10 ½" | 1'-4" | - | - | - | - | - | - |
| 5B12E | 5 | 2 | 5'-5" | 17 | 3'-6" | 7 ½" | 1'-3 ½" | - | - | - | - | - | - |
| 5B13E | 5 | 2 | 7'-11" | SP02 | 8" | 4'-0 ¼" | 3'-2 ¾" | 3'-3 ¼" | - | 4" | 6 ½" | 4'-0" | 7'-10 ¾" |
| 5B14E | 5 | 2 | 7'-10 ¾" | 31 | 8" | 4'-0" | 3'-2 ¾" | - | - | 1 ½" | - | 4'-0" | 7'-10 ¾" |
| 5B15E | 5 | 2 | 7'-10 ¾" | STR | - | - | - | - | - | - | - | - | - |
| 5B16E | 5 | 2 | 8'-0 ¼" | SP01 | 1'-0 ¾" | 2'-3 ½" | 4'-0" | 8" | 2 ¼" | 3" | 4'-0" | 1'-0 ½" | - |

**NOTES:**

1). CONCRETE CLEAR COVER FOR REINFORCEMENT BARS SHALL BE 1 ½" MINIMUM, UNLESS NOTED OTHERWISE.

2). USE STANDARD STIRRUP AND TIE HOOK BEND DIAMETERS, NOT STANDARD END HOOK DIAMETERS.

3). E.F. = EACH FACE

TL-5

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

# THRIE-BEAM AGT TO CONCRETE BUTTRESS - 42" SINGLE SLOPE TRANSITION

STANDARD NO. B-11 (2020) | SHT. 8 OF 8

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

SCALE : NTS

# B-12 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

DelDOT

ENGINEERING SUPPORT _____ DATE _____

RECOMMENDED

STANDARD NO. B-12 (2020)

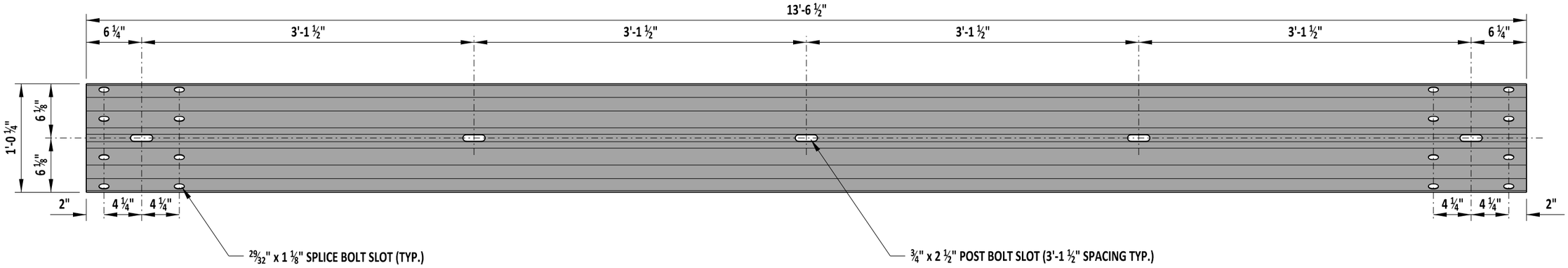
SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

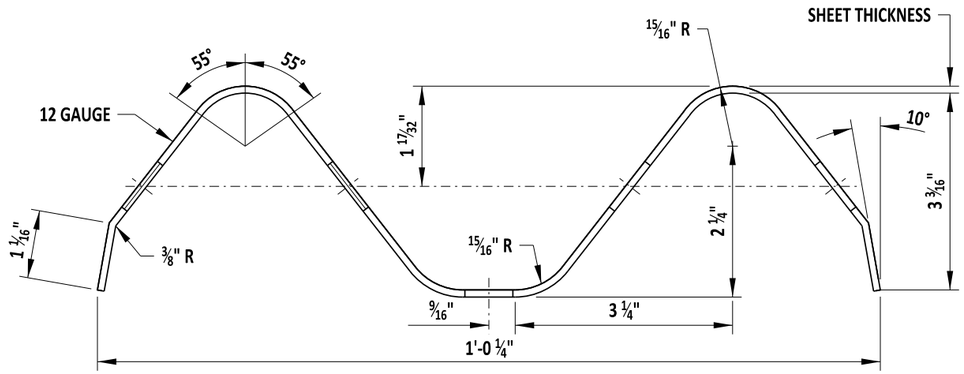
APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

SCALE : NTS




## W-BEAM ELEVATION




## W-BEAM SECTION

**NOTE:**

1). FOUR ADDITIONAL ¾" x 2 ½" SLOTS SHALL BE PROVIDED AT 3'-1 ½" SPACING FOR A 26'-0 ½" BEAM LENGTH.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

**W-BEAM SECTION AND ELEVATION**

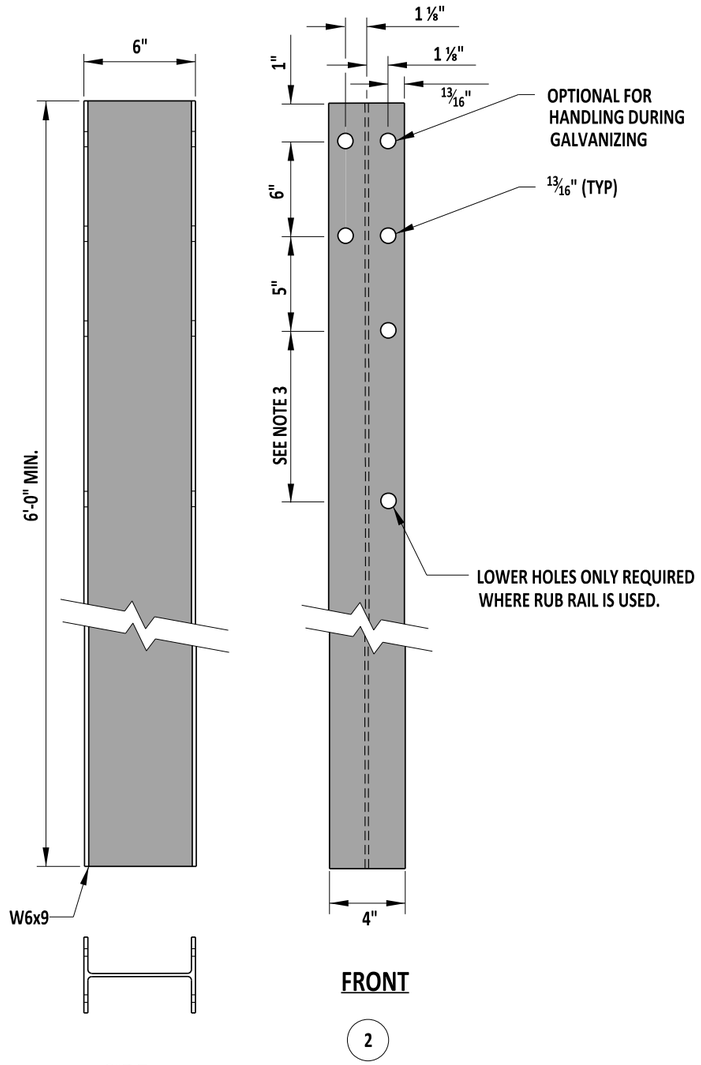
STANDARD NO. B-13 (2020) | SHT. 1 OF 12

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

SCALE : NTS

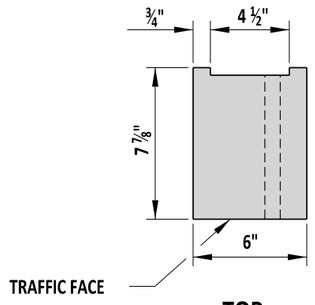



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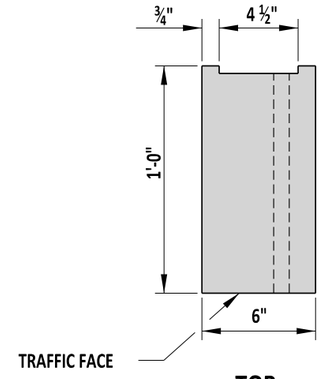
FRONT

2

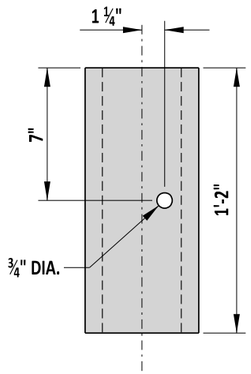
POST




TOP

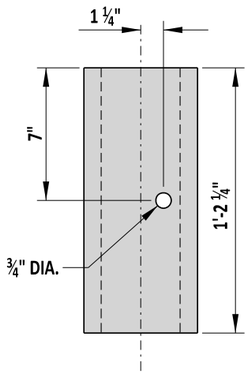



TOP




FRONT

8" OFFSET BLOCK (3B)




FRONT

12" OFFSET BLOCK (3A)

NOTE:

1). ALL HOLES SHALL BE 13/16" DIA. BOLT HOLE PATTERN IS SYMMETRICAL WITH RESPECT TO THE VERTICAL AXIS OF THE POST.
2). WHERE CONDITIONS REQUIRE, ALTERNATE POST LENGTHS IN INCREMENTS OF 6" MAY BE USED.
3). THE RUB RAIL HOLE OFFSET DISTANCE IS 10⅞" FOR GUARDRAIL TO BARRIER CONNECTION, TYPE 1-27 AND 1-31, 1'-2" FOR GUARDRAIL TO BARRIER CONNECTION, TYPE 2-27, AND 7 ⅞" FOR GUARDRAIL TO BARRIER CONNECTION, TYPE 2-31.

W-BEAM STEEL POST AND OFFSET BLOCK

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

W-BEAM STEEL POST AND OFFSET BLOCK

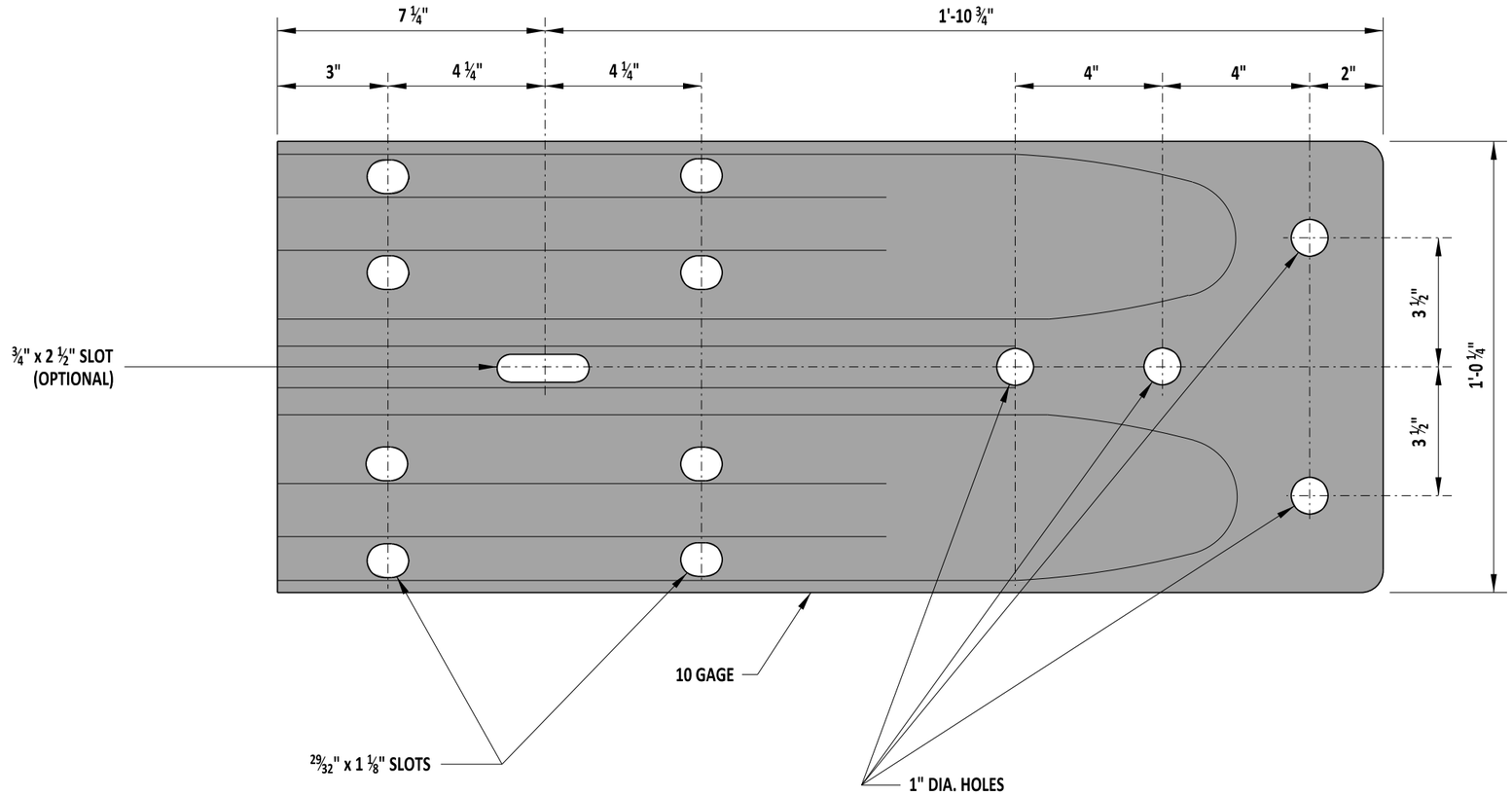
STANDARD NO. B-13 (2020) | SHT. 2 OF 12

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

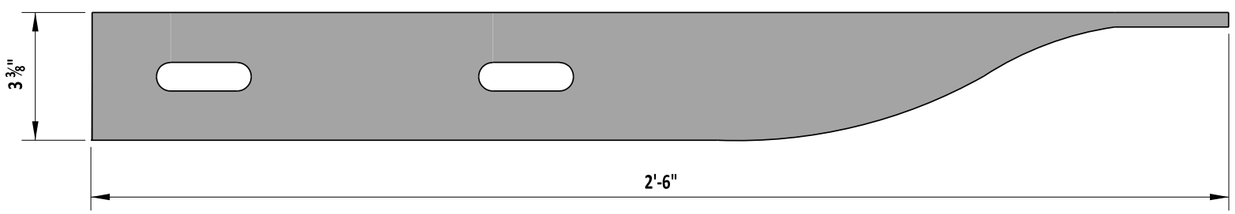
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

SCALE : NTS




ELEVATION




PLAN

## W-BEAM TERMINAL CONNECTOR (5)

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

W-BEAM TERMINAL CONNECTOR

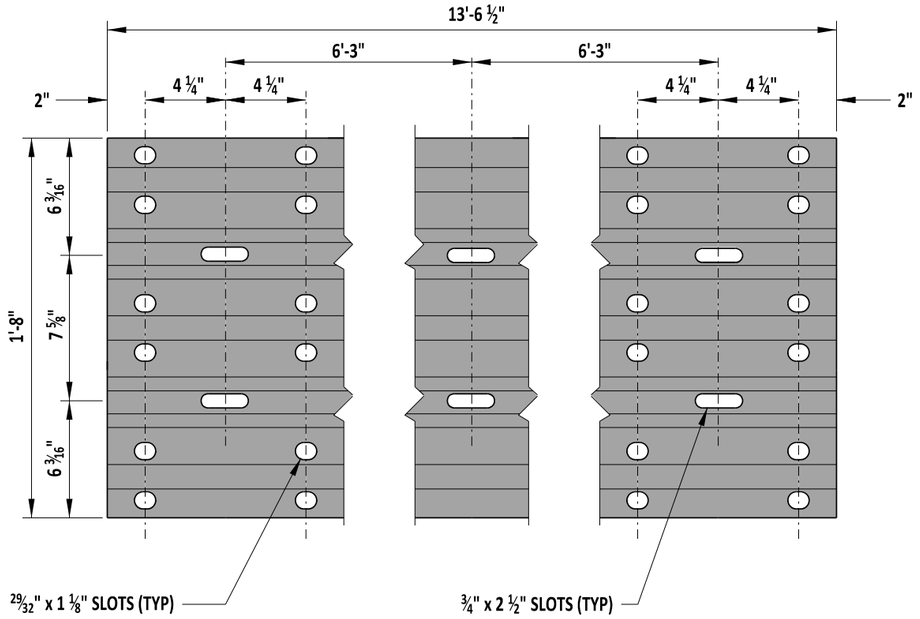
STANDARD NO. B-13 (2020) | SHT. 3 OF 12

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

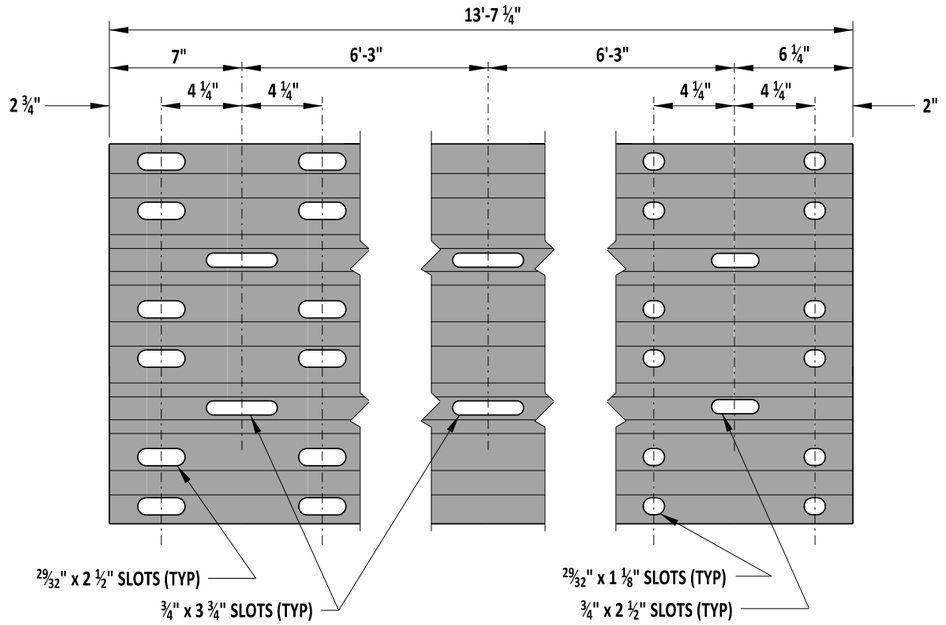
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

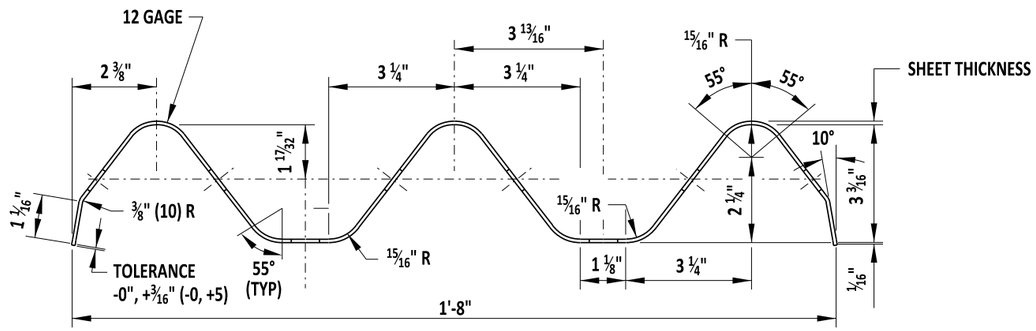
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## THRIE BEAM ELEVATION




## THRIE BEAM EXPANSION ELEMENT

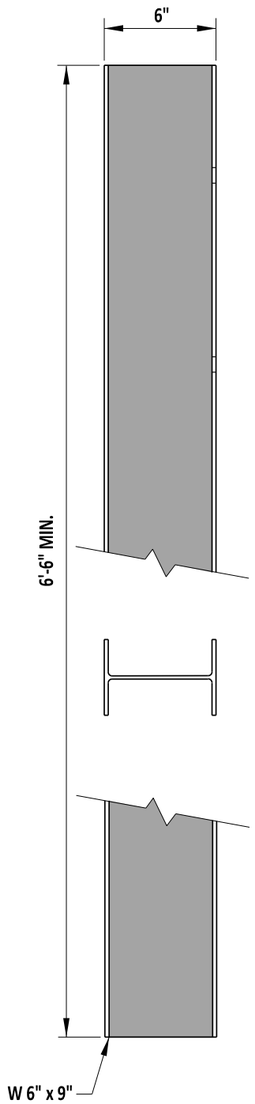



## THRIE BEAM SECTION

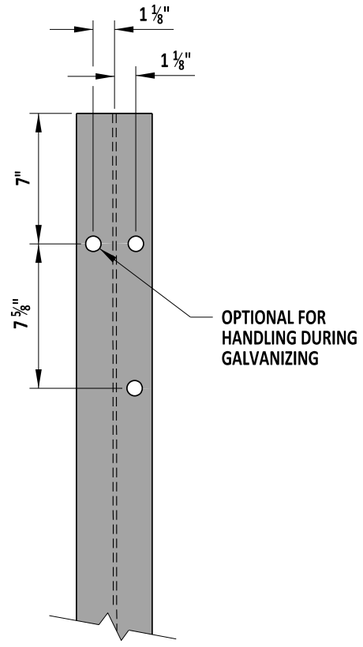
| | | | | | |
|---|---|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | THRIE BEAM SECTION AND ELEVATION | | REVIEWED | DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. B-13 (2020) | SHT. 4 OF 12 | APPROVED | CHIEF ENGINEER 09/01/2020 DATE |

8/19/2020

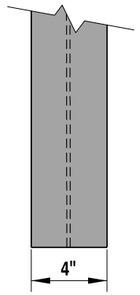
SCALE : NTS




SIDE

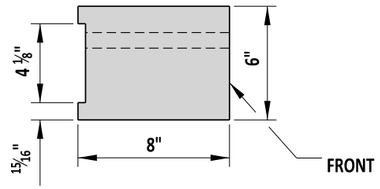



NOTE:
WHERE CONDITIONS REQUIRE, USE ALTERNATE LENGTHS IN INCREMENTS OF 6"

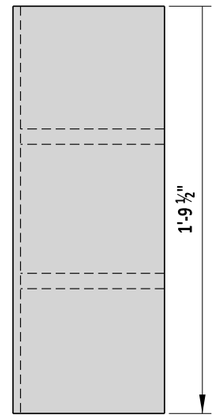



FRONT

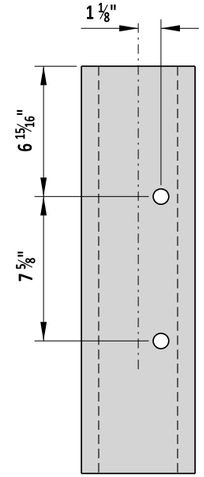
POST (2)




TOP




SIDE




FRONT

OFFSET BLOCK

NOTES:
1). ALL HOLES SHALL BE 13/16" DIA. BOLT HOLE PATTERN IS SYMMETRICAL WITH RESPECT TO THE VERTICAL AXIS OF THE POST.
2). STEEL POST AND OFFSET BLOCK DETAILS ARE BASED ON NCHRP 350 CRASH TESTING - MASH COMPLIANT DETAILS ARE NOT YET AVAILABLE

THRIE BEAM STEEL POST AND OFFSET BLOCK

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

THRIE BEAM STEEL POST AND OFFSET BLOCK

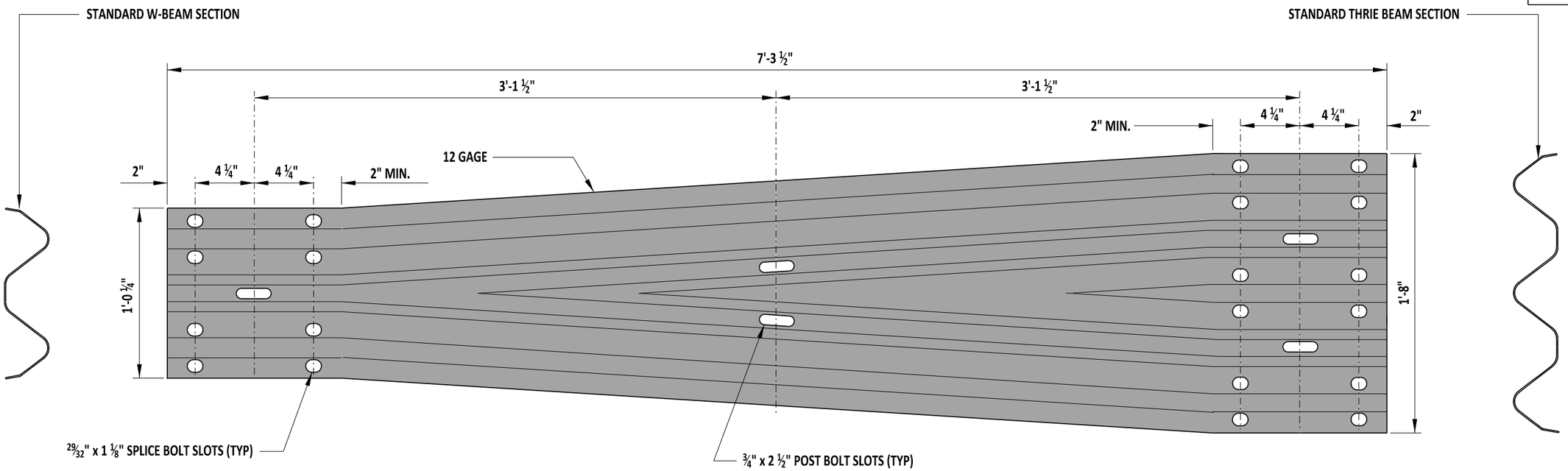
STANDARD NO. B-13 (2020) | SHT. 5 OF 12

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

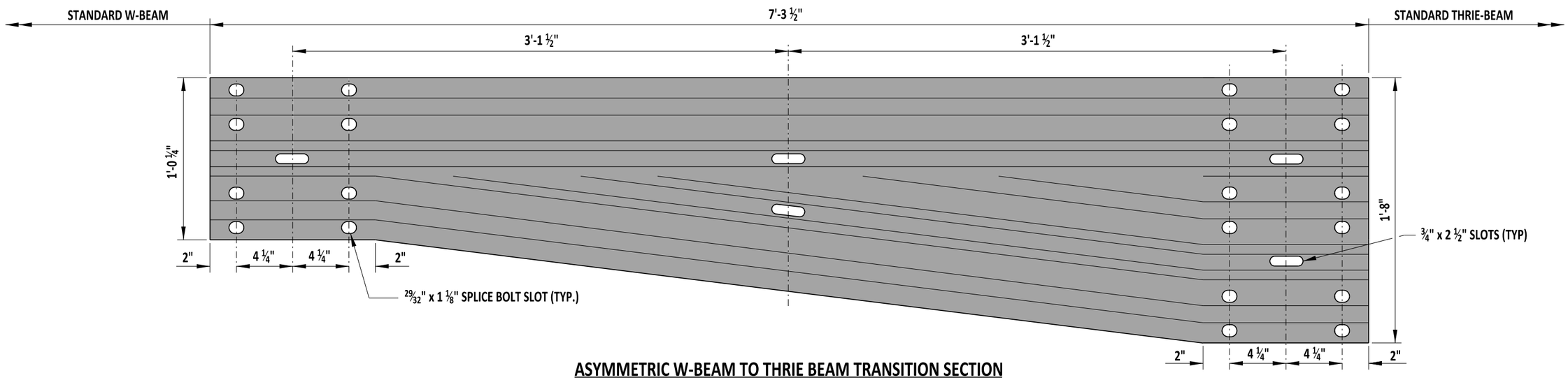
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

SCALE : NTS




## SYMMETRIC W-BEAM TO THRIE BEAM TRANSITION SECTION




## ASYMMETRIC W-BEAM TO THRIE BEAM TRANSITION SECTION

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

**THRIE BEAM TRANSITIONS**

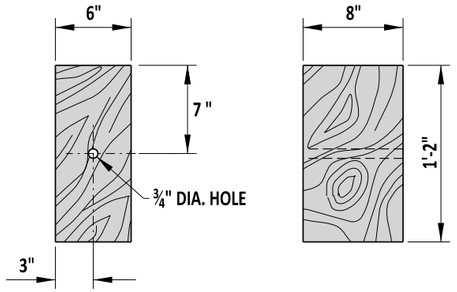
STANDARD NO. B-13 (2020) | SHT. 6 OF 12

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

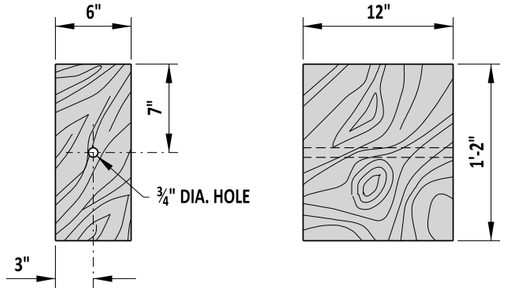
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

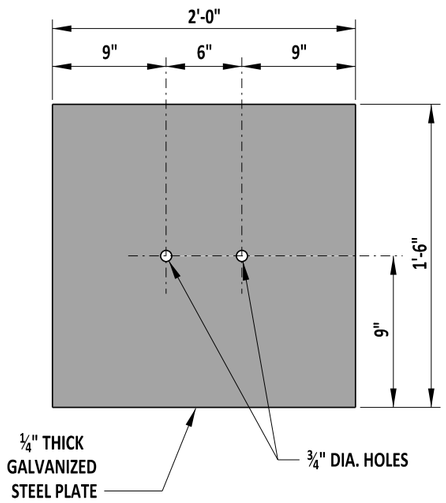
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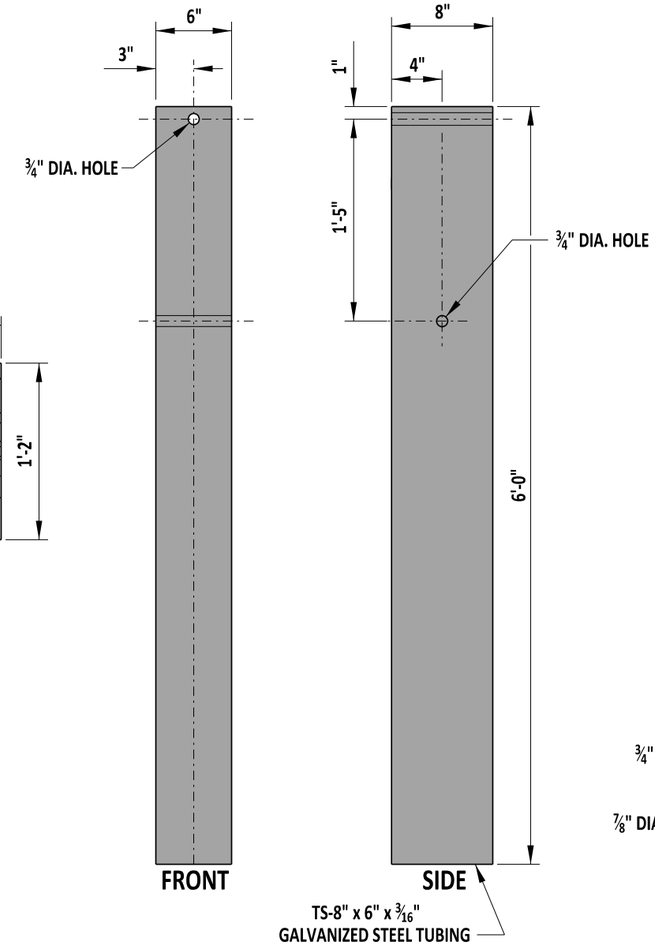

## WOOD OFFSET BLOCK TYPE 27




## WOOD OFFSET BLOCK, TYPE 31

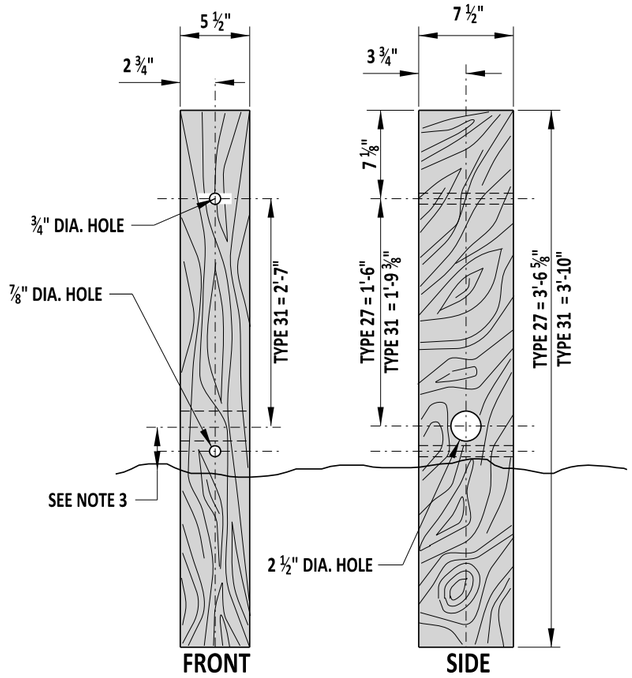



## SOIL PLATE

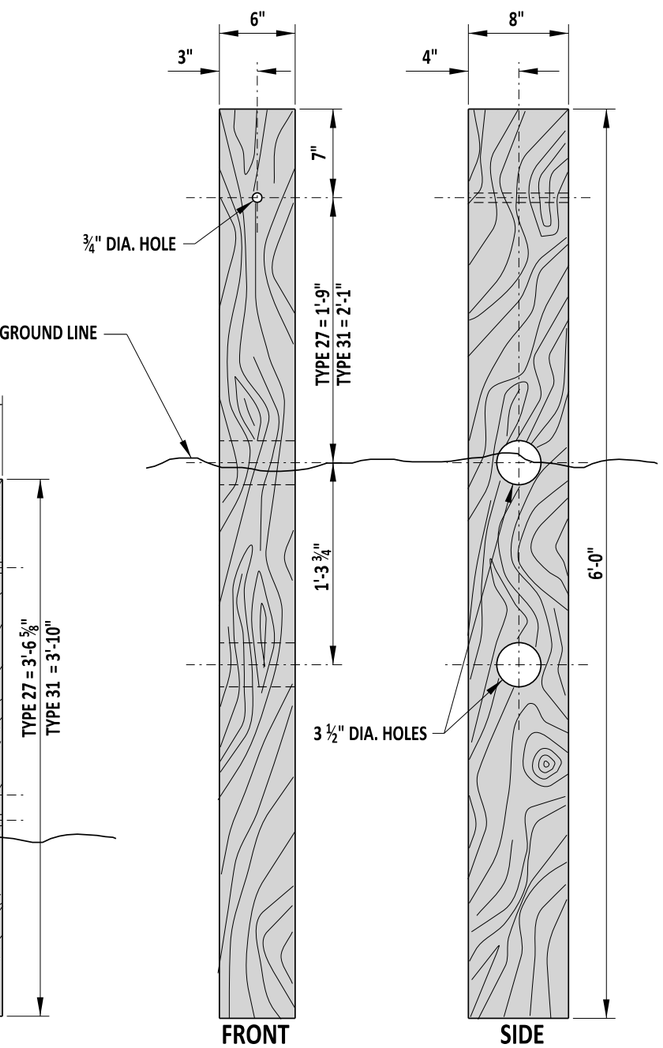



## STEEL TUBE

NOTES:
1). ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.
2). ALL WOOD SIZES ARE NOMINAL DIMENSIONS.
3). PLACE POST SUCH THAT BREAKAWAY HOLES ARE NO LOWER THAN GROUND LEVEL AND NO HIGHER THAN 4" ABOVE GROUND LEVEL.




## SHORT WOOD BREAKAWAY POST




## LONG WOOD BREAKAWAY POST

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ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

WOOD OFFSET BLOCKS, SOIL PLATE, STEEL TUBE AND WOOD BREAKAWAY POSTS

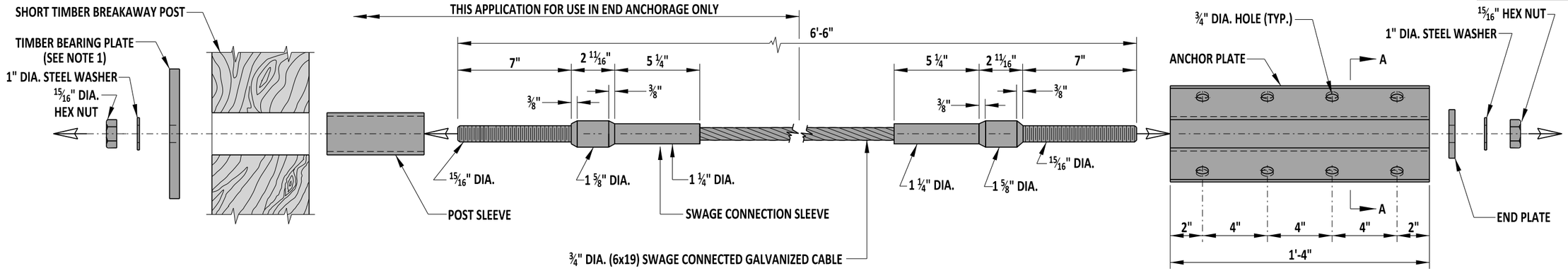
STANDARD NO. B-13 (2020) | SHT. 7 OF 12

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

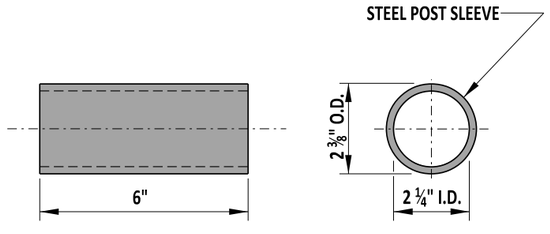
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

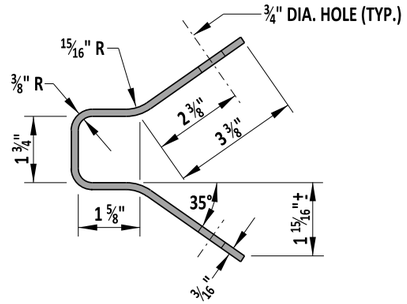
SCALE : NTS



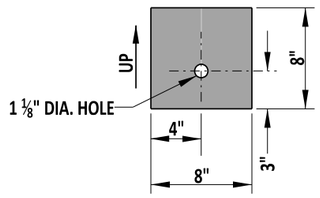

## SWAGED CABLE ASSEMBLAGE AND RELATED HARDWARE ASSEMBLY




### POST SLEEVE

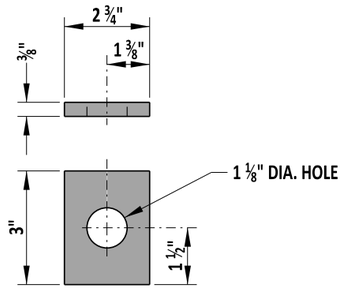



### SECTION A-A



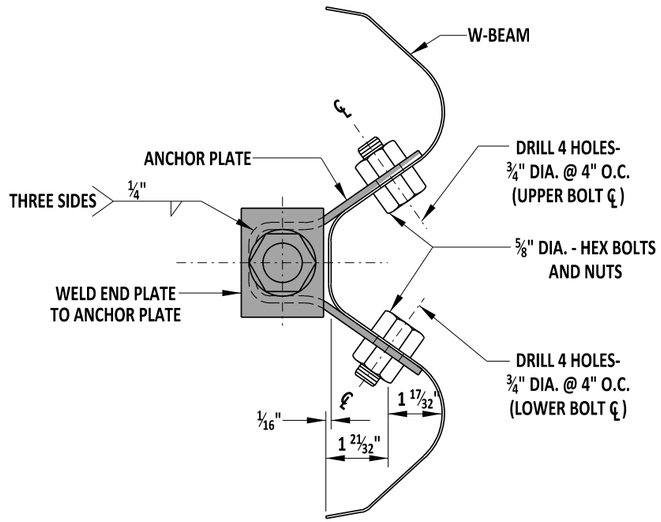

### TIMBER BEARING PLATE

5/8" THICKNESS




### END PLATE

3/8" THICKNESS




### ANCHOR PLATE TO W-BEAM CONNECTION DETAIL

NOTES:

1 ). PLACE A ½" WIDE GALVANIZED RETAINING TIE STRAP AROUND THE SHORT TIMBER BREAKAWAY POST AND TIMBER BEARING PLATE TO ENSURE PROPER ORIENTATION OF THE TIMBER BEARING PLATE.

2). TIGHTEN ASSEMBLY UNTIL CABLE IS TAUGHT.

3). ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.

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RECOMMENDED

END ANCHORAGE HARDWARE

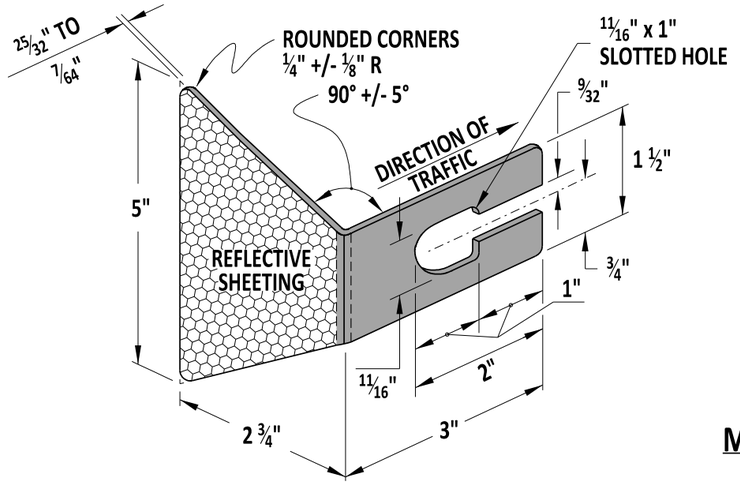
STANDARD NO. B-13 (2020) | SHT. 8 OF 12

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

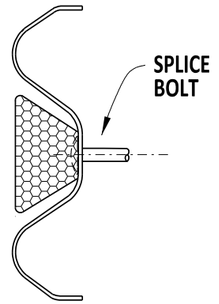
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

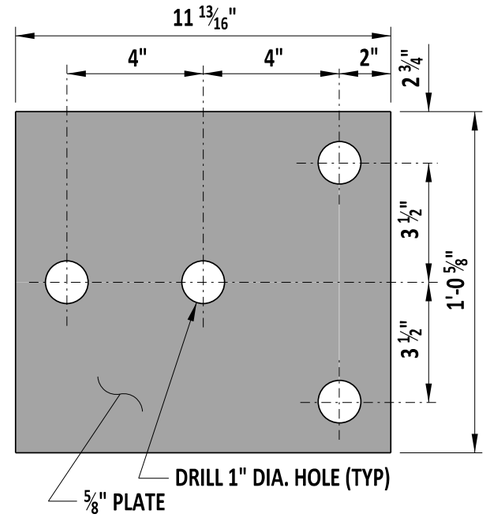
SCALE : NTS




## GUARDRAIL REFLECTOR




## MOUNTING POSITION




## W-BEAM BEARING PLATE

11

**NOTES:**

1). GUARDRAIL REFLECTORS ON TYPE 1 AND 3 GUARDRAIL SHALL BE INSTALLED IN THE CENTER SLOT HOLES WHERE POSTS ARE NOT LOCATED. GUARDRAIL REFLECTORS ON TYPE 2 GUARDRAIL ARE TO BE INSTALLED IN THE CENTER SLOT HOLES LOCATED ON THE SPLICE ONLY. GUARDRAIL REFLECTORS ON THRIE BEAM GUARDRAIL ARE TO BE LOCATED ON THE UPPER MOST CENTER SLOT HOLE LOCATED ON THE SPLICE ONLY.

2). GUARDRAIL REFLECTORS SHALL NOT BE INSTALLED WITHIN THE LIMITS OF GUARDRAIL END TERMINALS.

3). GUARDRAIL REFLECTOR SPACING SHALL BE NO LESS THAN 50 FEET.

4). GUARDRAIL REFLECTORS PLACED ON THE RIGHT SIDE OF A TWO-WAY TWO-LANE ROADWAY SHALL DISPLAY WHITE RETROREFLECTIVE SHEETING TO BOTH DIRECTIONS OF TRAVEL.

5). GUARDRAIL REFLECTORS PLACED ON THE LEFT SIDE OF A DIVIDED HIGHWAY OR RAMP SHALL DISPLAY YELLOW RETROREFLECTIVE SHEETING TO THE APPROACHING DIRECTION OF TRAVEL AND RED RETROREFLECTIVE SHEETING TO THE WRONG DIRECTION OF TRAVEL.

6). GUARDRAIL REFLECTORS PLACED ON THE RIGHT SIDE OF A DIVIDED HIGHWAY OR RAMP SHALL DISPLAY WHITE RETROREFLECTIVE SHEETING TO THE APPROACHING DIRECTION OF TRAVEL AND RED RETROREFLECTIVE SHEETING TO THE WRONG DIRECTION OF TRAVEL.

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ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

REFLECTOR AND W-BEAM BEARING PLATE

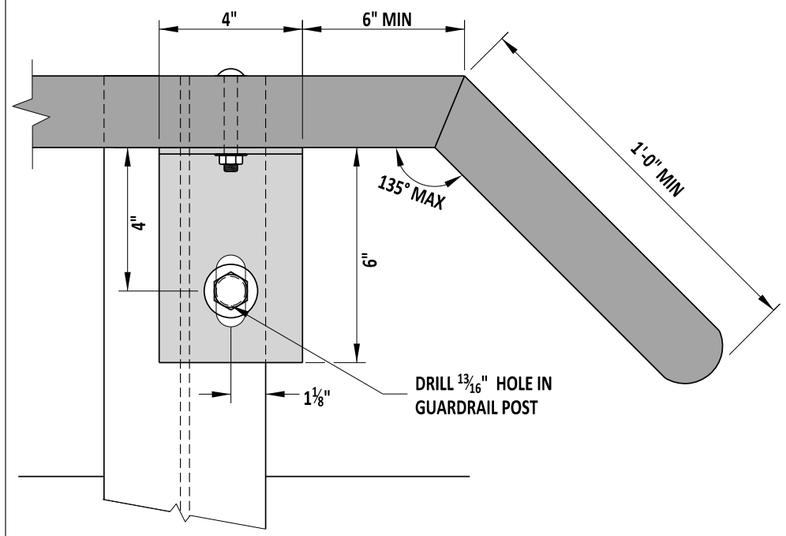
STANDARD NO. B-13 (2020) | SHT. 9 OF 12

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

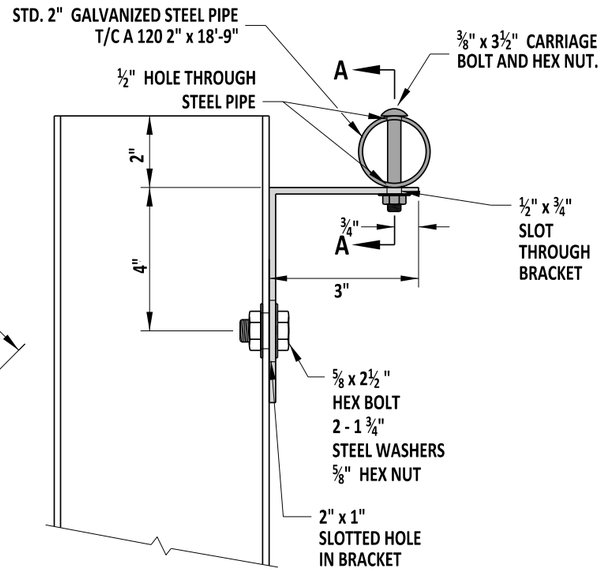
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

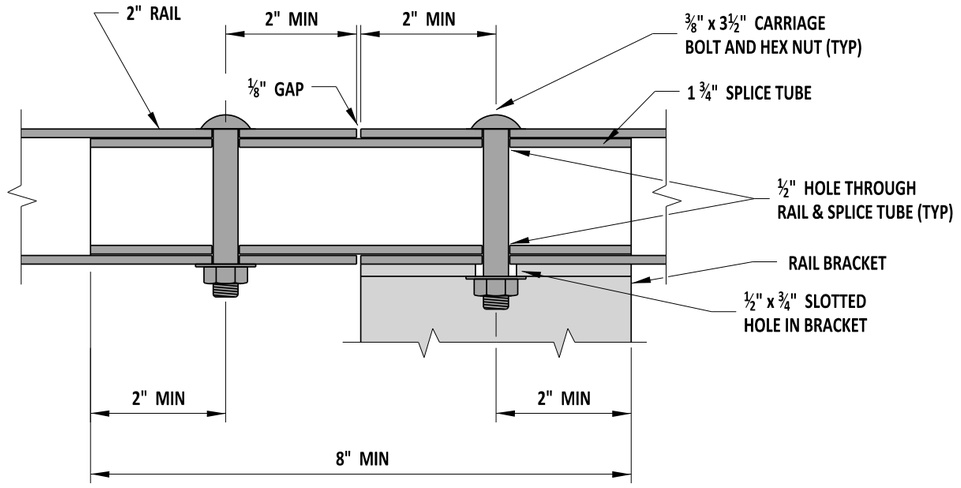
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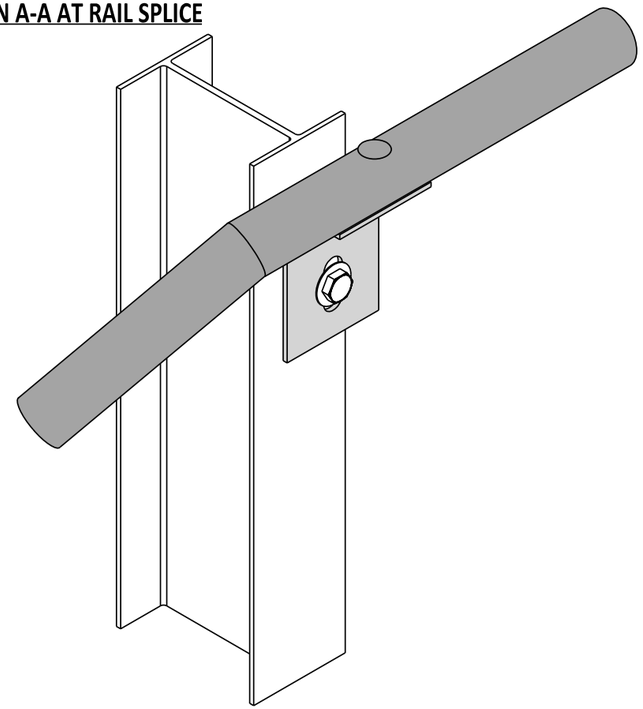

REAR VIEW WITH START & END SECTION



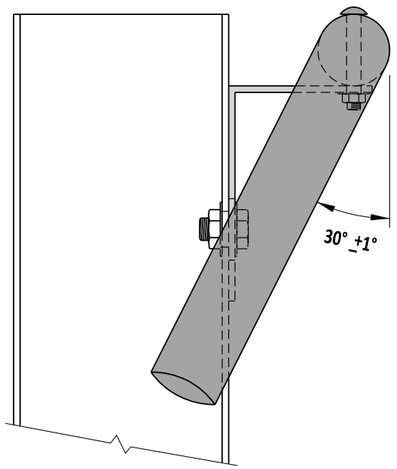

SIDE VIEW




SECTION A-A AT RAIL SPLICE



ISOMETRIC VIEW WITH START & END SECTION




SIDE VIEW WITH START & END SECTION

NOTES:
1). USE THIS RAIL ADJACENT TO AN PEDESTRIAN ACCESS ROUTE.
2). SHOP FABRICATE ALL COMPONENTS OF THE RAIL INCLUDING CUTTING AND DRILLING.
3). BUR ALL EXPOSED THREADED HARDWARE TO ENSURE NUTS CAN NOT BE REMOVED.
4). PRIOR TO GALVANIZING, SHOP DRILL GUARDRAIL POSTS THAT RAIL BRACKETS WILL BE ATTACHED TO.
5). PLACE RAIL SPLICES AT RAIL SUPPORT BRACKETS, USING THE SAME BOLT TO ATTACH THE RAIL TO THE BRACKET, TO SECURE THE SPLICE TUBE.
6). ONLY INSTALL RAILS TO STANDARD W-BEAM SECTIONS AND AT LEAST ONE POST AWAY FROM THE PAYMENT LIMITS OF THE END TREATMENT.
7). FOR TYPE 2-31 GUARDRAIL, BOLT RAILING TO EVERY OTHER POST OR AT A SPACING OF 6'-3".

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ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

GUARDRAIL MOUNTED RAIL

STANDARD NO. B-13 (2020) | SHT. 10 OF 12

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

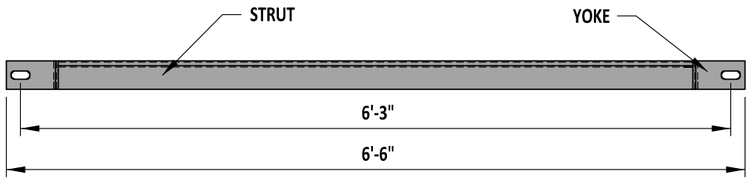
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

SCALE : NTS

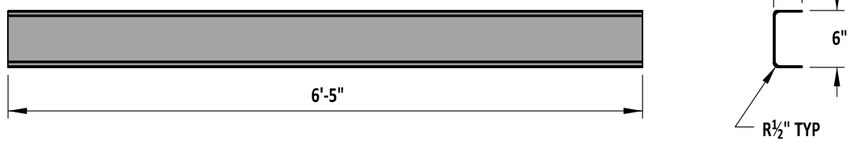



PLAN VIEW

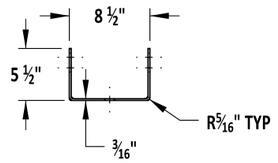


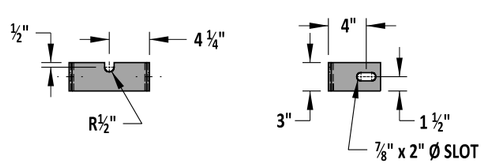

FRONT VIEW

STRUT & YOKE ASSEMBLY
PART C3




STRUT



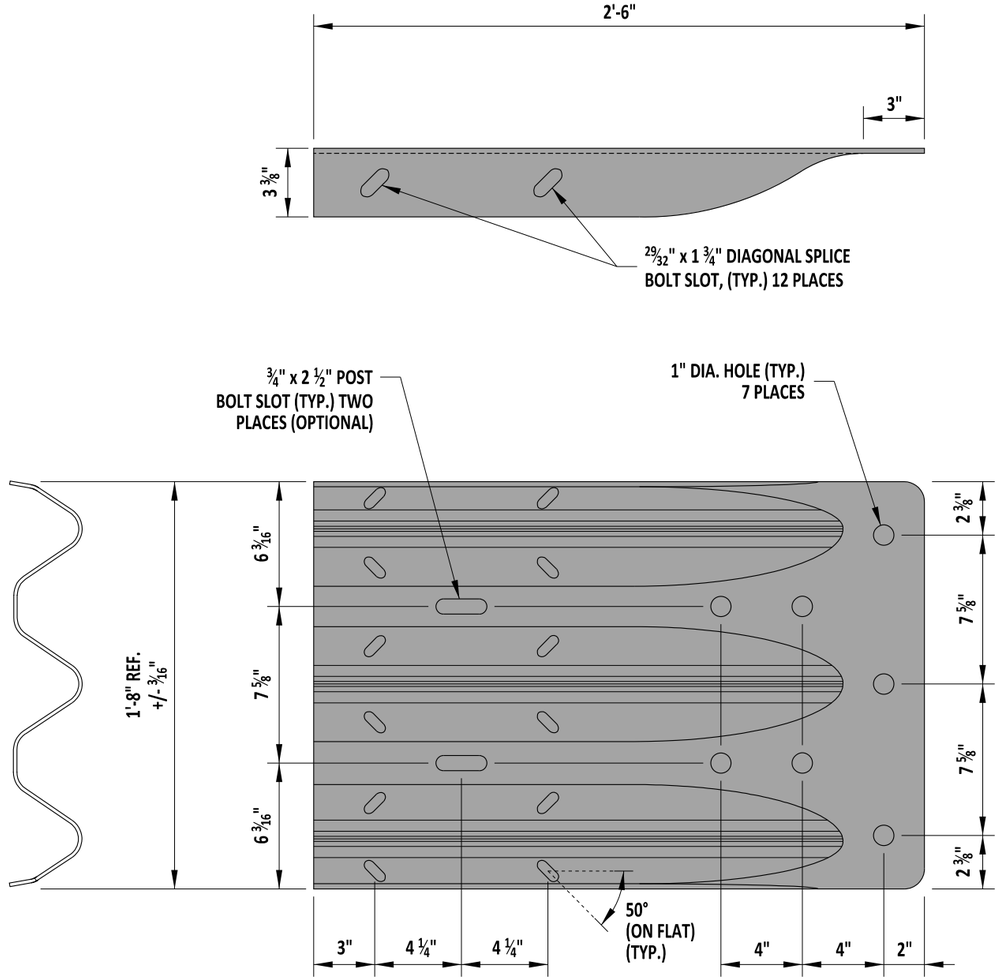




YOKE

| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | DOWNSTREAM ANCHORAGE SYSTEM - GROUND STRUT & ANCHOR BRACKET | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. B-13 (2020) SHT. 11 OF 12 | APPROVED CHIEF ENGINEER 09/01/2020 DATE |

8/19/2020

SCALE : NTS




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ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

GUARDRAIL TO BARRIER CONNECTION - THRIE-BEAM TERMINAL CONNECTOR

STANDARD NO. B-13 (2020) | SHT. 12 OF 12

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

SCALE : NTS

# B-14 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

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ENGINEERING SUPPORT _____ DATE _____

RECOMMENDED

STANDARD NO. B-14 (2020)

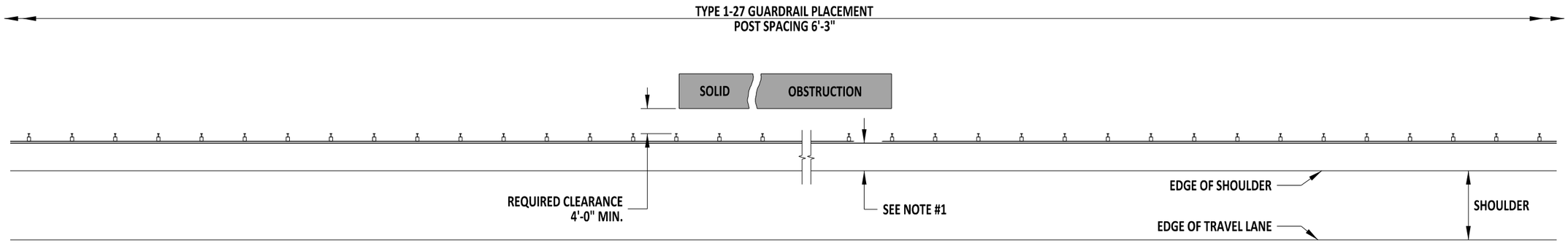
SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

APPROVED _____ CHIEF ENGINEER _____ DATE

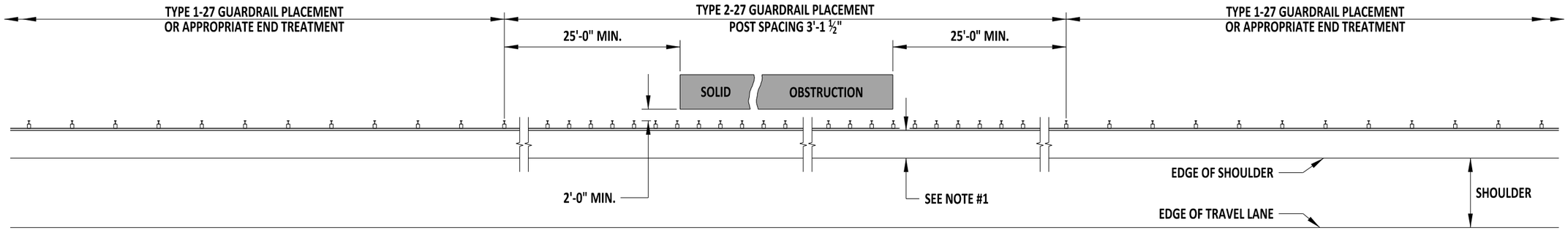
08/20/2020

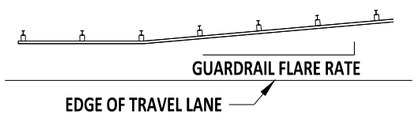
SCALE : NTS




## TYPE 1-27 GUARDRAIL

TYPICAL GUARDRAIL TREATMENT
WHEN THE REQUIRED 4'-0" CLEARANCE TO OBSTRUCTION IS AVAILABLE

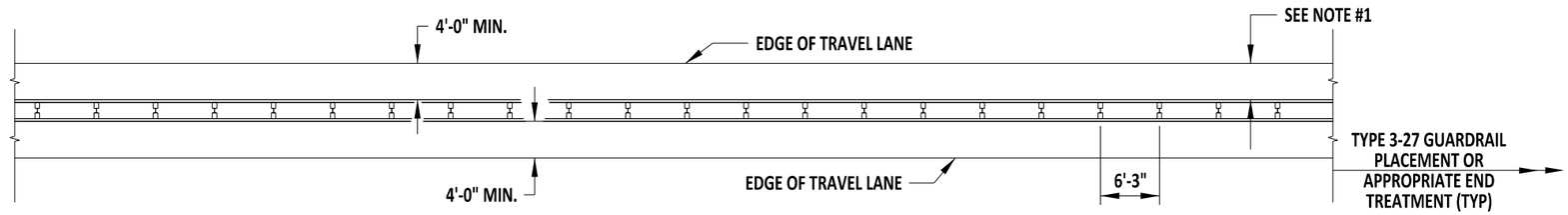



| FLARE RATES | |
|---|---|
| DESIGN SPEED | FLARE RATE |
| 70 MPH | 15:1 |
| 60 MPH | 14:1 |
| 55 MPH | 12:1 |
| 50 MPH | 11:1 |
| 45 MPH | 10:1 |
| 40 MPH | 9:1 |
| 30 MPH | 7:1 |

## TYPE 2-27 GUARDRAIL

TYPICAL GUARDRAIL TREATMENT
WHEN 2'-0" TO 4'-0" OF CLEARANCE TO OBSTRUCTION IS AVAILABLE




## TYPE 3-27 GUARDRAIL

TYPICAL MEDIAN GUARDRAIL TREATMENT

NOTES:
1). THE DISTANCE FROM THE EDGE OF THE TRAVEL LANE OR SHOULDER TO THE FACE OF GUARDRAIL SHOULD BE MAXIMIZED. THIS AREA SHALL BE GRADED 10:1 OR FLATTER.
2). PLACE GUARDRAIL DELINEATORS AS SHOWN IN DETAIL B-13, SHEET 9.
3). DETAILS ON THIS SHEET ARE NOT MASH COMPLIANT AND ARE TO BE USED SOLELY FOR MAINTENANCE REPAIRS OF 27" GUARDRAIL.

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ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

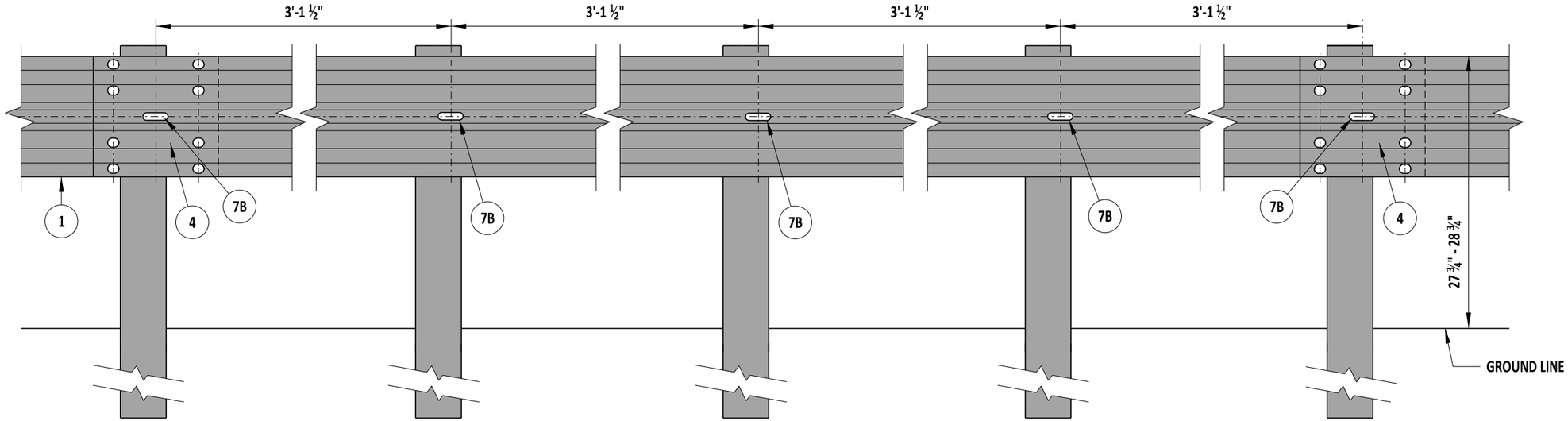
GUARDRAIL APPLICATIONS, 27"

STANDARD NO. B-15 (2020) | SHT. 1 OF 3

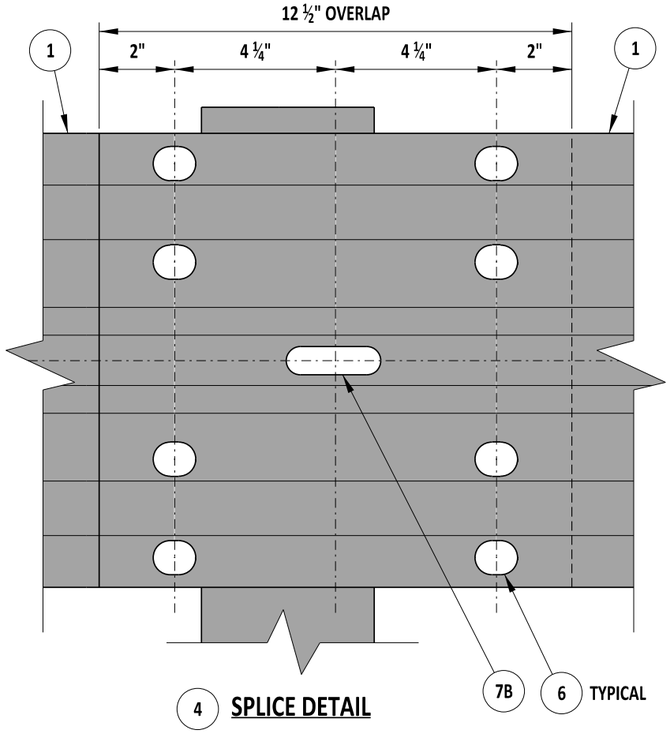
REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

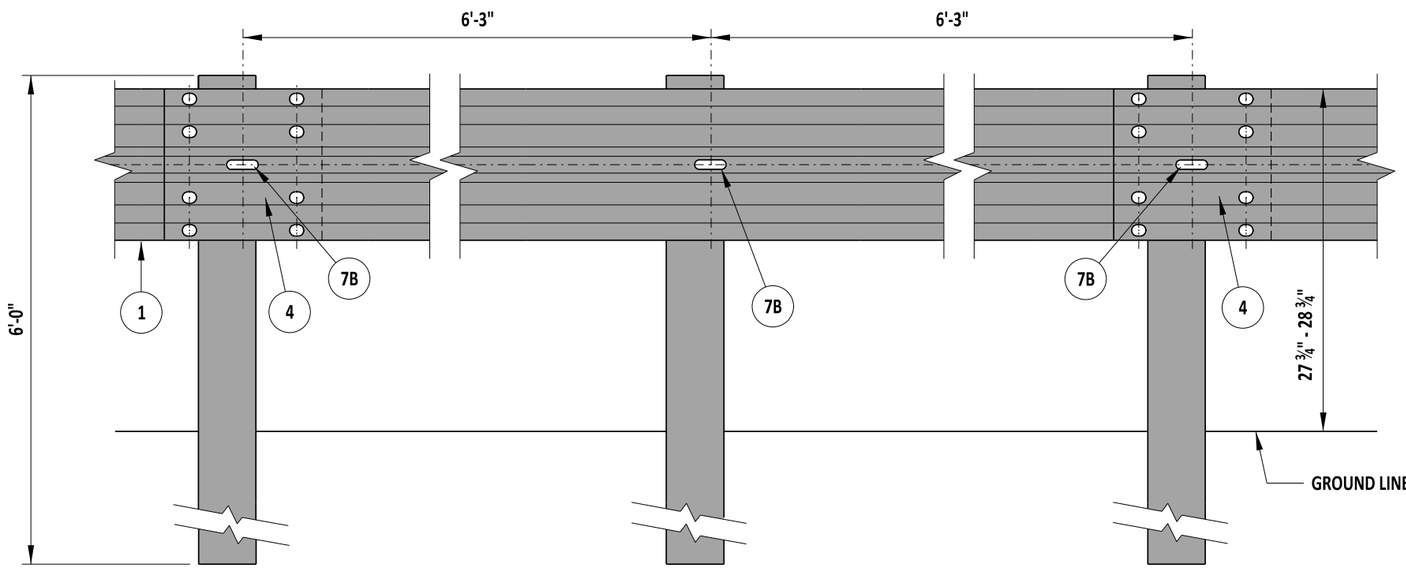
SCALE : NTS




## TYPE 2-27




4 **SPLICE DETAIL**




## TYPE 1-27 OR 3-27

**NOTES:**
1). OVERLAP W-BEAMS IN DIRECTION OF TRAVEL.
2). DETAILS ON THIS SHEET ARE NOT MASH COMPLIANT AND ARE TO BE USED SOLELY FOR MAINTENANCE REPAIRS OF 27" GUARDRAIL.

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09/01/2020
ENGINEERING SUPPORT DATE
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GUARDRAIL APPLICATIONS, 27"

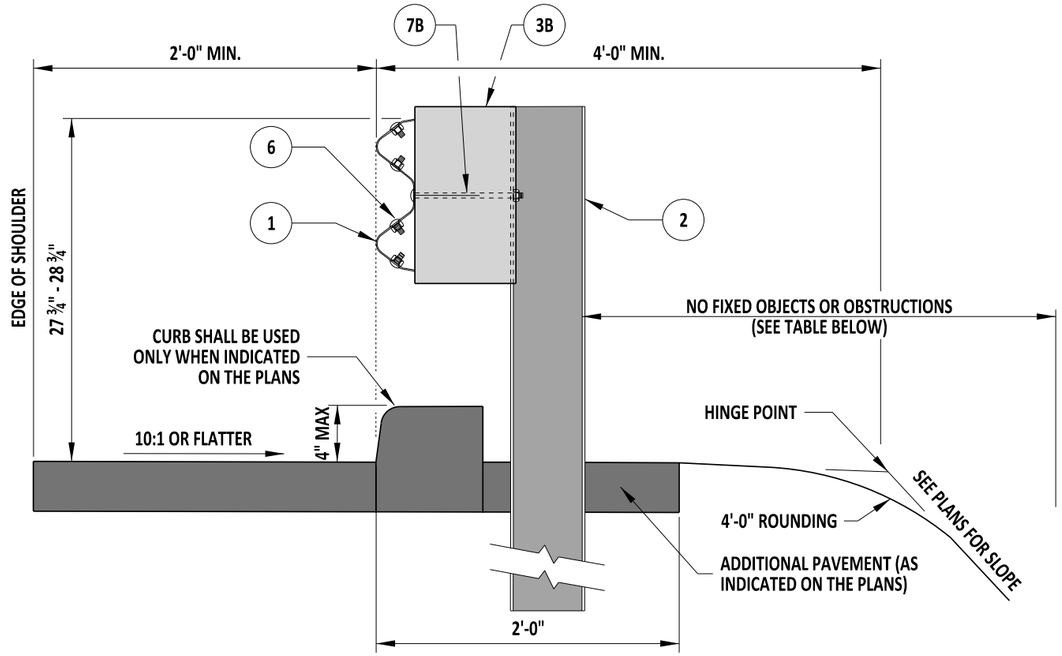
STANDARD NO. B-15 (2020) SHT. 2 OF 3

REVIEWED
DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE

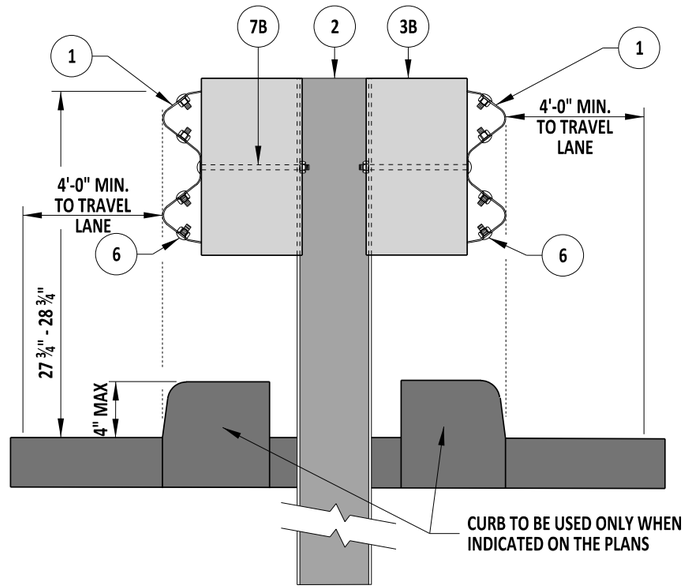
APPROVED
CHIEF ENGINEER 09/01/2020 DATE

8/19/2020

SCALE : NTS



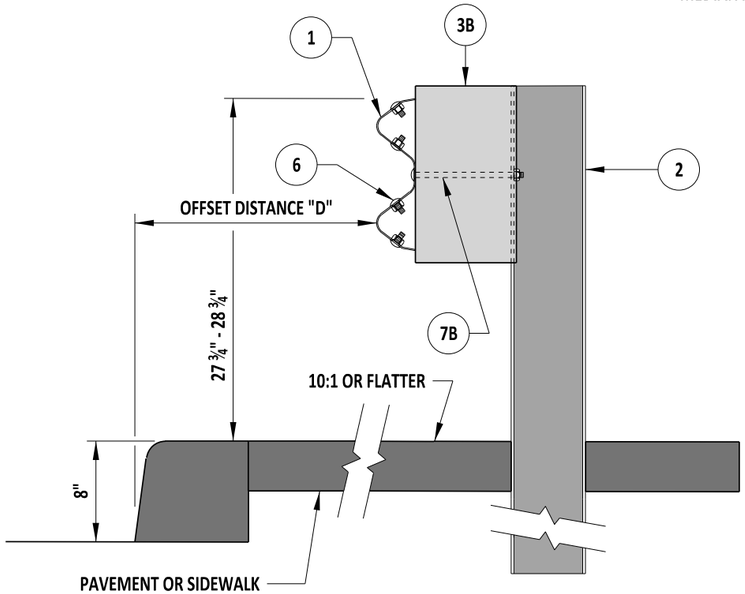

**GUARDRAIL SECTION**
RURAL SHOULDER APPLICATION




**GUARDRAIL SECTION**
MEDIAN APPLICATION

| TYPE | POST SPACING | CLEAR AREA BEHIND POST |
|---|---|---|
| 1 | 6'-3" | 4'-0" MIN. |
| 2 | 3' 1 ½" | 2'-0" MIN. |

NOTE:
1). DETAILS ON THIS SHEET ARE NOT MASH COMPLIANT AND ARE TO BE USED SOLELY FOR MAINTENANCE REPAIRS OF 27" GUARDRAIL.




**GUARDRAIL SECTION**
URBAN SHOULDER APPLICATION

| DESIGN SPEED | D |
|---|---|
| < 50 MPH | 6'-0" |
| 50 MPH | 10'-0" |

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**GUARDRAIL APPLICATIONS, 27"**

STANDARD NO. B-15 (2020) | SHT. 3 OF 3

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

SCALE : NTS

# B-16 DETAIL RESERVED
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STANDARD NO. B-16 (2020)

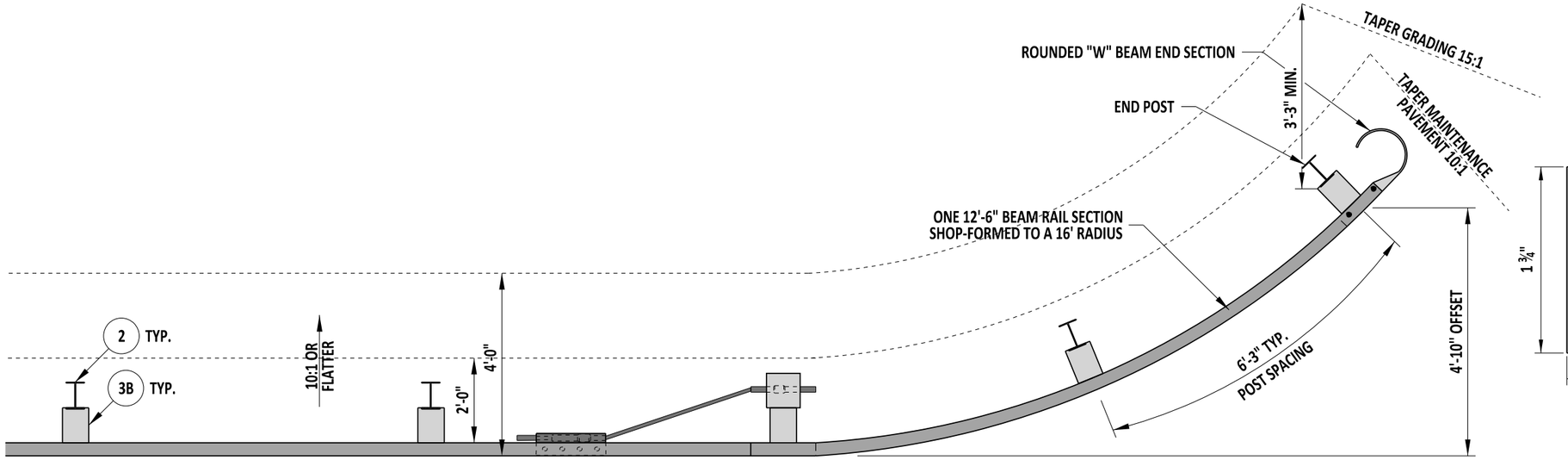
SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

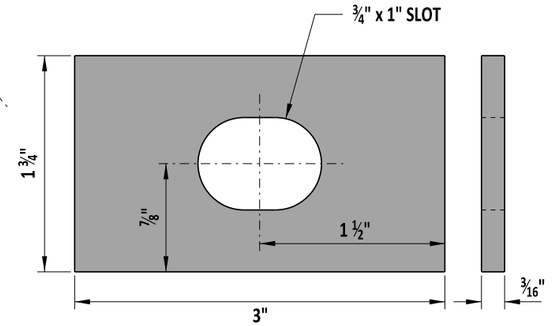
APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

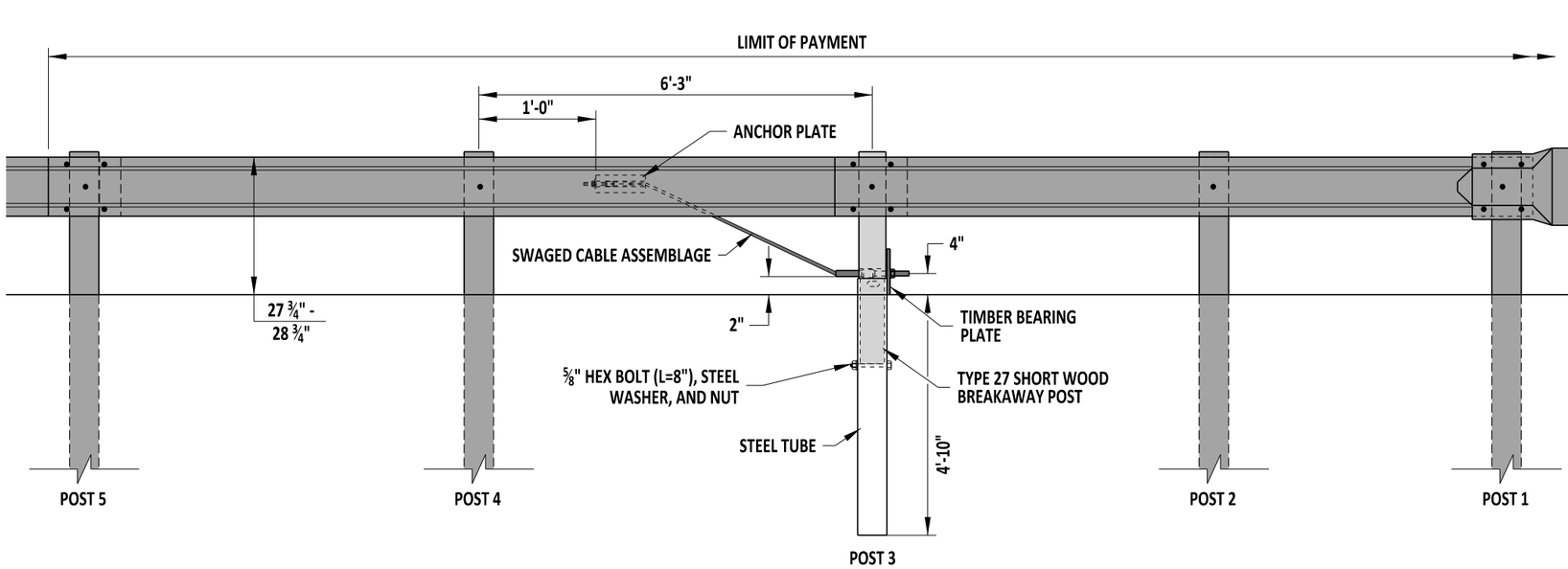
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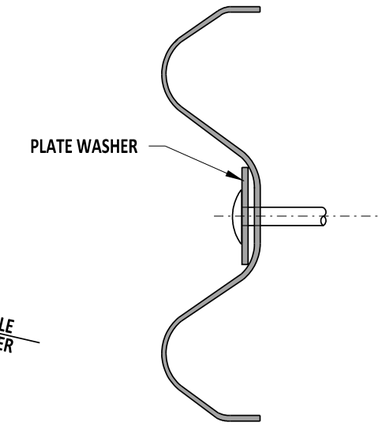

## PLAN




## PLATE WASHER DETAIL




## ELEVATION




## PLATE WASHER MOUNTING POSITION

NOTES:
1). ADDITIONAL HOLES IN W-BEAM FOR ANCHOR PLATE SHALL BE DRILLED PRIOR TO GALVANIZING. (SEE DETAIL B-13, SHEET 8 FOR HOLE SPACING INFORMATION).
2). PLATE WASHERS SHALL BE INSTALLED AT POSTS 3 & 4 ONLY.
3). THIS END TREATMENT SHALL ONLY BE USED ON TRAVEL WAYS WITH A POSTED SPEED LIMIT OF 40 MPH OR LESS, AT ENTRANCE LOCATIONS.
4). THIS DETAIL IS BASED ON NCHRP 350 CRASH TESTING. MASH COMPLIANT DETAILS ARE NOT YET AVAILABLE.

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ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

# GUARDRAIL END TREATMENT, TYPE 4-27

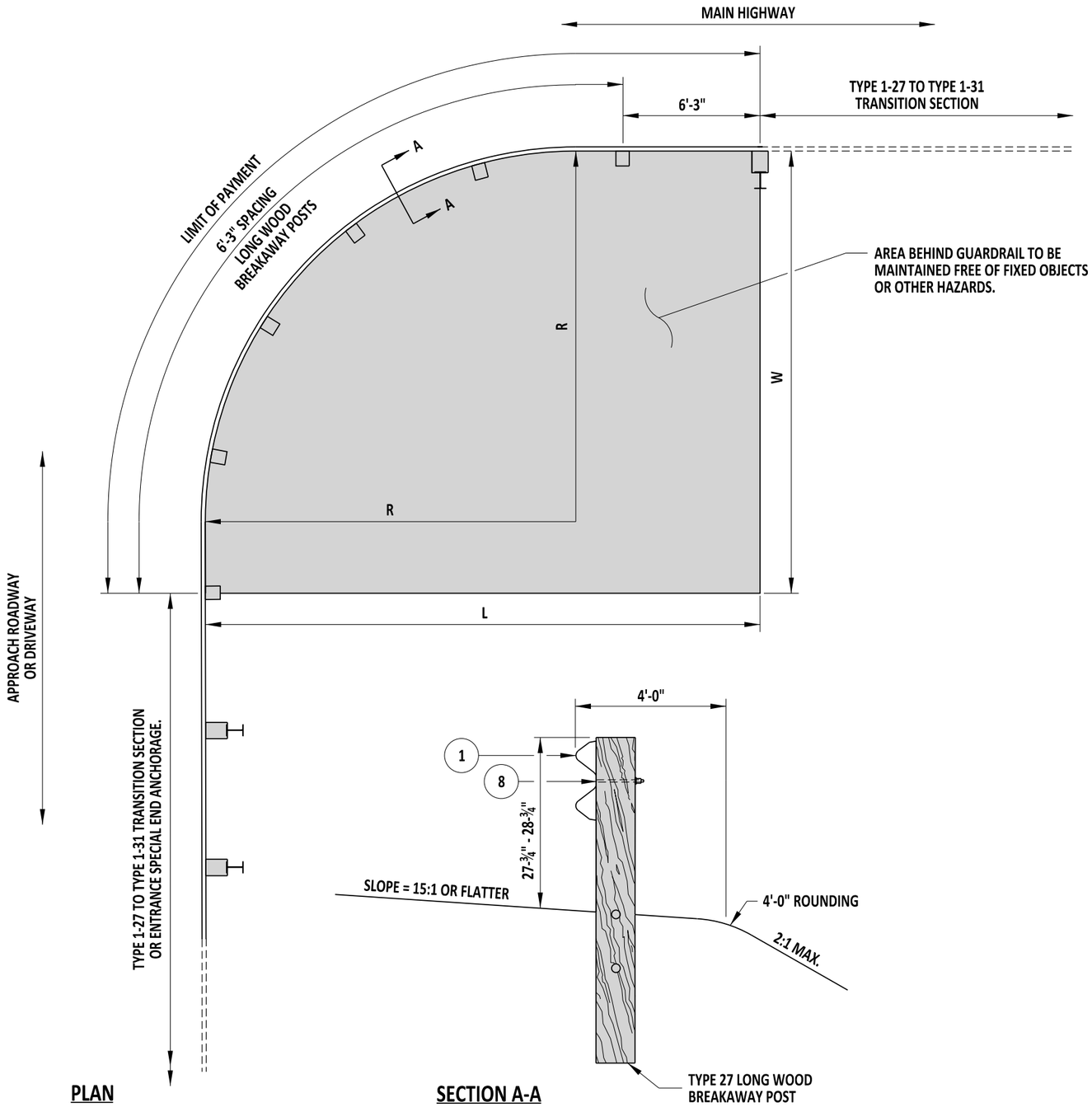
STANDARD NO. B-17 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

SCALE : NTS



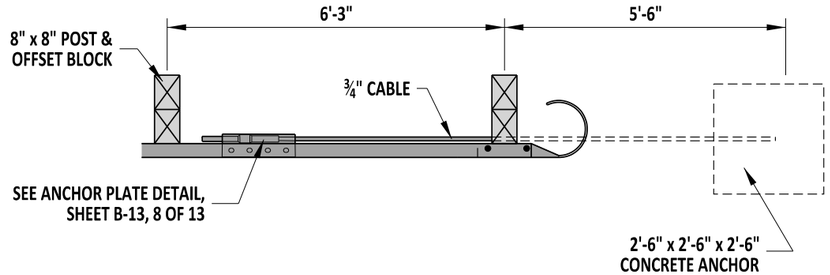

PLAN

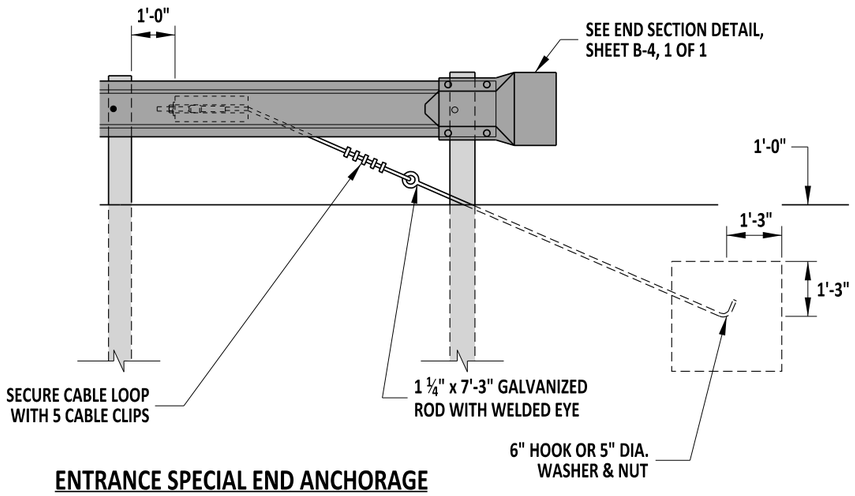



SECTION A-A

| RADIUS | MIN. REQUIRED AREA FREE OF FIXED OBJECTS |
|---|---|
| | L x W |
| 8'-6" | 25'-0" x 15'-0" |
| 17'-0" | 30'-0" x 15'-0" |
| 25'-6" | 40'-0" x 20'-0" |
| 35'-0" | 50'-0" x 20'-0" |

NOTES:
1). NO WASHERS ARE USED ON THE RAIL SIDE OF THE LONG WOOD BREAKAWAY POSTS.
2). THE CURVED GUARDRAIL SECTION SHALL BE SHOP BENT.
3). PLACE GUARDRAIL DELINEATORS AT THE INTERVALS SPECIFIED IN THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
4). INSTALL CURB IN ACCORDANCE WITH THE CONTRACT AT A MAX CURB HEIGHT OF 2", FLUSH WITH FACE OF GUARDRAIL.
5). ON THE 8'6' RADIUS SYSTEM ONLY, THE RAIL IS NOT TO BE BOLTED TO THE CENTER POST.
6). THIS DETAIL IS BASED ON NCHRP 350 CRASH TESTING. MASH COMPLIANT DETAILS ARE NOT YET AVAILABLE.




ENTRANCE SPECIAL END ANCHORAGE

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

CURVED GUARDRAIL SECTION, TYPE 1-27

STANDARD NO. B-18 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

SCALE : NTS

# B-19 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

DelDOT

ENGINEERING SUPPORT _____ DATE _____

RECOMMENDED

STANDARD NO. B-19 (2020)

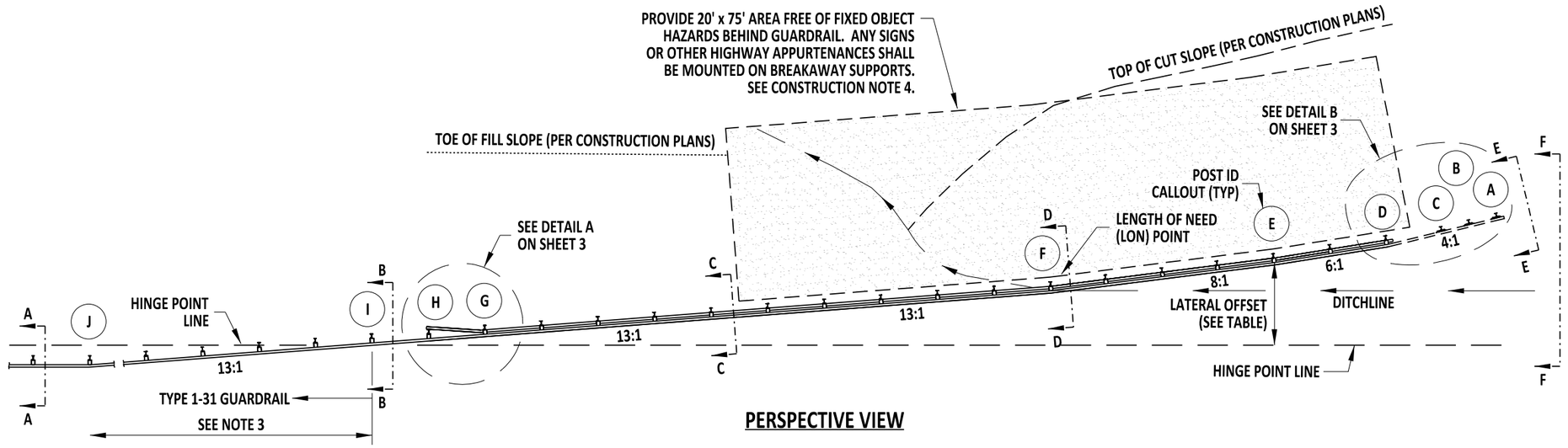
SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

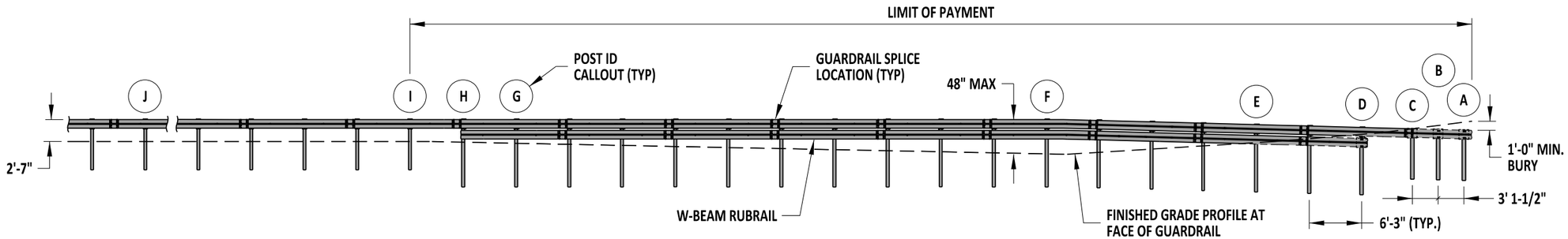
APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

SCALE : NTS




## PERSPECTIVE VIEW




## ELEVATION

**CONSTRUCTION NOTES:**

1). THIS TERMINAL IS MASH TL-3 TESTED.
2). PAY LIMITS FOR BURIED-IN-BACKSLOPE TERMINAL ARE FROM POST A TO POST I. PAYMENT FOR BURIED-IN-BACKSLOPE TERMINAL INCLUDES EXCAVATION AND BACKFILL WORK ASSOCIATED WITH BURIAL FROM POST A TO POST I.
3). EXTEND THE TYPE 1-31 GUARDRAIL AT A 13:1, OR FLATTER, FLARE RATE FROM POST I TO POST J, WHERE THE TYPICAL GUARDRAIL RUN IS PARALLEL TO THE SHOULDER. FIELD BEND W-BEAM RAIL ELEMENT TO TRANSITION FROM THE 13:1 FLARE TO PARALLEL TO THE SHOULDER AT POST J.
4). PROVIDE A 20' x 75' OBJECT FREE AREA WHEN BACKSLOPES ARE FLATTER THAN 2:1. WHEN REQUIRED, THIS WORK IS SUBSIDIARY TO THE BURIED-IN-BACKSLOPE TERMINAL.
5). CURB IS NOT PERMITTED WITHIN THE LIMIT OF PAYMENT.
6). MASH COMPLIANT DESIGN - BASED ON TTI REPORT NO. 608431-01-1&2.

**DESIGN NOTES:**

1). THE LENGTH OF NEED (LON) POINT SHOWN ON THIS SHEET IS FOR THE CONDITIONS SHOWN IN THE SECTIONS ON SHEET 2. FOR OTHER FORESLOPE CONDITIONS, THE LON POINT IS WHERE THE TOP OF THE RAIL HEIGHT FIRST REACHES 4'-0" WITH RESPECT TO THE FINISHED GRADE AT THE FACE OF THE GUARDRAIL.

| FLARE RATE TABLE | |
|---|---|
| POSTS | FLARE RATE |
| A-D | 4:1 |
| D-E | 6:1 |
| E-F | 8:1 |
| F-I | 13:1 |
| I-J | 13:1 OR FLATTER |

| LATERAL OFFSET TABLE | |
|---|---|
| POST NO. | OFFSET* |
| A | 14'-3" |
| D | 11'-2 1/4" |
| E | 9'-1 1/2" |
| F | 6'-0 1/4" |
| I | 3 1/4" |

*LATERAL OFFSET IS MEASURED FROM THE HINGE POINT LINE TO THE BACK OF GUARDRAIL. THESE OFFSETS APPLY ONLY FOR THE FORESLOPE AND BACKSLOPE CONDITIONS SHOWN ON THE SECTIONS ON SHEET 2. FOR OTHER FORESLOPE OR BACKSLOPE CONDITIONS, THESE OFFSETS NEED TO BE RECOMPUTED.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

# BURIED IN BACKSLOPE END TERMINAL, TYPE 1-31

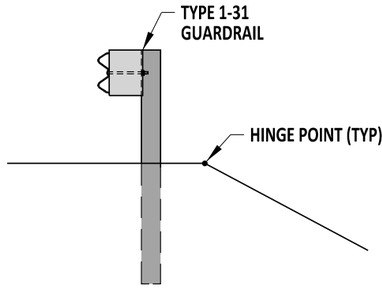
STANDARD NO. B-20 (2020) | SHT. 1 OF 4

REVIEWED
DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

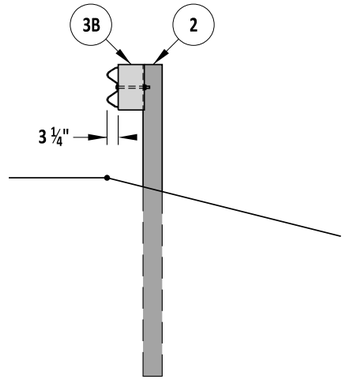
APPROVED
CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

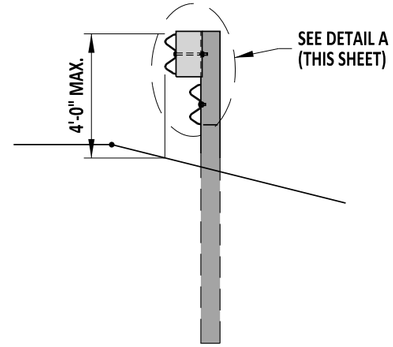
SCALE : NTS



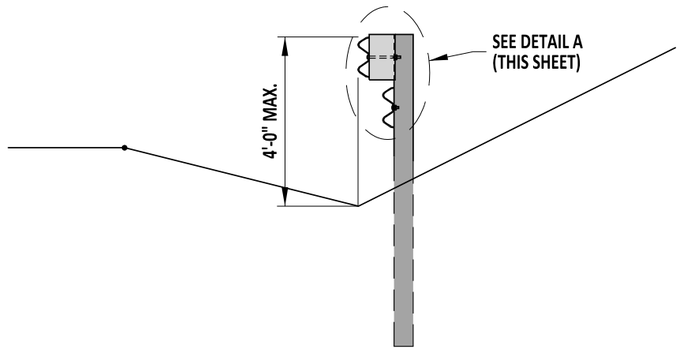

**SECTION A-A**
TYPICAL SECTION OF GUARDRAIL
INSTALLATION AT SHOULDER



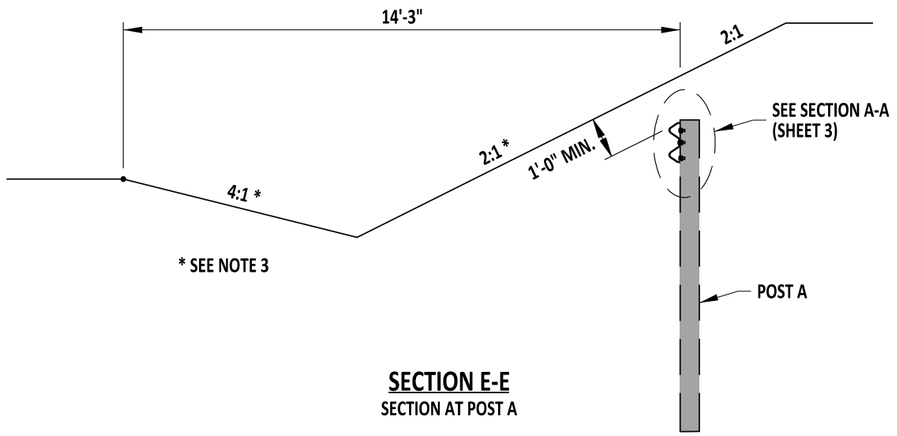

**SECTION B-B**
TYPICAL SECTION AT POST I.
FACE OF GUARDRAIL FLUSH WITH
SHOULDER HINGE POINT




**SECTION C-C**
GUARDRAIL ON FORESLOPE

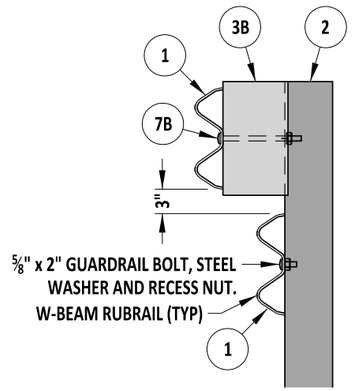



**SECTION D-D**
SECTION AT POST F
FACE OF GUARDRAIL ALIGNED
WITH CENTER OF DITCH

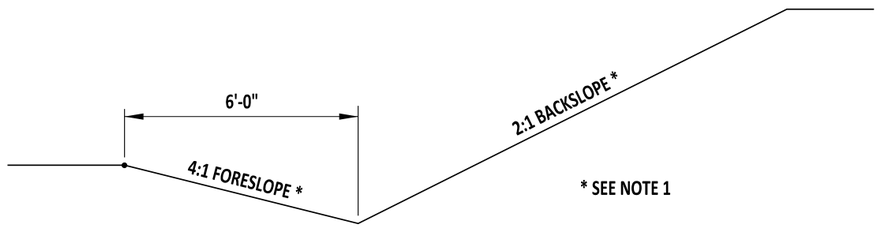



* SEE NOTE 3

**SECTION E-E**
SECTION AT POST A




**DETAIL A**




* SEE NOTE 1

**SECTION F-F**
TYPICAL DITCH SECTION

**NOTES:**
1). FORESLOPES SHALL BE 4:1 OR FLATTER. BACKSLOPES MAY BE 1:1 MAXIMUM TO 3:1 MINIMUM. LATERAL OFFSETS SHOWN ON THIS SHEET AND SHEET 1 ARE BASED ON THE 4:1 FORESLOPE, 2:1 BACKSLOPE, AND 1'-6" DITCH DEPTH SHOWN ON THIS SHEET. OTHER DITCH DEPTH, FORESLOPE, OR BACKSLOPE CONDITIONS WILL REQUIRE RECOMPUTATION OF LATERAL OFFSETS AND SPECIAL GRADING OF THE TOP OF GUARDRAIL TO MAINTAIN THE 4'-0" MAXIMUM GROUND CLEARANCE TO THE TOP OF GUARDRAIL AND 1'-0" MINIMUM BURY AT POST 12.
2). ALL POSTS SHALL BE W6x9 GALVANIZED STEEL POSTS.
3). ALL BLOCKOUTS WITHIN THE LIMITS OF THE BURIED-IN-BACKSLOPE SHALL BE 6"x8" BLOCKOUTS.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

**BURIED IN BACKSLOPE END TERMINAL SECTIONS, TYPE 1-31**

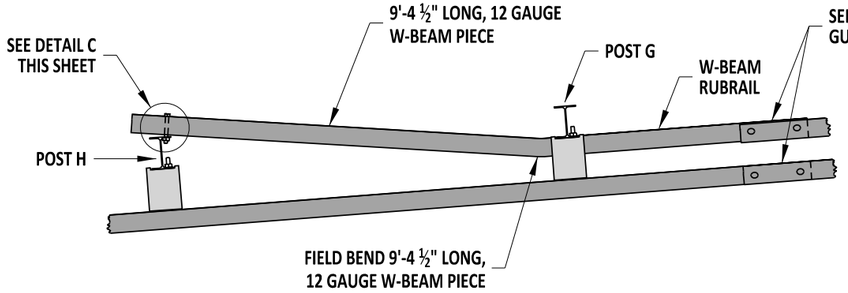
STANDARD NO. B-20 (2020) | SHT. 2 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

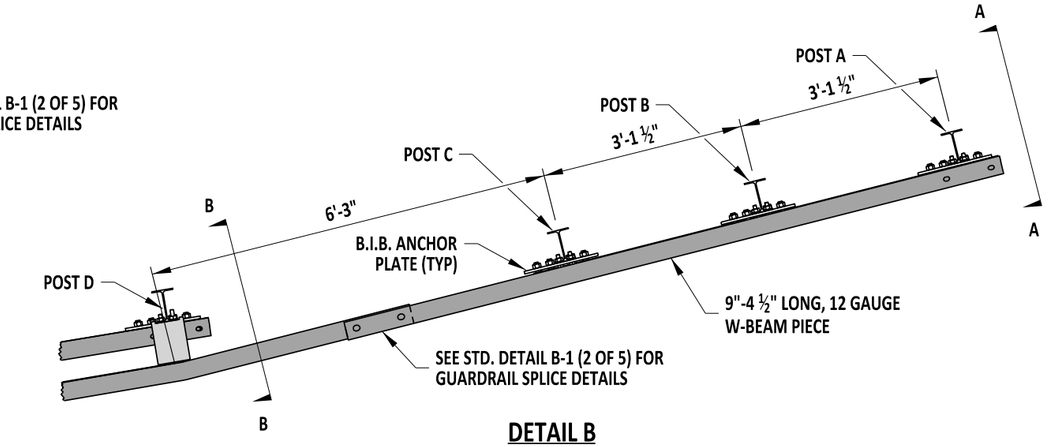
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

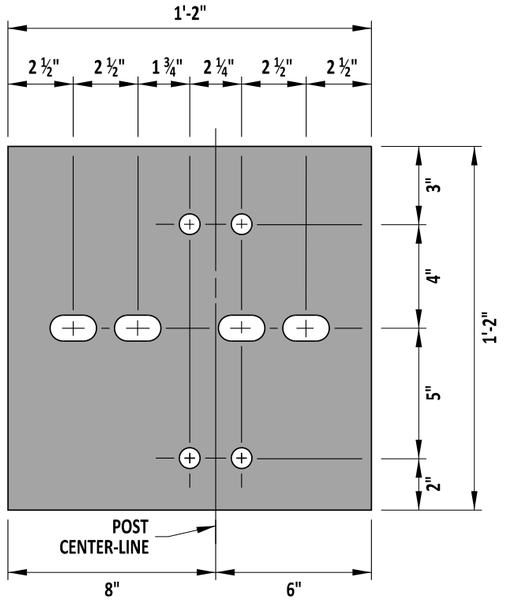
SCALE : NTS




## DETAIL A

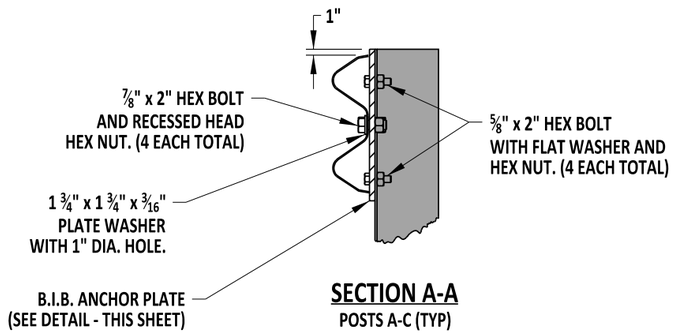



## DETAIL B



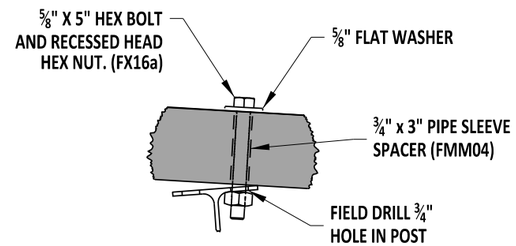

## B.I.B. ANCHOR PLATE

PLATE NOTES:
1). PLATE IS ½" GALVANIZED ASTM A36 STEEL.
2). ALL CIRCULAR HOLES ARE ¾" DIAMETER.
3). ALL SLOTTED HOLES ARE 1" x 1 ¾".

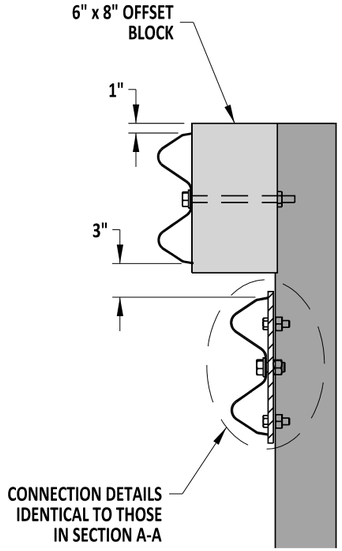



## SECTION A-A

POSTS A-C (TYP)




## DETAIL C




## SECTION B-B

POST D ONLY

NOTES:
1). FIELD DRILL 1" DIAMETER HOLES IN W-BEAM RAIL ELEMENTS TO MAKE CONNECTIONS TO THE B.I.B. ANCHOR PLATE.
2). ALL HARDWARE SHALL BE GALVANIZED UNLESS SPECIFIED OTHERWISE.
3). OFFSET BLOCKS SHALL BE WOOD OR COMPOSITE.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

BURIED IN BACKSLOPE END TERMINAL HARDWARE, TYPE 1-31

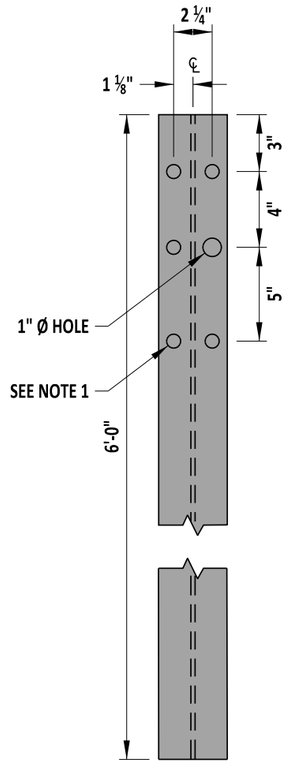
STANDARD NO. B-20 (2020) | SHT. 3 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

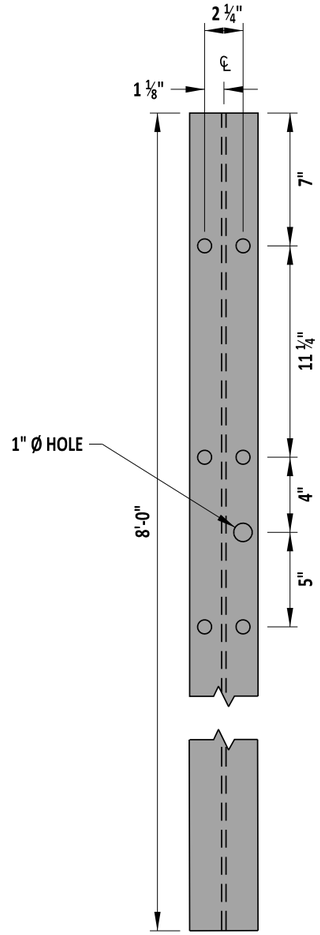
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

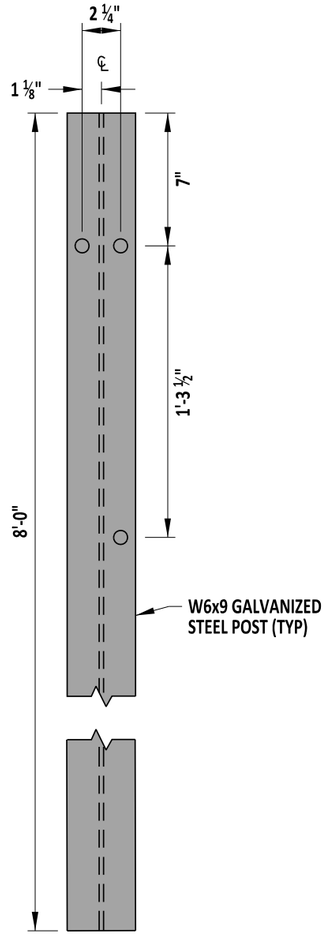
SCALE : NTS




POSTS A-C




POST D




FIRST POST AFTER D
TO POST H

NOTES:
1). ALL POST HOLES ARE ¾" DIAMETER, EXCEPT THOSE SHOWN AS 1" DIAMETER.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

BURIED IN BACKSLOPE END TERMINAL POSTS, TYPE 1-31

STANDARD NO. B-20 (2020) | SHT. 4 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

SCALE : NTS

# B-21 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

DelDOT

ENGINEERING SUPPORT _____ DATE _____

RECOMMENDED

STANDARD NO. B-21 (2020)

SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

SCALE : NTS

# B-22 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

DelDOT

ENGINEERING SUPPORT _____ DATE _____

RECOMMENDED

STANDARD NO. B-22 (2020)

SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

SCALE : NTS

# B-23 DETAIL RESERVED
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ENGINEERING SUPPORT _____ DATE _____

RECOMMENDED

STANDARD NO. B-23 (2020)

SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

SCALE : NTS

# B-24 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

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ENGINEERING SUPPORT _____ DATE _____

RECOMMENDED

STANDARD NO. B-24 (2020)

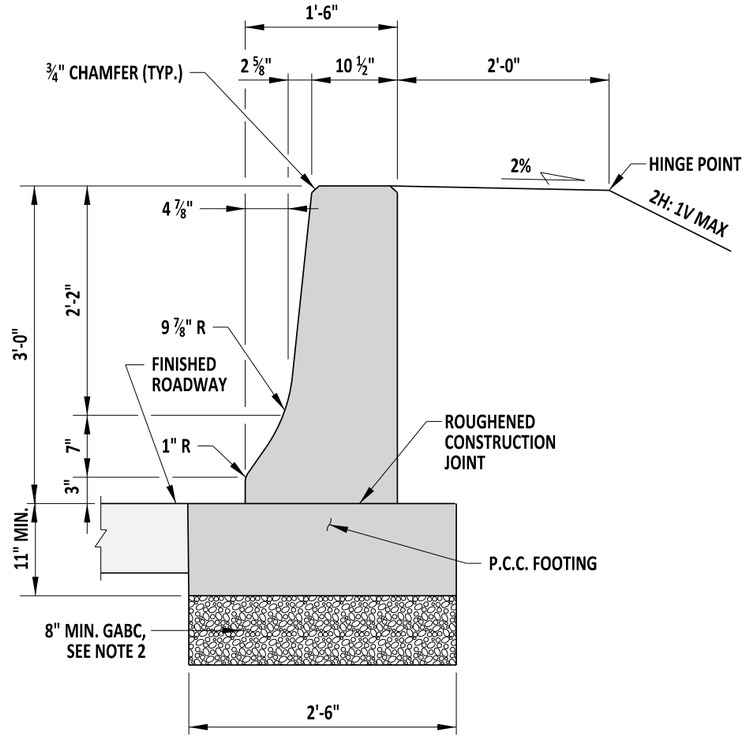
SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

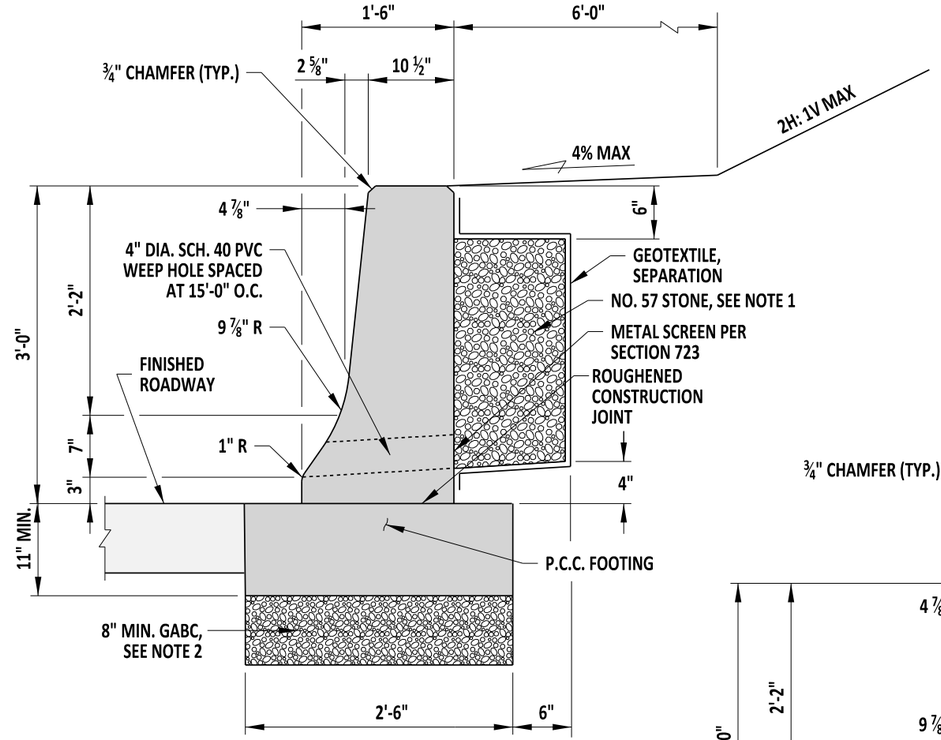
APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

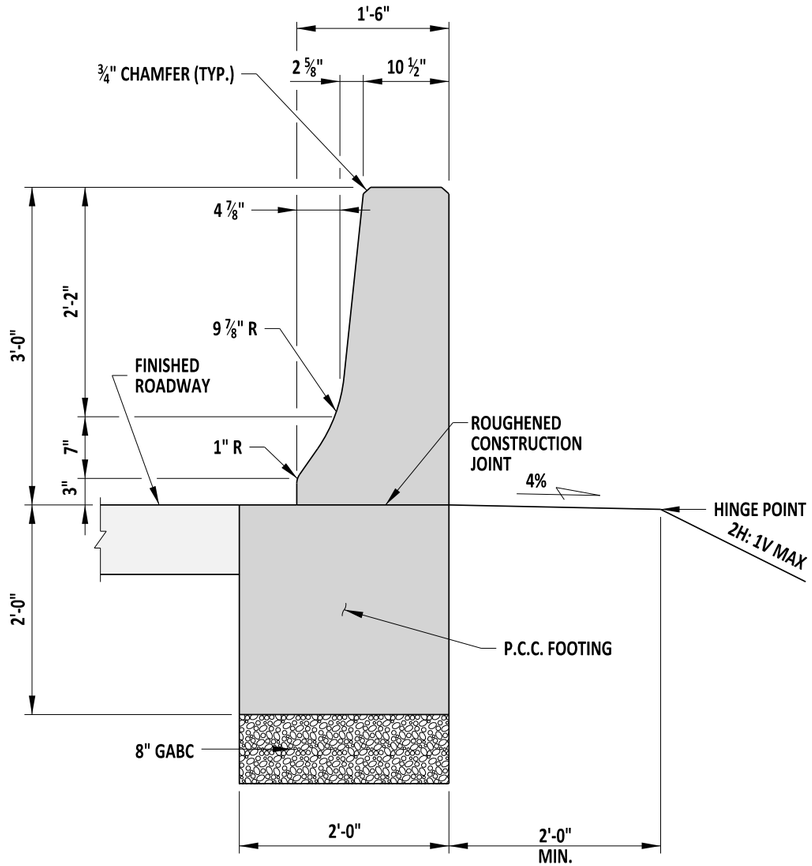
SCALE : NTS




TYPICAL BARRIER APPLICATION - TYPE 1




TYPICAL BARRIER APPLICATION - TYPE 2




TYPICAL BARRIER APPLICATION - TYPE 3

NOTES:
1). PAYMENT FOR NO. 57 STONE AND GEOTEXTILE WILL BE INCIDENTAL TO THE PERTINENT BARRIER ITEM.
2). DEPTH OF GABC TO MATCH ROADWAY BASE DEPTH, 8" MINIMUM.

