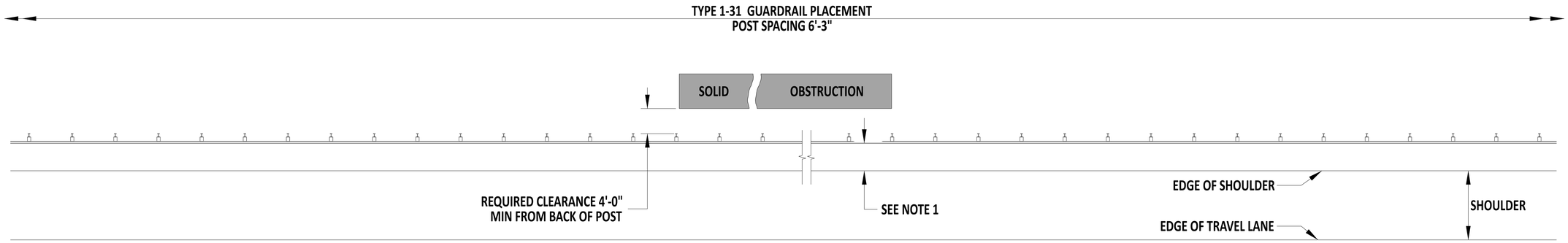
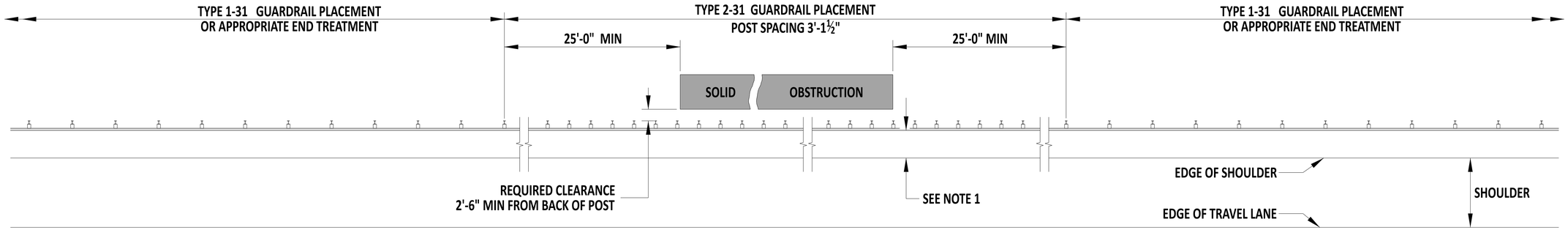
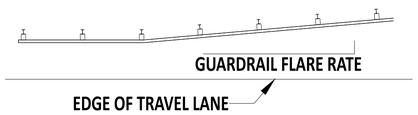
SCALE : NTS



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

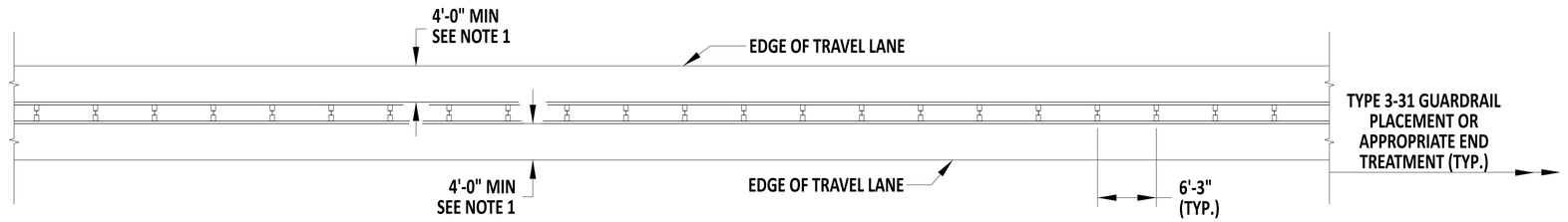




FLARE RATES	
DESIGN SPEED	FLARE RATE
70 MPH	15:1
60 MPH	14:1
55 MPH	12:1
50 MPH	11:1
45 MPH	10:1
40 MPH	8:1
30 MPH	7:1

TYPE 2-31 GUARDRAIL

TYPICAL GUARDRAIL TREATMENT WHEN 2'-6" TO 4'-0"
OF CLEARANCE TO OBSTRUCTION IS AVAILABLE
MASH COMPLIANT SYSTEM - TTI REPORT 610211-03, REV 1.



TYPE 3-31 GUARDRAIL

TYPICAL MEDIAN GUARDRAIL TREATMENT
MASH COMPLIANT SYSTEM - 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. GRADE THIS AREA 10:1 OR FLATTER.
2). INSTALL MAINTENANCE PAVEMENT THE FULL WIDTH FROM THE EDGE OF ROADWAY PAVEMENT, OR BACK OF CURB IF PRESENT, TO 8" BEHIND BACK OF GUARDRAIL POST. SEE DETAIL B-1, SHEET 3 FOR MAINTENANCE PAVEMENT MATERIAL DIMENSIONS.

DelDOT

Andrew Shortt — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

GUARDRAIL APPLICATIONS
PLAN VIEWS

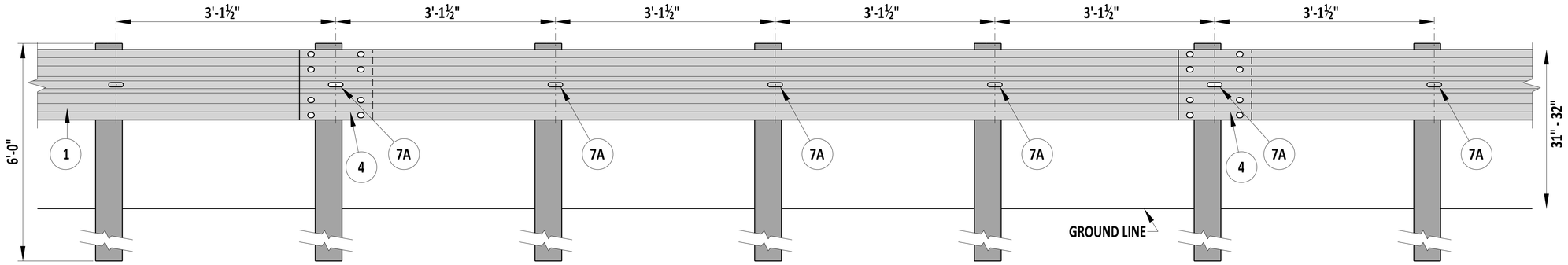
STANDARD NO. B-1 (2024) | SHT. 1 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

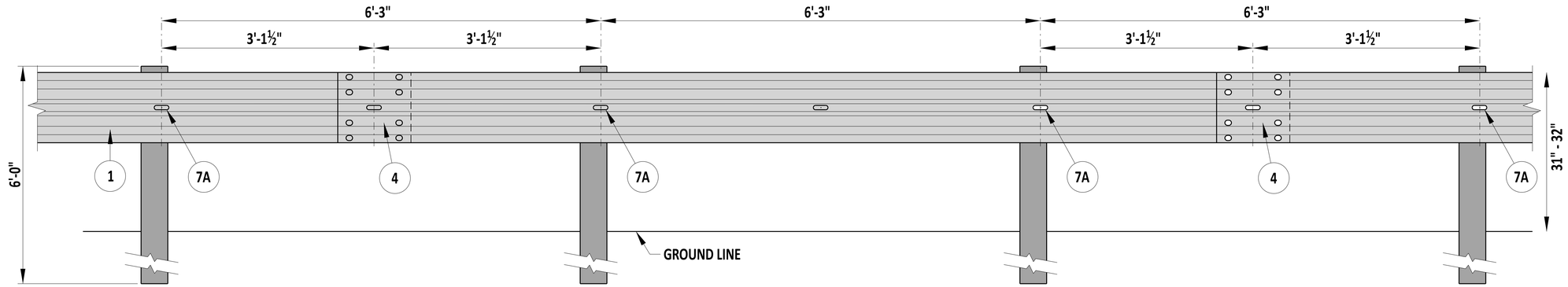
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

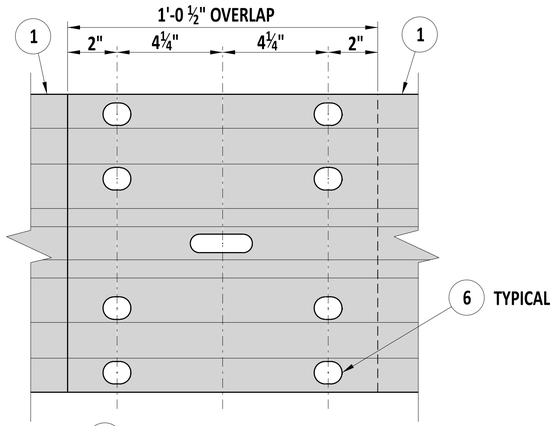
SCALE : NTS



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.

DelDOT

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

GUARDRAIL APPLICATIONS
ELEVATION VIEWS AND SPLICE DETAILS

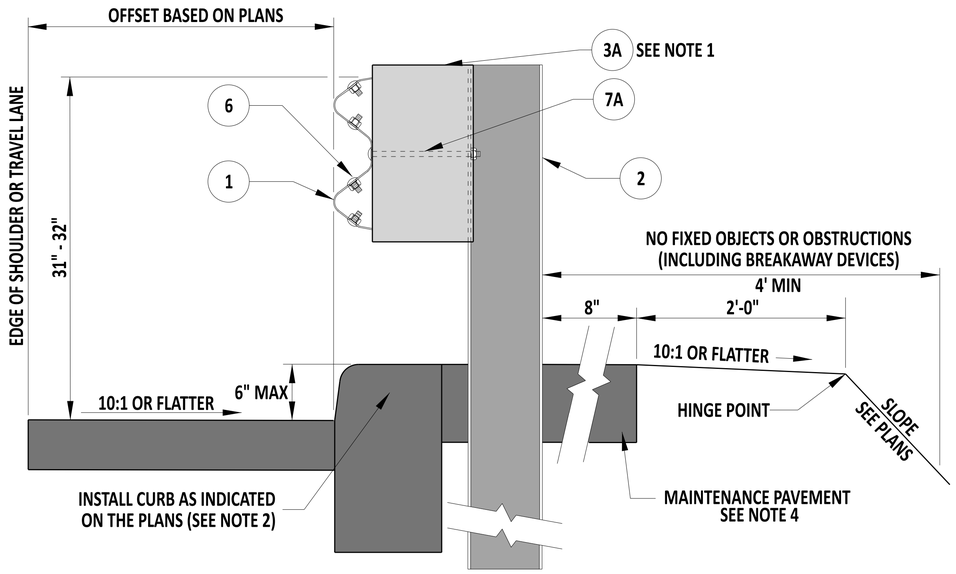
STANDARD NO. B-1 (2024) | SHT. 2 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

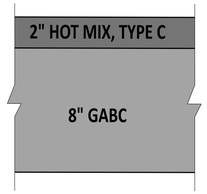
22-DEC-2023

SCALE : NTS

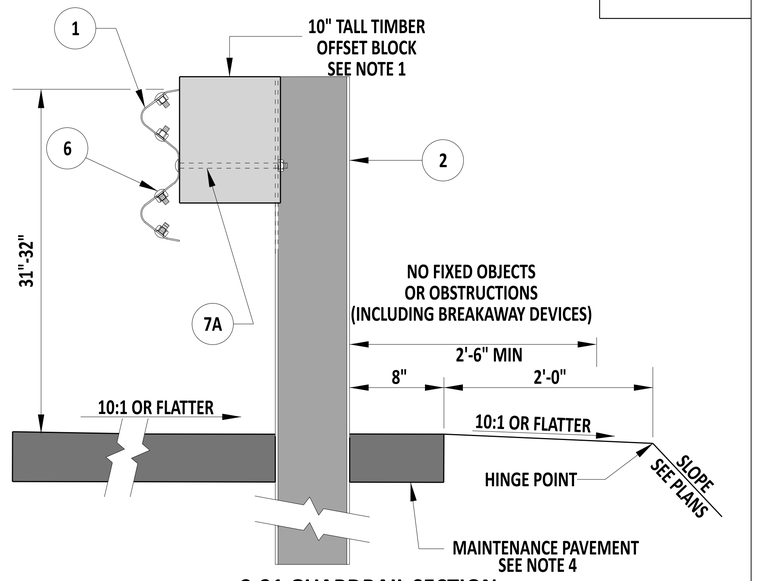


1-31 GUARDRAIL SECTION

SHOULDER APPLICATION
MASH COMPLIANT SYSTEM - TRP 03-390-20

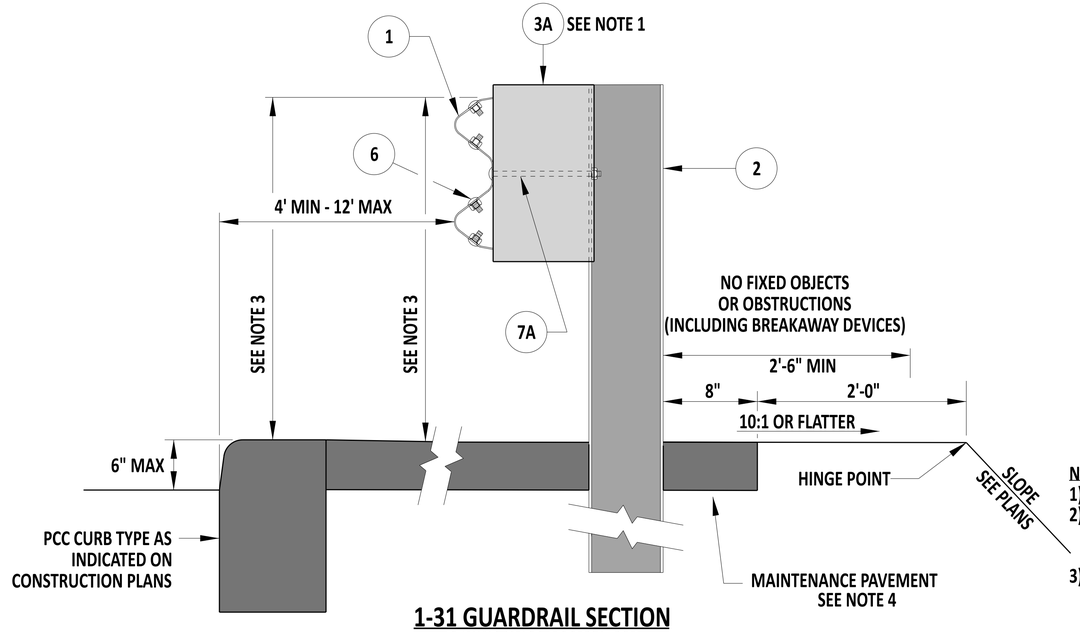


MAINTENANCE PAVEMENT



2-31 GUARDRAIL SECTION

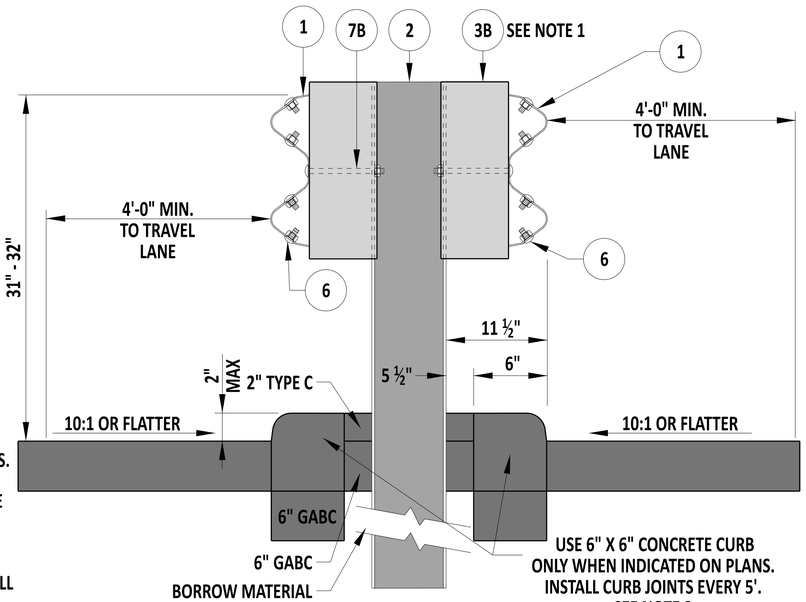
MASH COMPLIANT SYSTEM - TRP 610211-01, REV 1



1-31 GUARDRAIL SECTION

BEHIND CURB APPLICATION
MASH COMPLIANT SYSTEM - TRP-03-237-10.
THIS IS A MASH TL2 DEVICE. DO NOT USE THIS DEVICE ON ROADWAYS WITH POSTED SPEEDS ABOVE 44 MPH.

NOTES:
1). SEE STANDARD SPECIFICATION FOR OFFSET BLOCK MATERIALS.
2). INSTALL THE FACE OF THE GUARDRAIL FLUSH WITH THE FACE OF THE CURB OR NO MORE THAN 6 INCHES BEHIND THE FACE OF THE CURB.
3). INSTALL GUARDRAIL TO A HEIGHT OF 31"-32", MEASURED FROM TOP OF CURB. GUARDRAIL HEIGHT MEASURED FROM GROUND SURFACE DIRECTLY ADJACENT TO FACE OF RAIL SHALL BE NO MORE THAN 34".
4). INSTALL MAINTENANCE PAVEMENT THE FULL WIDTH BETWEEN THE EDGE OF ROADWAY PAVEMENT, OR CURB IF PRESENT, TO 8" BEHIND BACK OF GUARDRAIL POST.



3-31 GUARDRAIL SECTION

MEDIAN APPLICATION

DelDOT

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

GUARDRAIL APPLICATIONS SECTION VIEWS

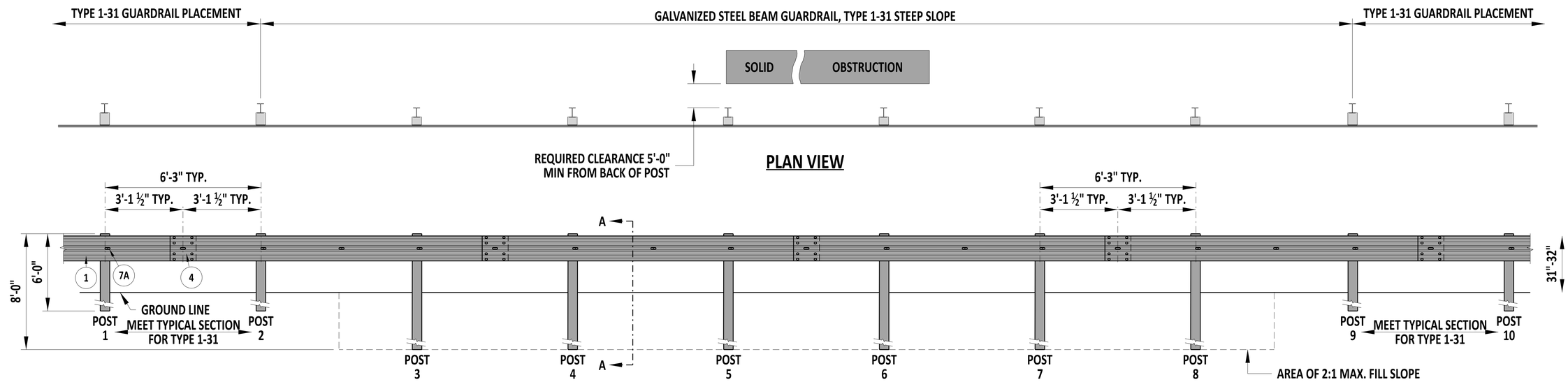
STANDARD NO. B-1 (2024) | SHT. 3 OF 5

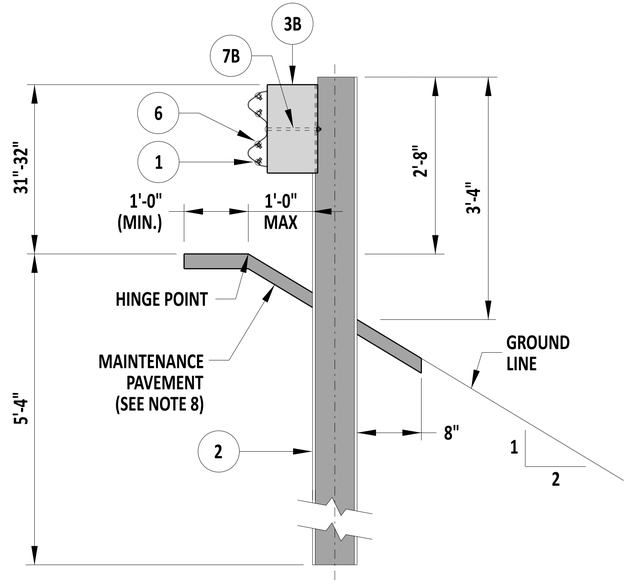
REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS





GUARDRAIL SECTION
SECTION A-A

NOTES:
1). PROVIDE A MINIMUM OFFSET FROM BACK OF POST TO OBSTRUCTION OF 5'-0" WITHIN STEEP SLOPE SECTION.
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). USE ONLY 6"x8"x14" OFFSET BLOCKS ON GUARDRAIL POSTS WITHIN THE 2:1 SLOPE AREA.
5). IF CURB IS USED, INSTALL A LAYDOWN CURB WITHIN LIMITS OF THE TYPE 1-31 STEEP SLOPE GUARDRAIL.
6). MASH COMPLIANT SYSTEM - TTI REPORT 405160-20 AND TRP 03-376-20.
7). PROVIDE A MINIMUM OF 25'-0" OF RAIL LENGTH BETWEEN THE STEEP SLOPE APPLICATION AND ANY W- BEAM TO THRIE-BEAM TRANSITION.
8). SEE DETAIL B-1, SHEET 3 FOR MAINTENANCE PAVEMENT MATERIAL DIMENSIONS.

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Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

TYPE 1-31, GUARDRAIL ADJACENT TO STEEP SLOPE

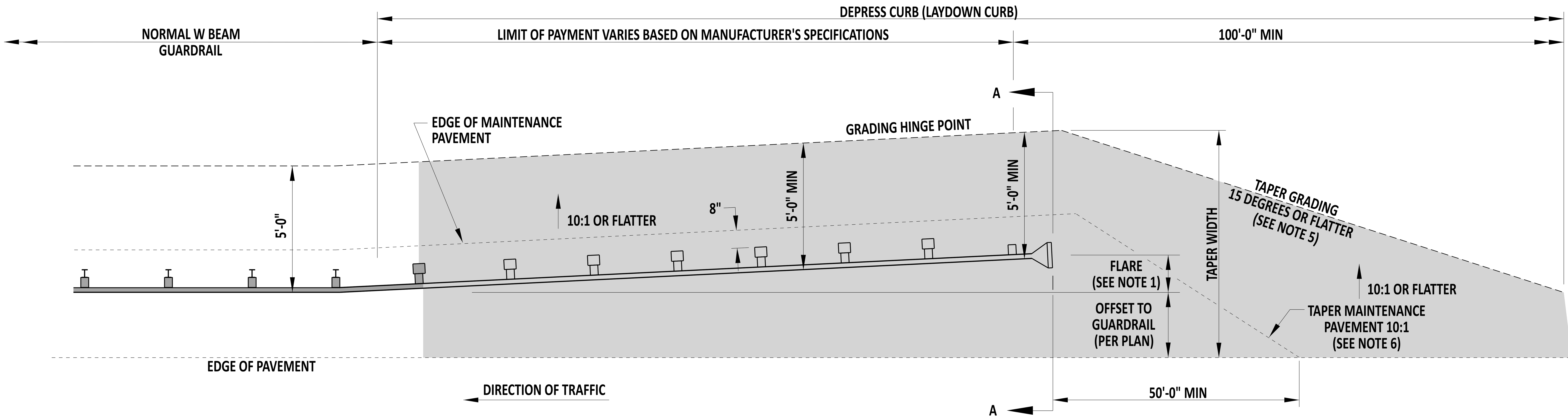
STANDARD NO. B-1 (2024) | SHT. 5 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

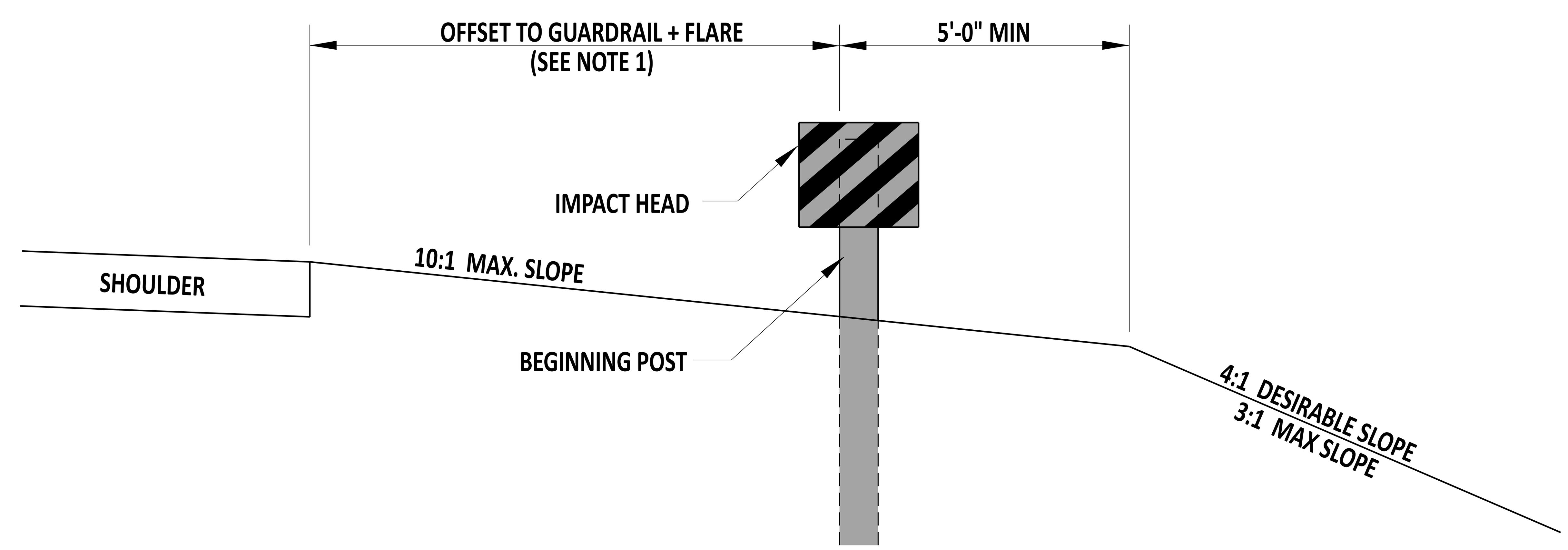
22-DEC-2023

SCALE : NTS



PLAN VIEW

= NO OBSTRUCTIONS IN SHADED AREA



SECTION A-A

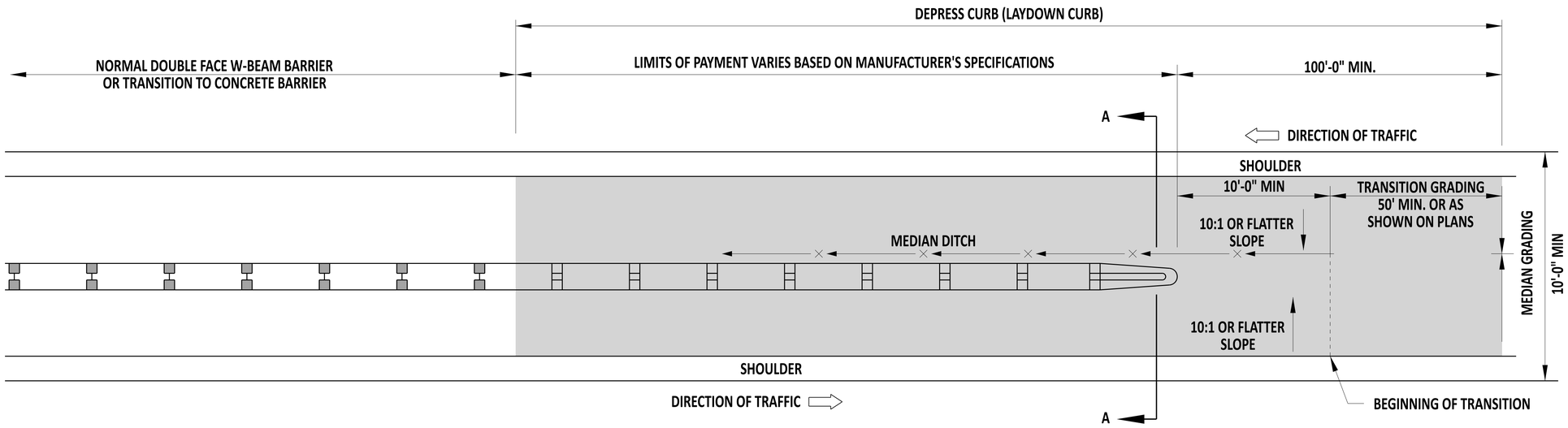
NOTES:

1). FLARE THE END TREATMENT AWAY FROM THE ROAD IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS UNLESS OTHERWISE INDICATED ON THE PLANS.
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). IF CURB IS PRESENT, INSTALL LAYDOWN CURB WITHIN THE LIMITS OF THE END TREATMENT AND THROUGH THE LENGTH OF THE TAPER GRADING.
4). DO NOT PLACE GUARDRAIL REFLECTORS WITHIN THE LIMITS OF THE GUARDRAIL END TREATMENT.
5). IF LAYDOWN CURB IS PRESENT, EXTEND THE TAPER GRADING TO THE EXTENTS OF THE LAYDOWN CURB.
6). SEE DETAIL B-1, SHEET 3 FOR MAINTENANCE PAVEMENT MATERIAL DIMENSIONS.
7). PROVIDE GUARDRAIL END TREATMENTS IN ACCORDANCE WITH SECTION 721.
    A) TYPE 1 - TANGENT END TREATMENT.
    B) TYPE 2 - FLARED END TREATMENT.

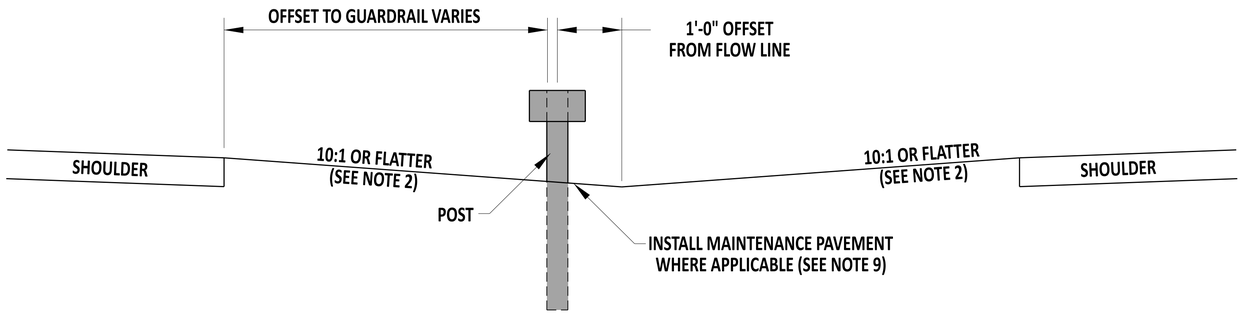
DelDOT	Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE — RECOMMENDED	GRADING FOR GUARDRAIL END TREATMENT ATTENUATOR, TYPE 1 & TYPE 2	REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE
		STANDARD NO. B-2 (2024) — SHT. 1 OF 2	APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

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). INSTALL THE GUARDRAIL END TREATMENT PER THE MANUFACTURER'S REQUIREMENTS.
6). IF CURB IS PRESENT, DEPRESS THE CURB TO LAYDOWN CURB WITHIN THE LIMITS OF THE END TREATMENT AND THROUGHOUT THE LENGTH OF THE TRANSITION GRADING.
7). DO NOT INSTALL GUARDRAIL REFLECTORS WITHIN THE LIMITS OF THE GUARDRAIL END TERMINAL.
8). DO NOT INSTALL GUARDRAIL END TREATMENT IN A CURVED SECTION OF GUARDRAIL.
9). SEE DETAIL B-1, SHEET 3 FOR MAINTENANCE PAVEMENT MATERIAL DIMENSIONS. IF THIS SYSTEM IS INSTALLED IN AN UNPAVED MEDIAN, INSTALL MAINTENANCE PAVEMENT WITHIN THE LIMITS OF PAYMENT LENGTH AND TO A FULL WIDTH OF 8" ON BOTH SIDES OF THE GUARDRAIL POSTS.

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Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

GRADING FOR GUARDRAIL END TREATMENT ATTENUATOR, TYPE 3

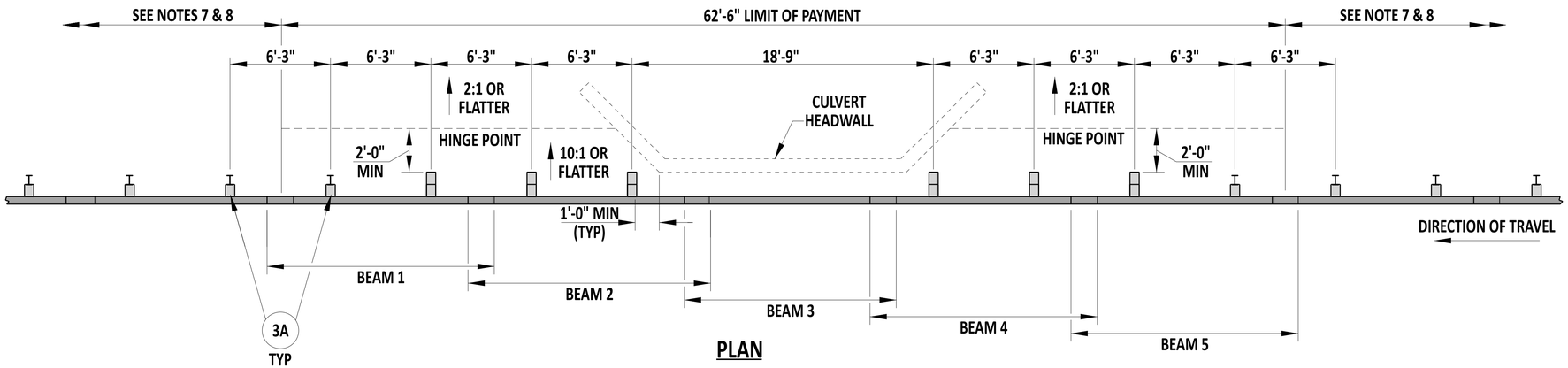
STANDARD NO. B-2 (2024) | SHT. 2 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

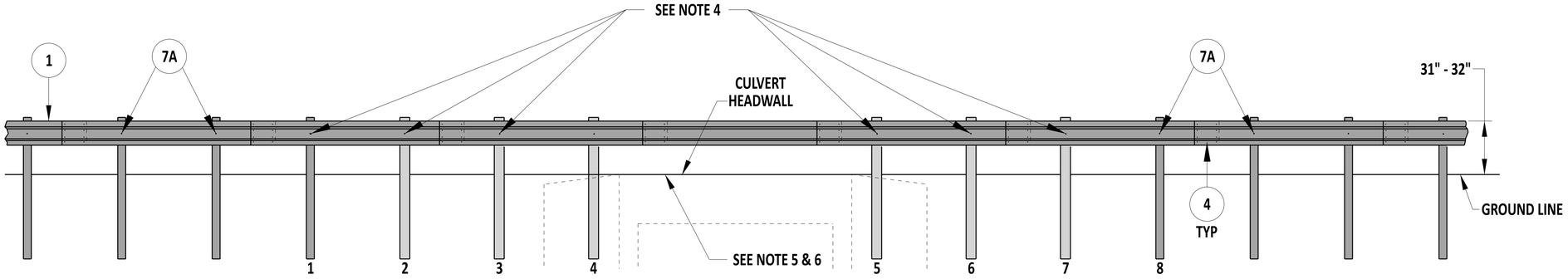
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS



PLAN



ELEVATION

NOTES:

1). FOR OMITTING ONE POST, SEE DETAIL B-1, SHEET 4.
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). ATTACH THE RAIL AT POSTS 2 THROUGH 7 WITH A $\frac{5}{8}$" x 22" GUARDRAIL BOLT, STEEL WASHER, AND RECESS NUT.
5). WHERE THE HEADWALL PROJECTION IS LESS THAN 2" ABOVE GRADE, THE BACK OF THE CRT POST MAY BE ALIGNED WITH THE NEAR SIDE OF THE HEADWALL.
6). WHERE THE STRUCTURE PROJECTION IS GREATER THAN 2" ABOVE GRADE, THE INSIDE FACE OF THE HEADWALL SHALL BE A MINIMUM OF 8'-0" FROM THE FACE OF THE W-BEAM.
7). PROVIDE AT LEAST 50'-0" OF TYPE 1-31 GUARDRAIL, INCLUDING END ANCHORAGE, TO ENSURE INTENDED FUNCTION.
8). PROVIDE AT LEAST 37'-6" OF TANGENT 1-31 GUARDRAIL BEFORE INTRODUCING GUARDRAIL FLARES IN ACCORDANCE WITH THE RATES SHOWN IN STANDARD DETAIL B-1, SHEET 1 TO ENSURE INTENDED FUNCTION.
9). IF CURB IS USED, IT SHALL BE A MAX 2" HEIGHT WITHIN THE LIMIT OF PAYMENT OF THE GUARDRAIL OVER CULVERT.
10). MASH COMPLIANT SYSTEM - FHWA ELIGIBILITY LETTER B-189.

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Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

GUARDRAIL OVER CULVERTS, TYPE 2-31

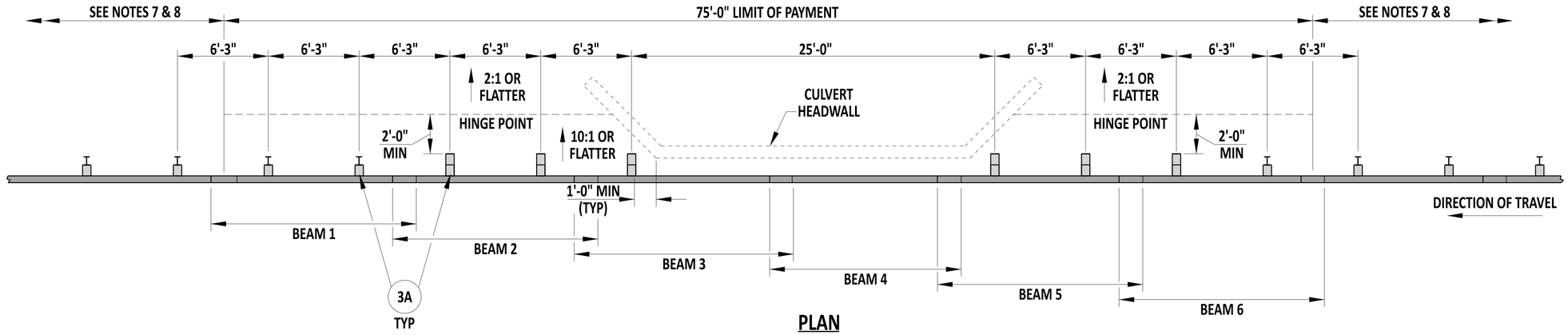
STANDARD NO. B-3 (2024) | SHT. 1 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

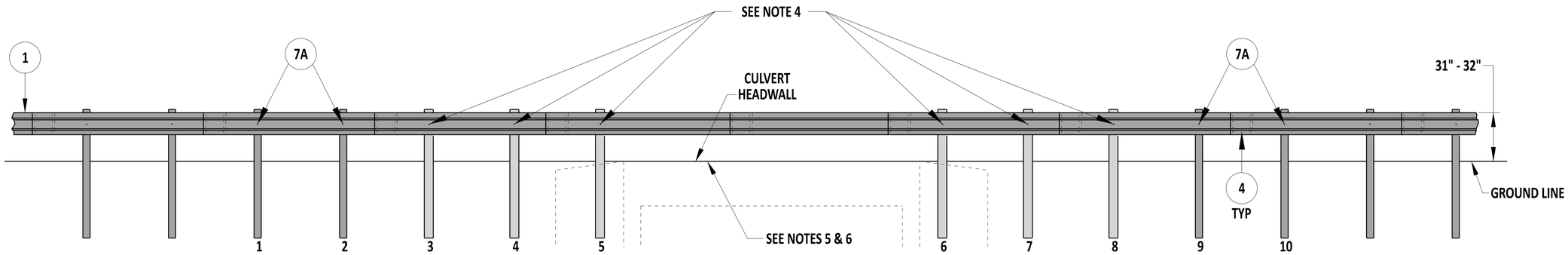
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS



PLAN



ELEVATION

NOTES:

1). FOR OMITTING ONE POST, SEE DETAIL B-1, SHEET 4.
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). ATTACH THE RAIL AT POSTS 3 THROUGH 8 WITH A $\frac{5}{8}$" x 22" GUARDRAIL BOLT, STEEL WASHER, AND RECESS NUT.
5). WHERE THE HEADWALL PROJECTION IS LESS THAN 2" ABOVE GRADE, THE BACK OF THE CRT POST MAY BE ALIGNED WITH THE NEAR SIDE OF THE HEADWALL.
6). WHERE THE STRUCTURE PROJECTION IS GREATER THAN 2" ABOVE GRADE, THE INSIDE FACE OF THE HEADWALL SHALL BE A MINIMUM OF 8'-0" FROM THE FACE OF THE W-BEAM.
7). PROVIDE AT LEAST 50'-0" OF TYPE 1-31 GUARDRAIL, INCLUDING END ANCHORAGE, TO ENSURE INTENDED FUNCTION.
8). PROVIDE AT LEAST 37'-6" OF TANGENT 1-31 GUARDRAIL BEFORE INTRODUCING GUARDRAIL FLARES IN ACCORDANCE WITH THE RATES SHOWN IN STANDARD DETAIL B-1, SHEET 1 TO ENSURE INTENDED FUNCTION.
9). IF CURB IS USED, IT SHALL BE A MAX 2" HEIGHT WITHIN THE LIMIT OF PAYMENT OF THE GUARDRAIL OVER CULVERT.
10). MASH COMPLIANT SYSTEM - FHWA ELIGIBILITY LETTER B-189.

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Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

GUARDRAIL OVER CULVERTS, TYPE 3-31

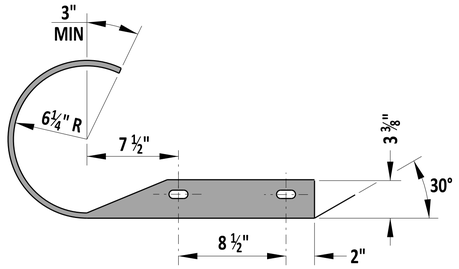
STANDARD NO. B-3 (2024) | SHT. 2 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

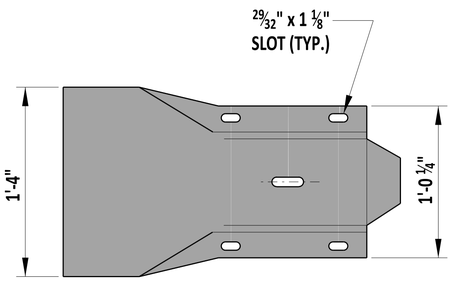
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

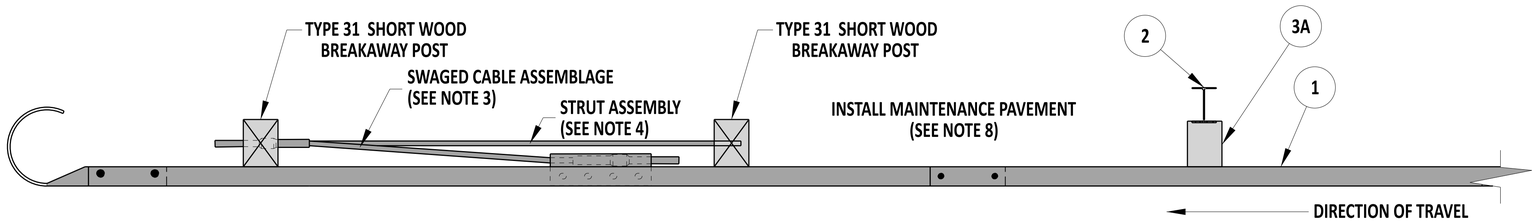
SCALE : NTS



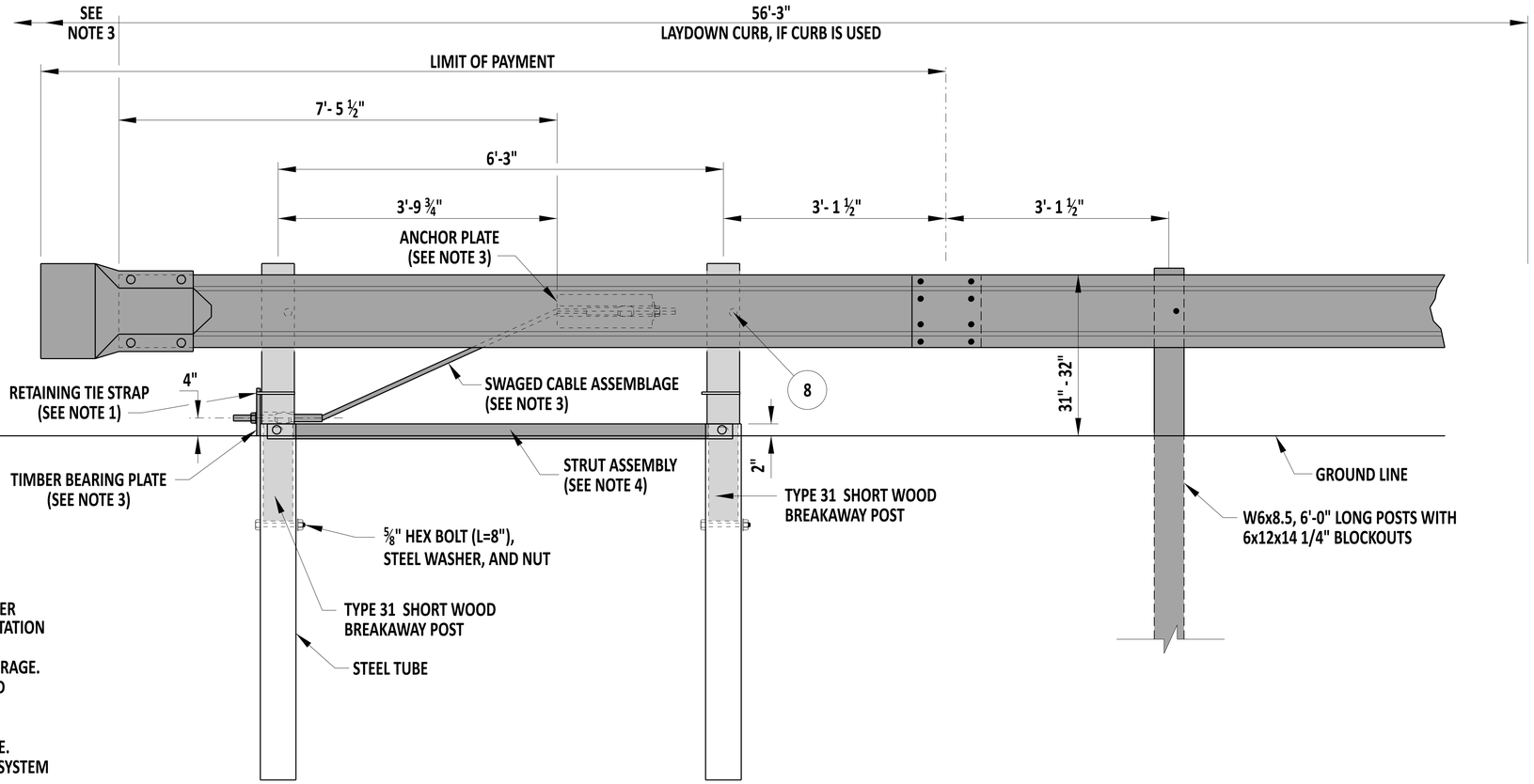
END SECTION PLAN



END SECTION ELEVATION



PLAN VIEW



ELEVATION VIEW

NOTES:

1). 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.
2). IF CURB IS USED, EXTEND LAYDOWN CURB 50'-0" DOWNSTREAM OF THE ANCHORAGE.
3). REFER TO DETAIL B-13, SHEET 8 OF 12, FOR SWAGED CABLE, ANCHOR PLATE, AND TIMBER BEARING PLATE DETAILS.
4). REFER TO DETAIL B-13, SHEET 11 OF 12, FOR STRUT ASSEMBLY DETAIL.
5). DO NOT PLACE GUARDRAIL REFLECTORS WITHIN THE LIMITS OF THE ANCHORAGE.
6). THIS IS DESIGNED TO ACT AS A DOWNSTREAM END ANCHOR. DO NOT USE THIS SYSTEM WHERE HEAD ON IMPACTS ARE EXPECTED.
7). MASH COMPLIANT SYSTEM - FHWA ELIGIBILITY LETTER B-256
8). SEE DETAIL B-1, SHEET 3 FOR MAINTENANCE PAVEMENT DEPTHS AND MATERIALS. INSTALL MAINTENANCE PAVEMENT WITHIN THE LIMITS OF PAYMENT, TO THE FULL WIDTH BETWEEN THE EDGE OF PAVEMENT, OR BACK OF CURB IF CURB IS INSTALLED, TO A DISTANCE OF 8" BEHIND THE BACK OF POST.

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Andrew Shoot — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

END ANCHORAGE, TYPE 31

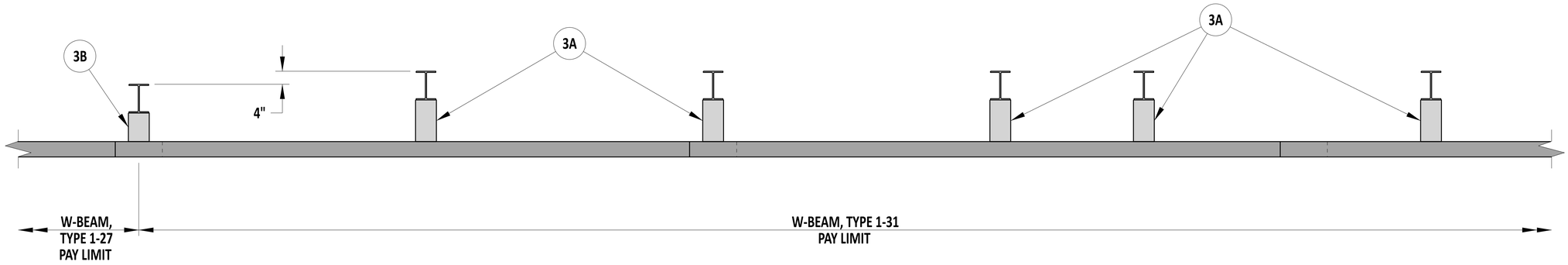
STANDARD NO. B-4 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

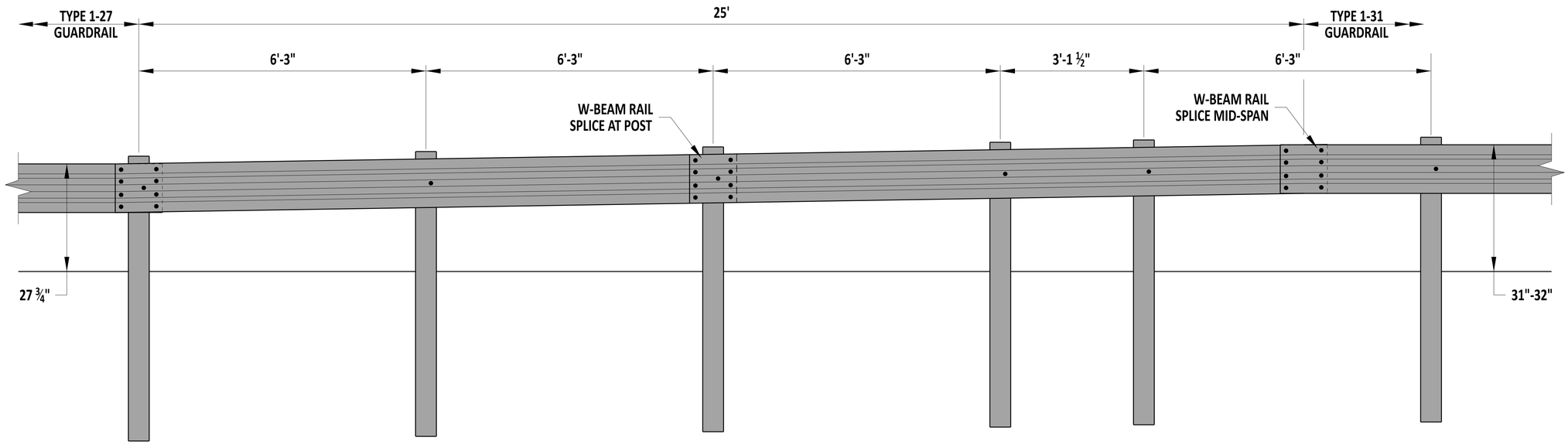
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS



PLAN



ELEVATION

NOTES:
1). IF CURB IS USED, FOLLOW DETAIL B-1, SHEET 3 OF 5 AND DETAIL B-15, SHEET 3 OF 3.

DelDOT

Andrew Shott
ENGINEERING SUPPORT
12/22/2023
DATE
RECOMMENDED

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

STANDARD NO. B-7 (2024)

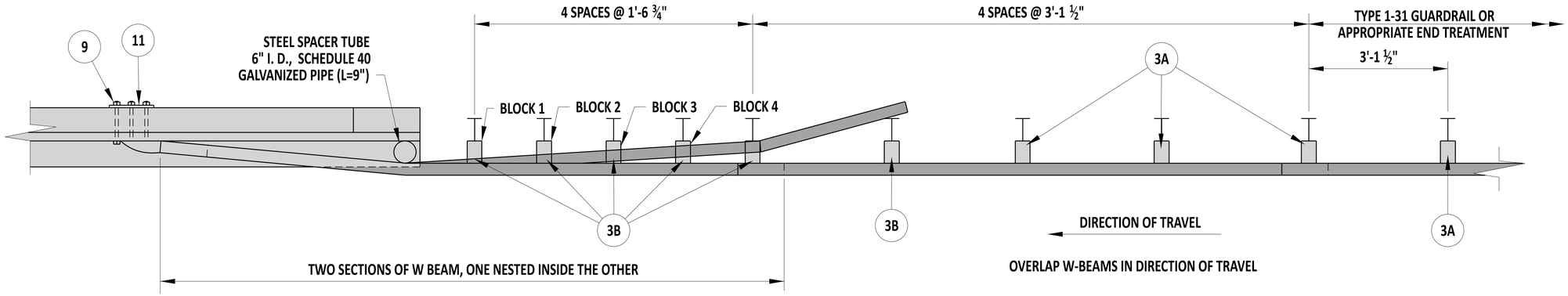
SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN
22 December 2023
DATE

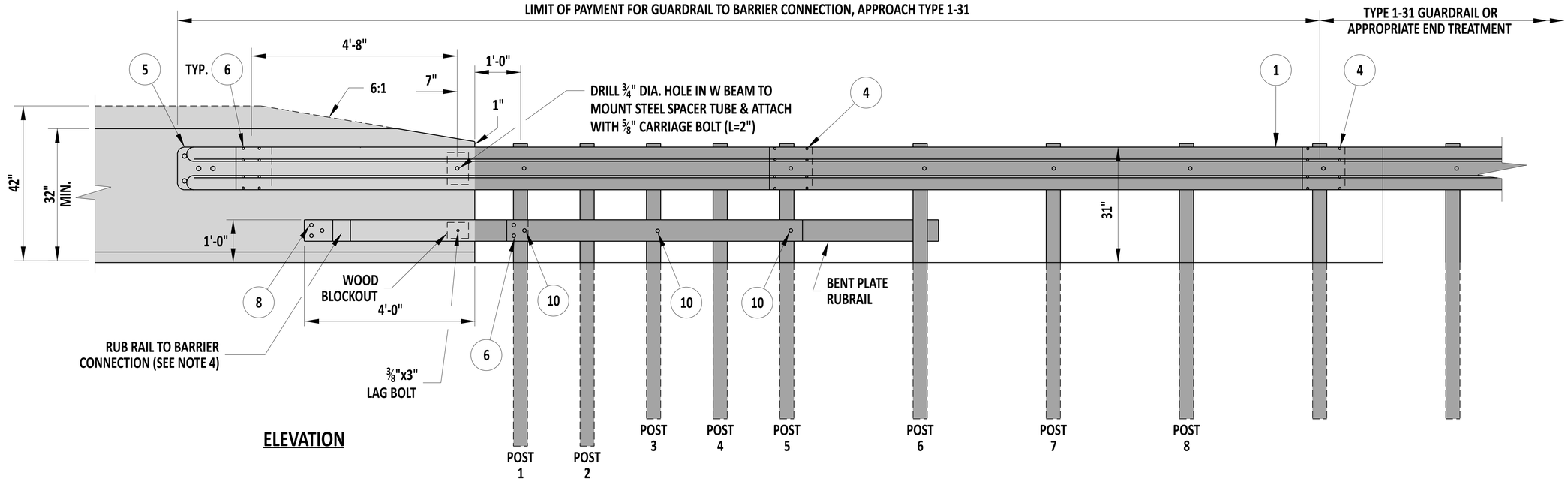
APPROVED
CHIEF ENGINEER
01/11/2024
DATE

22-DEC-2023

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). DRILL ALL HOLES PRIOR TO GALVANIZING.
6). PLACE GUARDRAIL REFLECTOR IN ACCORDANCE WITH THE DE MUTCD.
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.
10).THIS INSTALLATION IS ONLY FOR MAINTENANCE APPLICATIONS. DO NOT INSTALL THIS ON NEW CONSTRUCTION.

DelDOT

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

GUARDRAIL TO BARRIER CONNECTION - APPROACH TYPE 1-31

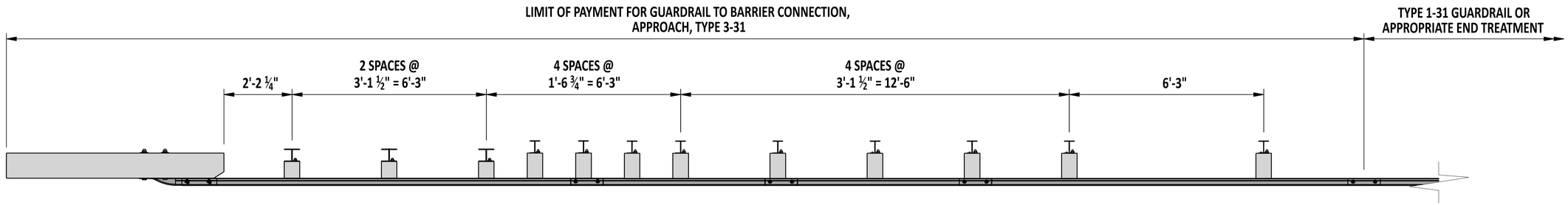
STANDARD NO. B-8 (2024) | SHT. 1 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

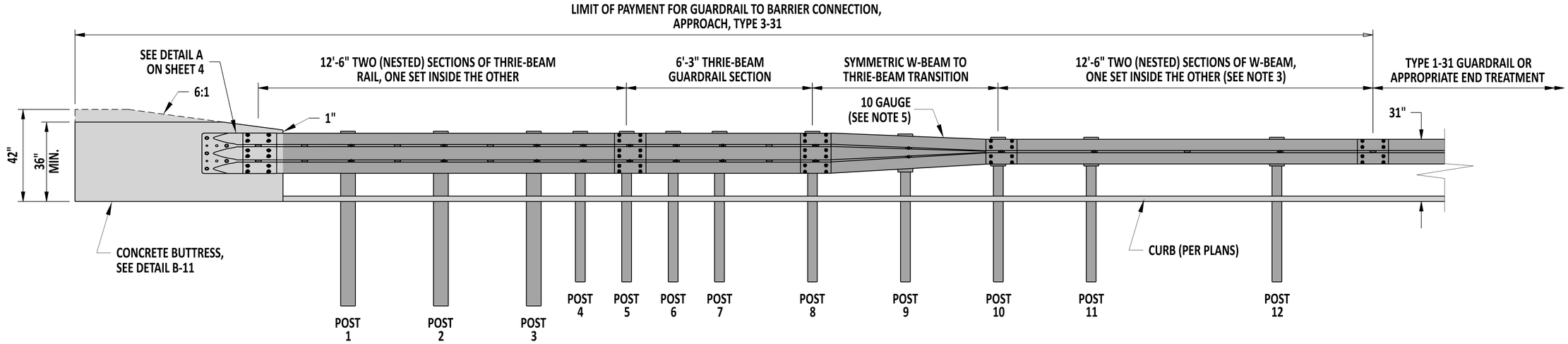
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

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 B-10 SHEETS 2 THROUGH 4 FOR ADDITIONAL DETAILS.
3). ONLY USE A SINGLE PIECE OF W-BEAM IN THIS SECTION WHEN CURB IS NOT USED. WHEN CURB IS USED, IT SHALL BE LIMITED TO 4" TALL MAX.
4). POSTS NOT DETAILED ON B-10 SHEETS 2 AND 3 ARE TO USE STANDARD POSTS AND BLOCKS.
5). AASHTO M180, CLASS B, TYPE I OR TYPE II.
6). MASH COMPLIANT SYSTEM - DESIGN BASED ON MWRSF TEST REPORT TRP 03-367-19.

DelDOT

Andrew Shortt — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

GUARDRAIL TO BARRIER CONNECTION, APPROACH, TYPE 3-31

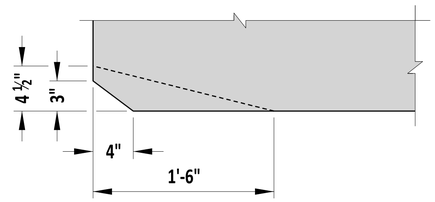
STANDARD NO. B-10 (2024) | SHT. 1 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

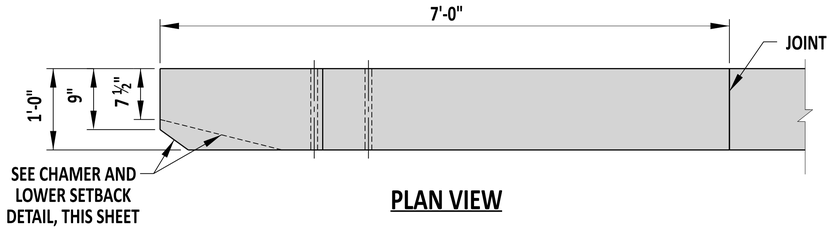
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

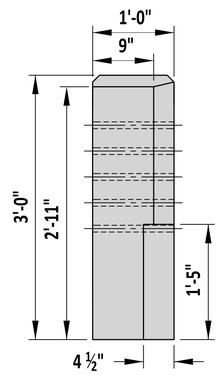
SCALE : NTS



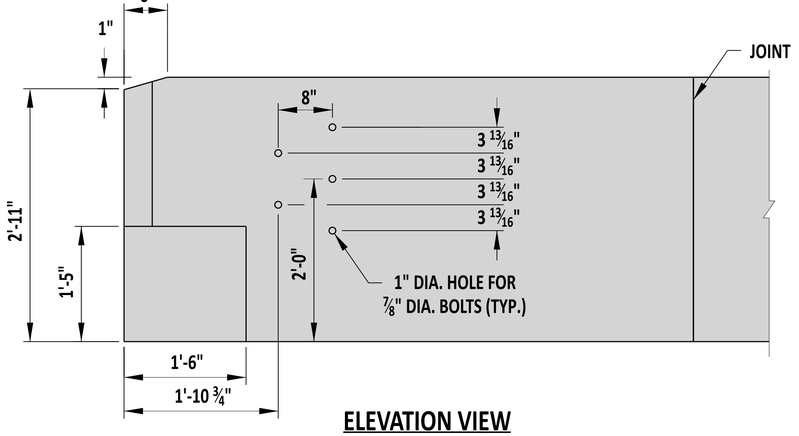
CHAMFER AND LOWER SETBACK DETAIL



PLAN VIEW



END VIEW



ELEVATION VIEW

NOTES:
1). THRIE-BEAM GUARDRAIL NOT SHOWN. SEE STANDARD NO. B-10 FOR MORE INFORMATION ON THRIE-BEAM CONNECTION.
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.

TL-3

DelDOT

Andrew Shoot — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

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

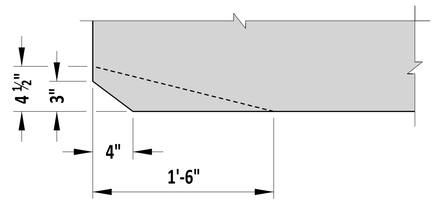
STANDARD NO. B-11 (2024) SHT. 1 OF 8

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

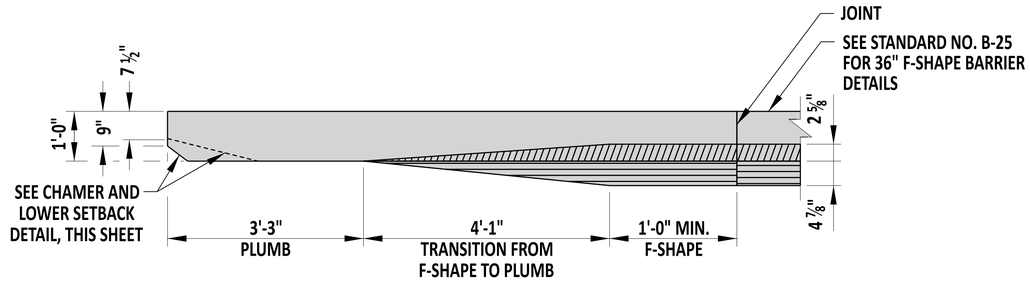
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

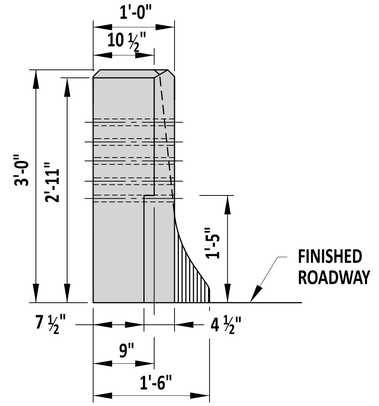
SCALE : NTS



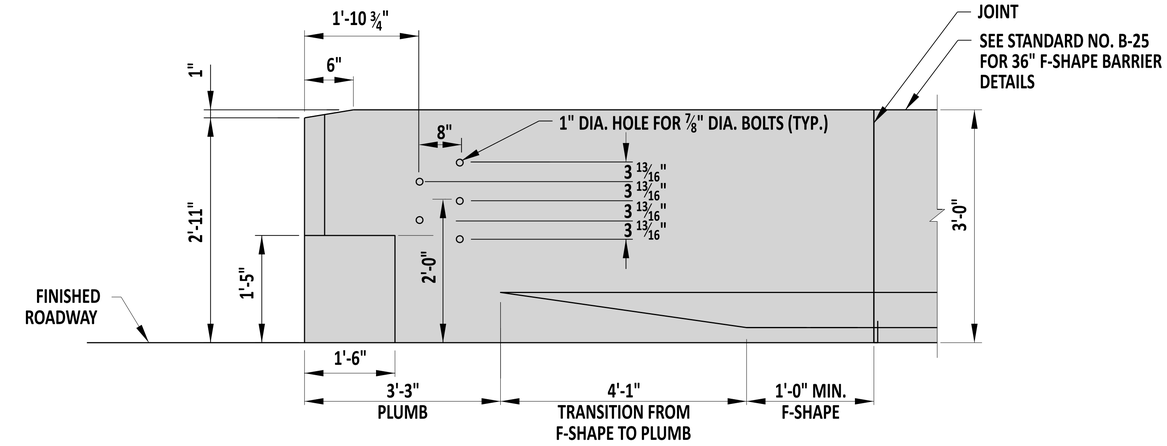
CHAMFER AND LOWER SETBACK DETAIL



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.

TL-4

DelDOT

Andrew Shortt — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

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

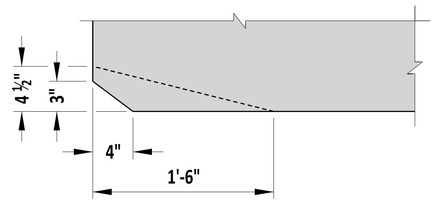
STANDARD NO. B-11 (2024) | SHT. 3 OF 8

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

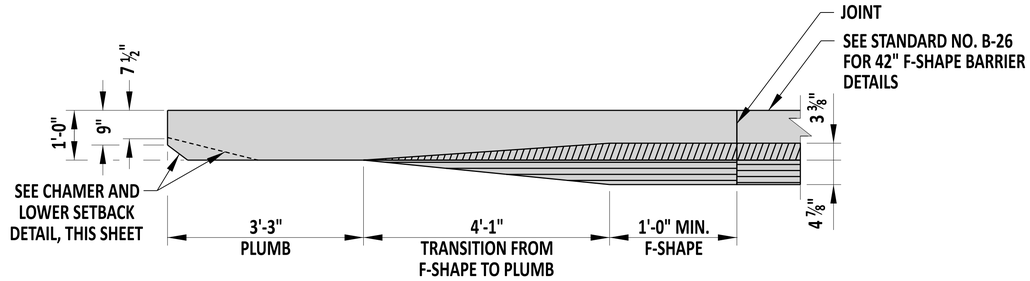
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

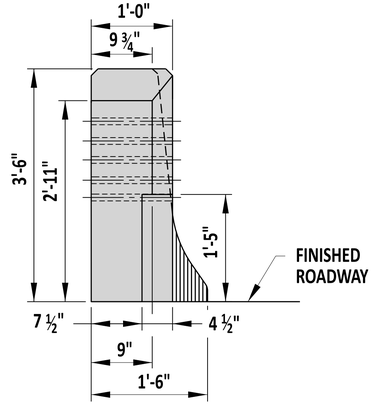
SCALE : NTS



CHAMFER AND LOWER SETBACK DETAIL



PLAN



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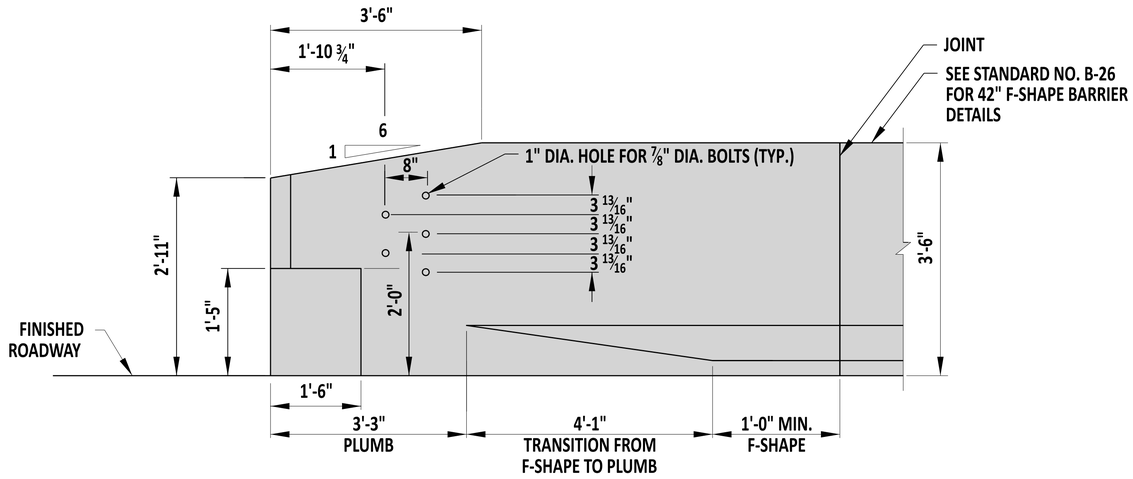


ELEVATION

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.

TL-4

DelDOT

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

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

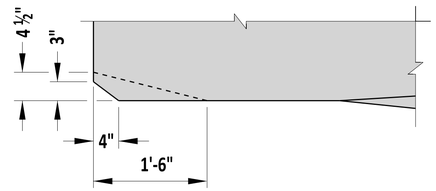
STANDARD NO. B-11 (2024) | SHT. 5 OF 8

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

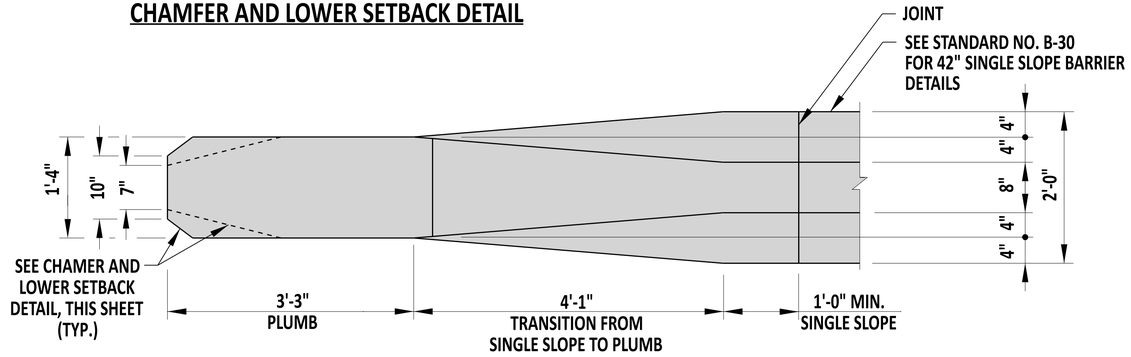
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

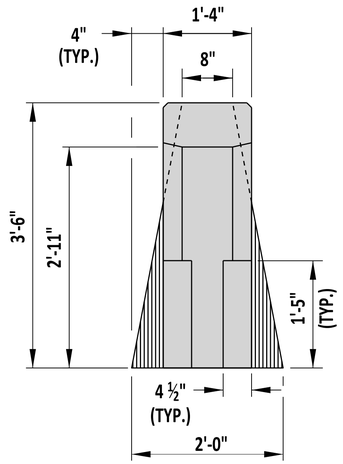
SCALE : NTS



CHAMFER AND LOWER SETBACK DETAIL



PLAN



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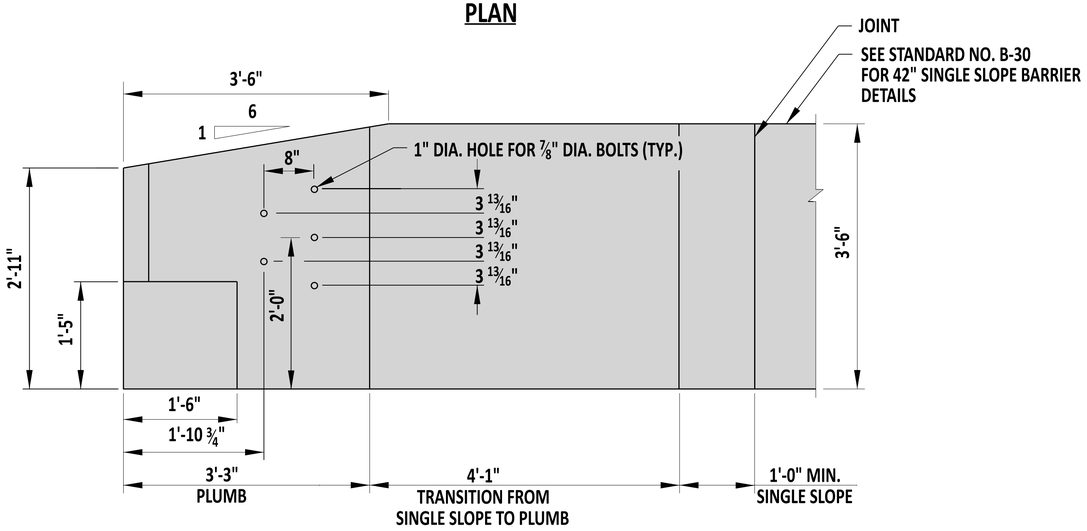


ELEVATION

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.

TL-5

DelDOT

Andrew Shortt — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

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

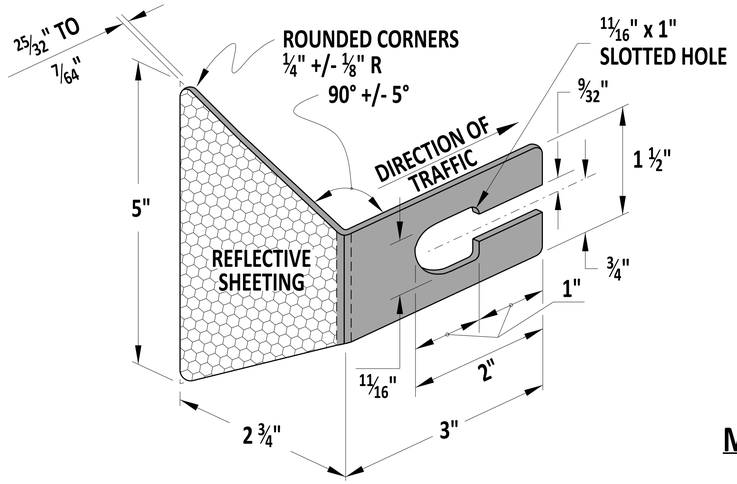
STANDARD NO. B-11 (2024) | SHT. 7 OF 8

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

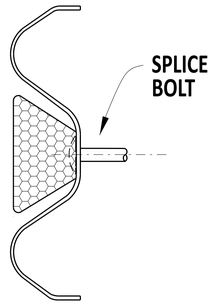
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS



GUARDRAIL REFLECTOR



MOUNTING POSITION

NOTES:

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

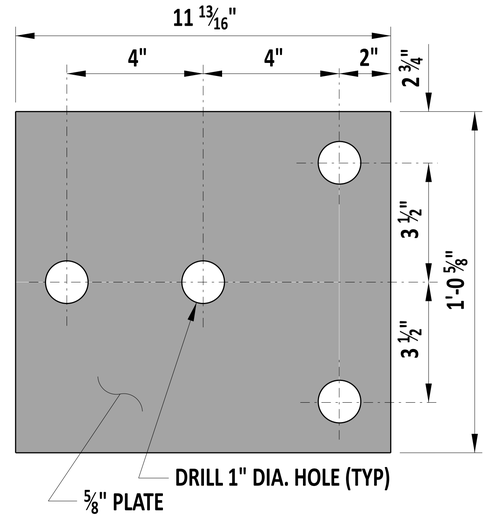
2). DO NOT INSTALL GUARDRAIL REFLECTORS WITHIN THE LIMITS OF GUARDRAIL END TERMINALS OR END ANCHORAGES.

3). SPACE GUARDRAIL REFLECTORS AT A MAXIMUM OF 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.



W-BEAM BEARING PLATE

11

DelDOT

Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

REFLECTOR AND W-BEAM BEARING PLATE

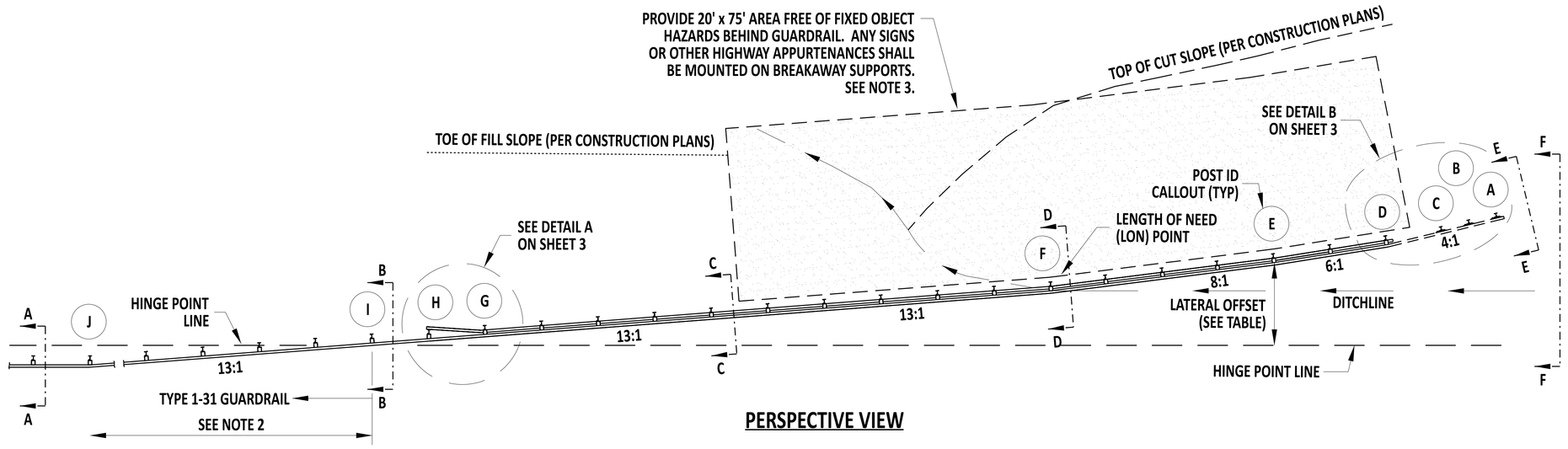
STANDARD NO. B-13 (2024) | SHT. 9 OF 12

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

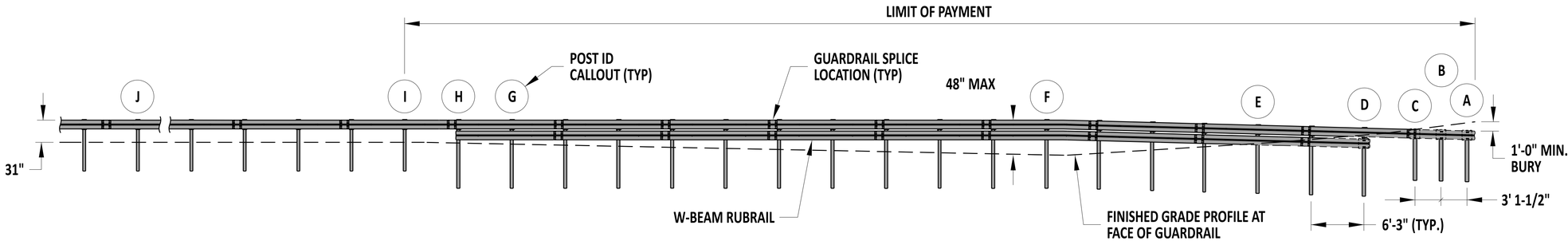
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS



PERSPECTIVE VIEW



ELEVATION

HINGE POINT 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"

*HINGE POINT 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.

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

NOTES:
1). PAY LIMITS FOR BURIED-IN-BACKSLOPE TERMINAL ARE FROM POST A TO POST I.
2). 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.
3). 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.
4). CURB IS NOT PERMITTED WITHIN THE LIMIT OF PAYMENT.
5). 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.

TL-3

DelDOT

Andrew Shoat — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

BURIED IN BACKSLOPE END TERMINAL, TYPE 1-31

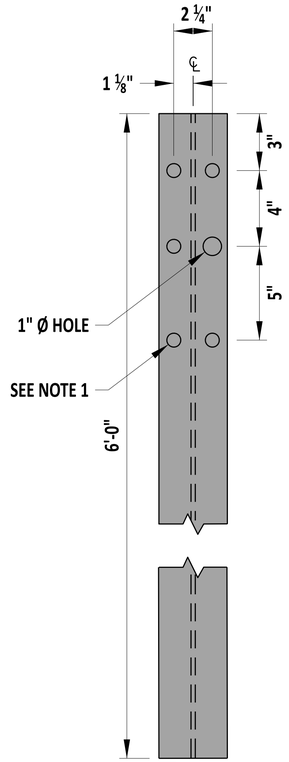
STANDARD NO. B-20 (2024) | SHT. 1 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

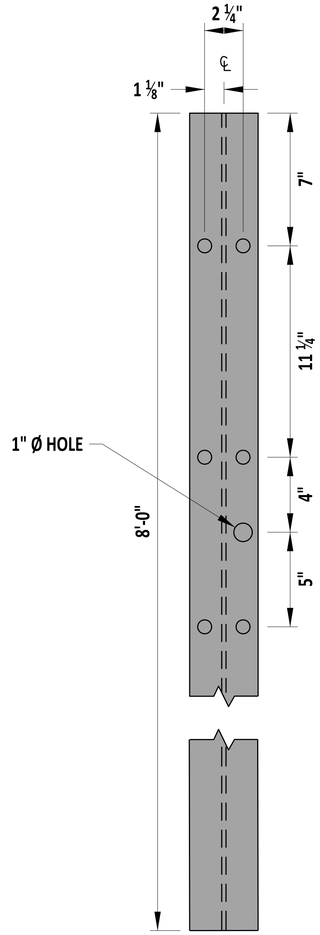
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

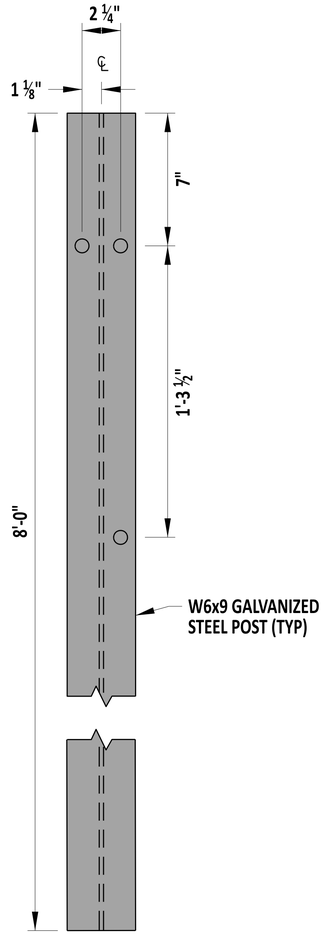
SCALE : NTS



POSTS A-C



POST D



FIRST POST AFTER D
TO POST H

NOTES:
1). ALL POST HOLES ARE ¾" DIAMETER, UNLESS NOTED OTHERWISE.

