

SECTION I - BARRIER

SHEET NO.	NAME
B-L (2010)	– BARRIER LEGEND
B-1	– GUARDRAIL APPLICATIONS (TYPES 1-31, 2-31, AND 3-31)
	(2018) - 1 PLAN VIEWS
	(2017) - 2 ELEVATION VIEWS AND SPLICE DETAIL
	(2018) - 3 SECTION VIEWS
B-2	– GRADING FOR GUARDRAIL END TREATMENTS (TYPES 1, 2, AND 3)
	(2013) - 1 GUARDRAIL END TREATMENT, TYPE 1
	(2013) - 2 GUARDRAIL END TREATMENT, TYPE 2
	(2010) - 3 GUARDRAIL END TREATMENT, TYPE 3
B-3	– GUARDRAIL OVER CULVERTS (TYPES 1-31, 2-31, AND 3-31)
	(2013) - 1 GUARDRAIL OVER CULVERTS, TYPE 1-31
	(2013) - 2 GUARDRAIL OVER CULVERTS, TYPE 2-31
	(2013) - 3 GUARDRAIL OVER CULVERTS, TYPE 3-31
B-4 (2012)	– END ANCHORAGE , TYPE 31
B-5	– GUARDRAIL TO BARRIER CONNECTION (TYPES 1-31, 2-31, AND EXIT TYPE 31)
	(2010) - 1 GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 1-31
	(2010) - 2 GUARDRAIL TO BARRIER CONNECTION, TYPE 1 HARDWARE
	(2010) - 3 GUARDRAIL TO BARRIER CONNECTION, BENT PLATE RUB RAIL
	(2012) - 4 GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 2-31
	(2010) - 5 GUARDRAIL TO BARRIER CONNECTION, TYPE 2 HARDWARE
	(2010) - 6 GUARDRAIL TO BARRIER CONNECTION, EXIT TYPE 31
B-6	– BRIDGE RAIL RETROFIT (TYPES 1, 2, 3, AND 4)
	(2013) - 1 BRIDGE RAIL RETROFIT, ENTRANCE AND END APPLICATIONS
	(2010) - 2 BRIDGE RAIL RETROFIT, TYPES 1 AND 2
	(2010) - 3 BRIDGE RAIL RETROFIT, TYPE 2 HARDWARE
	(2010) - 4 BRIDGE RAIL RETROFIT, TYPE 3
	(2010) - 5 BRIDGE RAIL RETROFIT, TYPE 4
B-7 (2010)	– W-BEAM, TYPE 1-27 TO TYPE 1-31 TRANSITION SECTION
B-8	– RESERVED
B-9	– RESERVED
B-10	– RESERVED
B-11	– RESERVED
B-12	– RESERVED
B-13	– HARDWARE
	(2010) - 1 W-BEAM ELEVATION AND SECTION VIEWS
	(2010) - 2 W-BEAM STEEL POST AND OFFSET BLOCK
	(2010) - 3 W-BEAM TERMINAL CONNECTOR
	(2010) - 4 THRIE BEAM AND THRIE BEAM EXPANSION ELEMENT ELEVATION AND SECTION VIEWS
	(2010) - 5 THRIE BEAM STEEL POST AND OFFSET BLOCK
	(2010) - 6 ASYMMETRIC AND SYMMETRIC W-BEAM TO THRIE BEAM TRANSITION SECTION
	(2010) - 7 SHORT AND LONG WOOD BREAKAWAY POSTS, STEEL TUBE, SOIL PLATE, AND OFFSET BLOCKS
	(2012) - 8 SWAGED CABLE ASSEMBLAGE AND HARDWARE
	(2010) - 9 GUARDRAIL DELINEATOR AND W-BEAM BEARING PLATE
	(2010) - 10 GUARDRAIL MOUNTED RAIL
B-14	– CONCRETE SAFETY BARRIER (F SHAPE)
	(2012) - 1 32" (960) CONCRETE BARRIER, TYPICAL CAST-IN-PLACE OR SLIP-FORM ELEVATION AND SECTION VIEWS
	(2009) - 2 32" (960) CONCRETE BARRIER, TYPICAL PRE-CAST ELEVATION AND SECTION VIEWS
	(2009) - 3 42" (1050) CONCRETE BARRIER, TYPICAL CAST-IN-PLACE OR SLIP-FORM ELEVATION AND SECTION VIEWS
	(2009) - 4 SLOTTED PLATE CONNECTION DETAILS
B-15	– GUARDRAIL APPLICATIONS (TYPES 1-27, 2-27, AND 3-27)
	(2010) - 1 PLAN VIEWS
	(2010) - 2 ELEVATION VIEWS AND SPLICE DETAIL
	(2010) - 3 SECTION VIEWS



SHEET NO. NAME

SECTION I - BARRIER (CONT'D)

B-16 - GUARDRAIL OVER CULVERTS (TYPES 1-27, 2-27, AND 3-27)

(2013) - 1 GUARDRAIL OVER CULVERTS, TYPE 1-27

(2013) - 2 GUARDRAIL OVER CULVERTS, TYPE 2-27

(2013) - 3 GUARDRAIL OVER CULVERTS, TYPE 3-27

B-17 (2010) - GUARDRAIL END TREATMENT (TYPE 4-27)

B-18 (2010) - CURVED GUARDRAIL SECTION

B-19 (2012) - END ANCHORAGE (TYPE 27)

B-20 - BURIED END SECTION

(2010) - 1 BURIED END SECTION - SINGLE RAIL

(2010) - 2 BURIED END SECTION - DOUBLE RAIL

(2010) - 3 POST, CONCRETE BLOCK, AND RUBRAIL DETAILS

B-21 - GUARDRAIL TO BARRIER CONNECTION (TYPES 1-27, 2-27, AND EXIT TYPE 27)

(2010) - 1 GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 1-27

(2010) - 2 GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 2-27

(2010) - 3 GUARDRAIL TO BARRIER CONNECTION, EXIT TYPE 27

SHEET NO. NAME

SECTION II - CURB & GUTTER

C-1 - P.C.C. CURB AND INTEGRAL P.C.C. CURB & GUTTER

(2013) - 1 P.C.C. CURB, TYPICAL CURB SECTION, AND TYPICAL TAPER SECTION AT NOSE OF MEDIANS

(2012) - 2 INTEGRAL P.C.C. CURB & GUTTER

(2018) - 3 INTEGRAL P.C.C. CURB & GUTTER (FOR USE AT CURB RAMPS ONLY)

C-2 - CURB RAMPS

(2018) - 1 TYPE 1

(2018) - 2 TYPE 2, 3, AND 4

(2018) - 3 TYPE 5

C-3 (2018) - ENTRANCES

C-4 (2012) - CURB OPENING DETAILS

C-5 (2017) - CURB OPENING WITH SIDEWALK DETAIL

C-6 (2017) - CURB RETAINING WALL

SHEET NO. NAME

SECTION III - DRAINAGE

D-1 - CONCRETE 6:1 SAFETY END STRUCTURE

(2018) - 1 DETAIL VIEWS

(2018) - 2 SCHEDULES

D-2 - CONCRETE 10:1 SAFETY END STRUCTURE

(2018) - 1 DETAIL VIEWS

(2018) - 2 SCHEDULES

D-3 - SAFETY GRATES

(2005) - 1 SAFETY END STRUCTURE GRATE AND ASSEMBLY DETAIL

(2007) - 2 PERSONNEL SAFETY GRATE FOR PIPE INLET DETAIL

D-R (2017) - DRAINAGE INLET REFERENCE SHEET

D-4 (2009) - INLET BOX DETAILS

D-5 - DRAINAGE INLET DETAILS

(2010) - 1 DRAINAGE INLET ASSEMBLY

(2014) - 2 DRAINAGE INLET FRAME AND GRATES

(2012) - 3 DRAINAGE INLET TOP UNITS

(2010) - 4 DRAINAGE INLET COVER SLAB DETAILS

(2010) - 5 DOUBLE INLET COVER SLAB DETAILS

(2012) - 6 34" x 24" DRAINAGE INLET AND COVER SLAB DETAILS

(2010) - 7 34" x 18" DRAINAGE INLET DETAILS

(2018) - 8 DRAINAGE INLET TOP UNIT, TYPE S

(2010) - 9 DOGHOUSE INLET BOX



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DEPARTMENT OF TRANSPORTATION

INDEX OF SHEETS (2018)

SHEET 2 OF 5

SHEET NO. NAME

SECTION III - DRAINAGE (CONT'D)

D-6	– MAHOLE DETAILS
	(2009) - 1 BOX MANHOLE ASSEMBLY
	(2001) - 2 ROUND MANHOLE ASSEMBLY
	(2001) - 3 MANHOLE, TOP UNIT, FRAME AND COVER
	(2007) - 4 BOX MANHOLE COVER SLAB
D-7	– JUNCTION BOX DETAILS
	(2009) - 1 JUNCTION BOX ASSEMBLY
	(2007) - 2 JUNCTION BOX COVER SLAB
D-8 (2018)	– PIPE BEDDING
D-9 (2018)	– PERFORATED PIPE UNDERDRAIN
D-10 (2011)	– PIPE PLUGGING DETAIL
D-11 (2018)	– SAFETY METAL END SECTION

SHEET NO. NAME

SECTION IV - EROSION

E-1 (2014)	– CONCRETE WASHOUT
E-2 (2014)	– SILT FENCE
E-3 (2014)	– SEDIMENT TRAP
E-4 (2014)	– INLET SEDIMENT CONTROL, DRAINAGE INLET
E-5 (2014)	– INLET SEDIMENT CONTROL, CULVERT INLET
E-6 (2014)	– PORTABLE SEDIMENT TANK
E-7 (2014)	– SUMP PIT
E-8 (2014)	– SKIMMER DEWATERING DEVICE
E-9 (2014)	– STONE CHECK DAM
E-10 (2014)	– TEMPORARY SLOPE DRAIN
E-11 (2014)	– INCREMENTAL STABILIZATION
E-14 (2014)	– STABILIZED CONSTRUCTION ENTRANCE
E-15 (2014)	– SANDBAG DIKE
E-16 (2014)	– SANDBAG DIVERSION
E-17 (2014)	– GEOTEXTILE-LINED CHANNEL DIVERSION
E-18 (2014)	– TURBIDITY CURTAIN
E-19 (2014)	– STILLING WELL
E-20 (2014)	– RIPRAP ENERGY DISSIPATOR
E-21 (2014)	– STONE OUTLET DETAIL



SECTION V - LANDSCAPING

SHEET NO.	NAME
L-1	– PLANTING DETAILS
(2017) - 1	ROADSIDE SHRUB PLANTING DETAIL
(2017) - 2	TREE PLANTING DETAIL
(2017) - 3	PERENNIAL/GROUND COVER PLANTING DETAIL

SECTION VI - MISCELLANEOUS

SHEET NO.	NAME
M-1 (2001)	– RIGHT-OF-WAY FENCE
M-2 (2017)	– RIGHT-OF-WAY MONUMENTATION
M-3 (2018)	– SHARED-USE PATH & SIDEWALK DETAILS
M-4 (2011)	– BIKE RACK LAYOUT DETAILS
M-5 (2004)	– WOOD RAIL FENCE
M-6 (2011)	– PATTERNED HOT-MIX OR CONCRETE & BRICK PAVER DETAILS
M-7 (2006)	– CHAIN LINK FENCE DETAILS
M-8 (2014)	– P.C.C. PARKING BUMPER
M-9	– BUS STOP PAD DETAILS
(2018) - 1	BUS STOP PAD DETAILS, TYPES 1, 2, & 3
(2018) - 2	BUS STOP PAD WITH SHELTER DETAILS, TYPES 1 & 2
M-10	– BRIDGE SAFETY FENCE
(2014) - 1	BRIDGE SAFETY FENCE, TYPE 1
(2014) - 2	BRIDGE SAFETY FENCE, TYPE 2
(2017) - 3	HARDWARE
M-11 (2017)	– STEEL PLATE
M-12 (2018)	– DRIVEWAY TRANSVERSE SLOPE GRADING

SECTION VII - PAVEMENT

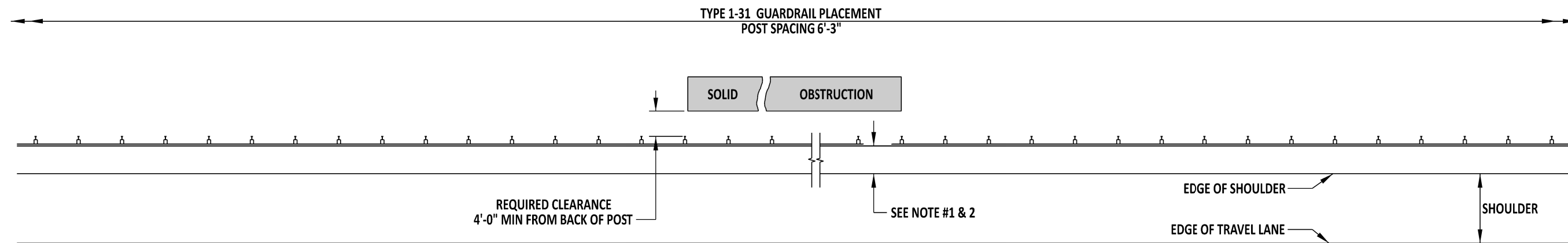
SHEET NO.	NAME
P-1	– P.C.C. PAVEMENT
(2001) - 1	SLAB PLAN (WITH DOWEL AND TIE LOCATIONS)
(2018) - 2	JOINT AND SEALANT DETAILS
(2001) - 3	W BOLT, HOOK BOLT, DOWEL AND TIE BAR DETAILS
(2001) - 4	DOWEL SUPPORT BASKET
(2001) - 5	DOWEL AND TIE BAR PLACEMENT TOLERANCES
P-2	– P.C.C. PAVEMENT PATCHING
(2008) - 1	FULL DEPTH PATCH, PLAN VIEW
(2008) - 2	FULL DEPTH PATCH, SECTION VIEWS
(2004) - 3	FULL DEPTH PATCH, SEALANT DETAILS, GROUT RETENTION DISK, AND DOWEL BAR
(2001) - 4	FULL DEPTH PATCH, DOWEL AND TIE BAR PLACEMENT TOLERANCES
(2001) - 5	PARTIAL DEPTH PATCH, PLAN AND SECTION VIEWS
P-3 (2014)	– BUTT JOINTS
P-4 (2013)	– PERMANENT CROSS-ROAD PATCH OVER PIPE TRENCH DETAIL
P-5 (2018)	– RUMBLE STRIPS
P-6 (2018)	– PAVEMENT SAFETY EDGE



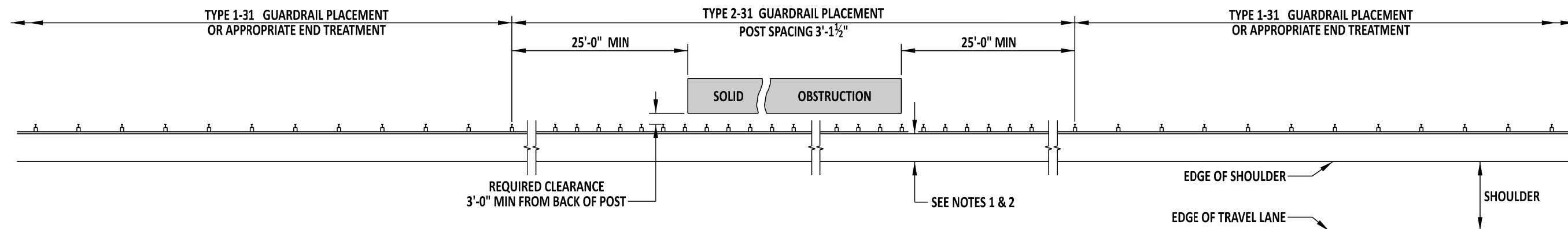
SECTION VIII - TRAFFIC

SHEET NO.	NAME
T-1	<div>- CONDUIT JUNCTION WELLS</div> <div>(2013) - 1 TYPE 1</div> <div>(2013) - 2 TYPE 4</div> <div>(2013) - 3 TYPE 5</div>
T-2 (2011)	<div>- JUNCTION WELL, GROUNDING & BONDING FOR STEEL FRAMES & LIDS</div>
T-3	<div>- CONDUIT JUNCTION WELLS</div> <div>(2013) - 1 TYPE 11</div> <div>(2012) - 2 TYPE 14</div> <div>(2012) - 3 TYPE 15</div>
T-4	<div>- CABINET BASES</div> <div>(2013) - 1 TYPES M & F</div> <div>(2017) - 2 TYPE "P & R"</div>
T-5	<div>- POLE BASES</div> <div>(2017) - 1 ROUND BASE & ROUND BASE WITH SQUARE FOUNDATION HEADER</div> <div>(2013) - 2 TYPICAL SECTION AND INSTALLATION (BASES 1, 2, 2A, 2B, 3, 3A, AND 3B)</div> <div>(2017) - 3 TYPICAL SECTION (BASES 6) AND POLE BASE DATA CHART</div> <div>(2014) - 4 TYPICAL SECTION (BASE 4A AND 4B) AND ANCHOR DETAIL</div>
T-6 (2011)	<div>- SPECIAL POLE BASE</div>
T-7 (2005)	<div>- SIGN FOUNDATION</div>
T-8	<div>- LOOP DETECTOR LEAD-IN WIRE INSTALLATION</div> <div>(2013) - 1 JUNCTION WELL BEHIND CURB OR CURB AND GUTTER WITH GRASS STRIP</div> <div>(2013) - 2 JUNCTION WELL BEHIND CURB OR CURB & GUTTER WITH SIDEWALK AND JUNCTION WELL DIRECTLY BEHIND CURB OR CURB & GUTTER</div> <div>(2013) - 3 JUNCTION WELL IN CONCRETE ISLAND</div> <div>(2013) - 4 JUNCTION WELL WITHOUT CURB OR CURB & GUTTER WITH SIDEWALK AND GRASS STRIPS AND JUNCTION WELL DIRECTLY ADJACENT TO PAVED SURFACE</div>
T-9	<div>- LOOP DETECTOR INSTALLATION</div> <div>(2013) - 1 LOOP DETECTOR SAWCUT TYPICAL, HOT MIX SURFACE TYPICAL SECTION, AND SPLICE KIT</div> <div>(2013) - 2 TYPICAL INTERSECTION LAYOUT</div> <div>(2013) - 3 PEDESTRIAN CROSSING TYPICAL LAYOUT</div>
T-10	<div>- **DETAIL REMOVED IN 2012 REVISION**</div>
T-11	<div>- MESSENGER WIRE ATTACHMENT</div> <div>(2005) - 1 INTERMEDIATE MESSENGER WIRE ATTACHMENT ON WOOD POLES</div> <div>(2005) - 2 ANGULAR INTERMEDIATE MESSENGER WIRE ATTACHMENT</div>
T-12	<div>- MESSENGER WIRE ATTACHMENT</div> <div>(2005) - 1 SPAN WIRE ATTACHMENT BETWEEN POLES</div> <div>(2005) - 2 DEAD END MESSENGER WIRE ATTACHMENT</div>
T-13 (2013)	<div>- CONDUIT JUNCTION WELL, TYPE 7</div>
T-14	<div>- EMERGENCY PREEMPTION RECIEVER</div> <div>(2006) - 1 UPRIGHT MOUNT</div> <div>(2005) - 2 INVERTED MOUNT</div>
T-15 (2013)	<div>- BREAKAWAY SIGN POST AND PIN ASSEMBLY DETAILS</div>
T-16 (2010)	<div>- WOOD BARRICADE DETAILS</div>
T-17 (2013)	<div>- ELECTRICAL SERVICE PEDESTAL - LIGHTING, SIGNAL & 'ITMS' COMPONENT INSTALLATIONS</div>