TL-4

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

36" CONCRETE ROADSIDE BARRIER (F-SHAPE)

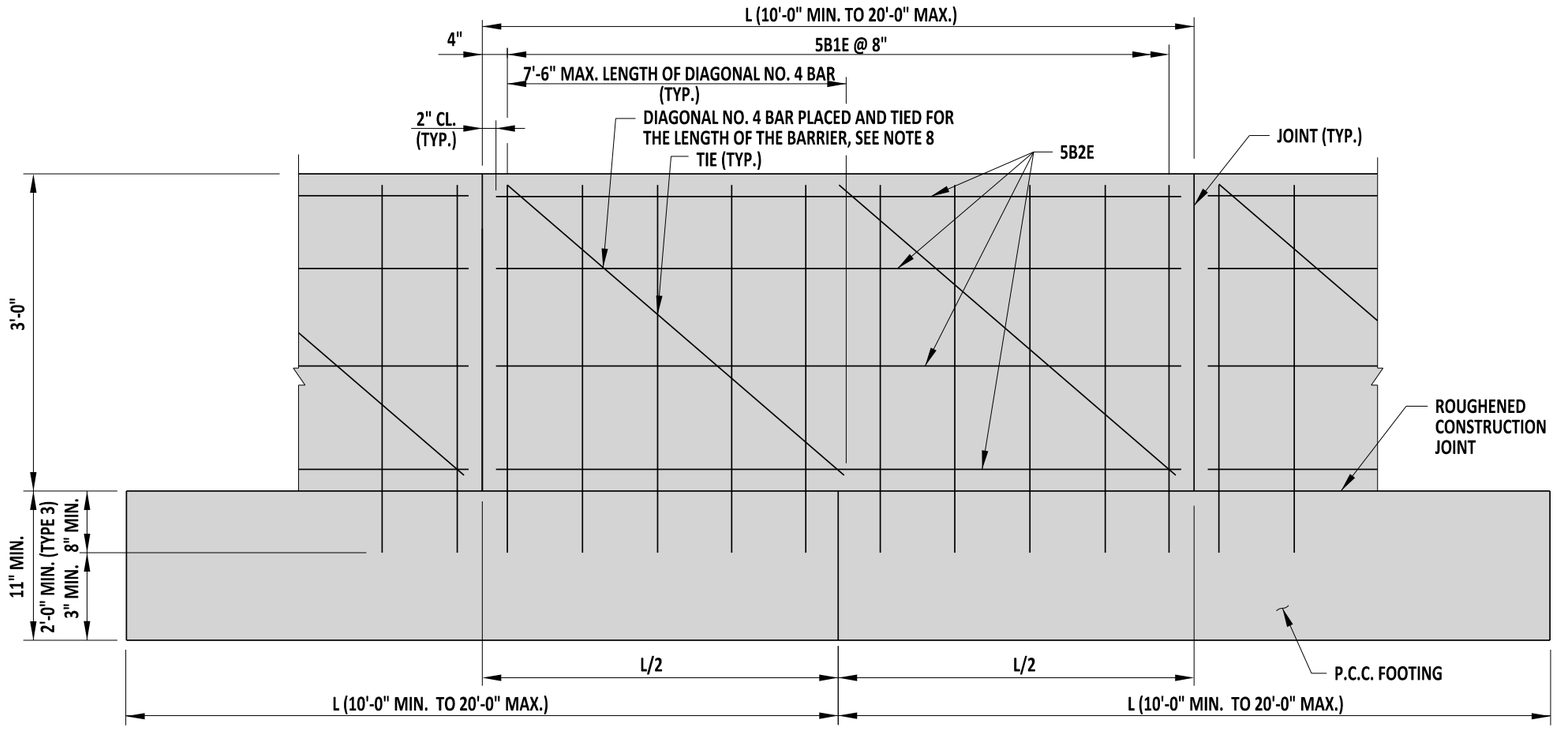
STANDARD NO. B-25 (2020) | SHT. 1 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

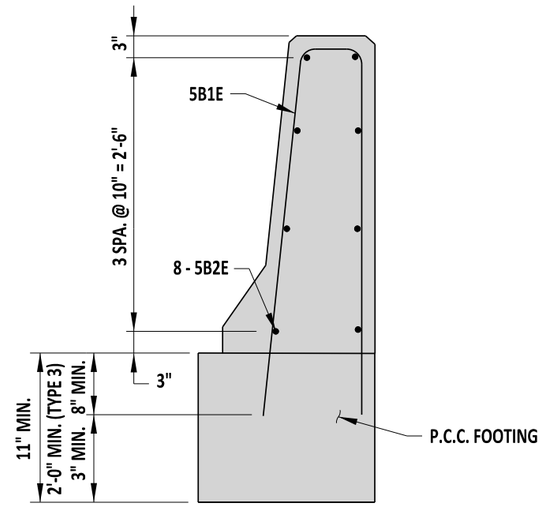
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

SCALE : NTS




## ELEVATION




## SECTION - REINFORCEMENT

NOTES:

1). CONCRETE CLEAR COVER FOR REINFORCEMENT BARS SHALL BE 2" MINIMUM, UNLESS NOTED OTHERWISE.

2). BARRIER CONTRACTION JOINTS OVER EXISTING PAVEMENT CONTRACTION JOINTS SHALL BE SEPARATED BY OPEN JOINTS HAVING THE SAME WIDTH AS THE PAVEMENT JOINTS FOR THE FULL EXPOSED SURFACE OF THE BARRIER.

3). BARRIER CONTRACTION JOINTS SHALL BE A GROOVE ⅛" WIDE AND ½" DEEP, SAWED OR FORMED ACROSS THE TOP AND ALONG THE SIDES FOR THE ENTIRE SURFACE OF THE BARRIER, OR A FULL DEPTH BUTT JOINT, AT APPROXIMATELY 10'-0" TO 20'-0" INTERVALS ALONG THE LENGTH OF THE BARRIER. IN ADDITION, THESE GROOVED OR BUTT JOINTS SHALL TRANSVERSELY ALIGN, WITH THE CONTRACTION JOINTS IN ABUTTING CONCRETE PAVEMENT.

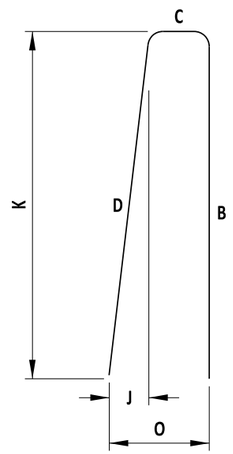
4). EXPANSION JOINTS SHALL BE PLACED IN THE BARRIER AT STRUCTURES AND OTHER EXPANSION JOINTS IN ABUTTING CONCRETE PAVEMENT, OVER EXISTING EXPANSION JOINTS IN UNDERLYING CONCRETE PAVEMENT, AND LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, BARRIER SECTIONS SHALL BE ¾" APART AND THE OPENING FILLED, FOR THE ENTIRE LENGTH AND DEPTH OF THE JOINT WITH ¾" PREFORMED JOINT FILLER WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 1042 OF THE STANDARD SPECIFICATIONS. THE FILLER SHALL BE RECESSED ¼" IN FROM THE SIDES AND TOP OF THE BARRIER.

5). AT EACH END OF THE BARRIER INSTALLATIONS, THE BARRIER SHALL BE ADEQUATELY TERMINATED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

6.) FOR SLIP-FORM CONSTRUCTION, THE 5B2E BARS SHALL BE PLACED AS ONE CONTINUOUS PIECE. THE BARS SHALL LAP A MINIMUM OF 2'-10 ½".

7.) FOR SLIP-FORM CONSTRUCTION, A CONTROL JOINT SHALL BE CUT IN THE BARRIER EVERY 10'-0" AT A MAXIMUM DEPTH OF ½".

8.) DIAGONAL NO. 4 BARS ONLY REQUIRED WHEN USING SLIP-FORM CONSTRUCTION. DIAGONAL NO. 4 BARS NOT SHOWN IN SECTION VIEW.




## TYPE T15 BAR

| BAR SCHEDULE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MARK | SIZE | NUMBER PER 20' SECTION * | LENGTH * | TYPE | B | C | D | J | K | O |
| 5B1E | 5 | 29 | 7'-5 ½" | T15 | 3'-6" | 6 ¾" | 3'-6 ¼" | 4 ¼" | 3'-6" | 11" |
| 5B2E | 5 | 8 | 19'-8" | STR. | - | - | - | - | - | - |

* NUMBER OF 5B1E BARS AND LENGTH OF 5B2E BARS GIVEN FOR 20'-0" SECTIONS.
NUMBER AND LENGTH OF BARS SHALL BE ADJUSTED ACCORDINGLY FOR SECTION LENGTHS BETWEEN 10'-0" AND 20'-0".

TL-4

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

36" CONCRETE ROADSIDE BARRIER (F-SHAPE)

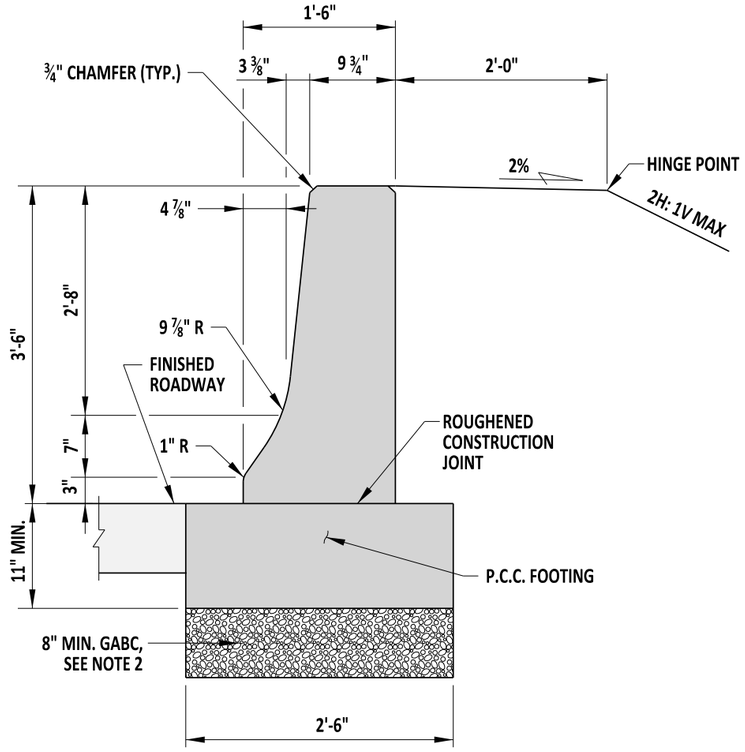
STANDARD NO. B-25 (2020) | SHT. 2 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

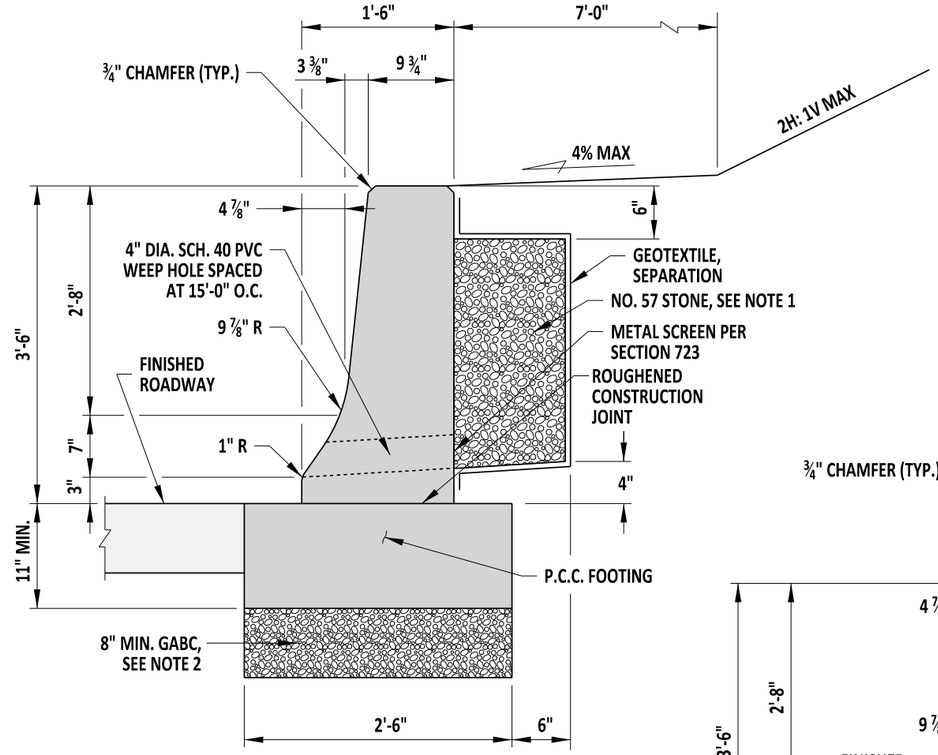
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

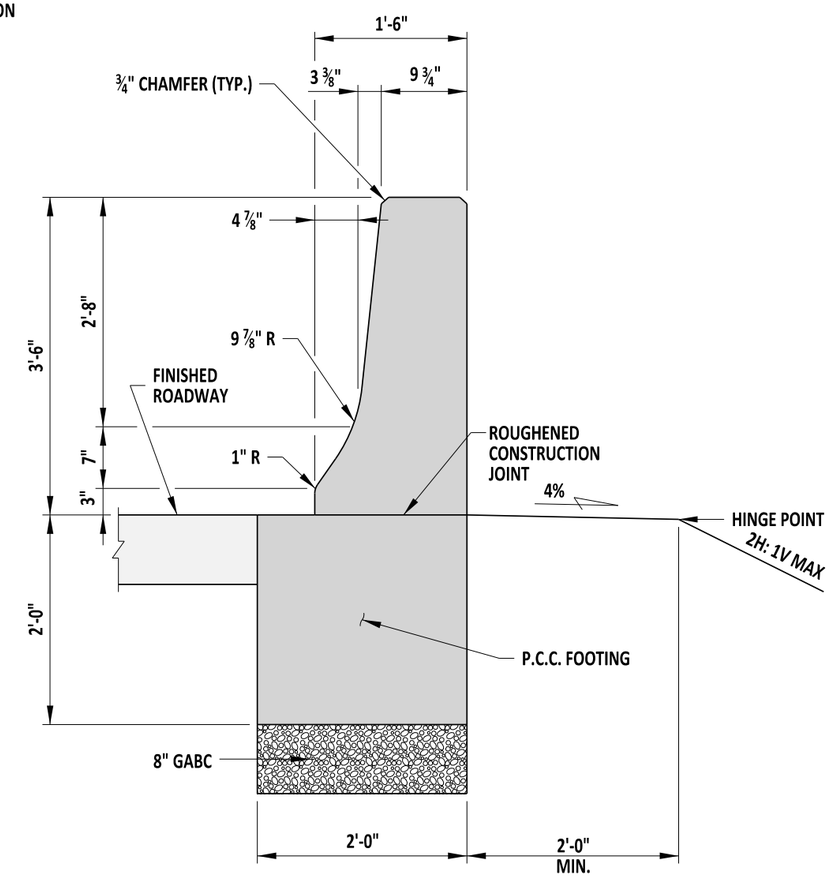
SCALE : NTS




## TYPICAL BARRIER APPLICATION - TYPE 1




## TYPICAL BARRIER APPLICATION - TYPE 2




## TYPICAL BARRIER APPLICATION - TYPE 3

NOTES:
1). PAYMENT FOR NO. 57 STONE AND GEOTEXTILE WILL BE INCIDENTAL TO THE PERTINENT BARRIER ITEM.
2). DEPTH OF GABC TO MATCH ROADWAY BASE DEPTH, 8" MINIMUM.

TL-4

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

42" CONCRETE ROADSIDE BARRIER (F-SHAPE)

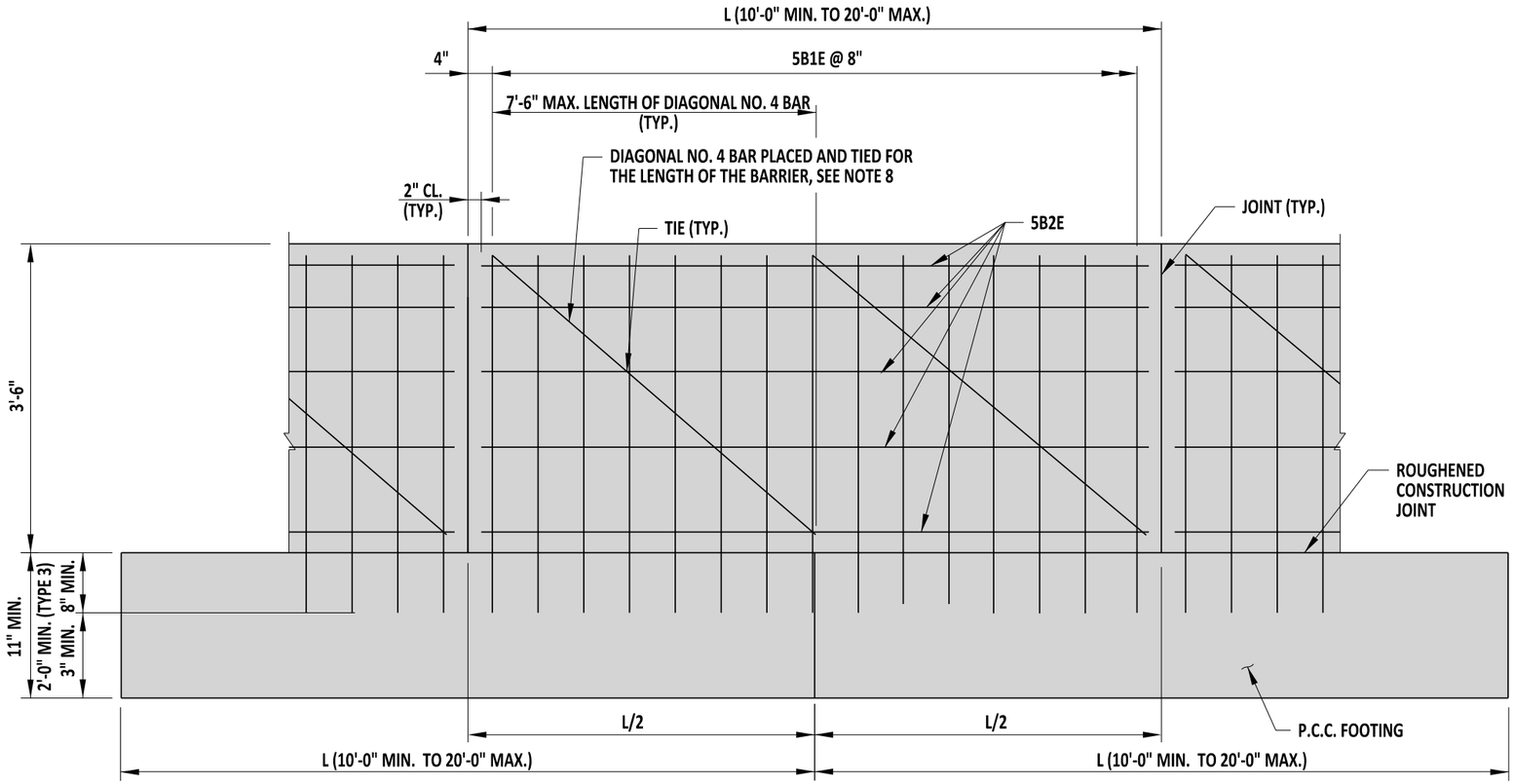
STANDARD NO. B-26 (2020) | SHT. 1 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

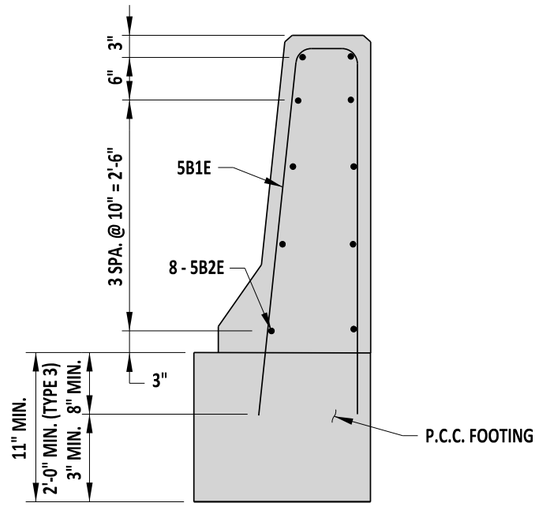
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

SCALE : NTS




## ELEVATION




## SECTION - REINFORCEMENT

NOTES:

1). CONCRETE CLEAR COVER FOR REINFORCEMENT BARS SHALL BE 2" MINIMUM, UNLESS NOTED OTHERWISE.

2). BARRIER CONTRACTION JOINTS OVER EXISTING PAVEMENT CONTRACTION JOINTS SHALL BE SEPARATED BY OPEN JOINTS HAVING THE SAME WIDTH AS THE PAVEMENT JOINTS FOR THE FULL EXPOSED SURFACE OF THE BARRIER.

3). BARRIER CONTRACTION JOINTS SHALL BE A GROOVE ⅛" WIDE AND ½" DEEP, SAWED OR FORMED ACROSS THE TOP AND ALONG THE SIDES FOR THE ENTIRE SURFACE OF THE BARRIER, OR A FULL DEPTH BUTT JOINT, AT APPROXIMATELY 10'-0" TO 20'-0" INTERVALS ALONG THE LENGTH OF THE BARRIER. IN ADDITION, THESE GROOVED OR BUTT JOINTS SHALL TRANSVERSELY ALIGN, WITH THE CONTRACTION JOINTS IN ABUTTING CONCRETE PAVEMENT.

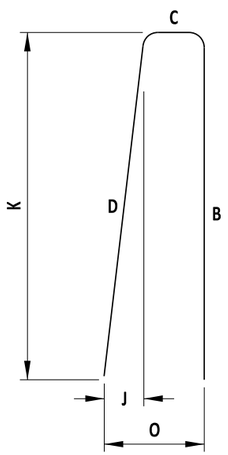
4). EXPANSION JOINTS SHALL BE PLACED IN THE BARRIER AT STRUCTURES AND OTHER EXPANSION JOINTS IN ABUTTING CONCRETE PAVEMENT, OVER EXISTING EXPANSION JOINTS IN UNDERLYING CONCRETE PAVEMENT, AND LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, BARRIER SECTIONS SHALL BE ¾" APART AND THE OPENING FILLED, FOR THE ENTIRE LENGTH AND DEPTH OF THE JOINT WITH ¾" PREFORMED JOINT FILLER WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 1042 OF THE STANDARD SPECIFICATIONS. THE FILLER SHALL BE RECESSED ¼" IN FROM THE SIDES AND TOP OF THE BARRIER.

5). AT EACH END OF THE BARRIER INSTALLATIONS, THE BARRIER SHALL BE ADEQUATELY TERMINATED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

6.) FOR SLIP-FORM CONSTRUCTION, THE 5B2E BARS SHALL BE PLACED AS ONE CONTINUOUS PIECE. THE BARS SHALL LAP A MINIMUM OF 2'-10 ½".

7.) FOR SLIP-FORM CONSTRUCTION, A CONTROL JOINT SHALL BE CUT IN THE BARRIER EVERY 10'-0" AT A MAXIMUM DEPTH OF ½".

8.) DIAGONAL NO. 4 BARS ONLY REQUIRED WHEN USING SLIP-FORM CONSTRUCTION. DIAGONAL NO. 4 BARS NOT SHOWN IN SECTION VIEW.




## TYPE T15 BAR

| BAR SCHEDULE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MARK | SIZE | NUMBER PER 20' SECTION * | LENGTH * | TYPE | B | C | D | J | K | O |
| 5B1E | 5 | 29 | 8'-4 ¾" | T15 | 4'-0" | 6" | 4'-0 ¼" | 5" | 4'-0" | 11" |
| 5B2E | 5 | 10 | 19'-8" | STR. | - | - | - | - | - | - |

* NUMBER OF 5B1E BARS AND LENGTH OF 5B2E BARS GIVEN FOR 20'-0" SECTIONS.
NUMBER AND LENGTH OF BARS SHALL BE ADJUSTED ACCORDINGLY FOR SECTION LENGTHS BETWEEN 10'-0" AND 20'-0".

TL-4

DelDOT

09/01/2020
ENGINEERING SUPPORT DATE
RECOMMENDED

# 42" CONCRETE ROADSIDE BARRIER (F-SHAPE)

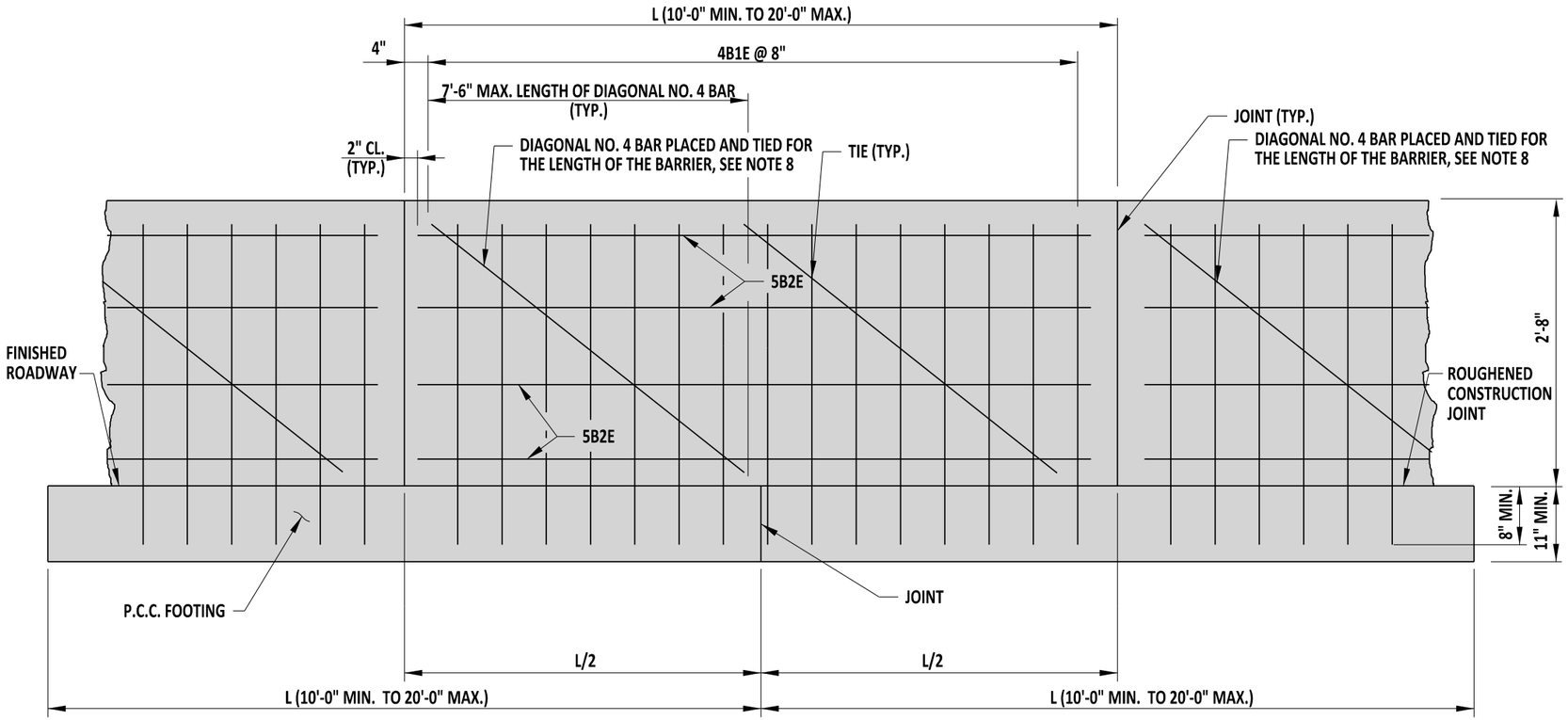
STANDARD NO. B-26 (2020) SHT. 2 OF 2

REVIEWED
DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE

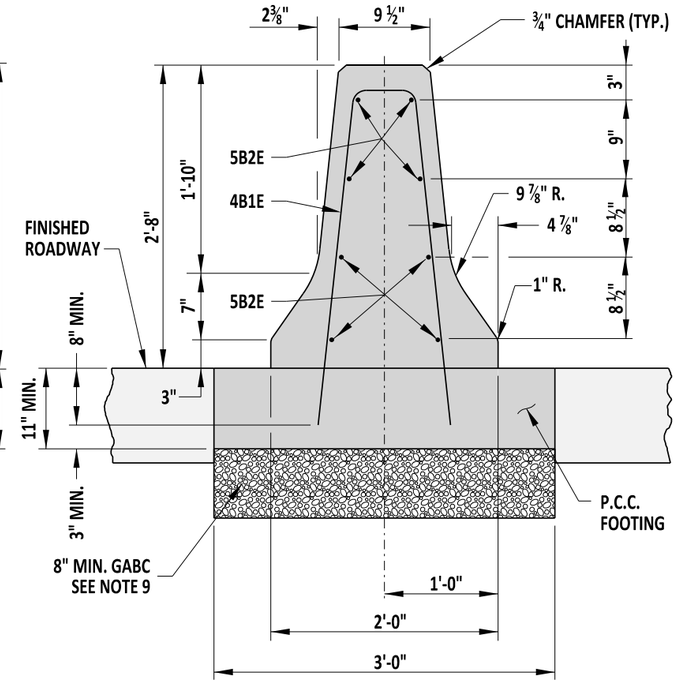
APPROVED
CHIEF ENGINEER 09/01/2020 DATE

8/19/2020

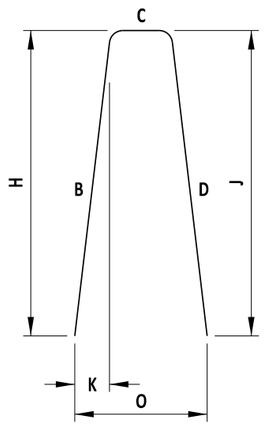
SCALE : NTS




## ELEVATION




## SECTION




## TYPE DE10 BAR

NOTES:

1). CONCRETE CLEAR COVER FOR REINFORCEMENT BARS SHALL BE 2" MINIMUM, UNLESS OTHERWISE NOTED.
2). BARRIER CONTRACTION JOINTS OVER EXISTING PAVEMENT CONTRACTION JOINTS SHALL BE SEPARATED BY OPEN JOINTS HAVING THE SAME WIDTH AS THE PAVEMENT JOINTS FOR THE FULL EXPOSED SURFACE OF THE BARRIER.
3). BARRIER CONTRACTION JOINTS SHALL BE A GROOVE ⅛" WIDE AND ½" DEEP, SAWED OR FORMED ACROSS THE TOP AND ALONG THE SIDES FOR THE ENTIRE SURFACE OF THE BARRIER, OR A FULL DEPTH BUTT JOINT, AT APPROXIMATELY 10'-0" TO 20'-0" INTERVALS ALONG THE LENGTH OF THE BARRIER. IN ADDITION, THESE GROOVED OR BUTT JOINTS SHALL TRANSVERSELY ALIGN, WITH THE CONTRACTION JOINTS IN ABUTTING CONCRETE PAVEMENT.
4). EXPANSION JOINTS SHALL BE PLACED IN THE BARRIER AT STRUCTURES AND OTHER EXPANSION JOINTS IN ABUTTING CONCRETE PAVEMENT, OVER EXISTING EXPANSION JOINTS IN UNDERLYING CONCRETE PAVEMENT, AND LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, BARRIER SECTIONS SHALL BE ¾" APART AND THE OPENING FILLED, FOR THE ENTIRE LENGTH AND DEPTH OF THE JOINT WITH ¾" PREFORMED JOINT FILLER WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 1042 OF THE STANDARD SPECIFICATIONS. THE FILLER SHALL BE RECESSED ¼" IN FROM THE SIDES AND TOP OF THE BARRIER.
5). AT EACH END OF THE BARRIER INSTALLATIONS, THE BARRIER SHALL BE ADEQUATELY TERMINATED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6.) FOR SLIP-FORM CONSTRUCTION, THE 5B2E BARS SHALL BE PLACED AS ONE CONTINUOUS PIECE. THE BARS SHALL LAP A MINIMUM OF 2'-10 ½".
7.) FOR SLIP-FORM CONSTRUCTION, A CONTROL JOINT SHALL BE CUT IN THE BARRIER EVERY 10'-0" AT A MAXIMUM DEPTH OF ½"
8.) DIAGONAL NO. 4 BARS ONLY REQUIRED WHEN USING SLIP-FORM CONSTRUCTION. DIAGONAL NO. 4 BARS NOT SHOWN IN SECTION VIEW.
9.) DEPTH OF GABC TO MATCH ROADWAY BASE, 8" MINIMUM.

| BAR SCHEDULE | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MARK | SIZE | NUMBER PER 20' SECTION * | LENGTH * | TYPE | B | C | D | H | K | J | O |
| 4B1E | 4 | 29 | 6'-9 ¼" | DE10 | 3'-2 ¼" | 6" | 3'-2 ¾" | 3'-2" | 4" | 3'-2" | 1'-2" |
| 5B2E | 5 | 8 | 19'-8" | STR. | | | | | | | |

* NUMBER OF 4B1E BARS AND LENGTH OF 5B2E BARS GIVEN FOR 20'-0" SECTIONS.
NUMBER AND LENGTH OF BARS SHALL BE ADJUSTED ACCORDINGLY FOR SECTION LENGTHS BETWEEN 10'-0" AND 20'-0".

TL-3

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

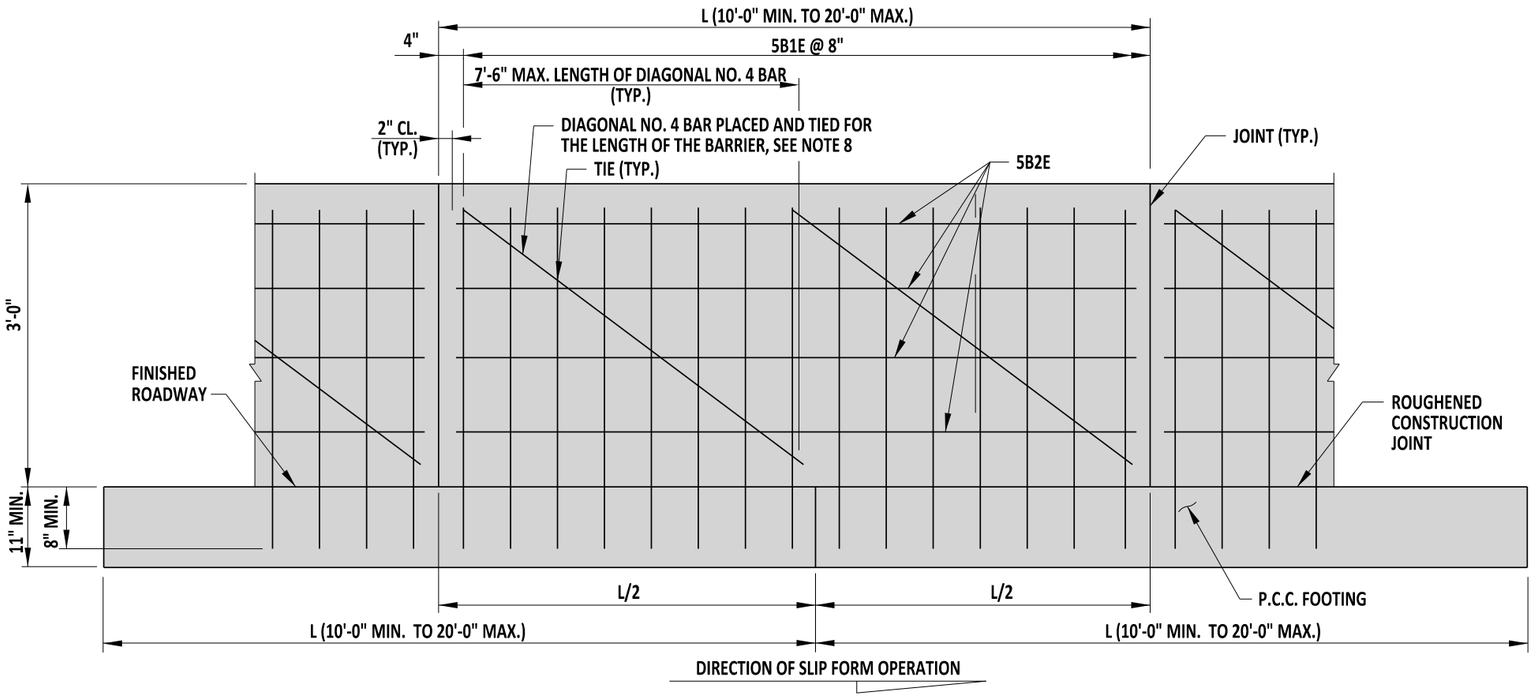
# 32" CONCRETE MEDIAN BARRIER (F-SHAPE)

STANDARD NO. B-27 (2020) | SHT. 1 OF 1

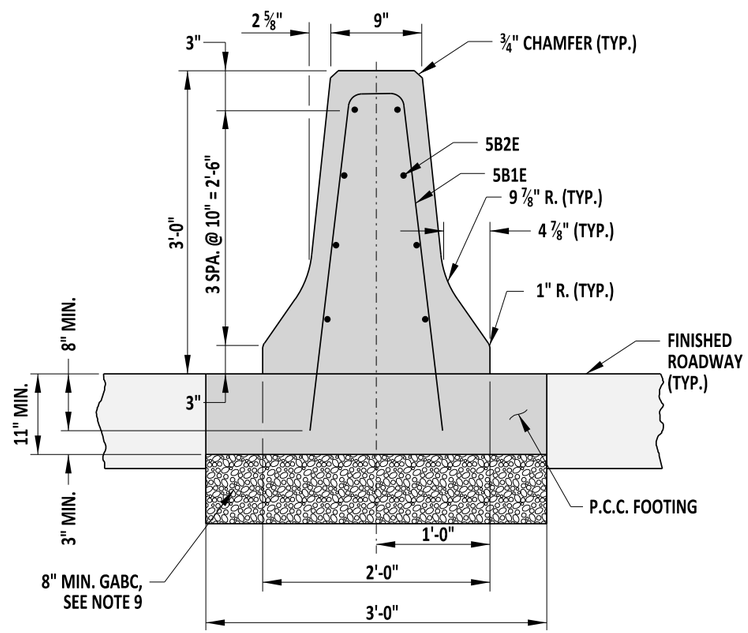
REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

8/19/2020

SCALE : NTS



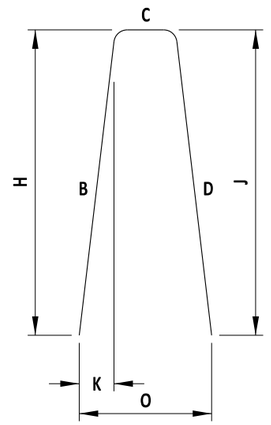

## ELEVATION




## SECTION

NOTES:

1). CONCRETE CLEAR COVER FOR REINFORCEMENT BARS SHALL BE 2" MINIMUM, UNLESS OTHERWISE NOTED.
2). BARRIER CONTRACTION JOINTS OVER EXISTING PAVEMENT CONTRACTION JOINTS SHALL BE SEPARATED BY OPEN JOINTS HAVING THE SAME WIDTH AS THE PAVEMENT JOINTS FOR THE FULL EXPOSED SURFACE OF THE BARRIER.
3). BARRIER CONTRACTION JOINTS SHALL BE A GROOVE ⅛" WIDE AND ½" DEEP, SAWED OR FORMED ACROSS THE TOP AND ALONG THE SIDES FOR THE ENTIRE SURFACE OF THE BARRIER, OR A FULL DEPTH BUTT JOINT, AT APPROXIMATELY 10'-0" TO 20'-0" INTERVALS ALONG THE LENGTH OF THE BARRIER. IN ADDITION, THESE GROOVED OR BUTT JOINTS SHALL TRANSVERSELY ALIGN, WITH THE CONTRACTION JOINTS IN ABUTTING CONCRETE PAVEMENT.
4). EXPANSION JOINTS SHALL BE PLACED IN THE BARRIER AT STRUCTURES AND OTHER EXPANSION JOINTS IN ABUTTING CONCRETE PAVEMENT, OVER EXISTING EXPANSION JOINTS IN UNDERLYING CONCRETE PAVEMENT, AND LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, BARRIER SECTIONS SHALL BE ¾" APART AND THE OPENING FILLED, FOR THE ENTIRE LENGTH AND DEPTH OF THE JOINT WITH ¾" PREFORMED JOINT FILLER WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 1042 OF THE STANDARD SPECIFICATIONS. THE FILLER SHALL BE RECESSED ¼" IN FROM THE SIDES AND TOP OF THE BARRIER.
5). AT EACH END OF THE BARRIER INSTALLATIONS, THE BARRIER SHALL BE ADEQUATELY TERMINATED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6.) FOR SLIP-FORM CONSTRUCTION, THE 5B2E BARS SHALL BE PLACED AS ONE CONTINUOUS PIECE. THE BARS SHALL LAP A MINIMUM OF 2'-10 ½".
7.) FOR SLIP-FORM CONSTRUCTION, A CONTROL JOINT SHALL BE CUT IN THE BARRIER EVERY 10'-0" AT A MAXIMUM DEPTH OF ½".
8.) DIAGONAL NO. 4 BARS ONLY REQUIRED WHEN USING SLIP-FORM CONSTRUCTION. DIAGONAL NO. 4 BARS NOT SHOWN IN SECTION VIEW.
9.) DEPTH OF GABC TO MATCH ROADWAY BASE, 8" MINIMUM.




## TYPE DE10 BAR

BAR SCHEDULE

| MARK | SIZE | NUMBER PER 20' SECTION * | LENGTH * | TYPE | B | C | D | H | J | K | O |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5B1E | 5 | 29 | 7'-4 ½" | DE10 | 3'-6 ¼" | 5 ¼" | 3'-6 ¼" | 3'-6" | 3'-6" | 4 ¼" | 1'-1 ¾" |
| 5B2E | 5 | 8 | 19'-8" | STR. | - | - | - | - | - | - | - |

* NUMBER OF 5B1E BARS AND LENGTH OF 5B2E BARS GIVEN FOR 20'-0" SECTIONS.
NUMBER AND LENGTH OF BARS SHALL BE ADJUSTED ACCORDINGLY FOR SECTION LENGTHS BETWEEN 10'-0" AND 20'-0".

TL-4

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

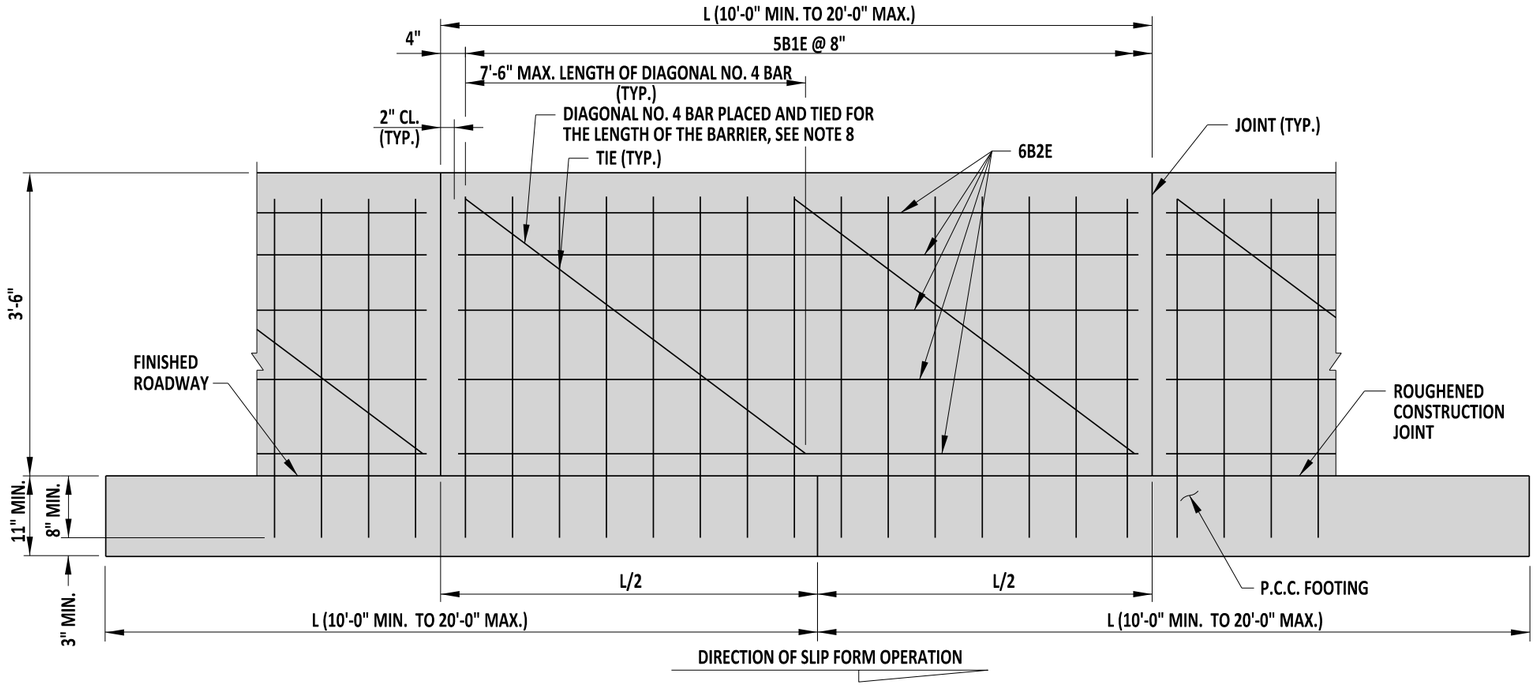
36" CONCRETE MEDIAN BARRIER (F - SHAPE)

STANDARD NO. B-28 (2020) | SHT. 1 OF 1

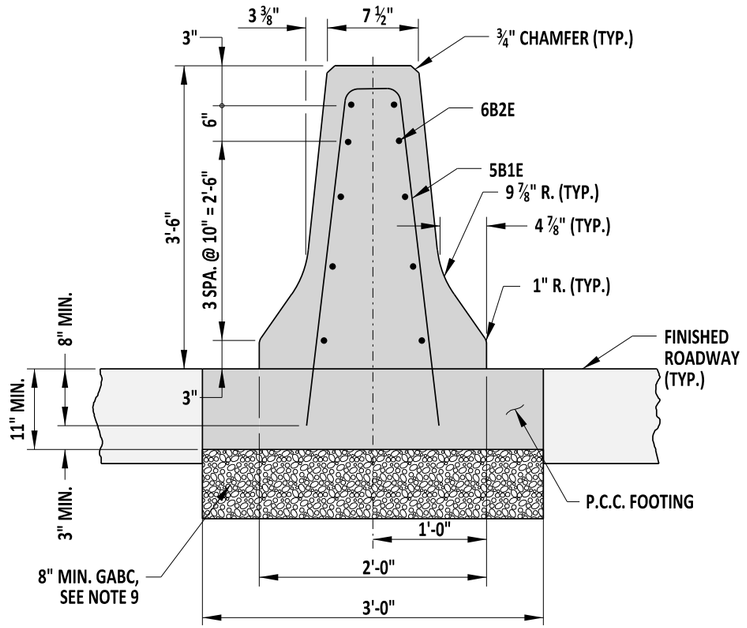
REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

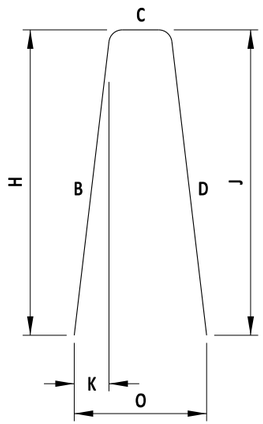
SCALE : NTS




## ELEVATION




## SECTION




## TYPE DE10 BAR

**NOTES:**

1). CONCRETE CLEAR COVER FOR REINFORCEMENT BARS SHALL BE 2" MINIMUM, UNLESS OTHERWISE NOTED.
2). BARRIER CONTRACTION JOINTS OVER EXISTING PAVEMENT CONTRACTION JOINTS SHALL BE SEPARATED BY OPEN JOINTS HAVING THE SAME WIDTH AS THE PAVEMENT JOINTS FOR THE FULL EXPOSED SURFACE OF THE BARRIER.
3). BARRIER CONTRACTION JOINTS SHALL BE A GROOVE ⅛" WIDE AND ½" DEEP, SAWED OR FORMED ACROSS THE TOP AND ALONG THE SIDES FOR THE ENTIRE SURFACE OF THE BARRIER, OR A FULL DEPTH BUTT JOINT, AT APPROXIMATELY 10'-0" TO 20'-0" INTERVALS ALONG THE LENGTH OF THE BARRIER. IN ADDITION, THESE GROOVED OR BUTT JOINTS SHALL TRANSVERSELY ALIGN, WITH THE CONTRACTION JOINTS IN ABUTTING CONCRETE PAVEMENT.
4). EXPANSION JOINTS SHALL BE PLACED IN THE BARRIER AT STRUCTURES AND OTHER EXPANSION JOINTS IN ABUTTING CONCRETE PAVEMENT, OVER EXISTING EXPANSION JOINTS IN UNDERLYING CONCRETE PAVEMENT, AND LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, BARRIER SECTIONS SHALL BE ¾" APART AND THE OPENING FILLED, FOR THE ENTIRE LENGTH AND DEPTH OF THE JOINT WITH ¾" PREFORMED JOINT FILLER WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 1042 OF THE STANDARD SPECIFICATIONS. THE FILLER SHALL BE RECESSED ¼" IN FROM THE SIDES AND TOP OF THE BARRIER.
5). AT EACH END OF THE BARRIER INSTALLATIONS, THE BARRIER SHALL BE ADEQUATELY TERMINATED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6.) FOR SLIP-FORM CONSTRUCTION, THE 6B2E BARS SHALL BE PLACED AS ONE CONTINUOUS PIECE. THE BARS SHALL LAP A MINIMUM OF 3'-9".
7.) FOR SLIP-FORM CONSTRUCTION, A CONTROL JOINT SHALL BE CUT IN THE BARRIER EVERY 10'-0" AT A MAXIMUM DEPTH OF ½".
8.) DIAGONAL NO. 4 BARS ONLY REQUIRED WHEN USING SLIP-FORM CONSTRUCTION. DIAGONAL NO. 4 BARS NOT SHOWN IN SECTION VIEW.
9.) DEPTH OF GABC TO MATCH ROADWAY BASE, 8" MINIMUM.

**BAR SCHEDULE**

| MARK | SIZE | NUMBER PER 20' SECTION * | LENGTH * | TYPE | B | C | D | H | J | K | O |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5B1E | 5 | 29 | 8'-3" | DE10 | 4'-0 ¼" | 4" | 4'-0 ¼" | 4'-0" | 4'-0" | 5" | 1'-2" |
| 6B2E | 6 | 10 | 19'-8" | STR. | - | - | - | - | - | - | - |

* NUMBER OF 5B1E BARS AND LENGTH OF 6B2E BARS GIVEN FOR 20'-0" SECTIONS.
NUMBER AND LENGTH OF BARS SHALL BE ADJUSTED ACCORDINGLY FOR SECTION LENGTHS BETWEEN 10'-0" AND 20'-0".

TL-4

DelDOT

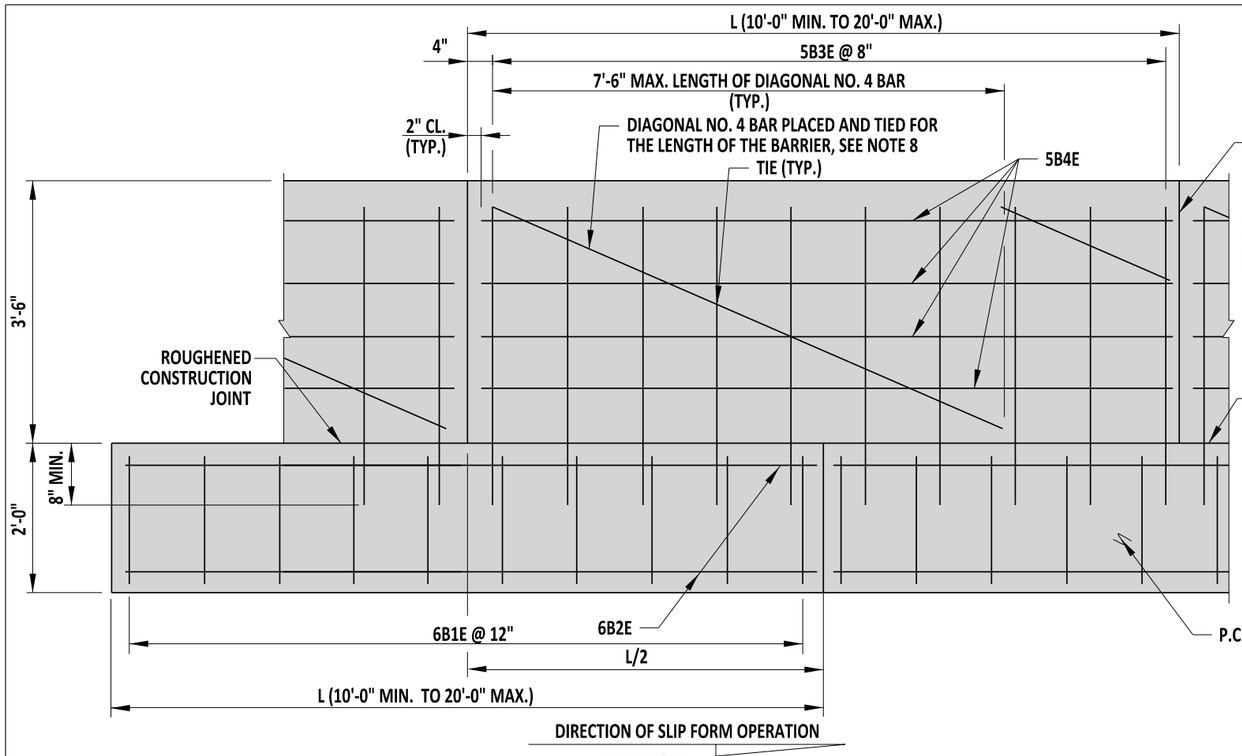
ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

42" CONCRETE MEDIAN BARRIER (F - SHAPE)

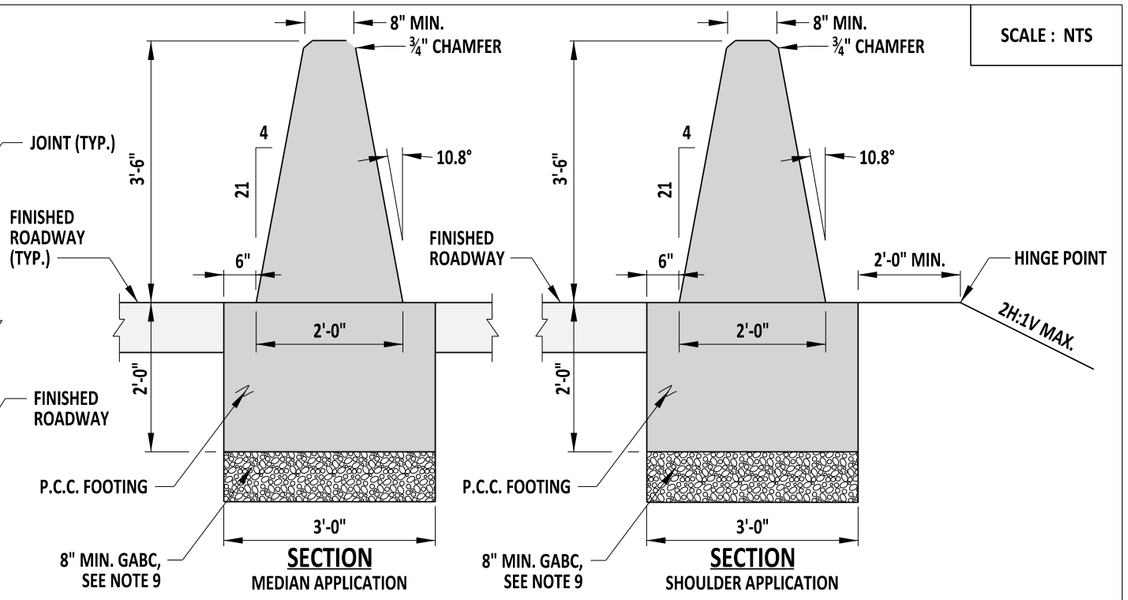
STANDARD NO. B-29 (2020) | SHT. 1 OF 1

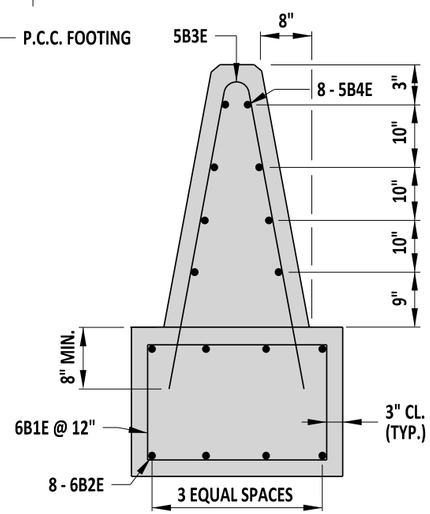
REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/19/2020

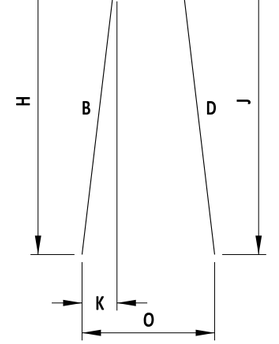



## ELEVATION

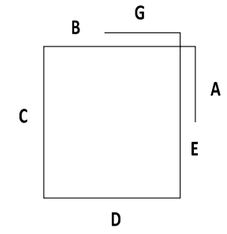



## SECTION - REINFORCEMENT




## TYPE DE10 BAR




## TYPE T2BAR

**NOTES:**

1). CONCRETE CLEAR COVER FOR REINFORCEMENT BARS SHALL BE 2" MINIMUM, UNLESS NOTED OTHERWISE.
2). BARRIER CONTRACTION JOINTS OVER EXISTING PAVEMENT CONTRACTION JOINTS SHALL BE SEPARATED BY OPEN JOINTS HAVING THE SAME WIDTH AS THE PAVEMENT JOINTS FOR THE FULL EXPOSED SURFACE OF THE BARRIER.
3). BARRIER CONTRACTION JOINTS SHALL BE A GROOVE ⅛" WIDE AND ½" DEEP, SAWED OR FORMED ACROSS THE TOP AND ALONG THE SIDES FOR THE ENTIRE SURFACE OF THE BARRIER, OR A FULL DEPTH BUTT JOINT, AT APPROXIMATELY 10'-0" TO 20'-0" INTERVALS ALONG THE LENGTH OF THE BARRIER. IN ADDITION, THESE GROOVED OR BUTT JOINTS SHALL TRANSVERSELY ALIGN, WITH THE CONTRACTION JOINTS IN ABUTTING CONCRETE PAVEMENT.
4). EXPANSION JOINTS SHALL BE PLACED IN THE BARRIER AT STRUCTURES AND OTHER EXPANSION JOINTS IN ABUTTING CONCRETE PAVEMENT, OVER EXISTING EXPANSION JOINTS IN UNDERLYING CONCRETE PAVEMENT, AND LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, BARRIER SECTIONS SHALL BE ¾" APART AND THE OPENING FILLED, FOR THE ENTIRE LENGTH AND DEPTH OF THE JOINT WITH ¾" PREFORMED JOINT FILLER WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 1042 OF THE STANDARD SPECIFICATIONS. THE FILLER SHALL BE RECESSED ¼" IN FROM THE SIDES AND TOP OF THE BARRIER.
5). AT EACH END OF THE BARRIER INSTALLATIONS, THE BARRIER SHALL BE ADEQUATELY TERMINATED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6). FOR SLIP-FORM CONSTRUCTION, THE 6B2E AND 5B4E BARS SHALL BE PLACED AS ONE CONTINUOUS PIECE. THE BARS SHALL LAP A MINIMUM OF 3'-5 ½" AND 2'-10 ½" RESPECTIVELY.
7). FOR SLIP-FORM CONSTRUCTION, A CONTROL JOINT SHALL BE CUT IN THE BARRIER EVERY 10'-0" AT A MAXIMUM DEPTH OF ½".
8). DIAGONAL NO. 4 BARS ONLY REQUIRED WHEN USING SLIP-FORM CONSTRUCTION. DIAGONAL NO. 4 BARS NOT SHOWN IN SECTION VIEW.
9). DEPTH OF GABC TO MATCH ROADWAY BASE, 8" MINIMUM.
10). THIS BARRIER TO BE ONLY BE USED ON INTERSTATES, FREEWAYS AND EXPRESSWAYS.

**BAR SCHEDULE**

| MARK | SIZE | NUMBER PER 20' SECTION * | LENGTH * | TYPE | A | B | C | D | E | G | H | J | K | O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6B1E | 6 | 20 | 10'-0" | T2 | 1'-0" | 2'-6" | 1'-6" | 2'-6" | 1'-6" | 1'-0" | - | - | - | - |
| 6B2E | 6 | 8 | 19'-6" | STR. | - | - | - | - | - | - | - | - | - | - |
| 5B3E | 5 | 29 | 8'-5" | DE10 | - | 4'-1" | 4 ¾" | 4'-1" | - | - | 4'-0" | 4'-0" | 9" | 1'-11" |
| 5B4E | 5 | 8 | 19'-8" | STR. | - | - | - | - | - | - | - | - | - | - |

* NUMBER OF 6B1E AND 6B3E BARS AND LENGTH OF 6B2E AND 5B4E BARS GIVEN FOR 20'-0" SECTIONS.
NUMBER AND LENGTH OF BARS SHALL BE ADJUSTED ACCORDINGLY FOR SECTION LENGTHS BETWEEN 10'-0" AND 20'-0".

SCALE : NTS

TL-5

DelDOT

09/01/2020
ENGINEERING SUPPORT DATE
RECOMMENDED

42" CONCRETE BARRIER (SINGLE SLOPE)

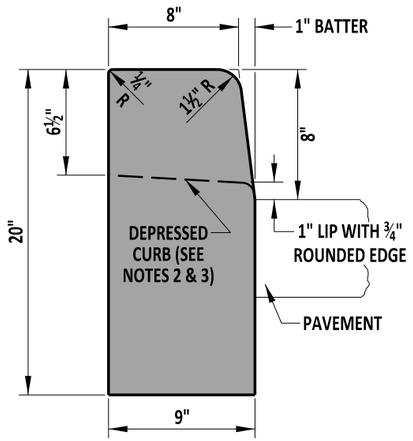
STANDARD NO. B-30 (2020) SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE

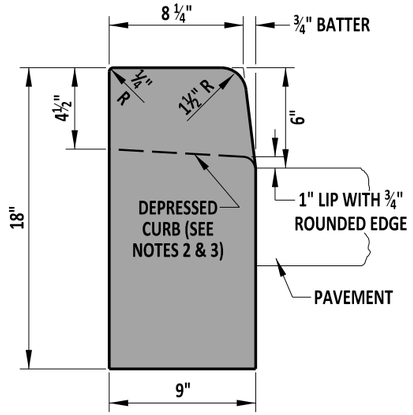
APPROVED
CHIEF ENGINEER 09/01/2020 DATE

8/19/2020

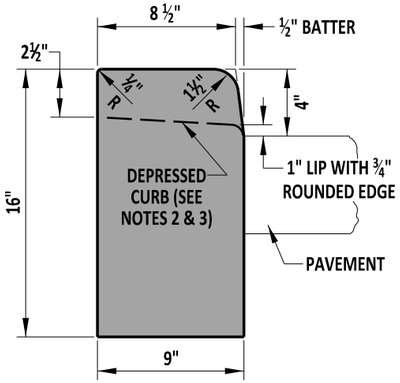
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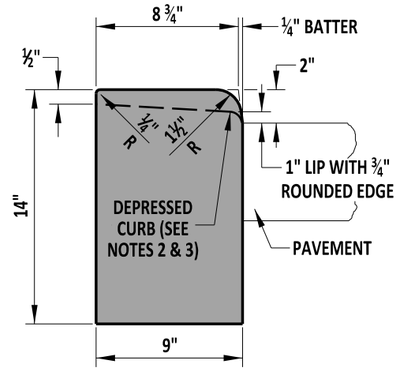

**PCC CURB**
TYPE 1-8



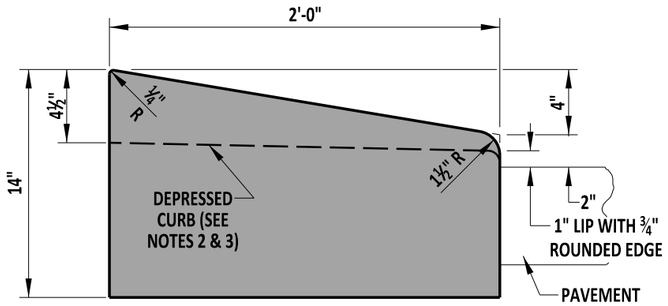

**PCC CURB**
TYPE 1-6



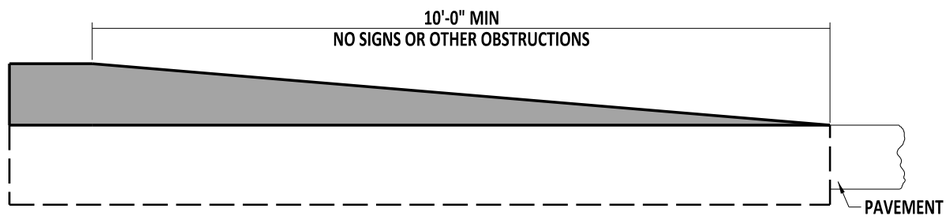

**PCC CURB**
TYPE 1-4



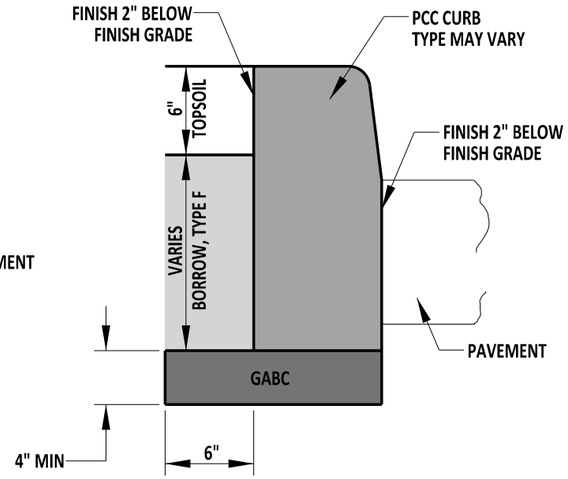

**PCC CURB**
TYPE 1-2




**PCC CURB**
TYPE 2




**TYPICAL TAPER SECTION AT NOSE OF MEDIANS**




**TYPICAL PCC CURB SECTION**

**NOTES:**

1). WHEN PCC CURB OR INTEGRAL PCC CURB AND GUTTER IS PLACED ADJACENT TO PORTLAND CEMENT CONCRETE PAVEMENT, CONSTRUCT THE JOINT AS PER THE LONGITUDINAL JOINT SEALANT DETAIL ON DETAIL P-2, SHEET 3. USE APPROVED JOINT FILLER TO SEAL. WORK TO BE PAID UNDER RESPECTIVE CURB AND GUTTER ITEM.
2). THE DEPRESSED CURB DIMENSIONS (INCLUDING 1" LIP) ON THIS SHEET ARE FOR USE AT ENTRANCES ONLY. FOR CURB DEPRESSIONS AT PEDESTRIAN CONNECTION, SEE NOTE 3.
3). AT PEDESTRIAN CONNECTIONS, DEPRESS CURB FLUSH WITH THE PAVEMENT (WITH NO LIP). SLOPE THE TOP OF THE CURB 8.3% OR FLATTER IN THE DIRECTION OF PEDESTRIAN TRAVEL.
4). DEPRESS CURB FLUSH WITH PAVEMENT OR ADJACENT AREA TO ALL CORNER RADII OF TRIANGULAR ISLANDS, TAPERING BACK TO FULL HEIGHT AT A RATE OF 4:1.
5). TAPER END OF CURB RUNS NOT PART OF AN ISLAND OR MEDIAN FLUSH WITH PAVEMENT OR ADJACENT AREA AT A RATE OF 12:1.
6). INSTALL TYPE IV POLYURETHANE-BONDED RECYCLED RUBBER EXPANSION MATERIAL BETWEEN THE FACE OF CURB AND EDGE OF PCC PAVEMENT.

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PCC CURB

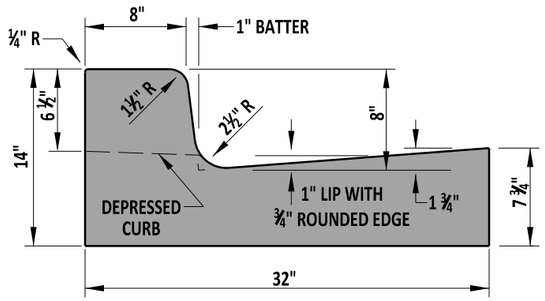
STANDARD NO. C-1 (2020) | SHT. 1 OF 4

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DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

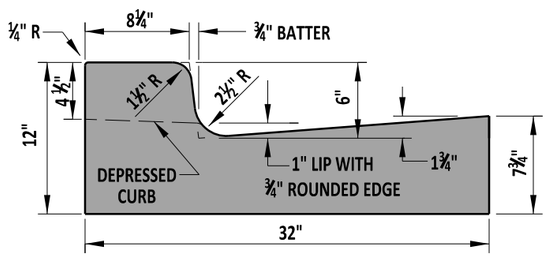
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CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

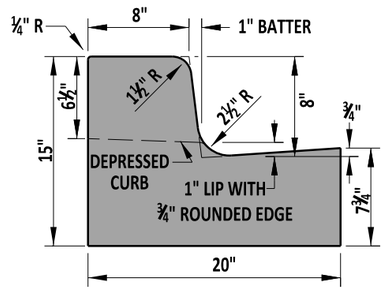
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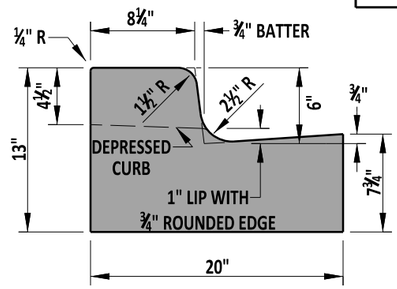

**INTEGRAL PCC CURB AND GUTTER**
TYPE 1-8



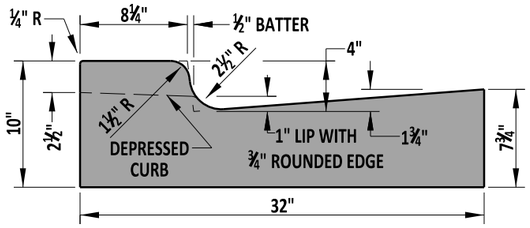

**INTEGRAL PCC CURB AND GUTTER**
TYPE 1-6



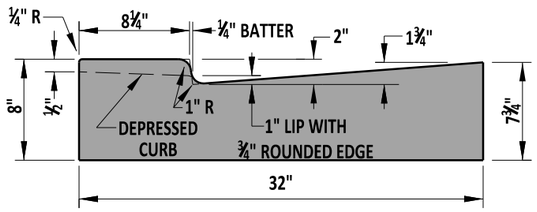

**INTEGRAL PCC CURB AND GUTTER**
TYPE 3-8



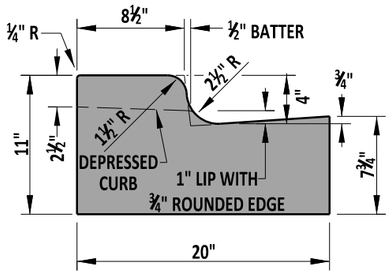

**INTEGRAL PCC CURB AND GUTTER**
TYPE 3-6



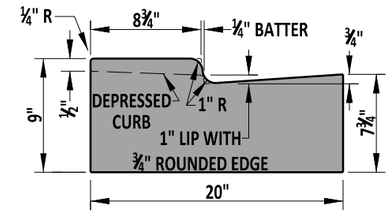

**INTEGRAL PCC CURB AND GUTTER**
TYPE 1-4



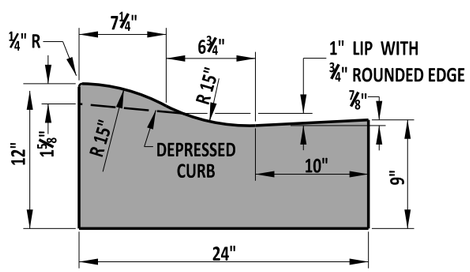

**INTEGRAL PCC CURB AND GUTTER**
TYPE 1-2



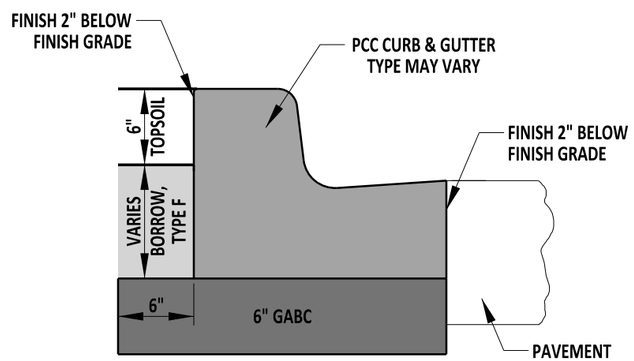

**INTEGRAL PCC CURB AND GUTTER**
TYPE 3-4




**INTEGRAL PCC CURB AND GUTTER**
TYPE 3-2




**INTEGRAL PCC CURB AND GUTTER**
TYPE 2




**TYPICAL PCC CURB AND GUTTER SECTION**

**NOTES:**

1). WHEN PCC CURB OR INTEGRAL PCC CURB AND GUTTER IS PLACED ADJACENT TO PORTLAND CEMENT CONCRETE PAVEMENT, CONSTRUCT THE JOINT AS PER THE LONGITUDINAL JOINT SEALANT DETAIL ON DETAIL P-2, SHEET 3 OF 5. USE APPROVED JOINT FILLER TO SEAL. WORK TO BE PAID UNDER RESPECTIVE CURB AND GUTTER ITEM.
2). THE DEPRESSED CURB DIMENSIONS (INCLUDING 1" LIP) ON THIS SHEET ARE FOR USE AT ENTRANCES ONLY. FOR CURB DIMENSIONS AT PEDESTRIAN CONNECTION, SEE NOTE 3.
3). SEE DETAIL C-1, SHEET 3 FOR DEPRESSING AT PEDESTRIAN CONNECTION.
4). DEPRESS CURB FLUSH WITH PAVEMENT OR ADJACENT AREA AT LEADING EDGE OF TRIANGULAR ISLANDS, TAPERING BACK TO FULL HEIGHT AT A SLOPE OF 4:1. SEE C-1, SHEET 1 OF 2 FOR TYPICAL SECTION OF TAPER AT NOSE OF MEDIAN ISLANDS.
5). DEPRESS END OF CURB RUNS NOT PART OF AN ISLAND OR MEDIAN FLUSH WITH PAVEMENT OR ADJACENT AREA AT A SLOPE OF 12:1.
6). INSTALL TYPE IV POLYURETHANE-BONDED RECYCLED RUBBER EXPANSION MATERIAL BETWEEN THE FACE OF CURB AND EDGE OF PCC PAVEMENT.

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ENGINEERING SUPPORT — 09/01/2020 DATE
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INTEGRAL PCC CURB & GUTTER

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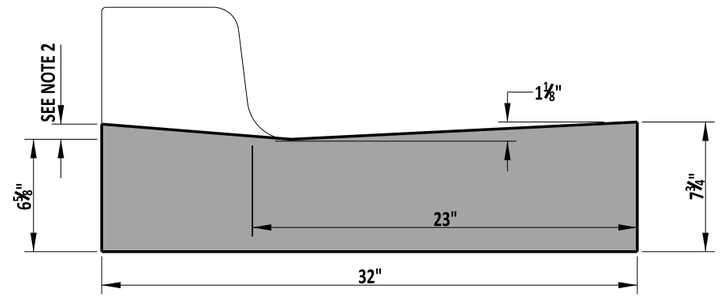
REVIEWED
DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED
CHIEF ENGINEER — 09/01/2020 DATE

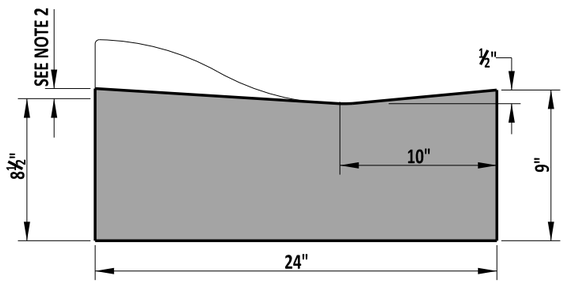
08/20/2020

THIS DETAIL IS TO BE USED ONLY FOR THE SECTIONS OF CURB & GUTTER THAT ARE DIRECTLY IN FRONT OF THE PEDESTRIAN CONNECTIONS. REFER TO DETAIL C-1, SHEET 2 FOR TYPICAL CURB DIMENSIONS AND FOR DEPRESSING CURB AT ENTRANCES

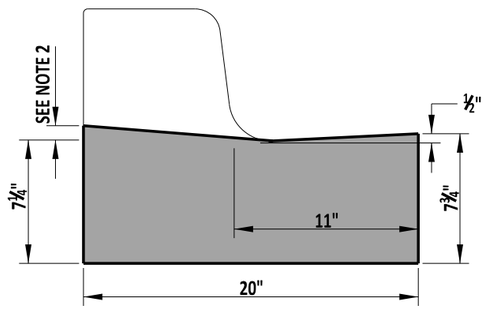
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INTEGRAL PCC CURB AND GUTTER
TYPES 1-2 THRU 1-8




INTEGRAL PCC CURB AND GUTTER
TYPE 2




INTEGRAL PCC CURB AND GUTTER
TYPES 3-2 THRU 3-8

NOTES:
1). WHEN PCC CURB OR INTEGRAL PCC CURB AND GUTTER IS PLACED ADJACENT TO PORTLAND CEMENT CONCRETE PAVEMENT, CONSTRUCT THE JOINT AS PER THE LONGITUDINAL JOINT SEALANT DETAIL ON DETAIL P-2, SHEET 3. USE APPROVED JOINT FILLER TO SEAL. WORK TO BE PAID UNDER RESPECTIVE CURB AND GUTTER ITEM.
2). DEPRESS CURB FLUSH WITH PAVEMENT (WITH NO LIP). SLOPE THE TOP OF THE CURB TO MATCH THE RUNNING SLOPE OF THE ADJACENT PEDESTRIAN CONNECTION. THE MAXIMUM RUNNING SLOPE IS 8.3%. THE MAXIMUM SLOPE OF THE GUTTER PAN AT THE PEDESTRIAN CONNECTION IS 5%.
3). SEE TYPICAL CURB AND GUTTER SECTION DETAIL ON DETAIL C-1, SHEET 2 FOR PLACEMENT OF GABC UNDER CURB AND GUTTER.
4). TRANSITION FROM STANDARD GUTTER SLOPE TO SLOPE SHOWN ON THIS DETAIL OVER A DISTANCE OF 5'-0".
5). FOLLOW TYPICAL SECTION GABC DEPTH PER C-1, SHEET 2 OF 3.

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ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

INTEGRAL PCC CURB & GUTTER
(FOR USE AT PEDESTRIAN CONNECTIONS ONLY)

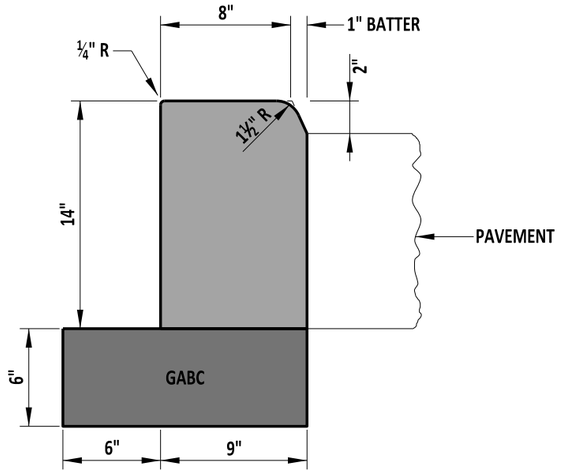
STANDARD NO. C-1 (2020) | SHT. 3 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

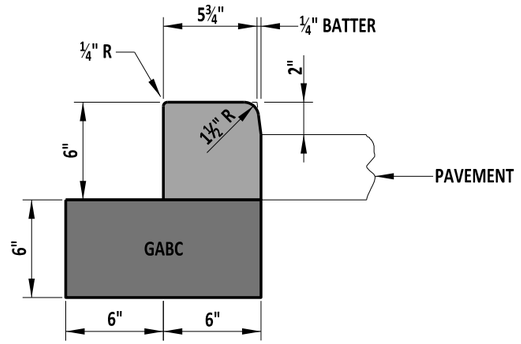
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

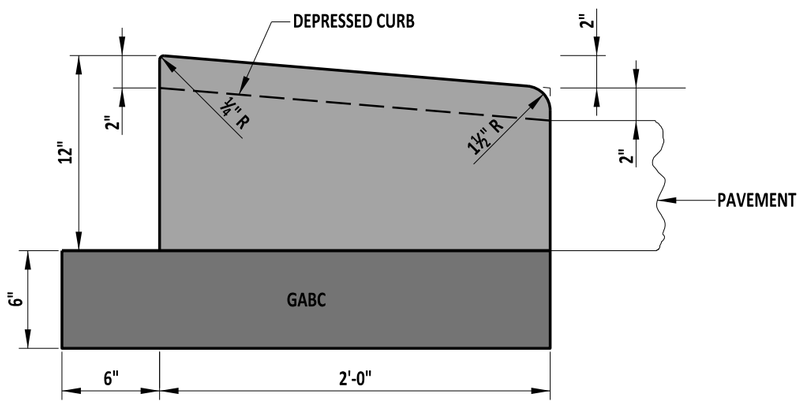
SCALE : NTS




**PCC CURB**
TYPE 1-2 ROUNDABOUT




**PCC CURB**
TYPE 1-2 GUARDRAIL MEDIAN CURB
INSTALL JOINTS AT 5'.




**PCC CURB**
TYPE 2 ROUNDABOUT

**NOTE:**
1). SEE TYPICAL PCC CURB SECTION DETAIL ON DETAIL C-1, SHEET 1 FOR PLACEMENT OF GABC UNDER CURB, UNLESS NOTED.

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PCC ROUNDABOUT AND GUARDRAIL MEDIAN CURB

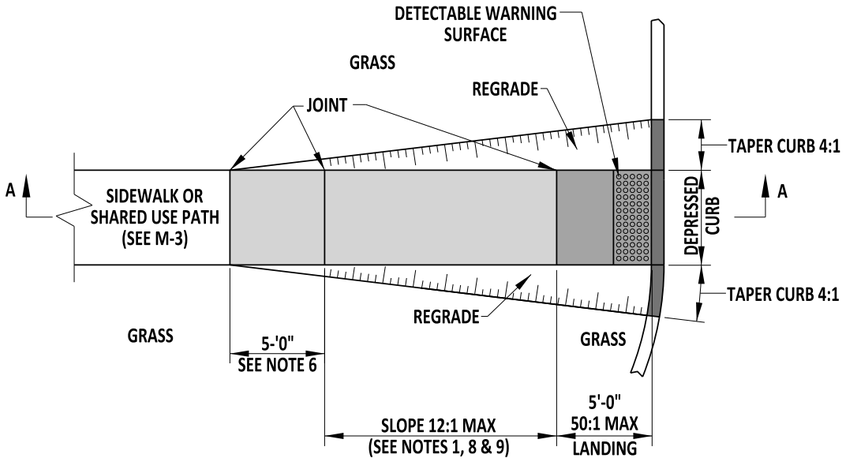
STANDARD NO. C-1 (2020) | SHT. 4 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

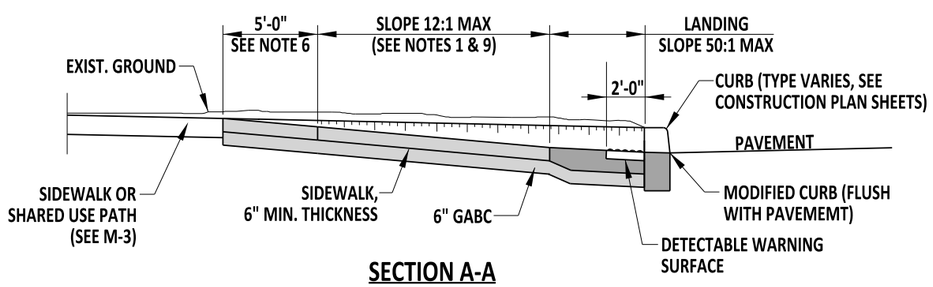
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

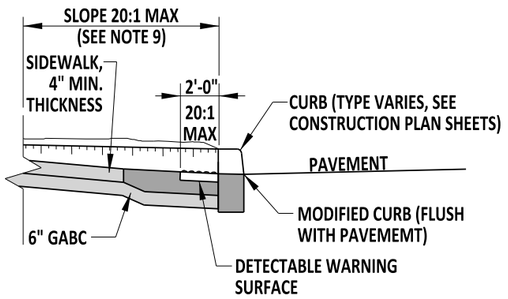
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## PLAN




## SECTION A-A

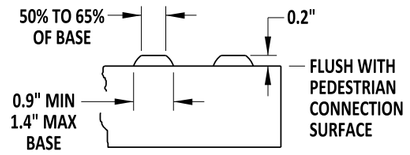


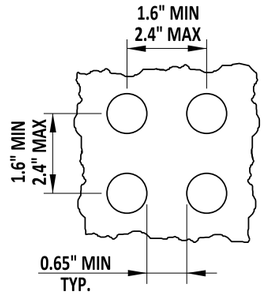

## SECTION A-A BLENDED TRANSITION

NOTES:

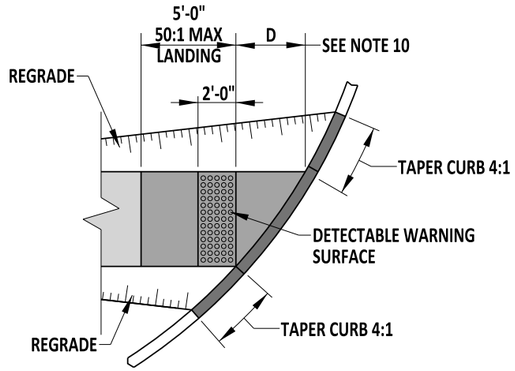
A). EXTEND THE DETECTABLE WARNING SYSTEM AT LEAST 2'-0" IN LENGTH, MEASURED IN THE DIRECTION OF TRAVEL, FROM THE BACK OF THE DEPRESSED CURB ALONG THE PEDESTRIAN CONNECTION SURFACE.

B). SEE SPECIFICATION FOR ADDITIONAL INFORMATION.

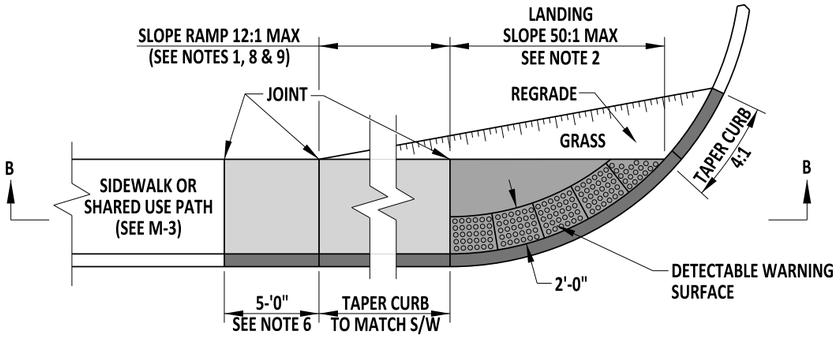


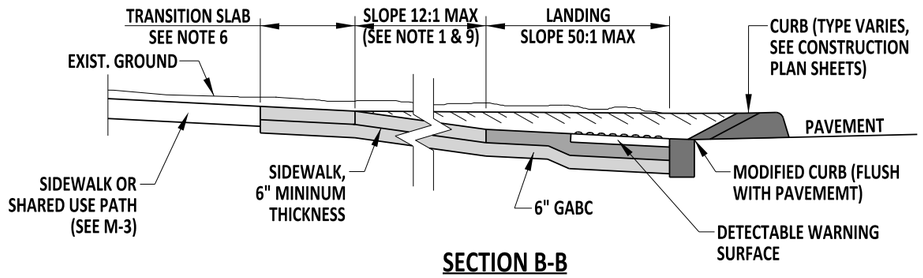

## DETECTABLE WARNING SURFACE DETAILS




## DETECTABLE WARNING SURFACE ON CURVE




## PLAN (ADJACENT TO CURB)




## SECTION B-B

NOTES:

1). FOR ALTERATIONS WHERE THE MAXIMUM ALLOWABLE 12:1 RUNNING SLOPE WILL NOT MEET THE EXISTING SIDEWALK GRADE WITHIN A LENGTH OF 15'-0" BEYOND THE LANDING, THE SLOPED SEGMENT OF THE PEDESTRIAN CONNECTION MAY BE LIMITED TO 15'-0" AT A CONSTANT SLOPE, AND ALLOWED TO EXCEED THE 12:1 MAXIMUM SLOPE.

2). APPLY A 50:1 (2%) MAXIMUM CROSS SLOPE TO SIDEWALK, SHARED USE PATHS AND PEDESTRIAN CONNECTIONS. THE PEDESTRIAN CONNECTION CROSS SLOPE IS NOT TO EXCEED THE SLOPE OF THE ADJACENT ROADWAY IN ACCORDANCE WITH THE LATEST VERSION OF THE PEDESTRIAN ACCESSIBILITY STANDARDS.

3). A 6:1 GRADE IS REQUIRED FOR A MINIMUM OF 2'-0" ADJACENT TO THE PEDESTRIAN CONNECTION IN ACCORDANCE WITH M-3, SHEET 1.

4). THE MAXIMUM ALGEBRAIC DIFFERENCE IN GRADE BETWEEN THE PEDESTRIAN CONNECTION OR MODIFIED CURB FROM THE PEDESTRIAN CONNECTION TO THE PAVEMENT SHALL NOT EXCEED 13.3%, WITH A MAXIMUM OF 8.3% ON THE PEDESTRIAN CONNECTION AND A MAXIMUM OF 5% ON THE PAVEMENT IN THE DIRECTION OF TRAVEL. SEE DETAIL C-1, SHEET 3 OF 4.

5). DELINEATE THE LANDING AREA WITH JOINTS.

6). FOR 3-R REHABILITATION WORK, PLACE TRANSITION SLAB FROM THE NEW PEDESTRIAN CONNECTION TO THE EXISTING SIDEWALK WHEN THE EXISTING SIDEWALK HAS A NON-CONFORMING CROSS SLOPE OR WIDTH.

7). REFER TO THE DE MUTCD FOR DETAILS REGARDING THE LOCATION OF PEDESTRIAN PUSH BUTTONS.

8). LAYOUT JOINTS AND EXPANSION IN ACCORDANCE WITH M-3, SHEET 1 OF 1.

9). IF THE RUNNING SLOPE OF THE PEDESTRIAN CONNECTION IS 5% (20:1) OR LESS WITH NO REQUIRED TURNING MOVEMENTS, THE LANDING CAN BE OMITTED AS IT IS A BLENDED TRANSITION. DETECTABLE WARNING SURFACE TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

10). FOR INSTALLATIONS ON A RADIUS AND WHEN DIMENSION D IS LESS THAN 5'-0", THE DETECTABLE WARNING SURFACE SHALL BE INSTALLED AT THE INTERSECTION OF THE BACK OF THE CURB AND THE BEGINNING OF THE FULL WIDTH OF THE PEDESTRIAN ACCESS ROUTE. THE DETECTABLE WARNING SURFACE SHALL BE INSTALLED PERPENDICULAR TO THE PATH OF PEDESTRIAN TRAVEL AND BE THE FULL WIDTH OF THE PEDESTRIAN ACCESS ROUTE.

11). WHERE THERE IS NO DEPRESSED CURB AT A CUT-THROUGH OF PEDESTRIAN CONNECTION, INSTALL THE DETECTABLE WARNING SURFACE A MINIMUM OF 8" FROM THE PAVEMENT EDGE. WHERE THERE IS DEPRESSED CURB, INSTALL THE DETECTABLE WARNING SURFACE DIRECTLY BEHIND THE FULL WIDTH OF THE DEPRESSED CURB.

# PEDESTRIAN CONNECTION, TYPE 1

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ENGINEERING SUPPORT DATE
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PEDESTRIAN CONNECTION, TYPE 1

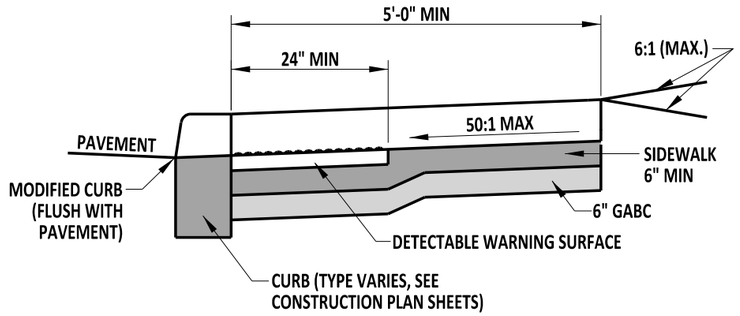
STANDARD NO. C-2 (2020) SHT. 1 OF 3

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DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE

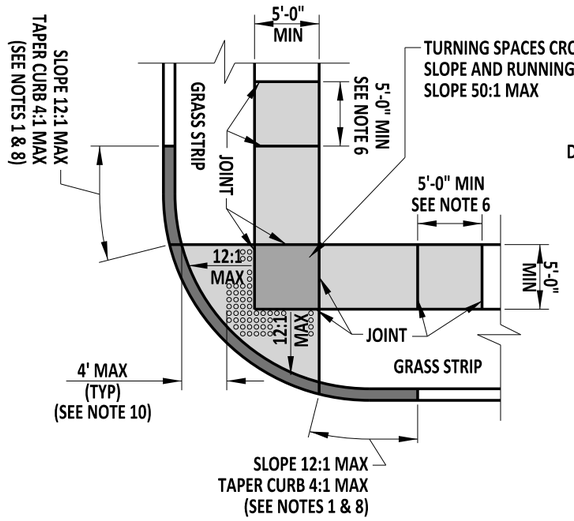
APPROVED
CHIEF ENGINEER 09/01/2020 DATE

08/20/2020

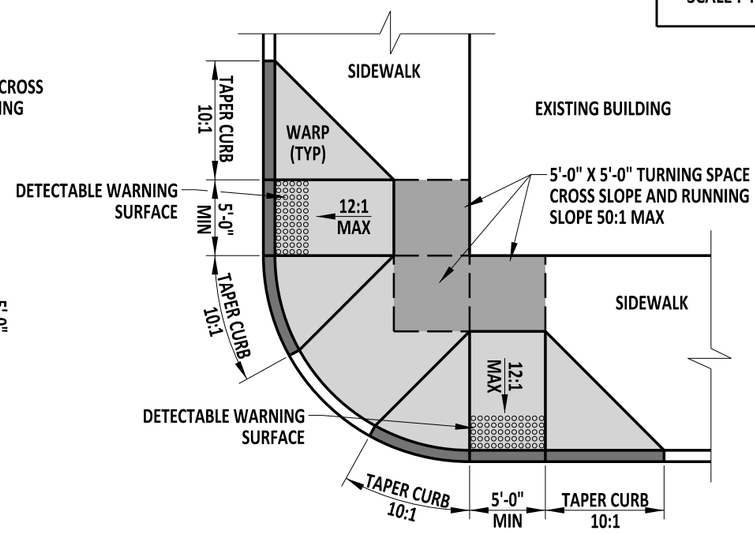
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## SECTION C-C

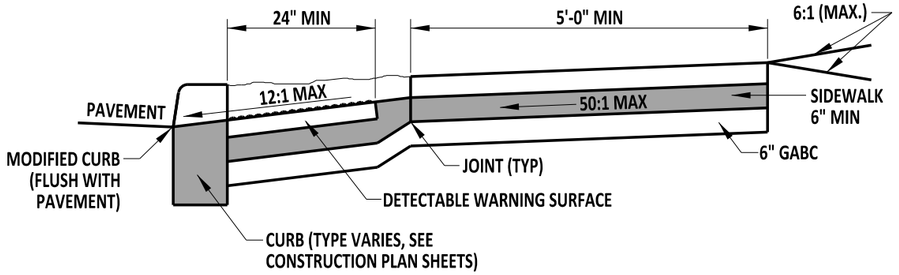



## PEDESTRIAN CONNECTION, TYPE 3




## PEDESTRIAN CONNECTION, TYPE 4

** - DASHED LINES DO NOT INDICATE JOINTS




## SECTION D-D

NOTES:

1). FOR ALTERATIONS WHERE THE MAXIMUM ALLOWABLE 12:1 RUNNING SLOPE WILL NOT MEET THE EXISTING SIDEWALK GRADE WITHIN A LENGTH OF 15'-0" BEYOND THE LANDING, THE SLOPED SEGMENT OF THE PEDESTRIAN CONNECTION MAY BE LIMITED TO 15'-0" AT A CONSTANT SLOPE, AND ALLOWED TO EXCEED THE 12:1 MAXIMUM SLOPE.

2). APPLY A 50:1 (2%) MAXIMUM CROSS SLOPE TO SIDEWALK, SHARED USE PATHS AND PEDESTRIAN CONNECTIONS. THE PEDESTRIAN CONNECTION CROSS SLOPE IS NOT TO EXCEED THE SLOPE OF THE ADJACENT ROADWAY IN ACCORDANCE WITH THE LATEST VERSION OF THE PEDESRIAN ACCESSIBILITY STANDARDS.

3). A 6:1 GRADE IS REQUIRED FOR A MINIMUM OF 2'-0" ADJACENT TO THE PEDESTRIAN CONNECTION IN ACCORDANCE WITH M-3, SHEET 1.

4). THE MAXIMUM ALGEBRAIC DIFFERENCE IN GRADE BETWEEN THE PEDESTRIAN CONNECTION OR MODIFIED CURB FROM THE PEDESTRIAN CONNECTION TO THE PAVEMENT SHALL NOT EXCEED 13.3%, WITH A MAXIMUM OF 8.3% ON THE PEDESTRIAN CONNECTION AND A MAXIMUM OF 5% ON THE PAVEMENT IN THE DIRECTION OF TRAVEL. SEE DETAIL C-1, SHEET 3 0F 4.

5). DELINEATE THE LANDING AREA WITH JOINTS.

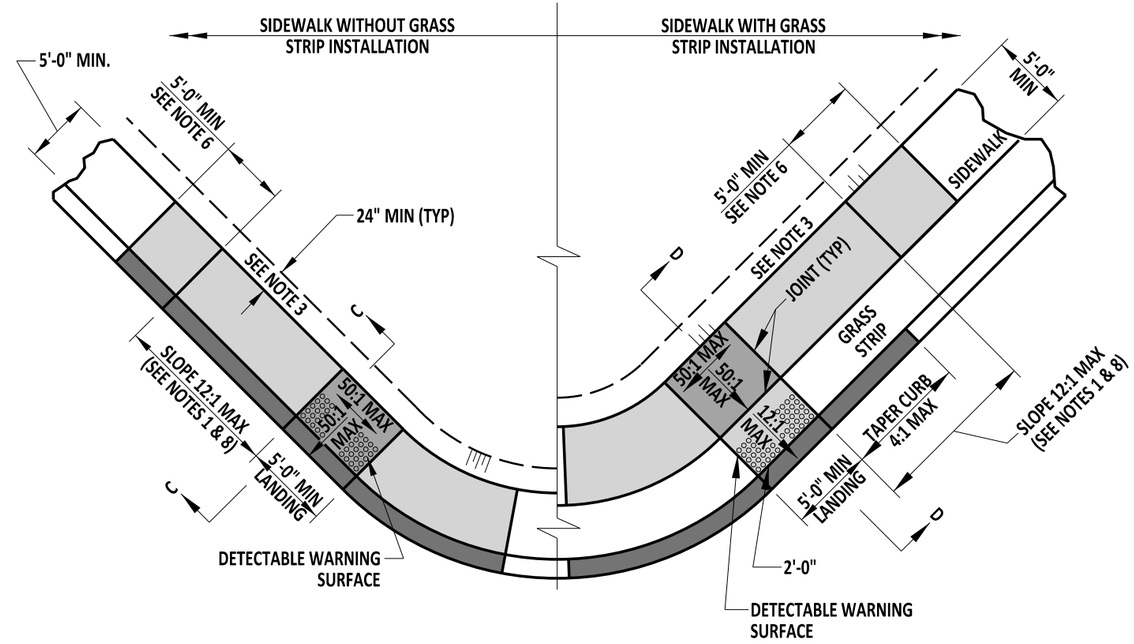
6). FOR 3-R REHABILITATION WORK, PLACE TRANSITION SLAB FROM THE NEW PEDESTRIAN CONNECTION TO THE EXISTING SIDEWALK WHEN THE EXISTING SIDEWALK HAS A NON-CONFORMING CROSS SLOPE OR WIDTH.

7). REFER TO THE DE MUTCD FOR DETAILS REGARDING THE LOCATION OF PEDESTRIAN PUSH BUTTONS.

8). LAYOUT JOINTS AND EXPANSION IN ACCORDANCE WITH M-3, SHEET 1 OF 1.

9). WHERE THERE IS NO DEPRESSED CURB AT A CUT-THROUGH OR PEDESTRIAN CONNECTION, INSTALL THE DETECTABLE WARNING SURFACE A MINIMUM OF 8" FROM THE PAVEMENT EDGE. WHERE THERE IS DEPRESSED CURB, INSTALL THE DETECTABLE WARNING SURFACE DIRECTLY BEHIND THE FULL WIDTH OF THE DEPRESSED CURB.

10). FOR INSTALLATIONS ON A RADIUS AND WHEN DIMENSION D IS LESS THAN 5'-0", THE DETECTABLE WARNING SURFACE SHALL BE INSTALLED AT THE INTERSECTION OF THE BACK OF THE CURB AND THE BEGINNING OF THE FULL WIDTH OF THE PEDESTRIAN ACCESS ROUTE. THE DETECTABLE WARNING SURFACE SHALL BE INSTALLED PERPENDICULAR TO THE PATH OF PEDESTRIAN TRAVEL AND BE THE FULL WIDTH OF THE PEDESTRIAN ACCESS ROUTE.




## PEDESTRIAN CONNECTION, TYPE 2

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ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

PEDESTRIAN CONNECTION, TYPE 2, 3 AND 4

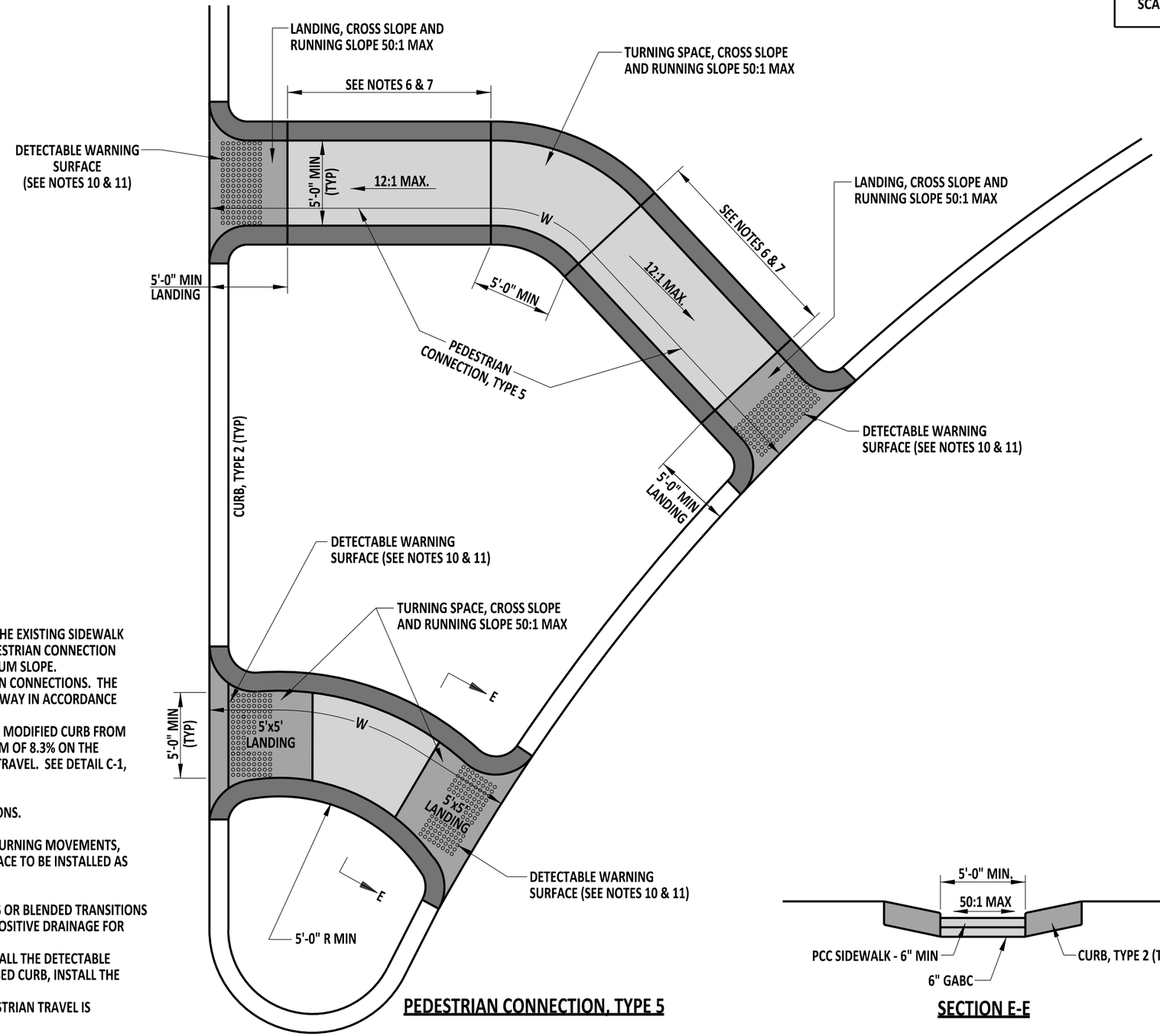
STANDARD NO. C-2 (2020) | SHT. 2 OF 3

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

SCALE : NTS




## PEDESTRIAN CONNECTION, TYPE 5




## SECTION E-E

**NOTES:**

1). FOR ALTERATIONS WHERE THE MAXIMUM ALLOWABLE 12:1 RUNNING SLOPE WILL NOT MEET THE EXISTING SIDEWALK GRADE WITHIN A LENGTH OF 15'-0" BEYOND THE LANDING, THE SLOPED SEGMENT OF THE PEDESTRIAN CONNECTION MAY BE LIMITED TO 15'-0" AT A CONSTANT SLOPE, AND ALLOWED TO EXCEED THE 12:1 MAXIMUM SLOPE.

2). APPLY A 50:1 (2%) MAXIMUM CROSS SLOPE TO SIDEWALK, SHARED USE PATHS AND PEDESTRIAN CONNECTIONS. THE PEDESTRIAN CONNECTION CROSS SLOPE IS NOT TO EXCEED THE SLOPE OF THE ADJACENT ROADWAY IN ACCORDANCE WITH THE LATEST VERSION OF THE PEDESTRIAN ACCESSIBILITY STANDARDS.

3). THE MAXIMUM ALGEBRAIC DIFFERENCE IN GRADE BETWEEN THE PEDESTRIAN CONNECTION OR MODIFIED CURB FROM THE PEDESTRIAN CONNECTION TO THE PAVEMENT SHALL NOT EXCEED 13.3%, WITH A MAXIMUM OF 8.3% ON THE PEDESTRIAN CONNECTION AND A MAXIMUM OF 5% ON THE PAVEMENT IN THE DIRECTION OF TRAVEL. SEE DETAIL C-1, SHEET 3 OF 4.

4). DELINEATE THE LANDING AREA WITH JOINTS.

5). REFER TO THE DE MUTCD FOR DETAILS REGARDING THE LOCATION OF PEDESTRIAN PUSH BUTTONS.

6). LAYOUT JOINTS AND EXPANSION IN ACCORDANCE WITH M-3, SHEET 1 OF 1.

7). IF THE RUNNING SLOPE OF THE PEDESTRIAN CONNECTION IS 5% OR LESS WITH NO REQUIRED TURNING MOVEMENTS, THE LANDING CAN BE OMITTED AS IT IS A BLENDED TRANSITION. DETECTABLE WARNING SURFACE TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

8). IN ISLANDS AND MEDIANS, FOLLOW PAR REQUIREMENTS IN ACCORDANCE WITH THE PAS.

9). A CUT-THROUGH LEVEL WITH THE STREET IS THE PREFERRED TREATMENT FOR ISLANDS. RAMPS OR BLENDED TRANSITIONS CAN BE USED WHERE THE ISLAND IS OF SUFFICIENT SIZE TO ACCOMMODATE THEM. PROVIDE POSITIVE DRAINAGE FOR EITHER TREATMENT.

10). WHERE THERE IS NO DEPRESSED CURB AT A CUT-THROUGH OR PEDESTRIAN CONNECTION, INSTALL THE DETECTABLE WARNING SURFACE A MINIMUM OF 8" FROM THE PAVEMENT EDGE. WHERE THERE IS DEPRESSED CURB, INSTALL THE DETECTABLE WARNING SURFACE DIRECTLY BEHIND THE FULL WIDTH OF THE DEPRESSED CURB.