DelDOT

Andrew Shoot — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

BURIED IN BACKSLOPE END TERMINAL POSTS, TYPE 1-31

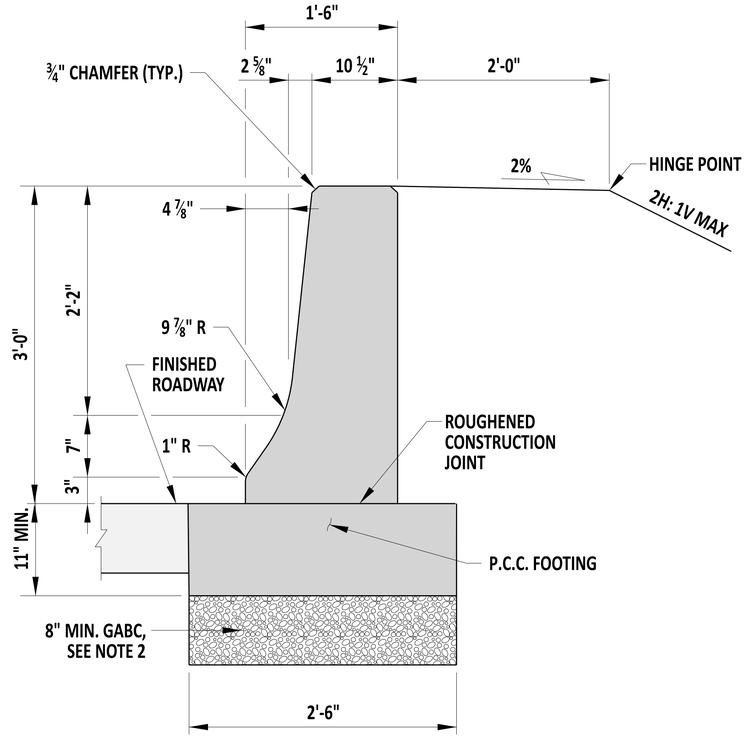
STANDARD NO. B-20 (2024) | SHT. 4 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

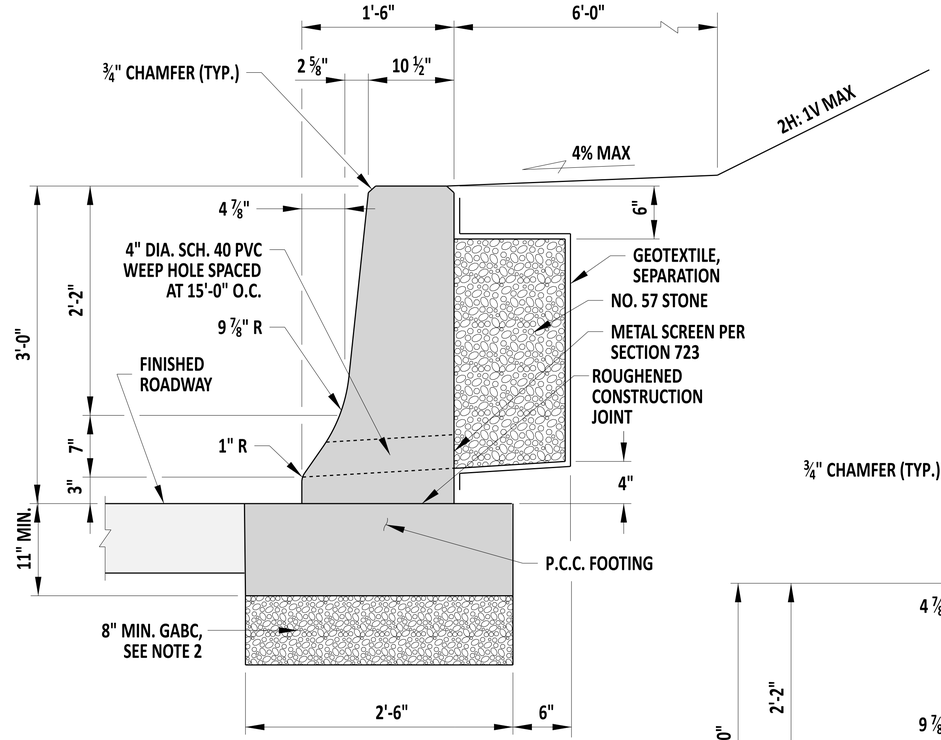
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

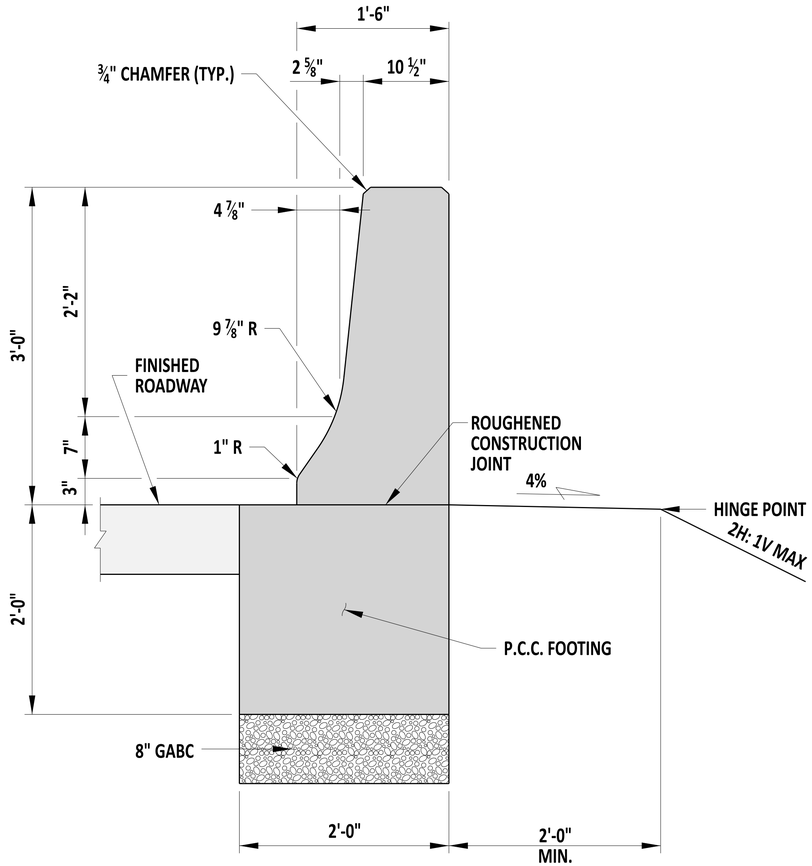
SCALE : NTS



TYPICAL BARRIER APPLICATION - TYPE 1



TYPICAL BARRIER APPLICATION - TYPE 2



TYPICAL BARRIER APPLICATION - TYPE 3

NOTES:
1). CONSTRUCT IN ACCORDANCE WITH SECTION 723.
2). DEPTH OF GABC TO MATCH ROADWAY BASE DEPTH, 8" MINIMUM.

TL-4

DelDOT

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

36" CONCRETE ROADSIDE BARRIER (F-SHAPE)

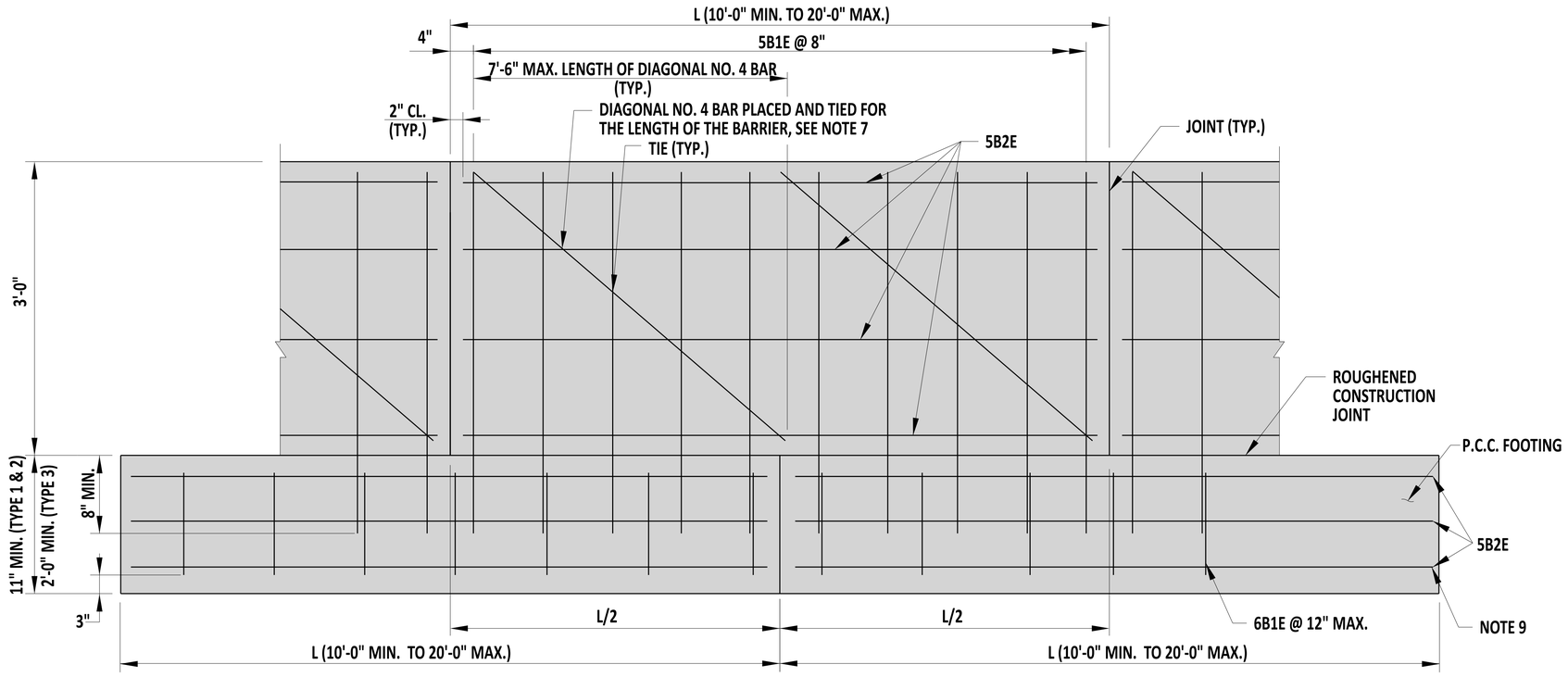
STANDARD NO. B-25 (2024) SHT. 1 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

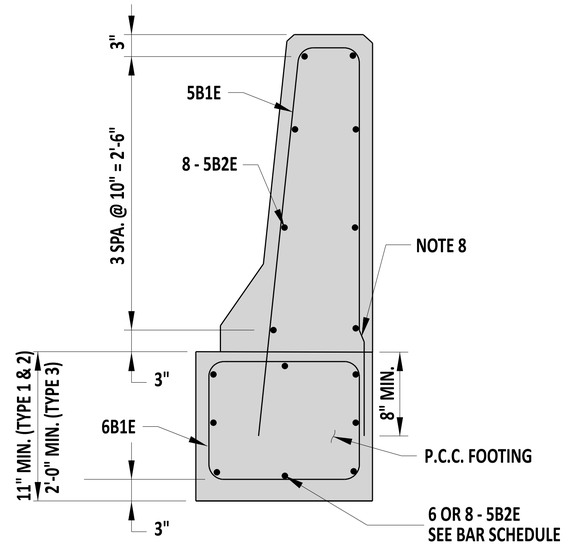
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

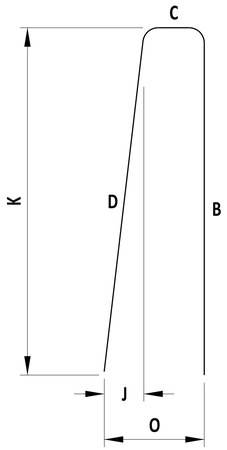
SCALE : NTS



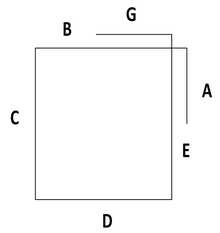
ELEVATION



SECTION - REINFORCEMENT



TYPE T15 BAR



TYPE T2 BAR

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). FOR SLIP-FORM CONSTRUCTION, THE 5B2E BARS SHALL BE PLACED AS ONE CONTINUOUS PIECE. THE BARS SHALL LAP A MINIMUM OF 2'-10 ½".
6). FOR SLIP-FORM CONSTRUCTION, A CONTROL JOINT SHALL BE CUT IN THE BARRIER EVERY 10'-0" AT A MAXIMUM DEPTH OF ½".
7). DIAGONAL NO. 4 BARS ONLY REQUIRED WHEN USING SLIP-FORM CONSTRUCTION. DIAGONAL NO. 4 BARS NOT SHOWN IN SECTION VIEW.
8). REINFORCEMENT BAR OFFSET IS SHOWN FOR CLARITY.
9). SPACE NO. 5 LONGITUDINAL REINFORCEMENT VERTICALLY IN FOOTER AT 12" MAXIMUM ON CENTER, WITH A MINIMUM OF 2 ROWS.

BAR SCHEDULE

MARK	SIZE	NUMBER PER 20' SECTION *	LENGTH *	TYPE	A	B	C	D	E	F	G	J	K	O
5B1E	5	29	7'-5 ½"	T15	-	3'-6"	6 ¾"	3'-6 ¼"	-	-	-	4 ¼"	3'-6"	11"
5B2E	5	13/15**	19'-8"	STR.	-	-	-	-	-	-	-	-	-	-
6B1E	5	20	7'-6"	T2	6"	1'-8"	1'-7"	1'-8"	1'-7"	-	6"	-	-	-

* NUMBER OF 5B1E BARS AND LENGTH OF 5B2E BARS GIVEN FOR 20'-0" SECTIONS.
** NUMBER OF 5B2E BARS VARIES DUE TO VARIANCE IN DEPTH OF FOOTER BASED ON TYPE OF BARRIER. NUMBER AND LENGTH OF BARS SHALL BE ADJUSTED ACCORDINGLY FOR SECTION LENGTHS BETWEEN 10'-0" AND 20'-0".
***6B1E, C AND E DIMENSIONS VARY WITH DEPTH OF FOOTER. DIMENSIONS SHOWN ARE FOR A 2' DEEP FOOTER.

TL-4

DelDOT

Andrew Shortt — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

36" CONCRETE ROADSIDE BARRIER (F-SHAPE)

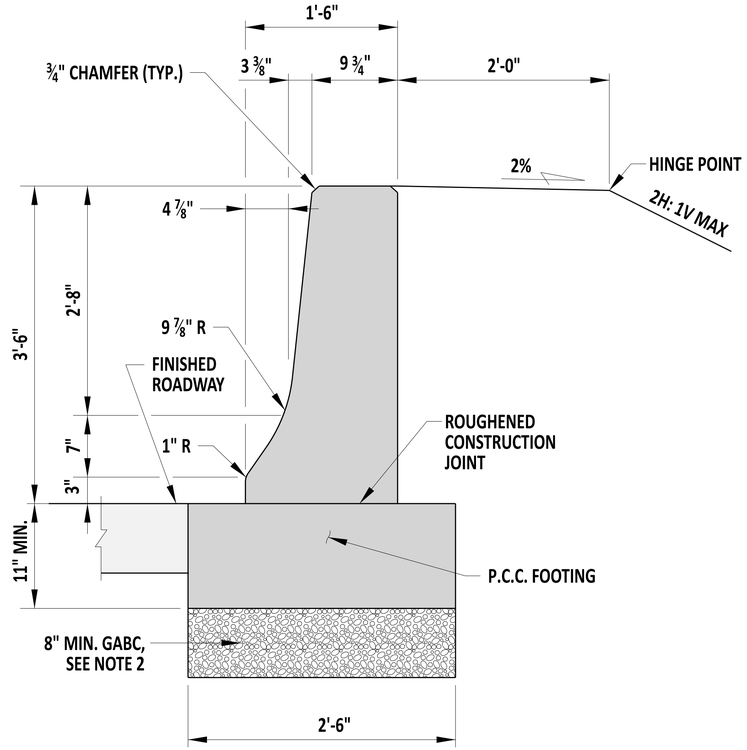
STANDARD NO. B-25 (2024) | SHT. 2 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

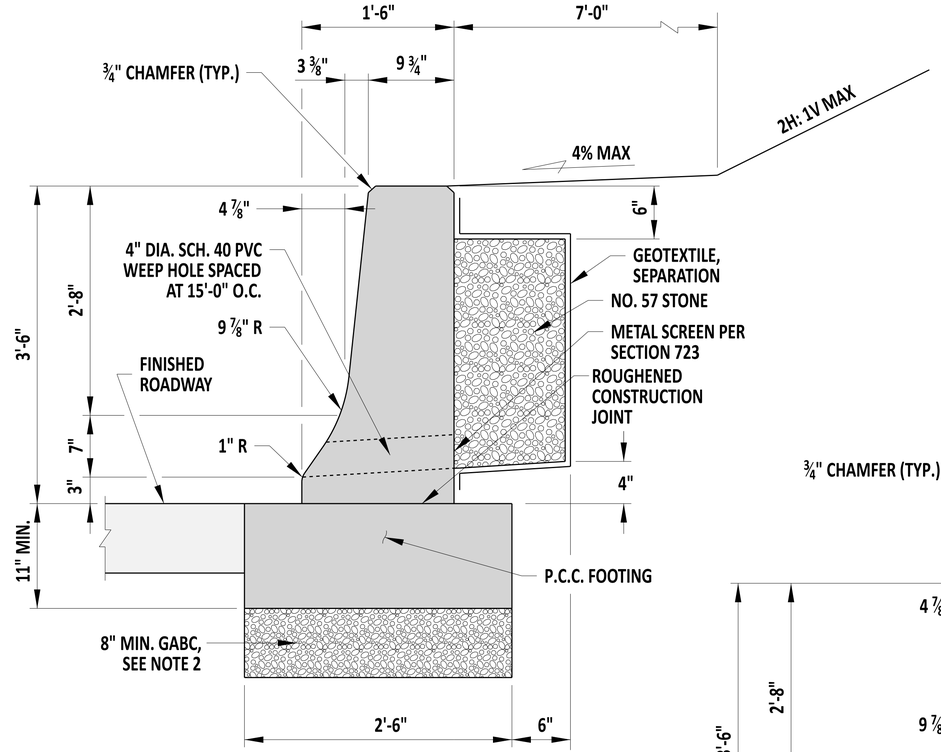
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

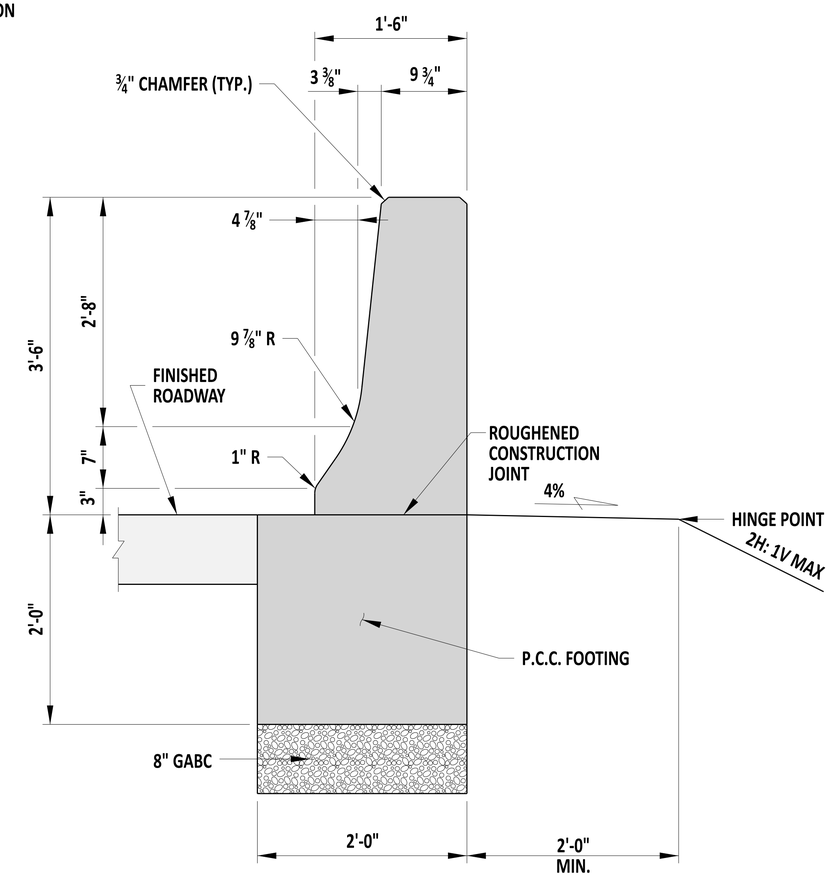
SCALE : NTS



TYPICAL BARRIER APPLICATION - TYPE 1



TYPICAL BARRIER APPLICATION - TYPE 2



TYPICAL BARRIER APPLICATION - TYPE 3

NOTES:
1). CONSTRUCT IN ACCORDANCE WITH SECTION 723.
2). DEPTH OF GABC TO MATCH ROADWAY BASE DEPTH, 8" MINIMUM.

TL-4

DelDOT

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

42" CONCRETE ROADSIDE BARRIER (F-SHAPE)

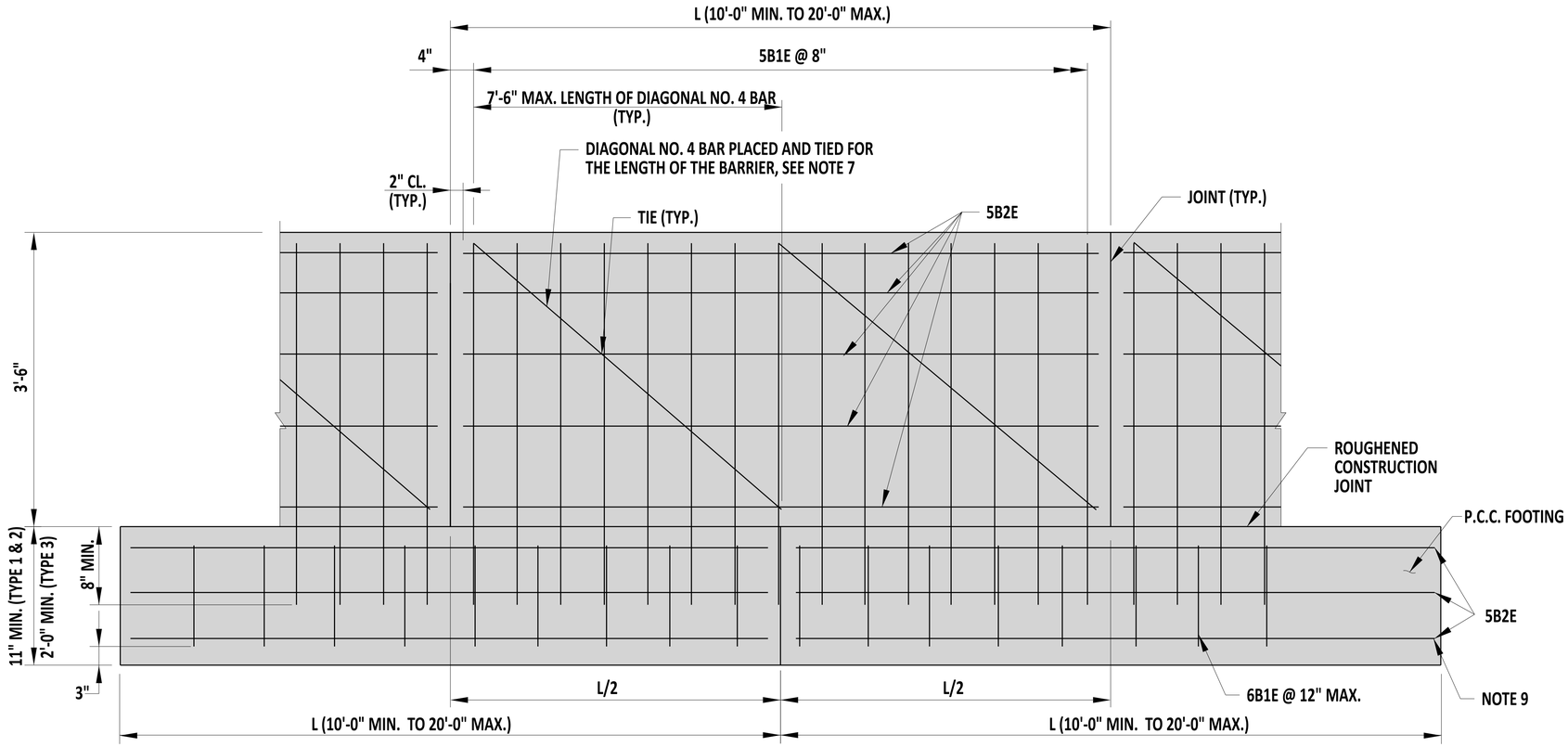
STANDARD NO. B-26 (2024) SHT. 1 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS



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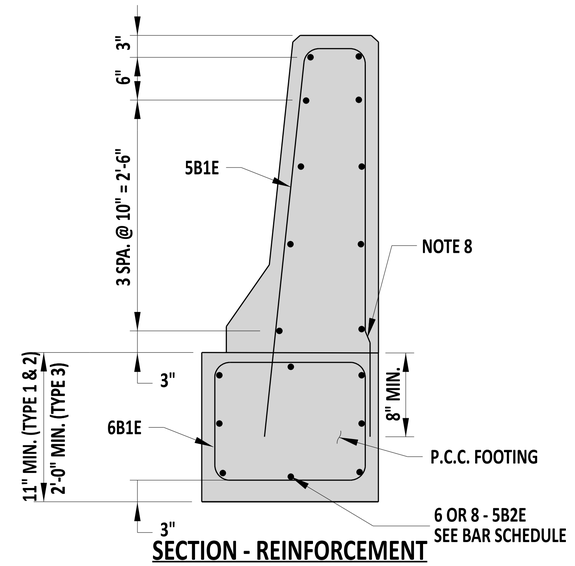
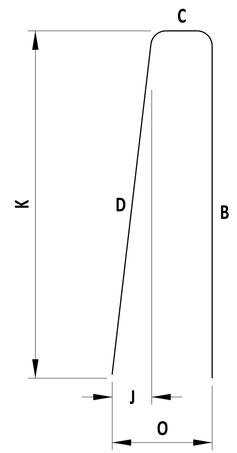
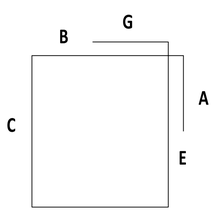


SECTION - REINFORCEMENT



TYPE T15 BAR



TYPE T2 BAR

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). FOR SLIP-FORM CONSTRUCTION, THE 5B2E BARS SHALL BE PLACED AS ONE CONTINUOUS PIECE. THE BARS SHALL LAP A MINIMUM OF 2'-10 ½".
6). FOR SLIP-FORM CONSTRUCTION, A CONTROL JOINT SHALL BE CUT IN THE BARRIER EVERY 10'-0" AT A MAXIMUM DEPTH OF ½".
7). DIAGONAL NO. 4 BARS ONLY REQUIRED WHEN USING SLIP-FORM CONSTRUCTION. DIAGONAL NO. 4 BARS NOT SHOWN IN SECTION VIEW.
8). REINFORCEMENT BAR OFFSET IS SHOWN FOR CLARITY.
9). SPACE NO. 5 LONGITUDINAL REINFORCEMENT VERTICALLY IN FOOTER AT 12" MAXIMUM ON CENTER, WITH A MINIMUM OF 2 ROWS.

BAR SCHEDULE

MARK	SIZE	NUMBER PER 20' SECTION *	LENGTH *	TYPE	A	B	C	D	E	F	G	J	K	O
5B1E	5	29	8'-5 ½"	T15	-	4'-0"	6 ¾"	4'- ¼"	-	-	-	4 ¼"	3'-6"	11"
5B2E	5	13/15**	19'-8"	STR.	-	-	-	-	-	-	-	-	-	-
6B1E	6	20	7'-6"	T2	6"	1'-8"	1'-7"	1'-8"	1'-7"	-	6"	-	-	-

* NUMBER OF 5B1E BARS AND LENGTH OF 5B2E BARS GIVEN FOR 20'-0" SECTIONS.
** NUMBER OF 5B2E BARS VARIES DUE TO VARIANCE IN DEPTH OF FOOTER BASED ON TYPE OF BARRIER. NUMBER AND LENGTH OF BARS SHALL BE ADJUSTED ACCORDINGLY FOR SECTION LENGTHS BETWEEN 10'-0" AND 20'-0".
***6B1E, C AND E DIMENSIONS VARY WITH DEPTH OF FOOTER. DIMENSIONS SHOWN ARE FOR A 2' DEEP FOOTER.

TL-4

DelDOT

Andrew Shoot — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

42" CONCRETE ROADSIDE BARRIER (F-SHAPE)

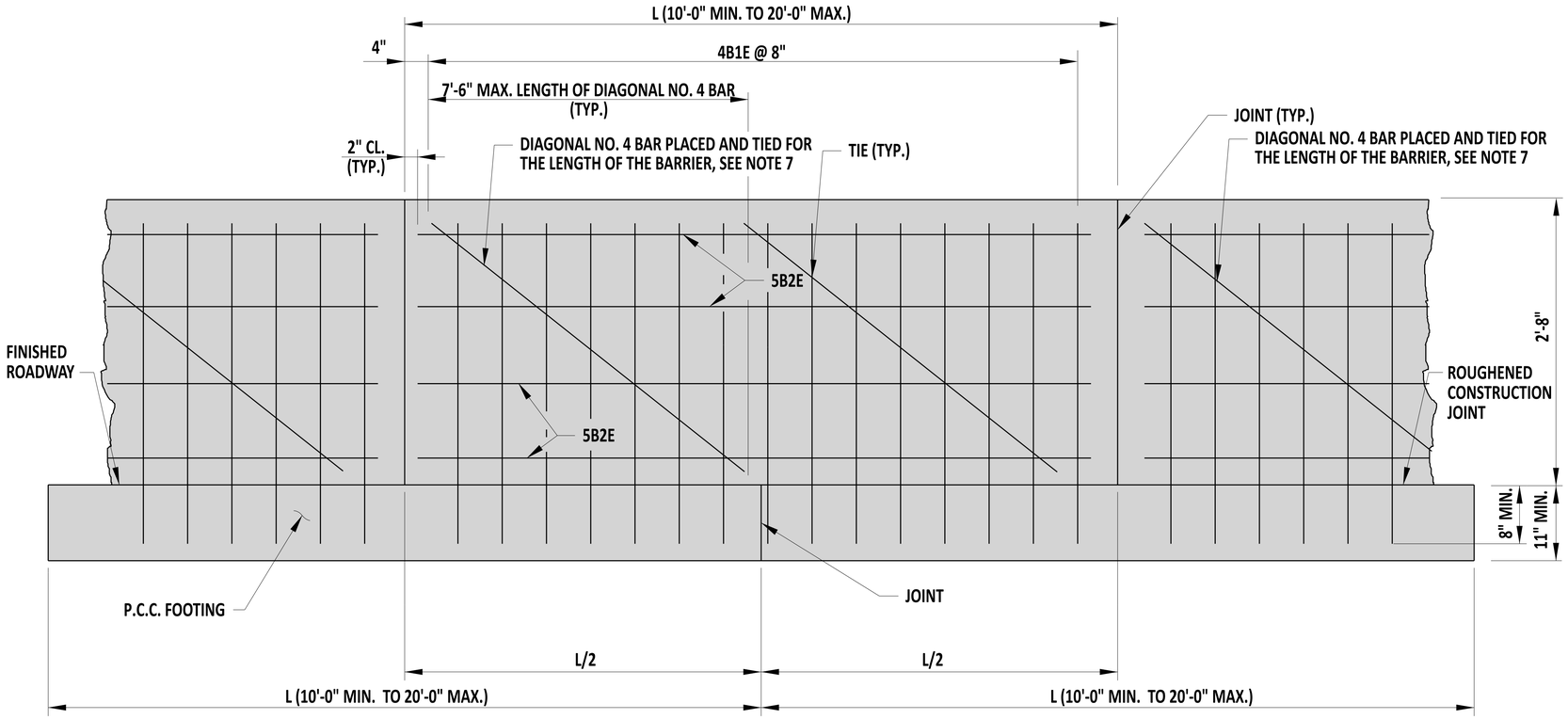
STANDARD NO. B-26 (2024) | SHT. 2 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

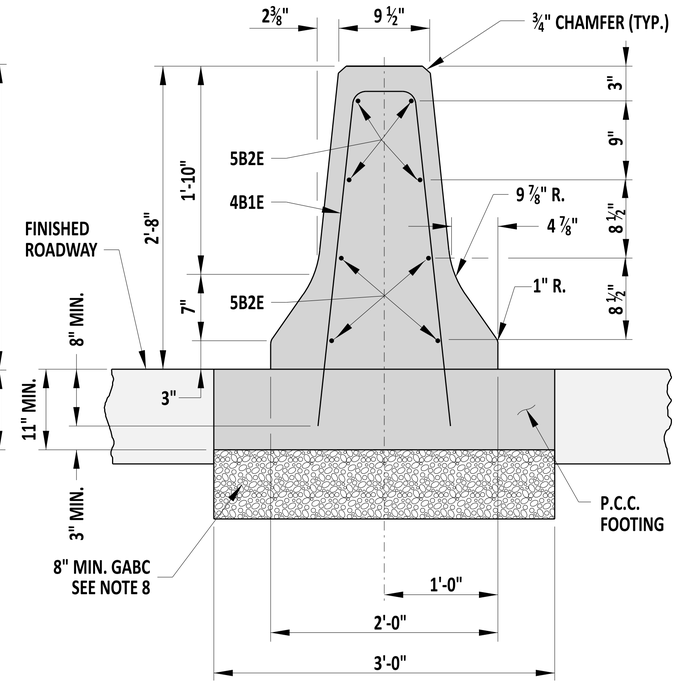
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS



ELEVATION



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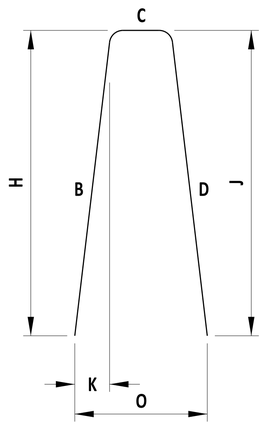


TYPE DE10 BAR

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). FOR SLIP-FORM CONSTRUCTION, THE 5B2E BARS SHALL BE PLACED AS ONE CONTINUOUS PIECE. THE BARS SHALL LAP A MINIMUM OF 2'-10 ½".
6). FOR SLIP-FORM CONSTRUCTION, A CONTROL JOINT SHALL BE CUT IN THE BARRIER EVERY 10'-0" AT A MAXIMUM DEPTH OF ½"
7). DIAGONAL NO. 4 BARS ONLY REQUIRED WHEN USING SLIP-FORM CONSTRUCTION. DIAGONAL NO. 4 BARS NOT SHOWN IN SECTION VIEW.
8). 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

Andrew Shoot — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

32" CONCRETE MEDIAN BARRIER (F-SHAPE)

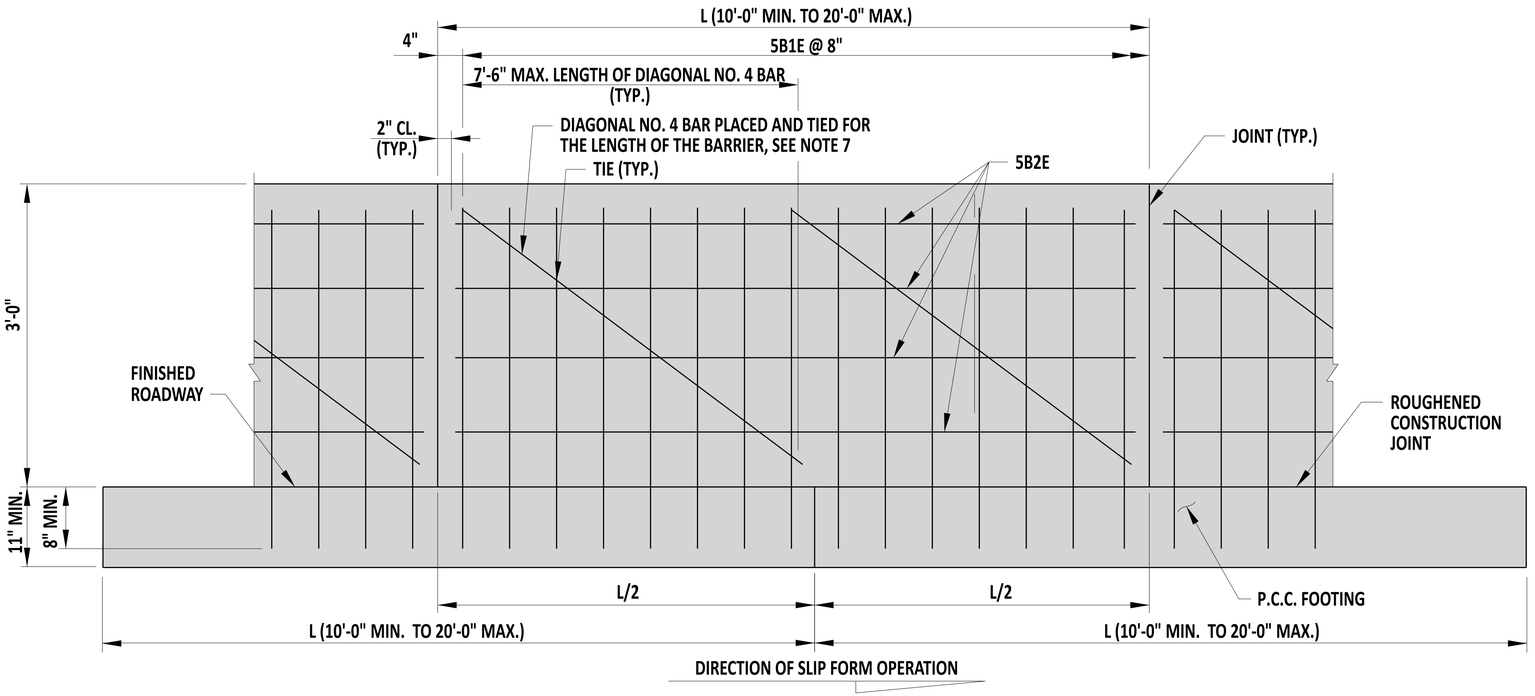
STANDARD NO. B-27 (2024) SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

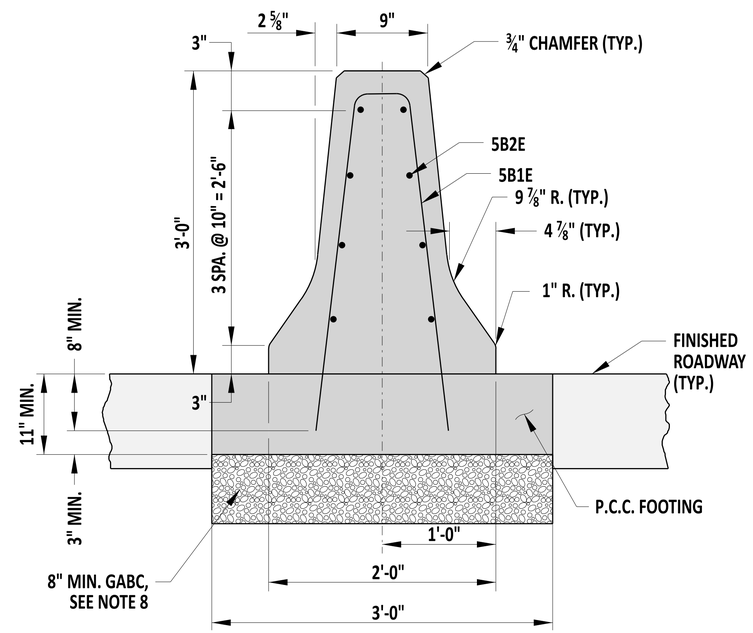
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS



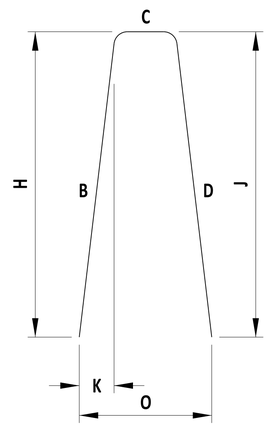
ELEVATION



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 1/8" WIDE AND 1/2" 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 3/4" APART AND THE OPENING FILLED, FOR THE ENTIRE LENGTH AND DEPTH OF THE JOINT WITH 3/4" PREFORMED JOINT FILLER WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 1042 OF THE STANDARD SPECIFICATIONS. THE FILLER SHALL BE RECESSED 1/4" IN FROM THE SIDES AND TOP OF THE BARRIER.
5). FOR SLIP-FORM CONSTRUCTION, THE 5B2E BARS SHALL BE PLACED AS ONE CONTINUOUS PIECE. THE BARS SHALL LAP A MINIMUM OF 2'-10 1/2".
6). FOR SLIP-FORM CONSTRUCTION, A CONTROL JOINT SHALL BE CUT IN THE BARRIER EVERY 10'-0" AT A MAXIMUM DEPTH OF 1/2".
7). DIAGONAL NO. 4 BARS ONLY REQUIRED WHEN USING SLIP-FORM CONSTRUCTION. DIAGONAL NO. 4 BARS NOT SHOWN IN SECTION VIEW.
8). 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 1/2"	DE10	3'-6 1/4"	5 1/4"	3'-6 1/4"	3'-6"	3'-6"	4 1/4"	1'-1 3/4"
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

Andrew Shoat — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

36" CONCRETE MEDIAN BARRIER (F - SHAPE)

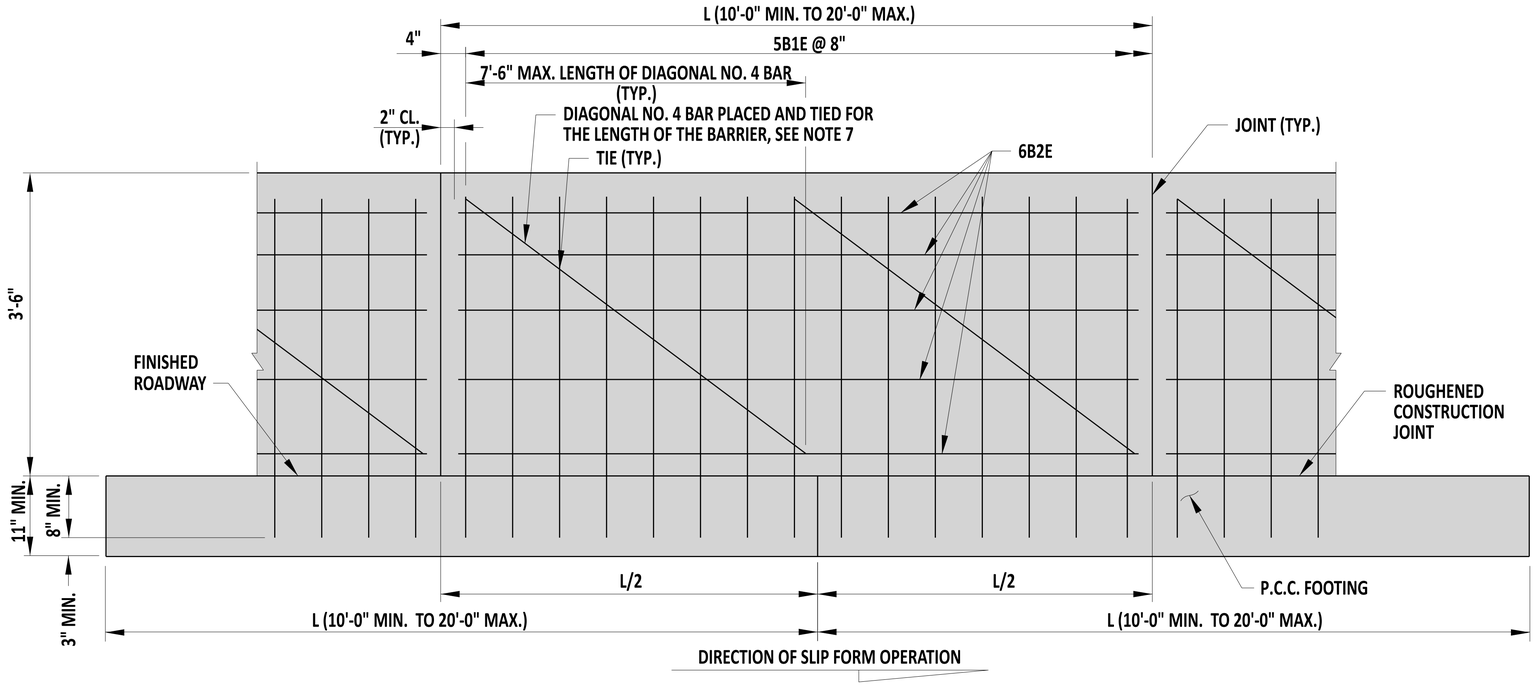
STANDARD NO. B-28 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS



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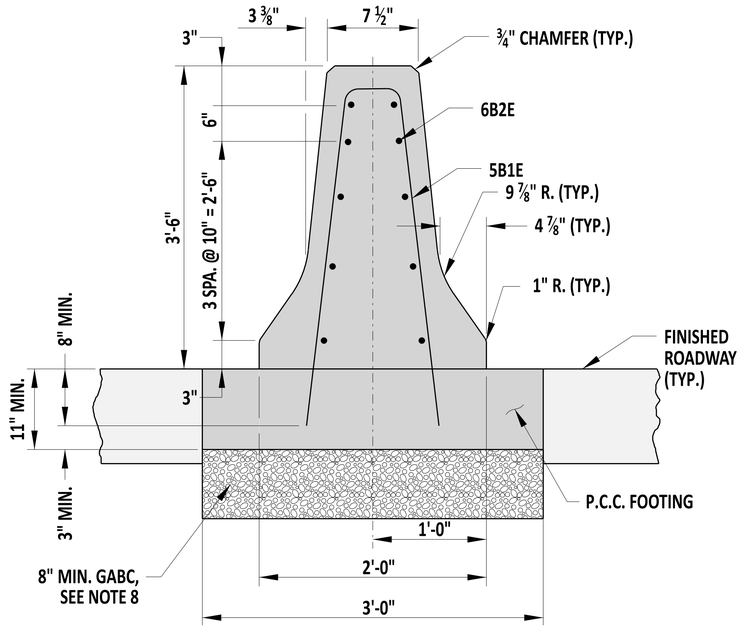

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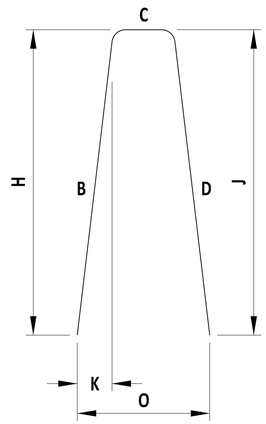


TYPE DE10 BAR

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). FOR SLIP-FORM CONSTRUCTION, THE 6B2E BARS SHALL BE PLACED AS ONE CONTINUOUS PIECE. THE BARS SHALL LAP A MINIMUM OF 3'-9".
6). FOR SLIP-FORM CONSTRUCTION, A CONTROL JOINT SHALL BE CUT IN THE BARRIER EVERY 10'-0" AT A MAXIMUM DEPTH OF ½".
7). DIAGONAL NO. 4 BARS ONLY REQUIRED WHEN USING SLIP-FORM CONSTRUCTION. DIAGONAL NO. 4 BARS NOT SHOWN IN SECTION VIEW.
8). 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

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

42" CONCRETE MEDIAN BARRIER (F - SHAPE)

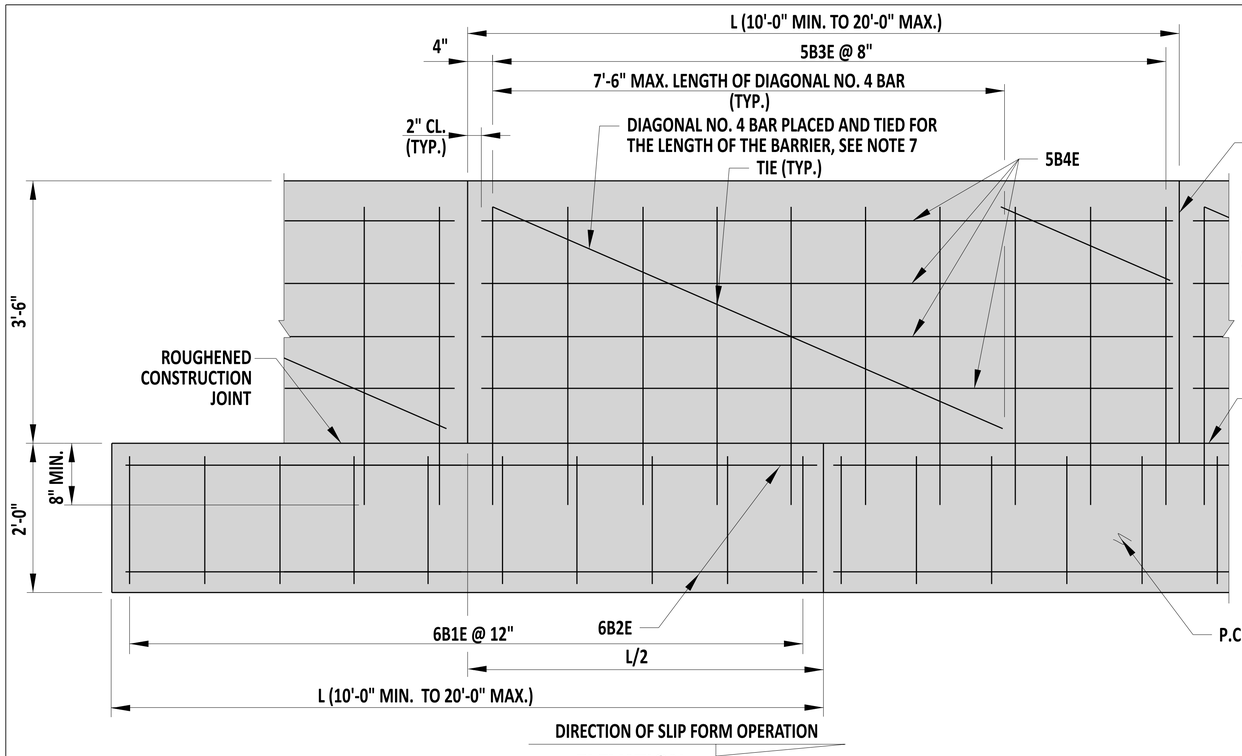
STANDARD NO. B-29 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS



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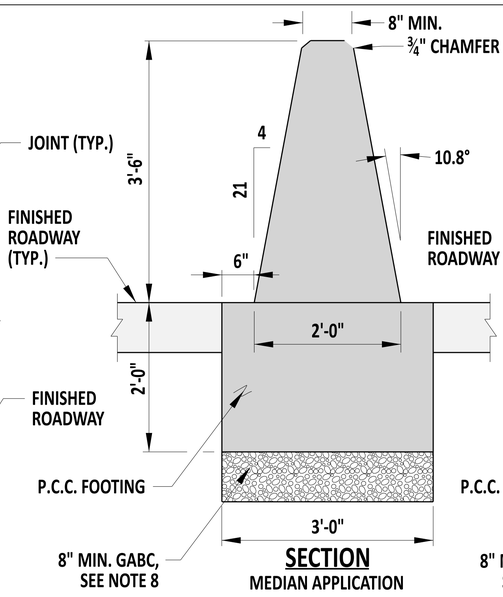
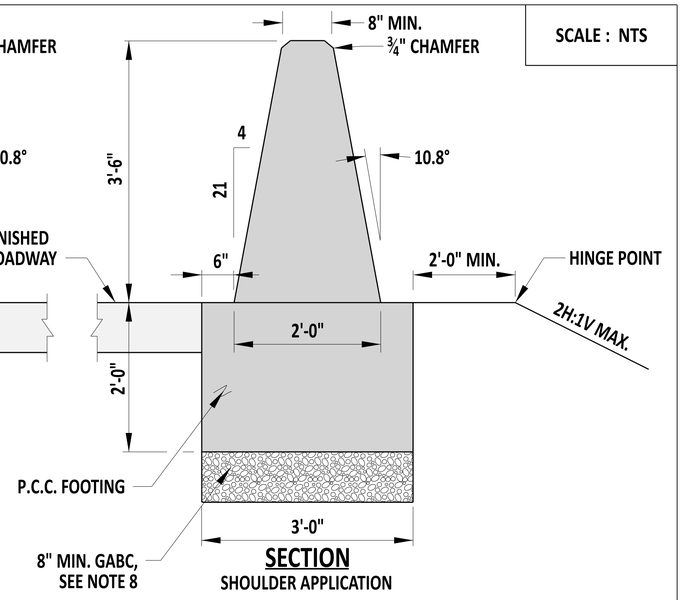
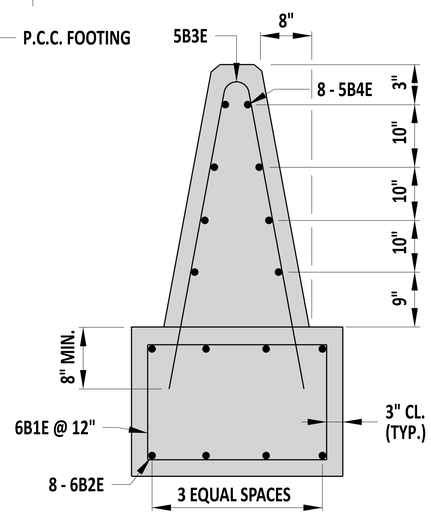


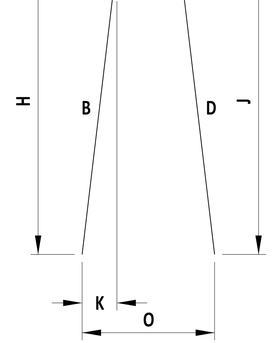
SECTION
MEDIAN APPLICATION



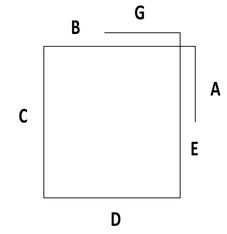
SECTION
SHOULDER APPLICATION



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). 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.
6). FOR SLIP-FORM CONSTRUCTION, A CONTROL JOINT SHALL BE CUT IN THE BARRIER EVERY 10'-0" AT A MAXIMUM DEPTH OF ½".
7). DIAGONAL NO. 4 BARS ONLY REQUIRED WHEN USING SLIP-FORM CONSTRUCTION. DIAGONAL NO. 4 BARS NOT SHOWN IN SECTION VIEW.
8). DEPTH OF GABC TO MATCH ROADWAY BASE, 8" MINIMUM.
9). 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".

TL-5

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Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

42" CONCRETE MEDIAN BARRIER (SINGLE SLOPE)

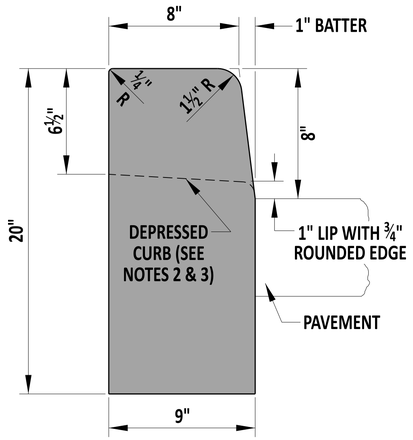
STANDARD NO. B-30 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

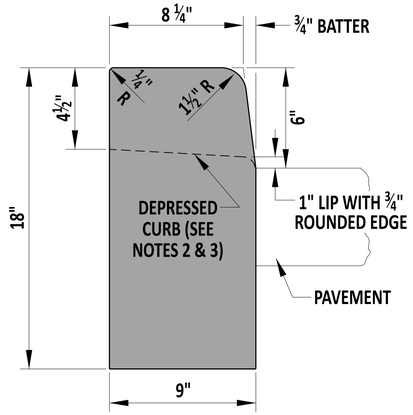
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

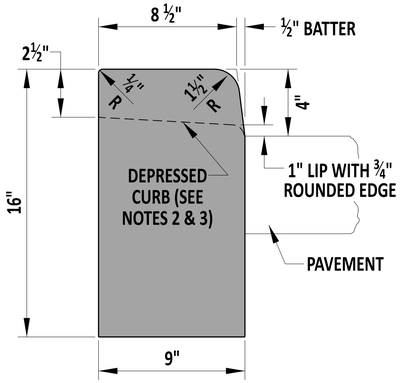
SCALE : NTS



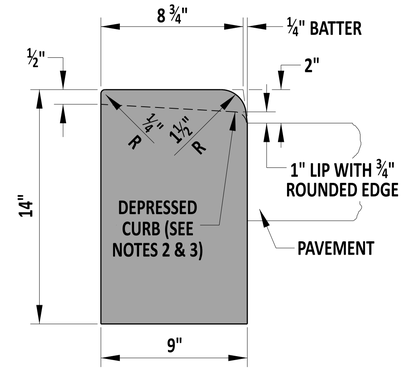
PCC CURB
TYPE 1-8



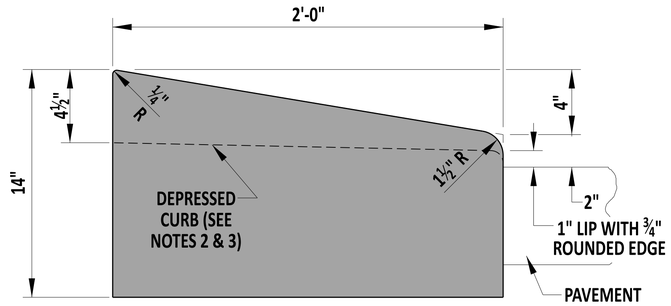
PCC CURB
TYPE 1-6



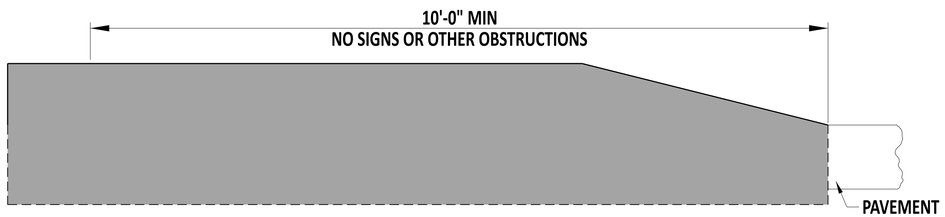
PCC CURB
TYPE 1-4



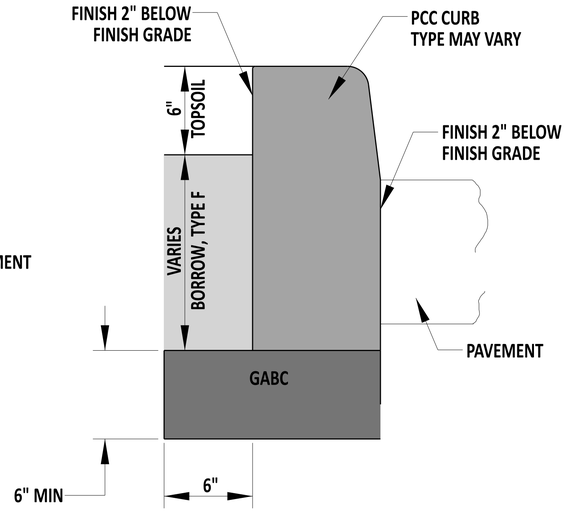
PCC CURB
TYPE 1-2



PCC CURB
TYPE 2



TYPICAL TAPER SECTION AT NOSE OF MEDIANS



TYPICAL PCC CURB SECTION

NOTES:

1). CONSTRUCT IN ACCORDANCE WITH SECTION 701.
2). 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.
3). THE DEPRESSED CURB DIMENSIONS (INCLUDING 1" LIP) ON THIS SHEET ARE FOR USE AT ENTRANCES ONLY. FOR CURB DEPRESSIONS AT PEDESTRIAN CONNECTION, SEE DETAIL C-1, SHEET 3.
4). DEPRESS CURB FLUSH WITH PAVEMENT OR ADJACENT AREA TO ALL CORNER RADII OF TRIANGULAR ISLANDS AND MEDIANS, 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.

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Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

PCC CURB, TYPICAL CURB SECTION, AND TYPICAL TAPER SECTION AT NOSE OF MEDIANS

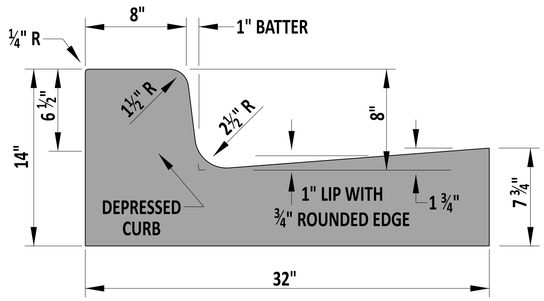
STANDARD NO. C-1 (2024) **SHT.** 1 **OF** 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

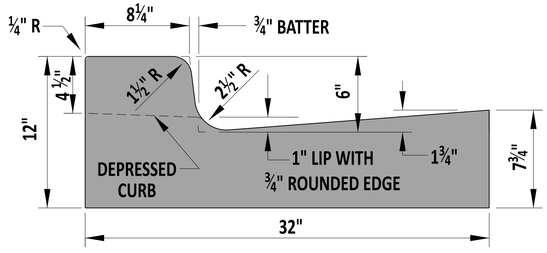
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

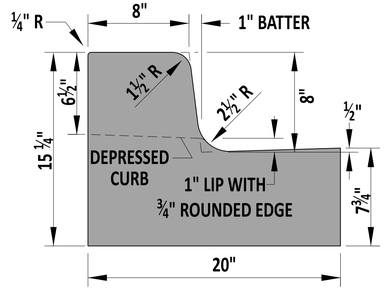
SCALE : NTS



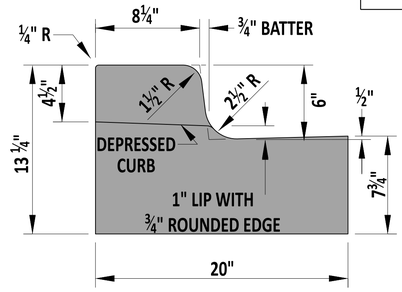
INTEGRAL PCC CURB AND GUTTER
TYPE 1-8



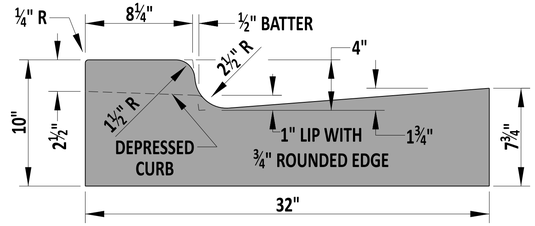
INTEGRAL PCC CURB AND GUTTER
TYPE 1-6



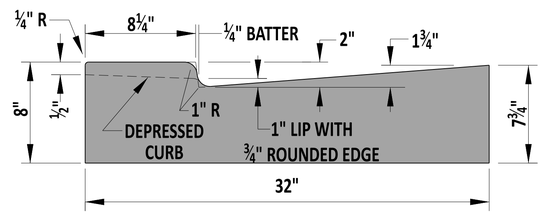
INTEGRAL PCC CURB AND GUTTER
TYPE 3-8



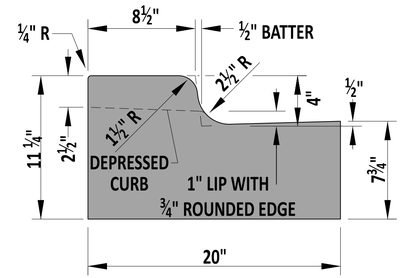
INTEGRAL PCC CURB AND GUTTER
TYPE 3-6



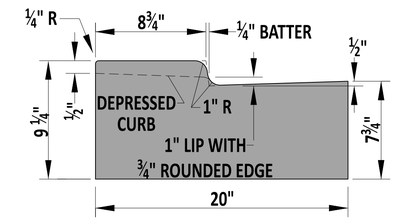
INTEGRAL PCC CURB AND GUTTER
TYPE 1-4



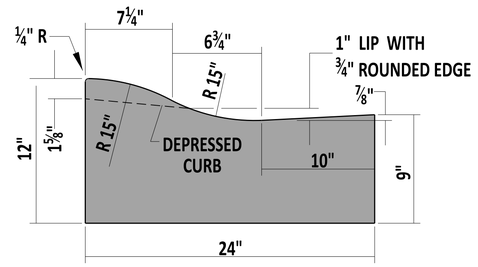
INTEGRAL PCC CURB AND GUTTER
TYPE 1-2



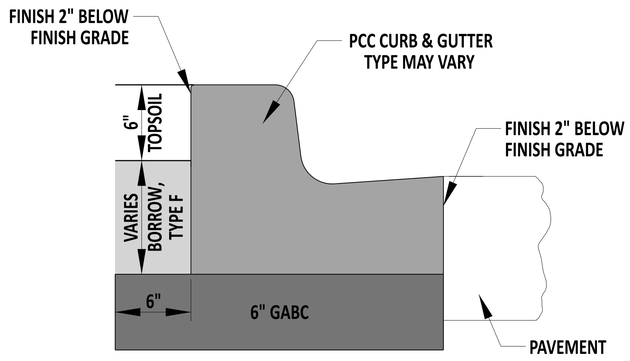
INTEGRAL PCC CURB AND GUTTER
TYPE 3-4



INTEGRAL PCC CURB AND GUTTER
TYPE 3-2



INTEGRAL PCC CURB AND GUTTER
TYPE 2



TYPICAL PCC CURB AND GUTTER SECTION

NOTES:

1). CONSTRUCT IN ACCORDANCE WITH SECTION 701.
2). 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.
3). THE DEPRESSED CURB DIMENSIONS (INCLUDING 1" LIP) ON THIS SHEET ARE FOR USE AT ENTRANCES ONLY. FOR CURB DIMENSIONS AT PEDESTRIAN CONNECTION, SEE DETAIL C-1, SHEET 3.
4). DIMENSIONS FOR CURB AND GUTTER BATTER AND PAN ARE MEASURED TO THE HINGE POINT.
5). 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 DETAIL C-1, SHEET 1 OF 4 FOR TYPICAL SECTION OF TAPER AT NOSE OF MEDIAN ISLANDS.
6). DEPRESS END OF CURB RUNS NOT PART OF AN ISLAND OR MEDIAN FLUSH WITH PAVEMENT OR ADJACENT AREA AT A SLOPE OF 12:1.

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Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

INTEGRAL PCC CURB & GUTTER

STANDARD NO. C-1 (2024) | SHT. 2 OF 4

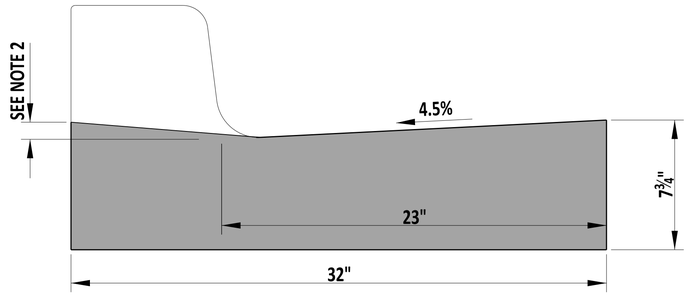
REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

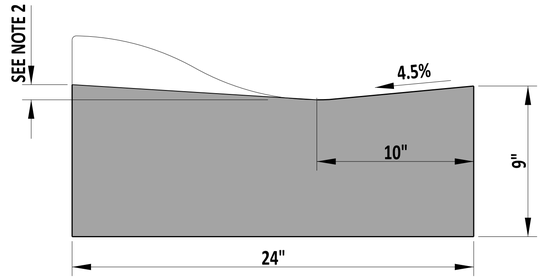
22-DEC-2023

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

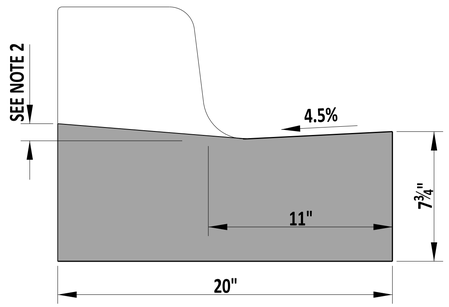
SCALE : NTS



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.
3). WHEN ROADWAY GEOMETRY DEVELOPS SHEET FLOW AWAY FROM THE INTEGRAL PCC CURB AND GUTTER, TRANSITION THE GUTTER TO A 4.5% SLOPE TOWARDS THE ROADWAY. PROVIDE AN ADEQUATE TRANSITION LENGTH TO PROVIDE POSITIVE DRAINAGE.
4). SEE TYPICAL CURB AND GUTTER SECTION DETAIL ON DETAIL C-1, SHEET 2 FOR PLACEMENT OF GABC UNDER CURB AND GUTTER.
5). IN ORDER TO MEET A 0.003 FT/FT MINIMUM LONGITUDINAL SLOPE, PROVIDE UPSTREAM GUTTER PAN TRANSITION LENGTHS IN ACCORDANCE WITH THE FOLLOWING TABLES.

INTEGRAL PCC CURB AND GUTTER TYPE 3

LONGITUDINAL SLOPE (FT/FT)	*TRANSITION LENGTH REQUIRED TO MEET 0.003 MIN SLOPE*
0.003	**N/A*
0.004	*25*
0.005 OR MORE	*15*

*TRANSITION NON ADA COMPLIANT PCC CURB AND GUTTER PAN SLOPES OVER 15 FEET WHEN LOGITUDINAL SLOPE IS LESS THAN 0.004 FT/FT.

INTEGRAL PCC CURB AND GUTTER TYPE 1

LONGITUDINAL SLOPE (FT/FT)	*TRANSITION LENGTH REQUIRED TO MEET 0.003 MIN SLOPE*
0.003	**N/A*
0.004	*65*
0.005	*35*
0.006	*25*
0.007	*20*
0.008 OR MORE	*15*

*TRANSITION NON ADA COMPLIANT PCC CURB AND GUTTER PAN SLOPES OVER 15 FEET WHEN LOGITUDINAL SLOPE IS LESS THAN 0.004 FT/FT.

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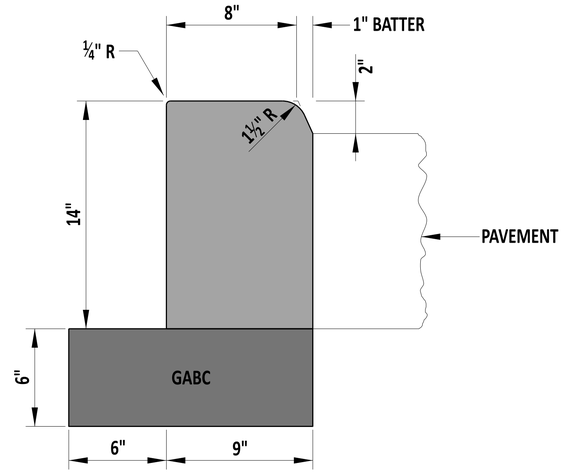
Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

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

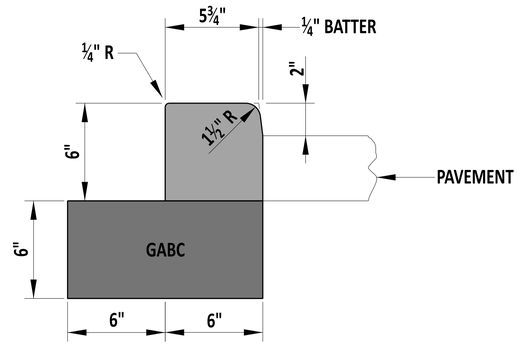
STANDARD NO. C-1 (2024) | SHT. 3 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

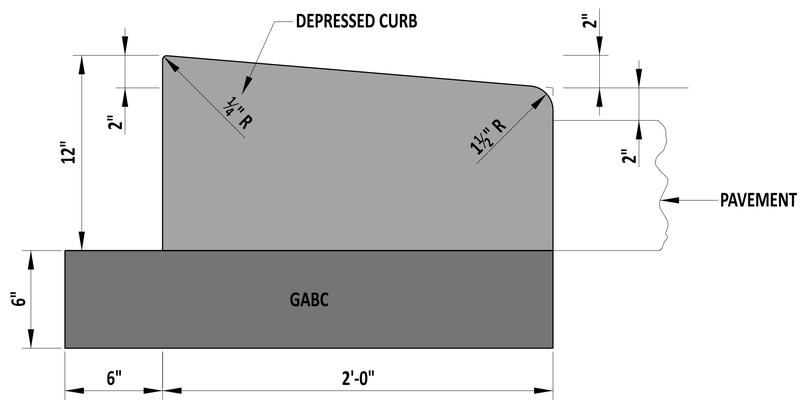
SCALE : NTS



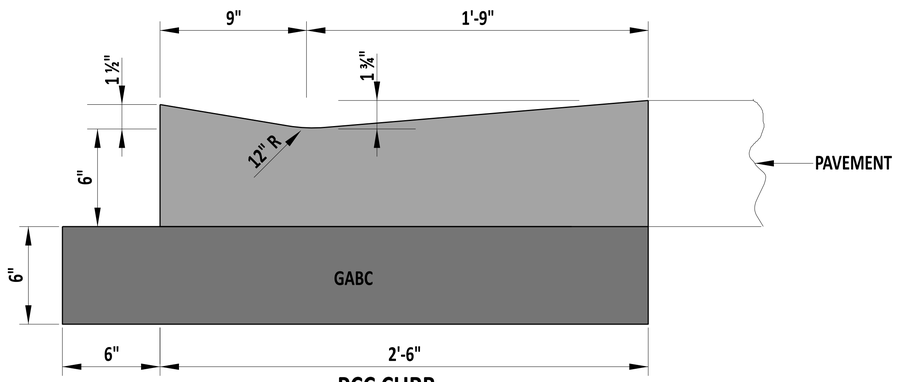
PCC CURB
TYPE 1-2 ROUNDABOUT



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



PCC CURB
TYPE 2 ROUNDABOUT



PCC CURB
LAYDOWN CURB FOR GUARDRAIL
INSTALL JOINTS AT 5'.

DelDOT

Andrew Shortt — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

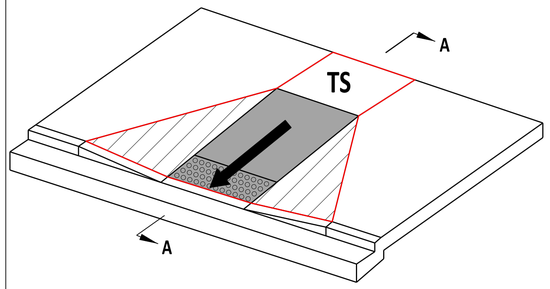
PCC ROUNDABOUT AND GUARDRAIL CURB

STANDARD NO. C-1 (2024) | SHT. 4 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

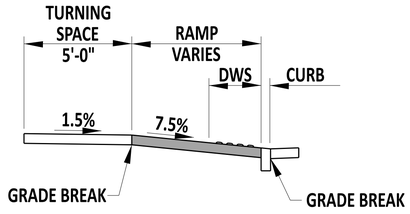
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

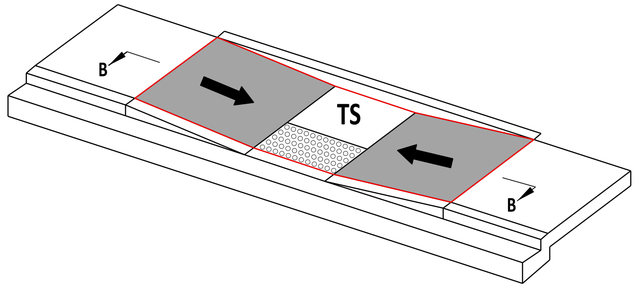


PERPENDICULAR CURB RAMP

SEE SHEET 2 AND 3 FOR LAYOUT ALTERNATIVES

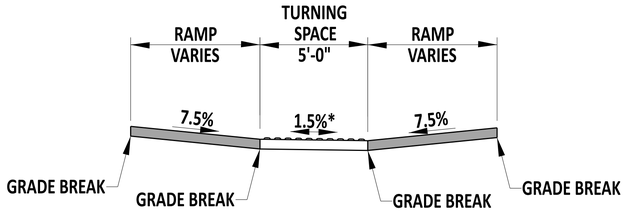


SECTION A-A



PARALLEL CURB RAMP

SEE SHEET 4 FOR LAYOUT ALTERNATIVES



SECTION B-B

*SEE NOTE 3

LEGEND

TS — TURNING SPACE	TRIANGULAR AREA
RAMP	DETECTABLE WARNING SURFACE
BLENDED TRANSITION	FLARED SIDE
CROSSWALK STRIPING	LIMIT OF 6" MIN. SIDEWALK OVER 6" GABC
BUFFER OR OTHER NON-WALKABLE SURFACE	

SCALE : NTS

REQUIRED ELEMENT DIMENSIONS AND CRITERIA (APPLIES TO ALL SHEETS OF STANDARD C-2)				
PEDESTRIAN CONNECTION ELEMENT	CRITERIA	LIMITS FOR DESIGN AND LAYOUT	LIMITS FOR WORK ACCEPTANCE	RELATED NOTES
RAMP	WIDTH	5'-0" MIN.	5'-0" MIN.	SEE NOTE 6
	RUNNING SLOPE	7.5%	8.3% MAX.	SEE NOTE 1
	CROSS SLOPE	1.5%	2.0% MAX.	SEE NOTE 3
	SLOPE OF FLARED SIDE	9.5%	10.0% MAX.	SEE NOTE 10
TURNING SPACE	DIMENSION	5'-0" X 5'-0" MIN.	5'-0" X 5'-0" MIN.	SEE NOTE 6
	RUNNING SLOPE	1.5%	2.0% MAX.	
	CROSS SLOPE	1.5%	2.0% MAX.	SEE NOTE 3
BLENDED TRANSITION	RUNNING SLOPE	4.5%	5.0 MAX.	
	CROSS SLOPE	1.5%	2.0% MAX.	SEE NOTE 3
TRIANGULAR AREA	RUNNING SLOPE	1.5%	5.0% MAX.	
	CROSS SLOPE	1.5%	2.0% MAX.	SEE NOTE 3
CLEAR SPACE	DIMENSION	4'-0" X 4'-0"	4'-0" X 4'-0"	SEE NOTE 12

* CROSS SLOPE IS MEASURED PERPENDICULAR TO THE PRIMARY DIRECTION OF PEDESTRIAN TRAVEL.

** RUNNING SLOPE IS MEASURED PARALLEL TO THE PRIMARY DIRECTION OF PEDESTRIAN TRAVEL.

*** ALL SLOPES ARE MEASURED WITH RESPECT TO A LEVEL PLANE.

GENERAL PEDESTRIAN CONNECTION NOTES:

1). TO AVOID CHASING GRADE INDEFINITELY ON STEEP ROADWAYS, RAMP LENGTH IS NOT REQUIRED TO EXCEED 15'-0" REGARDLESS OF THE RESULTING RAMP RUNNING SLOPE.

2). ALL JOINTS AND GRADE BREAKS ARE TO BE CONSTRUCTED FLUSH.

3). TO CREATE A FLUSH TRANSITION TO THE STREET, THE CROSS SLOPE OF THE INDICATED ELEMENTS MAY EXCEED THE REQUIRED 2.0% MAXIMUM CROSS SLOPE. THE ELEMENT PERMITTED TO EXCEED THE 2.0% MAXIMUM VARIES BY PEDESTRIAN CONNECTION TYPE. SEE THE CURRENT PEDESTRIAN ACCESSIBILITY STANDARDS MANUAL FOR ADDITIONAL INFORMATION ABOUT WHICH ELEMENTS MAY BE PERMITTED TO EXCEED THE 2.0% MAXIMUM. IN ALL CASES, THE CROSS SLOPE OF THE ELEMENT PERMITTED TO EXCEED THE 2.0% MAXIMUM IS NOT TO EXCEED THE SLOPE OF THE ADJACENT ROADWAY.

4). GRADE BREAKS AT THE TOP AND BOTTOM OF A RAMP, BLENDED TRANSITION, AND TURNING SPACE SHALL BE PERPENDICULAR TO THE RUNNING SLOPE. GRADE BREAKS SHALL NOT BE LOCATED WITHIN THE RAMP, BLENDED TRANSITION, TURNING SPACE, OR DETECTABLE WARNING SURFACE.

5). WHEN ADJACENT TO GRASS, A 6:1 GRADE IS REQUIRED FOR A MINIMUM OF 2'-0" ADJACENT TO THE PEDESTRIAN CONNECTION IN ACCORDANCE WITH M-3, SHEET 1. ALTERNATIVELY, A CURB AT THE BACK OF THE PEDESTRIAN PATH MAY BE INSTALLED AT DEPRESSED TURNING SPACES OR RAMP SEGMENTS IN LIEU OF PROVIDING A 6:1 GRADE.

6). SEE PLANS FOR WIDTH. PEDESTRIAN CONNECTIONS THAT SERVE SHARED USE PATHS ARE TO PROVIDE A RAMP WIDTH AND TURNING SPACE WIDTH THE SAME WIDTH AS THE APPROACH SHARED USE PATH.

7). PROVIDE A TURNING SPACE AT LOCATIONS WHERE THE PRIMARY DIRECTION OF TRAVEL IS REQUIRED TO CHANGE IN ORDER TO ACCESS THE PEDESTRIAN CONNECTION IN ACCORDANCE WITH THESE SHEETS.

8). IN ALTERATIONS, WHERE THE PEDESTRIAN CONNECTION WILL TIE INTO AN EXISTING CROSS SLOPE THAT EXCEEDS 2.0%, PLACE A MINIMUM 5'-0" LONG TRANSITION SLAB IN THE DIRECTION OF PEDESTRIAN TRAVEL TO CONNECT THE NEW PEDESTRIAN CONNECTION TO THE EXISTING PEDESTRIAN PATH. THE TRANSITION SLAB SHALL NOT OVERLAP ANY OTHER REQUIRED PEDESTRIAN CONNECTION ELEMENT. THE CROSS SLOPE TRANSITION SHALL BE SPREAD EVENLY OVER THE SLAB TO MINIMIZE THE DEGREE OF WARPING. THE RATE OF CROSS SLOPE CHANGE IN THE TRANSITION AREA SHALL NOT EXCEED 3% PER LINEAR FOOT.

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

10). PROVIDE FLARED SIDES ON PERPENDICULAR CURB RAMPS AND BLENDED TRANSITIONS WHERE THE RAMP OR BLENDED TRANSITION EDGE ABUTS A WALKABLE SURFACE. UNLESS APPROVED OTHERWISE BY THE ENGINEER, PROVIDE JOINTS BETWEEN THE FLARED SIDE AND THE ABUTTING WALKABLE SURFACE AND RAMPED SEGMENT. FLARED SIDES MAY BE SUBSTITUTED WITH APPROVAL OF THE ENGINEER WITH VERTICAL RETURNED CURBS OR A 4:1 CURB TAPER WITH ASSOCIATED GRADING ALONG THE RAMP WHERE THE RAMP ABUTS A NON-WALKABLE SURFACE, OR WHERE THE ADJACENT RAMP SURFACE IS BLOCKED TO PEDESTRIAN TRAFFIC. THE RETURNED CURB MUST NOT AFFECT THE CLEAR WIDTH OF THE PEDESTRIAN ACCESS ROUTE AND SHALL BE FLUSH WITH THE PEDESTRIAN PATH AT TERMINATION.

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

12). ALIGN THE PEDESTRIAN CONNECTION AND THE CROSSWALK SO THAT A 4'-0" X 4'-0" CLEAR SPACE AREA LOCATED BELOW THE BOTTOM GRADE BREAK OF CURB RAMPS AND BLENDED TRANSITIONS IS CONTAINED WHOLLY WITHIN THE CROSSWALK. ONLY DIAGONAL CURB RAMPS REQUIRE THAT THE CLEAR SPACE BE LOCATED OUTSIDE OF THE PARALLEL VEHICLE TRAVEL LANE AND THAT A SEGMENT OF CURB 2'-0" LONG MINIMUM BE LOCATED ON EACH SIDE OF THE DIAGANOL CURB RAMP'S FLARED SIDES AND BE WITHIN THE MARKED CROSSING.

13). WHERE PEDESTRIAN CONNECTIONS ARE LOCATED ON A RADII, THE REQUIRED DIMENSIONS ARE MEASURED PERPENDICULAR TO THE PEDESTRIAN CONNECTION ELEMENT AND NOT ALONG THE CURVE. SEE THE CURRENT DELDOT PAS MANUAL FOR ADDITIONAL INFORMATION.

14). PEDESTRIAN CONNECTIONS

A) PERPENDICULAR CURB RAMPS HAVE A RAMPED SECTION THAT CUTS THROUGH THE CURB AT AN ANGLE.

B) PARALLEL CURB RAMPS HAVE A RUNNING SLOPE THAT IS IN-LINE WITH THE DIRECTION OF SIDEWALK TRAVEL AND LOWERS THE SIDEWALK TO A TURNING SPACE WHERE A TURN IS MADE TO ENTER THE CROSSWALK.

C) COMBINATION PEDESTRIAN CONNECTIONS UTILIZE A PARALLEL CURB RAMP TO LOWER THE PEDESTRIAN PATH TO A MID TURNING SPACE AND THEN A SHORT PERPENDICULAR CURB RAMP TO CONNECT THE TURNING SPACE TO THE CROSSWALK.

D) PERPENDICULAR AND PARALLEL RAMP CONFIGURATIONS ARE PREFERRED TO DEPRESSED CORNERS. DEPRESSED CORNERS SHOULD ONLY BE USED WHERE SITE CONDITIONS MAKE THEM A MORE APPROPRIATE OPTION, OR WHERE PERPENDICULAR OR PARALLEL RAMPS CANNOT BE INSTALLED DUE TO A PHYSICAL SITE CONSTRAINT.

E) A SINGLE CURB RAMP THAT SERVES TWO SEPARATE CROSSWALKS IS CONSIDERED A SHARED CURB RAMP.

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PEDESTRIAN CONNECTIONS, GENERAL NOTES

STANDARD NO. C-2 (2024) | SHT. 1 OF 8

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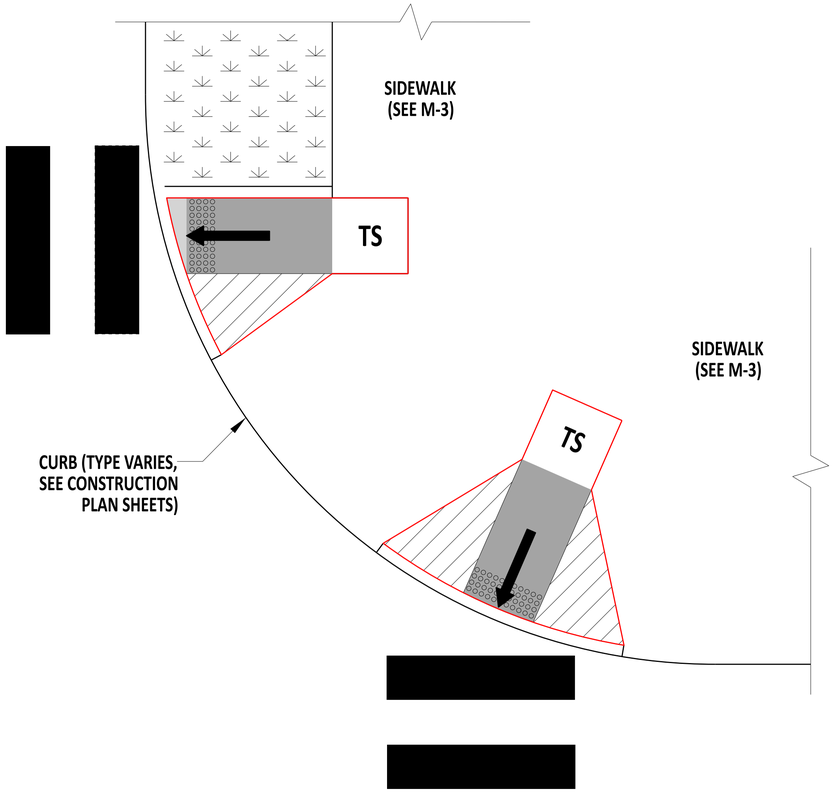
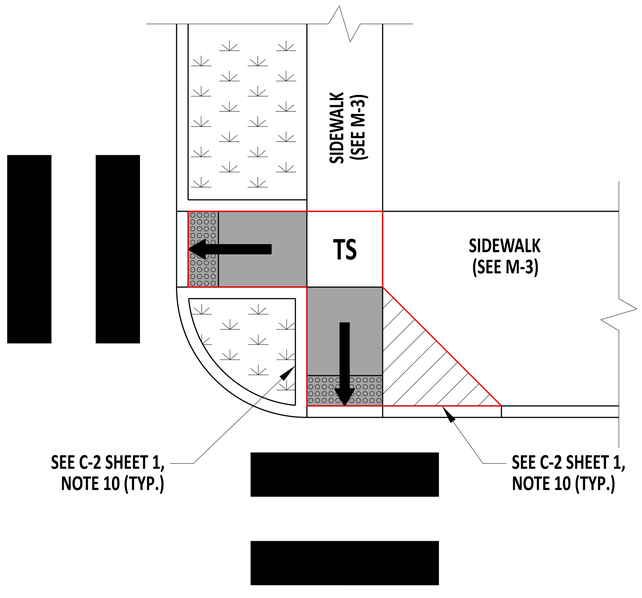


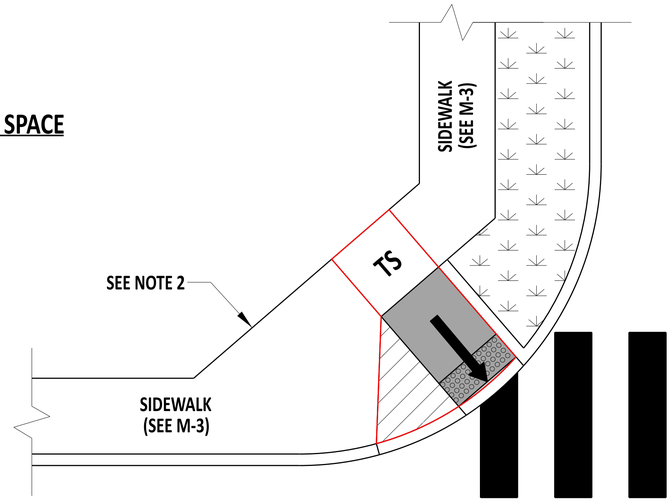
DUAL STREET CROSSINGS WITH SEPARATE TURNING SPACES



DUAL STREET CROSSINGS WITH SHARED TURNING SPACE

LEGEND

- TS — TURNING SPACE
- RAMP
- BLENDED TRANSITION
- CROSSWALK STRIPING
- BUFFER OR OTHER NON-WALKABLE SURFACE
- TRIANGULAR AREA
- DETECTABLE WARNING SURFACE
- FLARED SIDE
- LIMIT OF 6" MIN. SIDEWALK OVER 6" GABC



SINGLE STREET CROSSING

NOTES:

1). SEE DETAIL C-2, SHEET 1 FOR GENERAL PEDESTRIAN CONNECTION NOTES AND ELEMENT REQUIREMENTS.
2). LOCATE THE BACK OF PEDESTRIAN PATH IN A MANNER THAT ALLOWS FOR THE INSTALLATION OF A TURNING SPACE AT THE TOP OF THE PERPENDICULAR CURB RAMP.
3). SEE DETAIL C-2, SHEET 3 FOR DWS PLACEMENT.