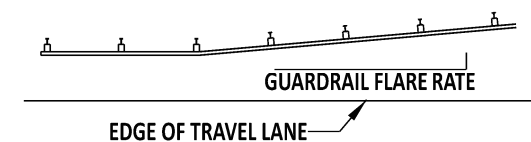




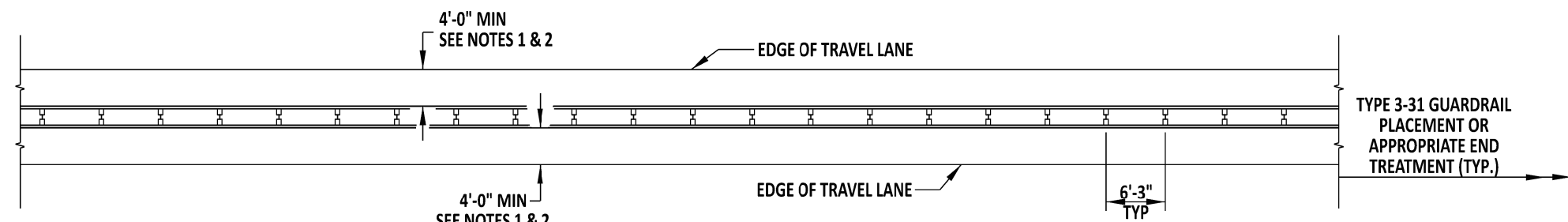
TYPE 1-31 GUARDRAIL
TYPICAL GUARDRAIL TREATMENT WHEN THE REQUIRED
4'-0" CLEARANCE TO THE OBSTRUCTION IS AVAILABLE



TYPE 2-31 GUARDRAIL
TYPICAL GUARDRAIL TREATMENT WHEN 3'-0" TO 4'-0"
OF CLEARANCE TO OBSTRUCTION IS AVAILABLE



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



TYPE 3-31 GUARDRAIL
TYPICAL MEDIAN GUARDRAIL TREATMENT

NOTES:

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



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DEPARTMENT OF TRANSPORTATION

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

STANDARD NO. B-1 (2018)

SHT. 1 OF 3

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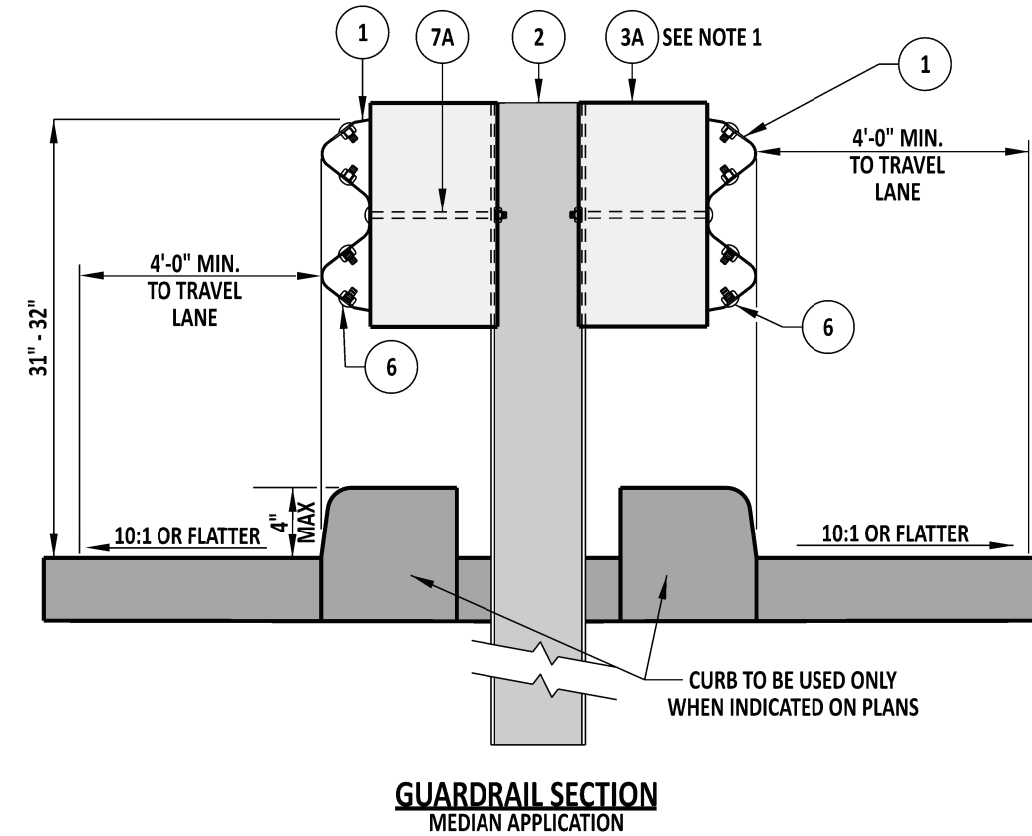
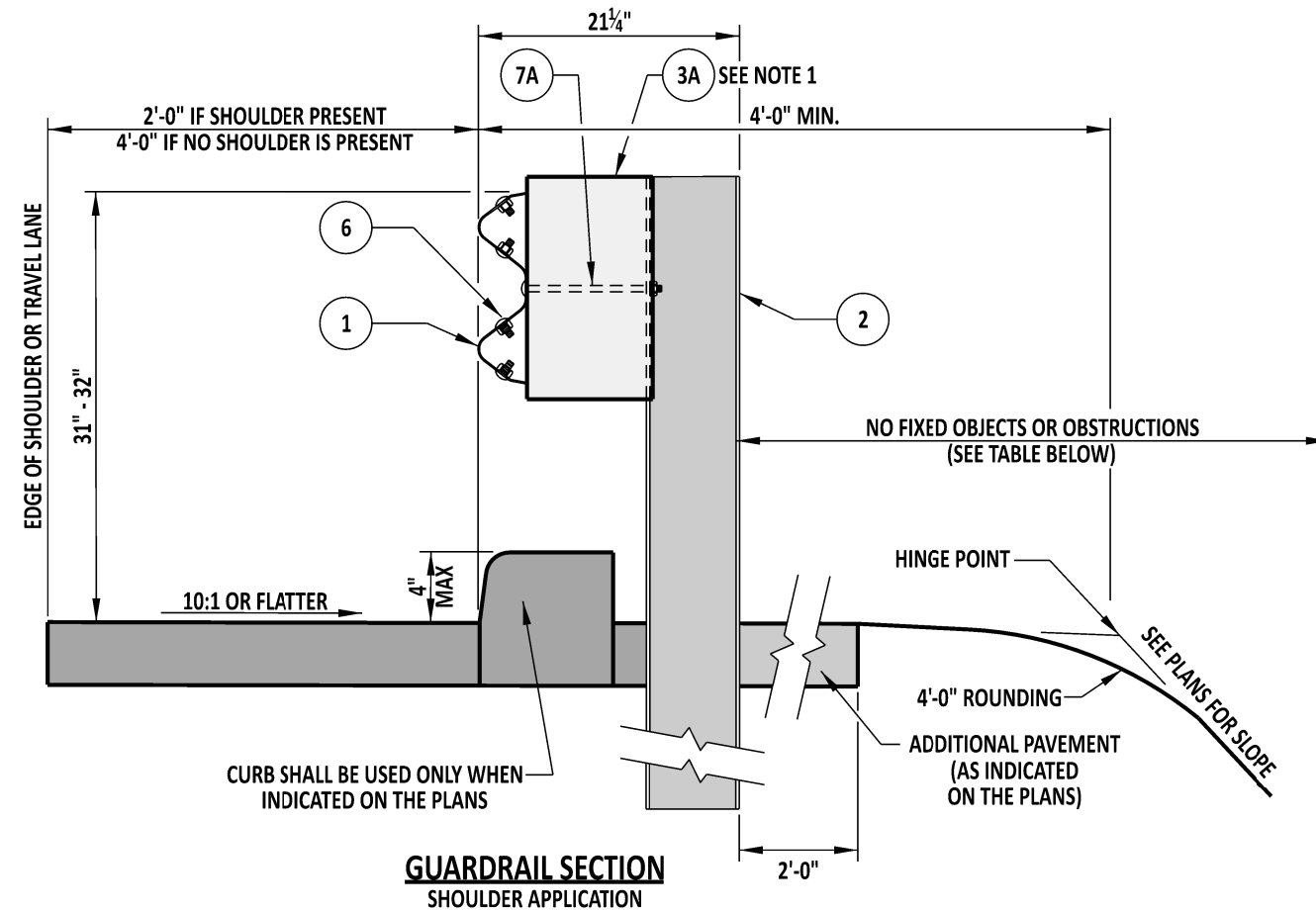
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CHIEF ENGINEER

1/04/2019
DATE

RECOMMENDED

SIGNATURE ON FILE
DESIGN ENGINEER

12/20/2018
DATE

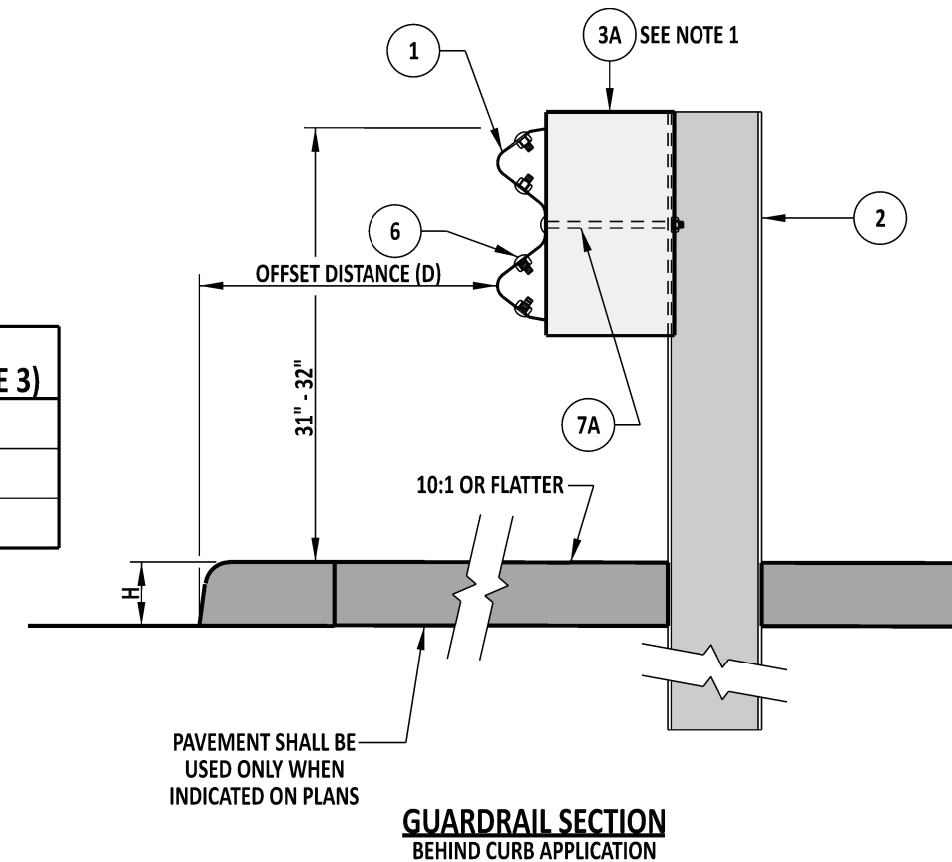


TYPE	POST SPACING	CLEAR AREA BEHIND POST
1	6'-3"	4'-0" MIN
2	3'-1 1/2"	3'-0" MIN

DESIGN SPEED	D (SEE NOTE 2)	H (SEE NOTE 3)
< 45 MPH	8'-0"	6"
45 TO 50 MPH	13'-0"	4"
> 50 MPH	SEE NOTE NOTE 4	4"

NOTES:

- 1). SEE STANDARD SPECIFICATIONS CONCERNING THE USE OF ALTERNATIVE OFFSET BLOCK MATERIALS.
- 2). THE FACE OF GUARDRAIL SHALL BE INSTALLED EITHER FLUSH WITH THE CURB FACE OR OFFSET A DISTANCE GREATER THAN D.
- 3). H IS DEFINED AS THE MAXIMUM CURB HEIGHT FOR THE CURB/ GUARDRAIL APPLICATION.
- 4). ON 50 MPH AND GREATER ROADWAYS, GUARDRAIL SHALL BE INSTALLED FLUSH TO THE CURB FACE.



**DELAWARE
DEPARTMENT OF TRANSPORTATION**

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

STANDARD NO. B-1 (2018)

SHT. 3 OF 3

APPROVED

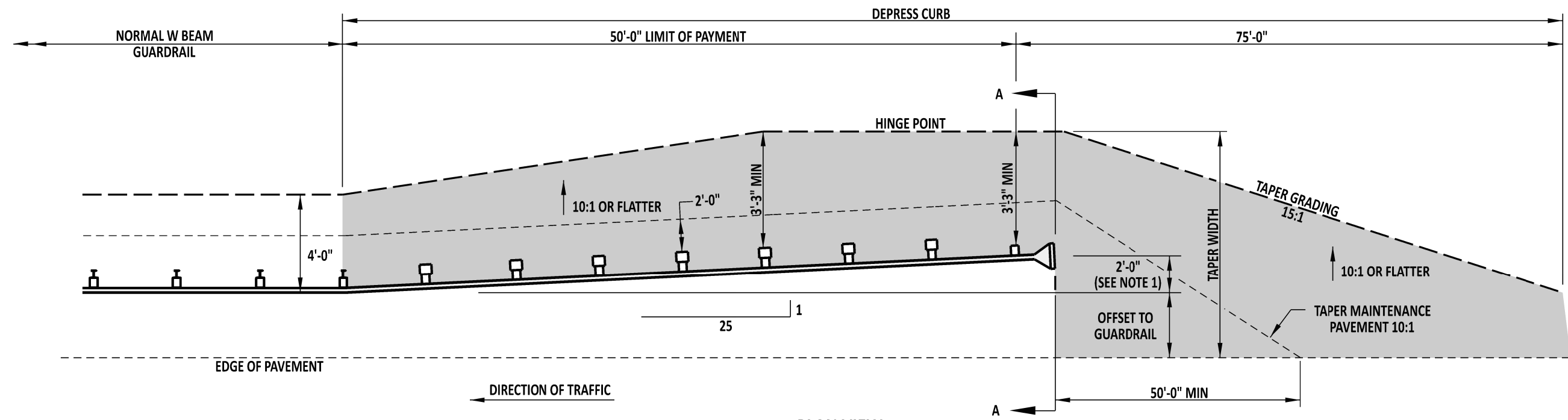
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CHIEF ENGINEER

1/04/2019
DATE

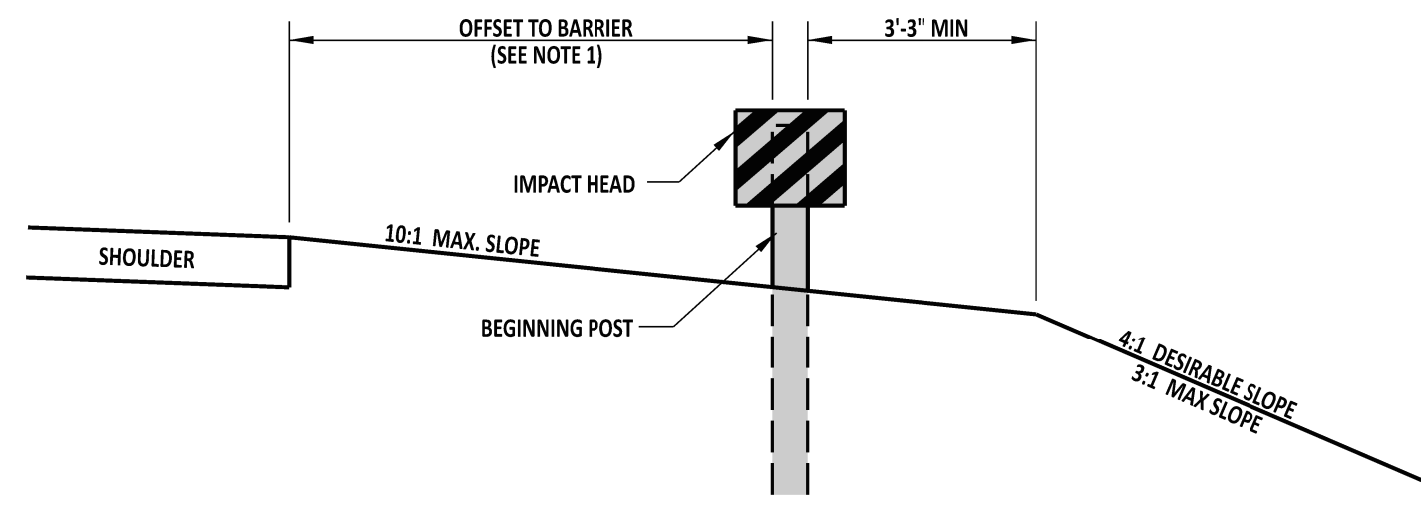
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12/20/2018
DATE