11). INSTALL A DETECTABLE WARNING SURFACE WHEN THE LENGTH 'W' IN THE DIRECTION OF PEDESTRIAN TRAVEL IS 6'-0" OR GREATER.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

PEDESTRIAN CONNECTION, TYPE 5

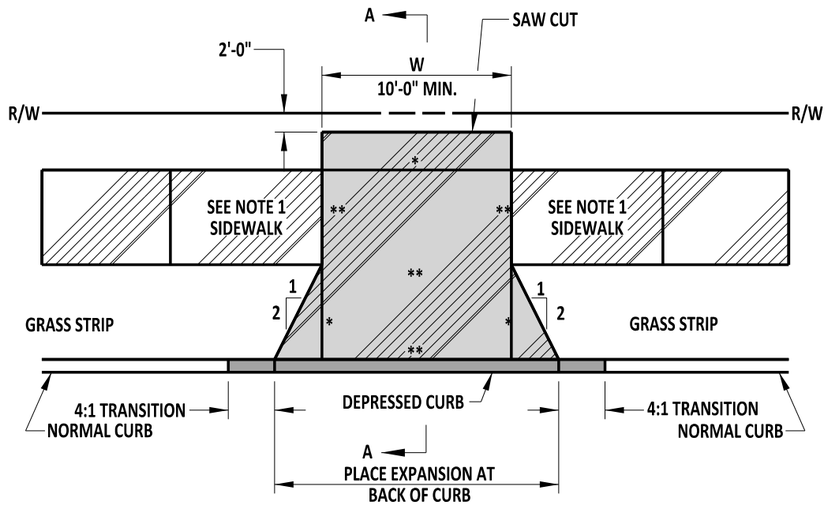
STANDARD NO. C-2 (2020) | SHT. 3 OF 3

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

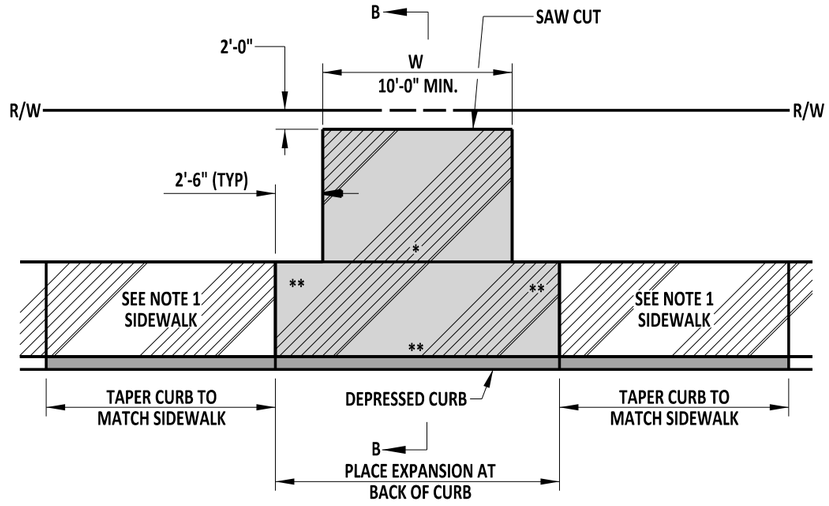
08/20/2020

SCALE : NTS



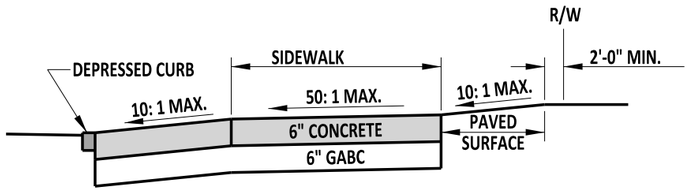

## ENTRANCE WITH SIDEWALK AND GRASS STRIP

* - JOINT
** - EXPANSION MATERIAL

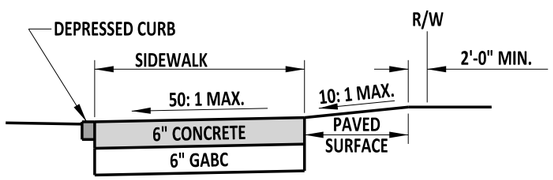



## ENTRANCE WITH SIDEWALK AND NO GRASS STRIP

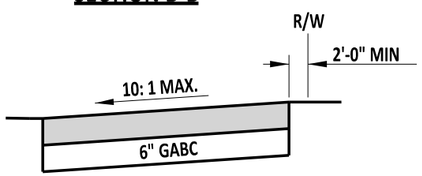
* - JOINT
** - EXPANSION MATERIAL



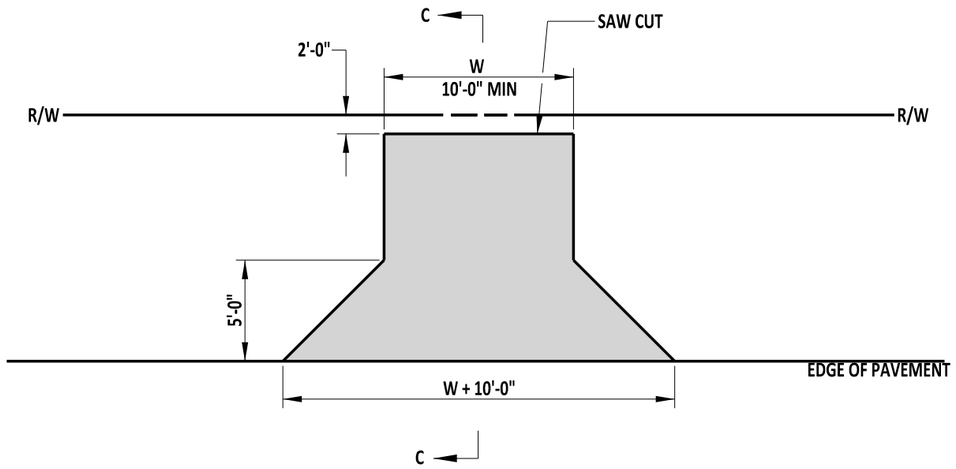

## SECTION A-A




## SECTION B-B




## SECTION C-C




## ENTRANCE WITHOUT SIDEWALK

**NOTE:**

1). SIDEWALK RUNNING SLOPE OF 20:1 (5%) IS PREFERRED WITH ALLOWANCE TO FOLLOW THE ADJACENT ROAD GRADES. SIDEWALK GRADE EXCEEDING THE ADJACENT ROAD GRADES OR 5%, MUST THEN MAINTAIN A MAXIMUM ALLOWABLE 12:1 (8.3%) RUNNING SLOPE.

- PCC SIDEWALK

- PCC 6"

DelDOT

09/01/2020
ENGINEERING SUPPORT DATE
RECOMMENDED

ENTRANCES

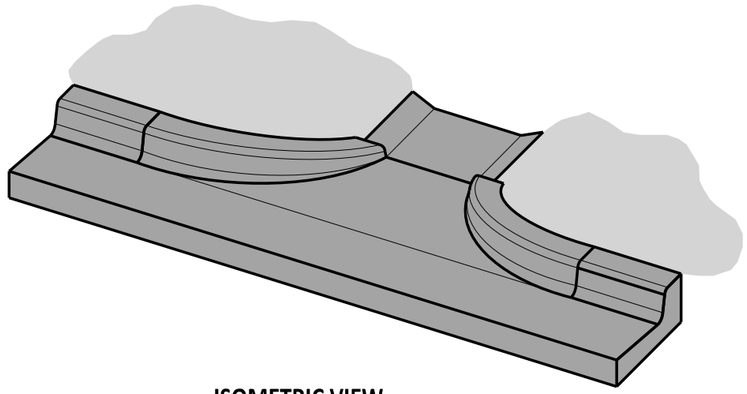
STANDARD NO. C-3 (2020) SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE

APPROVED
CHIEF ENGINEER 09/01/2020 DATE

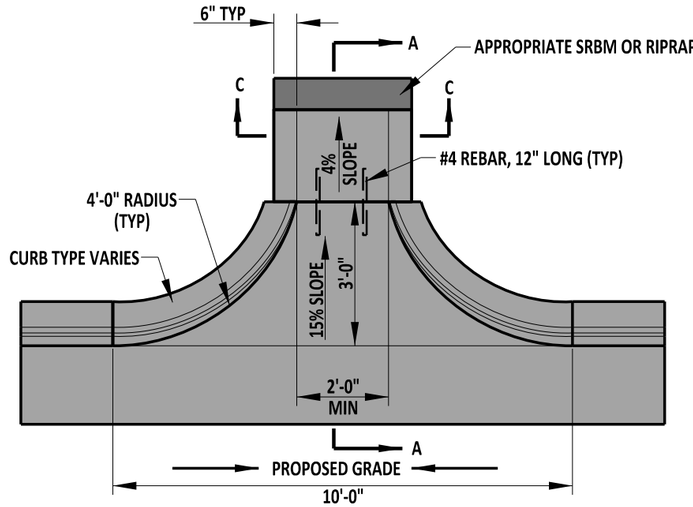
08/20/2020

SCALE : NTS



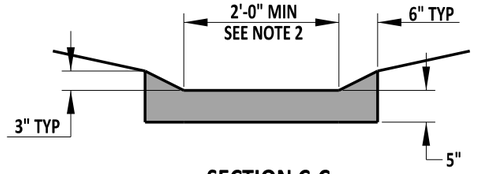
**ISOMETRIC VIEW**

SHOWN WITH INTEGRAL CURB & GUTTER, TYPE 1-8

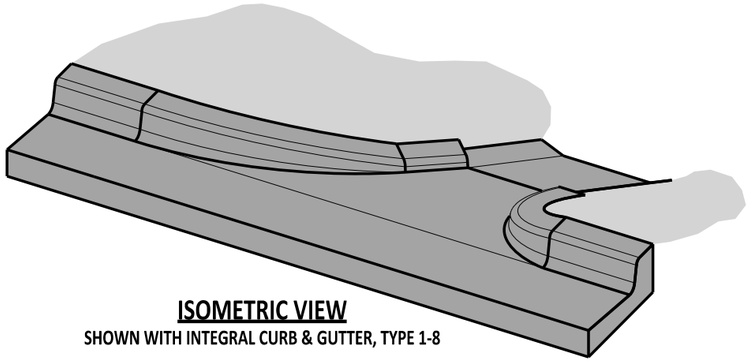



**PLAN VIEW**

**IN SUMP LOCATION**

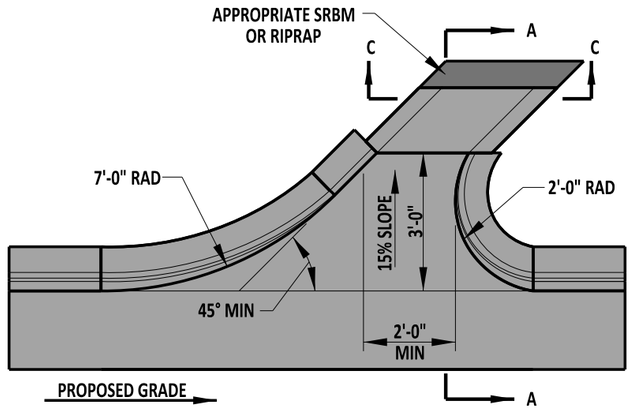



**SECTION C-C**



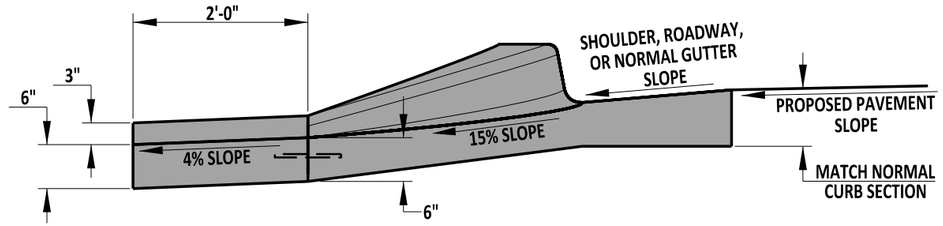
**ISOMETRIC VIEW**

SHOWN WITH INTEGRAL CURB & GUTTER, TYPE 1-8




**PLAN VIEW**

**ON GRADE OR SLOPE**




**SECTION A-A**

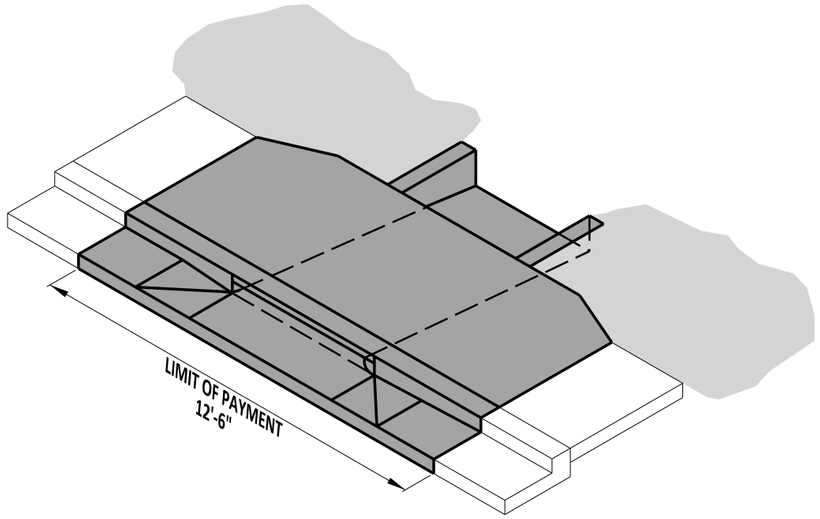
**NOTES:**

1). DESIGNER SHALL ESTABLISH WIDTH OF OPENING BASED ON DRAINAGE CALCULATIONS.
2). MATCH THE WIDTH OF THE APRON (SHOWN IN SECTION C-C) TO THE WIDTH OF THE CURB OPENING (SHOWN IN PLAN VIEW).

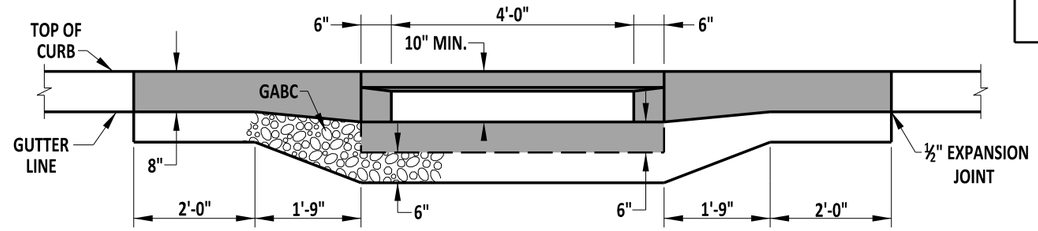
| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | CURB OPENING | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. C-4 (2020) SHT. 1 OF 1 | APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/20/2020

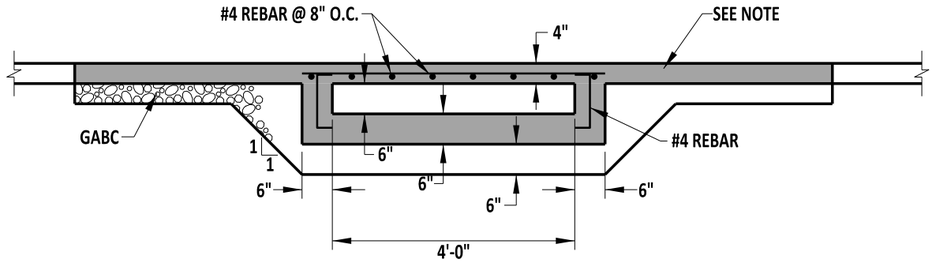
SCALE : NTS



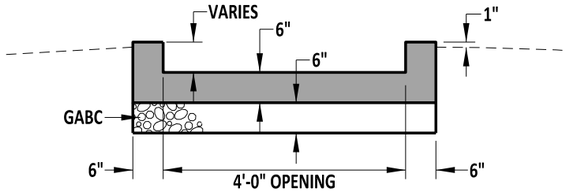

ISOMETRIC



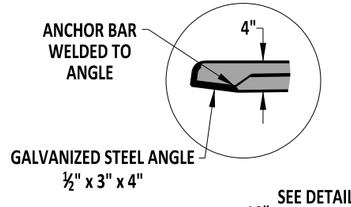

SECTION A-A

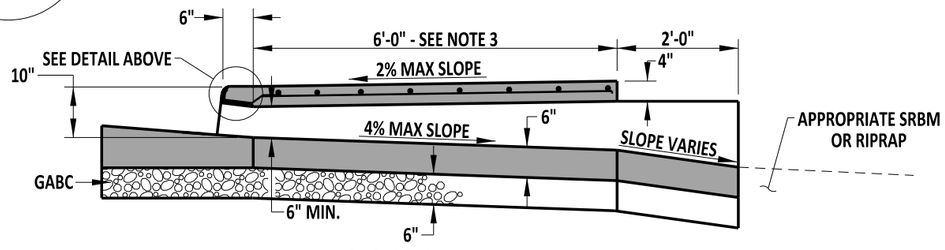



SECTION B-B

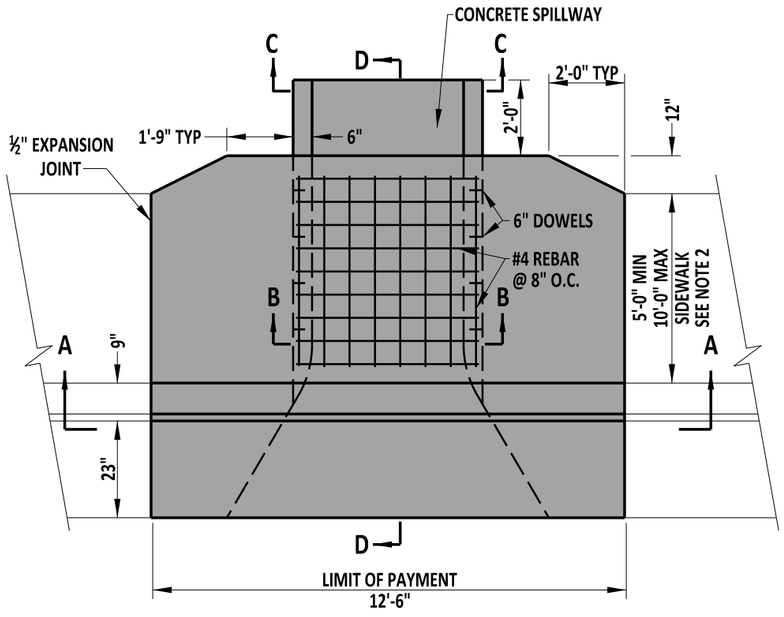



SECTION C-C




SECTION D-D




PLAN

## CURB / SIDEWALK OPENING

NOTES:

1). WHEN A GRASS STRIP IS PRESENT BETWEEN THE BACK OF CURB AND SIDEWALK, THE SIDEWALK PORTION OF THIS STRUCTURE MAY BE PRECAST. HOWEVER, WHEN THE SIDEWALK IS DIRECTLY BEHIND THE CURB, USE CAST-IN-PLACE CONSTRUCTION.
2). SIDEWALK WIDTHS LESS THAN SHOWN ON THIS SHEET REQUIRE DEPARTMENT APPROVAL. SEE PEDESTRIAN ACCESSIBILITY STANDARDS FOR MORE GUIDANCE.
3). OVER THE CONCRETE SPILLWAY, USE A SLAB WIDTH 12" WIDER THAN THE SIDEWALK WIDTH AND USE A 2'-0" CONCRETE APRON APPROACH. WHEN NOT ADJACENT TO CURB, USE A SLAB WIDTH 12" WIDER THAN THE SIDEWALK ON BOTH SIDES.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

CURB / SIDEWALK OPENING

STANDARD NO. C-5 (2020) | SHT. 1 OF 1

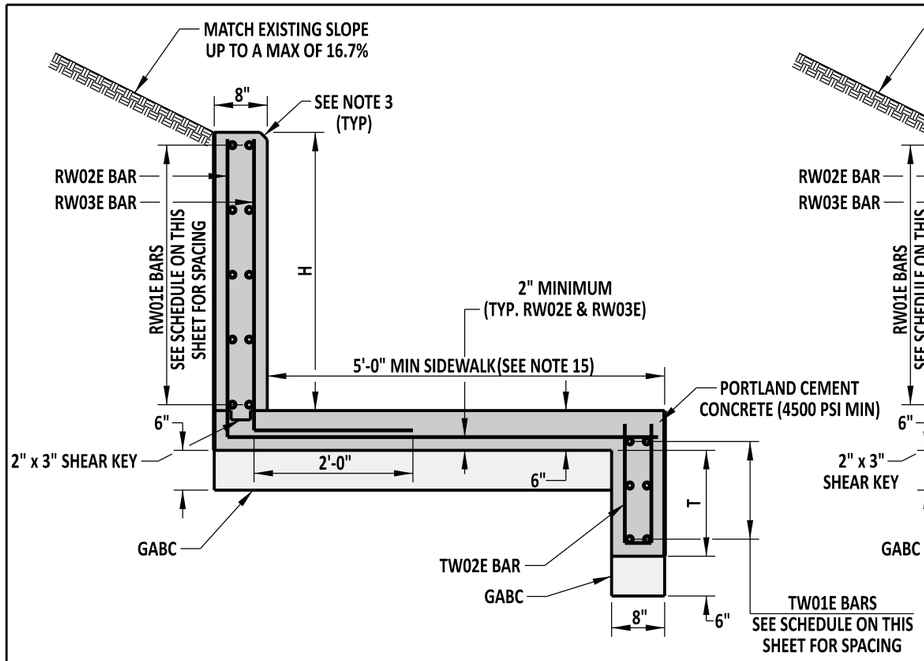
REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

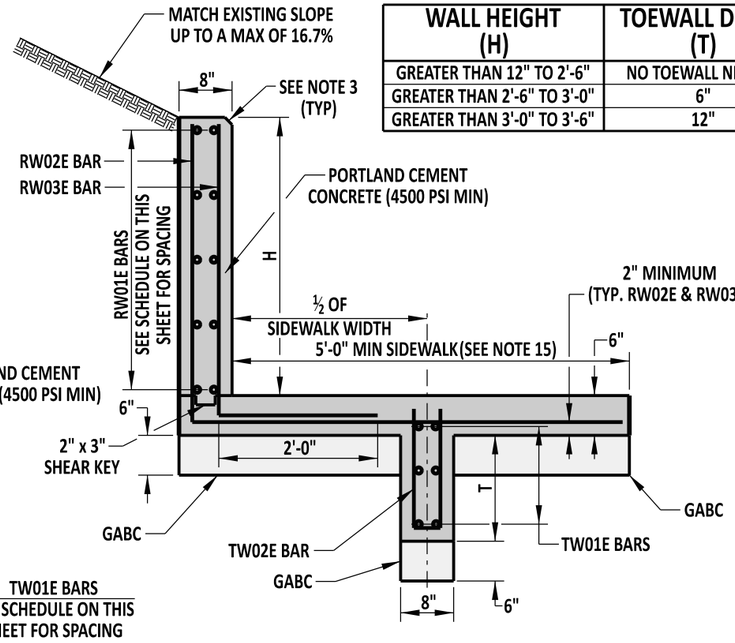
SCALE : NTS

| WALL HEIGHT (H) | TOEWALL DEPTH (T) | REQUIRED TRANSVERSE REINFORCEMENT | REQUIRED LONGITUDINAL REINFORCEMENT |
|---|---|---|---|
| GREATER THAN 12" TO 2'-6" | NO TOEWALL NEEDED | #4 BARS @ 6" (RW02E, & RW03E) | #4 BARS @ 12" (RW01E & TW01E) |
| GREATER THAN 2'-6" TO 3'-0" | 6" | #4 BARS @ 6" (RW02E, RW03E, & TW02E) | #4 BARS @ 12" (RW01E & TW01E) |
| GREATER THAN 3'-0" TO 3'-6" | 12" | #5 BARS @ 6" (RW02E, RW03E, & TW02E) | #4 BARS @ 12" (RW01E & TW01E) |




## CURB RETAINING WALL SECTION

FOR H GREATER THAN 2'-6"

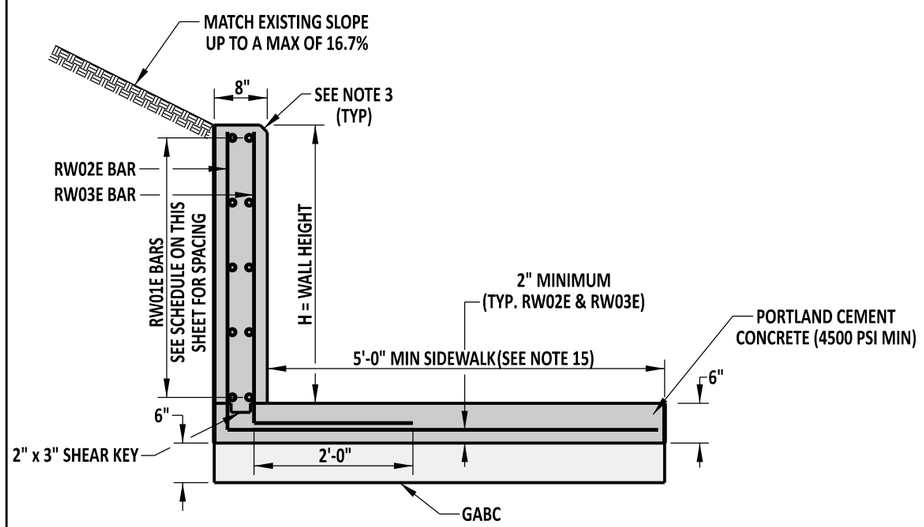



## OPTIONAL TOEWALL PLACEMENT CURB RETAINING WALL SECTION

FOR H GREATER THAN 2'-6"

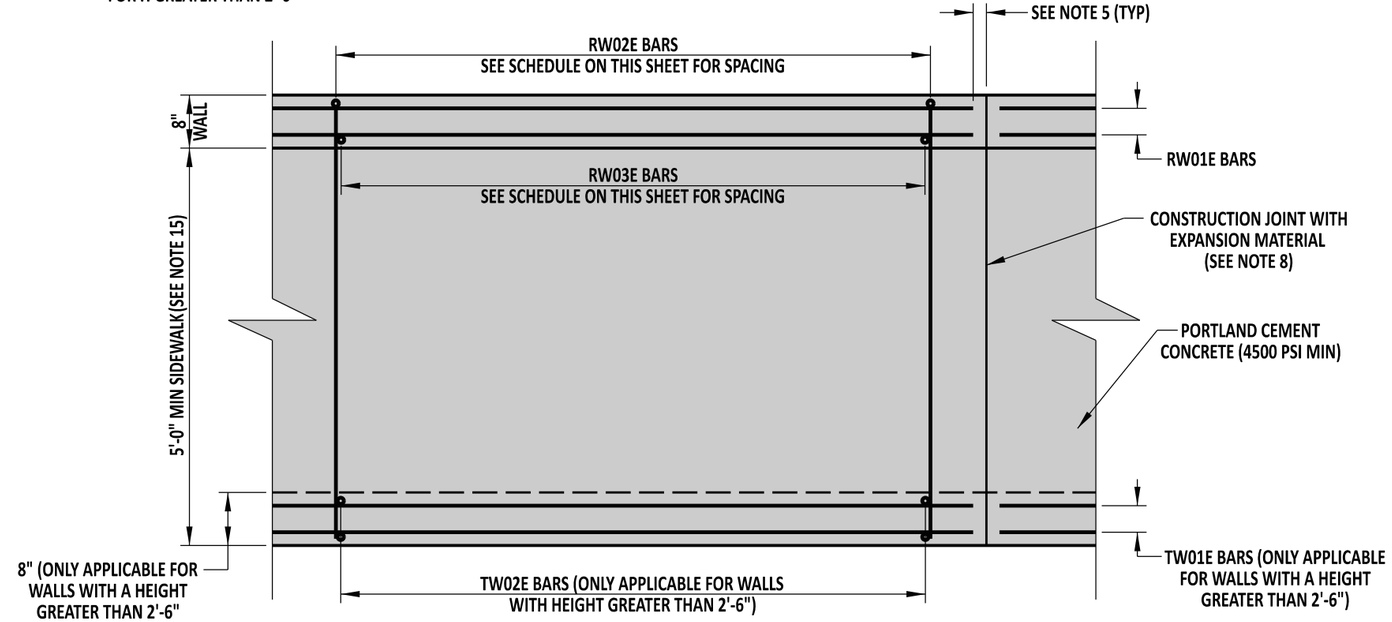
NOTES:

1). THE CURB RETAINING WALL DETAILS ARE FOR QUICK FIELD CHANGES WITH APPROVAL OF THE ENGINEER. MODULAR BLOCK WALLS OR ANY OTHER SMALL RETAINING WALLS ARE THE PREFERRED CHOICE DURING PLAN DEVELOPMENT.
2). WHEN H IS GREATER THAN 2'-6", CAST THE CURB RETAINING WALLS IN PLACE. WHEN H IS GREATER THAN 12" AND LESS THAN 2'-6", THE WALLS CAN BE EITHER PRECAST OR CAST-IN-PLACE.
3). CHAMFER EDGES ¾" AT THE TOP OF WALL. PLACE A ¼" ROUND EDGE AT THE FRONT OF SIDEWALK.
4). THE RETAINING WALL HAS BEEN DESIGNED TO RESIST EARTH PRESSURE ONLY. ADDITIONAL REINFORCEMENT MAY BE REQUIRED IF ANY SURCHARGE IS APPLIED BEHIND THE RETAINING WALL WITHIN A DISTANCE EQUAL TO 2 TIMES H AND WOULD REQUIRE AN APPROVED SHOP DRAWING.
5). MINIMUM BAR COVER IS 2" UNLESS OTHERWISE SPECIFIED ON THIS SHEET.
6). BEND THE RW02E AND RW03E BARS INTO ONE CONTINUOUS L-SHAPED BAR.
7). BEND THE TW02E BARS INTO 1 CONTINUOUS U-SHAPED BAR.
8). SEE DETAIL M-3 FOR SIDEWALK DETAILS AND NOTES, INCLUDING CONSTRUCTION JOINTS AND EXPANSION MATERIAL.
9). DO NOT PLACE RW01E AND TW01E BARS THROUGH EXPANSION JOINTS. STOP REINFORCEMENT AND MAINTAIN MINIMUM BAR COVER AS SPECIFIED IN PREVIOUS NOTES.
10). THE TOEWALL CAN OPTIONALLY BE PLACED AT MIDPOINT OF THE SIDEWALK.
11). ALL REINFORCING STEEL MUST BE EPOXY COATED.
12). IF A CURB IS CONSTRUCTED ADJACENT TO THE STRUCTURE, COAT THE FRONT FACE OF THE SIDEWALK/TOEWALL WITH AN APPROVED BOND BREAKER AGENT PRIOR TO THE PLACEMENT OF CONCRETE FOR THE CURB.
13). FOR CURB RETAINING WALLS WHERE H IS 12" OR LESS, A MODIFIED P.C.C. CURB TYPE 1-8 CAN BE USED.
14). CURB HAS BEEN OMITTED FROM THESE DETAILS FOR CLARITY PURPOSES. FOR INSTALLATIONS WHERE THE TOE WALL IS PLACED AT THE EDGE OF THE SIDEWALK, THE TOEWALL IS NOT A REPLACEMENT FOR CURB.
15). SIDEWALK WIDTHS LESS THEN SHOWN ON THIS SHEET REQUIRE DEPARTMENT APPROVAL. SEE PEDESTRIAN ACCESSIBILITY STANDARDS MANUAL FOR MORE GUIDANCE.




## CURB RETAINING WALL SECTION

FOR HEIGHTS GREATER THAN 12" BUT LESS THAN OR EQUAL TO 2'-6"




## PLAN VIEW

DELAWARE
DEPARTMENT OF TRANSPORTATION

CURB RETAINING WALL

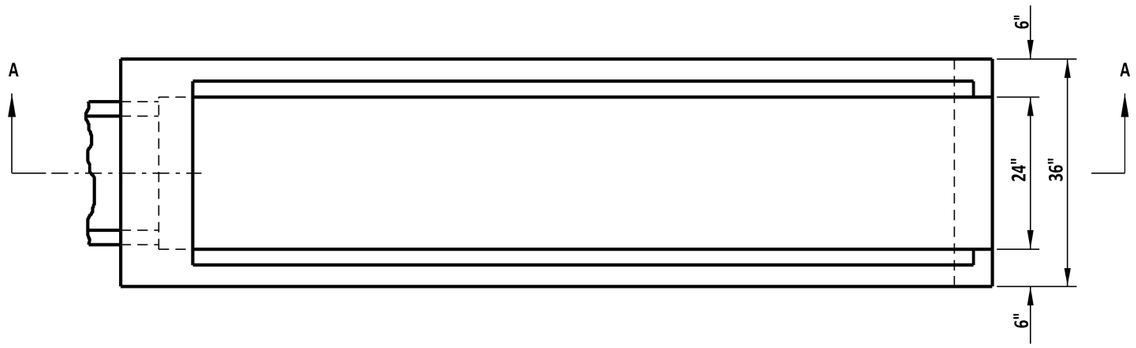
STANDARD NO. C-6 (2017) | SHT. 1 OF 1

APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 5/31/2017 (DATE)

RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 5/18/2017 (DATE)

5/11/2017

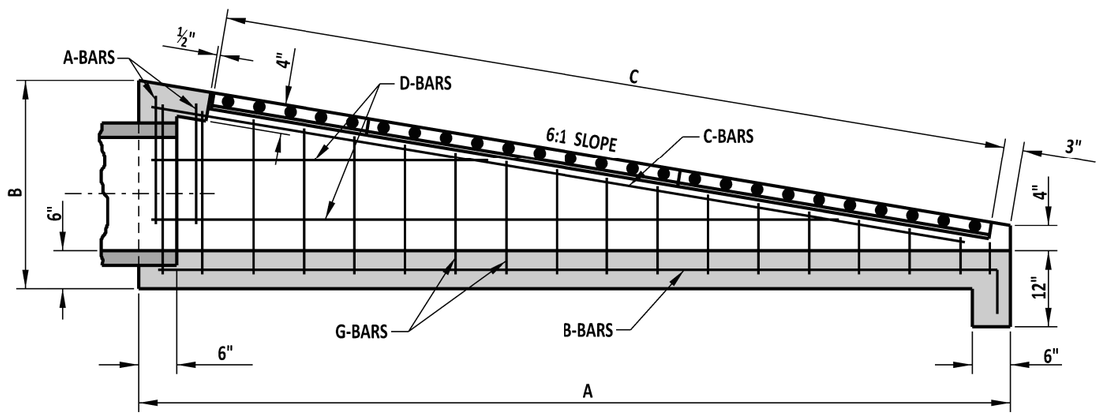
SCALE : NTS



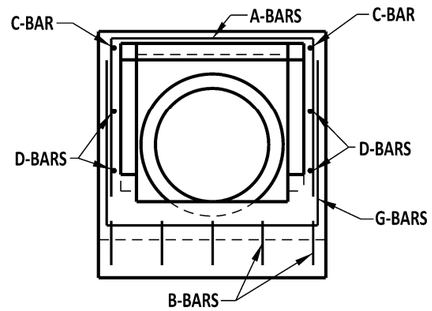

**PLAN VIEW**

SHOWN WITHOUT GRATE

NOTE: 6:1 SAFETY END STRUCTURE TO BE PRECAST




**SECTION A-A**




**FRONT VIEW**

| | | | |
|---|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | 6:1 CONCRETE SAFETY END STRUCTURE | | APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 1/04/2019 (DATE) |
| | STANDARD NO. D-1 (2018) | SHT. 1 OF 2 | RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 12/20/2018 (DATE) |

1/7/2019

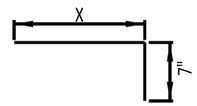
SCALE : NTS

## DIMENSIONS

| PIPE SIZE | A | B | C |
|---|---|---|---|
| 15" | 9'-6" | 2'-5" | 8'-4" |
| 18" | 11'-6" | 2'-9" | 10'-5" |
| 21" OR 24" | 14'-4" | 3'-2⅝" | 12'-6" |

## BENDING DIAGRAM

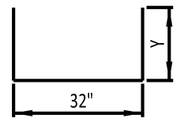
| PIPE SIZE | X |
|---|---|
| 15" | 9'-2" |
| 18" | 11'-2" |
| 21" OR 24" | 14'-0" |

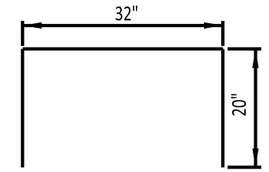



B-BARS

| PIPE SIZE | Y |
|---|---|
| 15" | VARIES 25" TO 4" |
| 18" | VARIES 29" TO 4" |
| 21" OR 24" | VARIES 34" TO 4" |

G-BARS




A-BARS

## APPROXIMATE QUANTITIES

| PIPE SIZE | CONCRETE FT³ | | REINF. STEEL LBS. | NO. OF GRATES | LENGTH TO BE CUT FROM 1 GRATE | WEIGHT OF FULL SIZE GRATE LBS. | WEIGHT OF CUT GRATE LBS. |
|---|---|---|---|---|---|---|---|
| | CONC. PIPE | C.M. PIPE | | | | | |
| 15" | 25 | 25.43 | 121.12 | 2 | -- | 270.92 | -- |
| 18" | 31.5 | 32.07 | 156.7 | 3 | 2'-1" | 270.92 | 135.47 |
| 21" OR 24" | 40.75 | 39.87 | 194.0 | 3 | -- | 270.92 | -- |

## SCHEDULE OF REINFORCING STEEL

| PIPE SIZE | A-BARS | | | | B-BARS | | | | C-BARS | | | | D-BARS | | | | G-BARS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SIZE | NO. | SPA. | LENGTH | SIZE | NO. | SPA. | LENGTH | SIZE | NO. | SPA. | LENGTH | SIZE | NO. | SPA. | LENGTH | SIZE | NO. | SPA. | LENGTH |
| 15" | #4 | 2 | 8" | 72" | #4 | 5 | 8" | 9'-9" | #4 | 2 | - | 9'-3" | #4 | 4 | 8" | VARIES 50" TO 100" | #4 | 15 | 8" | VARIES 40" TO 82" |
| 18" | #4 | 2 | 8" | 72" | #4 | 5 | 8" | 11'-9" | #4 | 2 | - | 11'-5" | #4 | 6 | 8" | VARIES 43½" TO 130½" | #4 | 18 | 8" | VARIES 40" TO 90" |
| 21" OR 24" | #4 | 2 | 8" | 72" | #4 | 5 | 8" | 14'-7" | #4 | 2 | - | 14'-3" | #4 | 6 | 8" | VARIES 51" TO 153" | #4 | 22 | 8" | VARIES 40" TO 100" |

DELAWARE
DEPARTMENT OF TRANSPORTATION

6:1 CONCRETE SAFETY END STRUCTURE

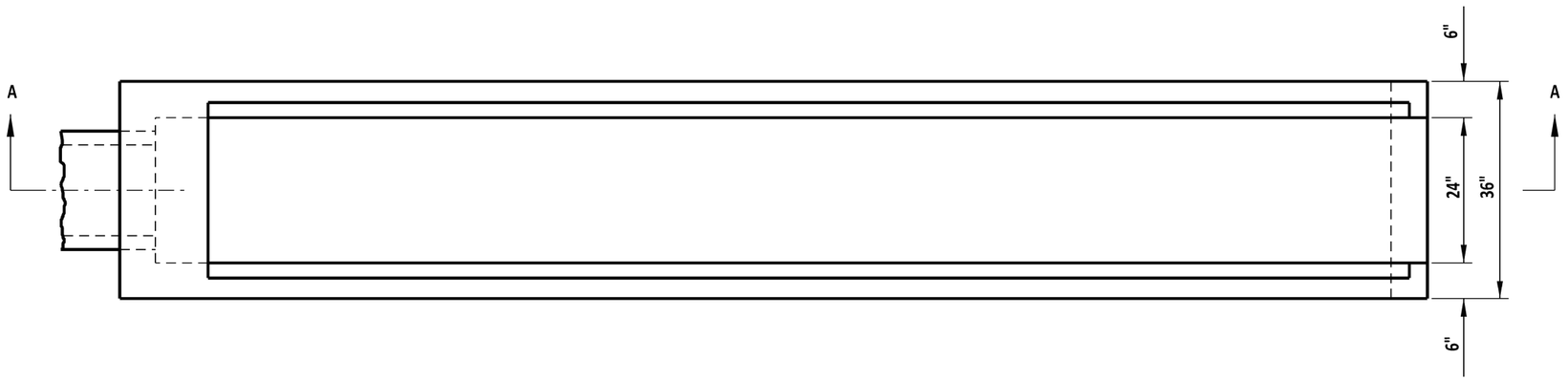
STANDARD NO. D-1 (2018) | SHT. 2 OF 2

APPROVED SIGNATURE ON FILE — CHIEF ENGINEER — 1/04/2019 DATE

RECOMMENDED SIGNATURE ON FILE — DES/GN ENGINEER — 12/20/2018 DATE

1/7/2019

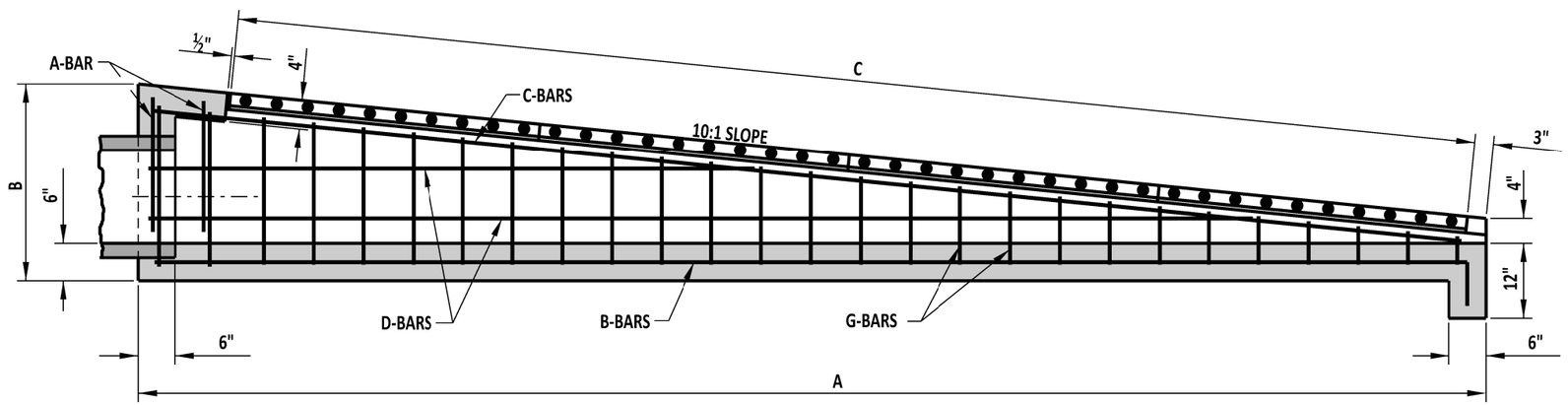
SCALE : NTS



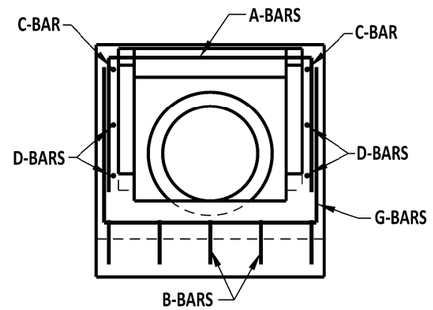

**PLAN VIEW**

SHOWN WITHOUT GRATE

NOTE: 10:1 SAFETY END STRUCTURE TO BE PRECAST




**SECTION A-A**




**FRONT VIEW**

| | | | | | |
|---|---|---|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | 10:1 CONCRETE SAFETY END STRUCTURE | | APPROVED | SIGNATURE ON FILE<br>CHIEF ENGINEER | 1/04/2019<br>DATE |
| | STANDARD NO. D-2 (2018) | SHT. 1 OF 2 | RECOMMENDED | SIGNATURE ON FILE<br>DESIGN ENGINEER | 12/20/2018<br>DATE |

1/7/2019

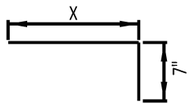
SCALE : NTS

## DIMENSIONS

| PIPE SIZE | A | B | C |
|---|---|---|---|
| 15" | 15'-4" | 2'-4 3/8" | 14'-7" |
| 18" | 19'-6" | 2'-9 3/8" | 18'-9" |
| 21" OR 24" | 24'-0" | 3'-2 13/16" | 22'-11" |

## BENDING DIAGRAM

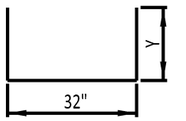
| PIPE SIZE | X |
|---|---|
| 15" | 15'-0" |
| 18" | 19'-2" |
| 21" OR 24" | 23'-8" |

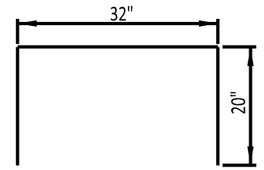



B-BARS

| PIPE SIZE | Y |
|---|---|
| 15" | VARIES 21 1/2" TO 4" |
| 18" | VARIES 26 7/16" TO 4" |
| 21" OR 24" | VARIES 31 3/4" TO 4" |

G-BARS




A-BARS

## APPROXIMATE QUANTITIES

| PIPE SIZE | CONCRETE FT³ | | REINF. STEEL LBS. | NO. OF GRATES | LENGTH TO BE CUT FROM 1 GRATE | WEIGHT OF FULL SIZE GRATE LBS. | WEIGHT OF CUT GRATE LBS. |
|---|---|---|---|---|---|---|---|
| | CONC. PIPE | C.M. PIPE | | | | | |
| 15" | 41.35 | 41.78 | 175.0 | 4 | 2'-1" | 270.92 | 135.47 |
| 18" | 50.11 | 50.68 | 227.0 | 5 | 2'-1" | 270.92 | 135.47 |
| 21" OR 24" | 69.43 | 70.31 | 310.4 | 6 | 2'-1" | 270.92 | 135.47 |

## SCHEDULE OF REINFORCING STEEL

| PIPE SIZE | A-BARS | | | | B-BARS | | | | C-BARS | | | | D-BARS | | | | G-BARS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SIZE | NO. | SPA. | LENGTH | SIZE | NO. | SPA. | LENGTH | SIZE | NO. | SPA. | LENGTH | SIZE | NO. | SPA. | LENGTH | SIZE | NO. | SPA. | LENGTH |
| 15" | #4 | 2 | 8" | 72" | #4 | 5 | 8" | 15'-7" | #4 | 2 | - | 15'-1 1/16" | #4 | 4 | 8" | VARIES 72 13/16" TO 145 5/8" | #4 | 24 | 8" | VARIES 40" TO 75 11/16" |
| 18" | #4 | 2 | 8" | 72" | #4 | 5 | 8" | 19'-9" | #4 | 2 | - | 19'-3 3/8" | #4 | 4 | 8" | VARIES 89 5/8" TO 179 3/16" | #4 | 30 | 8" | VARIES 40" TO 85 3/4" |
| 21" OR 24" | #4 | 2 | 8" | 72" | #4 | 5 | 8" | 24'-3" | #4 | 2 | - | 23'-9 5/8" | #4 | 6 | 8" | VARIES 80 3/4" TO 242 1/8" | #4 | 37 | 8" | VARIES 40" TO 96 9/16" |

DELAWARE
DEPARTMENT OF TRANSPORTATION

10:1 CONCRETE SAFETY END STRUCTURE

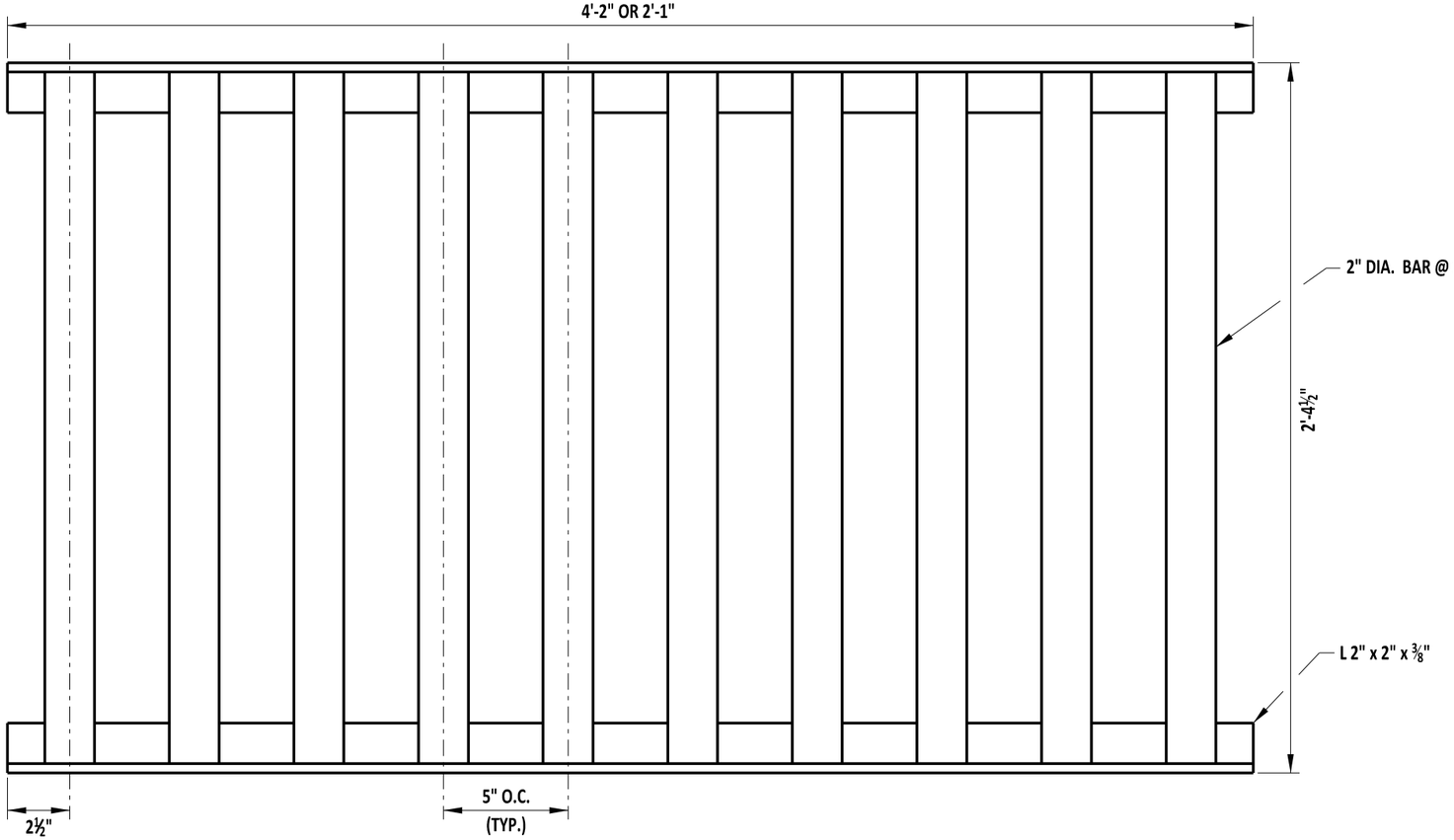
STANDARD NO. D-2 (2018) SHT. 2 OF 2

APPROVED SIGNATURE ON FILE — CHIEF ENGINEER — 1/04/2019 DATE

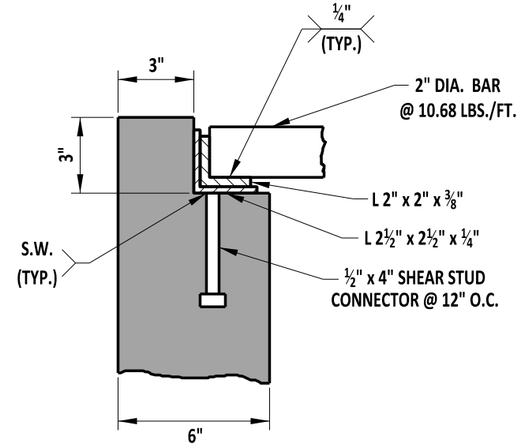
RECOMMENDED SIGNATURE ON FILE — DESIGN ENGINEER — 12/20/2018 DATE

1/7/2019

SCALE : NTS




**GRATE DETAIL**

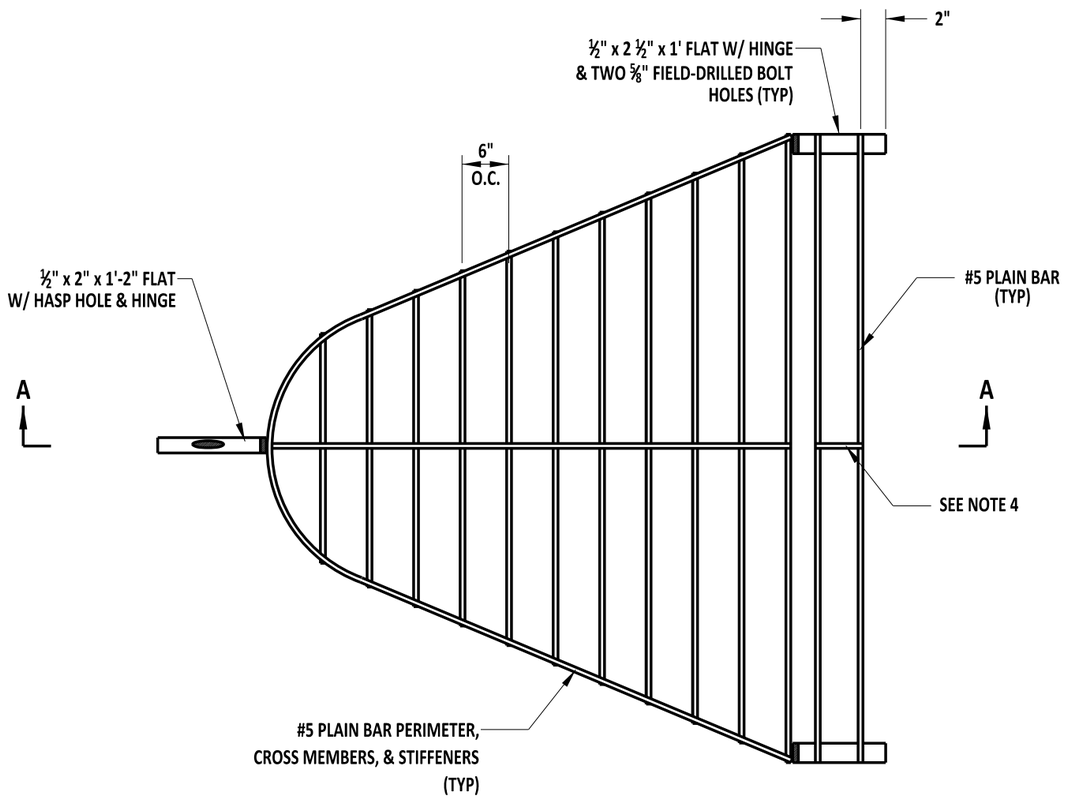



**FRAME & GRATE ASSEMBLY DETAIL**

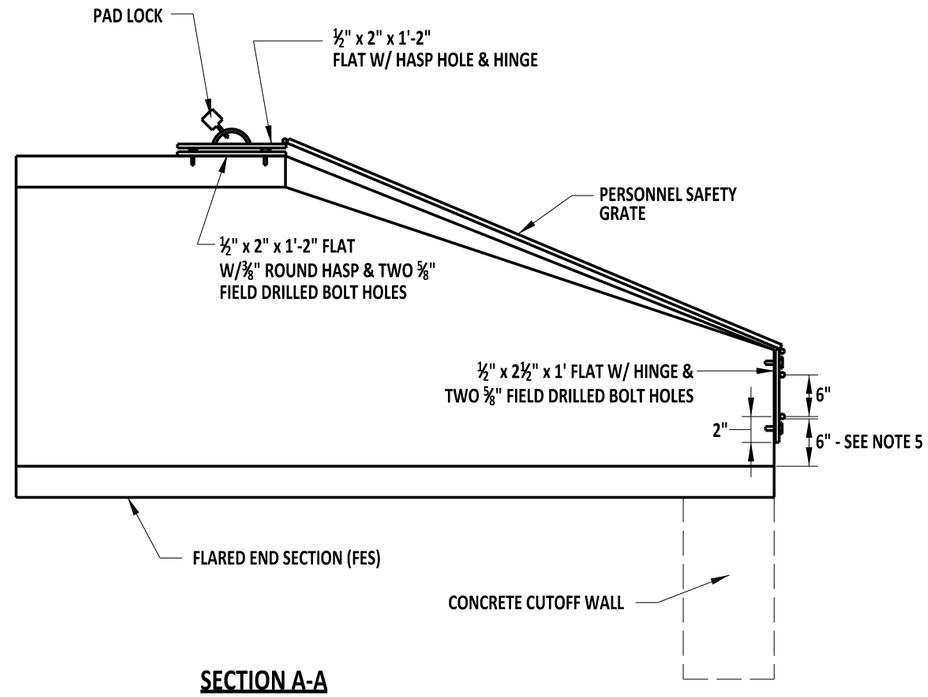
| | | | |
|---|---|---|---|
| DelDOT | 09/01/2020 ENGINEERING SUPPORT DATE<br>RECOMMENDED | SAFETY END STRUCTURE GRATE AND ASSEMBLY | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. D-3 (2020) SHT. 1 OF 2 | APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/20/2020

SCALE : NTS




PLAN VIEW




SECTION A-A

NOTES:

1). INSTALL PERSONNEL SAFETY GRATES (PSG) ONLY ON THE INLETS OF STORM WATER PIPES 12" OR LARGER IN DIAMETER THAT ARE NOT STRAIGHT FROM THE INLET TO THE OPEN OUTLET, REGARDLESS OF THE LENGTH.

2). FIT THE GRATE TO THE OUTSIDE PERIMETER OF THE FLARED END SECTION (FES) ± ½".

3). DRILL ALL BOLT HOLES IN THE FIELD.

4). INSTALL A STIFFENER WHERE TWO OR MORE BARS ARE USED.

5). PLACE BOTTOM BAR 6" ABOVE INVERT OF FES.

6). ATTACH ALL HARDWARE IN CONCRETE USING APPROVED TAMPER PROOF ANCHORS.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

PERSONNEL SAFETY GRATE FOR PIPE INLET

STANDARD NO. D-3 (2020) | SHT. 2 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

SCALE : NTS

| INLET BOX SIZE | | COVER SLAB SIZE (L X W) | DRAINAGE INLET TOP UNIT | INLET TOP UNIT REBAR LENGTH | INLET TOP UNIT LIMIT OF PAYMENT | INLET TOP UNIT BAR BENDING DIAGRAM | FRAME & GRATE (SEE DETAIL D-5, SHEET 2) SEE NOTE 6 | MAXIMUM PIPE SIZE (SEE NOTE 1) | | MAXIMUM HEIGHT (INVERT TO TOP OF GRATE) |
|---|---|---|---|---|---|---|---|---|---|---|
| L | W | | | | | | | L | W | |
| 17⅝" | 11⅝" | NO COVER SLAB | TYPE 5 (FRAME & GRATE COMBO) | N/A | N/A | N/A | TYPE 5 (FRAME & GRATE COMBO) | N/A | N/A | 4'-0" |
| 24" | 24" | NO COVER SLAB | TYPE 6 (FRAME & GRATE COMBO) | N/A | N/A | N/A | TYPE 6 (FRAME & GRATE COMBO) | 15" | 15" | 4'-0" |
| | | | | | | | | | | |
| 34" | 18" | NO COVER SLAB (D-5, SHEET 7) | TYPES A, C, D, & E (D-5, SHEET 7) | 79" | 82" | S504 (D-5, SHEET 7) | TYPES 1 THRU 4 AND 7 GRATE STANDARD DRAINAGE INLET FRAME | 24" | N/A | 4'-0" |
| 34" | 24" | NO COVER SLAB (D-5, SHEET 6) | TYPES A, B, C, D, E, & S (SEE NOTE 4) | 79" | 82" | S501 (SEE NOTE 5) | TYPES 1 THRU 4 AND 7 GRATE STANDARD DRAINAGE INLET FRAME | 24" | 15" | 11'-4" |
| 48" | 30" | 60" x 42" (D-5, SHEET 4) | TYPES A, B, C, D, E & S (SEE NOTE 5) | 93" | 96" | S501 (SEE NOTE 5) | TYPES 1 THRU 4 AND 7 GRATE STANDARD DRAINAGE INLET FRAME | 36" | 21" | 11'-4" |
| 48" | 48" | 60" x 60" (D-5, SHEET 4) | TYPES A, B, C, D, E & S (SEE NOTE 5) | 93" | 96" | S501 (SEE NOTE 5) | TYPES 1 THRU 4 AND 7 GRATE STANDARD DRAINAGE INLET FRAME | 36" | 36" | 11'-4" |
| 66" | 30" | 78" x 42" (D-4, SHEET 4) | TYPES A, B, C, D, E & S (SEE NOTE 5) | 111" | 114" | S501 (SEE NOTE 5) | TYPES 1 THRU 4 AND 7 GRATE STANDARD DRAINAGE INLET FRAME | 48" | 21" | 11'-4" |
| 66" | 48" | 78" x 60" (D-5, SHEET 4) | TYPES A, B, C, D, E & S (SEE NOTE 5) | 111" | 114" | S501 (SEE NOTE 5) | TYPES 1 THRU 4 AND 7 GRATE STANDARD DRAINAGE INLET FRAME | 48" | 36" | 11'-4" |
| 66" | 66" | 78" x 78" (D-5, SHEET 4) | TYPES A, B, C, D, E & S (SEE NOTE 5) | 111" | 114" | S501 (SEE NOTE 5) | TYPES 1 THRU 4 AND 7 GRATE STANDARD DRAINAGE INLET FRAME | 48" | 48" | 11'-4" |
| 72" | 24" | 84" x 36" (D-5, SHEET 5) | TYPES A, B, C, D, E & S (SEE NOTE 5) | 117" | 120" | S501 (SEE NOTE 5) | TYPES 1 THRU 4 AND 7 GRATE STANDARD DRAINAGE INLET FRAME | 54" | 15" | 11'-4" |
| 72" | 48" | 84" x 60" (D-5, SHEET 5) | TYPES A, B, C, D, E & S (SEE NOTE 5) | 117" | 120" | S501 (SEE NOTE 5) | TYPES 1 THRU 4 AND 7 GRATE STANDARD DRAINAGE INLET FRAME | 54" | 36" | 11'-4" |
| 72" | 72" | 84" x 84" (D-5, SHEET 5) | TYPES A, B, C, D, E & S (SEE NOTE 5) | 117" | 120" | S501 (SEE NOTE 5) | TYPES 1 THRU 4 AND 7 GRATE STANDARD DRAINAGE INLET FRAME | 54" | 54" | 11'-4" |

NOTES :

1). MAXIMUM PIPE SIZES ARE CALCULATED USING REINFORCED CONCRETE PIPE PERPENDICULAR TO THE BOX WALL. FOR OTHER PIPE SIZES, TYPES AND SKEW ANGLES OTHER THAN PERPENDICULAR, SEE CHART ON DELDOT DESIGN RESOURCE CENTER. THESE PIPE SIZES ARE NOT APPLICABLE FOR DOGHOUSE BOX INLET SHOWN ON DETAIL D-5, SHEET 9.
2). STEPS ARE REQUIRED ON ALL DRAINAGE INLETS WHOSE DEPTH IS 4'-0" OR GREATER.
3). SEE D-4 OR APPROPRIATE DETAIL SHEET FOR ADDITIONAL NOTES.
4). FOR A 34" X 24" DRAINAGE INLET, SEE D-5, SHEET 6 FOR INLET TOP UNIT TYPES A, B, C, D, & E. FOR INLET TOP UNIT TYPE S, SEE D-5, SHEET 8.
5). FOR MORE INFORMATION ON DRAINAGE INLET TOP UNIT TYPES A, B, C, D, & E SEE D-5, SHEET 3 AND FOR DRAINAGE INLET TOP UNIT, TYPE S, SEE D-5, SHEET 8.
6). ONLY USE THE TYPE 7 DRAINAGE INLET GRATE WHEN SPECIFIED ON THE PLANS OR WITH APPROVAL OF THE ENGINEER.

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ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

DRAINAGE INLET REFERENCE SHEET

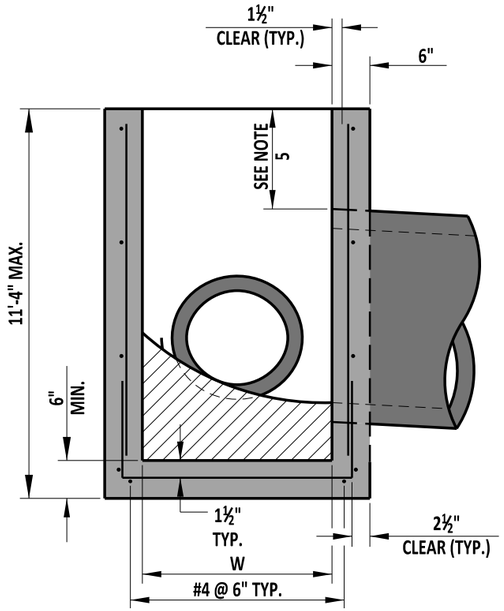
STANDARD NO. D-R (2020) SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

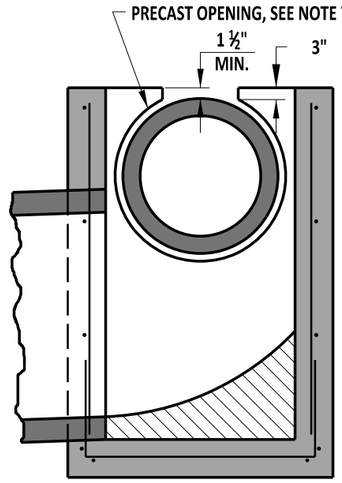
APPROVED
CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

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SECTION A-A



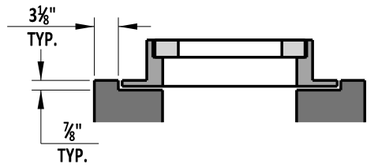

OPTIONAL PIPE OPENING DETAIL

SEE NOTE 5

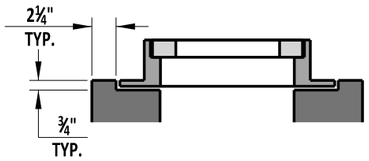
| INLET BOX SCHEDULE | | | |
|---|---|---|---|
| L | W | FABRICATION TOLERANCE | |
| 17⅝" | 11⅝" | +1" | * |
| 24" | 24" | +1" | * |
| 34" | 18" | -1" | ** |
| 34" | 24" | -1" | |
| 48" | 30" | +6" | |
| 48" | 48" | +6" | |
| 66" | 30" | +6" | |
| 66" | 48" | +6" | |
| 66" | 66" | +6" | |
| 72" | 24" | -1" | |
| 72" | 48" | -1" | |
| 72" | 72" | -1" | |

* - THESE SIZES ARE TO BE USED FOR LAWN INLETS AND ARE NOT INTENDED TO BE USED IN THE TRAVELWAY. THE MAX DEPTH FOR THESE INLETS IS 4'. SEE NOTE 8 FOR REINFORCEMENT.
** - MAX DEPTH IS 4' FOR THIS DRAINAGE INLET.

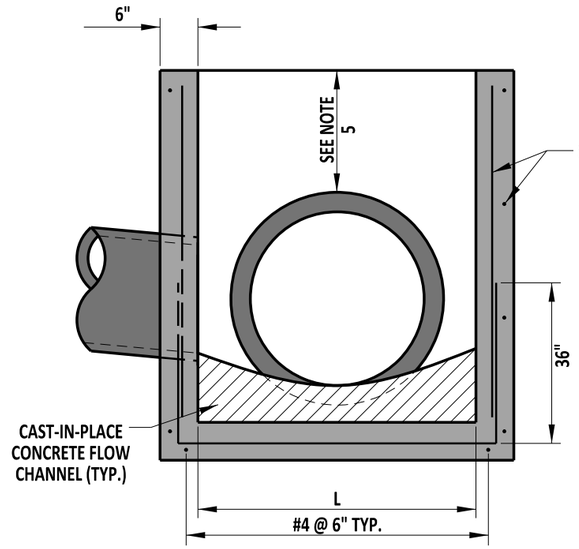
| WALL REINFORCEMENT SCHEDULE | | |
|---|---|---|
| INTERIOR WALL DIMENSION | AREA OF HORIZONTAL REINFORCEMENT PER FOOT | AREA OF VERTICAL REINFORCEMENT PER FOOT |
| | $IN^2$ | $IN^2$ |
| LESS THAN 4' | 0.132 | 0.132 |
| ≥ 4' | 0.163 | 0.132 |
| ≥ 4.5' | 0.198 | 0.132 |
| ≥ 5' | 0.239 | 0.132 |
| ≥ 5.5' | 0.284 | 0.132 |



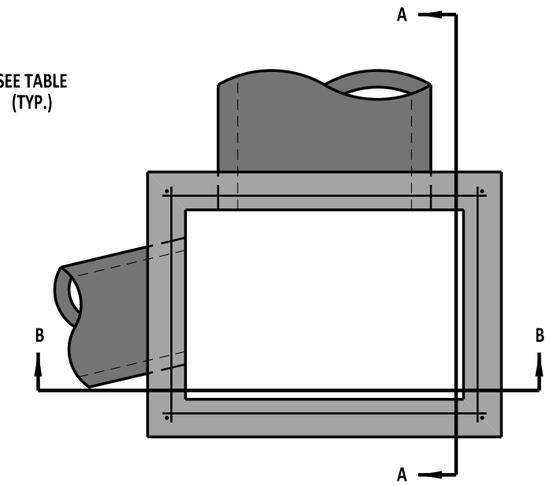

24" X 24" LAWN
INLET BOX DETAIL




17 5/8" X 11 5/8"
LAWN INLET BOX DETAIL




SECTION B-B




TOP VIEW

NOTES:

1). PROVIDE PRECAST OR CAST-IN-PLACE INLET BOXES IN ACCORDANCE WITH SECTION 602 .
2). DO NOT INSTALL PIPES THROUGH ANY CORNER OF THE INLET BOX.
3). RISER SECTIONS MAY BE USED FOR DEEP INLET BOXES.
4). PIPES MAY BE INSTALLED NEAR OR THROUGH JOINTS FOR RISER SECTIONS.
5). WHEN THE COVER ABOVE THE PIPE IS LESS THAN 4" TO THE COVER SLAB OR TOP UNIT OPENING, THE PORTION OF BOX WALL ABOVE THE PIPE MAY BE REMOVED AS SHOWN IN THE OPTIONAL PIPE OPENING DETAIL. FORM AND FILL THE AREA ABOVE THE PIPE WITH HIGH-STRENGTH, NON-SHRINK GROUT MIXED WITH COARSE AGGREGATE IN A 1:1 RATIO BY WEIGHT.
6). ENSURE POSITIVE FLOW WHEN CONSTRUCTING THE FLOW CHANNEL.
7). WHEN INLET BOX IS PRECAST, PROVIDE A PIPE OPENING DIAMETER BETWEEN 3" AND 4" LARGER THAN OUTSIDE DIAMETER OF PIPE.
8). USE 4" X 4", W4 X W4 WELDED WIRE AS REINFORCEMENT FOR LAWN INLET BOXES.
9). EXTEND PIPE TO BE FLUSH WITH THE INSIDE WALL OF THE INLET BOX IN ACCORDANCE WITH SECTION 602.3.B OF THE STANDARD SPECIFICATIONS.
10). PIPE SHALL NOT ENCROACH ON ADJACENT WALL.
11). INSTALL STEPS IN ACCORDANCE WITH SECTION 602.3.B WHEN INLETS ARE 4' OR DEEPER FROM THE TOP OF GRATE TO THE INVERT OF THE LOWEST PIPE.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

INLET BOX

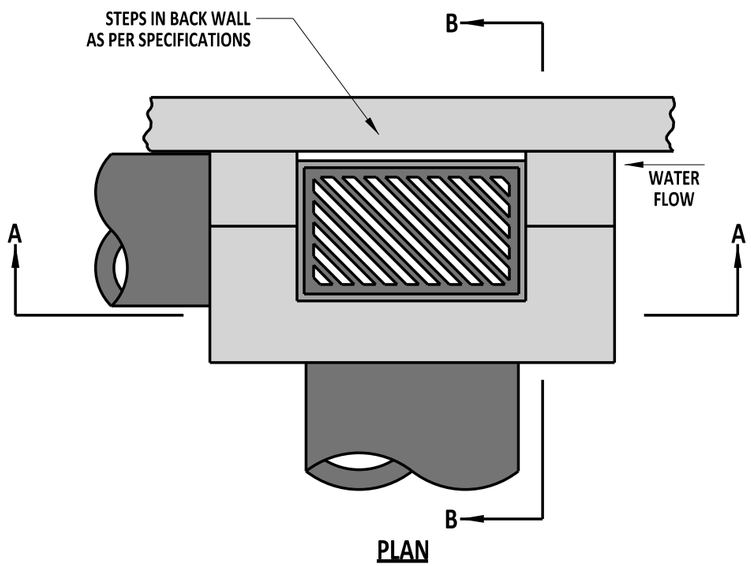
STANDARD NO. D-4 (2020) | SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

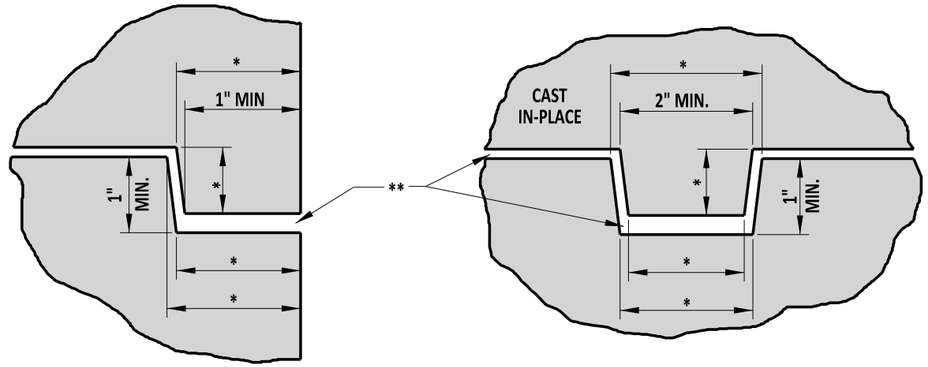
APPROVED
CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

SCALE : NTS



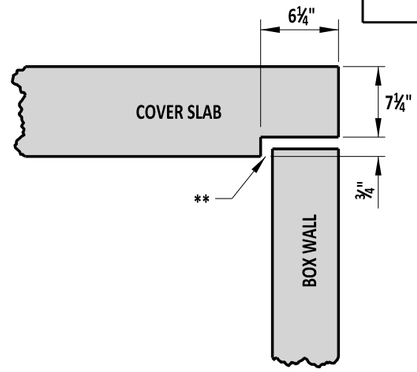

PLAN




TYPE 1 JOINT DETAIL



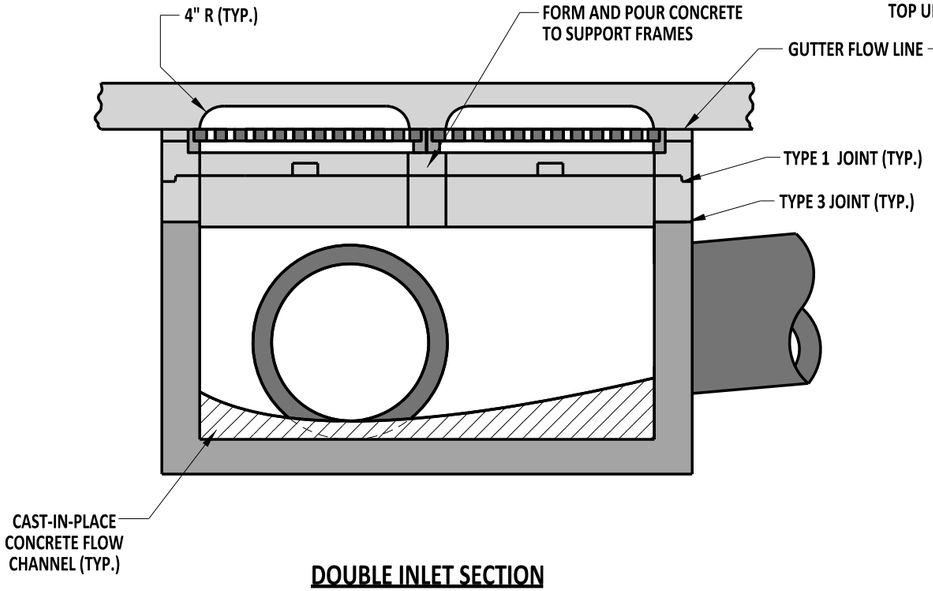

TYPE 2 JOINT DETAIL



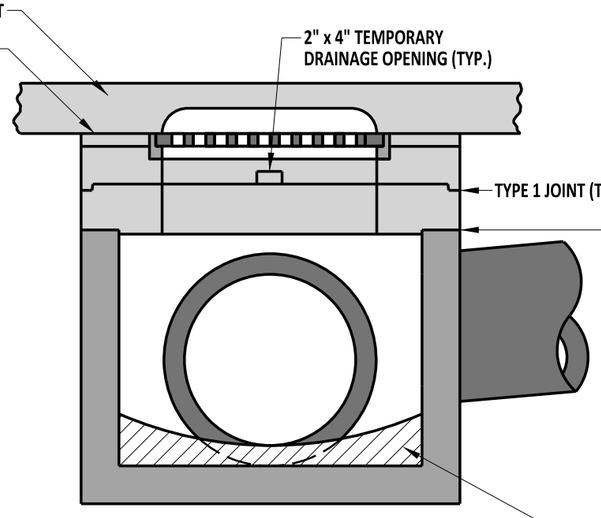

TYPE 3 JOINT DETAIL

* DIMENSIONS WILL VARY

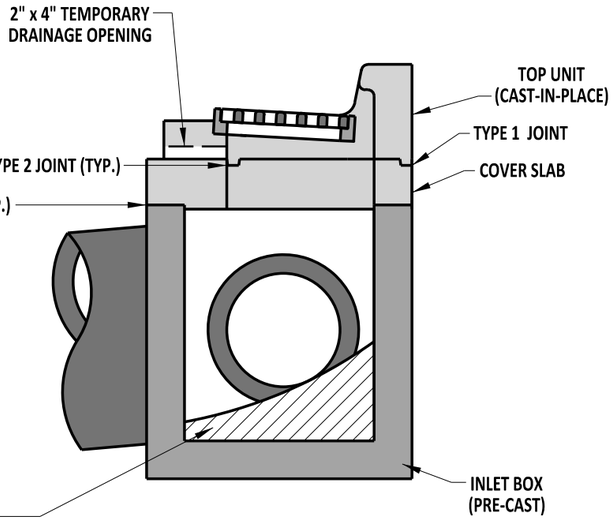
** JOINT SEALANT AS PER SPECIFICATIONS
ONLY BETWEEN 2 PRECAST UNITS




DOUBLE INLET SECTION




SECTION A-A



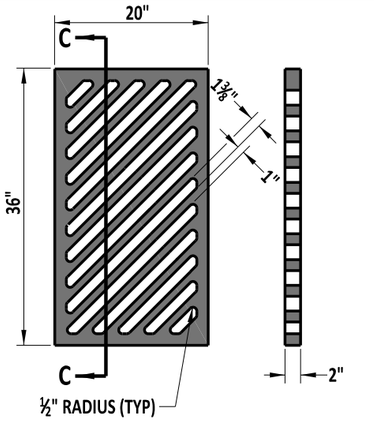

SECTION B-B

NOTE: THIS DETAIL USES A 48" x 30" DRAINAGE INLET FOR ILLUSTRATIVE PURPOSES.

| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | DRAINAGE INLET ASSEMBLY<br>STANDARD NO. D-5 (2020) SHT. 1 OF 9 | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE<br>APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/20/2020

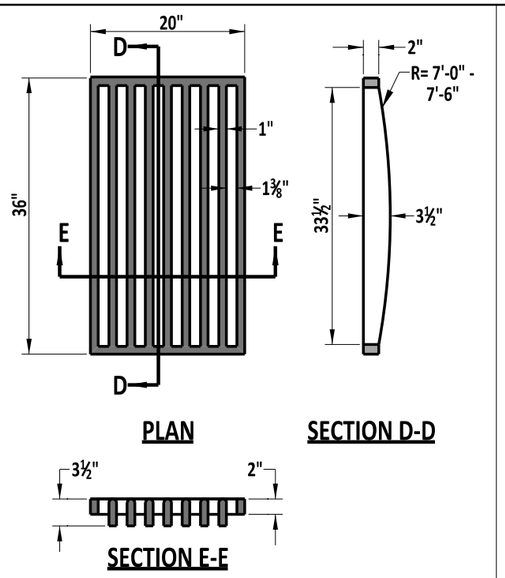
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PLAN

SECTION C-C

TYPE 1

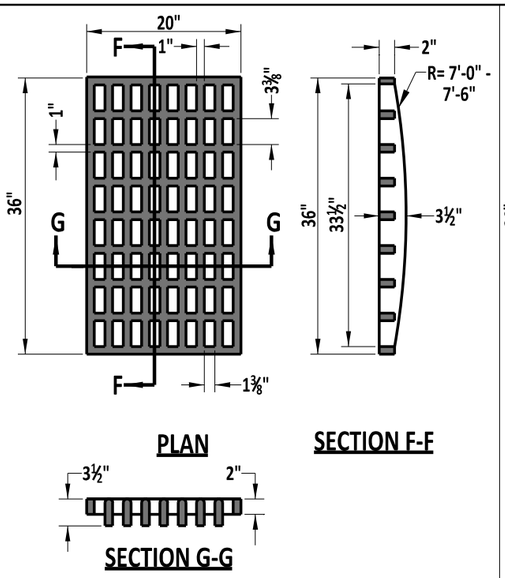



PLAN

SECTION D-D

SECTION E-E

TYPE 2

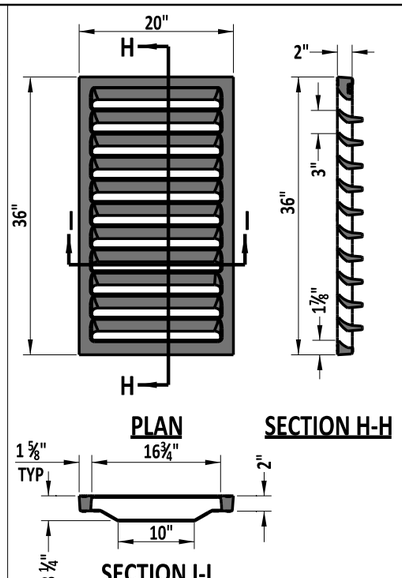



PLAN

SECTION F-F

SECTION G-G

TYPE 3

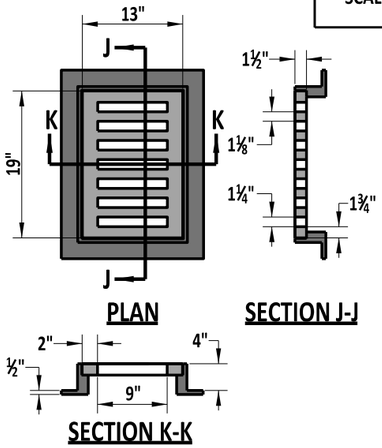



PLAN

SECTION H-H

SECTION I-I

TYPE 4

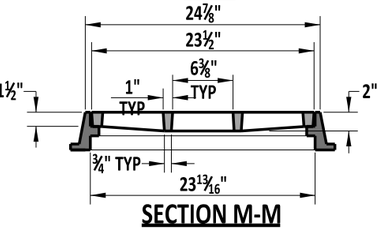



PLAN

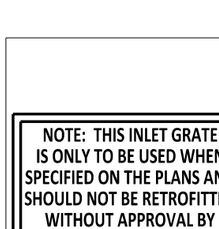
SECTION J-J

SECTION K-K

TYPE 5




PLAN




SECTION L-L

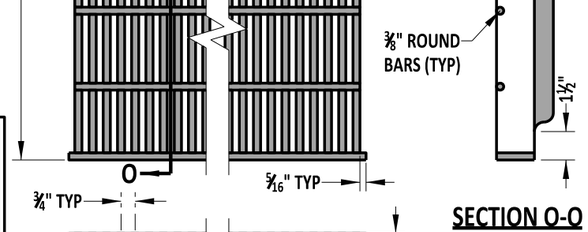



SECTION M-M

TYPE 6

NOTE: THIS INLET GRATE IS ONLY TO BE USED WHEN SPECIFIED ON THE PLANS AND SHOULD NOT BE RETROFITTED WITHOUT APPROVAL BY THE ENGINEER.

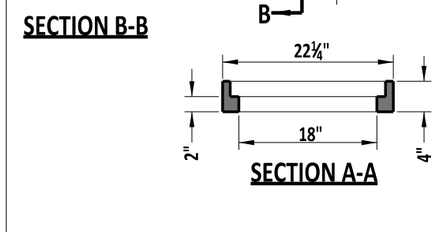
TYPE 7




SECTION N-N




SECTION O-O



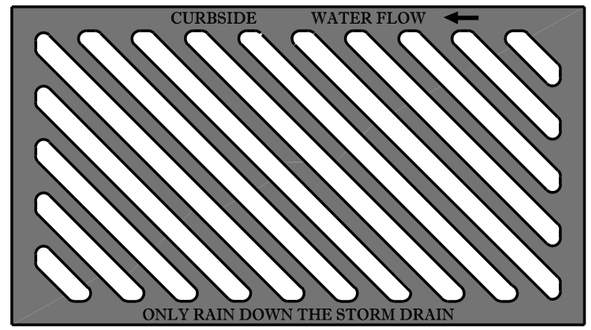

SECTION B-B




SECTION A-A

DRAINAGE INLET FRAME

THIS FRAME IS TO BE USED WITH TYPES 1 THROUGH 4 GRATES ONLY




DRAINAGE GRATE LABELING EXAMPLE DETAIL

NOTES:

1). INSTALL TYPE 1 AND 4 DRAINAGE INLET GRATES ONLY IN CONJUNCTION WITH CURB OR CURB & GUTTER.
2). INSTALL TYPE 2 DRAINAGE INLET GRATE ONLY WHERE BICYCLE TRAFFIC IS NOT EXPECTED TO BE PRESENT.
3). LABEL THE TOP OF ALL DRAINAGE INLET GRATES, EXCEPT TYPE 7, WITH "ONLY RAIN DOWN THE STORM DRAIN". ALSO, LABEL DRAINAGE INLET GRATES TYPE 1 AND TYPE 4 WITH "WATER FLOW" AND AN ARROW INDICATING FLOW DIRECTION AS SHOWN IN THE EXAMPLE DETAIL.
4). LABEL THE TOP AND BOTTOM OF THE TYPE 1 DRAINAGE INLET GRATE WITH "CURBSIDE" AS SHOWN ON THE EXAMPLE DETAIL.
5). ONLY USE THE TYPES 5 & 6 DRAINAGE INLET FRAME AND GRATE COMBINATIONS ON LAWN INLET DRAINAGE BOXES. SEE SCHEDULE ON D-4, SHEET 1 FOR WHICH BOX SIZES ARE CONSIDERED LAWN INLET DRAINAGE BOXES.
6). THE TYPE 6 DRAINAGE INLET FRAME AND GRATE COMBINATION SHOWN IS THE NEENAH FOUNDRY FRAME AND GRATE COMBINATION MODEL NF-1878-A5G, AN ACCEPTABLE ALTERNATIVE IS THE EAST JORDAN IRON WORKS FRAME AND GRATE COMBINATION MODEL V-5622.

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ENGINEERING SUPPORT DATE
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DRAINAGE INLET FRAME AND GRATES

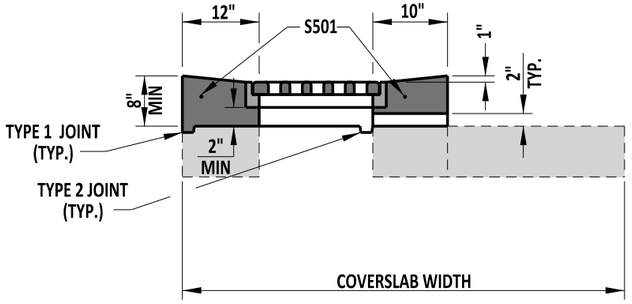
STANDARD NO. D-5 (2020) | SHT. 2 OF 9

REVIEWED
DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE

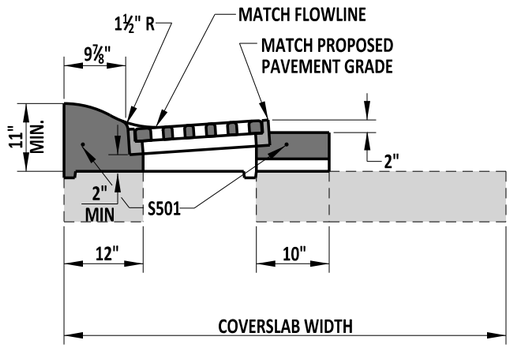
APPROVED
CHIEF ENGINEER 09/01/2020 DATE

08/20/2020

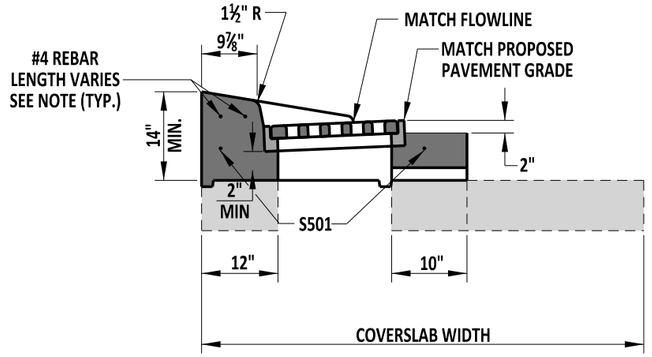
SCALE : NTS



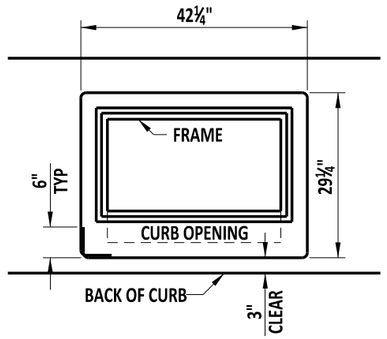

**TYPE A**




**TYPE D**

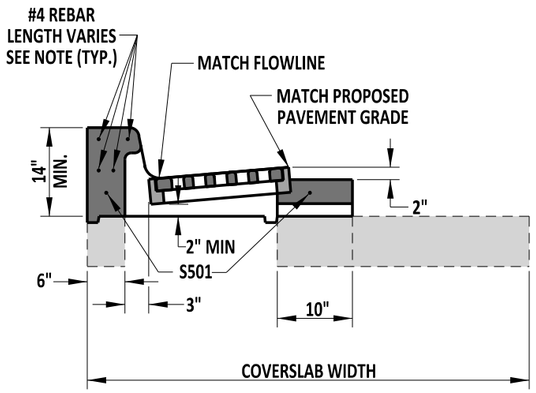



**TYPE E**



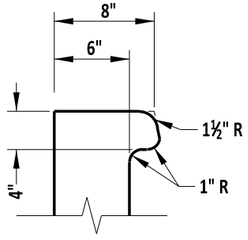

**S501 BENDING DIAGRAM**

#5 REBAR TO BE CONTINUOUS OR WITH 12" OVERLAP BETWEEN BARS.



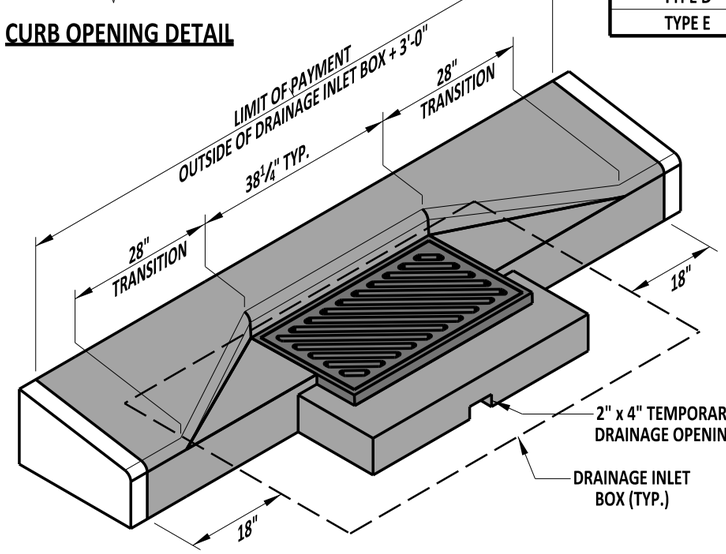

**TYPE B**

SEE CURB OPENING DETAIL ON THIS SHEET



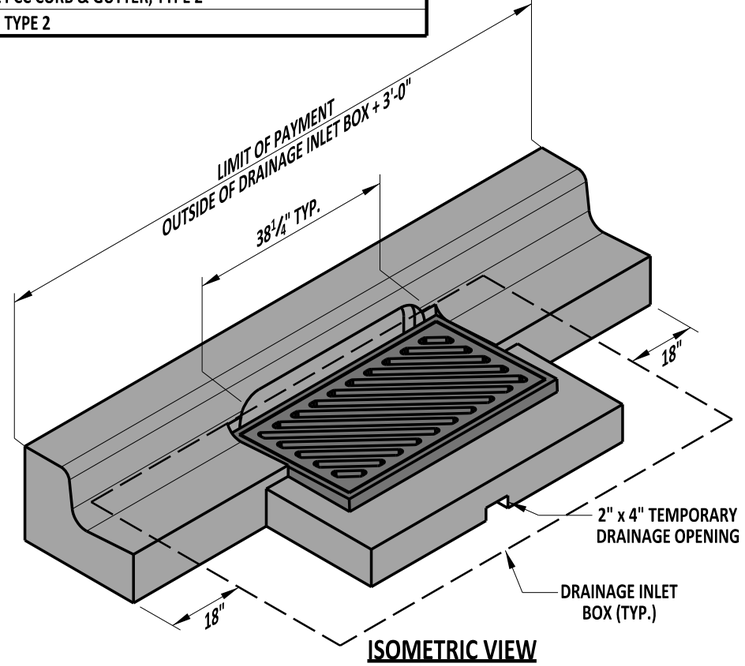

**CURB OPENING DETAIL**

| INLET TOP UNIT APPLICATIONS | |
|---|---|
| TOP UNIT | CURB |
| TYPE A | USE IN NON CURBED |
| TYPE B | INTEGRAL PCC CURB & GUTTER, TYPE 1-8 & 3-8, PCC CURB TYPE 1-8 |
| TYPE C | INTEGRAL PCC CURB & GUTTER, TYPES 1-6, 3-6, 1-4, 3-4 , 1-2 AND 3-2 AND PCC CURB TYPE 1-6, 1-4, AND 1-2. |
| TYPE D | INTEGRAL PCC CURB & GUTTER, TYPE 2 |
| TYPE E | PCC CURB TYPE 2 |



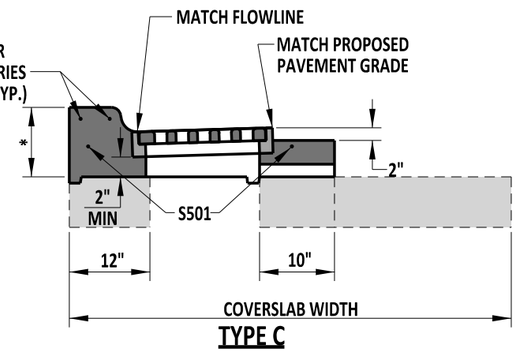

**ISOMETRIC VIEW**

TYPE E UNIT SHOWN




**ISOMETRIC VIEW**

TYPE B TOP UNIT SHOWN WITH INTEGRAL CURB & GUTTER TYPE 3




**TYPE C**

* - THIS DIMENSION VARIES BASED ON THE HEIGHT OF THE CURB AND GUTTER OR CURB USED:
- INTEGRAL PCC CURB AND GUTTER, TYPES 1-6 AND 3-6 & CURB, TYPE 1-6 - 12" MIN.
- INTEGRAL PCC CURB AND GUTTER, TYPES 1-4 AND 3-4 & CURB, TYPE 1-4 - 10" MIN.
- INTEGRAL PCC CURB AND GUTTER, TYPES 1-2 AND 3-2 & CURB, TYPE 1-2 - 8" MIN.

NOTE: LENGTH OF #4 REBAR SHALL BE THE OUTSIDE OF THE DRAINAGE INLET BOX PLUS 2'-9".

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ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

DRAINAGE INLET TOP UNITS

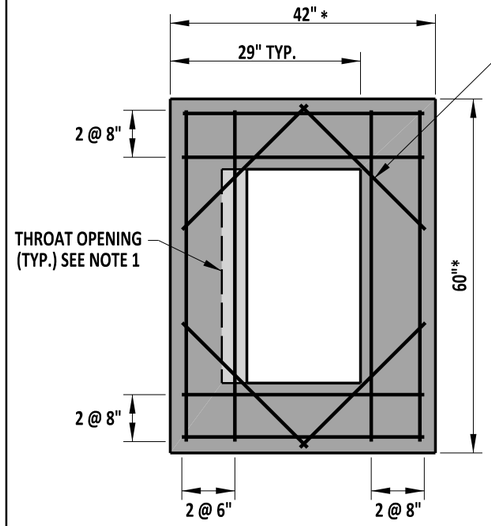
STANDARD NO. D-5 (2020) | SHT. 3 OF 9

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

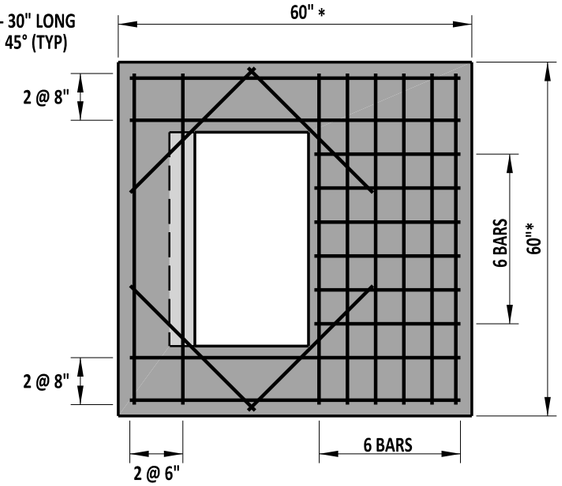
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

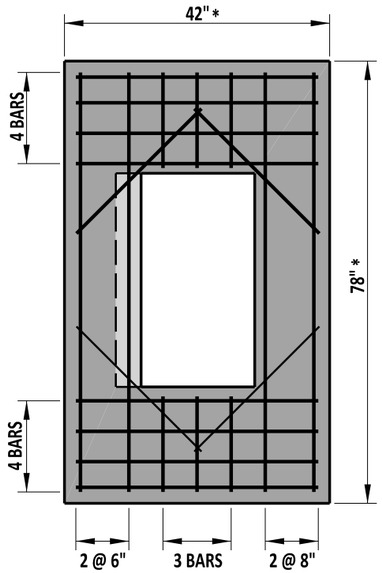
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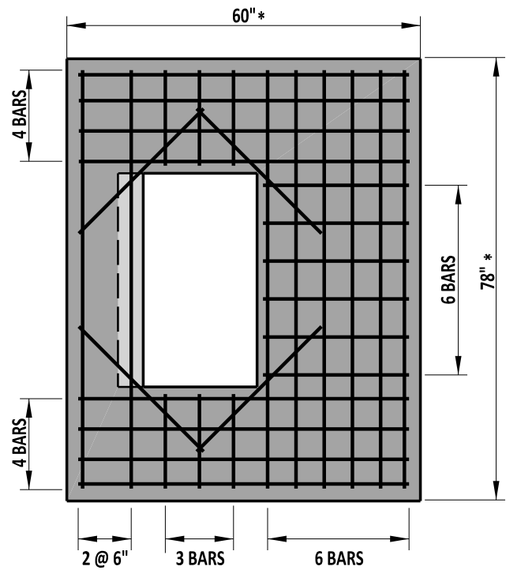

48" x 30" INLET



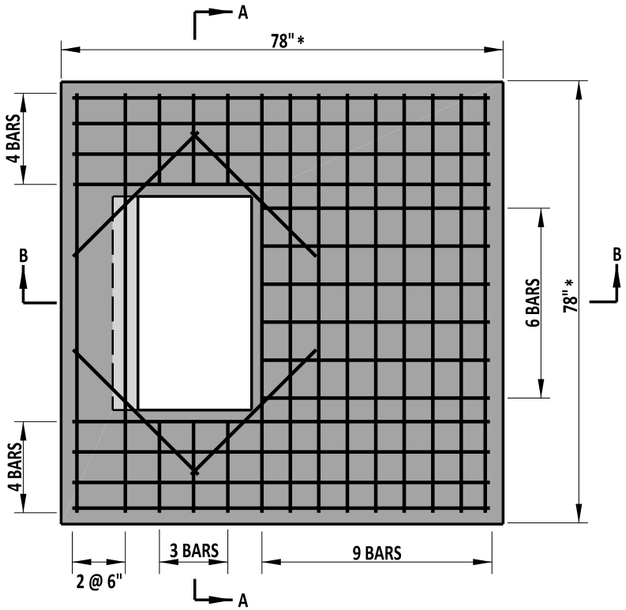

48" x 48" INLET



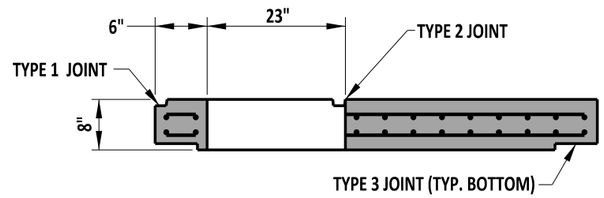

66" x 30" INLET



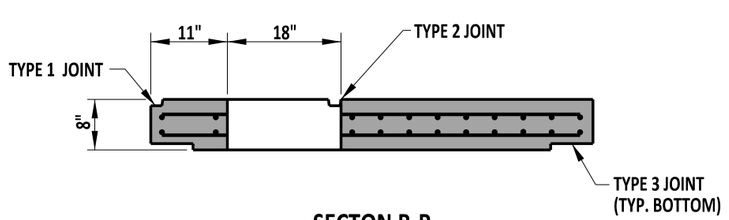

66" x 48" INLET



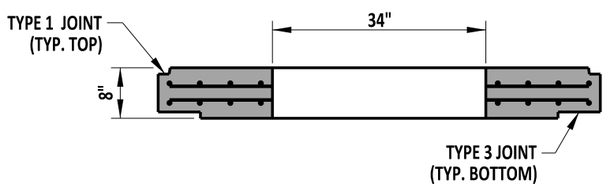

66" x 66" INLET




SECTON B-B
FOR TYPE B TOP UNITS




SECTON B-B
FOR TYPES A, C, D, & E TOP UNITS




SECTION A-A

NOTES :

1). RELOCATE ENCROACHING REINFORCING BARS WHEN USING TYPE B UNIT.
2). USE PRECAST COVER SLABS THAT ARE SIZED TO FIT INLET BOX OUTER DIMENSIONS (SEE DIMENSIONS DENOTED WITH *).
3). ALL BARS ARE TO BE #5 SPACED @ 6" UNLESS NOTED OTHERWISE. USE 0.12 SQ. IN. PER FOOT (MIN.) TOP HORIZONTAL REINFORCEMENT IN BOTH DIRECTIONS.
4). MINIMUM BAR COVER = 1 ½".
5). JOINTS ARE OMITTED FROM PLAN VIEWS FOR CLARITY.

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ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

DRAINAGE INLET COVER SLAB

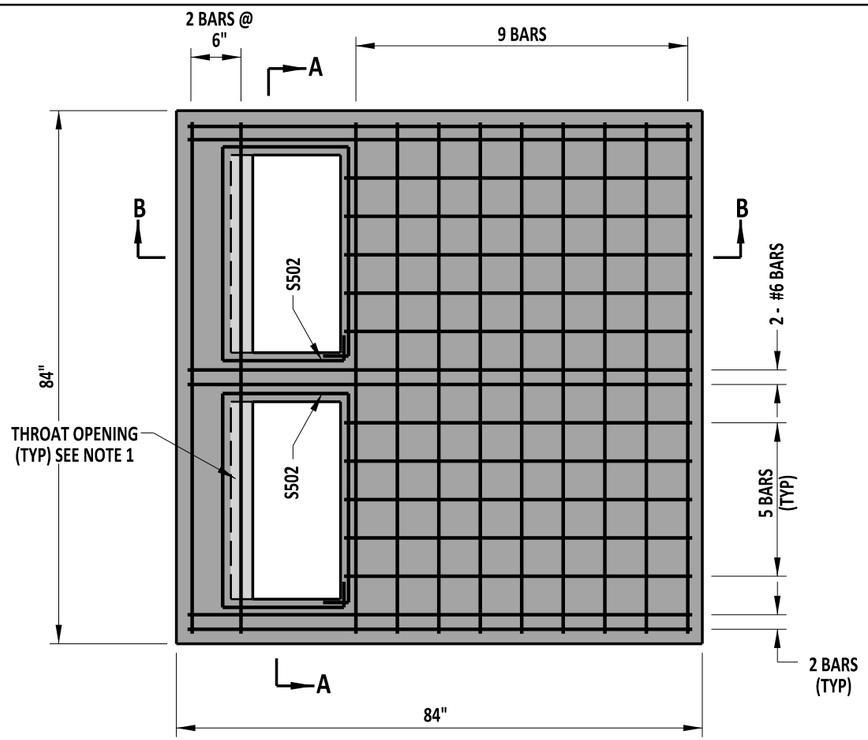
STANDARD NO. D-5 (2020) | SHT. 4 OF 9

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

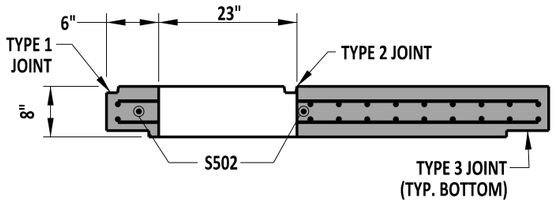
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

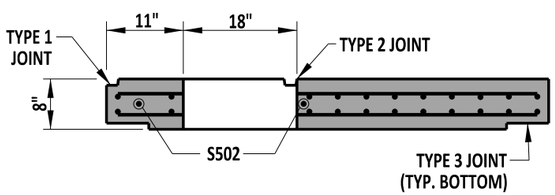
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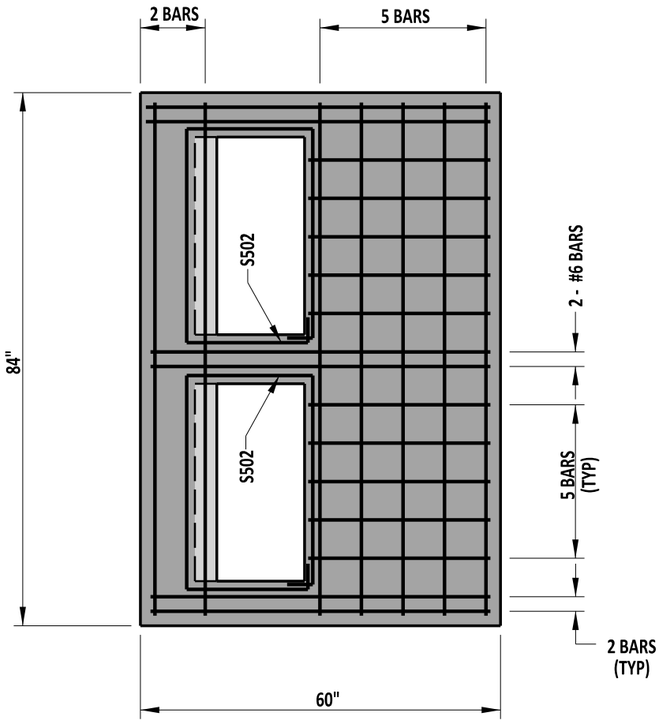

## 72" x 72" INLET



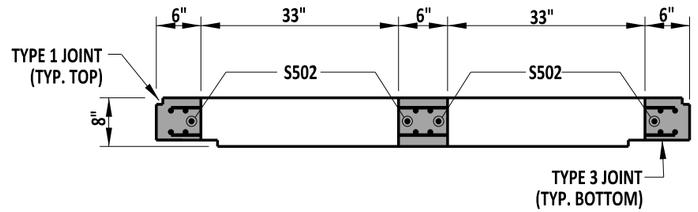

**SECTON B-B**
FOR TYPE B TOP UNITS




**SECTON B-B**
FOR TYPES A, C, D, & E TOP UNITS

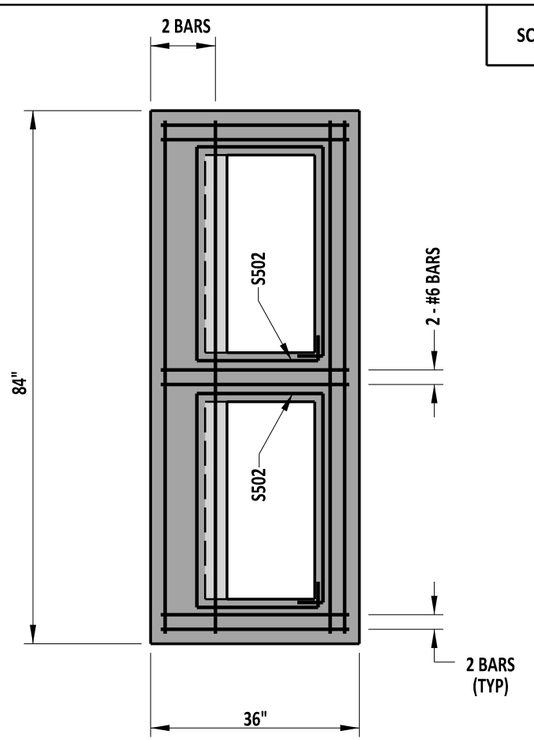



## 72" x 48" INLET

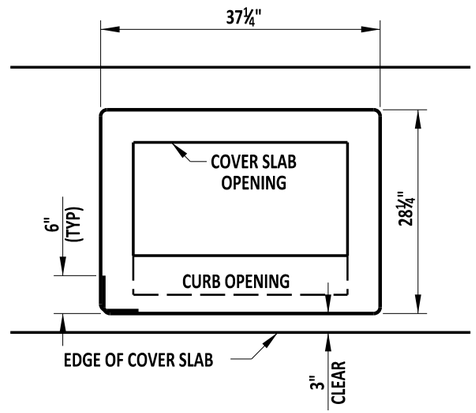



**SECTION A-A**

NOTES:
1). RELOCATE ENCROACHING REINFORCING BARS WHEN USING TYPE B UNIT.
2). USE PRECAST COVER SLABS THAT ARE SIZED TO FIT INLET BOX OUTER DIMENSIONS (SEE DIMENSIONS DENOTED WITH *).
3). ALL BARS ARE TO BE #5 SPACED @ 6" UNLESS NOTED OTHERWISE. USE 0.12 SQ. IN. PER FOOT (MIN.) TOP HORIZONTAL REINFORCEMENT IN BOTH DIRECTIONS.
4). MINIMUM BAR COVER = $1\frac{1}{2}$".
5). JOINTS ARE OMITTED FROM PLAN VIEWS FOR CLARITY.




## 72" x 24" INLET




**S502 BENDING DIAGRAM**
#5 BAR IS TO BE CONTINUOUS OR WITH A 12" OVERLAP BETWEEN BARS.

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09/01/2020
ENGINEERING SUPPORT — DATE
RECOMMENDED

DOUBLE INLET COVER SLAB

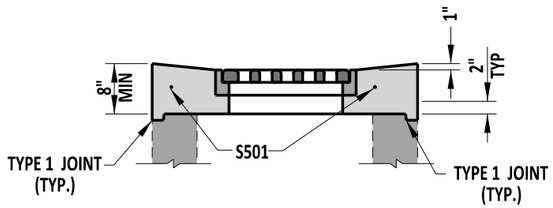
STANDARD NO. D-5 (2020) | SHT. 5 OF 9

REVIEWED
DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

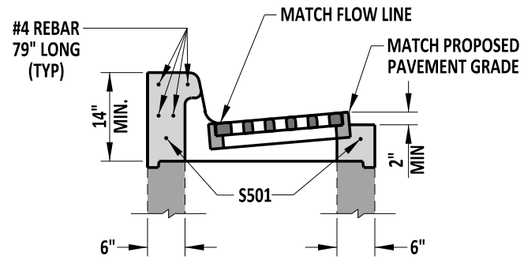
APPROVED
CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

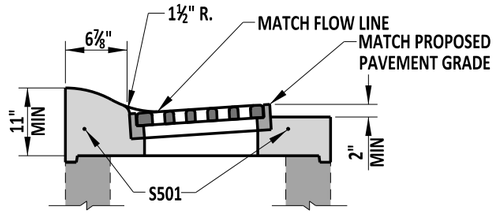
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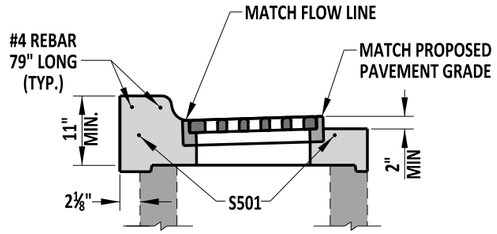

TYPE A



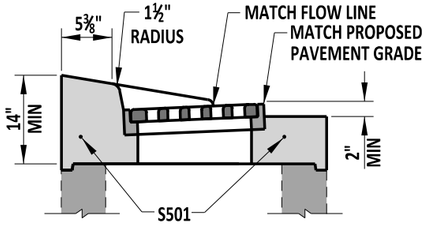

TYPE B




TYPE D



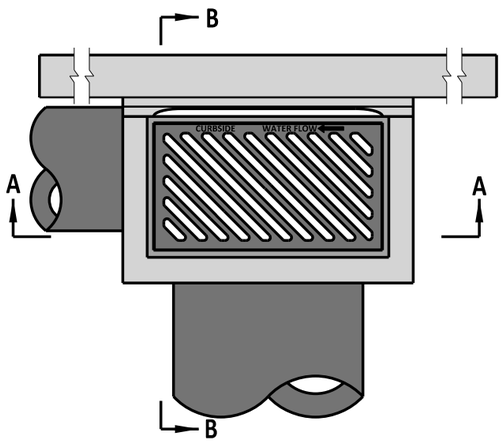

TYPE C



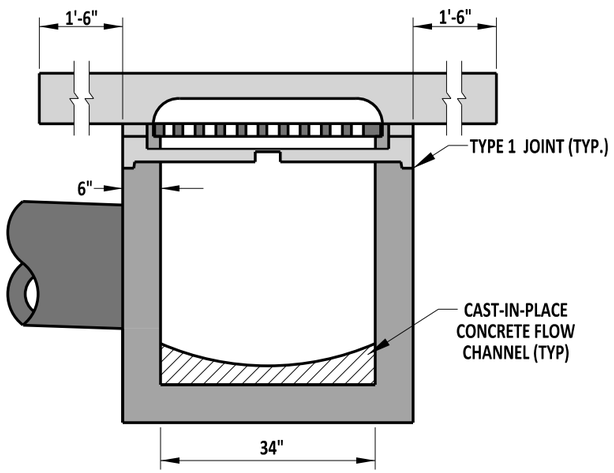

TYPE E

## TOP UNIT DETAILS

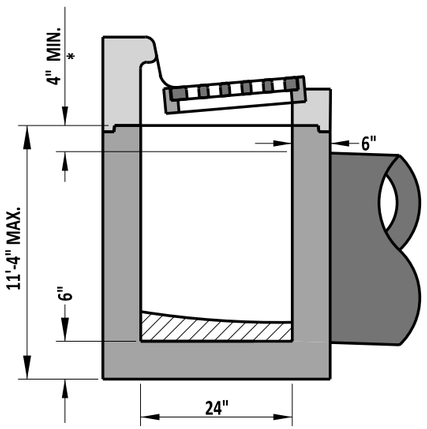
NOTE: SEE DETAIL D-5, SHEET 3 OF 9 FOR INLET TOP UNIT APPLICATIONS.