PEDESTRIAN CONNECTION, TYPE 1: PERPENDICULAR CURB RAMPS

DUAL APPROACH LAYOUT ALTERNATIVES

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PEDESTRIAN CONNECTION, TYPE 1

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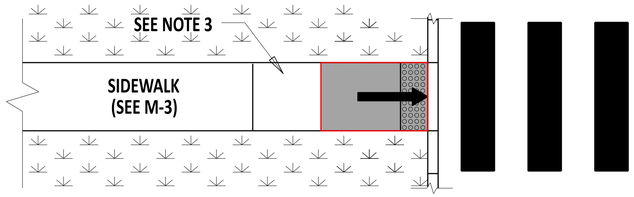
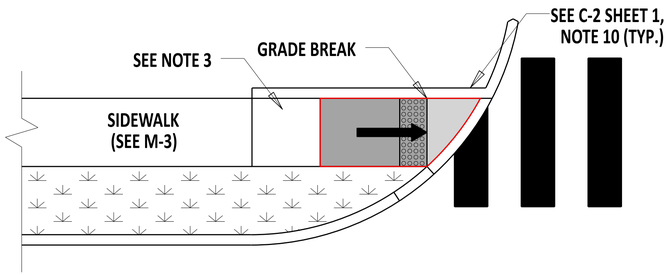
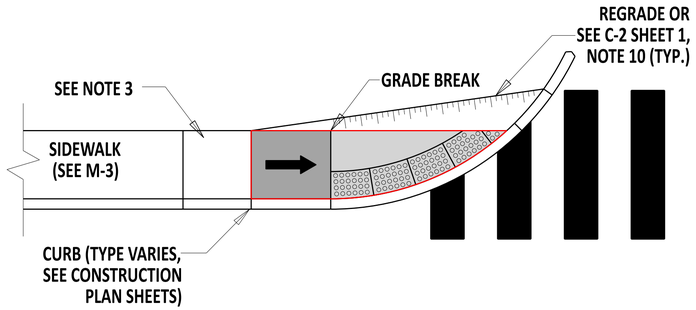


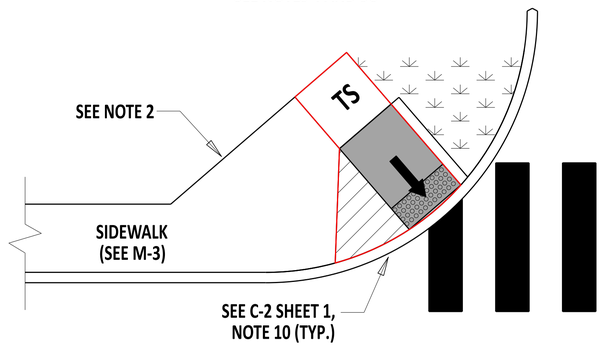
DIRECTIONAL WITH BUFFER STRIP
SEE NOTE 5A



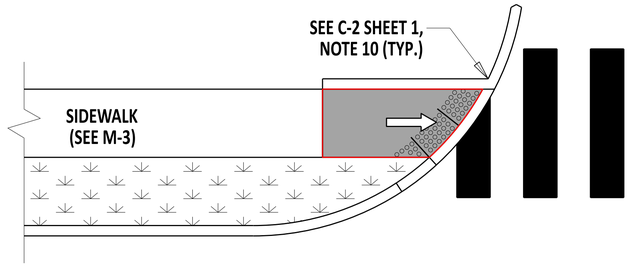
DIRECTIONAL WITH BUFFER STRIP
SEE NOTE 5B



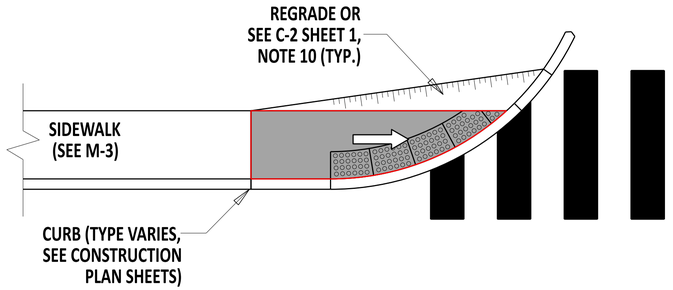
DIRECTIONAL WITH NO BUFFER STRIP
SEE NOTES 4 AND 5C



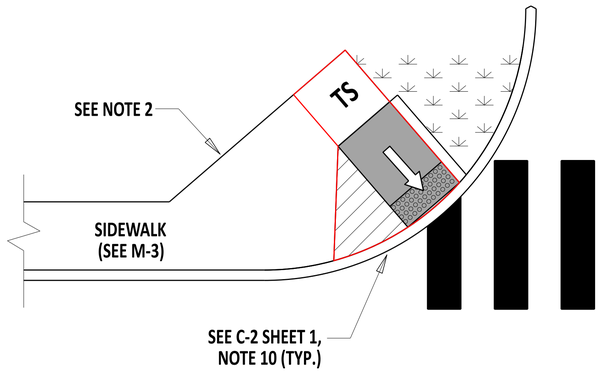
PERPENDICULAR NON-DIRECTIONAL



DIRECTIONAL BLENDED TRANSITION WITH BUFFER STRIP



DIRECTIONAL BLENDED TRANSITION WITH NO BUFFER STRIP
SEE NOTE 4



PERPENDICULAR NON-DIRECTIONAL BLENDED TRANSITION

PEDESTRIAN CONNECTION, TYPE 1: PERPENDICULAR CURB RAMPS AND BLENDED TRANSITIONS
SINGLE APPROACH LAYOUT ALTERNATIVES

LEGEND

TS — TURNING SPACE	TRIANGULAR AREA
RAMP	DETECTABLE WARNING SURFACE
BLENDED TRANSITION	FLARED SIDE
CROSSWALK STRIPING	LIMIT OF 6" MIN. SIDEWALK OVER 6" GABC
BUFFER OR OTHER NON-WALKABLE SURFACE	

NOTES:

1). SEE DETAIL C-2, SHEET 1 FOR GENERAL PEDESTRIAN CONNECTION NOTES AND ELEMENT REQUIREMENTS.
2). LOCATE THE BACK OF PEDESTRIAN PATH IN A MANNER THAT ALLOWS FOR THE INSTALLATION OF A TURNING SPACE AT THE TOP OF THE PERPENDICULAR CURB RAMP.
3). INSTALL A TURNING SPACE IF A TURNING MOVEMENT IS REQUIRED TO ENTER OR EXIT THE RAMP. IF A TURNING SPACE IS REQURIED, THE MINIMUM DEPTH IS 6" OF SIDEWALK OVER 6" OF GABC.
4). USE OF A SINGLE APPROACH PARALLEL CURB RAMP (SEE DETAIL C-2, SHEET 4) IS PREFERRED TO THE USE OF A SINGLE APPROACH DIRECTIONAL WITH NO BUFFER STRIP PERPENDICULAR TYPE APPLICATION.
5). INSTALL DWS IN LOCATIONS AS FOLLOWS:
   A). PLACE THE DWS AT THE BACK OF CURB WHEN THE ENDS OF THE BOTTOM GRADE BREAK ARE IN FRONT OF THE BACK OF CURB.
   B). PLACE THE DWS ON THE RAMP RUN WITHIN ONE DOME SPACING OF THE BOTTOM GRADE BREAK WHEN THE ENDS OF THE BOTTOM GRADE BREAK ARE BEHIND THE BACK OF CURB AND THE DISTANCE FROM EITHER END OF THE BOTTOM GRADE BREAK TO THE BACK OF CURB IS 5'-0" OR LESS.
   C). PLACE THE DWS AT THE BACK OF CURB WHEN THE ENDS OF THE BOTTOM GRADE BREAK ARE BEHIND THE BACK OF CURB AND THE DISTANCE FROM EITHER END OF THE BOTTOM GRADE BREAK TO THE BACK OF CURB IS MORE THAN 5'-0".
6). DO NOT PLACE DWS ACROSS A GRADE BREAK.

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PEDESTRIAN CONNECTION, TYPE 1

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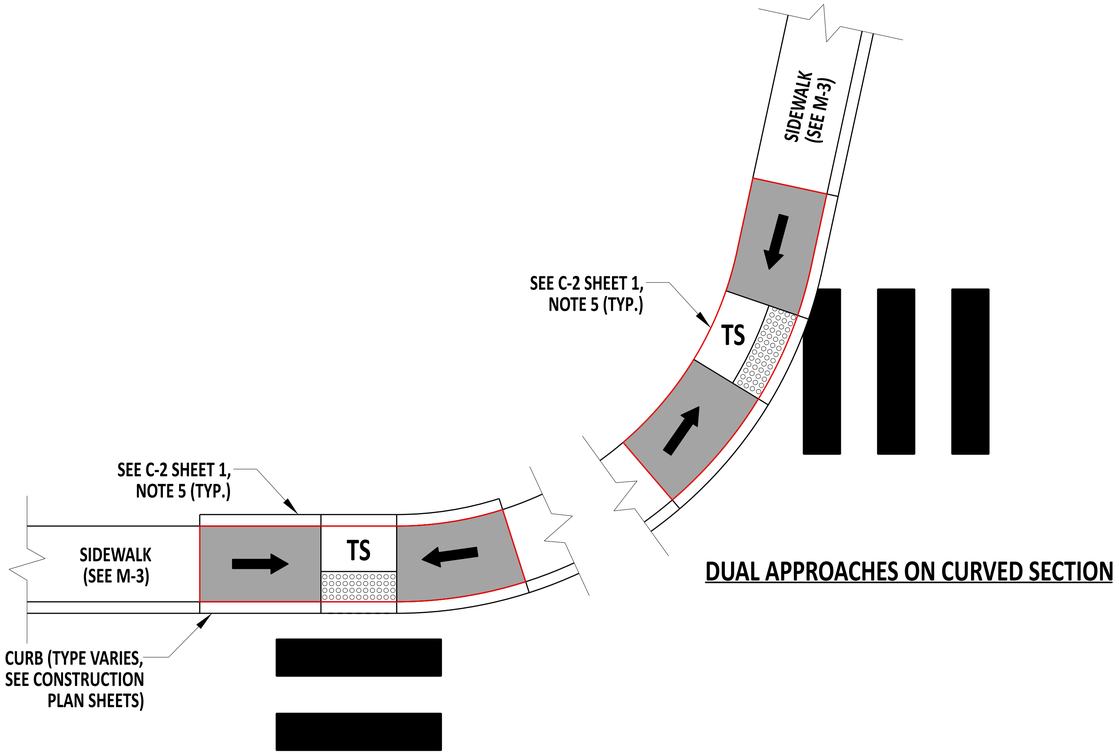
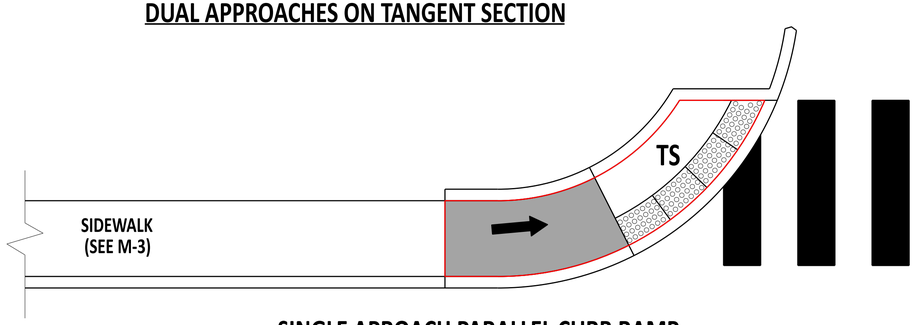
LEGEND

TS — TURNING SPACE	TRIANGULAR AREA
RAMP	DETECTABLE WARNING SURFACE
BLENDED TRANSITION	FLARED SIDE
CROSSWALK STRIPING	LIMIT OF 6" MIN. SIDEWALK OVER 6" GABC
BUFFER OR OTHER NON-WALKABLE SURFACE	

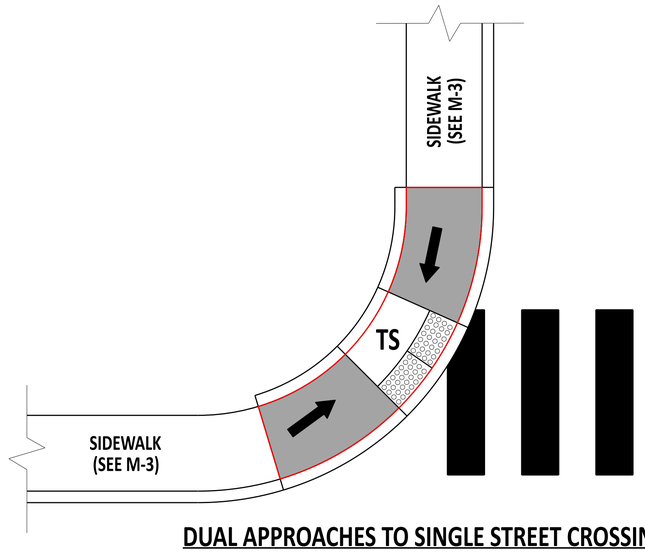


DUAL APPROACHES ON CURVED SECTION

DUAL APPROACHES ON TANGENT SECTION



SINGLE APROACH PARALLEL CURB RAMP



DUAL APPROACHES TO SINGLE STREET CROSSING

NOTES:

1). SEE DETAIL C-2, SHEET 1 FOR GENERAL PEDESTRIAN CONNECTION NOTES AND ELEMENT REQUIREMENTS.
2). APPLICATIONS SHOWN AS DUAL APPROACHES CAN ALSO SUPPORT A SINGLE PEDESTRIAN PATH APPROACH AS WELL.
3). PLACE THE DWS AT THE BACK OF CURB ALONG THE ENTIRE LENGTH OF THE DEPRESSED CURB.

PEDESTRIAN CONNECTION, TYPE 2: PARALLEL CURB RAMPS

SINGLE AND DUAL APPROACH LAYOUT ALTERNATIVES

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PEDESTRIAN CONNECTION, TYPE 2

STANDARD NO. C-2 (2024) | SHT. 4 OF 8

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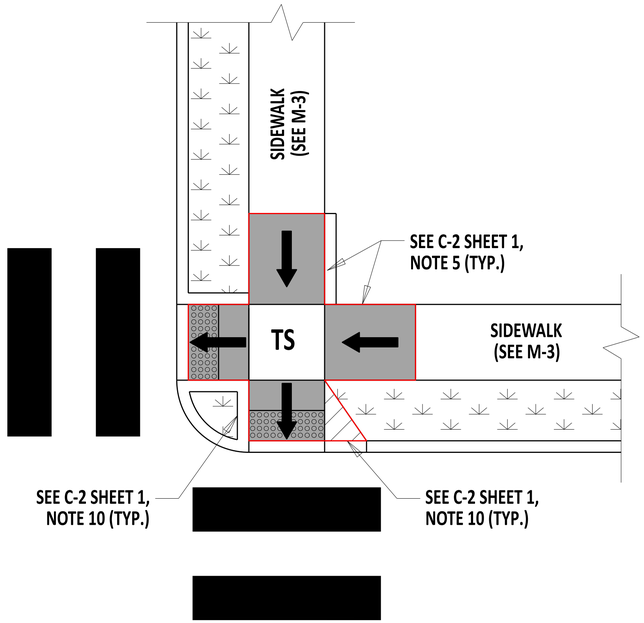
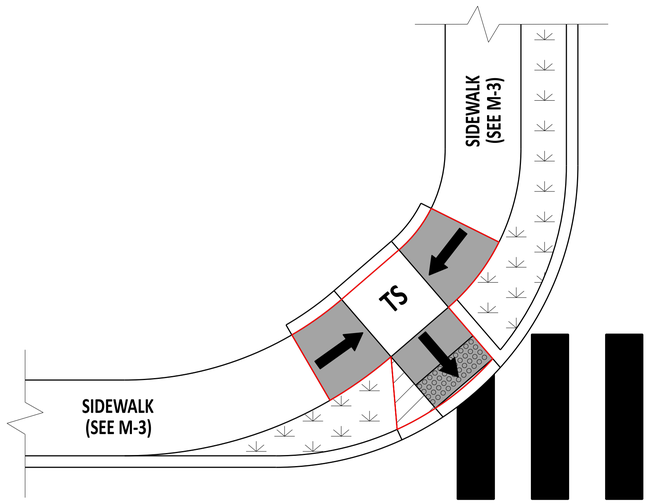
SCALE : NTS



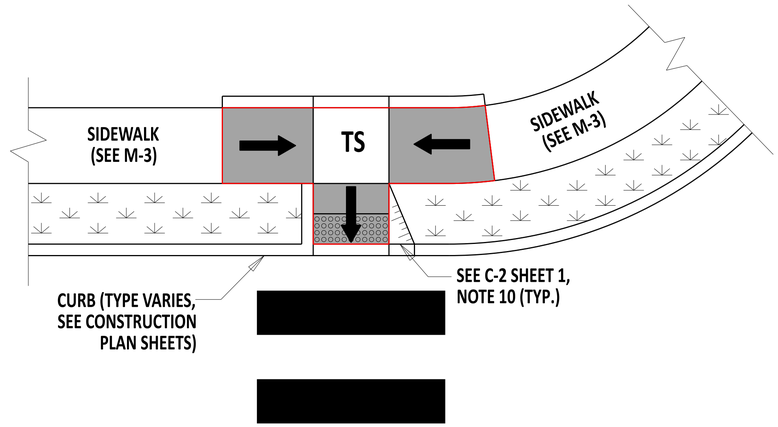
DUAL STREET CROSSINGS WITH SHARED TURNING SPACE



COMBINATION CURB RAMP ON CURVE

LEGEND

- TS — TURNING SPACE
- RAMP
- BLENDED TRANSITION
- CROSSWALK STRIPING
- BUFFER OR OTHER NON-WALKABLE SURFACE
- TRIANGULAR AREA
- DETECTABLE WARNING SURFACE
- FLARED SIDE
- LIMIT OF 6" MIN. SIDEWALK OVER 6" GABC



COMBINATION CURB RAMP ON TANGENT

NOTES:

1). SEE DETAIL C-2, SHEET 1 FOR GENERAL PEDESTRIAN CONNECTION NOTES AND ELEMENT REQUIREMENTS.
2). APPLICATIONS SHOWN AS DUAL APPROACHES CAN ALSO SUPPORT A SINGLE PEDESTRIAN PATH APPROACH AS WELL.
3). SEE DETAIL C-2, SHEETS 3 AND 4 FOR DWS PLACEMENT.

PEDESTRIAN CONNECTION, TYPE 3: COMBINATION CURB RAMPS

SINGLE AND DUAL APPROACH LAYOUT ALTERNATIVES

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PEDESTRIAN CONNECTION, TYPE 3

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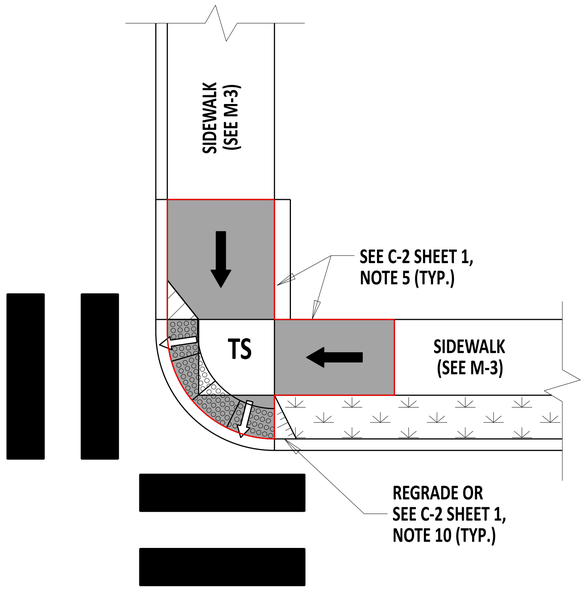
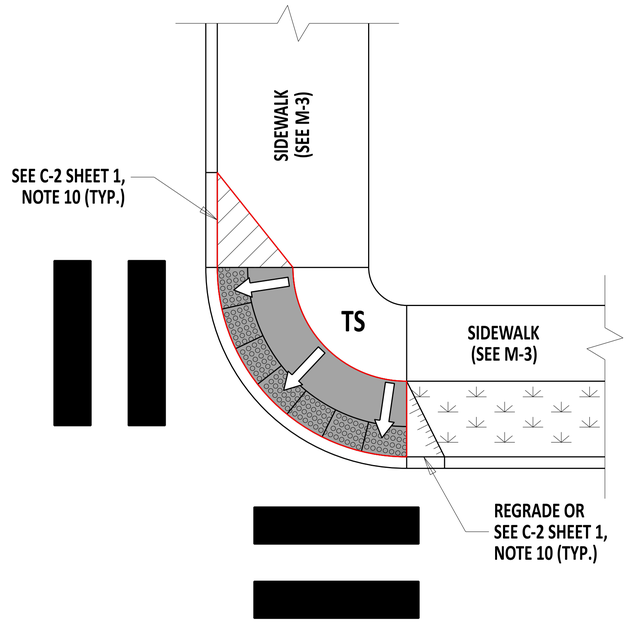
SCALE : NTS



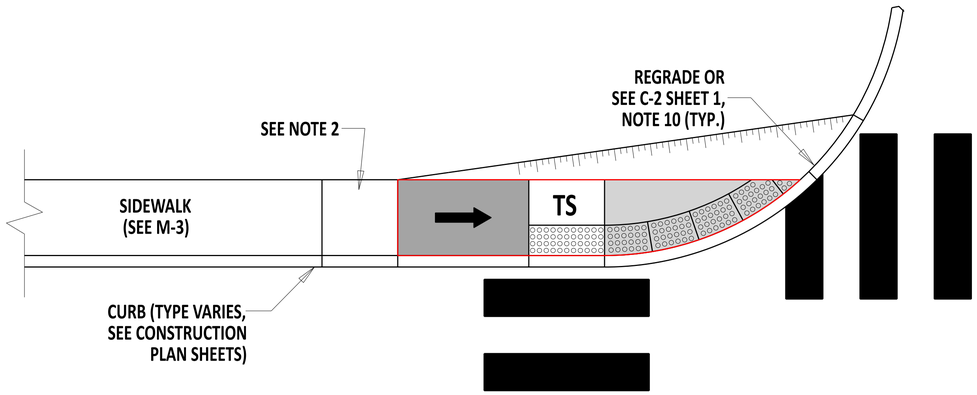
DEPRESSED CORNER WITH SHARED TURNING SPACE



CORNER BLENDED TRANSTION WITH SIDEWALK

LEGEND

- TS — TURNING SPACE
- RAMP
- BLENDED TRANSITION
- CROSSWALK STRIPING
- TRIANGULAR AREA
- DETECTABLE WARNING SURFACE
- FLARED SIDE
- LIMIT OF 6" MIN. SIDEWALK OVER 6" GABC
- BUFFER OR OTHER NON-WALKABLE SURFACE



SINGLE APPROACH DEPRESSED CORNER

NOTES:

1). SEE DETAIL C-2, SHEET 1 FOR GENERAL PEDESTRIAN CONNECTION NOTES AND ELEMENT REQUIREMENTS.
2). INSTALL A TURNING SPACE IF A TURNING MOVEMENT IS REQUIRED TO ENTER OR EXIT THE RAMP. IF A TURNING SPACE IS REQUIRED, THE MINIMUM DEPTH IS 6" OF SIDEWALK OVER 6" OF GABC.
3). PLACE THE DWS AT THE BACK OF CURB ALONG THE ENTIRE LENGTH OF THE DEPRESSED CURB.

PEDESTRIAN CONNECTION, TYPE 4: DEPRESSED CORNERS

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PEDESTRIAN CONNECTION, TYPE 4

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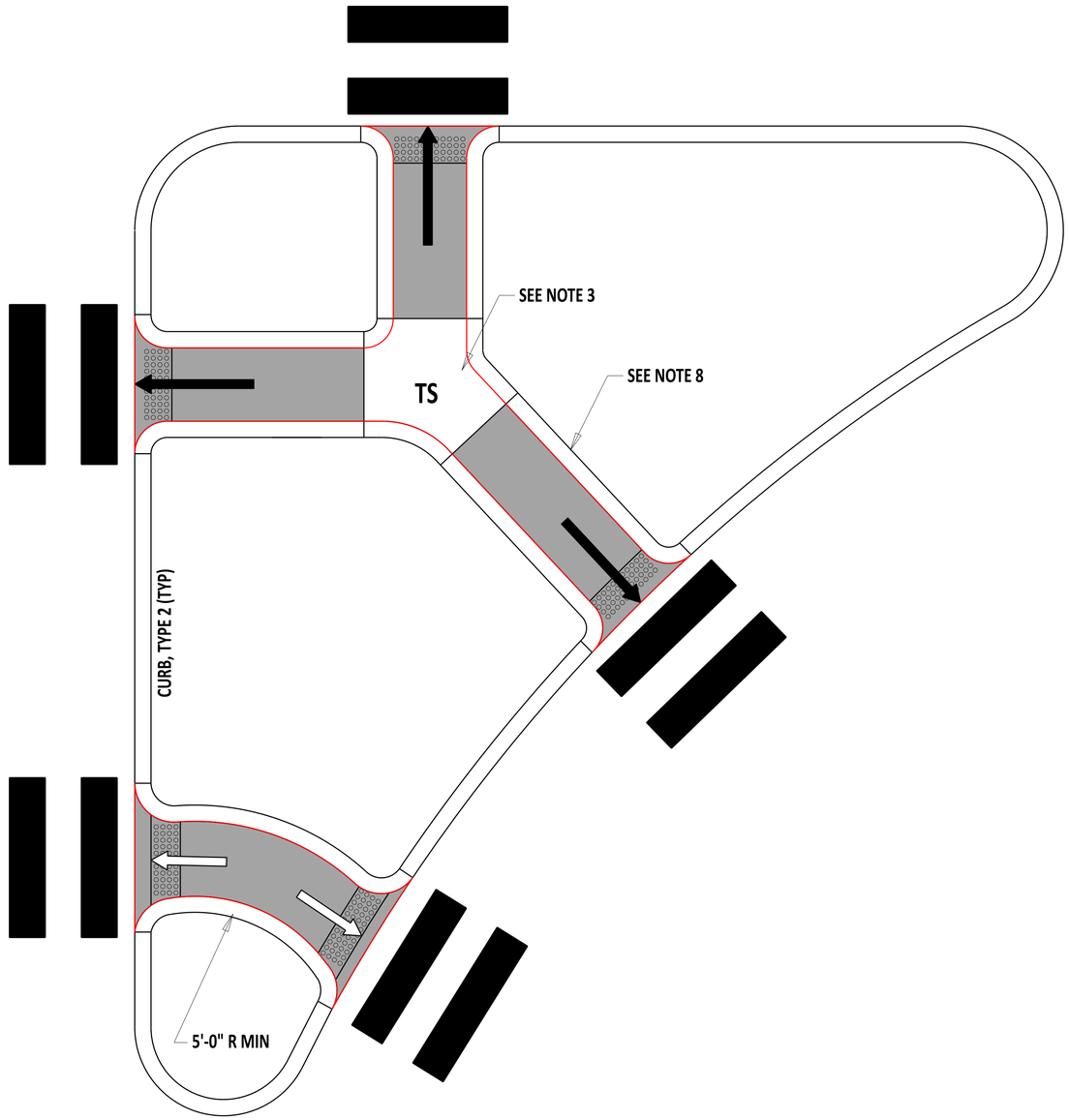

LEGEND

- TS — TURNING SPACE
- RAMP
- BLENDED TRANSITION
- CROSSWALK STRIPING
- BUFFER OR OTHER NON-WALKABLE SURFACE
- TRIANGULAR AREA
- DETECTABLE WARNING SURFACE
- FLARED SIDE
- LIMIT OF 6" MIN. SIDEWALK OVER 6" GABC

PEDESTRIAN CONNECTION, TYPE 5

PEDESTRIAN CONNECTION TYPE 5 NOTES:

1). SEE C-2, SHEET 1 FOR GENERAL PEDESTRIAN CONNECTION NOTES AND ELEMENT REQUIREMENTS.
2). 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.
3). A TURNING SPACE THAT ACCOMODATES ALL DIRECTIONS OF TRAVEL IS REQUIRED TO BE PLACED BETWEEN THE TOP OF RAMPED SEGMENTS.
4). THE WIDTH OF THE PEDESTRIAN PATH THROUGH THE MEDIAN SHOULD MATCH THE WIDTH OF THE PEDESTRIAN ACCESS ROUTE WHICH IT CONNECTS. EXPAND THE ENTIRE PEDESTRIAN PATH WIDTH THROUGH THE MEDIAN BY 2'-0" UP TO A WIDTH OF 10'-0" AT LOCATIONS WHERE A PEDESTRIAN PUSHBUTTON IS TO BE PLACED.
5). THE CROSS SLOPE IS PERMITTED TO MATCH THAT OF THE ADJACENT STREET. LOCATIONS THAT REQUIRE A CROSS SLOPE TRANSITION SHALL TRANSITION THE CROSS SLOPE UNIFORMLY AT A RATE NOT TO EXCEED 3.0% PER LINEAR FOOT.
6). THE DETECTABLE WARNING SURFACE MAY BE OMITTED WITH APPROVAL OF THE ENGINEER AT CUT-THROUGH LOCATIONS WHERE THE DETECTABLE WARNING SURFACE WILL BE SEPARATED BY 2'-0" OR LESS.
7). WHEN THERE IS NO DEPRESSED CURB AT A MEDIAN CUT-THROUGH PEDESTRIAN CONNECTION, INSTALL THE DETECTABLE WARNING SURFACE A MAXIMUM OF 6" FROM THE PAVEMENT EDGE.
8). INSTALL CURB OR EDGE DETECTION IN ACCORDANCE WITH THE PLANS.

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DWS PLACEMENT AND PEDESTRIAN CONNECTION, TYPE 5

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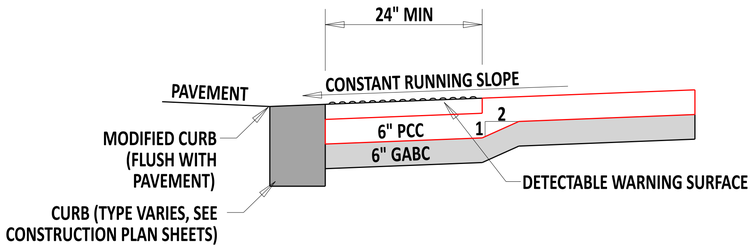
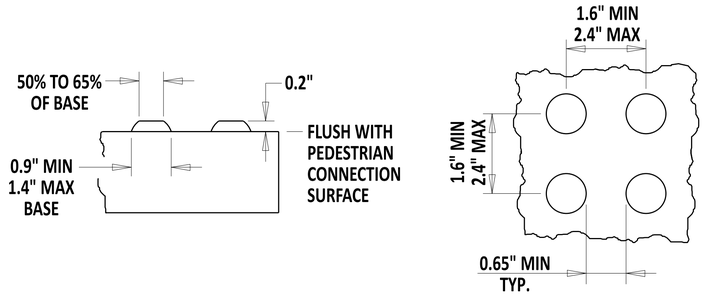
LEGEND

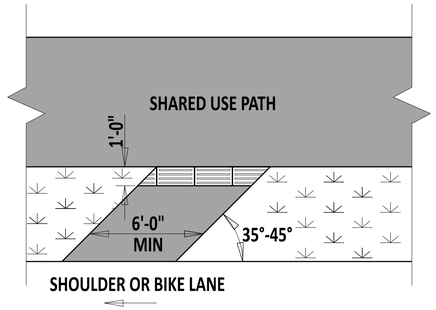
- DETECTABLE WARNING SURFACE
- DIRECTIONAL TACTILE SURFACE INDICATOR
- BUFFER OR OTHER NON-WALKABLE SURFACE
- SHARED USE PATH
- GABC
- LIMIT OF 6" MIN. SIDEWALK OVER 6" GABC



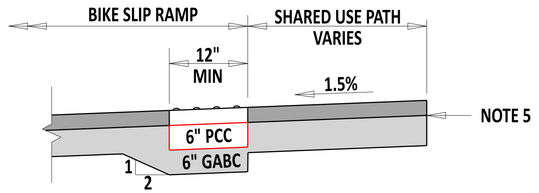
DETECTABLE WARNING SURFACE ELEVATION
SEE NOTE 3



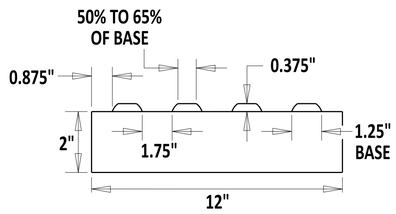
DETECTABLE WARNING SURFACE DETAILS

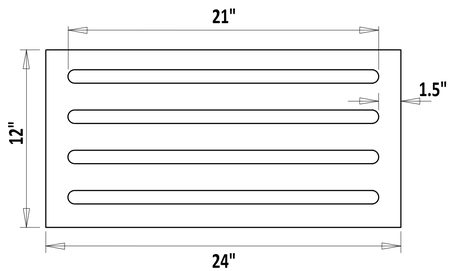


DIRECTIONAL TACTILE SURFACE INDICATORS AT BICYCLE SLIP LANE



DTSI ELEVATION
SEE DTSI NOTE 6





DIRECTIONAL TACTILE SURFACE INDICATORS FOR BICYCLE RAMPS

DETECTABLE WARNING SURFACE NOTES:

1). THE DETECTABLE WARNING SURFACE SHALL EXTEND A MINIMUM OF 2'-0" IN THE DIRECTION OF PEDESTRIAN TRAVEL AND EXTEND THE FULL WIDTH OF THE DEPRESSED CURB.
2). DO NOT PLACE THE DETECTABLE WARNING SURFACE ACROSS A GRADE BREAK.
3). INSTALL FULL 6" DEPTH OF PCC UNDER DETECTABLE WARNING SURFACE.

DIRECTIONAL TACTILE SURFACE INDICATOR NOTES:

1). THE DIRECTIONAL TACTILE SURFACE INDICATOR SHALL EXTEND A MINIMUM OF 1'-0" IN THE DIRECTION OF TRAVEL AND EXTEND THE FULL WIDTH OF THE BICYCLE SLIP RAMP.
2). DO NOT PLACE THE DIRECTIONAL TACTILE SURFACE INDICATORS ACROSS A GRADE BREAK.
3). PLACE DIRECTIONAL TACTILE SURFACE INDICATORS ADJACENT TO THE SHARED USE PATH.
4). DIRECTIONAL TACTILE SURFACE INCIDATORS MAY BE USED AT LOCATIONS OTHER THAN BICYCLE SLIP RAMPS, IN ORDER TO DELINEATE THE EDGE OF A PEDESTRIAN ACCESS ROUTE.
5). SHARED USE PATH CROSS SECTION SHOWN FOR CONCEPTUAL PURPOSES ONLY. INSTALL SHARED USE PATH AND BIKE SLIP RAMP AS SHOWN ON PLANS.
6). INSTALL FULL 6" DEPTH OF PCC UNDER DIRECTIONAL TACTILE SURFACE INDICATOR.

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Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE

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DWS AND DTSI PLACEMENT

STANDARD NO. C-2 (2024) | SHT. 8 OF 8

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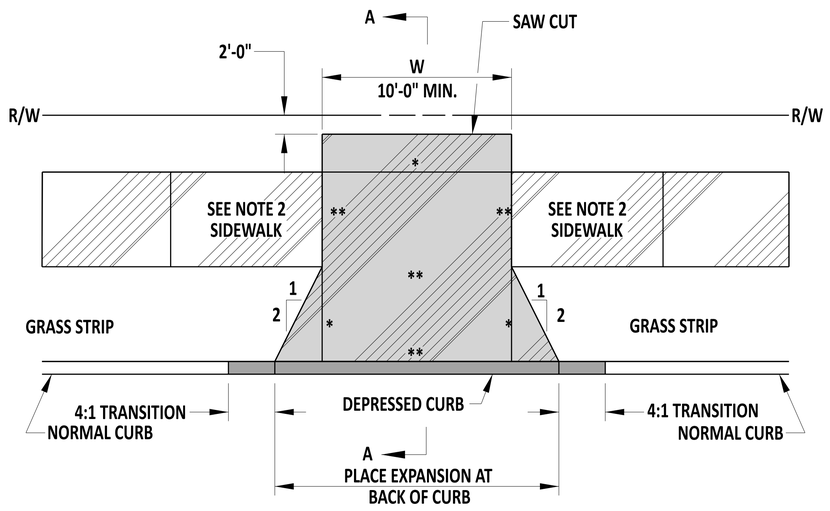
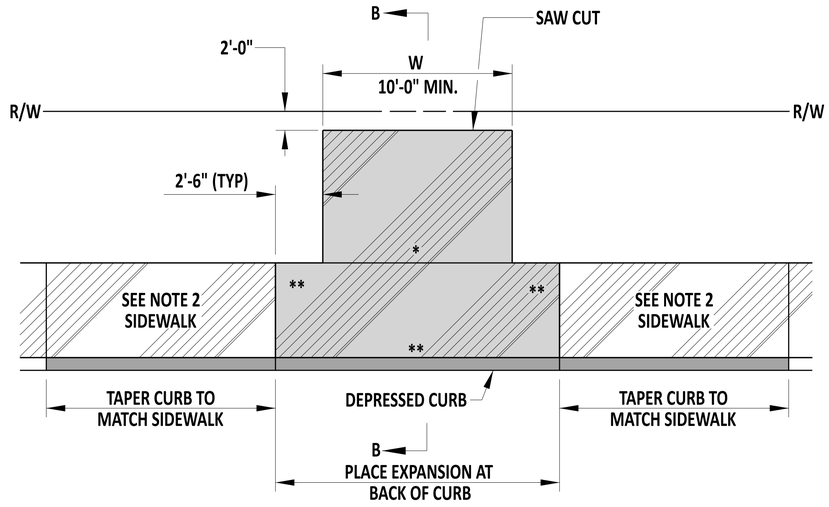
22-DEC-2023

SCALE : NTS



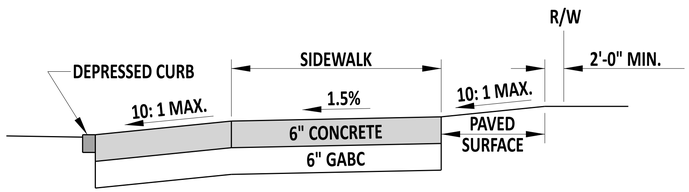
ENTRANCE WITH SIDEWALK AND GRASS STRIP

* - JOINT
** - EXPANSION MATERIAL

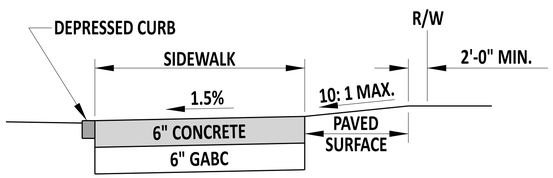


ENTRANCE WITH SIDEWALK AND NO GRASS STRIP

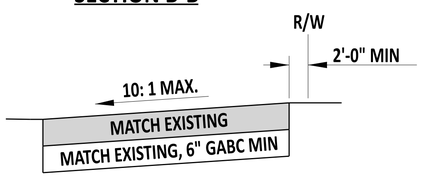
* - JOINT
** - EXPANSION MATERIAL



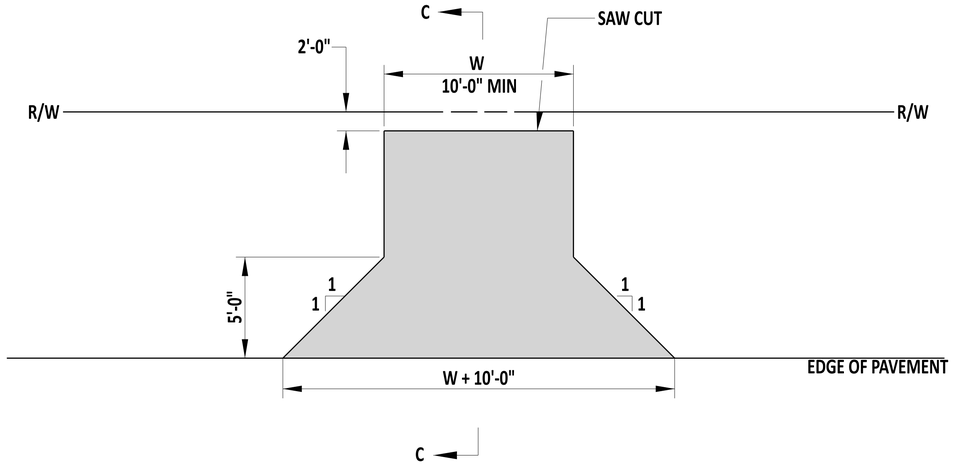
SECTION A-A



SECTION B-B



SECTION C-C



ENTRANCE WITHOUT SIDEWALK

NOTES:

1). A MAXIMUM SIDEWALK RUNNING SLOPE OF 4.5% IS PREFERRED WITH ALLOWANCE TO FOLLOW THE ADJACENT ROAD GRADES.
2). PROVIDE A SIDEWALK RUNNING SLOPE OF 4.5% LEADING TO THE DRIVEWAY APRON. THE LENGTH OF THE SLOPED SEGMENT LEADING TO THE DRIVEWAY APRON MAY BE LIMITED TO 15'-0" WHEN A 4.5% RUNNING SLOPE CREATES A GRADE CHASING SCENARIO.

- PCC SIDEWALK
- PCC 6"

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ENGINEERING SUPPORT
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ENTRANCES

STANDARD NO. C-3 (2024) | SHT. 1 OF 1

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DEPUTY DIRECTOR - DESIGN
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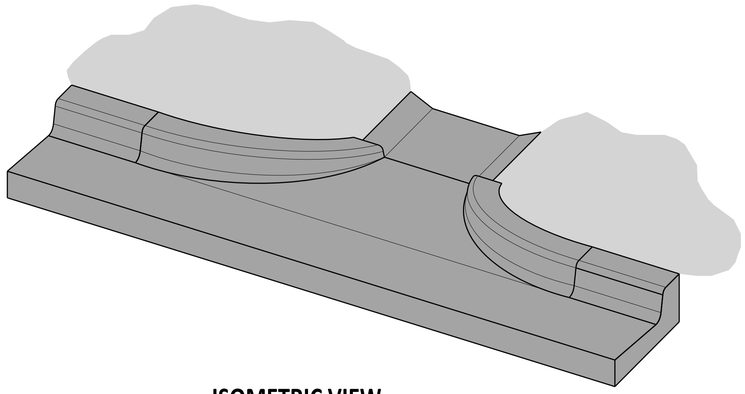
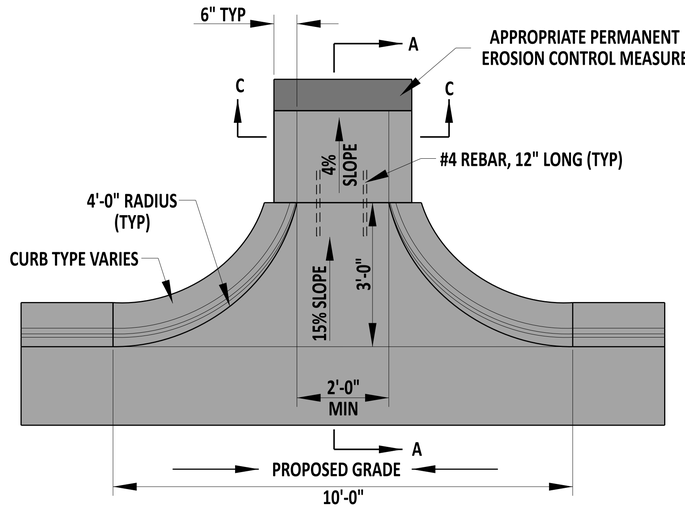


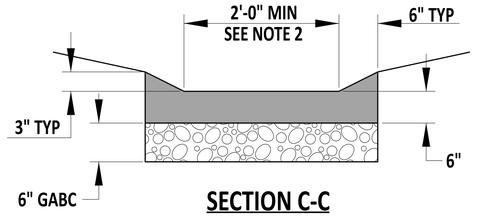
ISOMETRIC VIEW

SHOWN WITH INTEGRAL CURB & GUTTER, TYPE 1-8

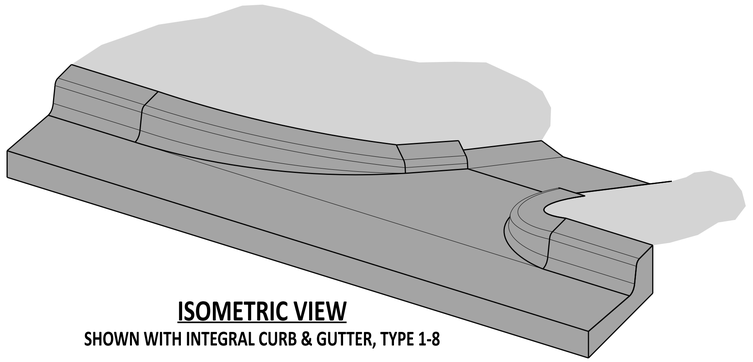


PLAN VIEW

IN SUMP LOCATION

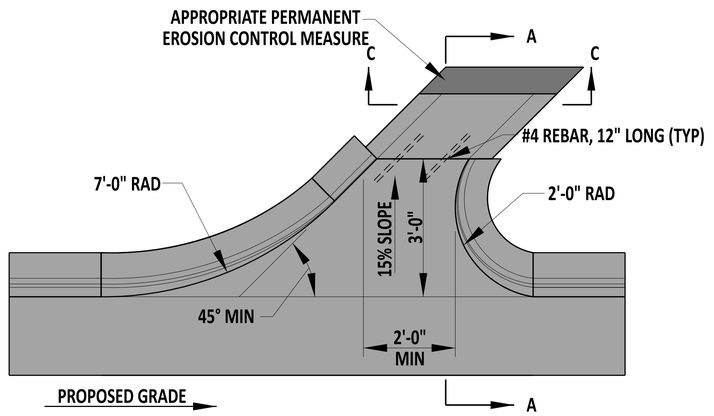


SECTION C-C



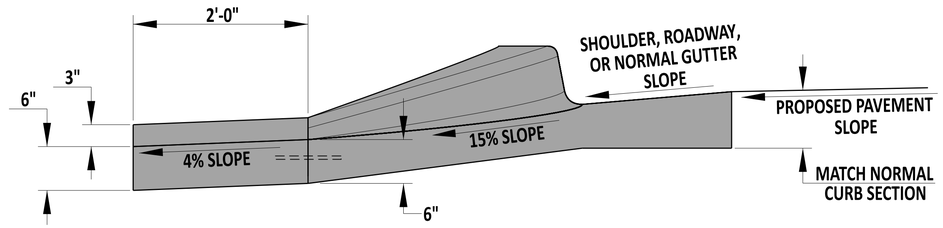
ISOMETRIC VIEW

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).
3). WHEN A SIDEWALK OPENING IS USED WHERE A GRASS BUFFER STRIP IS PRESENT, THIS DETAIL MAY BE USED IN CONJUNCTION WITH CURB/SIDEWALK OPENING DETAIL C-5. INCREASE THE WIDTH OF THE CURB OPENING CHANNEL TO MATCH THE WIDTH OF THE SIDEWALK OPENING. MODIFY DETAIL C-4 SECTION C-C TO MATCH DETAIL C-5 SECTION C-C.

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RECOMMENDED

CURB OPENING

STANDARD NO. C-4 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

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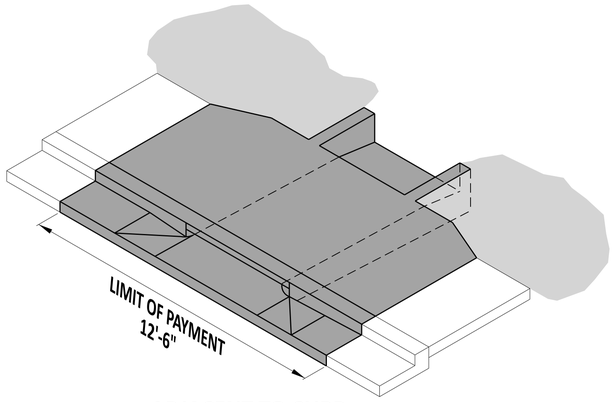
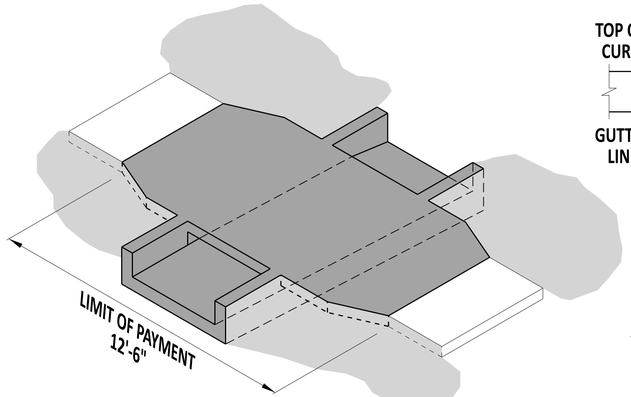
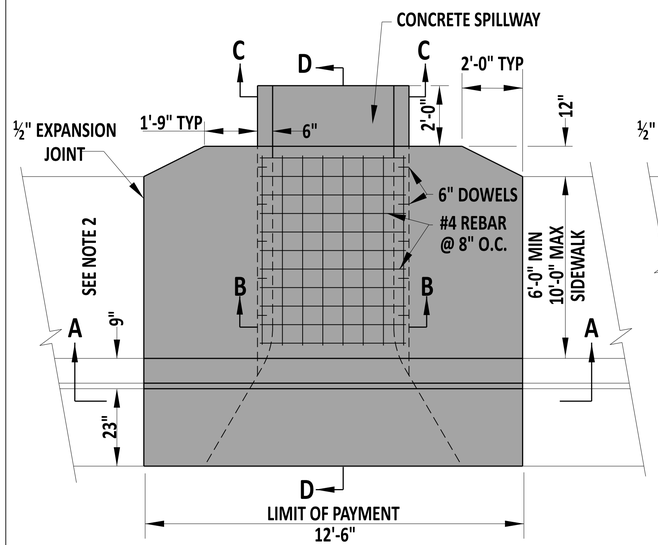


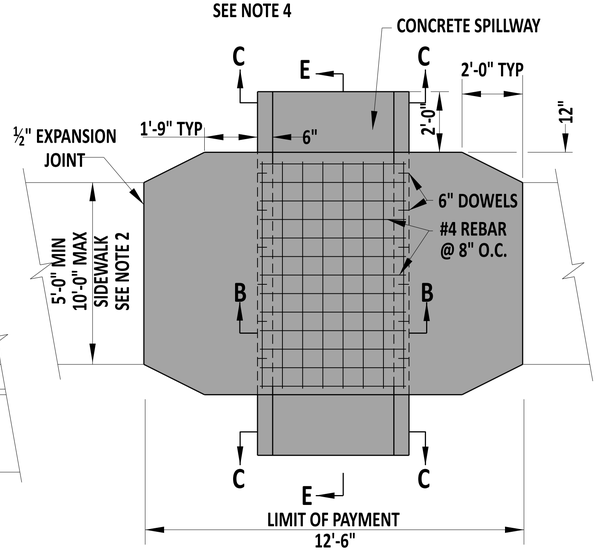
ADJACENT TO CURB
ISOMETRIC



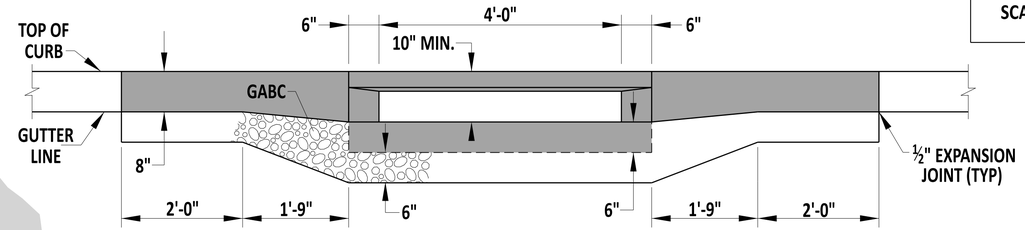
NOT ADJACENT TO CURB
ISOMETRIC
SEE NOTE 4



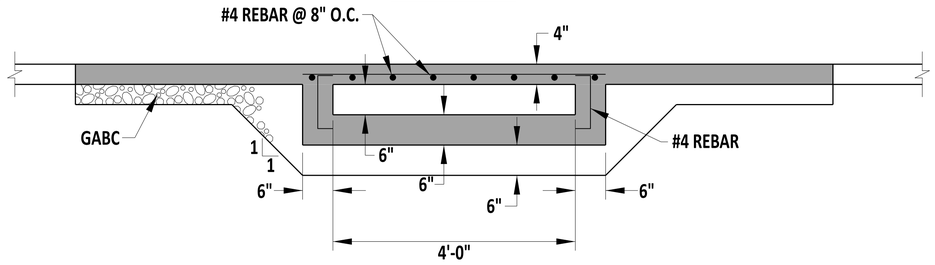
ADJACENT TO CURB
PLAN



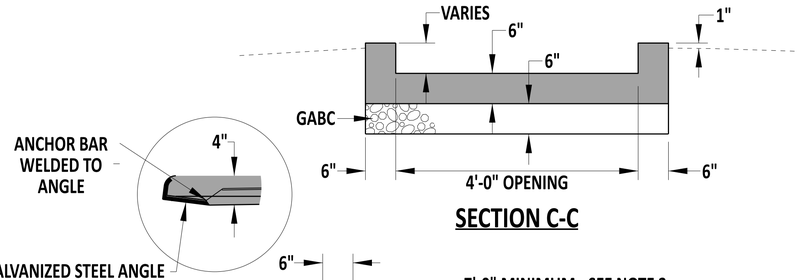
NOT ADJACENT TO CURB
PLAN



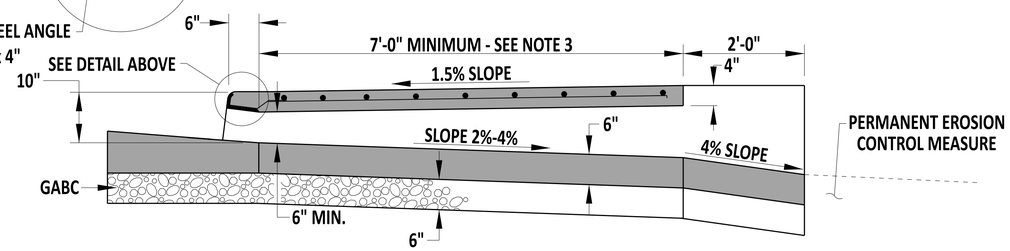
SECTION A-A



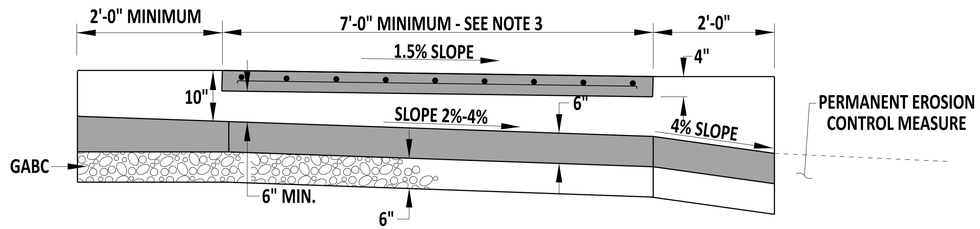
SECTION B-B



SECTION C-C



SECTION D-D



SECTION E-E

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). 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, EXTEND THE PATH AN ADDITIONAL 1'-0" IN WIDTH TOWARD THE BACK OF THE CURB USING SAME FLARE RATES AND DIMENSIONS AS SHOWN AT THE BACK OF SIDEWALK.
3). WHEN A SIDEWALK OPENING IS USED WHERE A GRASS BUFFER STRIP IS PRESENT, THIS DETAIL MAY BE USED IN CONJUNCTION WITH CURB OPENING DETAIL C-4. INCREASE THE WIDTH OF THE CURB OPENING CHANNEL TO THE WIDTH OF THE SIDEWALK OPENING. MODIFY DETAIL C-4 SECTION C-C TO MATCH DETAIL C-5 SECTION C-C.
4). WHEN THIS DETAIL IS USED IN CONJUNCTION WITH DETAIL C-4, THE UPSTREAM CONCRETE SPILLWAY LENGTH MAY BE REDUCED TO ACCOMODATE THE CURB OPENING RADIUS.

CURB / SIDEWALK OPENING

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Andrew Shoot — ENGINEERING SUPPORT — 12/22/2023 DATE
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CURB / SIDEWALK OPENING, INTEGRAL PCC CURB & GUTTER TYPE 1-8 AND NOT ADJACENT TO CURB INSTALLATIONS

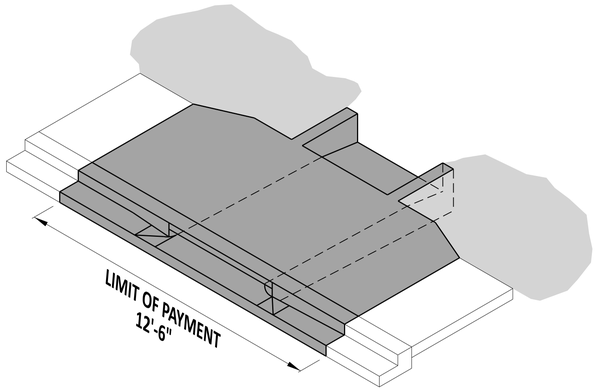
STANDARD NO. C-5 (2024) | SHT. 1 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

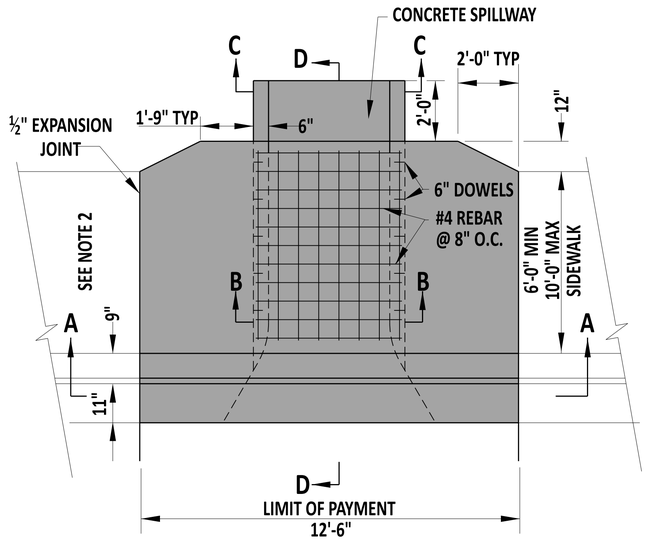
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

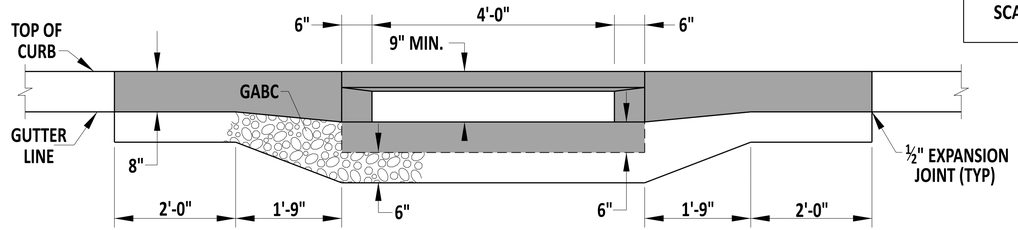
SCALE : NTS



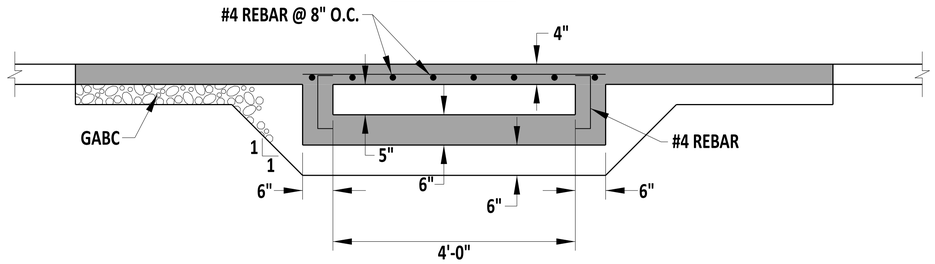
ADJACENT TO CURB
ISOMETRIC



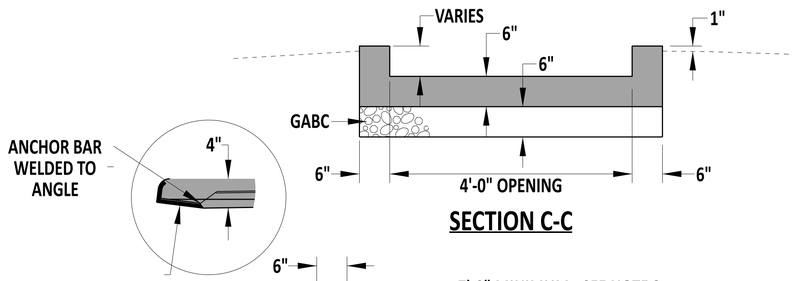
ADJACENT TO CURB
PLAN



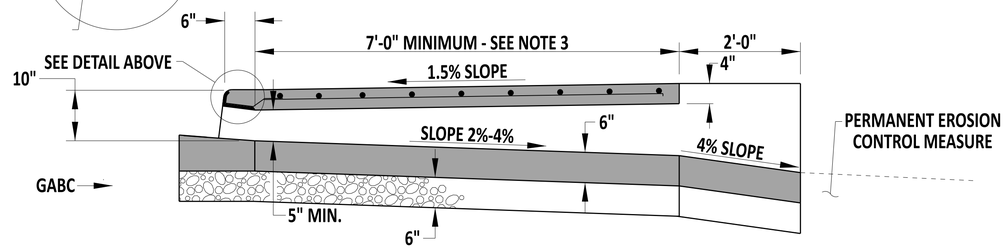
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

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). OVER THE CONCRETE SPILLWAY, USE A SLAB WIDTH 12" WIDER THAN THE SIDEWALK WIDTH AND USE A 2'-0" CONCRETE APRON APPROACH.

CURB / SIDEWALK OPENING

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Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

CURB / SIDEWALK OPENING, INTEGRAL PCC CURB & GUTTER TYPE 3-8

STANDARD NO. C-5 (2024) | SHT. 2 OF 2

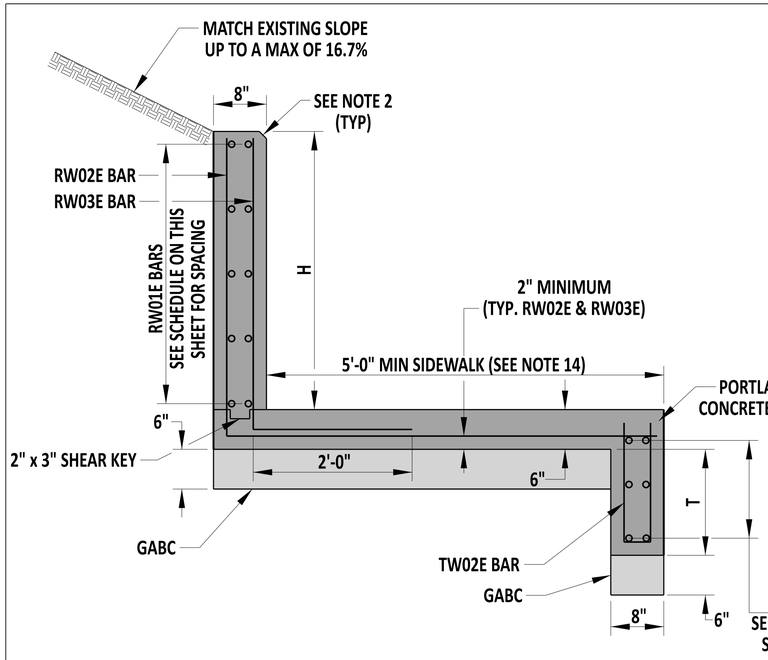
REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

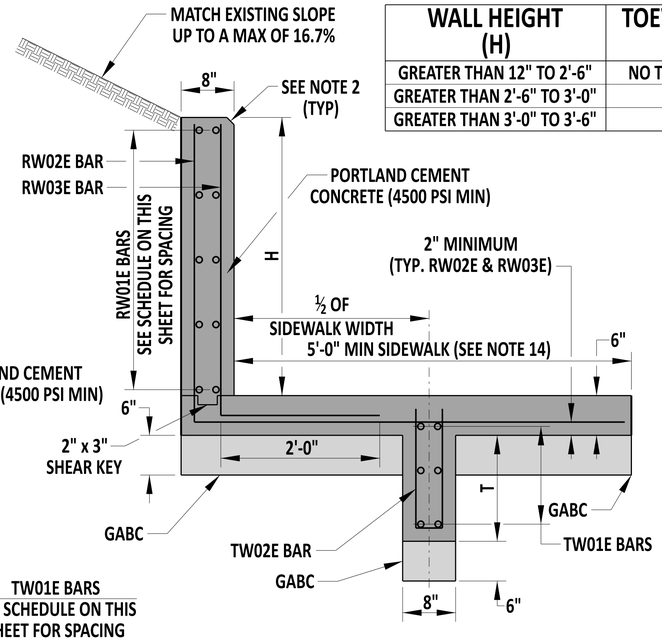
22-DEC-2023

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)



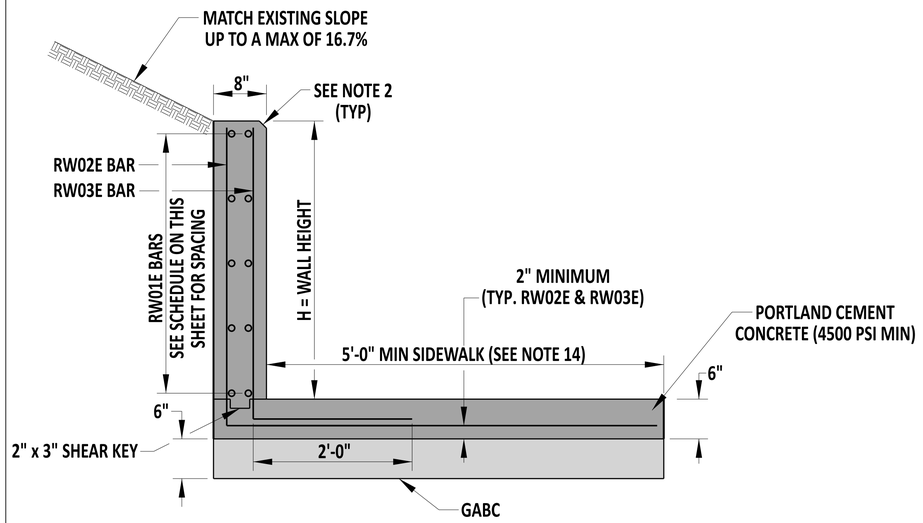
CURB RETAINING WALL SECTION
FOR H GREATER THAN 2'-6"



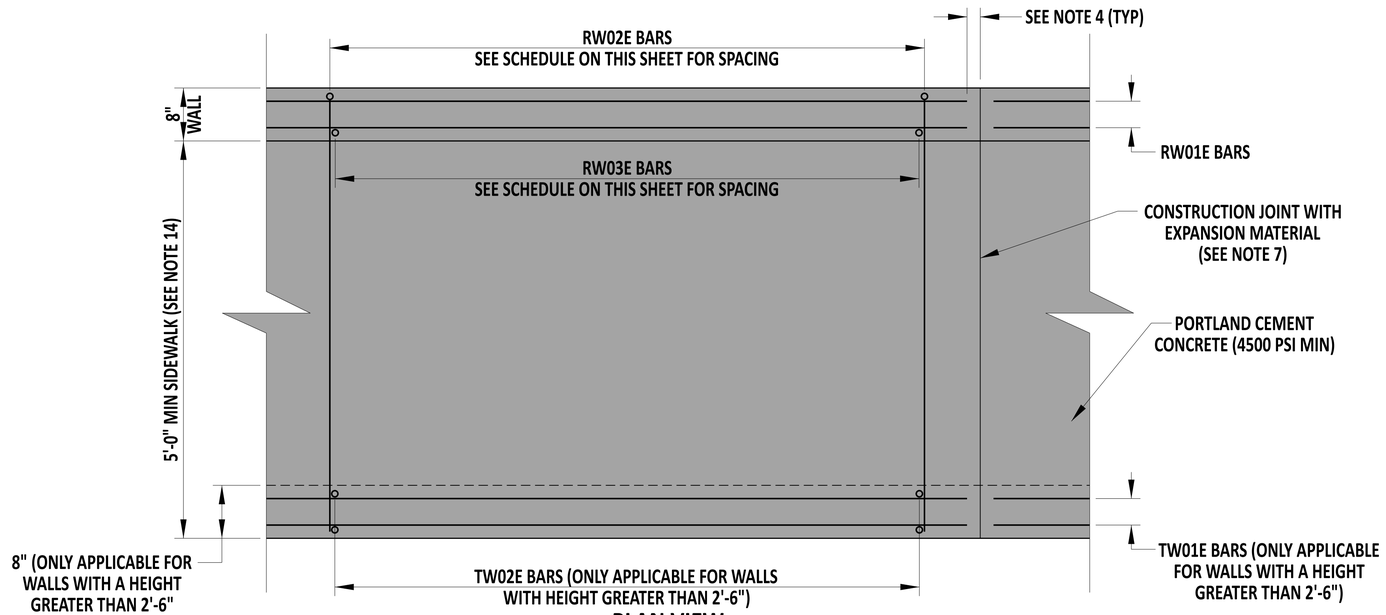
OPTIONAL TOEWALL PLACEMENT CURB RETAINING WALL SECTION
FOR H GREATER THAN 2'-6"

NOTES:

1). 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.
2). CHAMFER EDGES ¾" AT THE TOP OF WALL. PLACE A ¼" ROUND EDGE AT THE FRONT OF SIDEWALK.
3). 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.
4). MINIMUM BAR COVER IS 2" UNLESS OTHERWISE SPECIFIED ON THIS SHEET.
5). BEND THE RW02E AND RW03E BARS INTO ONE CONTINUOUS L-SHAPED BAR.
6). BEND THE TW02E BARS INTO 1 CONTINUOUS U-SHAPED BAR.
7). SEE DETAIL M-3 FOR SIDEWALK DETAILS AND NOTES, INCLUDING CONSTRUCTION JOINTS AND EXPANSION MATERIAL.
8). DO NOT PLACE RW01E AND TW01E BARS THROUGH EXPANSION JOINTS. STOP REINFORCEMENT AND MAINTAIN MINIMUM BAR COVER AS SPECIFIED IN PREVIOUS NOTES.
9). THE TOEWALL CAN OPTIONALLY BE PLACED AT MIDPOINT OF THE SIDEWALK.
10). ALL REINFORCING STEEL MUST BE EPOXY COATED.
11). 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.
12). FOR CURB RETAINING WALLS WHERE H IS 12" OR LESS, A MODIFIED P.C.C. CURB TYPE 1-8 CAN BE USED.
13). CURB HAS BEEN OMITTED FROM THESE DETAILS FOR CLARITY PURPOSES. FOR INSTALLATIONS WHERE THE TOEWALL IS PLACED AT THE EDGE OF THE SIDEWALK, THE TOEWALL IS NOT A REPLACEMENT FOR CURB.
14). THE MINIMUM SIDEWALK WIDTH WHEN A BUFFER STRIP IS PROVIDED BETWEEN THE EDGE OF PAVEMENT AND THE SIDEWALK IS 5'-0". THE MINIMUM SIDEWALK WIDTH WHEN A BUFFER STRIP IS NOT PROVIDED IS 6'-0".



CURB RETAINING WALL SECTION
FOR HEIGHTS GREATER THAN 12"
BUT LESS THAN OR EQUAL TO 2'-6"



PLAN VIEW

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Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

CURB RETAINING WALL

STANDARD NO. C-6 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

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 3)	79"	82"	S501 (SEE NOTE 4)	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 4)	93"	96"	S501 (SEE NOTE 4)	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 4)	93"	96"	S501 (SEE NOTE 4)	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 4)	111"	114"	S501 (SEE NOTE 4)	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 4)	111"	114"	S501 (SEE NOTE 4)	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 4)	111"	114"	S501 (SEE NOTE 4)	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 4)	117"	120"	S501 (SEE NOTE 4)	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 4)	117"	120"	S501 (SEE NOTE 4)	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 4)	117"	120"	S501 (SEE NOTE 4)	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). SEE D-4 OR APPROPRIATE DETAIL SHEET FOR ADDITIONAL NOTES.
3). FOR A 34" X 24" DRAINAGE INLET, SEE DETAIL D-5, SHEET 6 FOR INLET TOP UNIT TYPES A, B, C, D, & E. FOR INLET TOP UNIT TYPE S, SEE DETAIL D-5, SHEET 8.
4). FOR MORE INFORMATION ON DRAINAGE INLET TOP UNIT TYPES A, B, C, D, & E SEE DETAIL D-5, SHEET 3 AND FOR DRAINAGE INLET TOP UNIT, TYPE S, SEE DETAIL D-5, SHEET 8.
5). ONLY USE THE TYPE 7 DRAINAGE INLET GRATE WHEN SPECIFIED ON THE PLANS OR WITH APPROVAL OF THE ENGINEER.

DelDOT

Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

DRAINAGE INLET REFERENCE SHEET

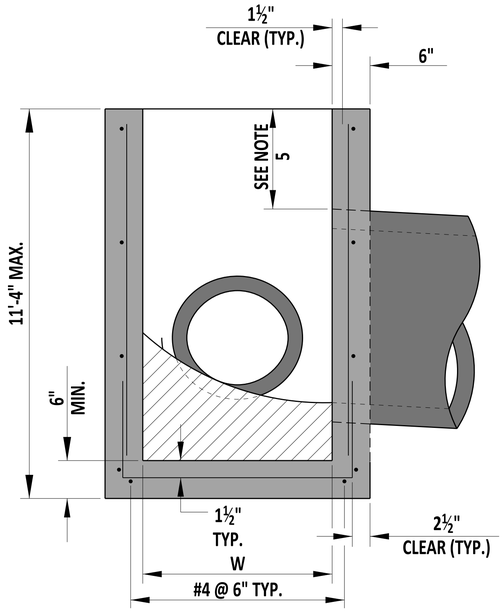
STANDARD NO. D-R (2024) SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

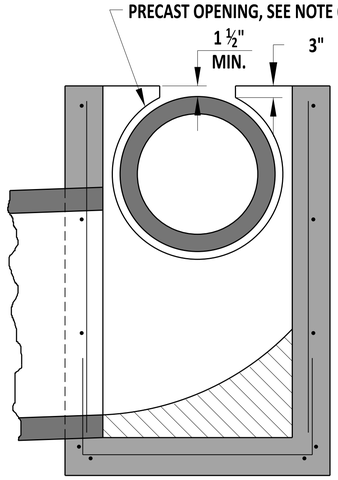
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS



SECTION A-A



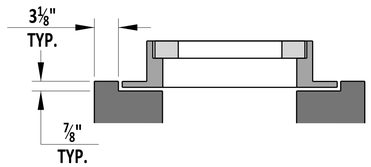
OPTIONAL PIPE OPENING DETAIL

SEE NOTE 5

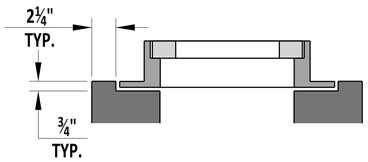
INLET BOX SCHEDULE			
L	W	FABRICATION TOLERANCE	
17⅝"	11⅝"	+1"	*
24"	24"	+1"	*
34"	18"	-1"	**
34"	24"	-1"	
48"	30"	+6"	
48"	48"	+6"	
66"	30"	+6"	
66"	48"	+6"	
66"	66"	+6"	
72"	24"	-1"	
72"	48"	-1"	
72"	72"	-1"	

* - 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 7 FOR REINFORCEMENT.
** - MAX DEPTH IS 4' FOR THIS DRAINAGE INLET.

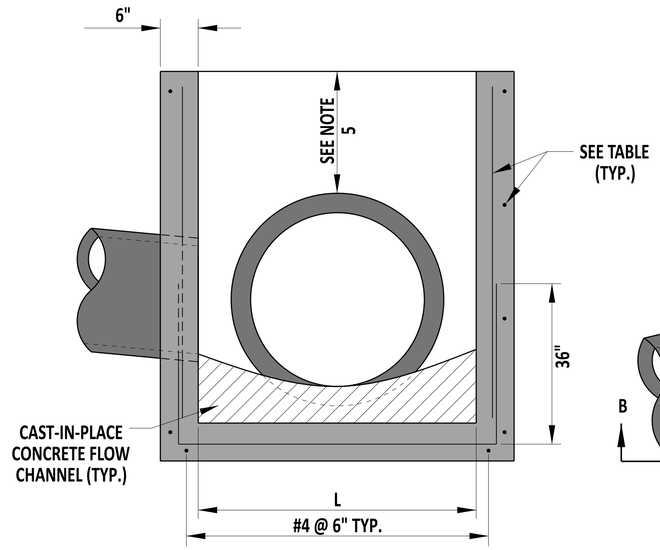
WALL REINFORCEMENT SCHEDULE		
INTERIOR WALL DIMENSION	AREA OF HORIZONTAL REINFORCEMENT PER FOOT	AREA OF VERTICAL REINFORCEMENT PER FOOT
	IN^2	IN^2
LESS THAN 4'	0.132	0.132
≥ 4'	0.163	0.132
≥ 4.5'	0.198	0.132
≥ 5'	0.239	0.132
≥ 5.5'	0.284	0.132



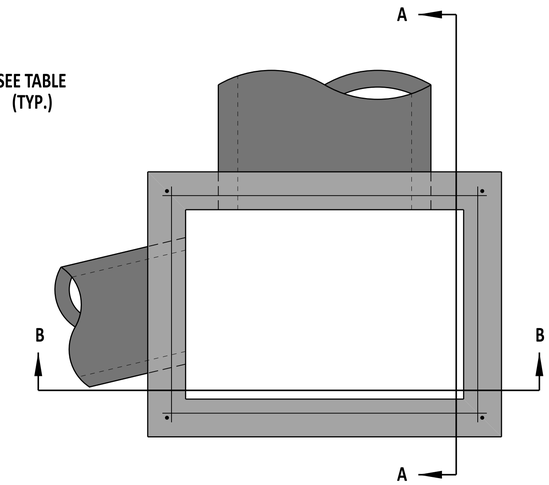
24" X 24" LAWN
INLET BOX DETAIL



17 ⅝" X 11 ⅝"
LAWN INLET BOX DETAIL



SECTION B-B



TOP VIEW

NOTES:

1). PROVIDE AND INSTALL 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). WHEN INLET BOX IS PRECAST, PROVIDE A PIPE OPENING DIAMETER BETWEEN 3" AND 4" LARGER THAN OUTSIDE DIAMETER OF PIPE.
7). USE 4" X 4", W4 X W4 WELDED WIRE AS REINFORCEMENT FOR LAWN INLET BOXES.

DelDOT

Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

INLET BOX

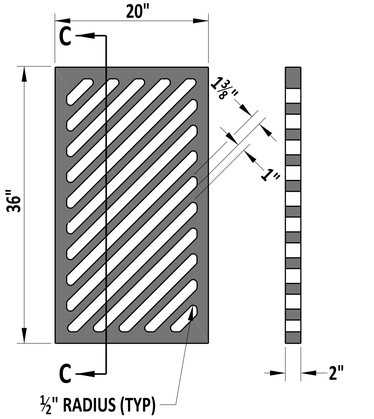
STANDARD NO. D-4 (2024) SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

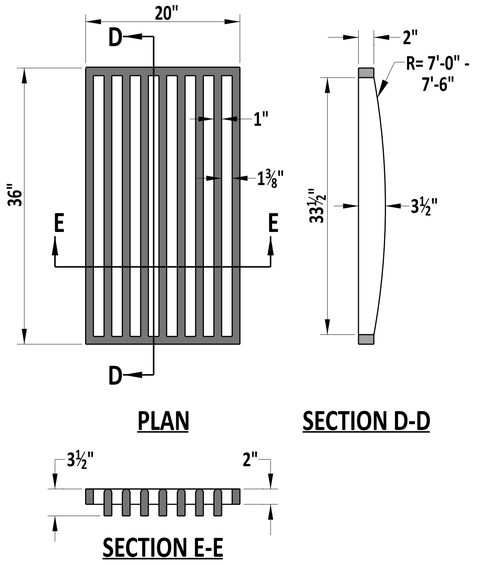
22-DEC-2023

SCALE : NTS



PLAN SECTION C-C

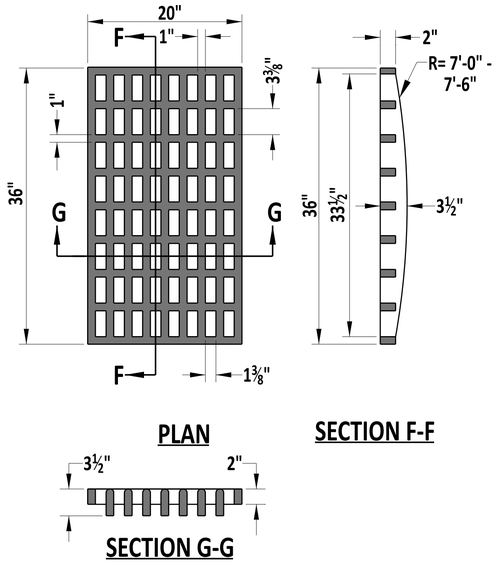
TYPE 1



PLAN SECTION D-D

SECTION E-E

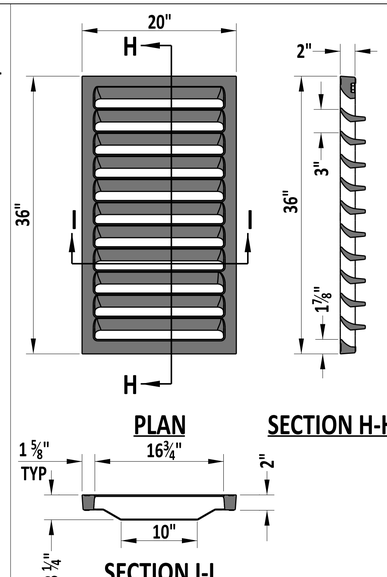
TYPE 2



PLAN SECTION F-F

SECTION G-G

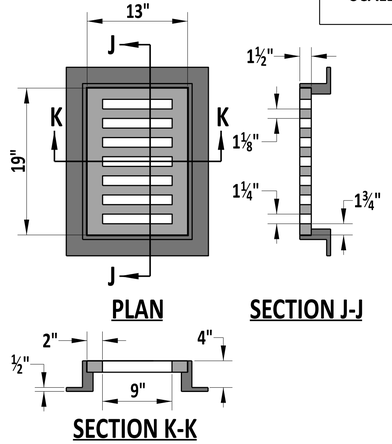
TYPE 3



PLAN SECTION H-H

SECTION I-I

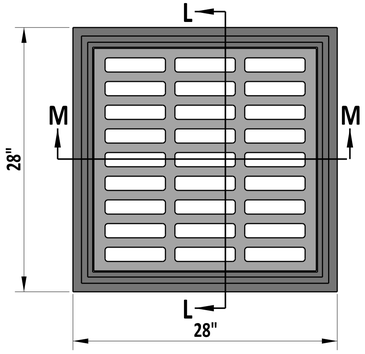
TYPE 4



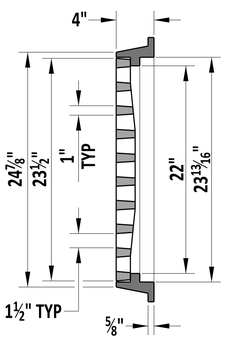
PLAN SECTION J-J

SECTION K-K

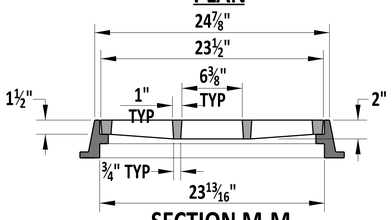
TYPE 5



PLAN



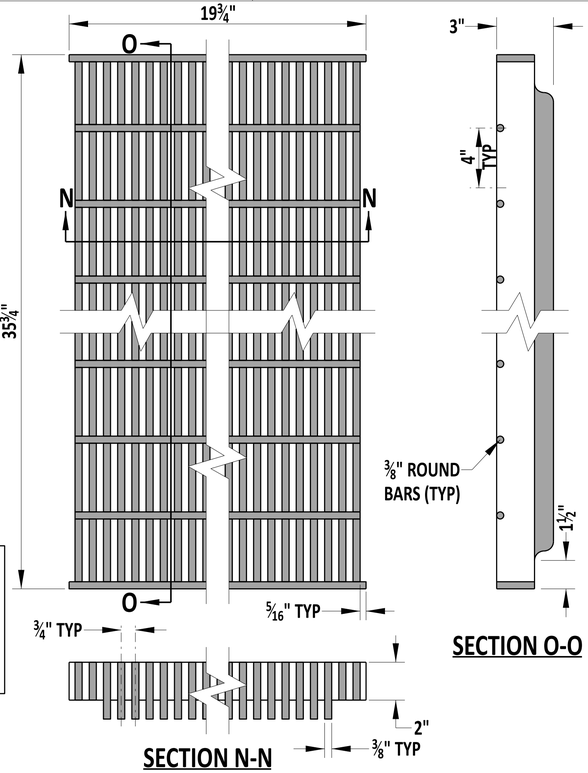
SECTION L-L



SECTION M-M

TYPE 6

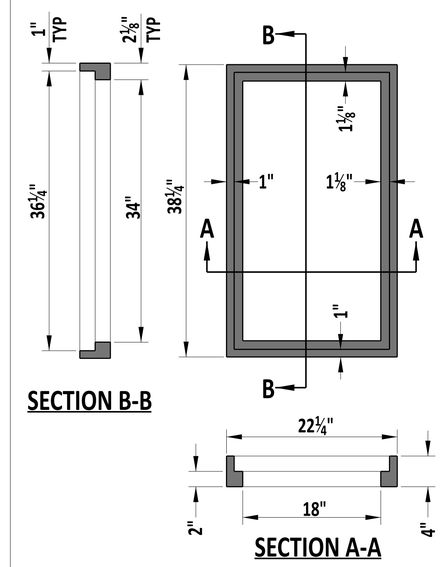
NOTE: THIS INLET GRATE IS ONLY TO BE USED WHEN SPECIFIED ON THE PLANS AND SHOULD NOT BE RETROFITTED WITHOUT APPROVAL BY THE ENGINEER.