PLAN VIEW

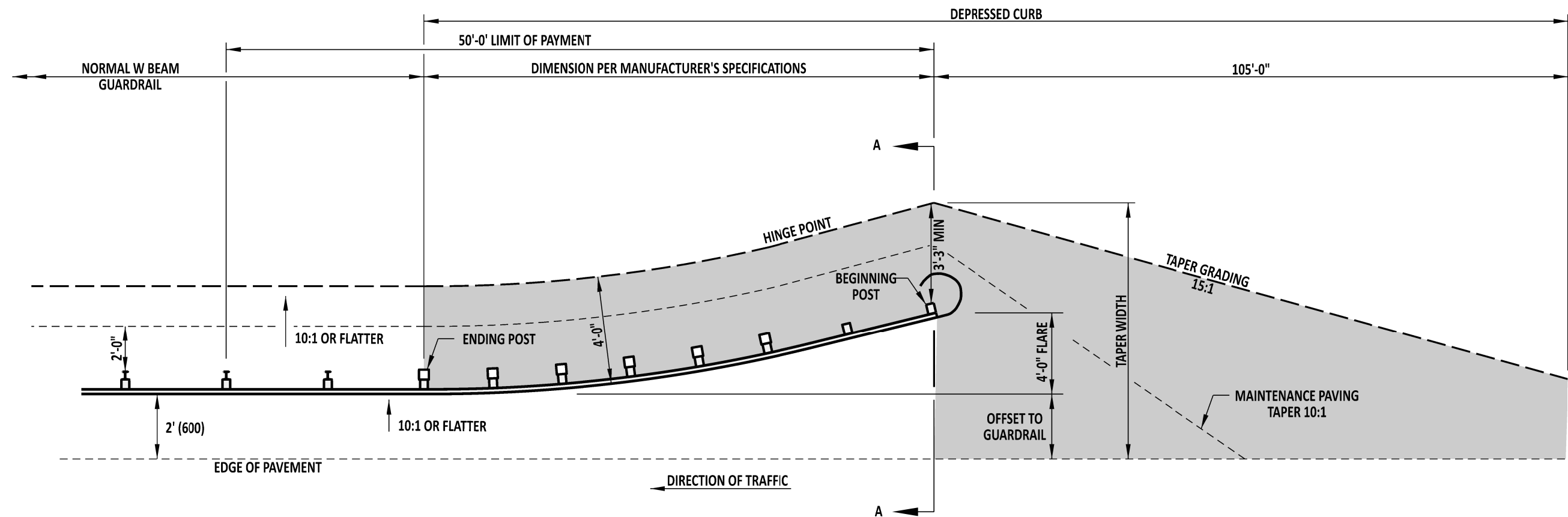


SECTION A-A

= NO OBSTRUCTIONS IN SHADED AREA

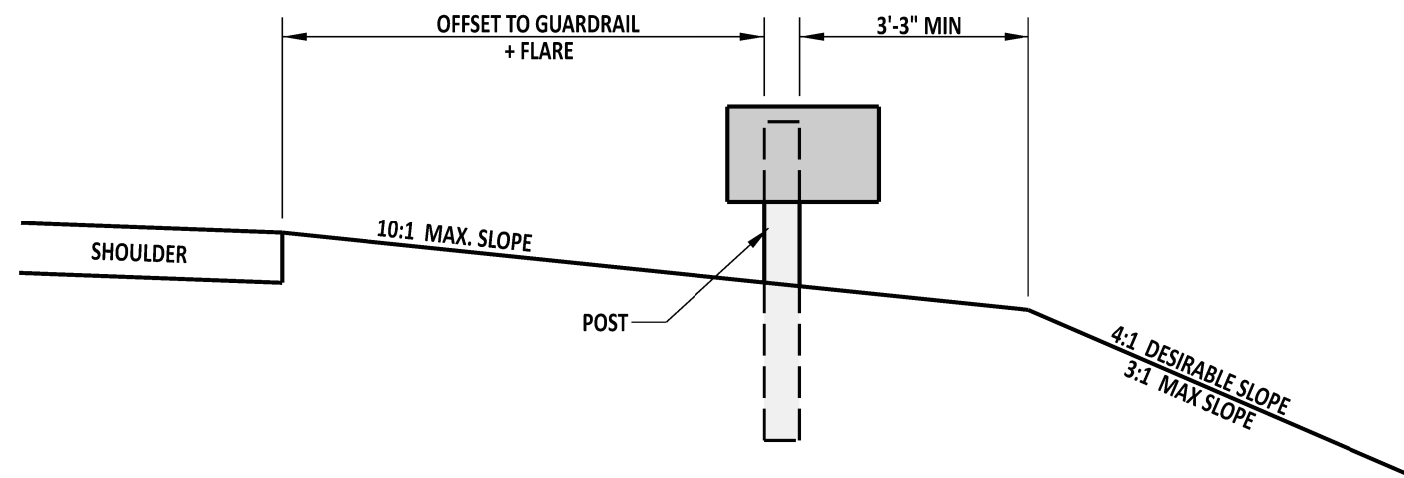
- NOTES:**
- 1). FLARE THE END TREATMENT AT 25:1 BEGINNING 50'-0" FROM THE END OF THE IMPACT HEAD, UNLESS THE CONSTRUCTION PLANS OR SPECIFICATIONS SPECIFY A SMALLER FLARE.
 - 2). THIS DETAIL WAS SOLELY CREATED TO SHOW THE GRADING REQUIRED FOR THIS TYPE OF ATTENUATOR AND IS APPLICABLE REGARDLESS OF THE HEIGHT OF THE GUARDRAIL SYSTEM.
 - 3). THE GUARDRAIL END TREATMENT ATTENUATOR SHALL BE INSTALLED AS PER THE MANUFACTURER'S AND THE DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS.
 - 4). IF CURB IS PRESENT, DEPRESS THE CURB TO A MAXIMUM HEIGHT OF 2" WITHIN THE LIMITS OF THE END TREATMENT AND THROUGHOUT THE LENGTH OF THE TAPER GRADING.

 DELAWARE DEPARTMENT OF TRANSPORTATION	GRADING FOR GUARDRAIL END TREATMENT ATTENUATOR, TYPE 1			APPROVED	SIGNATURE ON FILE	1/04/2019
	STANDARD NO.	B-2 (2018)	SHT. 1 OF 3	RECOMMENDED	SIGNATURE ON FILE	12/20/2018



PLAN VIEW

= NO OBSTRUCTIONS IN SHADED AREA



SECTION A-A

NOTES:

- 1). FLARE SHALL BE 4'-0" UNLESS THE CONSTRUCTION PLANS OR SPECIFICATIONS SPECIFY A SMALLER FLARE. FLARE MAY BE PARABOLIC OR STRAIGHT BASED ON MANUFACTURER'S SPECIFICATIONS.
- 2). THIS DETAIL WAS SOLELY CREATED TO SHOW THE GRADING REQUIRED FOR THIS TYPE OF ATTENUATOR AND IS APPLICABLE REGARDLESS OF THE HEIGHT OF THE GUARDRAIL SYSTEM.
- 3). THE GUARDRAIL END TREATMENT ATTENUATOR SHALL BE INSTALLED AS PER THE MANUFACTURER'S AND THE DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS.
- 4). IF CURB IS PRESENT, DEPRESS THE CURB TO A MAXIMUM HEIGHT OF 2" WITHIN THE LIMITS OF THE END TREATMENT AND THROUGHOUT THE LENGTH OF THE TAPER GRADING.



DELAWARE
DEPARTMENT OF TRANSPORTATION

GRADING FOR GUARDRAIL END TREATMENT ATTENUATOR, TYPE 2

STANDARD NO. B-2 (2018)

SHT. 2 OF 3

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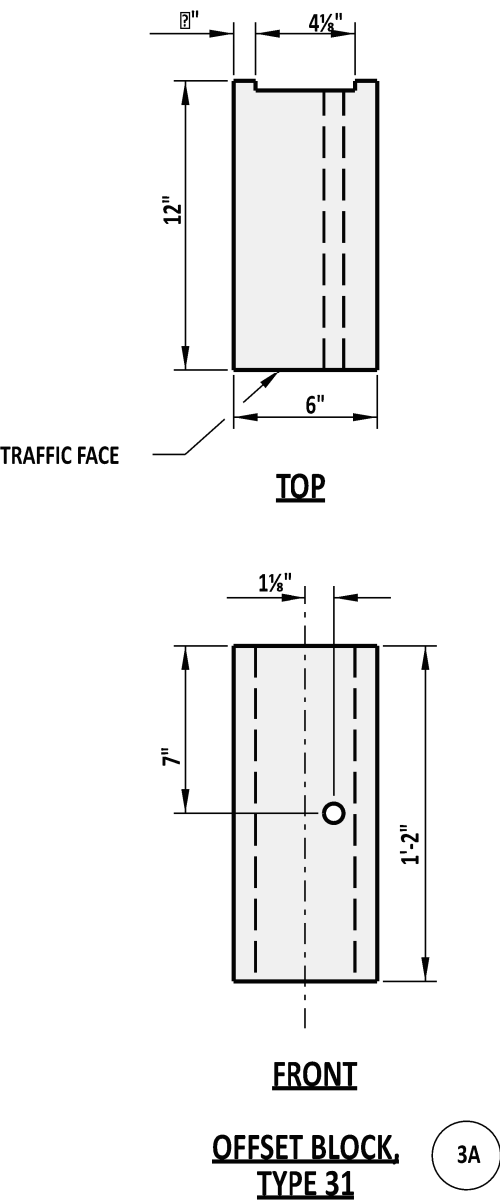
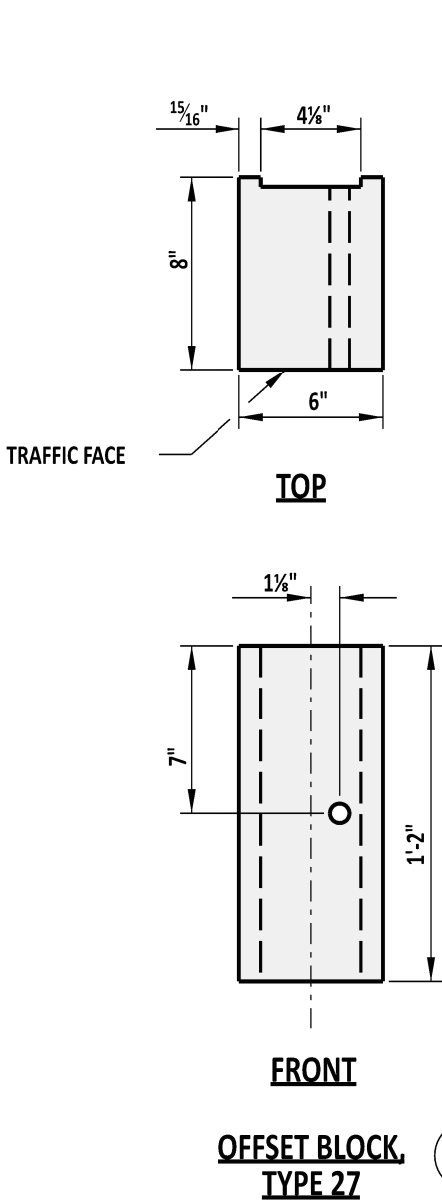
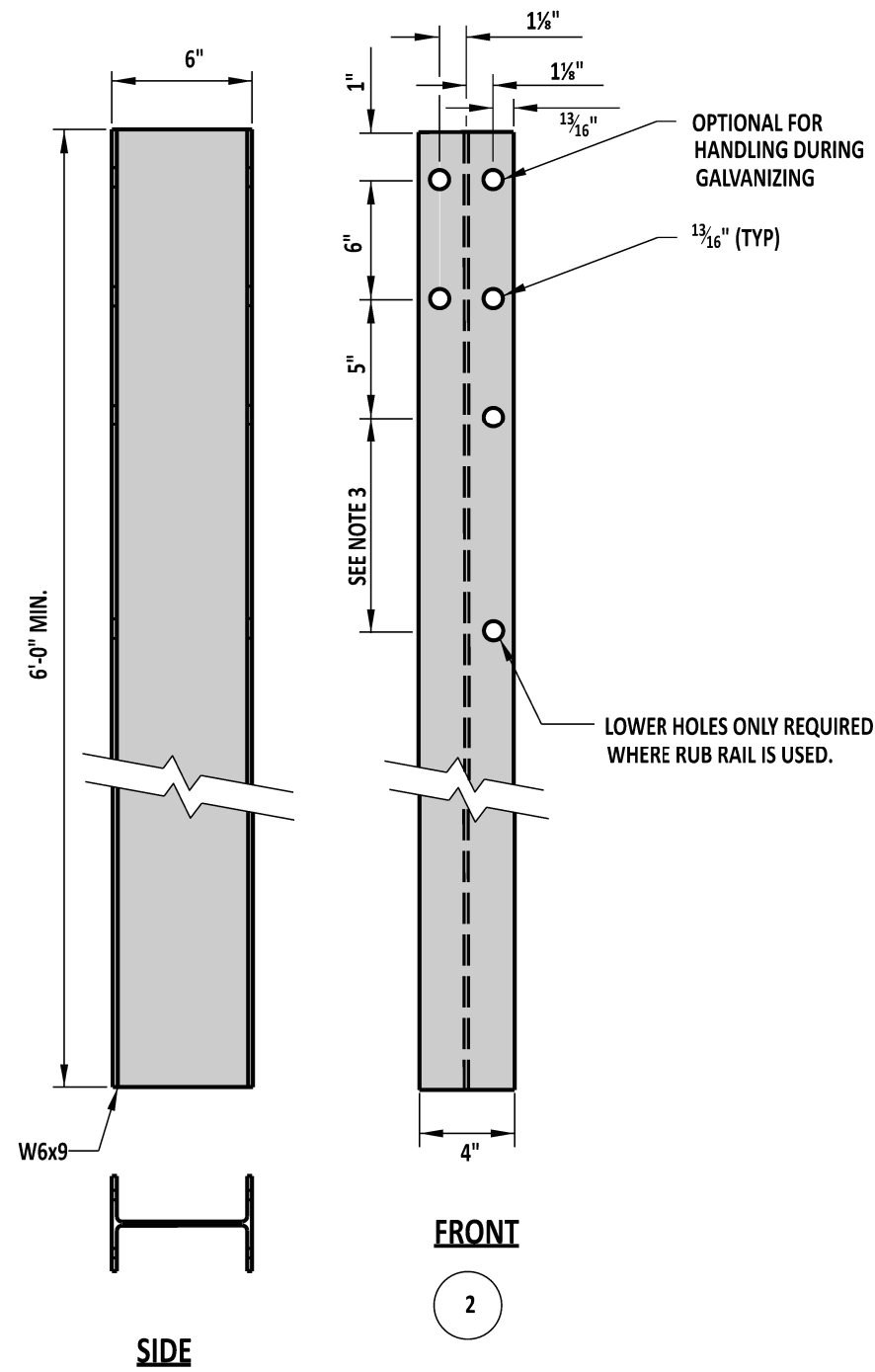
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1/04/2019
DATE

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DESIGN ENGINEER

12/20/2018
DATE



- NOTE:**
- 1). ALL HOLES SHALL BE 13/16" DIA. BOLT HOLE PATTERN IS SYMMETRICAL WITH RESPECT TO THE VERTICAL AXIS OF THE POST.
 - 2). WHERE CONDITIONS REQUIRE, ALTERNATE POST LENGTHS IN INCREMENTS OF 6" MAY BE USED.
 - 3). THE RUB RAIL HOLE OFFSET DISTANCE IS 10 1/2" FOR GUARDRAIL TO BARRIER CONNECTION, TYPE 1-27 AND 1-31, 1'-2" FOR GUARDRAIL TO BARRIER CONNECTION, TYPE 2-27, AND 7 1/8" FOR GUARDRAIL TO BARRIER CONNECTION, TYPE 2-31.



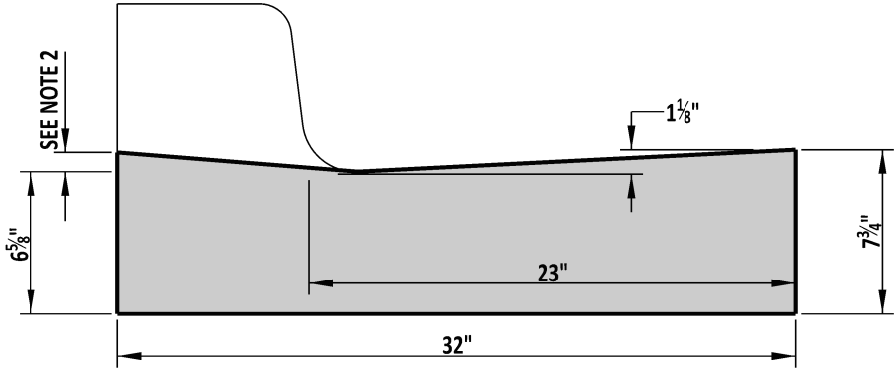
DELAWARE
DEPARTMENT OF TRANSPORTATION

W-BEAM STEEL POST AND OFFSET BLOCK

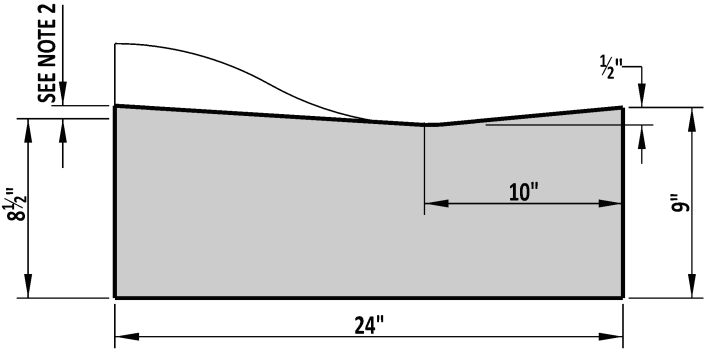
HARDWARE				APPROVED		SIGNATURE ON FILE		1/04/2019
STANDARD NO. B-13 (2018)				SHT. 2 OF 10		CHIEF ENGINEER		DATE
						RECOMMENDED		12/20/2018
						DESIGN ENGINEER		DATE

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

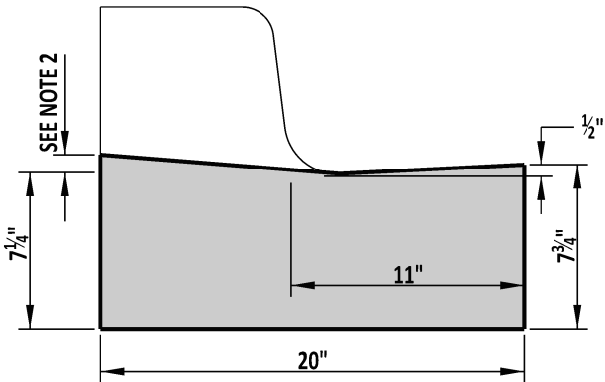
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INTEGRAL P.C.C. CURB AND GUTTER
TYPES 1-2 THRU 1-8



INTEGRAL P.C.C. CURB AND GUTTER
TYPE 2



INTEGRAL P.C.C. CURB AND GUTTER
TYPES 3-2 THRU 3-8

NOTES:

- 1). WHEN P.C.C. CURB OR INTEGRAL P.C.C. CURB AND GUTTER IS PLACED ADJACENT TO PORTLAND CEMENT CONCRETE PAVEMENT, CONSTRUCT THE JOINT AS PER THE LONGITUDINAL JOINT SEALANT DETAIL ON DETAIL P-2, SHEET 3. USE APPROVED JOINT FILLER TO SEAL. WORK TO BE PAID UNDER RESPECTIVE CURB AND GUTTER ITEM.
- 2). DEPRESS CURB FLUSH WITH PAVEMENT (WITH NO LIP). SLOPE THE TOP OF THE CURB TO MATCH THE RUNNING SLOPE OF THE ADJACENT PEDESTRIAN CONNECTION. THE MAXIMUM RUNNING SLOPE IS 8.3%. THE MAXIMUM SLOPE OF THE GUTTER PAN AT THE PEDESTRIAN CONNECTION IS 5%.
- 3). SEE TYPICAL CURB SECTION DETAIL AND NOTE 6 ON DETAIL C-1, SHEET 1 FOR PLACEMENT OF GABC UNDER CURB AND GUTTER.
- 4). TRANSITION FROM STANDARD GUTTER SLOPE TO SLOPE SHOWN ON THIS DETAIL OVER A DISTANCE OF 5'-0".