TOP VIEW




SECTION A-A




SECTION B-B

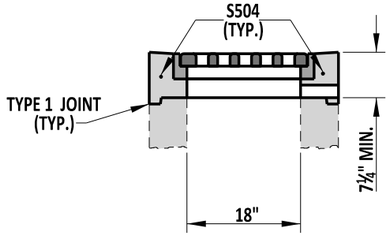
## DRAINAGE INLET DETAILS

NOTE: REFER TO PREVIOUS SHEETS FOR REINFORCING REQUIREMENTS
* - SEE OPTIONAL PIPE OPENING DETAIL ON STANDARD NO. D-4, SHEET 1 OF 1

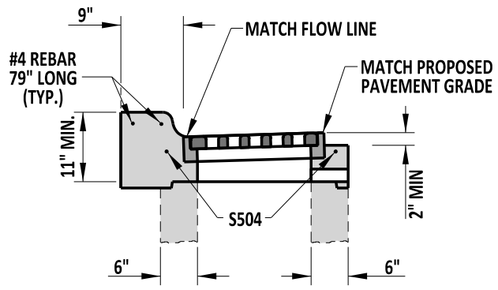
| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | 34" x 24" DRAINAGE INLET | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. D-5 (2020) SHT. 6 OF 9 | APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/20/2020

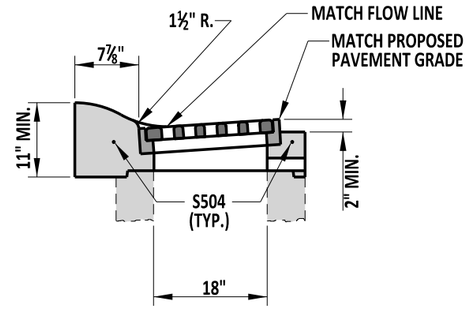
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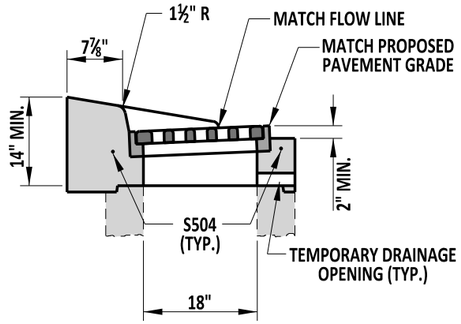

TYPE A




TYPE C

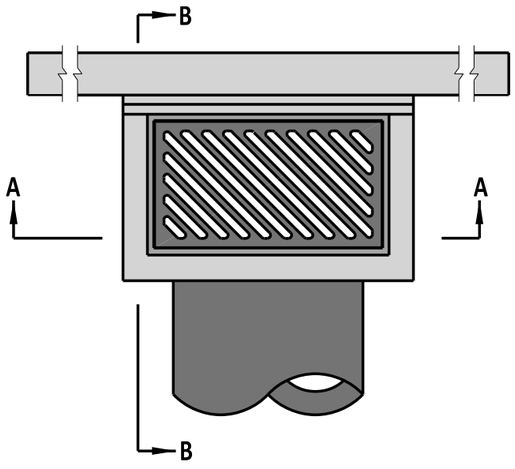



TYPE D

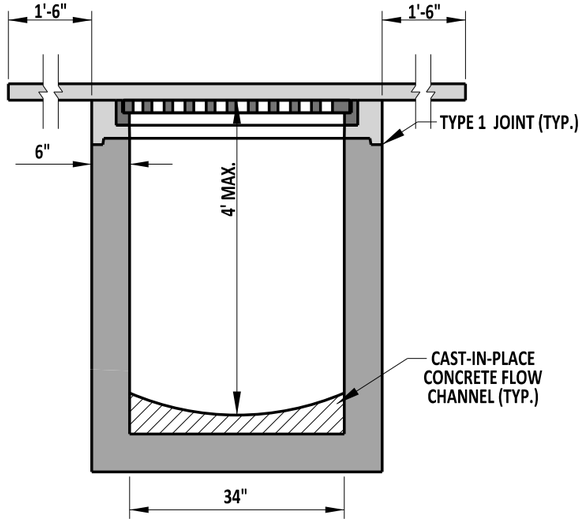



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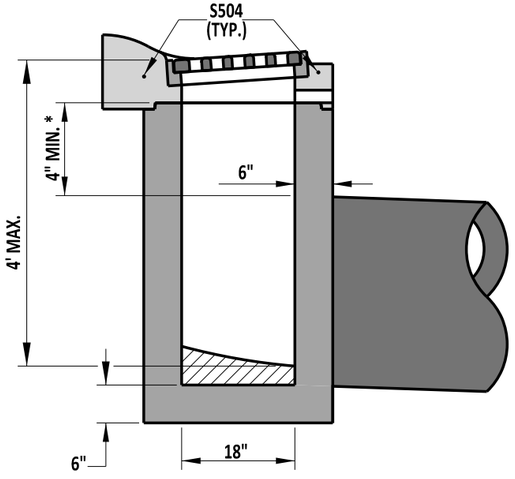
## TOP UNIT DETAILS




TOP VIEW

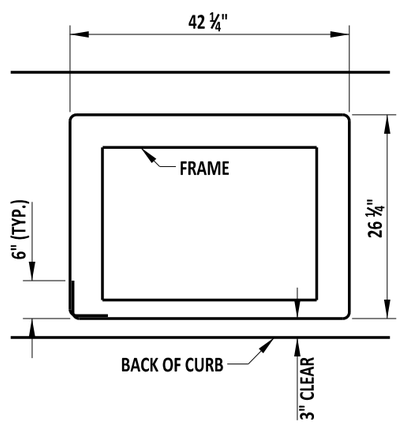



SECTION A-A




SECTION B-B

* - SEE OPTIONAL PIPE OPENING DETAIL ON STANDARD D-4, SHEET 1 OF 1.




S504 BENDING DIAGRAM

#5 REBAR TO BE CONTINUOUS OR WITH 12" OVERLAP BETWEEN BARS.

NOTES:

1). REFER TO PREVIOUS SHEETS FOR REINFORCEMENT REQUIREMENTS.
2). THE HEIGHT OF THIS INLET IS LIMITED TO 4' MAXIMUM, THEREFORE STEPS WILL NOT BE REQUIRED AND SHOULD NOT BE INSTALLED ON THIS INLET.
3). REFER TO DETAIL D-5, SHEET 3 OF 9 FOR INLET TOP UNIT APPLICATION.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

34" x 18" DRAINAGE INLET

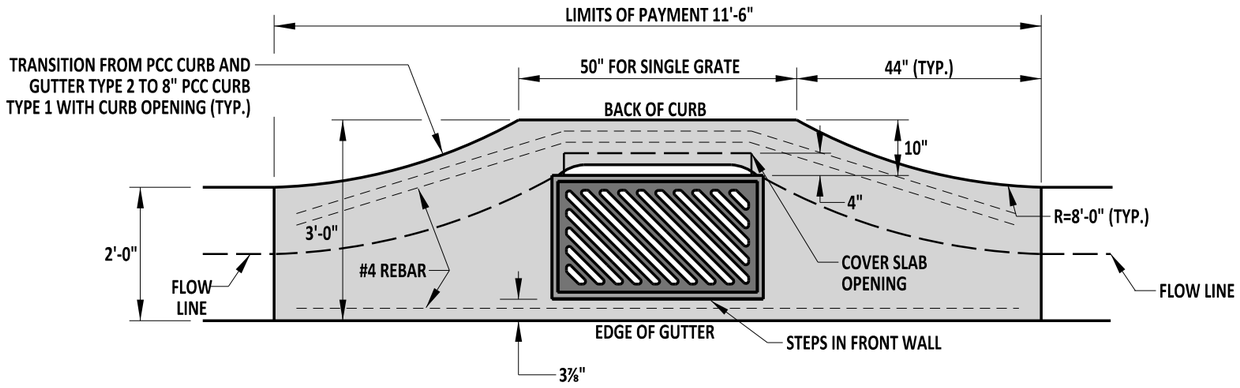
STANDARD NO. D-5 (2020) | SHT. 7 OF 9

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

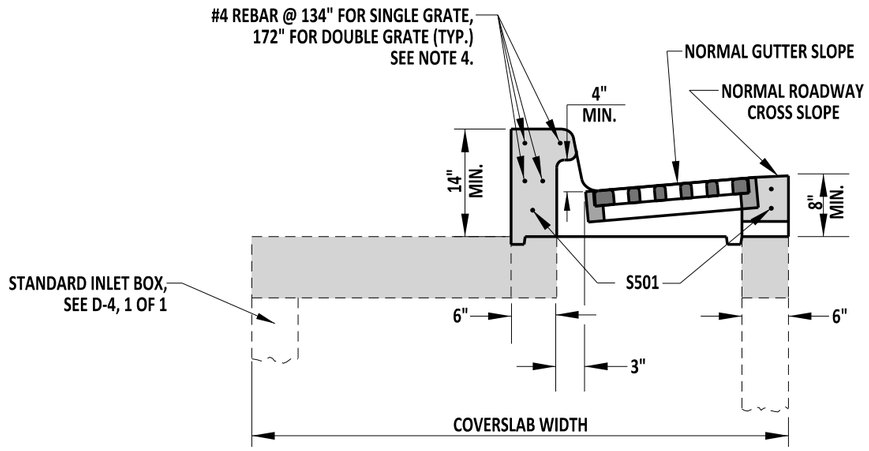
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

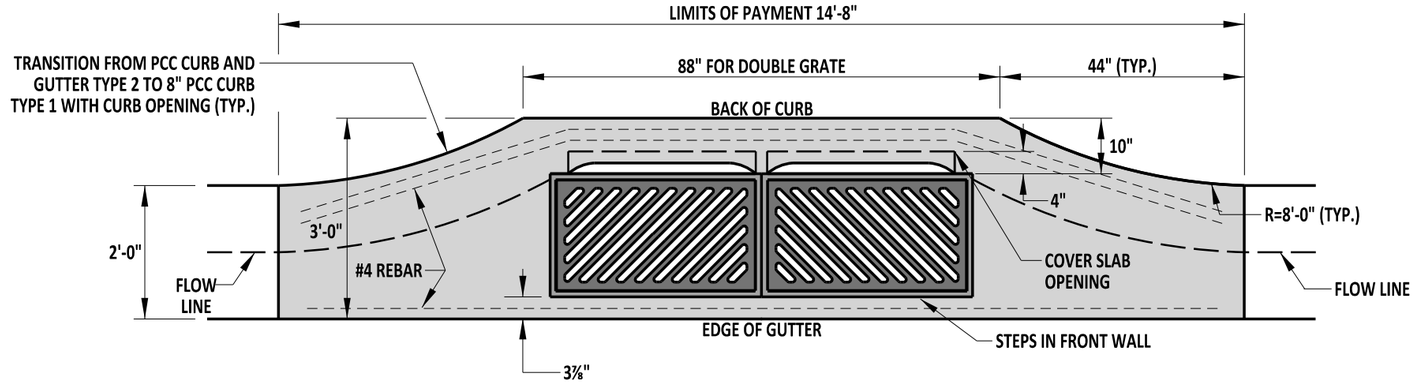
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## SINGLE GRATE SETUP




## SUBDIVISION TOP & CONFIGURATION




## DOUBLE GRATE SETUP

NOTES:

1). MINIMUM BOX SIZE TO BE 34" x 24".
2). FOR PIPE OPENINGS IN THE FRONT WALL, SHIFT THE PIPE HORIZONTALLY TO AVOID INTERFERENCE WITH THE STEPS. IT MAY BE NECESSARY TO USE A LARGER BOX TO AVOID CONFLICT BETWEEN STEPS AND PIPE OPENING.
3). SEE D-5, SHEET 3 OF 9, FOR S501 BAR DIAGRAM.
4). THE REBAR IN THE HEAD IS PREFERRED TO BE ONE CONTINUOUS PIECE. HOWEVER, IF MULTIPLE PIECES ARE TO BE USED, PROVIDE A 12" MINIMUM LAP AND THE TOTAL LENGTH OF REBAR AS NOTED ON THIS DETAIL.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

DRAINAGE INLET TOP UNIT, TYPE S

STANDARD NO. D-5 (2020) | SHT. 8 OF 9

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

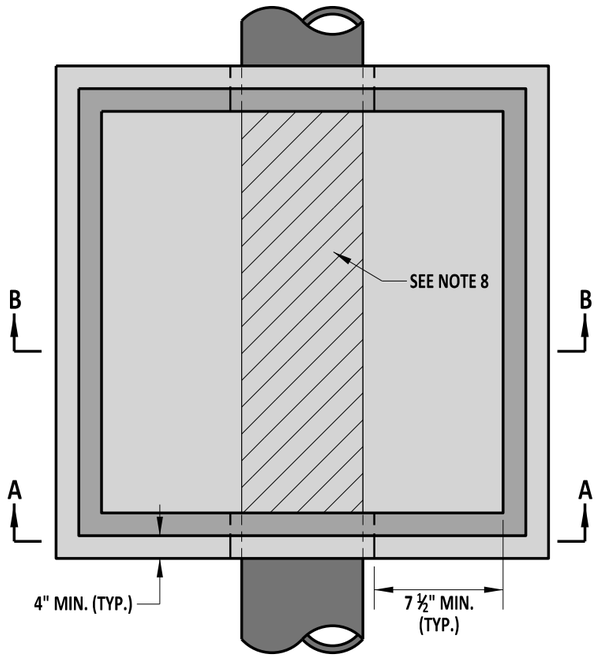
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

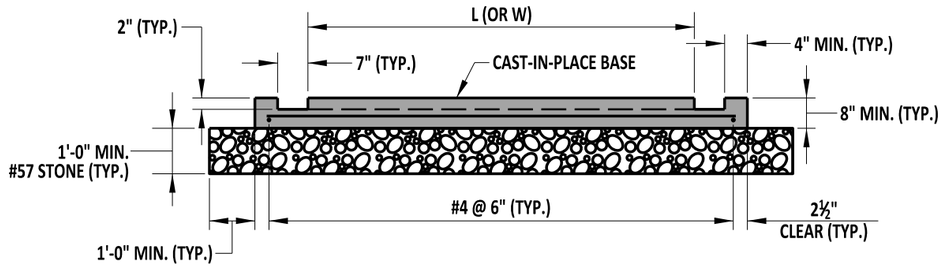
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NOTES:

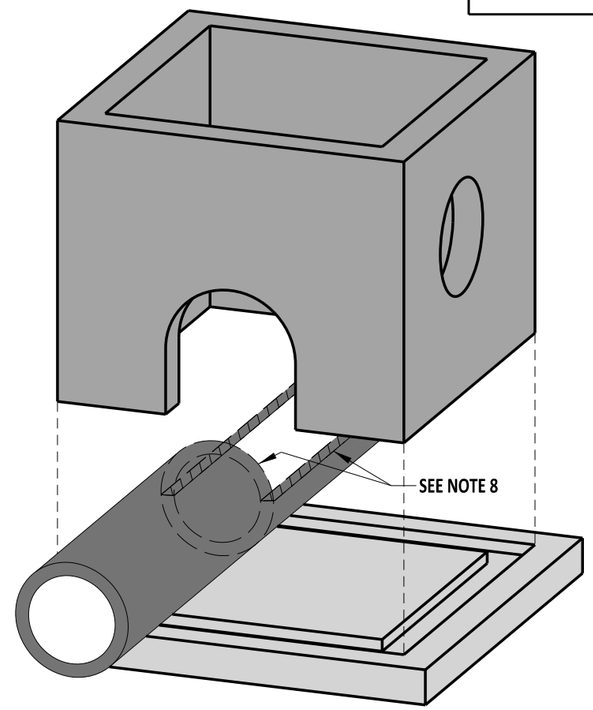
1). PRECAST THE DOGHOUSE INLET BOX AND CAST-IN-PLACE THE BASE UNLESS OTHERWISE SPECIFIED IN THE CONTRACT. SEE DETAIL D-4, SHEET 1 OF 1 FOR BOX DETAILS AND NOTES.
2). PROVIDE A MINIMUM COVER OF 1 ½" FOR ALL REINFORCEMENT, UNLESS NOTED OTHERWISE.
3). SUPPORT BOTH ENDS OF THE PIPE DURING THE CONSTRUCTION OF THE BASE.
4). SEE TABLE ON DETAIL D-4, SHEET 1 OF 1 FOR WALL REINFORCEMENT DETAILS.
5). FILL DOGHOUSE OPENING WITH HIGH STRENGTH, NON-SHRINK GROUT MIXED WITH COARSE AGGREGATE IN A 1:1 RATIO BY WEIGHT.
6). MAINTAIN A MINIMUM OF 12" FROM THE TOP OF THE DOGHOUSE OPENING TO THE TOP OF THE BOX. ADDITIONAL REINFORCEMENT AT PIPE OPENING REQUIRED AS SHOWN.
7). CONSTRUCT DOGHOUSE OPENING BETWEEN 3" AND 4" LARGER THAN THE OUTSIDE DIAMETER OF THE PIPE. DO NOT ENCROACH ON THE ADJACENT WALL.
8). INSIDE THE DOGHOUSE STRUCTURE, REMOVE THE EXISTING PIPE BY SAWCUTTING FLUSH WITH THE INSIDE WALL FACE. ALTERNATELY, REMOVE THE TOP HALF OF THE PIPE AND USE THE REMAINING PIPE SECTION AS THE BOTTOM OF THE FLOW CHANNEL, AS SHOWN IN SECTION B-B.



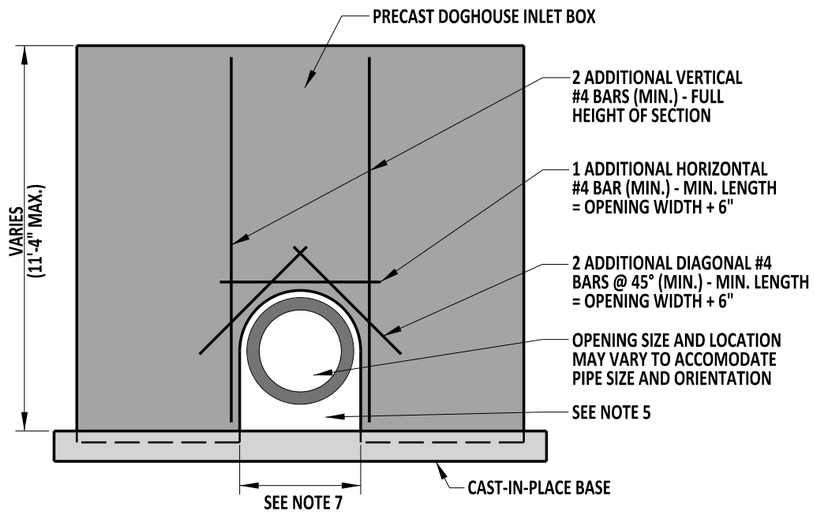

PLAN VIEW



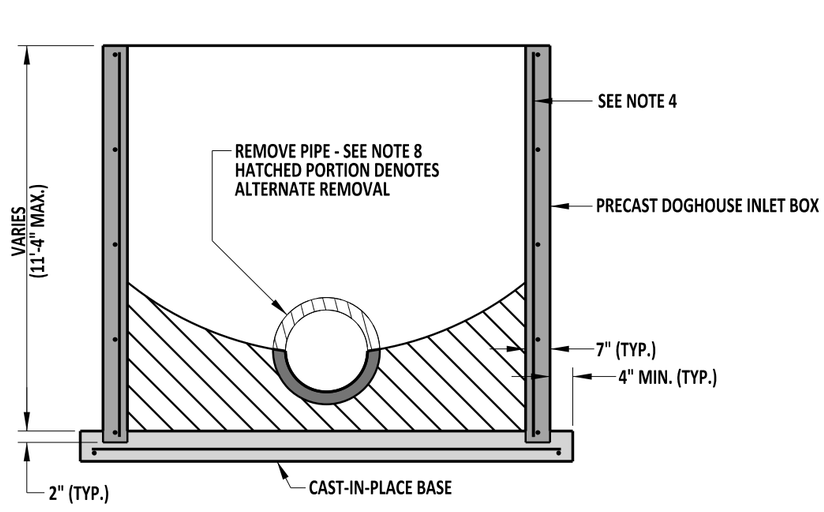

CAST-IN-PLACE BASE SECTION VIEW




ISOMETRIC VIEW




SECTION A-A




SECTION B-B

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ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

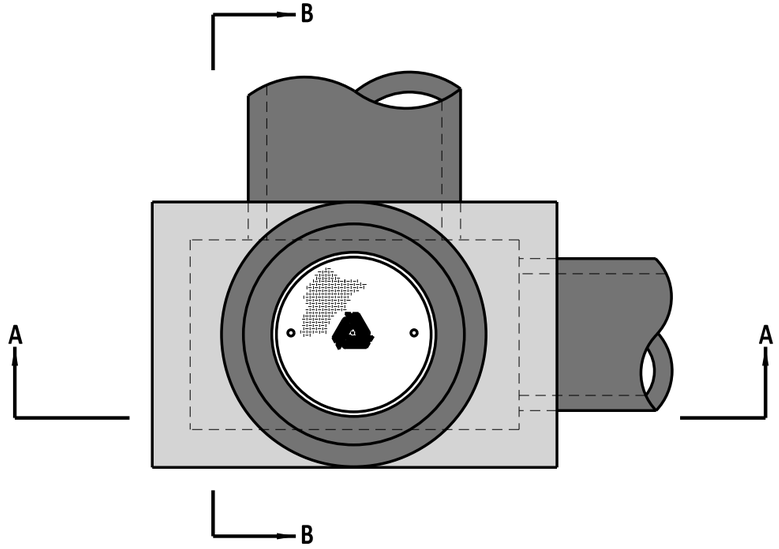
DOGHOUSE INLET BOX

STANDARD NO. D-5 (2020) | SHT. 9 OF 9

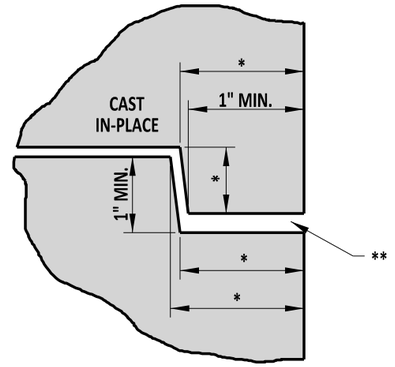
REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

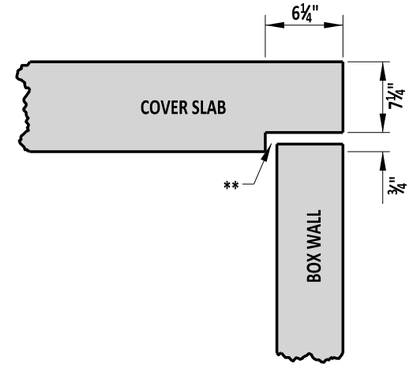
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PLAN

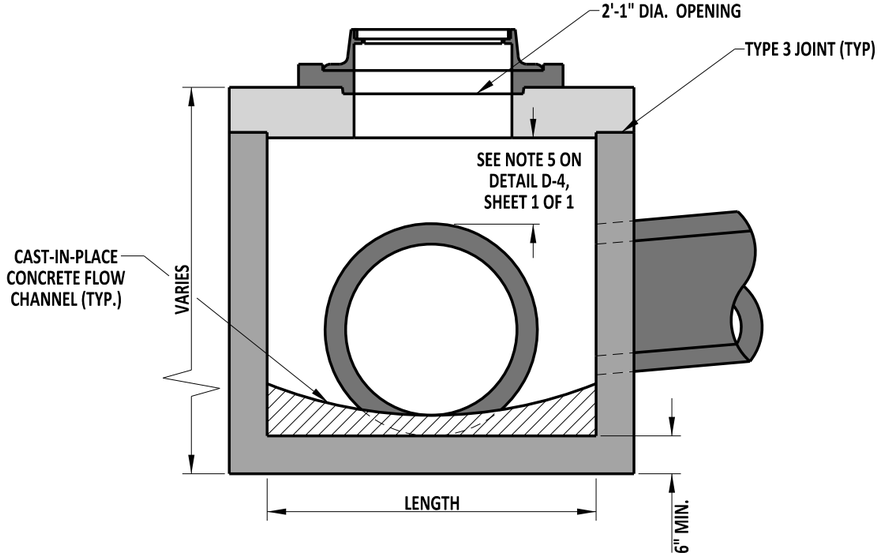



TYPE 1 JOINT DETAIL



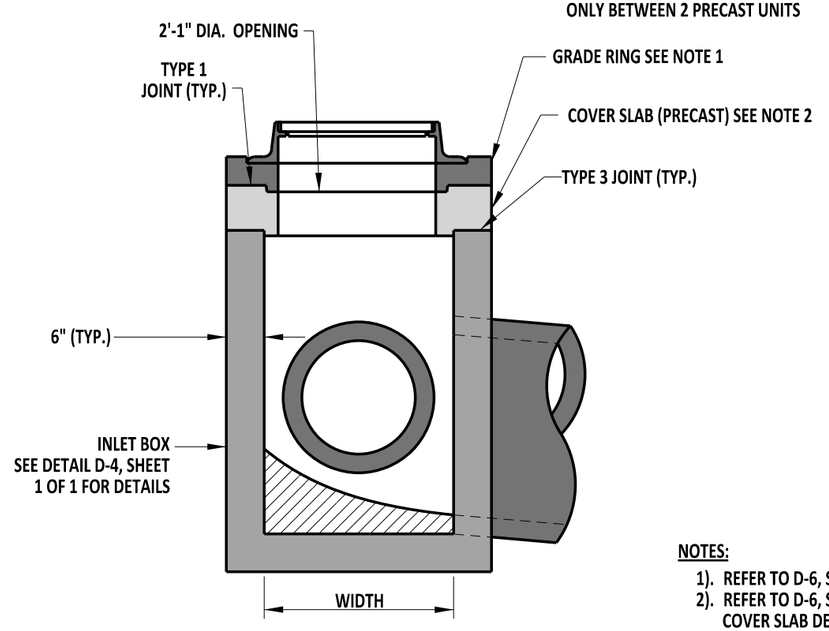

TYPE 3 JOINT DETAIL

* DIMENSIONS MAY VARY
** JOINT SEALANT AS PER SPECIFICATIONS ONLY BETWEEN 2 PRECAST UNITS




SECTION A-A

* - SEE OPTIONAL PIPE OPENING DETAIL ON STANDARD D-4, SHEET 1 OF 1.




SECTION B-B

NOTES:

1). REFER TO D-6, SHEET 3 OF 5, FOR GRADE RING DETAILS.
2). REFER TO D-6, SHEET 4 OF 5, FOR BOX MANHOLE COVER SLAB DETAILS.
3). INSTALL STEPS AS PER SECTION 602.3.B OF THE STANDARD SPECIFICATIONS.

## BOX MANHOLE ASSEMBLY

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ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

BOX MANHOLE ASSEMBLY

STANDARD NO. D-6 (2020) | SHT. 1 OF 5

REVIEWED
DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED
CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

SCALE : NTS

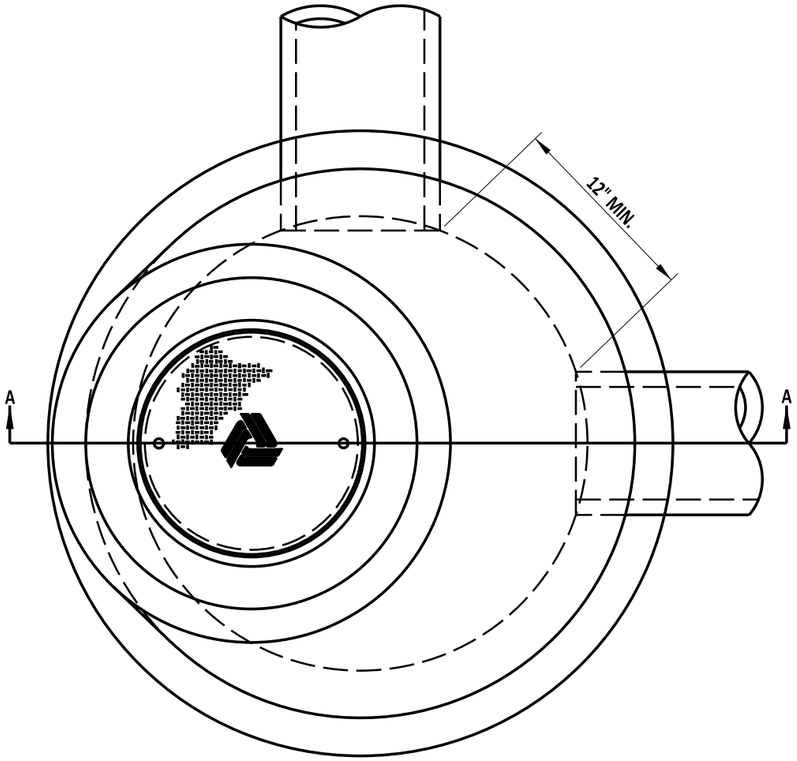
| MINIMUM PRECAST ROUND MANHOLE REQUIREMENTS | | | |
|---|---|---|---|
| MANHOLE DIAMETER | MINIMUM WALL THICKNESS | CIRCUMFERENTIAL REINFORCEMENT* (PER VERTICAL FOOT) | BASE SLAB THICKNESS** |
| 48" | 4" | 0.12 $IN^2$ | 6" |
| 60" | 5" | 0.15 $IN^2$ | 8" |
| 72" | 6" | 0.18 $IN^2$ | 8" |
| 84" | 7" | 0.21 $IN^2$ | 8" |

**ADDITIONAL MINIMUM REQUIREMENTS:**

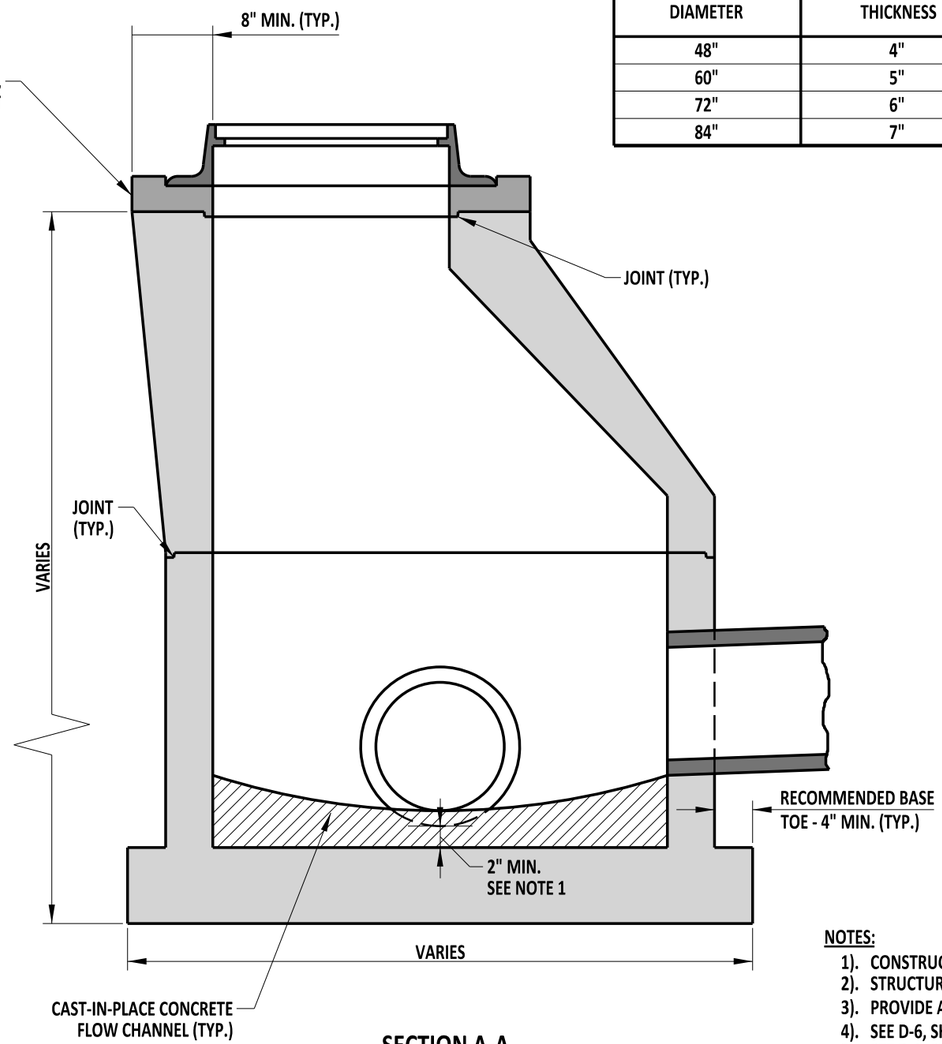
* MINIMUM VERTICAL REINFORCEMENT:
ASSEMBLE EACH LINE OF HORIZONTAL REINFORCEMENT INTO A CAGE CONTAINING SUFFICIENT VERTICAL BARS OR MEMBERS TO MAINTAIN THE REINFORCEMENT IN SHAPE AND POSITION WITHIN THE FORM.

** MINIMUM BASE SLAB REINFORCEMENT:
PROVIDE A MINIMUM OF ONE LAYER IN EACH DIRECTION, LOCATED ABOVE THE MIDPOINT. PROVIDE MINIMUM AREA OF 0.12 SQ. IN. PER LINEAR FOOT IN EACH LAYER.

*** ADDITIONAL REINFORCEMENT AT OPENINGS:
PLACE 8 ADDITIONAL #4 BARS (2 HORIZ., 2 VERT. 4 DIAGONAL) AROUND EACH OPENING IN MANHOLE RISER OR BASE SECTIONS. MAKE BAR LENGTH = OPENING SIZE + 6".




PLAN




SECTION A-A

ROUND MANHOLE ASSEMBLY

**NOTES:**

1). CONSTRUCT ROUND MANHOLES IN ACCORDANCE WITH AASHTO M 199.
2). STRUCTURE BASE TOE IS RECOMMENDED TO COUNTERACT BUOYANCY.
3). PROVIDE A MINIMUM COVER OF 1½" FOR ALL REINFORCEMENT.
4). SEE D-6, SHEET 3 OF 5, FOR GRADE RING DETAILS.
5). SEE D-6, SHEET 5 OF 5, FOR ROUND COVER SLAB DETAILS.
6). INSTALL PIPES FLUSH WITH MANHOLE WALL PER DELDOT STANDARD SPECIFICATIONS SECTION 602.3.
7). FABRICATOR IS RESPONSIBLE FOR LIFTING, HANDLING AND TRANSPORTATION STRESSES.
8). STEPS ARE REQUIRED FOR ALL MANHOLES 4'-0" DEPTH OR GREATER. STEPS SHALL BE INSTALLED IN ACCORDANCE WITH AASHTO M 199.

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ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

ROUND MANHOLE ASSEMBLY

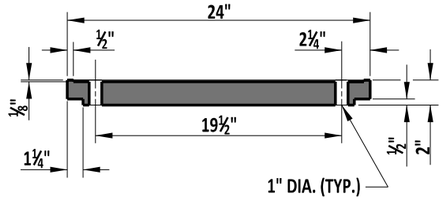
STANDARD NO. D-6 (2020) | SHT. 2 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

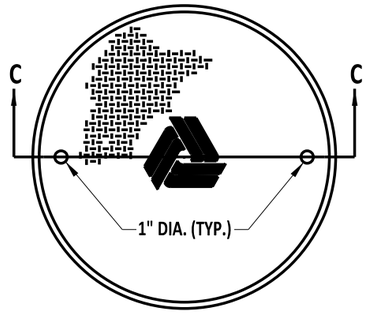
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

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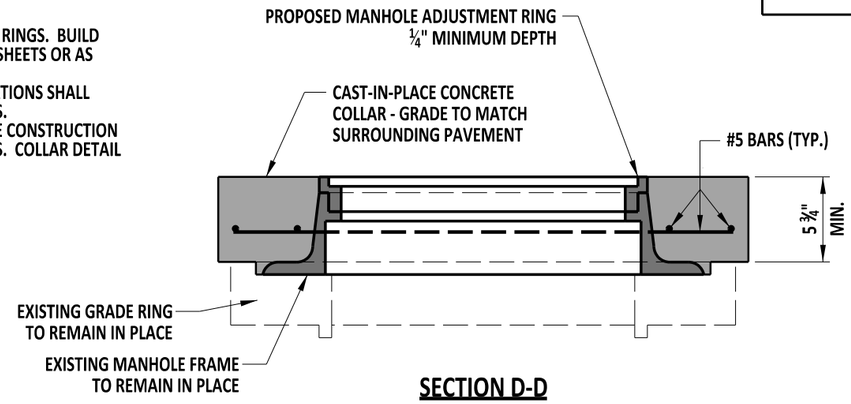

SECTION C-C



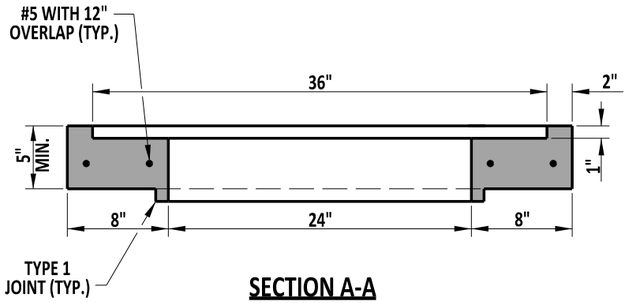

COVER

NOTES:

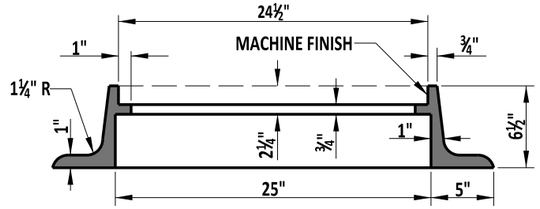
1). DETAILS SHOWN ARE FOR CAST-IN-PLACE GRADE RINGS. BUILD GRADE RINGS TO GRADE AS SPECIFIED ON PLAN SHEETS OR AS DIRECTED BY ENGINEER.
2). IF GRADE RINGS ARE PRECAST, DESIGN SPECIFICATIONS SHALL CONFORM TO AASHTO M-199, LATEST REVISIONS.
3). COLLAR DETAILS SHOWN ARE FOR CAST-IN-PLACE CONSTRUCTION AROUND MANHOLE ADJUSTMENTS AND REPAIRS. COLLAR DETAIL IS NOT INTENDED FOR NEW CONSTRUCTION
4). PROVIDE MINIMUM COVER OF 1½".



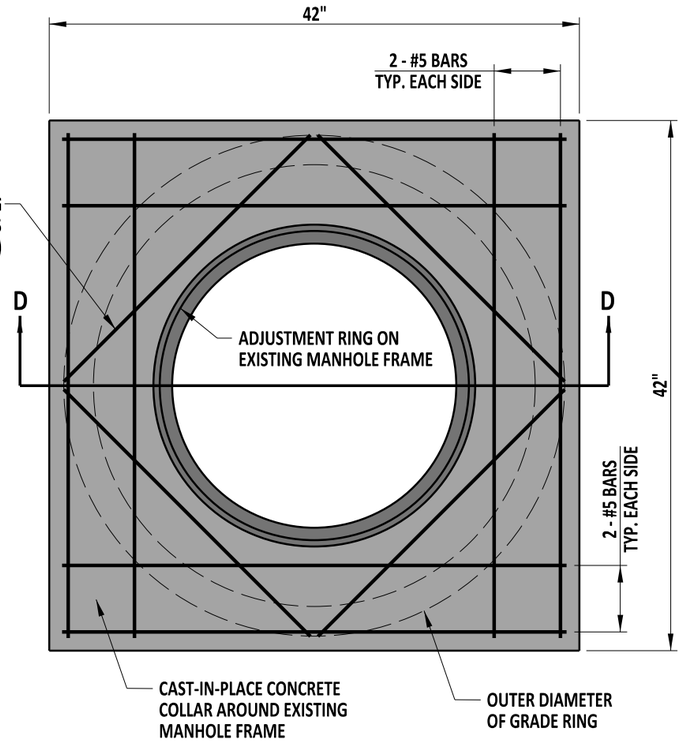

SECTION D-D




SECTION A-A



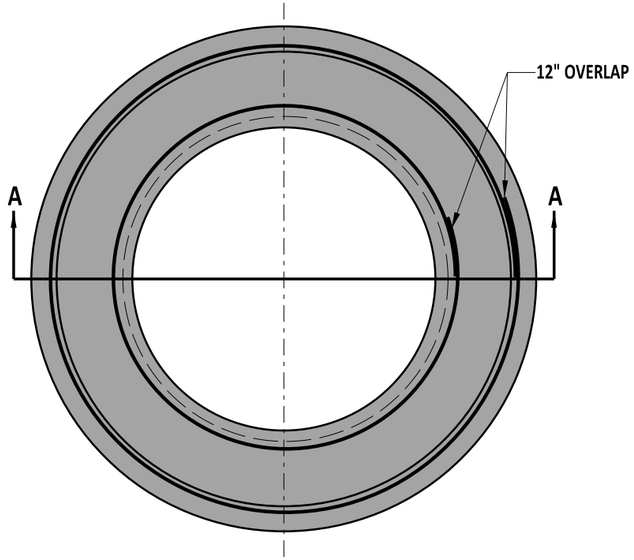

SECTION B-B



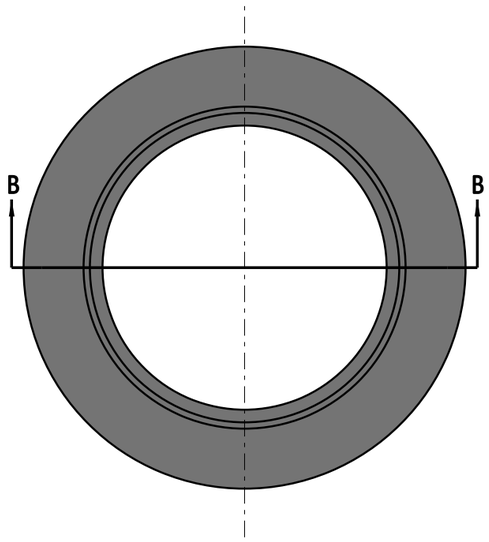

NOTES:

1). USE TOP UNIT WHERE BITUMINOUS PAVEMENT IS NOT AVAILABLE.
2). WHERE COLLAR EXTENDS BEYOND GRADE RING, PREPARE ADEQUATE SUB-BASE.

TOP UNIT




GRADE RING




FRAME

DelDOT

09/01/2020
ENGINEERING SUPPORT DATE
RECOMMENDED

MANHOLE GRADE RING, TOP UNIT, FRAME AND COVER

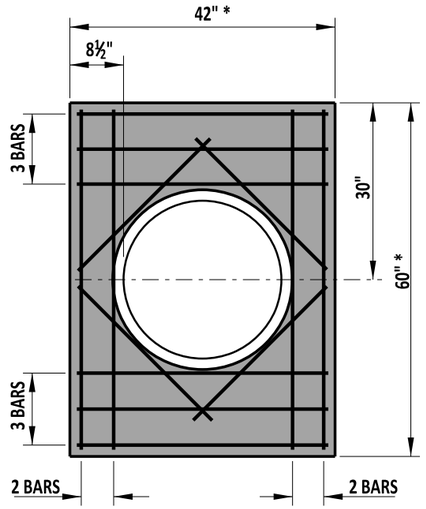
STANDARD NO. D-6 (2020) | SHT. 3 OF 5

REVIEWED
DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE

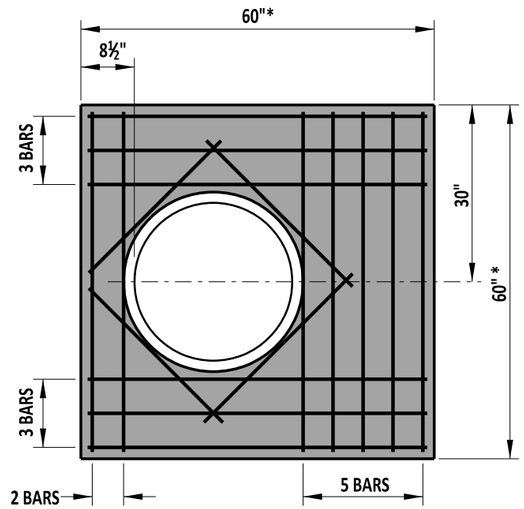
APPROVED
CHIEF ENGINEER 09/01/2020 DATE

08/20/2020

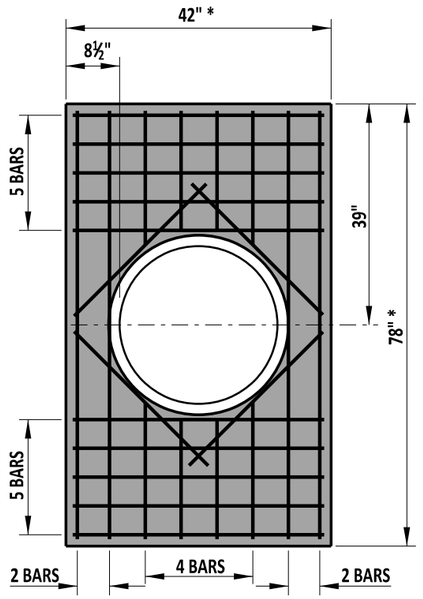
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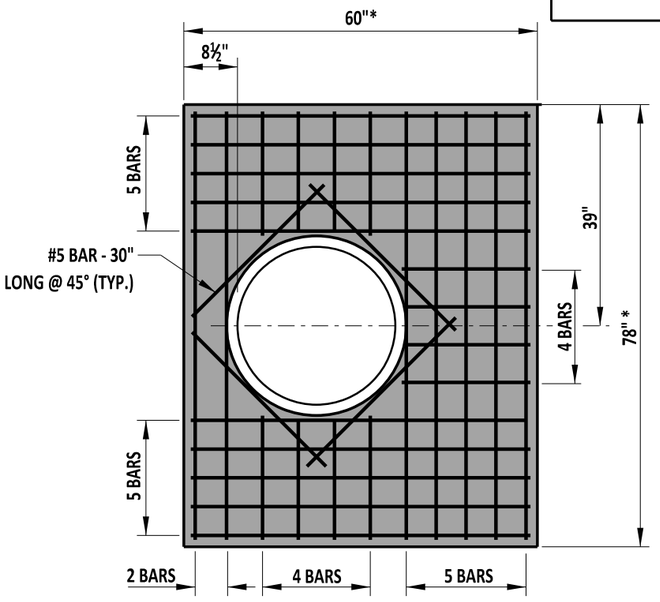

48" X 30" MANHOLE



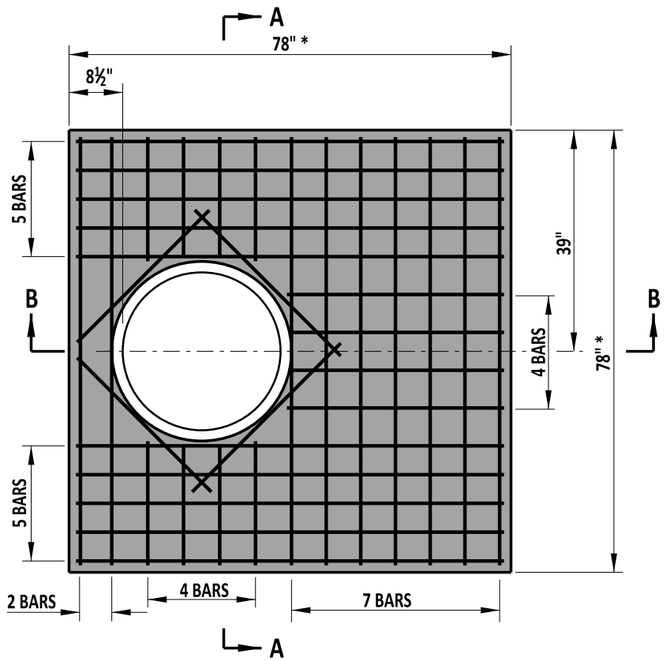

48" X 48" MANHOLE



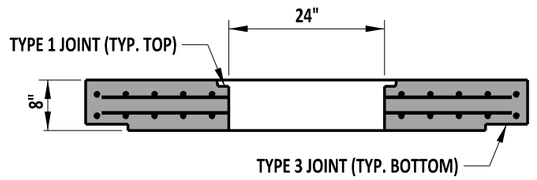

66" X 30" MANHOLE



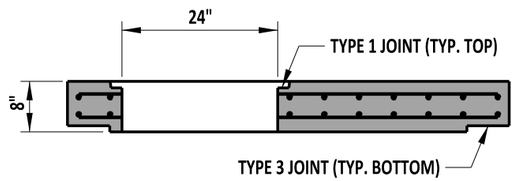

66" X 48" MANHOLE




66" x 66" MANHOLE




SECTION A-A




SECTION B-B

NOTES:

1). PRECAST COVER SLABS.
2). USE #5 BARS SPACED AT 6" UNLESS NOTED OTHERWISE.
3). PROVIDE A MINIMUM BAR COVER OF 1½".
4). COVER SLAB DESIGN SPECIFICATIONS SHALL MEET HL-93 LOADING AND CONFORM TO AASHTO M-199, LATEST REVISIONS.

* DIMENSIONS TO MATCH OUTSIDE TO OUTSIDE DIMENSIONS OF BOX.

BOX MANHOLE COVER SLAB DETAILS

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

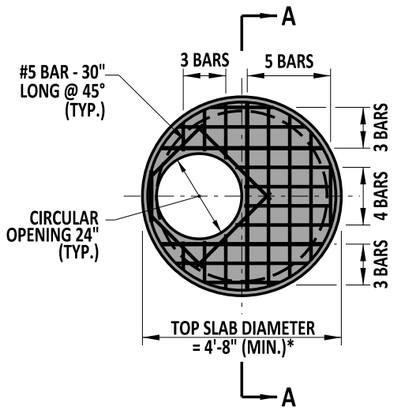
BOX MANHOLE COVER SLAB

STANDARD NO. D-6 (2020) | SHT. 4 OF 5

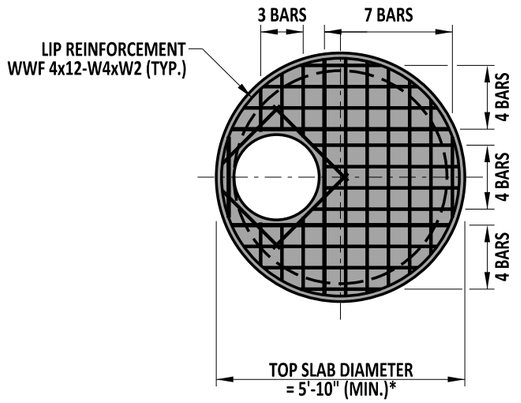
REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

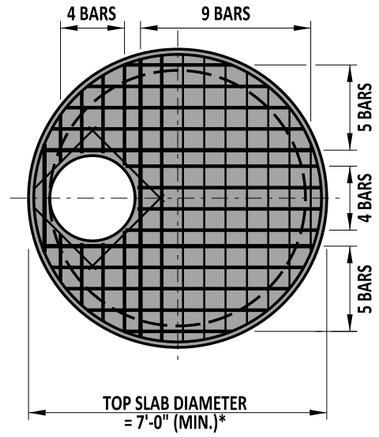
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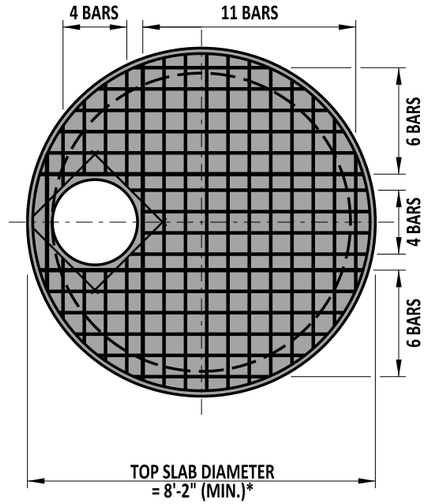

48" DIAMETER MANHOLE




60" DIAMETER MANHOLE

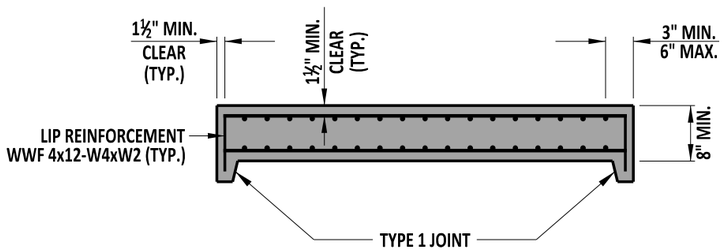



72" DIAMETER MANHOLE




84" DIAMETER MANHOLE

## ROUND MANHOLE COVER SLAB DETAILS




**SECTION A-A**
(ADDITIONAL REINFORCEMENT NOT SHOWN)

NOTES:

1). PRECAST COVER SLABS.
2). USE #5 BARS SPACED AT 6" UNLESS NOTED OTHERWISE.
3). PROVIDE A MINIMUM BAR COVER OF 1½".
4). COVER SLAB DESIGN SPECIFICATIONS SHALL MEET HL-93 LOADING AND CONFORM TO AASHTO M-199, LATEST REVISIONS.

* DIMENSIONS TO MATCH OUTSIDE TO OUTSIDE DIMENSIONS OF MANHOLE. SEE SHEET 3 OF 5 FOR MINIMUM WALL THICKNESS.

| | | | | |
|---|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | ROUND MANHOLE COVER SLAB | REVIEWED | DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. D-6 (2020) SHT. 5 OF 5 | APPROVED | CHIEF ENGINEER 09/01/2020 DATE |

08/20/2020

SCALE : NTS

# D-7 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

DelDOT

ENGINEERING SUPPORT _____ DATE _____
RECOMMENDED

STANDARD NO. D-7 (2020)

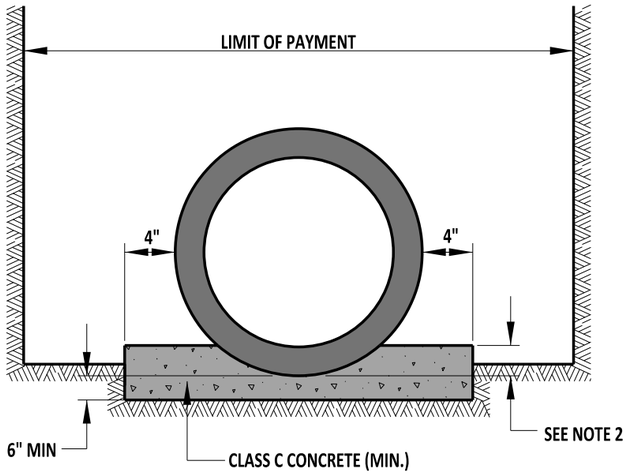
SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

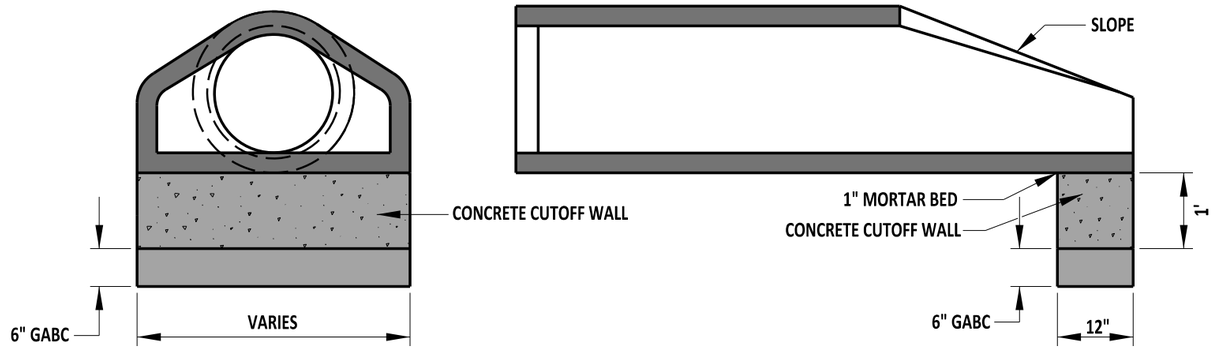
APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

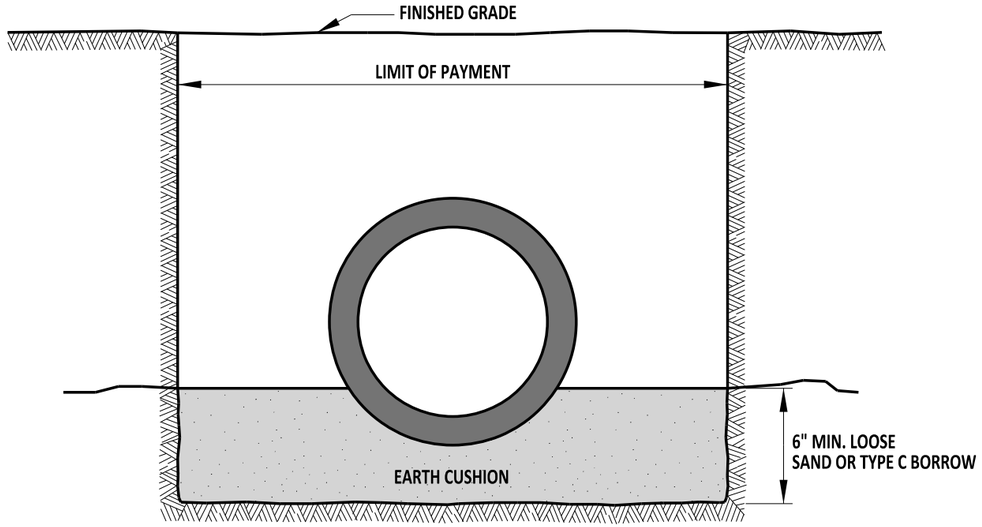
SCALE : NTS




## CLASS A PIPE BEDDING




## END SECTIONS FOR CONCRETE PIPE




## CLASS C PIPE BEDDING

## PIPE BEDDING

**NOTES:**

1). USE CLASS C BEDDING UNLESS OTHERWISE INDICATED.
2). FOR CLASS A BEDDING, IMBED PIPE IN CONCRETE 6" FOR PIPES SMALLER THAN 24" I.D., 10" FOR PIPES 24" TO 60", AND FOR PIPES LARGER THAN 60" SEE PROJECT DETAILS.
3). USE IN SITU MATERIAL AS APPROVED BY THE ENGINEER OR AS PER MANUFACTURER REQUIREMENTS.
4). USE CLASS B CONCRETE FOR CONCRETE CUTOFF WALLS, PRECAST AS DIRECTED BY THE ENGINEER.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

PIPE BEDDING AND PIPE FLARED END SUPPORT

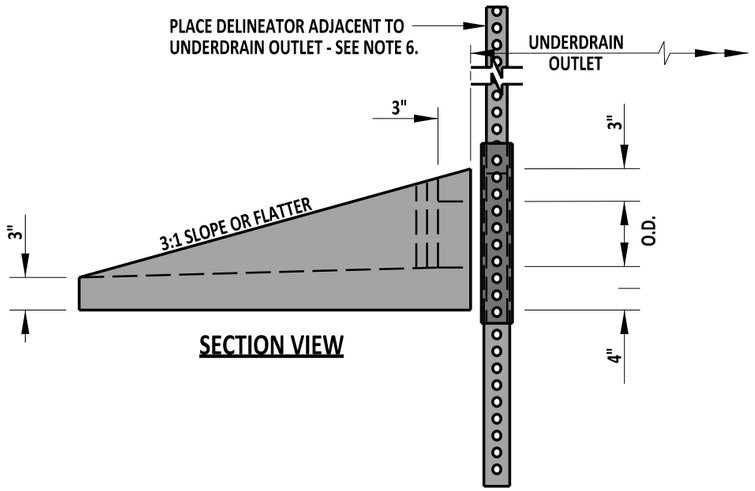
STANDARD NO. D-8 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

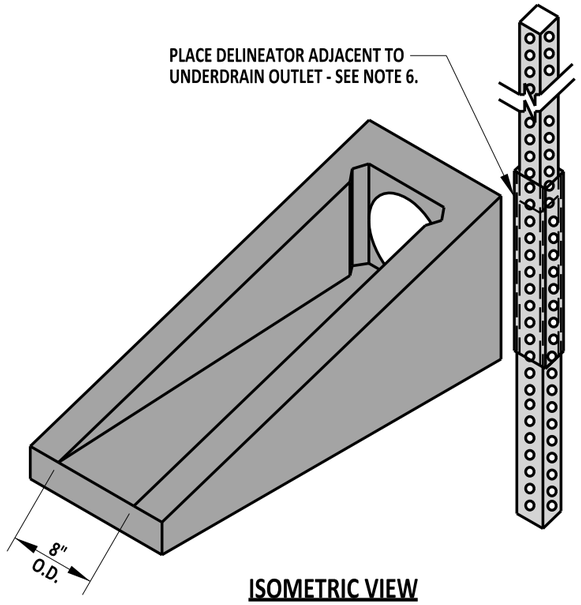
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

SCALE : NTS

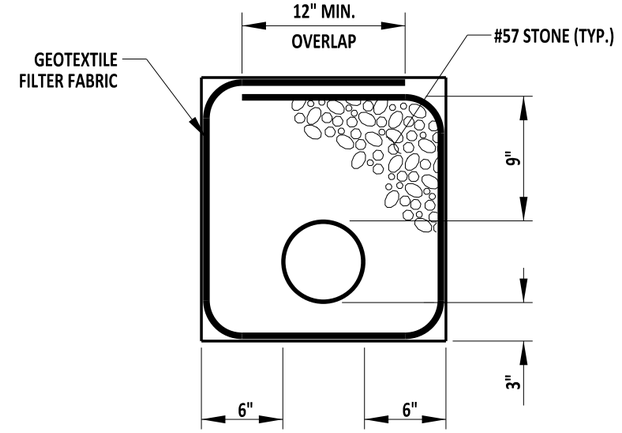



SECTION VIEW

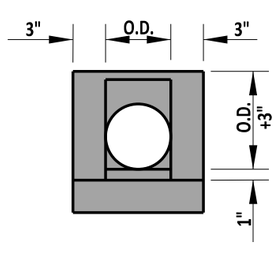


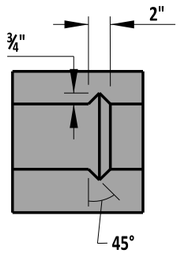

ISOMETRIC VIEW

UNDERDRAIN OUTLET




SECTION

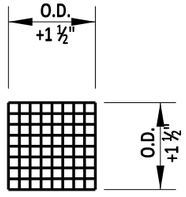



FRONT VIEW

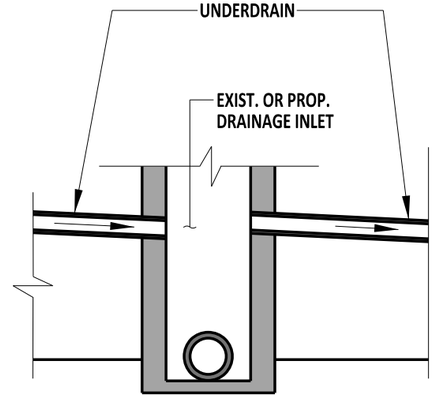
TOP VIEW

SLOTTED HEADWALL DETAIL




FRONT VIEW

RODENT SCREEN




ELEVATION

PERFORATED PIPE UNDERDRAIN

NOTES:

1). INSTALL PERFORATED PIPE UNDERDRAINS AT LOCATIONS SHOWN ON THE TYPICAL SECTIONS OF THE CONSTRUCTION PLANS.
2). PLACE GEOTEXTILE FILTER FABRIC ENTIRELY OVER THE TOP OF UNDERDRAIN TRENCH AND LAP AS SHOWN.
3). MATCH THE SLOPE OF UNDERDRAINS TO THE ROADWAY GRADE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
4). TO DIRECT UNDERDRAIN PIPE INTO THE SIDE OF A DRAINAGE INLET OR TO POSITIVE OUTFALL GRADE, USE 45 DEGREE ELBOWS OR A STRAIGHT PIPE WITH A MINIMUM RADIUS OF 3'. AT THESE LOCATIONS, USE NON-PERFORATED PIPE WITH A SMOOTH INTERIOR.
5). INSTALL RODENT SCREEN TO SNUGLY FIT THE PROVIDED SLOT WITH THE SCREEN LIP FITTING TIGHT TO THE BOTTOM FLOW LINE.
6). INSTALL A DELINEATOR ADJACENT TO THE CONCRETE APRON OF THE UNDERDRAIN OUTFALL ON THE APPROACH SIDE OF TRAFFIC. INSTALL THE DELINEATOR ON A BREAKAWAY POST ASSEMBLY, EXTENDING 4' ABOVE GROUND ELEVATION, IN ACCORDANCE WITH STANDARD T-15 SHEET 1 OF 1. PERPENDICULAR TO THE TRAVEL LANE, INSTALL AN OM-2-2V BLUE REFLECTOR ON BOTH SIDES OF THE POST WITH HARDWARE COMPATIBLE WITH THE SIGN POST.
7). WHEN TWO LINES OF PIPE UNDERDRAIN DRAIN TO A LOW POINT, PROVIDE AN OUTLET FOR EACH PIPE.
8). DO NOT PLACE UNDERDRAIN PIPE UNDER GUARDRAIL IN ORDER TO AVOID PUNCTURING.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

PERFORATED PIPE UNDERDRAIN

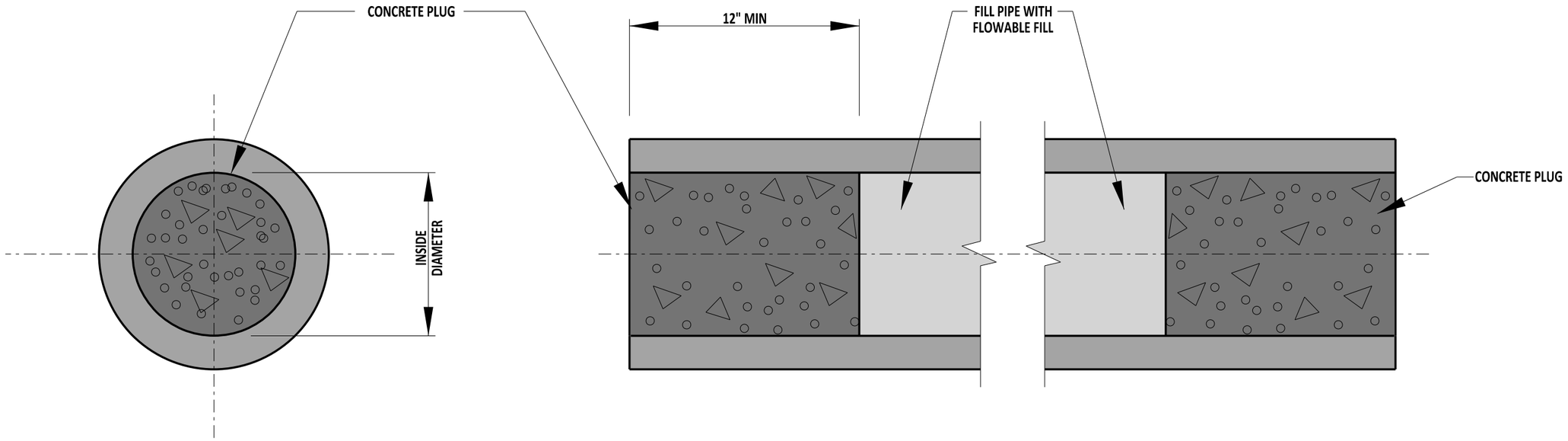
STANDARD NO. D-9 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

SCALE : NTS




**SECTION**

**ELEVATION**

**NOTE:**
FURNISH FLOWABLE FILL MATERIAL AND PLUG ABANDONED DRAINAGE PIPES WITH CONCRETE AS DIRECTED BY THE ENGINEER.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

PIPE PLUGGING

STANDARD NO. D-10 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

SCALE : NTS

# D-11 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

DelDOT

ENGINEERING SUPPORT _____ DATE _____

RECOMMENDED

STANDARD NO. D-11 (2020)

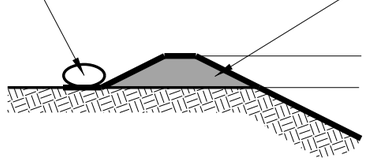
SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

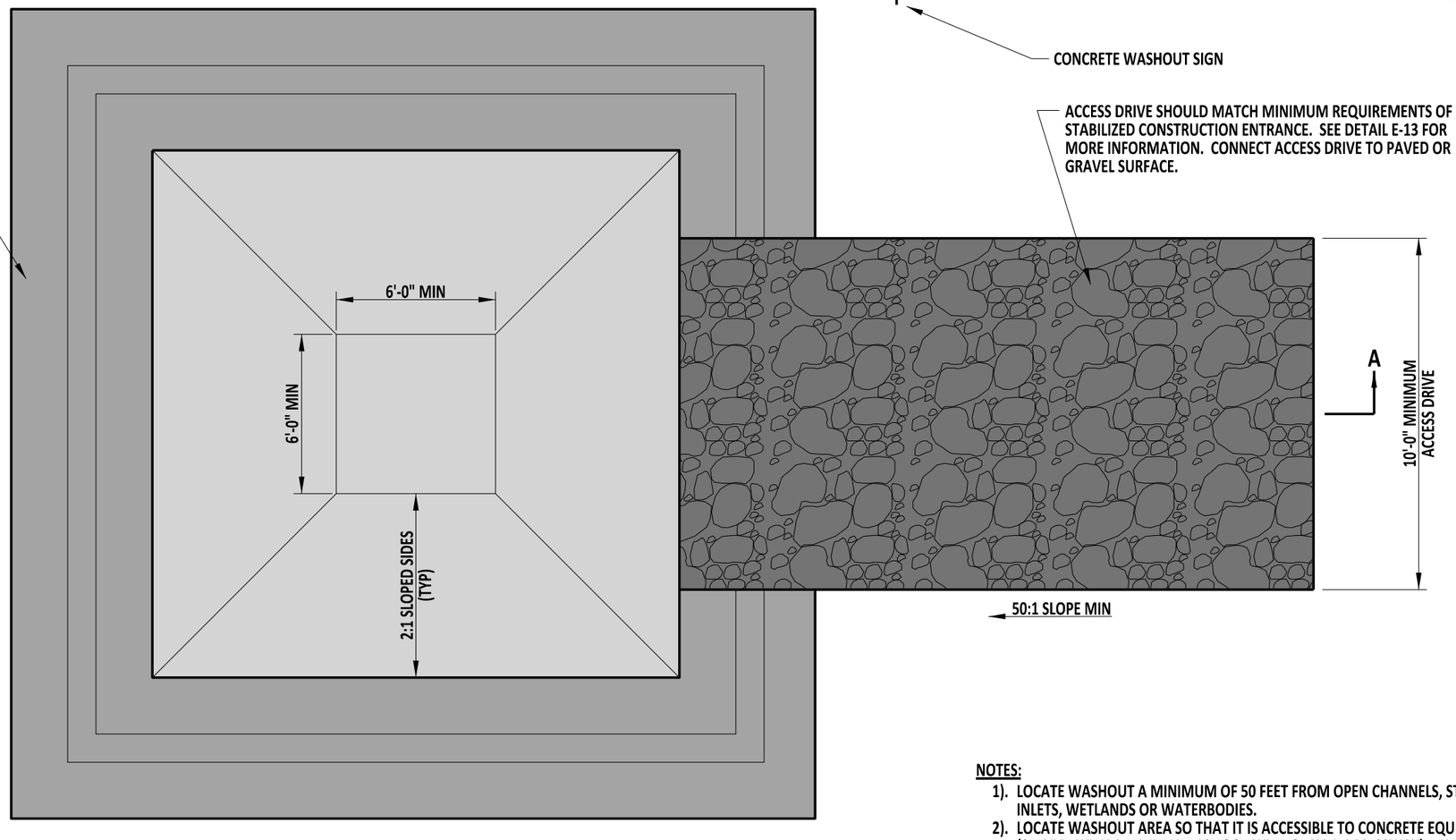
APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

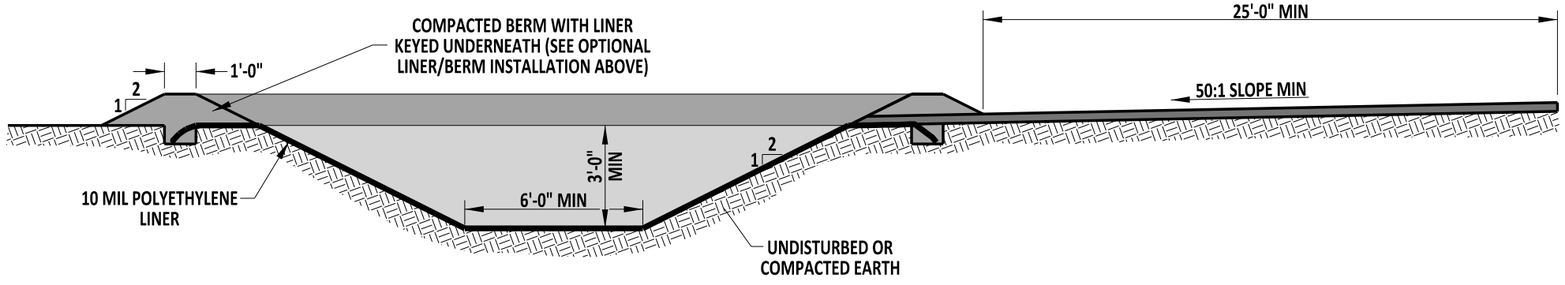
SCALE : NTS




**OPTIONAL LINER/BERM INSTALLATION**




**PLAN VIEW**




**SECTION A-A**

**NOTES:**

1). LOCATE WASHOUT A MINIMUM OF 50 FEET FROM OPEN CHANNELS, STORMDRAIN INLETS, WETLANDS OR WATERBODIES.
2). LOCATE WASHOUT AREA SO THAT IT IS ACCESSIBLE TO CONCRETE EQUIPMENT (SERVICE WITH A MINIMUM 10 FOOT WIDE GRAVEL ACCESSWAY), BUT SO IT IS NOT IN A HIGHLY ACTIVE CONSTRUCTION AREA CAUSING ACCIDENTAL DAMAGE.
3). A PREFABRICATED CONCRETE WASHOUT UNIT MAY BE USED IN LIEU OF THE DESIGN SHOWN ON THIS DETAIL. THE DIMENSIONS ARE 4'-0" x 4'-0" x 1'-0" DEEP WITH A 4 MIL POLYETHYLENE PLASTIC LINER. FOLLOW THE DIMENSIONS IN THIS DETAIL FOR CONSTRUCTED CONCRETE WASHOUT AREAS.
4). THE LINER MUST BE FREE OF TEARS OR HOLES AND PLACED OVER SMOOTH SURFACES TO PREVENT PUNCTURING. FOR EXCAVATED WASHOUTS, ANCHOR THE LINER UNDERNEATH THE BERM OR OVERTOP WITH SANDBAGS OR CONCRETE BLOCKS TO HOLD IN PLACE, AS DIRECTED ON THIS DETAIL.
5). ALLOW WASHED OUT CONCRETE MIXTURE TO HARDEN THROUGH EVAPORATION OF THE WASTEWATER. ONCE THE FACILITY HAS REACHED 75% OF ITS CAPACITY, REMOVE THE HARDENED CONCRETE BY REUSING THE BROKEN AGGREGATE ON SITE, RECYCLING, OR DISPOSING OFFSITE. THE HARDENED MATERIAL CAN BE BURIED ON SITE WITH A MINIMUM OF 1'-0" OF CLEAN, COMPACTED FILL.
6). APPLY A NEW LINER BEFORE REUSING THE STATION FOR ADDITIONAL WASHOUTS AFTER MAINTENANCE HAS OCCURRED.
7). PROVIDE A SIGN DESIGNATING THE WASHOUT AREA, AND FOR LARGE CONSTRUCTION SITES, PROVIDE SIGNS THROUGHOUT DIRECTING TRAFFIC TO ITS LOCATION.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

# CONCRETE WASHOUT

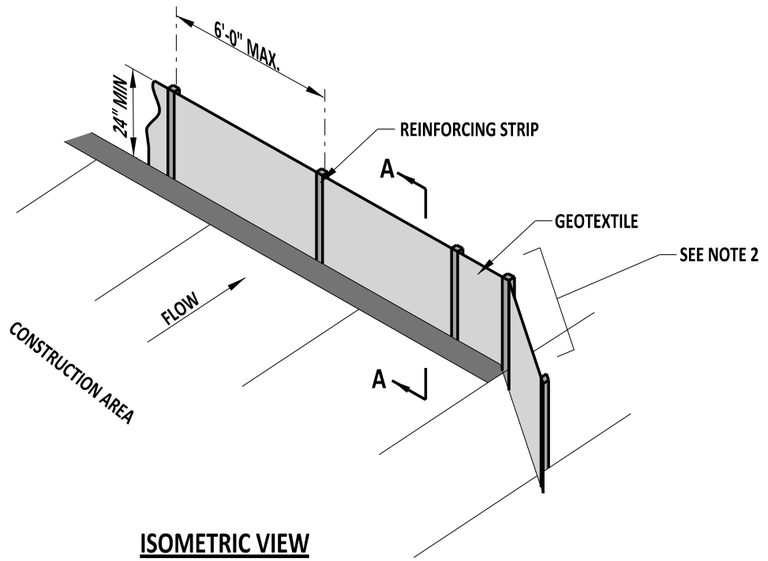
STANDARD NO. E-1 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

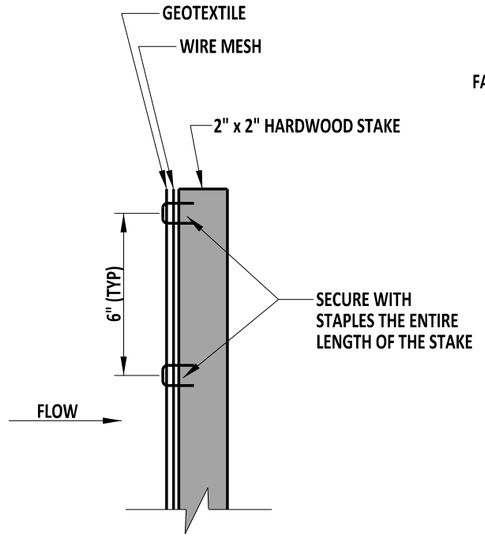
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

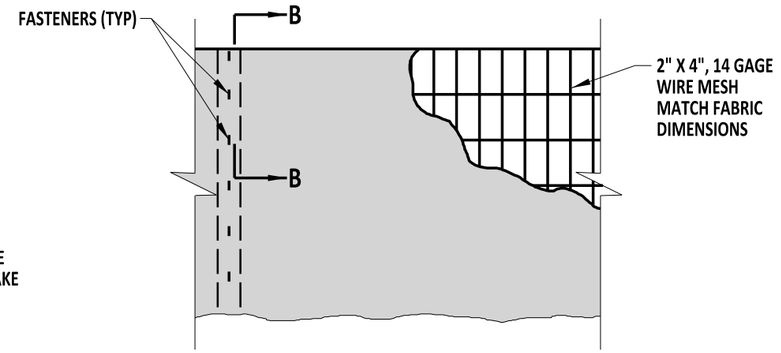
SCALE : NTS




**ISOMETRIC VIEW**

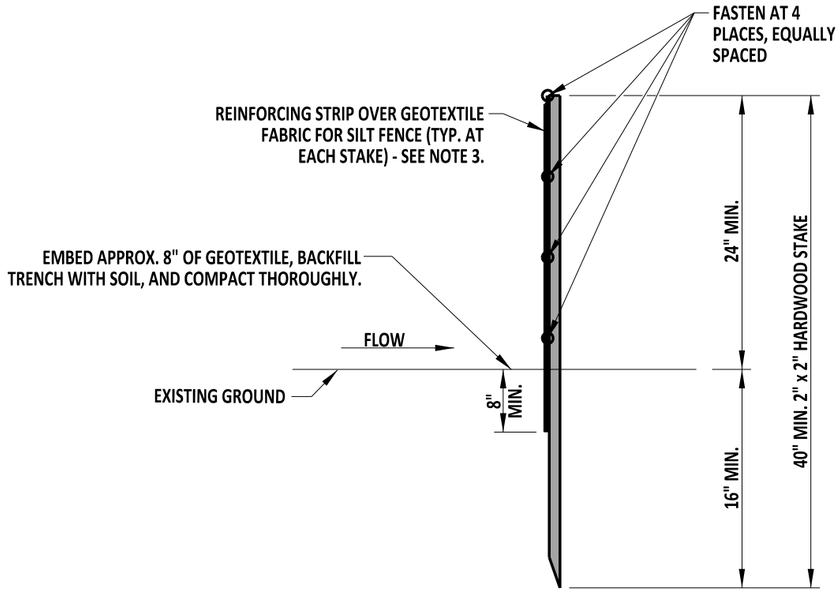



**SECTION B-B**

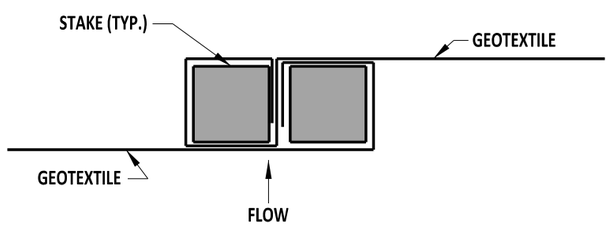



**ELEVATION**

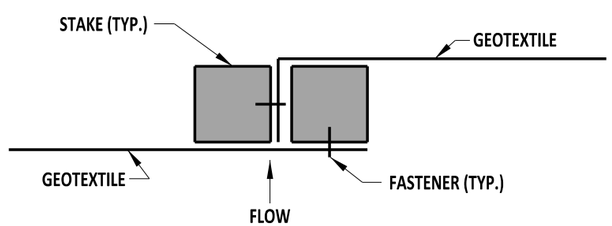
**WIRE MESH DETAIL**
(REINFORCED SILT FENCE ONLY)




**SECTION A-A**




**SILT FENCE CONNECTON DETAIL**




**REINFORCED SILT FENCE CONNECTON DETAIL**

**NOTES:**
1). THIS DEVICE IS INTENDED TO CONTROL SHEET FLOW ONLY AND IS NOT TO BE USED IN AREAS OF CONCENTRATED FLOW.
2). TURN ENDS OF SILT FENCE UPSLOPE TO CONTAIN RUNOFF.
3). REINFORCING STRIP IS TO BE ONE COMPLETE STRIP COVERING ALL GEOTEXTILE FABRIC AT POST.
4). FOR SILT FENCE CONSTRUCTION, JOIN TERMINAL ENDS AND ROLL ONE FULL REVOLUTION.

DelDOT

09/01/2020
ENGINEERING SUPPORT DATE
RECOMMENDED

SILT FENCE

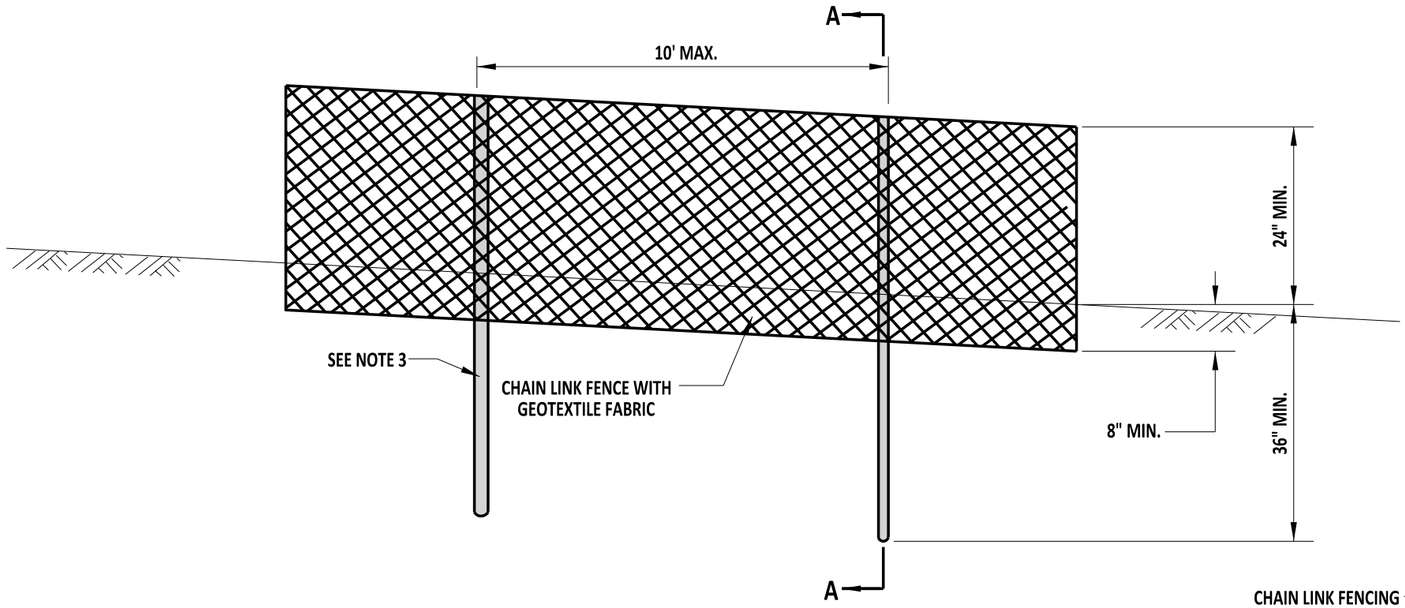
STANDARD NO. E-2 (2020) SHT. 1 OF 2

REVIEWED
DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE

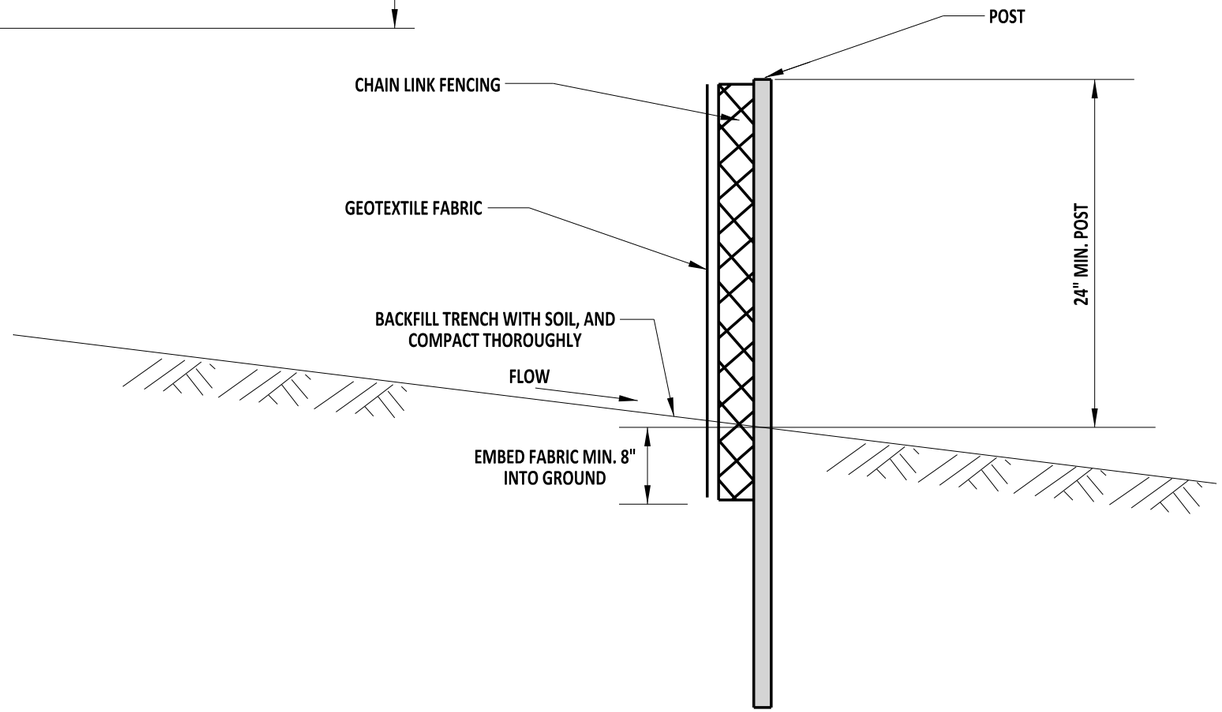
APPROVED
CHIEF ENGINEER 09/01/2020 DATE

08/20/2020

SCALE : NTS




## SUPER SILT FENCE CONSTRUCTION DETAIL




## SECTION A-A

**NOTES:**

1). THIS DEVICE IS INTENDED TO CONTROL SHEET FLOW ONLY AND IS NOT TO BE USED IN AREAS OF CONCENTRATED FLOW.
2). TURN ENDS OF SILT FENCE UPSLOPE TO CONTAIN RUNOFF.
3). 2½" DIAMETER GALVANIZED OR ALUMINUM POSTS. POSTS DO NOT NEED TO BE SET IN CONCRETE.
4). FASTEN CHAIN LINK FENCE SECURELY TO FENCE POSTS WITH WIRE TIES.
5). FASTEN GEOTEXTILE FABRIC SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24" AT THE TOP AND MID SECTION.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

SUPER SILT FENCE

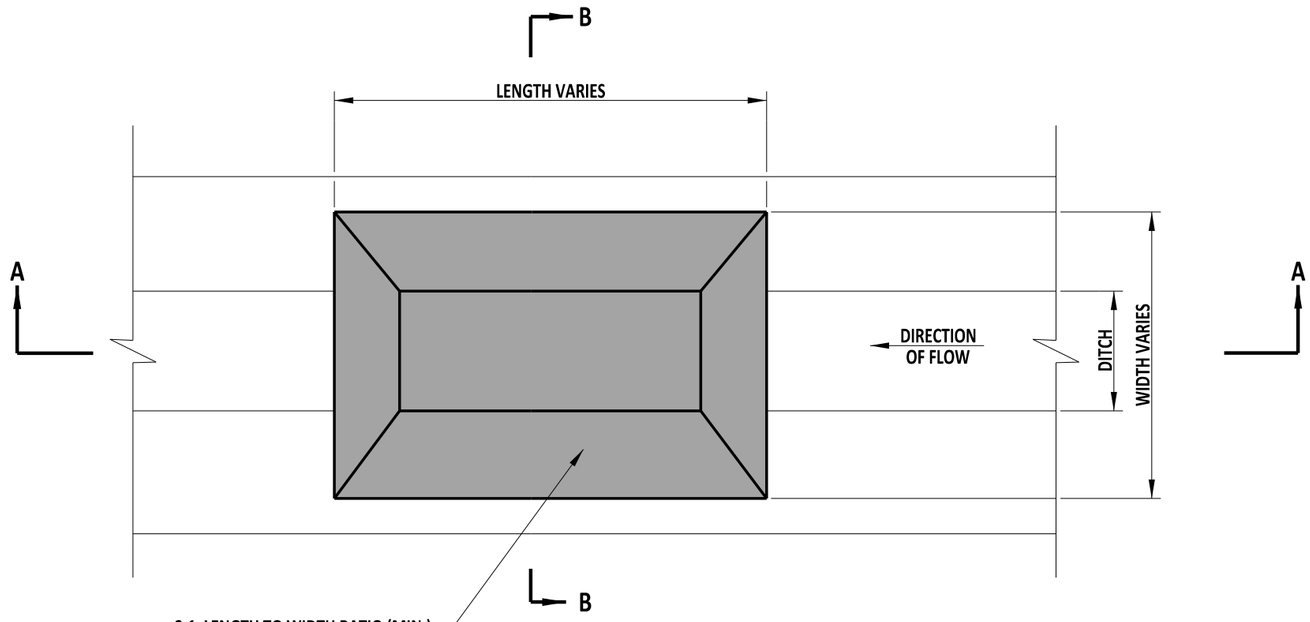
STANDARD NO. E-2 (2020) | SHT. 2 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

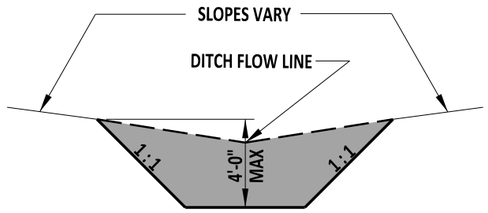
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

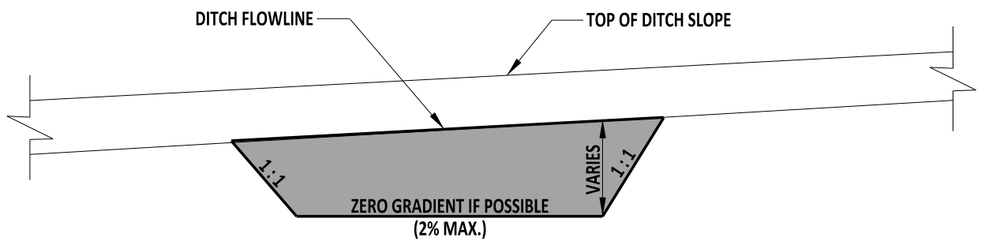
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PLAN




SECTION B-B




SECTION A-A

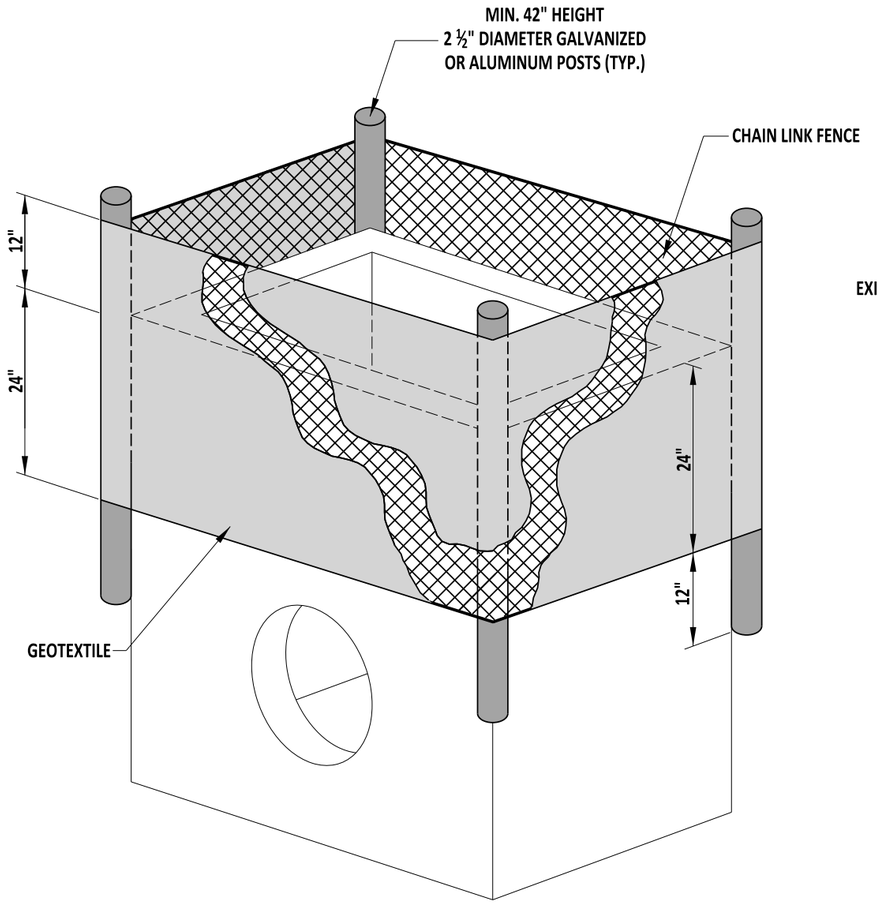
NOTES:

1). SEDIMENT TRAPS ARE INTENDED FOR USE IN EXISTING, PROPOSED, AND TEMPORARY DITCHES OF ALL TYPES WITH A MAXIMUM DRAINAGE AREA OF 5 ACRES, AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.
2). STABILIZE SIDE SLOPES WITH TEMPORARY GRASS SEEDING AS PER SPECIFICATIONS.
3). AN OUTLET STRUCTURE IS REQUIRED AND IS NOTED ON THE PLANS.
4). ALL FILL SLOPES ARE TO HAVE A SLOPE OF 2:1.
5). THE SEDIMENT TRAP LENGTH TO WIDTH RATIO IS TO BE 2:1. SPECIAL DESIGNS ARE PERMITTED TO INCREASE THE FLOW TIME AFTER APPROVAL BY THE STORMWATER ENGINEER.
6). IF A COMPOST FILTER LOG IS UTILIZED ON THE DOWNSTREAM SIDE OF THE SEDIMENT TRAP, STAKE THE COMPOST FILTER LOG 6" ON CENTER.
7). IF R4 RIPRAP IS UTILIZED ON THE DOWNSTREAM SIDE OF THE SEDIMENT TRAP, CHOKE THE R-4 RIPRAP WITH DELAWARE NO. 3 STONE ON THE FLOW FACE.

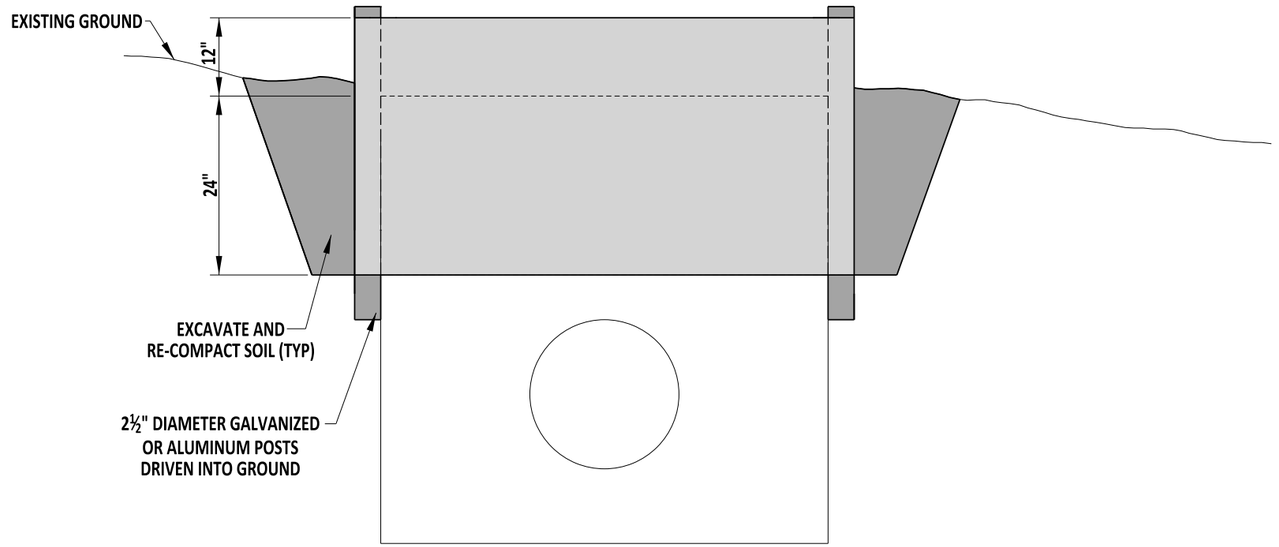
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|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | SEDIMENT TRAP | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. E-3 (2020) SHT. 1 OF 1 | APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/20/2020

SCALE : NTS




**ISOMETRIC VIEW**




**ELEVATION VIEW**

**NOTES:**

1). COMPOST FILTER LOG IS PAID SEPARATELY FROM SEDIMENT CONTROL, DRAINAGE INLET.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

INLET SEDIMENT CONTROL, DRAINAGE INLET

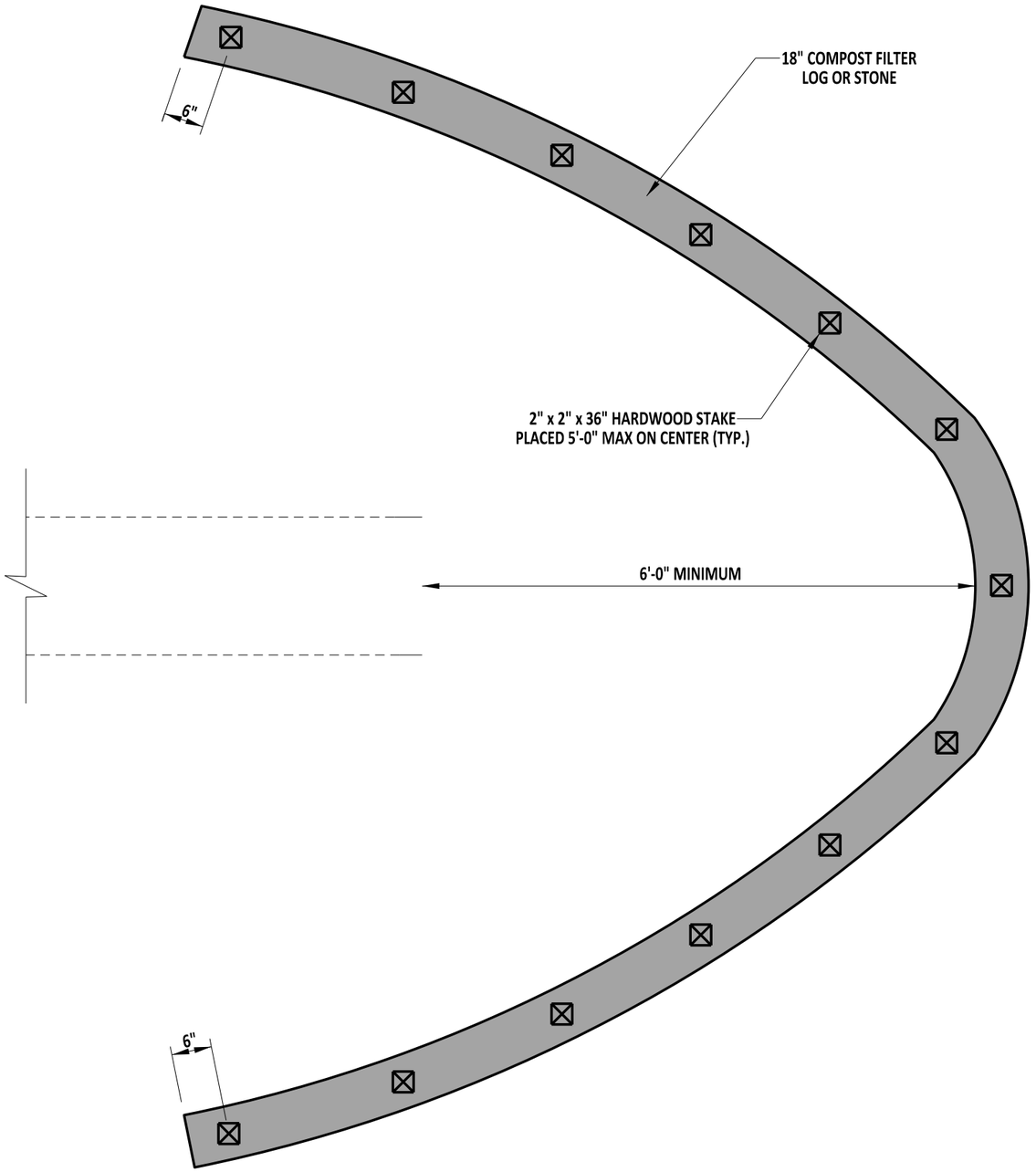
STANDARD NO. E-4 (2020) | SHT. 1 OF 1

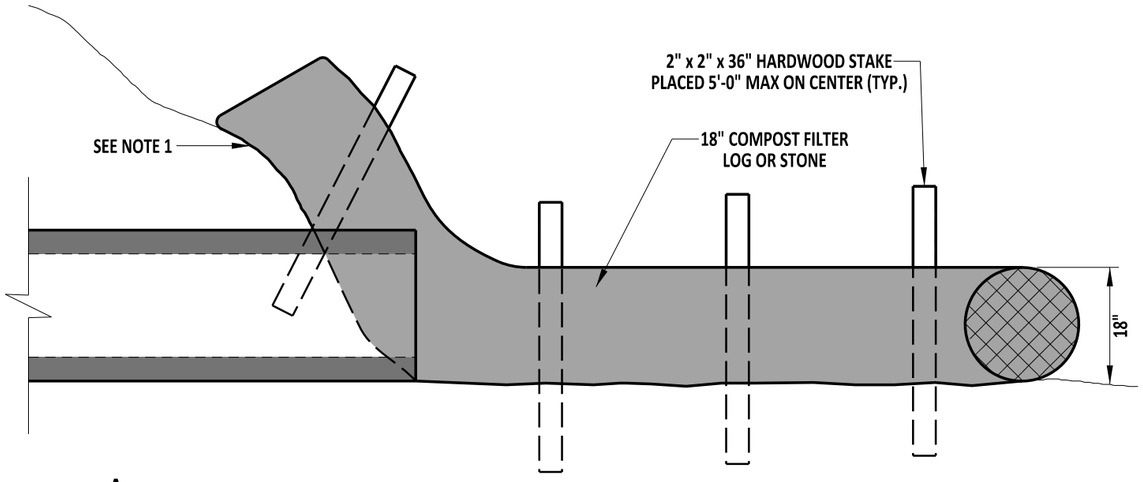
REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

APPROVED — CHIEF ENGINEER — DATE 09/01/2020

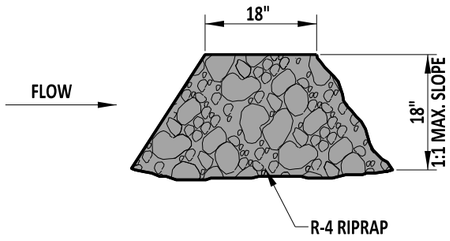
08/20/2020

SCALE : NTS




SECTION A-A




SECTION VIEW - STONE OPTION

NOTE:

1). EXTEND THE BOTTOM OF THE COMPOST FILTER LOG ABOVE THE TOP OF THE PIPE.
2). USE A MINIMUM OF 3 STAKES PER APPLICATION.
3). IF COMPOST FILTER LOGS CAN NOT BE INSTALLED PROPERLY OR FLOW CONDITIONS EXCEED THE CAPABILITIES OF THE COMPOST FILTER LOGS, THE STONE OPTION SHALL BE EMPLOYED.
4). PLACEMENT OF THE COMPOST LOG OR STONE BARRIER SHOULD BE IN A "HORSESHOE" SHAPE AND PROVIDE A MINIMUM OF 6 FEET OF CLEARANCE FROM THE CULVERT INLET.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

INLET SEDIMENT CONTROL, CULVERT INLET

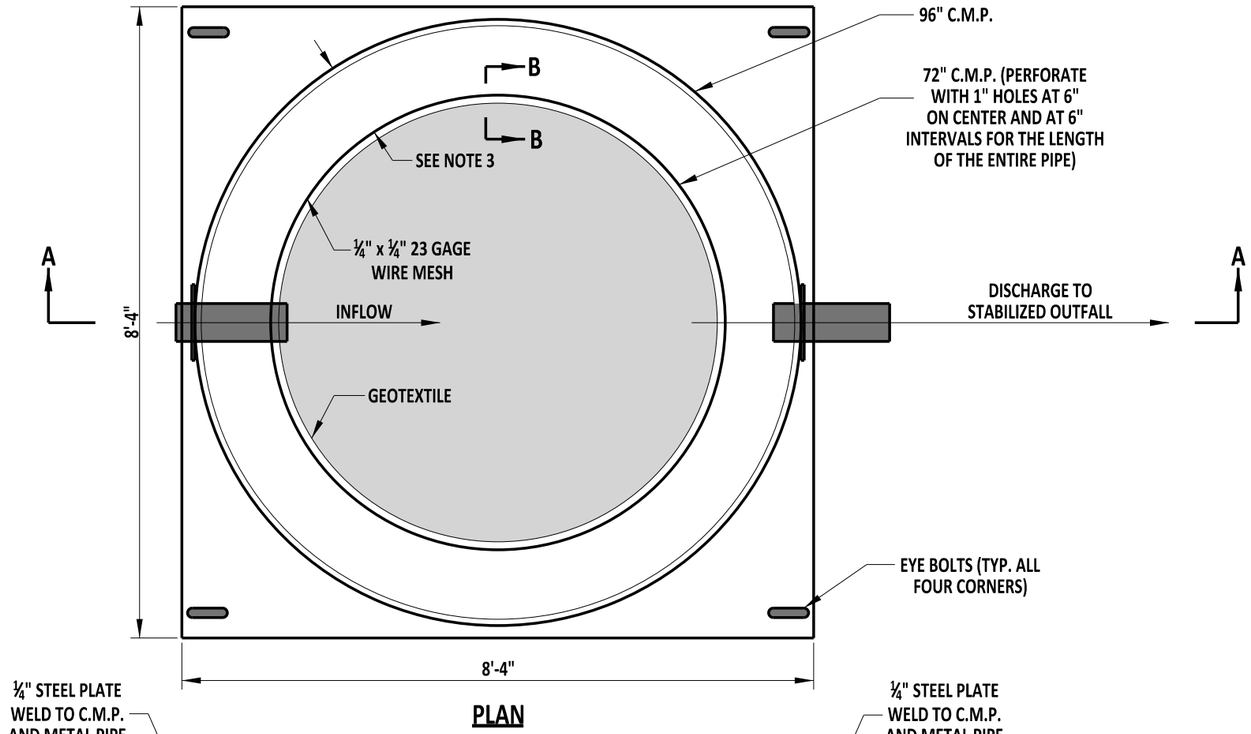
STANDARD NO. E-5 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

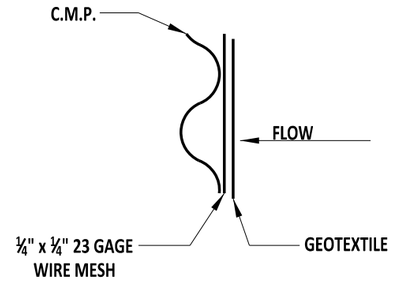
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

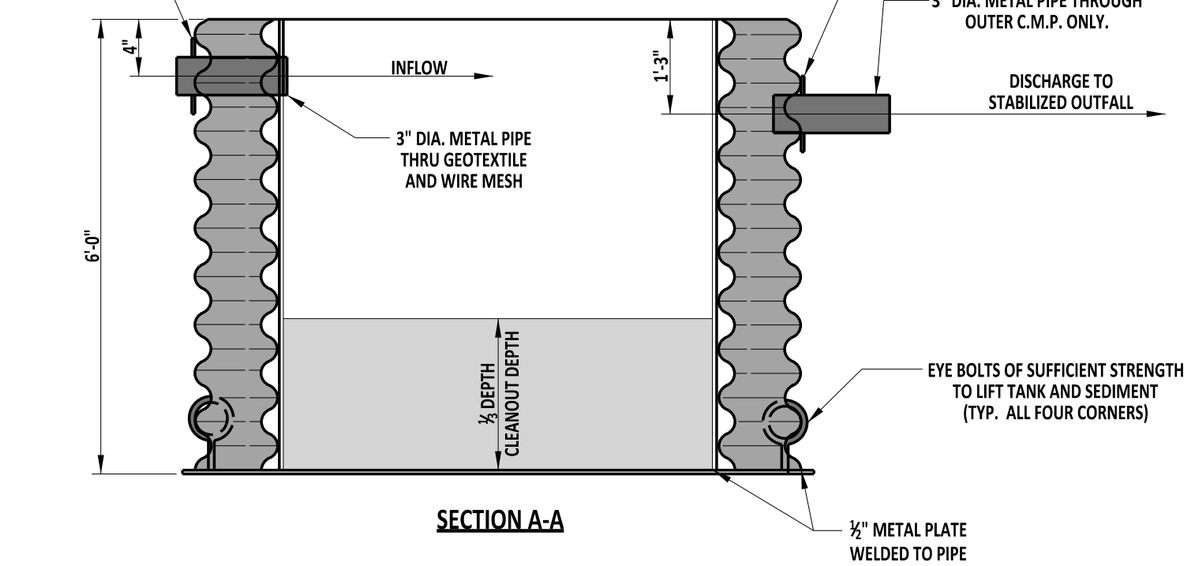
SCALE : NTS




PLAN




SECTION B-B




SECTION A-A

NOTES:

1). THE MAXIMUM PUMP DISCHARGE IN THIS TYPICAL PORTABLE SEDIMENT TANK IS 125 GALLONS PER MINUTE. REPLACE THE GEOTEXTILE WHEN THE PORTABLE SEDIMENT TANK CAN NO LONGER ALLOW THIS FLOW RATE, WHEN THERE IS A TEAR, OR WHEN DIRECTED BY THE ENGINEER.
2). SEVERAL UNCONNECTED OR CONNECTED IN PARALLEL PORTABLE SEDIMENT TANKS MAY BE USED WHEN A HIGHER FLOW RATE IS NEEDED TO DEWATER THE JOB.
3). PLACE 72" C.M.P. SO THAT IT IS CENTERED IN THE 96" C.M.P. AND THERE IS AN EQUAL AMOUNT OF SPACE BETWEEN THE TWO PIPES.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

PORTABLE SEDIMENT TANK

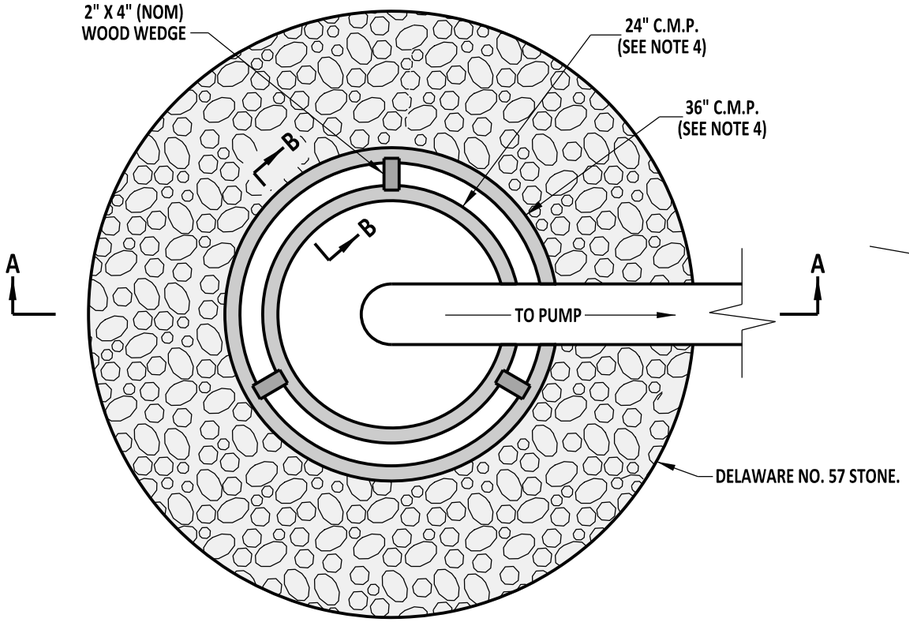
STANDARD NO. E-6 (2020) | SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

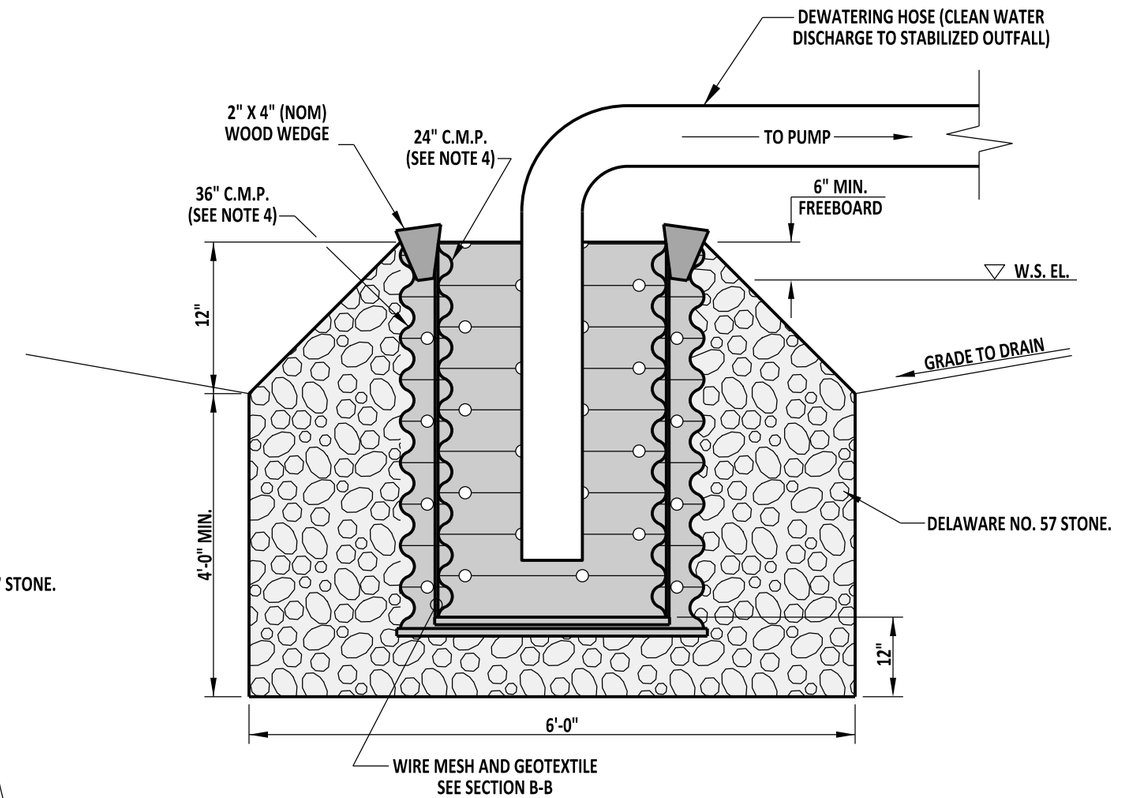
APPROVED
CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

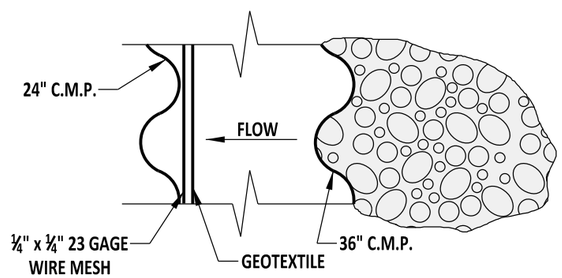
SCALE : NTS




PLAN




SECTION A-A




SECTION B-B

NOTES:
1). ALL PERFORATIONS ARE 1" IN DIAMETER AND 12" ON CENTER IN ALL DIRECTIONS.
2). PLACE WIRE MESH AROUND THE REMOVABLE 24" C.M.P. BEFORE ATTACHING THE GEOTEXTILE TO INCREASE FLOW THROUGH THE GEOTEXTILE.
3). WELD PERFORATED CAP TO THE BOTTOM OF BOTH PIPES.
4). REPLACE GEOTEXTILE FOR THE 24" C.M.P. WHEN CLOGGED WITH SEDIMENT.