SECTION N-N

SECTION O-O

TYPE 7

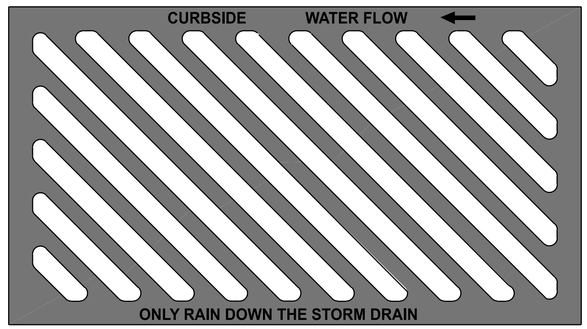


SECTION B-B

SECTION A-A

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

TYPE 6 TYPE 7



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". 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.

DelDOT

Andrew Shott
ENGINEERING SUPPORT
12/22/2023
DATE
RECOMMENDED

DRAINAGE INLET FRAME AND GRATES

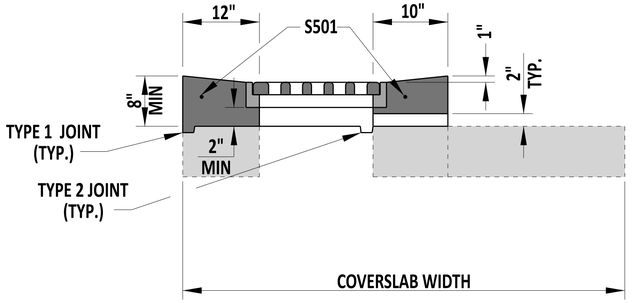
STANDARD NO. D-5 (2024) SHT. 2 OF 9

REVIEWED
DEPUTY DIRECTOR - DESIGN
22 December 2023
DATE

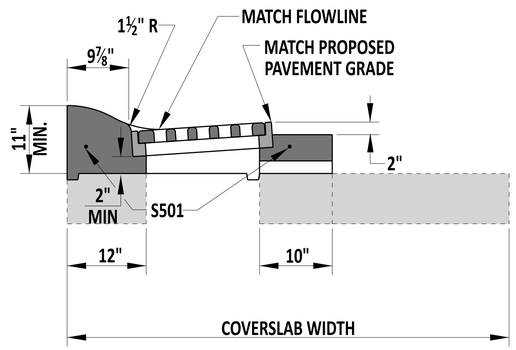
APPROVED
CHIEF ENGINEER
01/11/2024
DATE

22-DEC-2023

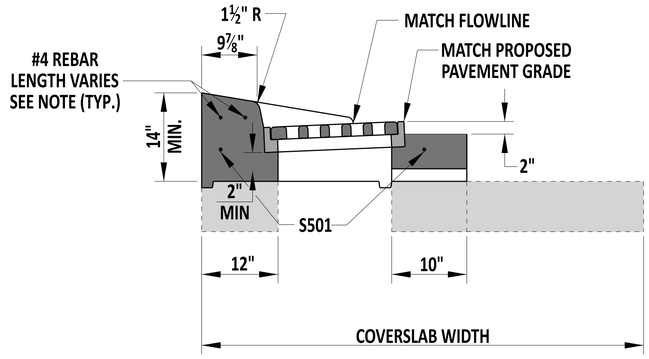
SCALE : NTS



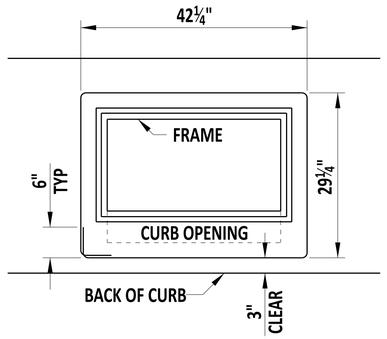
TYPE A



TYPE D

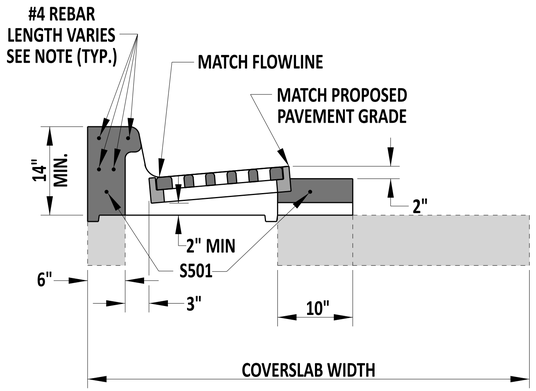


TYPE E



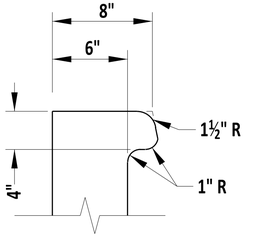
S501 BENDING DIAGRAM

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



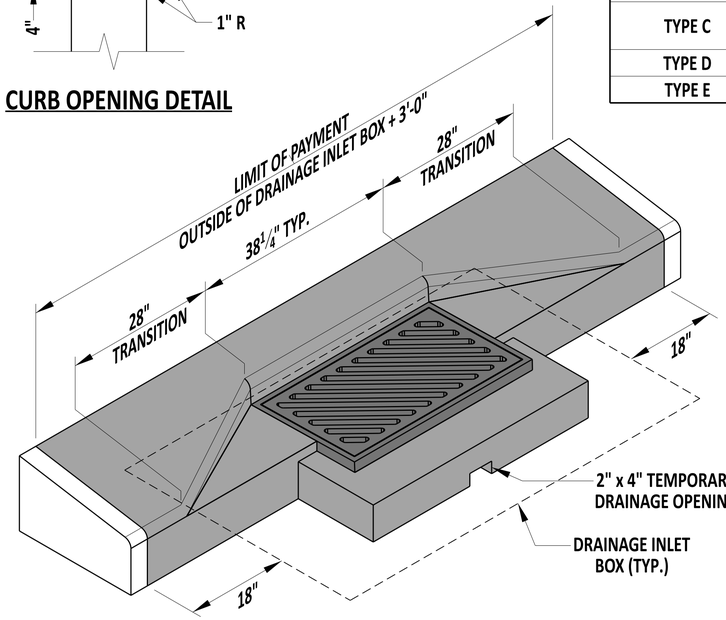
TYPE B

SEE CURB OPENING DETAIL ON THIS SHEET



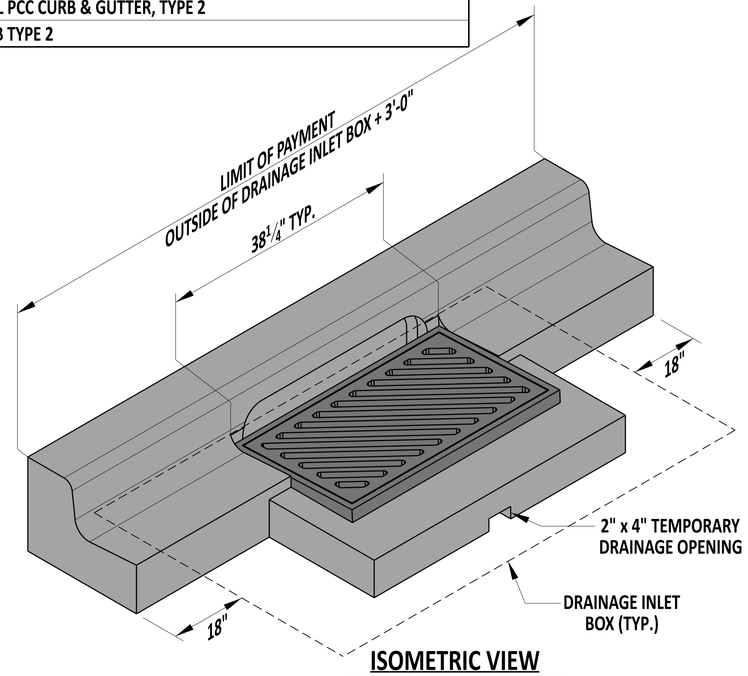
CURB OPENING DETAIL

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



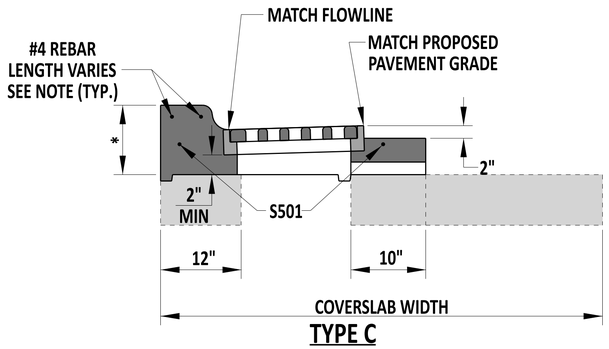
ISOMETRIC VIEW

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".

TYPE E TOP UNITS ARE INTENDED TO LIMIT INTRUSION INTO BIKE AND TRAVEL LANES. WHERE SUFFICIENT SHOULDER EXISTS, THE GRATE IS TO BE INSTALLED IN LINE WITH THE CURB FACE.

DelDOT

Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

DRAINAGE INLET TOP UNITS

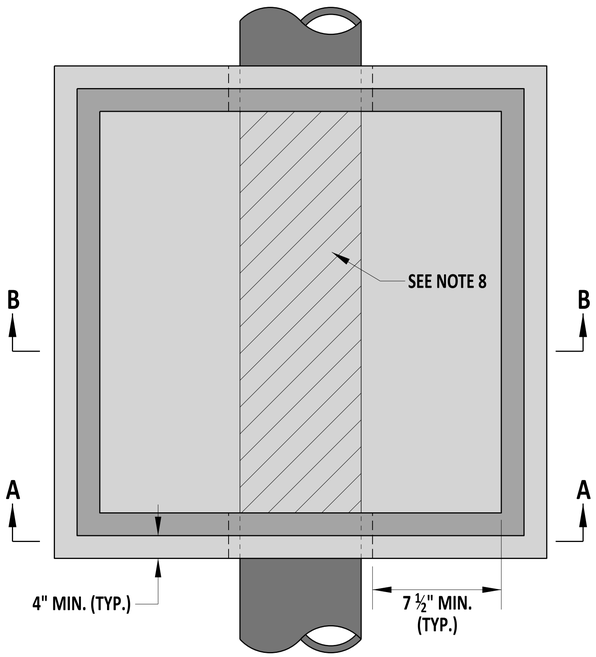
STANDARD NO. D-5 (2024) SHT. 3 OF 9

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

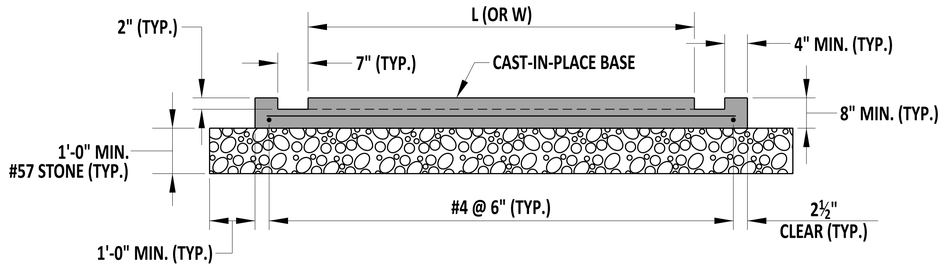
SCALE : NTS



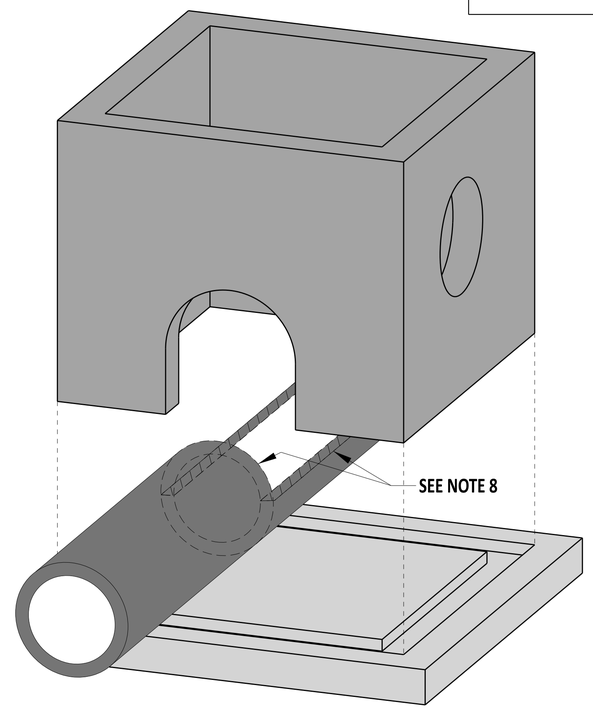
PLAN VIEW

NOTES:

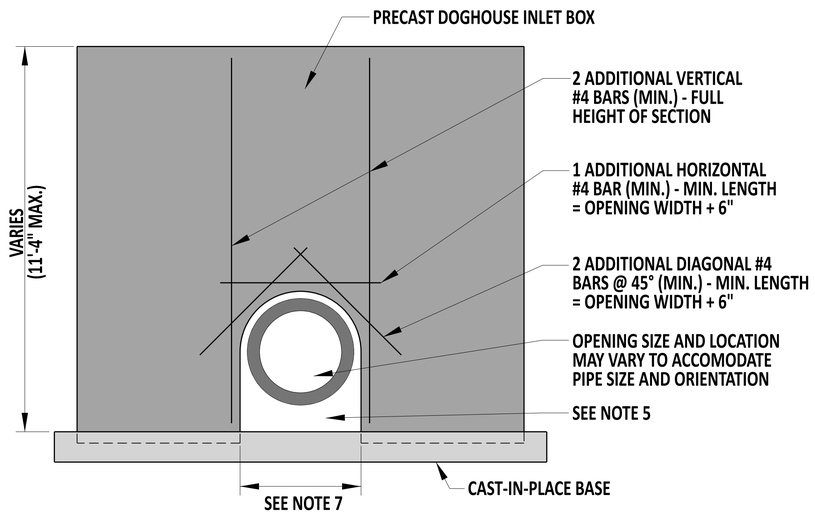
1). CONSTRUCT THE DOGHOUSE INLET BOX IN ACCORDANCE WITH SECTION 602. SEE DETAIL D-4, SHEET 1 OF 1 FOR BOX DETAILS AND NOTES.
2). PROVIDE A MINIMUM COVER OF 1 ½" FOR ALL REINFORCEMENT, UNLESS NOTED OTHERWISE.
3). SUPPORT BOTH ENDS OF THE PIPE DURING THE CONSTRUCTION OF THE BASE.
4). SEE TABLE ON DETAIL 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.



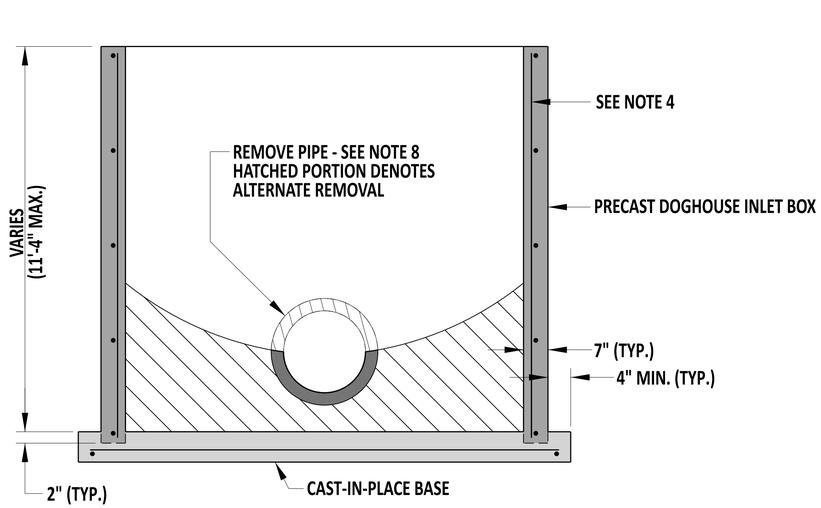
CAST-IN-PLACE BASE
SECTION VIEW



ISOMETRIC VIEW



SECTION A-A



SECTION B-B

DelDOT

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

DOGHOUSE INLET BOX

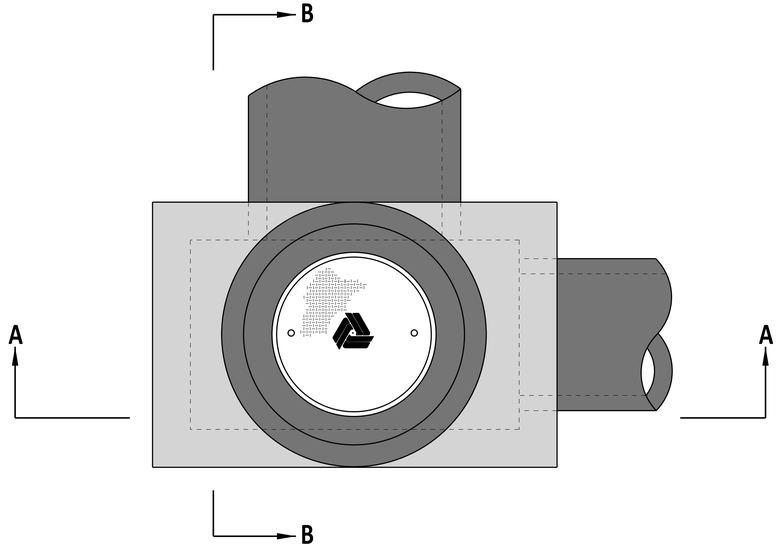
STANDARD NO. D-5 (2024) | SHT. 9 OF 9

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

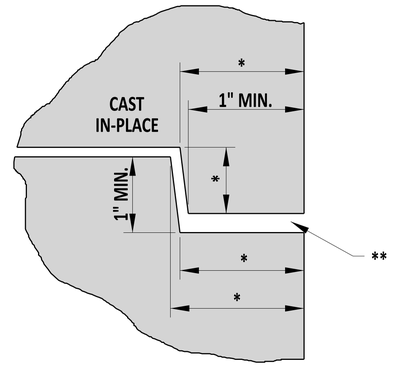
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

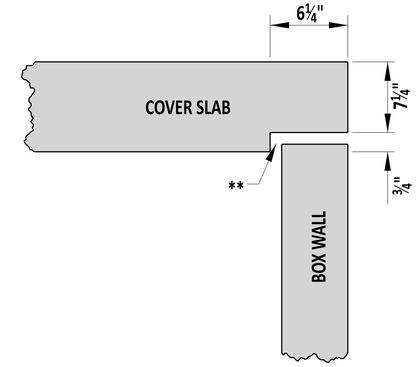
SCALE : NTS



PLAN

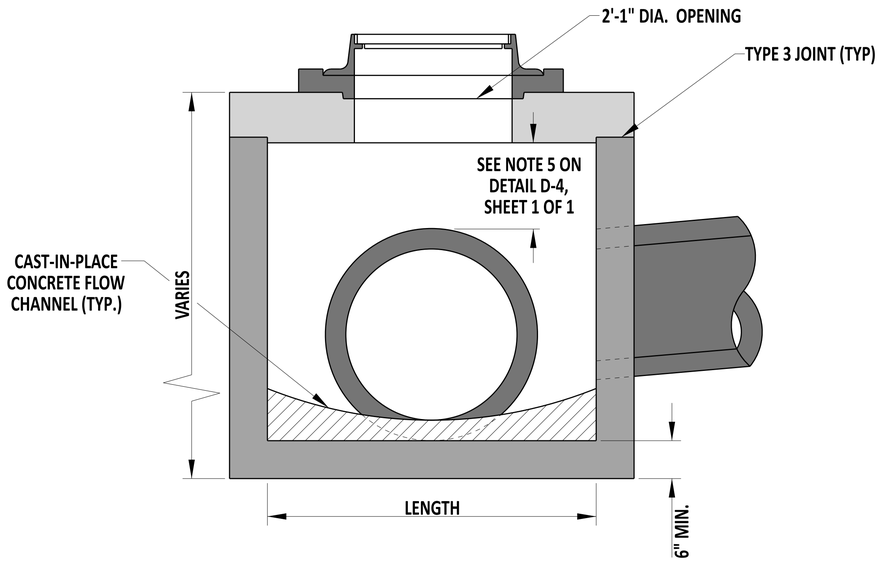


TYPE 1 JOINT DETAIL



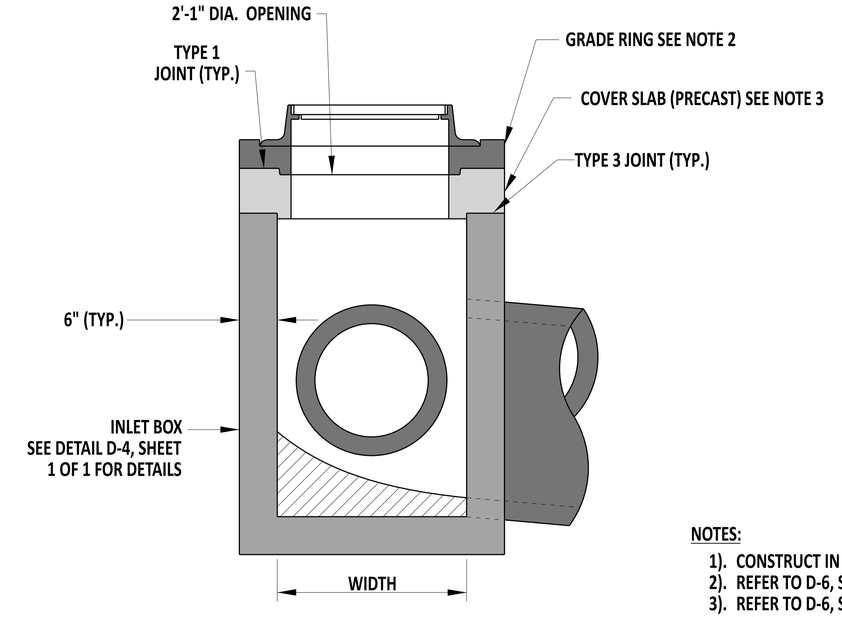
TYPE 3 JOINT DETAIL

* 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). CONSTRUCT IN ACCORDANCE WITH SECTION 602.
2). REFER TO D-6, SHEET 3 OF 5, FOR GRADE RING DETAILS.
3). REFER TO D-6, SHEET 4 OF 5, FOR BOX MANHOLE COVER SLAB DETAILS.

BOX MANHOLE ASSEMBLY

DelDOT

Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

BOX MANHOLE ASSEMBLY

STANDARD NO. D-6 (2024) | SHT. 1 OF 5

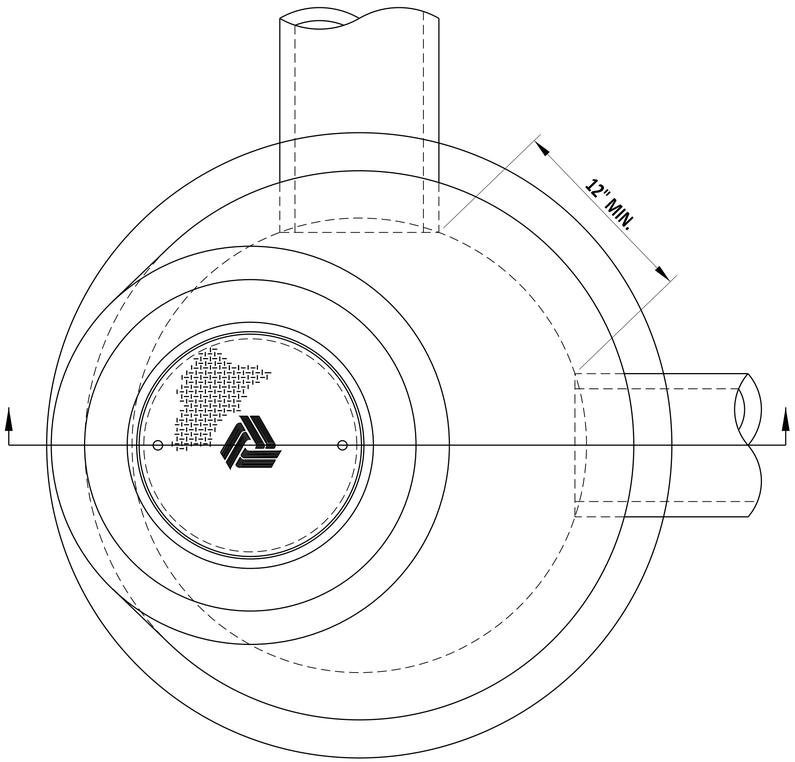
REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

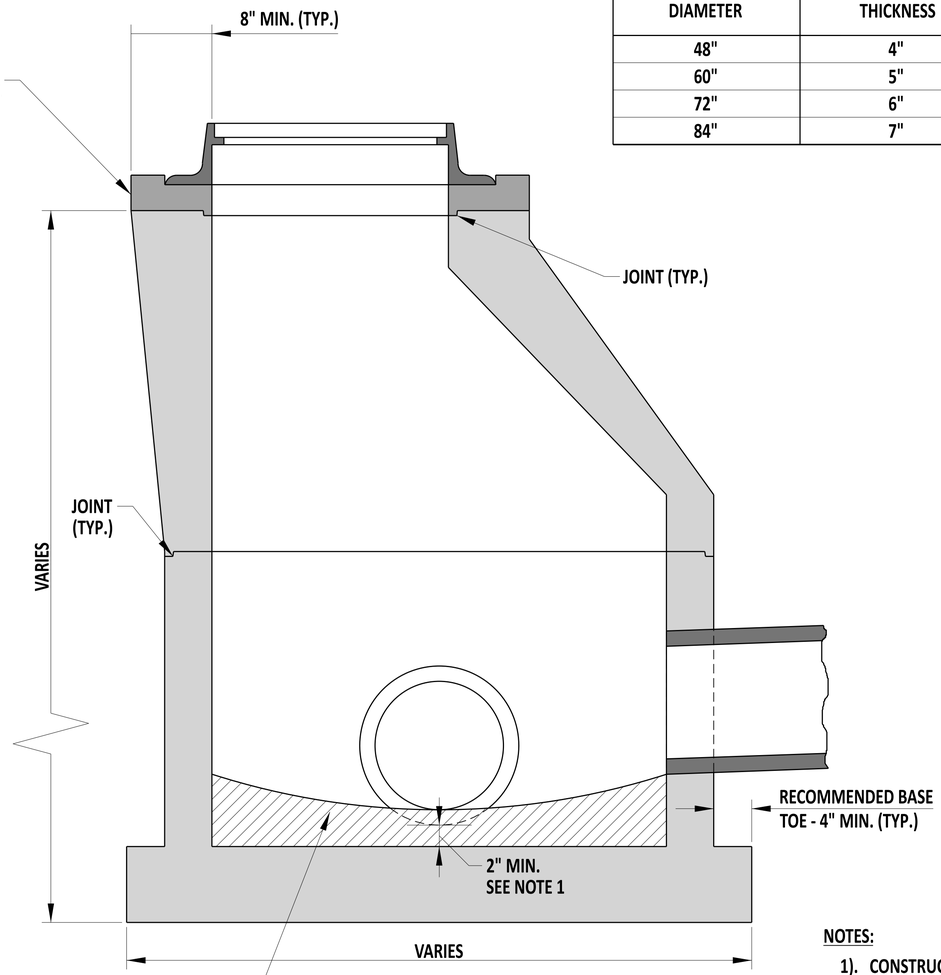
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

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".

NOTES:

1). CONSTRUCT ROUND MANHOLES IN ACCORDANCE WITH SECTION 602.
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). FABRICATOR IS RESPONSIBLE FOR LIFTING, HANDLING AND TRANSPORTATION STRESSES.

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RECOMMENDED

ROUND MANHOLE ASSEMBLY

STANDARD NO. D-6 (2024) | SHT. 2 OF 5

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APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

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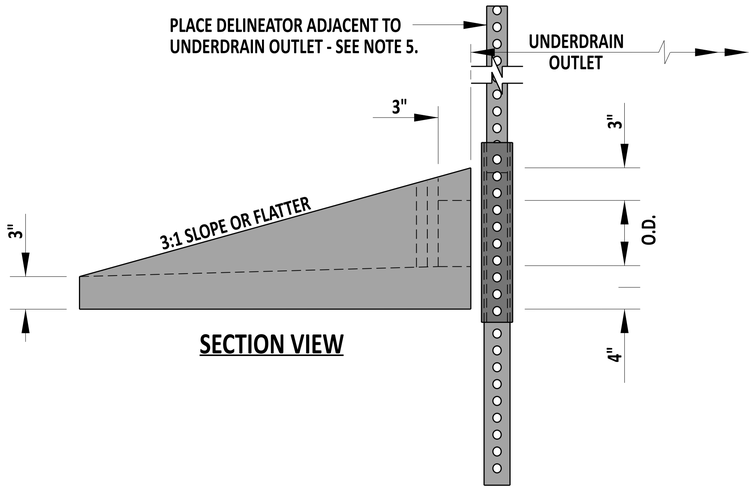
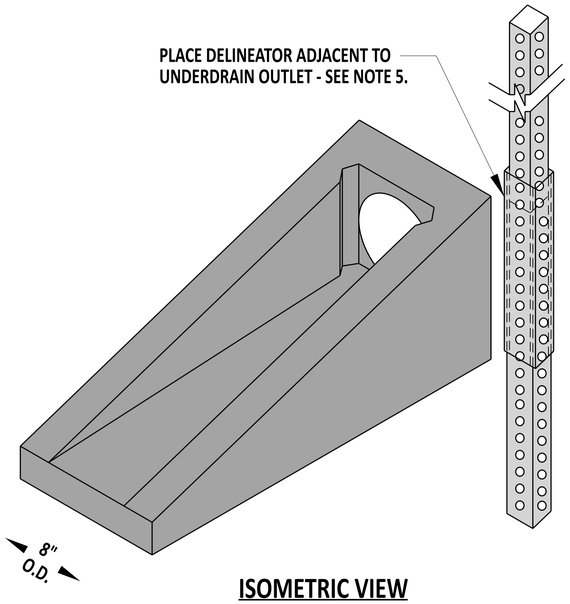
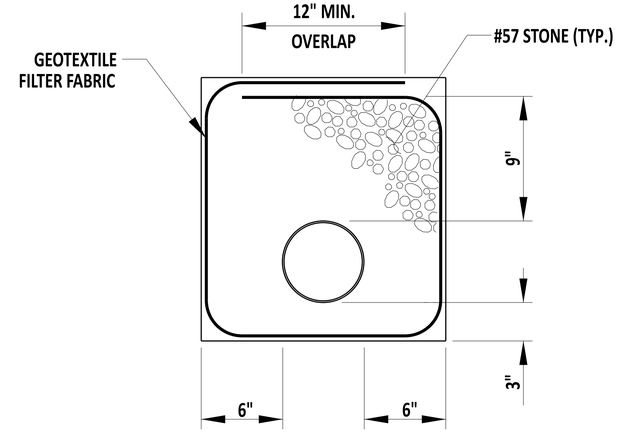


SECTION VIEW

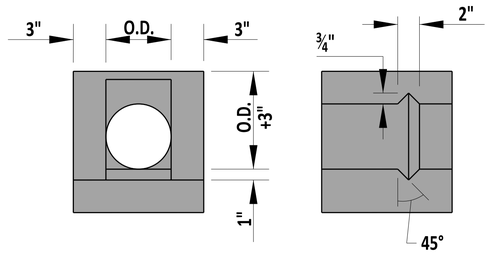


ISOMETRIC VIEW

UNDERDRAIN OUTLET

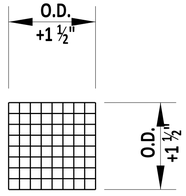


SECTION



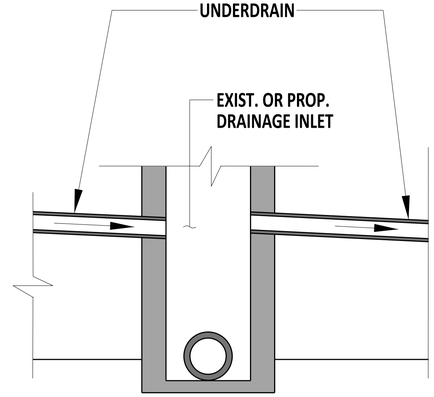
FRONT VIEW TOP VIEW

SLOTTED HEADWALL DETAIL



FRONT VIEW

RODENT SCREEN



ELEVATION

PERFORATED PIPE UNDERDRAIN

NOTES:

1). PLACE GEOTEXTILE FILTER FABRIC ENTIRELY OVER THE TOP OF UNDERDRAIN TRENCH AND LAP AS SHOWN.
2). MATCH THE SLOPE OF UNDERDRAINS TO THE ROADWAY GRADE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
3). 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.
4). INSTALL RODENT SCREEN TO SNUGLY FIT THE PROVIDED SLOT WITH THE SCREEN LIP FITTING TIGHT TO THE BOTTOM FLOW LINE.
5). INSTALL A DELINEATOR ADJACENT TO THE TOP OF THE UNDERDRAIN OUTLET ON THE APPROACH SIDE OF TRAFFIC. INSTALL THE DELINEATOR ON A BREAKAWAY POST ASSEMBLY, EXTENDING 4' ABOVE GROUND ELEVATION, IN ACCORDANCE WITH DETAIL T-15, SHEET 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.
6). WHEN TWO LINES OF PIPE UNDERDRAIN DRAIN TO A LOW POINT, PROVIDE AN OUTLET FOR EACH PIPE.
7). DO NOT PLACE UNDERDRAIN PIPE UNDER GUARDRAIL.

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PERFORATED PIPE UNDERDRAIN

STANDARD NO. D-9 (2024) SHT. 1 OF 1

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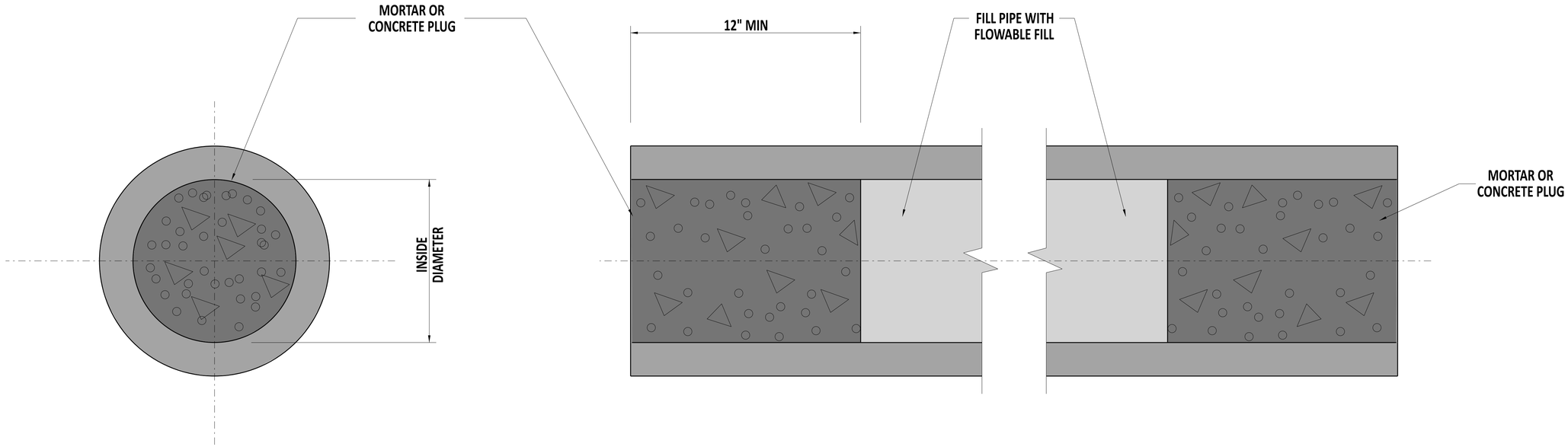


SECTION

ELEVATION

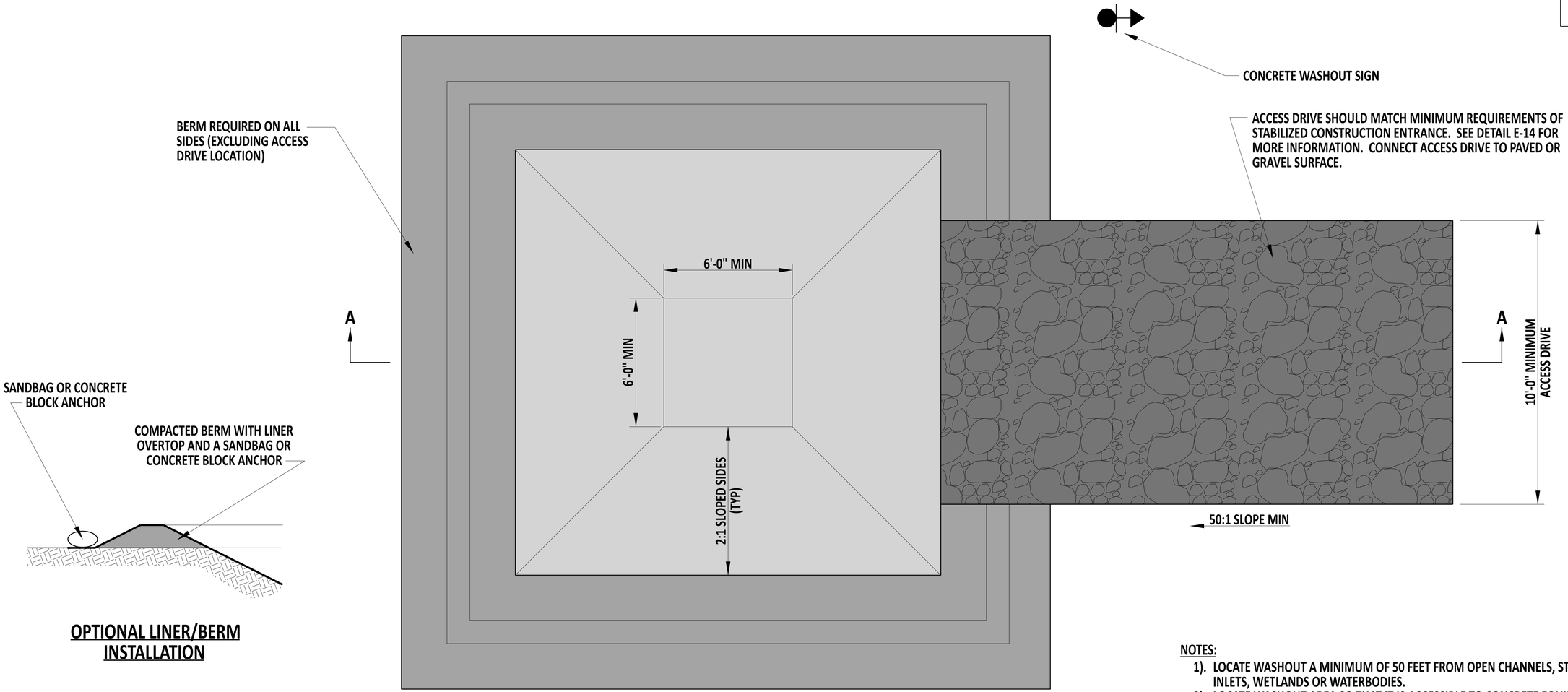
NOTE:

1). PLUG THE DOWNSTREAM PIPE END WITH MORTAR, AND FLOWABLE FILL IN ACCORDANCE WITH SECTION 208.

DelDOT	Andrew Shott 12/22/2023 ENGINEERING SUPPORT DATE RECOMMENDED	PIPE PLUGGING	REVIEWED DEPUTY DIRECTOR - DESIGN 22 December 2023 DATE
		STANDARD NO. D-10 (2024) SHT. 1 OF 1	APPROVED CHIEF ENGINEER 01/11/2024 DATE

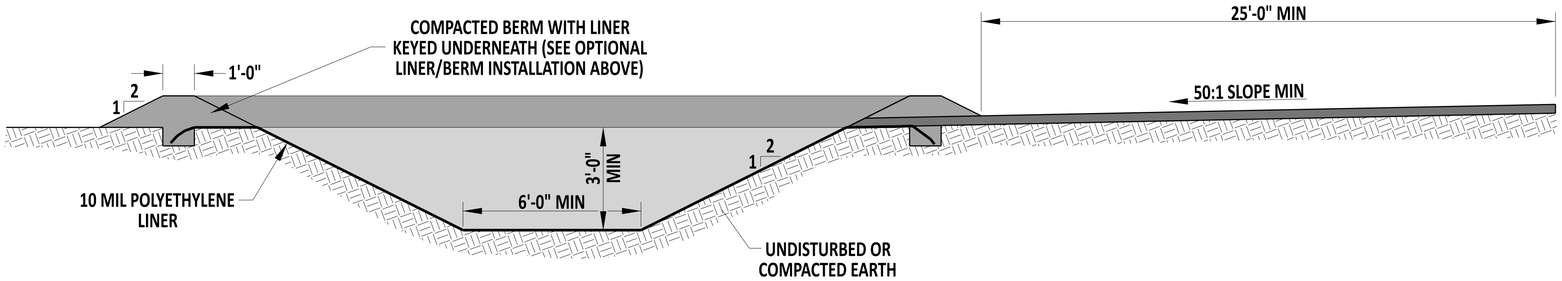
22-DEC-2023

SCALE : NTS



PLAN VIEW

OPTIONAL LINER/BERM INSTALLATION



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.

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RECOMMENDED

CONCRETE WASHOUT

STANDARD NO. E-1 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

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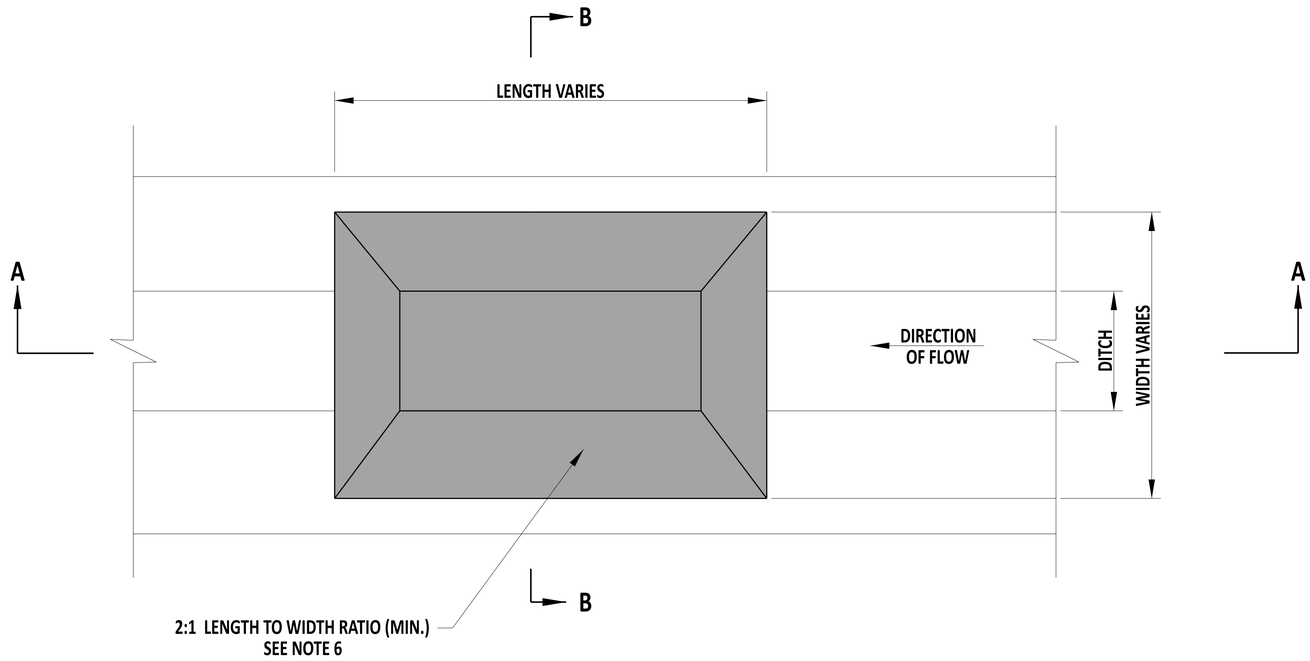
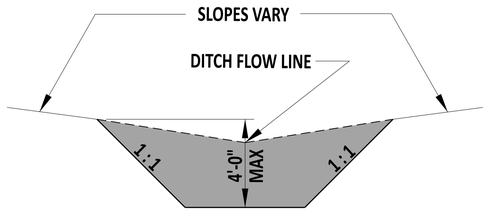
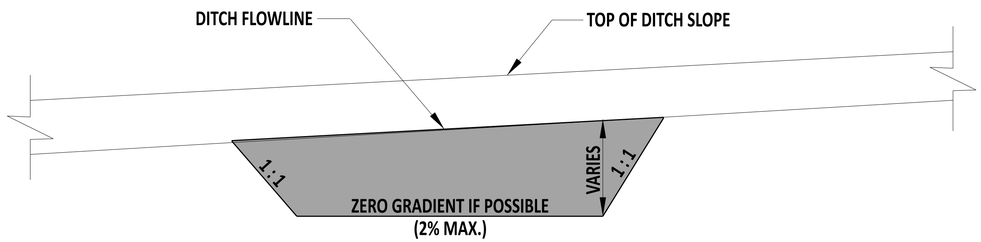


PLAN



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.
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 R-4 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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SEDIMENT TRAP

STANDARD NO. E-3 (2024) | SHT. 1 OF 1

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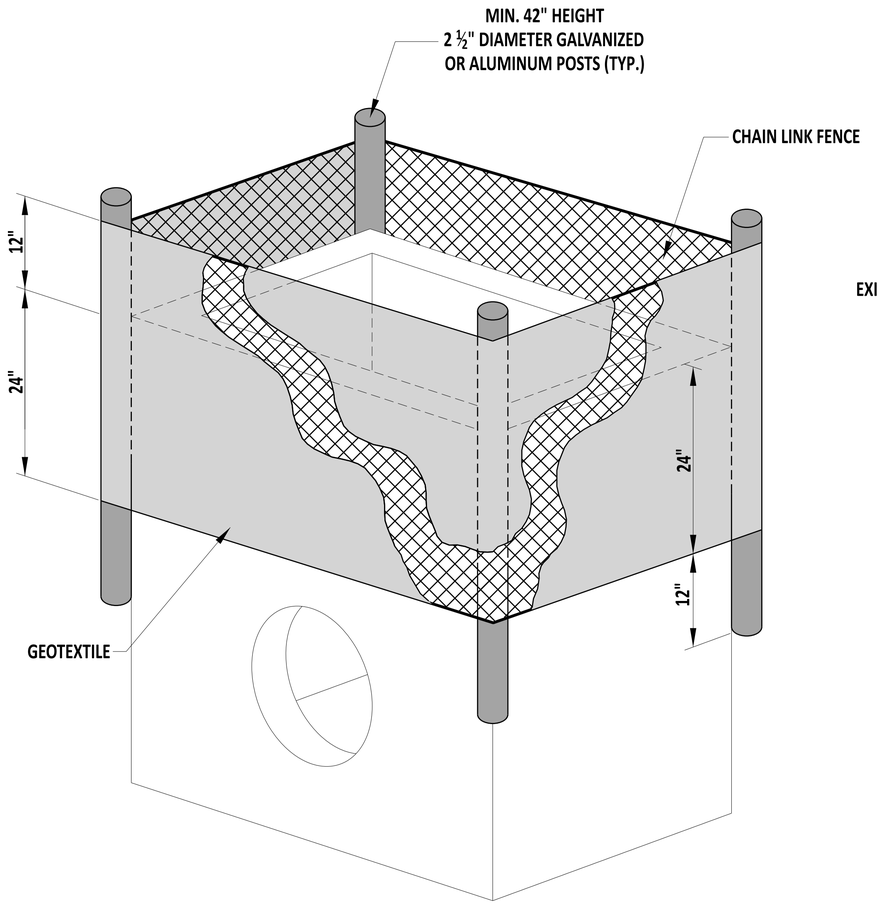
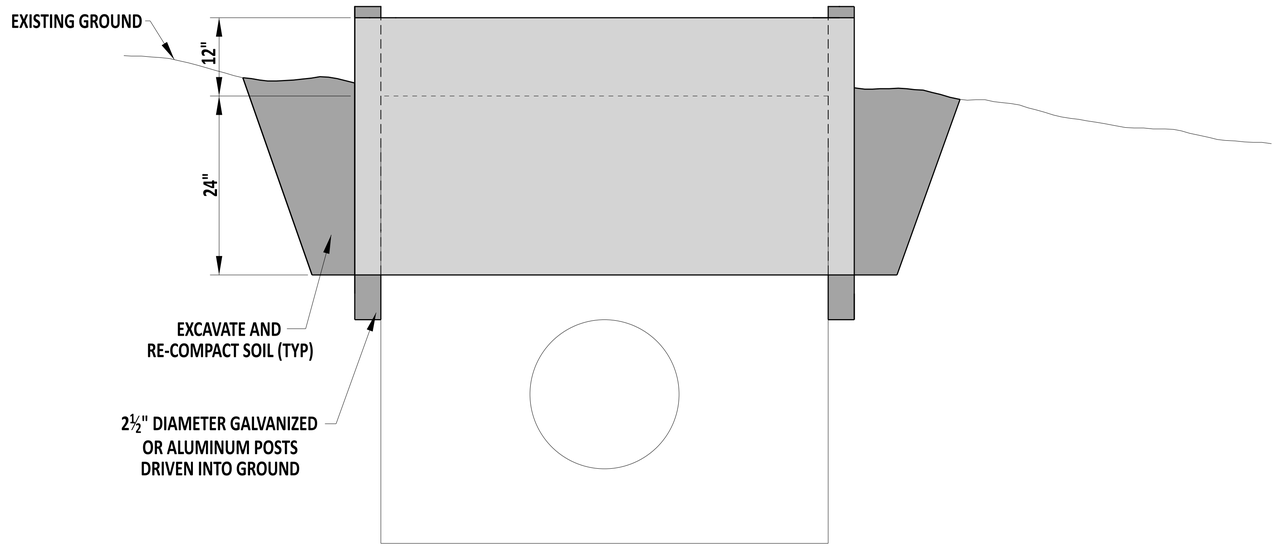


ISOMETRIC VIEW



ELEVATION VIEW

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ENGINEERING SUPPORT
12/22/2023
DATE
RECOMMENDED

INLET SEDIMENT CONTROL, DRAINAGE INLET

STANDARD NO. E-4 (2024) | SHT. 1 OF 1

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DEPUTY DIRECTOR - DESIGN
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APPROVED
CHIEF ENGINEER
01/11/2024
DATE

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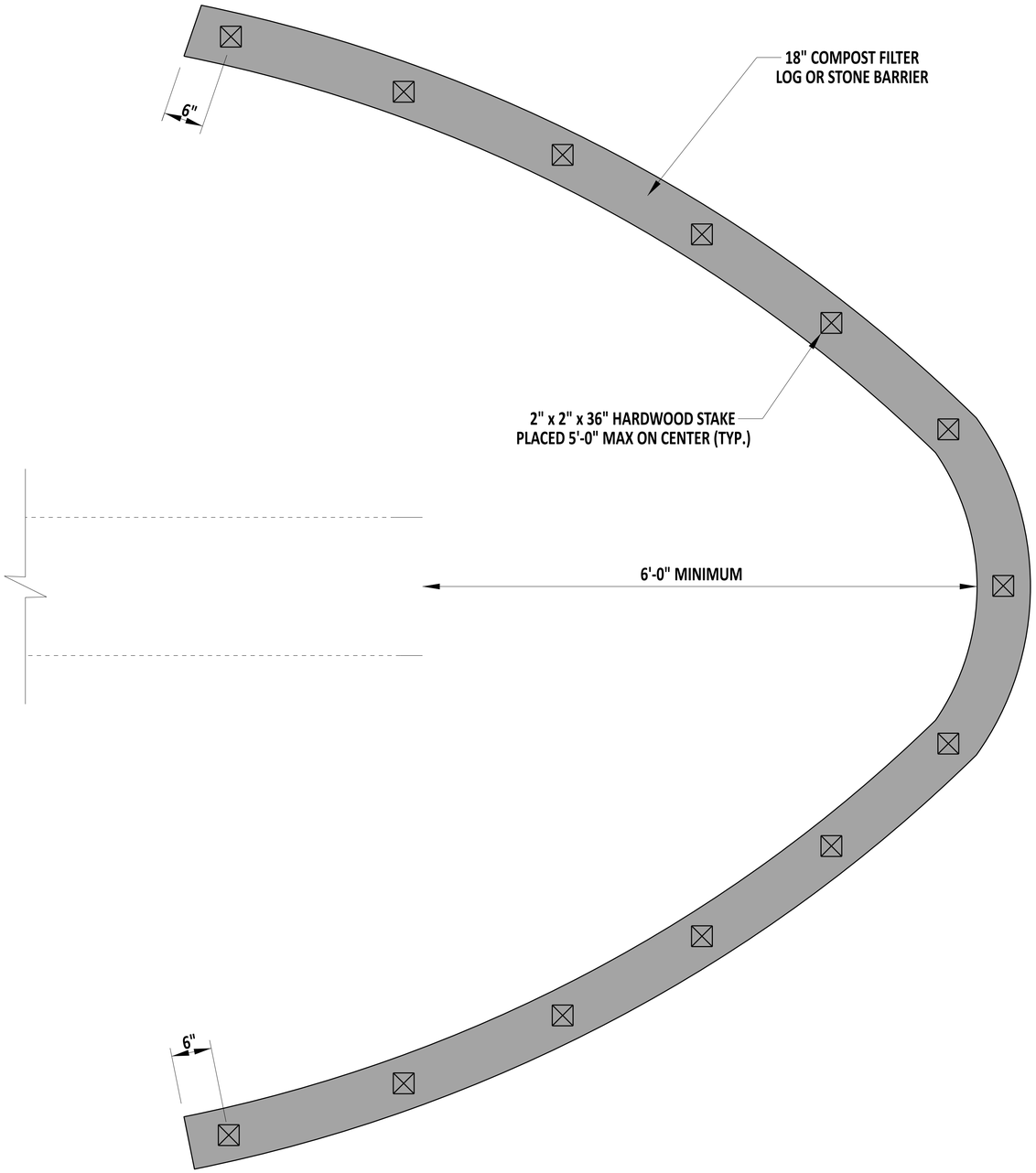
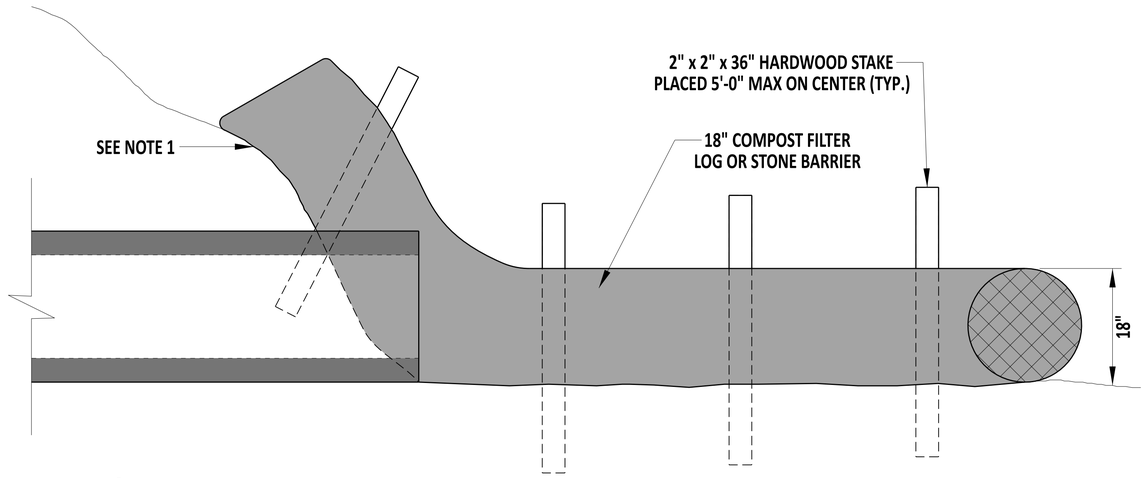
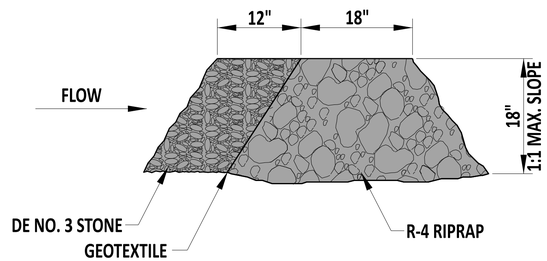




SECTION A-A



SECTION VIEW - STONE BARRIER

NOTE:

1). EXTEND THE BOTTOM OF THE COMPOST FILTER LOG OR STONE BARRIER ABOVE THE TOP OF THE PIPE.
2). IF COMPOST FILTER LOGS ARE USED, 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, EMPLOY THE STONE BARRIER OPTION.
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.

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RECOMMENDED

INLET SEDIMENT CONTROL, CULVERT INLET

STANDARD NO. E-5 (2024) | SHT. 1 OF 1

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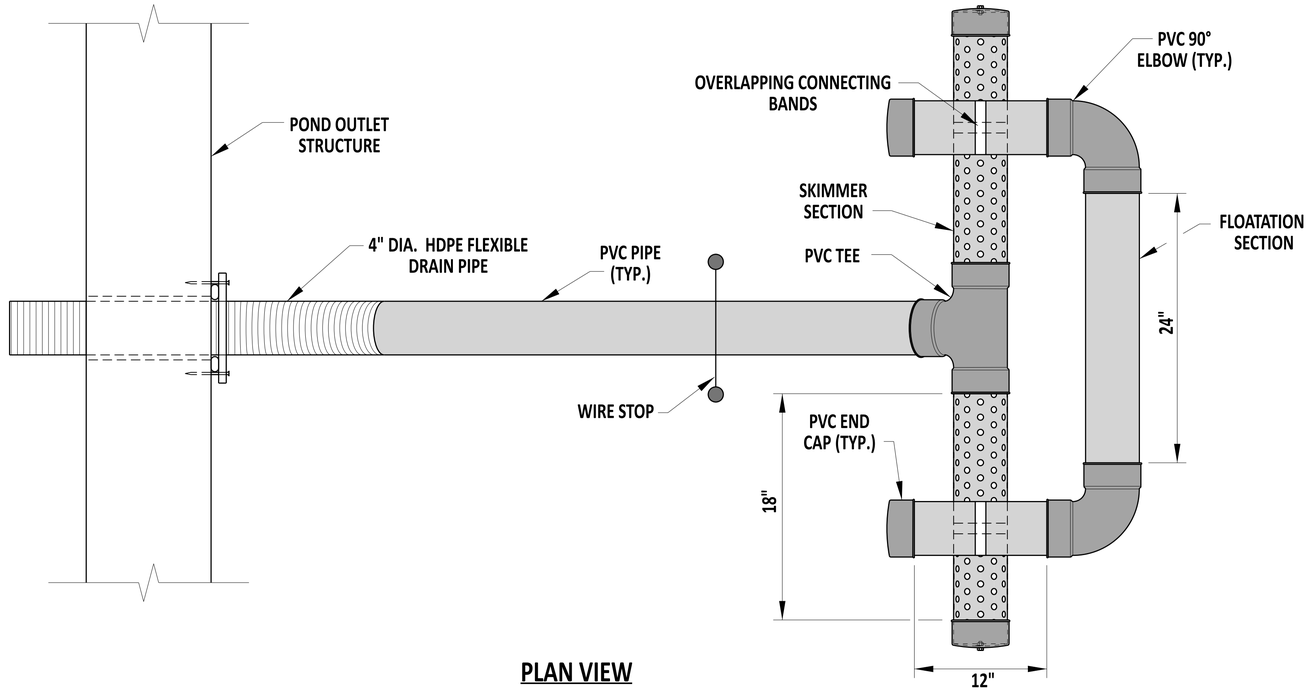
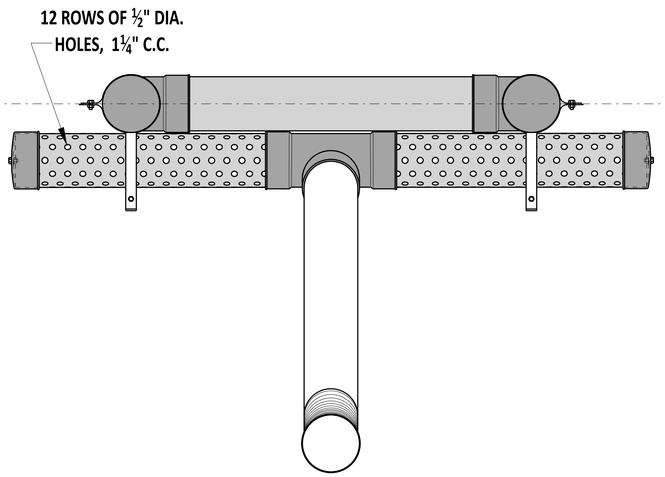
NOTES:

1). ALL PVC PIPES ARE 4" NOMINAL DIAMETER.
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.

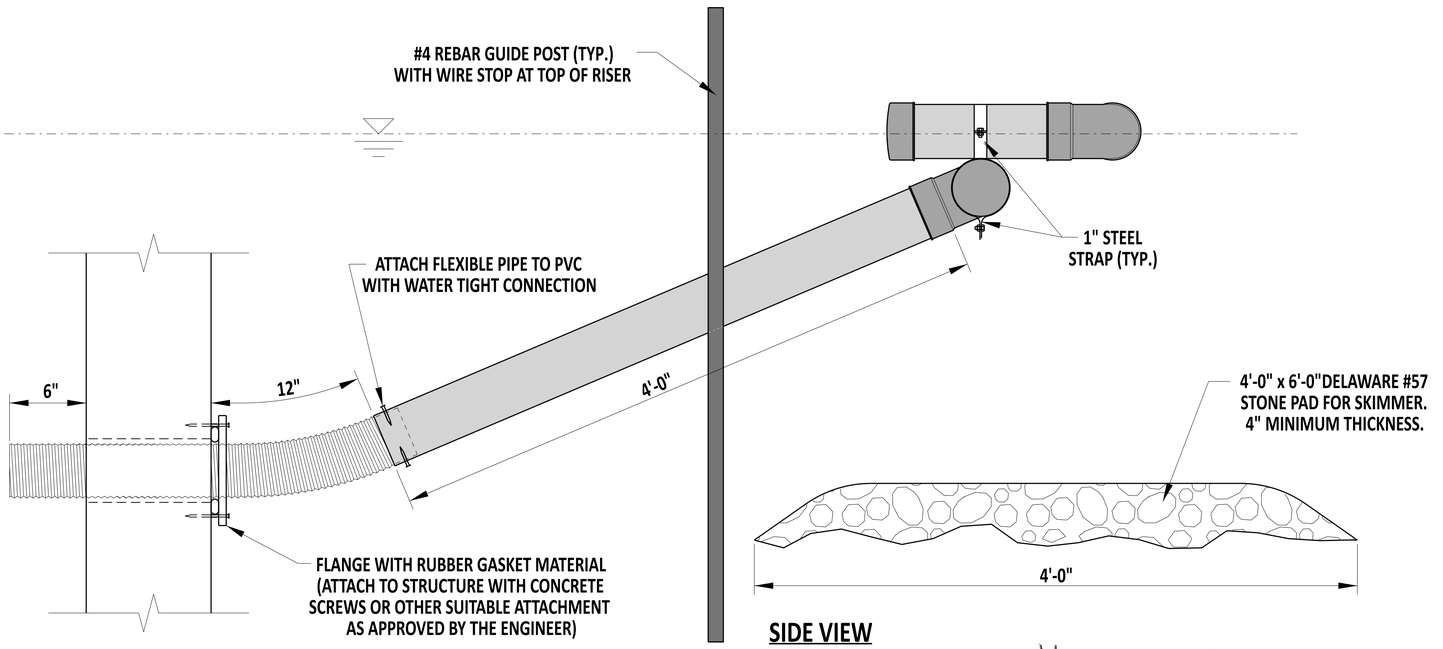
SCALE : NTS



PLAN VIEW



FRONT VIEW



SIDE VIEW

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RECOMMENDED

SKIMMER DEWATERING DEVICE

STANDARD NO. E-8 (2024) | **SHT.** 1 **OF** 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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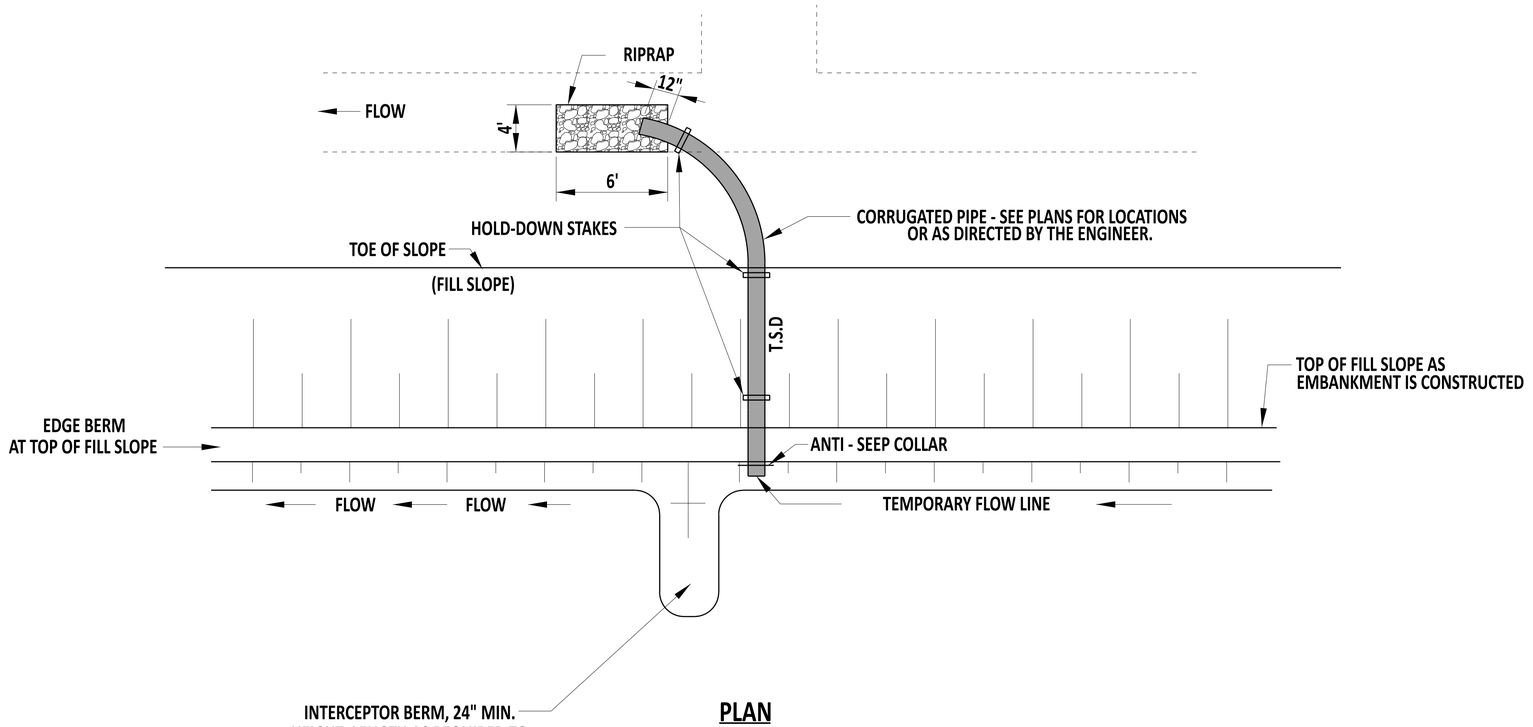
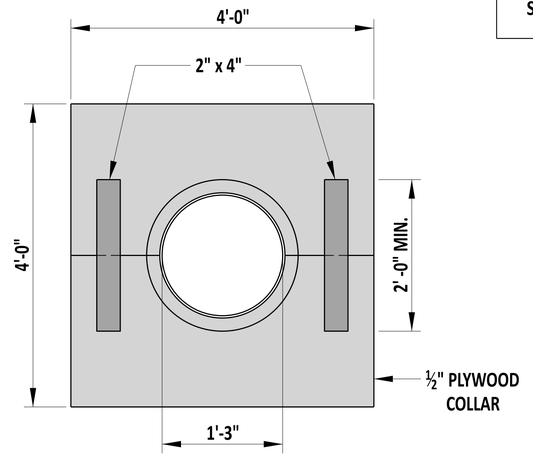
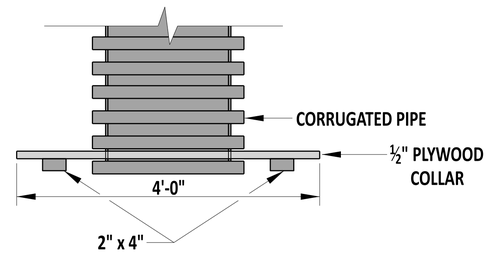


PLAN

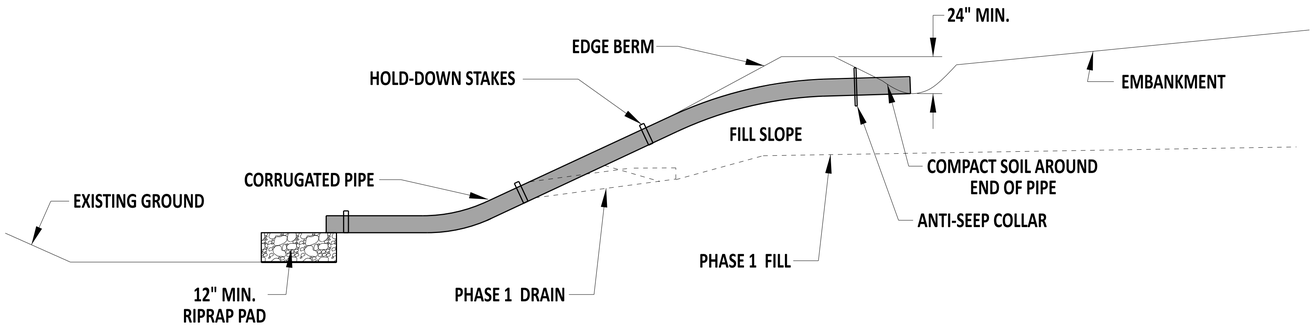


ELEVATION



PLAN

ANTI-SEEP COLLAR



SLOPE DRAIN PROFILE
(FOR FILL SLOPES)

NOTES:

1). DISCHARGE ALL TEMPORARY SLOPE DRAINS ONTO A STABILIZED OUTFALL AND THEN INTO A SEDIMENT TRAPPING DEVICE.
2). 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.
3). 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.

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TEMPORARY SLOPE DRAIN

STANDARD NO. E-10 (2024) | SHT. 1 OF 1

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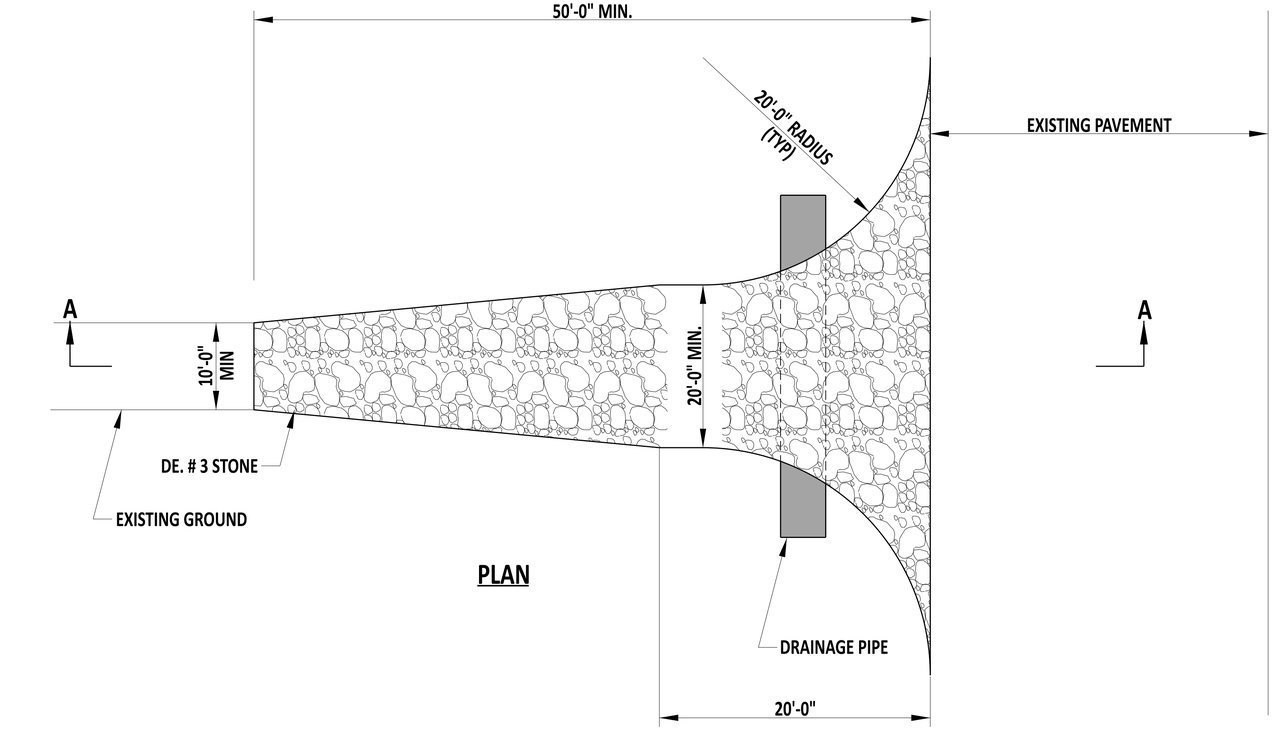
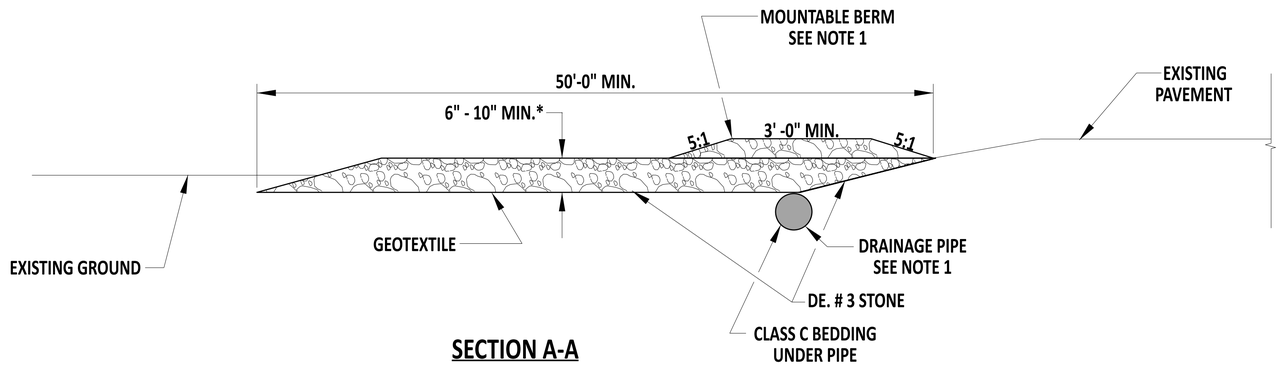


PLAN



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.

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STABILIZED CONSTRUCTION ENTRANCE

STANDARD NO. E-14 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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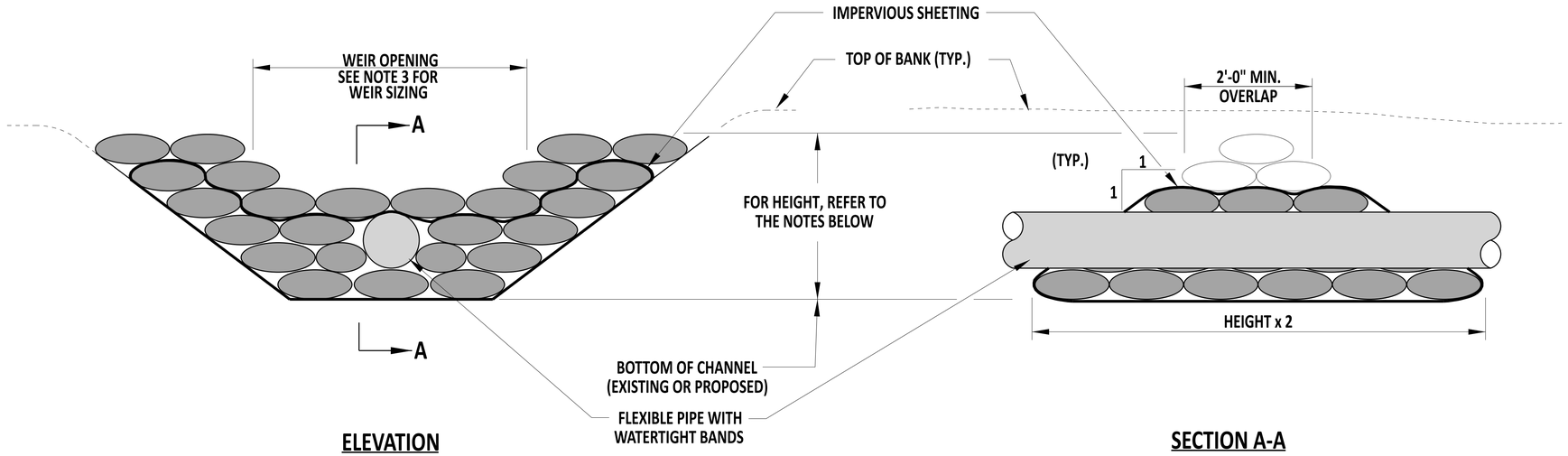

ELEVATION

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.

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RECOMMENDED

SANDBAG DIKE

STANDARD NO. E-15 (2024) | SHT. 1 OF 1

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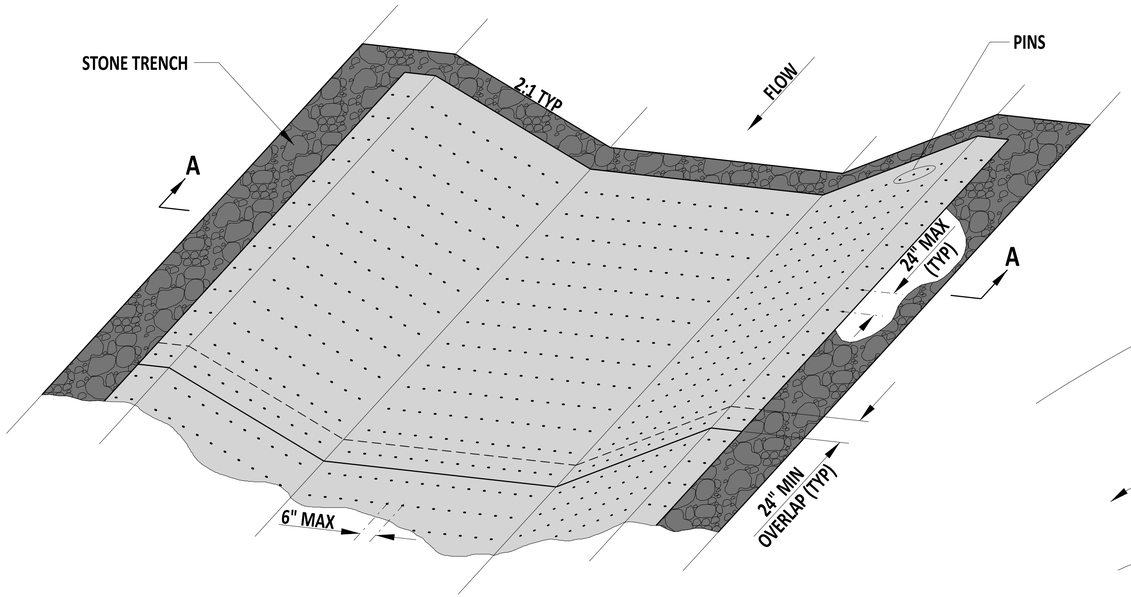
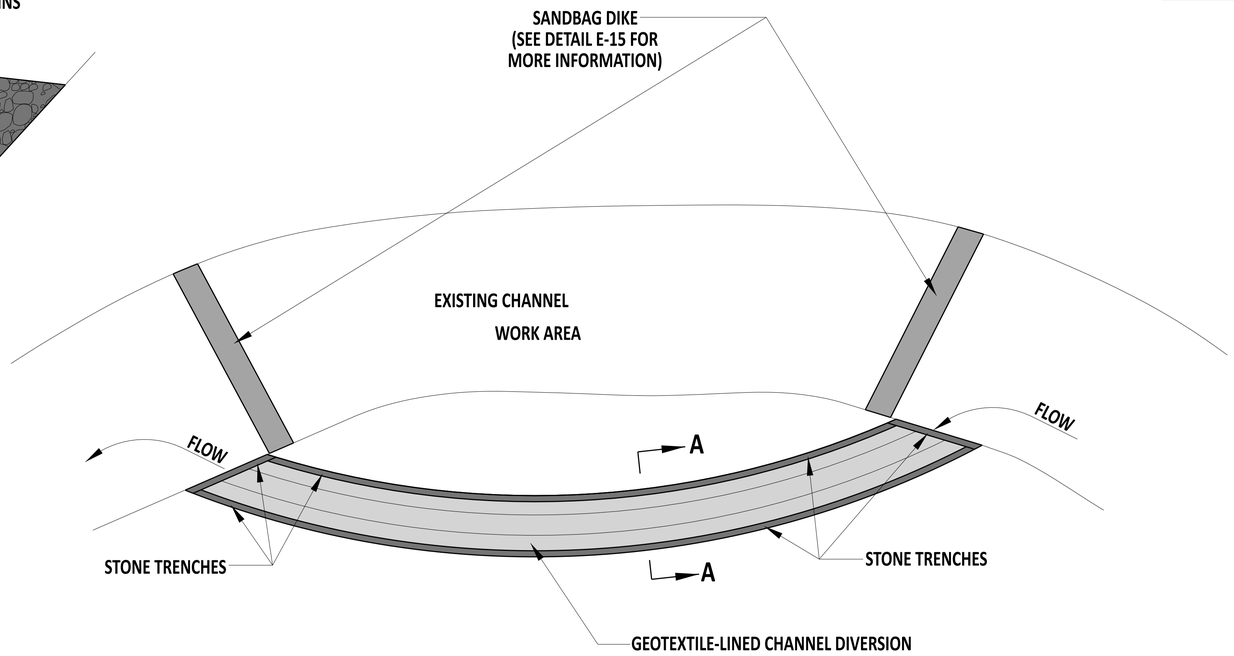
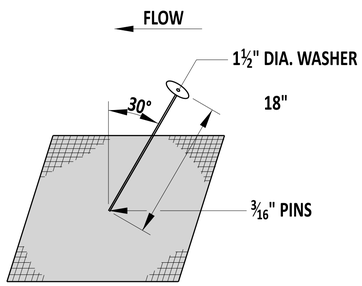


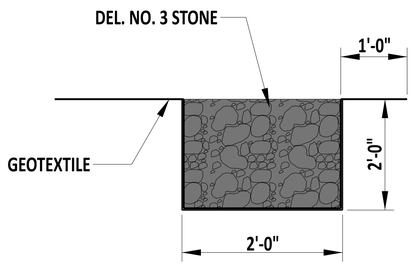
ISOMETRIC VIEW



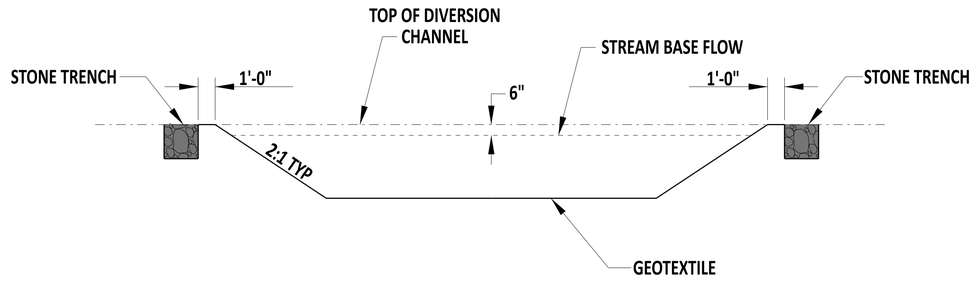
PLAN



FASTENING DETAIL



TRENCHING DETAIL



SECTION A-A

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ENGINEERING SUPPORT
12/22/2023
DATE
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GEOTEXTILE-LINED CHANNEL DIVERSION

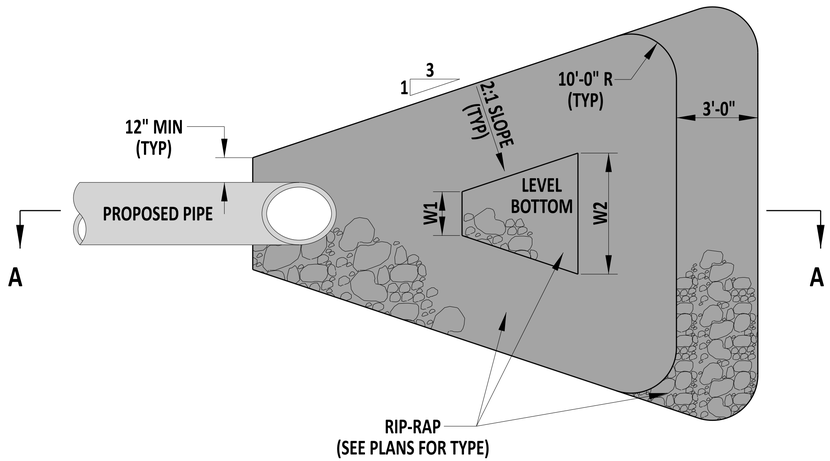
STANDARD NO. E-17 (2024) | SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN
22 December 2023
DATE

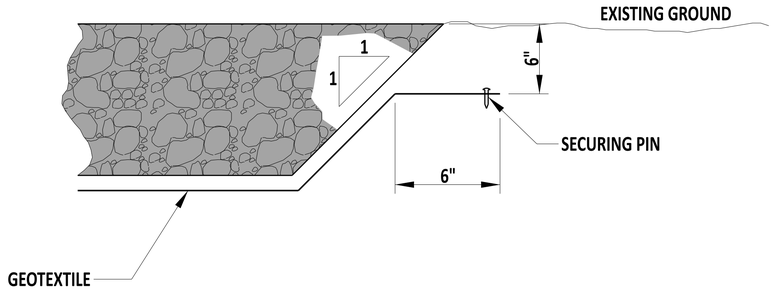
APPROVED
CHIEF ENGINEER
01/11/2024
DATE

22-DEC-2023

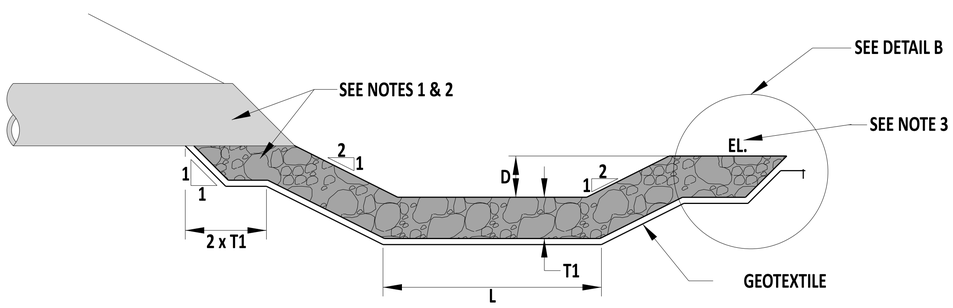
SCALE : NTS



PLAN VIEW



DETAIL B



SECTION A-A

NOTES:
1). PLACE RIPRAP PRIOR TO PLACING PIPE.
2). PLACE DELAWARE NO. 3 BETWEEN THE RIPRAP AND 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.