DELAWARE
DEPARTMENT OF TRANSPORTATION

INTEGRAL P.C.C. CURB & GUTTER
(FOR USE AT PEDESTRIAN CONNECTIONS ONLY)

STANDARD NO.

C-1 (2018)

SHT. 3

OF 3

APPROVED

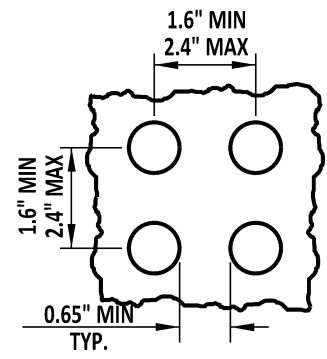
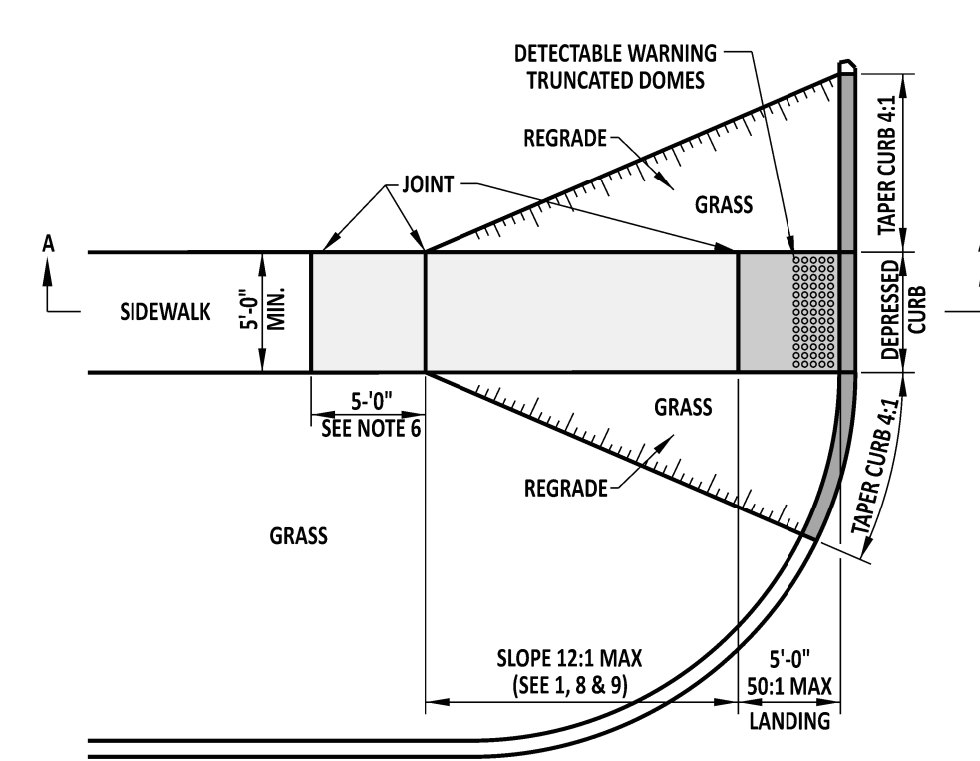
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1/04/2019
DATE

RECOMMENDED

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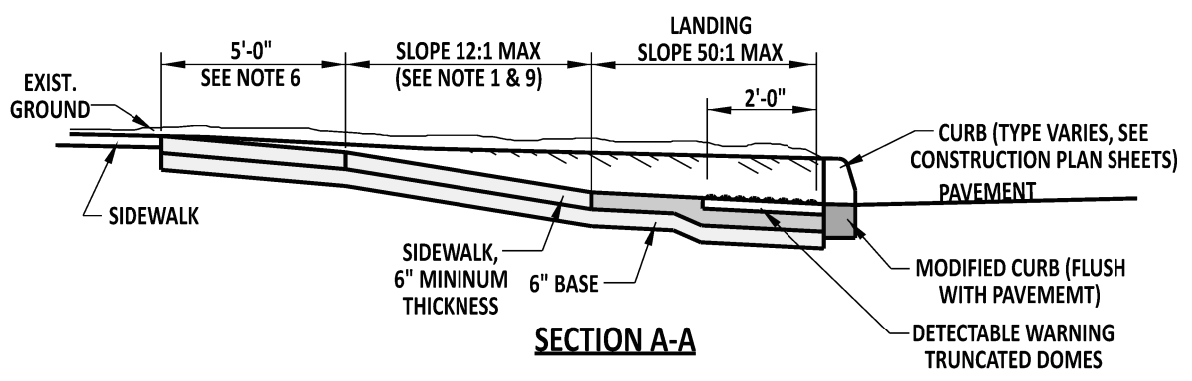
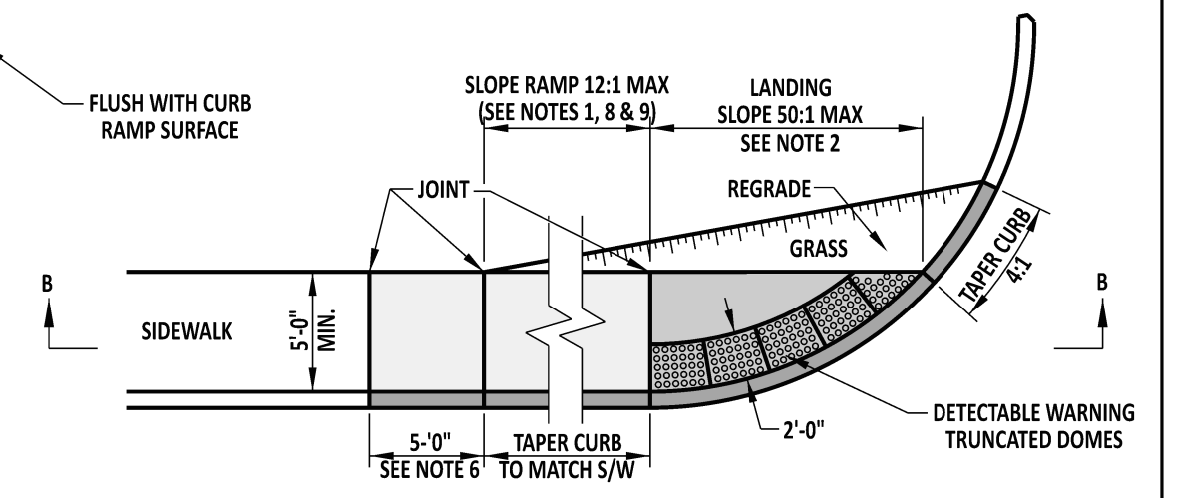
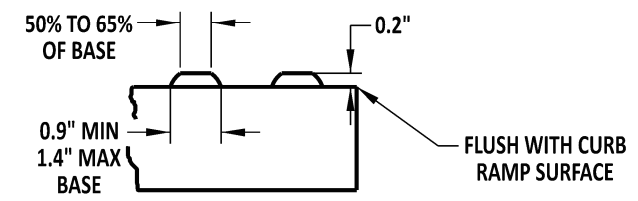
12/20/2018
DATE



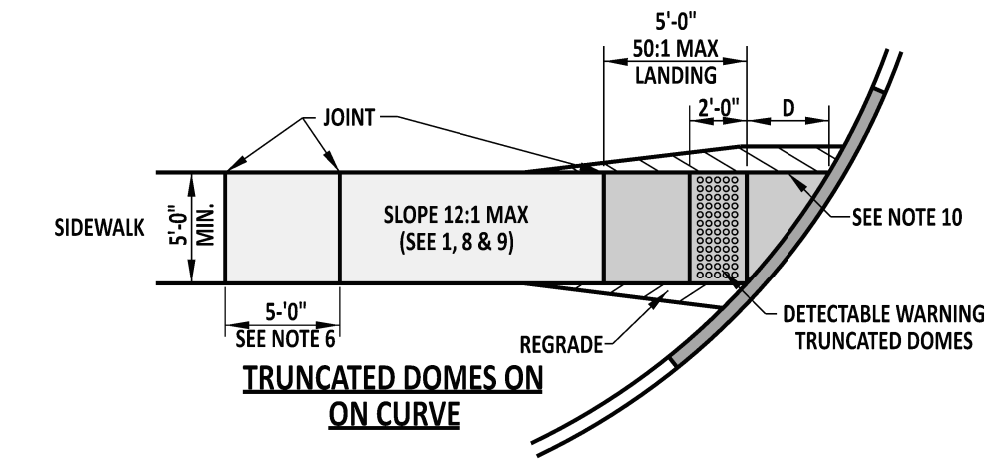
DETECTABLE WARNING TRUNCATED DOME DETAILS

NOTES:

- ENTIRE DEPRESSED AREA OF CURB EXCLUDING THE TAPERED CURBS SHALL HAVE DETECTABLE WARNING TRUNCATED DOMES.
- THE DETECTABLE WARNING SYSTEM SHALL EXTEND AT LEAST 2'-0" IN LENGTH, MEASURED IN THE DIRECTION OF TRAVEL, FROM THE BACK OF THE CURB ALONG THE PEDESTRIAN CONNECTION SURFACE.
- SEE SPECIFICATION FOR ADDITIONAL INFORMATION.



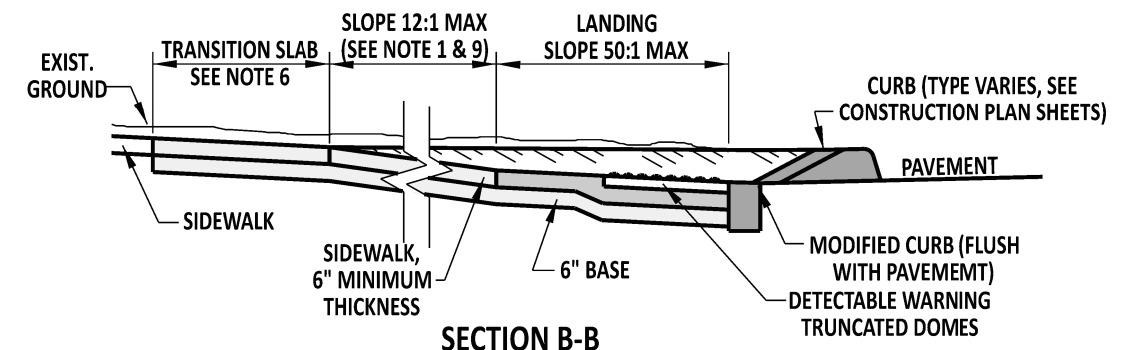
SECTION A-A



TRUNCATED DOMES ON ON CURVE

PEDESTRIAN CONNECTION, TYPE 1

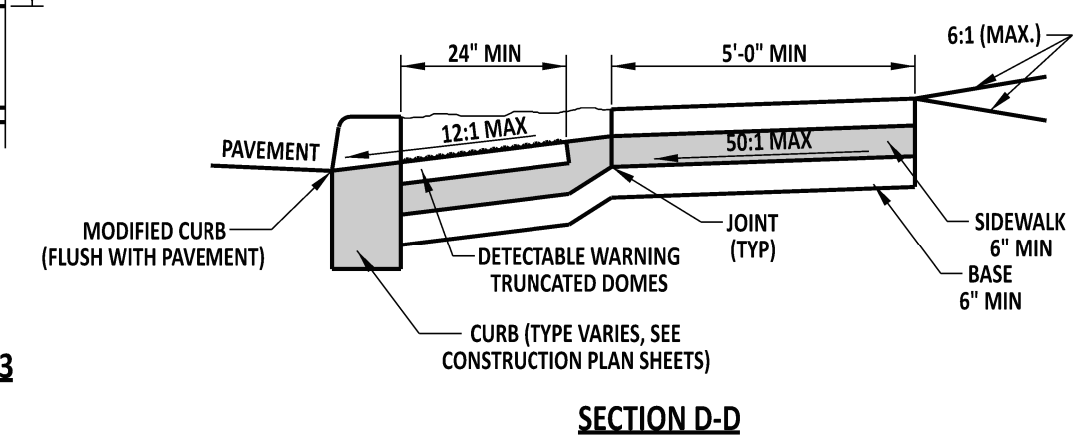
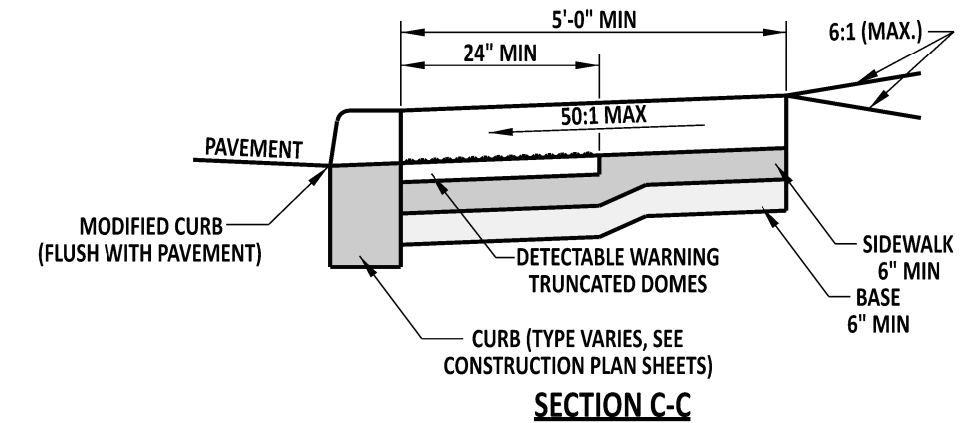
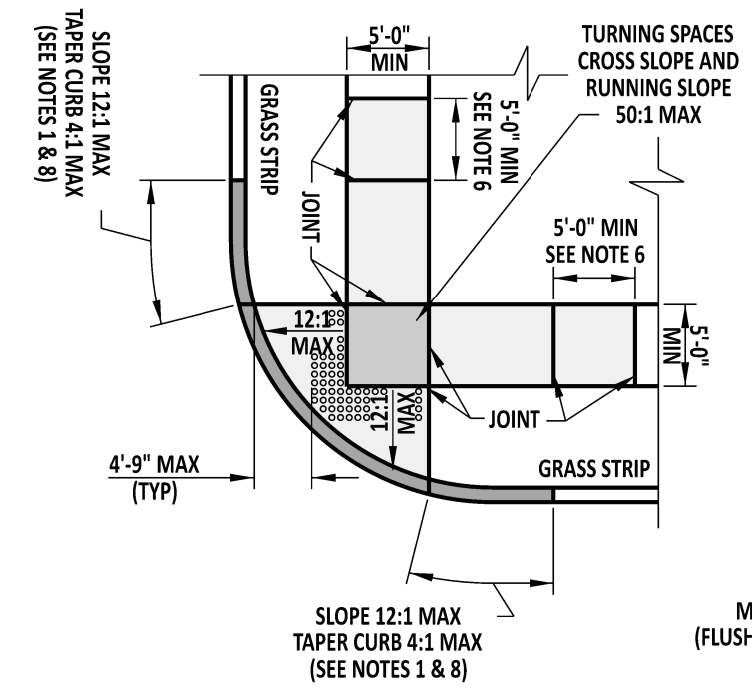
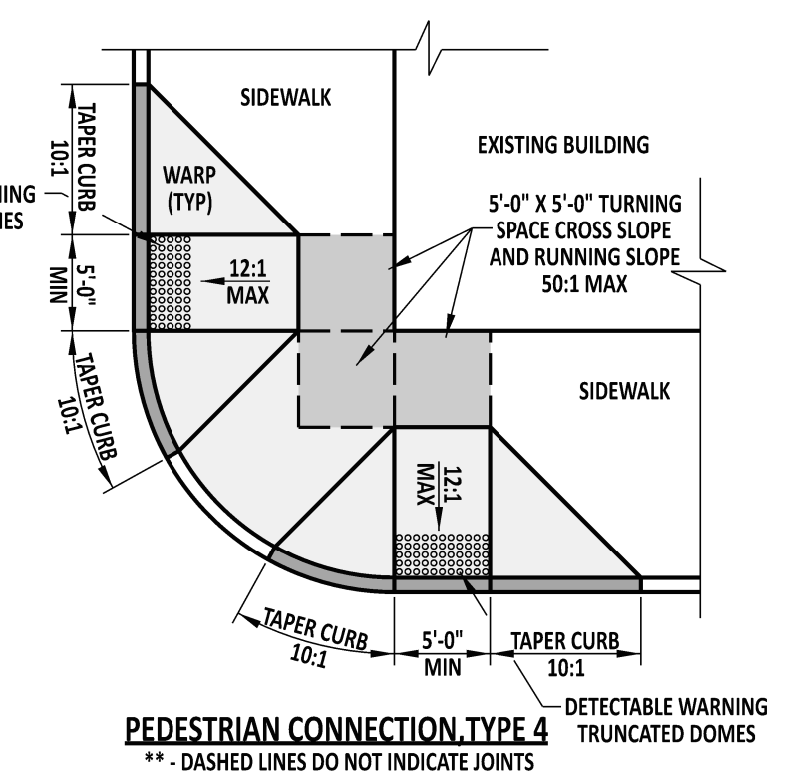
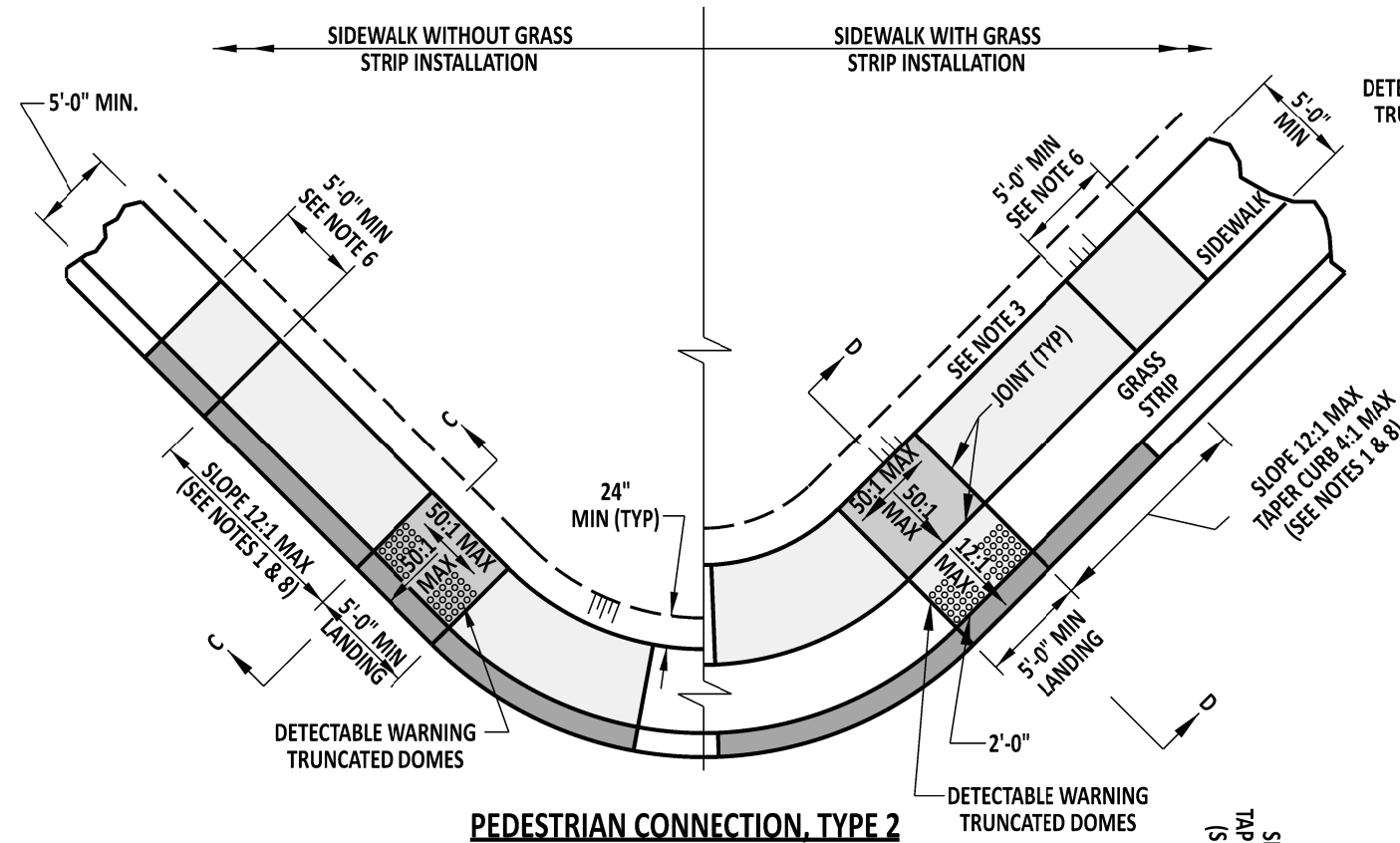
SECTION B-B