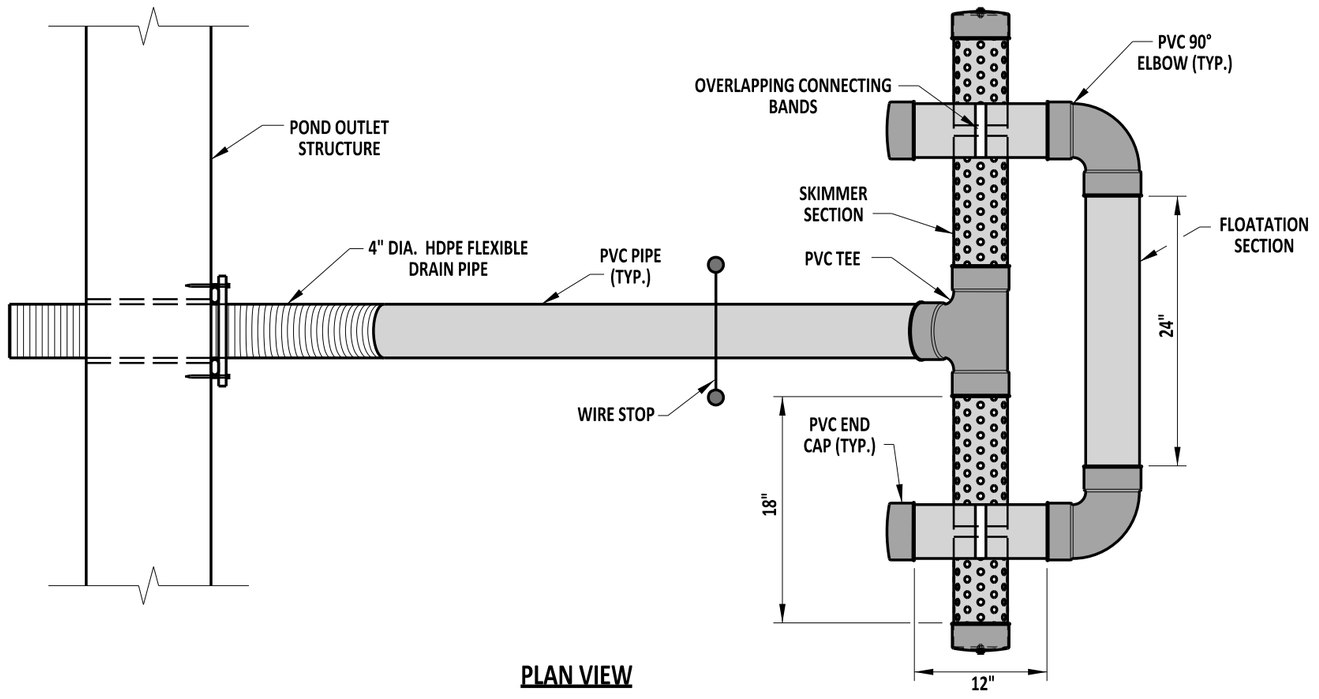
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| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | SUMP PIT | | APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 12/30/2014 (DATE) |
| | STANDARD NO. E-7 (2014) | SHT. 1 OF 1 | RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 12/11/2014 (DATE) |

10/30/2014

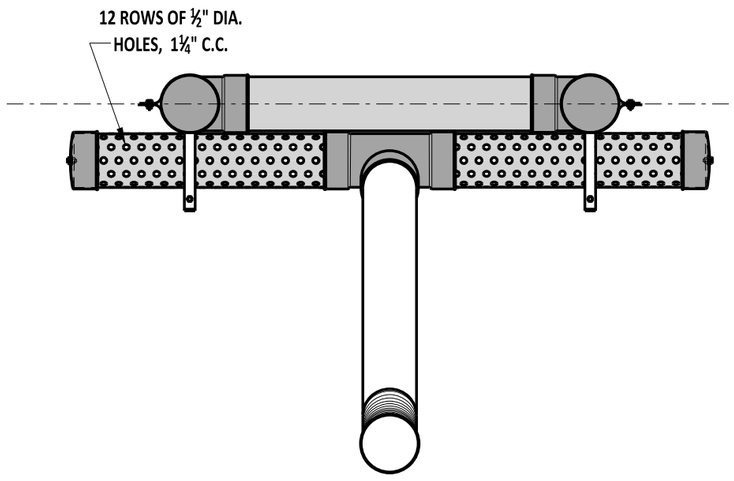
SCALE : NTS

**NOTES:**

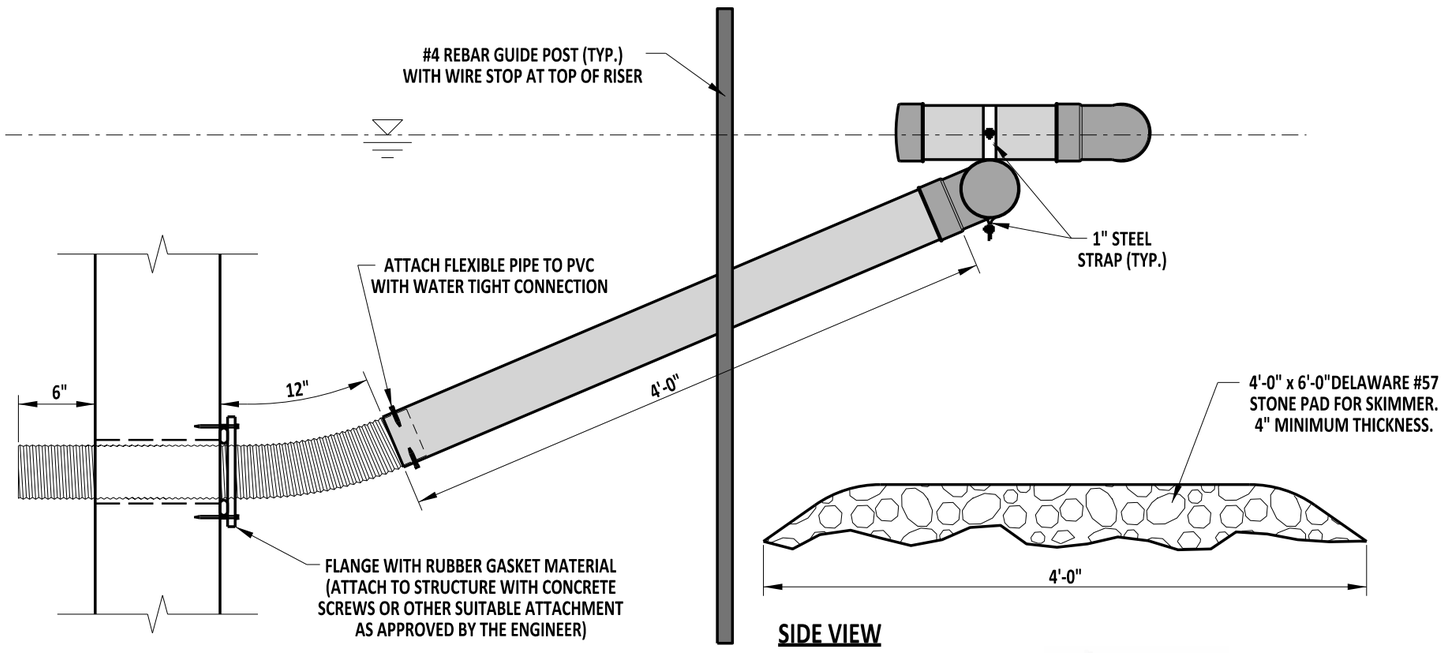
1). ALL PVC PIPES ARE 4" I.D., SCHEDULE 40.
2). SOLVENT WELD ALL JOINTS OF THE FLOTATION SECTION..
3). ATTACH A 4" HDPE FLEXIBLE DRAIN PIPE TO THE POND OUTLET STRUCTURE USING WATER TIGHT CONNECTIONS.
4). FOR ANY NON-TYPICAL SKIMMER OUTLET CONNECTION, SUBMIT A SHOP DRAWING FOR ENGINEER APPROVAL.




**PLAN VIEW**




**FRONT VIEW**




**SIDE VIEW**

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

# SKIMMER DEWATERING DEVICE

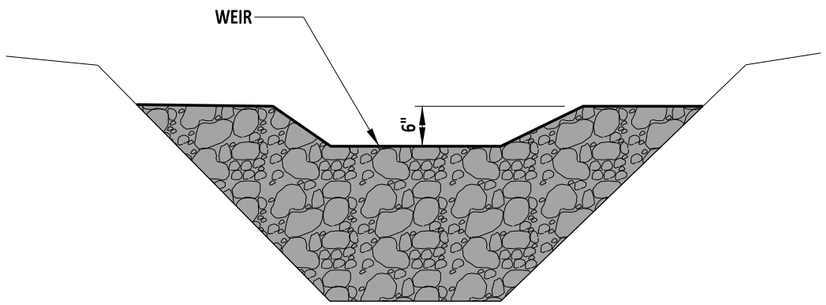
STANDARD NO. E-8 (2020) | SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

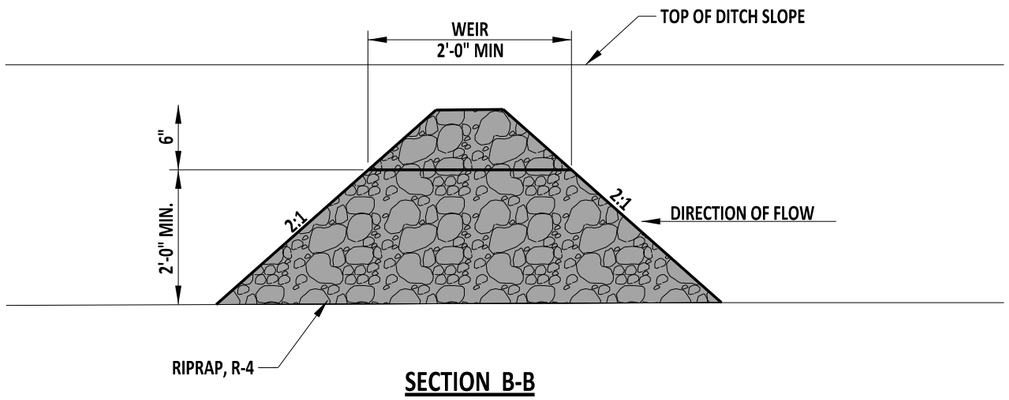
APPROVED
CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

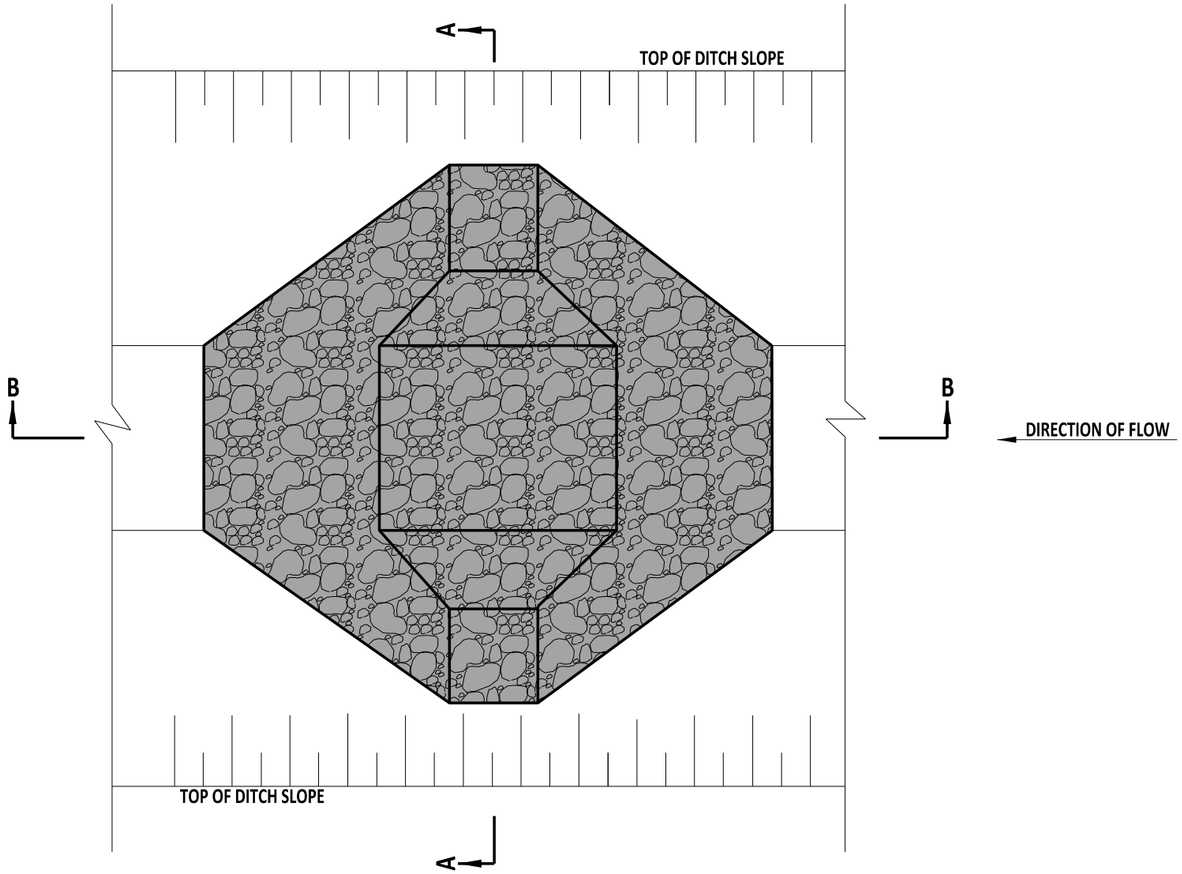
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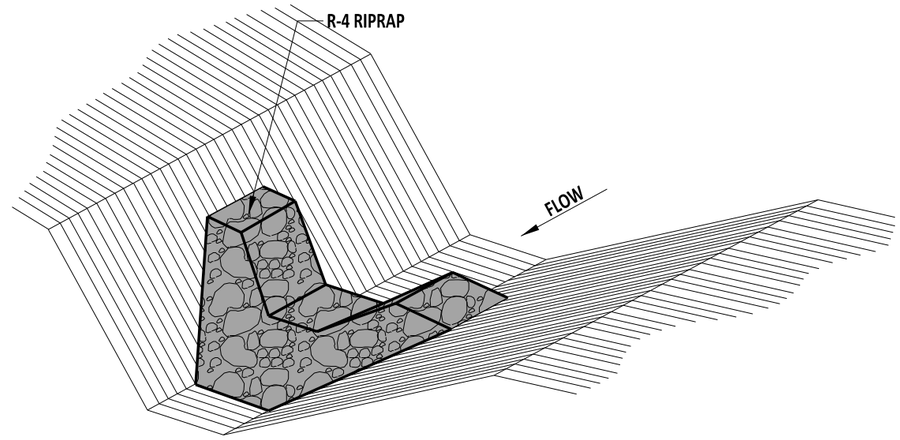

SECTION A-A




SECTION B-B




PLAN




ISOMETRIC VIEW

STONE CHECK DAM

NOTES:

1). THE MAXIMUM HEIGHT OF THE CHECK DAM IS 2'-0" AT THE CENTER OF THE WEIR.
2). CONSTRUCT CHECK DAM SO THAT THE CENTER OF THE DAM IS 6" LOWER THAN THE OUTER EDGES, FORMING A WEIR THAT WATER CAN FLOW ACROSS.
3). INSTALL GEOTEXTILE FABRIC UNDERNEATH RIPRAP ON PERMANENT CHECK DAMS ONLY.
4). SPACE DAMS SO THAT THE TOE OF THE UPSTREAM DAM IS AT THE SAME ELEVATION AS THE TOP OF THE WIER OF THE DOWNSTREAM DAM. PLACE DAMS NO FURTHER THAN 200'-0" APART WHEN THE SLOPE IS LESS THAN 1%.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

CHECK DAM

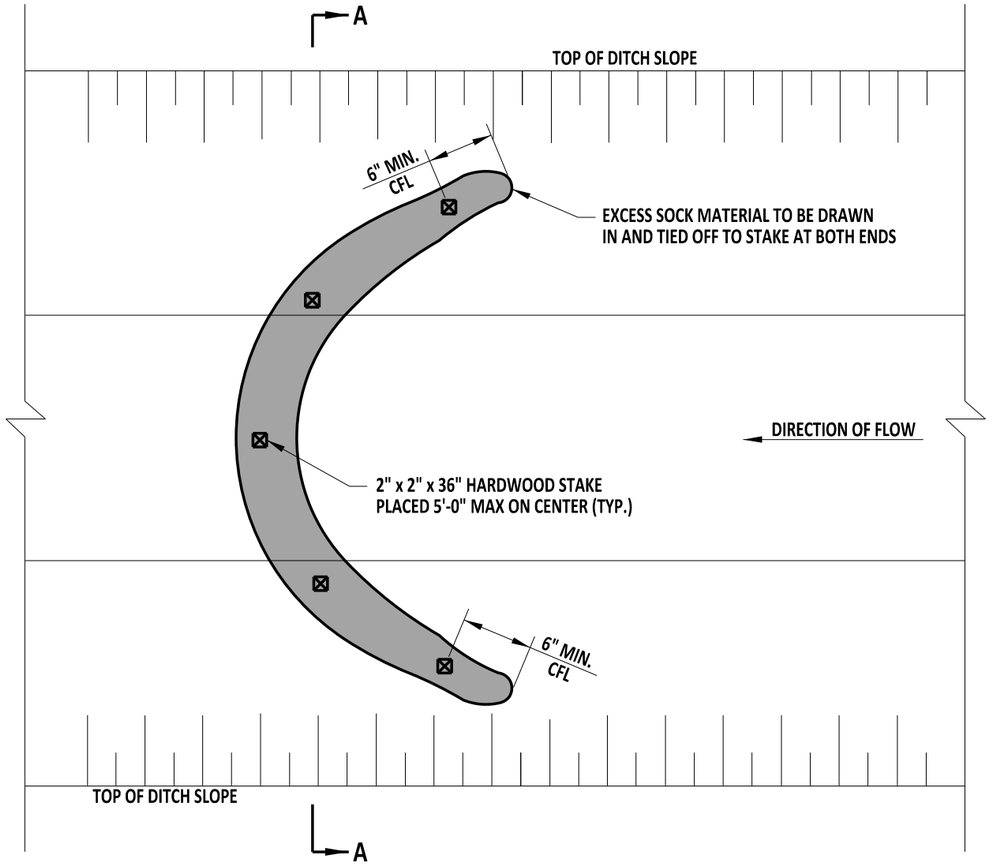
STANDARD NO. E-9 (2020) | SHT. 1 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

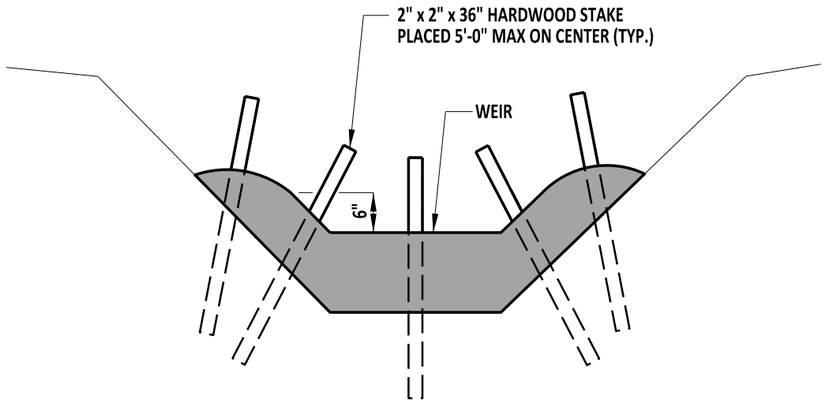
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

SCALE : NTS




**PLAN**




**SECTION A-A**

**NOTES:**

1). THE MAXIMUM HEIGHT OF THE CHECK DAM IS 2'-0" AT THE CENTER OF THE WEIR.
2). CONSTRUCT CHECK DAM SO THAT THE CENTER OF THE DAM IS 6" LOWER THAN THE OUTER EDGES, FORMING A WEIR THAT WATER CAN FLOW ACROSS. THE ENDS OF THE COMPOST FILTER LOG SHALL WRAP UPSLOPE TO PREVENT END CUTTING.
3). SPACE DAMS SO THAT THE TOE OF THE UPSTREAM DAM IS AT THE SAME ELEVATION AS THE TOP OF THE WIER OF THE DOWNSTREAM DAM. PLACE DAMS NO FURTHER THAN 200'-0" APART WHEN THE SLOPE IS LESS THAN 1%.

## COMPOST FILTER LOG CHECK DAM

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

CHECK DAM

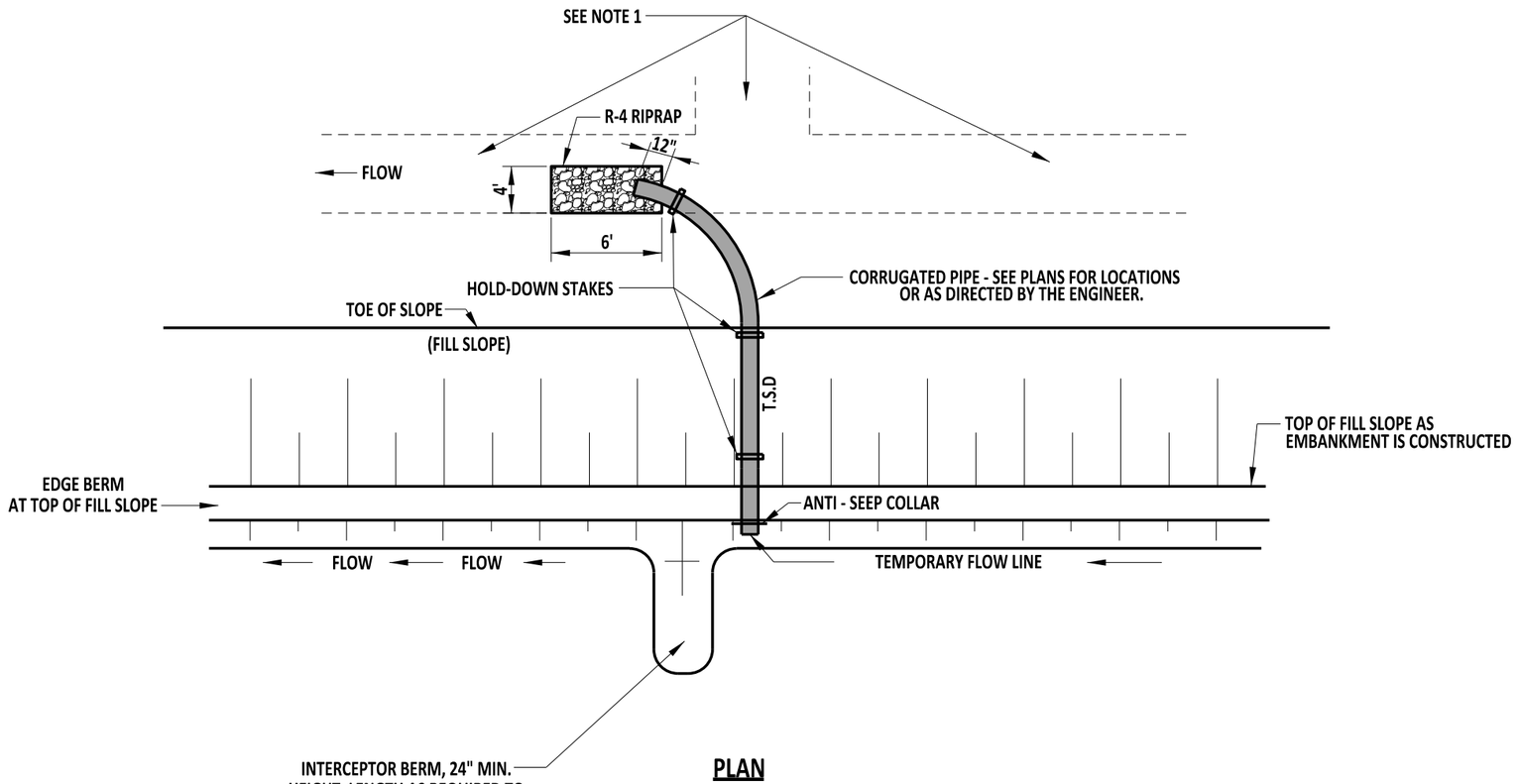
STANDARD NO. E-9 (2020) | SHT. 2 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

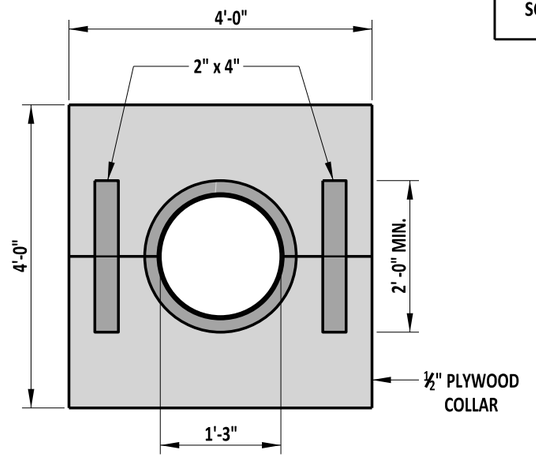
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

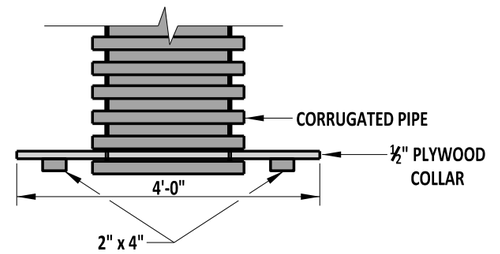
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**PLAN**

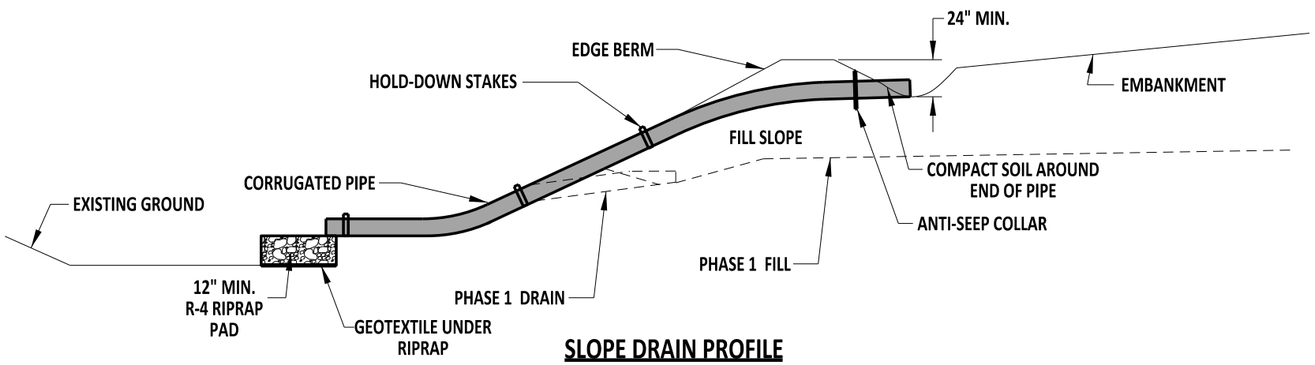



**ELEVATION**




**PLAN**

**ANTI-SEEP COLLAR**




**SLOPE DRAIN PROFILE**
(FOR FILL SLOPES)

NOTES:

1). 15" PIPE FOR MAXIMUM DRAINAGE AREA OF ONE ACRE.
2). DISCHARGE ALL TEMPORARY SLOPE DRAINS ONTO A STABILIZED OUTFALL AND THEN INTO A SEDIMENT TRAPPING DEVICE.
3). USE TEMPORARY SLOPE DRAINS AT THE TOP OF FILL SLOPES AS EMBANKMENT IS CONSTRUCTED TO PREVENT EXCESSIVE EROSION UNTIL SHOULDERS ARE CONSTRUCTED AND THE SLOPES ARE SEEDED AS PER SPECIFICATIONS.
4). FOR ALL TEMPORARY SLOPE DRAINS, USE A MINIMUM OF 3 HOLD DOWN STAKES SPACED EVENLY THROUGHOUT THE WHOLE LENGTH BEGINNING AT THE PIPE OUTLET INTO THE R-4 RIPRAP.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

TEMPORARY SLOPE DRAIN

STANDARD NO. E-10 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

SCALE : NTS

# E-11 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

DelDOT

ENGINEERING SUPPORT _____ DATE _____

RECOMMENDED

STANDARD NO. E-11 (2020)

SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

SCALE : NTS

# E-12 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

DelDOT

ENGINEERING SUPPORT _____ DATE _____
RECOMMENDED

STANDARD NO. E-12 (2020)

SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

SCALE : NTS

# E-13 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

DelDOT

ENGINEERING SUPPORT _____ DATE _____
RECOMMENDED

STANDARD NO. E-13 (2020)

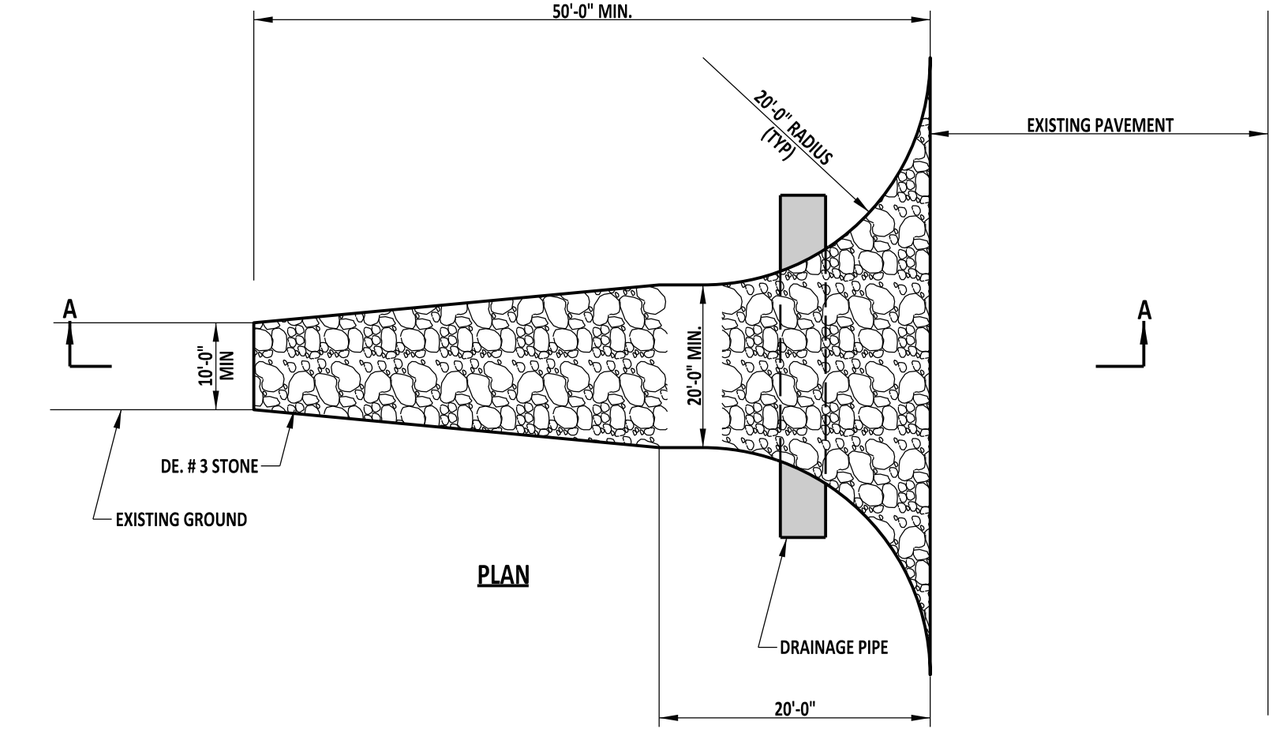
SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

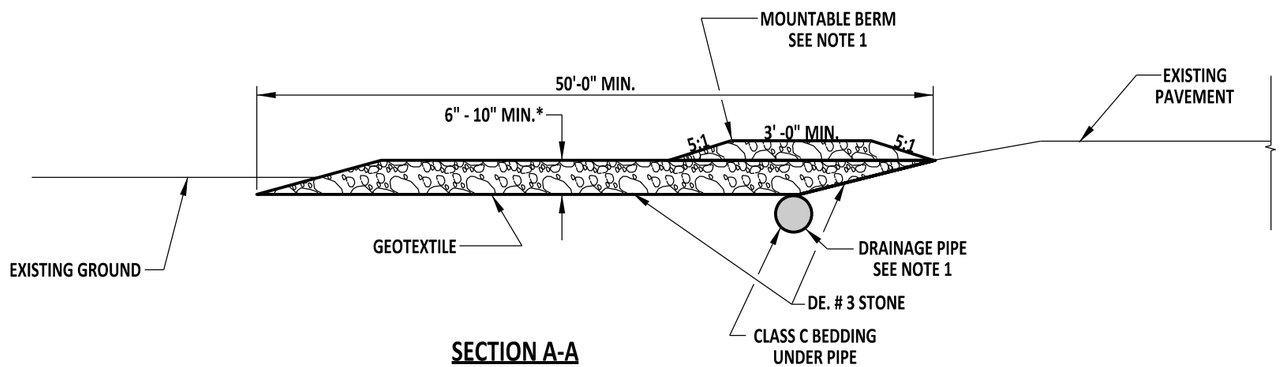
APPROVED _____ CHIEF ENGINEER _____ DATE

08/20/2020

SCALE : NTS




**PLAN**




**SECTION A-A**

* - 6" MIN (< 3 AXLE) - 10" MIN (> 3 AXLE)

NOTES:

1). PIPE ALL SURFACE WATER THAT IS FLOWING OR DIVERTED TOWARDS THE CONSTRUCTION ENTRANCE UNDER THE ENTRANCE. A MOUNTABLE BERM AS SHOWN ON THIS DETAIL, IS PERMITTED TO FACILITATE PLACEMENT OF PIPES IN SHALLOW CONDITIONS.

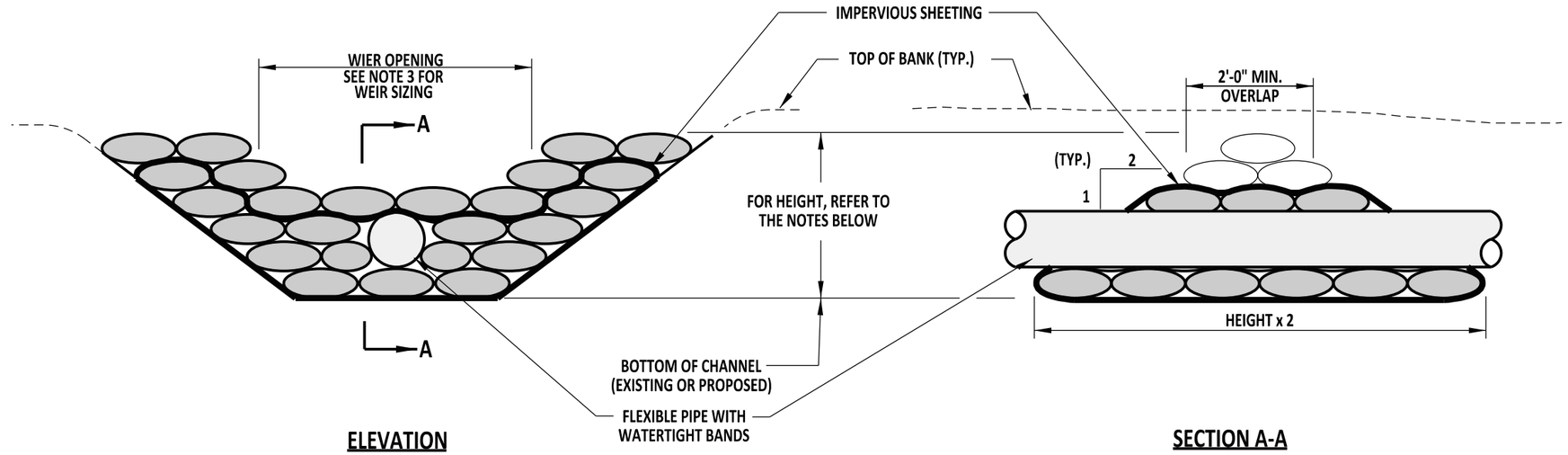
2). SEE PLANS FOR LOCATION AND NUMBER OF STABILIZED CONSTRUCTION ENTRANCES. PRIOR APPROVAL BY THE ENGINEER IS REQUIRED FOR ANY CHANGE IN LOCATION OR NUMBER OF ENTRANCES.

3). REMOVE AND REPLACE TOP 2" OF STONE WITH 2" OF CLEAN STONE WHEN VOIDS ARE FILLED OR AS DIRECTED BY THE ENGINEER.

| | | | |
|---|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | STABILIZED CONSTRUCTION ENTRANCE | | APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 12/30/2014 (DATE) |
| | STANDARD NO. E-14 (2014) | SHT. 1 OF 1 | RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 12/11/2014 (DATE) |

10/24/2014

SCALE : NTS




**ELEVATION**

**SECTION A-A**

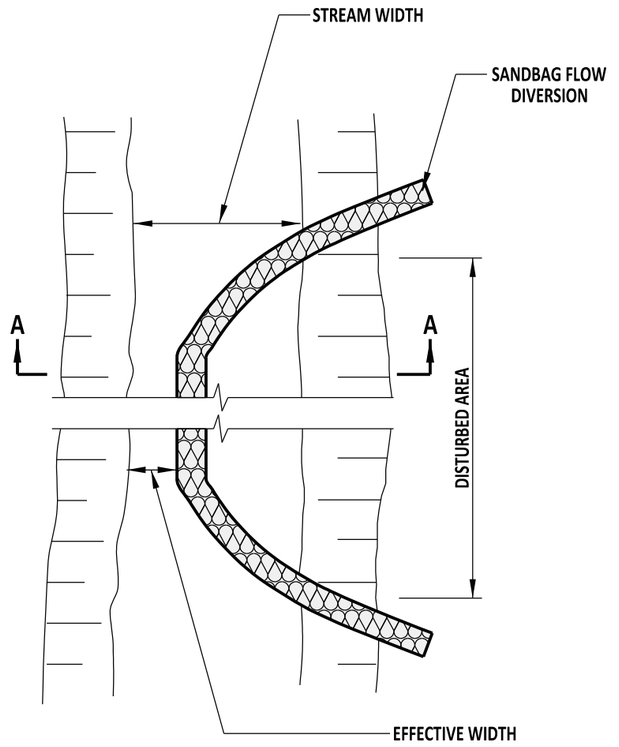
**NOTES:**

1). INSTALL SANDBAG DIKE IN UPSTREAM LOCATION FIRST.
2). CONSTRUCT SANDBAG DIKE SUCH THAT THE HEIGHT IS 1'-0" ABOVE THE PEAK ELEVATION OF THE 1 YEAR STORM, OR 1'-0" BELOW THE TOP OF THE BANK, WHICHEVER IS LESS. SEE PLANS FOR MORE INFORMATION.
3). CONSTRUCT WEIR SUCH THAT IT WILL PASS A 1 YEAR STORM EVENT PEAK FLOW. SEE PLANS FOR MORE INFORMATION.
4). SIZE THE PIPE SUCH THAT IT WILL ALLOW PASSAGE OF THE STREAM BASE FLOW.

| | | |
|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | SANDBAG DIKE | APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 12/30/2014 (DATE) |
| | STANDARD NO. E-15 (2014) SHT. 1 OF 1 | RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 12/11/2014 (DATE) |

10/24/2014

SCALE : NTS




PLAN



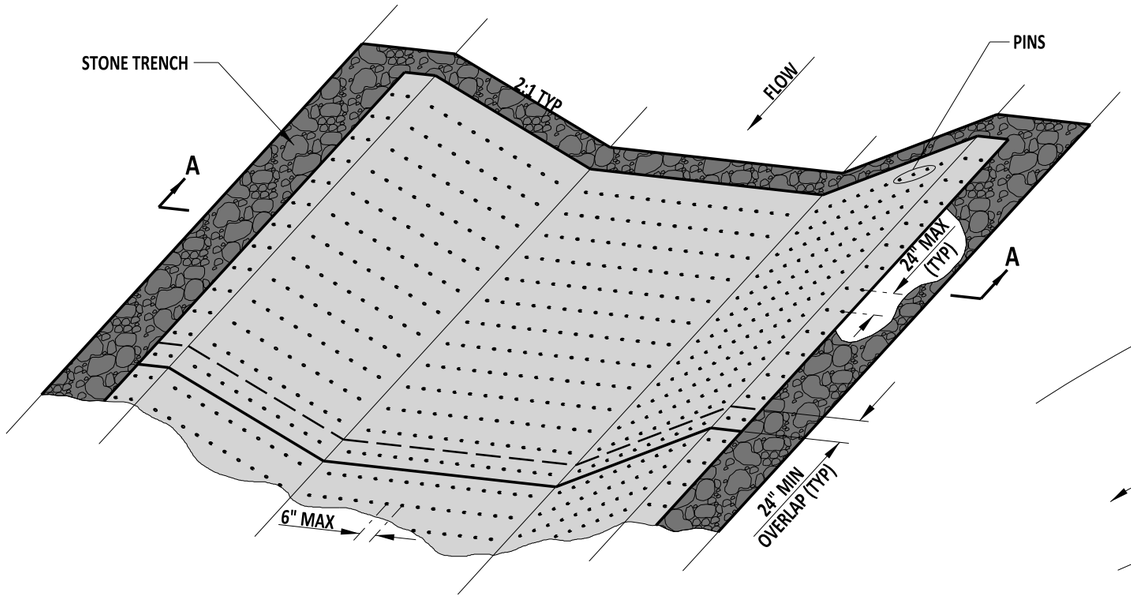

SECTION A-A

NOTES:
1). INSTALL DIVERSION STRUCTURE FROM UPSTREAM TO DOWNSTREAM.
2). SIZE EFFECTIVE CHANNEL WIDTH SO THAT IT WILL PASS A 1 YEAR STORM EVENT PEAK FLOW, OR ⅓ OF STREAM WIDTH, WHICHEVER IS GREATER.
3). CONSTRUCT SANDBAG DIVERSION HEIGHT SUCH THAT TOP OF THE DIVERSION STRUCTURE IS 1'-0" ABOVE THE 1 YEAR STORM PEAK ELEVATION.

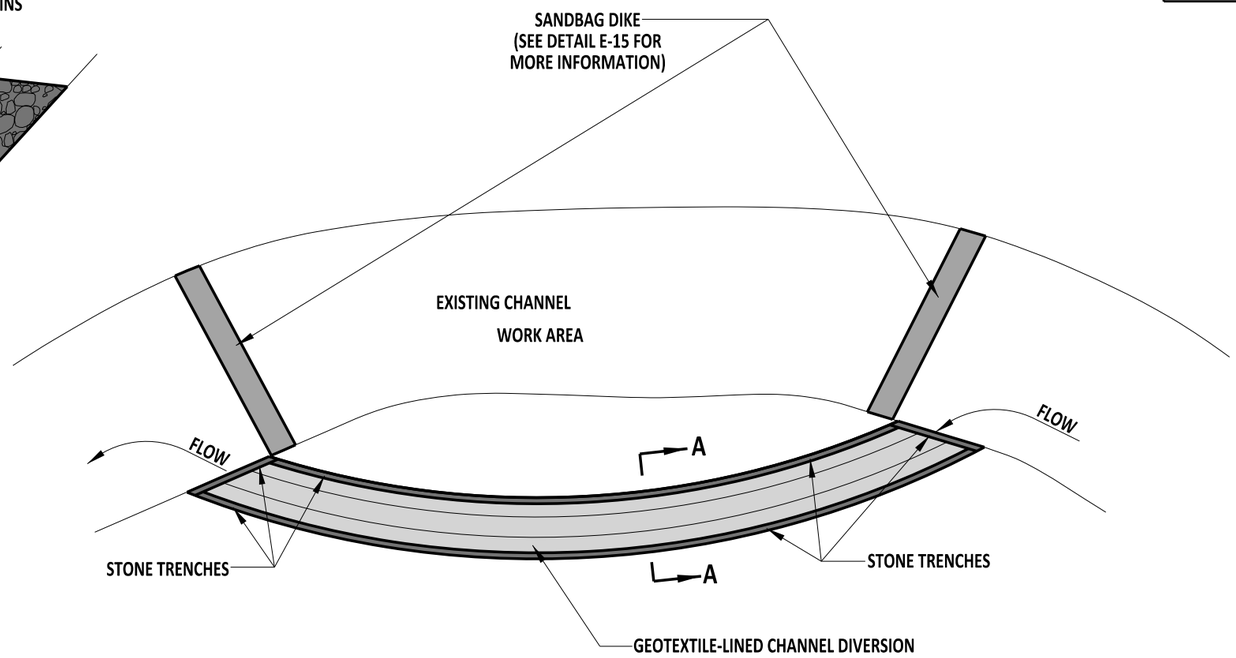
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| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | SANDBAG DIVERSION | | APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 12/30/2014 (DATE) |
| | STANDARD NO. E-16 (2014) | SHT. 1 OF 1 | RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 12/11/2014 (DATE) |

10/24/2014

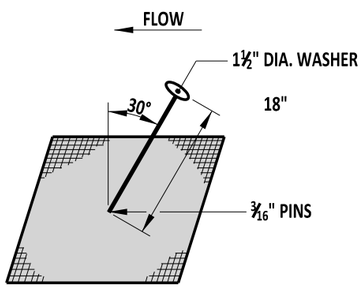
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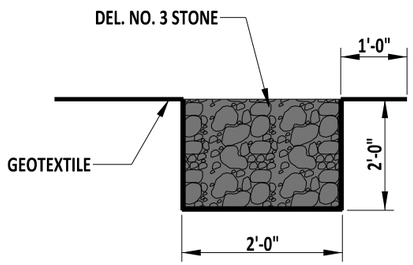

ISOMETRIC VIEW



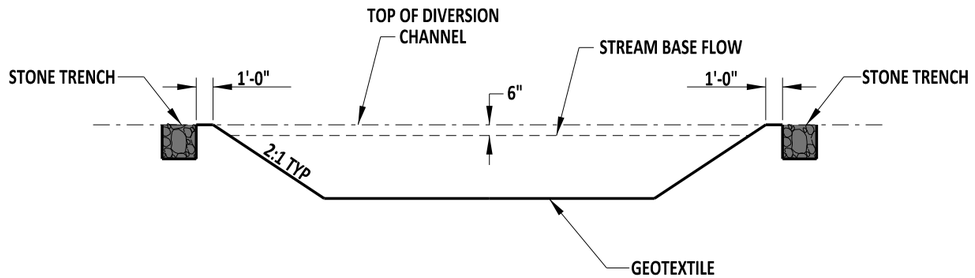

PLAN




FASTENING DETAIL




TRENCHING DETAIL



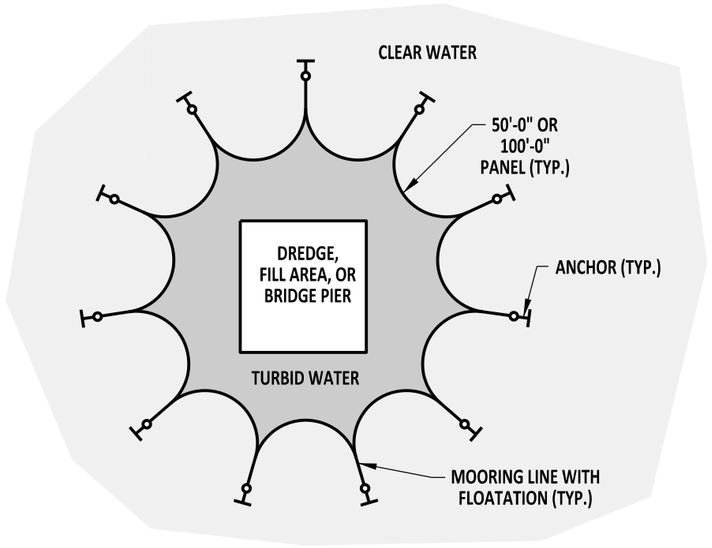

SECTION A-A

**NOTE:**
SEE PLANS FOR LOCATION, DIMENSIONS, GRADES, ETC.

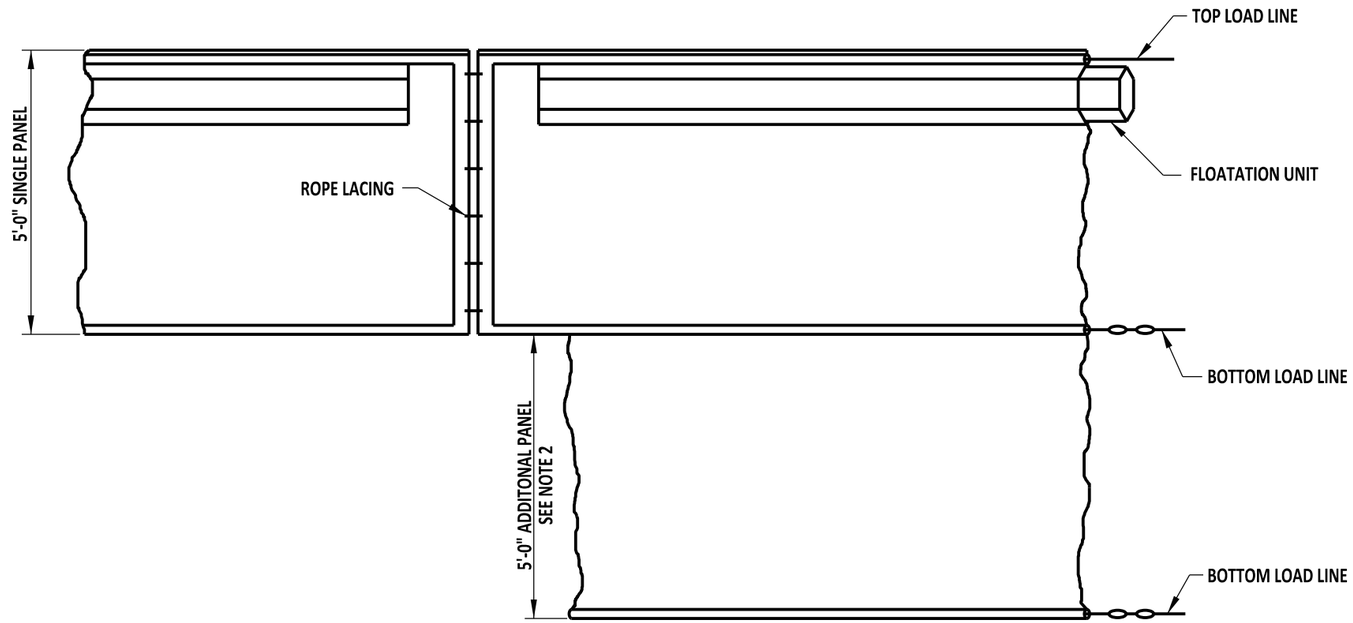
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|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | GEOTEXTILE-LINED CHANNEL DIVERSION<br>STANDARD NO. E-17 (2020) SHT. 1 OF 1 | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE<br>APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/20/2020

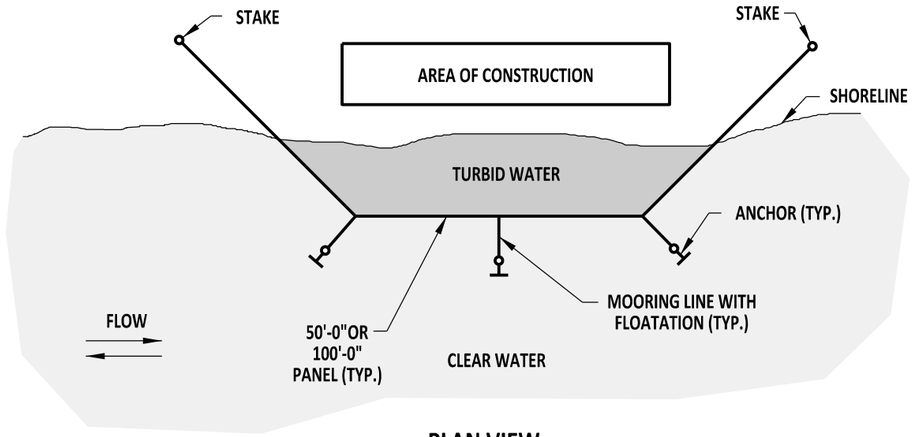
SCALE : NTS




**PLAN VIEW**
OPEN WATER APPLICATION




**ELEVATION**




**PLAN VIEW**
SHORELINE APPLICATION

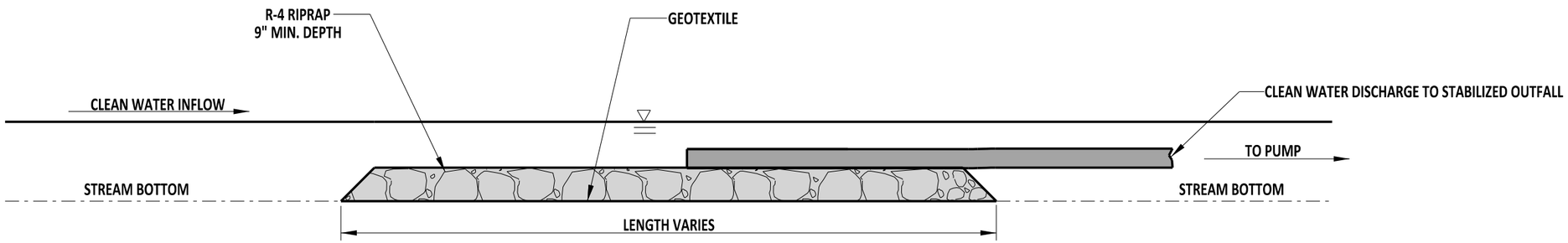
**FLOATING TURBIDITY CURTAIN**

**NOTE:**
1). ADDITIONAL PANEL REQUIRED FOR DEPTHS GREATER THAN 5'-0".
2). USE 2 TURBIDITY CURTAIN PANELS TO REACH BOTTOM DEPTHS OF 10'-0". SPECIAL DEPTH TURBIDITY CURTAIN PANELS ARE REQUIRED FOR DEPTHS GREATER THAN 10'-0" AND THEIR USE WITH BE CALLED OUT IN THE PLANS OR DIRECTED BY THE ENGINEER.

| | | | |
|---|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | TURBIDITY CURTAIN | | APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 12/30/2014 (DATE) |
| | STANDARD NO. E-18 (2014) | SHT. 1 OF 1 | RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 12/11/2014 (DATE) |

11/19/2014

SCALE : NTS




NOTE:

1). THE DIMENSIONS OF THE STILLING WELL ARE SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER. THE MINIMUM SIZE OF THE STILLING WELL IS 5'-0" x 5'-0".

2). NO STREAMBED MATERIAL SHALL BE ALLOWED TO PASS THROUGH THE DEWATERING HOSE.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

# STILLING WELL

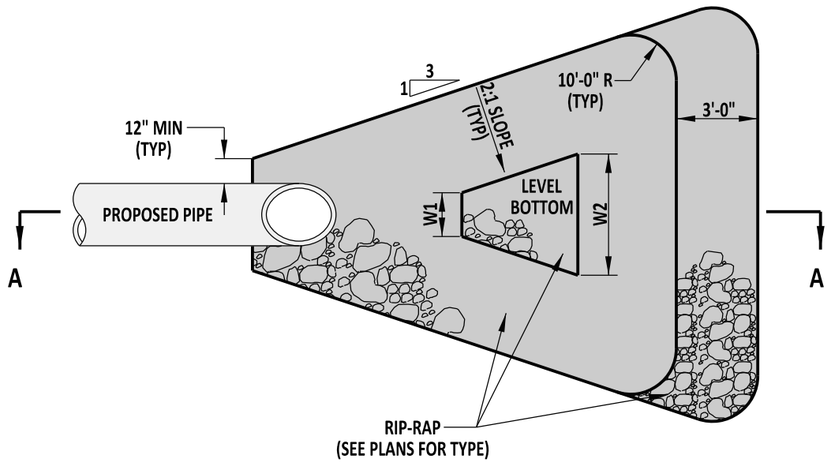
STANDARD NO. E-19 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

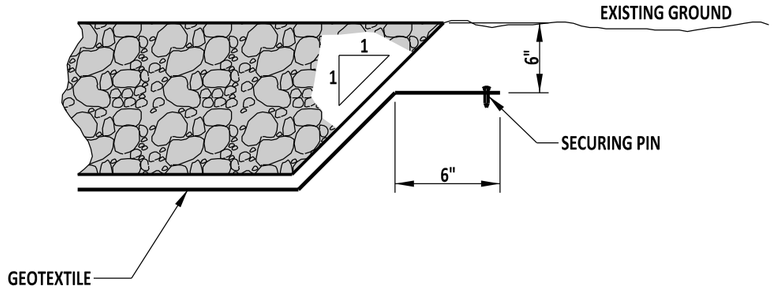
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

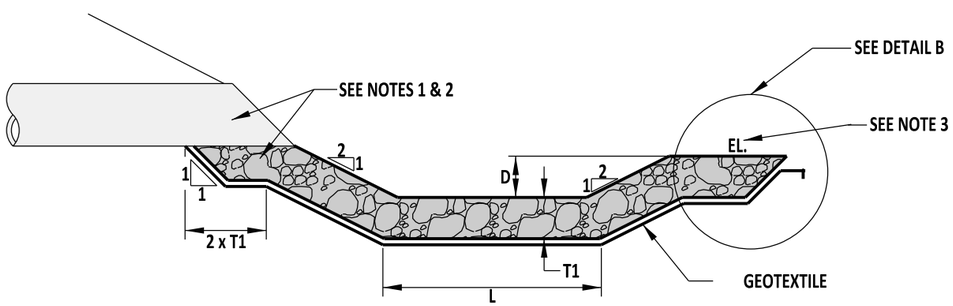
SCALE : NTS




PLAN VIEW




DETAIL B



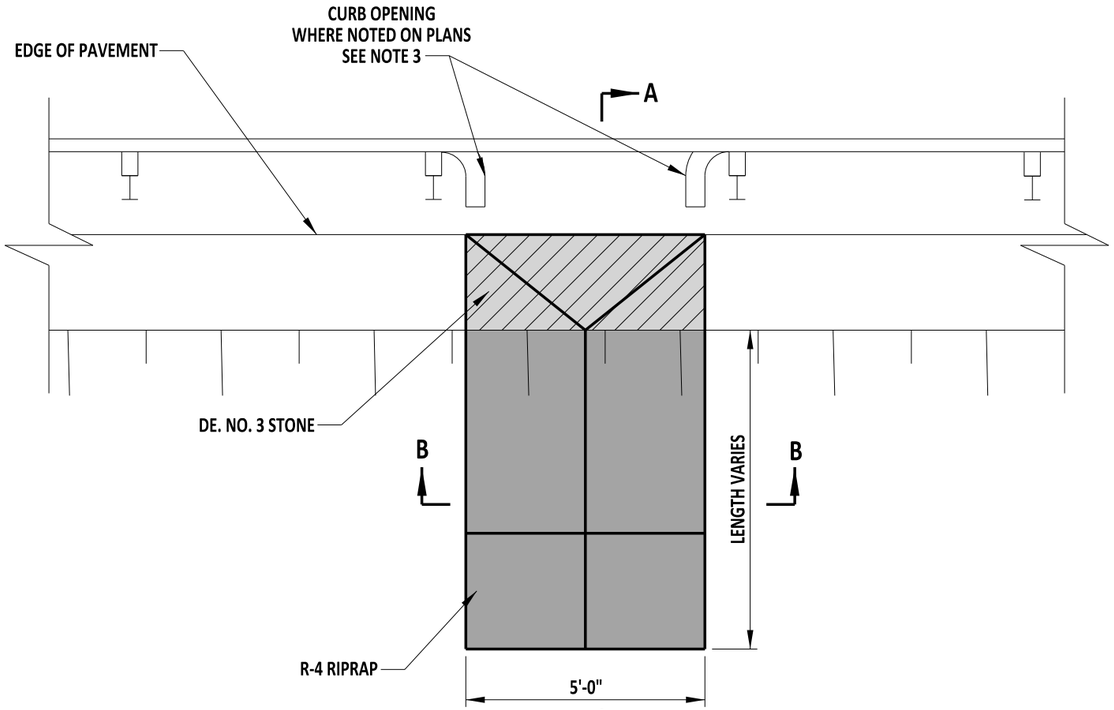

SECTION A-A

NOTES:
1). PLACE RIPRAP PRIOR TO PLACING PIPE.
2). PLACE DELAWARE NO. 3 STONE UNDER PIPE.
3). CONSTRUCT DISSIPATOR SUCH THAT THE ELEVATION (EL.) IS LOWER THAN PIPE INVERT.
4). REFER TO THE PIPE ENERGY DISSIPATOR SCHEDULE ON THE PLANS FOR THE VALUE OF DIMENSION VARIABLES.

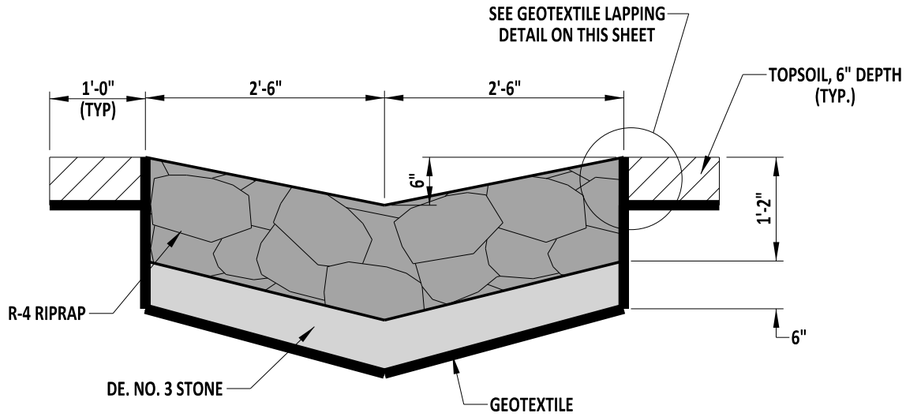
| | | | |
|---|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | RIPRAP ENERGY DISSIPATOR | | APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 12/30/2014 (DATE) |
| | STANDARD NO. E-20 (2014) | SHT. 1 OF 1 | RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 12/11/2014 (DATE) |

10/24/2014

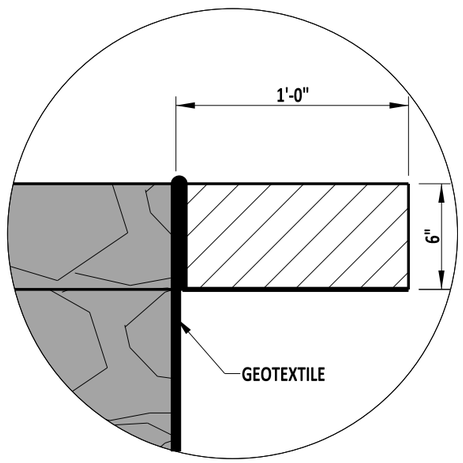
SCALE : NTS



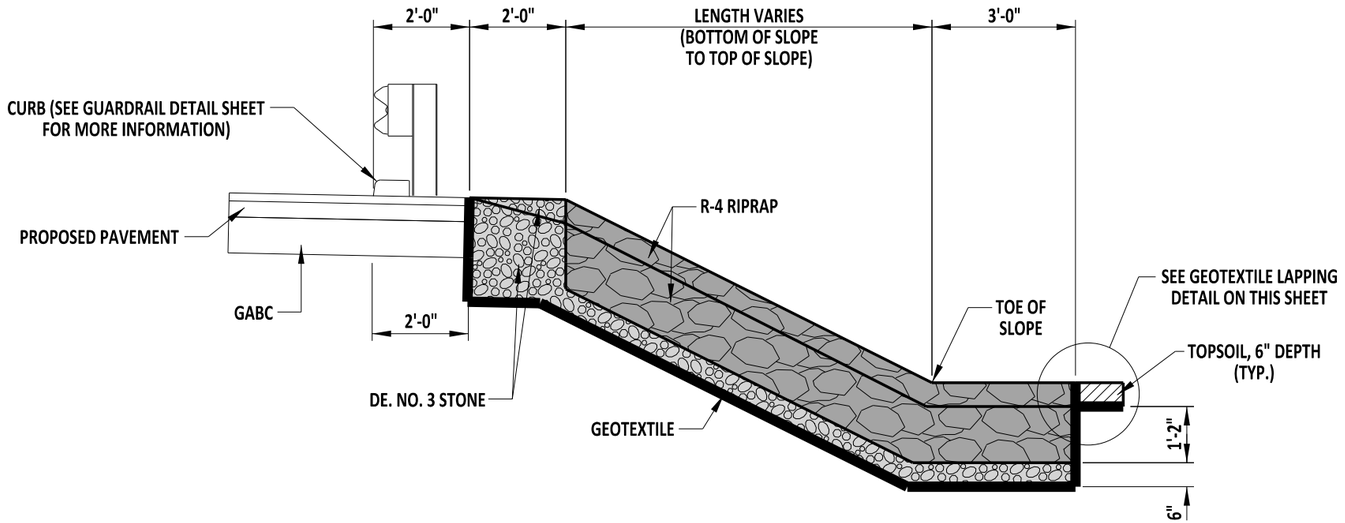

**PLAN**




**SECTION B-B**




**GEOTEXTILE LAPPING DETAIL**




**SECTION A-A**

**NOTES:**

1). GUARDRAIL DEPICTED ON THIS SHEET IS FOR ILLUSTRATIVE PURPOSES ONLY. REFER TO THE GUARDRAIL DETAILS FOR ACTUAL PLACEMENT. PLACEMENT OF SLOPE DRAIN MAY NEED TO BE ADJUSTED TO AVOID CONFLICT WITH GUARDRAIL POSTS.
2). PLACE CURB OPENING AT EACH SLOPE DRAIN LOCATION.
3). SEE DETAILS C-4 AND C-5 FOR MORE INFORMATION.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

# STONE OUTLET

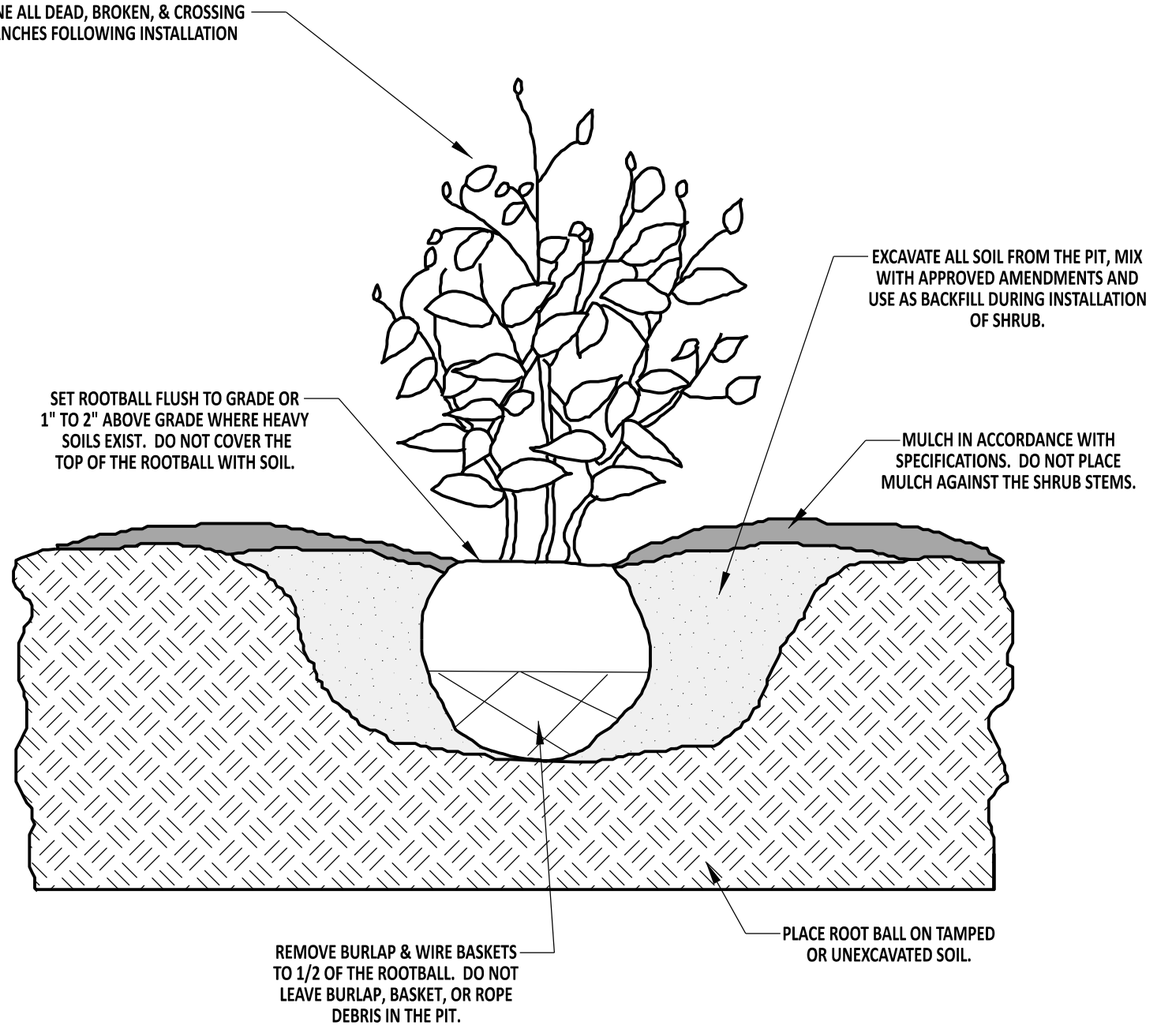
STANDARD NO. E-21 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

SCALE : NTS




NOTES:

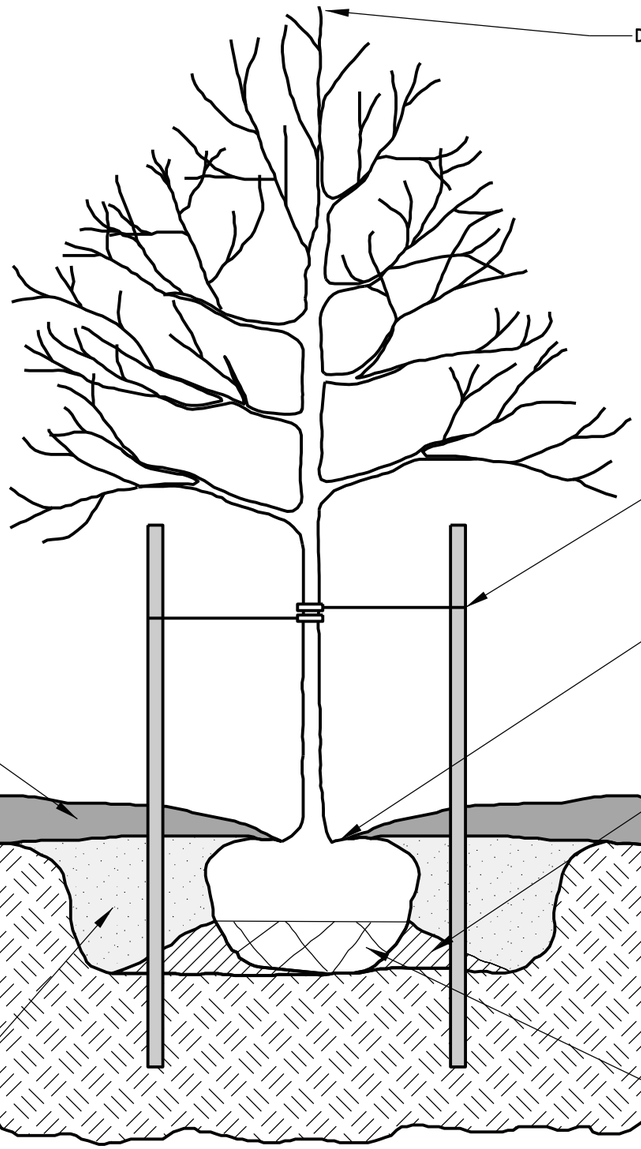
1). DIG BASE OF PLANTING PIT A MINIMUM OF TWO AND A MAXIMUM OF THREE TIMES THE SIZE OF THE ROOT BALL.
2). INSTALL SHRUBS IN MASSES OF NO LESS THAN 3 PLANTS. A MINIMUM OF 3'-0" IS REQUIRED FROM MIDDLE OF SHRUB TO ANY PERMANENT STRUCTURE (I.E. CURB, SIDEWALK, BUILDING, ETC...)
3). SHRUB PRUNING IS TO BE PERFORMED BY AN I.S.A. CERTIFIED ARBORIST, CERTIFIED NURSERY PROFESSIONAL, OR UNDER THE DIRECTION THEREOF. DO NOT HEAVILY PRUNE SHRUBS AT PLANTING.
4). HAND DIG AUGERED HOLES TO FINAL WIDTH AND DEPTH TO ELIMINATE GLAZING.
5). MULCH ALL SHRUB MASSES IN ONE CONTINUOUS BED.

## ROADSIDE SHRUB PLANTING DETAIL

| | | | | | |
|---|---|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | PLANTING DETAILS | | APPROVED | SIGNATURE ON FILE (CHIEF ENGINEER) | 5/31/2017 (DATE) |
| | STANDARD NO. L-1 (2017) | SHT. 1 OF 3 | RECOMMENDED | SIGNATURE ON FILE (DESIGN ENGINEER) | 5/18/2017 (DATE) |

5/11/2017

SCALE : NTS




**NOTES**

1). TREE PRUNING IS TO BE PERFORMED BY AN I.S.A. CERTIFIED ARBORIST, CERTIFIED NURSERY PROFESSIONAL, OR UNDER THE DIRECTION THEREOF. DO NOT HEAVILY PRUNE TREES AT PLANTING.
2). PRUNE ALL DEAD, BROKEN, & CROSSING BRANCHES FOLLOWING INSTALLATION.
3). DIG BASE OF PLANTING PIT A MINIMUM OF TWO AND A MAXIMUM THREE TIMES THE SIZE OF THE ROOT BALL.
4). A MINIMUM OF 3'-0" IS REQUIRED FROM THE MIDDLE OF THE TREE TO ANY PERMANENT STRUCTURE (I.E. CURB, SIDEWALK, BUILDING, ETC...)
5). LIMB TREE TO 7'-0" FOR PEDESTRIAN CLEARANCE WHEN PLANTING ADJACENT TO SIDEWALKS.

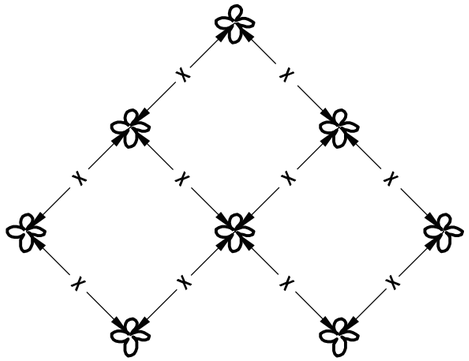
## TREE PLANTING DETAIL

| | | | | | |
|---|---|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | PLANTING DETAILS | | APPROVED | SIGNATURE ON FILE (CHIEF ENGINEER) | 5/31/2017 (DATE) |
| | STANDARD NO. L-1 (2017) | SHT. 2 OF 3 | RECOMMENDED | SIGNATURE ON FILE (DESIGN ENGINEER) | 5/18/2017 (DATE) |

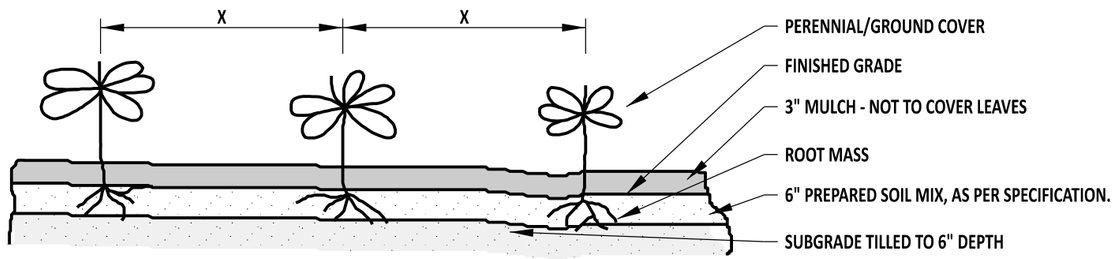
5/11/2017

SCALE : NTS

NOTE:
1). SEE PLANT LIST FOR SPACING (X).




PLAN VIEW



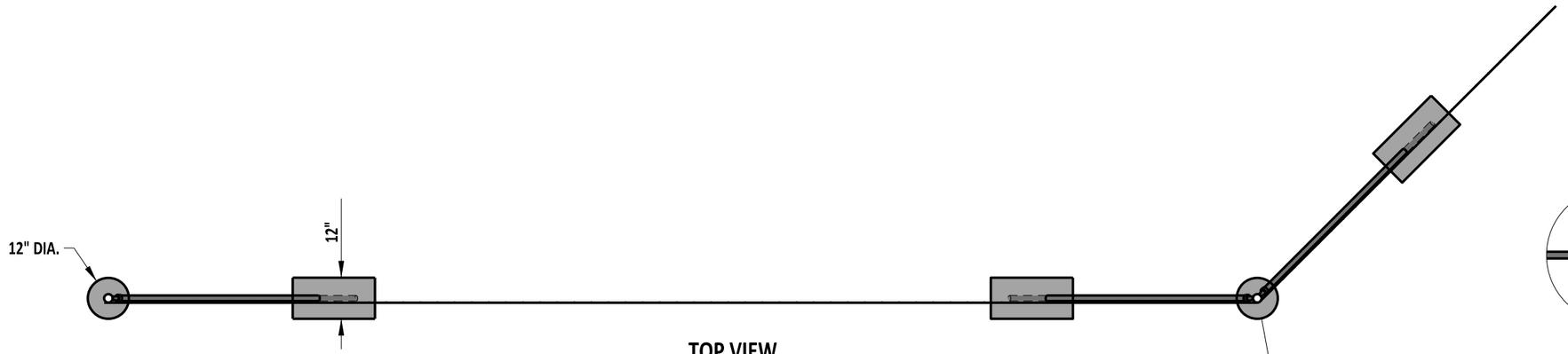

SECTION VIEW

PERENNIAL/GROUNDCOVER PLANTING DETAIL

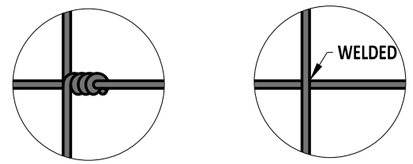
| | | | | | |
|---|---|---|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | PLANTING DETAILS | | | APPROVED | SIGNATURE ON FILE (CHIEF ENGINEER) 5/31/2017 (DATE) |
| | STANDARD NO. L-1 (2017) | SHT. 3 OF 3 | | RECOMMENDED | SIGNATURE ON FILE (DESIGN ENGINEER) 5/18/2017 (DATE) |

5/11/2017

SCALE : NTS

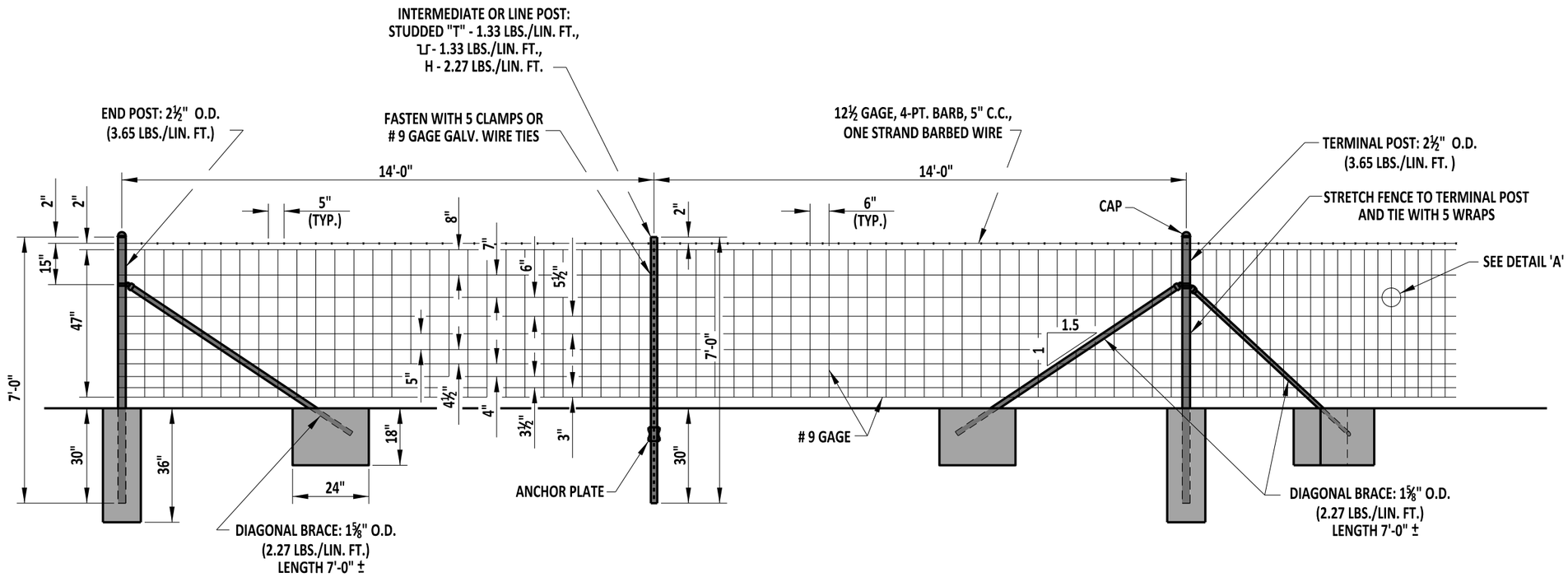



TOP VIEW




ALTERNATE METHODS OF SECURING VERTICAL
STAY WIRES TO THE HORIZONTAL WIRES OF THE FABRIC.

DETAIL 'A'




FRONT VIEW

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

RIGHT-OF-WAY FENCE

STANDARD NO. M-1 (2020) | SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

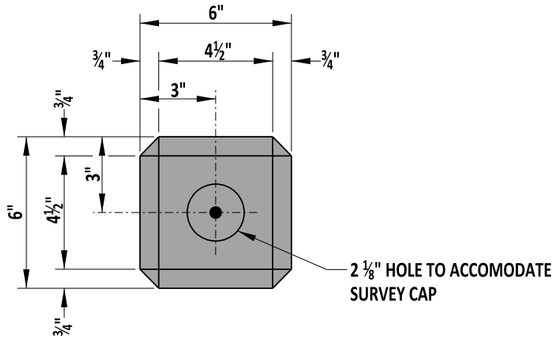
APPROVED
CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

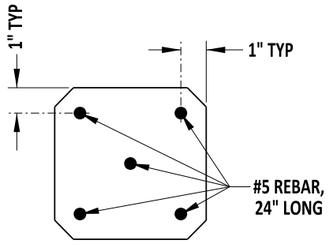
SCALE : NTS

NOTES :

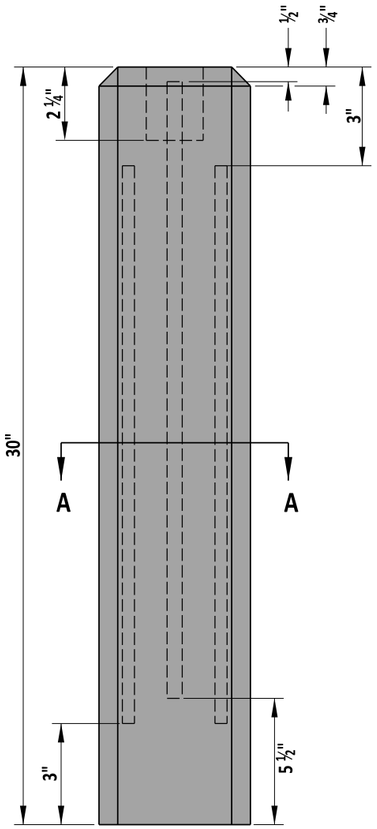
1). SUPPORT LONGITUDINAL STEEL IN PLACE BY CRADLES.
2). COUNTERSINK LETTERS ON CONCRETE MONUMENT IN TOP OF MARKER ¼".
3). USE FLEXIBLE DELINEATORS ONLY ON ROADS WITH A SPECIFIED DENIAL OF ACCESS OR CLASSIFIED AS MINOR ARTERIALS OR HIGHER. ON ALL OTHER ROAD CLASSIFICATIONS, PLACE A WOODEN STAKE WITH "ROW" HANDWRITTEN VERTICALLY IN 1" TALL LETTERS.
4). PLACE CAP ON CONCRETE MONUMENT SO THAT TOP OF CAP IS FLUSH WITH THE TOP OF THE CONCRETE MONUMENT.
5). DO NOT CHAMFER THE CONCRETE MONUMENT WHEN PLACED WITHIN BITUMINOUS OR PCC.



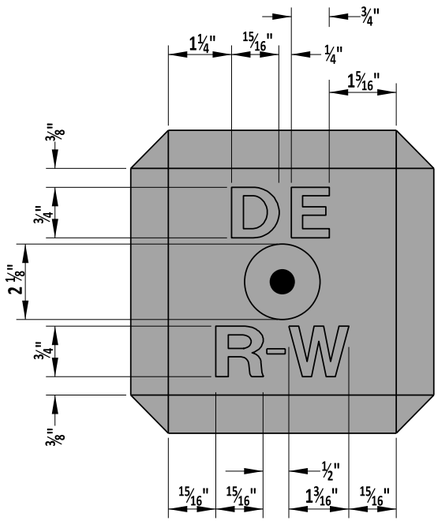

TOP



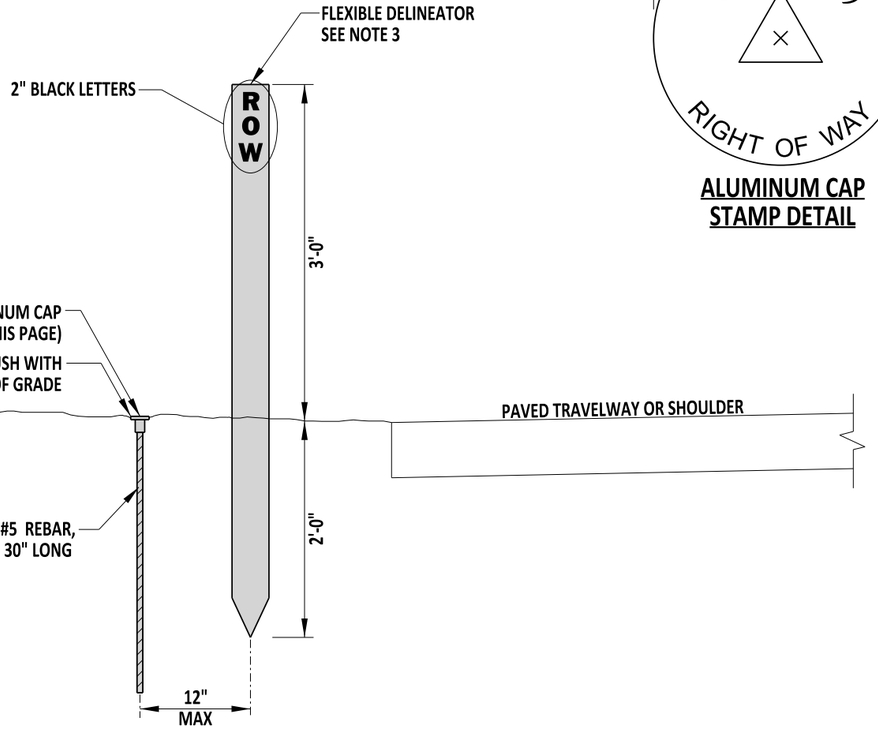

SECTION A-A




ELEVATION




TOP DETAIL




REBAR AND CAP WITH FLEXIBLE DELINEATOR DETAIL




ALUMINUM CAP STAMP DETAIL

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ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

RIGHT OF WAY MONUMENTATION

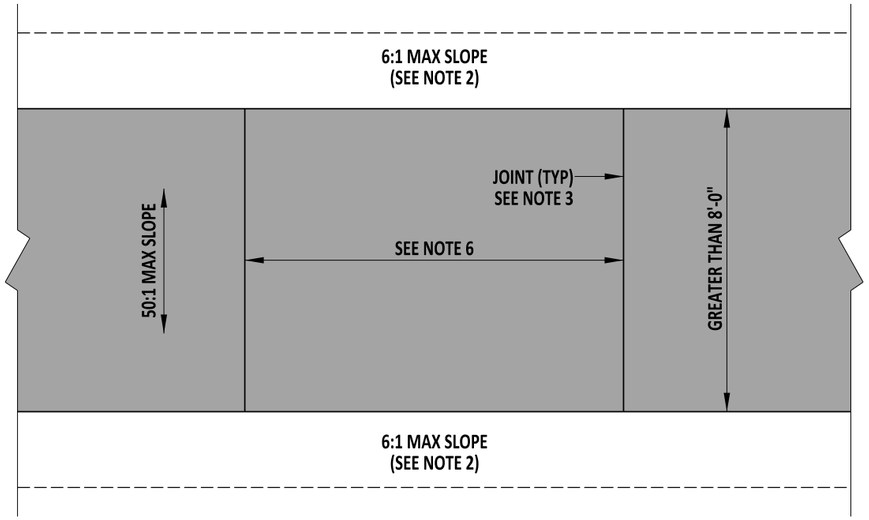
STANDARD NO. M-2 (2020) | SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

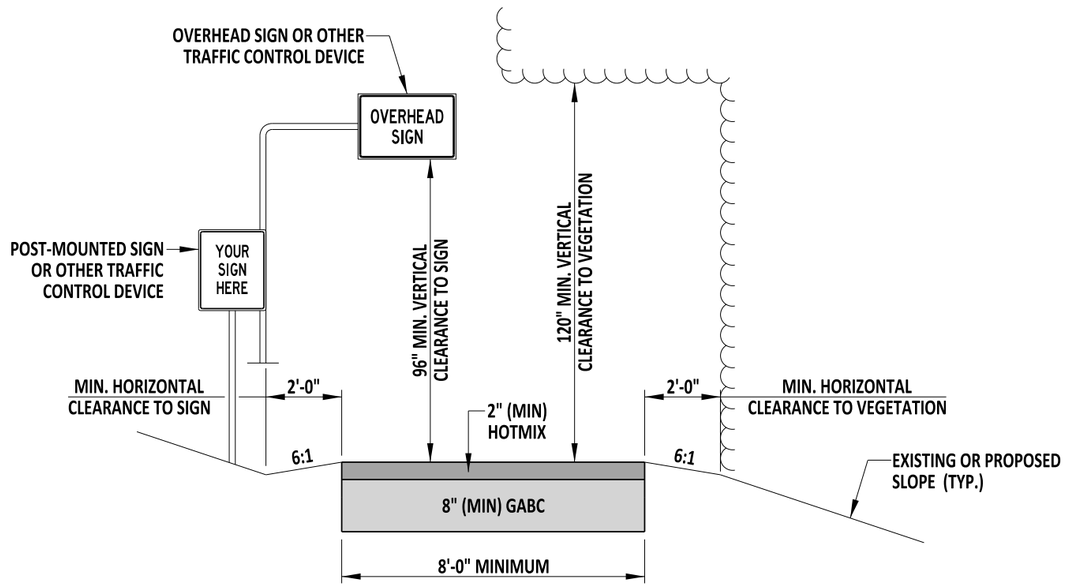
APPROVED
CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

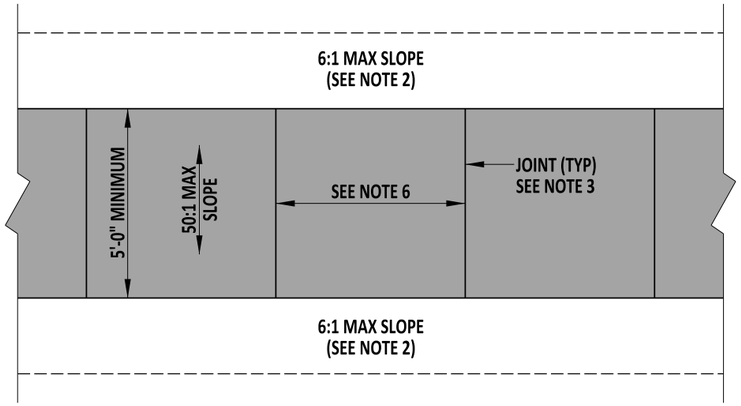
SCALE : NTS



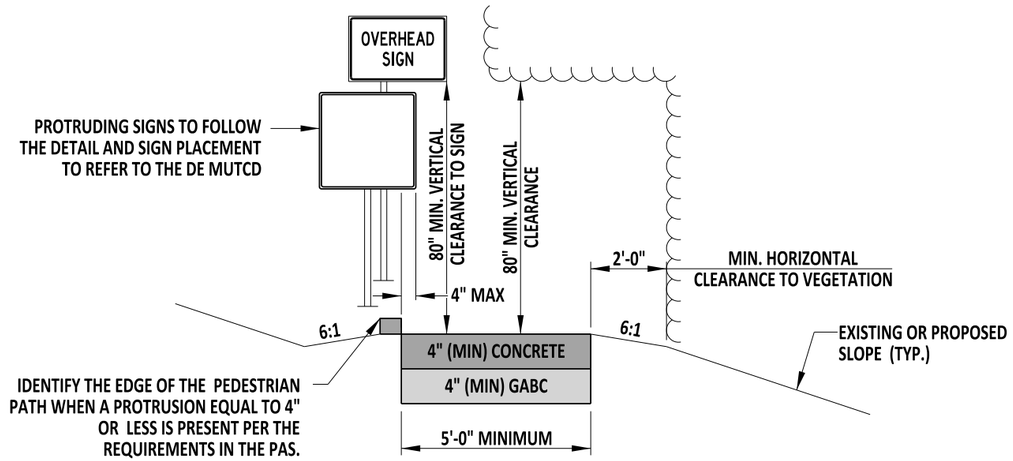

## SHARED-USE PATH PLAN




## SHARED-USE PATH TYPICAL SECTION




## SIDEWALK PLAN




## SIDEWALK TYPICAL SECTION

NOTES:

1). IF THE SHARED-USE PATH OR SIDEWALK ENDS AT A TRAVELWAY OR RAILROAD CROSSING, INSTALL A PEDESTRIAN CONNECTION AT THE WIDTH OF THE PATH OR SIDEWALK (SEE C-2).
2). A 6:1 GRADE IS REQUIRED FOR A MINIMUM OF 2'-0" IMMEDIATELY ADJACENT TO THE SHARED USE PATH OR SIDEWALK.
3). FOR SIDEWALKS, PLACE CONSTRUCTION JOINTS EVERY 5' IN ACCORDANCE WITH SECTION 705.3. FOR CONCRETE SHARED-USE PATHS, PLACE CONSTRUCTION JOINTS EVERY 10'.
4). PLACE EXPANSION MATERIAL PLACEMENT IN ACCORDANCE WITH SECTION 701.3.
5). ON REHABILITATION PROJECTS, WHEN EXISTING OBSTRUCTIONS (FIRE HYDRANT, UTILITY POLE, ETC...) ARE LOCATED IN THE SIDEWALK, MAINTAIN A MINIMUM WIDTH OF 34" AND MAXIMUM LENGTH CONSTRICTION OF 24".
6). NOT TO EXCEED 5% OR ADJACENT ROAD GRADE.

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ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

SHARED-USE PATH & SIDEWALK

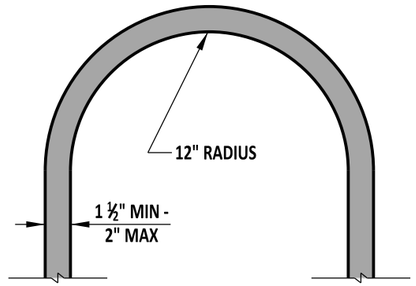
STANDARD NO. M-3 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

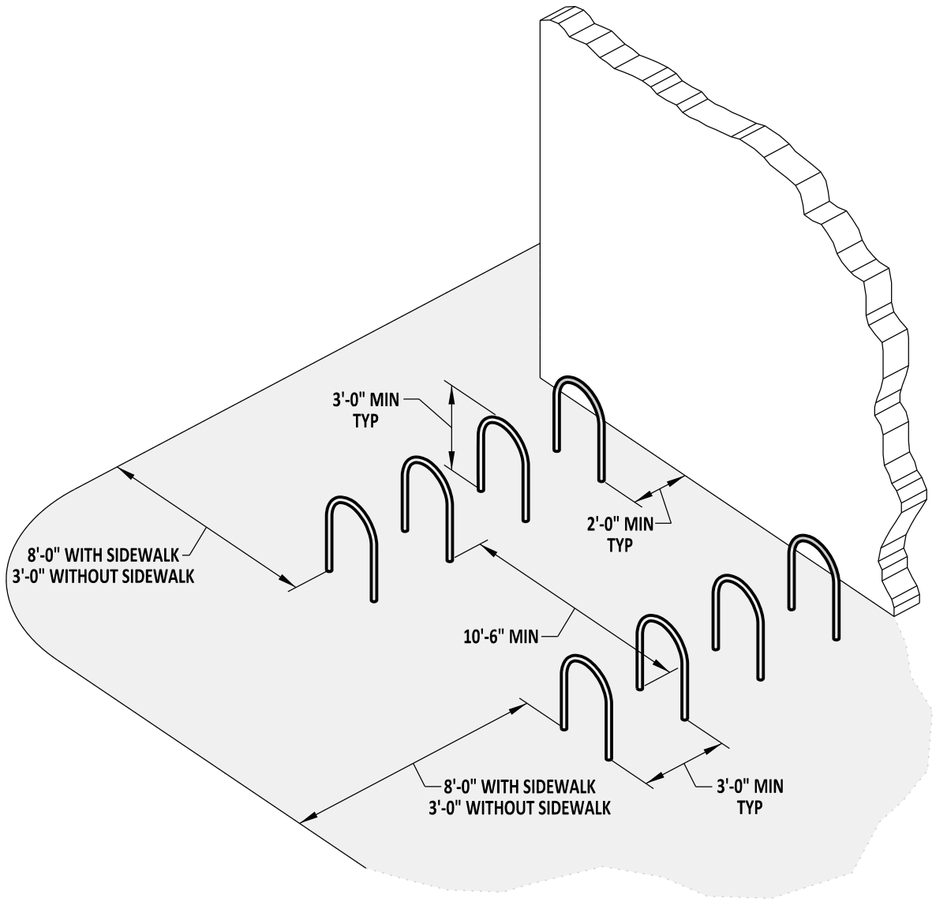
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

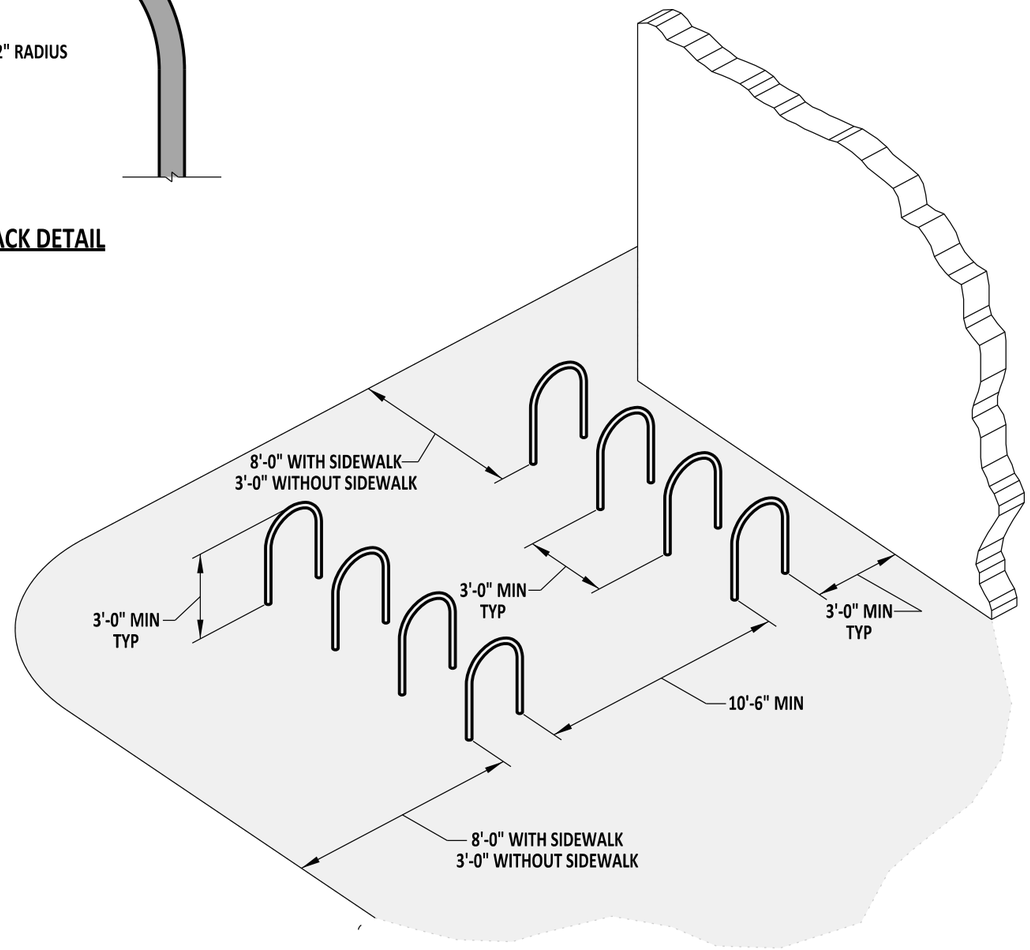
08/20/2020

SCALE : NTS




**BIKE RACK DETAIL**



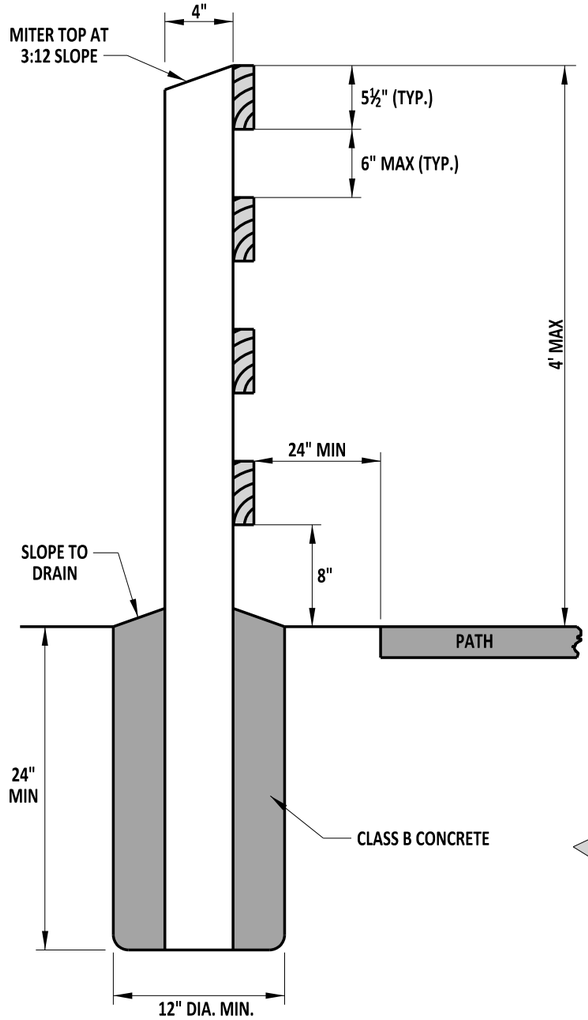

NOTES:

1). BIKE RACK SHALL BE ANCHORED AS PER MANUFACTURER'S RECOMMENDATIONS AFTER APPROVAL FROM ENGINEER IN THE FIELD.
2). DETAIL SHOWN WITH P.C.C. CURB TYPE 1-8, HOWEVER ACTUAL CURB VARIES AND SHOULD BE PLACED AS SHOWN ON PLANS.
3). SPECIAL CONSIDERATIONS SHOULD BE TAKEN WHEN PLACING BIKE RACKS NEAR CURB RAMPS AND MAY REQUIRE A DETAIL ON THE PLANS.

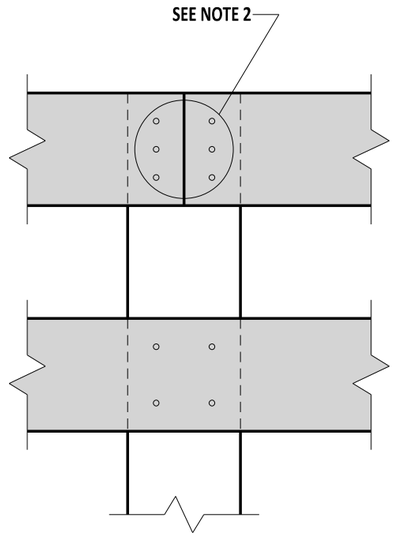
| | | | |
|---|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | BIKE RACK LAYOUT DETAILS | | APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 12/22/2011 (DATE) |
| | STANDARD NO. M-4 (2011) | SHT. 1 OF 1 | RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 12/21/2011 (DATE) |

04/15/2011

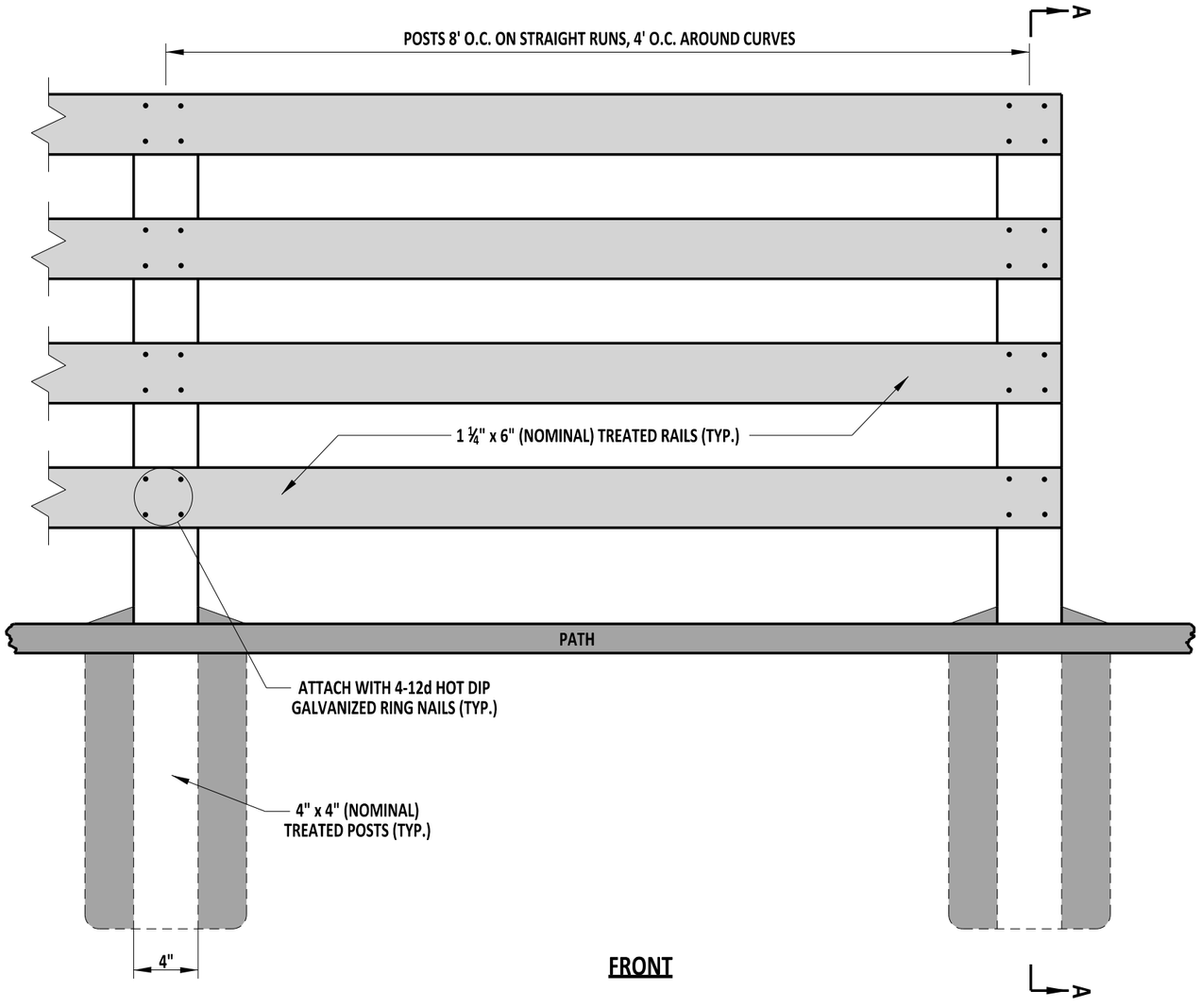
SCALE : NTS




SECTION A-A




TYPICAL JOINT DETAIL




FRONT

NOTES:

1). CENTER ALL RAIL JOINTS AT THE POSTS. DO NOT END TWO ADJACENT RAILS ON THE SAME POST.
2). ATTACH ALL RAILS SHALL BE ATTACHED WITH 3 - 12d NAILS.
3). INSTALL RAILS FLUSH TO THE POSTS AT THE END POSTS.
4). FENCE TO BE LOCATED OUTSIDE OF CLEAR ZONE OR ALONG LOW SPEED AREAS AS DIRECTED BY THE ENGINEER.

DelDOT

ENGINEERING SUPPORT 09/01/2020 DATE
RECOMMENDED

WOOD RAIL FENCE

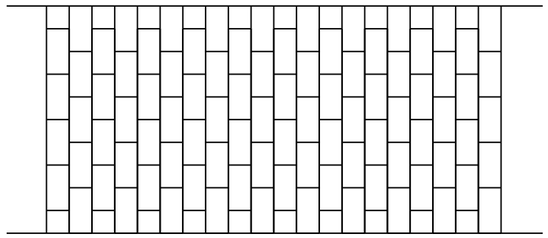
STANDARD NO. M-5 (2020) SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE

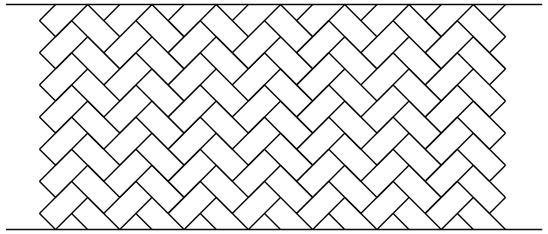
APPROVED
CHIEF ENGINEER 09/01/2020 DATE

08/20/2020

SCALE : NTS



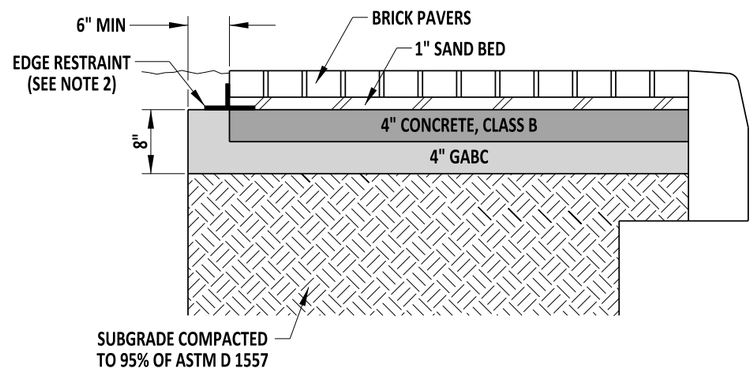
4" x 8" RUNNING BOND PATTERN



4" x 8" HERRINGBONE PATTERN

NOTES:

1. CONSTRUCT THE PATTERN SPECIFIED ON THE PLANS. COLOR IS TO BE "BRICK RED" UNLESS OTHERWISE NOTED ON THE PLANS.
2. MATERIALS AND PAVEMENT BOX VARY DEPENDING ON PLANS.
3. FOR CROSSWALK APPLICATIONS, REFER TO THE DE MUTCD CONTROL DEVICES FOR STRIPING WIDTH.
4. THE PATTERNS ABOVE ARE THE PREFERRED PATTERNS AVAILABLE FOR SIDEWALK OR CROSSWALK APPLICATIONS.




BRICK PAVER SIDEWALK DETAIL

NOTES:

1. WHEN SIDEWALK IS CONFINED BY A RIGID STRUCTURE ON BOTH SIDES, PLACE EXPANSION JOINT MATERIAL FROM TOP OF BRICK TO BOTTOM OF CONCRETE BASE ON AT LEAST ONE SIDE OF THE SIDEWALK.
2. EDGE RESTRAINT TO BE APPROVED BY THE ENGINEER IN THE FIELD AND INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.