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RIPRAP ENERGY DISSIPATOR

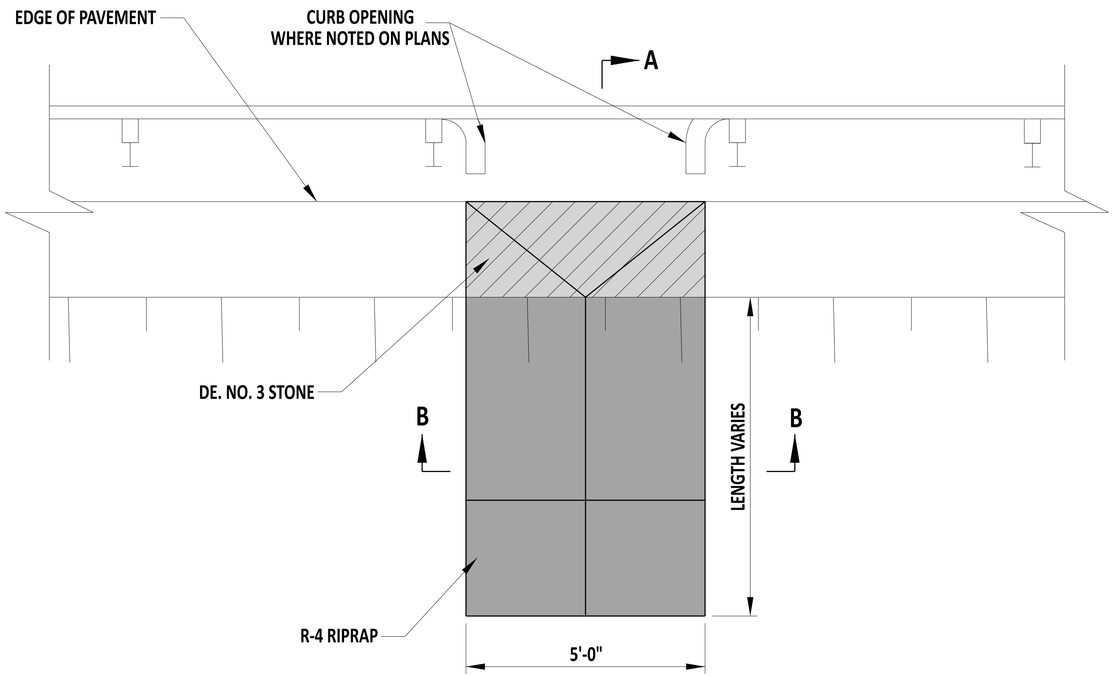
STANDARD NO. E-20 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

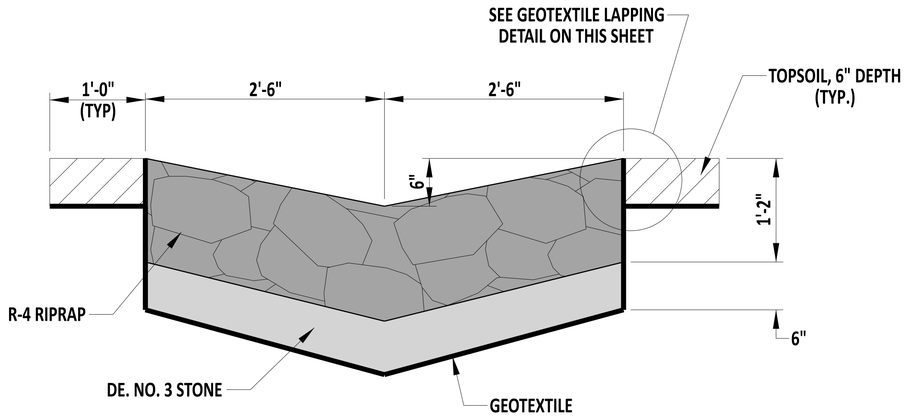
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

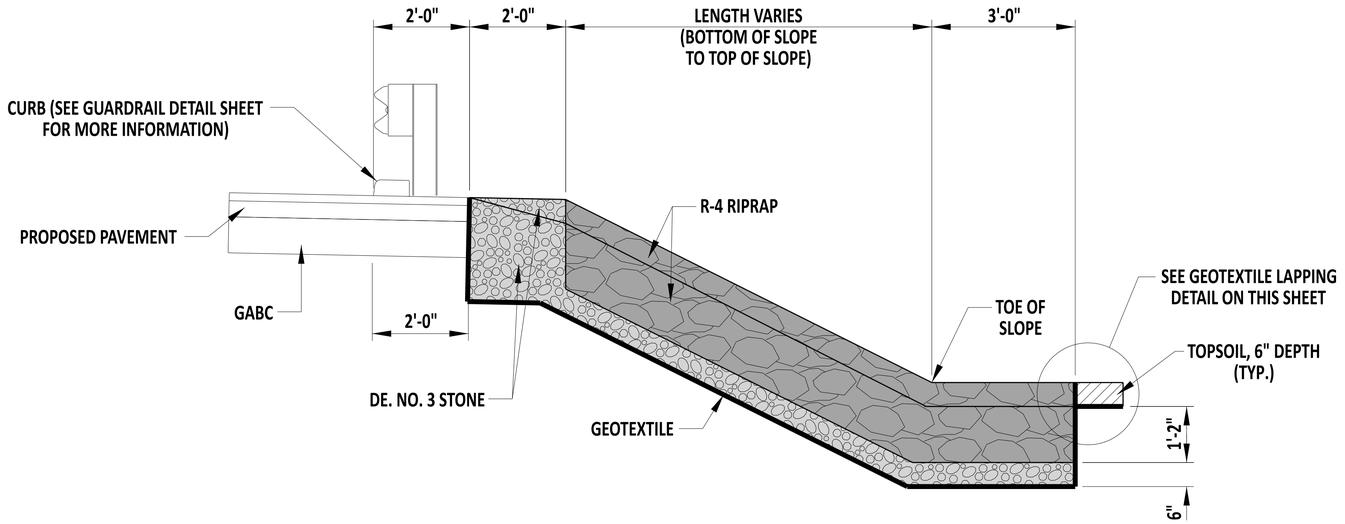
SCALE : NTS



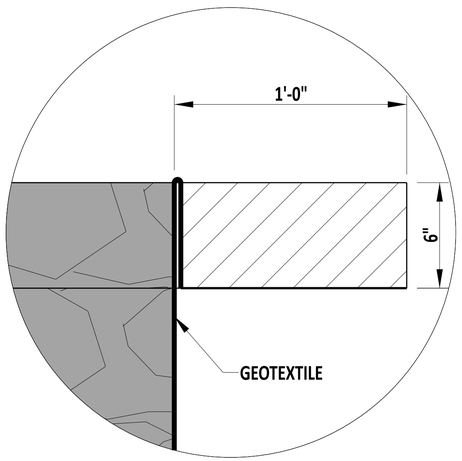
PLAN



SECTION B-B



SECTION A-A



GEOTEXTILE LAPPING DETAIL

NOTES:

1). GUARDRAIL DEPICTED ON THIS SHEET IS FOR ILLUSTRATIVE PURPOSES ONLY. REFER TO THE GUARDRAIL DETAILS FOR ACTUAL PLACEMENT. PLACEMENT OF GUARDRAIL POSTS MAY NEED TO BE ADJUSTED TO AVOID CONFLICT WITH STONE OUTLET.

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STONE OUTLET

STANDARD NO. E-21 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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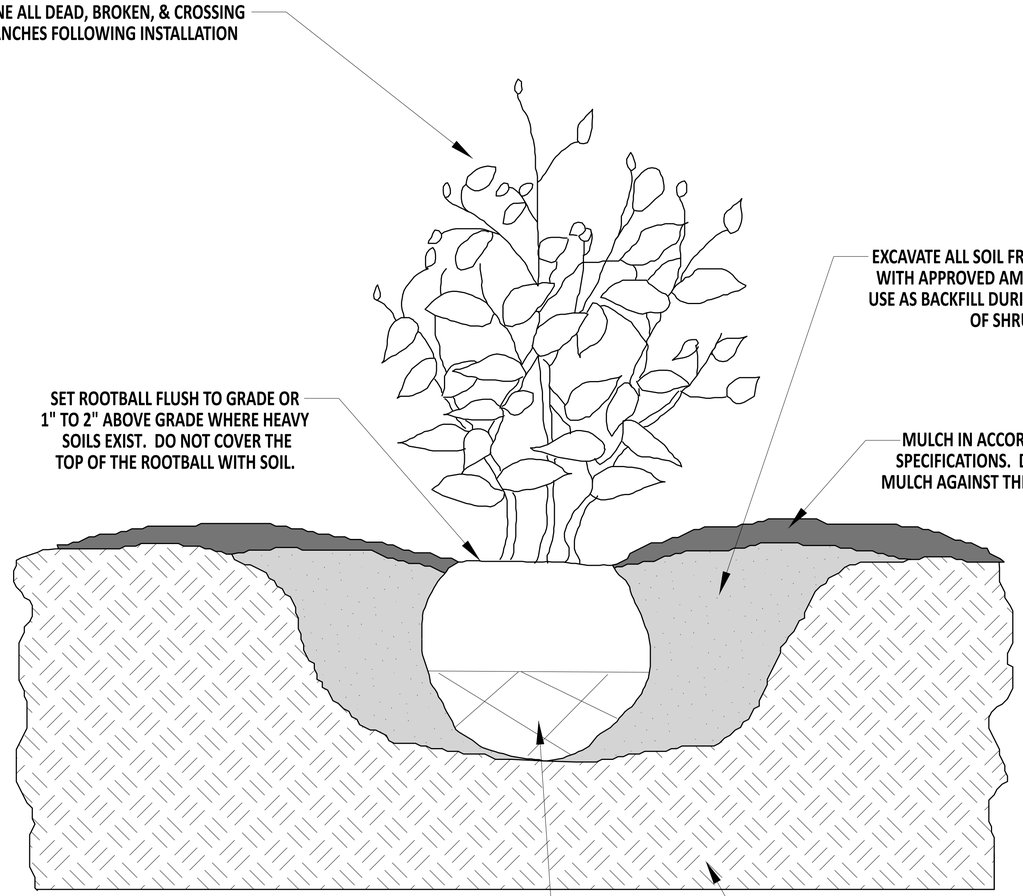
SCALE : NTS



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

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PLANTING DETAILS

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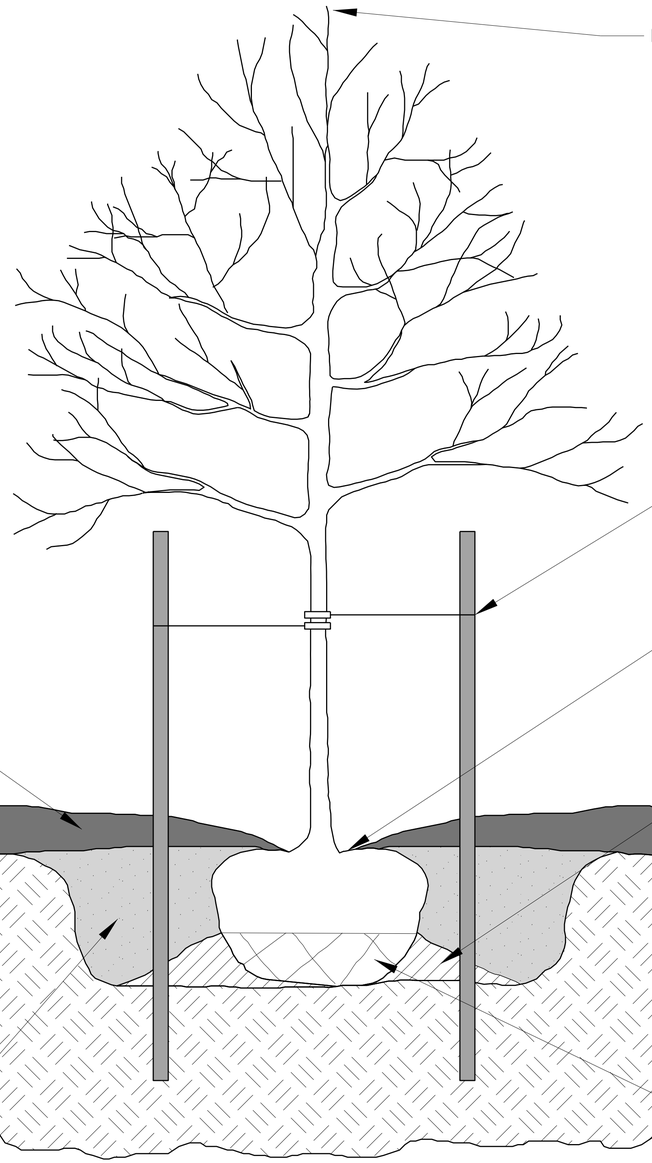
SCALE : NTS



DO NOT PRUNE THE DOMINANT LEADER OR TERMINAL BUDS OF THE CROWN.

STAKE & GUY TREES. GUY WIRE, STAKES, & RUBBER HOSE SHALL BE AS SPECIFIED IN SECTION 737.

SET ROOT BALL FLUSH TO GRADE OR 1" (25) TO 2" (50) ABOVE GRADE IF SOILS ARE SLOW TO DRAIN. PLANT TREES SUCH THAT THE TRUNK FLARE IS VISIBLE. ANY TREE WHERE TRUNK FLARE IS NOT VISIBLE SHALL BE REJECTED. DO NOT COVER THE TOP OF THE ROOT BALL WITH SOIL.

MULCH IN ACCORDANCE WITH SPECIFICATIONS. DO NOT PLACE MULCH AGAINST THE TRUNK.

TAMP SOIL AROUND THE ROOT BALL BASE WITH FOOT PRESSURE SO ROOT BALL DOES NOT SHIFT.

ALL SOIL SHALL BE EXCAVATED FROM THE PIT, MIXED WITH APPROVED AMENDMENTS AS PER SPECIFICATIONS AND USED AS BACKFILL DURING INSTALLATION OF TREES. PLACE ROOT BALL ON TAMPED OR UNEXCAVATED SOIL.

REMOVE BURLAP AND BASKETS TO 1/2 OF THE ROOT BALL. DO NOT BURY EXCESS BURLAP, ROPE OR REMNANTS OF BASKET IN THE PLANTING PIT.

TREE PLANTING DETAIL

NOTES

1). ALL PRUNING SHALL BE DONE BY OR UNDER THE DIRECTION OF, AN I.S.A. CERTIFIED ARBORIST OR CERTIFIED NURSERY PROFESSIONAL. DO NOT HEAVILY PRUNE TREES AT PLANTING.
2). ALL DEAD, BROKEN, & CROSSING BRANCHES SHALL BE PRUNED OFF FOLLOWING INSTALLATION.
3). BASE OF PLANTING PIT SIZE SHALL BE A MINIMUM WIDTH OF TWICE THE ROOT BALL SIZE AND A MAXIMUM OF THREE TIMES THE ROOT BALL SIZE.
4). WHEN PLANTING TREES ALONG STREETS, THERE MUST BE A MINIMUM OF 6' BETWEEN THE BACK OF CURB AND THE EDGE OF SIDEWALK AND SHALL BE CENTERED BETWEEN THE BACK OF CURB AND THE EDGE OF SIDEWALK.
5). WHEN PLANTING TREES ALONG SIDEWALKS, THE TREE SHALL BE LIMBED TO 7' FOR PEDESTRIAN CLEARANCE.

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PLANTING DETAILS

STANDARD NO. L-1 (2024) | SHT. 2 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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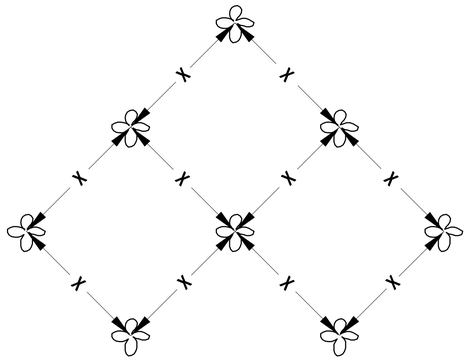
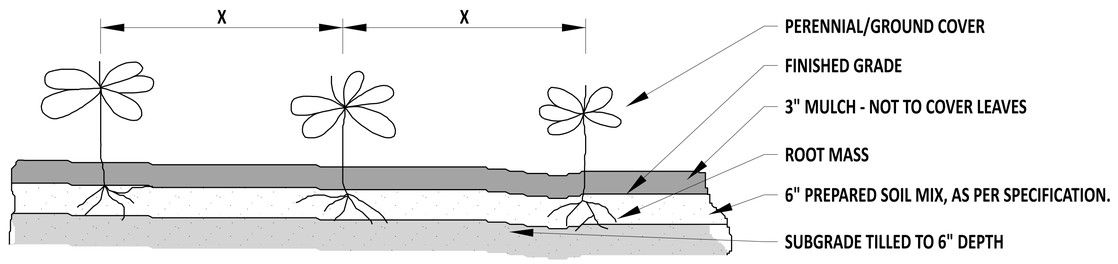
SCALE : NTS



PLAN VIEW
SEE PLANT LIST FOR SPACING (X)



SECTION VIEW
SEE PLANT LIST FOR SPACING (X)

PERENNIAL/GROUNDCOVER PLANTING DETAIL

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PLANTING DETAILS				REVIEWED	DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE
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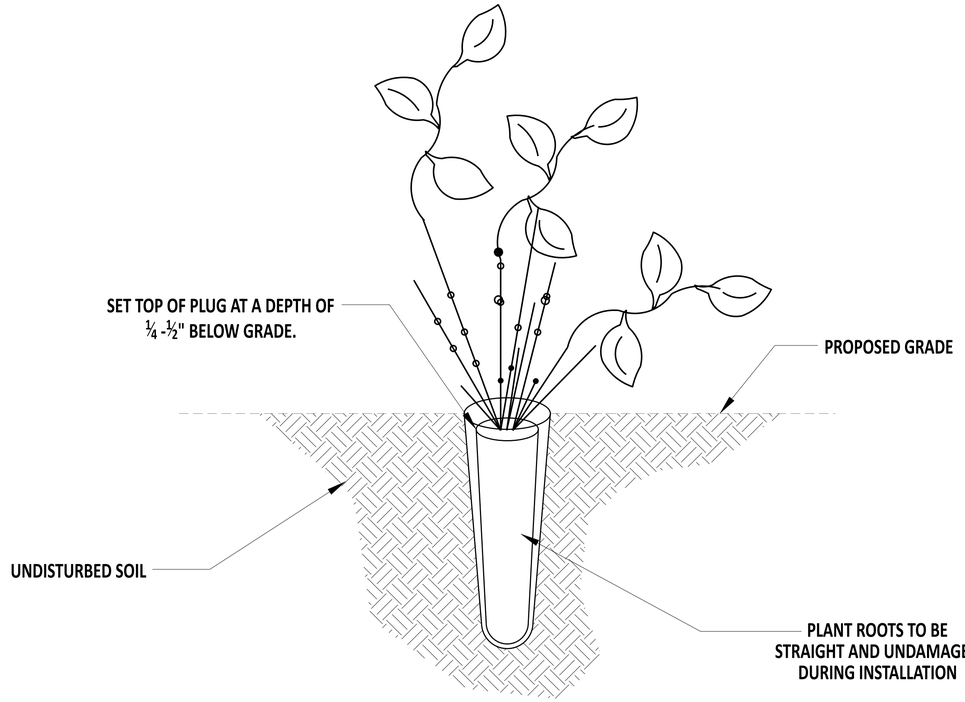
SCALE : NTS



SECTION VIEW

NOTES:

1). PLANT USING A DIBBLE BAR, STEEL STAKE OR SIMILAR APPROVED PLANTING DEVICE.
2). PLANTING PIT SHALL BE SLIGHTLY LARGER THAN THE PLANT ROOT MASS.
3). DO NOT DAMAGE LEAVES, ROOTS OR STAKES DURING CONSTRUCTION.
4). PLANT AQUATIC PLUGS IN GROUPS OF 50 PLANTS MIN, PER SPECIES.

AQUATIC PLANTING DETAIL - 2" PLUG

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PLANTING DETAILS					
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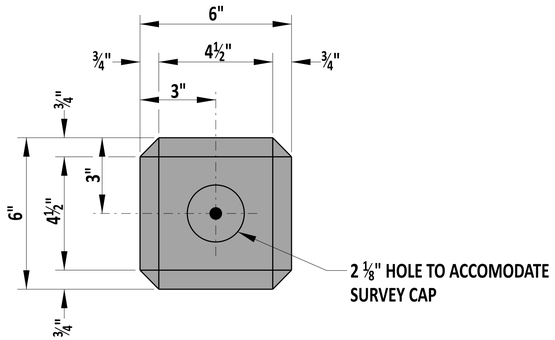
SCALE : NTS



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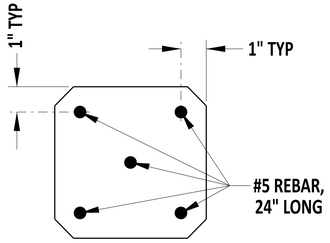
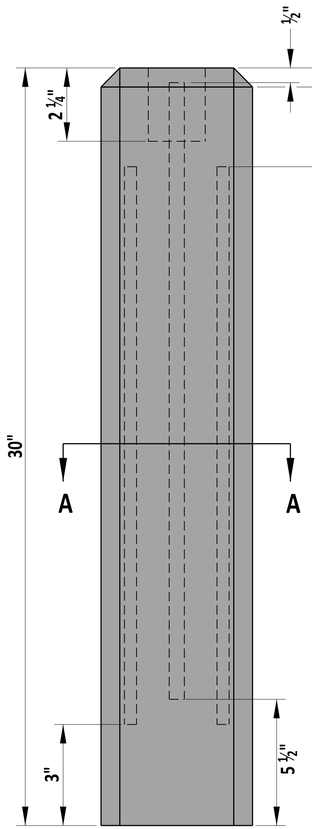


SECTION A-A

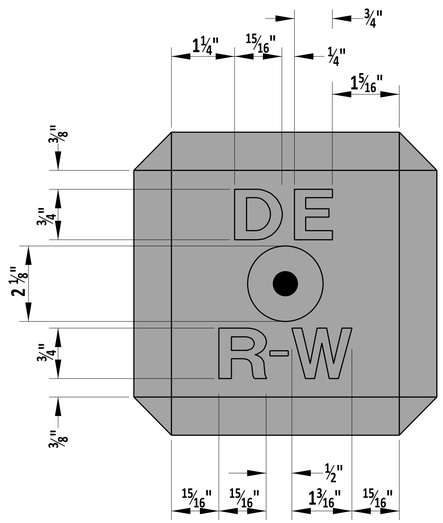
NOTES :

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.
6). DO NOT USE FLEXIBLE DELINEATOR AT PERMANENT EASEMENT MONUMENTS.

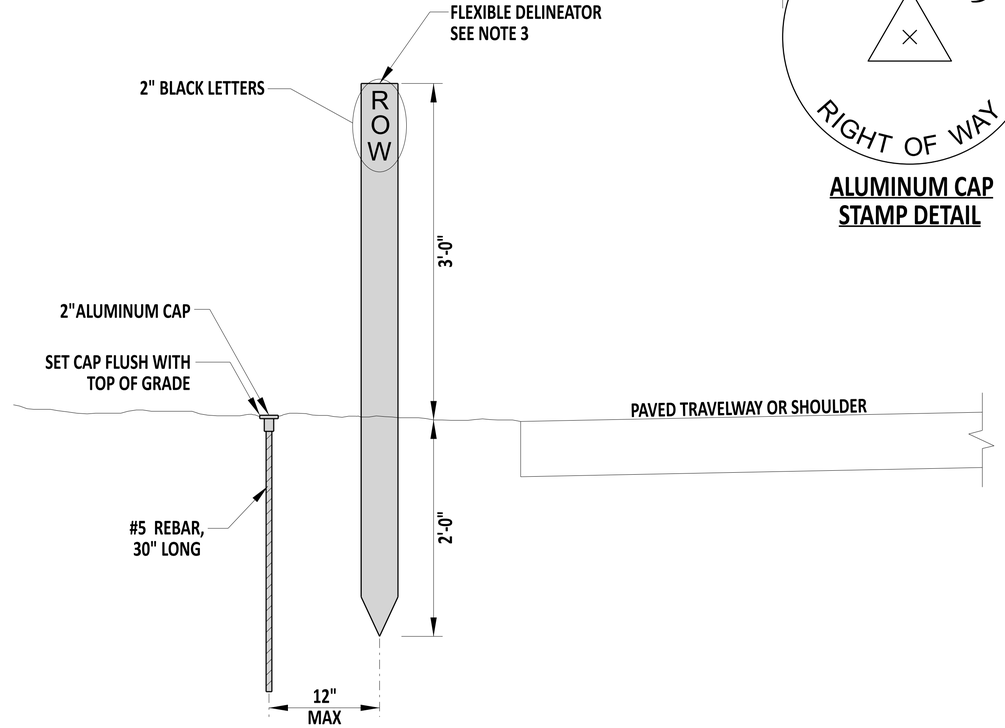
ALUMINUM CAP STAMP DETAIL



ELEVATION



TOP DETAIL



REBAR AND CAP WITH FLEXIBLE DELINEATOR DETAIL

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RIGHT OF WAY MONUMENTATION

STANDARD NO. M-2 (2024) SHT. 1 OF 1

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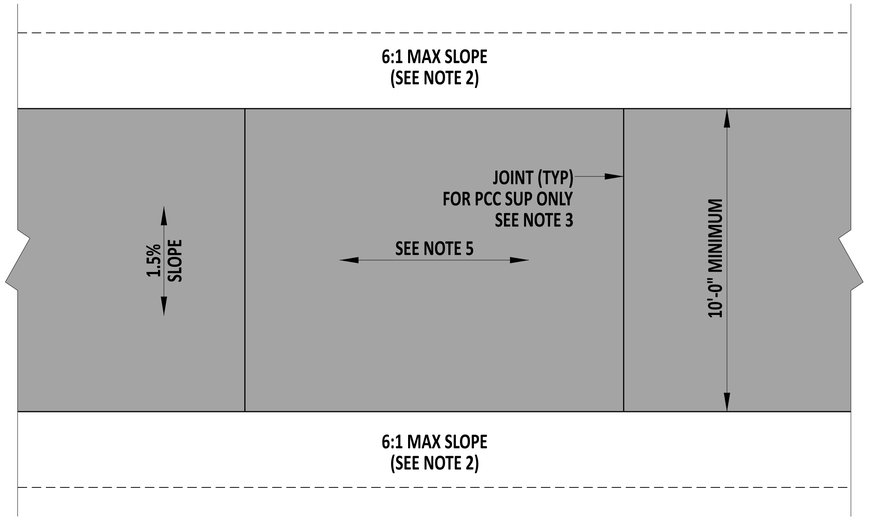
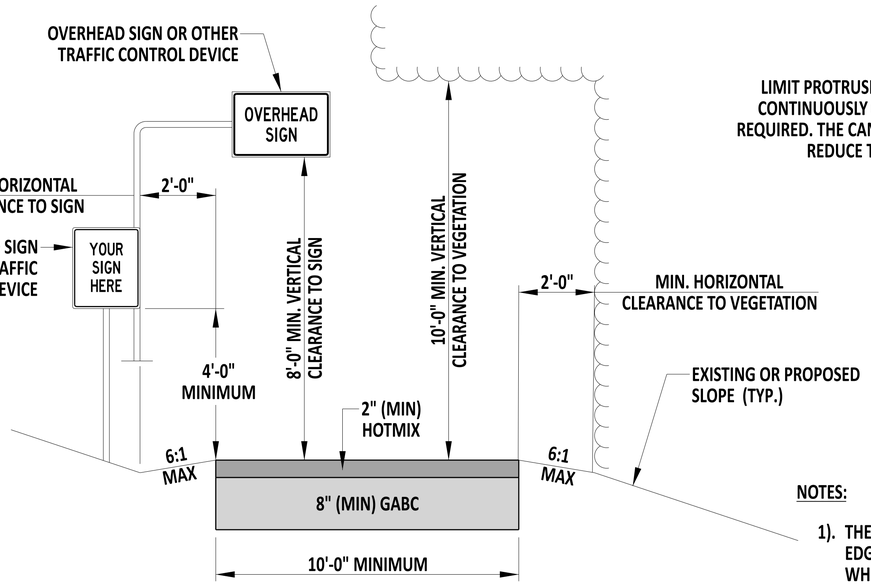
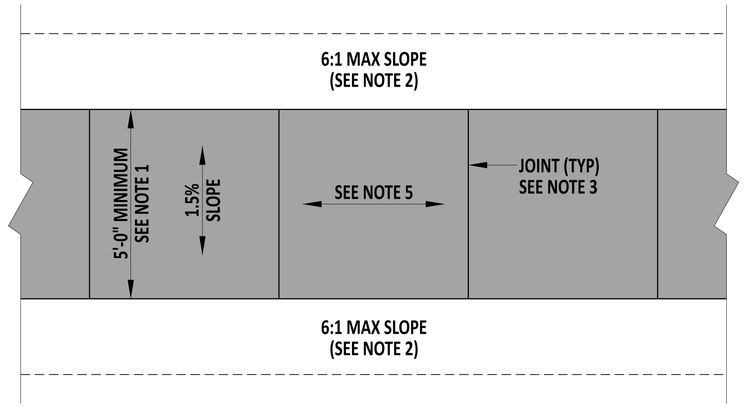


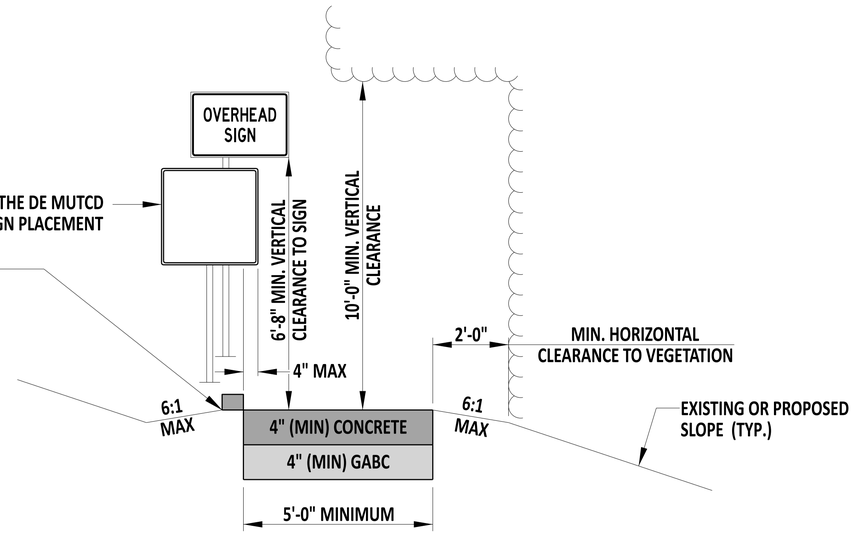
SHARED-USE PATH PLAN



SHARED-USE PATH TYPICAL SECTION



SIDEWALK PLAN



SIDEWALK TYPICAL SECTION

NOTES:

1). THE MINIMUM SIDEWALK WIDTH WHEN A BUFFER STRIP IS PROVIDED BETWEEN THE EDGE OF PAVEMENT AND THE SIDEWALK IS 5'-0". THE MINIMUM SIDEWALK WIDTH WHEN A BUFFER STRIP IS NOT PROVIDED IS 6'-0".
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'-0".
FOR CONCRETE SHARED-USE PATHS, PLACE CONSTRUCTION JOINTS EVERY 10'-0".
4). WHEN EXISTING OBSTRUCTIONS (FIRE HYDRANT, UTILITY POLE, ETC...) ARE LOCATED IN THE SIDEWALK, MAINTAIN A MINIMUM WIDTH OF 32" AND MAXIMUM LENGTH CONSTRICTION OF 24".
5). NOT TO EXCEED 4.5% OR ADJACENT ROAD GRADE.
6). PROVIDE A STANDARD 3'-0" BUFFER WIDTH BETWEEN SIDEWALK AND BACK OF CURB.
7). FOR TRANSITIONS TO STANDARD BUFFER WIDTH, MAINTAIN FULL WIDTH CONCRETE UNTIL THE SIDEWALK BUFFER STRIP IS A MINIMUM WIDTH OF 18".
8). PROVIDE A STANDARD 10'-0" BUFFER WIDTH BETWEEN SHARED USE PATH AND BACK OF CURB. THE MINIMUM ALLOWABLE BUFFER WIDTH IS 5'-0".

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SHARED-USE PATH & SIDEWALK

STANDARD NO. M-3 (2024) | SHT. 1 OF 1

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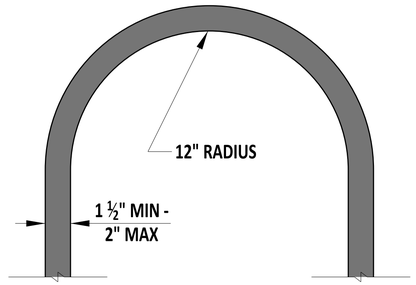
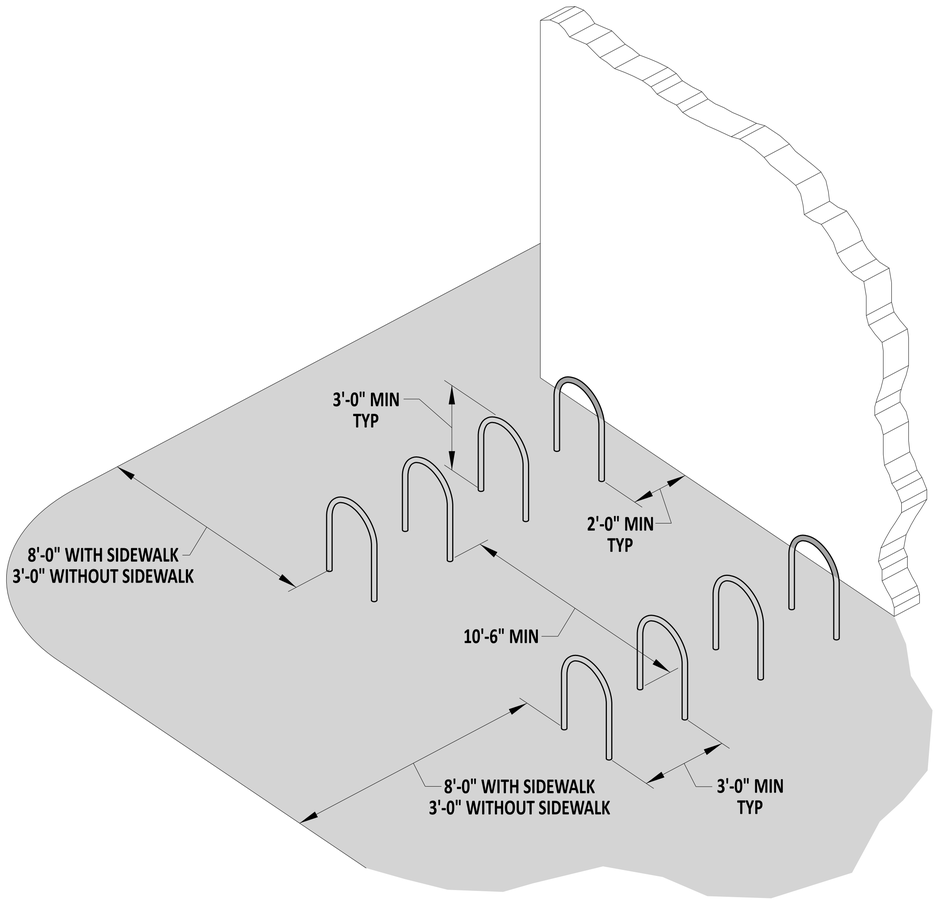
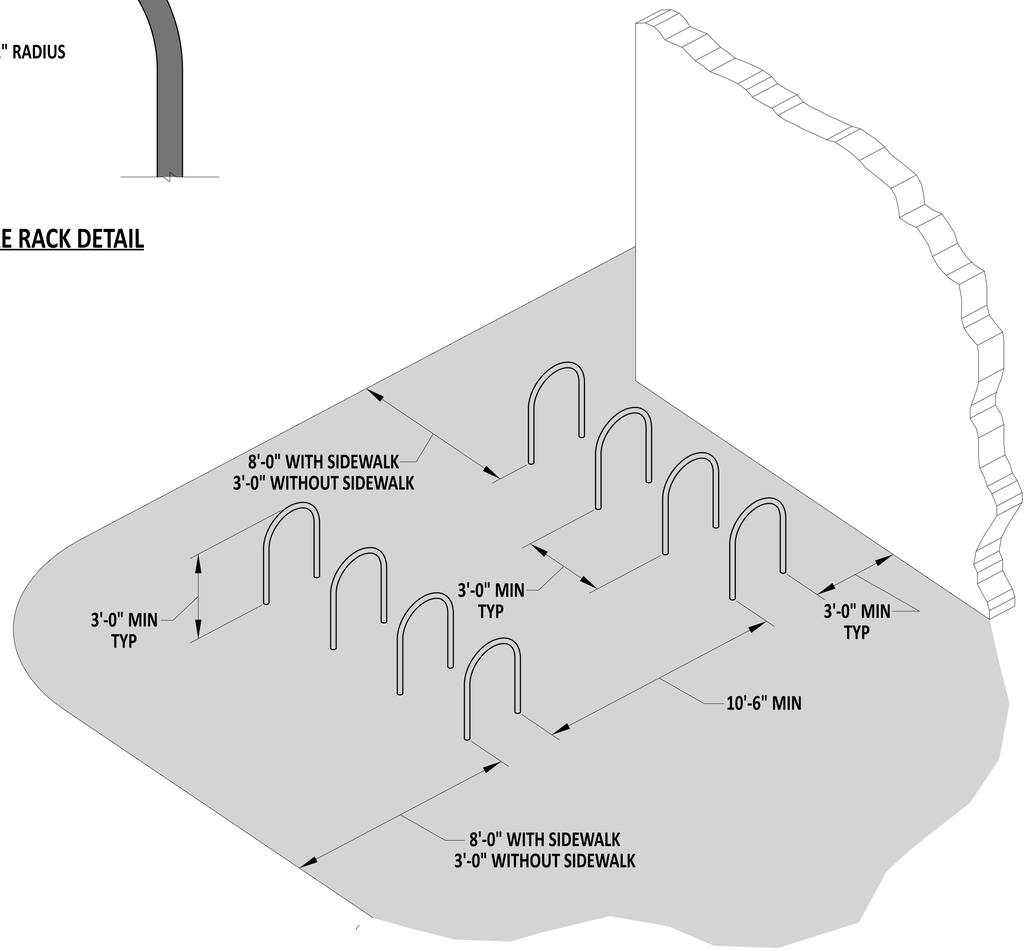


TYPICAL BIKE RACK DETAIL





NOTES:

1). ANCHOR BIKE RACK IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, AFTER APPROVAL FROM ENGINEER IN THE FIELD.
2). SPECIAL CONSIDERATIONS SHOULD BE TAKEN WHEN PLACING BIKE RACKS NEAR CURB RAMPS AND MAY REQUIRE A DETAIL ON THE PLANS.

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BIKE RACK LAYOUT DETAILS

STANDARD NO. M-4 (2024) | SHT. 1 OF 1

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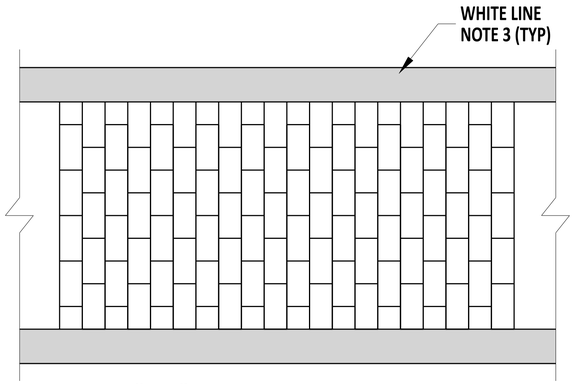
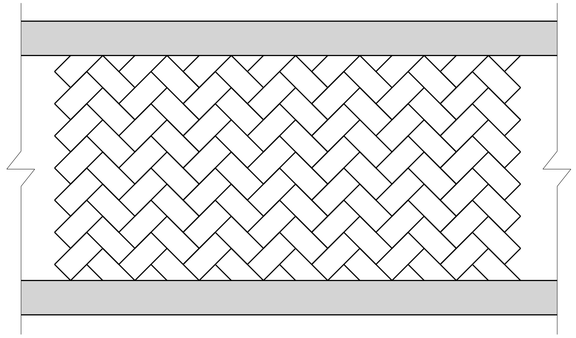
SCALE : NTS



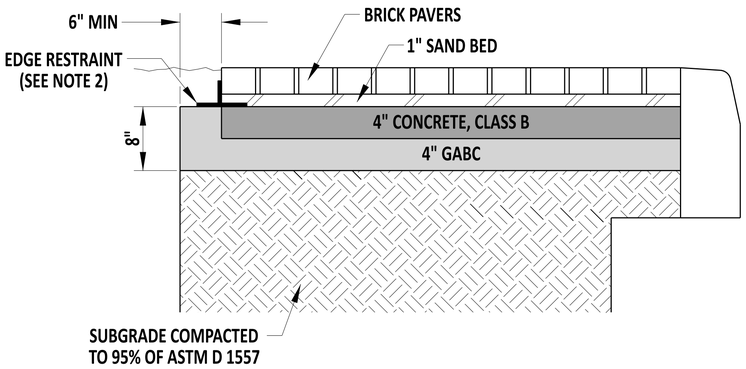
4" x 8" RUNNING BOND PATTERN



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. INSTALL PAVEMENT STRIPING AS REQUIRED BY THE DE MUTCD AND IN ACCORDANCE WITH DELDOT STANDARD SPECIFICATIONS, SECTION 817.
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.

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PATTERNED HOT-MIX OR CONCRETE & BRICK PAVER

STANDARD NO. M-6 (2024) SHT. 1 OF 1

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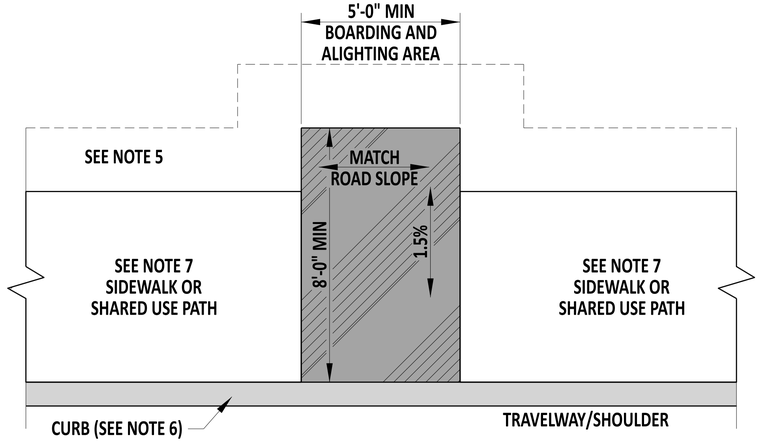
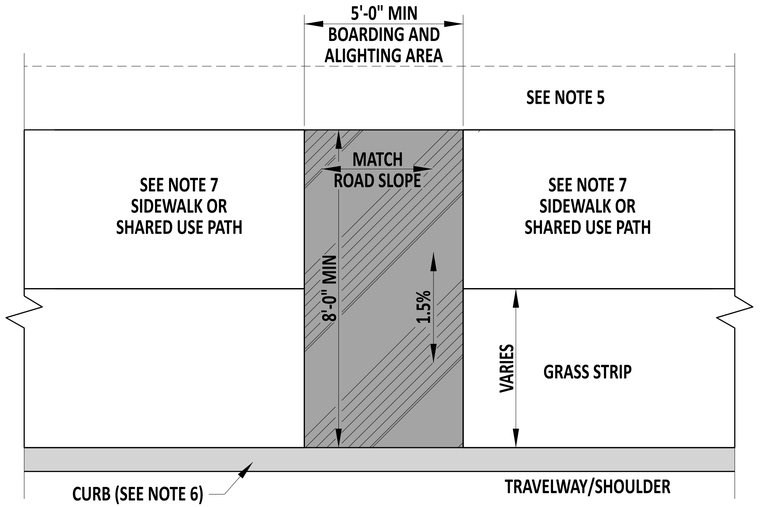


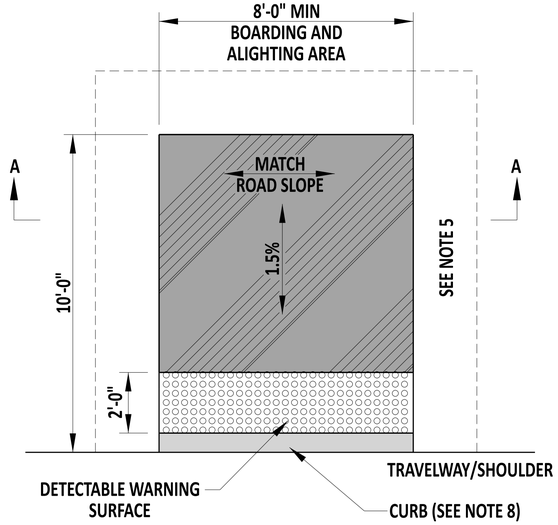
BUS STOP PAD, TYPE 1

* - TO BE USED WHEN A SIDEWALK OR SHARED USE PATH IS INCLUDED WITHOUT A GRASS STRIP.
* - WHEN USED AT A LOCATION WITH A SHARED USE PATH, MATCH BUS PAD DIMENSIONS TO FULL WIDTH OF THE PATH.



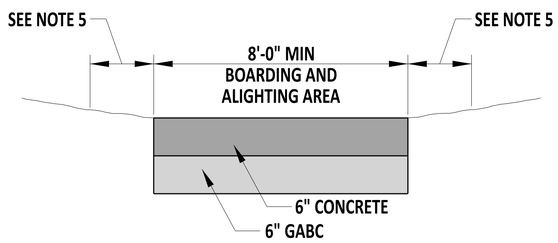
BUS STOP PAD, TYPE 2

* - TO BE USED WHEN A SIDEWALK OR SHARED USE PATH IS INCLUDED WITH A GRASS STRIP.



BUS STOP PAD , TYPE 3

* - TO ONLY BE USED WHEN SIDEWALK OR SHARED USE PATH IS NOT INCLUDED.
* - A 5'-0" MINIMUM SHOULDER IS REQUIRED FOR PEDESTRIAN ACCESS



SECTION A-A

- 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). MATCH EXISTING CURB. FOR BUS STOP PADS TYPE 1 AND 2, IF NO CURB IS PRESENT, TYPE 1-4 CURB SHALL BE INSTALLED FOR A MINIMUM OF 5' ON EACH SIDE OF THE BUS PAD UNLESS OTHERWISE NOTED ON PLANS. DO NOT DEPRESS CURB IN FRONT OF BUS PAD TYPE 1 OR 2. TAPER END OF CURB FLUSH WITH PAVEMENT OR ADJACENT AREA AT A RATE OF 12:1.
7). SEE DETAIL M-3 FOR ADDITIONAL SIDEWALK AND SHARED USE PATH DETAILS AND REQUIREMENTS.
8.) FOR BUS STOP PAD TYPE 1, INSTALL FULLY DEPRESSED CURB MATCHING THE RUNNING SLOPE OF THE BUS PAD WITH THE FRONT OF CURB BEING FLUSH WITH THE SHOULDER OR THE TRAVELWAY.

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RECOMMENDED

BUS STOP PAD, TYPES 1, 2 & 3

STANDARD NO. M-9 (2024) | SHT. 1 OF 2

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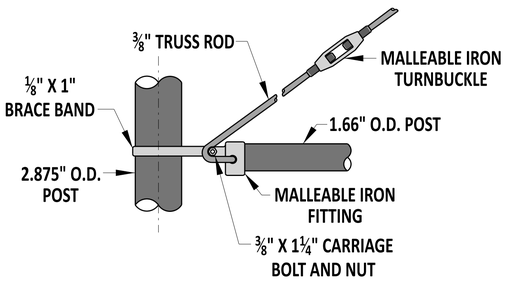
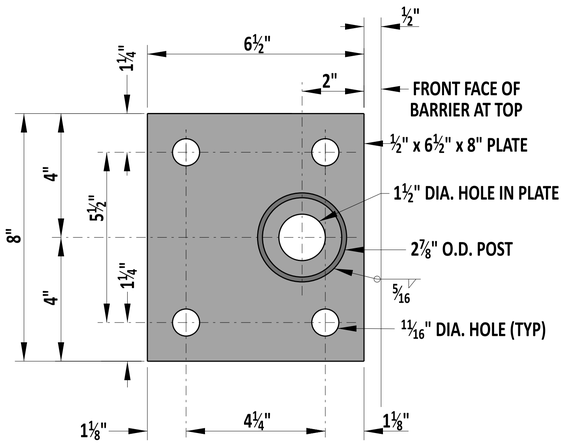
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

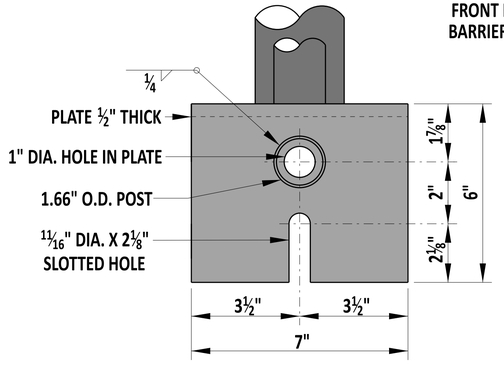
SCALE : NTS



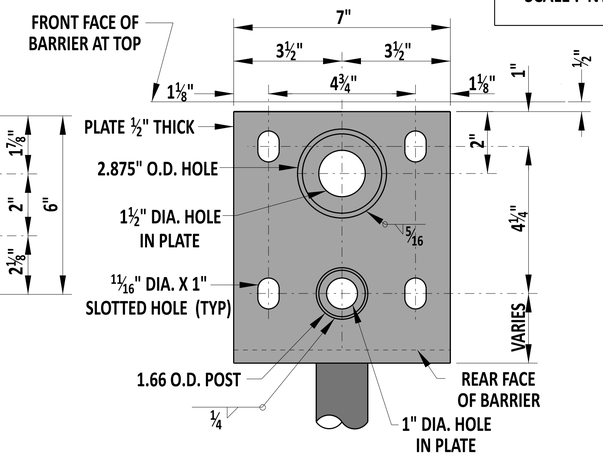
TRUSS ROD ATTACHMENT



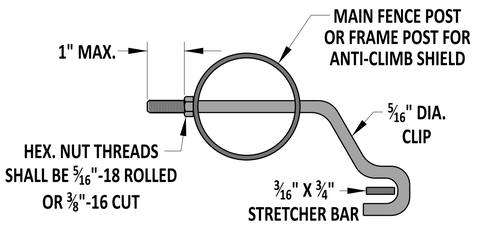
DETAIL 'A'



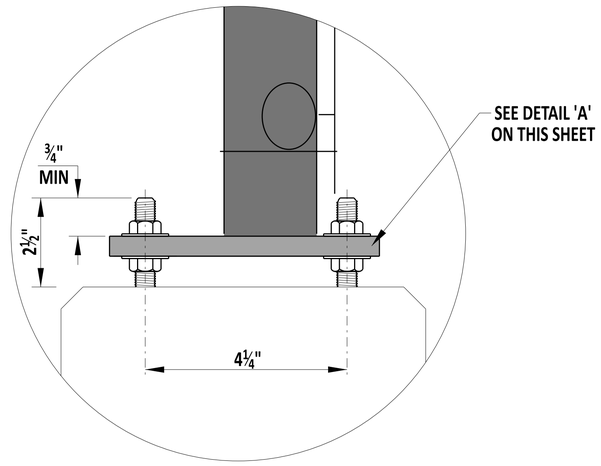
SIDE VIEW



PLAN VIEW



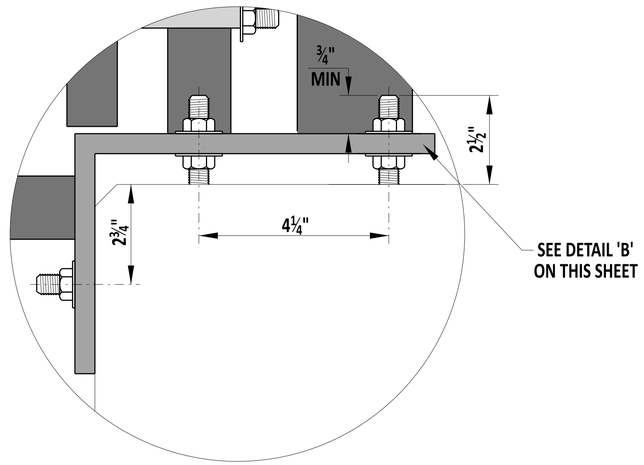
STRETCHER BAR ATTACHMENT



POST TO BARRIER CONNECTION 'A'

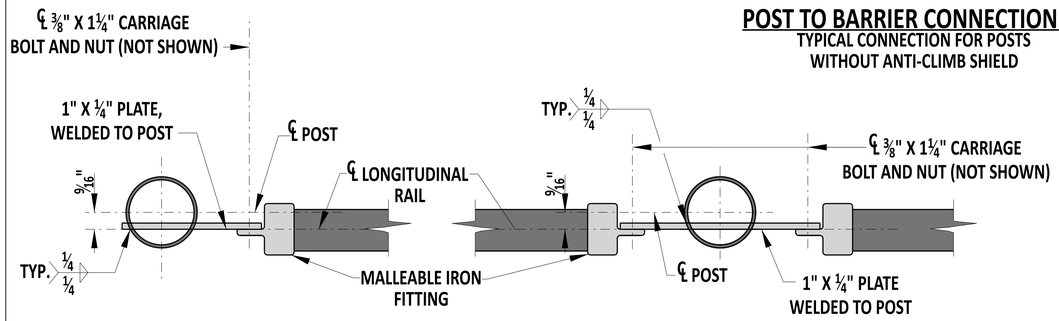
TYPICAL CONNECTION FOR POSTS
WITHOUT ANTI-CLIMB SHIELD

DETAIL 'B'



POST TO BARRIER CONNECTION 'B'

TYPICAL CONNECTION FOR POSTS
WITH ANTI-CLIMB SHIELD



TOP LONGITUDINAL RAIL-POST ATTACHMENT

NOTES:

1). POST SPACING 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). SUBMIT WORKING DRAWINGS TO THE ENGINEER FOR REVIEW.

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RECOMMENDED

BRIDGE SAFETY FENCE

STANDARD NO. M-10 (2024) | SHT. 3 OF 3

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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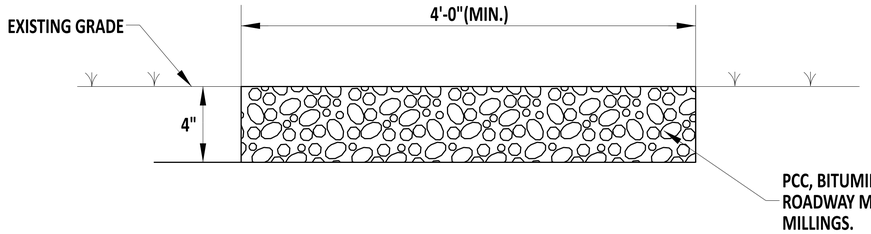
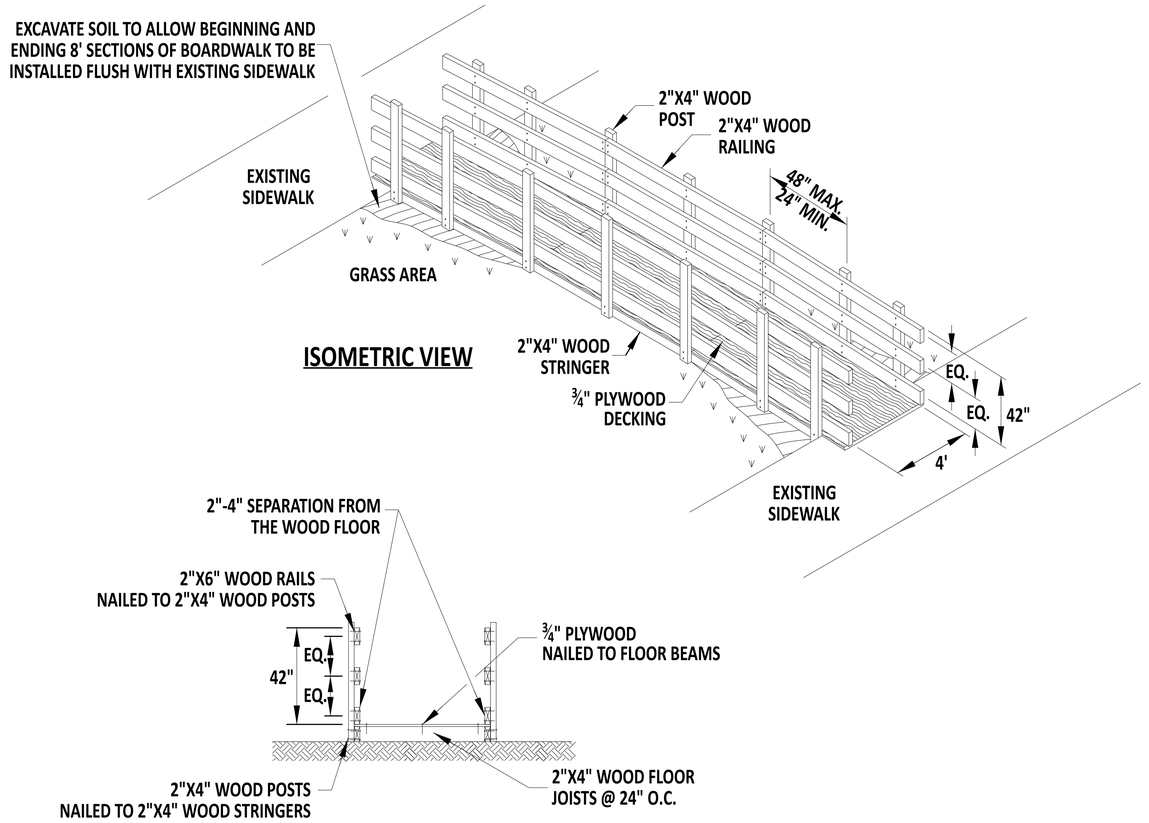


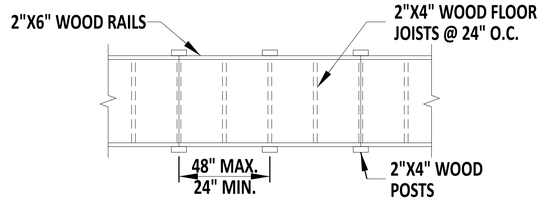
TEMPORARY PEDESTRIAN PATHWAY
N.T.S.

NOTES:
1). PROVIDE 4'-0" WIDE TEMPORARY PATHWAY, SUPPLY PCC, BITUMINOUS PAVEMENT, TEMPORARY ROADWAY MATERIAL (TRM), OR COMPACTED 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 SURFACE DISCONTINUITIES NOT TO EXCEED 1/4".



ISOMETRIC VIEW

SECTION VIEW



PLAN VIEW

NOTES:
1. MAXIMUM ALLOWABLE RUNNING SLOPE NOT TO EXCEED 5%. MAXIMUM ALLOWABLE CROSS SLOPE NOT TO EXCEED 2% AND VERTICAL SURFACE DISCONTINUITIES NOT TO EXCEED 1/4".
2. MAINTAIN A UNIFORM MATERIAL THAT IS FIRM, STABLE, AND SLIP RESISTANT.

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

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TEMPORARY PEDESTRIAN PATHWAY

STANDARD NO. M-13 (2024) | SHT. 1 OF 1

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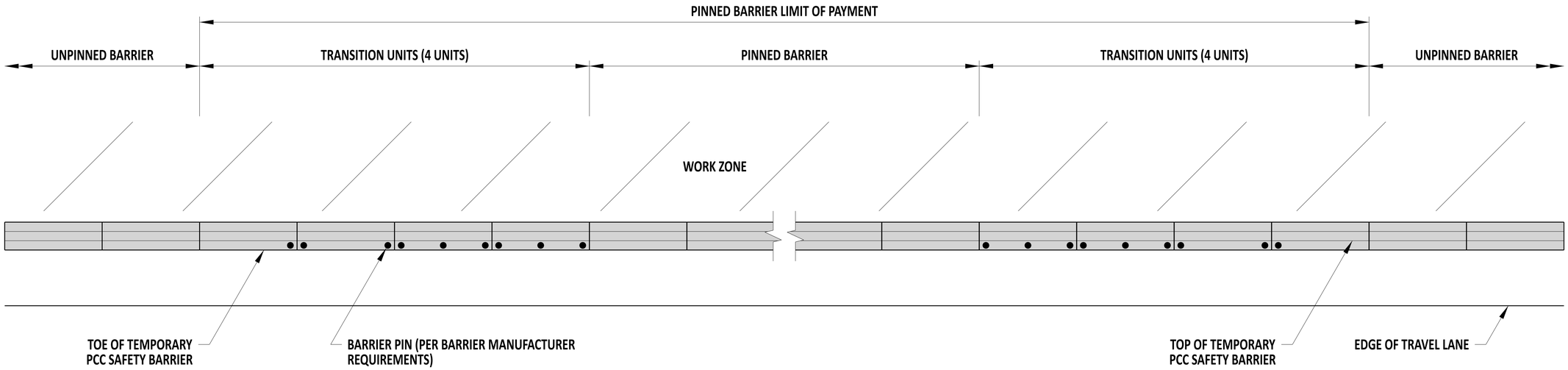
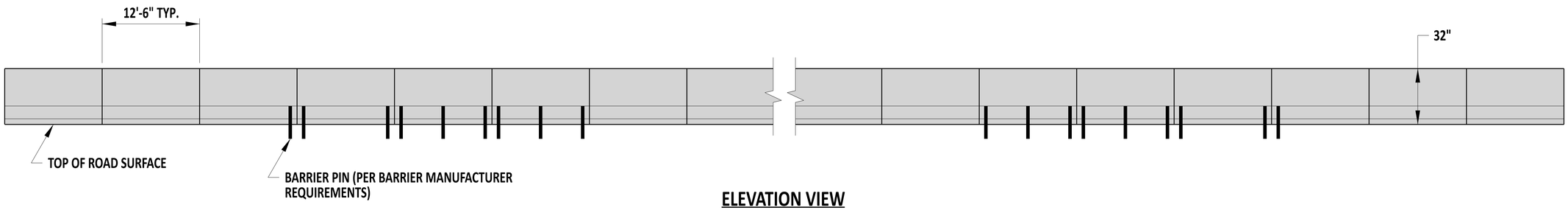


PLAN VIEW



ELEVATION VIEW
(TRAFFIC SIDE OF BARRIER)

NOTES:
1). USE THIS DETAIL IN THE ABSENCE OF MANUFACTURER SPECIFIC DETAILS FOR TRANSITIONING FROM PINNED OR BOLTED TO UNPINNED BARRIER.

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RECOMMENDED

PINNED TO UNPINNED TEMPORARY PCC SAFETY BARRIER CONNECTION

STANDARD NO. M-14 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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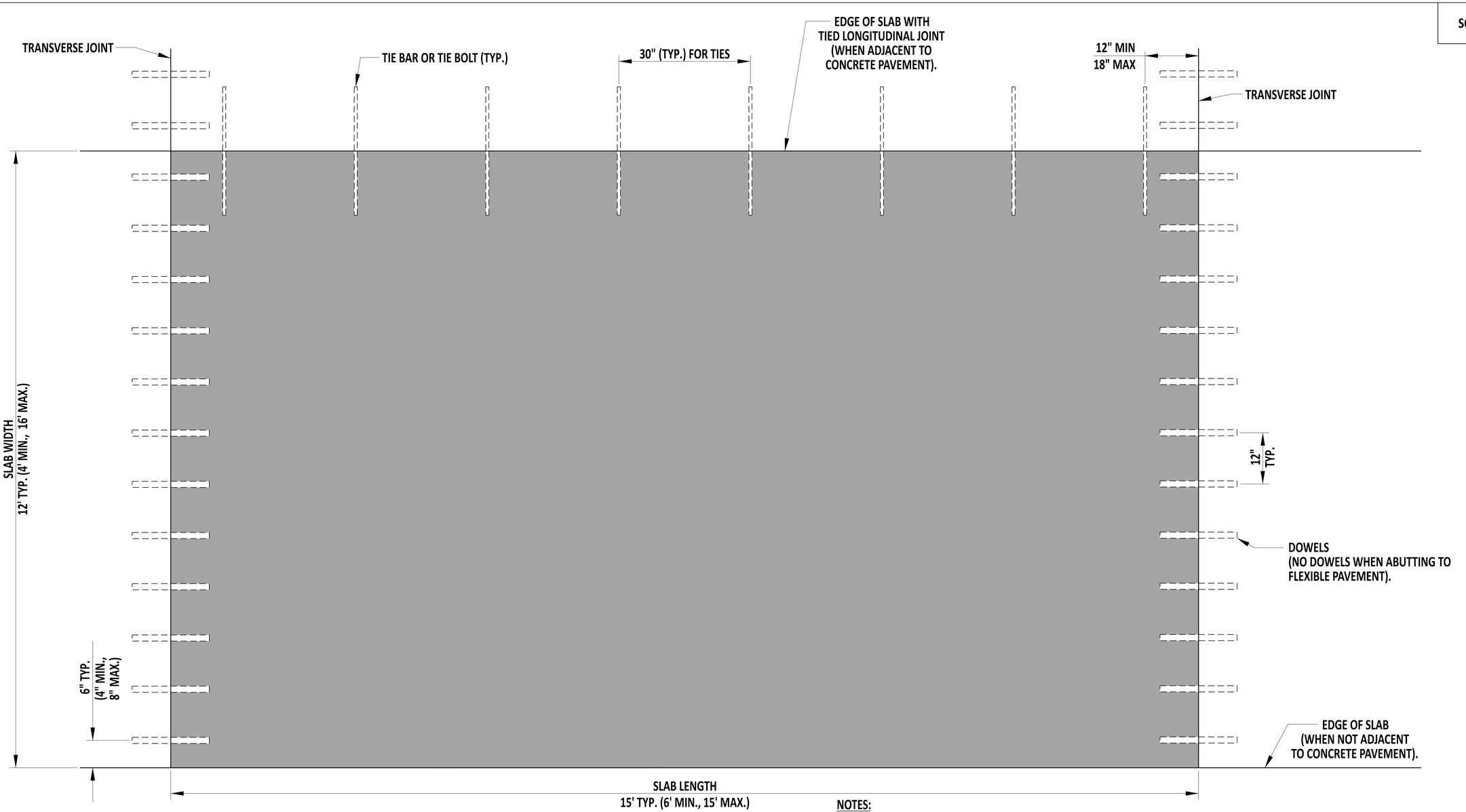

SLAB PLAN (WITH DOWEL AND TIE LOCATIONS)

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.

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SLAB PLAN (WITH DOWEL AND TIE LOCATIONS)

STANDARD NO. P-1 (2024) | SHT. 1 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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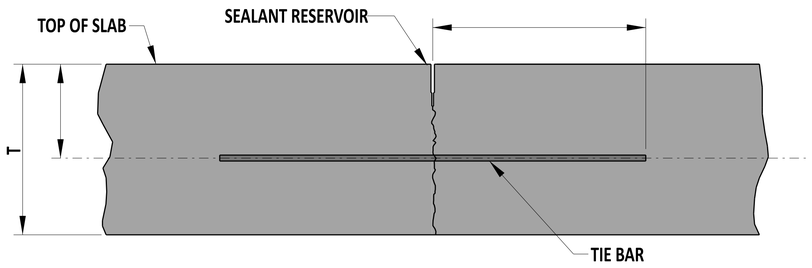
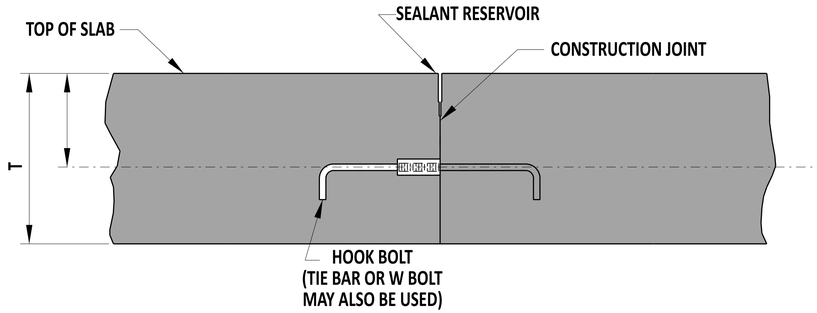
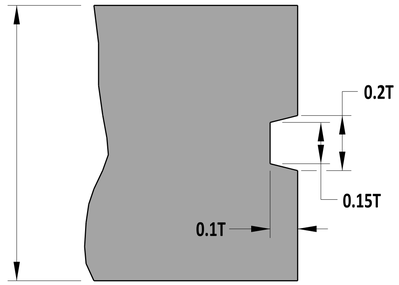
SCALE : NTS



LONGITUDINAL SAW-CUT JOINT DETAIL

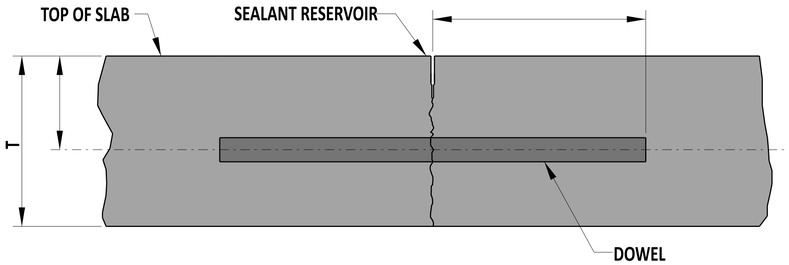


LONGITUDINAL CONSTRUCTION JOINT DETAIL

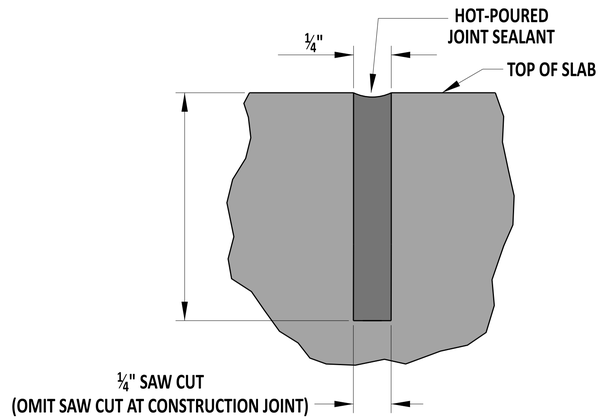


KEYWAY DETAIL

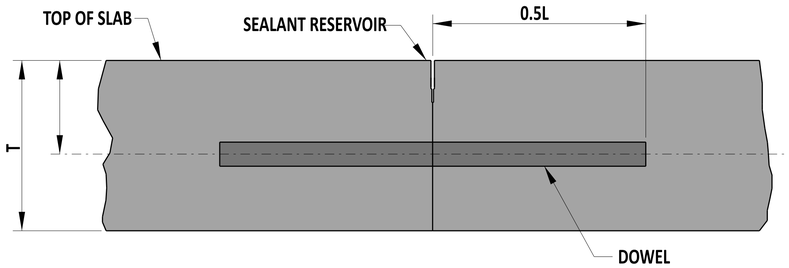
SEE NOTE 8



TRANSVERSE SAW-CUT JOINT DETAIL



SEALANT RESERVOIR DETAIL-
TRANSVERSE AND LONGITUDINAL JOINT



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
9). SAW CUT TO A DEPTH OF 3" WHEN PCC PAVEMENTS ARE BETWEEN 8" TO 11". SAW CUT TO A DEPTH OF 4" WHEN PCC PAVEMENT IS THICKER THAN 11".

JOINT AND SEALANT DETAILS

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JOINT AND SEALANT

STANDARD NO. P-1 (2024) | SHT. 2 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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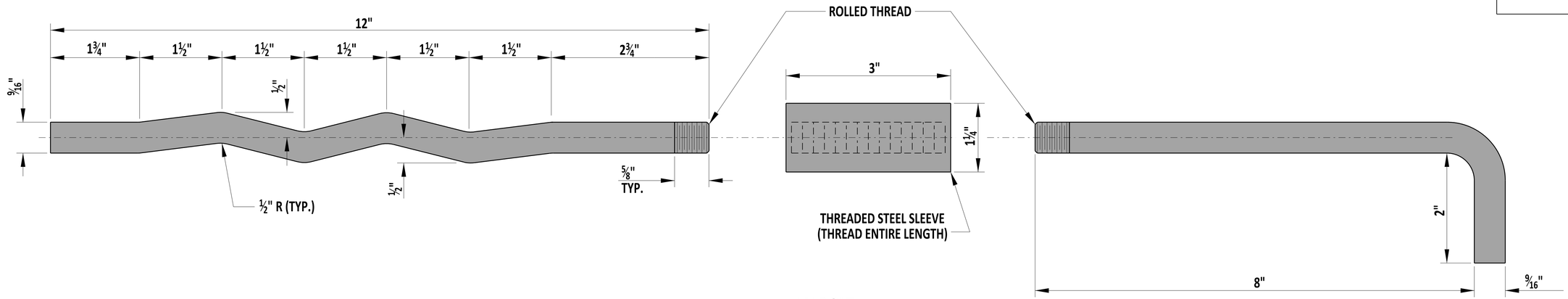
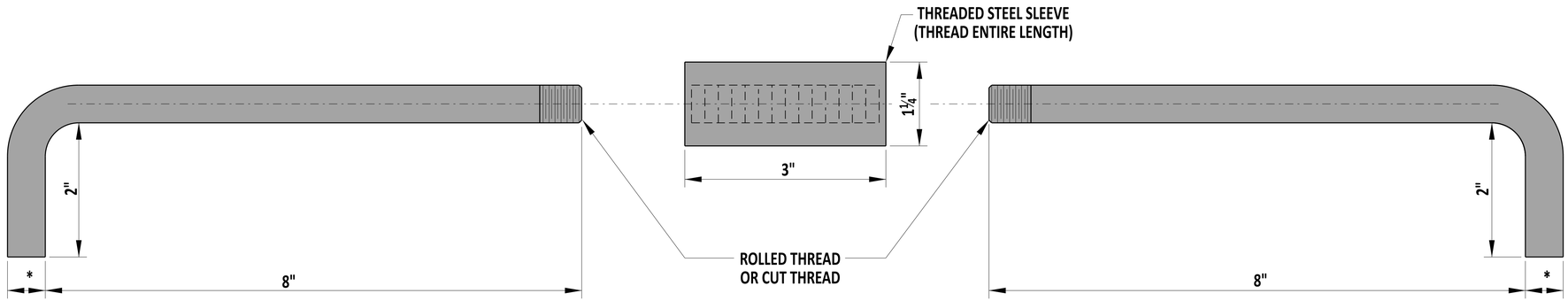
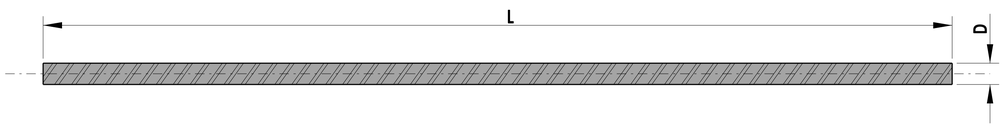


W BOLT

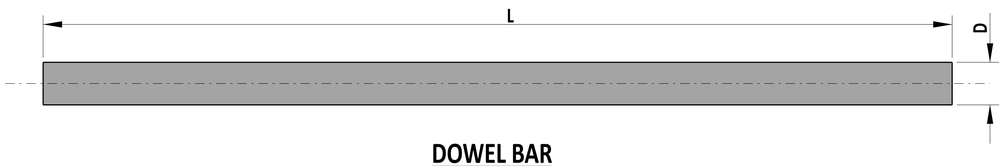


* - 11/16" ROLLED THREADS
¾" CUT THREADS

HOOK BOLT



TIE BAR



DOWEL BAR

DOWEL & TIE BAR CHART				
SLAB THICKNESS	DOWEL		TIE BAR	
	D	L	D	L
8" < T ≤ 11"	1¼"	18"	⅝"	30"
T > 11"	1½"	20"	⅝"	30"

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RECOMMENDED

W BOLT, HOOK BOLT, DOWEL AND TIE BAR

STANDARD NO. P-1 (2024) | SHT. 3 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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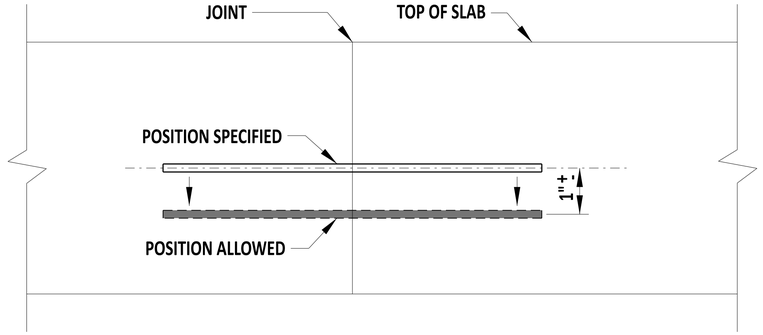
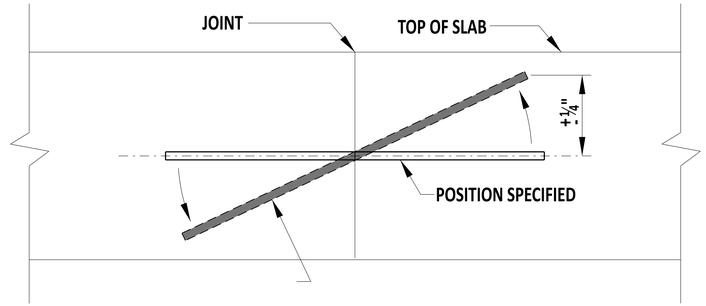
22-DEC-2023

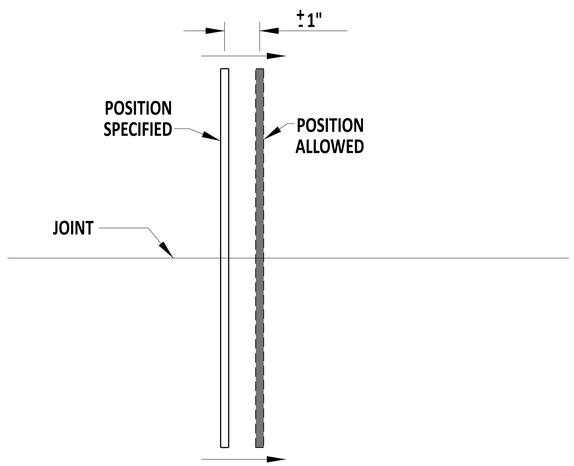
SCALE : NTS



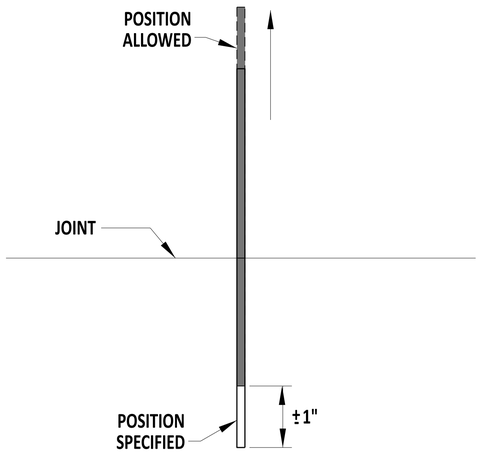
VERTICAL TRANSLATION



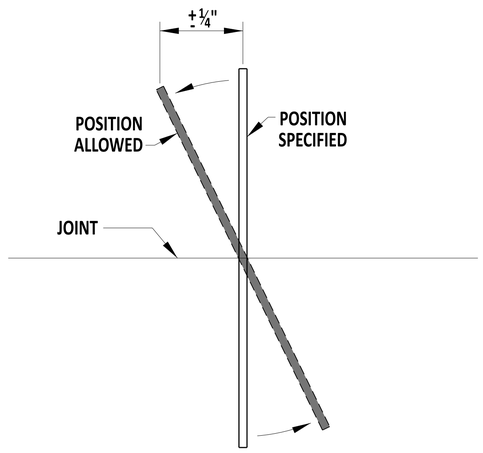
VERTICAL ROTATION



HORIZONTAL TRANSLATION



LONGITUDINAL TRANSLATION



HORIZONTAL ROTATION

DOWEL & TIE BAR PLACEMENT TOLERANCES

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DOWEL AND TIE BAR PLACEMENT TOLERANCE			
STANDARD NO. P-1 (2024)	SHT. 4	OF 4	

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DEPUTY DIRECTOR - DESIGN
22 December 2023
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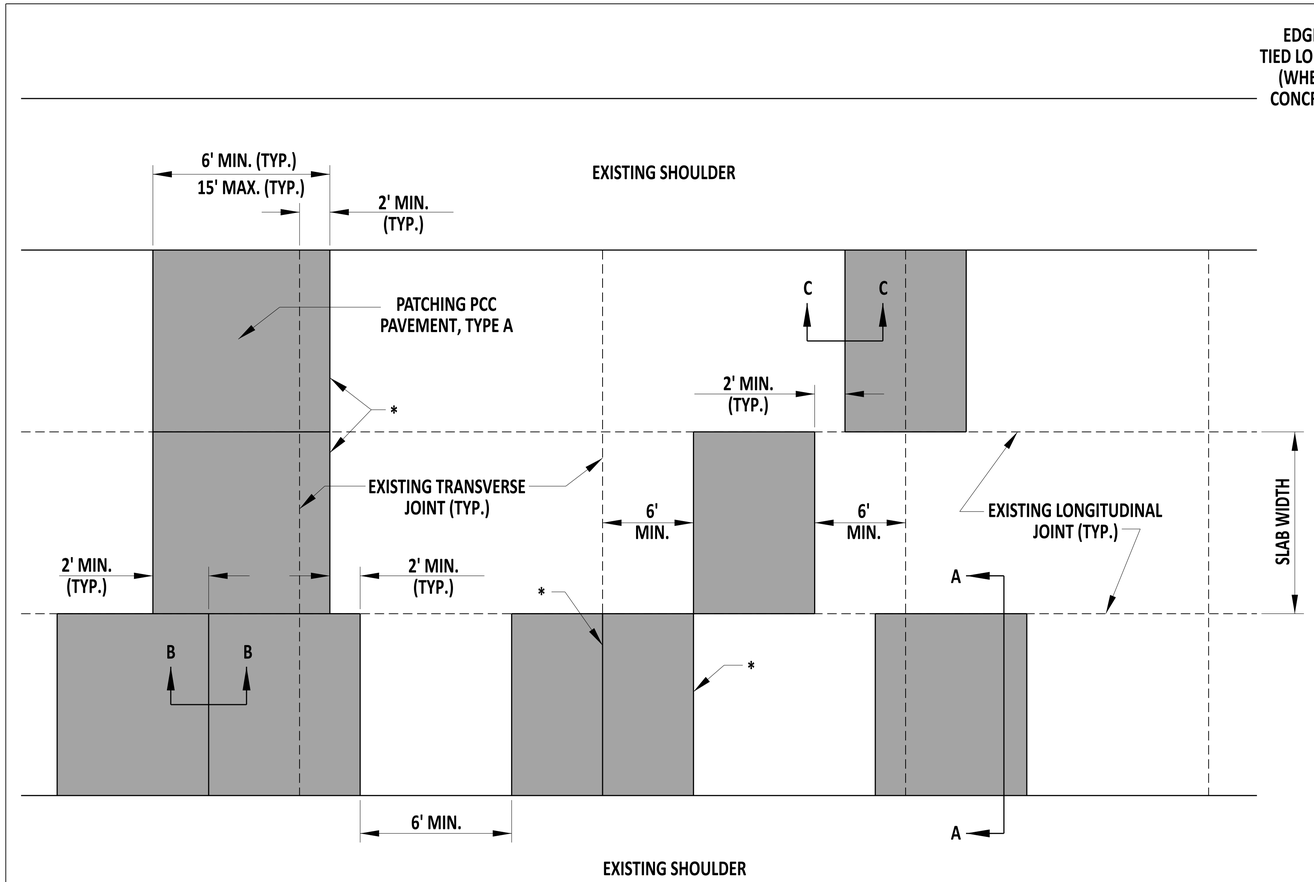
01/11/2024
DATE

22-DEC-2023



PLAN

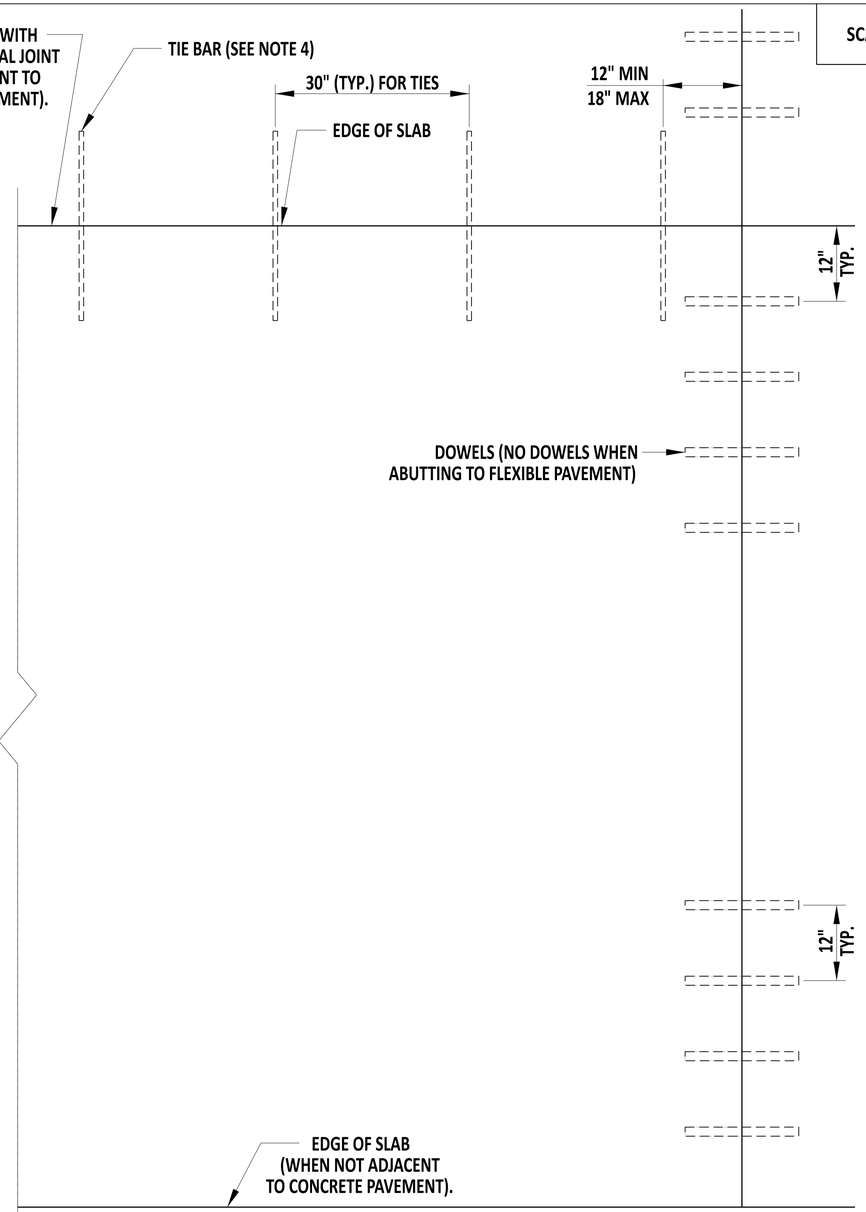
* - EXACTLY MATCH PROPOSED LOCATIONS FOR TRANSVERSE JOINTS TO THE ALIGNMENT OF THE FINAL (EXISTING OR RELOCATED) TRANSVERSE JOINTS IN ALL IMMEDIATELY ADJACENT LANES.