NOTES:

- FOR ALTERATIONS WHERE THE MAXIMUM ALLOWABLE 12:1 RUNNING SLOPE WILL NOT MEET THE EXISTING SIDEWALK GRADE WITHIN A LENGTH OF 15'-0", THE SLOPED SEGMENT OF THE PEDESTRIAN CONNECTION MAY BE LIMITED TO 15'-0" AT A CONSTANT SLOPE, AND ALLOWED TO EXCEED THE 12:1 MAXIMUM SLOPE.
- PEDESTRIAN CONNECTION AND SIDEWALK CROSS SLOPE SHALL BE 50:1 (2%) MAXIMUM. FOR REHABILITATION WORK, THE PEDESTRIAN CONNECTION CROSS SLOPE MAY MATCH THE SLOPE OF THE ADJACENT ROADWAY IN ACCORDANCE WITH THE LATEST VERSION OF THE PAS MANUAL.
- A 6:1 GRADE IS REQUIRED FOR A MINIMUM OF 2'-0" IMMEDIATELY ADJACENT TO THE PEDESTRIAN CONNECTION.
- THE MAXIMUM ALGEBRAIC DIFFERENCE IN GRADE BETWEEN THE PEDESTRIAN CONNECTION OR MODIFIED CURB AT THE FLOW LINE AND THE PAVEMENT SHALL BE 13.3%, HOWEVER 11% IS PREFERRED.
- LANDING AREA SHALL BE DELINEATED WITH JOINTS.
- FOR REHABILITATION WORK, PLACE TRANSITION SLAB TO TRANSITION FROM THE NEW PEDESTRIAN CONNECTION TO THE EXISTING SIDEWALK WHEN THE EXISTING SIDEWALK HAS A NON-CONFORMING RUNNING SLOPE, CROSS SLOPE, OR WIDTH. ADJACENT CURB TAPER SHOULD MATCH THE SLOPE OF THE TRANSITION SLAB.
- REFER TO THE DELAWARE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES FOR DETAILS REGARDING THE LOCATION OF PEDESTRIAN PUSH BUTTONS.
- CONSTRUCTION JOINTS ARE REQUIRED ON RAMPS AT THE INTERVAL SPECIFIED IN NOTE 6 ON DETAIL M-3, SHEET 1 OF 1. HOWEVER, EXPANSION MATERIAL SHALL NOT BE USED IN THE PEDESTRIAN CONNECTION SECTION.
- IF THE RUNNING SLOPE IS LESS THAN 20:1 (5%) THEN THE 50:1 (2%) LANDING CAN BE OMITTED. DETECTABLE WARNING SYSTEM MUST STILL BE PLACED.
- FOR INSTALLATIONS ON A RADIUS AND WHEN DIMENSION D IS LESS THAN 5'-0", THE DETECTABLE WARNING TRUNCATED DOMES SYSTEM SHALL BE INSTALLED AT THE INTERSECTION OF THE BACK OF THE CURB AND THE BEGINNING OF THE FULL WIDTH OF THE PEDESTRIAN ACCESS ROUTE. THE DOMES SHALL BE INSTALLED PERPENDICULAR TO THE PATH OF THE PEDESTRIAN TRAVEL AND BE THE FULL WIDTH OF THE PEDESTRIAN ACCESS ROUTE.

 <div>DELAWARE DEPARTMENT OF TRANSPORTATION</div>	PEDESTRIAN CONNECTION, TYPE 1 AND SECTIONS			APPROVED	SIGNATURE ON FILE	1/04/2019		
	STANDARD NO.	C-2 (2018)	SHT.	1	OF	3	RECOMMENDED	SIGNATURE ON FILE



NOTES:

- 1). FOR ALTERATIONS WHERE THE MAXIMUM ALLOWABLE 12:1 RUNNING SLOPE WILL NOT MEET THE EXISTING SIDEWALK GRADE WITHIN A LENGTH OF 15'-0", THE SLOPED SEGMENT OF THE PEDESTRIAN CONNECTION MAY BE LIMITED TO 15'-0" AT A CONSTANT SLOPE, AND ALLOWED TO EXCEED THE 12:1 MAXIMUM SLOPE.
- 2). PEDESTRIAN CONNECTION AND SIDEWALK CROSS SLOPE SHALL BE 50:1 (2%) MAXIMUM. FOR REHABILITATION WORK, THE PEDESTRIAN CONNECTION CROSS SLOPE MAY MATCH THE SLOPE OF THE ADJACENT ROADWAY IN ACCORDANCE WITH THE LATEST VERSION OF THE PAS MANUAL.
- 3). A 6:1 GRADE IS REQUIRED FOR A MINIMUM OF 2'-0" IMMEDIATELY ADJACENT TO THE PEDESTRIAN CONNECTION.
- 4). THE MAXIMUM ALGEBRAIC DIFFERENCE IN GRADE BETWEEN THE PEDESTRIAN CONNECTION OR CURB AND THE PAVEMENT SHALL BE 13.3%, HOWEVER 11% IS PREFERRED.
- 5). LANDING AREA SHALL BE DELINEATED WITH JOINTS.
- 6). FOR REHABILITATION WORK, PLACE TRANSITION SLAB TO TRANSITION FROM THE NEW PEDESTRIAN CONNECTION TO THE EXISTING SIDEWALK WHEN THE EXISTING SIDEWALK HAS A NON-CONFORMING RUNNING SLOPE, CROSS SLOPE, OR WIDTH. ADJACENT CURB SHOULD MATCH THE SLOPE OF THE TRANSITION SLAB.
- 7). REFER TO DELAWARE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES FOR DETAILS REGARDING THE LOCATION OF PEDESTRIAN PUSH BUTTONS.
- 8). CONSTRUCTION JOINTS ARE REQUIRED AT THE INTERVALS SPECIFIED IN NOTE 6 ON DETAIL M-3, SHEET 1 OF 1. HOWEVER, EXPANSION MATERIAL SHALL NOT BE USED IN THE PEDESTRIAN CONNECTION SECTION.
- 9). ENTIRE DEPRESSED AREA OF CURB SHALL HAVE DETECTABLE WARNING TRUNCATED DOMES.



DELAWARE
DEPARTMENT OF TRANSPORTATION

PEDESTRIAN CONNECTION, TYPES 2, 3, & 4

STANDARD NO.

C-2 (2018)

SHT. 2

OF 3

APPROVED

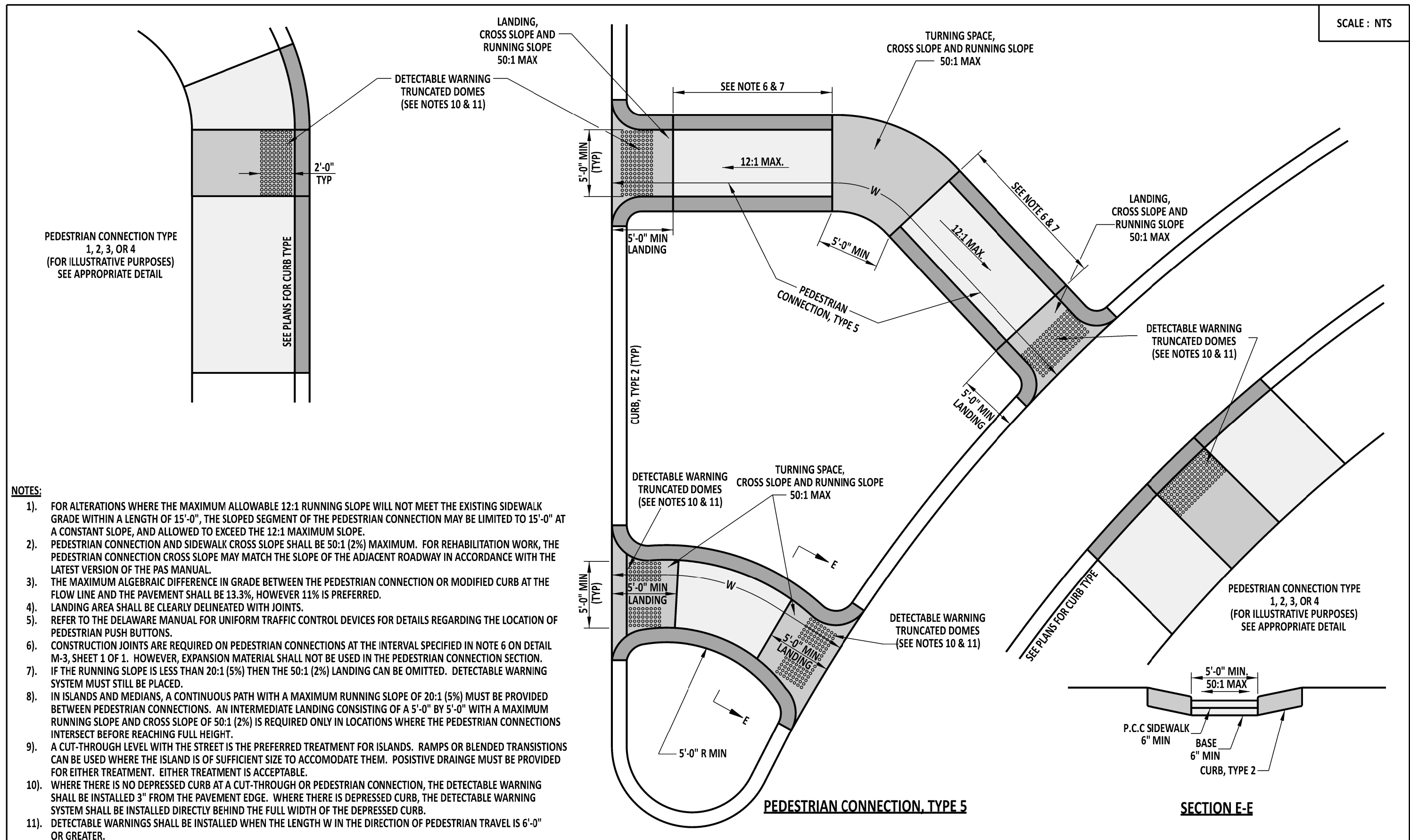
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1/04/2019
DATE

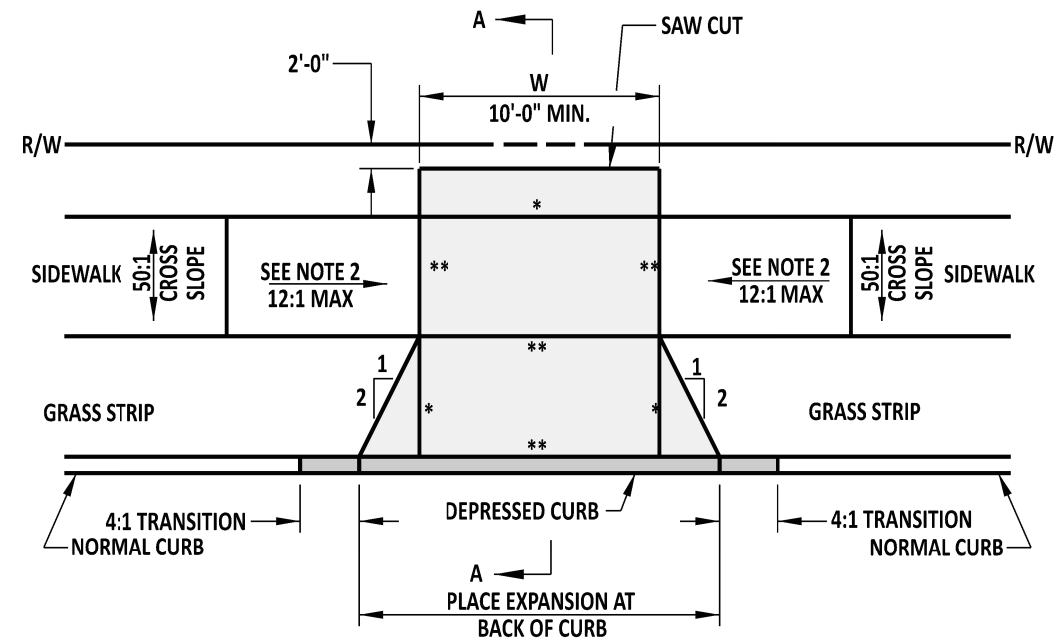
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DESIGN ENGINEER

12/20/2018
DATE

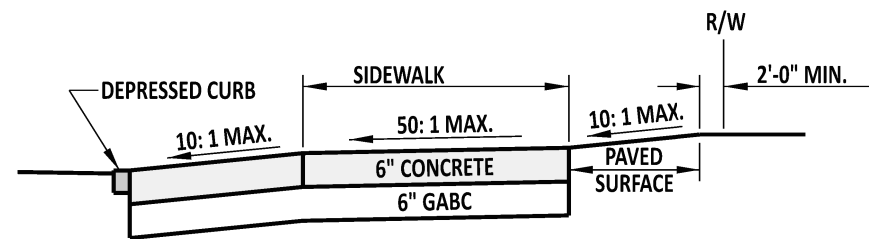


 <div>DELAWARE DEPARTMENT OF TRANSPORTATION</div>	PEDESTRIAN CONNECTION, TYPE 5 & SECTIONS				APPROVED	SIGNATURE ON FILE	1/04/2019	
	STANDARD NO.	C-2 (2018)	SHT.	3	OF	3	RECOMMENDED	SIGNATURE ON FILE