DelDOT

09/01/2020
ENGINEERING SUPPORT DATE
RECOMMENDED

PATTERNED HOT-MIX OR CONCRETE & BRICK PAVER

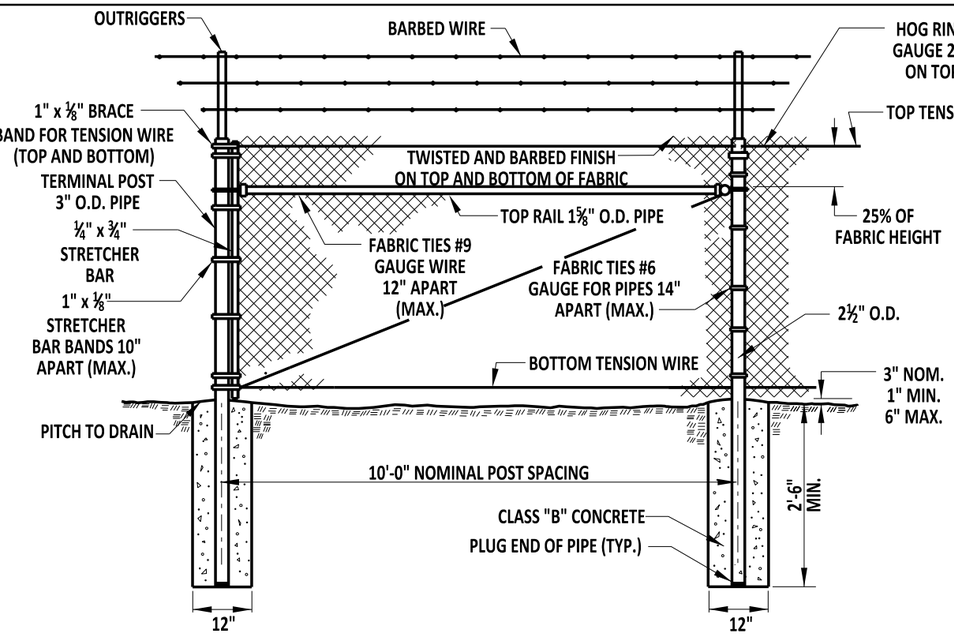
STANDARD NO. M-6 (2020) SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE

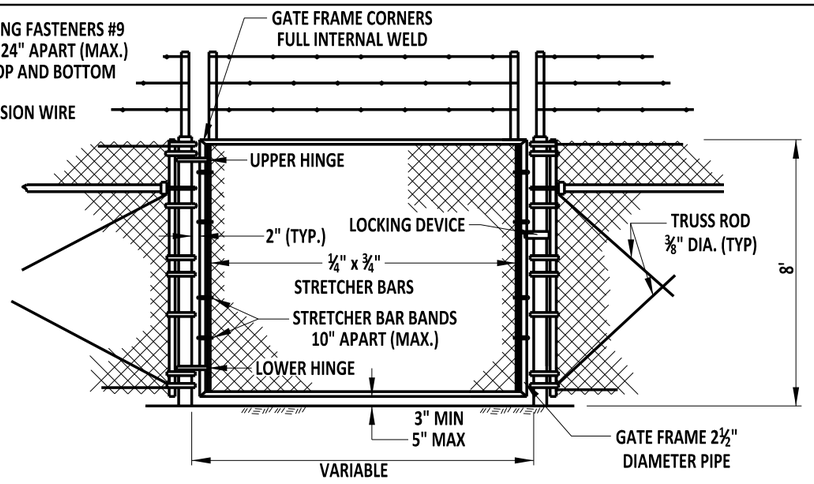
APPROVED
CHIEF ENGINEER 09/01/2020 DATE

08/20/2020

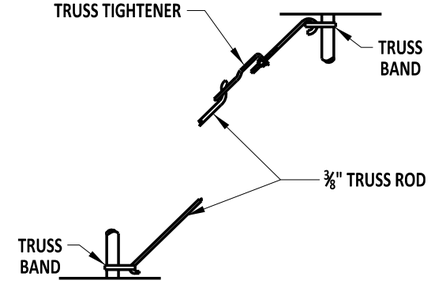
SCALE : NTS




## CHAIN-LINK FENCE




## GATES, CHAIN-LINK FENCE




⅜" TRUSS ROD ASSEMBLY

## CHAIN-LINK FENCE ASSEMBLIES



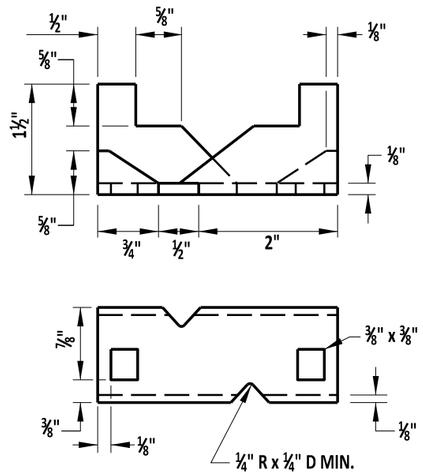
## TENSION WIRE CONNECTION AT ROUND INTERMEDIATE OR CORNER POST

## GENERAL NOTES

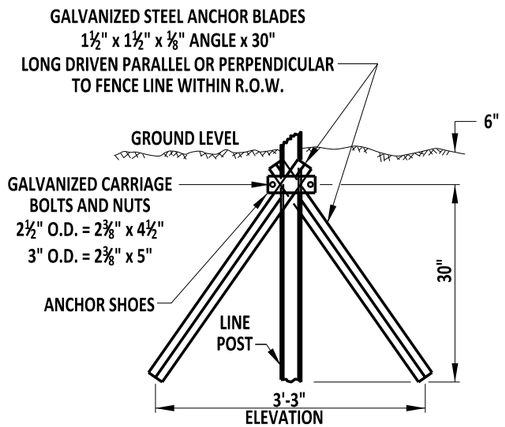
1). POSTS

| | TERMINAL, CORNER AND GATE POSTS | LINE POSTS | TOP OR BRACE RAIL |
|---|---|---|---|
| | 3" O.D. PIPE | 2½" O.D. PIPE | 1⅝" O.D. PIPE |
| AASHTO TYPE | I OR II | I OR II | I OR II |
| AASHTO GRADE | 1 OR 2 | 1 OR 2 | 1 OR 2 |
| MINIMUM LENGTH OF POST | 10'-8" | 10'-8" | N/A |
| ACTUAL OUTSIDE DIAMETER | 2⅞" | 2⅜" | 1.660" |
| WALL THICKNESS | GRADE 1 = .203" GRADE 2 = .160" | GRADE 1 = .154" GRADE 2 = .120" | GRADE 1 = .140" GRADE 2 = .111" |

2). THE DEPTH OF CONCRETE FOOTERS IN SOLID ROCK MAY BE REDUCED TO 12" BELOW THE TOP OF ROCK AND THE DIAMETER OF THE HOLE IN ROCK MAY BE REDUCED TO 6".
3). FURNISH BRACE BANDS AND STRETCHER BAR BANDS WITH 5/16" DIA. CARRIAGE BOLTS AND ELASTIC STOP NUTS.
4). DRIVE ANCHOR SHOE ASSEMBLY ONLY TO BE USED IN WET AREAS AND WITH PRIOR APPROVAL OF THE ENGINEER.
5). TACK WELD OR BURR NUTS AND BOLTS TO PREVENT REMOVAL.
6). IF THERE ARE ANY OPENINGS IN THE FENCE LARGER THAN 96 SQ. IN. DUE TO UTILITIES OR GRADED TERRAIN, SECURE THE OPENINGS WITH A METAL GRILL THAT IS LOCKED OR PERMANENTLY WELDED.
7). VEGETATION AND PERMANENT STRUCTURES (SUCH AS BUILDINGS, LIGHT POLES, AND UTILITY POLES) SHALL BE AT LEAST 14' FROM THE FENCE. ANY EXCEPTIONS SHALL REQUIRE CONSTRUCTION OF TOP GUARDS.
8). INSTALL ALL FENCES OUTSIDE OF THE CLEAR ZONE.




## ANCHOR SHOE




## DRIVE ANCHOR SHOE ASSEMBLY

(SEE NOTE 4)

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

CHAIN LINK FENCE

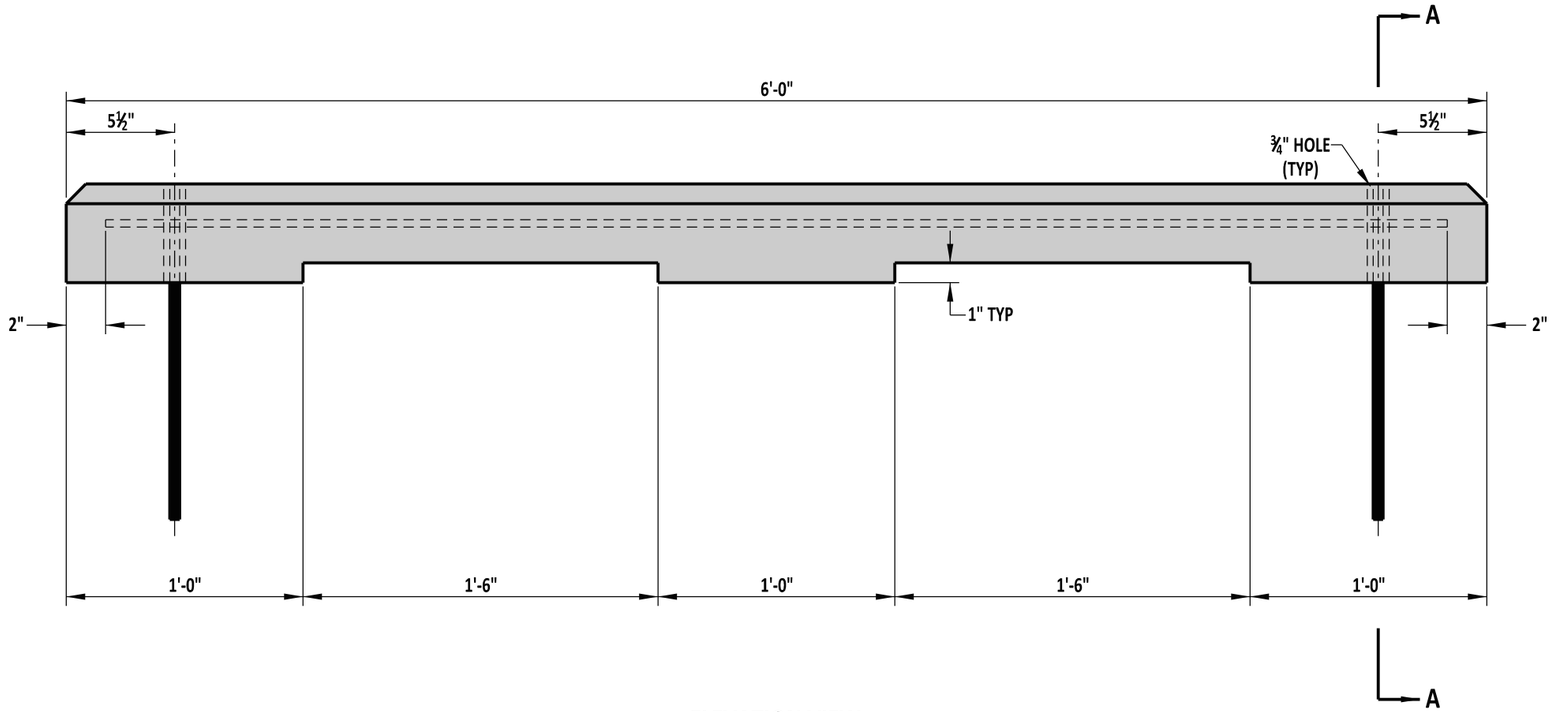
STANDARD NO. M-7 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

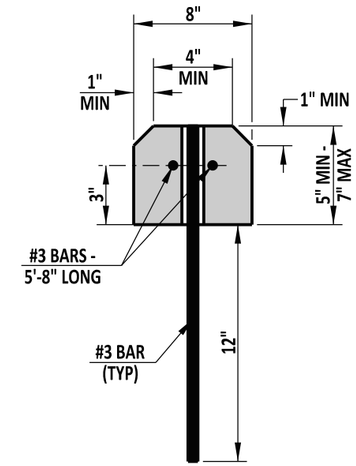
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

SCALE : NTS




ELEVATION VIEW

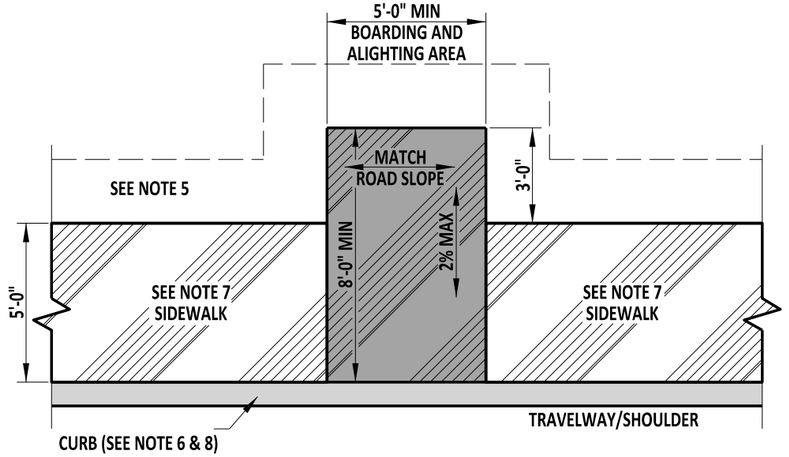



SECTION A-A

| | | | | | |
|---|---|---|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | P.C.C. PARKING BUMPER | | | APPROVED | SIGNATURE ON FILE (CHIEF ENGINEER) 12/30/2014 (DATE) |
| | STANDARD NO. M-8 (2014) | SHT. 1 OF 1 | | RECOMMENDED | SIGNATURE ON FILE (DESIGN ENGINEER) 12/11/2014 (DATE) |

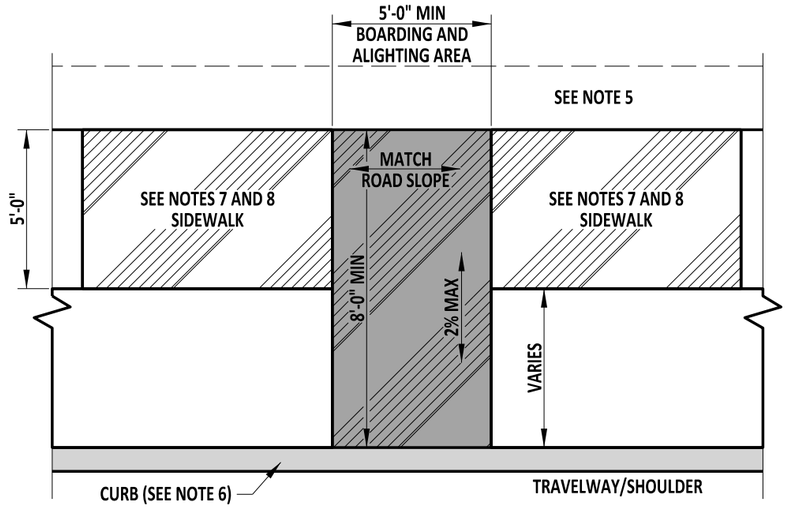
10/27/2014

SCALE : NTS



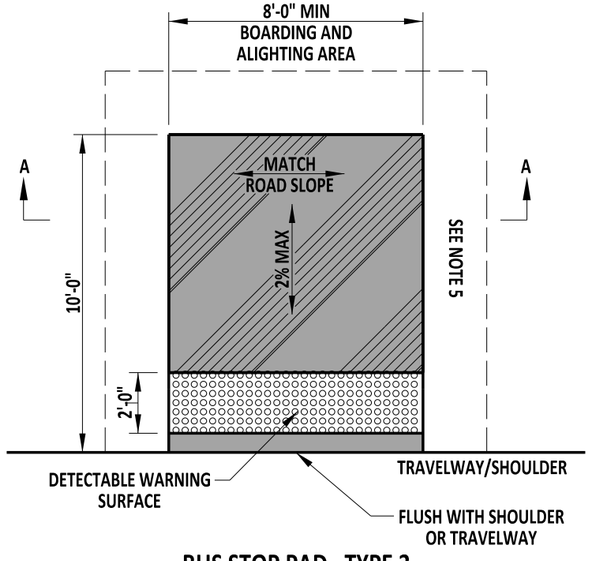

## BUS STOP PAD, TYPE 1

* - TO BE USED WHEN THE PAD IS PLACED BEHIND CURB AND INCLUDES A SIDEWALK WITHOUT A GRASS STRIP



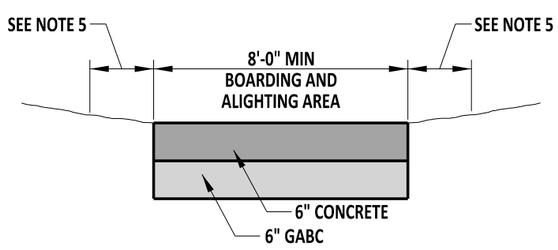

## BUS STOP PAD, TYPE 2

* - TO BE USED WHEN THE PAD IS PLACED BEHIND CURB AND INCLUDES A SIDEWALK WITH A GRASS STRIP




## BUS STOP PAD , TYPE 3

* - TO BE USED WHEN THE PAD IS PLACED FLUSH WITH THE TRAVELWAY AND NO CURB OR SIDEWALK IS INCLUDED




## SECTION A-A

- PCC SIDEWALK

- PCC 6"

**NOTES:**

1). BUS STOP PAD LOCATIONS TO BE APPROVED BY BOTH DART AND DELDOT PRIOR TO ANY CONSTRUCTION.
2). REFERENCE THE DE MUTCD FOR GENERAL INFORMATION ON PLACEMENT OF SIGNS.
3). SEE CONSTRUCTION PLAN SIGNING AND STRIPING SHEETS FOR SPECIFIC SIGN AND SIGN LOCATION DETAILS.
4). TYPICAL BUS STOP PADS MAY BE USED IN CONJUNCTION WITH BUS STOP SHELTER LOCATIONS IN THE EVENT OF LAND CONSTRAINTS AT THE SHELTER LOCATIONS. AN INTERCONNECTING PEDESTRIAN ACCESS PATH MUST EXIST THAT IS ACCESSIBLE TO BUS STOP ALIGHTING AREAS, SHELTERS, PEDESTRIAN CONNECTIONS, CROSSWALKS, AND SIDEWALKS.
5). A 6:1 GRADE IS REQUIRED FOR A MINIMUM OF 2'-0" IMMEDIATELY ADJACENT TO THE BUS STOP PAD OR APPROACHING SIDEWALK.
6). SEE PLANS FOR CORRECT CURB TYPE. DO NOT DEPRESS CURB
7). SEE DETAIL M-3, SHEET 1 OF 1 FOR ADDITIONAL SIDEWALK DETAILS AND REQUIREMENTS.
8). THE MAXIMUM RUNNING SLOPE TO TRANSITION THE SIDEWALK TO MEET BUS STOP PAD ELEVATION IS 12:1 (8.3%), HOWEVER, 20:1 (5%) IS PREFERRED. RAMPS ARE ONLY REQUIRED WHEN THE VERTICAL HEIGHT OF THE APPROACHING SIDEWALK DIFFERS FROM THAT OF THE ADJACENT CURB.

DelDOT

ENGINEERING SUPPORT 09/01/2020 DATE

RECOMMENDED

BUS STOP PAD, TYPES 1, 2 & 3

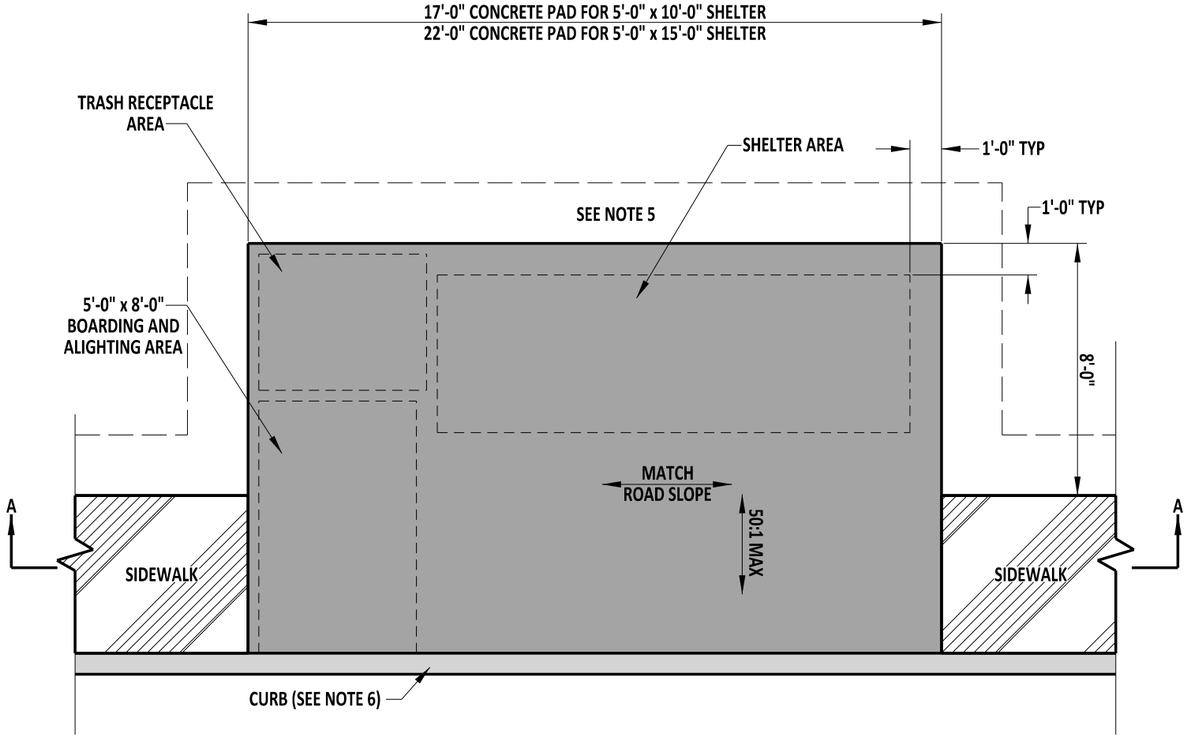
STANDARD NO. M-9 (2020) SHT. 1 OF 2

REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE

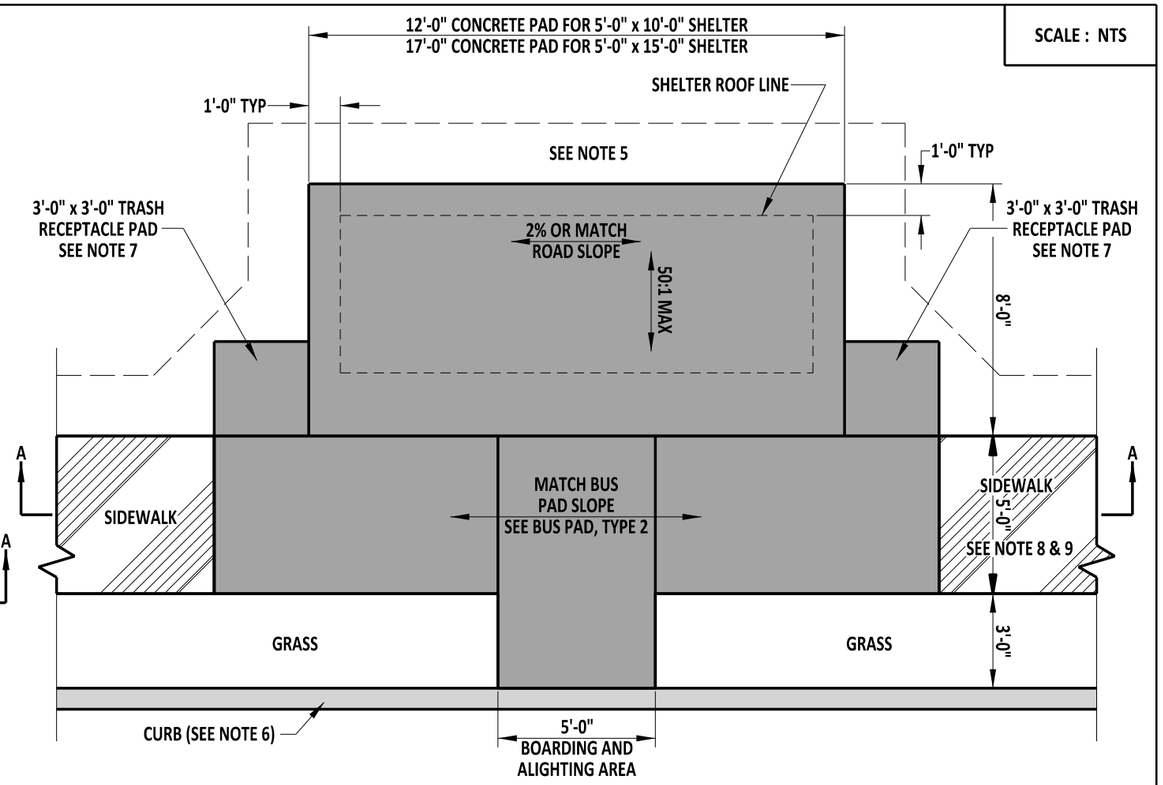
APPROVED CHIEF ENGINEER 09/01/2020 DATE

08/20/2020

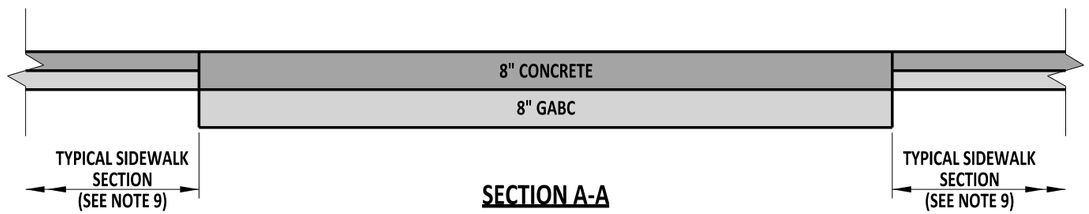
SCALE : NTS




## BUS STOP WITH SHELTER PAD, TYPE 1




## BUS STOP WITH SHELTER PAD, TYPE 2




## SECTION A-A

- PCC SIDEWALK
- PCC 8"

**NOTES:**

1). BUS STOP SHELTER PAD LOCATIONS TO BE APPROVED BY DART AND DELDOT PRIOR TO ANY CONSTRUCTION.
2). REFERENCE THE DE MUTCD FOR GENERAL INFORMATION ON PLACEMENT OF SIGNS.
3). SEE CONSTRUCTION PLANS SIGNING AND STRIPING SHEETS FOR SPECIFIC SIGN AND SIGN LOCATION DETAILS.
4). A 6:1 GRADE IS REQUIRED FOR A MINIMUM OF 2'-0" IMMEDIATELY ADJACENT TO THE BUS STOP PAD OR APPROACHING SIDEWALK.
5). SEE PLANS FOR CORRECT CURB TYPE. DO NOT DEPRESS CURB.
6). THE MAXIMUM RUNNING SLOPE TO TRANSITION THE SIDEWALK TO MEET BUS STOP PAD ELEVATION IS 12:1 (8.3%), HOWEVER, 20:1 (5%) IS PREFERRED. RAMPS ARE ONLY REQUIRED WHEN THE VERTICAL HEIGHT OF THE APPROACHING SIDEWALK DIFFERS FROM THAT OF THE ADJACENT CURB.
7). SEE DETAIL M-3, SHEET 1 OF 1 FOR ADDITIONAL SIDEWALK DETAILS AND REQUIREMENTS.
8). BUS STOP CONFIGURATIONS MAY VARY DUE TO TOPOGRAPHIC OBSTRUCTIONS OR GRADES. CONSULT DART OR DELDOT FOR OPTIONAL PAD DETAILS.
9). TRASH RECEPTACLE PAD CAN BE PLACED ON EITHER SIDE OF THE SHELTER PAD, AT THE DIRECTION OF THE ENGINEER IN THE FIELD.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

BUS STOP PAD WITH SHELTER, TYPES 1 & 2

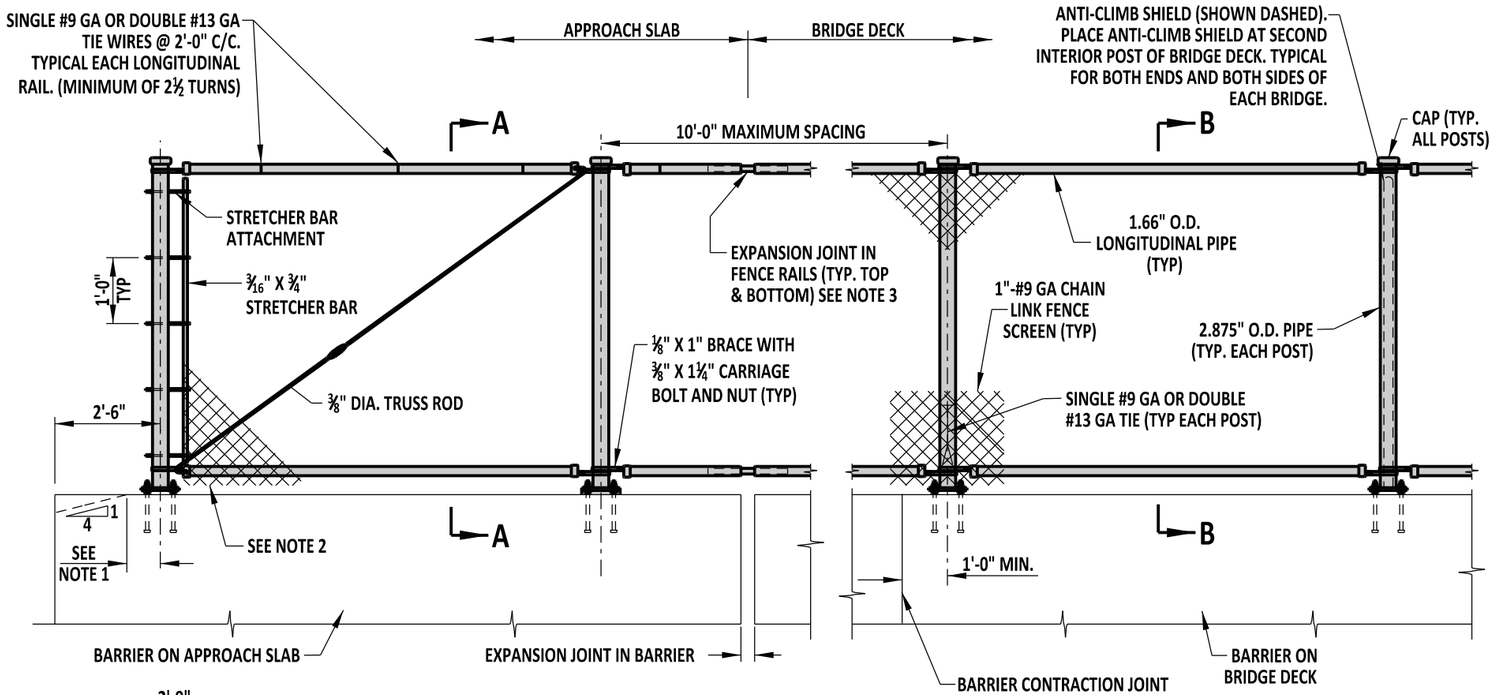
STANDARD NO. M-9 (2020) | SHT. 2 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

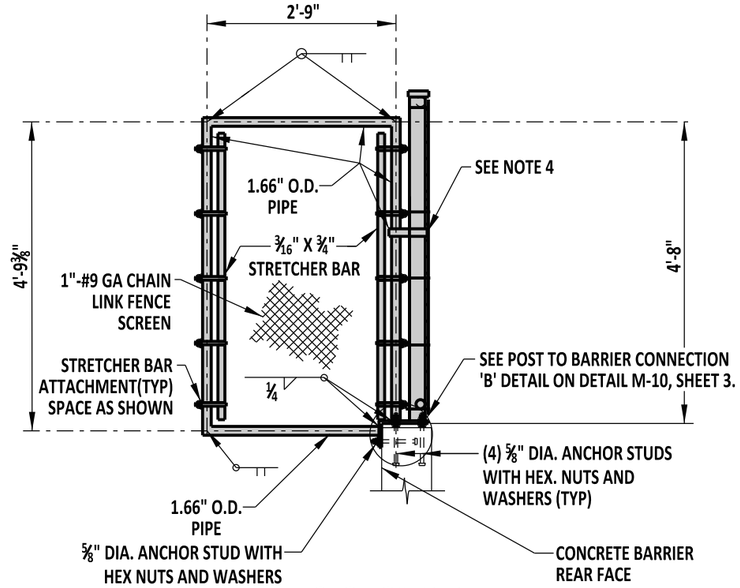
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

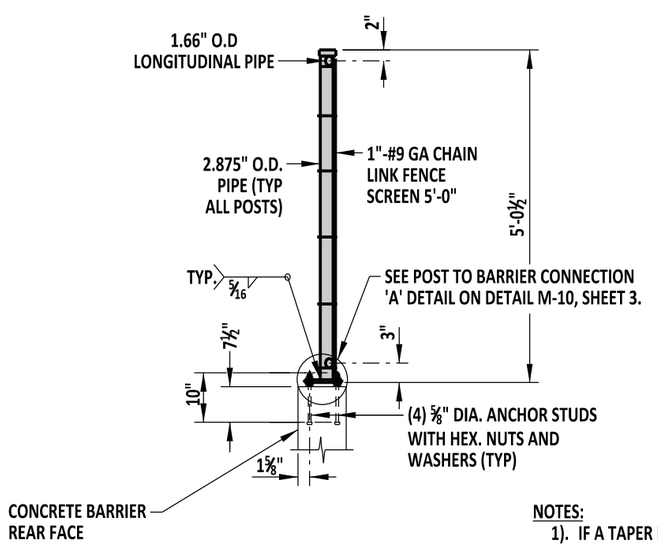
SCALE : NTS




## ELEVATION




## SECTION B-B




## SECTION A-A

# BRIDGE SAFETY FENCE, TYPE 1

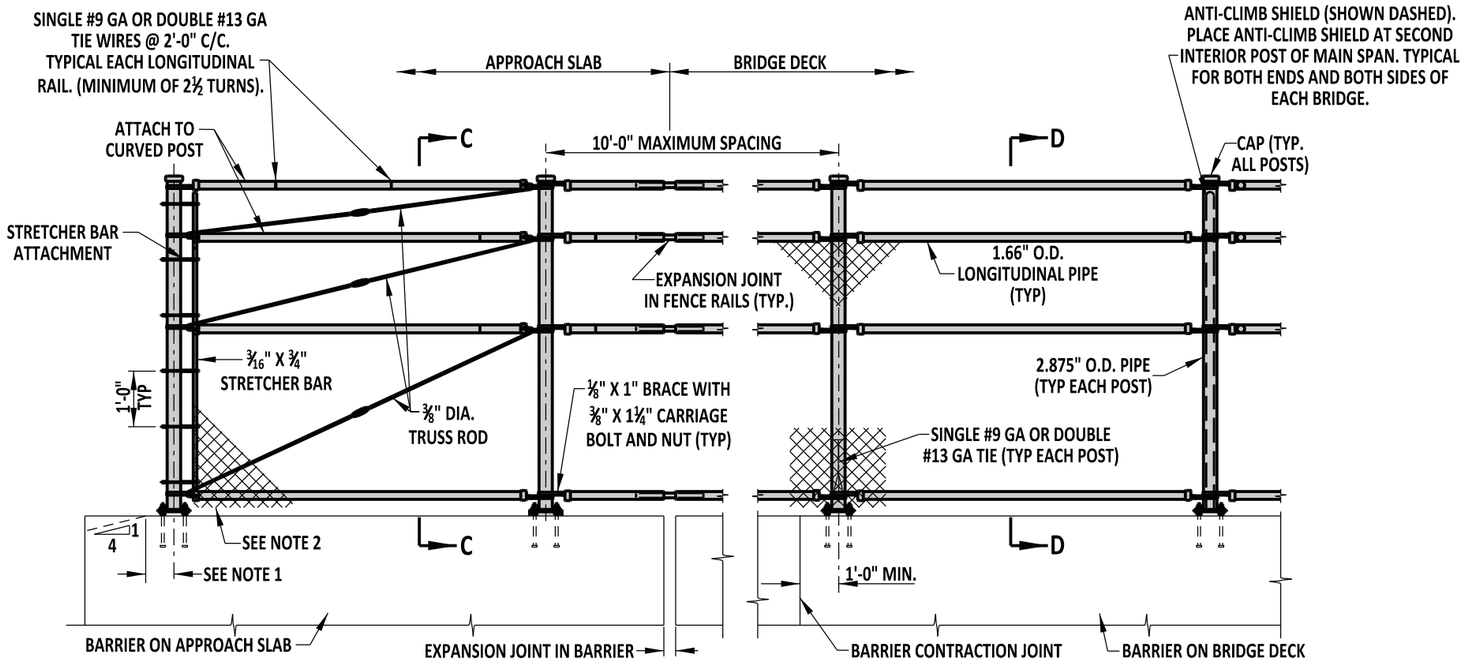
NOTES:

1). IF A TAPER EXISTS AT THE END OF THE BARRIER, PLACE POST 6" FROM THE TOP OF TAPER.
2). MINIMUM ½" TO MAXIMUM 1" OF CLEARANCE BETWEEN TOP OF BARRIER AND BOTTOM OF CHAIN LINK FENCE SCREEN.
3). LINE UP EXPANSION JOINTS IN TOP AND BOTTOM FENCE RAILS WITH EXPANSION JOINTS IN BARRIER.
4). ATTACH ANTI-CLIMB SHIELD TO FENCE POST BY SMALL SECTION OF PIPE TO EACH VERTICAL POST WITH ¼" FILLET WELD. SHAPE PIPE CONNECTOR TO HAVE FULL CONTACT WITH EACH POST.

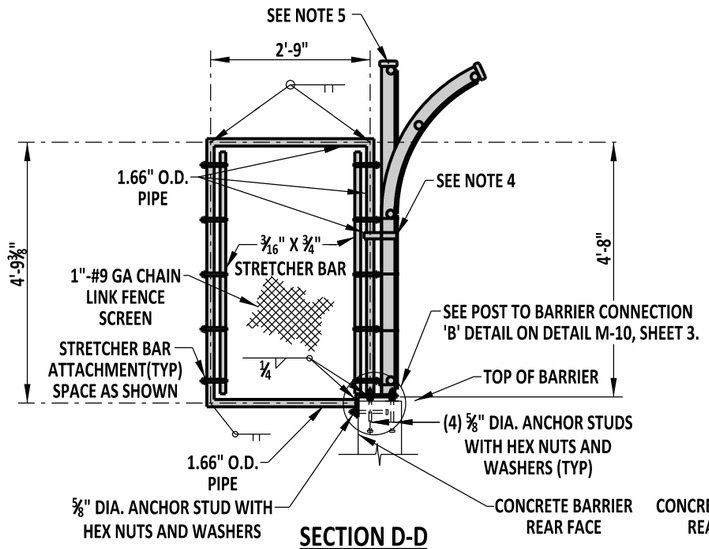
| | | | | | |
|---|---|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | BRIDGE SAFETY FENCE | | | APPROVED | SIGNATURE ON FILE (CHIEF ENGINEER) 12/30/2014 (DATE) |
| | STANDARD NO. M-10 (2014) | SHT. 1 | OF 3 | RECOMMENDED | SIGNATURE ON FILE (DESIGN ENGINEER) 12/11/2014 (DATE) |

11/19/2014

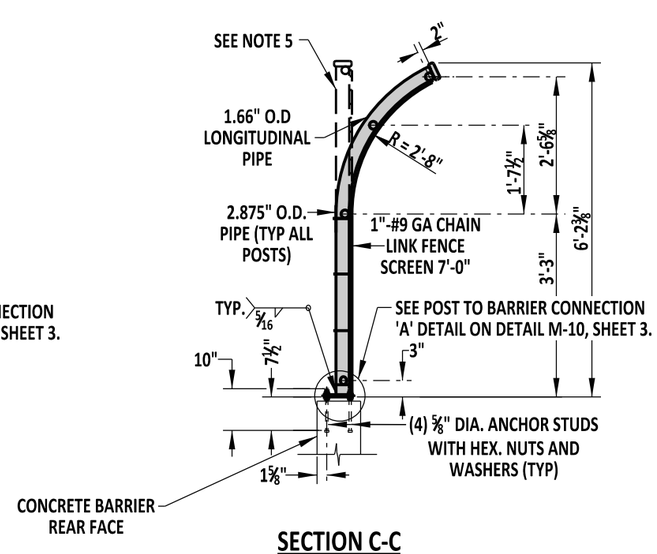
SCALE : NTS




## ELEVATION




## SECTION D-D




## SECTION C-C

## BRIDGE SAFETY FENCE, TYPE 2

DESIGNER NOTE: BRIDGE SAFETY FENCE, TYPE 2 SHOULD BE USED WHEN A SIDEWALK EXISTS ADJACENT TO THE BARRIER. OTHERWISE, USE BRIDGE SAFETY FENCE, TYPE 1.

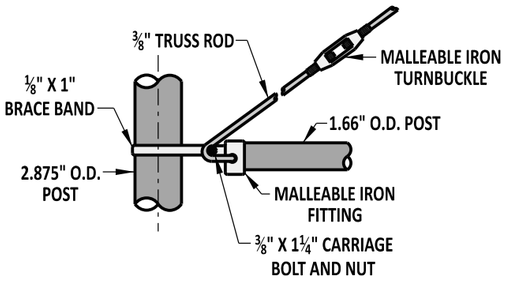
NOTES:

1). IF A TAPER EXISTS AT THE END OF THE BARRIER, PLACE POST 6" FROM THE TOP OF TAPER.
2). MINIMUM ½" TO MAXIMUM 1" OF CLEARANCE BETWEEN TOP OF BARRIER AND BOTTOM OF CHAIN LINK FENCE SCREEN.
3). LINE UP EXPANSION JOINTS IN TOP AND BOTTOM FENCE RAILS WITH EXPANSION JOINTS IN BARRIER.
4). ATTACH ANTI-CLIMB SHIELD TO FENCE POST BY SMALL SECTION OF PIPE TO EACH VERTICAL POST WITH ¼" FILLET WELD. SHAPE PIPE CONNECTOR TO HAVE FULL CONTACT WITH EACH POST.
5). WELD ADDITIONAL STRAIGHT POST TO CURVED POST AT SECOND INTERIOR POST OF MAIN SPAN. (TYPICAL FOR BOTH ENDS OF THE BRIDGE.)

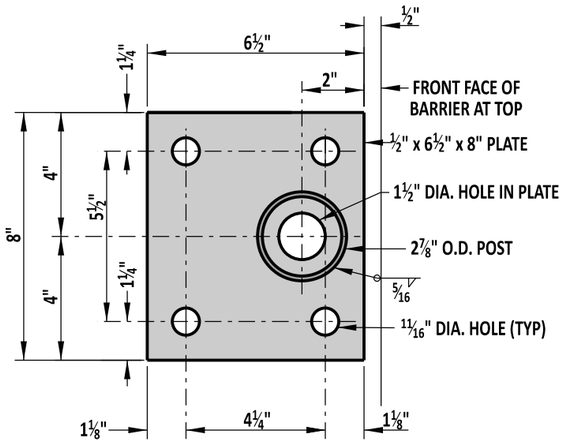
| | | | | | |
|---|---|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | BRIDGE SAFETY FENCE | | | APPROVED | SIGNATURE ON FILE (CHIEF ENGINEER) 12/30/2014 (DATE) |
| | STANDARD NO. M-10 (2014) | SHT. 2 | OF 3 | RECOMMENDED | SIGNATURE ON FILE (DESIGN ENGINEER) 12/11/2014 (DATE) |

11/19/2014

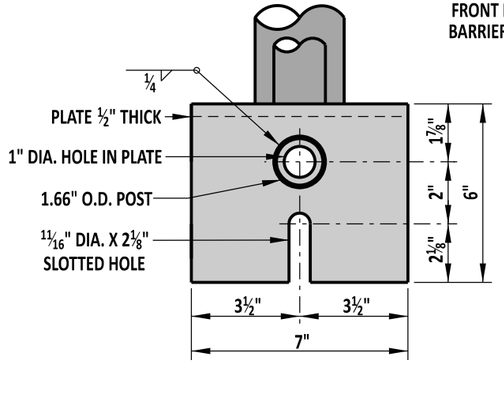
SCALE : NTS



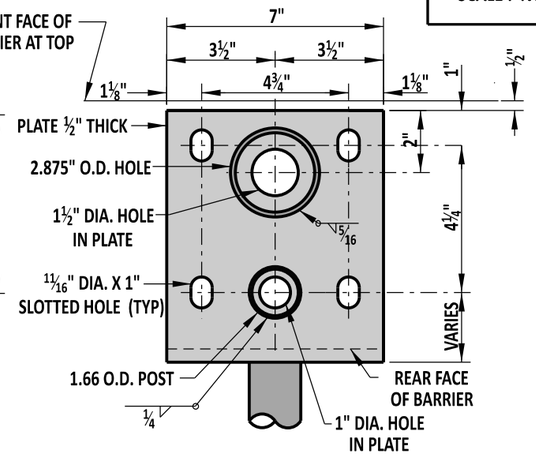

## TRUSS ROD ATTACHMENT



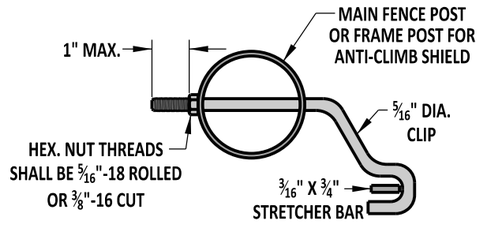

## DETAIL 'A'



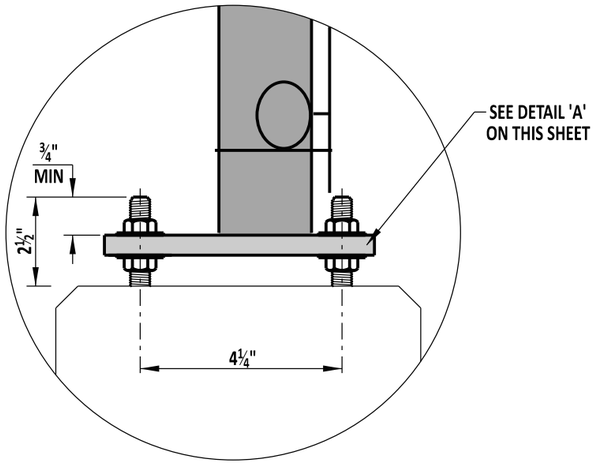

## SIDE VIEW




## PLAN VIEW



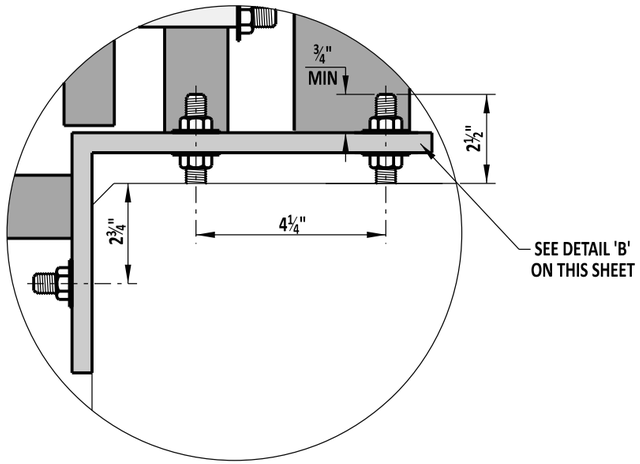

## STRETCHER BAR ATTACHMENT




## POST TO BARRIER CONNECTION 'A'

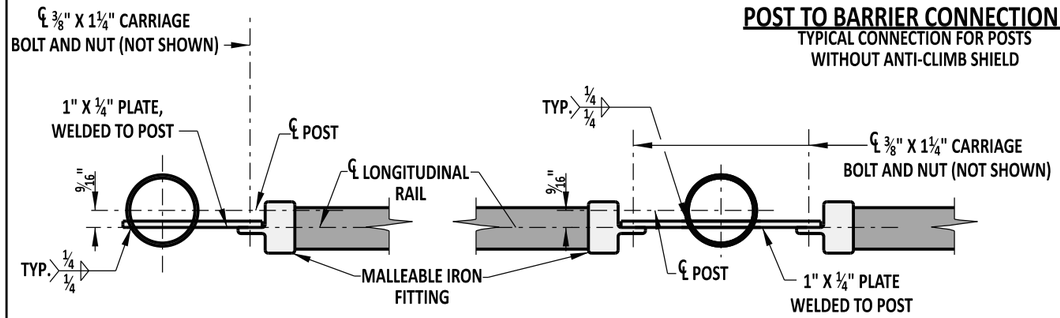
TYPICAL CONNECTION FOR POSTS WITHOUT ANTI-CLIMB SHIELD

## DETAIL 'B'




## POST TO BARRIER CONNECTION 'B'

TYPICAL CONNECTION FOR POSTS WITH ANTI-CLIMB SHIELD




## TOP LONGITUDINAL RAIL-POST ATTACHMENT

NOTES:

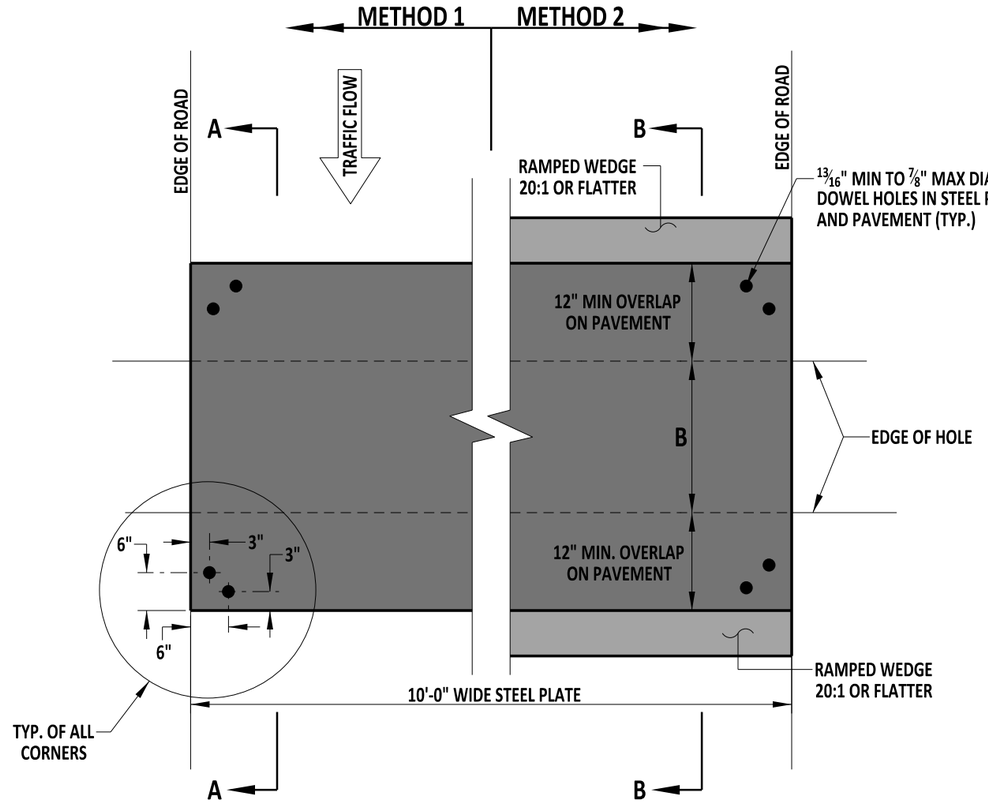
1). POST SPACING - POST SPACING TO BE DETERMINED BY THE CONTRACTOR AND INCLUDED IN THE WORKING DRAWINGS. EACH POST MUST BE A MINIMUM OF 1'-0" FROM ANY PARAPET JOINT.

2). WORKING DRAWINGS - WORKING DRAWINGS WILL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW

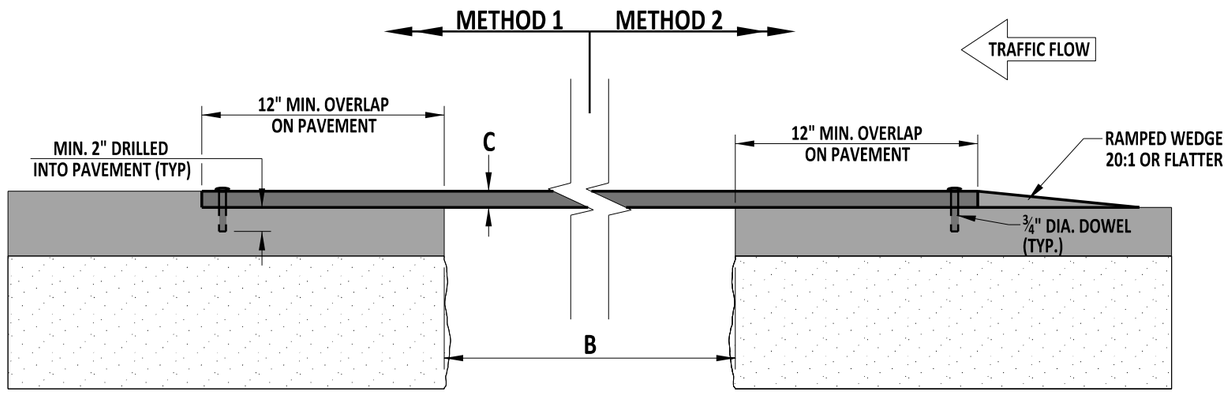
| | | | |
|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | BRIDGE SAFETY FENCE | | APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 5/31/2017 (DATE) |
| | STANDARD NO. M-10 (2017) | SHT. 3 OF 3 | RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 5/18/2017 (DATE) |

5/11/2017

SCALE : NTS




PLAN VIEW




SECTION A-A

SECTION B-B

| B | C |
|---|---|
| TRENCH WIDTH | MIN. PLATE THICKNESS |
| 1'-0" | 1/2" |
| 2'-0" | 3/4" |
| 3'-0" | 7/8" |
| 4'-0" | 1" |
| 5-'0" | 1 1/8" |
| 6'-0" | 1 1/4" |

BASED ON HL-93 TRUCK LOAD

NOTES:

1. USE OF STEEL PLATES TO BE APPROVED BY THE DEPARTMENT AND IS NOT PERMITTED BETWEEN NOVEMBER 1ST AND MARCH 31ST.
2. STEEL PLATE BRIDGING ON FREEWAYS AND EXPRESSWAYS IS STRICTLY PROHIBITED.
3. PROVIDE STEEL PLATES AND DOWELS CONFORMING TO ASTM A36 STANDARDS.
4. ADEQUATELY SHORE THE TRENCH IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS TO SUPPORT THE BRIDGING AND TRAFFIC LOADS.
5. SECURE BRIDGING AGAINST DISPLACEMENT BY USING ADJUSTABLE CLEATS, SHIMS, OR OTHER DEVICES.
6. USE OF STEEL PLATE BRIDGING IS NOT TO EXCEED FOUR (4) CONSECUTIVE WORKING DAYS IN ANY GIVEN WEEK AND NOT LEFT IN PLACE OVER THE WEEKEND, UNLESS DIRECTED BY THE ENGINEER IN THE FIELD.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF STEEL PLATES, SHORING, ASPHALT CONCRETE RAMPS, AND ENSURING THEY MEET ALL MINIMUM SPECIFICATIONS. DEFORMATIONS OF ANY KIND ARE NOT ACCEPTABLE ON STEEL PLATES. EXAMPLES OF DEFORMATIONS COULD BE, BUT NOT LIMITED TO, ANY OF THE FOLLOWING: FREE FROM ANY CLIPS, CHAINS, ATTACHMENTS, WELDMENTS, SURFACE IRREGULARITIES, ETC.
8. A STRUCTURE DESIGN IS REQUIRED FOR TRENCH WIDTHS GREATER THAN 6'-0". SUBMIT DESIGN TO THE DEPARTMENT FOR APPROVAL.
9. INSTALL STEEL PLATE BRIDGING AND SHORING USING EITHER OF THE METHODS BELOW:
   METHOD 1: FOR SPEEDS GREATER THAN 45 MPH, MILL THE PAVEMENT TO A DEPTH EQUAL TO THE THICKNESS OF THE PLATE AND TO A WIDTH AND LENGTH EQUAL TO THE DIMENSION OF THE PLATE. BUTT SUBSEQUENT PLATES TO EACH OTHER. ATTACH THE PLATE TO THE ROADWAY BY A MINIMUM OF TWO DOWELS PRE-DRILLED INTO EACH CORNER OF THE PLATE AND DRILLED 2" INTO THE PAVEMENT AS SHOWN ON THIS DETAIL.
   METHOD 2: FOR SPEEDS 45 MPH OR LESS, ATTACH THE PLATE TO THE ROADWAY BY A MINIMUM OF TWO DOWELS PRE-DRILLED INTO EACH CORNER OF THE PLATE AND DRILLED 2" INTO THE PAVEMENT AS SHOWN IN ON THIS DETAIL. BUTT SUBSEQUENT PLATES TO EACH OTHER. USE COMPACTED BITUMINOUS TEMPORARY ROADWAY MATERIAL (TRM) TO FORM A RAMPED WEDGE WITH A MAXIMUM SLOPE OF 5% AND A MINIMUM TAPER LENGTH OF 20" TO COVER ALL EDGES OF STEEL PLATES.
10. FOR BOTH METHODS, WHEN THE STEEL PLATES ARE REMOVED, BACKFILL THE DOWEL HOLES IN THE PAVEMENT WITH EITHER GRADED FINES OF ASPHALT CONCRETE MIX, CONCRETE SLURRY,OR EQUIVALENT SLURRY TO THE SATISFACTION OF THE ENGINEER.
11. PROVIDE STEEL PLATES WITH A SURFACE THAT IS MANUFACTURED WITH A MINIMUM NOMINAL COEFFICIENT OF FRICTION OF 0.35 AT THE TIME OF PLACEMENT.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

STEEL PLATE

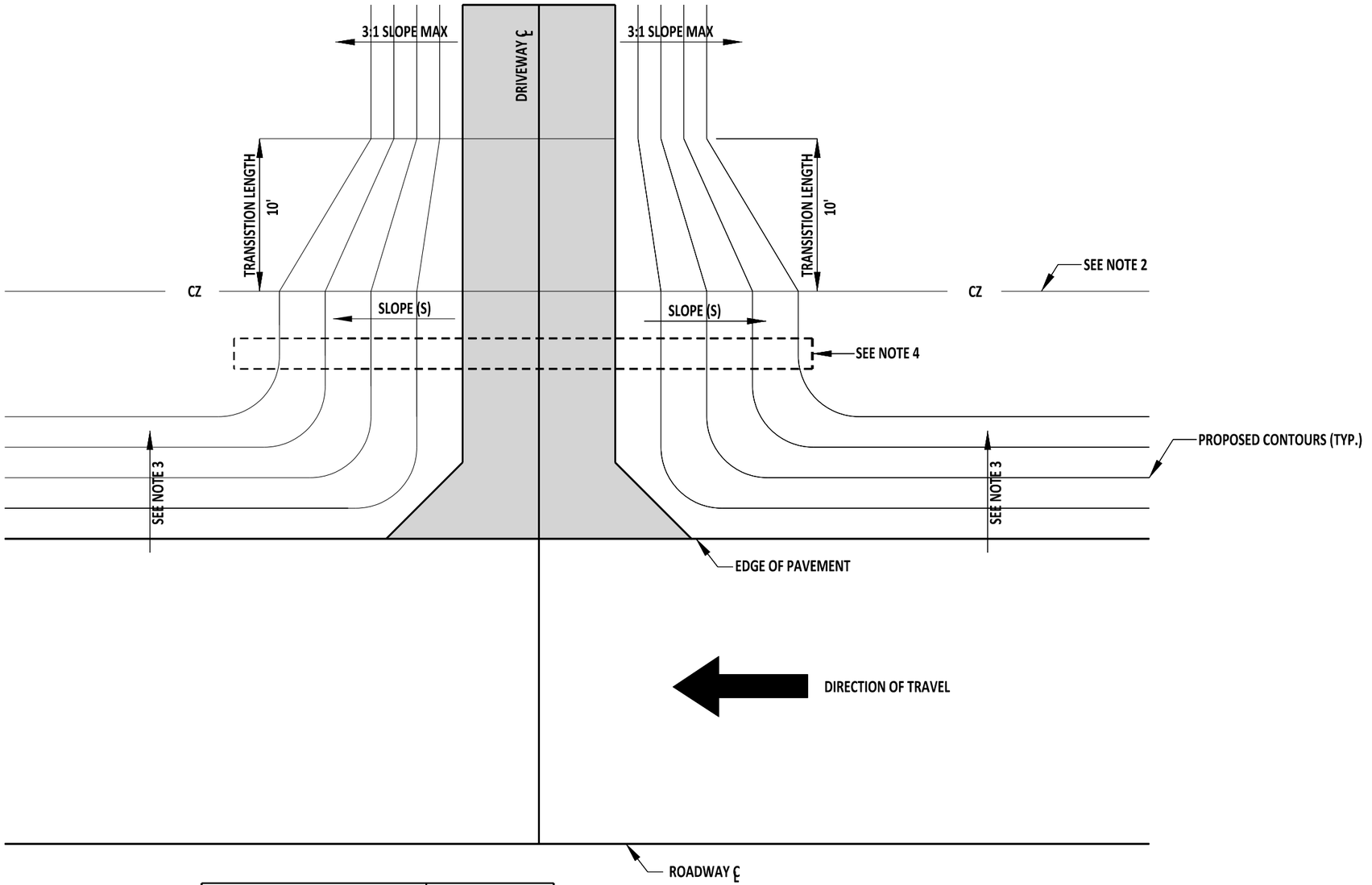
STANDARD NO. M-11 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

SCALE : NTS




| DESIGN SPEED | S (H:V) |
|---|---|
| < 50 MPH | 4:1 |
| ≥ 50 MPH | 6:1 |

**NOTES:**

1). REFER TO PLANS AND STANDARD DETAIL C-3 FOR ENTRANCE CONSTRCTION.
2). REFER TO THE PLANS FOR LOCATION OF THE CLEAR ZONE.
3). REFER TO THE PLANS FOR THE DITCH SIDESLOPE GRADING REQUIREMENTS.
4). REFER TO THE PLANS FOR PIPE END TREATMENTS.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

# DRIVEWAY TRANSVERSE SLOPE GRADING

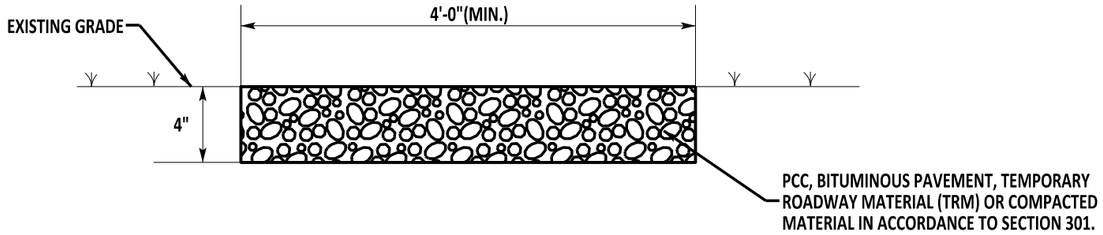
STANDARD NO. M-12 (2020) | SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED
CHIEF ENGINEER — 09/01/2020 DATE

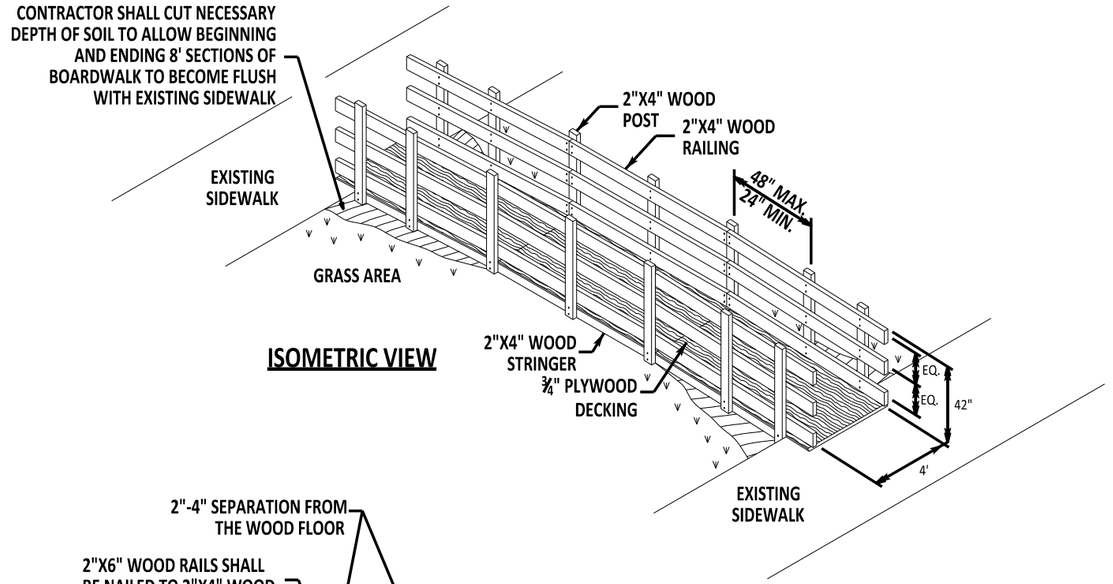
08/20/2020

SCALE : NTS

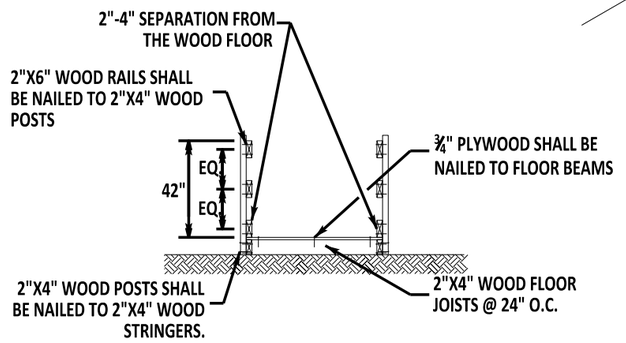



## TEMPORARY PEDESTRIAN PATHWAY
N.T.S.

NOTES:
1. PROVIDE 4'-0" WIDE TEMPORARY PATHWAY, SUPPLY CONCRETE, HOTMIX, COLD PATCH OR MILLINGS TO A MINIMUM DEPTH OF 4", FLUSH WITH EXISTING GRADE.
2. MAINTAIN A UNIFORM MATERIAL THAT IS FIRM, STABLE, AND SLIP RESISTANT.
3. IN THE EVENT THAT THE WALKING SURFACE OF THE TEMPORARY SIDEWALK IS LOCATED MORE THAN 30" FROM GRADE AT ANY POINT ALONG THE PROPOSED PATH, PROVIDE TYPE 2 TEMPORARY SIDEWALK.
4. MAXIMUM ALLOWABLE RUNNING SLOPE NOT TO EXCEED 5%. MAXIMUM ALLOWABLE CROSS SLOPE NOT TO EXCEED 2% AND VERTICAL SURFACES NOT TO EXCEED 1/4". FURTHER GUIDANCE IN ACCORDANCE WITH THE LATEST VERSION OF THE PEDESTRIAN ACCESSIBILITY STANDARDS FOR FACILITIES IN THE PUBLIC RIGHT-OF-WAY.
5. ANY REQUIRED EXCAVATION TO CONSTRUCT THE PATHWAY IS INCIDENTAL TO ITEM 813503.
6. COST FOR SEEDING REQUIRED TO RESTORE THE AREA IS PAYABLE BY THE DEPARTMENT.

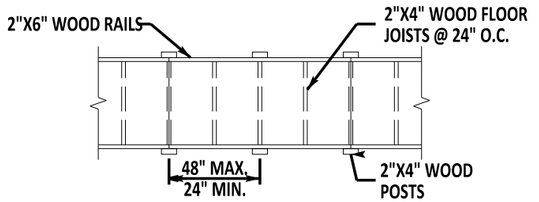



## ISOMETRIC VIEW




## SECTION VIEW

NOTES:
1. MAXIMUM ALLOWABLE RUNNING SLOPE NOT TO EXCEED 5%. MAXIMUM ALLOWABLE CROSS SLOPE NOT TO EXCEED 2% AND VERTICAL SURFACES NOT TO EXCEED 1/4". FURTHER GUIDANCE IN ACCORDANCE WITH THE LATEST VERSION OF THE PEDESTRIAN ACCESSIBILITY STANDARDS FOR FACILITIES IN THE PUBLIC RIGHT-OF-WAY.
2. MAINTAIN A UNIFORM MATERIAL THAT IS FIRM, STABLE, AND SLIP RESISTANT.




## PLAN VIEW

## TEMPORARY SIDEWALK DETAIL - TYPE 2
N.T.S.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

TEMPORARY PEDESTRIAN PATHWAY

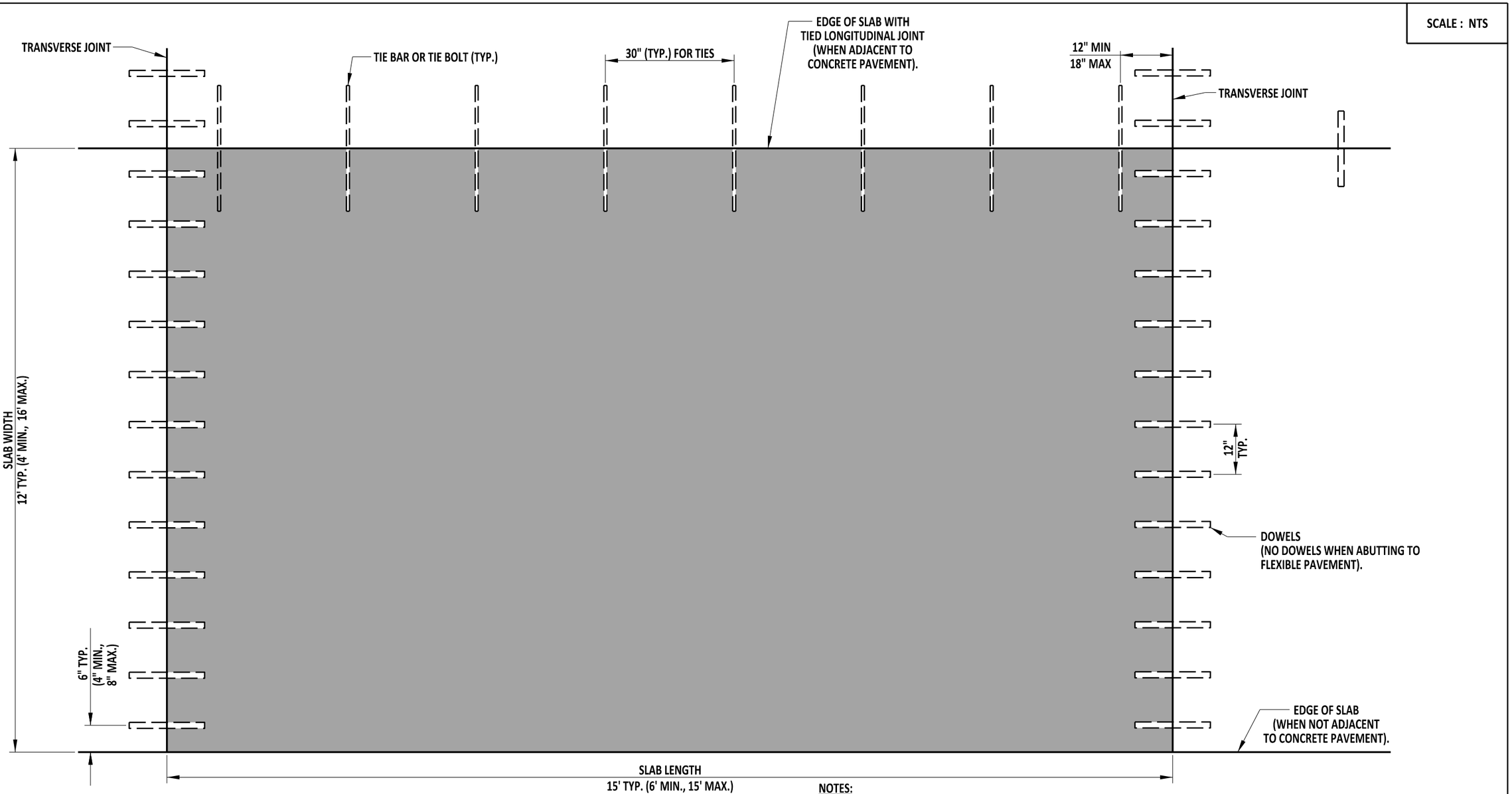
STANDARD NO. M-13 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

SCALE : NTS




## SLAB PLAN (WITH DOWEL AND TIE LOCATIONS)

NOTES:

1). TRANSVERSE JOINTS ARE PERPENDICULAR TO THE CENTERLINE OF THE PAVEMENT WHEN THE PAVEMENT IS STRAIGHT.
2). TRANSVERSE JOINTS ARE PERPENDICULAR TO A TANGENT LINE TO THE OUTSIDE ARC OF THE PAVEMENT WHEN THE PAVEMENT IS CURVED.
3). ALIGN THE TRANSVERSE JOINTS FOR ALL ADJACENT SLABS WITH EACH OTHER.
4). ABRUPT CHANGES IN PAVEMENT WIDTH MAY OCCUR ONLY AT THE TRANSVERSE JOINT LINE; MAKE LONGITUDINAL JOINTS CONTINUOUS WHENEVER POSSIBLE.
5). DO NOT LOCATE LONGITUDINAL JOINTS WITHIN PROPOSED WHEEL PATHS. THE WHEEL PATH IS GENERALLY LOCATED 2' INSIDE OF THE LANE EDGELINE OR CENTERLINE.
6). CURB WITHOUT GUTTER WILL REQUIRE TYPE IV POLYURETHANE-BONDED RECYCLED RUBBER EXPANSION MATERIAL BETWEEN THE FACE OF CURB AND EDGE OF PCC PAVEMENT.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

SLAB PLAN (WITH DOWEL AND TIE LOCATIONS)

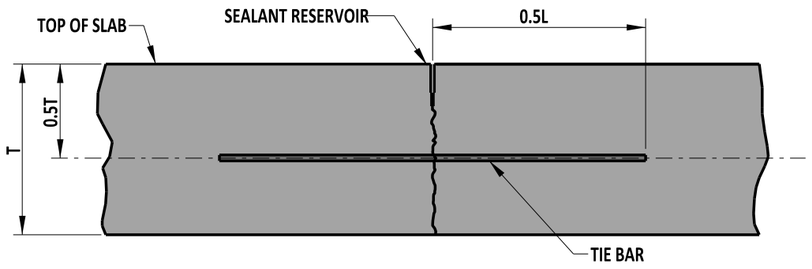
STANDARD NO. P-1 (2020) | SHT. 1 OF 5

REVIEWED
DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

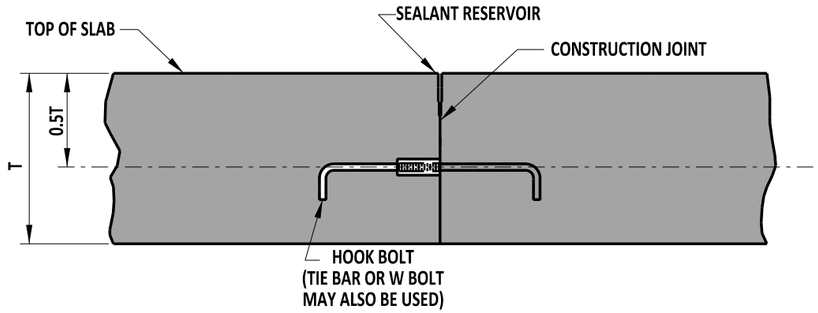
APPROVED
CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

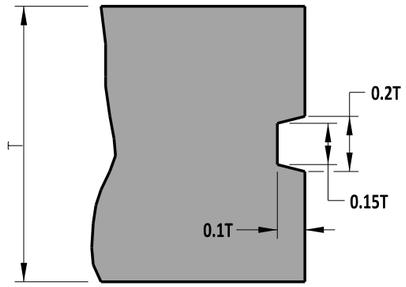
SCALE : NTS



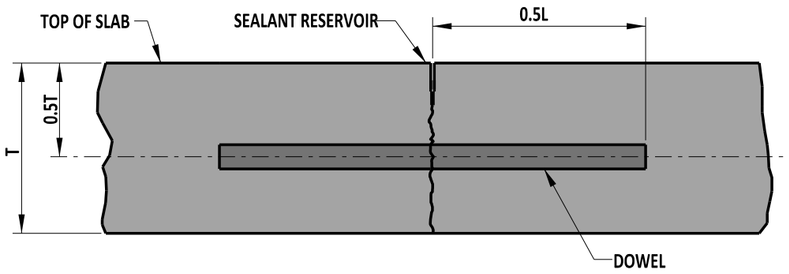

LONGITUDINAL SAW-CUT JOINT DETAIL



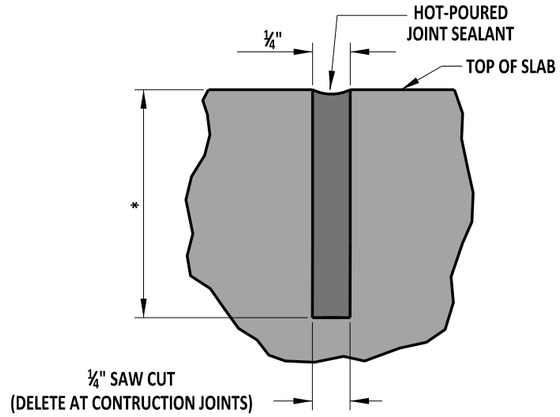

LONGITUDINAL CONSTRUCTION JOINT DETAIL




KEYWAY DETAIL
SEE NOTE 8

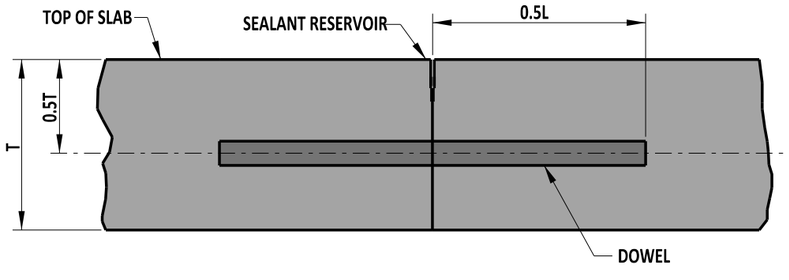



TRANSVERSE SAW-CUT JOINT DETAIL




SEALANT RESERVOIR DETAIL-
TRANSVERSE AND LONGITUDINAL JOINT

* - 0.3T (10" PCC PAVEMENT)
0.4T (12" PCC PAVEMENT)




TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTES:

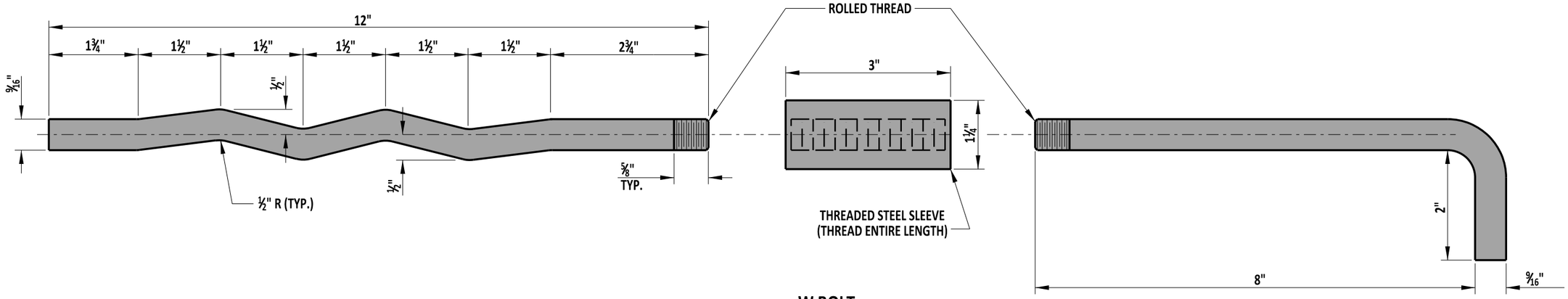
1). AS DIMENSIONED, THE WIDTH OF THE TRANSVERSE SEALANT RESERVOIR IS APPLICABLE WHEN THE TEMPERATURE OF THE PAVEMENT SURFACE IS BETWEEN 60°F AND 80°F. WHEN THE TEMPERATURE IS BELOW 60°F, CUT THE SEALANT RESERVOIR 1/16" WIDER. WHEN THE TEMPERATURE IS ABOVE 80°F, CUT THE SEALANT RESERVOIR 1/16" NARROWER.
2). "T" REFERS TO THE ACTUAL CONSTRUCTED SLAB THICKNESS.
3). THE TOLERANCE ON ALL JOINT SEALANT DETAIL DIMENSIONS IS PLUS 1/16" , MINUS 0".
4). CONSTRUCT THE TOP EDGES OF THE CONTACT SURFACES OF THE SEALANT MATERIAL ON BOTH SIDES OF THE JOINT RESERVOIR TO THE SAME ELEVATION.
5). PLACE TRANSVERSE JOINT MATERIAL BEFORE LONGITUDINAL JOINT MATERIAL; PLACE TRANSVERSE JOINT MATERIAL ACROSS THE FULL WIDTH OF ALL ADJACENT PCC PAVEMENT SLABS.
6). PLACE LONGITUDINAL JOINT MATERIAL WITHOUT GAPS WHENEVER INTERRUPTED BY THE TRANSVERSE JOINT MATERIAL.
7). TRANSVERSE JOINT SEAL TO BE RECESSED 3/16" TO 5/16" BELOW THE TOP OF THE SLAB.
8). USE KEYWAY WHEN HOOK BOLT, TIE BAR, OR W BOLT IS NOT USED.

# JOINT AND SEALANT DETAILS

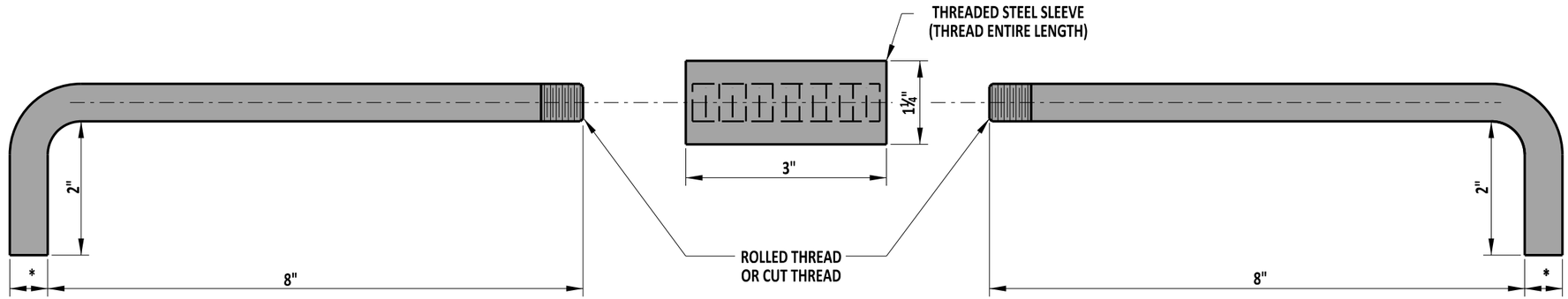
| | | | | |
|---|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE | JOINT AND SEALANT | REVIEWED | DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | RECOMMENDED | STANDARD NO. P-1 (2020) / SHT. 2 OF 5 | APPROVED | CHIEF ENGINEER 09/01/2020 DATE |

08/20/2020

SCALE : NTS




## W BOLT




* -$\frac{11}{16}$" ROLLED THREADS
¾" CUT THREADS

## HOOK BOLT



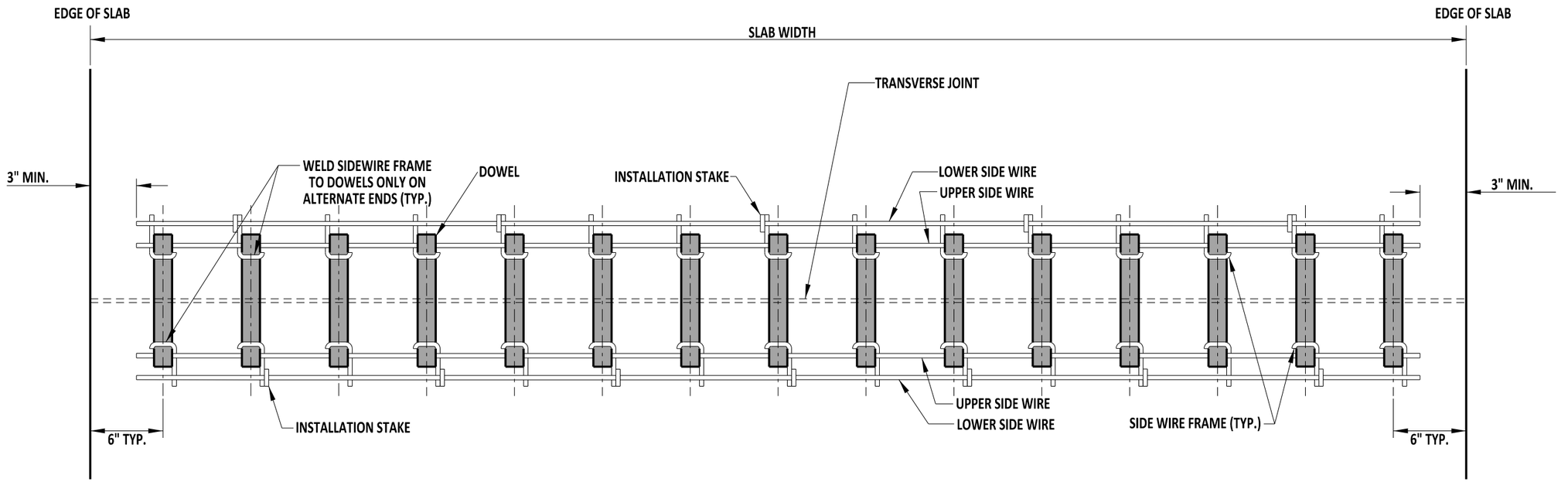

## DOWEL & TIE BAR

| DOWEL & TIE BAR CHART | | | | |
|---|---|---|---|---|
| SLAB THICKNESS | DOWEL | | TIE BAR | |
| | D | L | D | L |
| 10" | 1¼" | 18" | ⅝" | 30" |
| 12" | 1½" | 20" | ⅝" | 30" |

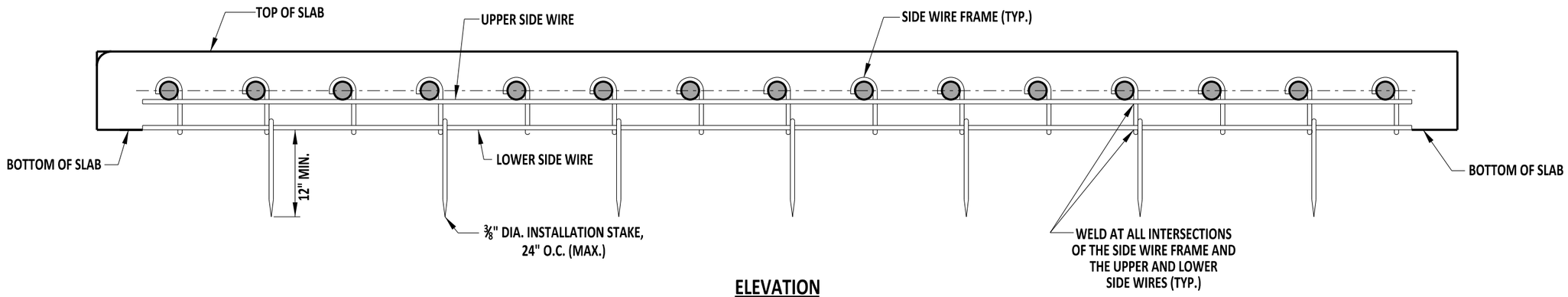
| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | W BOLT, HOOK BOLT, DOWEL AND TIE BAR | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. P-1 (2020) SHT. 3 OF 5 | APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/20/2020

SCALE : NTS




**PLAN**



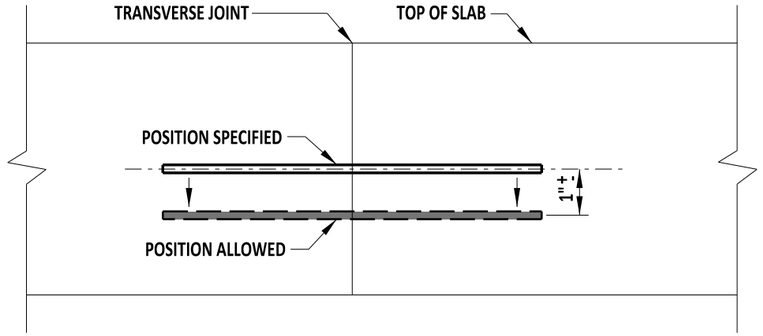

**ELEVATION**

## DOWEL SUPPORT BASKET

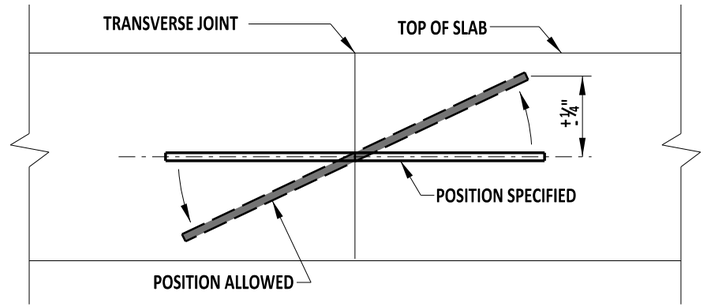
| | | | | |
|---|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | DOWEL SUPPORT BASKET | REVIEWED | DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. P-1 (2020) SHT. 4 OF 5 | APPROVED | CHIEF ENGINEER 09/01/2020 DATE |

08/20/2020

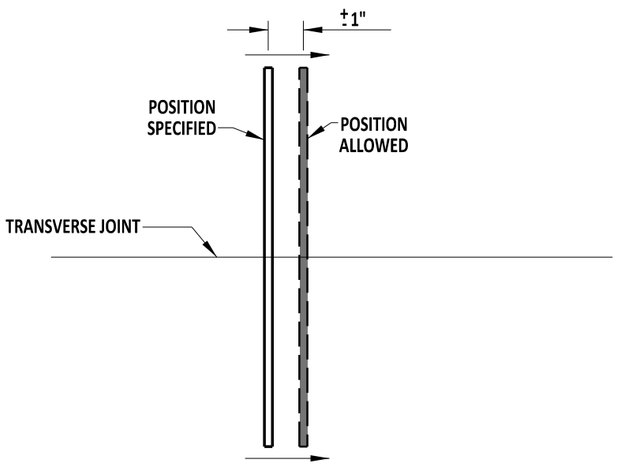
SCALE : NTS



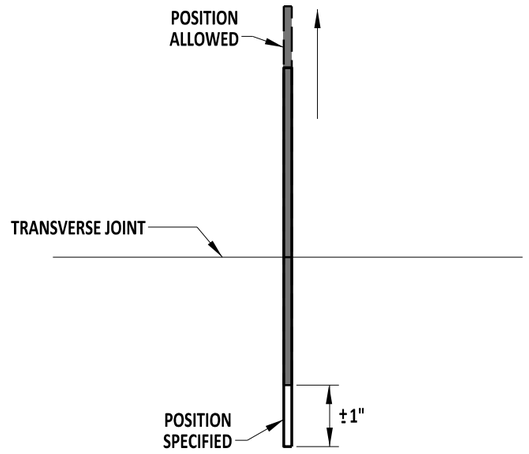

## VERTICAL TRANSLATION



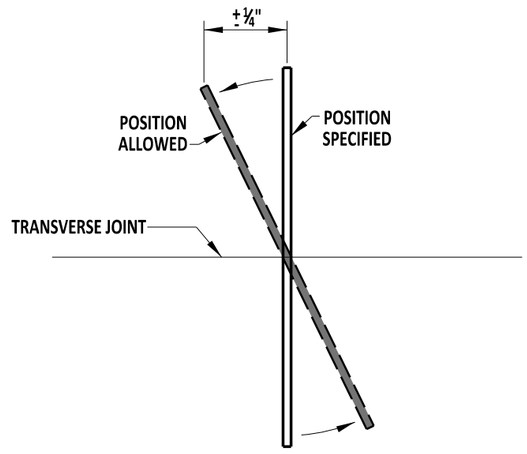

## VERTICAL ROTATION




## HORIZONTAL TRANSLATION




## LONGITUDINAL TRANSLATION




## HORIZONTAL ROTATION

## DOWEL & TIE BAR PLACEMENT TOLERANCES

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

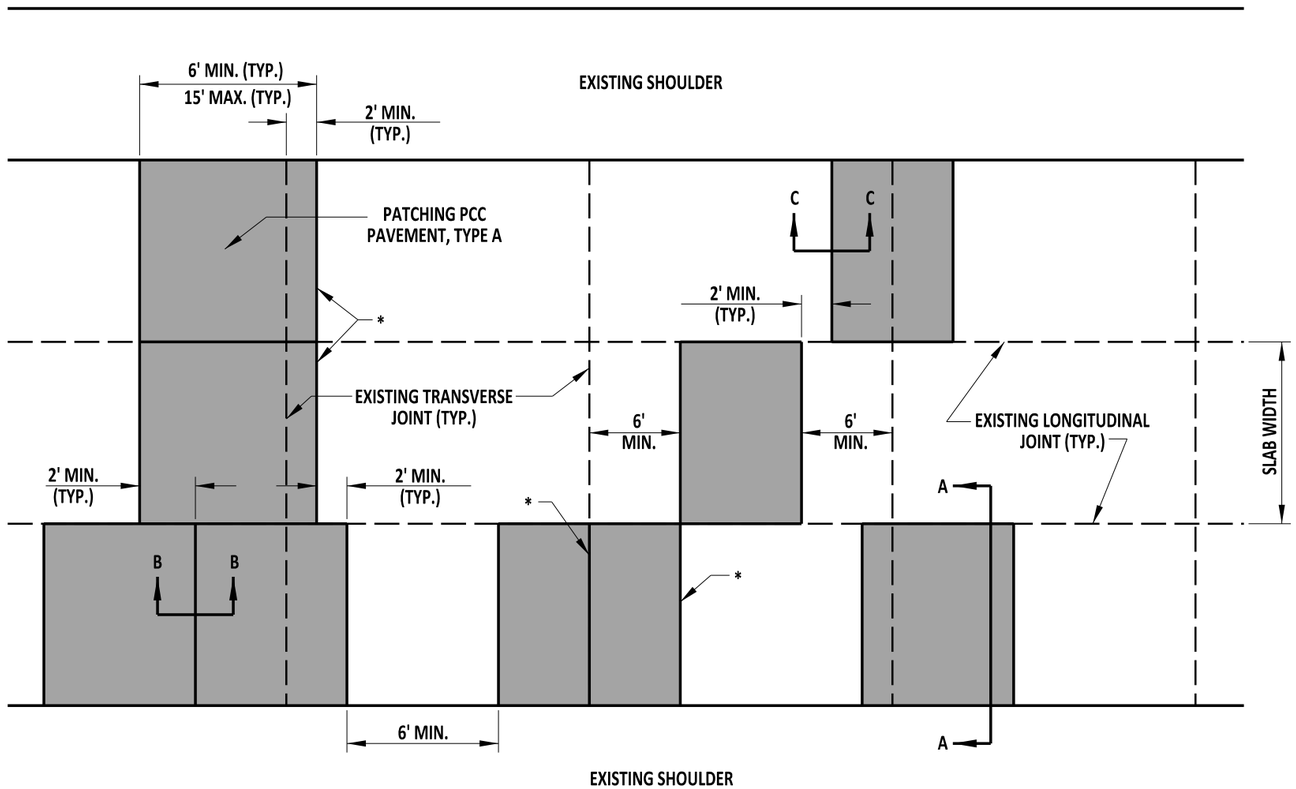
DOWEL AND TIE BAR PLACEMENT TOLERANCE

STANDARD NO. P-1 (2020) | SHT. 5 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020



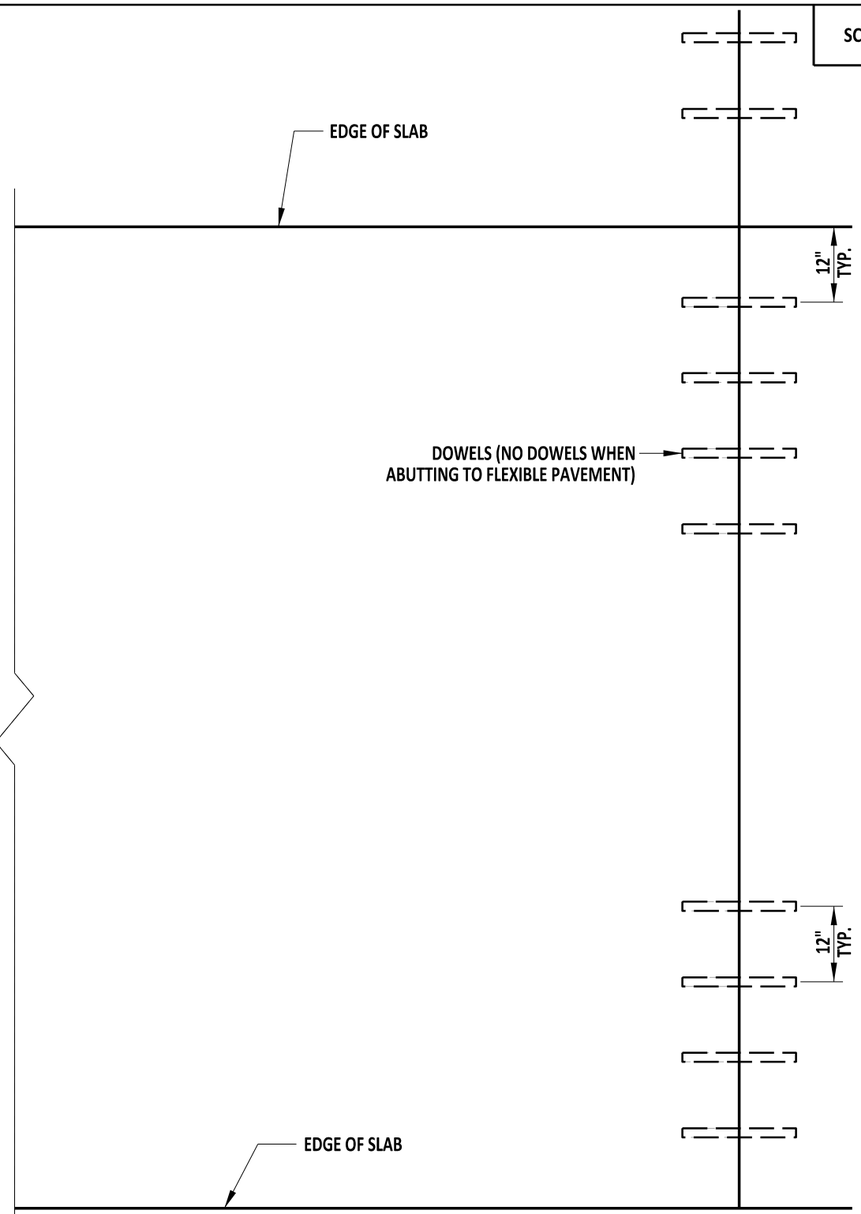

## PLAN

* - EXACTLY MATCH PROPOSED LOCATIONS FOR TRANSVERSE JOINTS TO THE ALIGNMENT OF THE FINAL (EXISTING OR RELOCATED) TRANSVERSE JOINTS IN ALL IMMEDIATELY ADJACENT LANES.

NOTES:

1). WHEN REPAIRING EXISTING TRANSVERSE JOINTS, EXTEND THE PATCH A MINIMUM OF 24" THROUGH THE EXISTING JOINT, WHICH WILL RELOCATE THE JOINT.
2). WHEN NOT ALIGNED WITH THE FINAL EXPECTED TRANSVERSE JOINT LOCATIONS IN THE IMMEDIATELY ADJACENT LANES, OFFSET PROPOSED LOCATIONS FOR TRANSVERSE JOINTS A MINIMUM OF 2' FROM THE AFOREMENTIONED JOINTS.
3). MAKE THE LONGITUDINAL JOINT ALIGNMENT STRAIGHT AND CONTINUOUS THROUGH THE REPAIRED AREA.

SCALE : NTS




## SLAB PLAN (WITH DOWEL AND TIE LOCATIONS)

# FULL DEPTH PATCH

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

FULL DEPTH PATCH PLAN VIEWS

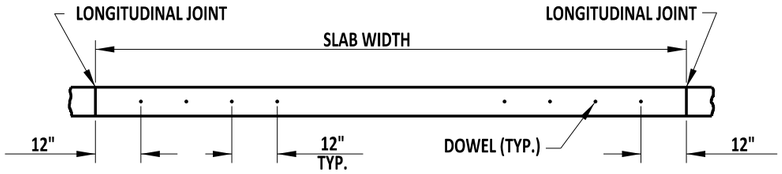
STANDARD NO. P-2 (2020) | SHT. 1 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

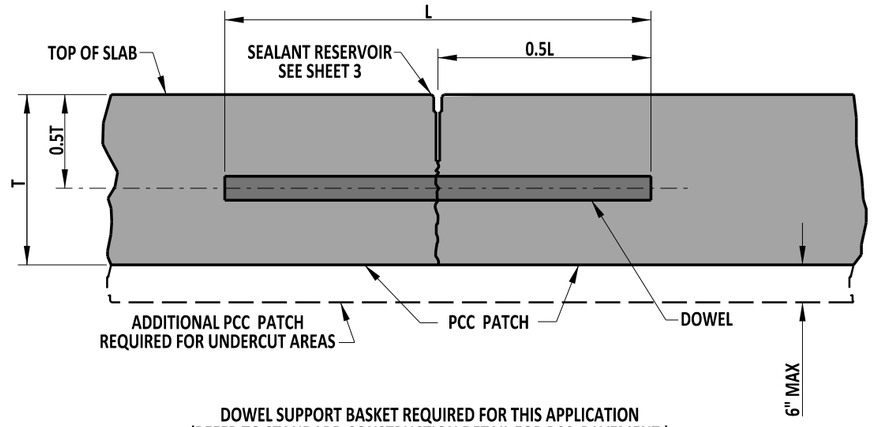
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

SCALE : NTS



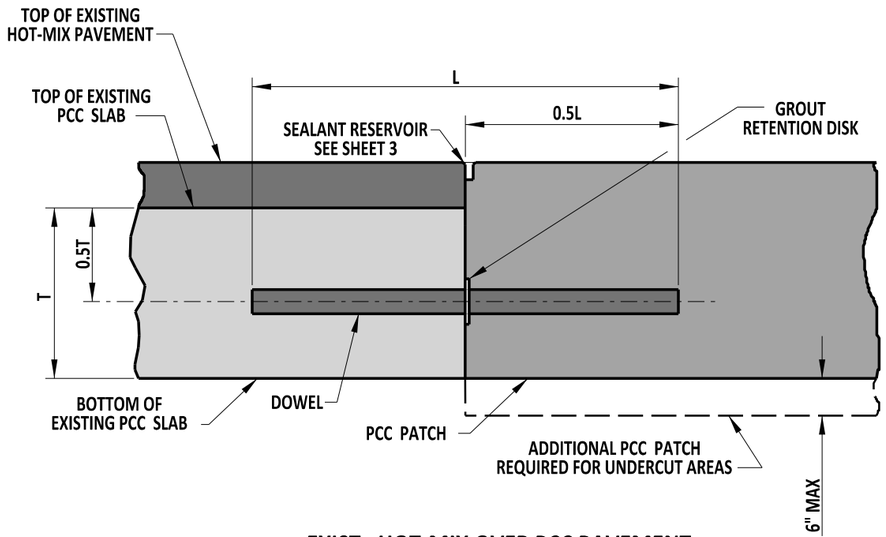

## SECTION A-A



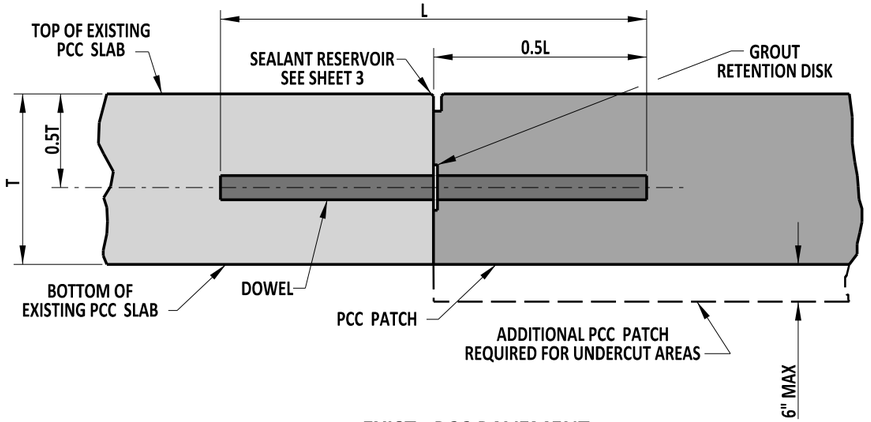

DOWEL SUPPORT BASKET REQUIRED FOR THIS APPLICATION
(REFER TO STANDARD CONSTRUCTION DETAIL FOR PCC PAVEMENT.)

## SECTION B-B

TRANSVERSE SAW-CUT USED FOR
JOINTS LOCATED WITHIN THE PATCH




## EXIST. HOT-MIX OVER PCC PAVEMENT




## EXIST. PCC PAVEMENT

## SECTION C-C

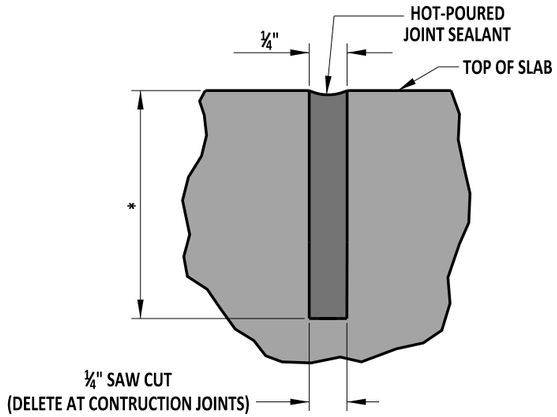
TRANSVERSE CONSTRUCTION JOINT USED ON
JOINTS BETWEEN EXISTING PAVEMENT AND PATCH

## FULL DEPTH PATCH

| | | | | |
|---|---|---|---|---|
| DelDOT | 09/01/2020 ENGINEERING SUPPORT DATE<br>RECOMMENDED | FULL DEPTH PATCH, SECTION VIEWS | REVIEWED | 09/01/2020 DEPUTY DIRECTOR - DESIGN DATE |
| | | STANDARD NO. P-2 (2020) SHT. 2 OF 5 | APPROVED | 09/01/2020 CHIEF ENGINEER DATE |

08/20/2020

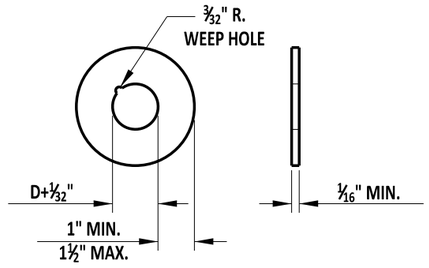
SCALE : NTS




## SEALANT RESERVOIR DETAIL- TRANSVERSE AND LONGITUDINAL JOINT

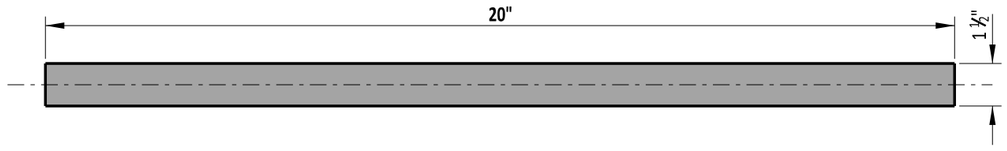
* - 0.3T (10" PCC PAVEMENT)
0.4T (12" PCC PAVEMENT)

| DOWEL BAR CHART | | |
|---|---|---|
| SLAB THICKNESS | DOWEL | |
| | D | L |
| 10" | 1¼" | 18" |
| 12" | 1½" | 20" |




D - DOWEL DIAMETER (INCLUDING PROTECTING COATINGS, IF ANY.)

## GROUT RETENTION DISK




## DOWEL BAR

NOTES:

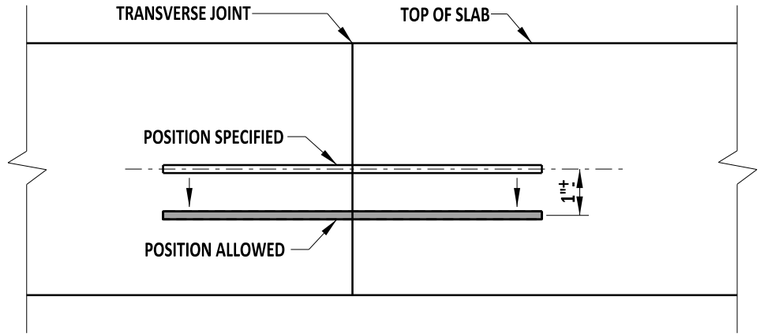
1). AS DIMENSIONED, THE WIDTH OF THE TRANSVERSE SEALANT RESERVOIR IS APPLICABLE WHEN THE TEMPERATURE OF THE PAVEMENT SURFACE IS BETWEEN 60°F AND 80°F. WHEN THE TEMPERATURE IS BELOW 60°F, CUT THE SEALANT RESERVOIR 1/16" WIDER. WHEN THE TEMPERATURE IS ABOVE 80°F, CUT THE SEALANT RESERVOIR 1/16" NARROWER.
2). "T" REFERS TO THE "AS BUILT" SLAB THICKNESS.
3). THE TOLERANCE ON ALL JOINT SEALANT DETAIL DIMENSIONS SHOWN WITHOUT A RANGE IS PLUS 1/16" , MINUS 0".
4). CONSTRUCT THE TOP EDGES OF THE CONTACT SURFACES OF THE SEALANT MATERIAL ON BOTH SIDES OF THE JOINT RESERVOIR TO THE SAME ELEVATION.

## FULL DEPTH PATCH

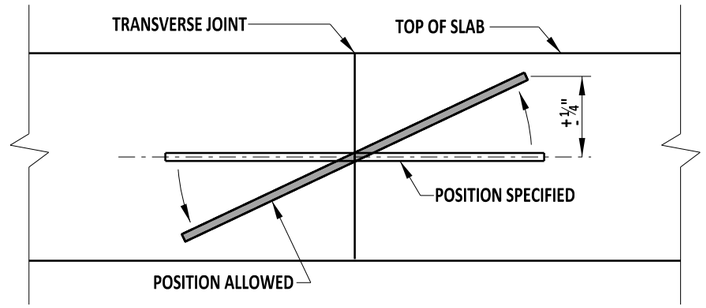
| | | | | |
|---|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | FULL DEPTH PATCH, SEALANT, GROUT RETENTION DISK AND DOWEL BARS | REVIEWED | DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. P-2 (2020) SHT. 3 OF 5 | APPROVED | CHIEF ENGINEER 09/01/2020 DATE |

08/20/2020

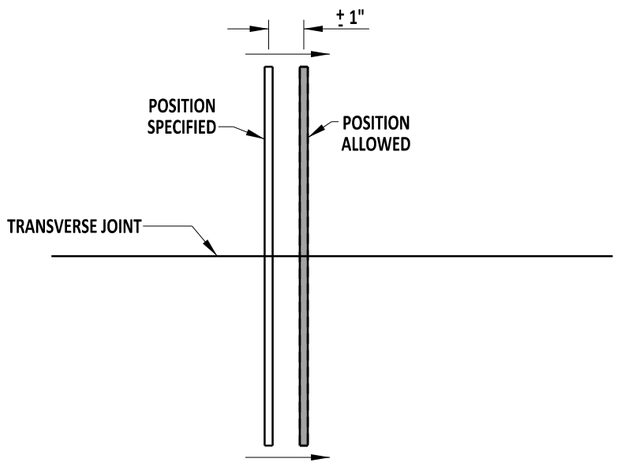
SCALE : NTS



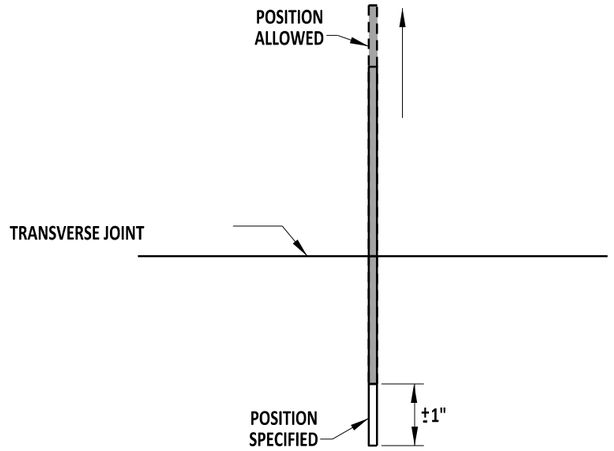

## VERTICAL TRANSLATION



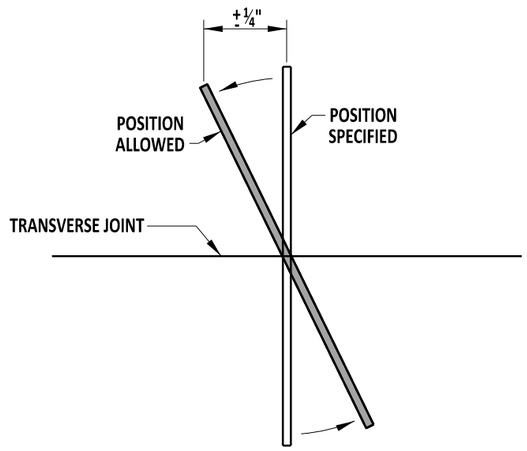

## VERTICAL ROTATION




## HORIZONTAL TRANSLATION




## LONGITUDINAL TRANSLATION




## HORIZONTAL ROTATION

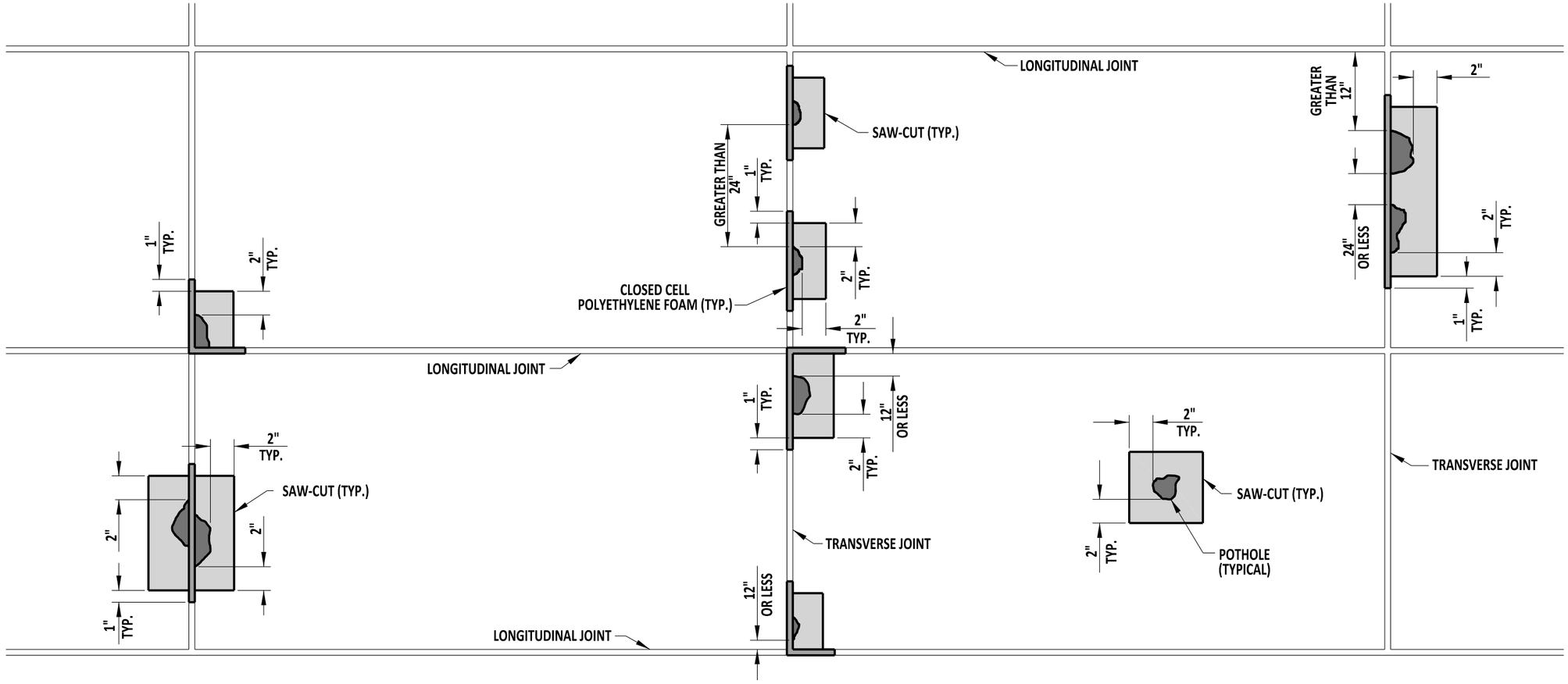
## DOWEL BAR PLACEMENT TOLERANCES

## FULL DEPTH PATCH

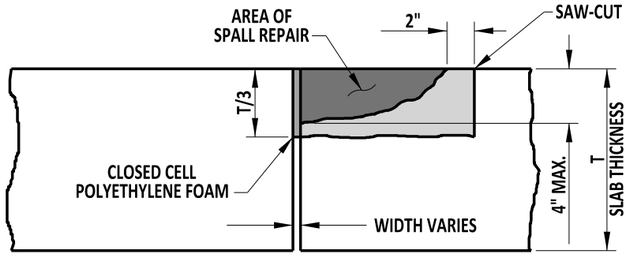
| | | | | |
|---|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | FULL DEPTH PATCH, DOWEL BAR PLACEMENT TOLERANCE | | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. P-2 (2020) | SHT. 4 OF 5 | APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/20/2020

SCALE : NTS




PLAN

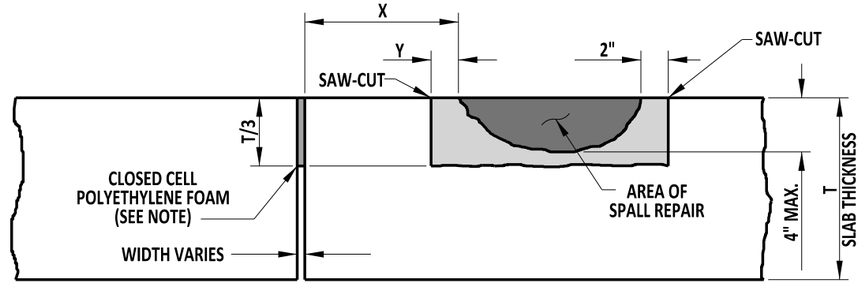



SECTION WITH SPALL ADJACENT TO JOINT

NOTES:

1). MATCH THE WIDTH THE CLOSED CELL POLYETHYLENE FOAM TO THE WIDTH OF THE JOINT.