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.
4). PROVIDE TIE BARS FOR TYPE B PATCHES PLACED ADJACENT TO CONCRETE. DO NOT INSTALL TIE BARS ON TYPE A PATCHES.

FULL DEPTH PATCH

SCALE : NTS



SLAB PLAN (WITH DOWEL AND TIE LOCATIONS)

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RECOMMENDED

FULL DEPTH PATCH PLAN VIEWS

STANDARD NO. P-2 (2024) SHT. 1 OF 6

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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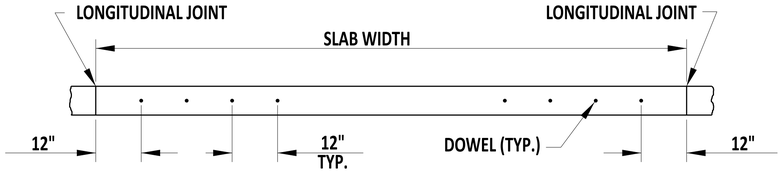
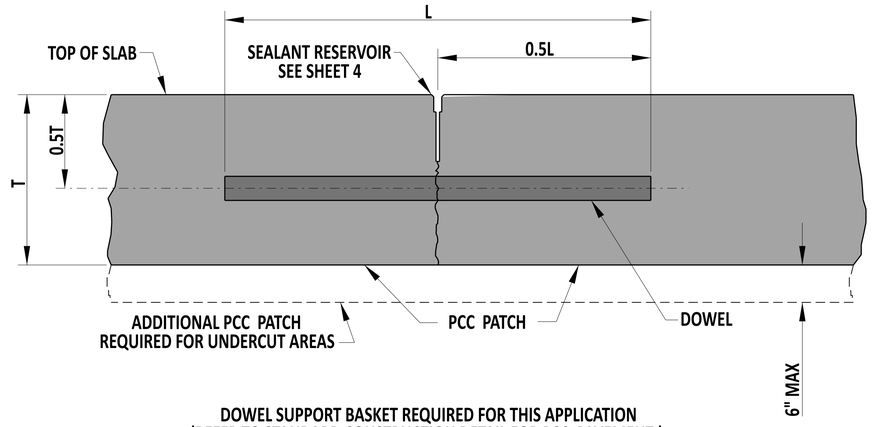


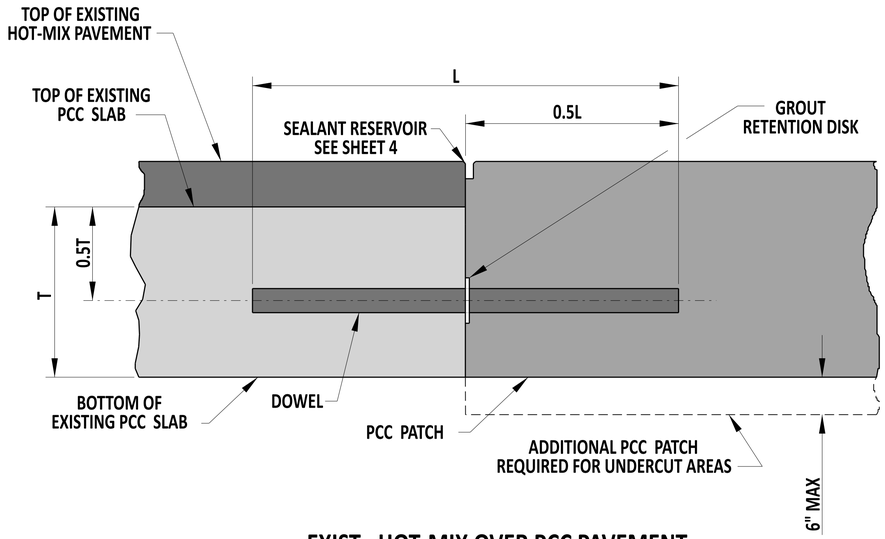
SECTION A-A



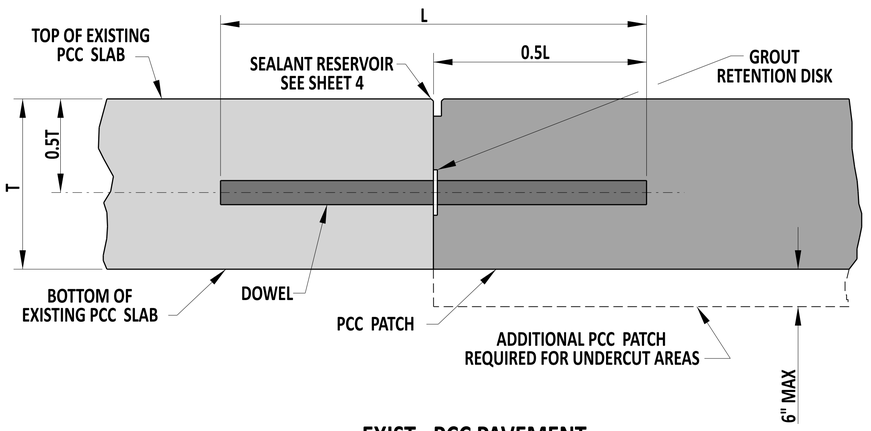
DOWEL SUPPORT BASKET REQUIRED FOR THIS APPLICATION
(REFER TO STANDARD CONSTRUCTION DETAIL FOR PCC PAVEMENT.)

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

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FULL DEPTH PATCH, SECTION VIEWS

STANDARD NO. P-2 (2024) | SHT. 2 OF 6

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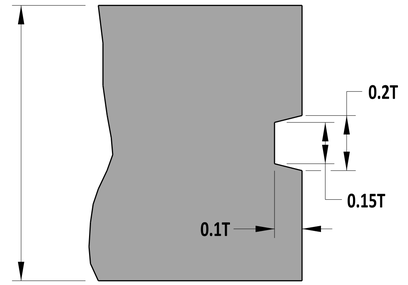
DATE

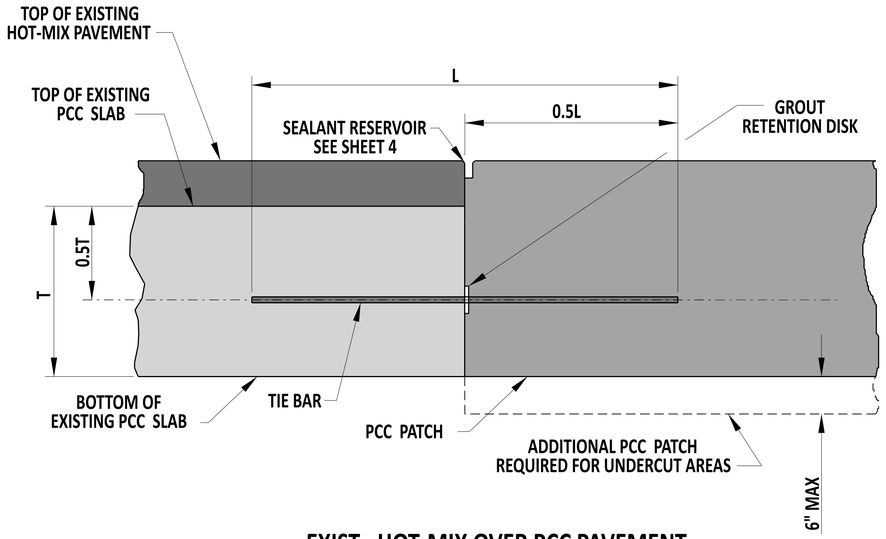
APPROVED
CHIEF ENGINEER
01/11/2024
DATE

22-DEC-2023

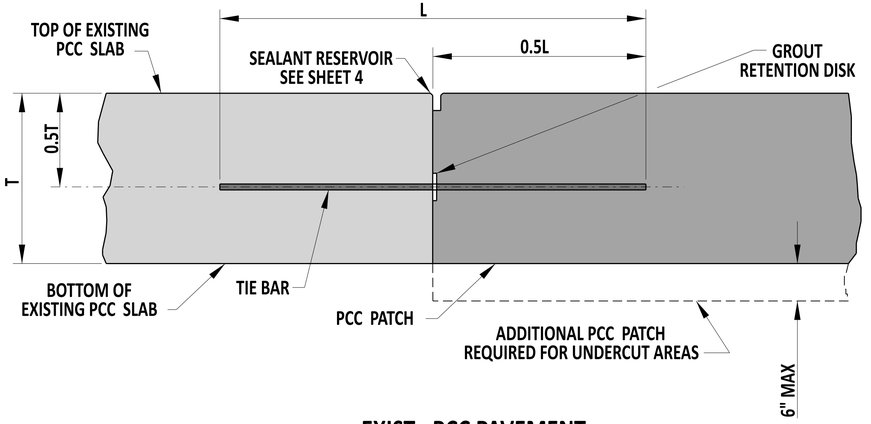
SCALE : NTS



KEYWAY DETAIL
SEE NOTE 1



EXIST. HOT-MIX OVER PCC PAVEMENT



EXIST. PCC PAVEMENT

NOTES:

1). USE KEYWAY WHEN HOOK BOLT, TIE BAR, OR W BOLT IS NOT USED.
2). PROVIDE TIE BARS FOR TYPE B PATCHES PLACED ADJACENT TO CONCRETE. DO NOT INSTALL TIE BARS ON TYPE A PATCHES.

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LONGITUDINAL CONSTRUCTION JOINT DETAIL

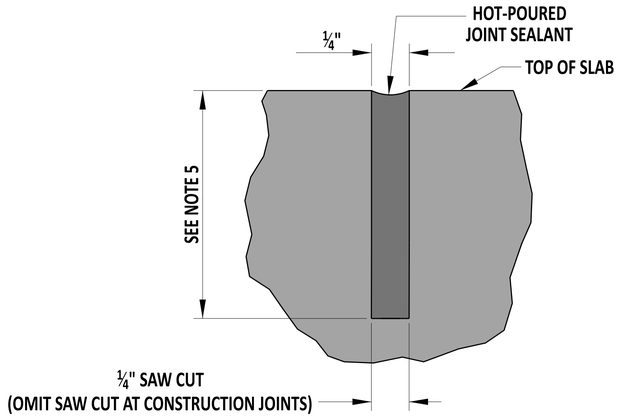
STANDARD NO. P-2 (2024) | SHT. 3 OF 6

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

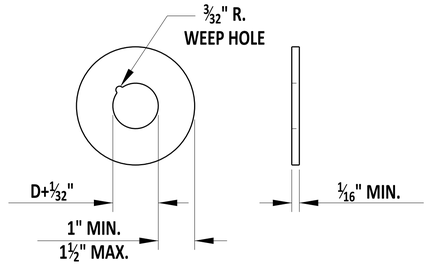
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS



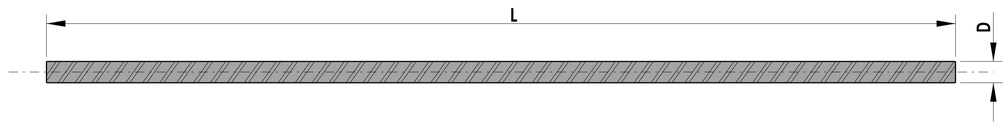
SEALANT RESERVOIR DETAIL- TRANSVERSE AND LONGITUDINAL JOINT



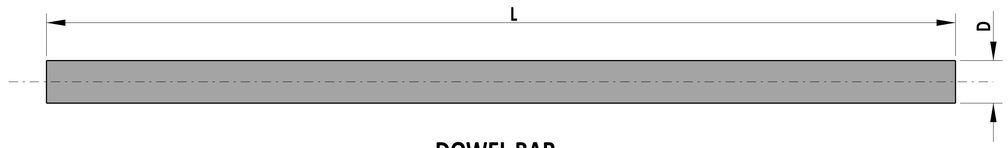
D - DIAMETER (INCLUDING COATINGS, IF ANY.)

GROUT RETENTION DISK

DOWEL & TIE BAR CHART				
SLAB THICKNESS	DOWEL		TIE BAR	
	D	L	D	L
8" < T ≤ 11"	1¼"	18"	⅝"	30"
T > 11"	1½"	20"	⅝"	30"



TIE BAR



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.

5). SAW CUT TO A DEPTH OF 3" WHEN PCC PAVEMENTS ARE BETWEEN 8" TO 11". SAW CUT TO A DEPTH OF 4" WHEN PCC PAVEMENT IS THICKER THAN 11".

FULL DEPTH PATCH

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RECOMMENDED

FULL DEPTH PATCH, SEALANT, GROUT RETENTION DISK AND DOWEL BARS

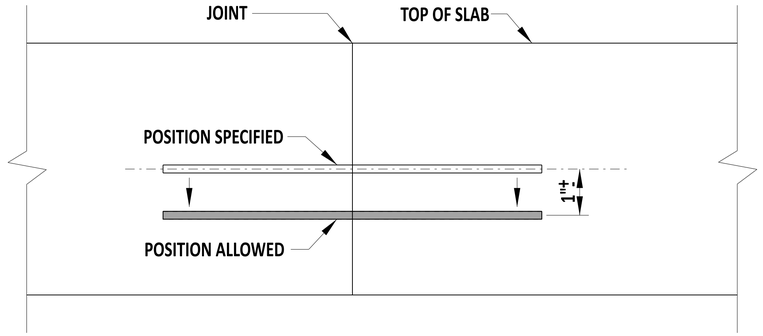
STANDARD NO. P-2 (2024) | SHT. 4 OF 6

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

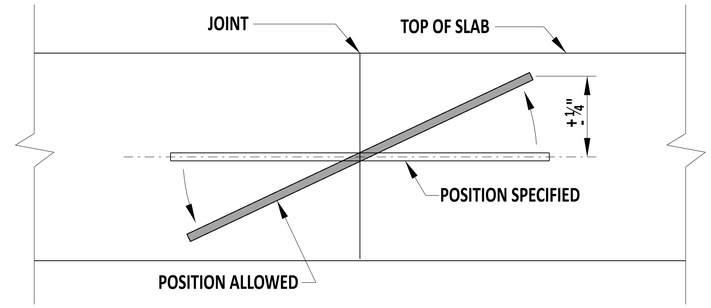
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

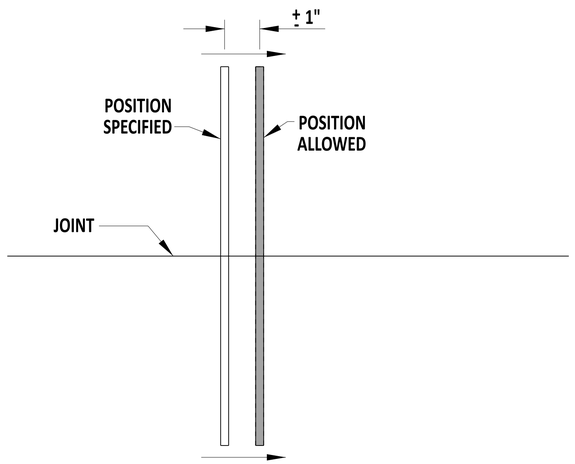
SCALE : NTS



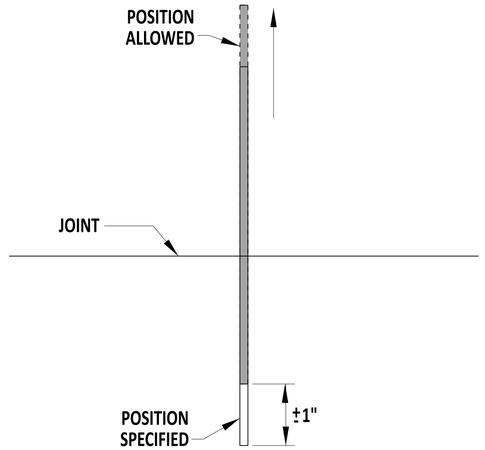
VERTICAL TRANSLATION



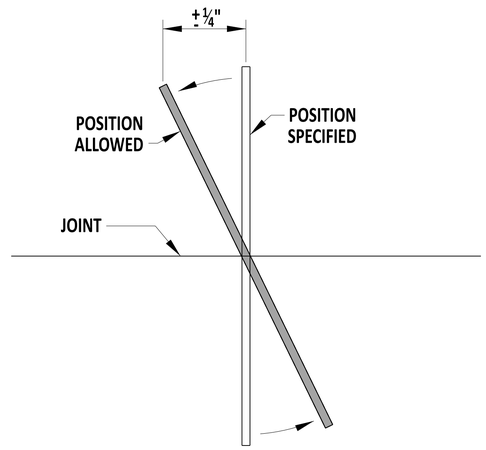
VERTICAL ROTATION



HORIZONTAL TRANSLATION



LONGITUDINAL TRANSLATION



HORIZONTAL ROTATION

DOWEL & TIE BAR PLACEMENT TOLERANCES

PLACE TIE BARS IN ACCORDANCE WITH SECTION 503

FULL DEPTH PATCH

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RECOMMENDED

FULL DEPTH PATCH, DOWEL BAR PLACEMENT TOLERANCE

STANDARD NO. P-2 (2024) | SHT. 5 OF 6

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

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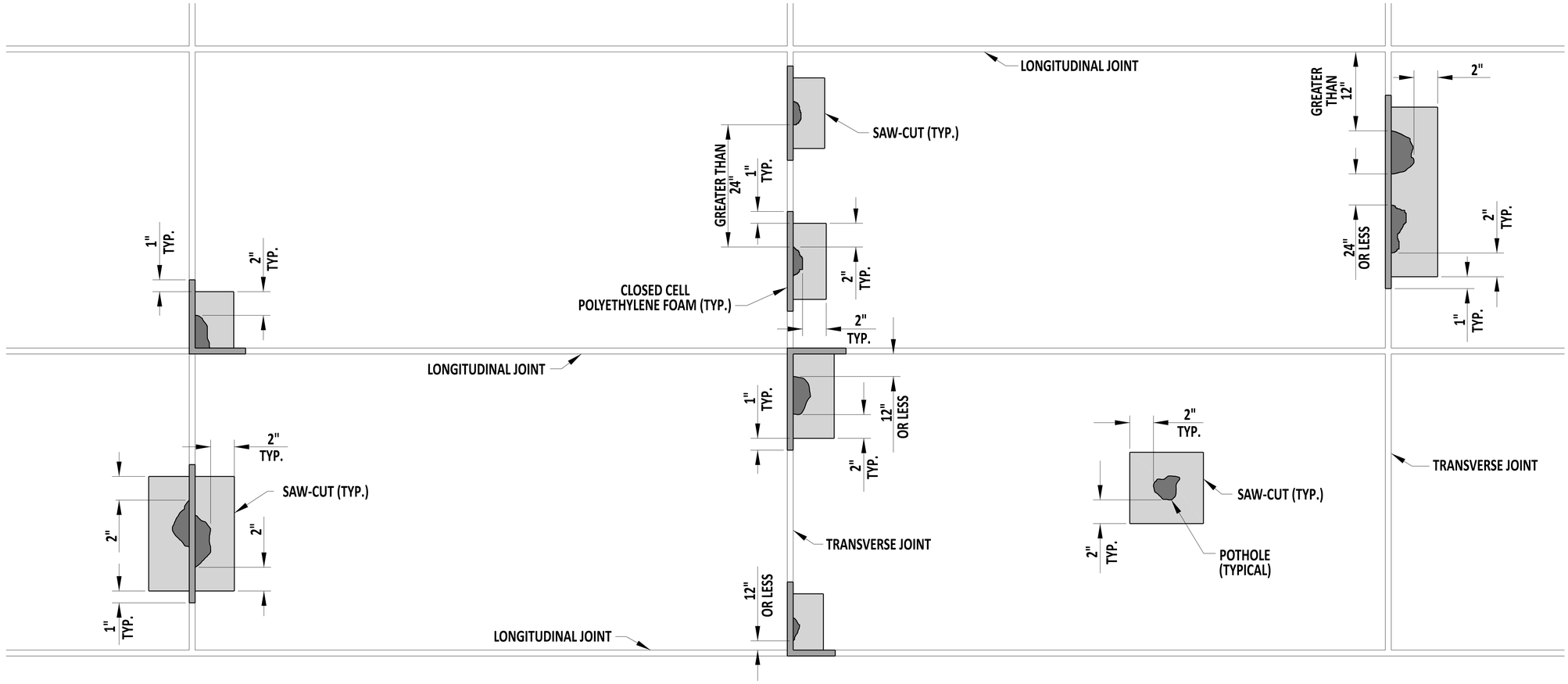
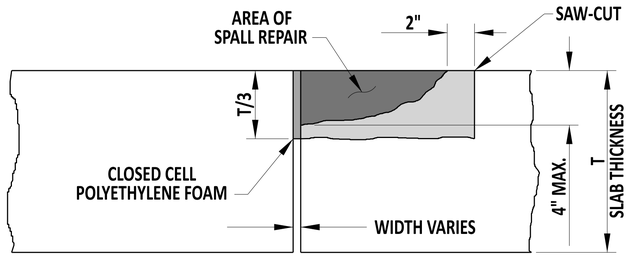
SCALE : NTS



PLAN

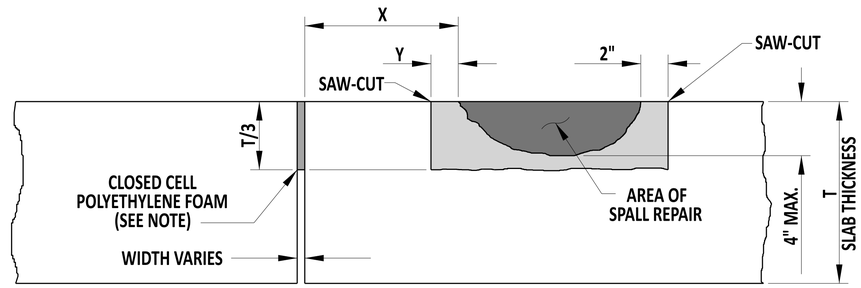


SECTION WITH SPALL ADJACENT TO JOINT

NOTES:

1). MATCH THE WIDTH OF 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

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RECOMMENDED

PARTIAL DEPTH PATCH, PLAN AND SECTION VIEWS

STANDARD NO. P-2 (2024) | SHT. 6 OF 6

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

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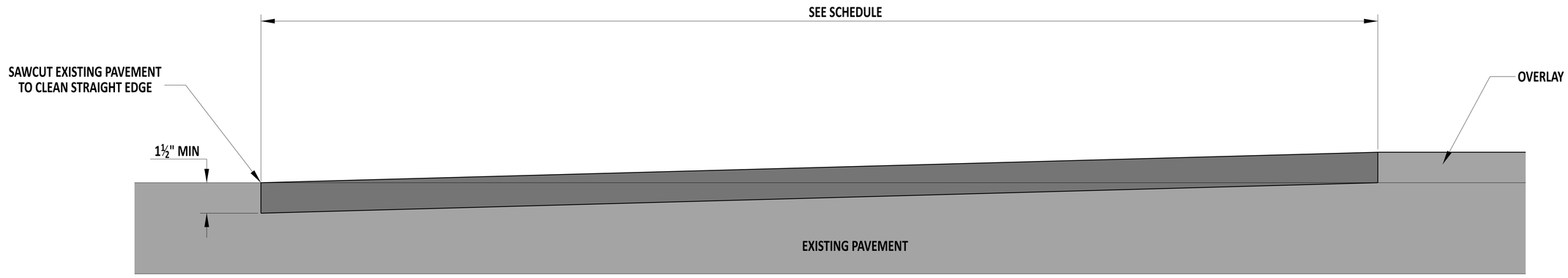

CONDITION	SLOPE FEET:INCHES
GREATER THAN OR EQUAL TO 55 MPH	40:1
LESS THAN 55MPH	30:1
STOP CONTROLLED INTERSECTION	15:1

NOTES:

1). ADJUST THE PROFILE OF THE OVERLAY PAVING TO ASSURE A SMOOTH TRANSITION THROUGH THE BUTT JOINT.
2). SEAL JOINTS IN ACCORDANCE WITH SECTION 401.

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RECOMMENDED

BUTT JOINTS

STANDARD NO. P-3 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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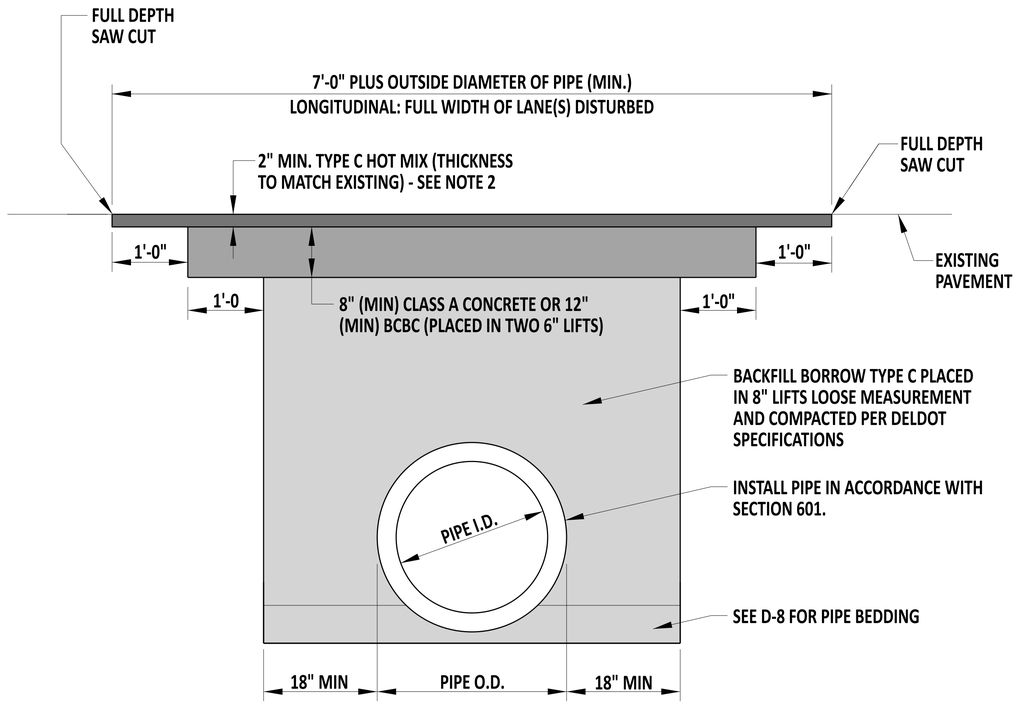
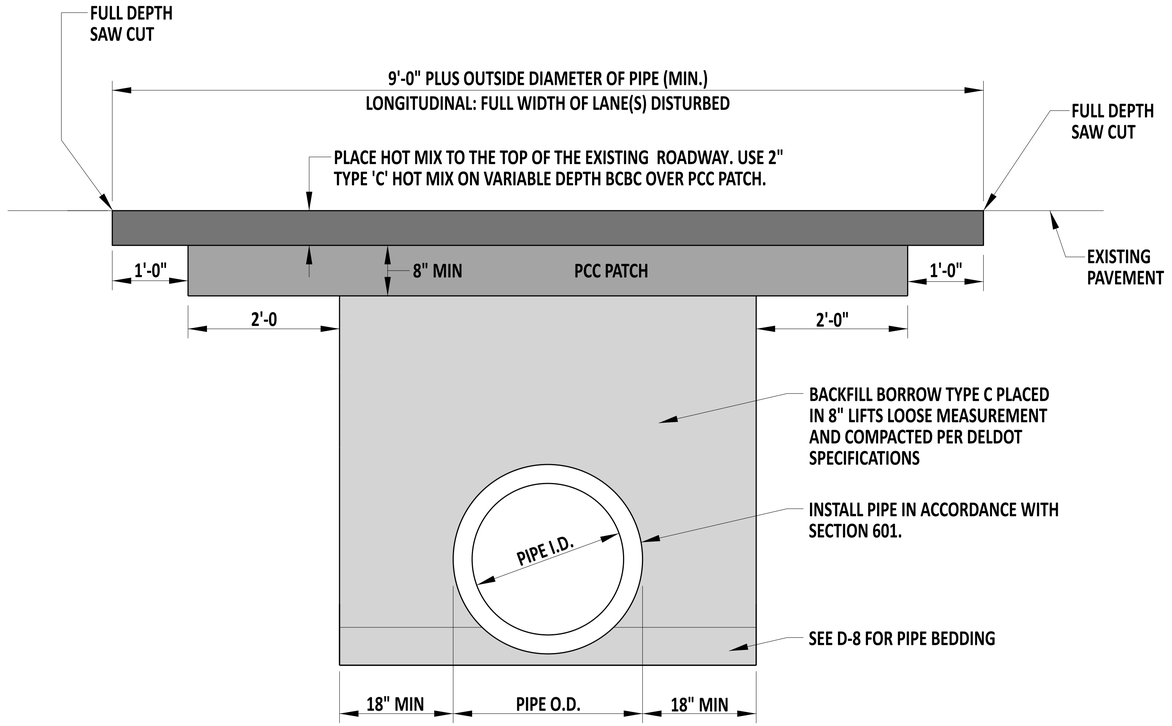
SCALE : NTS



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.

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PERMANENT CROSS-ROAD PATCH OVER PIPE TRENCH

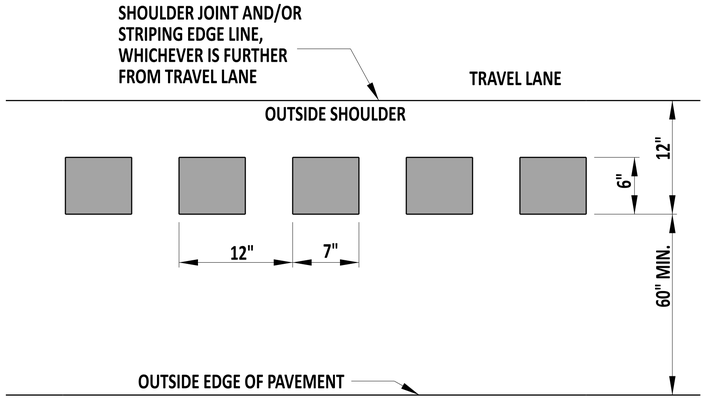
STANDARD NO. P-4 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

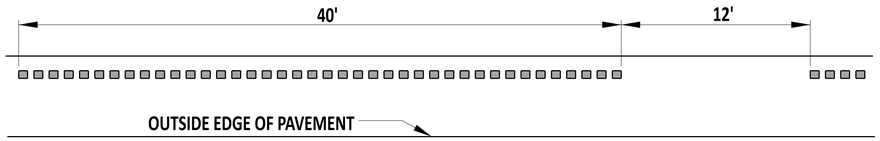
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

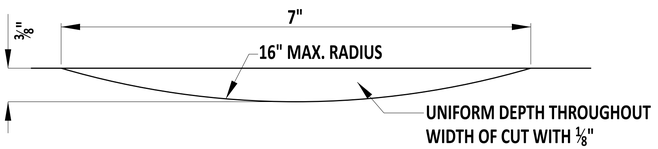
SCALE : NTS



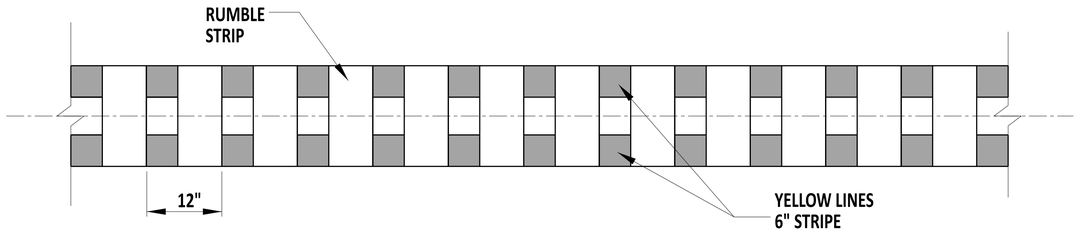
BIKE-FRIENDLY EDGELINE RUMBLE STRIPS



BIKE-FRIENDLY EDGELINE RUMBLE STRIPS
SEGMENT VIEW

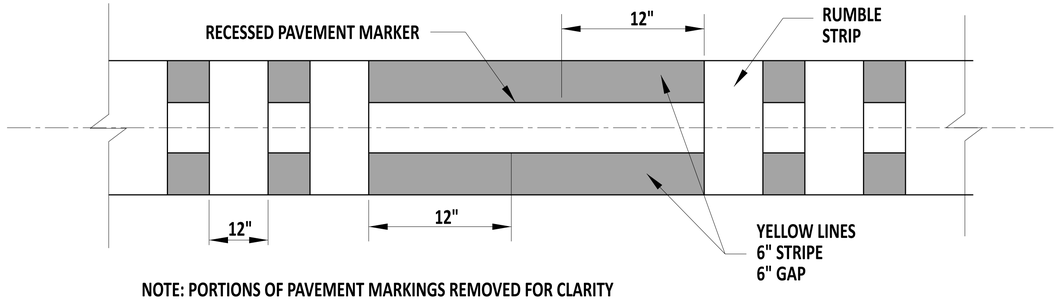


BIKE-FRIENDLY EDGELINE RUMBLE STRIPS
SECTION VIEW



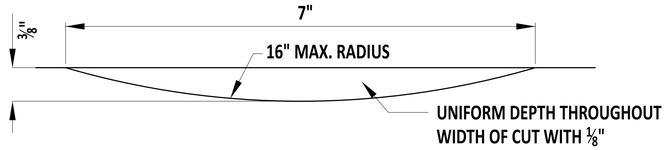
NOTE: PORTIONS OF PAVEMENT MARKINGS REMOVED FOR CLARITY

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). PLACE RUMBLE STRIPS ON SHOULDERS IN LOCATIONS DESCRIBED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
2). BREAK RUMBLE STRIPS FOR ALL INTERSECTIONS AND DRIVEWAY ENTRANCES WHERE THE EDGELINE PAVEMENT MARKINGS TIE INTO DRIVEWAY ENTRANCE OR WHERE THE EDGELINE PAVEMENT MARKINGS ARE BROKEN. STOP THE INSTALLATION OF RUMBLE STRIPS 25' PRIOR TO THE POINT OF CURVATURE (PC) AND RESTART 25' AFTER THE POINT OF TANGENCY (PT).
3). DO NOT INSTALL RUMBLE STRIPS ON ACCELERATION LANES, DECELERATION LANES, BYPASS LANES, OR TWO-WAY LEFT TURN LANES. STOP INSTALLATION 150' PRIOR TO THE DIVERGE POINT OF A DECELERATION LANE AND DO NOT COMMENCE UNTIL 150' DOWNSTREAM OF THE MERGE POINT FOR AN ACCELERATION LANE.
4). DISCONTINUE BICYCLE-FRIENDLY RUMBLE STRIPS 50' BEFORE AND START 50' AFTER ADJACENT 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, DISCONTINUE THE CENTERLINE RUMBLE STRIPS 25' IN ADVANCE OF THE ISLAND.
6). IN AREAS WHERE THE CENTER LINE SPLITS TO CREATE, FOR EXAMPLE A TURN LANE, PLACE THE RUMBLE STRIPS ONLY ALONG THE DOUBLE YELLOW CENTER LINE THAT IS NOT FORMING THE LEFT TURN LANE.
7). ON ROADS WITH RECESSED PAVEMENT MARKERS (RPMs), BEGIN CENTER LINE RUMBLE STRIPS 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'.

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RECOMMENDED

RUMBLE STRIPS

STANDARD NO. P-5 (2024) | SHT. 2 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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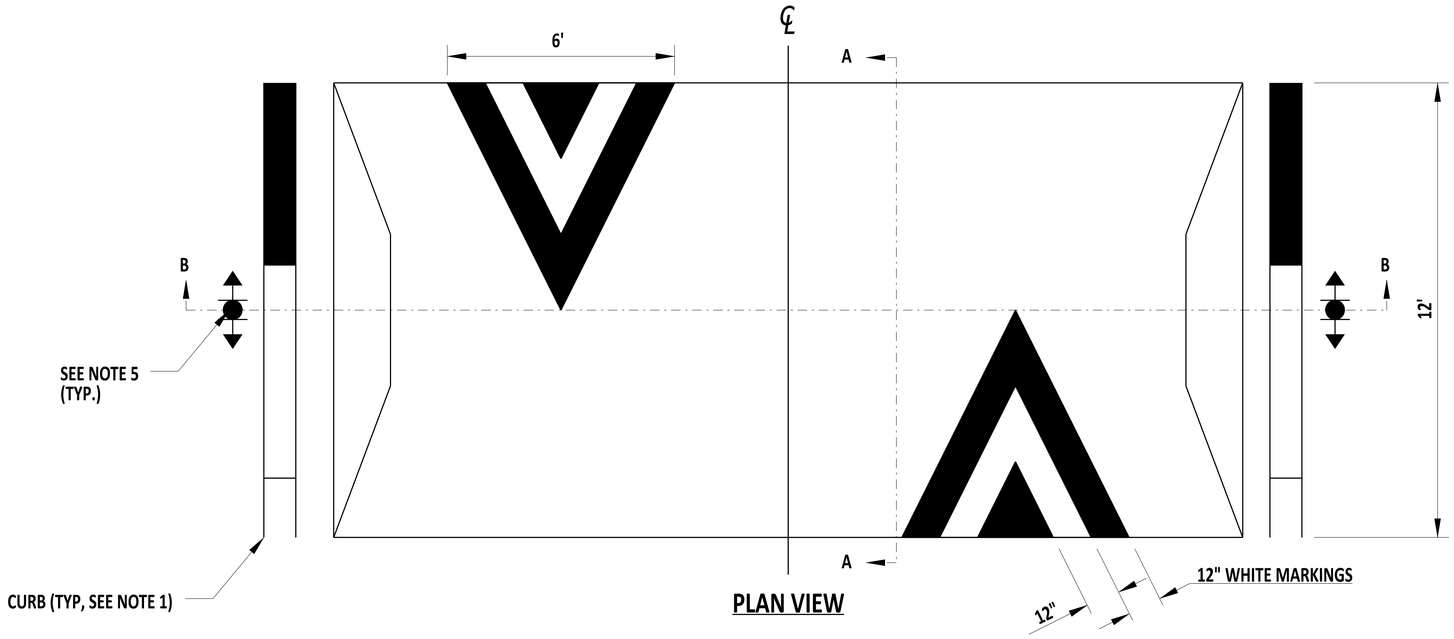
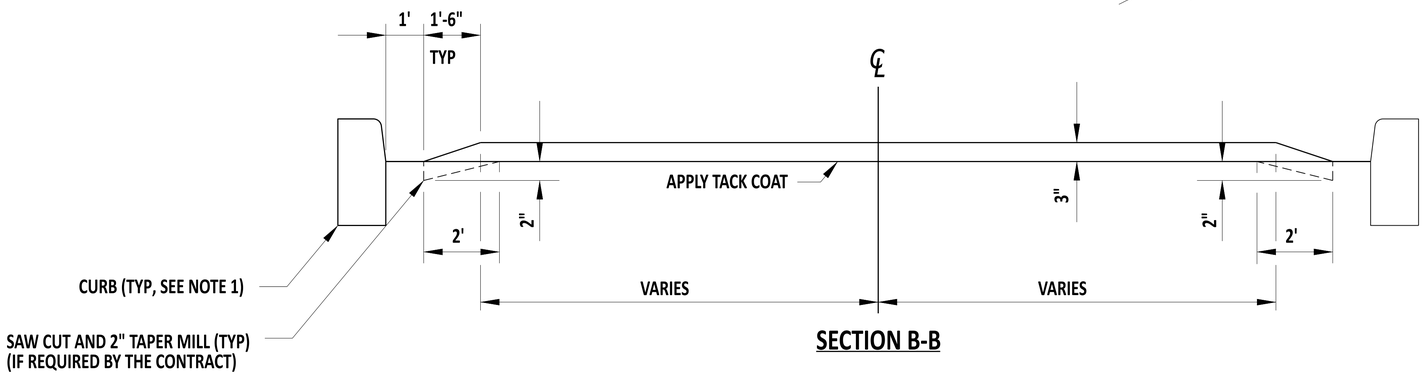
22-DEC-2023

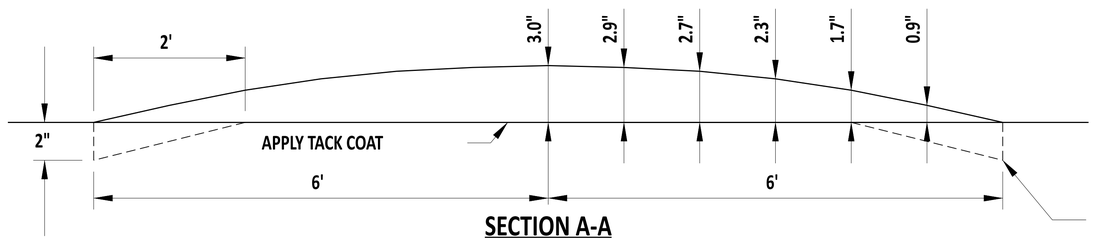
SCALE : NTS



PLAN VIEW



SECTION B-B



SECTION A-A

NOTES:

1). CURB SHOWN IS CONCEPTUAL ONLY. INSTALL CURB PER PLANS.
2). IF NO CURB IS REQURED, INSTALL SPEED HUMP TO THE FULL WIDTH OF ROADWAY.
3). INSTALL STRIPING IN ACCORDANCE WITH THE DE MUTCD.
4). INSTALL SPEED HUMP SIGNS (W17-1) IN ACCORDANCE WITH THE DE MUTCD.
5). PROVIDE AND INSTALL DELINEATORS IN ACCORDANCE WITH THE CONTRACT.
6). SEAL ALL JOINTS IN ACCORDANCE WITH SECTION 401.

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RECOMMENDED

SPEED HUMP

STANDARD NO. P-7 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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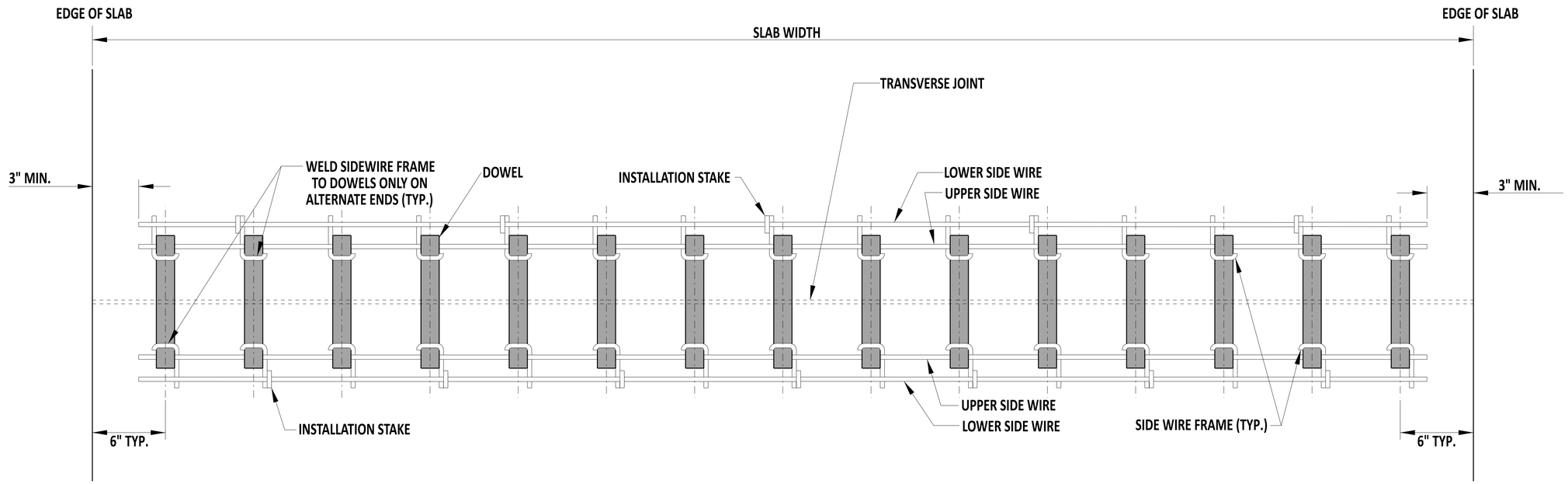
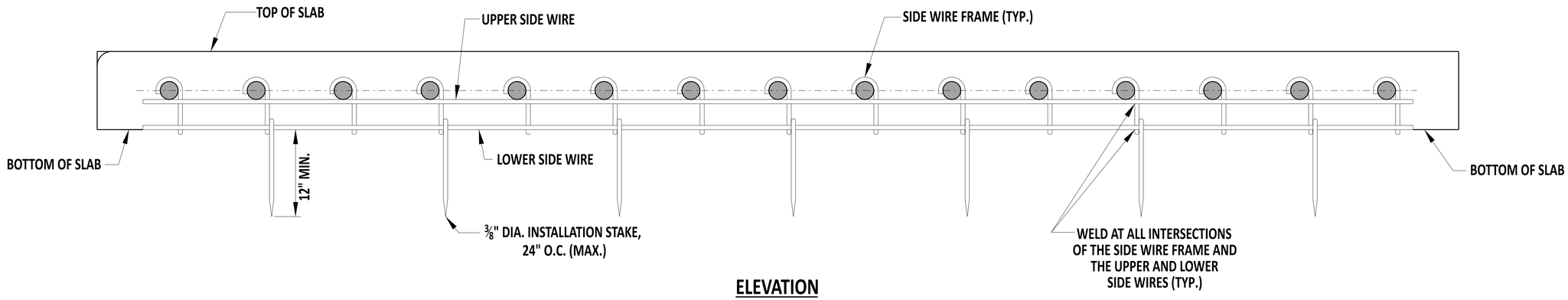


PLAN



ELEVATION

DOWEL SUPPORT BASKET

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Andrew Shoot — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

DOWEL SUPPORT BASKET			
STANDARD NO. P-8 (2024)	SHT. 1	OF 1	

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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22-DEC-2023

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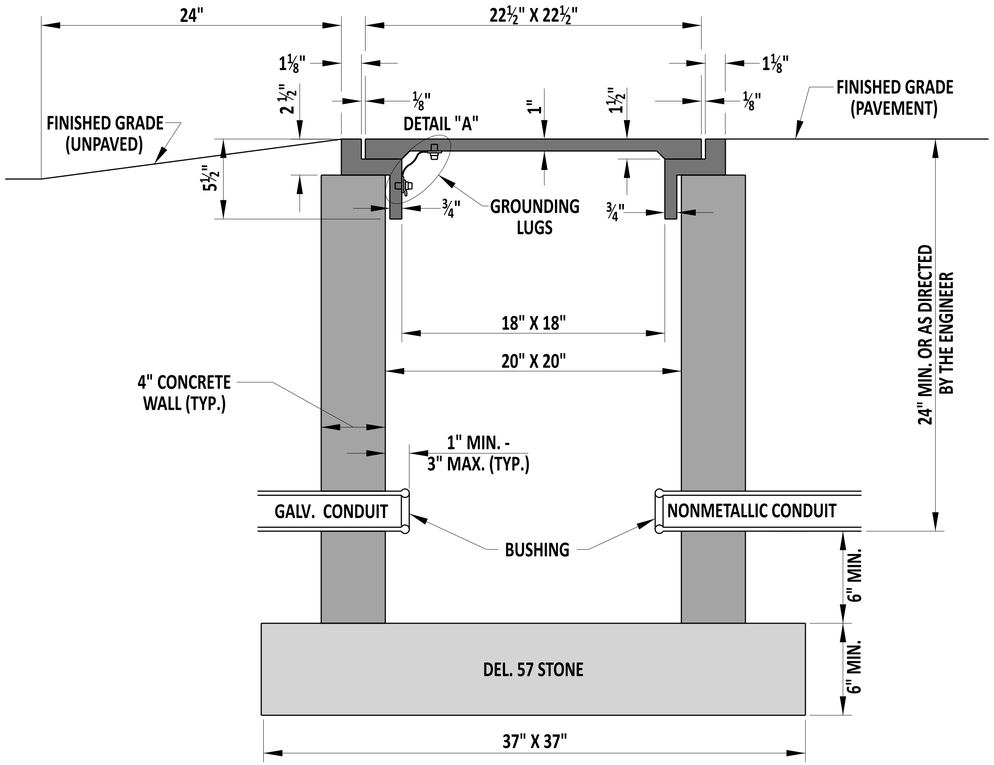
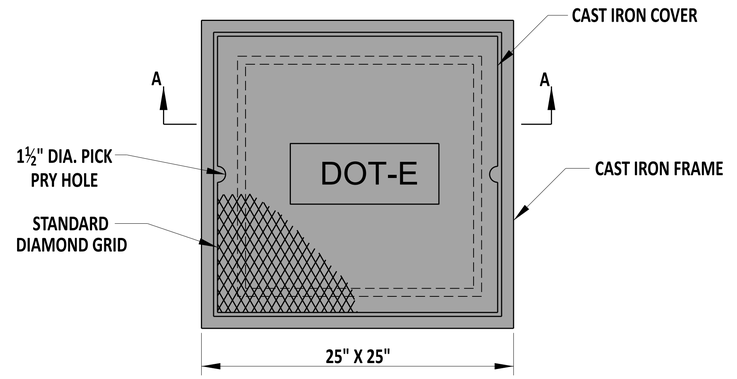
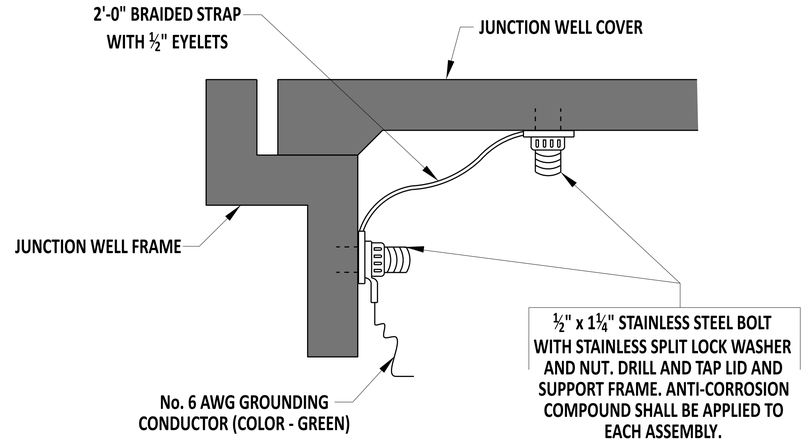


SECTION A-A



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.

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RECOMMENDED

CONDUIT JUNCTION WELL, TYPE 1

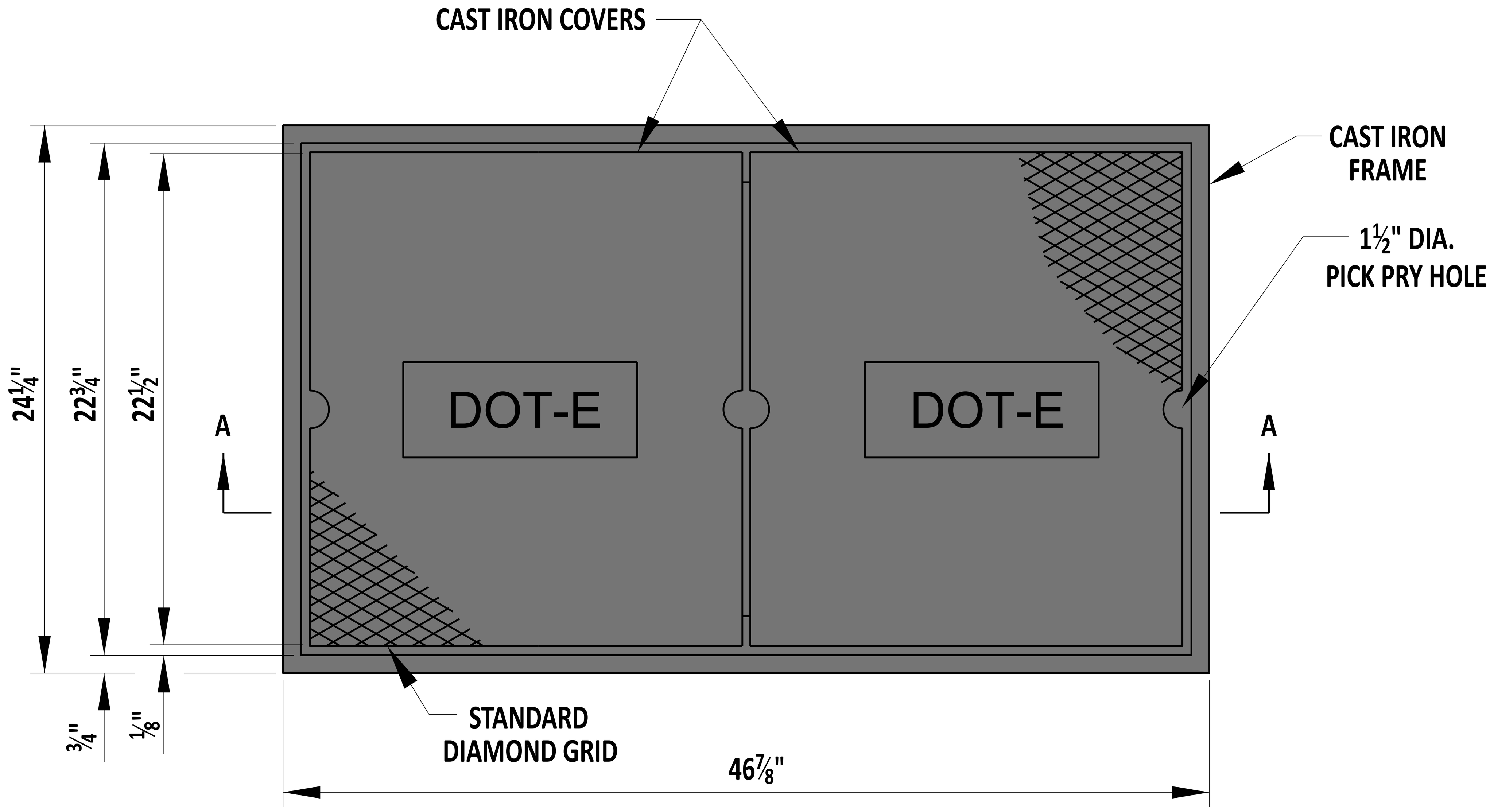
STANDARD NO. T-1 (2024) | SHT. 1 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

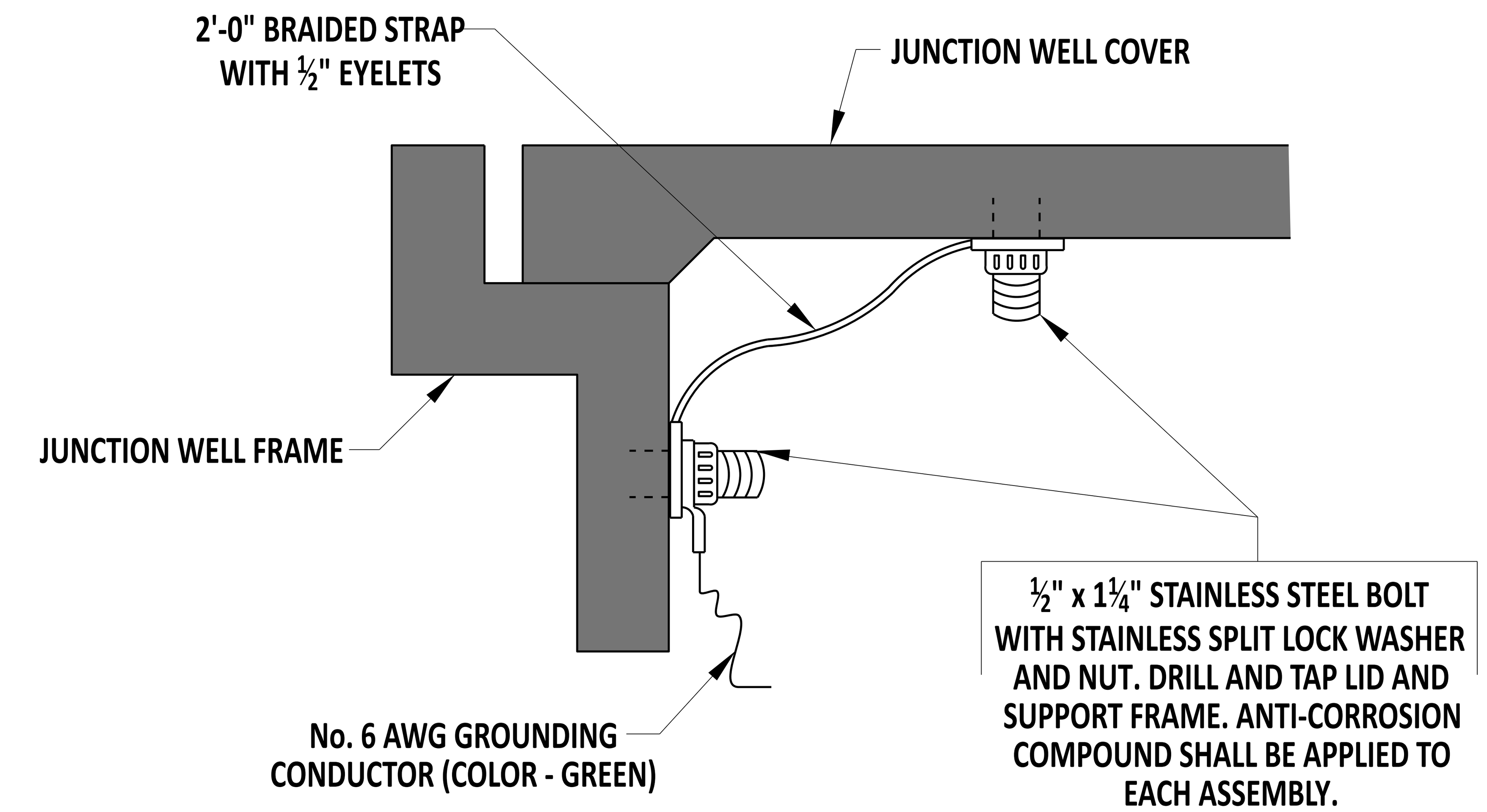
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

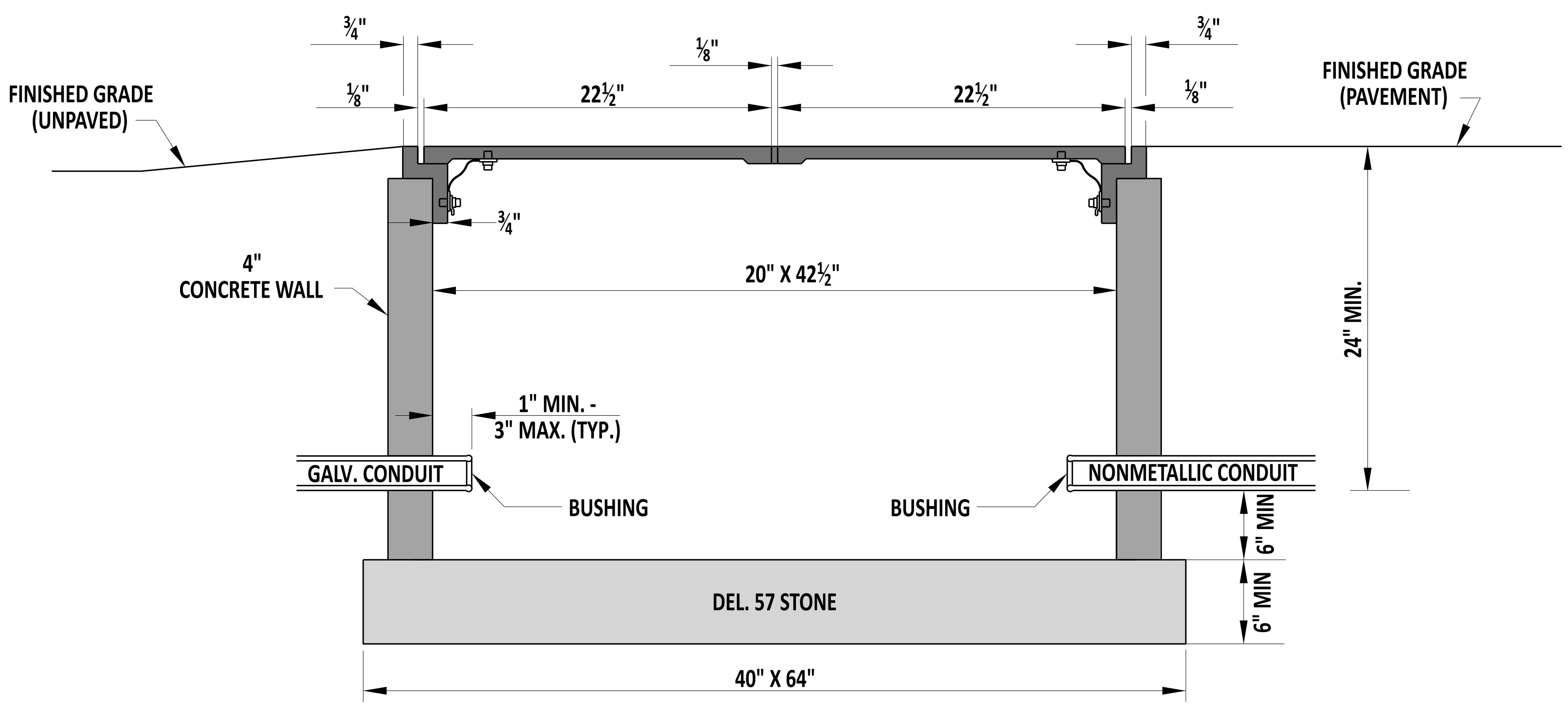
SCALE : NTS

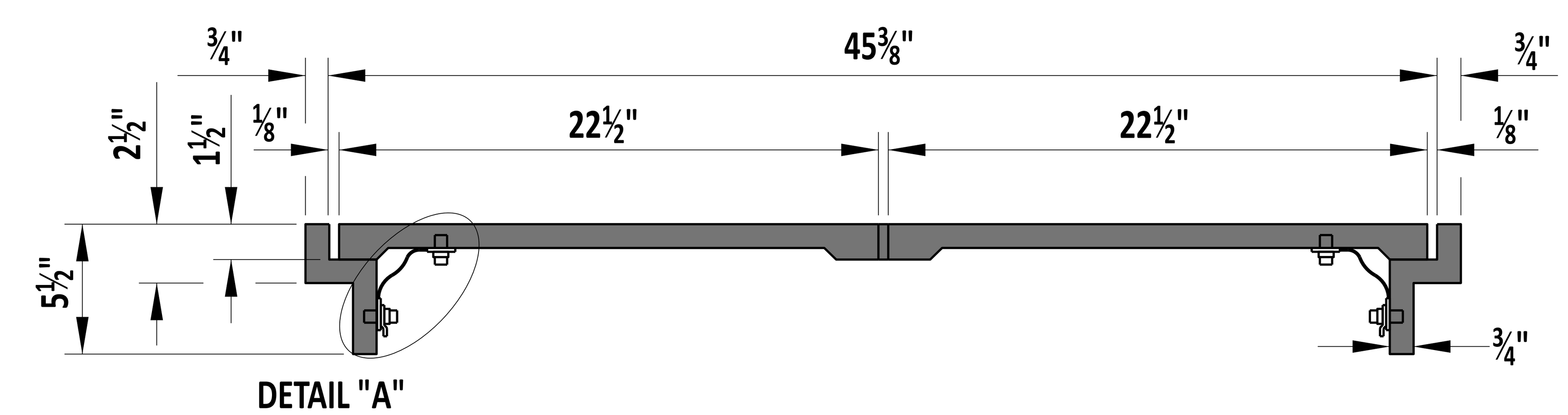


PLAN VIEW



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). CONDUIT JUNCTION WELLS SHALL NOT BE PLACED WITHIN OR UNDER THE 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.

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Andrew Shott
ENGINEERING SUPPORT — DATE 12/22/2023
RECOMMENDED

CONDUIT JUNCTION WELL, TYPE 4

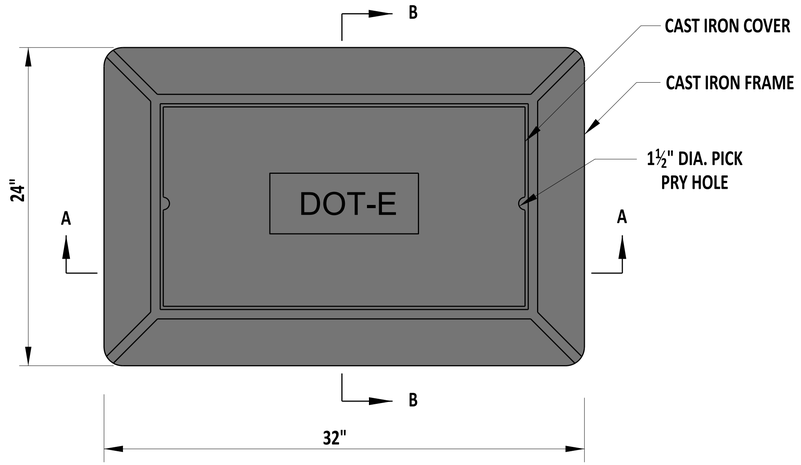
STANDARD NO. T-1 (2024) | SHT. 2 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — DATE 22 December 2023

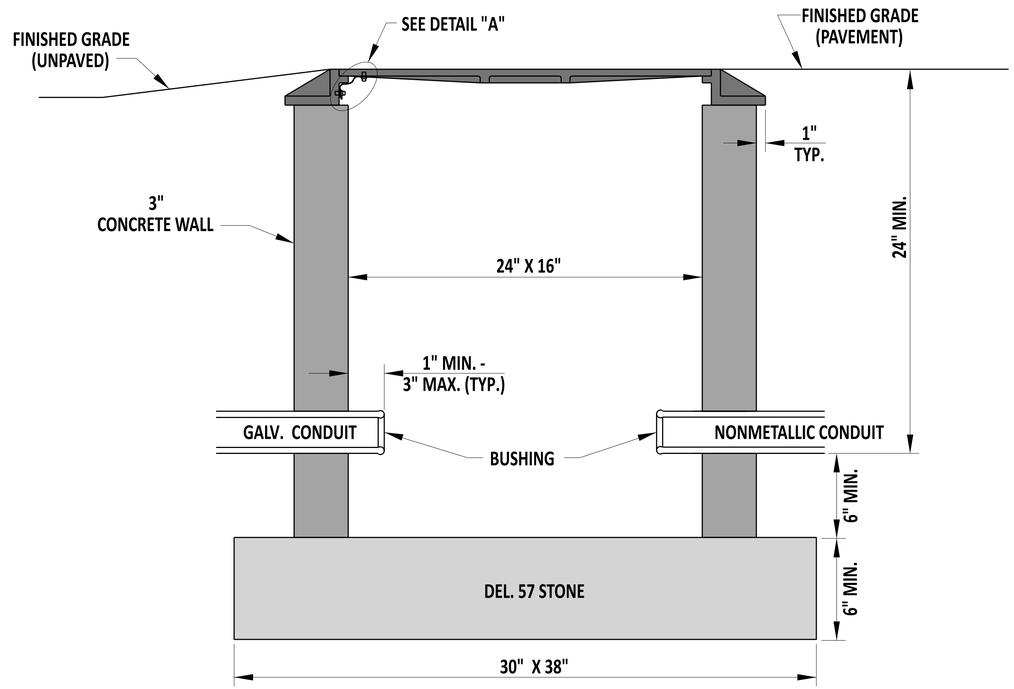
APPROVED — CHIEF ENGINEER — DATE 01/11/2024

22-DEC-2023

SCALE : NTS



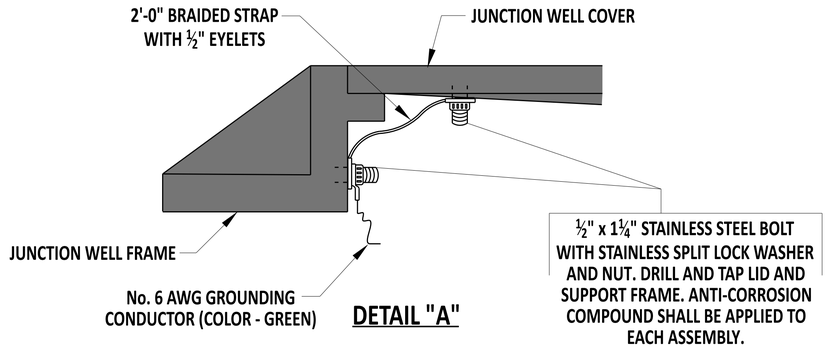
PLAN VIEW



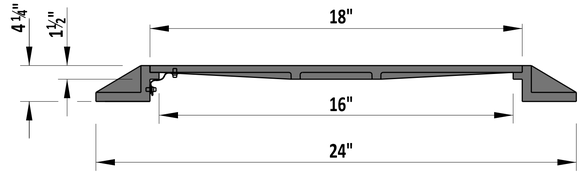
SECTION A-A

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). CONDUIT JUNCTION WELLS SHALL NOT BE PLACED WITHIN OR UNDER THE 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 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.



DETAIL "A"



SECTION B-B

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RECOMMENDED

CONDUIT JUNCTION WELL, TYPE 5

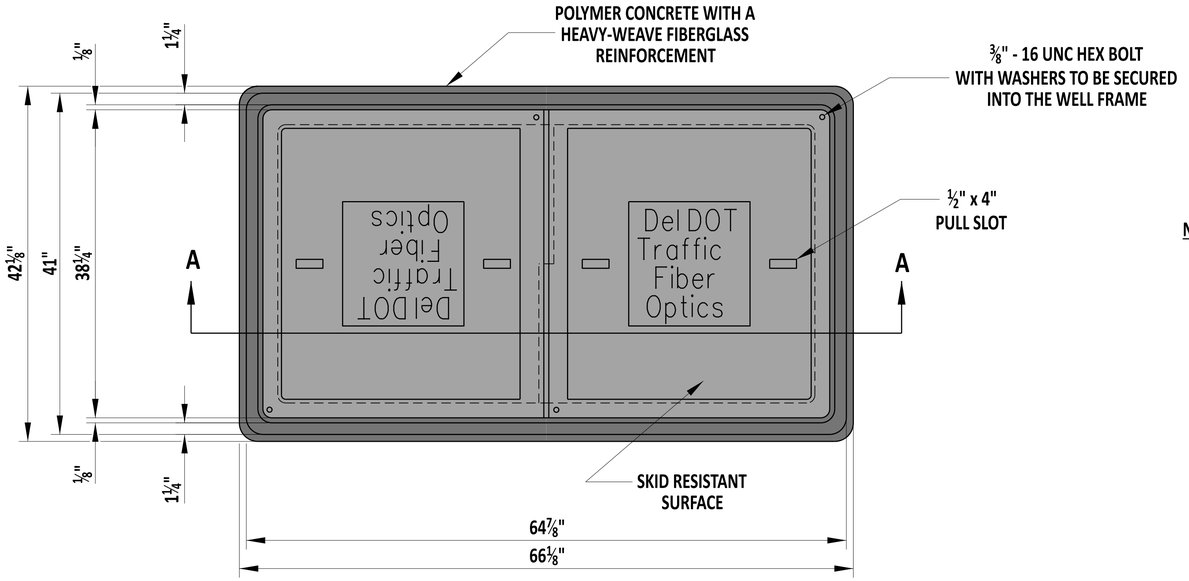
STANDARD NO. T-1 (2024) | SHT. 3 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

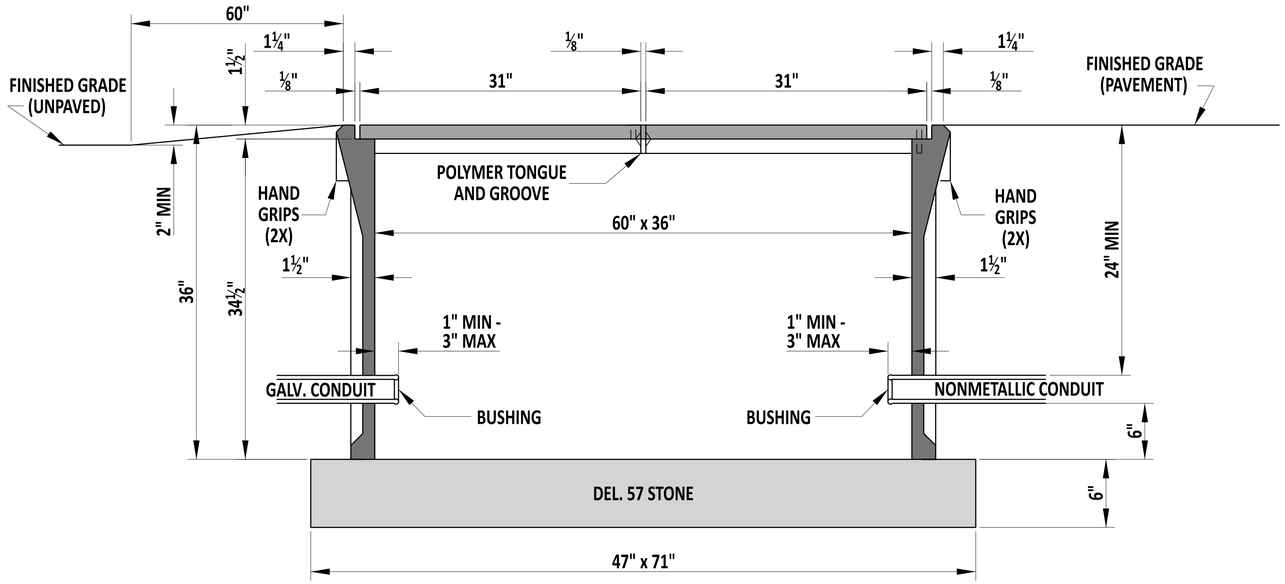
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS



PLAN VIEW



SECTION A-A

NOTES:

1). TYPE 7 CONDUIT JUNCTION WELL SHALL BE PRECAST POLYMER CONCRETE.
2) CONDUIT JUNCTION WELLS SHALL NOT BE PLACED WITHIN OR UNDER THE TRAVELWAY.
3). 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.
4). POLYMER CONCRETE COVERS SHALL BE THE HEAVY DUTY TYPE WITH A DESIGN LOAD OF 15,000 LBS OVER A 10" SQUARE.

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CONDUIT JUNCTION WELL, TYPE 7

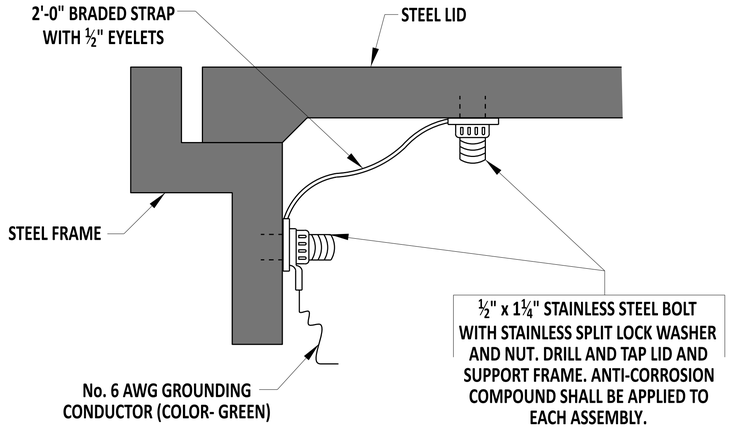
STANDARD NO. T-1 (2024) | SHT. 4 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

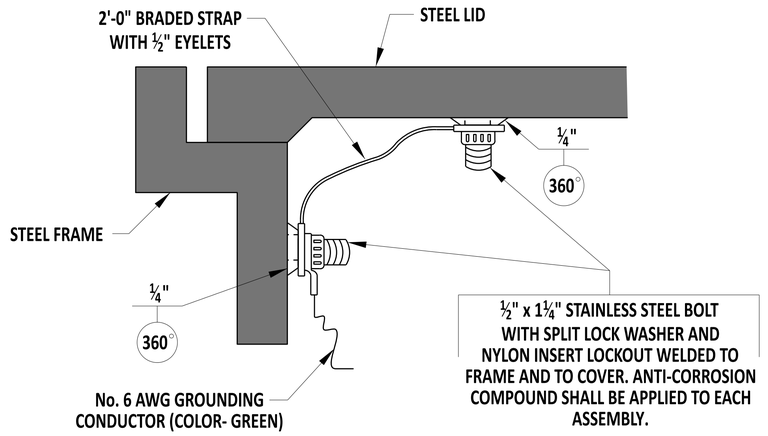
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

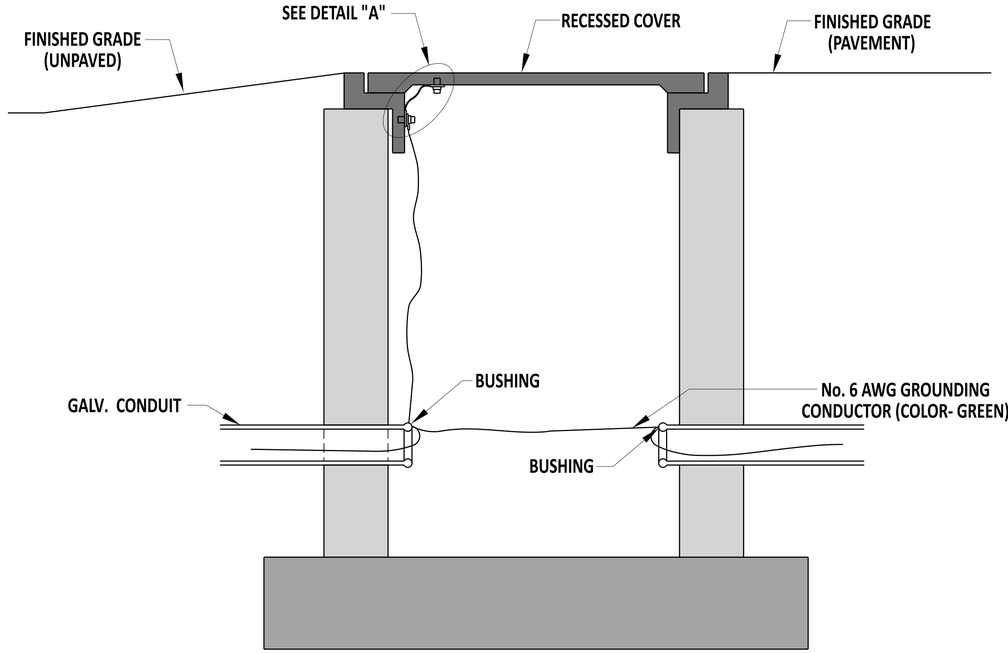
SCALE : NTS



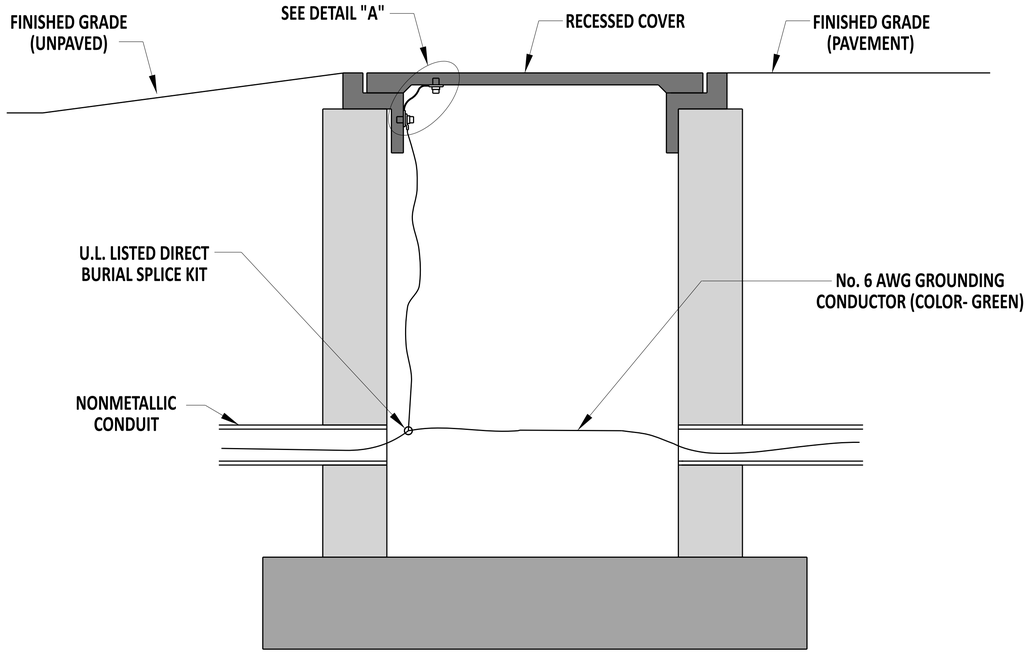
DETAIL "A"



BONDING AN EXISTING JUNCTION WELL COVER & FRAME



JUNCTION WELL BONDING GALVANIZED TO GALVANIZED



JUNCTION WELL BONDING NONMETALLIC CONDUIT

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RECOMMENDED

JUNCTION WELL, GROUNDING & BONDING FOR STEEL FRAMES & LIDS

STANDARD NO. T-2 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

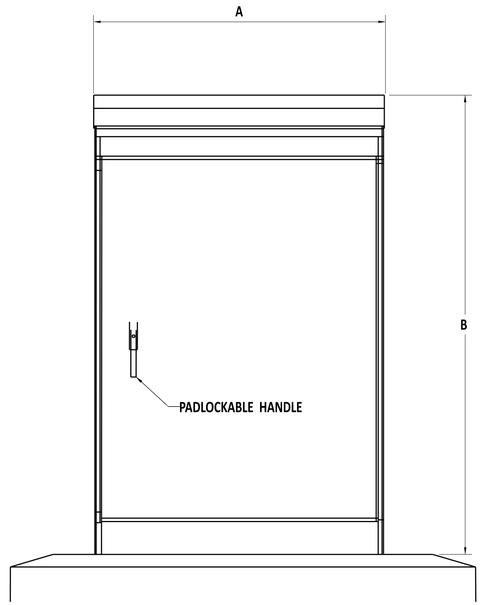
22-DEC-2023

SCALE : NTS

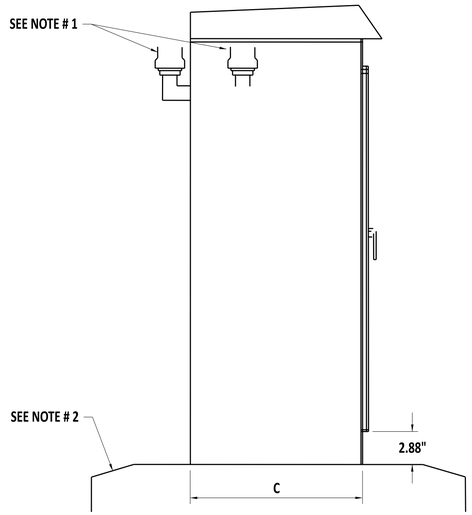
CABINET TYPE			
DIM.	TYPE M	TYPE P	TYPE R
A	36"	44"	44"
B	51"	56"	77"
C	16.88"	25.5"	25.5"

NOTES:

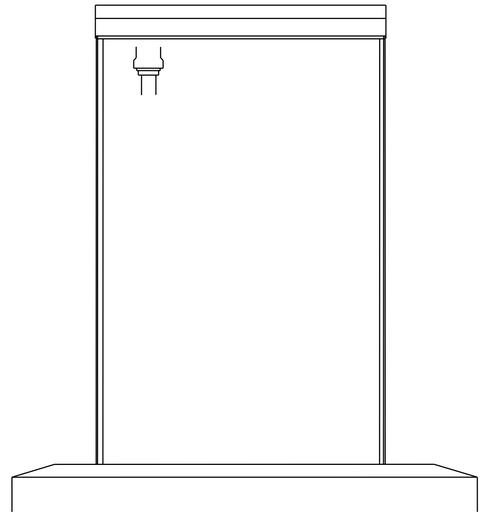
1). PHOTOCONTROL DEVICE SHALL BE MOUNTED ON BACK OR SIDE OF CABINET ON 90 DEGREE CONDUIT FITTING TO AVOID VEHICLE HEADLIGHT GLARE. PHOTOCONTROL DEVICE CAN ALSO BE INSTALLED INSIDE OF THE CABINET, BEHIND PLEXI-GLASS SHIELD. THE DESIGNER SHALL COORDINATE WITH THE APPLICABLE MAINTENANCE DISTRICT TO DETERMINE THE LOCATION OF THE PHOTOCONTROL DEVICE ON THE CABINET.
2). REFER TO STANDARD DETAILS T-4, SHEET 1 AND T-4, SHEET 2 FOR CABINET BASE DETAILS.
3). METER AND LOAD-SIDE DISCONNECT SWITCH TO BE MOUNTED SEPARATELY FROM CABINET. REFER TO STANDARD DETAIL T-17 METERED SERVICE PEDESTAL.
4). CONTACT INDIVIDUAL DISTRICTS FOR ANY SOLE SOURCE COMPONENTS WITHIN THE CABINET.