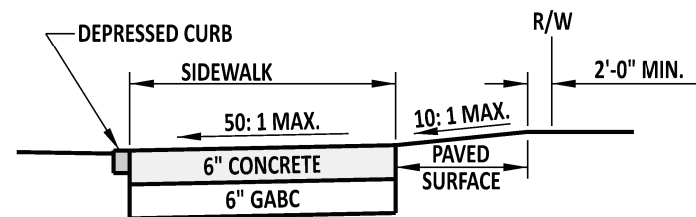


**ENTRANCE WITH SIDEWALK
AND GRASS STRIP**

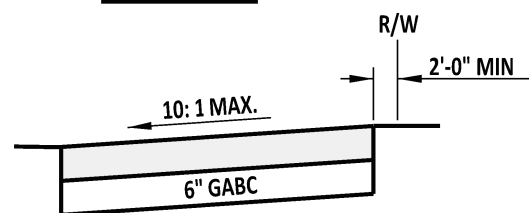
* - JOINT
** - EXPANSION MATERIAL



SECTION A-A



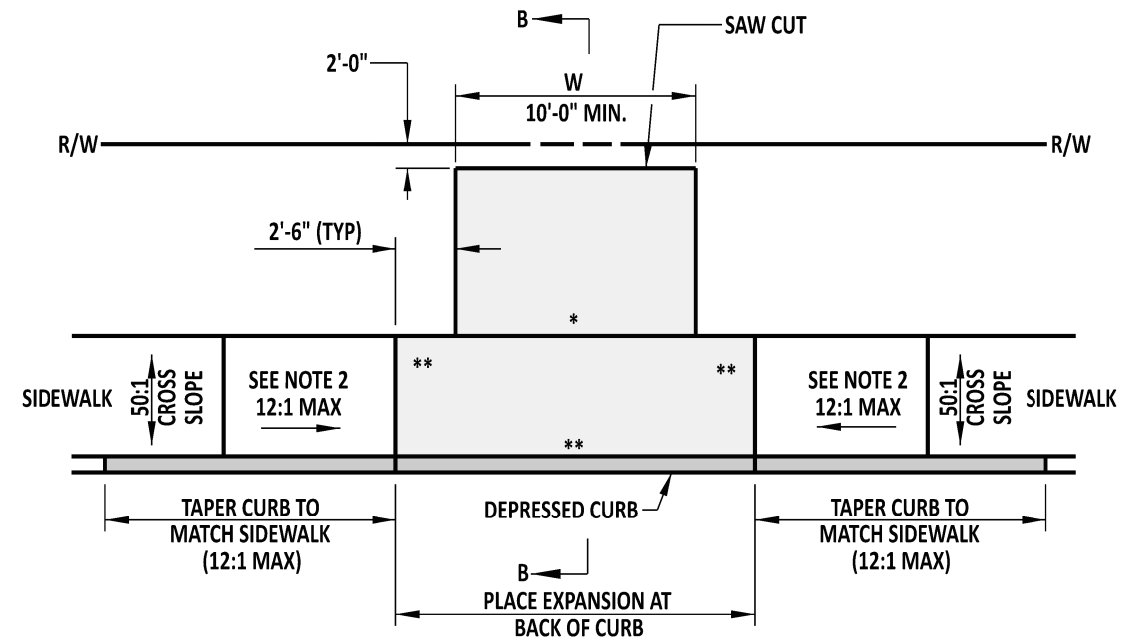
SECTION B-B



SECTION C-C

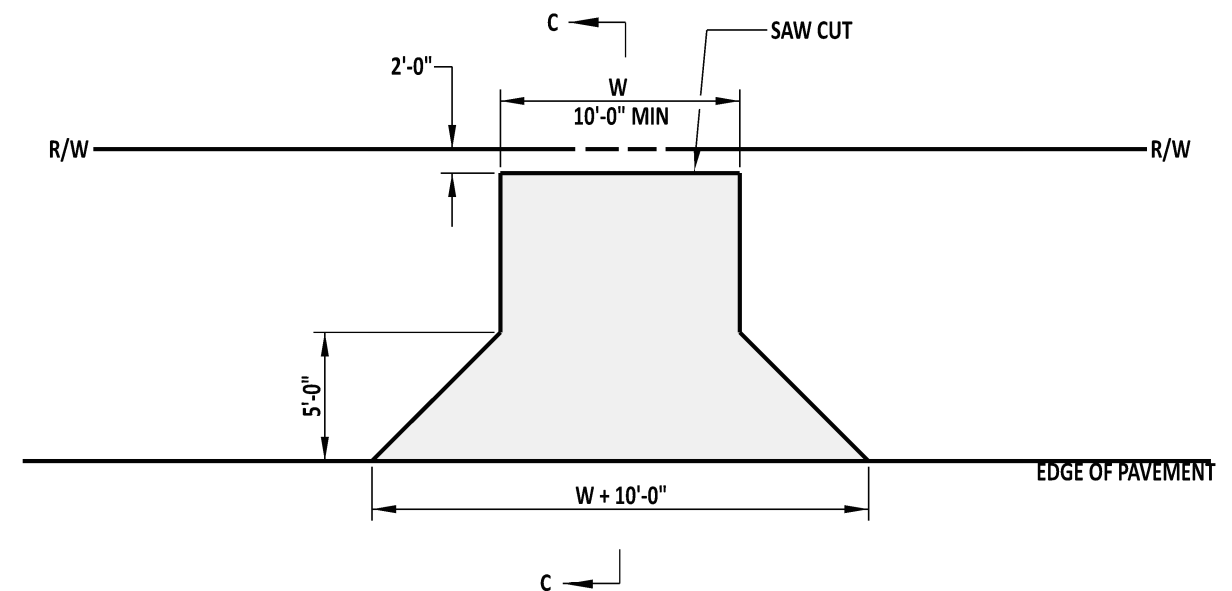
NOTE:

- 1). IF WIDTH OF DRIVEWAY IS 15'-0" OR GREATER, THE FLARE EXTENSIONS CAN BE OMITTED.
- 2). THE MAXIMUM RUNNING SLOPE TO TRANSITION THE SIDEWALK TO MEET DRIVEWAY ELEVATION IS 12:1 (8.3%), HOWEVER, 20:1 (5%) IS PREFERRED.



**ENTRANCE WITH SIDEWALK
AND NO GRASS STRIP**

* - JOINT
** - EXPANSION MATERIAL



ENTRANCE WITHOUT SIDEWALK



**DELAWARE
DEPARTMENT OF TRANSPORTATION**

ENTRANCES

STANDARD NO. C-3 (2018)

SHT. 1 OF 1

APPROVED

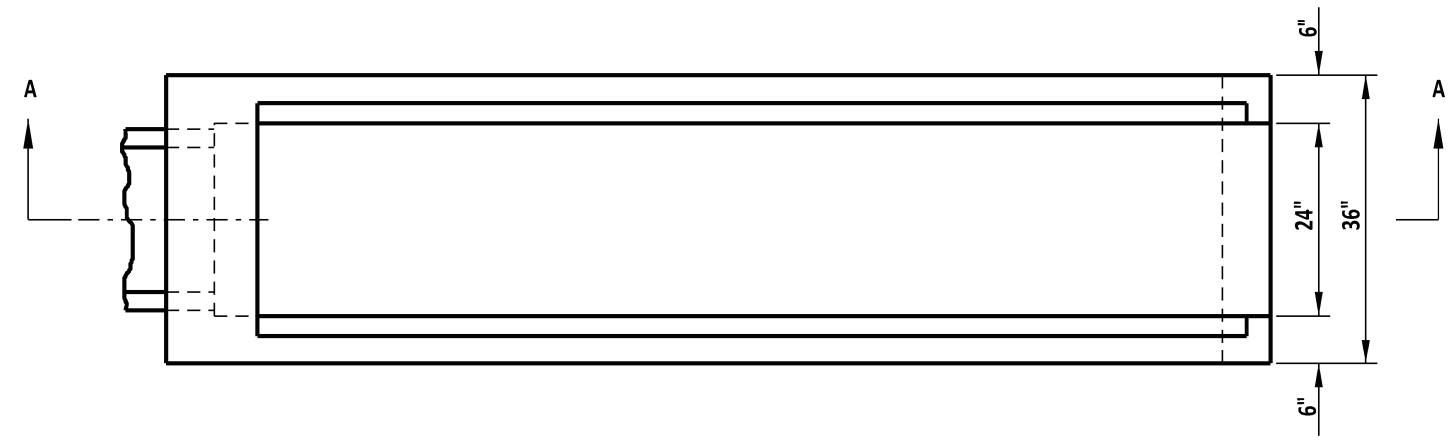
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1/04/2019
DATE

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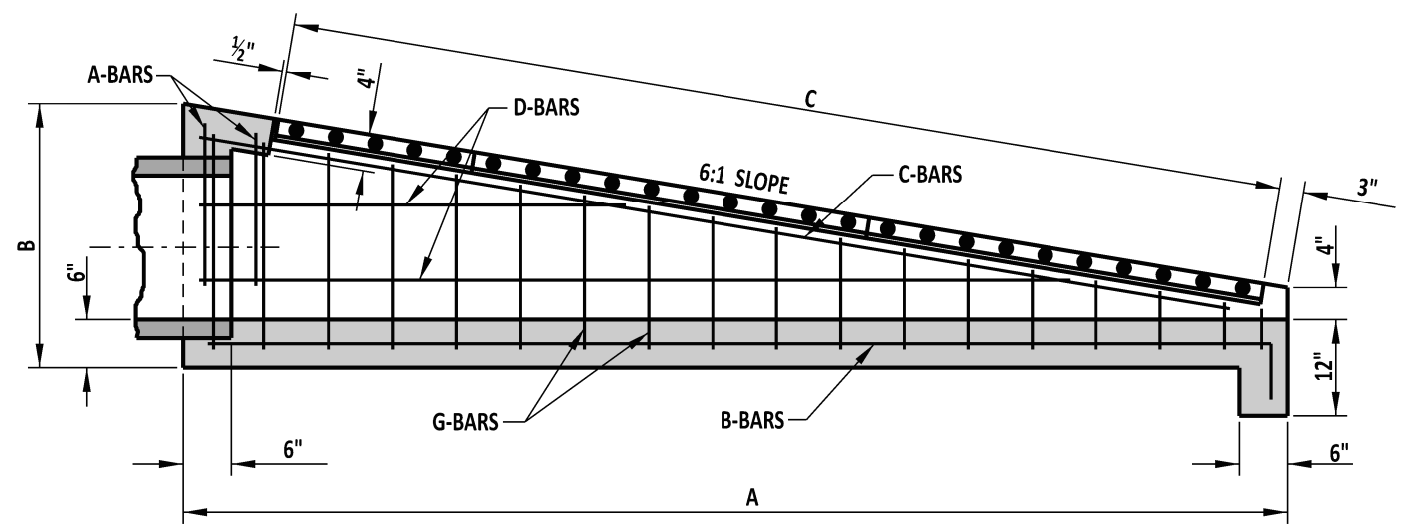
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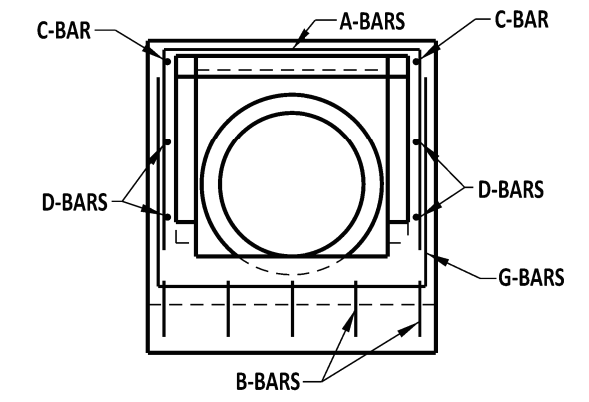


PLAN VIEW
SHOWN WITHOUT GRATE


NOTE: 6:1 SAFETY END STRUCTURE TO BE PRECAST



SECTION A-A

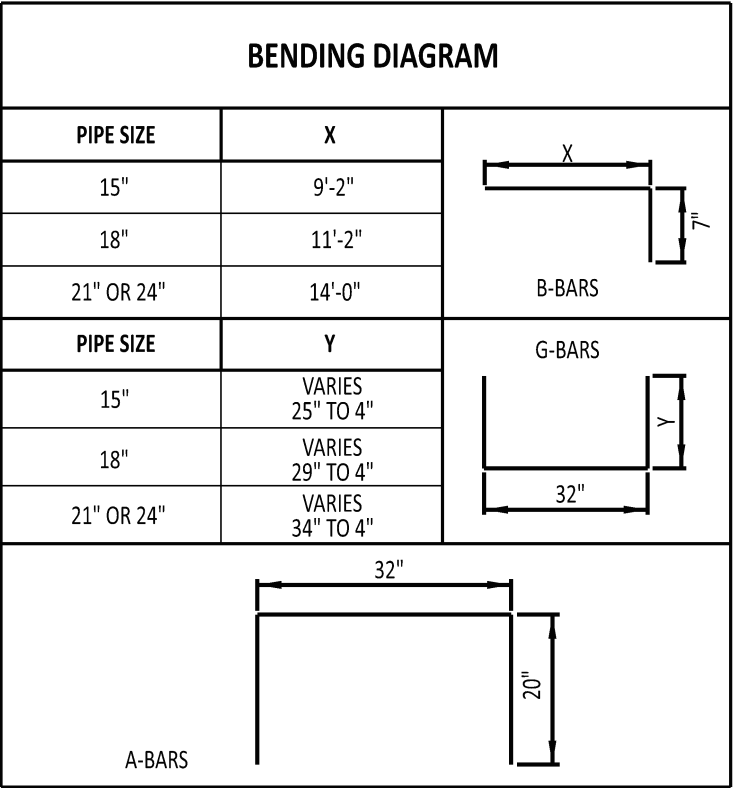


FRONT VIEW

 DELAWARE DEPARTMENT OF TRANSPORTATION	6:1 CONCRETE SAFETY END STRUCTURE			APPROVED	SIGNATURE ON FILE	1/04/2019
	STANDARD NO.	D-1 (2018)	SHT. 1 OF 2	RECOMMENDED	SIGNATURE ON FILE	12/20/2018

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

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



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



DELAWARE
DEPARTMENT OF TRANSPORTATION

6:1 CONCRETE SAFETY END STRUCTURE

STANDARD NO.

D-1 (2018)

SHT.

2

OF

2

APPROVED

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1/04/2019

CHIEF ENGINEER

DATE

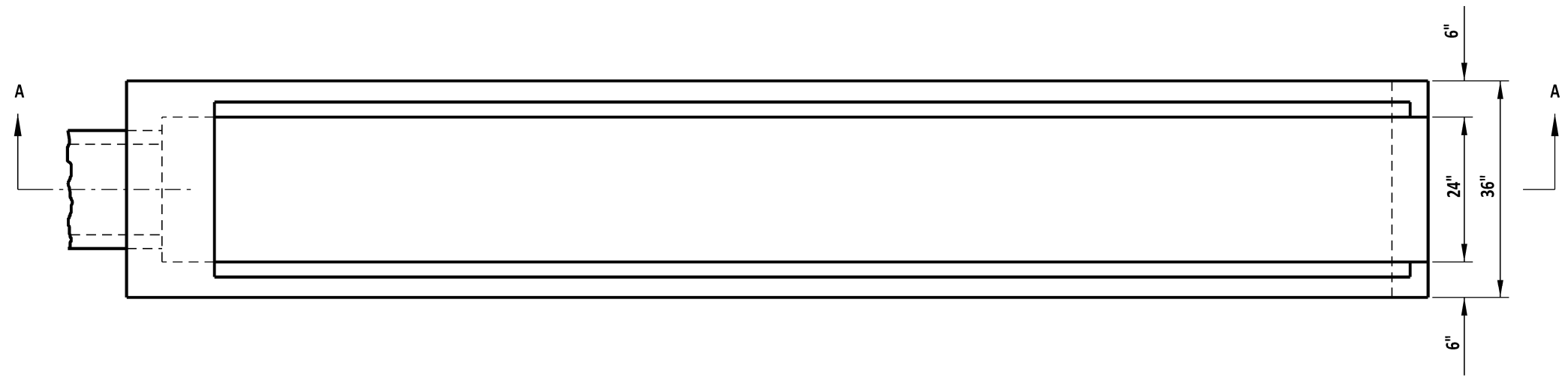
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SIGNATURE ON FILE

12/20/2018

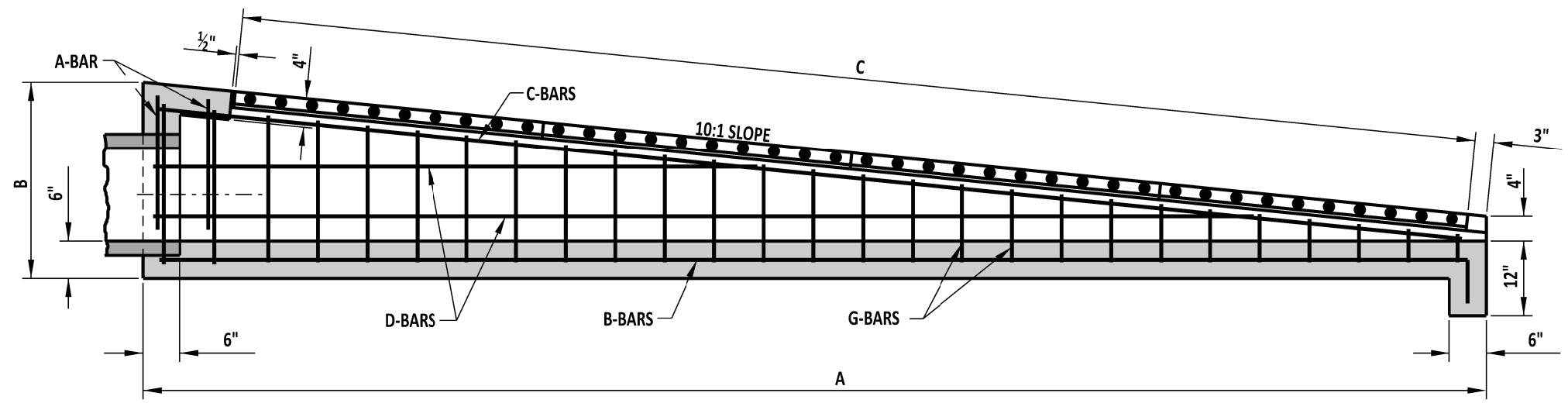
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DATE

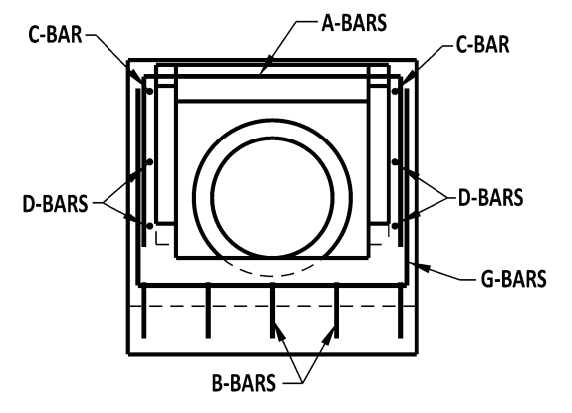


PLAN VIEW
SHOWN WITHOUT GRATE

NOTE: 10:1 SAFETY END STRUCTURE TO BE PRECAST



SECTION A-A

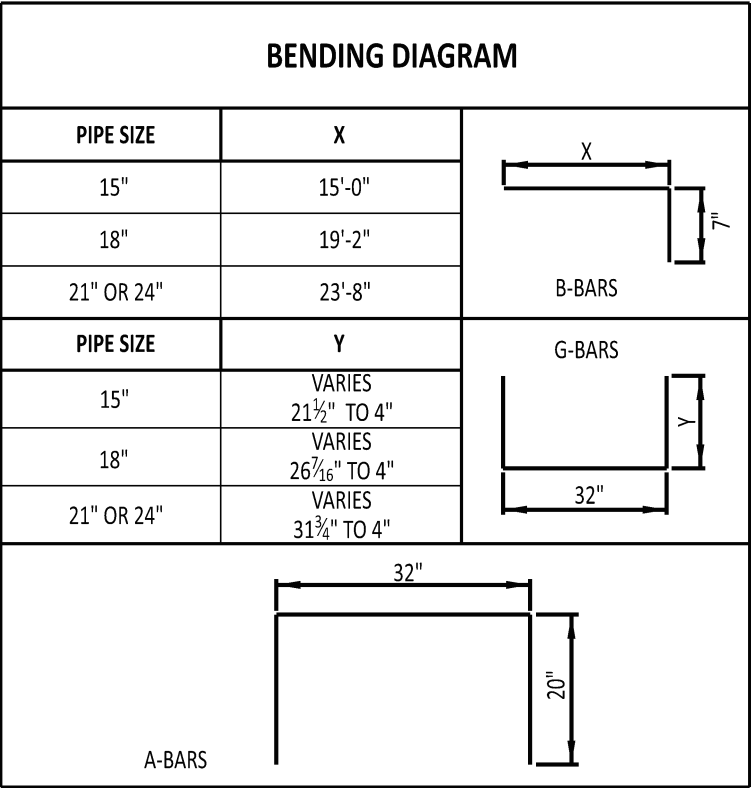


FRONT VIEW

 DELAWARE DEPARTMENT OF TRANSPORTATION	10:1 CONCRETE SAFETY END STRUCTURE			APPROVED	SIGNATURE ON FILE	1/04/2019
	STANDARD NO.	D-2 (2018)	SHT. 1 OF 2	RECOMMENDED	SIGNATURE ON FILE	12/20/2018