2). AFTER THE REPAIR HAS ACHIEVED THE SPECIFIED STRENGTH, REMOVE THE FOAM, CLEAN JOINTS AND SEAL WITH HOT POUR SEALANT.




SECTION WITH SPALL NOT ADJACENT TO JOINT

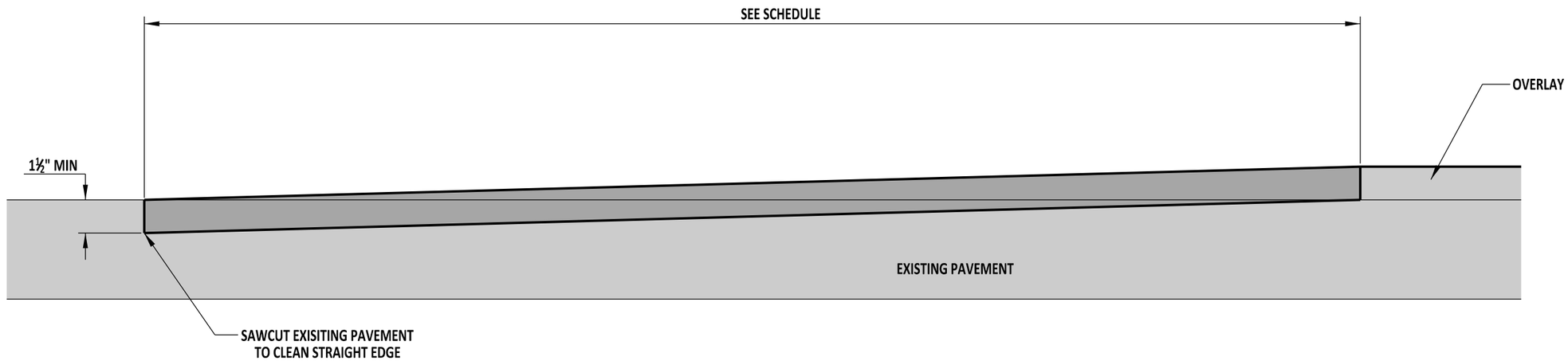
NOTE: WHEN X > 12", THEN Y=1" AND POLYETHYLENE FOAM IS NOT USED.
WHEN X ≤ 12", THEN Y=X AND POLYETHYLENE FOAM IS USED.

## PARTIAL DEPTH PATCH

| | | | |
|---|---|---|---|
| DelDOT | 09/01/2020 ENGINEERING SUPPORT — DATE<br>RECOMMENDED | PARTIAL DEPTH PATCH, PLAN AND SECTION VIEWS | REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE |
| | | STANDARD NO. P-2 (2020) — SHT. 5 OF 5 | APPROVED — CHIEF ENGINEER — 09/01/2020 DATE |

08/20/2020

SCALE : NTS




NOTES:

1). ADJUST THE PROFILE OF THE OVERLAY PAVING TO ASSURE A SMOOTH TRANSITION THROUGH THE BUTT JOINT.
2). CRACK SEAL THE JOINT BETWEEN THE BUTT JOINT AND THE EXISTING PAVEMENT.

| CONDITION | SLOPE FEET:INCHES |
|---|---|
| GREATER THAN OR EQUAL TO 55 MPH | 40:1 |
| LESS THAN 55MPH | 30:1 |
| STOP CONTROLLED INTERSECTION | 15:1 |

DELAWARE
DEPARTMENT OF TRANSPORTATION

BUTT JOINTS

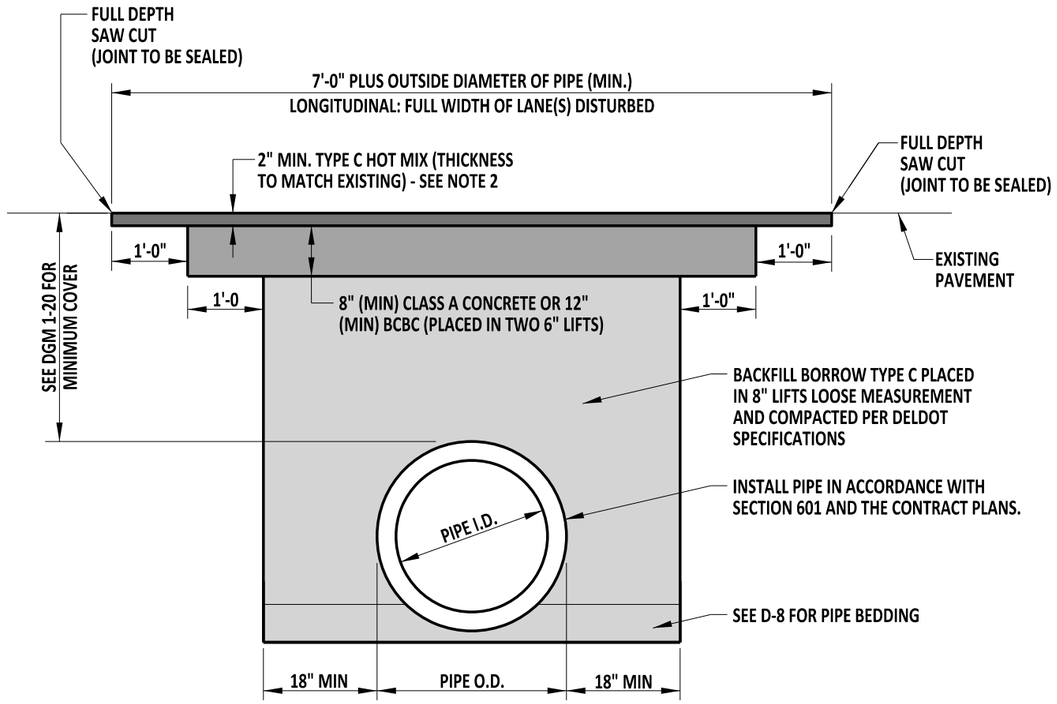
STANDARD NO. P-3 (2014) | SHT. 1 OF 1

APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 12/30/2014 (DATE)

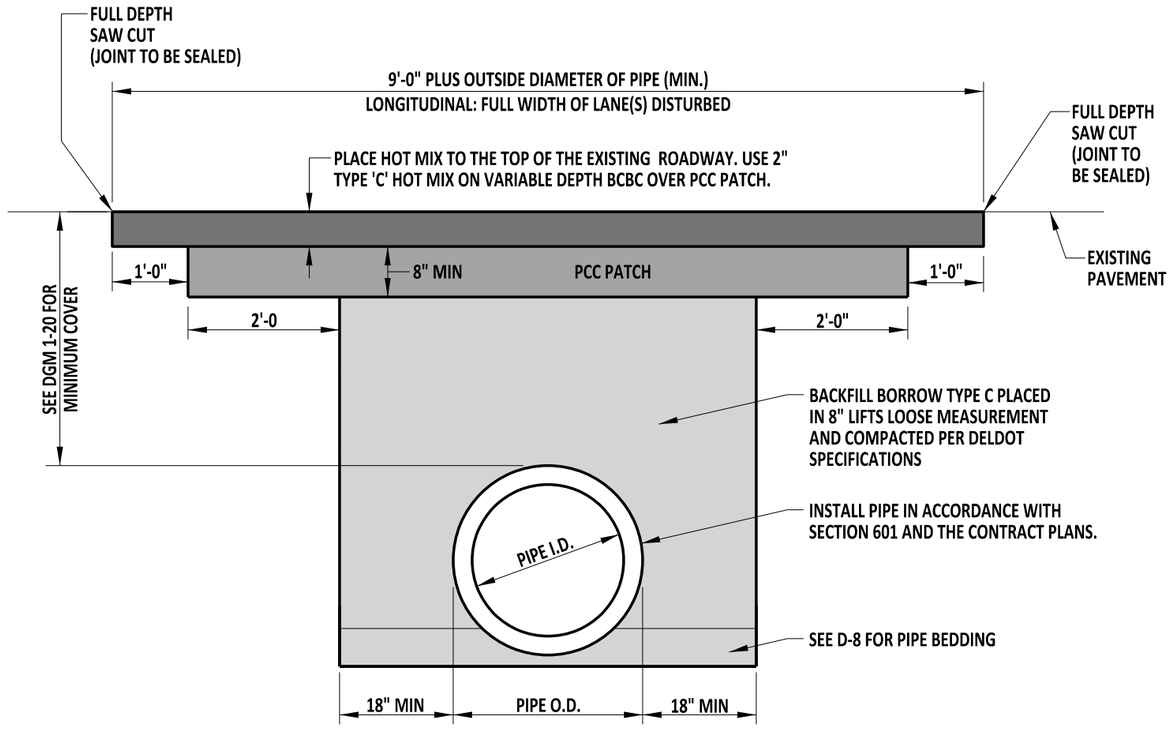
RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 12/11/2014 (DATE)

10/28/2014

SCALE : NTS




**PERMANENT CROSS-ROAD OR LONGITUDINAL PATCH DETAIL**




**PERMANENT CROSS-ROAD OR LONGITUDINAL PATCH DETAIL**
* EXISTING CONCRETE PAVEMENT OVERLAYED WITH HOTMIX LOCATIONS

**NOTES:**
1). PATCH WIDTHS ARE MEASURED ALONG THE ROADWAY CENTERLINE. CONSTRUCT PATCHES THE FULL WIDTH OF THE LANE OR LANES DISTURBED.
2). THIS IS A MINIMUM PATCH. IF THE EXISTING ROADWAY HAS A HEAVIER CROSS SECTION THAN SHOWN HERE, IT WILL BE REPLACED WITH THAT CROSS SECTION, OR AS DIRECTED BY THE ENGINEER.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

PERMANENT CROSS-ROAD PATCH OVER PIPE TRENCH

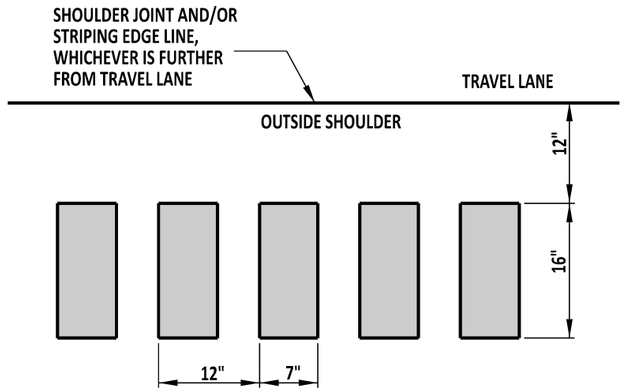
STANDARD NO. P-4 (2020) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

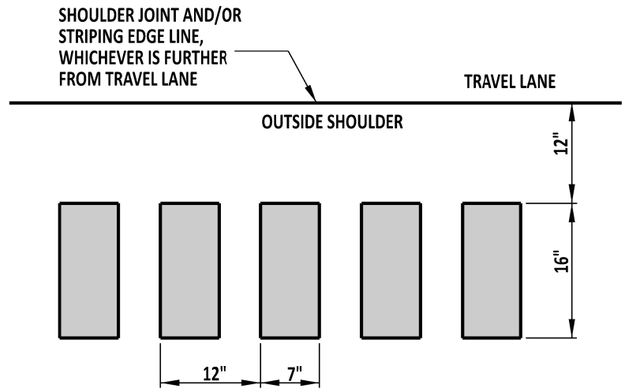
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/20/2020

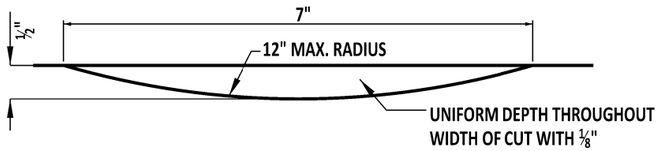
SCALE : NTS

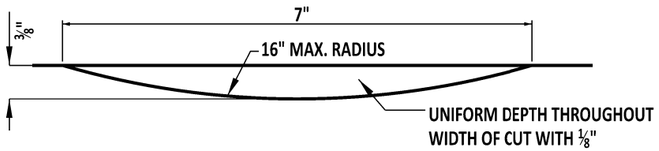



**CONTINUOUS EDGELINE RUMBLE STRIP**




**CONTINUOUS SHALLOW DEPTH RUMBLE STRIP**



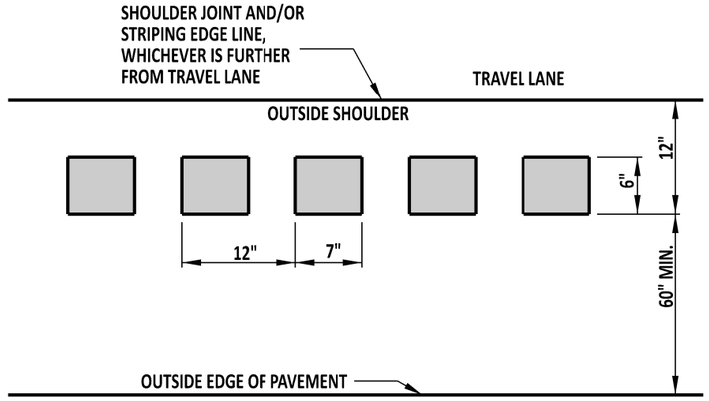

NOTES :

1). RUMBLE STRIPS SHALL BE PLACED ON SHOULDERS IN LOCATIONS DESCRIBED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
2). WHERE RUMBLE STRIPS ARE SHOWN ON THE PLANS TO BE ON BRIDGE DECKS, ONLY USE CONTINUOUS SHALLOW DEPTH RUMBLE STRIPS.
3). RUMBLE STRIPS ARE TO BE BROKEN FOR ALL INTERSECTIONS AND DRIVEWAY ENTRANCES WHERE THE EDGELINE PAVEMENT MARKINGS TIE INTO DRIVEWAY ENTRANCE OR WHERE THE EDGELINE PAVEMENT MARKINGS ARE BROKEN. THE INSTALLATION OF RUMBLE STRIPS SHOULD BE STOPPED 25' PRIOR TO THE POINT OF CURVATURE (PC) AND RESTARTED 25' AFTER THE POINT OF TANGENCY (PT).
4). RUMBLE STRIPS SHOULD NOT BE INSTALLED ON ACCELERATION, DECELERATION LANES, DECELERATION OR BYPASS LANES, OR TWO-WAY LEFT TURN LANES. INSTALLATION SHOULD STOP 150' PRIOR TO THE DIVERGE POINT OF A DECELERATION LANE AND SHOULD NOT COMMENCE UNTIL 150' DOWNSTREAM OF THE MERGE POINT FOR AN ACCELERATION LANE.

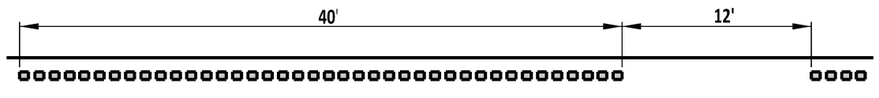
| | | | |
|---|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | RUMBLE STRIPS | | APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 1/04/2019 (DATE) |
| | STANDARD NO. P-5 (2018) | SHT. 1 OF 2 | RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 12/20/2018 (DATE) |

1/7/2019

SCALE : NTS



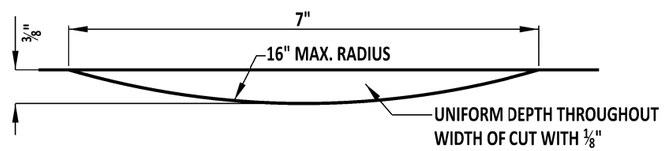

## BIKE-FRIENDLY EDGELINE RUMBLE STRIPS



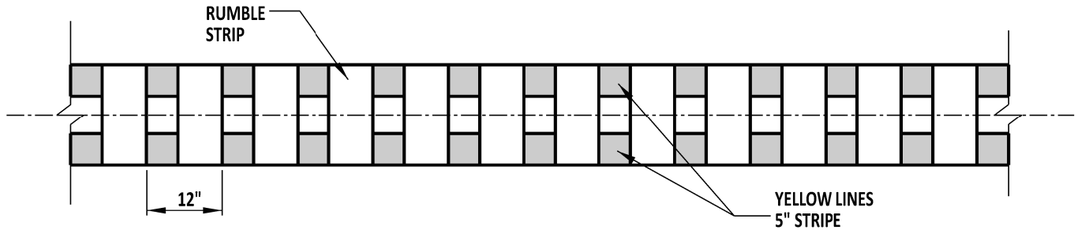




BIKE-FRIENDLY EDGELINE RUMBLE STRIPS
SEGMENT VIEW

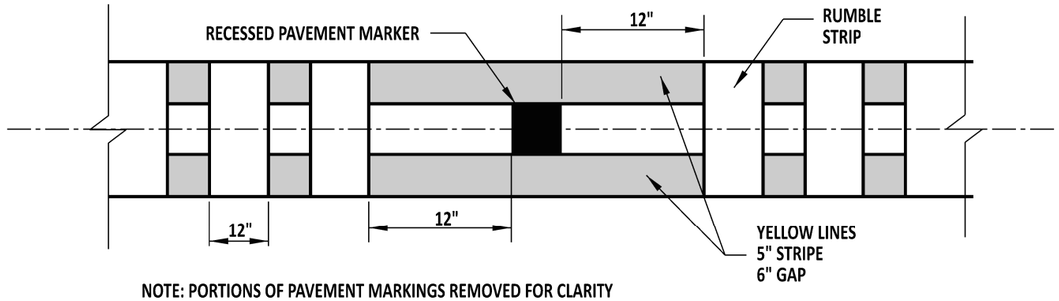



BIKE-FRIENDLY EDGELINE RUMBLE STRIPS
SECTION VIEW



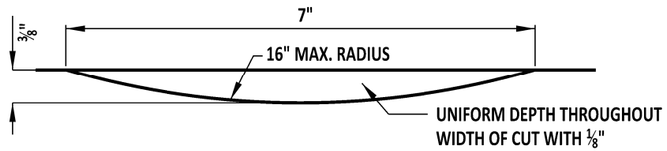

NOTE: PORTIONS OF PAVEMENT MARKINGS REMOVED FOR CLARITY

## CENTERLINE RUMBLE STRIP




NOTE: PORTIONS OF PAVEMENT MARKINGS REMOVED FOR CLARITY

CENTERLINE RUMBLE STRIP
AT RECESSED PAVEMENT MARKER




CENTERLINE RUMBLE STRIPS
SECTION VIEW

NOTES :

1). RUMBLE STRIPS SHALL BE PLACED ON SHOULDERS IN LOCATIONS DESCRIBED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
2). RUMBLE STRIPS ARE TO BE BROKEN FOR ALL INTERSECTIONS AND DRIVEWAY ENTRANCES WHERE THE EDGELINE PAVEMENT MARKINGS TIE INTO DRIVEWAY ENTRANCE OR WHERE THE EDGELINE PAVEMENT MARKINGS ARE BROKEN. THE INSTALLATION OF RUMBLE STRIPS SHOULD BE STOPPED 25' PRIOR TO THE POINT OF CURVATURE (PC) AND RESTARTED 25' AFTER THE POINT OF TANGENCY (PT).
3). RUMBLE STRIPS SHOULD NOT BE INSTALLED ON ACCELERATION, DECELERATION LANES, DECELERATION OR BYPASS LANES, OR TWO-WAY LEFT TURN LANES. INSTALLATION SHOULD STOP 150' PRIOR TO THE DIVERGE POINT OF A DECELERATION LANE AND SHOULD NOT COMMENCE UNTIL 150' DOWNSTREAM OF THE MERGE POINT FOR AN ACCELERATION LANE.
4). BICYCLE-FRIENDLY RUMBLE STRIPS SHOULD BE DISCONTINUED 50' BEFORE AND STARTED 50' AFTER WHEN ADJACENT TO GUARDRAIL WHERE THERE IS LESS THAN 5' BETWEEN THE OUTSIDE EDGE OF THE RUMBLE STRIP AND THE FACE OF THE GUARDRAIL.
5). IN AREAS WHERE THE CENTER LINE LEADS INTO A RAISED CONCRETE ISLAND, THE CENTERLINE RUMBLE STRIPS SHOULD BE DISCONTINUED 25' IN ADVANCE OF THESE ISLANDS.
6). IN AREAS WHERE THE CENTER LINE SPLITS TO CREATE, FOR EXAMPLE A TURN LANE, THE RUMBLE STRIPS SHOULD BE PLACED ONLY ALONG THE DOUBLE YELLOW CENTER LINE THAT IS NOT FORMING THE LEFT TURN LANE.
7). ON ROADS WITH RECESSED PAVEMENT MARKERS (RPMs), CENTER LINE RUMBLE STRIPS SHOULD BEGIN 1' DOWNSTREAM OF THE RPM HOUSING AND TERMINATE 1' UPSTREAM OF THE RPM HOUSING.
8). DO NOT INSTALL CENTERLINE RUMBLE STRIPS UNLESS THE DISTANCE BETWEEN THE EDGE OF THE PAVEMENT TO THE EDGE OF THE CENTER STRIPE IS GREATER THAN 10'.

DELAWARE
DEPARTMENT OF TRANSPORTATION

RUMBLE STRIPS

STANDARD NO. P-5 (2018) | SHT. 2 OF 2

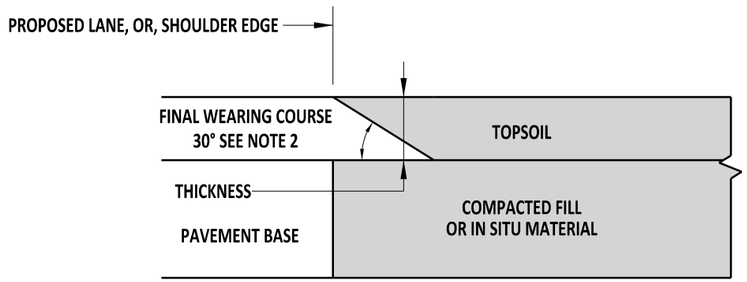
APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 1/04/2019 (DATE)

RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 12/20/2018 (DATE)

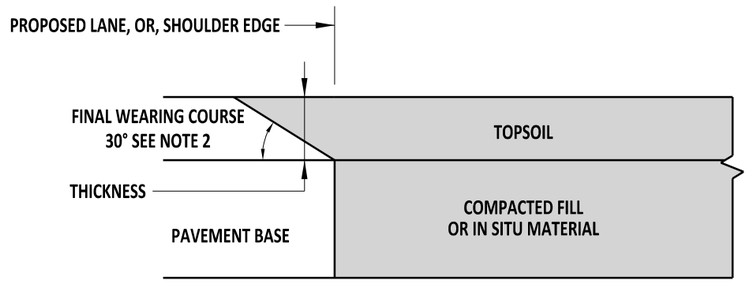
1/7/2019

SCALE : NTS

## WHERE LANE WIDTH ≤11' OR SHOULDER WIDTH ≤5'




## WHERE LANE WIDTH ≥11' OR SHOULDER WIDTH ≥5'




| THICKNESS OF SAFETY EDGE | |
|---|---|
| CONCRETE PAVEMENT | 3" |
| BITUMINOUS CONCRETE PAVEMENT FINAL WEARING COURSE | > 1¼" |

NOTE:
1). LEVEL COMPACTED FILL OR IN-SITU MATERIAL WITH THE PAVEMENT BASE PRIOR TO FINAL BITUMINOUS CONCRETE PAVING LIFT.
2). ANGLE ALLOWANCE OF 26° MINIMUM TO 40° MAXIMUM.

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ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

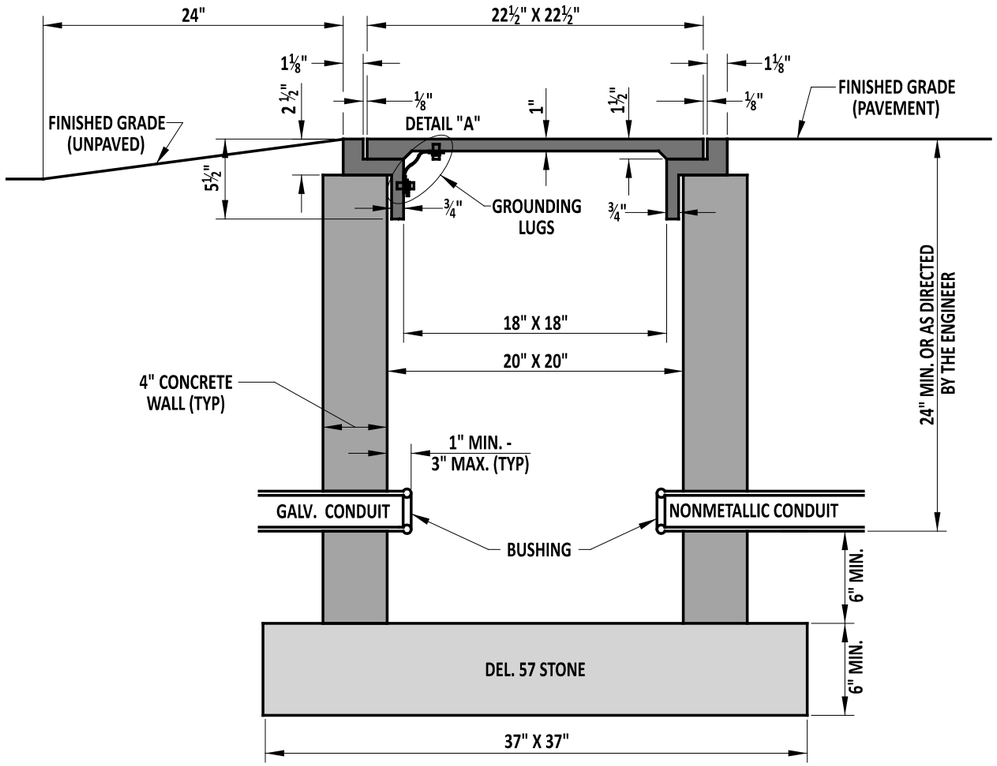
PAVEMENT SAFETY EDGE

STANDARD NO. P-6 (2020) | SHT. 1 OF 1

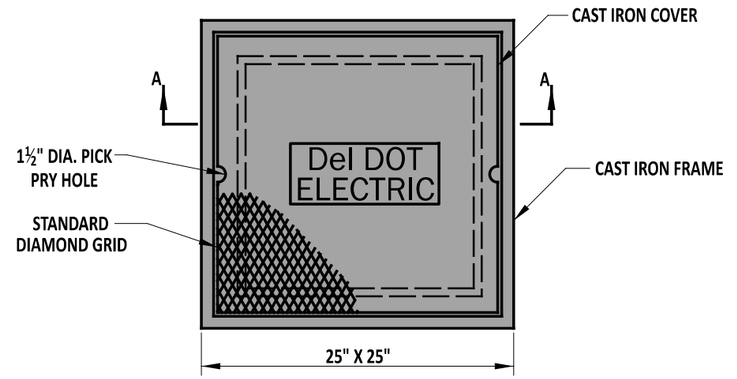
REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/20/2020

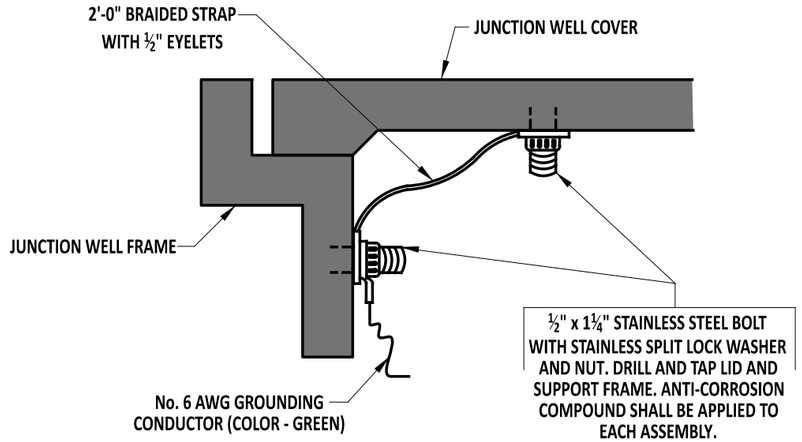
SCALE : NTS




## SECTION A-A




## PLAN VIEW




## DETAIL "A"

NOTES:

1). TYPE 1 CONDUIT JUNCTION WELL SHALL BE PRECAST CONCRETE. AT LEAST ONE HOLE IN PRECAST WELLS WILL BE OF A 5" DIAMETER COMPLETELY THROUGH THE WALL. UNUSED HOLES SHALL BE PLUGGED.
2). CONDUIT JUNCTION WELLS SHALL NOT BE PLACED UNDER A TRAVELWAY.
3). ALL CONDUIT JUNCTION WELLS PLACED IN PAVED AREAS SHALL BE CONSTRUCTED FLUSH WITH THE FINISHED GRADE. ALL CONDUIT JUNCTION WELLS PLACED IN UNPAVED AREAS SHALL BE CONSTRUCTED ABOVE FINISHED GRADE AND GRADED TO DRAIN AWAY FROM THE WELL, AS DETAILED.
4). ALL CRACKS, GAPS, OR OPENINGS IN JUNCTION WELL WALL SHALL BE SEALED WITH CONCRETE.
5). AREA AROUND THE JUNCTION WELL SHALL BE BACKFILLED WITH BORROW TYPE C MATERIAL TO THE REQUIRED ELEVATION IN ACCORDANCE WITH SECTION 207. EXCESS AND UNSUITABLE MATERIAL SHALL BE DISPOSED PER SECTION 106.8.

DelDOT

09/01/2020
ENGINEERING SUPPORT — DATE
RECOMMENDED

CONDUIT JUNCTION WELL, TYPE 1

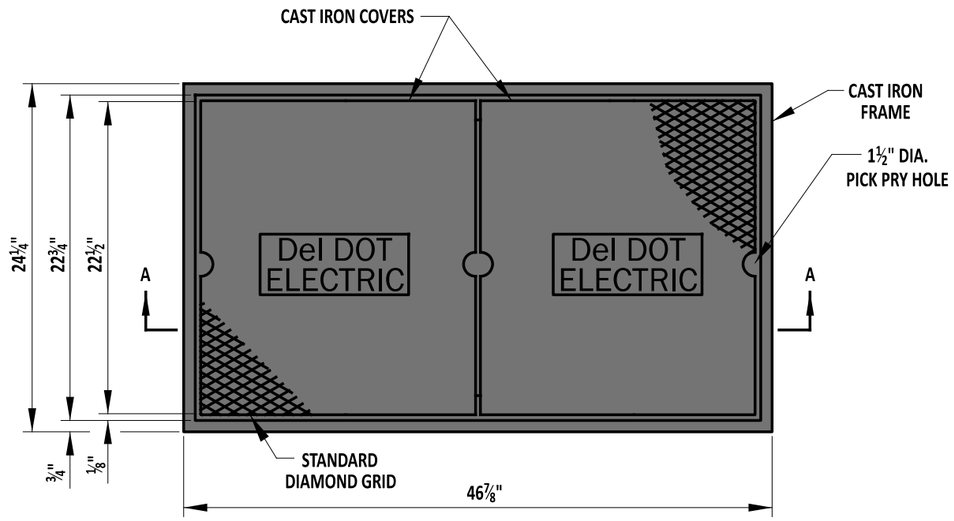
STANDARD NO. T-1 (2020) | SHT. 1 OF 4

REVIEWED
DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

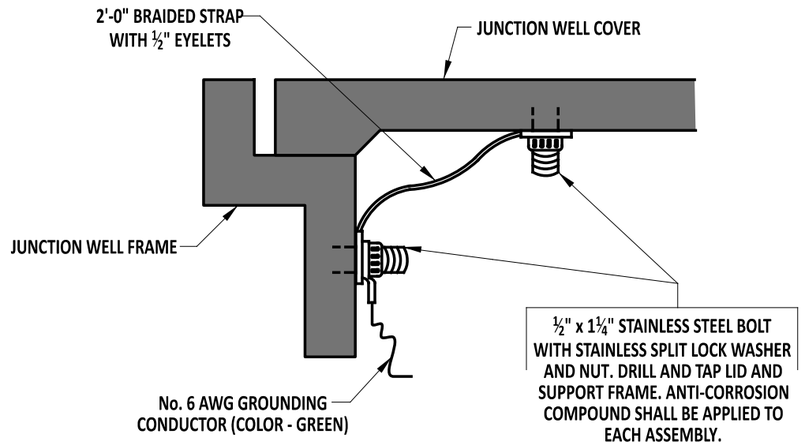
APPROVED
CHIEF ENGINEER — 09/01/2020 DATE

08/21/2020

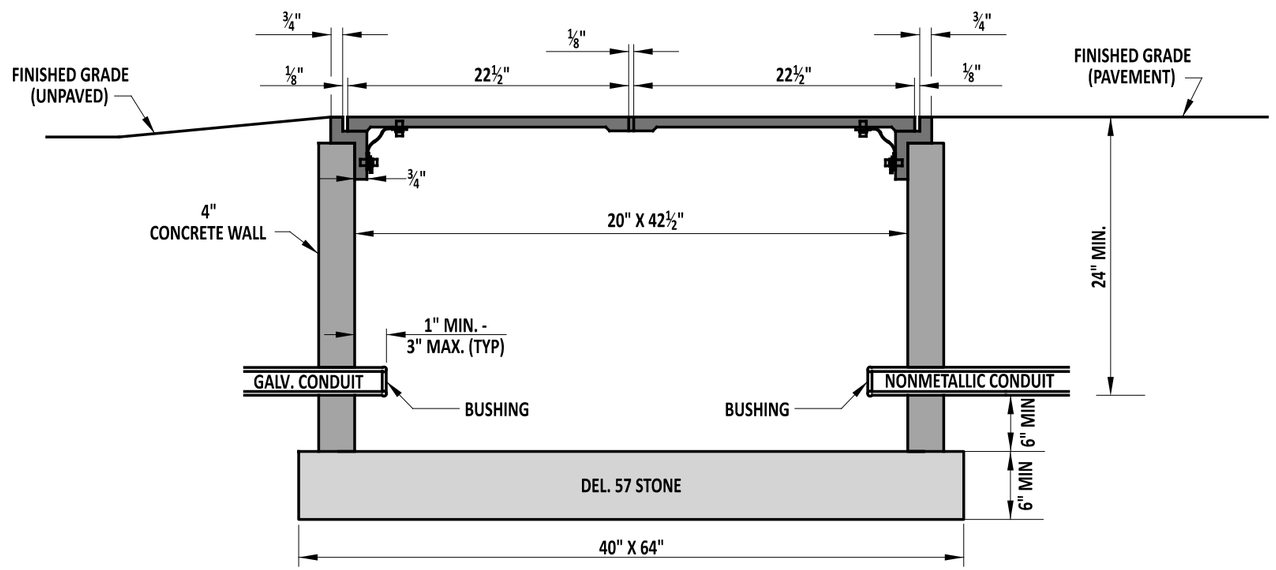
SCALE : NTS

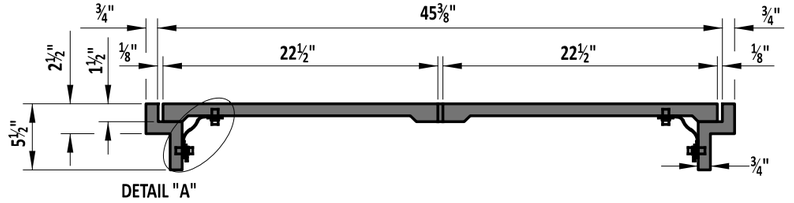



PLAN VIEW




DETAIL "A"




SECTION A-A

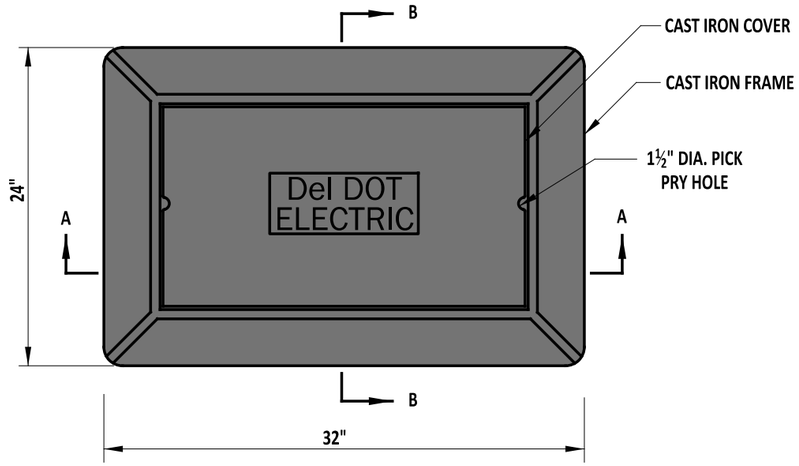
NOTES:

1). TYPE 4 CONDUIT JUNCTION WELL SHALL BE PRECAST CONCRETE. AT LEAST ONE HOLE IN PRECAST WELLS WILL BE OF A 5" DIAMETER COMPLETELY THROUGH THE WALL. UNUSED HOLES SHALL BE PLUGGED.
2). ALL CONDUIT JUNCTION WELLS PLACED IN PAVED AREAS SHALL BE CONSTRUCTED FLUSH WITH THE FINISHED GRADE. ALL CONDUIT JUNCTION WELLS PLACED IN UNPAVED AREAS SHALL BE CONSTRUCTED ABOVE FINISHED GRADE, AND GRADED TO DRAIN AWAY FROM THE WELL, AS DETAILED.
3). ALL CRACKS, GAPS, OR OPENINGS IN JUNCTION WELL WALL SHALL BE SEALED WITH CONCRETE.
4). AREA AROUND THE JUNCTION WELL SHALL BE BACKFILLED WITH BORROW TYPE C MATERIAL TO THE REQUIRED ELEVATION IN ACCORDANCE WITH SECTION 207. EXCESS AND UNSUITABLE MATERIAL SHALL BE DISPOSED PER SECTION 106.8.

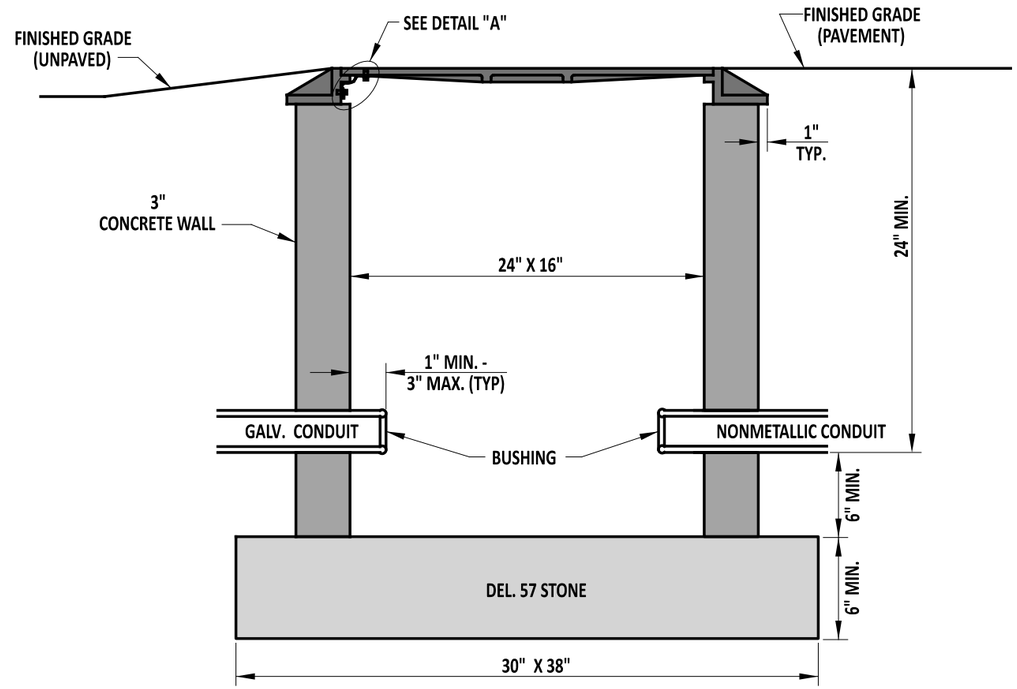
| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | CONDUIT JUNCTION WELL, TYPE 4 | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. T-1 (2020) SHT. 2 OF 4 | APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/21/2020

SCALE : NTS




**PLAN VIEW**




**SECTION A-A**

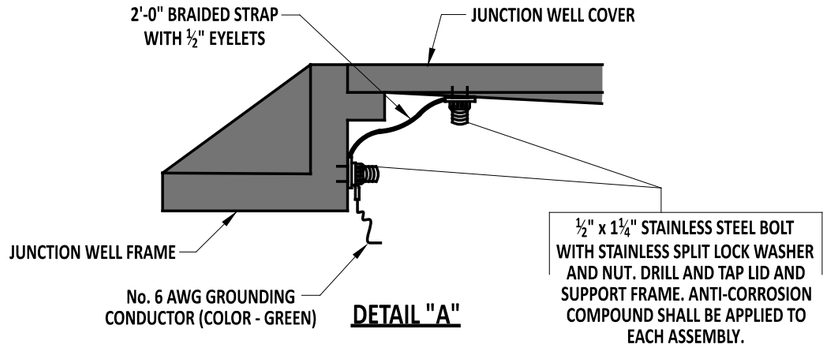
**NOTES:**

1). TYPE 5 CONDUIT JUNCTION WELL SHALL BE PRECAST CONCRETE. AT LEAST ONE HOLE IN PRECAST WELLS WILL BE OF A 5" DIAMETER COMPLETELY THROUGH THE WALL. UNUSED HOLES SHALL BE PLUGGED.

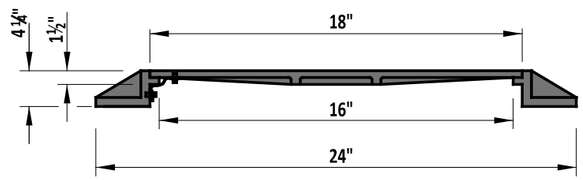
2). ALL CONDUIT JUNCTION WELLS PLACED IN PAVED AREAS SHALL BE CONSTRUCTED FLUSH WITH THE FINISHED GRADE. ALL CONDUIT JUNCTION WELLS PLACED IN UNPAVED AREAS SHALL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM THE WELL, AS DETAILED.

3). ALL CRACKS, GAPS, OR OPENINGS IN JUNCTION WELL WALL SHALL BE SEALED WITH CONCRETE.

4). AREA AROUND THE JUNCTION WELL SHALL BE BACKFILLED WITH BORROW TYPE C MATERIAL TO THE REQUIRED ELEVATION IN ACCORDANCE WITH SECTION 207. EXCESS AND UNSUITABLE MATERIAL SHALL BE DISPOSED PER SECTION 106.8.




**DETAIL "A"**

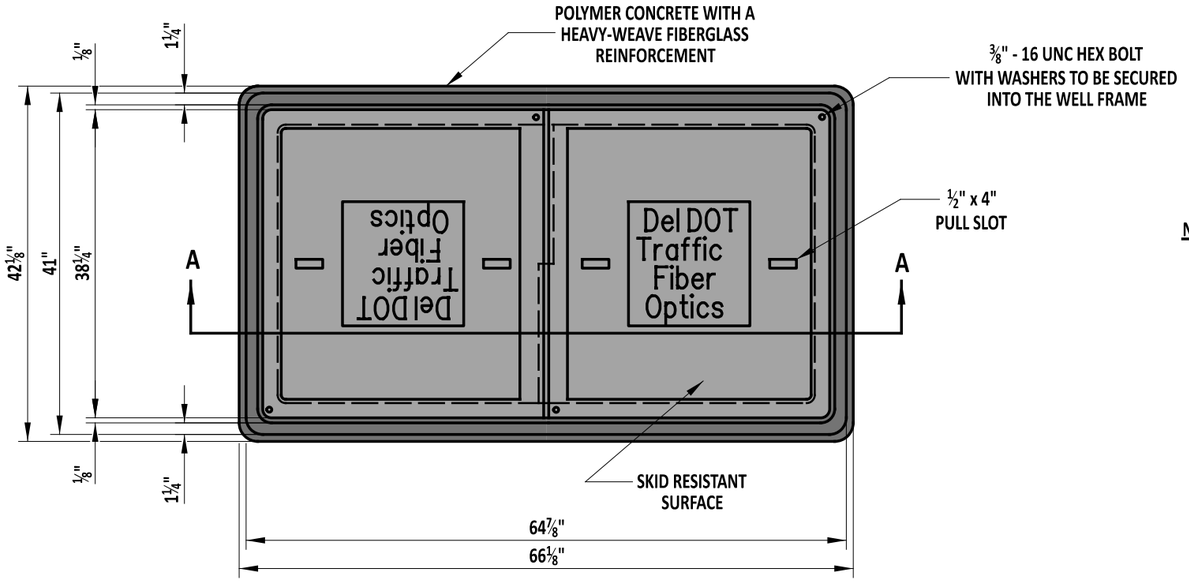



**SECTION B-B**

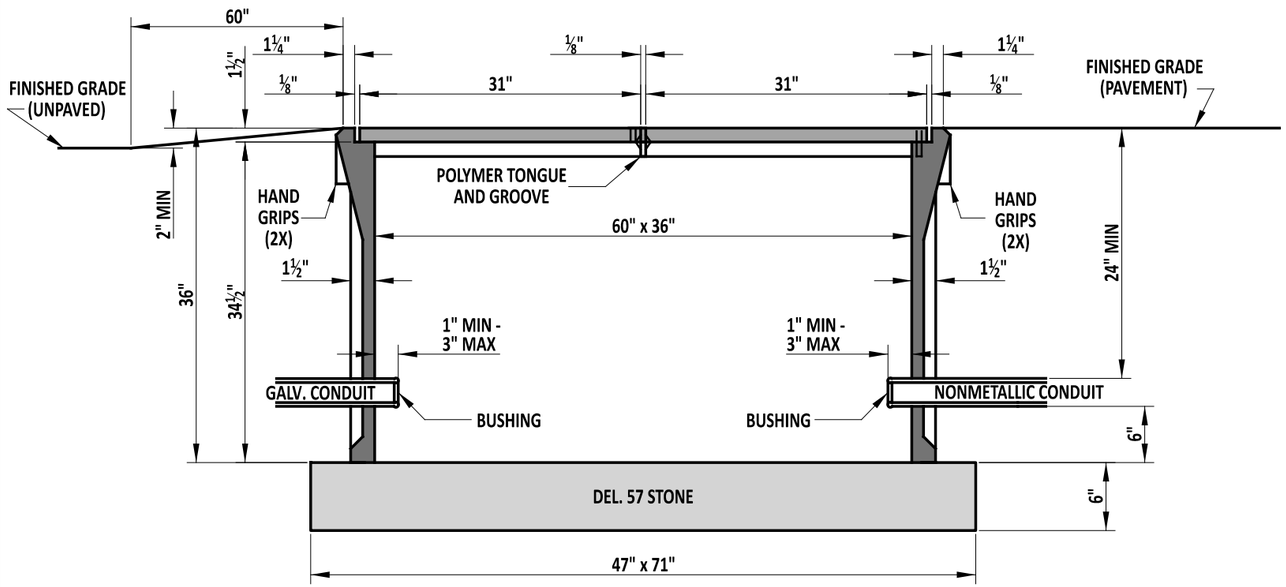
| | | | | | |
|---|---|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE | CONDUIT JUNCTION WELL, TYPE 5 | | REVIEWED | DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | RECOMMENDED | STANDARD NO. T-1 (2020) | SHT. 3 OF 4 | APPROVED | CHIEF ENGINEER 09/01/2020 DATE |

08/21/2020

SCALE : NTS




PLAN VIEW




SECTION A-A

**NOTES:**

1). TYPE 7 CONDUIT JUNCTION WELL SHALL BE PRECAST POLYMER CONCRETE.
2). ALL CONDUIT JUNCTION WELLS CONSTRUCTED WITHIN PAVEMENT, SIDEWALKS, ETC. WILL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM THE CONDUIT JUNCTION WELL.
3). POLYMER CONCRETE COVERS SHALL BE THE HEAVY DUTY TYPE WITH A DESIGN LOAD OF 15,000 LBS OVER A 10" SQUARE.
4). AREA AROUND THE JUNCTION WELL SHALL BE BACKFILLED WITH BORROW TYPE C MATERIAL TO THE REQUIRED ELEVATION IN ACCORDANCE WITH SECTION 207. EXCESS AND UNSUITABLE MATERIAL SHALL BE DISPOSED PER SECTION 106.8.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

CONDUIT JUNCTION WELL, TYPE 7

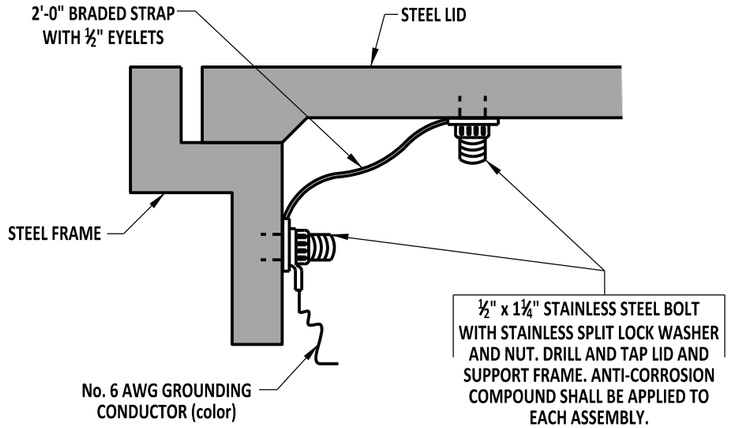
STANDARD NO. T-1 (2020) | SHT. 4 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

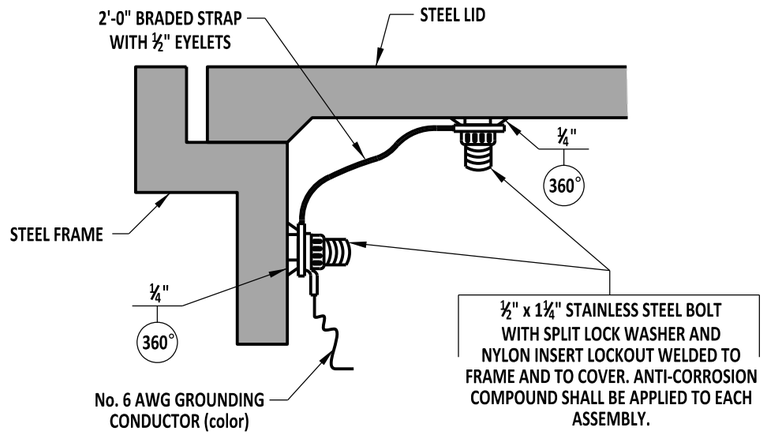
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/21/2020

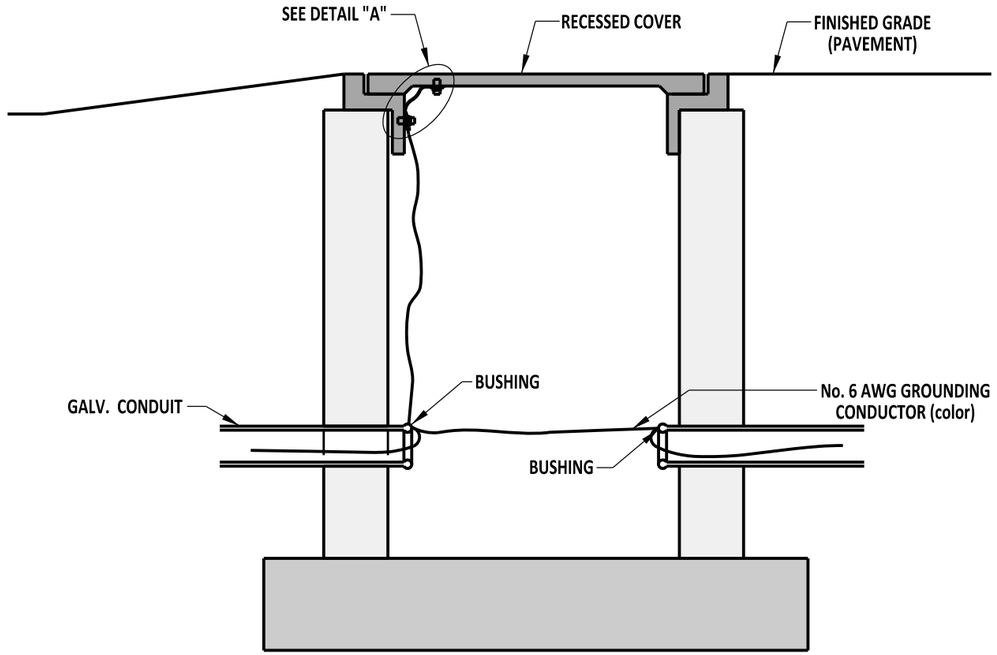
SCALE : NTS



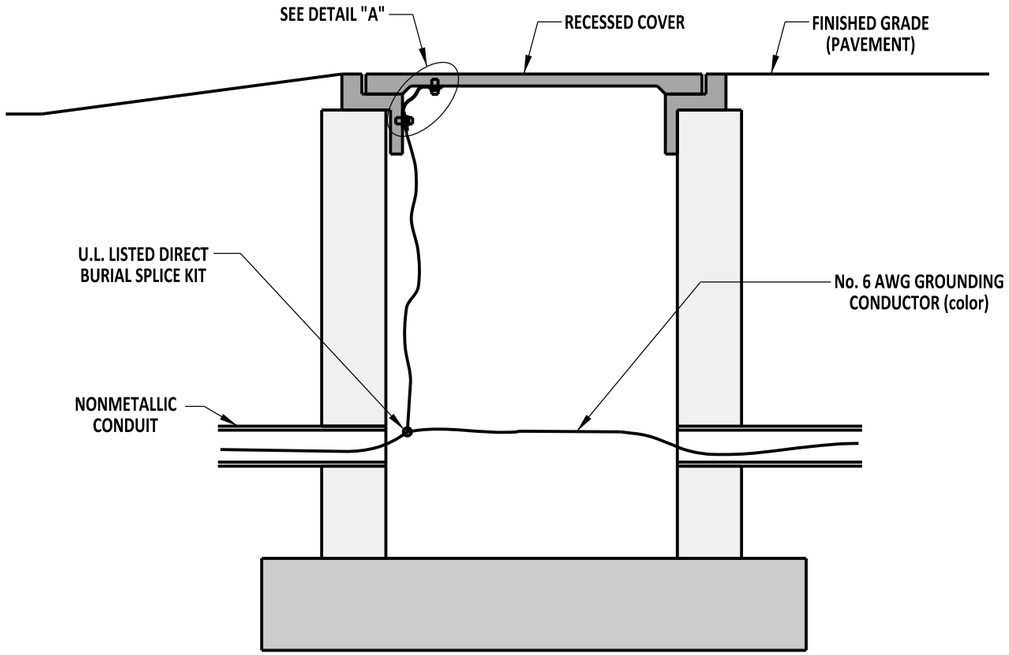

## DETAIL "A"




## BONDING AN EXISTING JUNCTION WELL COVER & FRAME




## JUNCTION WELL BONDING GALVANIZED TO GALVANIZED




## JUNCTION WELL BONDING NONMETALLIC CONDUIT

| | | | |
|---|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | JUNCTION WELL, GROUNDING & BONDING FOR STEEL FRAMES & LIDS | | APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 12/22/2011 (DATE) |
| | STANDARD NO. T-2 (2011) | SHT. 1 OF 1 | RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 12/21/2011 (DATE) |

11/14/2011

SCALE : NTS

# T-3 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

DelDOT

ENGINEERING SUPPORT _____ DATE _____

RECOMMENDED

-

STANDARD NO. T-3 (2020)

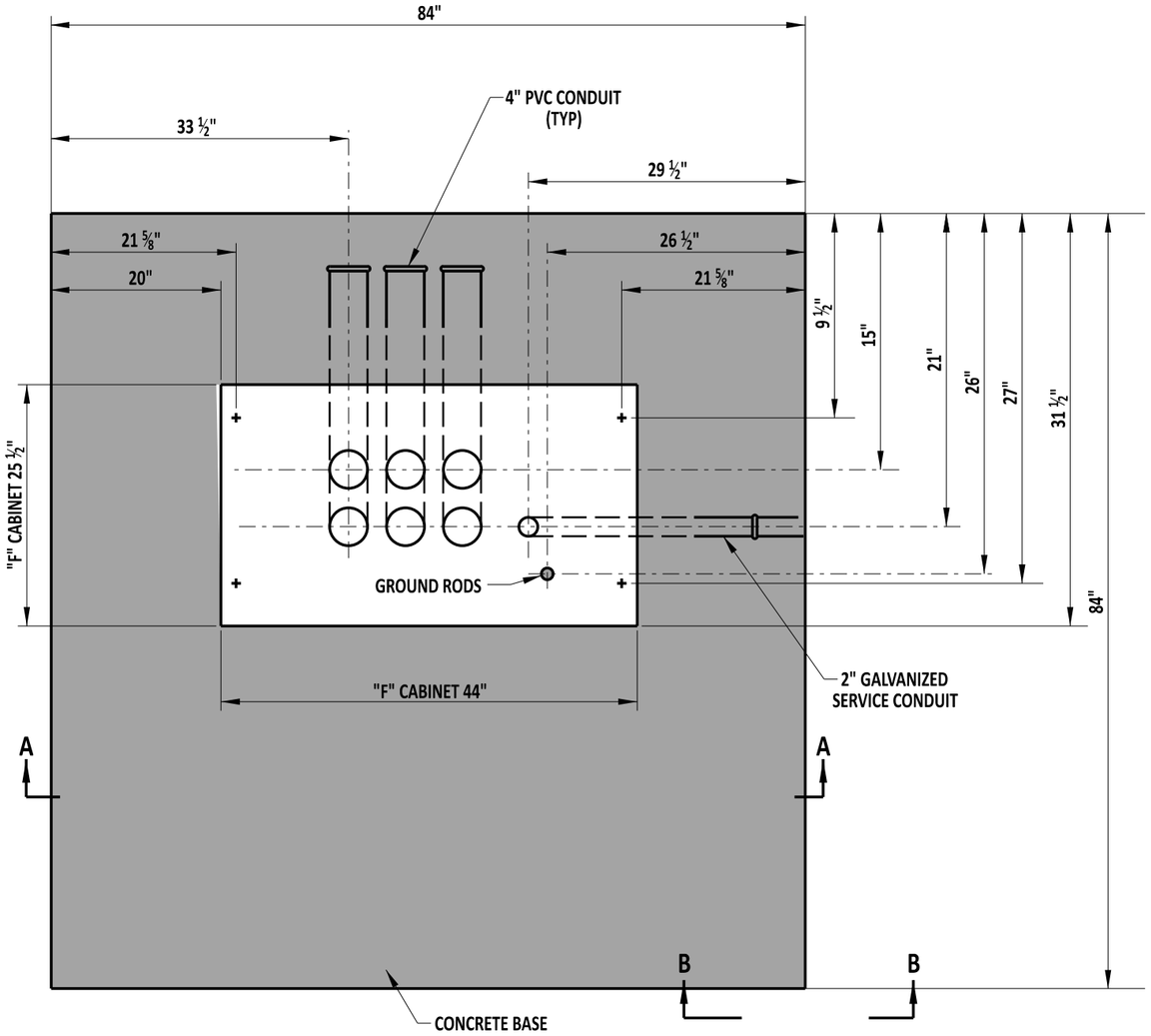
SHT. 1 OF 1

REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE

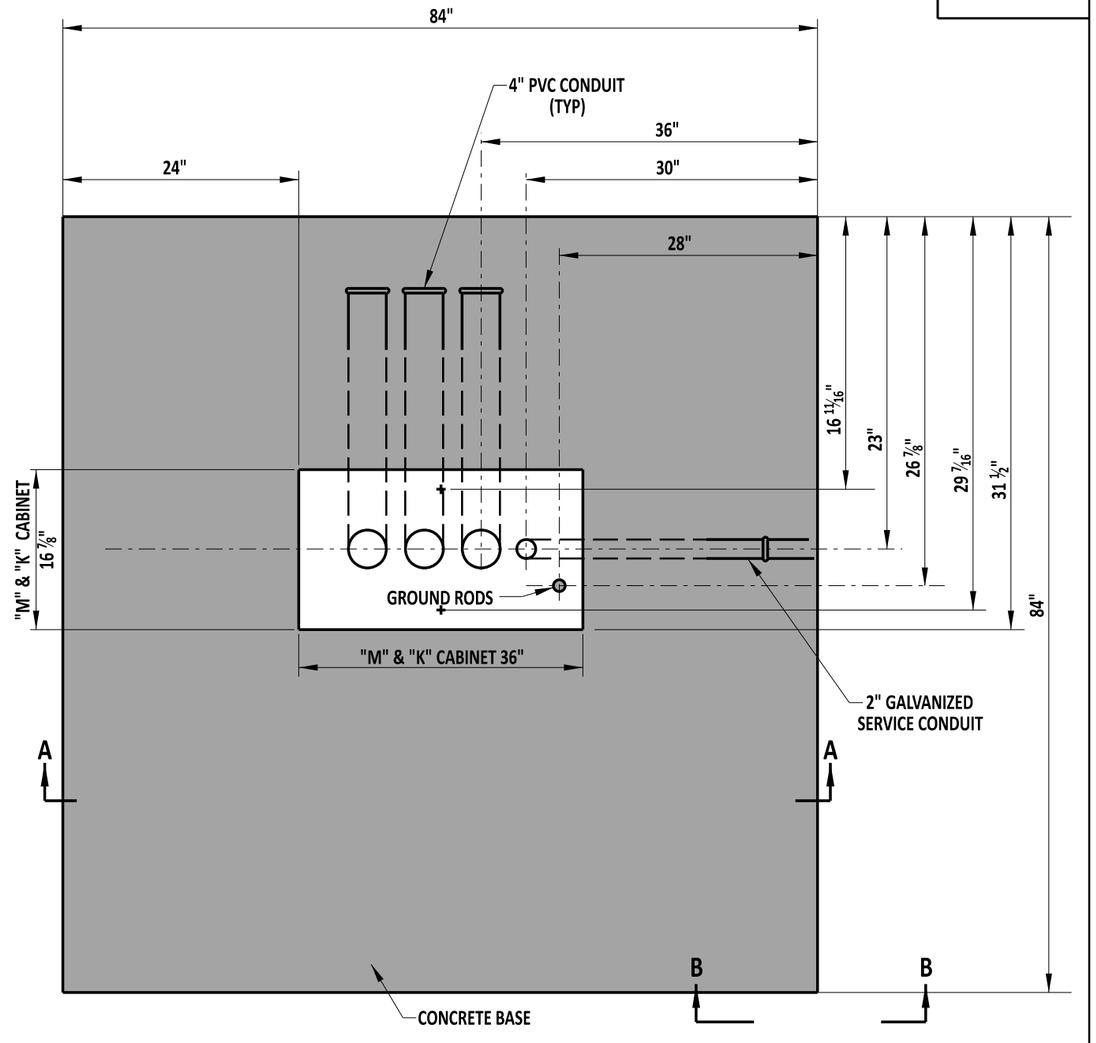
APPROVED _____ CHIEF ENGINEER _____ DATE

08/21/2020

SCALE : NTS




"F" CABINET
PLAN VIEW



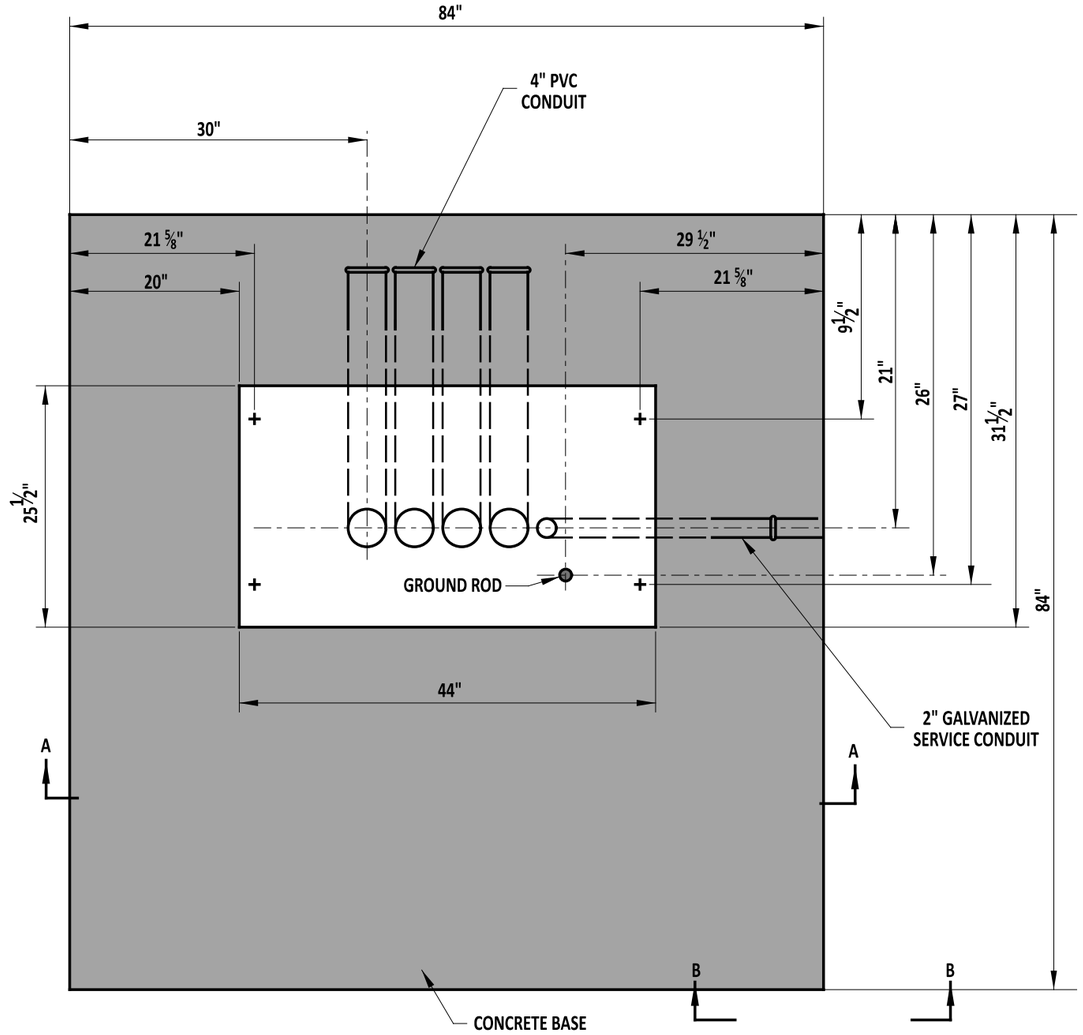

"M" & "K" CABINET
PLAN VIEW

NOTE:
1). CONDUITS SHALL BE EVENLY SPACED, WITH MINIMUM 2" WIDTH SPACING ESTABLISHED BETWEEN ALL CONDUITS.
2). FOR VIEW OF SECTION A-A AND SECTION B-B, SEE DETAIL T-4, SHEET 2 OF 2.
3). IF FULL SIZE OF BASE CANNOT BE ESTABLISHED, A 56"X 58" BASE SHALL BE INSTALLED PER DELDOT'S SIGNAL CONSTRUCTION INSPECTOR.

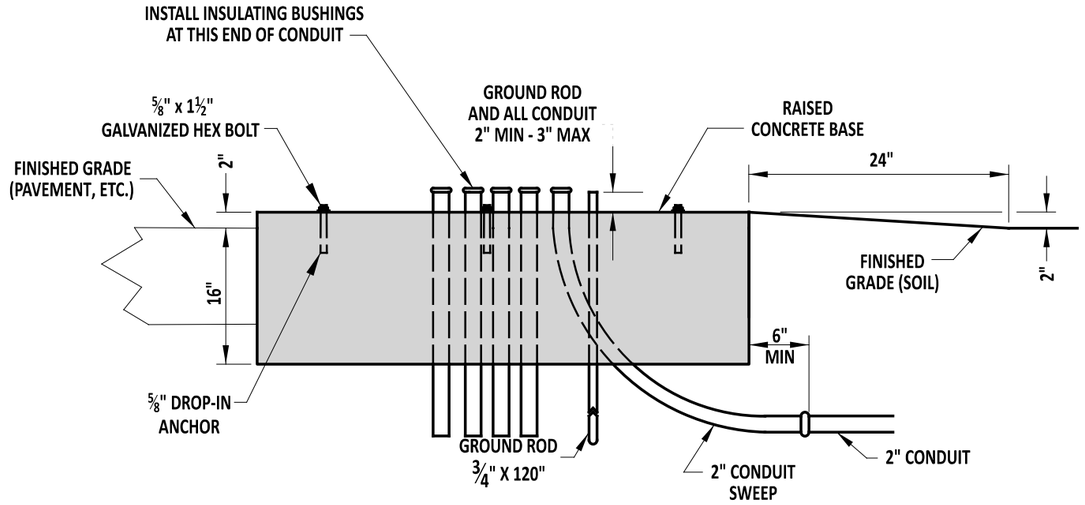
| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | CABINET BASES, TYPES M, K, & F | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. T-4 (2020) SHT. 1 OF 2 | APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/21/2020

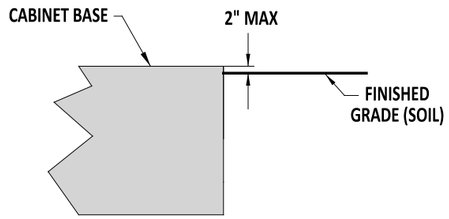
SCALE : NTS




"P & R" CABINET
PLAN VIEW




SECTION A-A




SECTION B-B

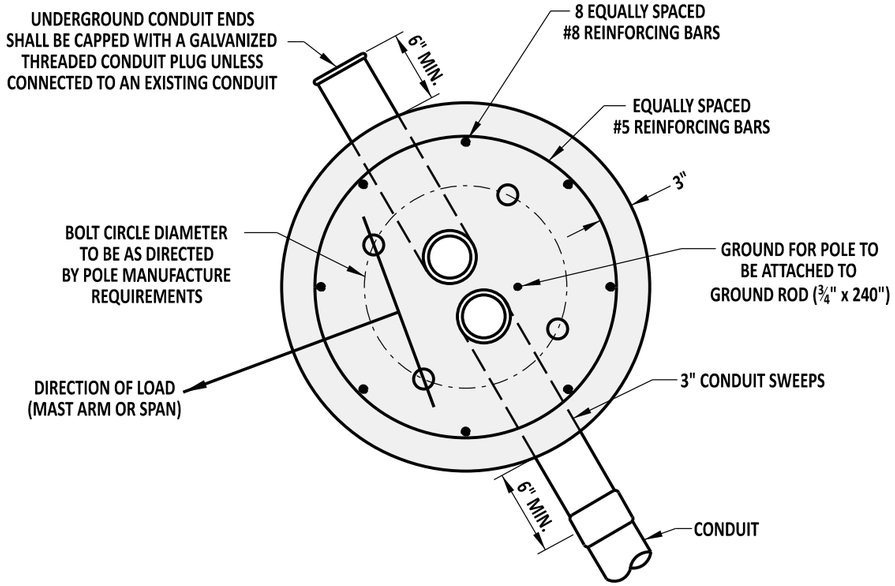
NOTE:

1). CONDUITS SHALL BE EVENLY SPACED, WITH MINIMUM 2" WIDTH SPACING ESTABLISHED BETWEEN ALL CONDUITS.
2). IF FULL SIZE OF BASE CANNOT BE ESTABLISHED, A 56" X 58" BASE SHALL BE INSTALLED PER DELDOT'S SIGNAL CONSTRUCTION INSPECTOR.

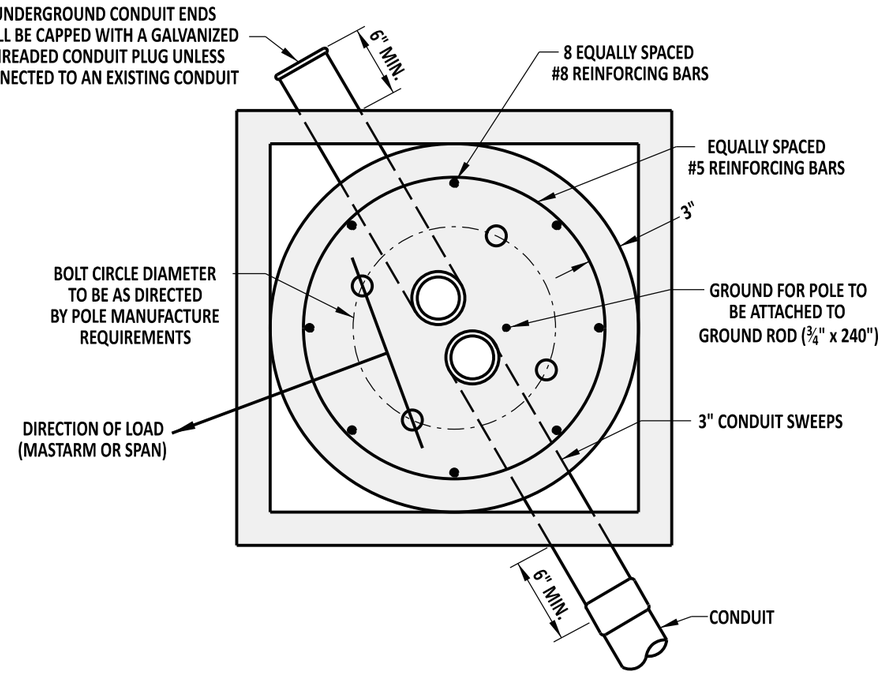
| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | CABINET BASES, TYPES P & R | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. T-4 (2020) SHT. 2 OF 2 | APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/21/2020

SCALE : NTS




ROUND BASE



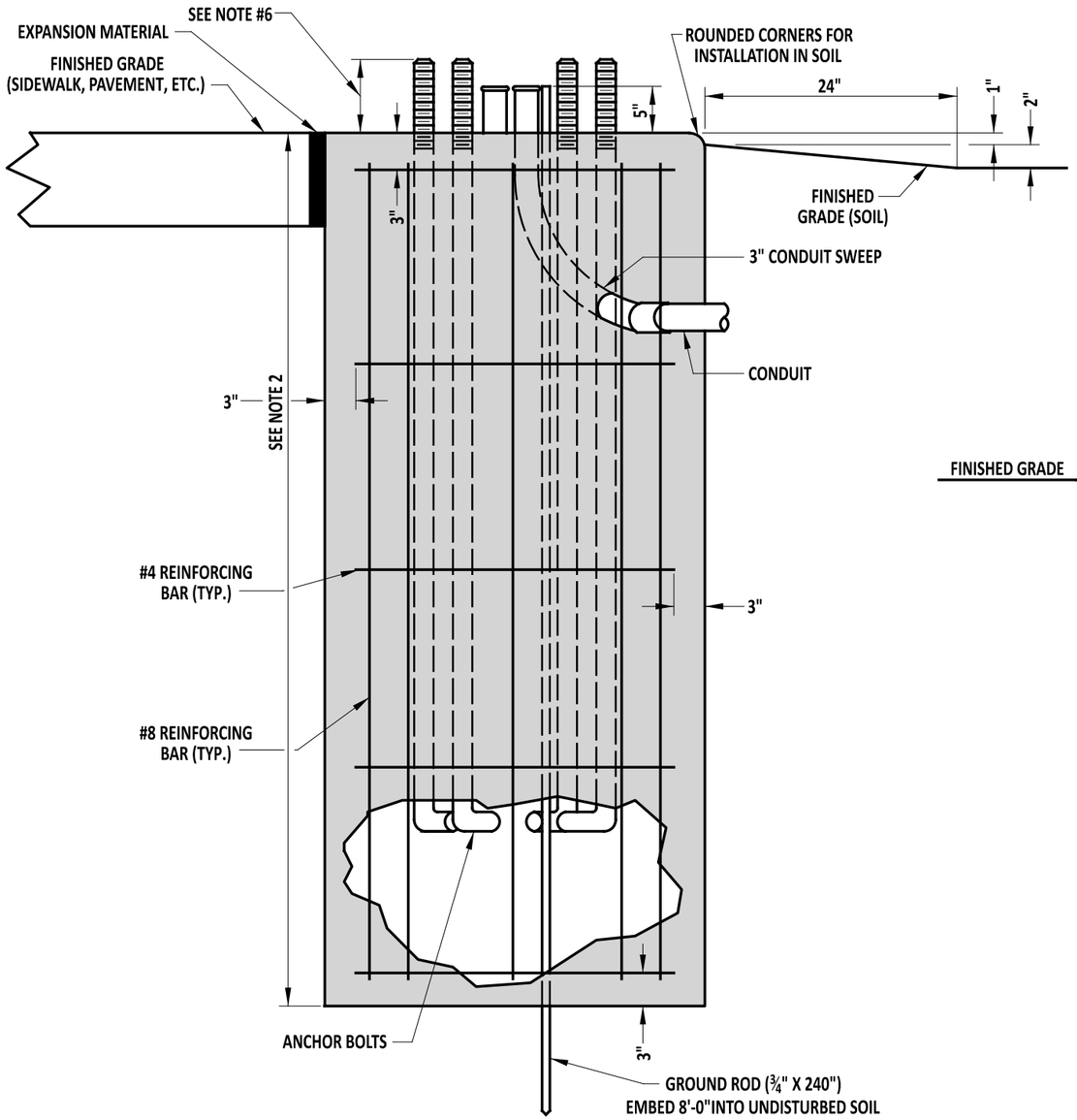

ROUND BASE w/ SQUARE FOUNDATION HEADER

NOTE: SQUARE FOUNDATION HEADER SHALL HAVE A 6" MINIMUM DEPTH.

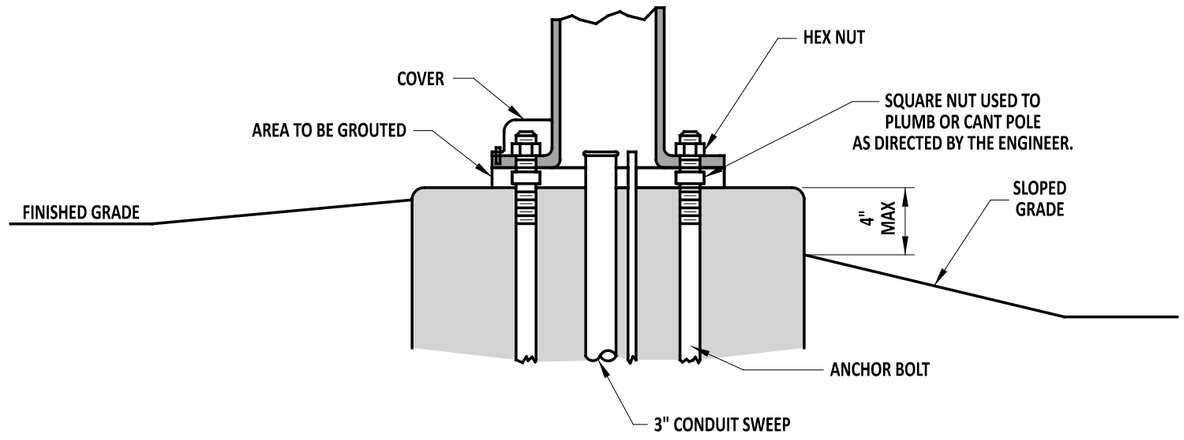
| | | | |
|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | POLE BASES | | APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 5/31/2017 (DATE) |
| | STANDARD NO. T-5 (2017) | SHT. 1 OF 4 | RECOMMENDED SIGNATURE ON FILE (DESIGN ENGINEER) 5/18/2017 (DATE) |

6/13/2017

SCALE : NTS




TYPICAL SECTION (BASES 1,2,2A,2B,3,3A, AND 3B)




TYPICAL INSTALLATION (BASES 1,2,2A,2B,3,3A, AND 3B)

NOTE:

1). PLACE 2 EACH 6" LONG x 1/2" DIA. P.V.C., SCHEDULE 40 (TYP) VENTS IN THE GROUT AS DIRECTED IN THE FIELD BY ENGINEER.
2). SEE POLE BASE DATA CHART ON DETAIL T-5, SHEET 3 OF 4, FOR POLE BASE DIMENSIONS.
3). STRAIN POLES AND MAST ARMS UP TO 60' SHALL USE 2¼" ANCHORS BOLTS, SUPPLIED BY THE DEPARTMENT.
4). MAST ARMS FROM 70-90' SHALL USE 2½" ANCHOR BOLTS, SUPPLIED BY THE DEPARTMENT.
5). ALL OTHER POLE BASES NOT LISTED SHALL ADHERE TO MANUFACTURER AND DEPARTMENT STANDARDS.
6). PER MANUFACTURER SPECIFICATIONS AND DETAILS, THE CONTRACTOR SHALL ENSURE THAT THE FOLLOWING LENGTH OF THREADS ARE EXPOSED PER EACH POLE TYPE:

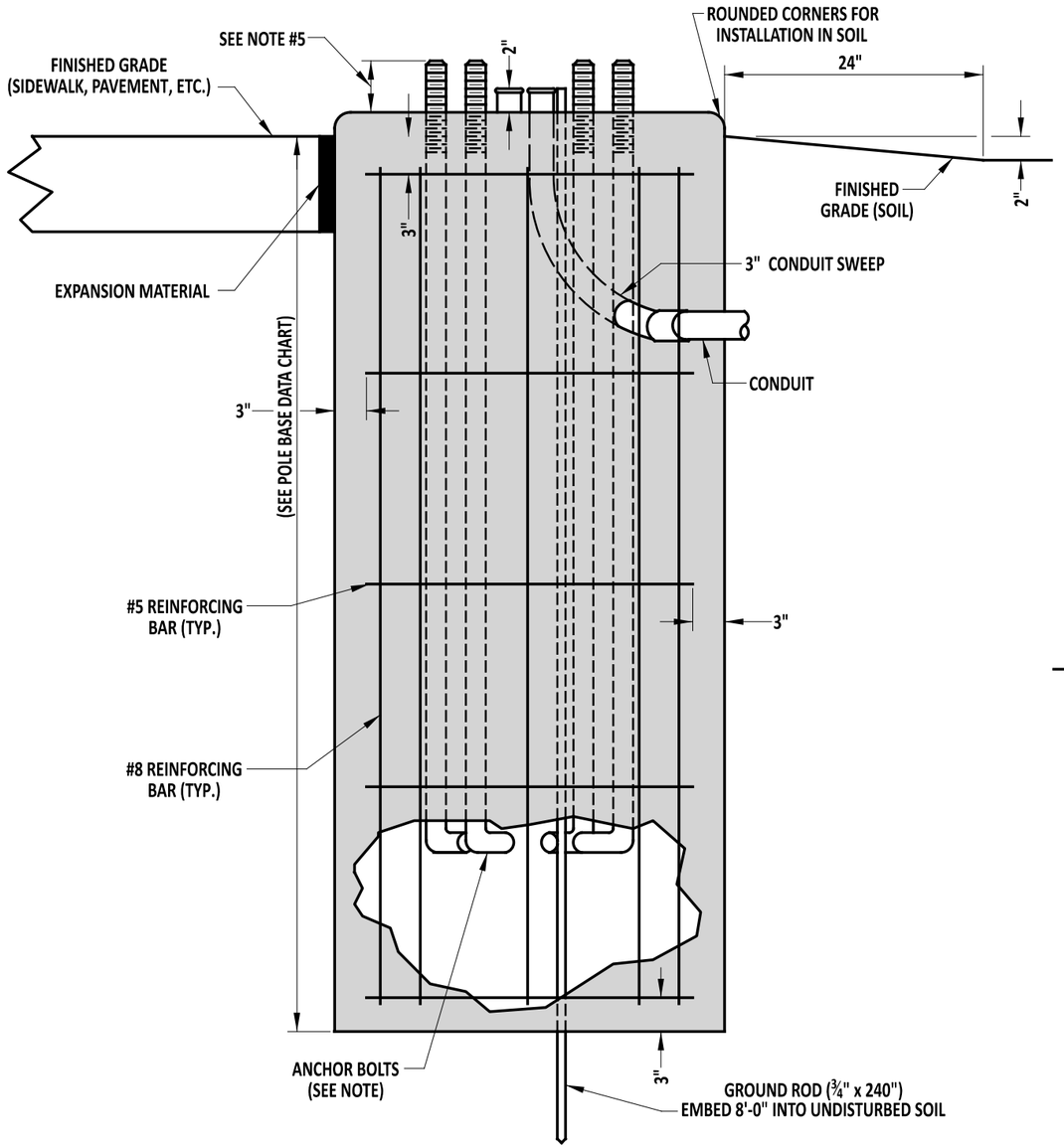
- STRAIN: 10½"
- B (MAST): 9½"
- C (MAST): 11¼"
- CAMERA: 7"
- LIGHTING: 4½"

7). MAXIMUM EXPOSED FOUNDATION DEPTH OF 4" AT FINISHED GRADE TO APPROACHING TRAFFIC.

| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | POLE BASES - TYPICAL SECTION AND INSTALLATION (BASES 1, 2, 2A, 2B, 3, 3A, AND 3B) | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. T-5 (2020) SHT. 2 OF 4 | APPROVED CHIEF ENGINEER 09/01/2020 DATE |

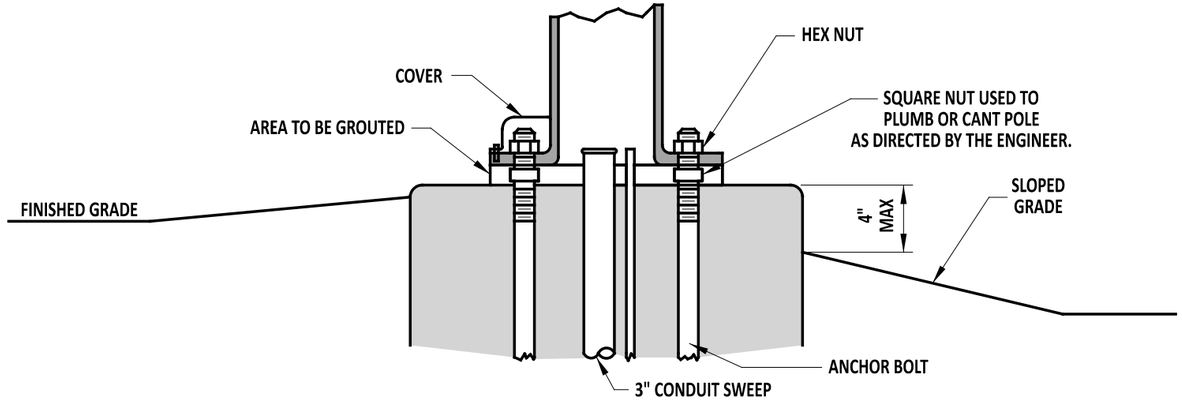
08/21/2020

SCALE : NTS




TYPICAL SECTION (BASE 6)

| POLE BASE DATA CHART | | | | | |
|---|---|---|---|---|---|
| POLE BASE TYPE # | DIAMETER | DEPTH | #5 HORIZONTAL REINFORCING BARS | #8 VERTICAL REINFORCING BARS | CONDUITS |
| 1 | 36" | 7'-0" | 5 | 8 | 2 - 3" |
| 2 | 36" | 10'-0" | 6 | 8 | 2 - 3" |
| 2A | 48" | 8'-0" | 5 | 8 | 2 - 3" |
| 2B | 60" | 7'-0" | 5 | 8 | 2 - 3" |
| 3 | 48" | 10'-0" | 14 | 17 | 2 - 3" |
| 3A | 48" | 12'-0" | 17 | 17 | 2 - 3" |
| 3B | 48" | 15'-0" | 21 | 17 | 2 - 3" |
| 3C | 48" | 20'-0" | 27 | 17 | 2 - 3" |
| 4A & 4B | 24" | 2'-4" | NONE | NONE | 2 - 2.5" |
| 6 | 24" | 6'-0" | 4 | 8 | 2 - 3" |




TYPICAL INSTALLATION (BASE 6)

NOTE:

1). ANCHOR BOLTS AND BOLT PATTERN FOR TYPE 6 POLE BASES TO BE PROVIDED BY THE MANUFACTURER.
2). STRAIN POLES AND MAST ARMS UP TO 60' SHALL USE 2¼" ANCHORS BOLTS, SUPPLIED BY THE DEPARTMENT.
3). MAST ARMS FROM 70-90' SHALL USE 2½" ANCHOR BOLTS, SUPPLIED BY THE DEPARTMENT.
4). ALL OTHER POLE BASES NOT LISTED SHALL ADHERE TO MANUFACTURER AND DEPARTMENT STANDARDS.
5). PER MANUFACTURER SPECIFICATIONS AND DETAILS, THE CONTRACTOR SHALL ENSURE THAT THE FOLLOWING LENGTH OF THREADS ARE EXPOSED PER EACH POLE TYPE:

- STRAIN: 10½"
- B (MAST): 9½"
- C (MAST): 11¼"
- CAMERA: 7"
- LIGHTING: 4½"

6). MAXIMUM EXPOSED FOUNDATION DEPTH OF 4" AT FINISHED GRADE IN ANY ORIENTATION AROUND POLE BASE.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

POLE BASES - TYPICAL SECTION (BASE 6)
AND POLE BASE DATA CHART

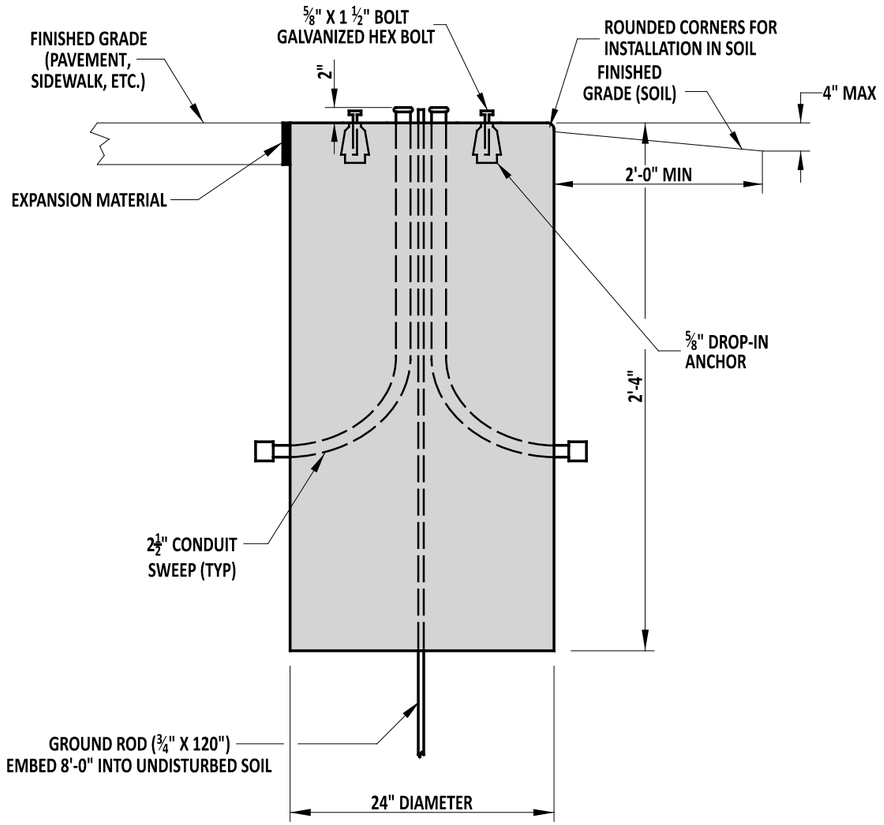
STANDARD NO. T-5 (2020) | SHT. 3 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

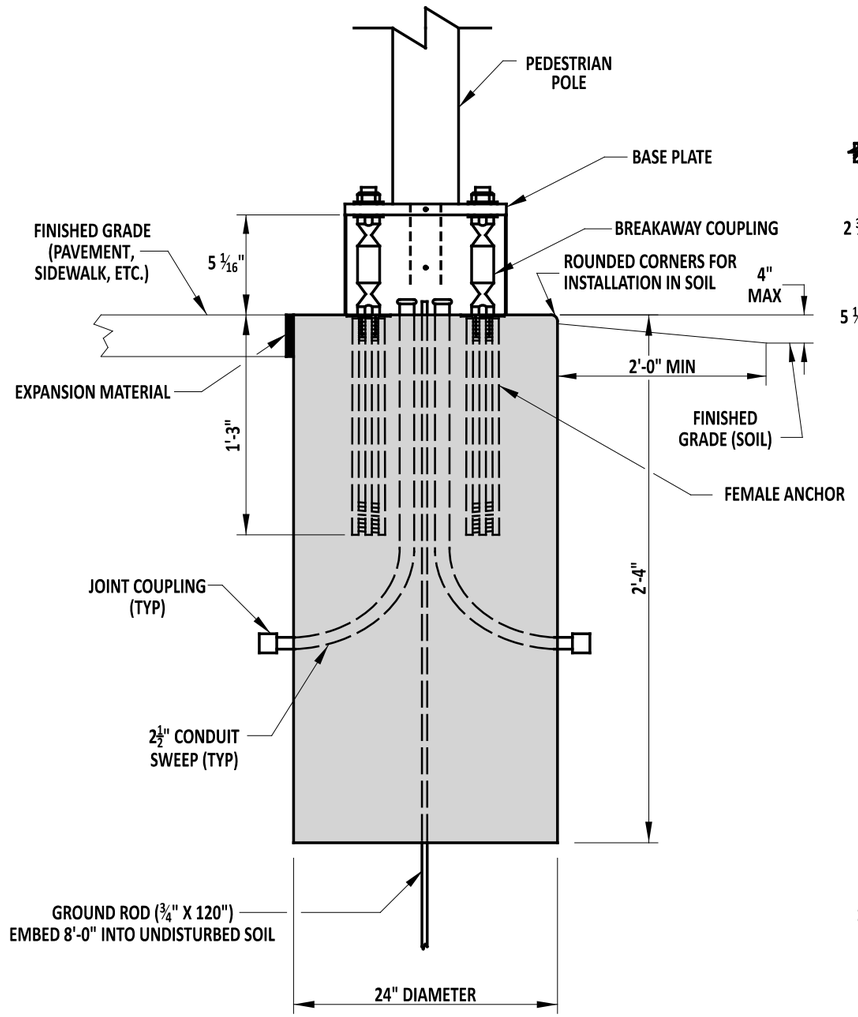
08/21/2020

SCALE : NTS



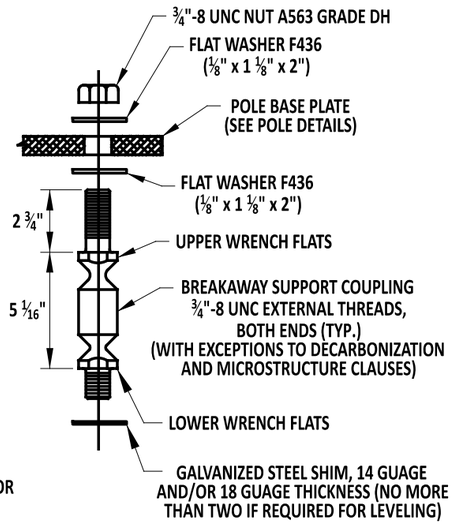

## TYPICAL SECTION (BASE 4A)

NOTE:
BOLT PATTERN TO BE PROVIDED BY DELDOT'S SIGNAL CONSTRUCTION INSPECTOR.

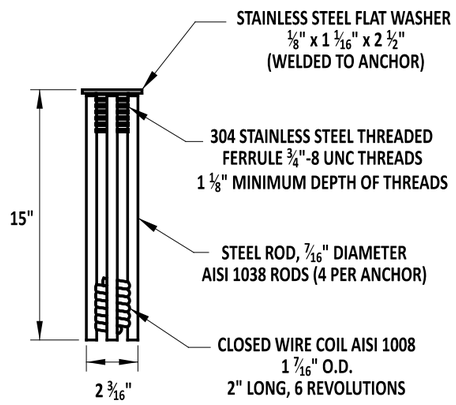



## TYPICAL SECTION (BASE 4B)

NOTE:
BOLT PATTERN TO BE PROVIDED BY DELDOT'S SIGNAL CONSTRUCTION INSPECTOR.




## BREAKAWAY COUPLING DETAIL




## ANCHOR DETAIL

| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | POLE BASES - TYPICAL SECTION (BASE 4A AND 4B) AND ANCHOR AND BREAKAWAY COUPLING<br>STANDARD NO. T-5 (2020) SHT. 4 OF 4 | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE<br>APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/21/2020

SCALE : NTS

# T-6 DETAIL REMOVED IN 2020 REVISIONS
# LEFT BLANK FOR FUTURE

| | | | |
|---|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | - | | APPROVED _____ CHIEF ENGINEER _____ DATE |
| | STANDARD NO. T-6 | SHT. 1 OF 1 | RECOMMENDED _____ DESIGN ENGINEER _____ DATE |

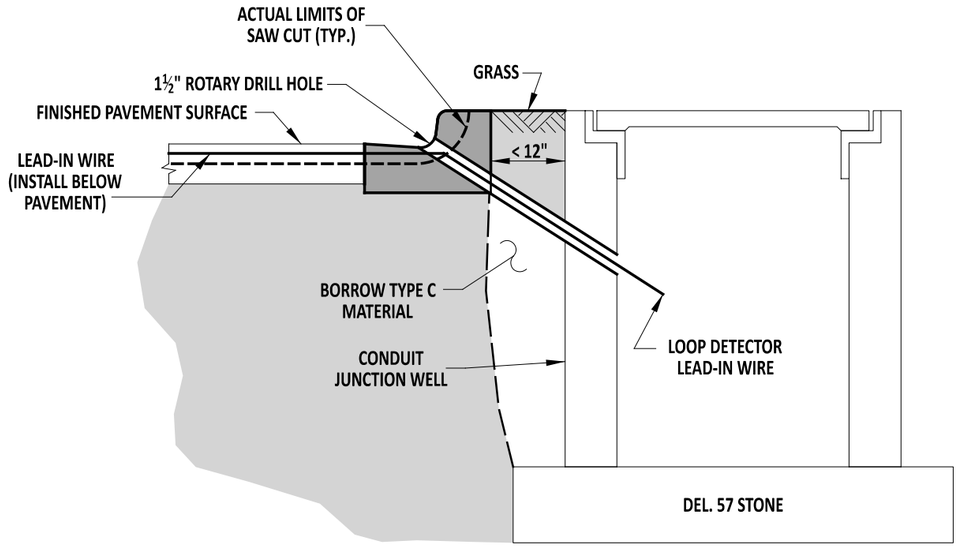
SCALE : NTS

# T-7 DETAIL REMOVED IN 2020 REVISIONS
# LEFT BLANK FOR FUTURE

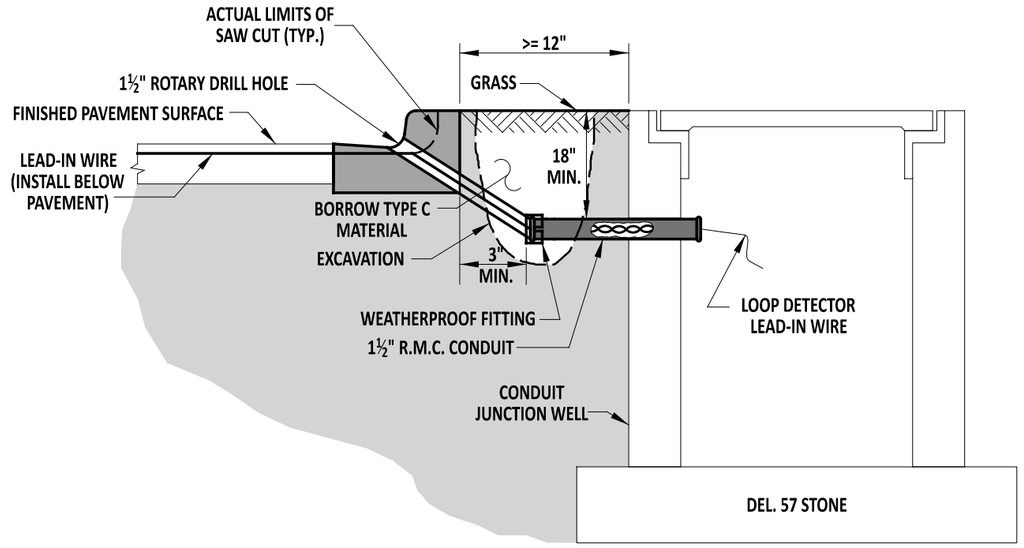
| | | | |
|---|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | - | | APPROVED _____ CHIEF ENGINEER _____ DATE |
| | STANDARD NO. T-7 | SHT. 1 OF 2 | RECOMMENDED _____ DESIGN ENGINEER _____ DATE |

7/20/2020

SCALE : NTS




**LOOP DETECTOR LEAD-IN WIRE INSTALLATION**




**LOOP DETECTOR LEAD-IN WIRE INSTALLATION**

NOTES:

1). ALL SAWCUTS SHALL BE A DEPTH OF 3½" ON ALL SURFACES.
2). CONTRACTOR SHALL INSTALL LEAD-IN WIRE IN THE MOST DIRECT ROUTE TO THE JUNCTION WELL USING THE CLOSEST CONCRETE CURB JOINT.
3). ALL SAWCUTS SHALL BE PATCHED WITH NON-SHRINK CONCRETE CAULK.
4). CONTRACTOR SHALL CORE AT FULL DEPTH OF SAWCUT, 3 ½".
5). CONTRACTOR SHALL INSTALL DETECTABLE WARNING TAPE IN TRENCH FOR LEAD-IN CONDUIT.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

LOOP DETECTOR LEAD-IN WIRE INSTALLATION - JUNCTION WELL BEHIND CURB OR CURB AND GUTTER WITH GRASS STRIP

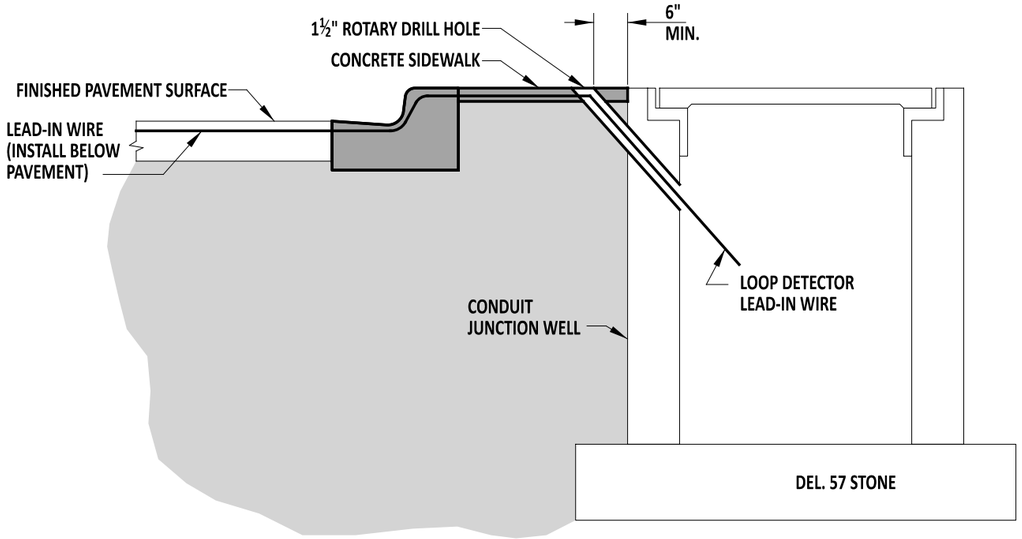
STANDARD NO. T-8 (2020) | SHT. 1 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

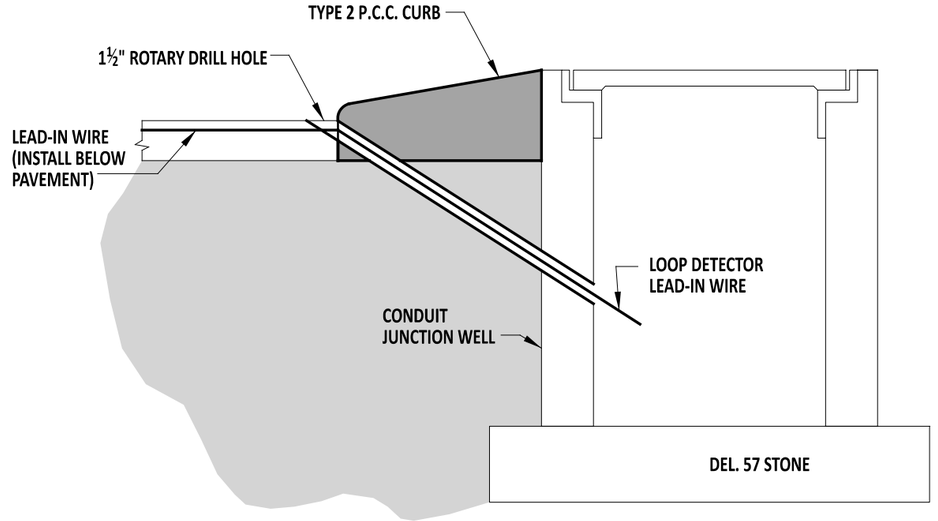
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/21/2020

SCALE : NTS




**LOOP DETECTOR**
**LEAD-IN WIRE INSTALLATION**




**LOOP DETECTOR**
**LEAD-IN WIRE INSTALLATION**

**NOTES:**

1). ALL SAWCUTS SHALL BE A DEPTH OF 3½" ON ALL SURFACES.
2). CONTRACTOR SHALL INSTALL LEAD-IN WIRE IN THE MOST DIRECT ROUTE TO THE JUNCTION WELL USING THE CLOSEST CONCRETE CURB JOINT.
3). ALL SAWCUTS SHALL BE PATCHED WITH NON-SHRINK CONCRETE CAULK.
4). CONTRACTOR SHALL CORE AT FULL DEPTH OF SAWCUT, 3½".

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

LOOP DETECTOR LEAD-IN WIRE INSTALLATION - JUNCTION WELL BEHIND CURB OR CURB AND GUTTER WITH OR WITHOUT SIDEWALK

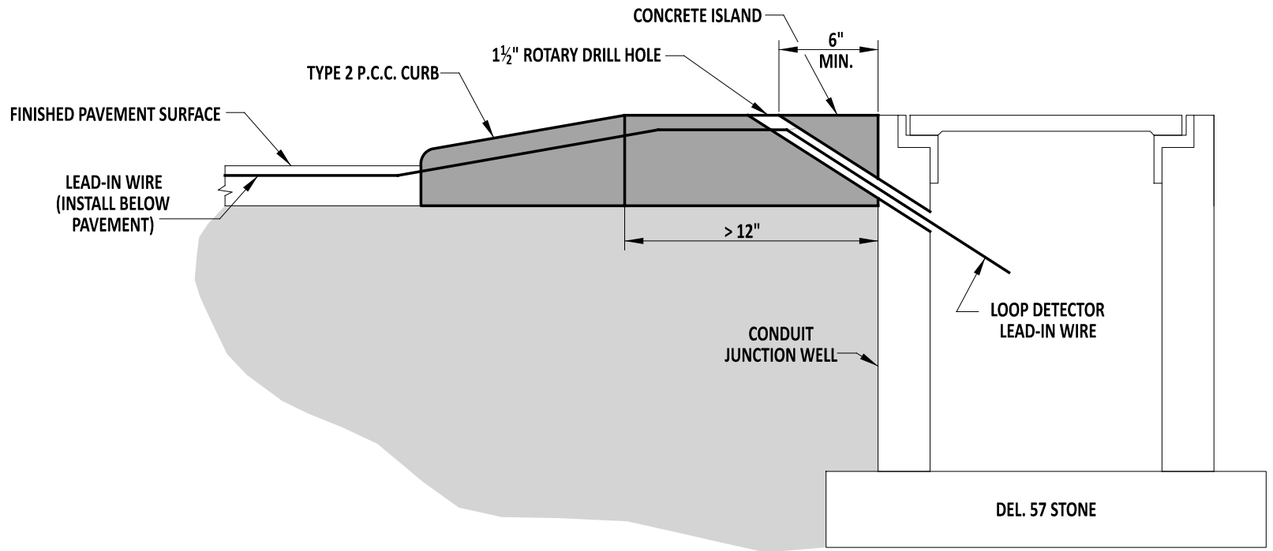
STANDARD NO. T-8 (2020) | SHT. 2 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/21/2020

SCALE : NTS




## LOOP DETECTOR
## LEAD-IN WIRE INSTALLATION

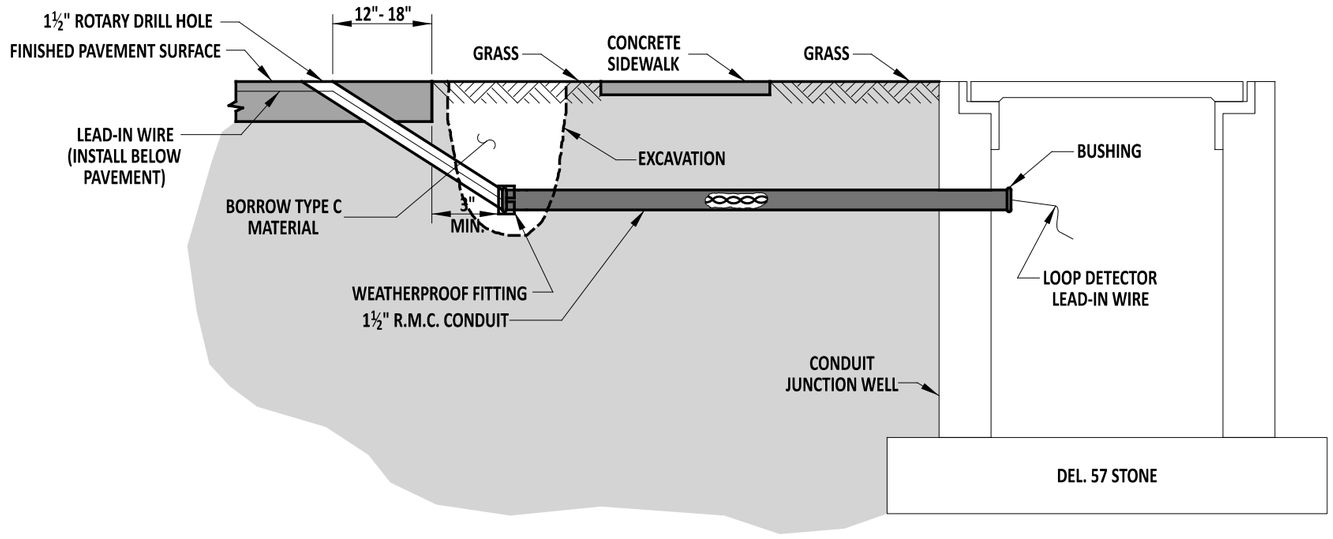
**NOTES:**

1). ALL SAWCUTS SHALL BE A DEPTH OF 3½" ON ALL SURFACES.
2). CONTRACTOR SHALL INSTALL LEAD-IN WIRE IN THE MOST DIRECT ROUTE TO THE JUNCTION WELL USING THE CLOSEST CONCRETE CURB JOINT.
3). ALL SAWCUTS SHALL BE PATCHED WITH NON-SHRINK CONCRETE CAULK.
4). CONTRACTOR SHALL CORE AT FULL DEPTH OF SAWCUT, 3 ½".

| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | LOOP DETECTOR LEAD-IN WIRE INSTALLATION - JUNCTION WELL IN CONCRETE ISLAND<br>STANDARD NO. T-8 (2020) SHT. 3 OF 4 | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE<br>APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/21/2020

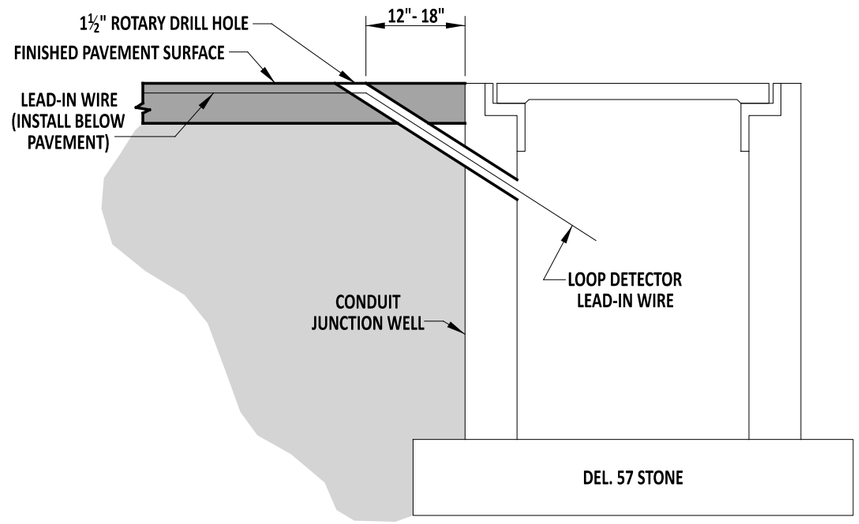
SCALE : NTS




**LOOP DETECTOR LEAD-IN WIRE INSTALLATION**

**NOTES:**

1). ALL SAWCUTS SHALL BE A DEPTH OF 3½" ON ALL SURFACES.
2). CONTRACTOR SHALL INSTALL LEAD-IN WIRE IN THE MOST DIRECT ROUTE TO THE JUNCTION WELL USING THE CLOSEST CONCRETE CURB JOINT.
3). ALL SAWCUTS SHALL BE SEALED WITH AN APPROVED LOOP DETECTOR SEALANT.
4). CONTRACTOR SHALL CORE AT FULL DEPTH OF SAWCUT, 3 ½".
5). CONTRACTOR SHALL INSTALL DETECTABLE WARNING TAPE IN TRENCH FOR LEAD-IN CONDUIT.