FRONT VIEW



SIDE VIEW



BACK VIEW

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ENGINEERING SUPPORT
12/22/2023
DATE
RECOMMENDED

STANDARD LIGHTING CABINET, TYPES M, P, AND R

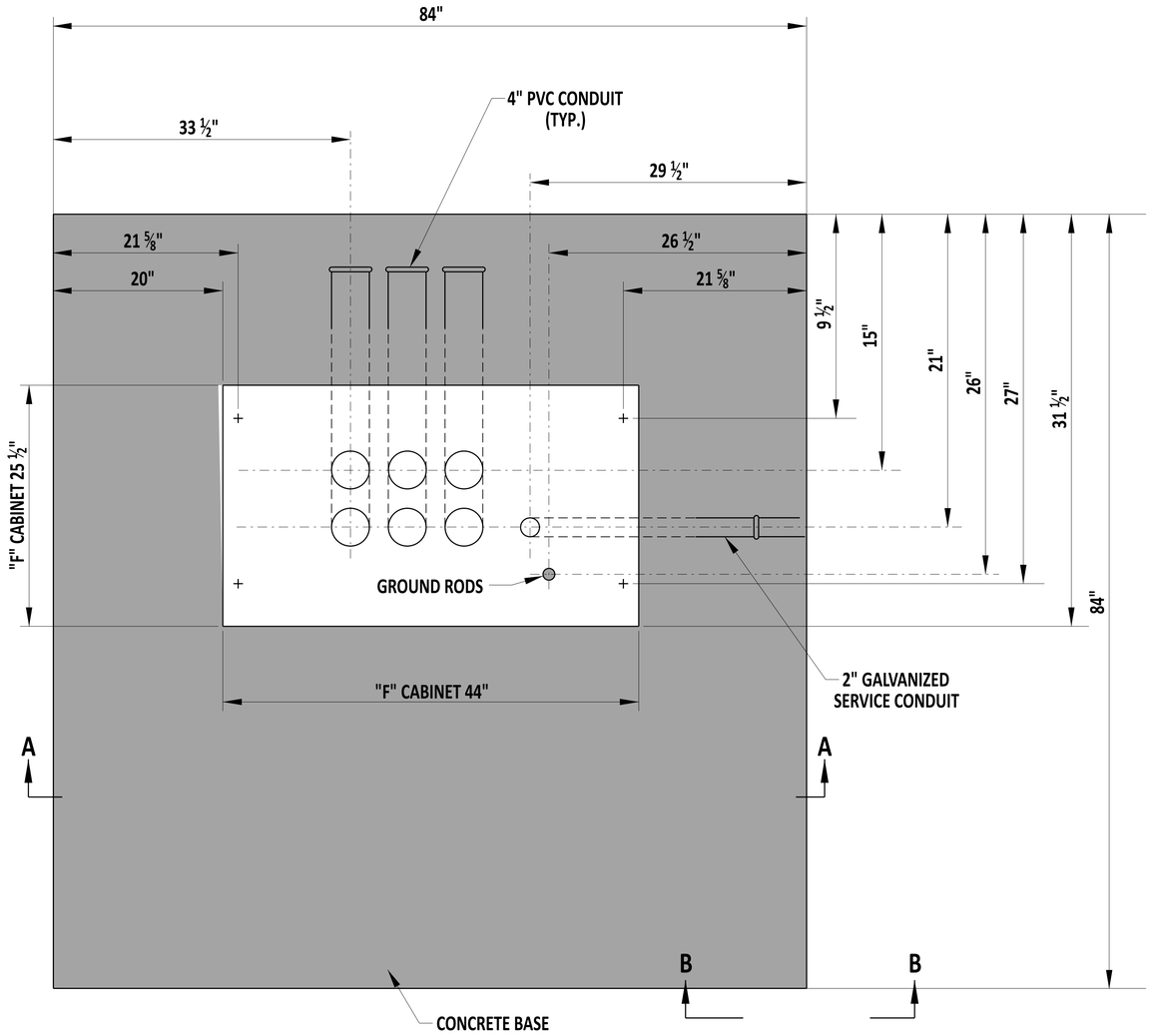
STANDARD NO. T-3 (2024) SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN
22 December 2023
DATE

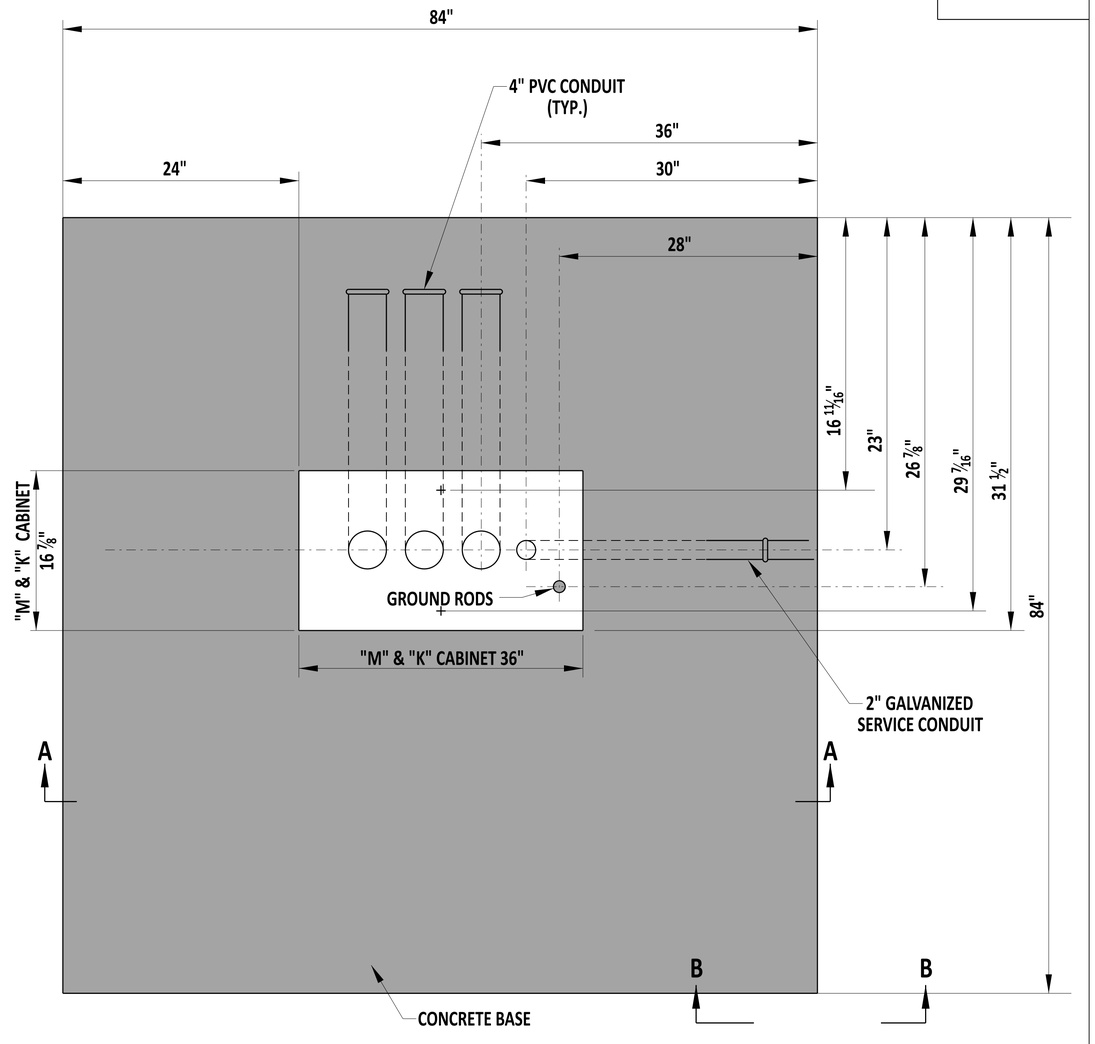
APPROVED
CHIEF ENGINEER
01/11/2024
DATE

22-DEC-2023

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.

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Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

CABINET BASES, TYPES M, K, & F

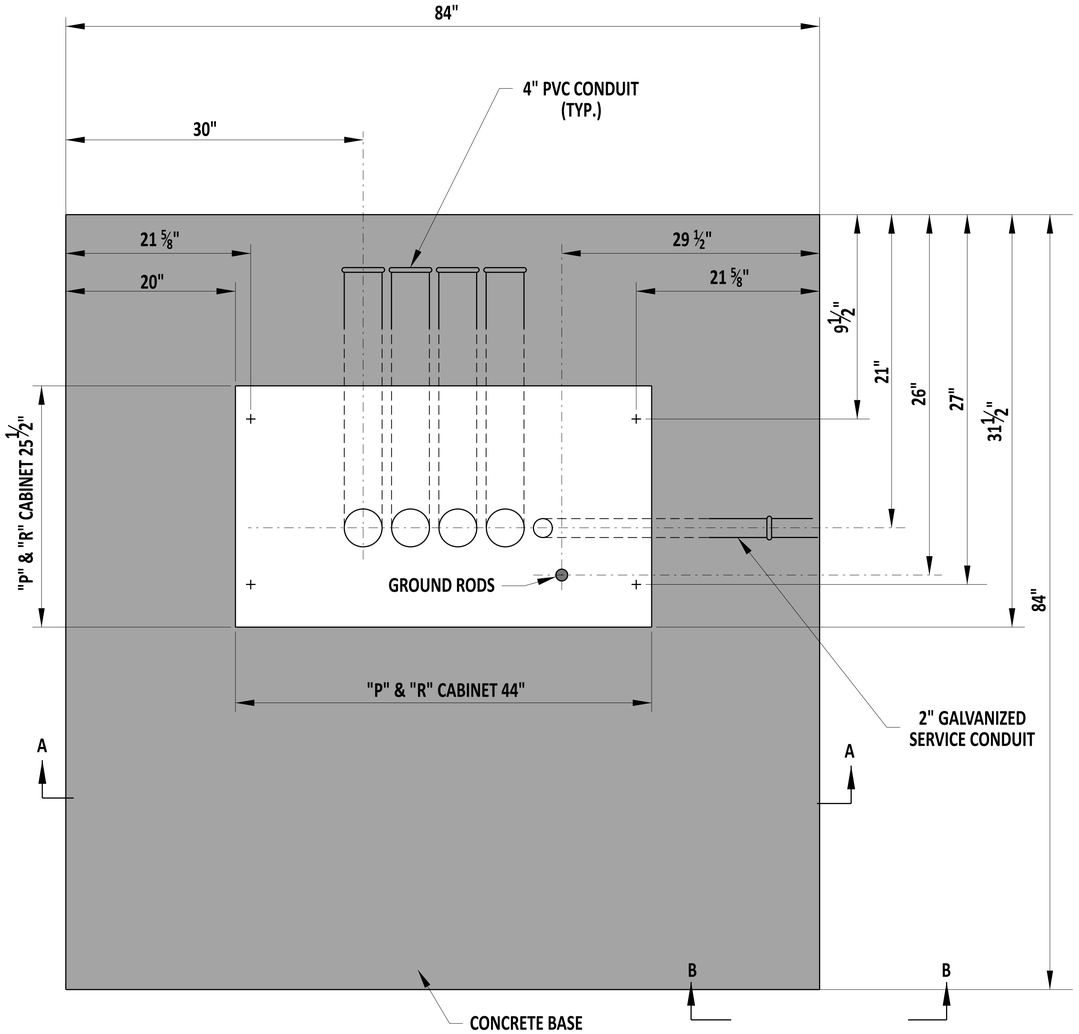
STANDARD NO. T-4 (2024) | SHT. 1 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

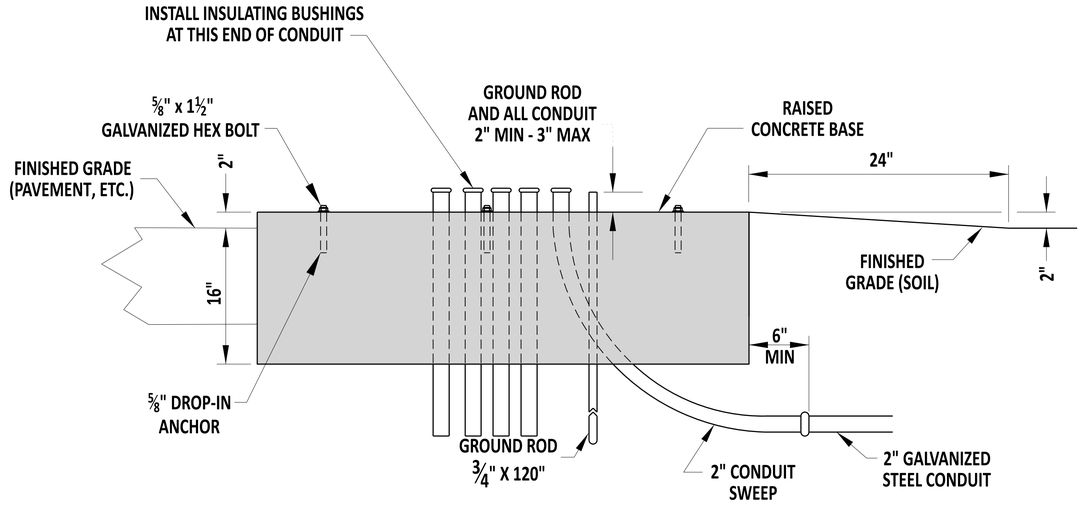
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

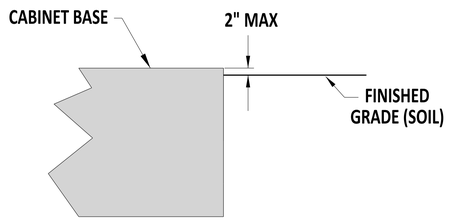
SCALE : NTS



"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

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

CABINET BASES, TYPES P & R

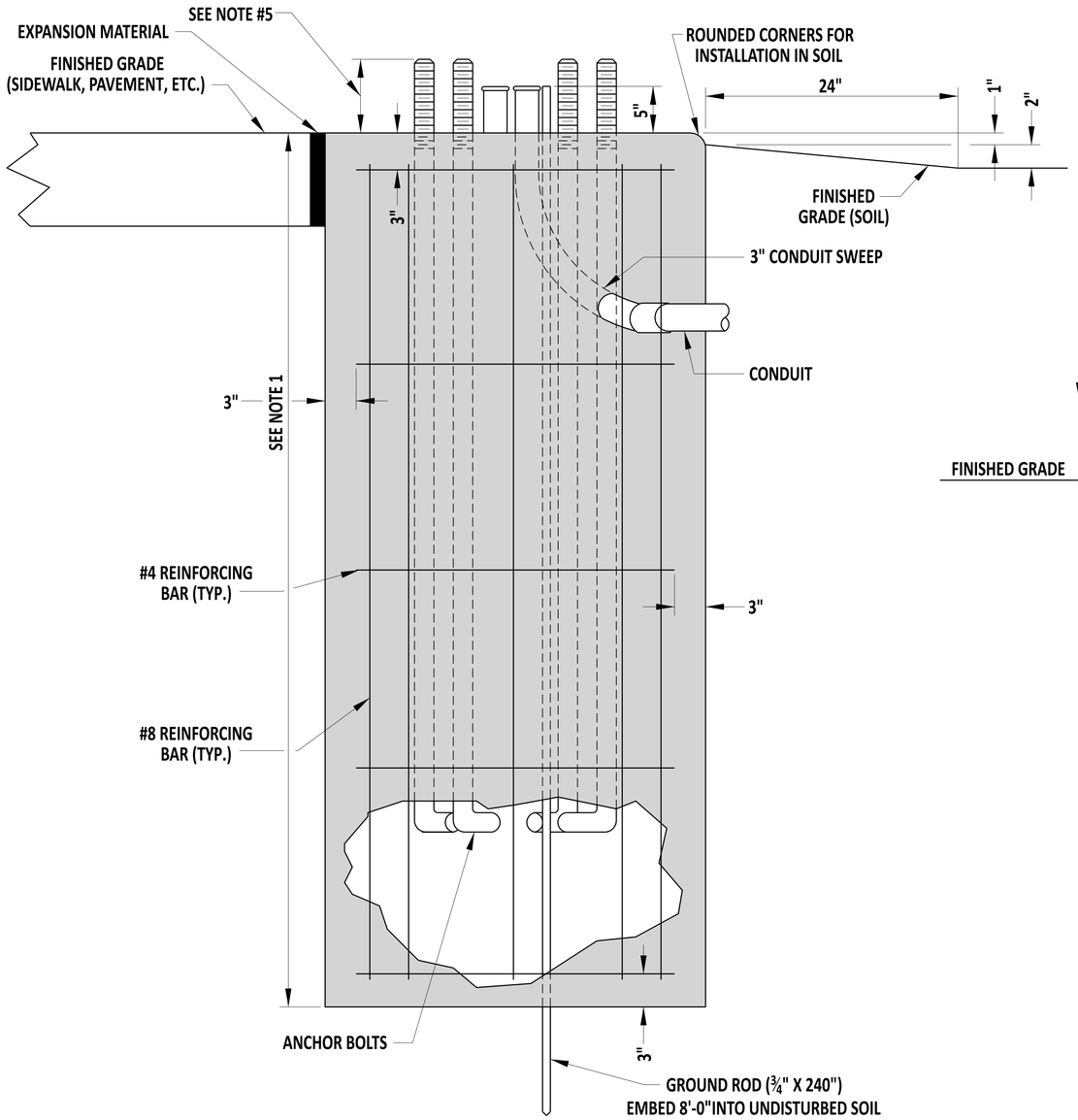
STANDARD NO. T-4 (2024) | SHT. 2 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

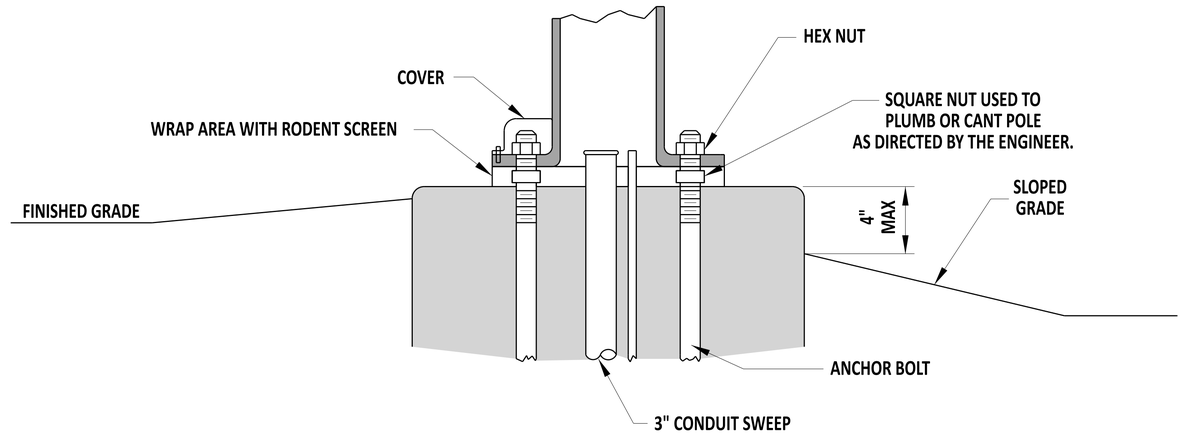
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

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). SEE POLE BASE DATA CHART ON DETAIL T-5, SHEETS 3 AND 4, FOR POLE BASE DIMENSIONS.
2). STRAIN POLES SHALL USE 2¼" ANCHOR BOLTS AND MAST ARMS UP TO 60' SHALL USE 2" ANCHOR BOLTS. ANCHOR BOLTS TO BE 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 TO APPROACHING TRAFFIC.

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

STANDARD NO. T-5 (2024) | SHT. 2 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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22-DEC-2023

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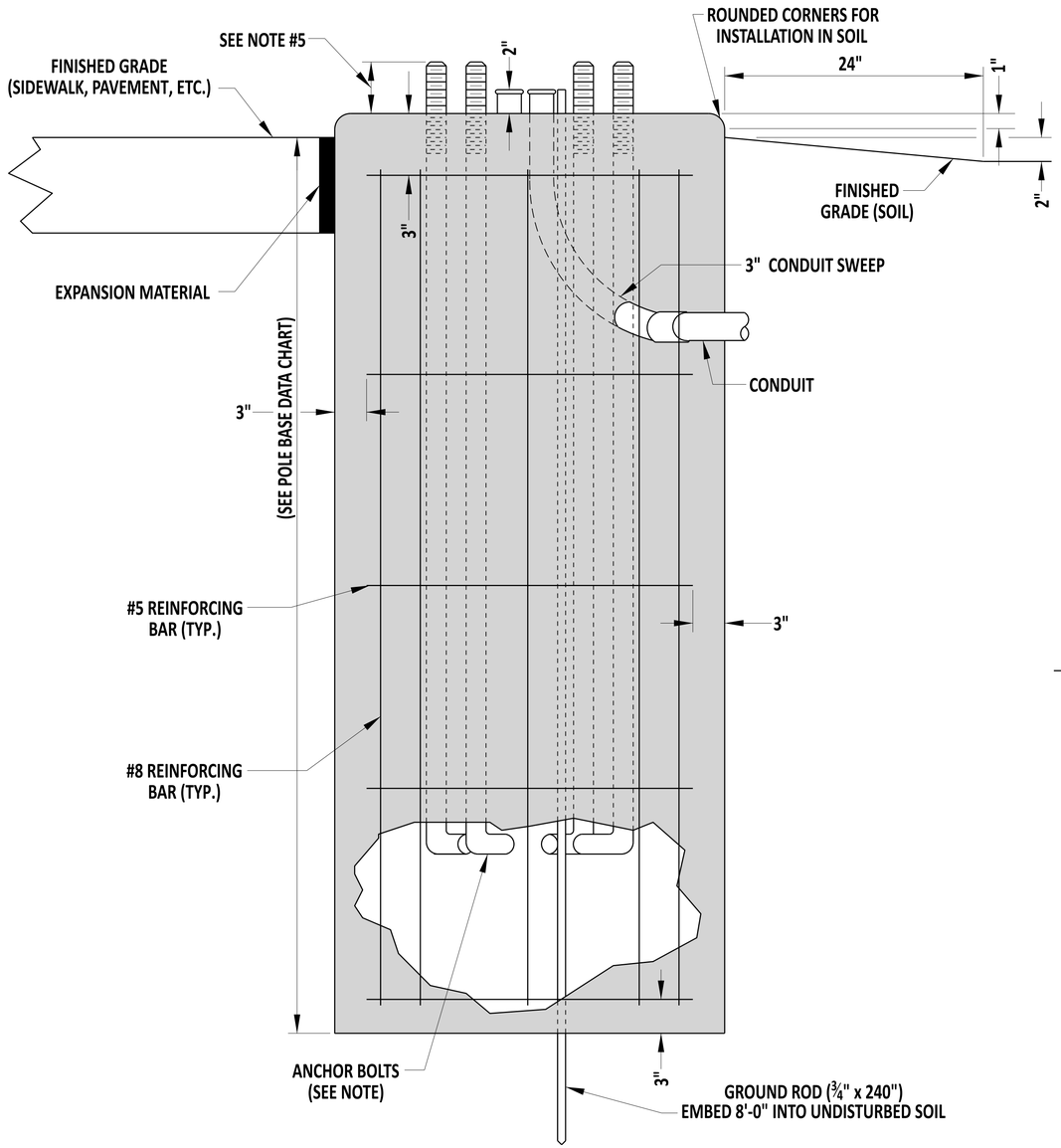
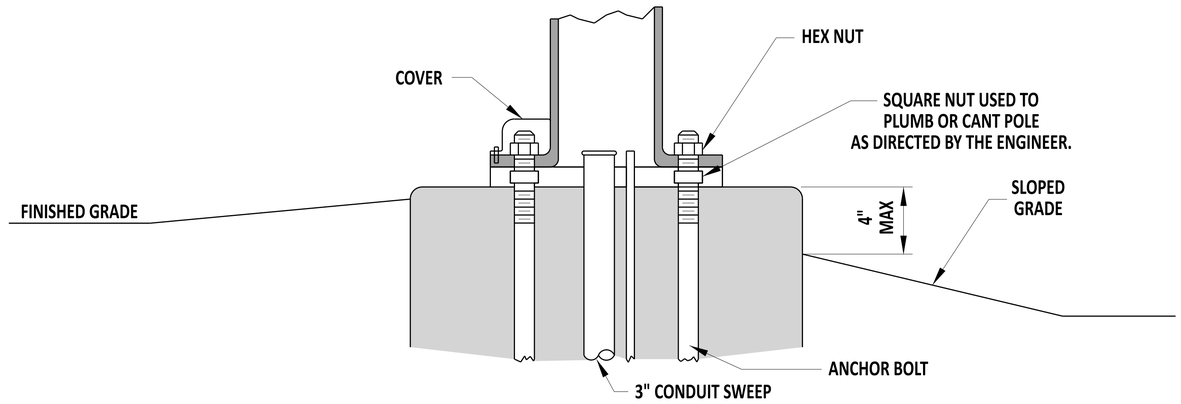


TYPICAL SECTION (BASE 6)

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 & 6B	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 SHALL USE 2¼" ANCHOR BOLTS AND MAST ARMS UP TO 60' SHALL USE 2" ANCHOR BOLTS. ANCHOR BOLTS ARE TO BE 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.

7). TYPE 6 POLE BASES ARE TYPICALLY USED TO SUPPORT LIGHT POLES AND BREAKAWAY BASES.

DelDOT

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

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

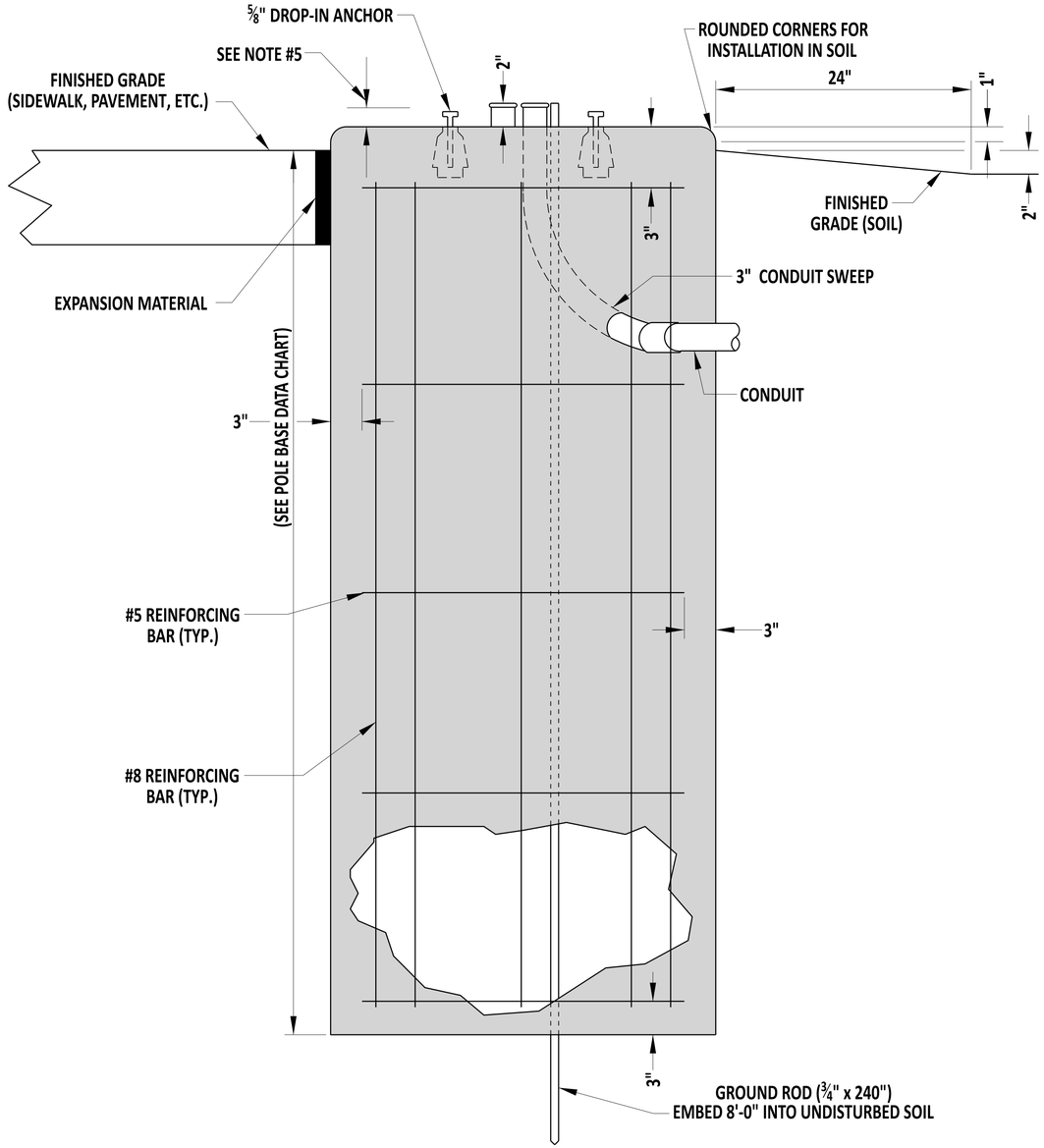
STANDARD NO. T-5 (2024) | SHT. 3 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

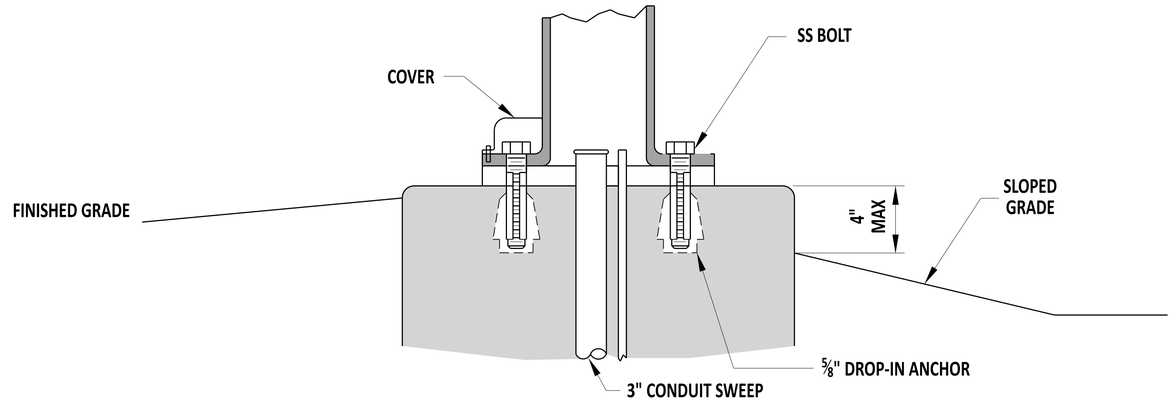
22-DEC-2023

SCALE : NTS



TYPICAL SECTION (BASE 6B)

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 & 6B	24"	6'-0"	4	8	2 - 3"



TYPICAL INSTALLATION (BASE 6B)

NOTE:

1). DROP-IN ANCHORS AND BOLT PATTERN FOR TYPE 6 POLE BASES TO BE PROVIDED BY THE MANUFACTURER.

2). STRAIN POLES SHALL USE 2¼" ANCHOR BOLTS AND MAST ARMS UP TO 60' SHALL USE 2" ANCHOR BOLTS. ANCHOR BOLTS ARE TO BE 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.

7). TYPE 6B POLES BASES ARE TYPICALLY USED TO SUPPORT PEDESTAL POLES AND PEDESTAL BREAKAWAY BASES WITH SIGNS AND/OR FLASHING BEACCONS. REFER TO DETAIL T-18, SHEET 3 FOR MORE INFORMATION.

DelDOT

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

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

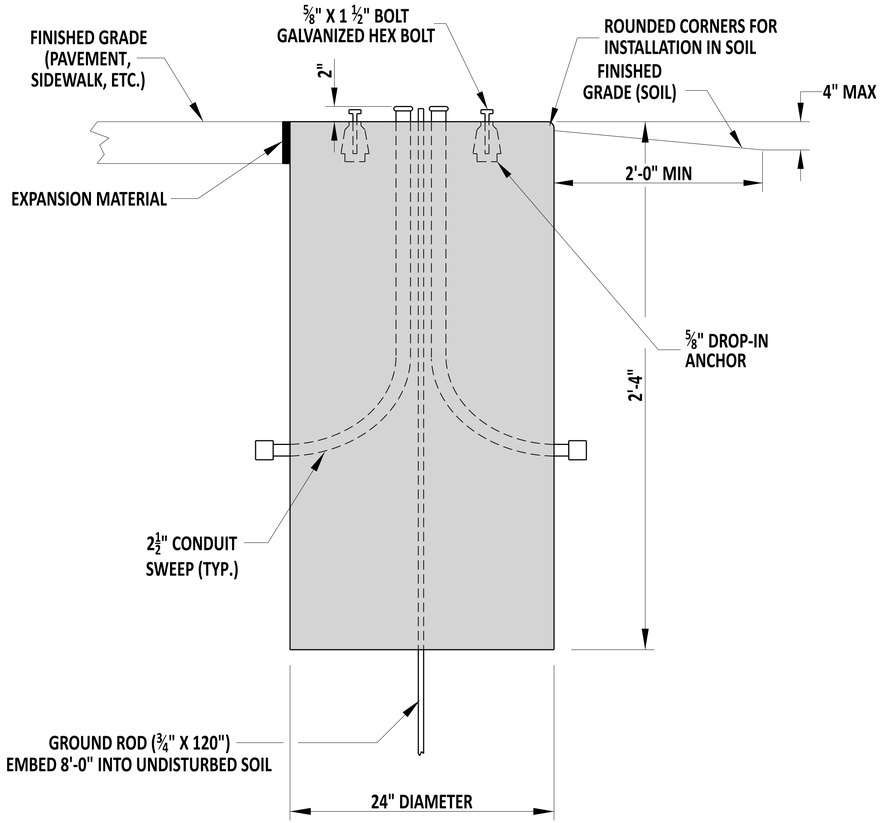
STANDARD NO. T-5 (2024) | SHT. 4 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

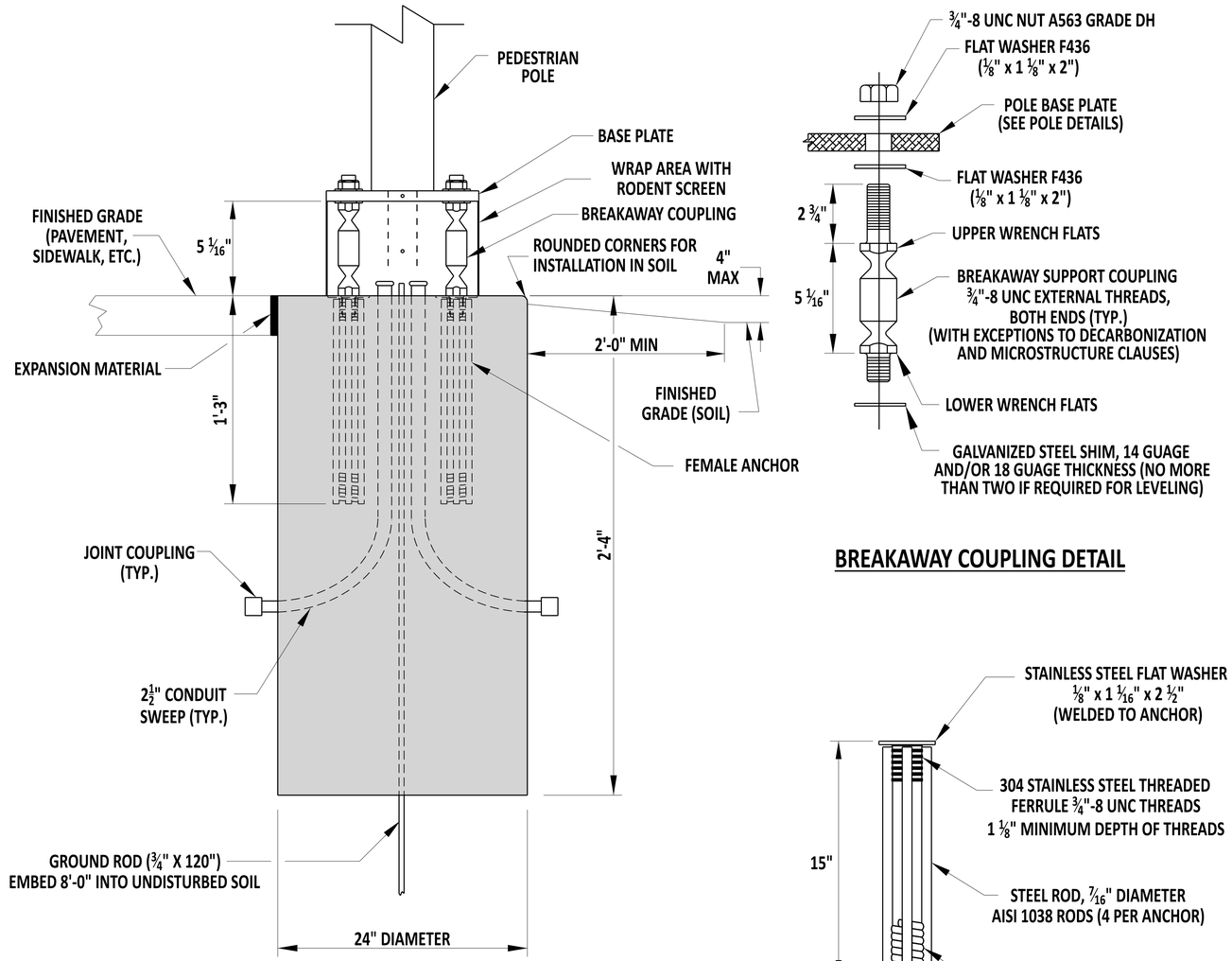
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS

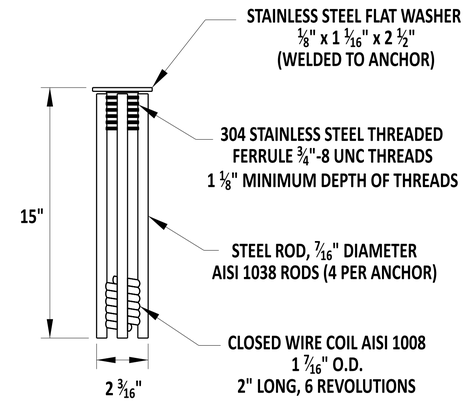


TYPICAL SECTION (BASE 4A)



TYPICAL SECTION (BASE 4B)

BREAKAWAY COUPLING DETAIL



ANCHOR DETAIL

NOTE:

1). BOLT PATTERN TO BE PROVIDED BY DELDOT'S SIGNAL CONSTRUCTION INSPECTOR.
2) TYPE 4A POLE BASES ARE TYPICALLY USED TO SUPPORT PEDESTAL POLES WITH PEDESTAL BREAKWAY BASES.

NOTE:

1). BOLT PATTERN TO BE PROVIDED BY DELDOT'S SIGNAL CONSTRUCTION INSPECTOR.
2) TYPE 4B POLE BASES ARE TYPICALLY USED TO SUPPORT ORNAMENTAL PEDESTAL POLES WITH BREAKWAY COUPLINGS.

DelDOT

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

POLE BASES - TYPICAL SECTION (BASE 4A AND 4B) AND ANCHOR AND BREAKAWAY COUPLING

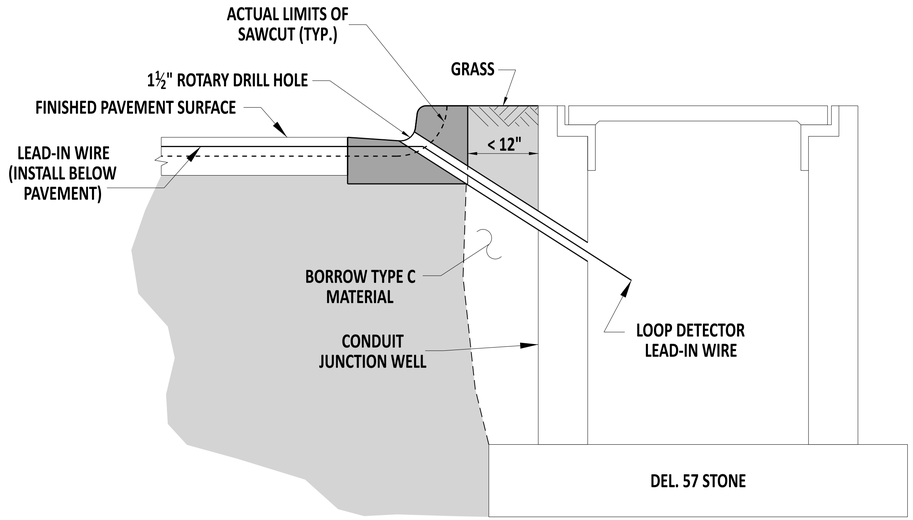
STANDARD NO. T-5 (2024) | SHT. 5 OF 5

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

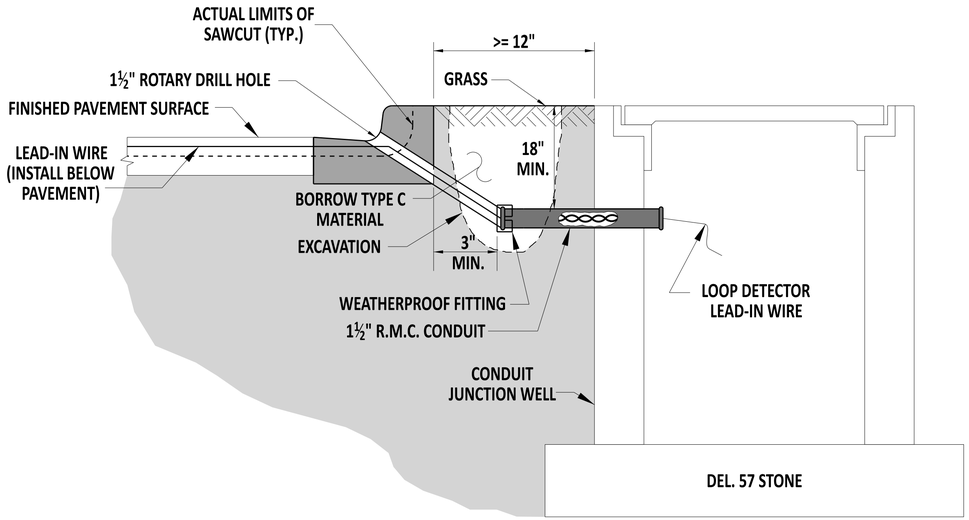
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

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

Andrew Shoat — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

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

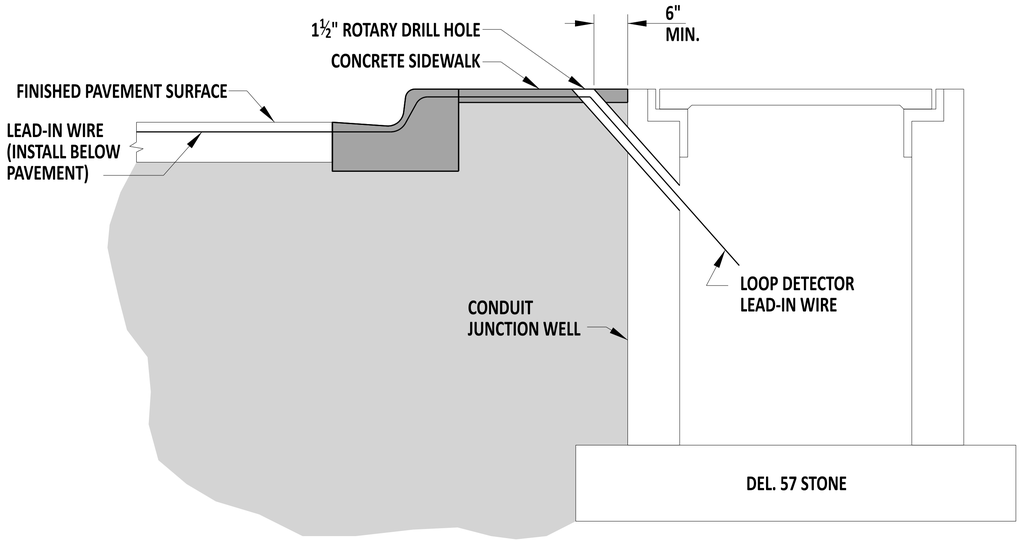
STANDARD NO. T-8 (2024) | SHT. 1 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

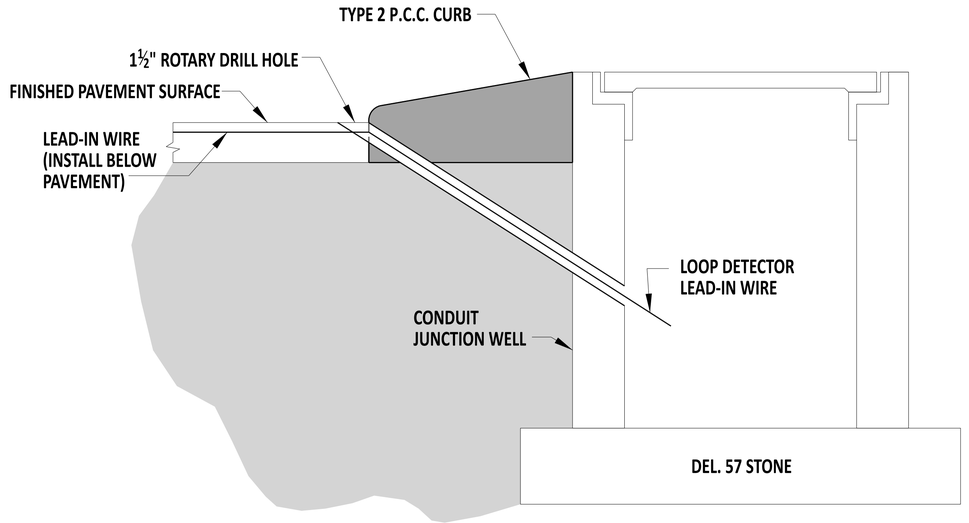
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

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

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

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

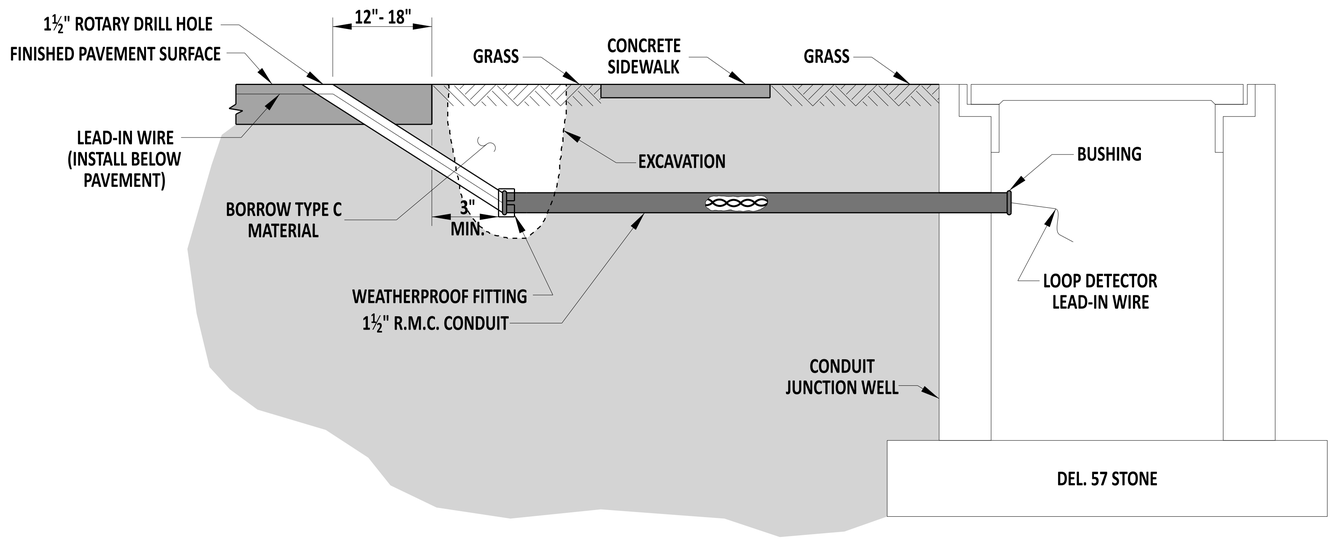
STANDARD NO. T-8 (2024) | SHT. 2 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

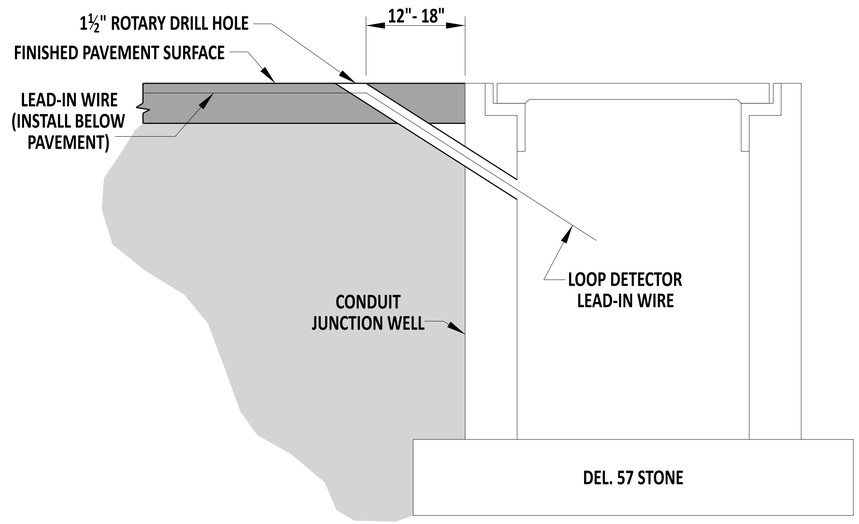
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

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".
5). CONTRACTOR SHALL INSTALL DETECTABLE WARNING TAPE IN TRENCH FOR LEAD-IN CONDUIT.

DelDOT

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

LOOP DETECTOR LEAD-IN WIRE INSTALLATION - JUNCTION WELL WITH SIDEWALK AND GRASS STRIPS AND DIRECTLY ADJACENT TO PAVED SURFACE

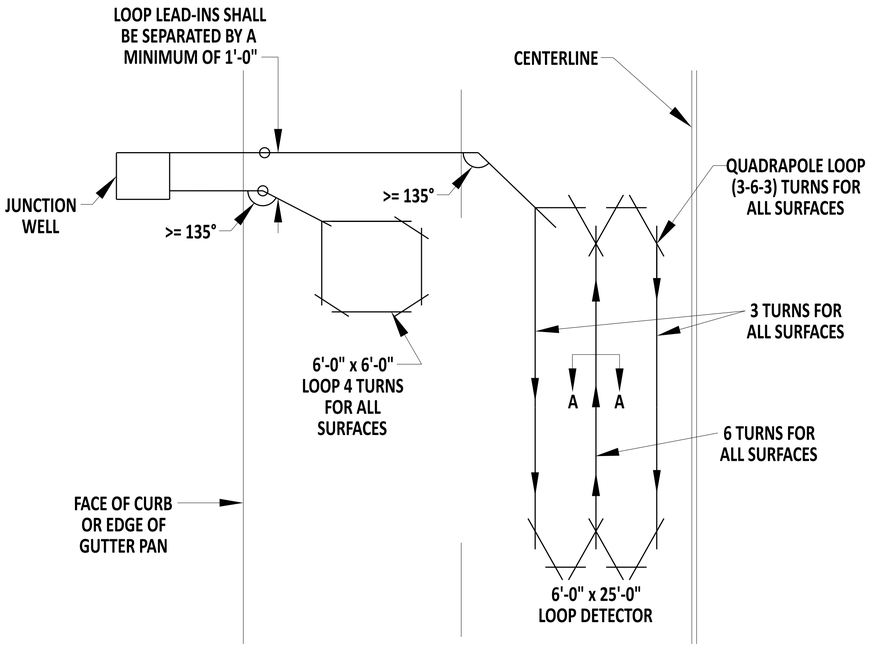
STANDARD NO. T-8 (2024) | SHT. 4 OF 4

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

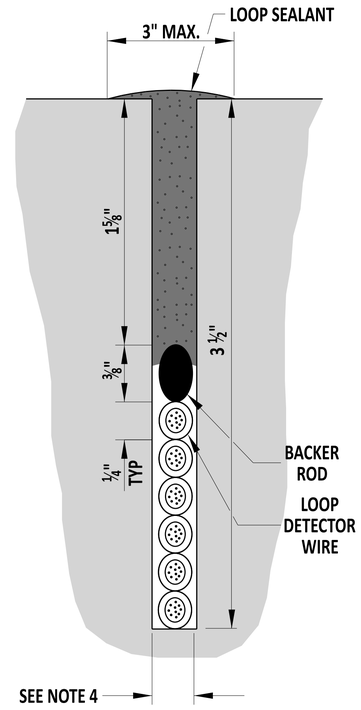
22-DEC-2023

SCALE : NTS

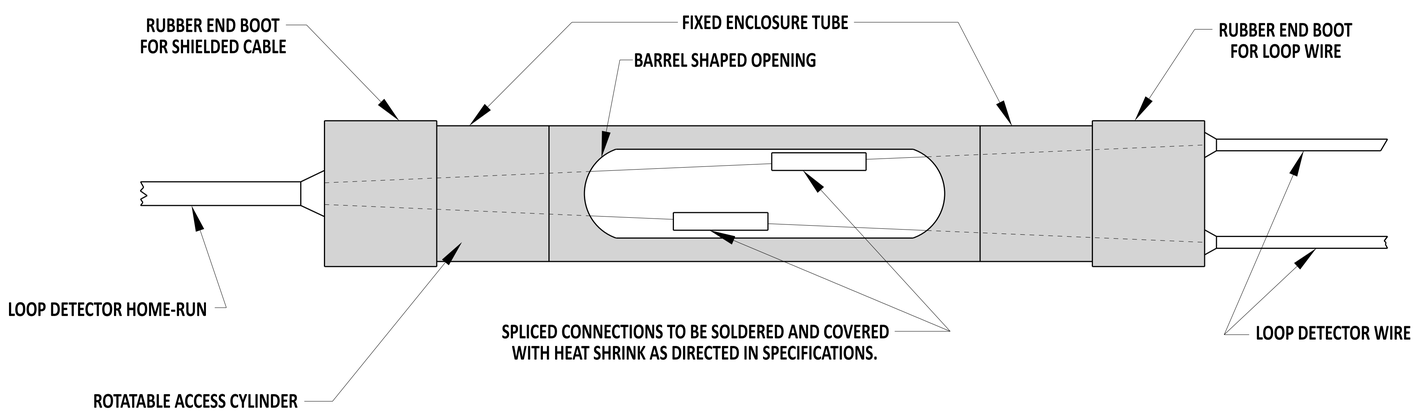


LOOP DETECTOR SAWCUT TYPICAL

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



SECTION A-A
HOT-MIX SURFACE



LOOP DETECTOR SPLICE

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 5/8" WIDE.
5). DURING MULTIPLE LOOP INSTALLATIONS, ALL LOOP LEAD-INS TO THE JUNCTION WELL SHALL OFFSET 12" FROM EACH OTHER.

DelDOT

Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

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

STANDARD NO. T-9 (2024) | SHT. 1 OF 4

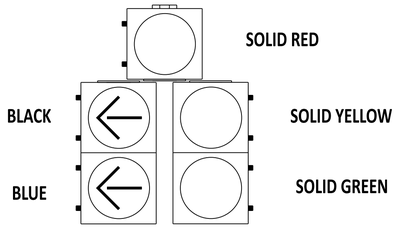
REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS

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

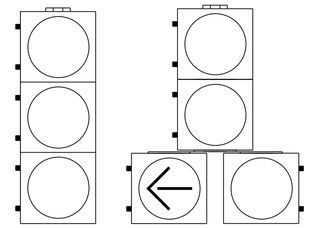
MAIN STREET SIGNALS	WIRE COLORS	SIGNAL INDICATION
	SOLID RED SOLID ORANGE SOLID GREEN SOLID WHITE	RED YELLOW GREEN NEUTRAL
SIDE STREET SIGNALS	WIRE COLORS	SIGNAL INDICATION
	BLACK TRACER/RED BLACK TRACER/ORANGE BLACK TRACER/GREEN BLACK TRACER/WHITE	RED YELLOW GREEN NEUTRAL
NON-PERMISSIVE LEFT TURN SIGNALS	MAIN STREET WIRE COLORS	SIDE STREET WIRE COLORS	SIGNAL INDICATION
	WHITE TRACER/RED WHITE TRACER/BLACK WHITE TRACER/GREEN WHITE TRACER/BLUE	BLACK/RED TRACER SOLID BLACK SOLID BLUE BLUE/BLACK TRACER	RED YELLOW GREEN NEUTRAL
5-SECTION SIGNAL ARROWS	MAIN STREET WIRE COLORS	SIDE STREET WIRE COLORS	SIGNAL INDICATION
	SOLID BLACK SOLID BLUE	BLACK/RED TRACER BLUE/BLACK TRACER	YELLOW ARROW GREEN ARROW



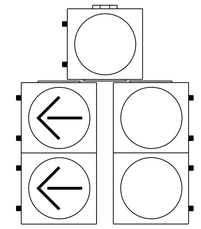
WIRING COLOR CODE FOR #14/9 TCC

MAST ARM:

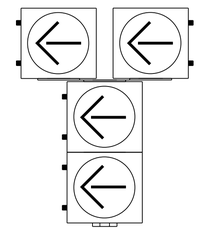
MAIN STREET	WIRE COLORS	SIGNAL INDICATION
	SOLID RED SOLID ORANGE SOLID GREEN SOLID WHITE	RED YELLOW GREEN NEUTRAL

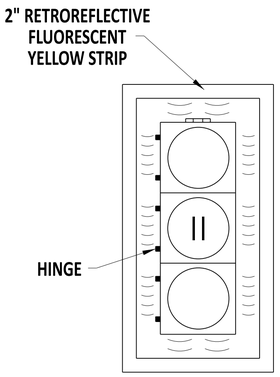


MAIN STREET PERMISSIVE LEFT	WIRE COLORS	SIGNAL INDICATION
	SOLID BLACK SOLID BLUE SOLID WHITE	YELLOW ARROW GREEN ARROW NEUTRAL

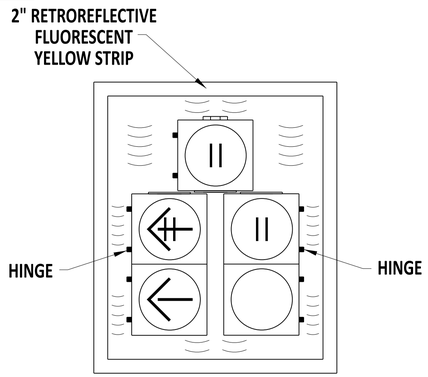


MAIN STREET FLASHING TOP "T"	WIRE COLORS	SIGNAL INDICATION
	BLACK/RED TRACER SOLID WHITE	RED ARROW NEUTRAL

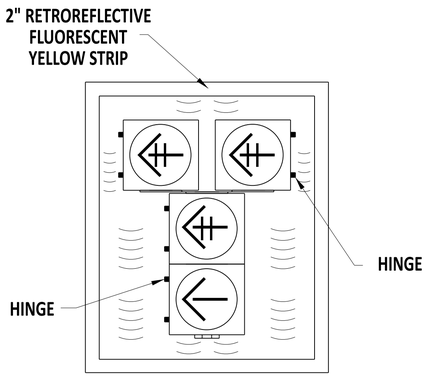




ONE-WAY THREE - SECTION 12" SIGNAL HEADS



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 INSTALLATIONS SHALL CONTAIN ONE SPLICE PER SIGNAL HEAD.
5). ALL BOLTS SHALL BE STAINLESS STEEL.
6). ALL BACKPLATES SHALL BE POWDER-COATED ALUMINUM.
7). ALL BACKPLATES SHALL BE OUTLINED WITH A 2" RETROREFLECTIVE FLUORESCENT YELLOW STRIP.

LEGEND:

|| LOCATION OF TERMINAL BLOCK

DelDOT

Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

WIRING INSTALLATION TYPICALS - WIRING COLOR CODES

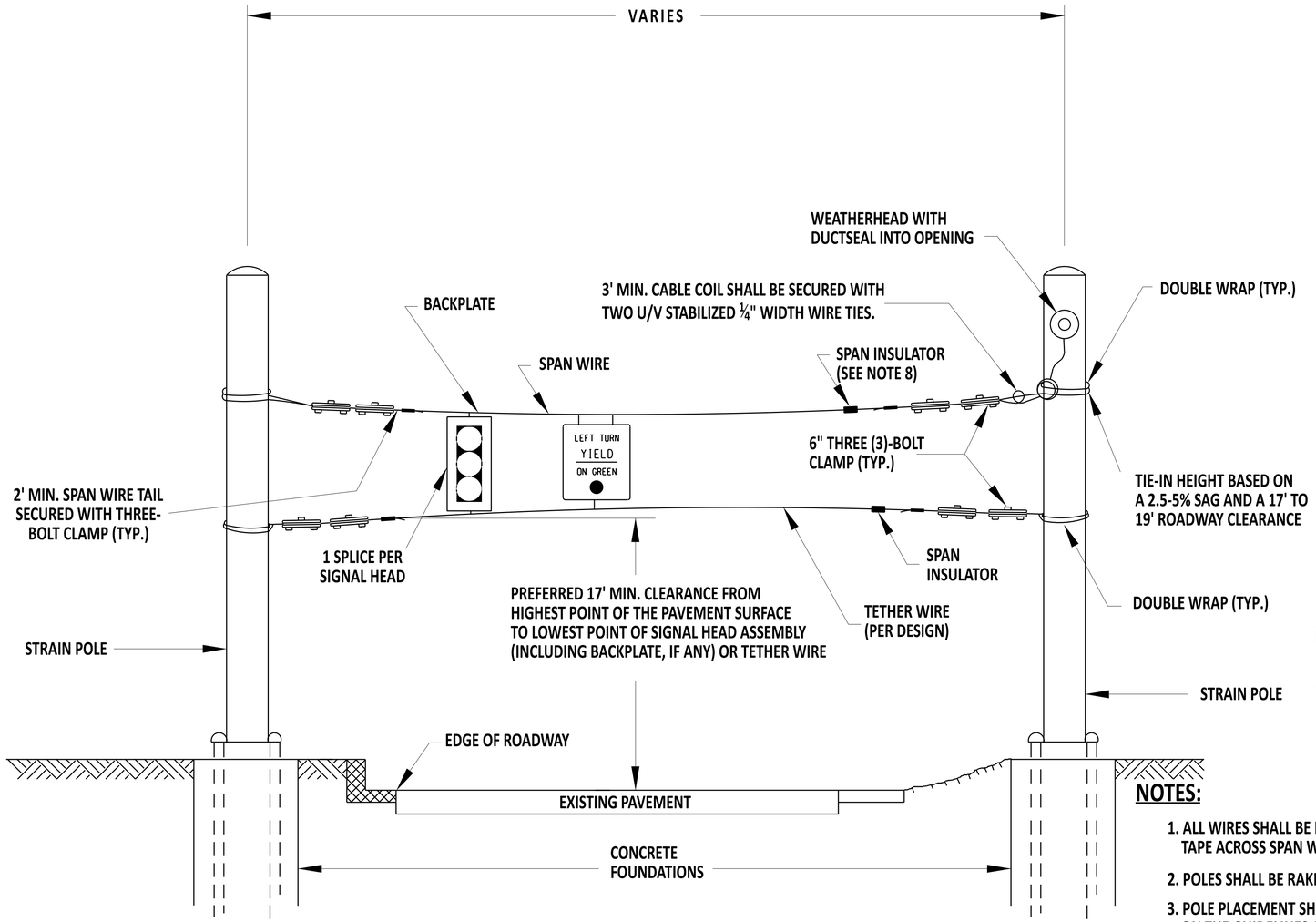
STANDARD NO. T-9 (2024) | SHT. 4 OF 4

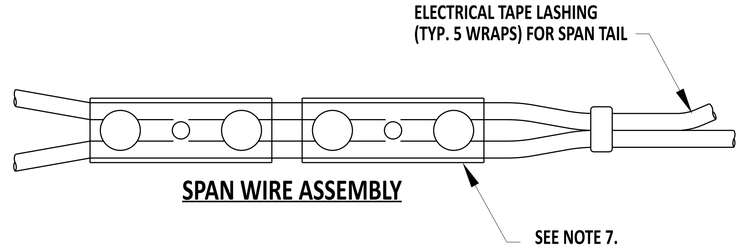
REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS

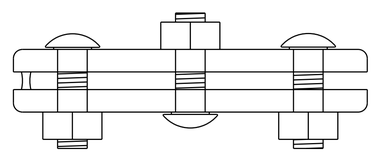




SPAN WIRE ASSEMBLY

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 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

Andrew Shortt — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

SPAN WIRE ASSEMBLY

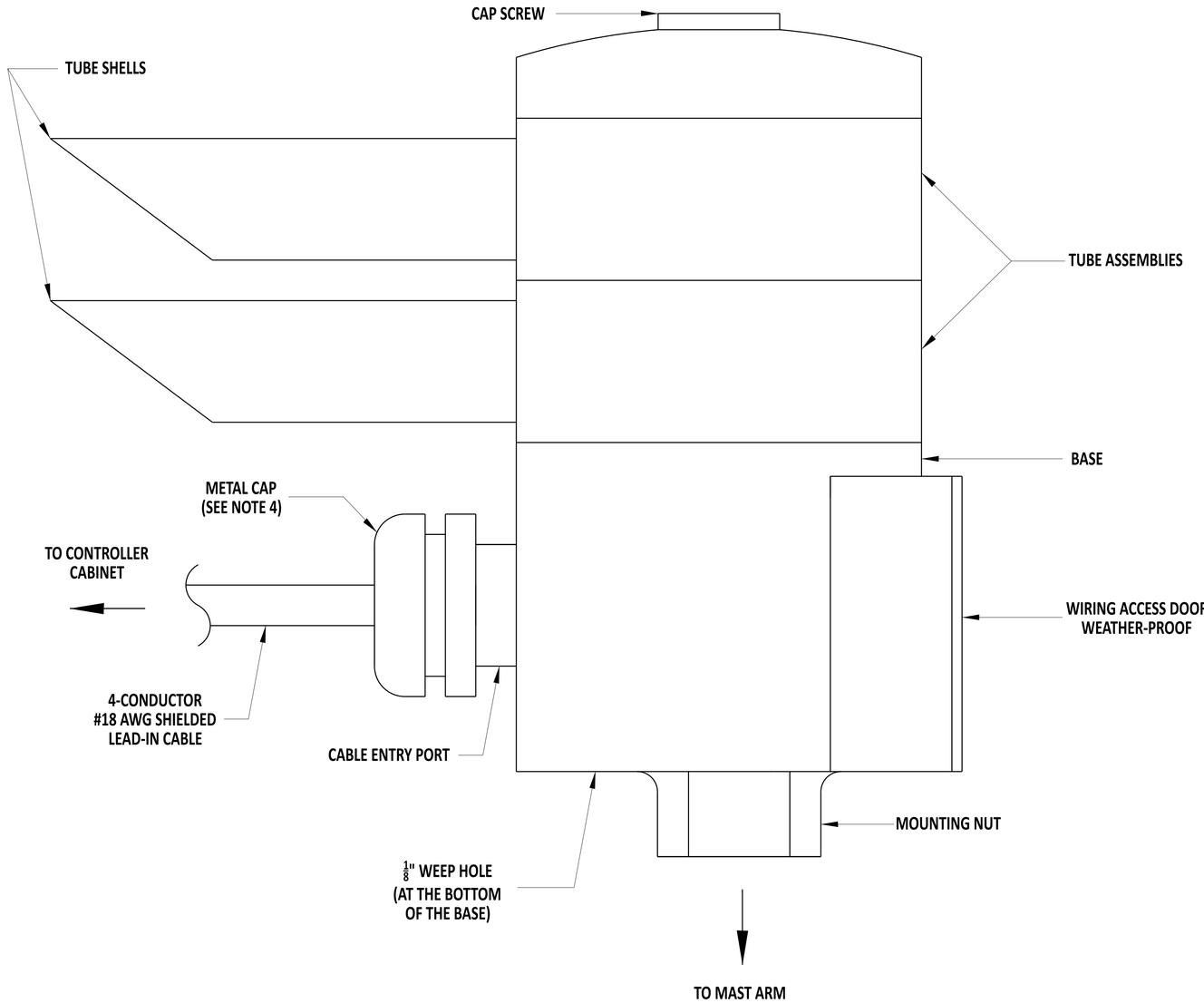
STANDARD NO.	T-12 (2024)	SHT. 3	OF 3

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

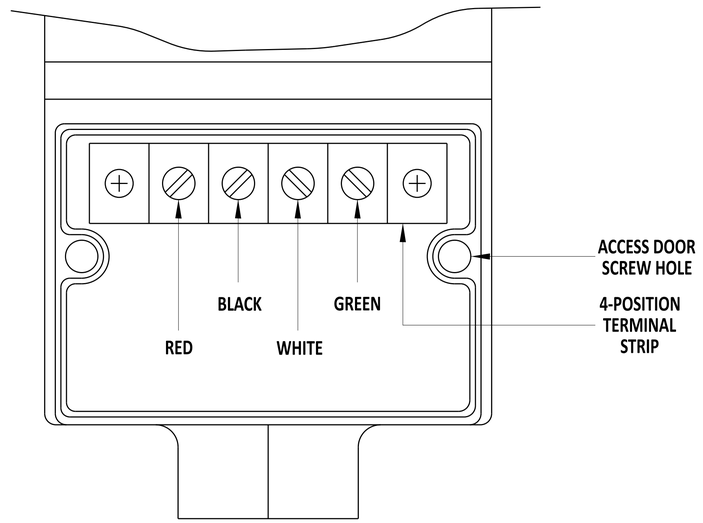
22-DEC-2023

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

Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

EMERGENCY PREEMPTION RECEIVER - UPRIGHT MOUNT

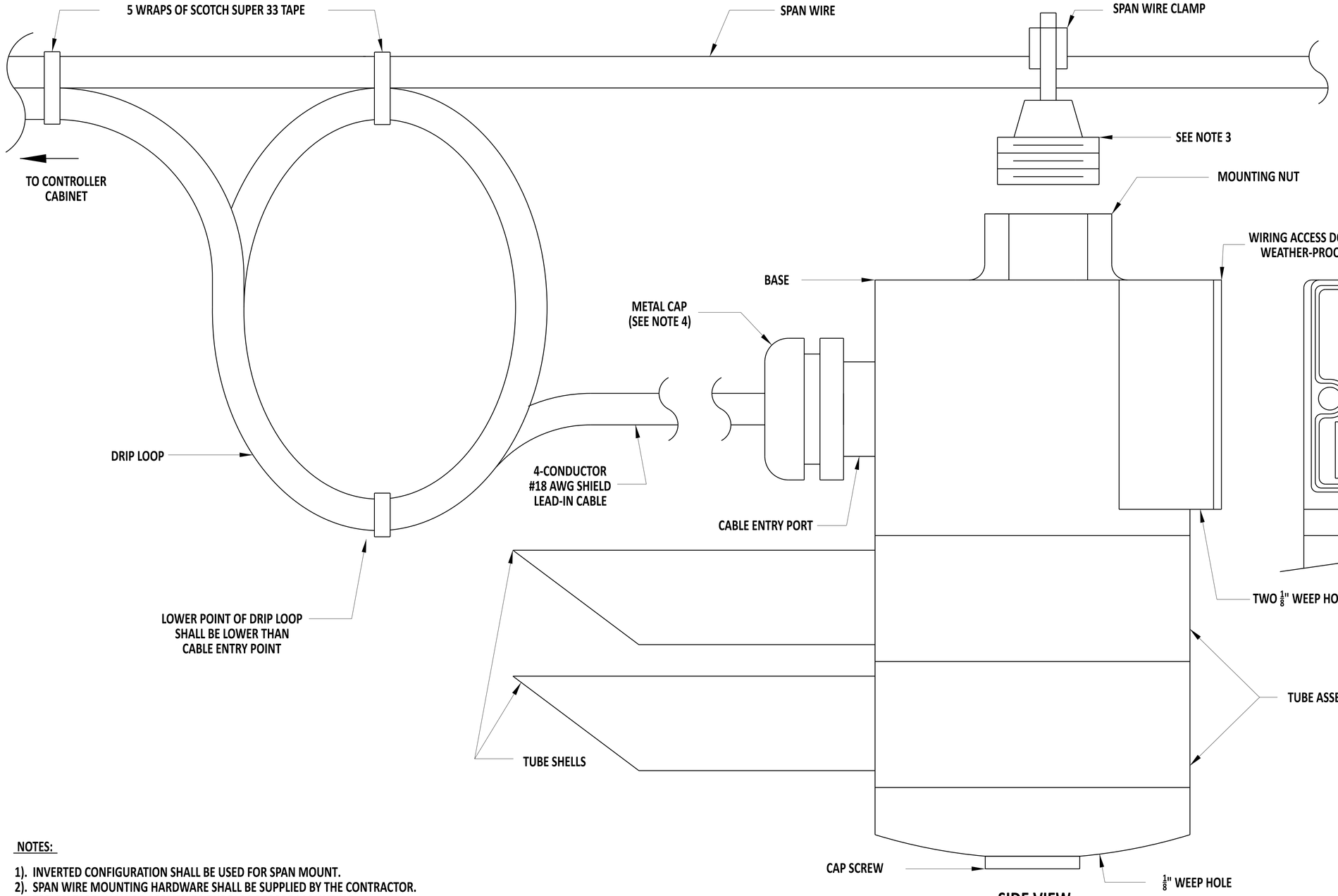
STANDARD NO. T-14 (2024) | SHT. 1 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

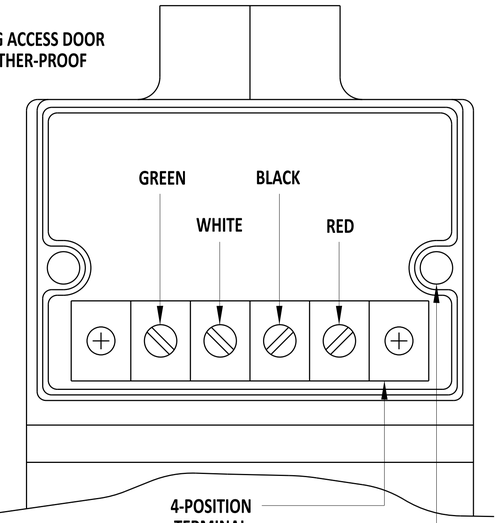
22-DEC-2023

SCALE : NTS



SIDE VIEW

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

Andrew Shoot — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

EMERGENCY PREEMPTION RECEIVER - INVERTED MOUNT

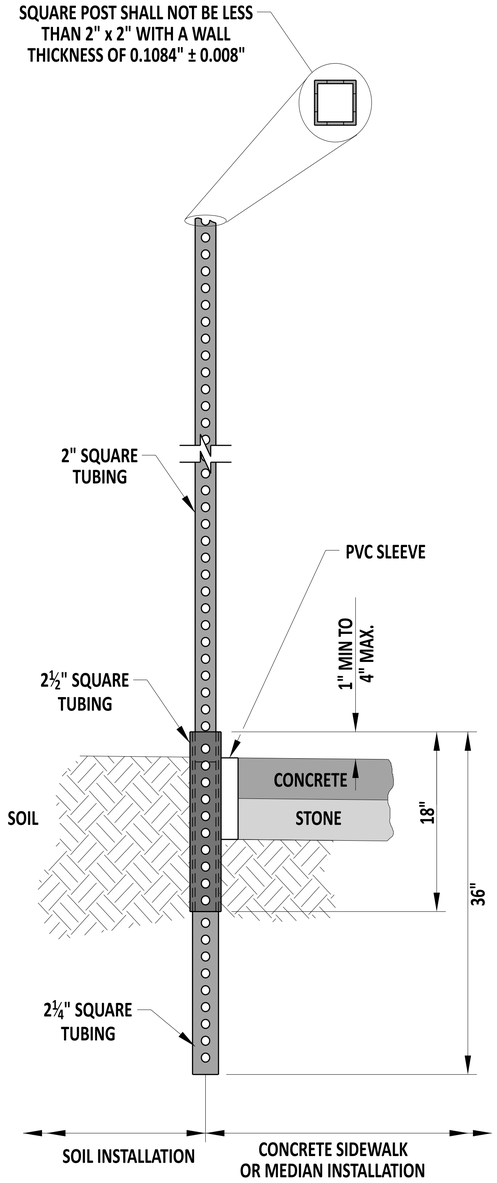
STANDARD NO. T-14 (2024) | SHT. 2 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

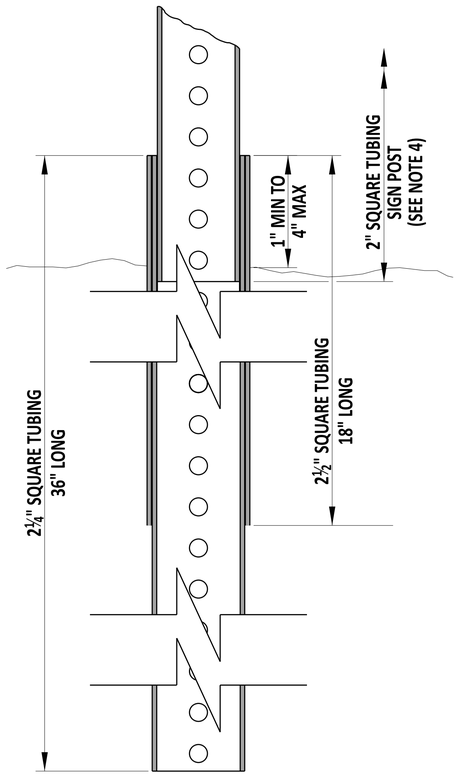
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

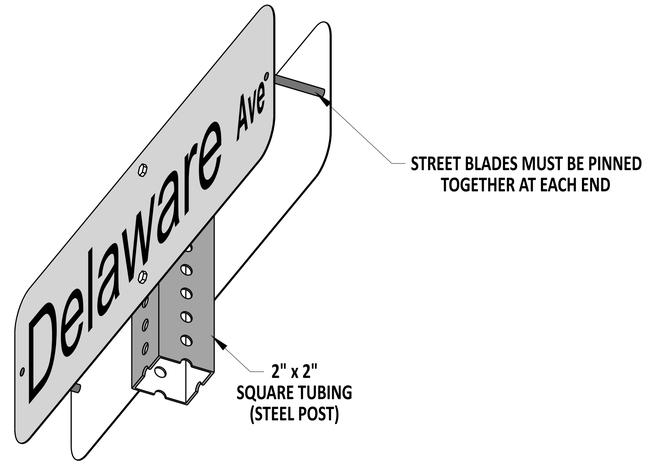
SCALE : NTS



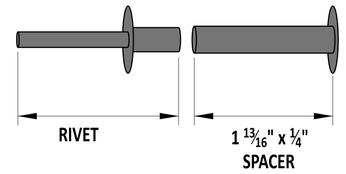
BREAKAWAY ASSEMBLY ELEVATION VIEW



BREAKAWAY 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.

NOTES:

1). PROVIDE MATERIALS IN ACCORDANCE WITH SECTION 1072.1.
2). THE SIGN POST SHALL EXTEND A MINIMUM OF 4" INTO THE 2½" SQUARE TUBING.
3). 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. SIGNS SHOULD NOT BE PLACED WITHIN 10' OF THE NOSE OF A MEDIAN ISLAND, WHERE FEASIBLE.

DelDOT

Andrew Shortt — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

BREAKAWAY SIGN POST AND PIN ASSEMBLY DETAILS

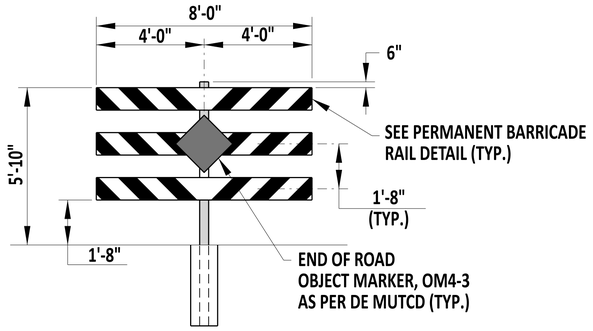
STANDARD NO. T-15 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

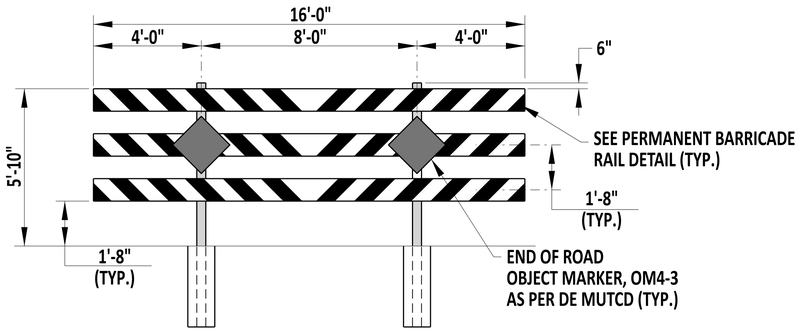
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

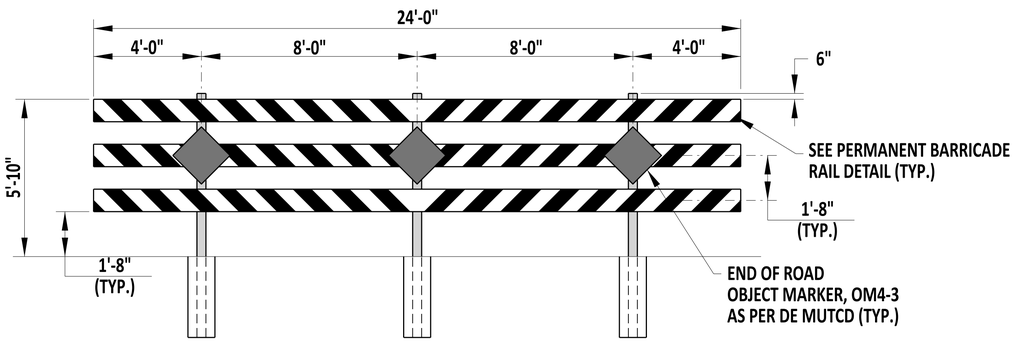
SCALE : NTS



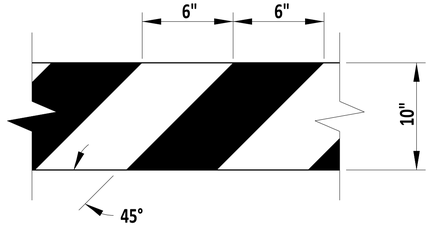
1-POST PERMANENT WOOD BARRICADE DETAIL



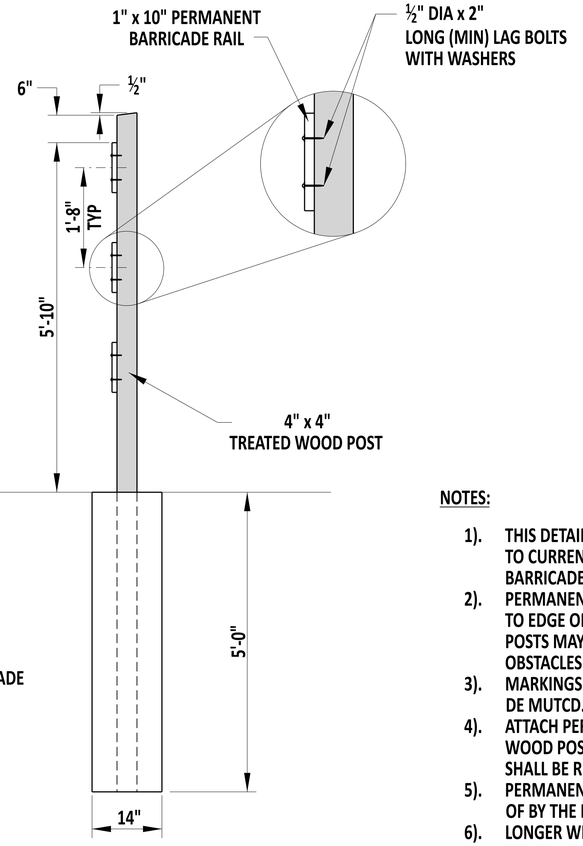
2-POST PERMANENT WOOD BARRICADE DETAIL



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"
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 3-POST	1'-0"
36'-0"	2	2-POST 3-POST	2'-0"
38'-0"	2	2-POST 3-POST	3'-0"
40'-0"	2	2-POST 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> (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 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 MEET SECTION 2B.67 AND SECTION 6F.68 OF THE DE MUTCD. STRIPES SHALL SLOPE DOWNWARD TOWARDS THE CENTER OF THE CLOSURE.

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

5). PERMANENT BARRICADE RAILS MAY BE CONSTRUCTED FROM MATERIALS OTHER THAN WOOD AS APPROVED OF BY THE ENGINEER.

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

DelDOT

Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

PERMANENT WOOD BARRICADE

STANDARD NO. T-16 (2024) | SHT. 1 OF 1

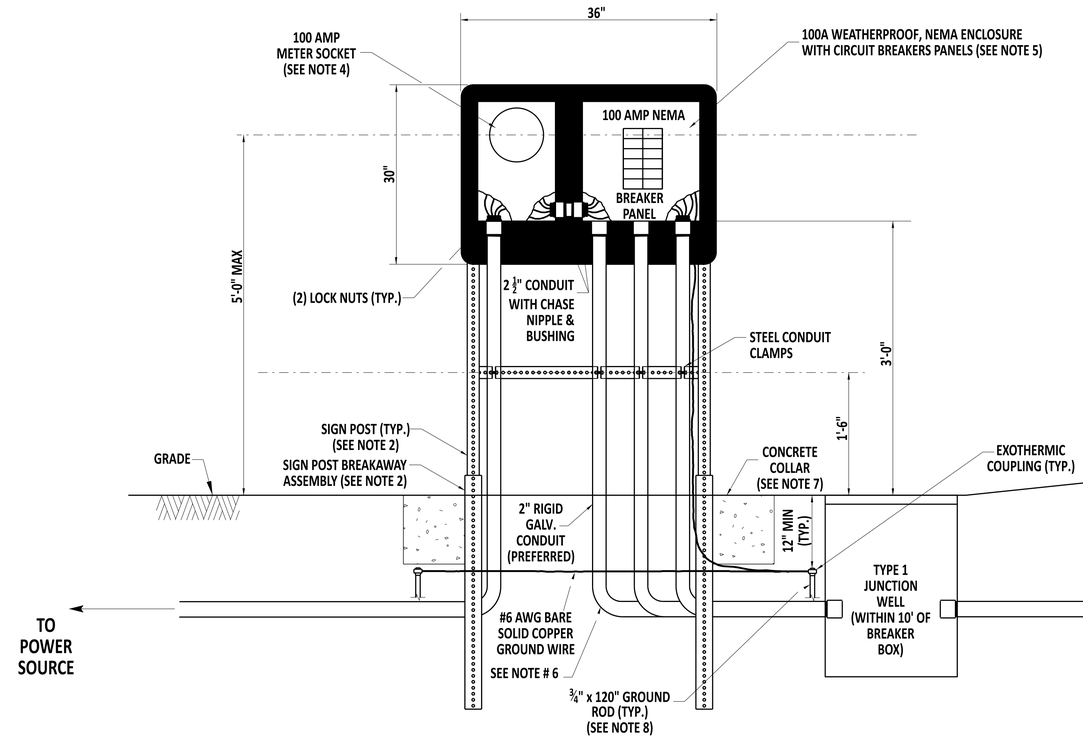
REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

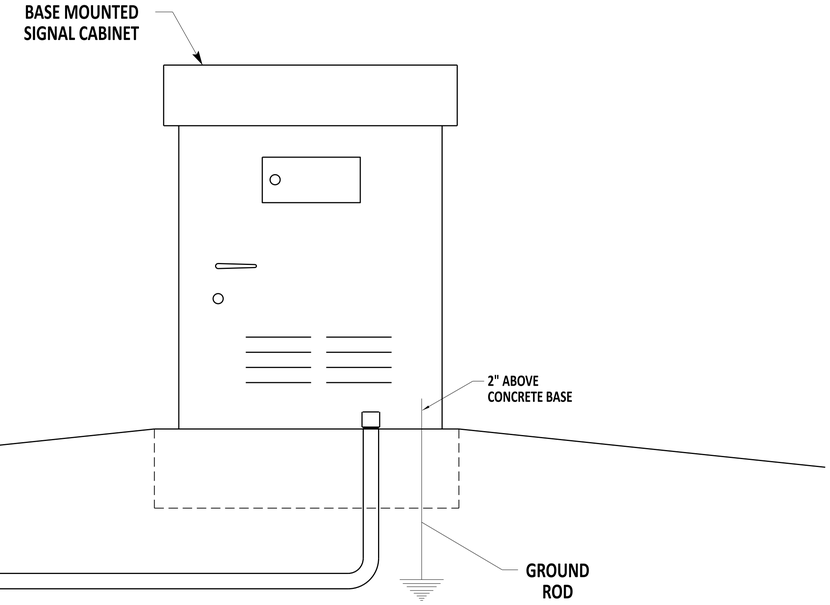
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

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) 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) 5/16" x ¾" STAINLESS STEEL BOLTS AND NYLON LOCK NUTS.
5). MOUNT CIRCUIT BREAKER BOX TO ALUMINUM PANEL WITH (4) 5/16" x ¾" 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).
7). CONCRETE COLLAR SHALL CONTAIN 25 LBS OF CONCRETE AT EACH LEG JUST BELOW GRADE AS DIRECTED BY INSPECTOR.
8). GROUND ROD SPREAD SHALL BE TWICE THE LENGTH OF THE GROUND ROD.