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

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



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



DELAWARE
DEPARTMENT OF TRANSPORTATION

10:1 CONCRETE SAFETY END STRUCTURE

STANDARD NO. D-2 (2018)

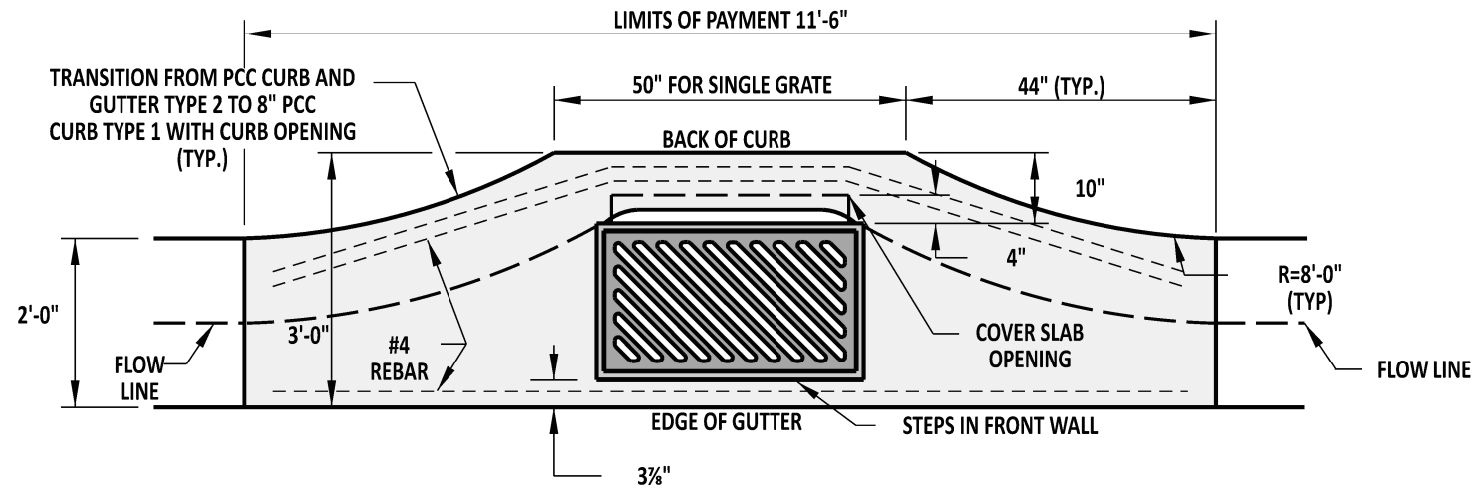
SHT. 2 OF 2

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DATE

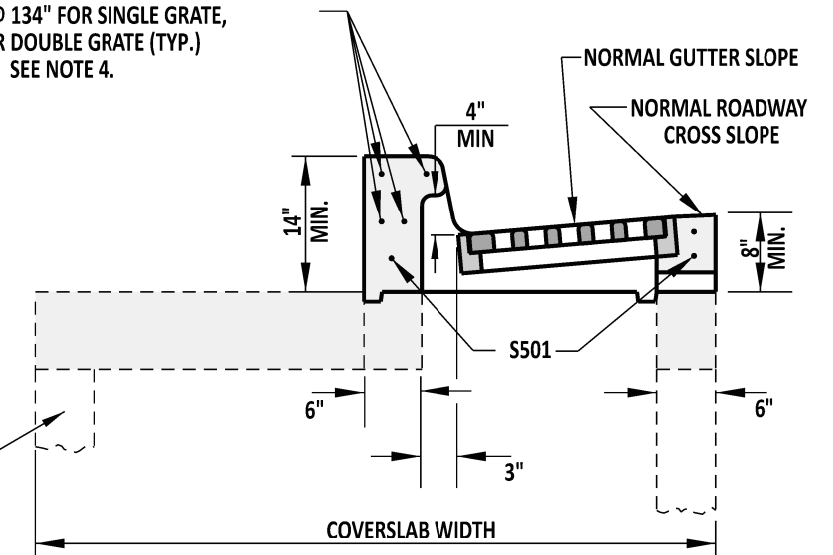
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DATE



SINGLE GRATE SETUP

#4 REBAR @ 134" FOR SINGLE GRATE,
172" FOR DOUBLE GRATE (TYP.)
SEE NOTE 4.



SUBDIVISION TOP & CONFIGURATION

NOTES:

- 1). MINIMUM BOX SIZE TO BE 34" x 24".
- 2). PIPE OPENINGS IN THE FRONT WALL SHALL NOT INTERFERE WITH THE STEPS. THE PIPE SHALL BE SHIFTED HORIZONTALLY TO AVOID THE STEPS. IT MAY BE NECESSARY TO USE A LARGER BOX TO AVOID CONFLICT BETWEEN STEPS AND PIPE OPENING.
- 3). SEE DETAIL D-5, SHEET 3 OF 9, FOR S501 BAR DIAGRAM.
- 4). THE REBAR IN THE HEAD IS PREFERRED TO BE 1 CONTINUOUS PIECE, HOWEVER, IF MULTIPLE PIECES ARE TO BE USED, EACH PIECE SHALL OVERLAP BY 12" MINIMUM AND THE FINAL LENGTH OF THE SPLICED REBAR SHALL BE AS NOTED ON THIS DETAIL.



DELAWARE
DEPARTMENT OF TRANSPORTATION

DRAINAGE INLET TOP UNIT, TYPE S

STANDARD NO.

D-5 (2018)

SHT. 8

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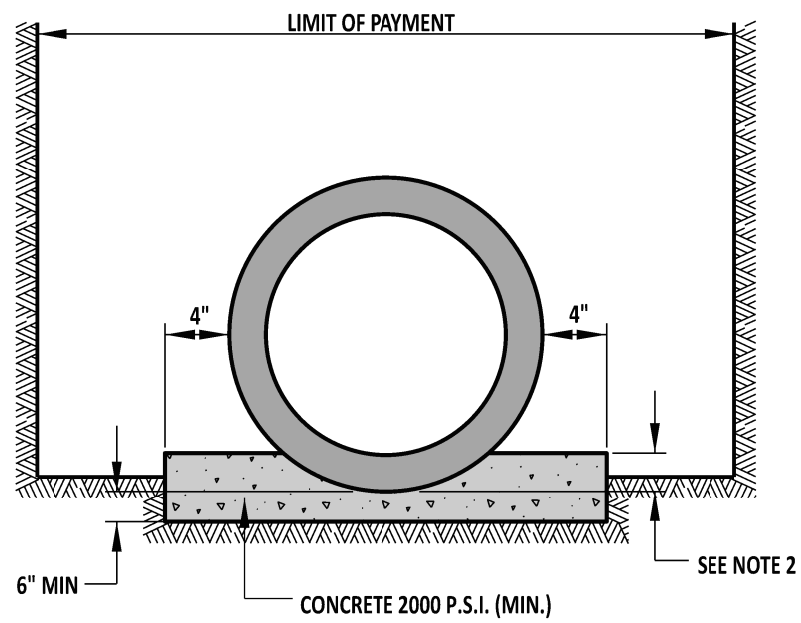
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DATE

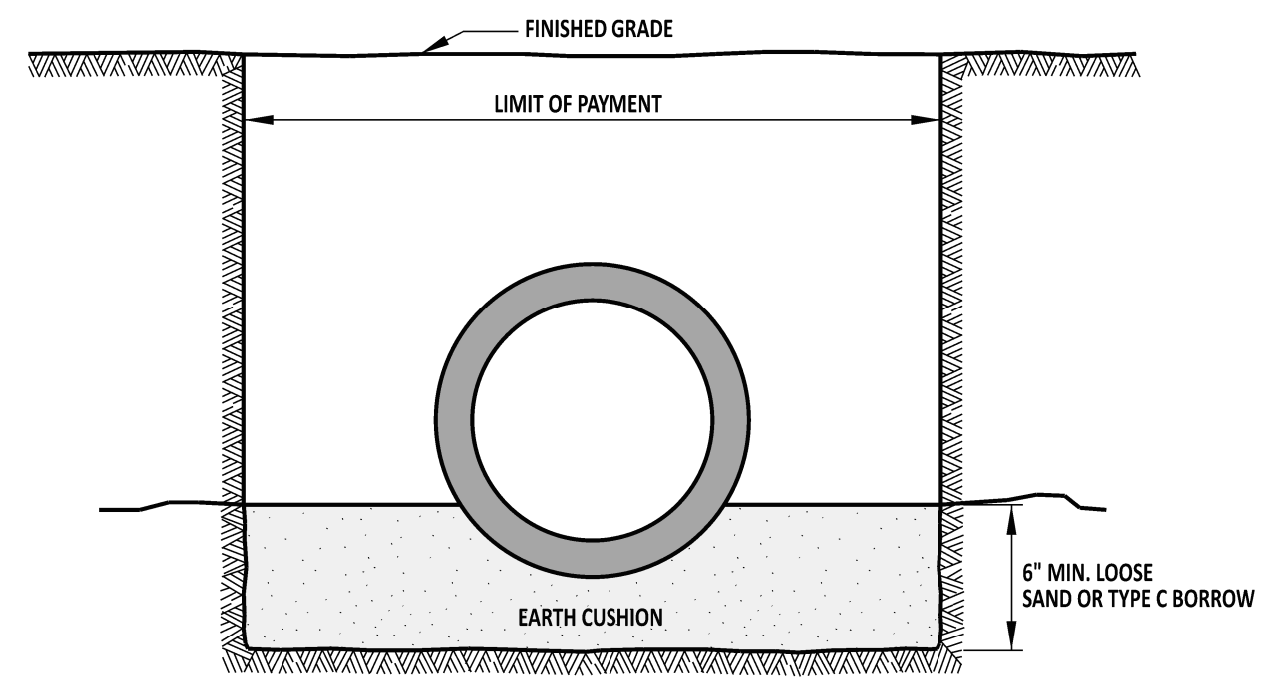
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12/20/2018
DATE




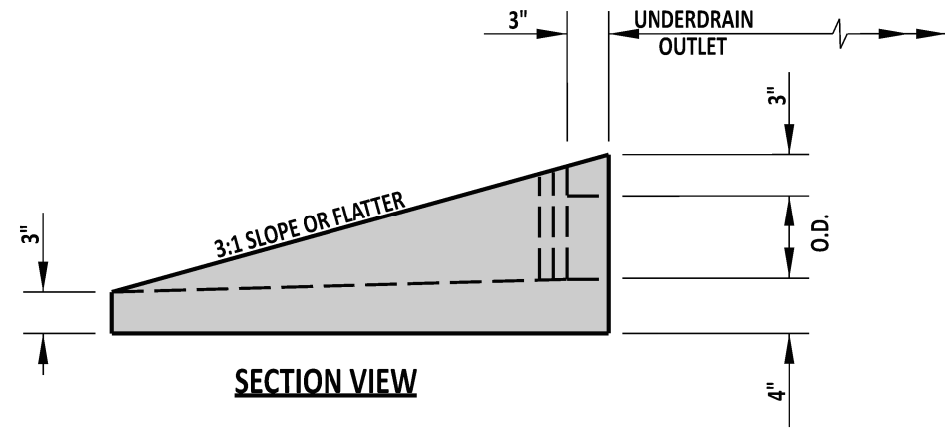
CLASS A BEDDING



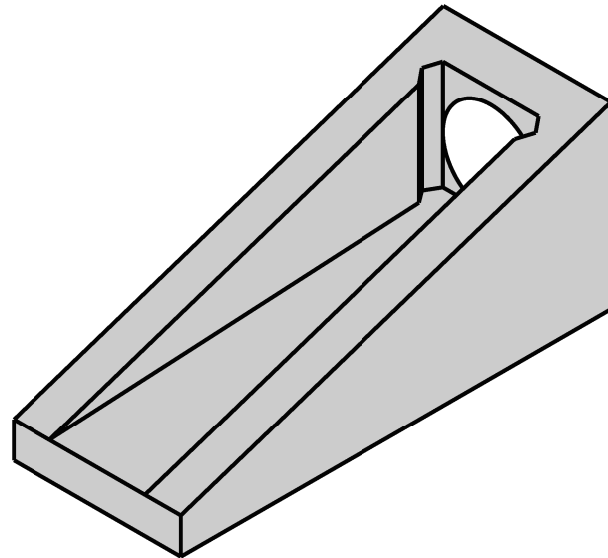
CLASS C BEDDING

- NOTE:
- 1). USE CLASS C BEDDING UNLESS OTHERWISE INDICATED.
 - 2). FOR CLASS A BEDDING, IMBED PIPE IN CONCRETE 6" FOR PIPES SMALLER THAN 24" I.D., 10" FOR PIPES 24" TO 60", AND FOR PIPES LARGER THAN 60" SEE PROJECT DETAILS.

 DELAWARE DEPARTMENT OF TRANSPORTATION	PIPE BEDDING			APPROVED	SIGNATURE ON FILE	1/04/2019
	STANDARD NO.	D-8 (2018)	SHT. 1 OF 1	RECOMMENDED	SIGNATURE ON FILE	12/20/2018

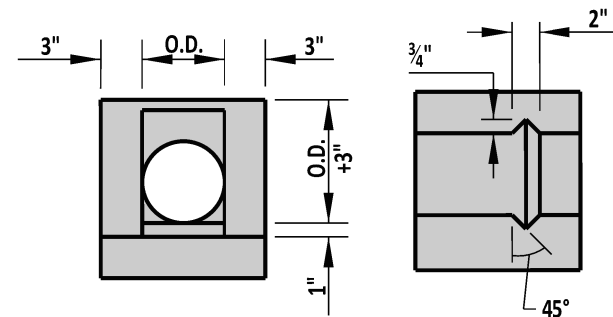


SECTION VIEW



ISOMETRIC VIEW

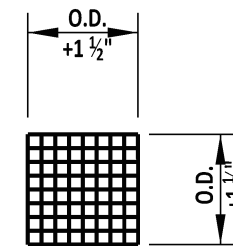
UNDERDRAIN OUTLET



FRONT VIEW

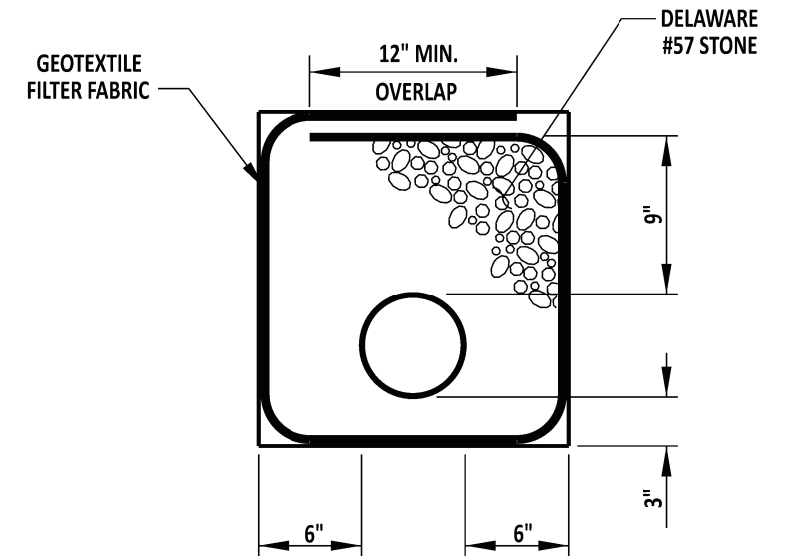
TOP VIEW

SLOTTED HEADWALL DETAIL

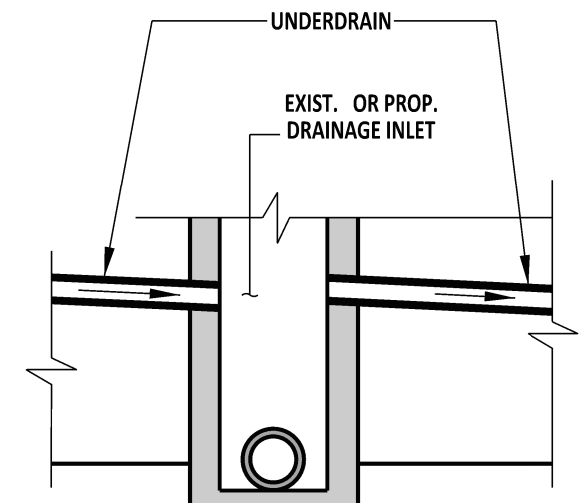


FRONT VIEW

RODENT SCREEN



SECTION



ELEVATION

PERFORATED PIPE UNDERDRAIN

NOTES:

- 1). THE PERFORATED PIPE UNDERDRAIN SHALL BE LOCATED AS SHOWN ON THE TYPICAL SECTIONS OF THE CONSTRUCTION PLANS.
- 2). GEOTEXTILE FILTER FABRIC SHALL BE PLACED ENTIRELY OVER THE TOP OF UNDERDRAIN TRENCH AND LAPPED AS SHOWN.
- 3). SLOPE OF UNDERDRAINS SHALL MATCH ROADWAY GRADE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- 4). OUTLET PIPE CONFIGURATIONS SHALL USE 45 DEGREE ELBOWS OR SHALL USE STRAIGHT PIPE WITH A MINIMUM RADIUS OF 3' TO DIRECT UNDERDRAIN PIPE INTO SIDE OF DRAINAGE INLET OR TO POSITIVE GRADE. PIPE SHALL ALSO BE NON-PERFORATED AND HAVE A SMOOTH INTERIOR.
- 5). RODENT SCREEN SHALL SNUGLY FIT THE PROVIDED SLOT WITH THE SCREEN LIP FITTING TIGHT TO THE BOTTOM FLOW LINE.
- 6). A DELINEATOR SHALL BE INSTALLED ADJACENT TO THE CONCRETE APRON OF THE UNDERDRAIN OUTFALL IN THE UPSTREAM DIRECTION OF VEHICULAR TRAVEL. THE DELINEATOR SHALL BE GALVANIZED TELESCOPING STEEL SIGN POST AND INSTALLED IN ACCORDANCE WITH STANDARD T-15 SHEET 1 OF 1. THE DELINEATOR SHALL EXTEND 4' ABOVE GROUND ELEVATION AND SHALL HAVE A 4" x 8" x 0.08" ALUMINUM RETROREFLECTIVE BLUE REFLECTOR BOLTED TO BOTH SIDES OF THE POST WITH HARDWARE COMPATIBLE WITH THE SIGN POST.
- 7). WHEN TWO LINES OF PIPE UNDERDRAIN DRAIN TO A LOW POINT, EACH PIPE MUST HAVE ITS OWN OUTLET.
- 8). PERFORATED PIPE UNDERDRAIN SHALL NOT BE PLACED UNDER GUARDRAIL IN ORDER TO AVOID PUNCTURING.