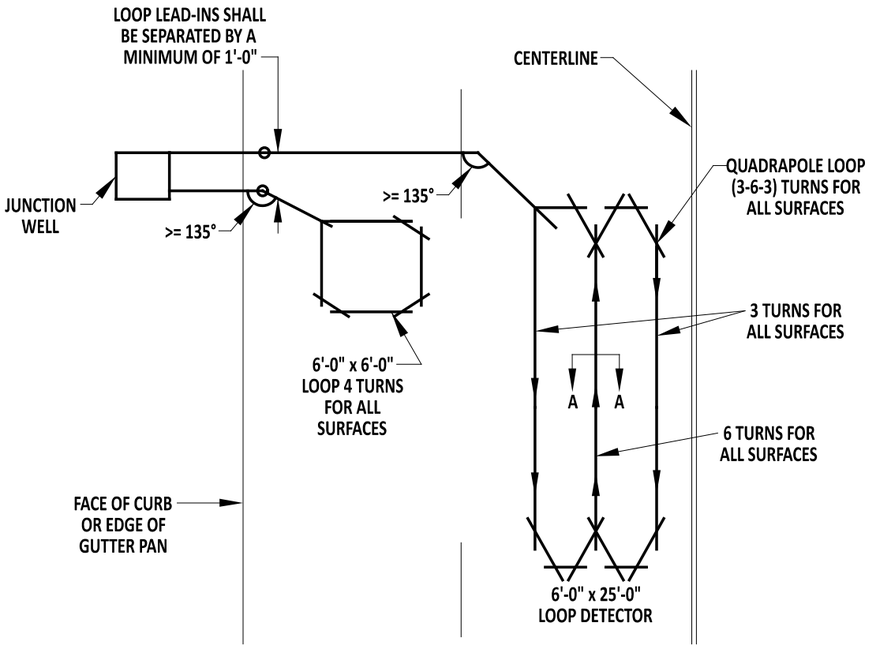



**LOOP DETECTOR LEAD-IN WIRE INSTALLATION**

| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | LOOP DETECTOR LEAD-IN WIRE INSTALLATION - JUNCTION WELL WITH SIDEWALK AND GRASS STRIPS AND DIRECTLY ADJACENT TO PAVED SURFACE | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. T-8 (2020) SHT. 4 OF 4 | APPROVED CHIEF ENGINEER 09/01/2020 DATE |

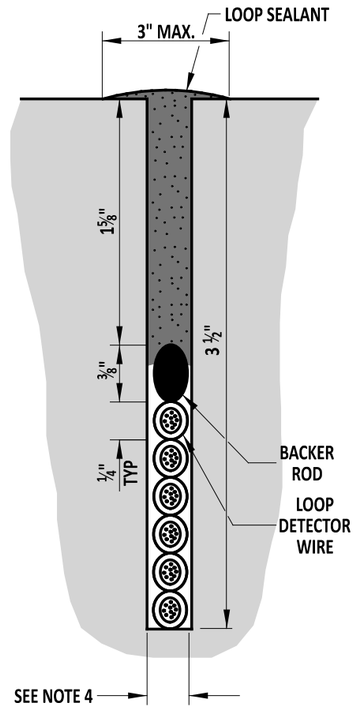
08/21/2020

SCALE : NTS

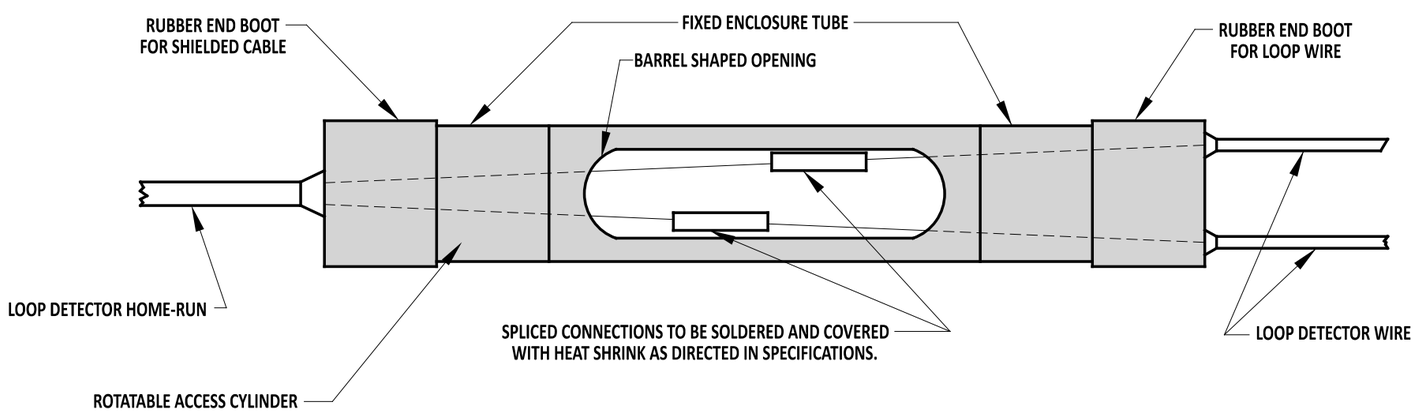



## LOOP DETECTOR SAWCUT TYPICAL

REFER TO DETAIL T-8, SHEETS 1 THROUGH 4 FOR LOOP DETECTOR LEAD-IN INSTALLATION REQUIREMENTS.




## SECTION A-A
## HOT-MIX SURFACE




**NOTES:**

1). WHEN A PROPOSED LOOP DETECTOR SAWCUT CROSSES A LATERAL ROADWAY JOINT OR OTHER OBSTRUCTION (VALVE COVER, MANHOLE, JUNCTION WELL, ETC.), LOOP DETECTOR INSTALLATION SHALL BE MODIFIED INTO TWO SEPARATE LOOP DETECTORS WHICH SHALL NOT TRAVERSE JOINTS OR OBSTRUCTION.
2). THE LOOPS SHALL BE PLACED IN THE CENTER OF THE LANE UNLESS NOTED OTHERWISE ON PLANS.
3). PRESENCE LOOP DETECTORS ARE TO BE PLACED 12" BEHIND THE EXISTING OR PROPOSED STOP LINE.
4). LOOP DETECTOR AND LEAD-IN SAWCUTS SHALL BE ⅝" WIDE.
5). DURING MULTIPLE LOOP INSTALLATIONS, ALL LOOP LEAD-INS TO THE JUNCTION WELL SHALL OFFSET 12" FROM EACH OTHER.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

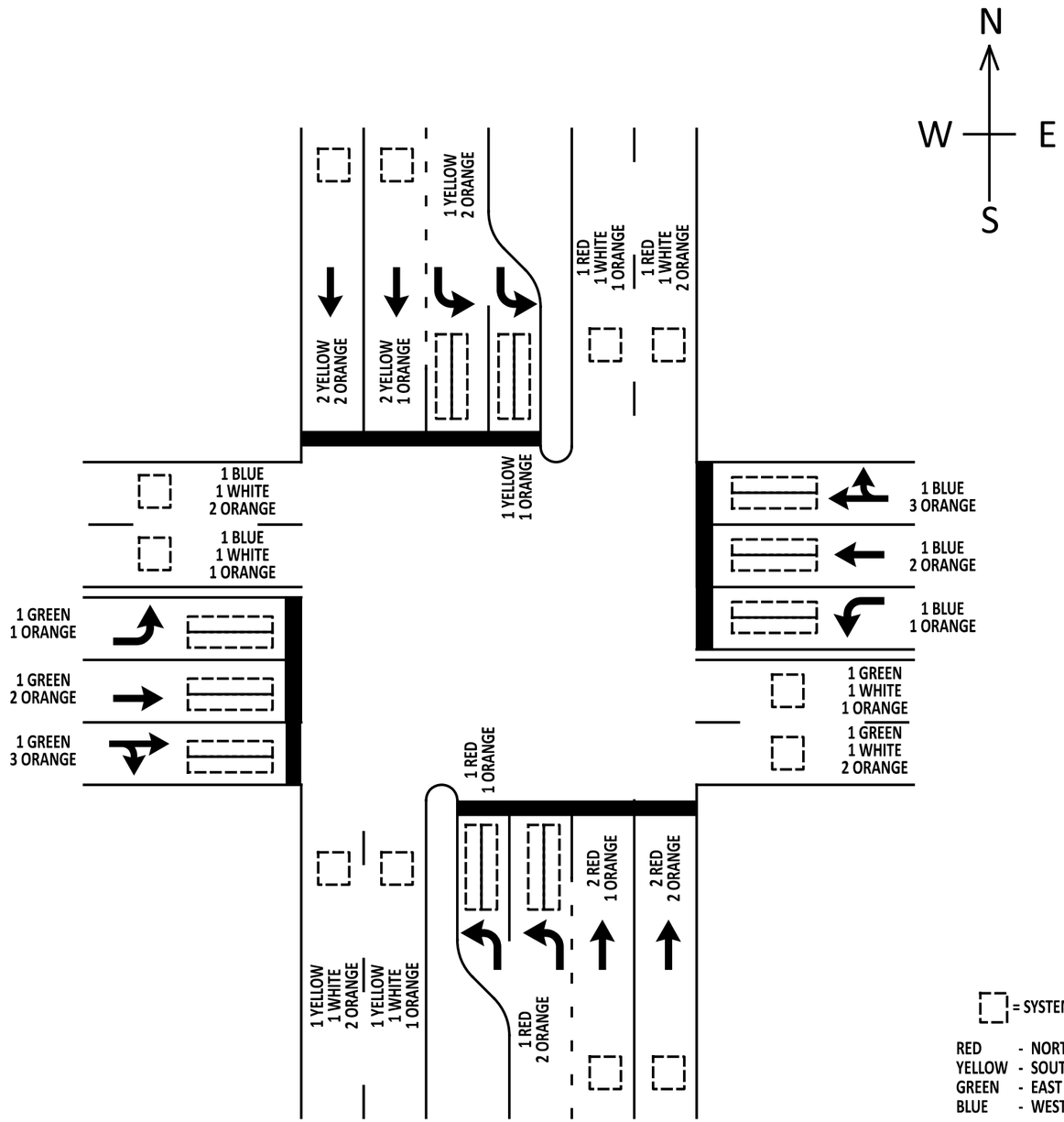
WIRING INSTALLATION TYPICALS - LOOP DETECTOR SAWCUT TYPICAL, HOT-MIX SURFACE TYPICAL SECTION, AND SPLICE KIT

STANDARD NO. T-9 (2020) | SHT. 1 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/21/2020

SCALE : NTS




NOTES

1). ORANGE BANDS SHALL DESIGNATE THE LANE ASSIGNMENT. ALL LANES SHALL BE DESIGNATED FROM LEFT TO RIGHT IN THE DIRECTION OF TRAVEL. EXAMPLE: FOR A DOUBLE LEFT TURN WITH 2 THRU LANES FOR NORTHBOUND, THE CABLES WILL BE IDENTIFIED AS 1-RED W/ 1-ORANGE (LT LANE 1) 1-RED W/ 2-ORANGE (LT LANE 2), 2-RED W/ 1-ORANGE (THRU LANE 1) AND 2-RED W/ 2-ORANGE (THRU LANE 2). THIS CODE IS THEN FOLLOWED FOR THE REMAINING APPROACHES TO THE INTERSECTION.

DelDOT

09/01/2020
ENGINEERING SUPPORT DATE
RECOMMENDED

WIRING INSTALLATION TYPICALS - TYPICAL INTERSECTION LAYOUT

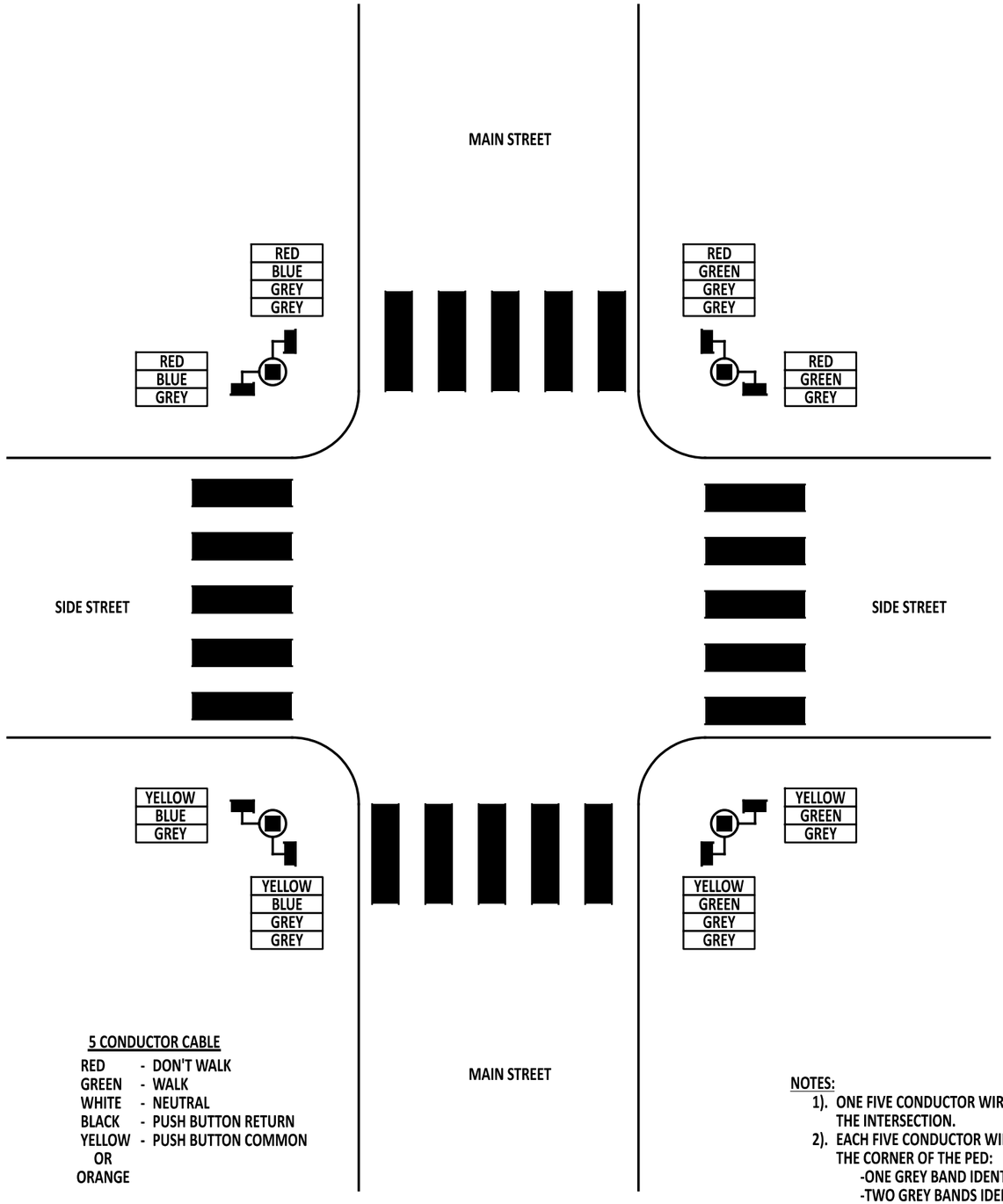
STANDARD NO. T-9 (2020) | SHT. 2 OF 4

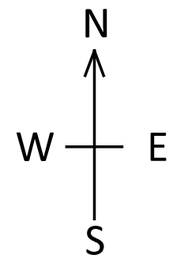
REVIEWED
DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE

APPROVED
CHIEF ENGINEER 09/01/2020 DATE

08/21/2020

SCALE : NTS




RED - NORTH
YELLOW - SOUTH
GREEN - EAST
BLUE - WEST

**5 CONDUCTOR CABLE**

RED - DON'T WALK
GREEN - WALK
WHITE - NEUTRAL
BLACK - PUSH BUTTON RETURN
YELLOW OR ORANGE - PUSH BUTTON COMMON

**NOTES:**

1). ONE FIVE CONDUCTOR WIRE WILL BE PULLED TO EACH PED MODULE OF THE INTERSECTION.
2). EACH FIVE CONDUCTOR WIRE WILL HAVE COLOR BANDS INDICATING THE CORNER OF THE PED:
-ONE GREY BAND IDENTIFYING MAIN STREET
-TWO GREY BANDS IDENTIFYING SIDE STREET.

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

WIRING INSTALLATION TYPICALS -
PEDESTRIAN CROSSING TYPICAL LAYOUT

STANDARD NO. T-9 (2020) | SHT. 3 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/21/2020

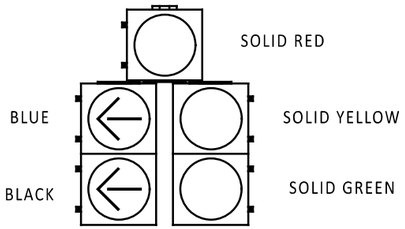
## WIRING COLOR CODE FOR #14/16 SIGNAL CABLE FOR SIGNAL HEADS

| MAIN STREET SIGNALS | WIRE COLORS | SIGNAL INDICATION |
|---|---|---|
| | SOLID RED | RED |
| | SOLID ORANGE | YELLOW |
| | SOLID GREEN | GREEN |
| | SOLID WHITE | GROUND |

| SIDE STREET SIGNALS | WIRE COLORS | SIGNAL INDICATION |
|---|---|---|
| | BLACK TRACER/RED | RED |
| | BLACK TRACER/ORANGE | YELLOW |
| | BLACK TRACER/GREEN | GREEN |
| | BLACK TRACER/WHITE | GROUND |

| NON-PERMISSIVE LEFT TURN SIGNALS | MAIN STREET WIRE COLORS | SIDE STREET WIRE COLORS | SIGNAL INDICATION |
|---|---|---|---|
| | WHITE TRACER/RED | BLACK/RED TRACER | RED |
| | WHITE TRACER/ORANGE | SOLID BLACK | YELLOW |
| | WHITE TRACER/GREEN | SOLID BLUE | GREEN |
| | WHITE TRACER/BLUE | BLUE/BLACK TRACER | GROUND |

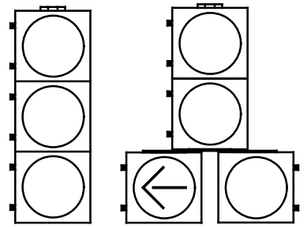
| 5-SECTION SIGNAL ARROWS | MAIN STREET WIRE COLORS | SIDE STREET WIRE COLORS | SIGNAL INDICATION |
|---|---|---|---|
| | SOLID BLUE | BLACK/RED TRACER | YELLOW ARROW |
| | SOLID BLACK | BLUE/BLACK TRACER | GREEN ARROW |



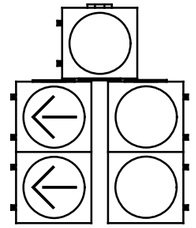

## WIRING COLOR CODE FOR #14/9 TCC

**MAST ARM:**

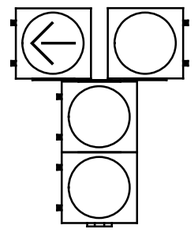
| MAIN STREET | WIRE COLORS | SIGNAL INDICATION |
|---|---|---|
| | SOLID RED | RED |
| | SOLID ORANGE | YELLOW |
| | SOLID GREEN | GREEN |
| | SOLID WHITE | GROUND |

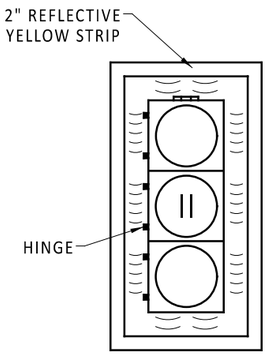


| MAIN STREET PERMISSIVE LEFT | WIRE COLORS | SIGNAL INDICATION |
|---|---|---|
| | SOLID BLACK | YELLOW |
| | SOLID BLUE | GREEN |
| | SOLID WHITE | NEUTRAL |

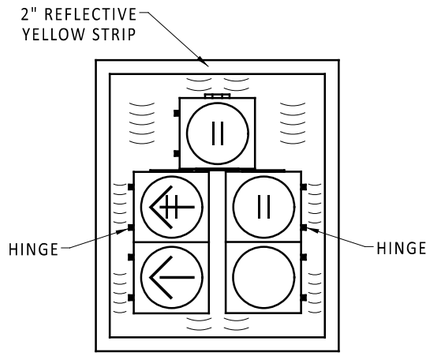


| MAIN STREET FLASHING TOP "T" | WIRE COLORS | SIGNAL INDICATION |
|---|---|---|
| | BLACK/RED TRACER | RED |
| | SOLID WHITE | NEUTRAL |

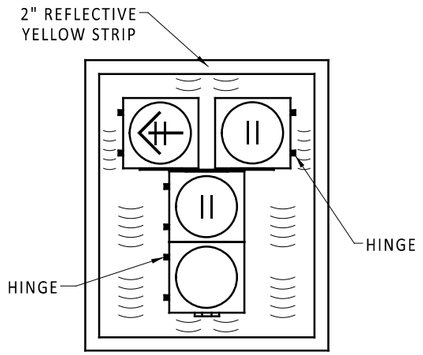





**ONE-WAY THREE - SECTION 12" SIGNAL HEADS**




**ONE-WAY, FIVE-SECTION 12" SIGNAL HEADS**




**ONE-WAY FOUR - SECTION 12" SIGNAL HEADS**

### NOTES

1). HEAD CABLE SHALL BE MARKED WITH THE COLOR DESIGNATED FOR EACH DIRECTION OF TRAVEL. RED/NORTH, YELLOW/ SOUTH, GREEN/EAST, BLUE/WEST.
2). SIDE STREET SIGNAL HEADS SHALL BE SPLICED INTO THE BLACK TRACER WIRES INSTEAD OF SOLID COLOR WIRES.
3). ALL SIGNAL HEADS INSTALLED ON MAST ARMS SHALL HAVE OWN SIGNAL CABLE AND SHALL BE SPLICED AT THE BASE.
4). ALL BOLTS SHALL BE STAINLESS STEEL.
5). ALL BACKPLATES SHALL BE POWDER-COATED ALUMINUM.
6). ALL BACKPLATES SHALL BE OUTLINED WITH A 2" REFLECTIVE YELLOW STRIP.

**LEGEND:**

|| LOCATION OF TERMINAL BLOCK

SCALE : NTS

DelDOT

ENGINEERING SUPPORT — DATE 09/01/2020

RECOMMENDED

WIRING INSTALLATION TYPICALS - WIRING COLOR CODES

STANDARD NO. T-9 (2020) | SHT. 4 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/21/2020

SCALE : NTS

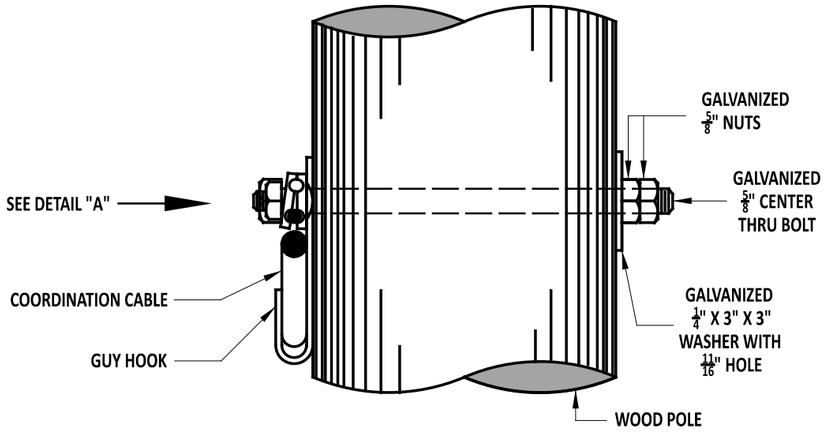
# T-10 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

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|---|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT _____ DATE _____ RECOMMENDED | - | | REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE |
| | | STANDARD NO. T-10 (2020) | SHT. 1 OF 1 | APPROVED _____ CHIEF ENGINEER _____ DATE |

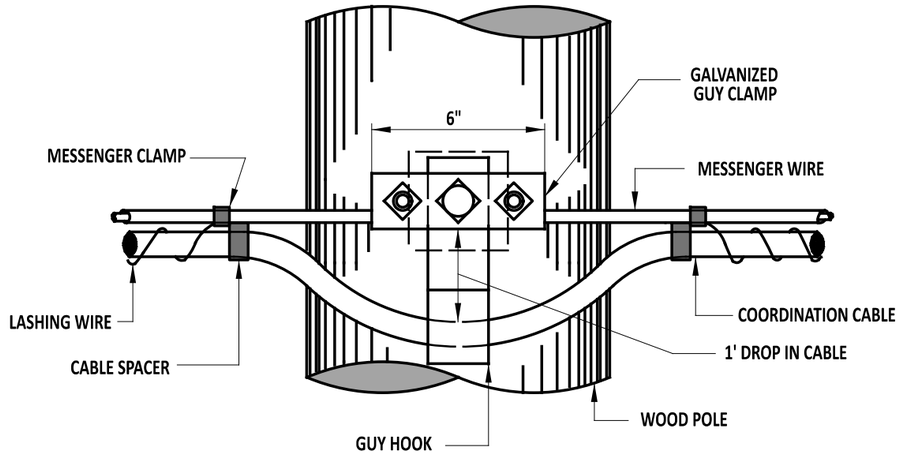
08/21/2020

SCALE : NTS

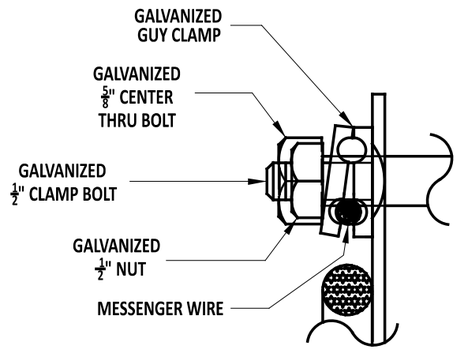
## INTERMEDIATE



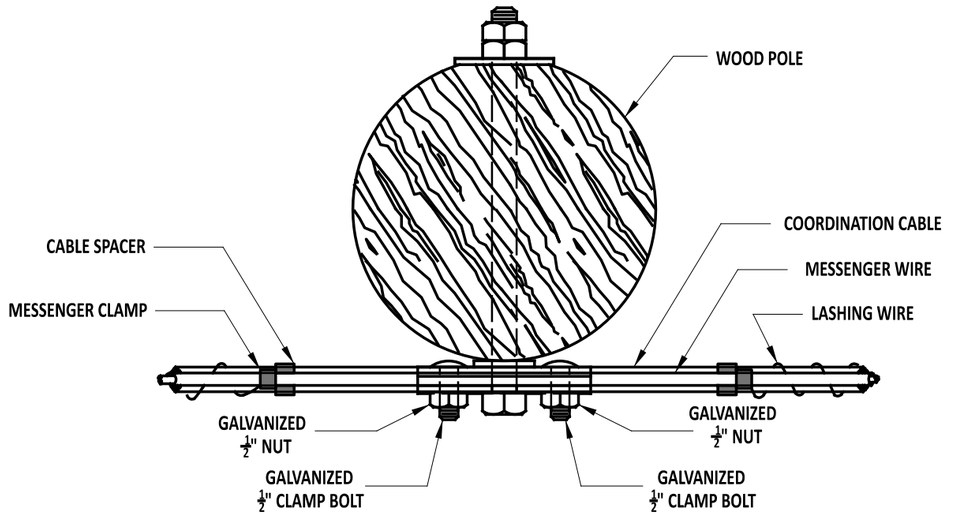

SIDE VIEW




FRONT VIEW




DETAIL "A"




TOP VIEW

DelDOT

09/01/2020
ENGINEERING SUPPORT DATE
RECOMMENDED

MESSENGER WIRE ATTACHMENT -
INTERMEDIATE MESSENGER WIRE ATTACHMENT ON WOOD POLES

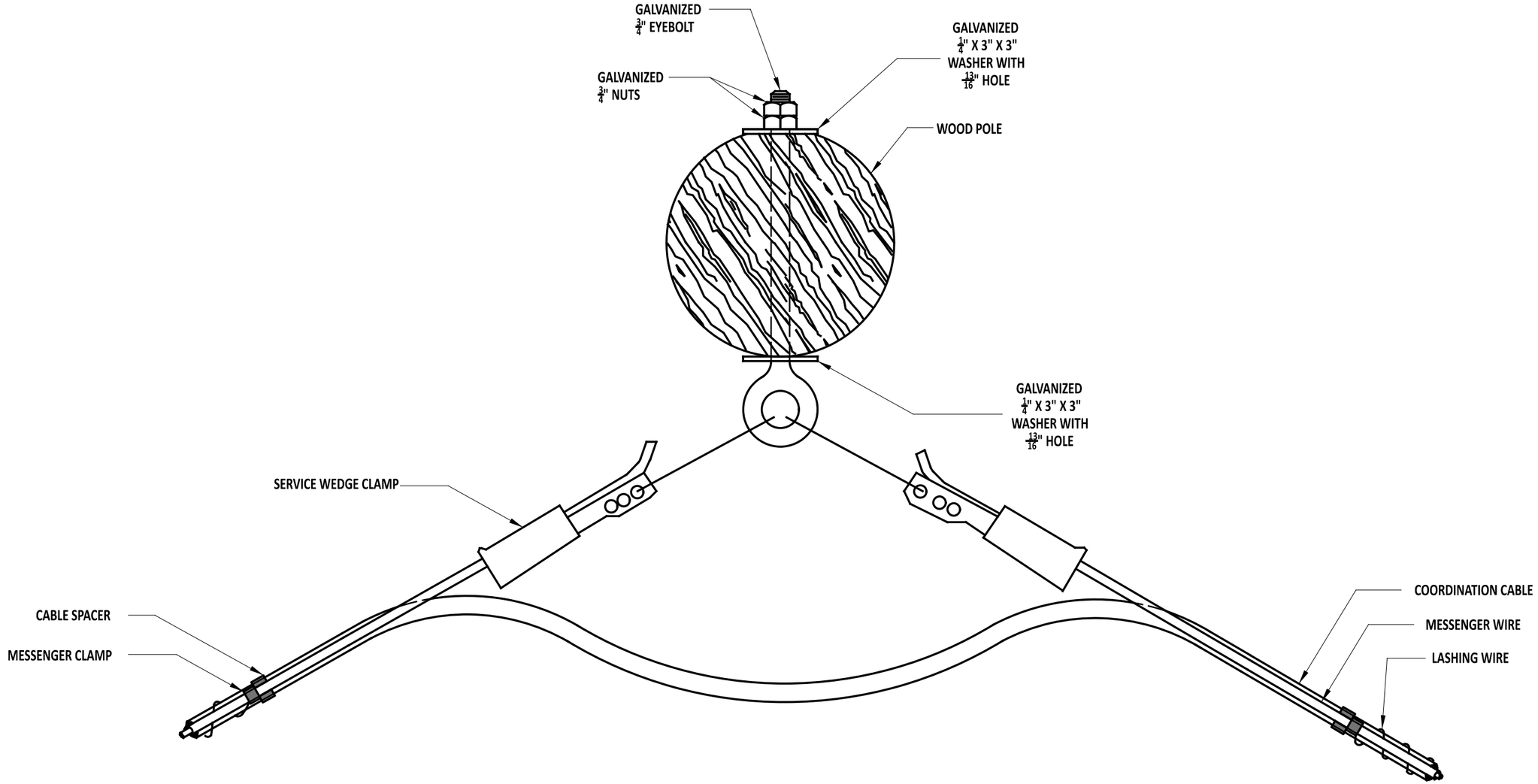
STANDARD NO. T-11 (2020) SHT. 1 OF 2

REVIEWED
DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE

APPROVED
CHIEF ENGINEER 09/01/2020 DATE

08/21/2020

SCALE : NTS

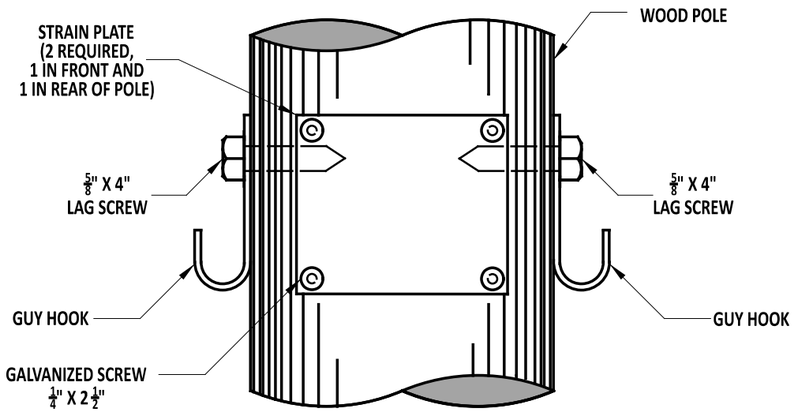



**TOP VIEW**

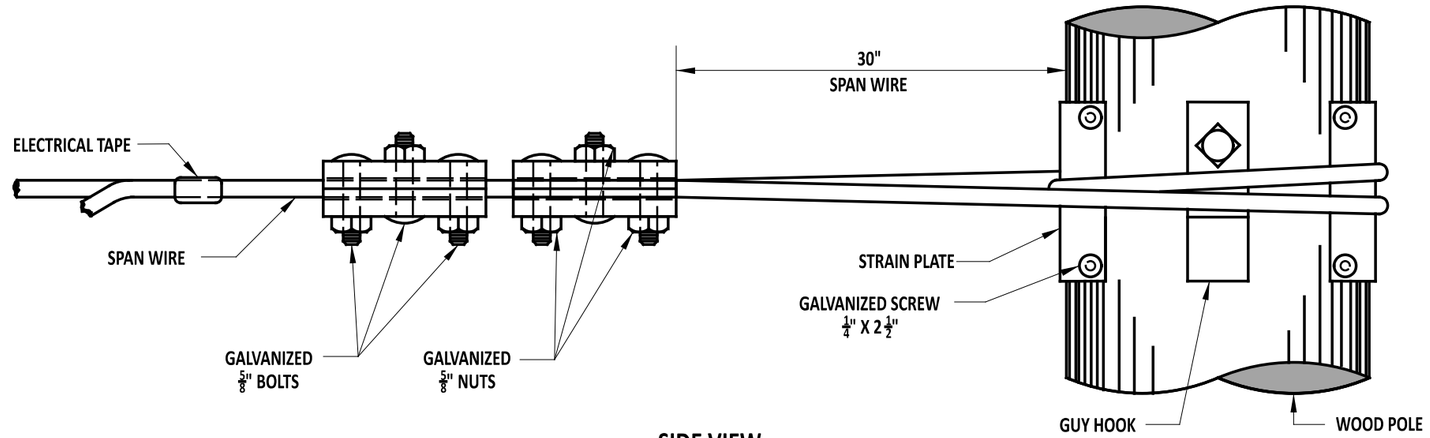
| | | | | |
|---|---|---|---|---|
| DelDOT | 09/01/2020 ENGINEERING SUPPORT DATE<br>RECOMMENDED | MESSENGER WIRE ATTACHMENT -<br>ANGULAR INTERMEDIATE MESSENGER WIRE ATTACHMENT | REVIEWED | DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. T-11 (2020) SHT. 2 OF 2 | APPROVED | CHIEF ENGINEER 09/01/2020 DATE |

08/21/2020

SCALE : NTS




**FRONT VIEW**
(SPAN WIRE NOT SHOWN)




**SIDE VIEW**







**TOP VIEW**

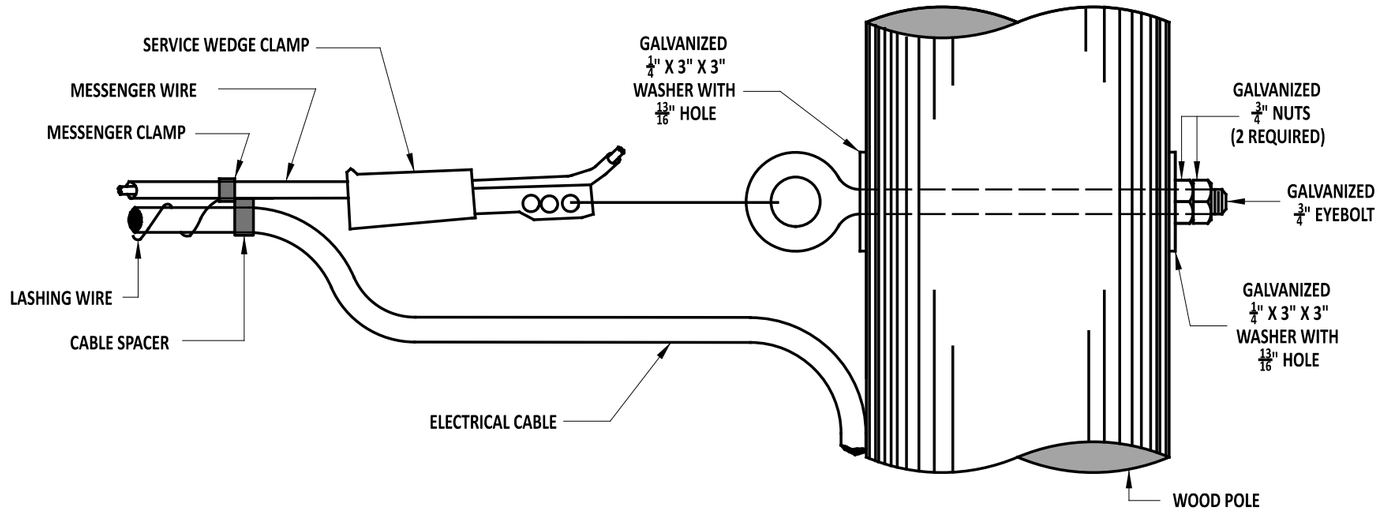
**NOTES**

1). SPAN WIRE ATTACHMENT BETWEEN METAL POLES IS THE SAME AS SHOWN FOR WOOD POLES EXCEPT THAT THE STRAIN PLATES AND GUY HOOKS ARE NOT USED. FOR DETAIL SHEET, SEE T-12 SHEET 2 - "DEAD END MESSENGER WIRE ATTACHMENT, METAL POLES".

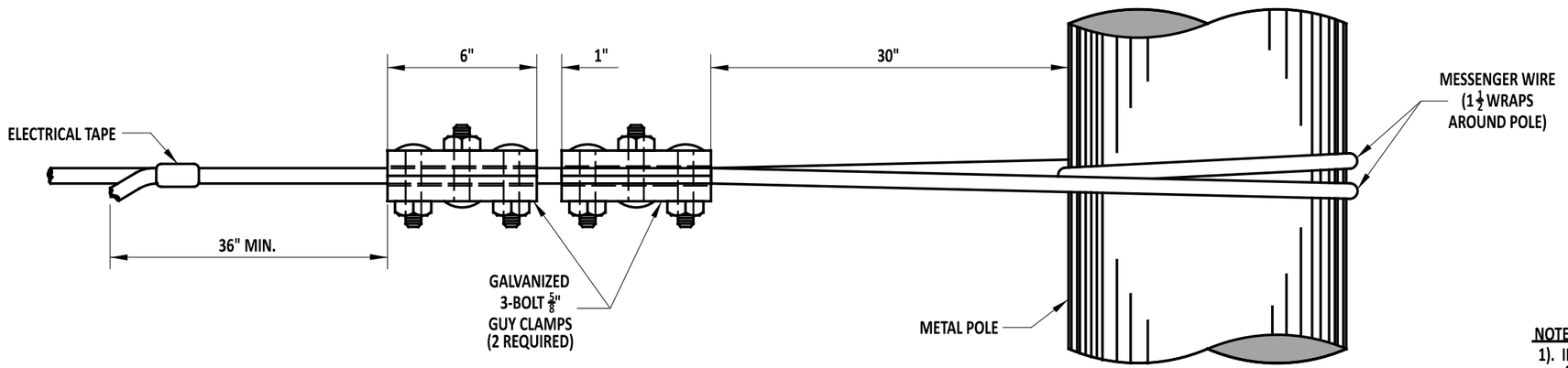
| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | ATTACHMENT BETWEEN POLES | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. T-12 (2020) SHT. 1 OF 3 | APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/21/2020

SCALE : NTS




**WOOD POLES**




**NOTES**

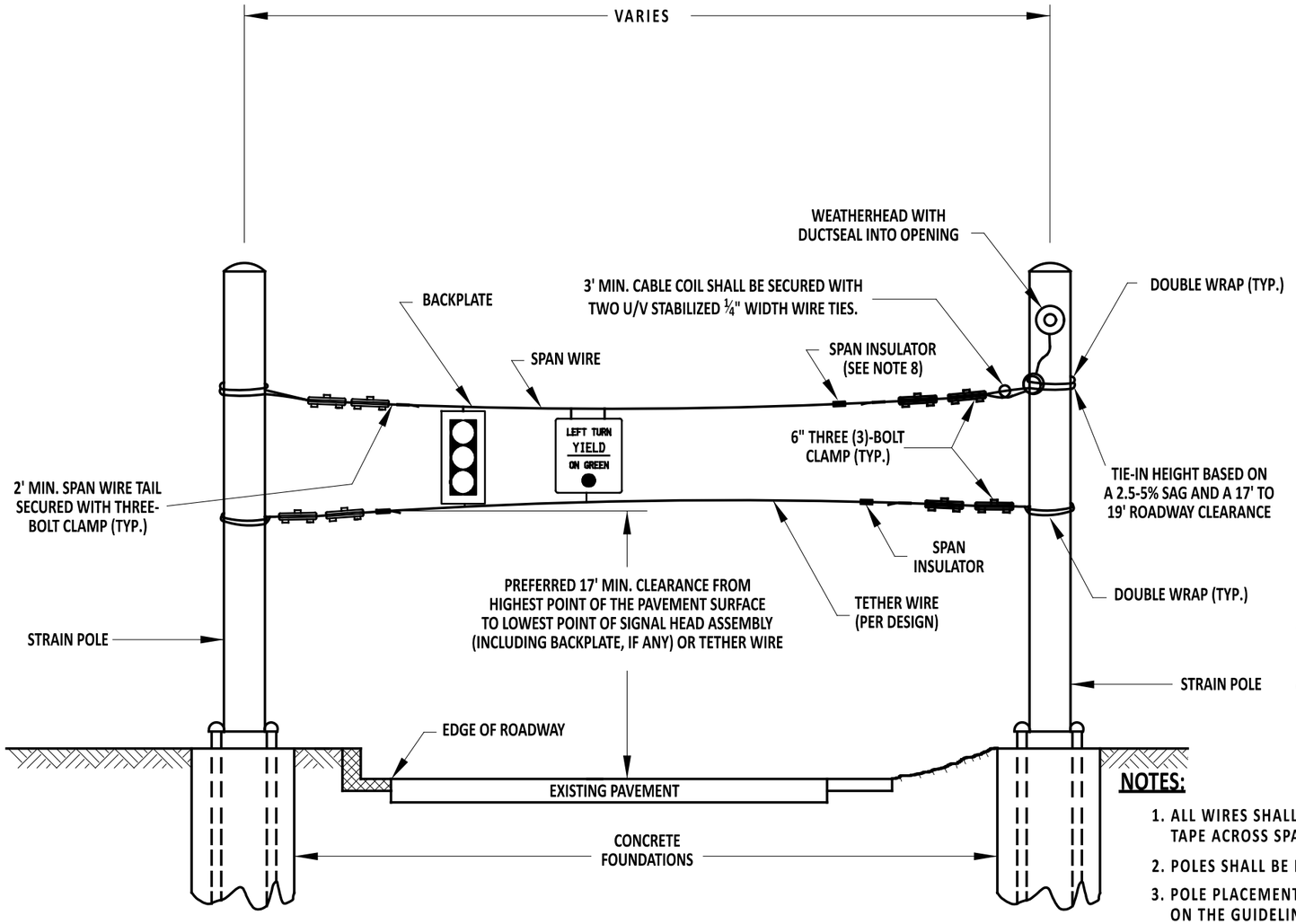
1). INSTALLATION METHOD SHOWN FOR DEAD END MESSENGER WIRE ATTACHMENT TO METAL POLES SHALL BE USED FOR SPAN WIRE ATTACHMENT BETWEEN METAL POLES.

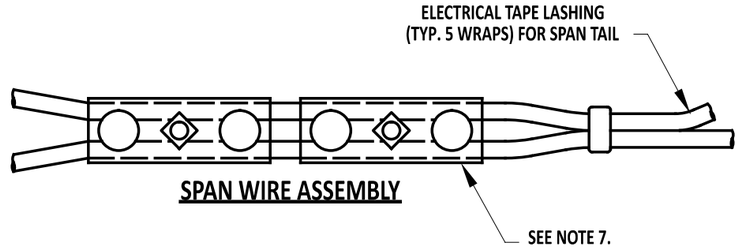
**METAL POLES**

| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | DEAD END MESSENGER WIRE ATTACHMENT<br>STANDARD NO. T-12 (2020) SHT. 2 OF 3 | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE<br>APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/21/2020

SCALE : NTS

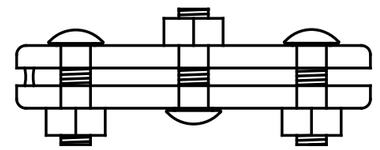



SPAN WIRE ASSEMBLY

## NOTES:

1. ALL WIRES SHALL BE LASHED WITH FIVE (5) WRAP (12" O.C.) ELECTRICAL TAPE ACROSS SPAN WIRE.
2. POLES SHALL BE RAKED AS SPECIFIED BY THE PROJECT ENGINEER.
3. POLE PLACEMENT SHALL BE OUTSIDE OF THE CLEAR ZONE BASED ON THE GUIDELINES OF THE MOST RECENT AASHTO ROADSIDE DESIGN GUIDE.
4. SPAN WIRE SHALL BE PLACED UNDER ALL RISERS.
5. SPAN WIRE SHALL BE 7/16" SEVEN (7)-WIRE GAL. STEEL STRAND. (STRENGTH SHALL BE SIEMENS-MARTIN 6.950 LBS.)
6. TETHER WIRE SHALL BE 1/4" SEVEN (7)-WIRE GAL. STEEL STRAND. (STRENGTH SHALL BE SIEMENS-MARTIN 3.150 LBS.)
7. TWO (2) THREE-BOLT CLAMPS SHALL BE USED FOR EACH END OF THE SPANS.
8. SPAN INSULATOR SHALL BE INSTALLED ON THE SPAN(S) CLOSEST TO THE CABINET, 15-20 FEET FROM THE POLE (OR AS DIRECTED BY THE ENGINEER).
9. REFER TO TRAFFIC DESIGN MANUAL FOR MORE INFORMATION PERTAINING TO VERTICAL CLEARANCE FOR SIGNAL HEADS.



3-BOLT CLAMP

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

SPAN WIRE ASSEMBLY

STANDARD NO. T-12 (2020) | SHT. 3 OF 3

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/21/2020

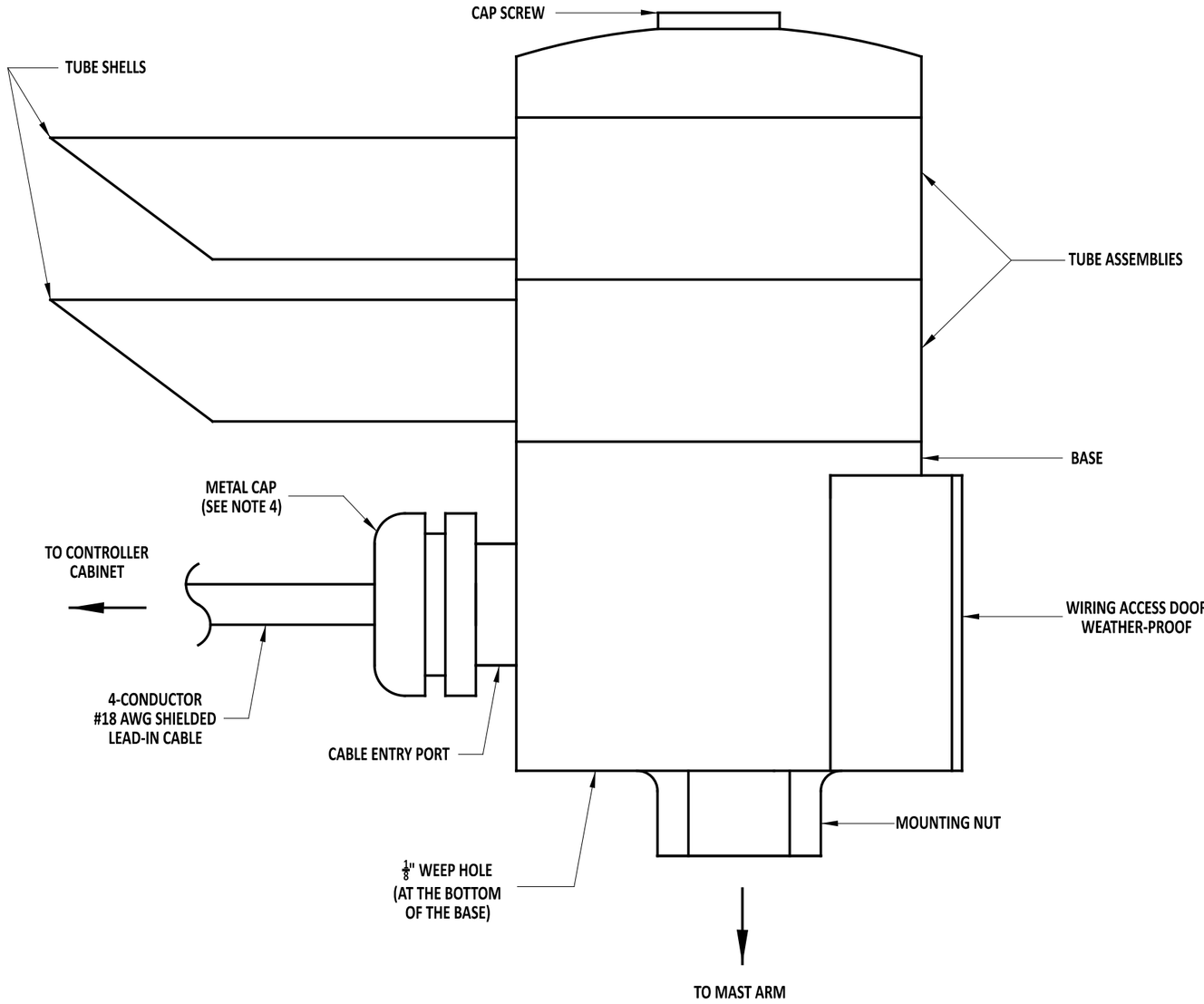
SCALE : NTS

# T-13 DETAIL RESERVED
# LEFT BLANK FOR FUTURE

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| DelDOT | ENGINEERING SUPPORT _____ DATE _____ RECOMMENDED | - | | REVIEWED _____ DEPUTY DIRECTOR - DESIGN _____ DATE |
| | | STANDARD NO. T-13 (2020) | SHT. 1 OF 1 | APPROVED _____ CHIEF ENGINEER _____ DATE |

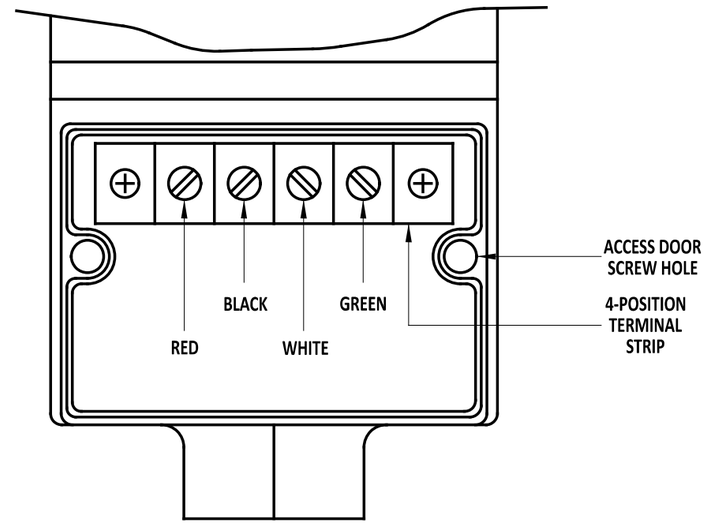
08/21/2020

SCALE : NTS




SIDE VIEW

## CABLE CONNECTIONS TO TERMINAL STRIP




FRONT VIEW
(CABLE IS NOT SHOWN)

NOTES:

1). UPRIGHT CONFIGURATION SHALL BE USED FOR MOUNTING ON MAST ARMS, SIGNAL HEAD FRAMEWORKS AND PEDESTALS.
2). UPRIGHT MOUNTING HARDWARE SHALL BE SUPPLIED BY THE CONTRACTOR.
3). TEFLON TAPE SHALL BE APPLIED TO THREADS BEFORE MOUNTING.
4). ROUTE THE LEAD-IN CABLE THROUGH THE METAL CAP AND THE RUBBER PLUG. REPLACE THE METAL CAP, SEALING THE CABLE ENTRY PORT. TIGHTEN THE METAL CAP SO THE CABLE WILL NOT SLIDE THROUGH THE RUBBER PLUG.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

EMERGENCY PREEMPTION RECEIVER - UPRIGHT MOUNT

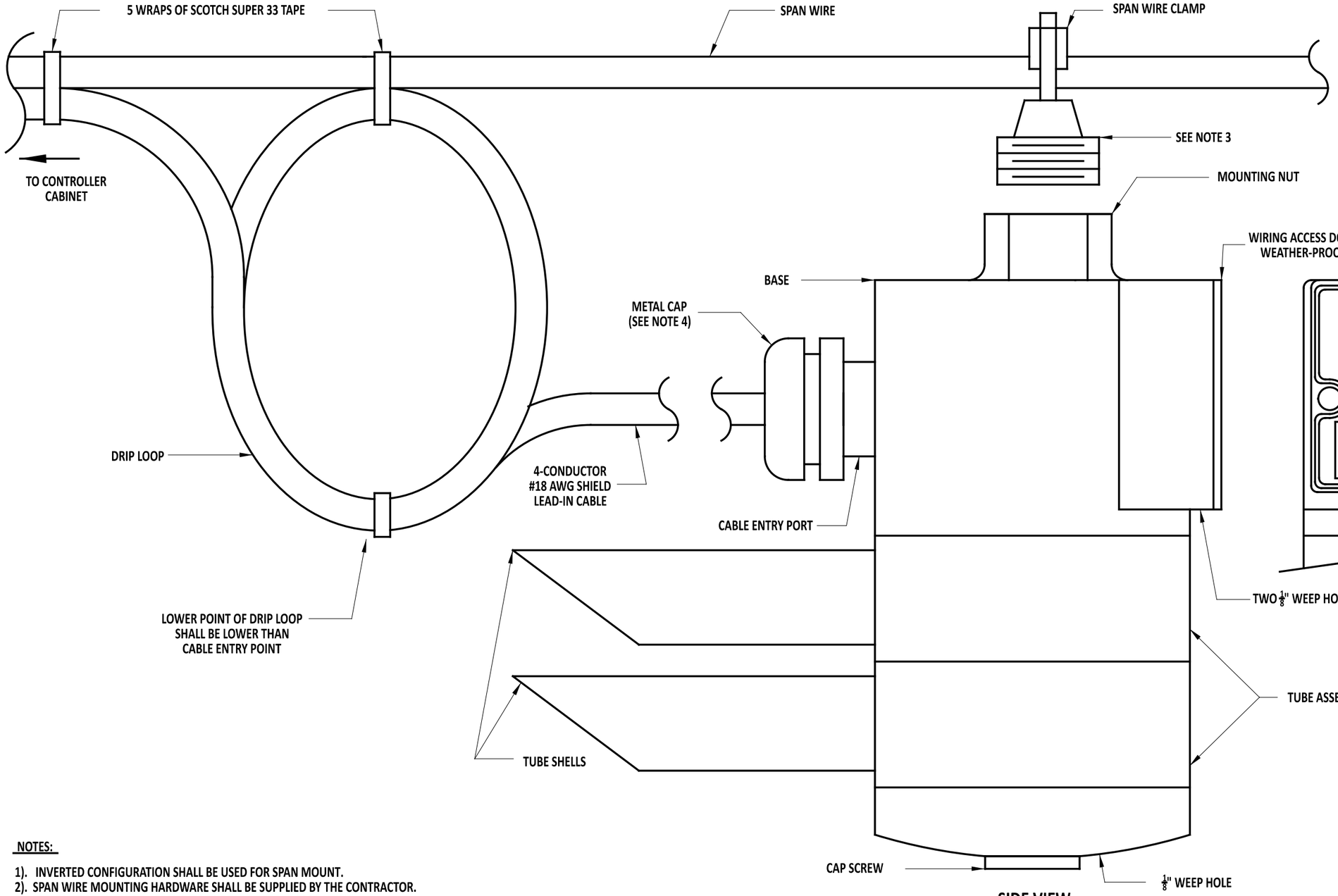
STANDARD NO. T-14 (2020) | SHT. 1 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

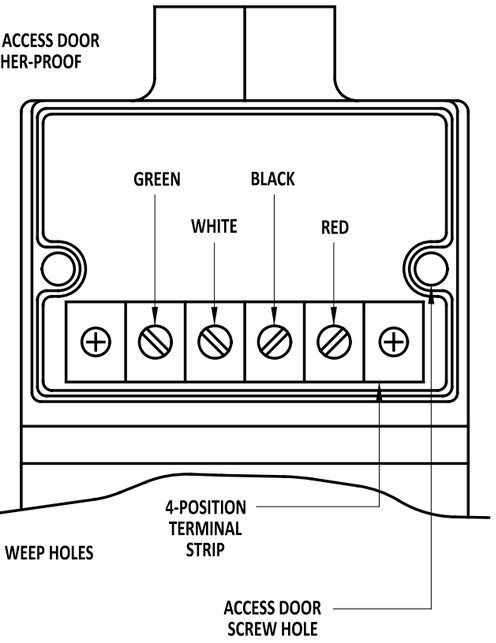
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/21/2020

SCALE : NTS




## CABLE CONNECTIONS TO TERMINAL STRIP




FRONT VIEW
(CABLE IS NOT SHOWN)

NOTES:

1). INVERTED CONFIGURATION SHALL BE USED FOR SPAN MOUNT.
2). SPAN WIRE MOUNTING HARDWARE SHALL BE SUPPLIED BY THE CONTRACTOR.
3). TEFLON TAPE SHALL BE APPLIED TO THREADS BEFORE MOUNTING.
4). ROUTE THE LEAD-IN CABLE THROUGH THE METAL CAP AND THE RUBBER PLUG. REPLACE THE METAL CAP, SEALING THE CABLE ENTRY PORT. TIGHTEN THE METAL CAP SO THE CABLE WILL NOT SLIDE THROUGH THE RUBBER PLUG.

DelDOT

ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

EMERGENCY PREEMPTION RECEIVER - INVERTED MOUNT

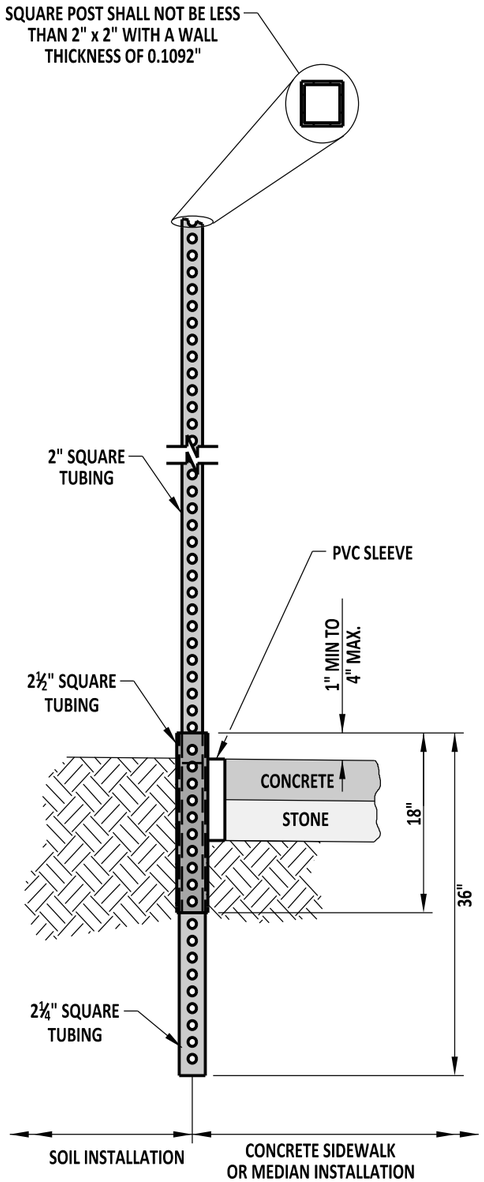
STANDARD NO. T-14 (2020) | SHT. 2 OF 2

REVIEWED
DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

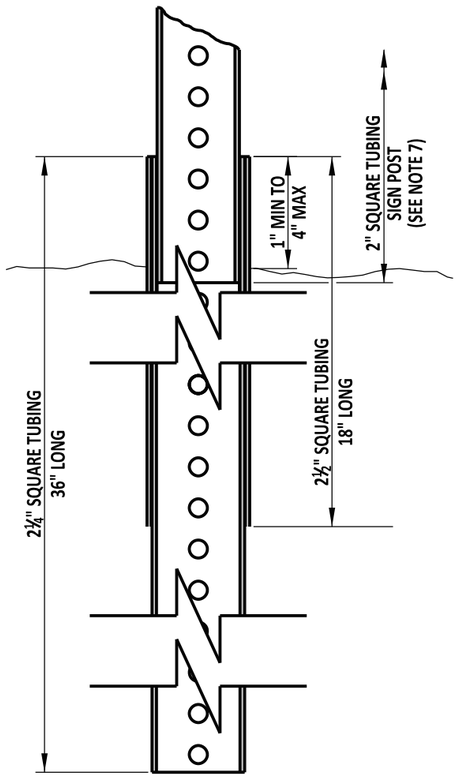
APPROVED
CHIEF ENGINEER — 09/01/2020 DATE

08/21/2020

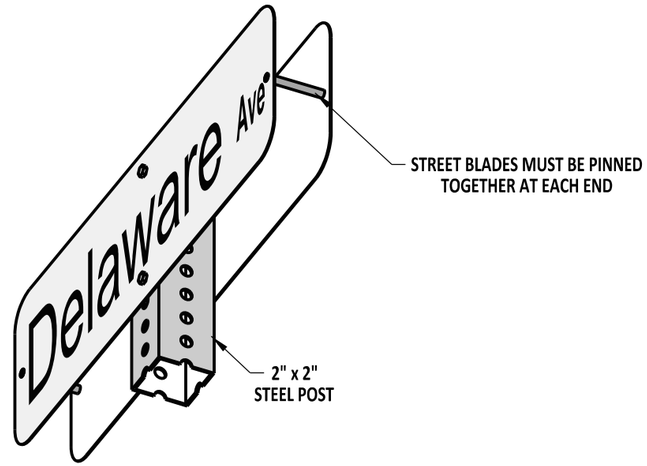
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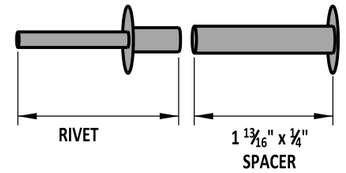

**BREAK-AWAY ASSEMBLY ELEVATION VIEW**




**BREAK-AWAY ASSEMBLY SECTION VIEW**




**TYPICAL ASSEMBLY**




**PIN ASSEMBLY**

NOTE: THE PIN ASSEMBLY IS TO BE USED WITH THE INSTALLATION OF BACK TO BACK STREET BLADE SIGNS WITH 6" LETTERS.

NOTES:

1). SQUARE TUBES ARE TO BE FORMED FROM GALVANIZED SHEET STRUCTURAL (PHYSICAL) QUALITY, ASTM A 446, GRADE A, COATING DESIGNATION G 90, REGULAR SPANGLE, OR HOT ROLLED CARBON SHEET STEEL STRUCTURAL (PHYSICAL) QUALITY, ASTM A 57, GRADE 33.

2). NOMINAL OUTSIDE DIMENSIONS ARE AS FOLLOWS:
   A). 2" x 2" +/- 0.008
   B). 2¼" x 2¼" +/- 0.010
   C). 2½" x 2½" +/- 0.010

3). ALL FOUR SIDES ARE TO HAVE EVENLY SPACED 7/16" DIAMETER HOLES ON 1" CENTERS THE ENTIRE LENGTH OF THE TUBE.

4). STANDARD CORNER RADIUS SHALL BE 5/32".

5). THE FASTENERS TO BE SUPPLIED UNDER THIS SPECIFICATION SHALL BE 5/16", GRADE 5 UNC CORNER BOLTS WITH CADMIUM OR ZINC PLATING. INSTALLATION OF SIGNS SHALL BE WITH 3/8" x 2½" BOLT WITH LOCKNUT AND WASHER.

6). THE CONTRACTOR SHALL PROVIDE AND INSTALL PVC SLEEVES (4" INSIDE DIAMETER MINIMUM, 6" INSIDE DIAMETER MAXIMUM) IN PROPOSED CONCRETE SIDEWALKS, ISLANDS, AND MEDIANS FOR FUTURE TRAFFIC SIGN POSTS AS DIRECTED BY THE ENGINEER. THE LOWER END OF THE SLEEVE SHALL BE SET ON TOP OF THE SOIL.

7). THE SIGN POST SHALL EXTEND A MINIMUM OF 4" INTO THE 2½" SQUARE TUBING.

DELAWARE
DEPARTMENT OF TRANSPORTATION

BREAKWAY SIGN POST AND PIN ASSEMBLY DETAILS

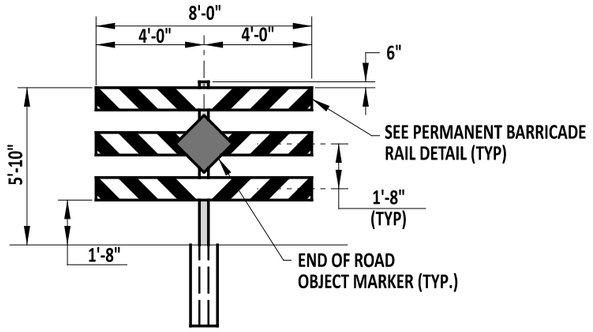
STANDARD NO. T-15 (2013) | SHT. 1 OF 1

APPROVED SIGNATURE ON FILE (CHIEF ENGINEER) 02/14/2014 (DATE)

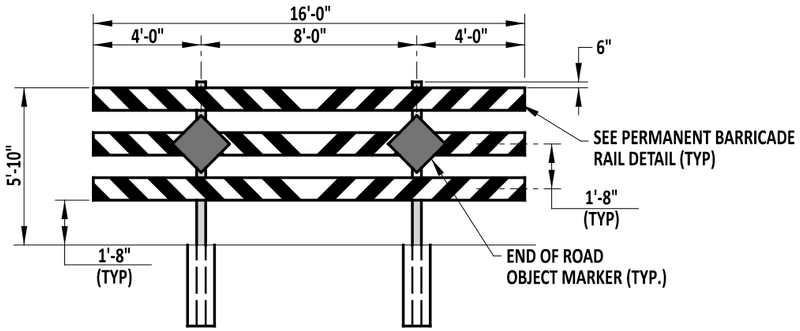
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1/9/2014

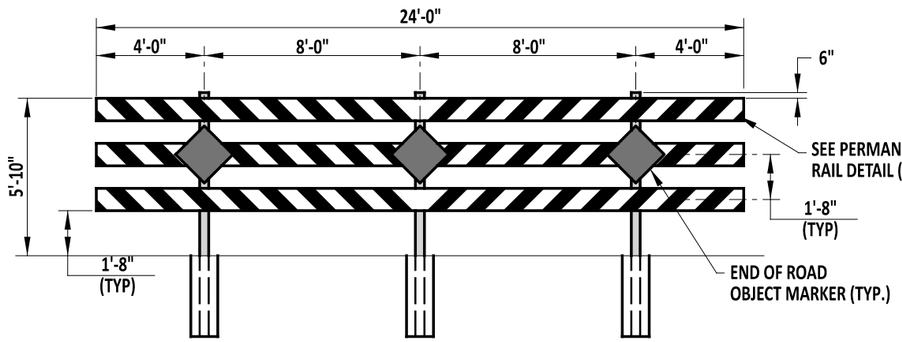
SCALE : NTS



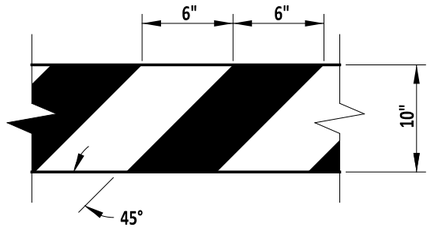

## 1-POST PERMANENT WOOD BARRICADE DETAIL



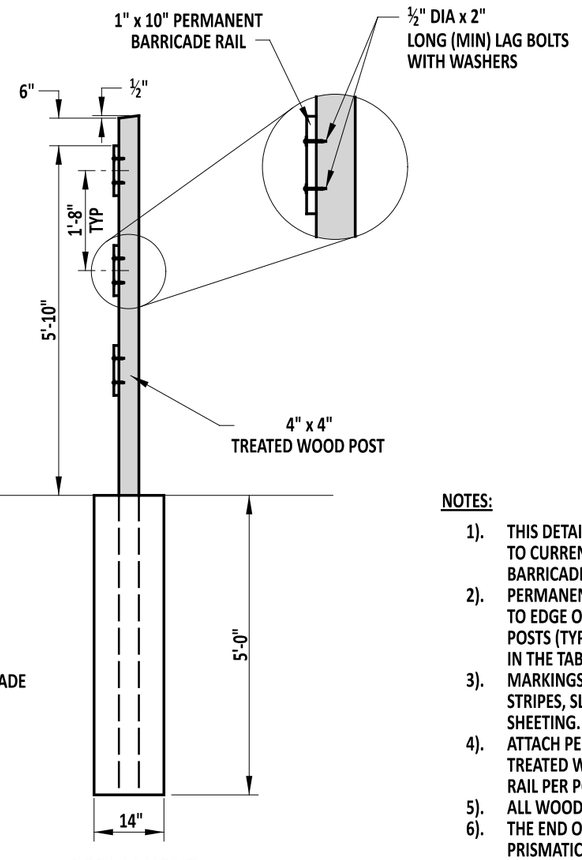

## 2-POST PERMANENT WOOD BARRICADE DETAIL




## 3-POST PERMANENT WOOD BARRICADE DETAIL




## PERMANENT BARRICADE RAIL DETAIL




## PERMANENT BARRICADE POST DETAIL

| PERMANENT WOOD BARRICADE POST CHART | | | |
|---|---|---|---|
| ROADWAY WIDTH | NUMBER OF BARRICADES | TYPE OF POST | OUTSIDE OVERHANG |
| 4'-0" | 1 | 1-POST | 2'-0" |
| 6'-0" | 1 | 1-POST | 3'-0" |
| 8'-0" | 1 | 1-POST | 4'-0" (1.2m) |
| 10'-0" | 1 | 2-POST | 1'-0" |
| 12'-0" | 1 | 2-POST | 2'-0" |
| 14'-0" | 1 | 2-POST | 3'-0" |
| 16'-0" | 1 | 2-POST | 4'-0" |
| 18'-0" | 1 | 3-POST | 1'-0" |
| 20'-0" | 1 | 3-POST | 2'-0" |
| 22'-0" | 1 | 3-POST | 3'-0" |
| 24'-0" | 1 | 3-POST | 4'-0" |
| 26'-0" | 2 | 2-POST | 1'-0" |
| 28'-0" | 2 | 2-POST | 2'-0" |
| 30'-0" | 2 | 2-POST | 3'-0" |
| 32'-0" | 2 | 2-POST | 4'-0" |
| 34'-0" | 2 | 2-POST<br>3-POST | 1'-0" |
| 36'-0" | 2 | 2-POST<br>3-POST | 2'-0" |
| 38'-0" | 2 | 2-POST<br>3-POST | 3'-0" |
| 40'-0" | 2 | 2-POST<br>3-POST | 4'-0" |
| 42'-0" | 2 | 3-POST | 1'-0" |
| 44'-0" | 2 | 3-POST | 2'-0" |
| 46'-0" | 2 | 3-POST | 3'-0" |
| 48'-0" | 2 | 3-POST | 4'-0" |
| 50'-0" | 3 | (2) 2-POST <ENDS><br>(1) 3-POST <CENTER> | 1'-0" |

NOTES:

1). THIS DETAIL IS NOT IS NOT CONSIDERED A BREAKAWAY FEATURE AND HAS NOT BEEN CRASH TESTED TO CURRENT MASH CRASH TESTING STANDARDS. THIS DETAIL SHALL ONLY BE USED FOR PERMANENT BARRICADES PLACED OUTSIDE OF THE CLEAR ZONE OR ON LOW SPEED (<40 MPH) ROADWAYS.

2). PERMANENT BARRICADES SHALL BE PLACED COMPLETELY ACROSS THE ROADWAY FROM EDGE OF ROAD TO EDGE OF ROAD. IF NECESSARY, THE PERMANENT BARRICADE OVERHANG BEYOND THE OUTSIDE POSTS (TYPICALLY 4'-0" (1.2m)) MAY BE REDUCED TO THE "OUTSIDE OVERHANG' VALUE INDICATED IN THE TABLE ABOVE IF OBSTACLES ARE PRESENT BEYOND THE ROADWAY EDGE.

3). MARKINGS FOR PERMANENT BARRICADE RAILS SHALL BE ALTERNATING FLUORESCENT RED AND WHITE STRIPES, SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES, USING PRISMATIC, RETROREFLECTIVE SHEETING. STRIPES SHALL SLOPE DOWNWARD TOWARDS THE CENTER OF THE CLOSURE.

4). ATTACH PERMANENT BARRICADE RAIL AND OBJECT MARKER TO THE 4" (100) x 4" (100) PRESSURE TREATED WOOD POST USING LAG BOLTS (2" (50) LONG, MINIMUM) WITH WASHERS. TWO BOLTS PER RAIL PER POST SHALL BE REQUIRED.

5). ALL WOOD SHALL BE PRESSURE TREATED.

6). THE END OF ROAD OBJECT MARKER (MUTCD CODE OM4-3) SHALL BE 18" (450) x 18" (450) WITH RED PRISMATIC, RETROREFLECTIVE SHEETING.

7). TREATED WOOD POST SHALL BE PLACED IN PRE-DUG HOLE, BACKFILLED USING SUITABLE MATERIAL, AND TAMPERED THOROUGHLY TO PROVIDE A RIGID SUB-SURFACE CONDITION AROUND THE POST.

8). PERMANENT BARRICADE RAILS MAY BE CONSTRUCTED USING PLASTIC OR WOOD AND SHALL NOT BE METAL.

9). LONGER WIDTH CLOSERS CAN BE ACCOMODATED BY VARIOUS COMBINATIONS OF 2-POST AND 3-POST PERMANENT BARRICADES.

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RECOMMENDED

PERMANENT WOOD BARRICADE

STANDARD NO. T-16 (2020) | SHT. 1 OF 1

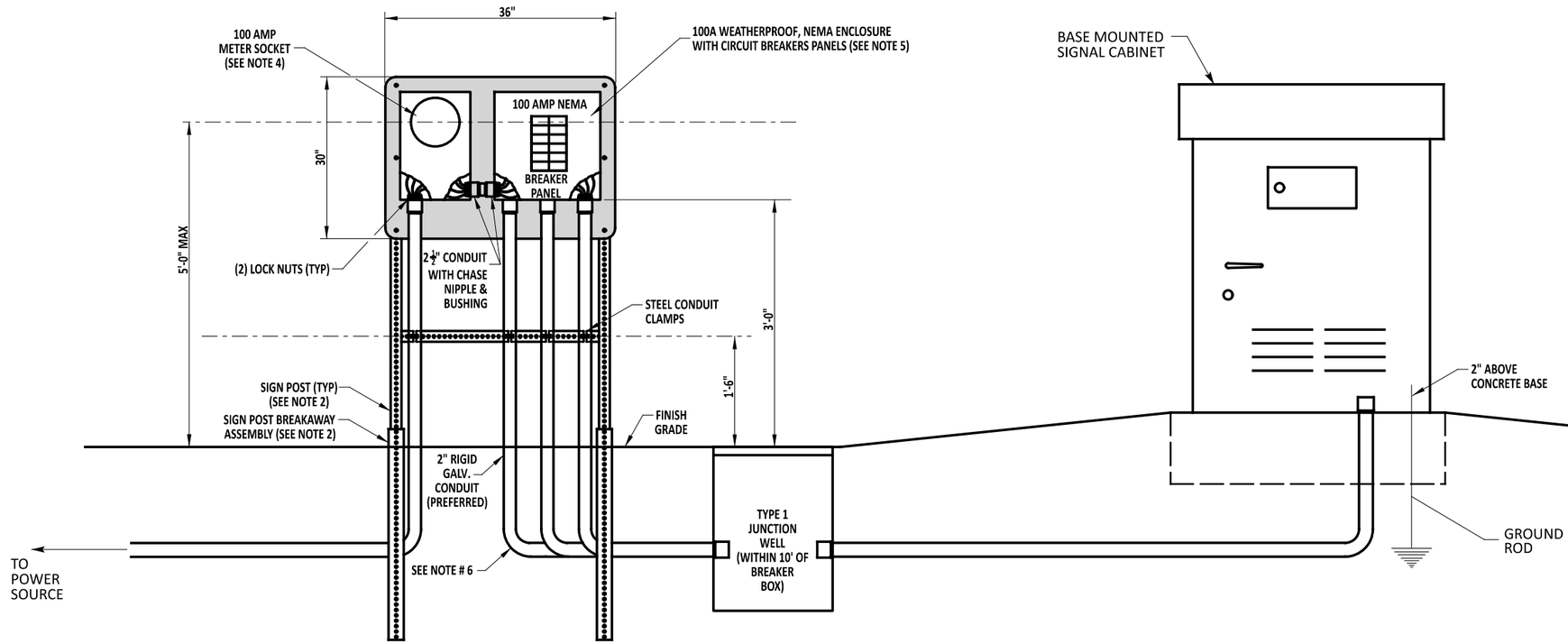
REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020

APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/21/2020

SCALE : NTS

## STANDARD INSTALLATION (3+ DEVICES)




### NOTES:

1). INSTALLATION OF EQUIPMENT BETWEEN SERVICE PEDESTAL AND CONTROLLER CABINET SHALL BE AS PER CONTRACT DRAWINGS/DETAILS.
2). SEE DETAIL T-15, SHEET 1, FOR SIGN POST AND BREAKAWAY ASSEMBLY DETAILS.
3). ATTACH ALUMINUM PANEL TO SIGN POSTS WITH (6) $\frac{5}{16}$" x $2\frac{1}{2}$" LONG GRADE 5 BOLTS, FLAT WASHERS, AND NYLON LOCK NUTS, 3 ON EACH SIDE.
4). MOUNT METER SOCKET TO ALUMINUM PANEL WITH (4) $\frac{5}{16}$" x $\frac{3}{4}$" STAINLESS STEEL BOLTS AND NYLON LOCK NUTS.
5). MOUNT CIRCUIT BREAKER BOX TO ALUMINUM PANEL WITH (4) $\frac{5}{16}$" x $\frac{3}{4}$" STAINLESS STEEL BOLTS AND NYLON LOCK NUTS.
6). ALL CONDUITS AND OTHER ASSOCIATED PIECES SHALL BE 2" RIGID GALVINZED CONDUIT UNLESS SPECIFIED DIFFERENTLY ON THE PLANS OR BY LOCAL UTILITY COMPANY. ALL CONDUITS SHALL BE INSTALLED FROM ENCLOSURE TO TYPE 1 JUNCTION WELL. JUNCTION WELL SHALL BE PLACED WITHIN 10' OF SERVICE PEDESTAL (OR PER PLAN).

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ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

ELECTRICAL SERVICE PEDESTAL - SIGNAL & ITS COMPONENT INSTALLATIONS - 100 AMP (3+ DEVICES)

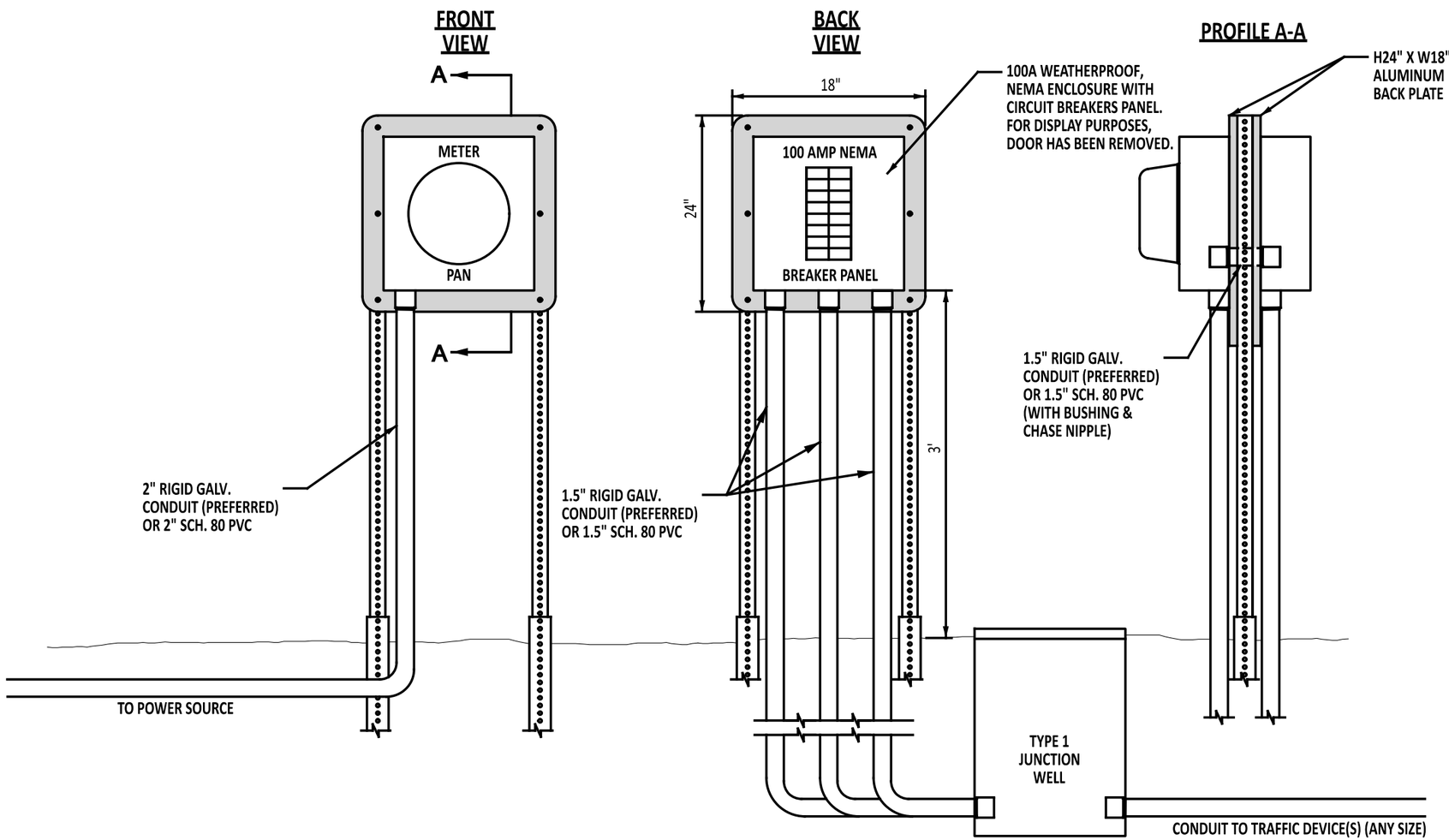
STANDARD NO. T-17 (2020) | SHT. 1 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

8/21/2020

SCALE : NTS

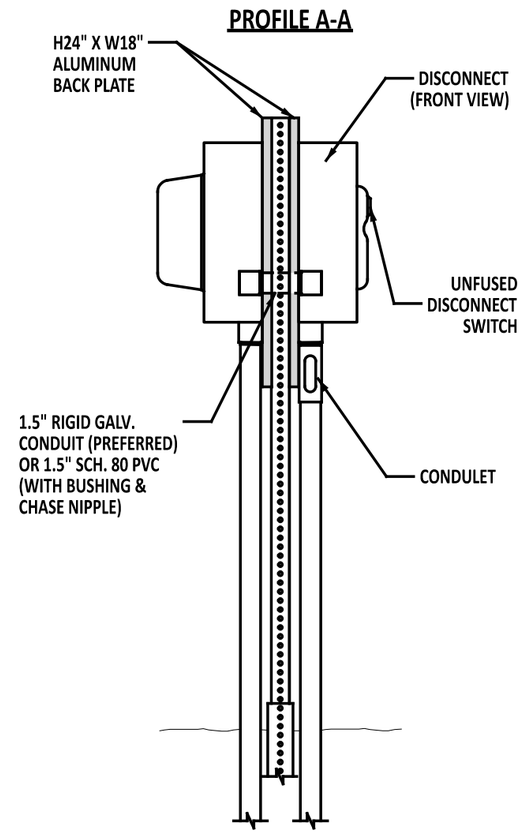
## CONDENSED INSTALLATION (3+ DEVICES)




NOTES

1.) PEDESTAL SHALL BE USED WHEN ALL DEVICES ARE CLOSE TO POWER SOURCE.
2.) PEDESTAL SHALL BE 5 FEET FROM JUNCTION WELL.
3.) TO BE USED FOR 3 OR MORE DEVICES WITHIN CONDENSED SPACE.

## CONDENSED INSTALLATION (UP TO 2 DEVICES)




### SPECIALTY DISCONNECT TYPICAL

NOTES

1.) TO BE USED FOR 2 OR LESS DEVICES WITHIN CONDENSED SPACE.

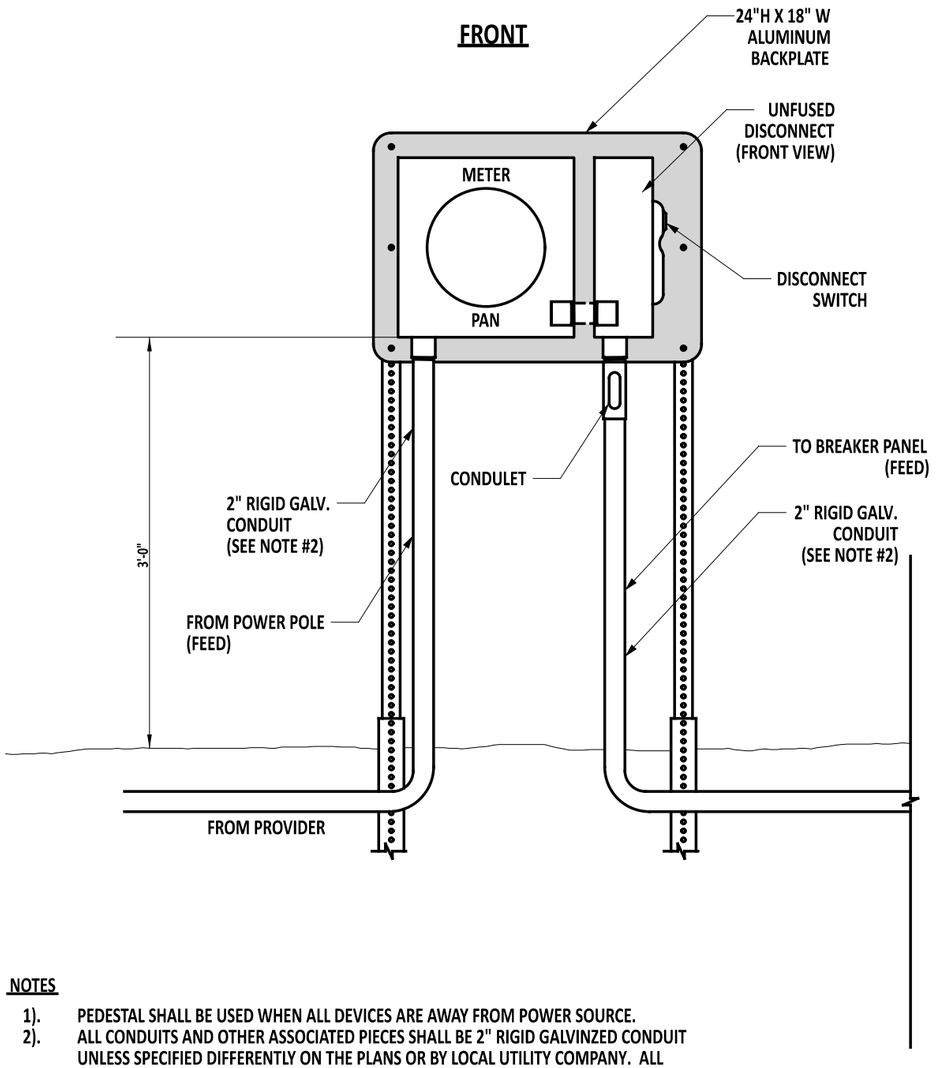
| | | | |
|---|---|---|---|
| DelDOT | ENGINEERING SUPPORT 09/01/2020 DATE<br>RECOMMENDED | ELECTRICAL SERVICE PEDESTAL - SIGNAL & ITS COMPONENT INSTALLATIONS - 100 AMP (CONDENSED) | REVIEWED DEPUTY DIRECTOR - DESIGN 09/01/2020 DATE |
| | | STANDARD NO. T-17 (2020) SHT. 2 OF 5 | APPROVED CHIEF ENGINEER 09/01/2020 DATE |

08/21/2020

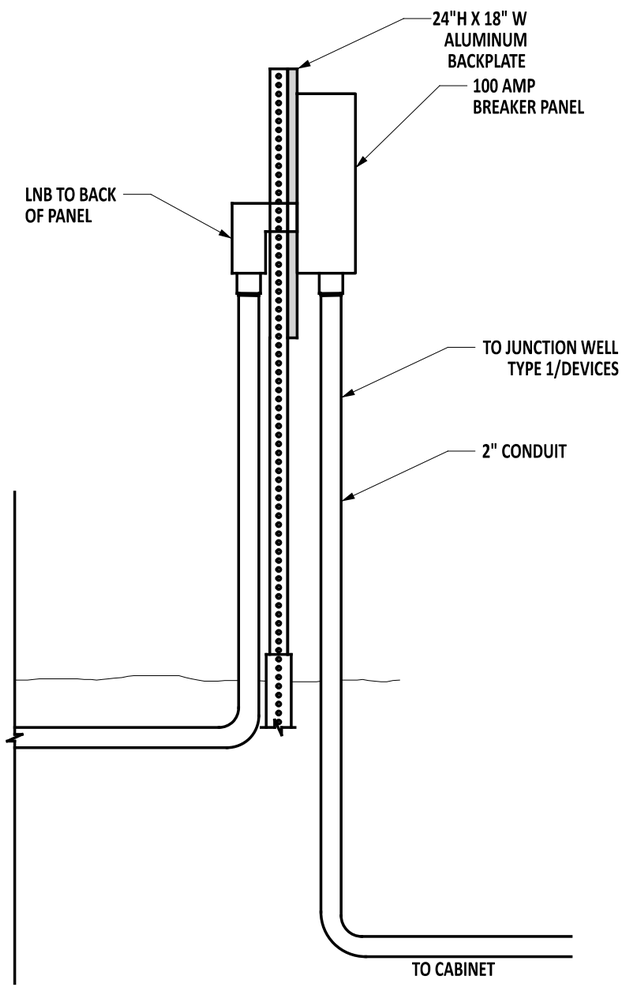
SCALE : NTS

## STANDARD INSTALLATION (UP TO 2 DEVICES)

### FRONT




### SIDE VIEW




NOTES

1). PEDESTAL SHALL BE USED WHEN ALL DEVICES ARE AWAY FROM POWER SOURCE.
2). ALL CONDUITS AND OTHER ASSOCIATED PIECES SHALL BE 2" RIGID GALVINZED CONDUIT UNLESS SPECIFIED DIFFERENTLY ON THE PLANS OR BY LOCAL UTILITY COMPANY. ALL CONDUITS SHALL BE INSTALLED FROM ENCLOSURE TO TYPE 1 JUNCTION WELL. JUNCTION WELL SHALL BE PLACED WITHIN 10' OF SERVICE PEDESTAL (OR PER PLAN).

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ENGINEERING SUPPORT — DATE 09/01/2020
RECOMMENDED

ELECTRICAL SERVICE PEDESTAL -
SIGNAL & ITS COMPONENT INSTALLATIONS - 100 AMP (UP TO 2 DEVICES)

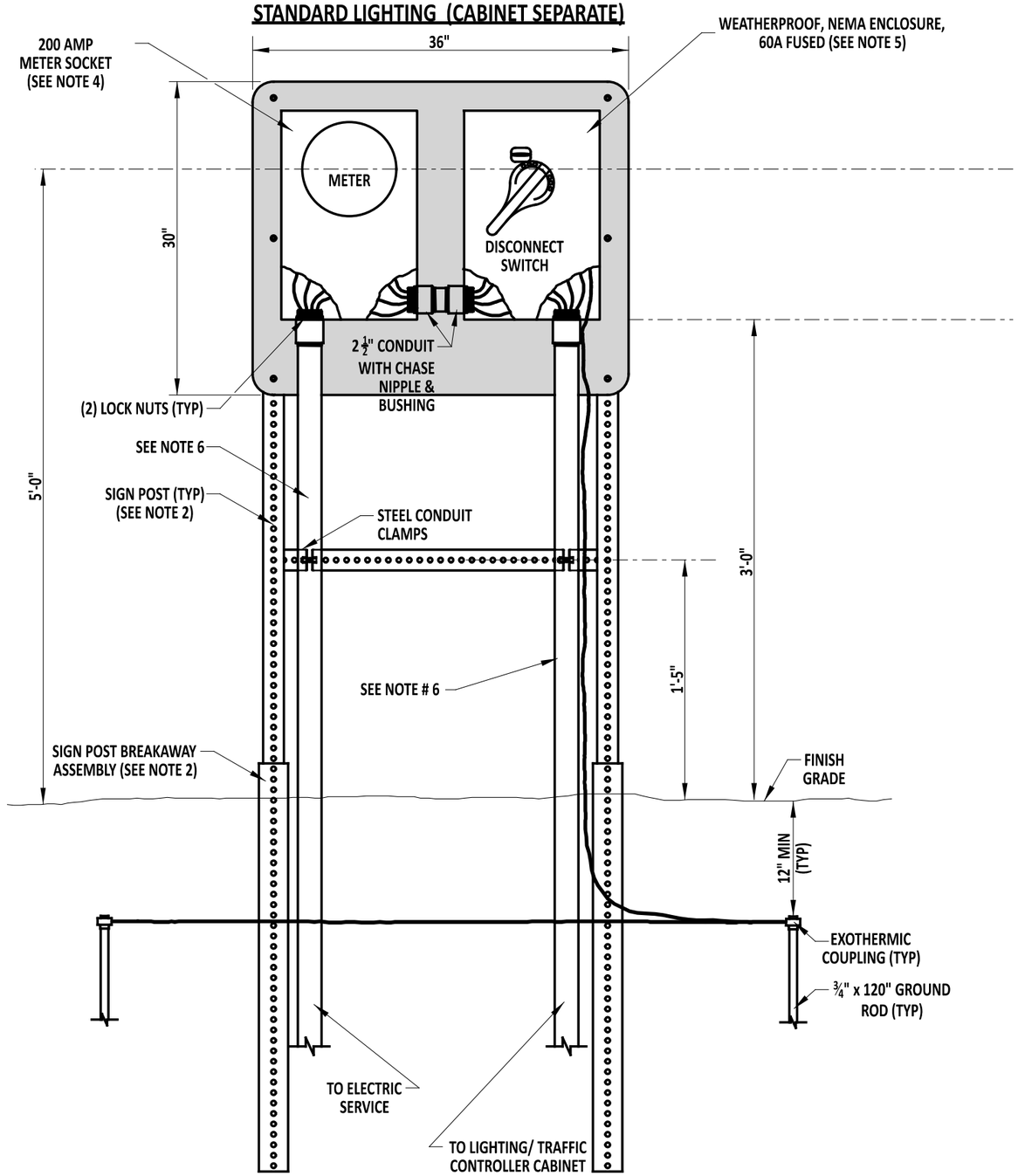
STANDARD NO. T-17 (2020) | SHT. 3 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 09/01/2020
APPROVED — CHIEF ENGINEER — DATE 09/01/2020

08/21/2020

SCALE : NTS

## STANDARD LIGHTING (CABINET SEPARATE)




**NOTES:**

1). INSTALLATION OF EQUIPMENT BETWEEN SERVICE PEDESTAL AND LIGHTING/CONTROLLER CABINET SHALL BE AS PER CONTRACT DRAWINGS/DETAILS.
2). SEE DETAIL T-15, SHEET 1, FOR SIGN POST AND BREAKAWAY ASSEMBLY DETAILS.
3). ATTACH ALUMINUM PANEL TO SIGN POSTS WITH (6) $\frac{5}{16}$" x 2½" LONG GRADE 5 BOLTS, FLAT WASHERS, AND NYLON LOCK NUTS, 3 ON EACH SIDE.
4). MOUNT METER SOCKET TO ALUMINUM PANEL WITH (4) $\frac{5}{16}$" x ¾" STAINLESS STEEL BOLTS AND NYLON LOCK NUTS.
5). MOUNT CIRCUIT BREAKER BOX TO ALUMINUM PANEL WITH (4) $\frac{5}{16}$" x ¾" STAINLESS STEEL BOLTS AND NYLON LOCK NUTS.
6). ALL CONDUITS AND OTHER ASSOCIATED PIECES SHALL BE 2" RIGID GALVINIZED CONDUIT UNLESS SPECIFIED DIFFERENTLY ON THE PLANS OR BY LOCAL UTILITY COMPANY. ALL CONDUITS SHALL BE INSTALLED FROM ENCLOSURE TO TYPE 1 JUNCTION WELL. JUNCTION WELL SHALL BE PLACED WITHIN 10' OF SERVICE PEDESTAL (OR PER PLAN).

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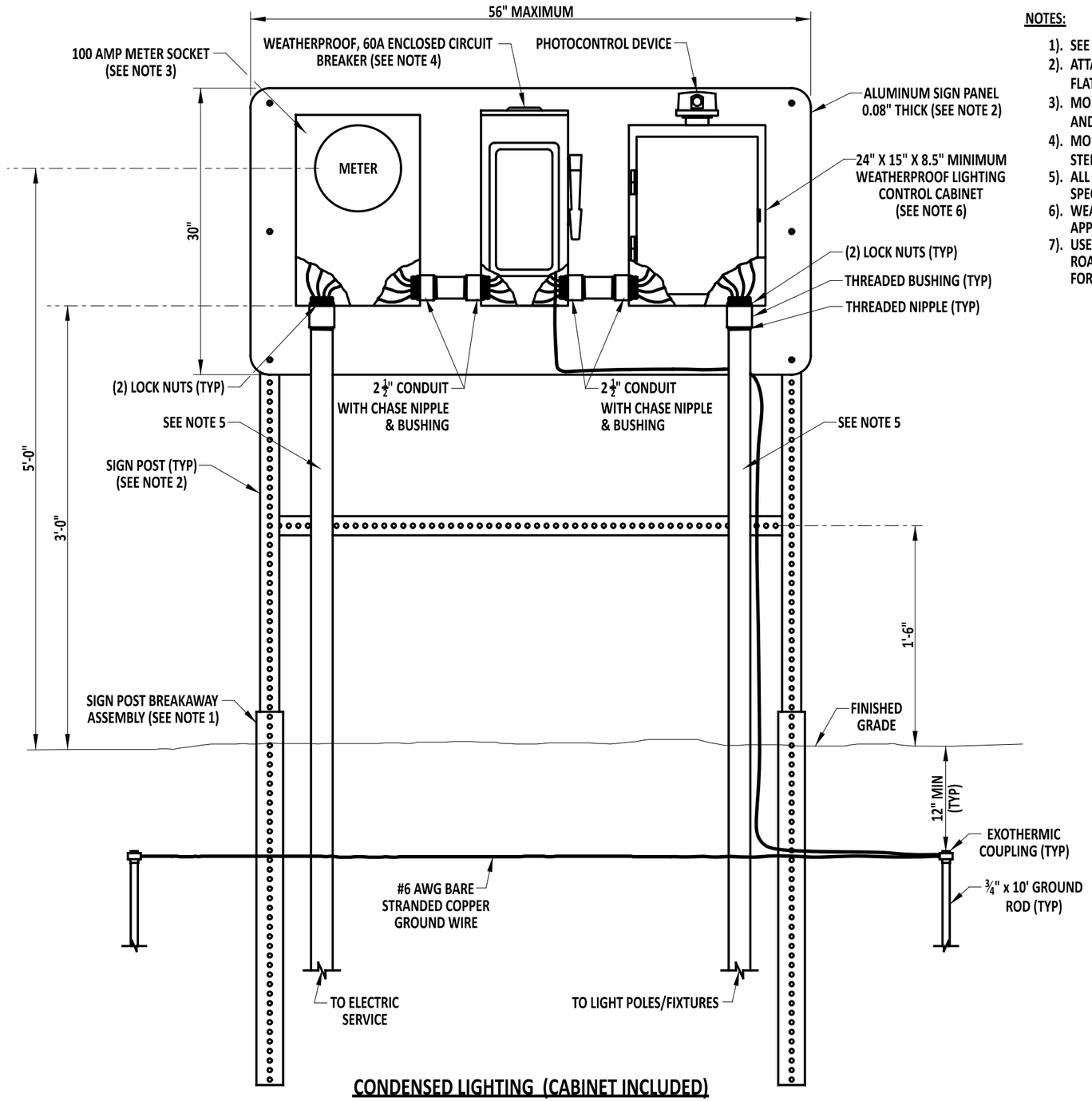
ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

ELECTRICAL SERVICE PEDESTAL - SIGNAL & ITS COMPONENT INSTALLATIONS
200 AMP - STANDARD LIGHTING COMPONENT INSTALLATIONS

STANDARD NO. T-17 (2020) | SHT. 4 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/21/2020




**CONDENSED LIGHTING (CABINET INCLUDED)**

SCALE : NTS

**NOTES:**

1). SEE DETAIL T-15, SHEET 1, FOR SIGN POST AND BREAKAWAY ASSEMBLY DETAILS.
2). ATTACH ALUMINUM PANEL TO SIGN POSTS WITH (6) 5/16" x 2½" LONG GRADE 5 BOLTS, FLAT WASHERS, AND NYLON LOCK NUTS, 3 ON EACH SIDE.
3). MOUNT METER SOCKET TO ALUMINUM PANEL WITH (4) 5/16" x ¾" STAINLESS STEEL BOLTS AND NYLON LOCK NUTS.
4). MOUNT ENCLOSED CIRCUIT BREAKER TO ALUMINUM PANEL WITH (4) 5/16" x ¾" STAINLESS STEEL BOLTS AND NYLON LOCK NUTS.
5). ALL CONDUITS AND OTHER ASSOCIATED PIECES SHALL BE 2" GALVANIZED UNLESS SPECIFIED DIFFERENTLY ON THE PLANS OR BY LOCAL UTILITY COMPANY.
6). WEATHERPROOF LIGHTING CONTROL CABINET SHALL CONTAIN LIGHTING CONTACTOR AND APPROPRIATE OVERCURRENT PROTECTION FOR LIGHTING CIRCUIT(S) BEING USED.
7). USE OF THESE DETAILS ARE MEANT FOR SMALLER INTERSECTION LIGHTING SYSTEMS, OR ROADWAY LIGHTING INSTALLATIONS WITH LOADS APPROXIMATELY 12 FIXTURES OR LESS. FOR LARGER LIGHTING INSTALLATIONS, SEE DETAIL T-17, 4 OF 5.

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ENGINEERING SUPPORT — 09/01/2020 DATE
RECOMMENDED

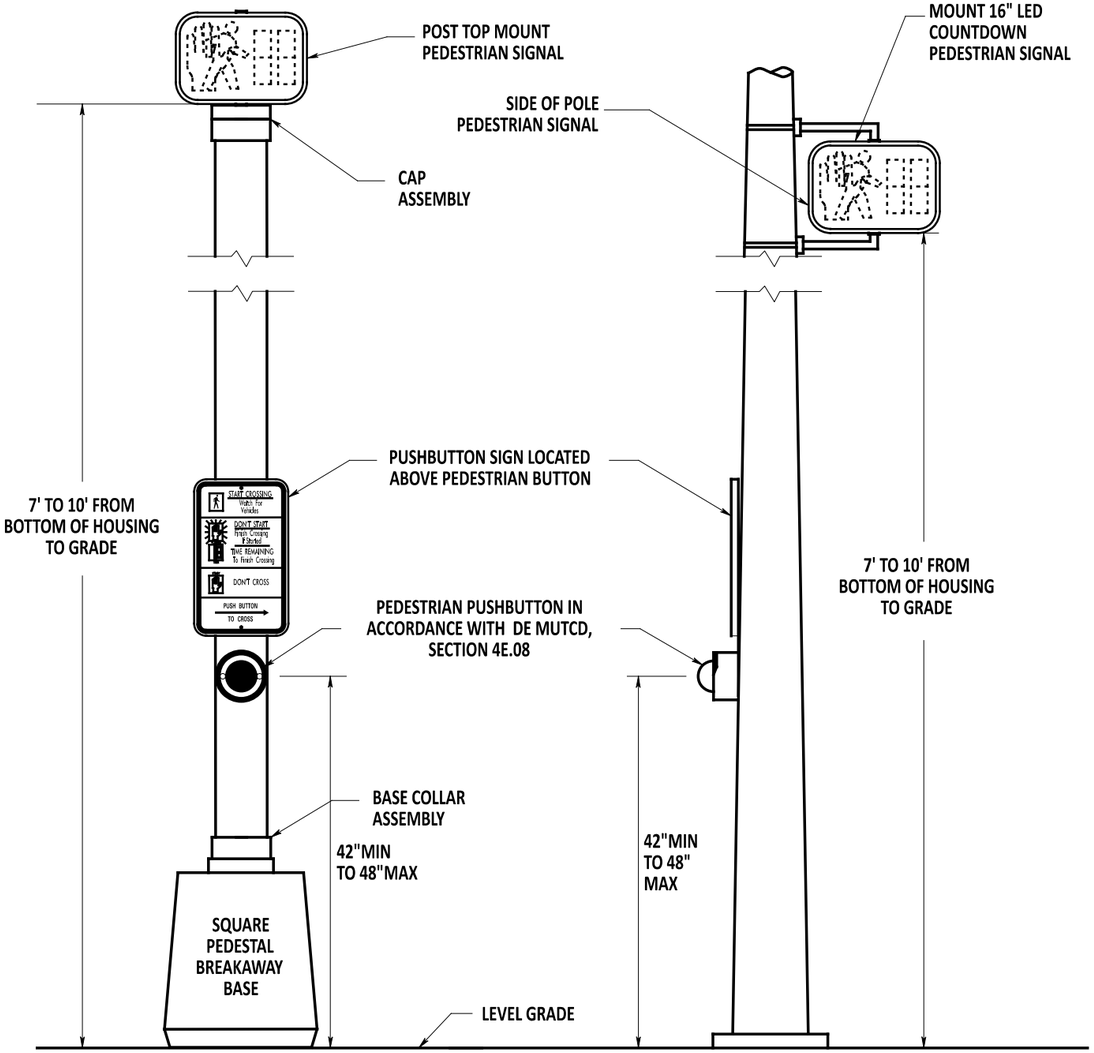
ELECTRICAL SERVICE PEDESTAL - SIGNAL & ITS COMPONENT INSTALLATIONS
LIGHTING COMPONENT INSTALLATIONS ( 12 OR LESS FIXTURES)

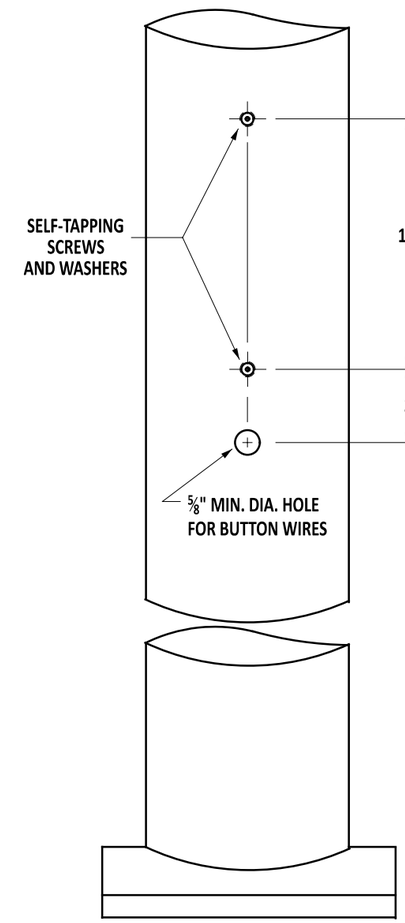
STANDARD NO. T-17 (2020) | SHT. 5 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE
APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/21/2020

SCALE : NTS



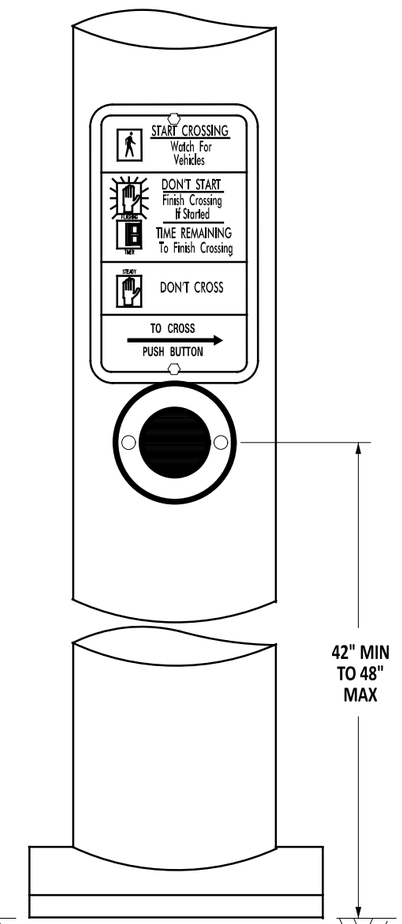




**PEDESTAL POLE** **SIGNAL POLE**

NOTES:

1). WHEN CUTTING IS REQUIRED, CONTRACTOR SHALL CONFIRM PROPER HEIGHT OF PEDESTAL IS MAINTAINED PRIOR TO CUTTING POLE.
2). REFER TO POLE MOUNTING FOR PEDESTRIAN SIGNAL HEADS STANDARD PLATES FOR DETAILS.




**PUSHBUTTON TEMPLATE** **PUSHBUTTON ASSEMBLY**

NOTES:

1). PUSHBUTTON ASSEMBLY SHALL BE SECURED TO WOOD POLES WITH 21#2" LAG BOLTS.

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ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

# PEDESTRIAN PUSHBUTTON LOCATION - PUSHBUTTON ASSEMBLY LOCATION ON POLE

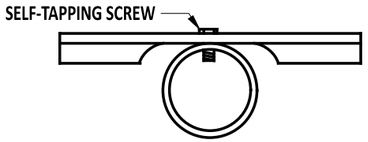
STANDARD NO. T-18 (2020) | SHT. 1 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

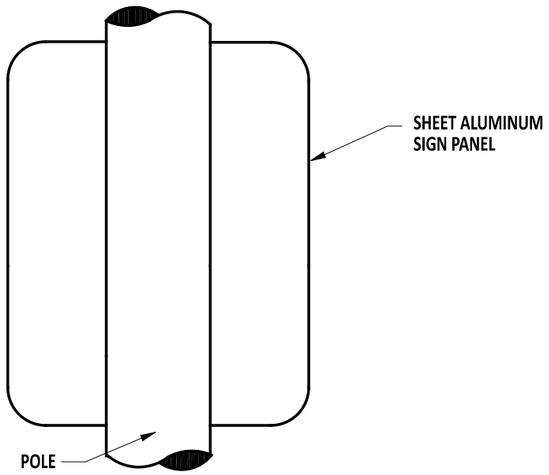
08/21/2020

SCALE : NTS

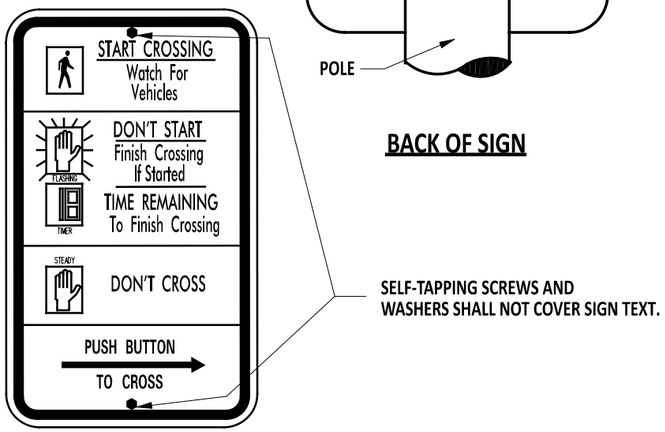



## SIGN ATTACHMENT DETAIL

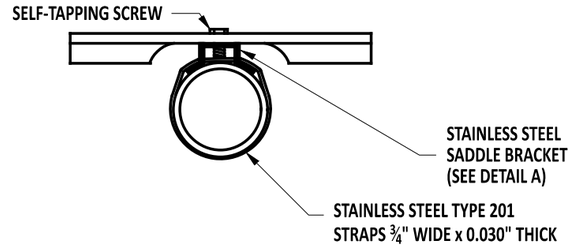
## VERTICAL POLE INSTALLATION ONLY FOR PUSHBUTTON SIGN (PLAN VIEW)




BACK OF SIGN

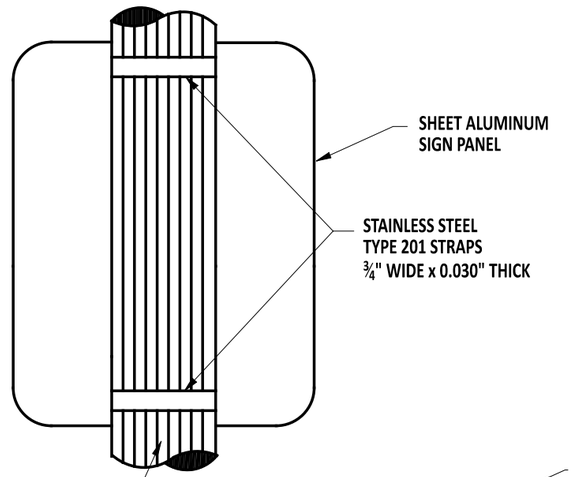



FRONT OF SIGN

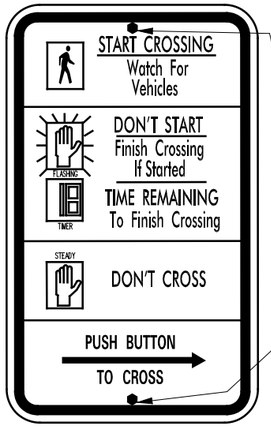



## SIGN ATTACHMENT DETAIL

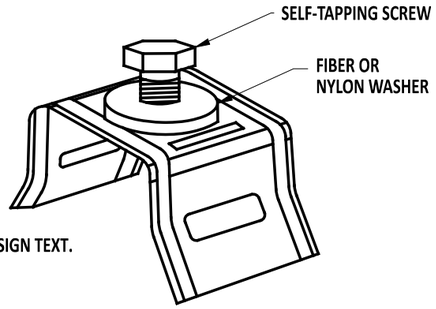
## VERTICAL POLE INSTALLATION ONLY FOR PUSHBUTTON SIGN (PLAN VIEW)




BACK OF SIGN




FRONT OF SIGN




DETAIL A
STAINLESS STEEL SADDLE BRACKET

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ENGINEERING SUPPORT — 09/01/2020 DATE

RECOMMENDED

PEDESTRIAN PUSHBUTTON LOCATION - SIGN ATTACHMENT

STANDARD NO. T-18 (2020) | SHT. 2 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 09/01/2020 DATE

APPROVED — CHIEF ENGINEER — 09/01/2020 DATE

08/21/2020