DelDOT

Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

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

STANDARD NO. T-17 (2024) | SHT. 1 OF 7

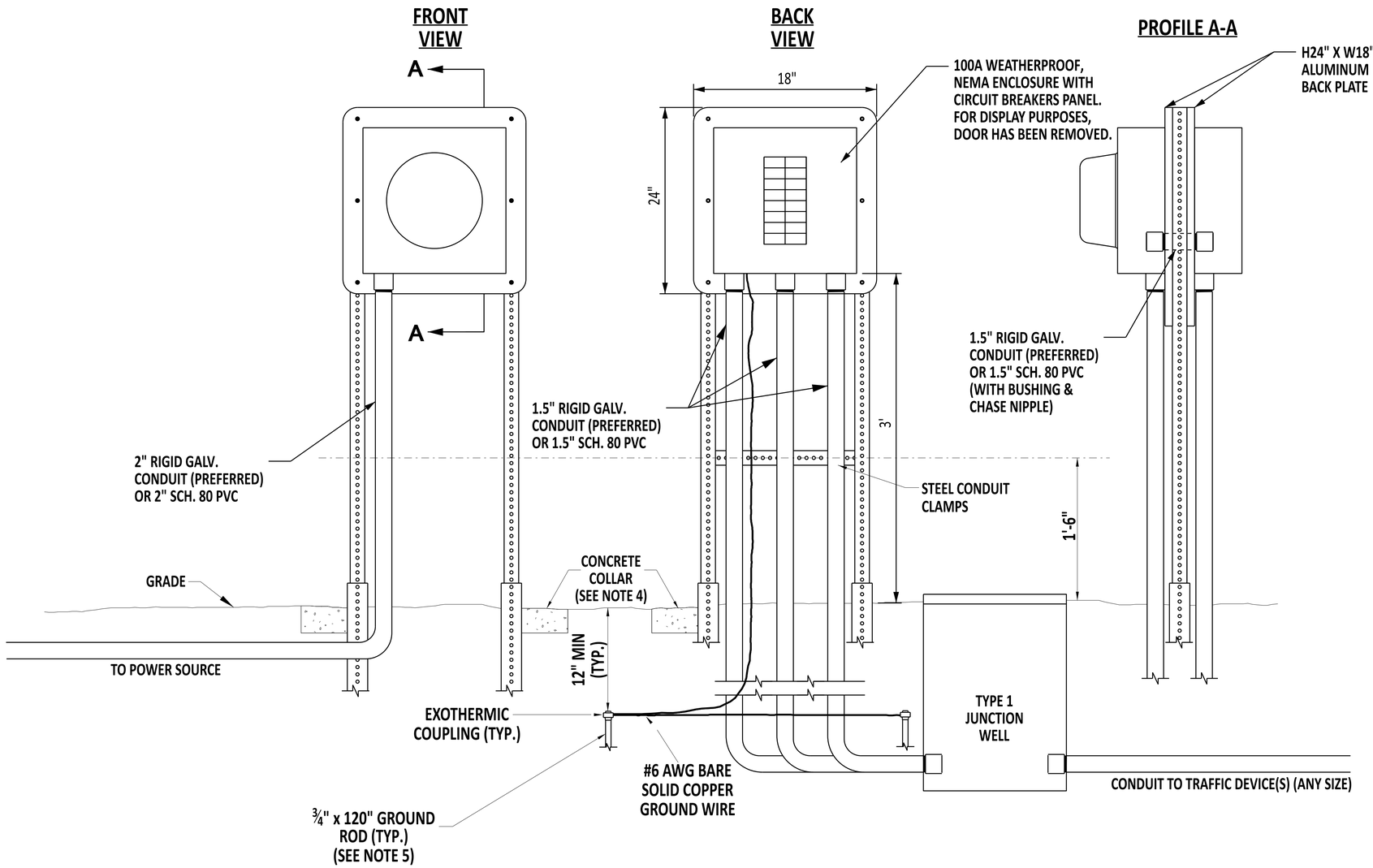
REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS

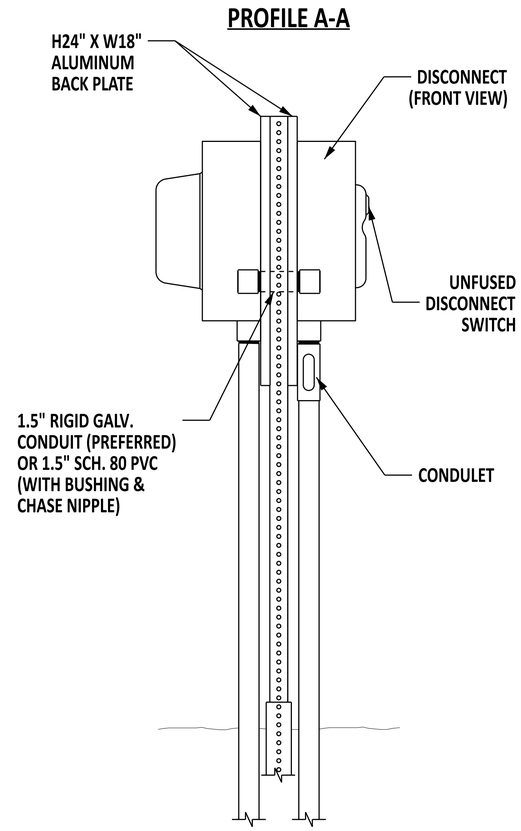
CONDENSED INSTALLATION (3+ DEVICES)



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.
4.) CONCRETE COLLAR SHALL CONTAIN 25 LBS OF CONCRETE AT EACH LEG JUST BELOW GRADE AS DIRECTED BY INSPECTOR.
5). GROUND ROD SPREAD SHALL BE TWICE THE LENGTH OF THE GROUND ROD.

CONDENSED INSTALLATION (UP TO 2 DEVICES)



SPECIALTY DISCONNECT TYPICAL

NOTES

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

DelDOT

Andrew Shoot — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

ELECTRICAL SERVICE PEDESTAL - SIGNAL & ITS COMPONENT INSTALLATIONS - 100 AMP (CONDENSED)

STANDARD NO. T-17 (2024) | SHT. 2 OF 7

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

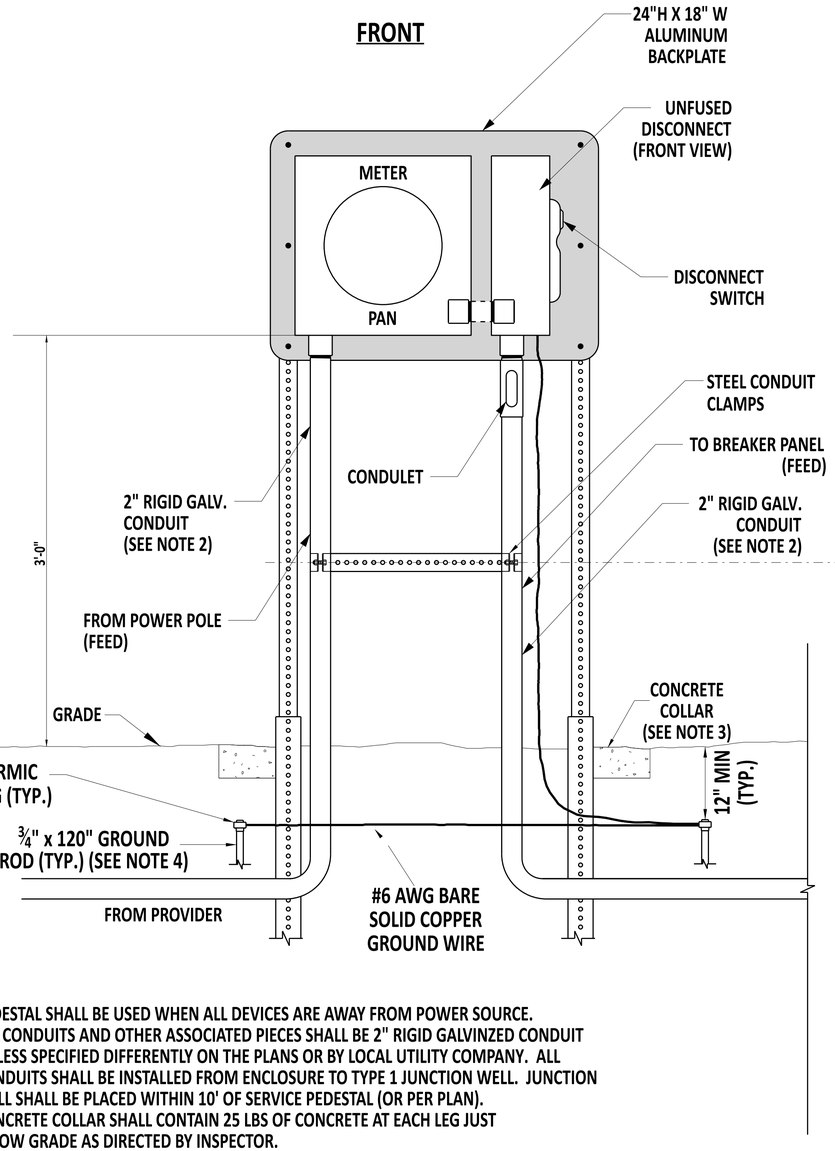
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

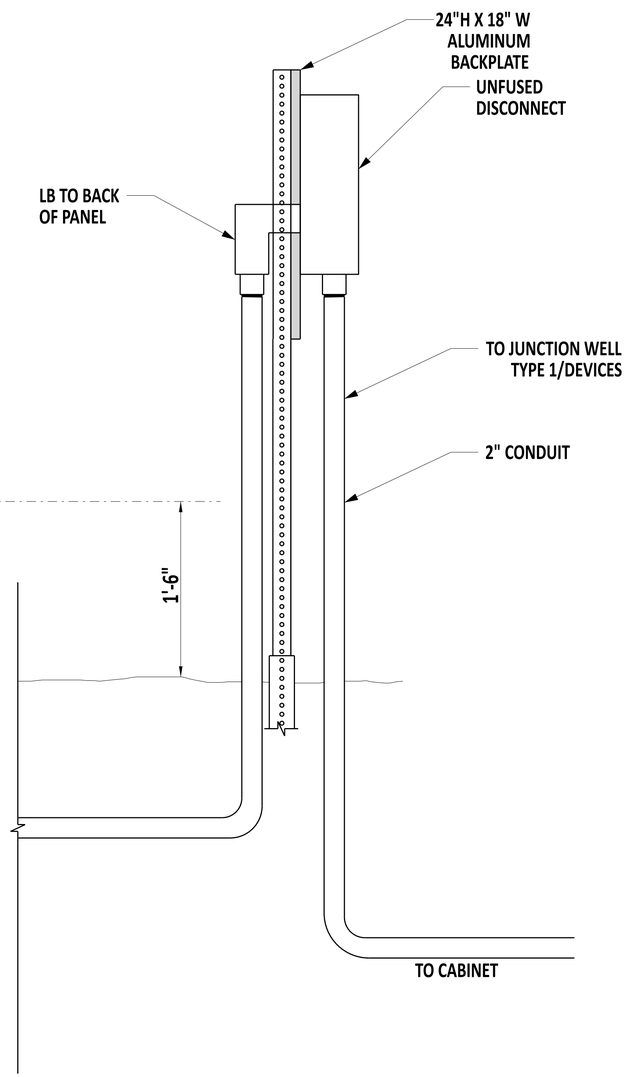
SCALE : NTS

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).
3). CONCRETE COLLAR SHALL CONTAIN 25 LBS OF CONCRETE AT EACH LEG JUST BELOW GRADE AS DIRECTED BY INSPECTOR.
4). GROUND ROD SPREAD SHALL BE TWICE THE LENGTH OF THE GROUND ROD.

DelDOT

Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

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

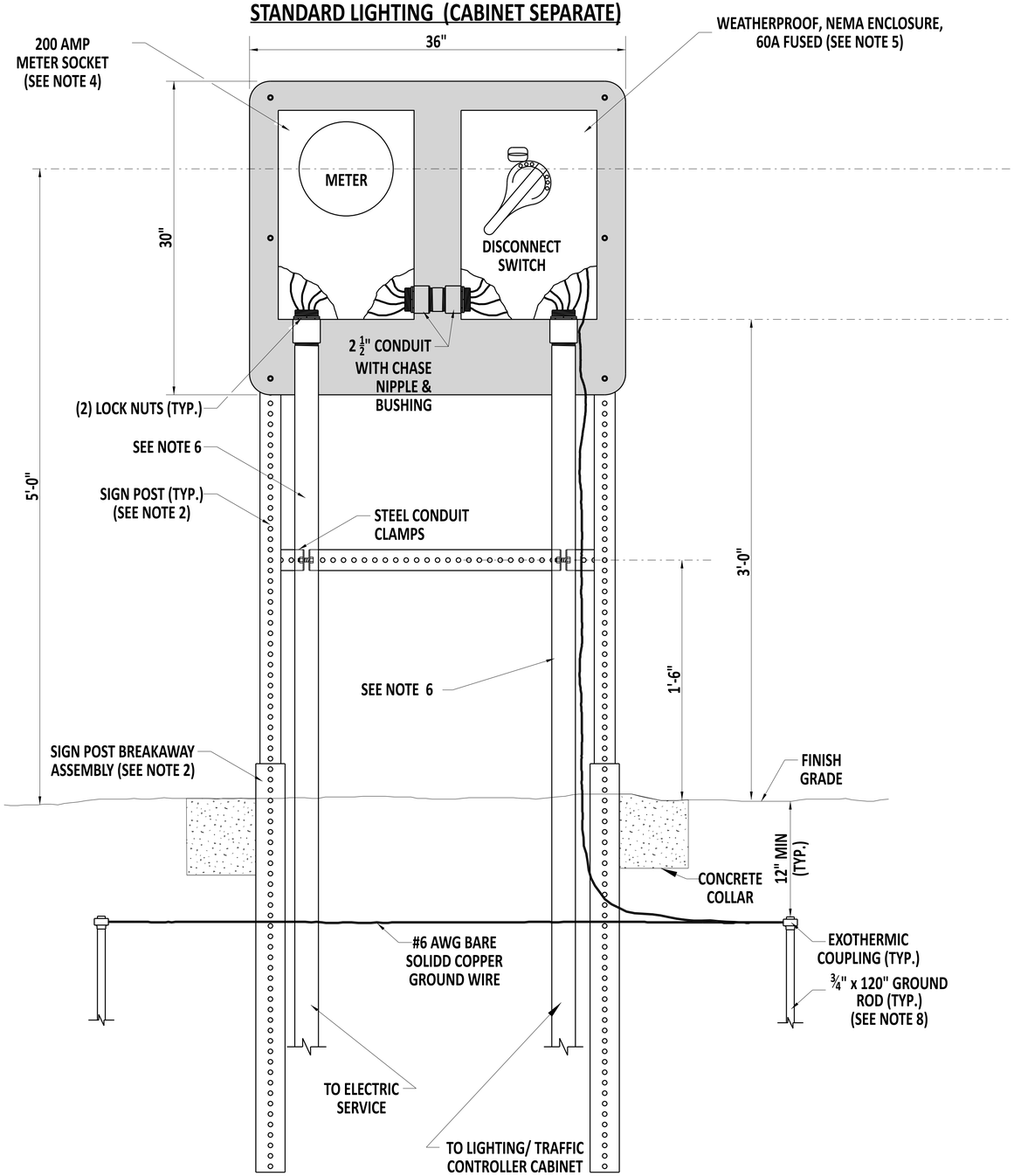
STANDARD NO. T-17 (2024) | SHT. 3 OF 7

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

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).
7). CONCRETE COLLAR SHALL CONTAIN 25 LBS OF CONCRETE AT EACH LEG JUST BELOW GRADE AS DIRECTED BY INSPECTOR.
8). GROUND ROD SPREAD SHALL BE TWICE THE LENGTH OF THE GROUND ROD.

DelDOT

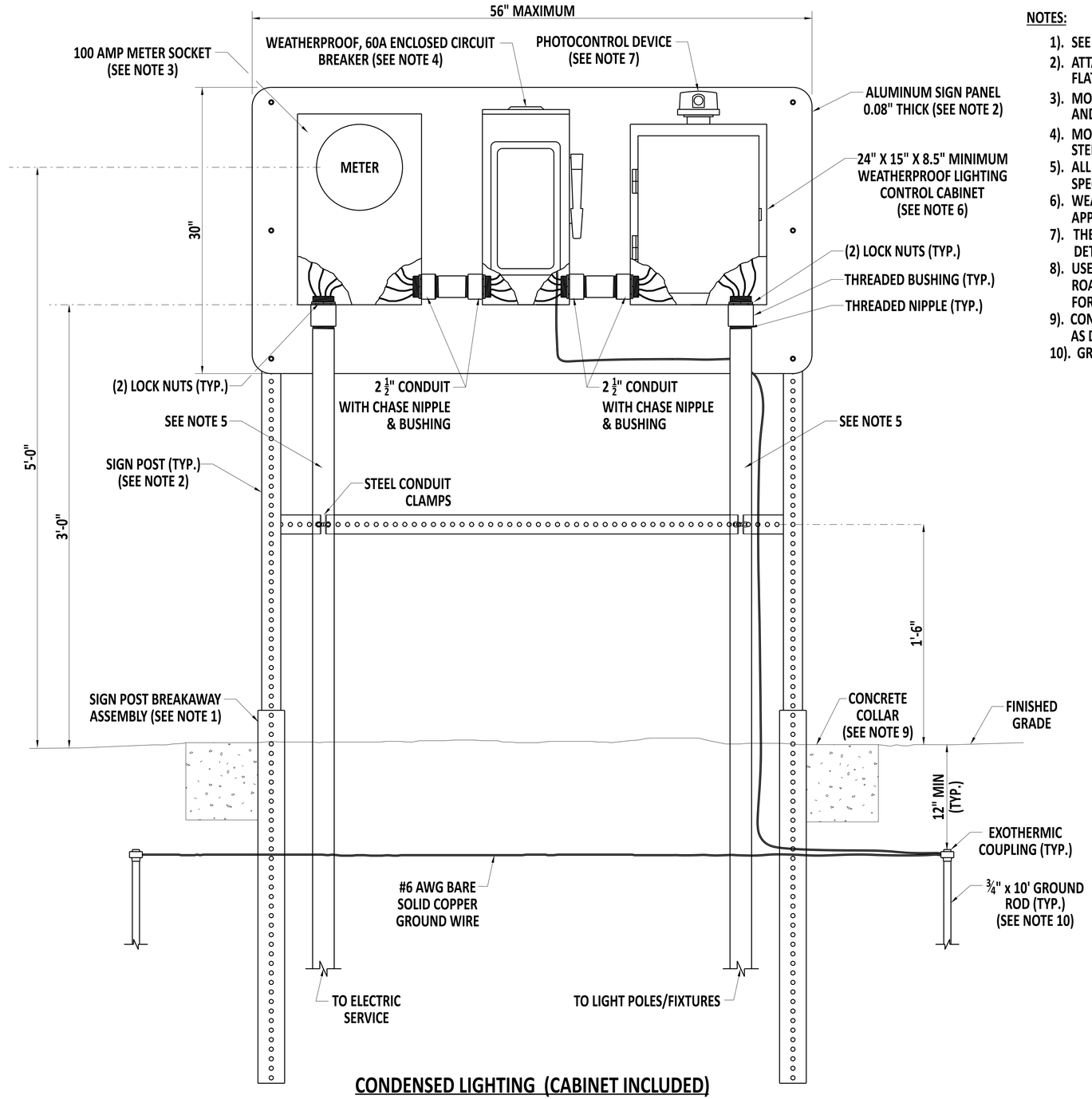
Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

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

STANDARD NO. T-17 (2024) | SHT. 4 OF 7

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023



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) $\frac{5}{16}$" x 2$\frac{1}{2}$" LONG GRADE 5 BOLTS, FLAT WASHERS, AND NYLON LOCK NUTS, 3 ON EACH SIDE.
3). MOUNT METER SOCKET TO ALUMINUM PANEL WITH (4) $\frac{5}{16}$" x $\frac{3}{4}$" STAINLESS STEEL BOLTS AND NYLON LOCK NUTS.
4). MOUNT ENCLOSED CIRCUIT BREAKER TO ALUMINUM PANEL WITH (4) $\frac{5}{16}$" x $\frac{3}{4}$" 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). THE DESIGNER SHALL COORDINATE WITH THE APPLICABLE MAINTENANCE DISTRICT TO DETERMINE THE LOCATION OF THE PHOTOCONTROL DEVICE ON THE CABINET.
8). 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, SHEET 4.
9). CONCRETE COLLAR SHALL CONTAIN 25 LBS OF CONCRETE AT EACH LEG JUST BELOW GRADE AS DIRECTED BY INSPECTOR.
10). GROUND ROD SPREAD SHALL BE TWICE THE LENGTH OF THE GROUND ROD.

DelDOT

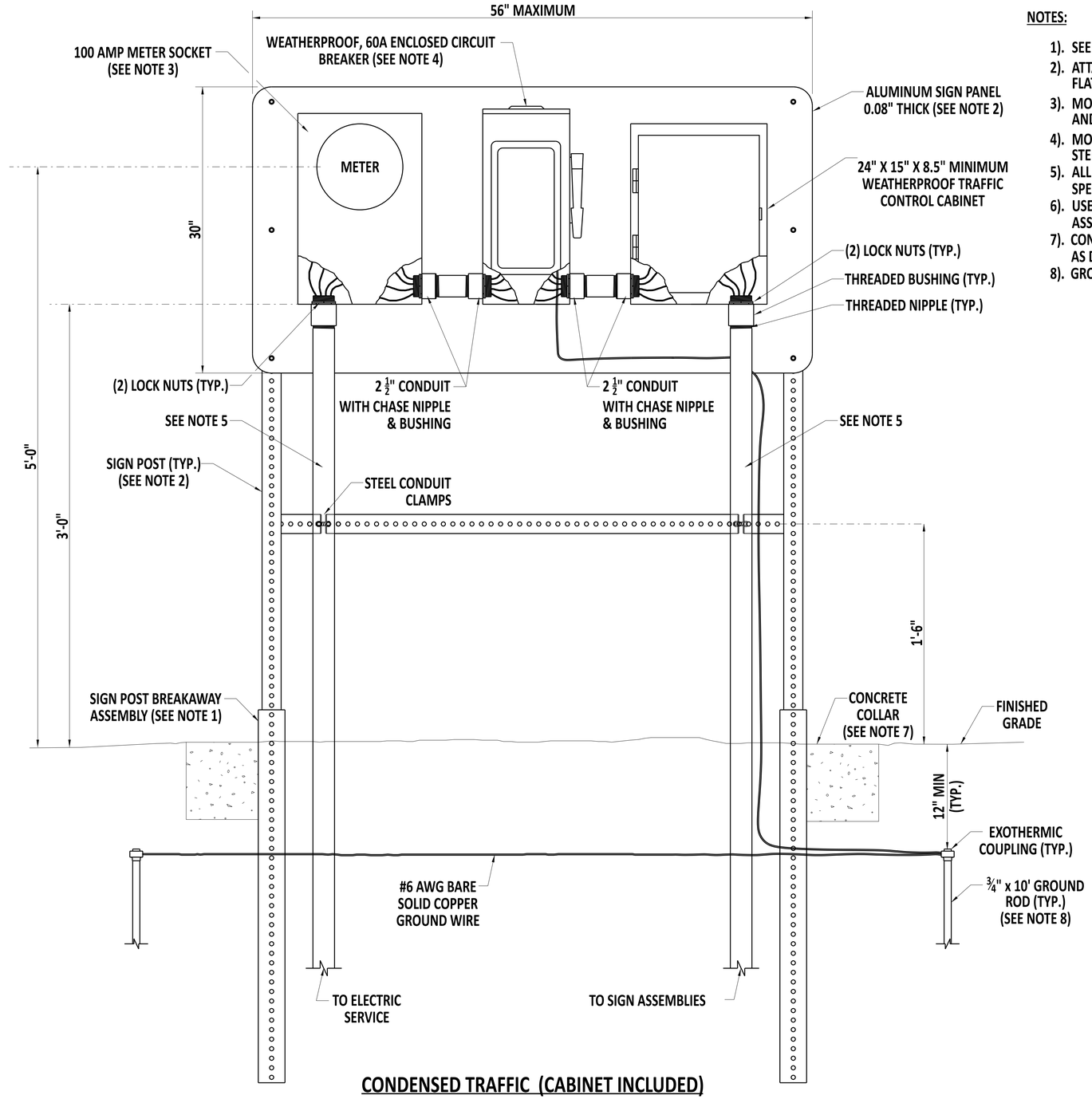
Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

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

STANDARD NO. T-17 (2024) | SHT. 5 OF 7

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023



CONDENSED TRAFFIC (CABINET INCLUDED)

NOTES:

1). SEE DETAIL T-15, SHEET 1, FOR SIGN POST AND BREAKAWAY ASSEMBLY DETAILS.
2). 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.
3). MOUNT METER SOCKET TO ALUMINUM PANEL WITH (4) $\frac{5}{16}$" x $\frac{3}{4}$" STAINLESS STEEL BOLTS AND NYLON LOCK NUTS.
4). MOUNT ENCLOSED CIRCUIT BREAKER TO ALUMINUM PANEL WITH (4) $\frac{5}{16}$" x $\frac{3}{4}$" 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). USE OF THESE DETAILS ARE MEANT FOR THE OPERATION OF FLASHING BEACONS FOR SIGN ASSEMBLIES SUCH AS RECTANGULAR RAPID FLASHING BEACONS (RRFB).
7). CONCRETE COLLAR SHALL CONTAIN 25 LBS OF CONCRETE AT EACH LEG JUST BELOW GRADE AS DIRECTED BY INSPECTOR.
8). GROUND ROD SPREAD SHALL BE TWICE THE LENGTH OF THE GROUND ROD.

SCALE : NTS

DelDOT

Andrew Shoat — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

ELECTRICAL SERVICE PEDESTAL - SIGNAL & ITS COMPONENT INSTALLATIONS SIGN ASSEMBLIES WITH FLASHING BEACONS - 100 AMP

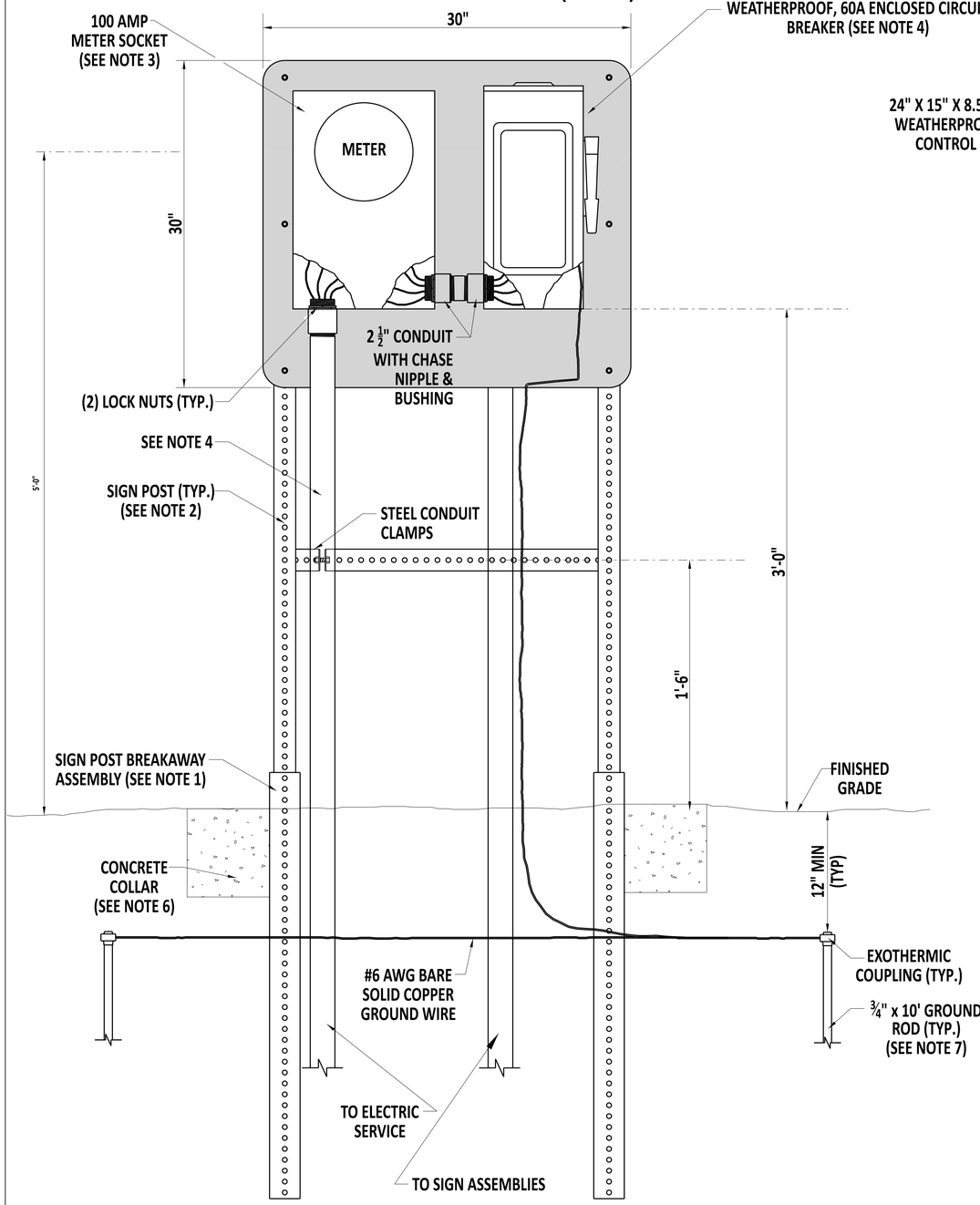
STANDARD NO. T-17 (2024) | SHT. 6 OF 7

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

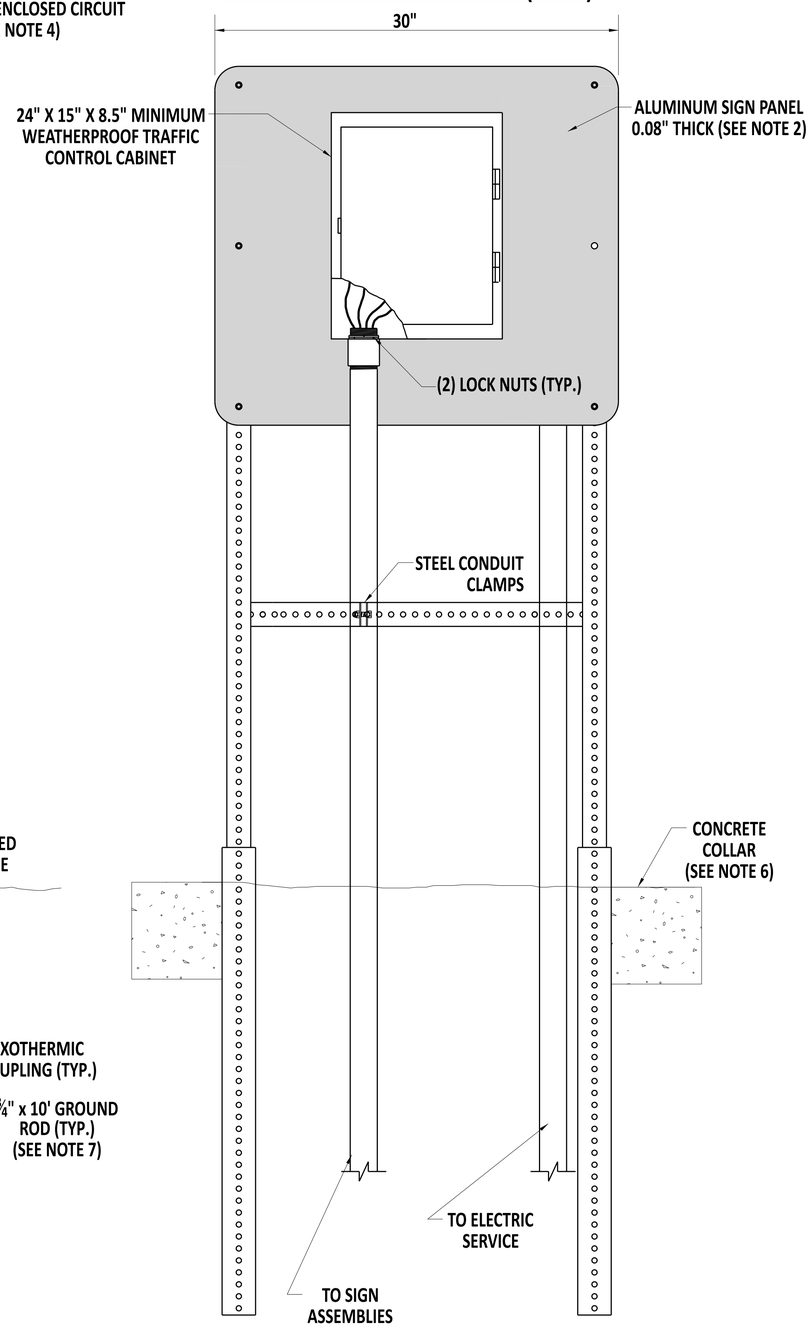
22-DEC-2023

SCALE : NTS

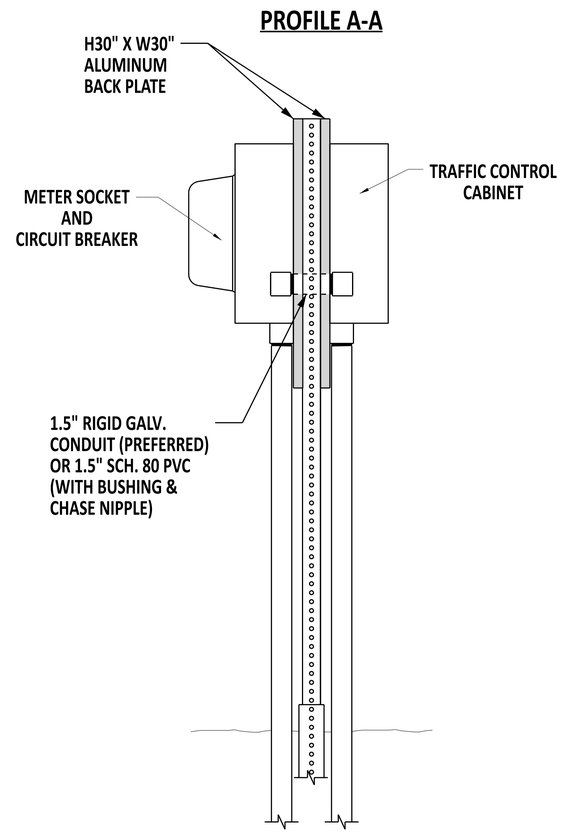
CONDENSED TRAFFIC CABINET (FRONT)



CONDENSED TRAFFIC CABINET (BACK)



PROFILE A-A



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 2 1/2" 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 3/4" STAINLESS STEEL BOLTS AND NYLON LOCK NUTS.
4). ALL CONDUITS AND OTHER ASSOCIATED PIECES SHALL BE 2" RIGID GALVANIZED CONDUIT UNLESS SPECIFIED DIFFERENTLY ON THE PLANS OR BY LOCAL UTILITY COMPANY.
5). USE OF THESE DETAILS ARE MEANT FOR THE OPERATION OF FLASHING BEACONS FOR SIGN ASSEMBLIES SUCH AS RECTANGULAR RAPID FLASHING BEACONS (RRFB) WHERE FIELD CONDITIONS DO NOT ALLOW FOR THE INSTALLATION PER T-17, SHEET 6.
6). CONCRETE COLLAR SHALL CONTAIN 25 LBS OF CONCRETE AT EACH LEG JUST BELOW GRADE AS DIRECTED BY INSPECTOR.
7). GROUND ROD SPREAD SHALL BE TWICE THE LENGTH OF THE GROUND ROD.

DelDOT

Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

ELECTRICAL SERVICE PEDESTAL - SIGNAL & ITS COMPONENT INSTALLATIONS SIGN ASSEMBLIES WITH FLASHING BEACONS - 100 AMP (CONDENSED)

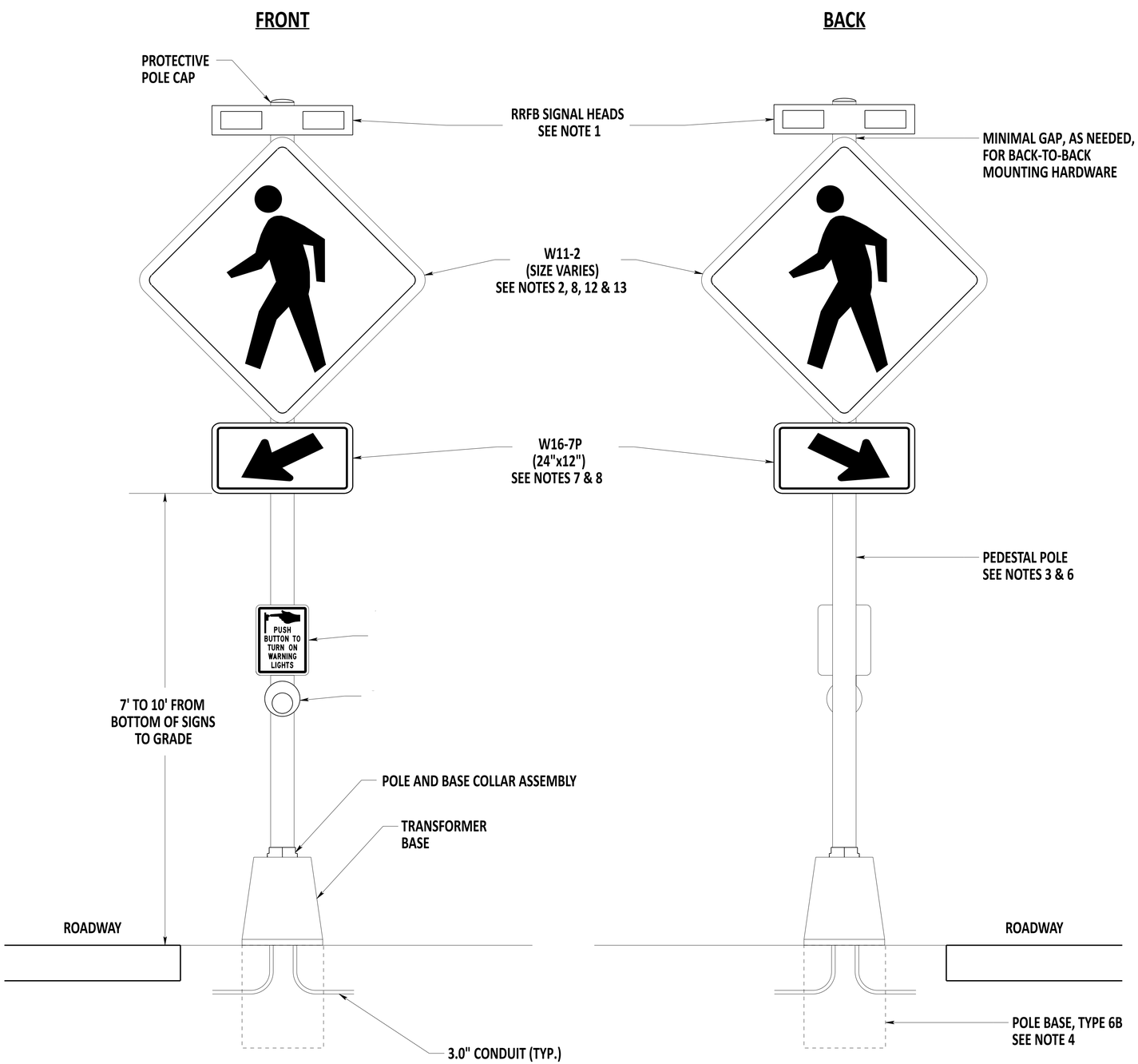
STANDARD NO. T-17 (2024) | SHT. 7 OF 7

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS



NOTES:

1). INSTALL RRFB SIGNAL HEADS IN ACCORDANCE WITH SECTION 837 OF THE STANDARD SPECIFICATIONS.
2). INSTALL SIGNS IN ACCORDANCE WITH SECTION 818 OF THE STANDARD SPECIFICATIONS.
3). INSTALL PEDESTAL POLE IN ACCORDANCE WITH SECTION 836 OF THE STANDARD SPECIFICATIONS.
4). REFER TO T-5, SHEET 4 FOR INFORMATION ON POLE BASE TYPE 6B.
5). REFER TO T-18, SHEET 1 FOR INFORMATION ON PEDESTRIAN PUSHBUTTON LOCATION.
6). THE PEDESTAL POLE SHALL BE CONTINUOUS SPUN ALUMINUM, SCHEDULE 80. SPLICING POLE EXTENSIONS SHALL BE PROHIBITED.
7). W16-7P PLAQUES ON ROADWAY EDGES SHALL POINT TOWARDS THE ROAD. W16-7P PLAQUES IN THE MEDIAN SHALL POINT TO THE RIGHT.
8). SIGNS, PLAQUES, AND RRFB BEACONS SHALL BE INSTALLED ON RRFB SIGNAL POLES AS FOLLOWS:

TRAFFIC	NUMBER OF MEDIAN POLES	SIGNS, PLAQUES, & BEACONS	PEDESTRIAN SIGN & PUSHBUTTON
2-WAY	0	DOUBLE-SIDED	ONE PER POLE
	1		
	2	SINGLE-SIDED*	
1-WAY	ANY		

* SINGLE-SIDED ASSEMBLIES SHALL FACE APPROACHING TRAFFIC.

DESIGNER NOTES:

9). REFER TO FHWA INTERIM APPROVAL 21 FOR ADDITIONAL DESIGN INFORMATION.
10). REFER TO STANDARD DETAIL T-17, SHEETS 6 AND 7 FOR INFORMATION ON THE DESIGN OF RRFB POWER METERS AND CABINETS.
11). RRFB POLE(S) SHOULD BE INSTALLED IN THE MEDIAN TO ALLOW USERS TO REACTIVATE THE RRFB BEACONS.
12). SIGNS SHALL BE 30"x30" ON SINGLE-LANE APPROACHES AND 36"x36" ON MULTI-LANE APPROACHES. 48"x48" SIGNS MAY ONLY BE INSTALLED WITH APPROVAL OF THE CHIEF OF TRAFFIC ENGINEERING.
13). RRFB'S SHALL ONLY BE INSTALLED WITH S1-1, W11-2, AND W11-15 SIGNS. SUPPLEMENTARY PLAQUES, SUCH AS W11-15P, MAY BE USED.

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Andrew Shott — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

PEDESTRIAN PUSHBUTTON LOCATION - AC-POWERED RRFB SIGNAL POLE INSTALLATION

STANDARD NO. T-18 (2024) | SHT. 3 OF 3

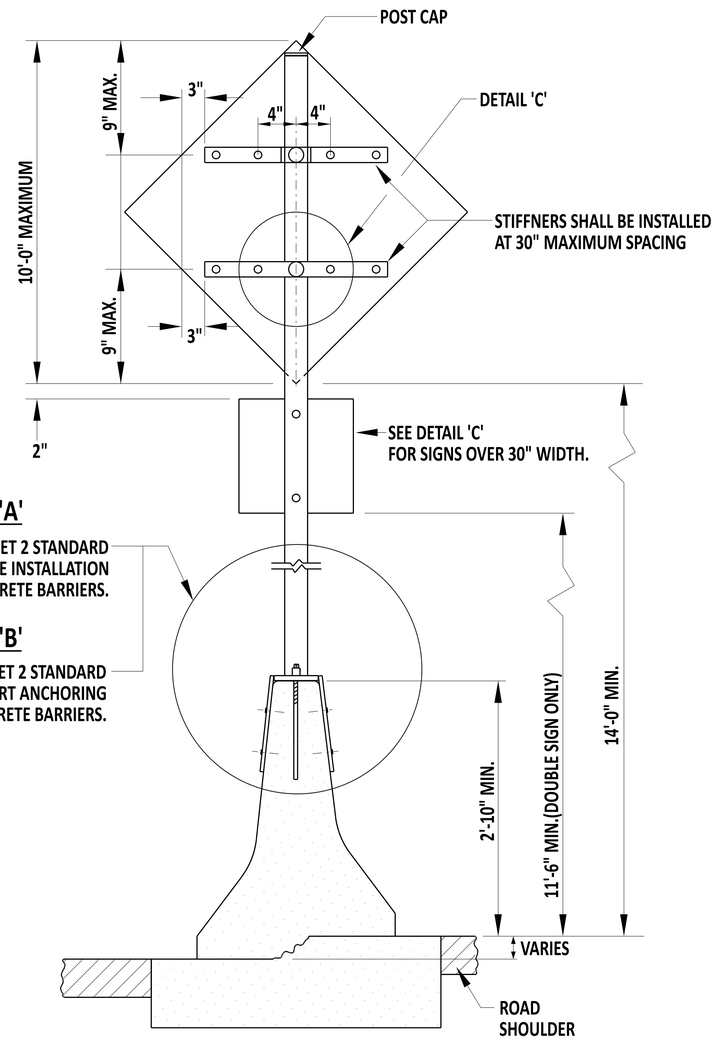
REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

SCALE : NTS

CONCRETE BARRIER MOUNTED SIGN
MAXIMUM SIGN AREA - 40 SQ. FT.



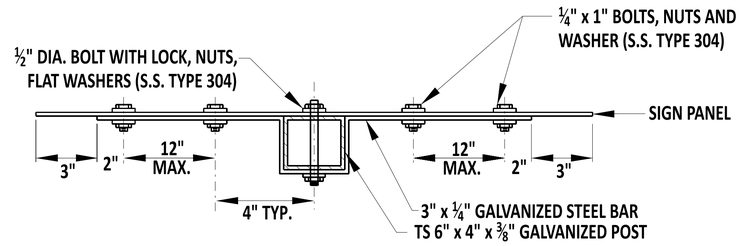
DETAIL 'A'

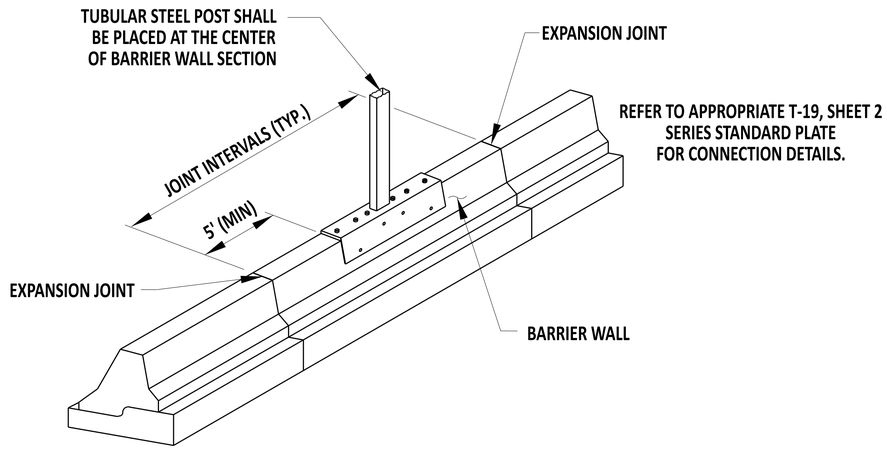
REFER TO APPROPRIATE T-19, SHEET 2 STANDARD PLATE FOR CAST-IN-PLACE INSTALLATION ON NEW CONCRETE BARRIERS.

DETAIL 'B'

REFER TO APPROPRIATE T-19, SHEET 2 STANDARD PLATE FOR SIGN SUPPORT ANCHORING ON EXISTING CONCRETE BARRIERS.

DETAIL 'C' - TOP VIEW
TUBULAR STEEL POST





NOTES:

1. THE BARRIER MOUNT SHALL BE INSTALLED 5' (MIN.) OFF OF ALL EXPANSION JOINTS.
2. ANCHOR BOLTS SHALL BE ASTM F 1554, GR 55 S1 GALVANIZED. NUTS SHALL BE ASTM A194 GRADE 2 OR 2H.
3. TUBULAR STEEL POST TS 6" X 4" X ⅜" SHALL BE A501 UNLESS OTHERWISE NOTED.
4. REFER TO APPROPRIATE T-19, SHEET 2 STANDARD PLATES FOR ALTERNATIVE SIGN ATTACHMENT TO STEEL TUBE POSTS OR W6X12 POSTS.
5. ALL STRUCTURAL STEEL AND HARDWARE SHALL BE GALVANIZED IN CONFORMANCE WITH ASTM A123 AND A153, RESPECTIVELY.
6. ALL PLATES AND W6X12 POST SHALL CONFORM TO ASTM A706, GRADE 36.
7. CONCRETE BARRIER MOUNTED SIGN MAXIMUM SIGN AREA OF 40 SQ. FT.

DelDOT

Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE
RECOMMENDED

BARRIER MOUNTED SIGN

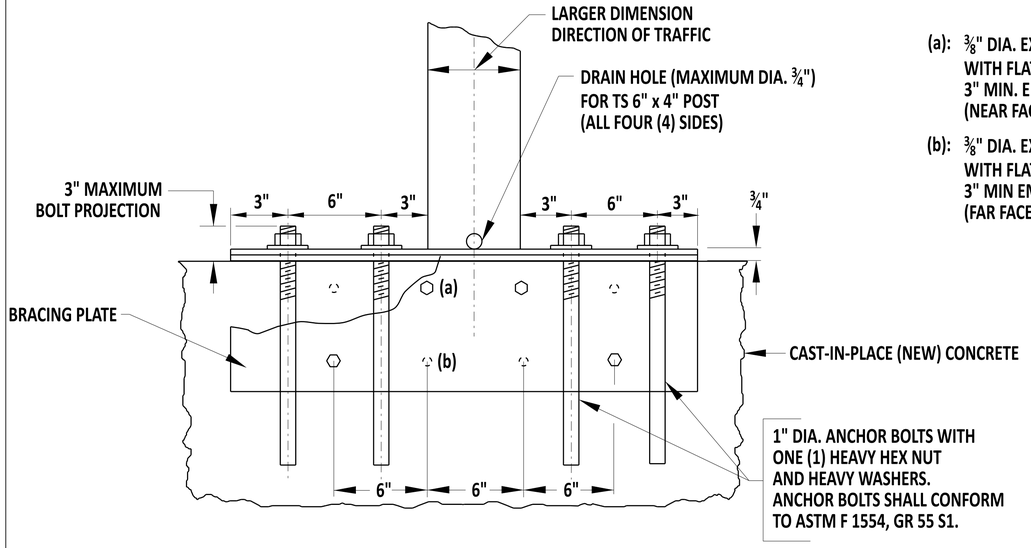
STANDARD NO. T-19 (2024) | SHT. 1 OF 3

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

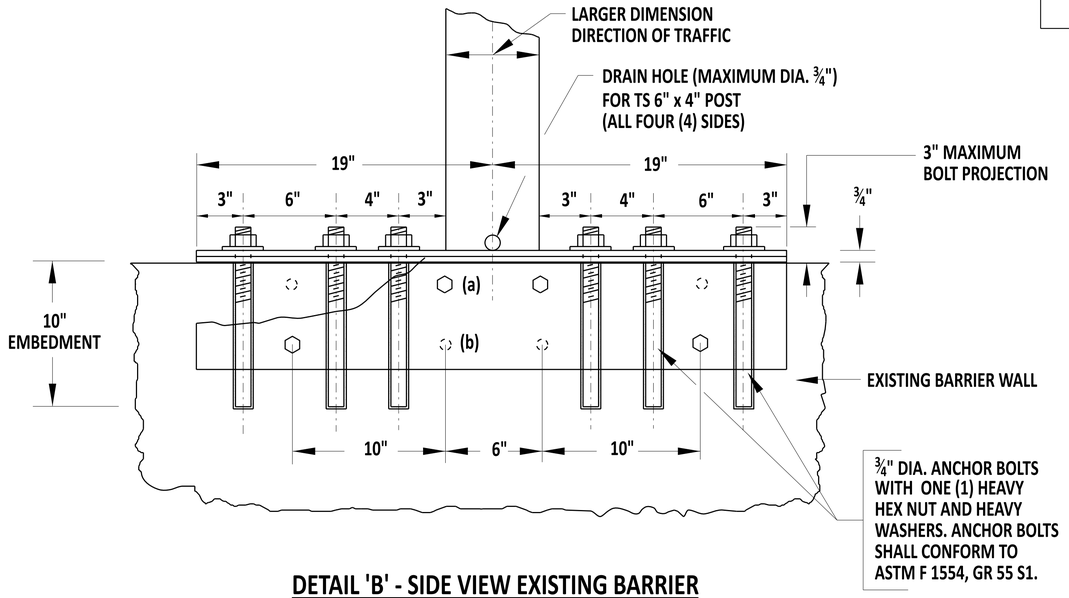
SCALE : NTS



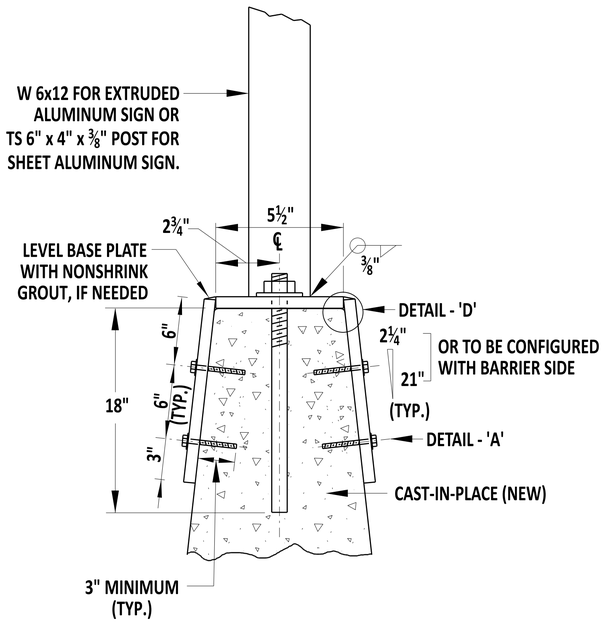
(a): ⅜" DIA. EXPANSION BOLTS
WITH FLAT WASHERS
3" MIN. EMBEDMENT (TYP.)
(NEAR FACE)

(b): ⅜" DIA. EXPANSION BOLTS
WITH FLAT WASHERS
3" MIN EMBEDMENT (TYP.)
(FAR FACE)

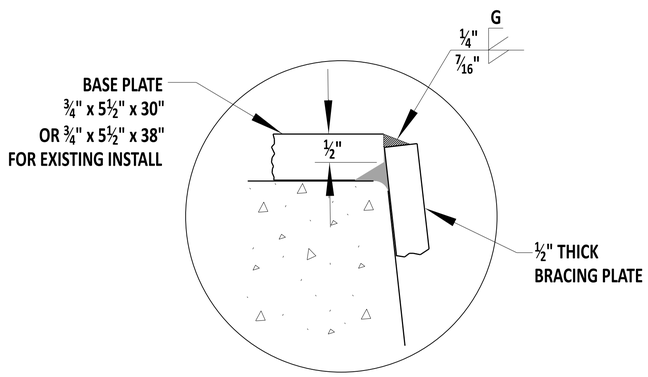
DETAIL 'A' - SIDE VIEW NEW BARRIER



DETAIL 'B' - SIDE VIEW EXISTING BARRIER



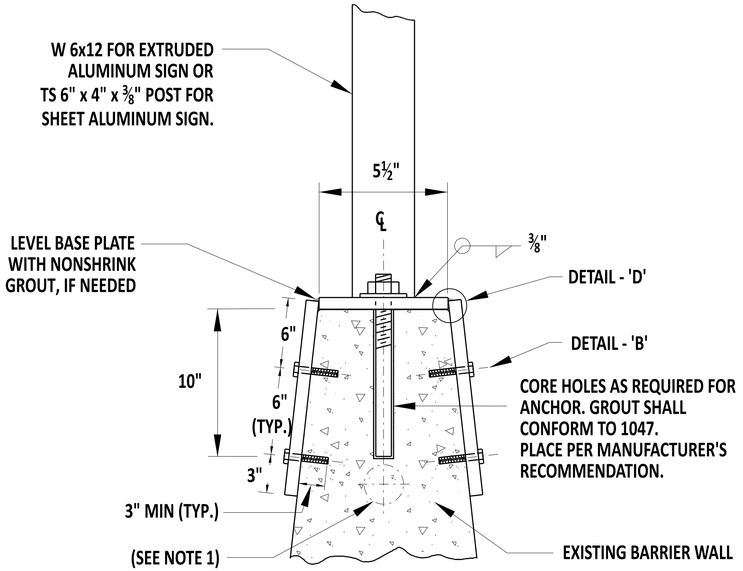
DETAIL 'A' NEW BARRIER



DETAIL 'D'

NOTES:

1. THE CONTRACTOR SHALL VERIFY ANY EXISTING CONDUIT BEFORE DRILLING HOLES. IF THE CONDUIT IS WITHIN 10" FROM THE TOP OF THE BARRIER, THE ENGINEER SHALL BE CONTACTED FOR ALTERNATE DESIGN.



DETAIL 'A' EXISTING BARRIER

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Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE

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BARRIER MOUNTED SIGN

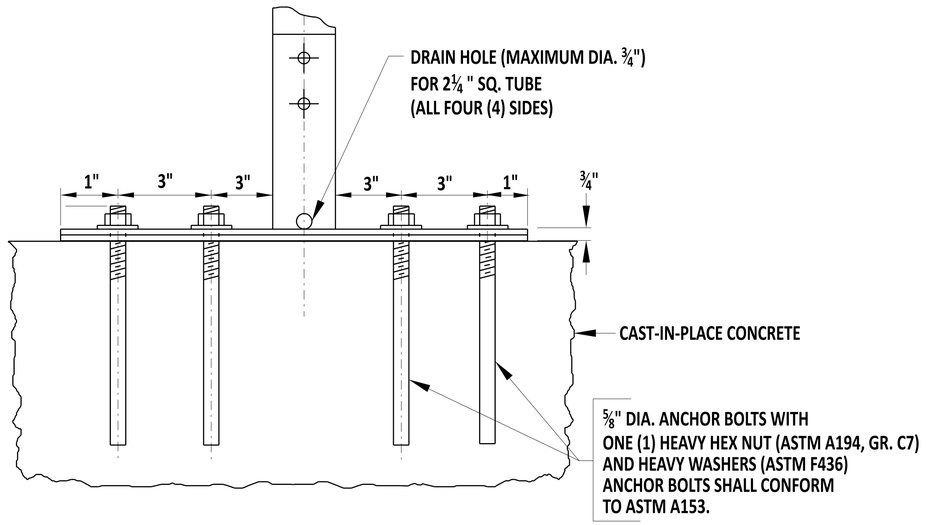
STANDARD NO. T-19 (2024) | SHT. 2 OF 3

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

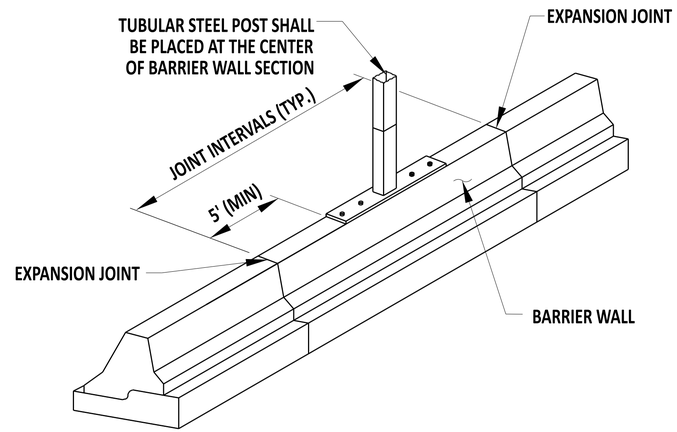
22-DEC-2023

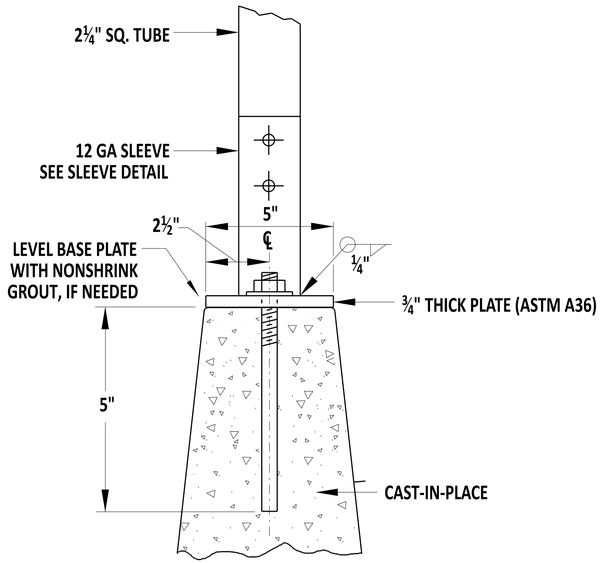
SCALE : NTS



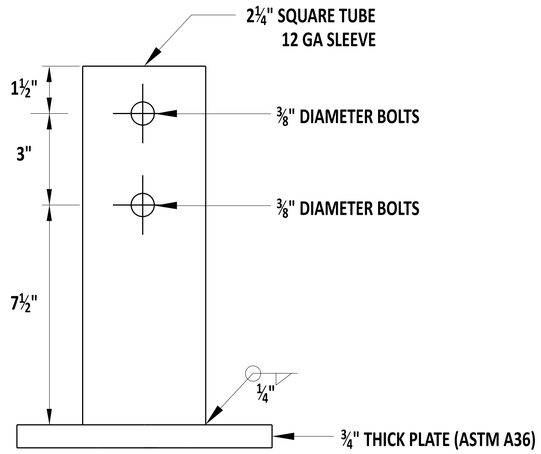
DETAIL 'A' - SIDE VIEW CONCRETE BARRIER

CONCRETE BARRIER MOUNTED MILE MARKER
MAXIMUM SIGN AREA - 8 SQ. FT.





DETAIL 'A' CONCRETE BARRIER



SLEEVE DETAIL

NOTES:

1. MILE MARKER BARRIER MOUNT SHALL BE INSTALLED FOLLOWING DE MUTCD GUIDANCE. SIGNS MAXIMUM WIDTH SHALL NOT EXCEED 18".
2. THE MILE MARKER BARRIER MOUNT SHALL BE INSTALLED 5' (MIN.) OFF OF ALL EXPANSION JOINTS.
3. REFER TO OTHER APPROPRIATE SERIES STANDARD FOR ATTACHMENT DETAIL.
4. VERIFY ANY EXISTING CONDUIT BEFORE DRILLING HOLES. IF THE CONDUIT IS WITHIN 10" FROM THE TOP OF THE BARRIER, CONTACT THE ENGINEER FOR ALTERNATE DESIGN.

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MILE MARKER BARRIER MOUNT

STANDARD NO. T-19 (2024) | SHT. 3 OF 3

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

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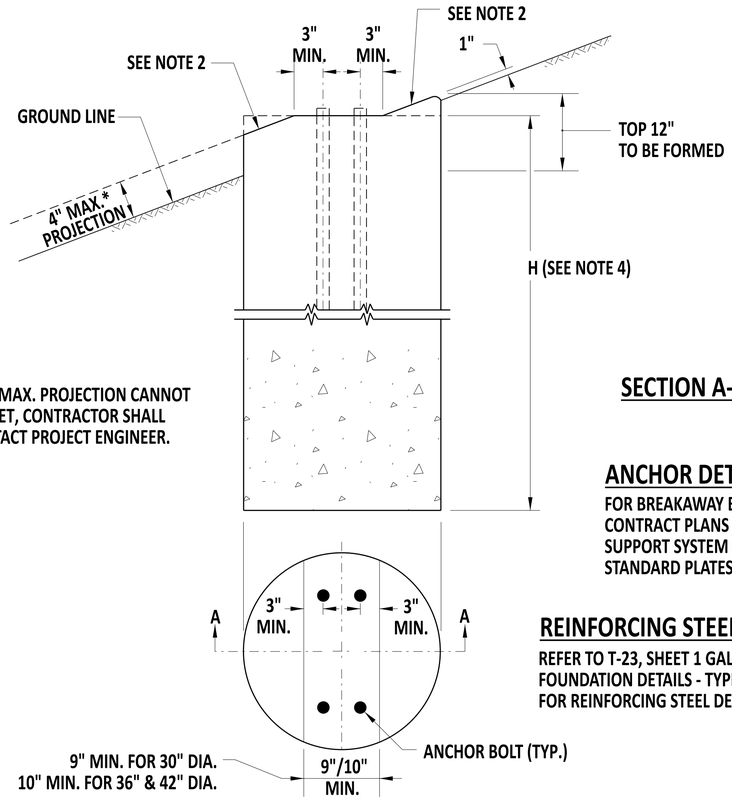
BREAKAWAY TYPE C SIGN POST FOUNDATIONS



✱ IF 4" MAX. PROJECTION CANNOT BE MET, CONTRACTOR SHALL CONTACT PROJECT ENGINEER.

SECTION A-A

ANCHOR DETAILS

FOR BREAKAWAY BASE DETAILS, REFER TO CONTRACT PLANS BREAKAWAY BASE SUPPORT SYSTEM FOR HIGHWAY SIGNS STANDARD PLATES.

REINFORCING STEEL DETAILS

REFER TO T-23, SHEET 1 GALVANIZED STEEL BEAM SIGN POSTS FOUNDATION DETAILS - TYPE A STANDARD PLATE FOR REINFORCING STEEL DETAILS.

PLAN VIEW

STEEL BREAKAWAY SUPPORT FOUNDATION SELECTION MATRIX

POST SIZE	FOUNDATION DIAMETER	ROADWAY CUT / FILL SLOPE										
		≥2:1	3:1	4:1	5:1	6:1	7:1	8:1	9:1	10:1	12:1	≤13:1
W6X9	30"	***	C	C	C	C	B	B	B	A	A	A
W6X12	30"	***	C	C	C	C	B	B	B	A	A	A
W6X15	30"	***	C	C	C	C	B	B	B	A	A	A
W6X16	30"	***	C	C	C	C	B	B	B	A	A	A
W8X18	30"	***	C	C	C	C	B	B	B	A	A	A
W8X21	30"	***	C	C	C	C	B	B	B	A	A	A
W10X22	36"	***	***	C	C	C	C	B	B	B	A	A
W10X26	36"	***	***	C	C	C	C	B	B	B	A	A
W12X26	36"	***	***	C	C	C	C	B	B	B	A	A
W14X30	36"	***	***	C	C	C	C	B	B	B	A	A
W16X31	36"	***	***	C	C	C	C	B	B	B	A	A
W18X35 OR W18X40	36"	***	***	C	C	C	C	C	B	B	B	A

✱ IF A FOUNDATION EXCEEDS THE 4" AASHTO CRITERIA, THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR APPROPRIATE GUIDANCE.

NOTES:

1. THIS FOUNDATION SHALL BE USED ONLY IN LOCATIONS MEETING SLOPE CRITERIA IN ACCORDANCE WITH THE STEEL BREAKAWAY SUPPORT FOUNDATION SELECTION TABLE.
2. SLOPED PORTIONS OF THE FOUNDATION SHALL MATCH THE FINISHED GROUND SLOPE.
3. ON FILL SLOPES GREATER THAN 6:1 BUT NO STEEPER THAN 3:1, FOUNDATIONS DESIRABLY SHOULD BE INSTALLED A MINIMUM OF 14 FT BEYOND THE HINGE POINT. THE HINGE POINT IS THE POINT OF SLOPE TRANSITION FROM THE SHOULDER SLOPE, OR A RELATIVELY FLAT RECOVERY AREA ADJACENT TO THE ROADWAY, TO A STEEPER FORESLOPE, (ALSO KNOWN AS THE FORESLOPE BREAK).
4. REFER TO T-23, SHEET 1 GALVANIZED STEEL BEAM SIGN POSTS FOUNDATION DETAILS - TYPE A FOR FOUNDATION DIMENSIONS AND REINFORCING STEEL DETAILS.

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RECOMMENDED

BREAKAWAY STEEL SIGN SUPPORT FOUNDATIONS

STANDARD NO. T-23 (2024) | SHT. 2 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

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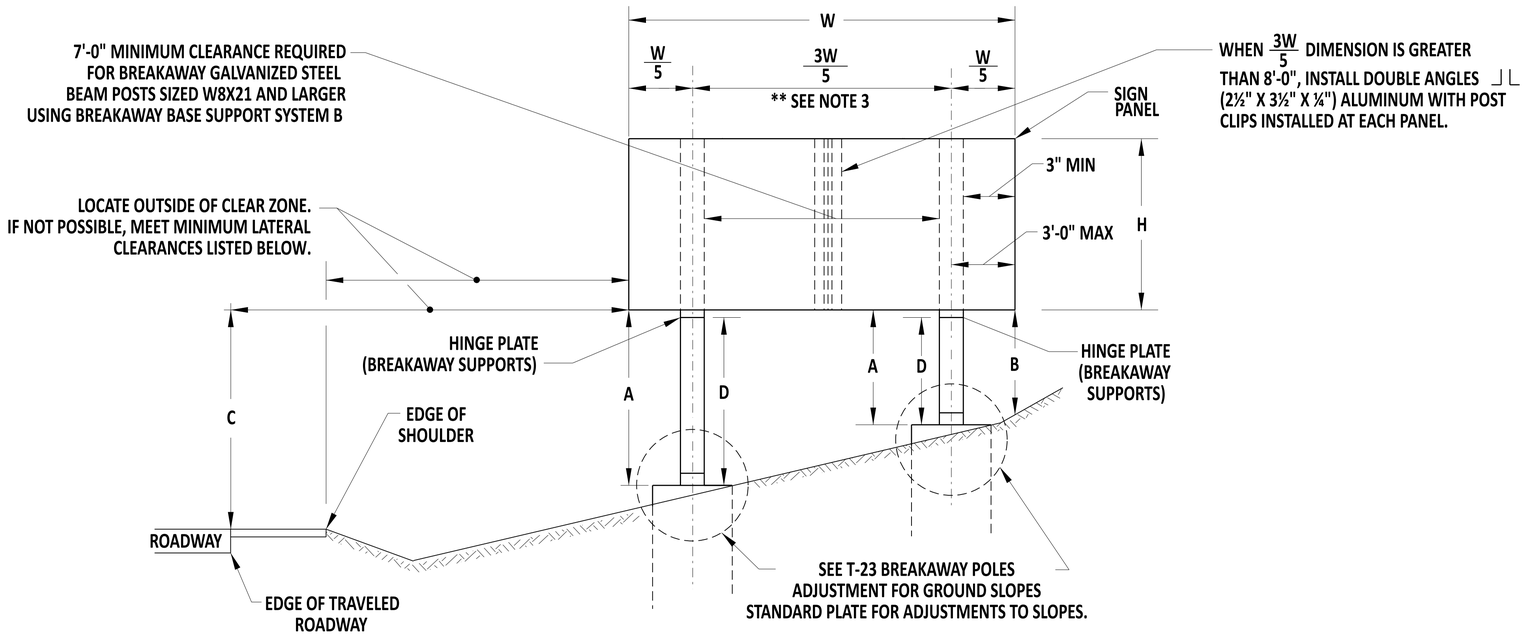

VERTICAL CLEARANCE FOR SIGNS

A. 7'-6" MINIMUM FOR BREAKAWAY SUPPORTS
B. 2'-0" MINIMUM
C. 7'-6" MINIMUM
   ALL MOUNTING HEIGHTS LESS THAN 7'-6" REQUIRE DelDOT APPROVAL. THIS DIMENSION IS TO BE INCREASED ONLY WHEN REQUIRED TO MEET 'A' (MIN.) = 7'-6" FOR BREAKAWAY AND/OR 'B' (MIN.) = 2'-0". ALL DIMENSIONS ARE TO BOTTOM OF SIGN.
D. 7'-0" MINIMUM FOR BREAKAWAY SUPPORTS MEASURED TO CENTERLINE OF HINGE PLATE.

PREFERRED SIGN LOCATION IS OUTSIDE OF THE CLEAR ZONE
IF THIS CONDITION CANNOT BE MET, THE SIGN SHOULD BE PLACED AS FAR FROM THE ROADWAY AS POSSIBLE

MINIMUM LATERAL CLEARANCES FOR SIGNS

1 = EDGE OF SIGN 6'-0" FROM FACE OF W-BEAM TRAFFIC BARRIER
2 = EDGE OF SIGN 6'-0" PREFERABLE MIN. (2'-0" ABSOLUTE MIN.) FROM FACE OF CURB
3 = EDGE OF SIGN 6'-0" FROM EDGE OF SHOULDER
4 = EDGE OF SIGN 6'-0" PREFERABLE MIN. (2'-0" ABSOLUTE MIN.) FROM EACH EDGE OF SHOULDER IN MEDIAN
5 = EDGE OF SIGN 6'-0" FROM EACH EDGE OF SHOULDER CENTERED IN GORE AREA

NOTES:

1. FOR THREE SUPPORTS, POSTS SHOULD BE SPACED 1/6, 1/3, 1/3, 1/6 X WIDTH OF SIGN, WITHIN MAXIMUM EDGE SPACING AS SHOWN.
2. ALL SUPPORTS SHALL BE BREAKAWAY.
3. REFER TO CONTRACT PLANS FOR POST SPACING.
4. AASHTO LRFD SPECIFICATION FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES, AND TRAFFIC SIGNALS, 1st EDITION INCLUDING INTERIMS THROUGH 2022.
5. REFER TO T-20 BREAKAWAY STEEL SIGN SUPPORT CHARTS FOR ADDITIONAL INFORMATION.

DelDOT

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GALVANIZED STEEL BEAM SIGN POSTS VERTICAL AND LATERAL CLEARANCE

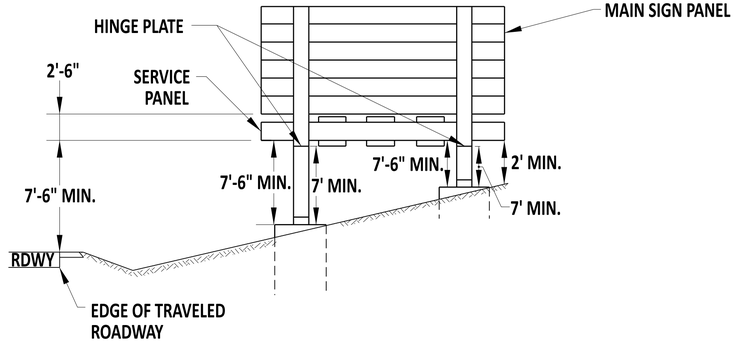
STANDARD NO. T-24 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

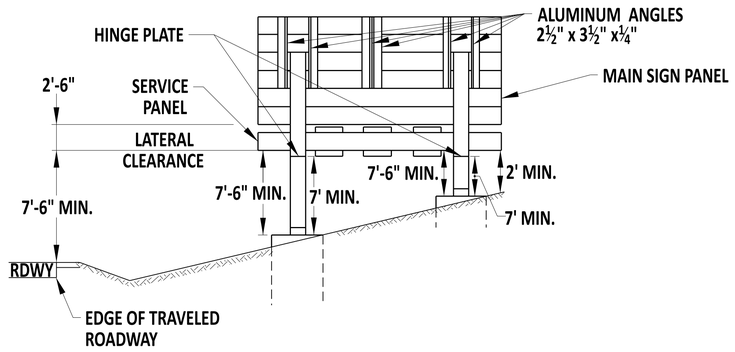
SCALE : NTS



NOTES: (ALL SCENARIOS)

1. MUST MAINTAIN 7'-0" MIN. FROM FOUNDATION TO HINGE PLATE ON BREAKAWAY SUPPORT.
2. MUST MAINTAIN 10'-0" FROM BOTTOM OF MAIN SIGN PANEL ABOVE EDGE OF TRAVELED LANE WHEN WHEN SERVICE PANEL IS PRESENT.
3. (1' X SIGN WIDTH) SERVICE PANEL ATTACHED TO "I" BEAMS WITH POST CLIPS (EIGHT (8) PER SERVICE PANEL)

SERVICE PANEL INSTALLATIONS TO NEW BREAKAWAY SUPPORTS



NOTES:

1. RAISE MAIN SIGN PANEL 2' MAX. TO OBTAIN THE PROPER CLEARANCE FROM ROADWAY.
2. SERVICE PANEL ATTACHED ABOVE HINGE PLATE WITH POSTCLIPS (EIGHT (8) PER SERVICE PANEL.
3. UNSUPPORTED MAIN SIGN PANEL TO BE STIFFENDED USING ALUMINUM ANGLES 2½ X 3½ X ¼.

SERVICE PANEL ATTACHMENTS TO EXISTING BREAKAWAY SUPPORTS

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RECOMMENDED

GALVANIZED STEEL BEAM SIGN POSTS SERVICE PANEL ATTACHMENT DETAILS

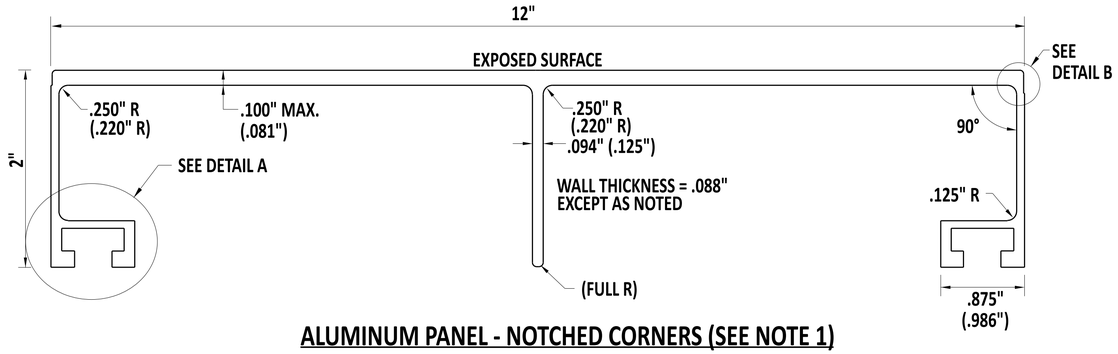
STANDARD NO. T-25 (2024) | SHT. 1 OF 1

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

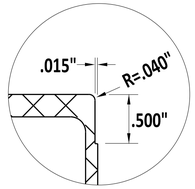
APPROVED — CHIEF ENGINEER — 01/11/2024 DATE

22-DEC-2023

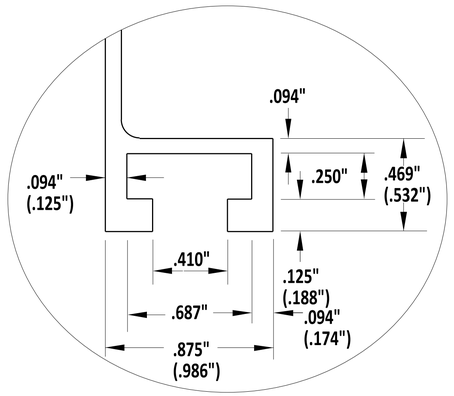
SCALE : NTS



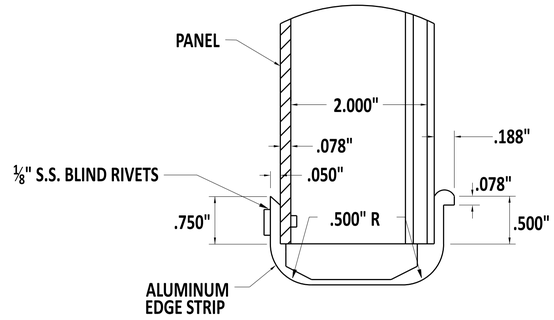
ALUMINUM PANEL - NOTCHED CORNERS (SEE NOTE 1)



DETAIL B



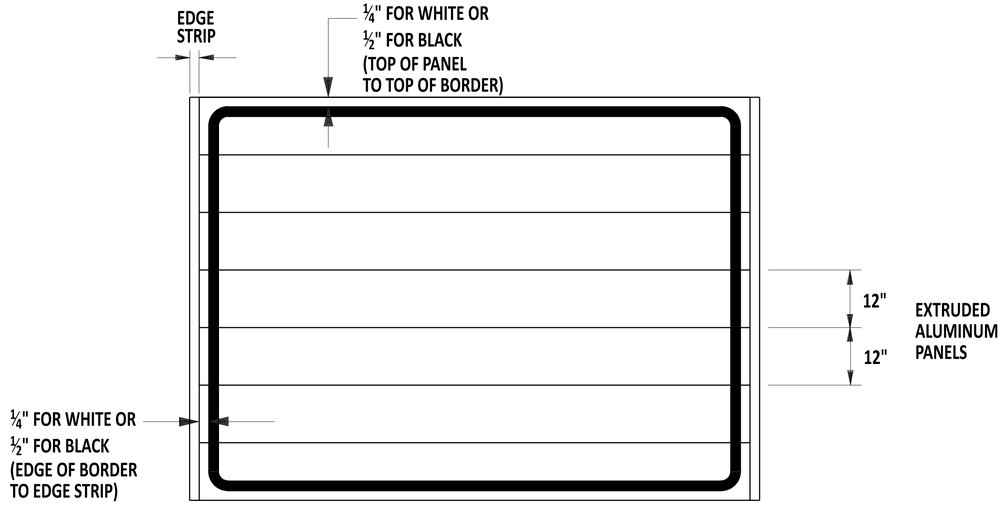
DETAIL A



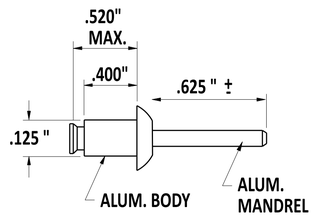
DETAIL OF EDGE STRIP

NOTE:

EDGE STRIP SHALL BE PLACED ON BOTH SIDES OF ALL EXTRUDED PANEL SIGNS.



BORDER DETAIL



DETAIL OF A BLIND RIVET FOR CUTOUT LETTER (TYP.)

NOTES:

1. ALUMINUM PANELS SHALL HAVE NOTCHED CORNERS AS SHOWN. NO OTHER TYPE CORNERS ARE ACCEPTABLE.
2. ALTERNATE DIMENSIONS INDICATED IN PARENTHESES ARE ACCEPTABLE.
3. THE REFLECTIVE SHEETING APPLIED TO EXTRUDED PANELS SHALL EXTEND APPROX. ⅜" OVER EACH SIDE IN THE NARROW DIRECTION AND SHALL BE ADHERED TO THE PANEL.

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Andrew Short — ENGINEERING SUPPORT — 12/22/2023 DATE

RECOMMENDED

EXTRUDED ALUMINUM DETAIL

STANDARD NO. T-26 (2024) | SHT. 1 OF 2

REVIEWED — DEPUTY DIRECTOR - DESIGN — 22 December 2023 DATE

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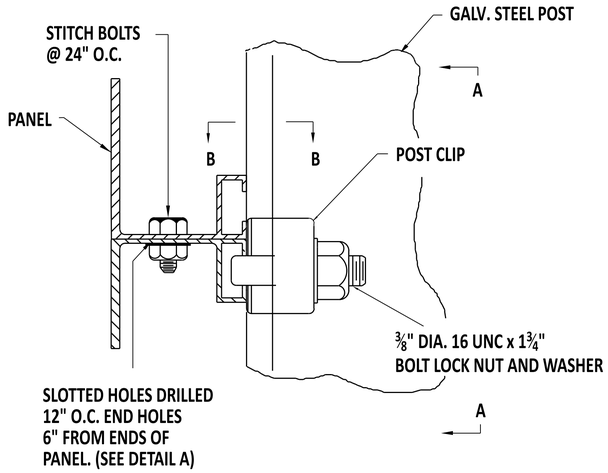
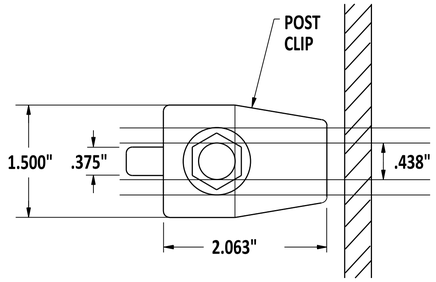
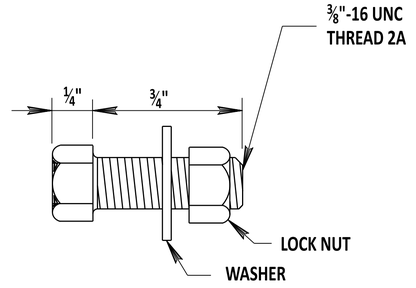
SCALE : NTS



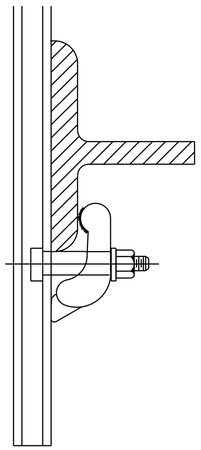
SIGN PANEL ASSEMBLY



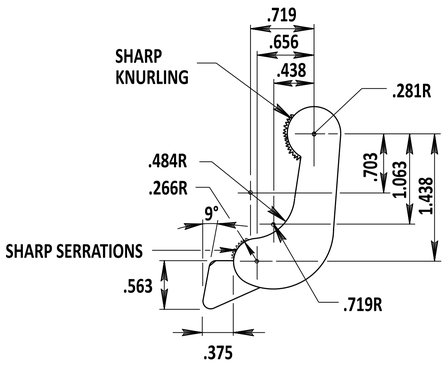
SECTION A-A



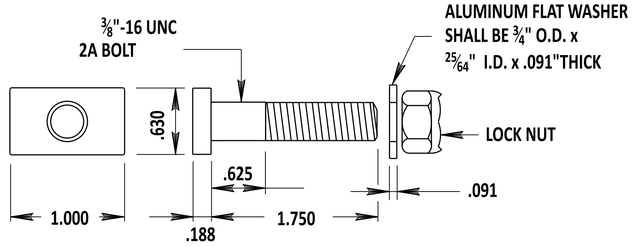
STITCH BOLT (TYP.)



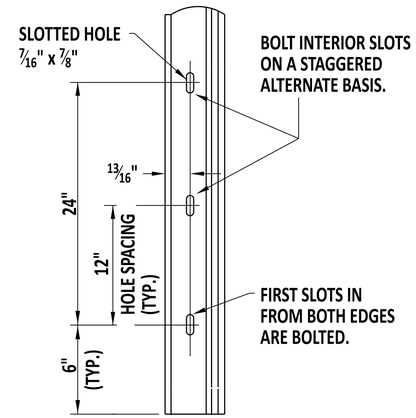
SECTION B-B



POST CLIP (TYP.)



POST CLIP BOLT (TYP.)



DETAIL A

BOLTS	B211, ALLOY 2024-T4, 6262-T9 OR 6061-T6
FLAT WASHERS	B209, ALLOY 2024-T4
RIVETS	ALLOY 5052
NUTS	B211, ALLOY 2017-T4
POST CLIPS	B108, ALLOY 356-T6

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EXTRUDED ALUMINUM DETAIL

STANDARD NO. T-26 (2024) | SHT. 2 OF 2

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