DELAWARE
DEPARTMENT OF TRANSPORTATION

PERFORATED PIPE UNDERDRAIN DETAIL

STANDARD NO.

D-9 (2018)

SHT. 1

OF 1

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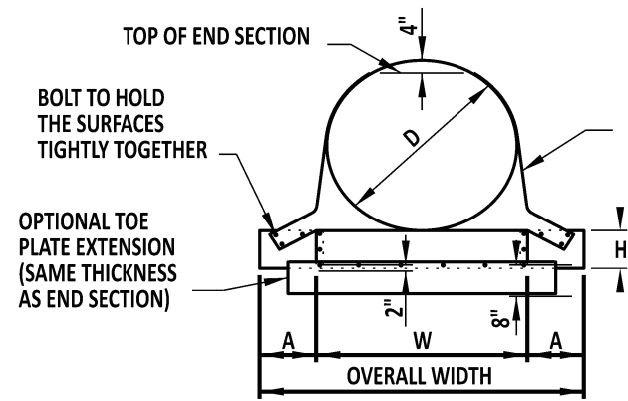
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DATE

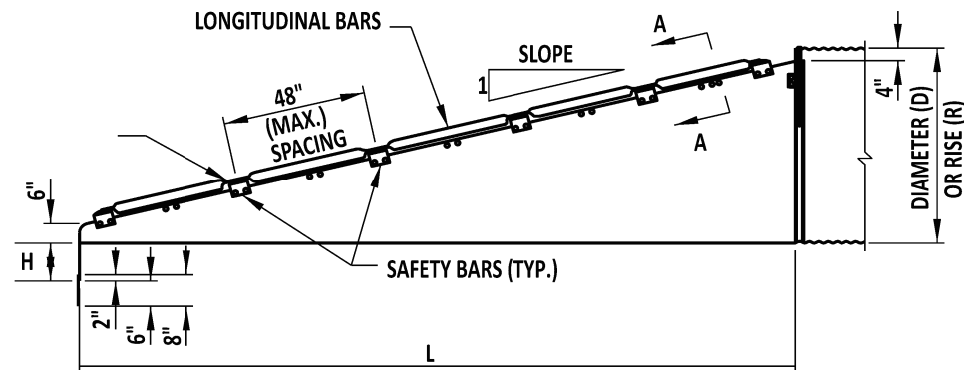
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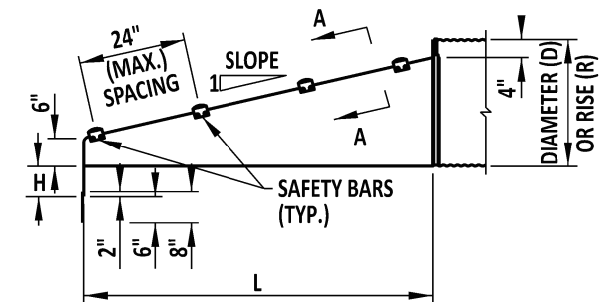
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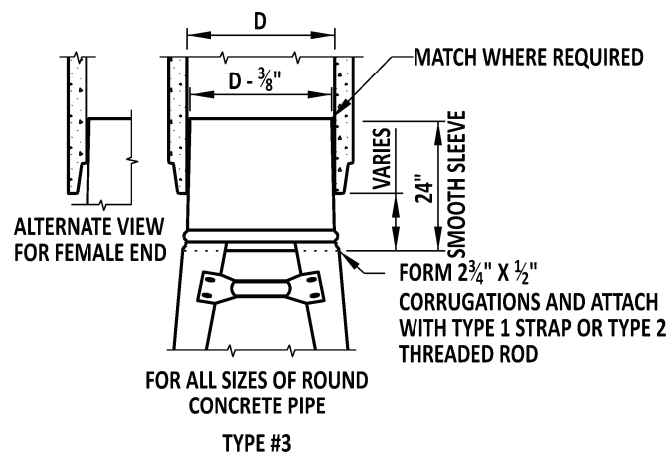
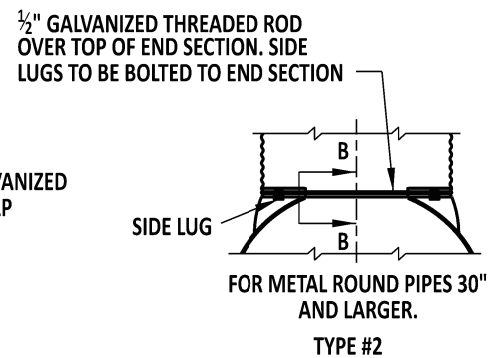
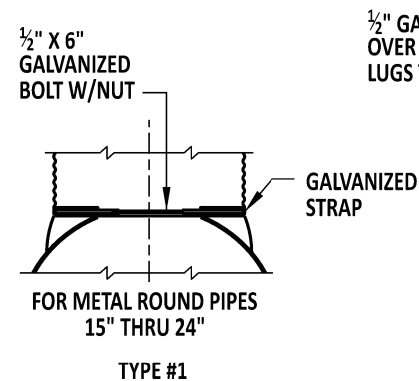
ROUND PIPE CULVERT



CROSS DRAINAGE END SECTION

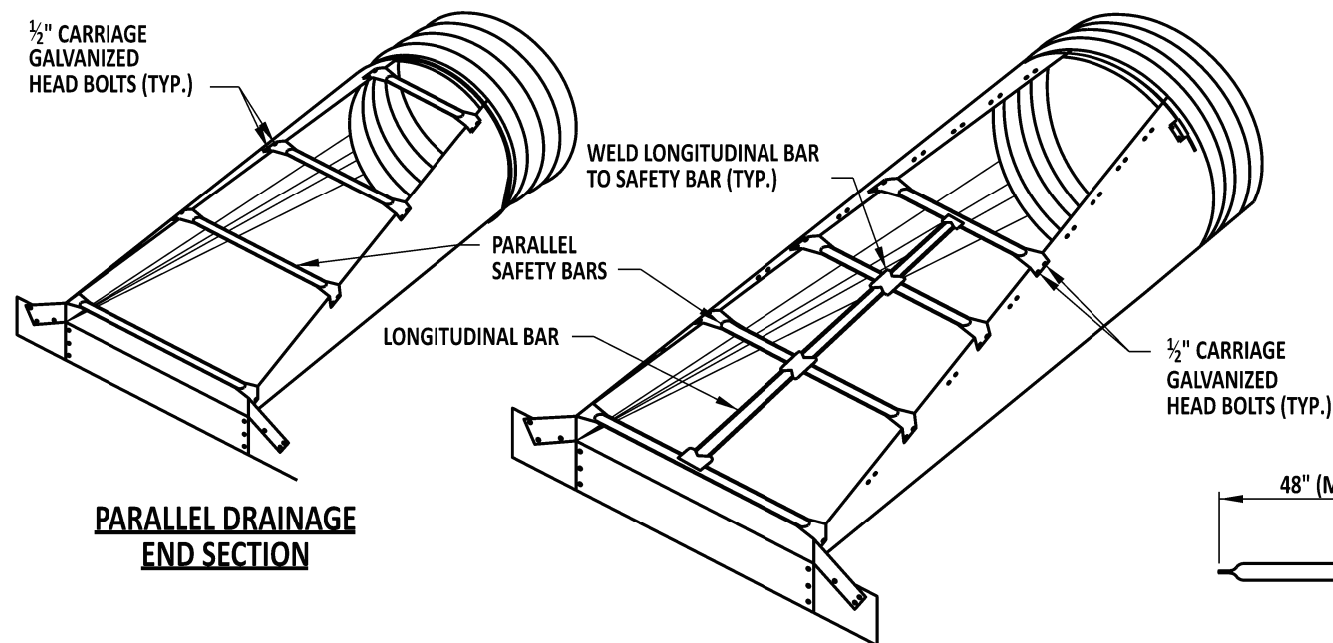


PARALLEL DRAINAGE END SECTION

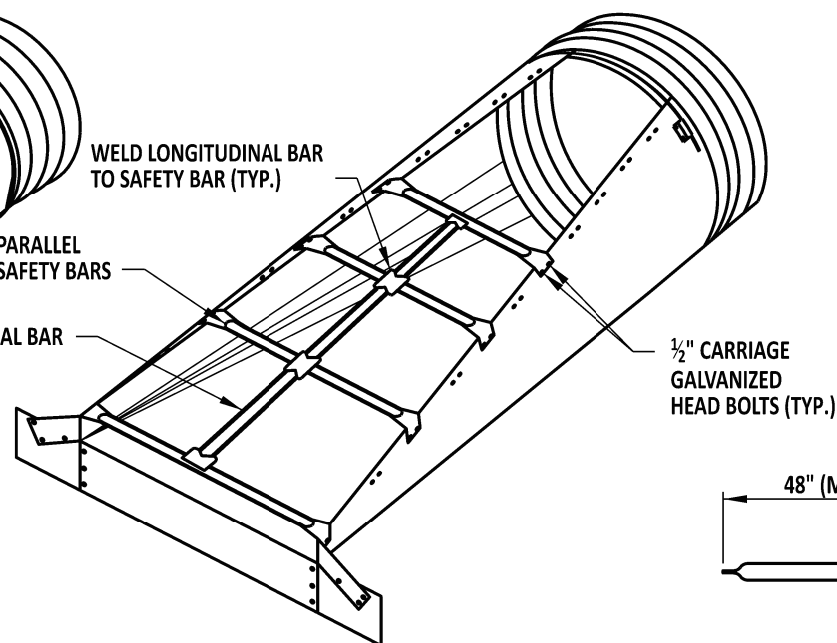


CONNECTOR DETAILS

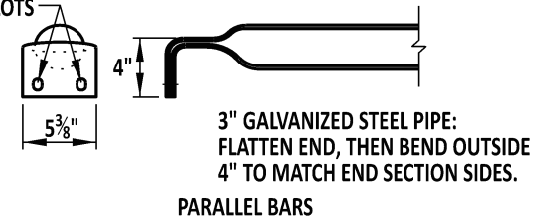
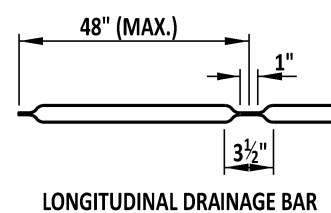
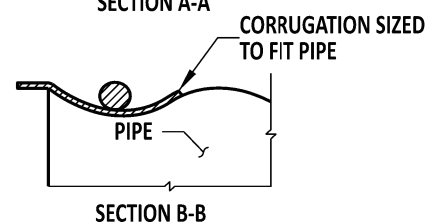
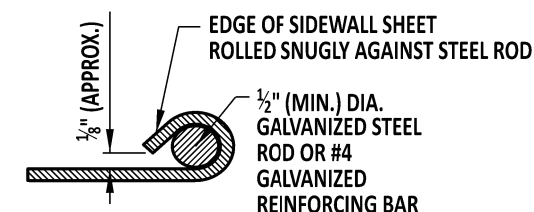
METAL END SECTIONS FOR ROUND PIPE CULVERT							
PIPE SIZE D INCHES	METAL THICK (MIN.) INCH/GAGE	DIMENSIONS IN INCHES					
		A	H	W	OVERALL WIDTH	L	
						Slope=4	Slope=6
18	0.064/16	8	6	24	40	32	32
24	0.064/16	8	6	30	46	55	83
30	0.109/12	12	9	36	60	79	118
36	0.109/12	12	9	42	66	102	154
42	0.109/12	16	12	48	80	126	189
48	0.109/12	16	12	54	86	150	224
54	0.109/12	16	12	60	92	173	260
60	0.109/12	16	12	66	98	197	295



**PARALLEL DRAINAGE
END SECTION**



CROSS DRAINAGE END SECTION



SAFETY BAR DETAILS

NOTES:

- 1). USE END SECTIONS ON 1V:4H TO 1V:6H SLOPES ONLY. USE TOE PLATE EXTENSION WHERE SHOWN ON THE PLANS.
- 2). FABRICATE SAFETY AND LONGITUDINAL BARS FROM STEEL PIPE CONFORMING TO ASTM SCHEDULE 40 SPECIFICATIONS. GALVANIZE BARS HOT DIPPED AFTER FABRICATION.
- 3). A LONGITUDINAL BAR IS REQUIRED FOR CROSS DRAINAGE END SECTIONS WHEN THE SPAN IS GREATER THAN 30". USE ADDITIONAL LONGITUDINAL BARS IF SPACING EXCEEDS 30" ON LARGER END SECTIONS.
- 4). 18" DIAMETER SLEEVES HAVE A THICKNESS OF 0.079", ALL OTHERS ARE 0.109".



DELAWARE
DEPARTMENT OF TRANSPORTATION

SAFETY METAL END SECTION

STANDARD NO. D-11 (2018)

SHT. 1 OF 1

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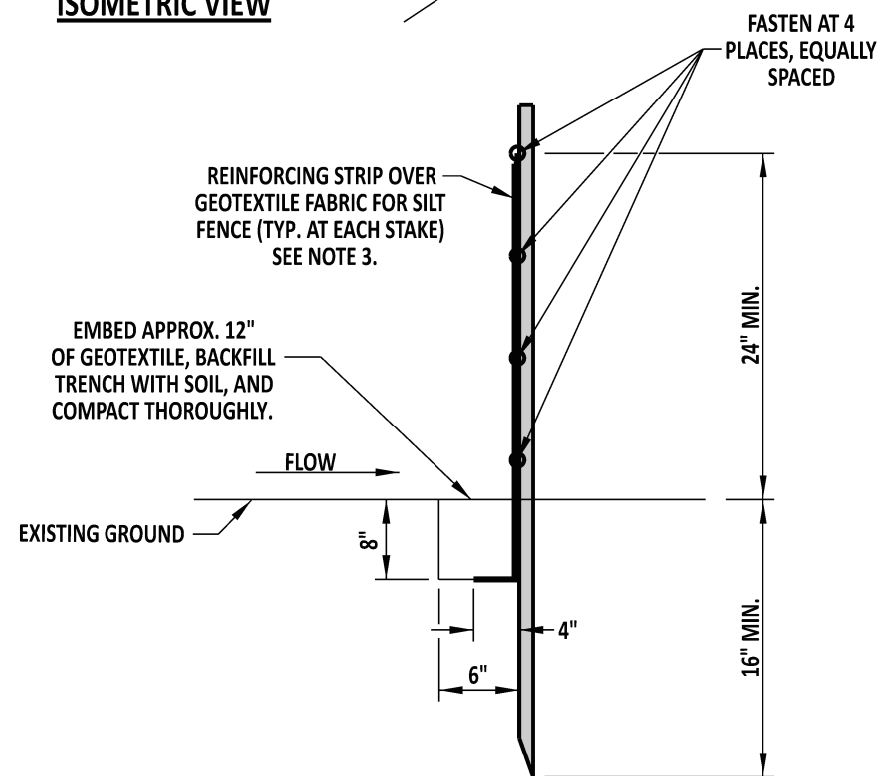
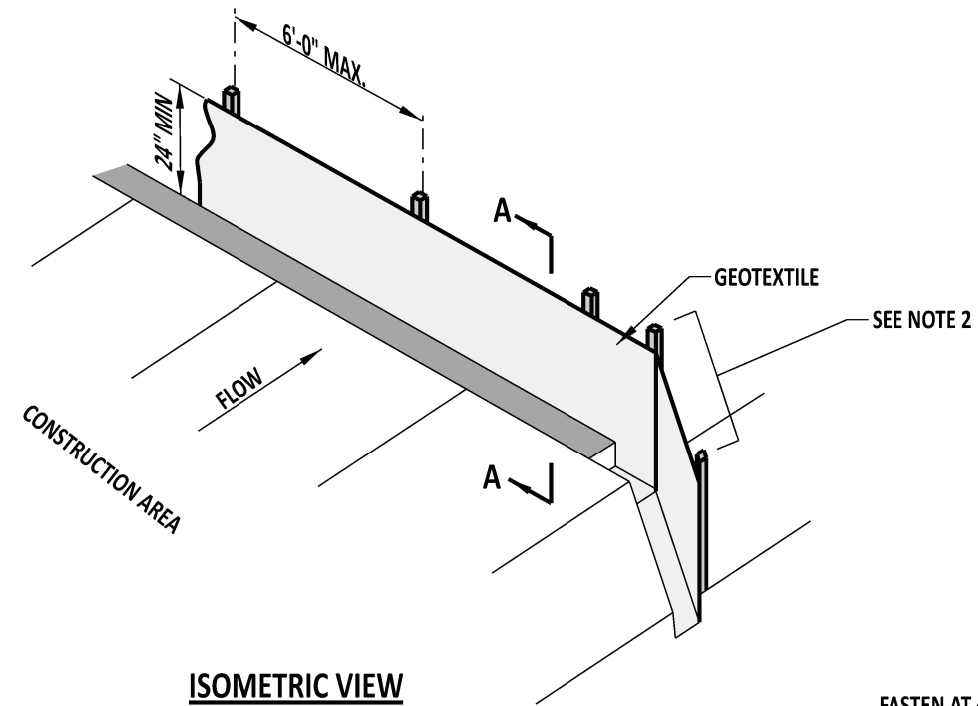
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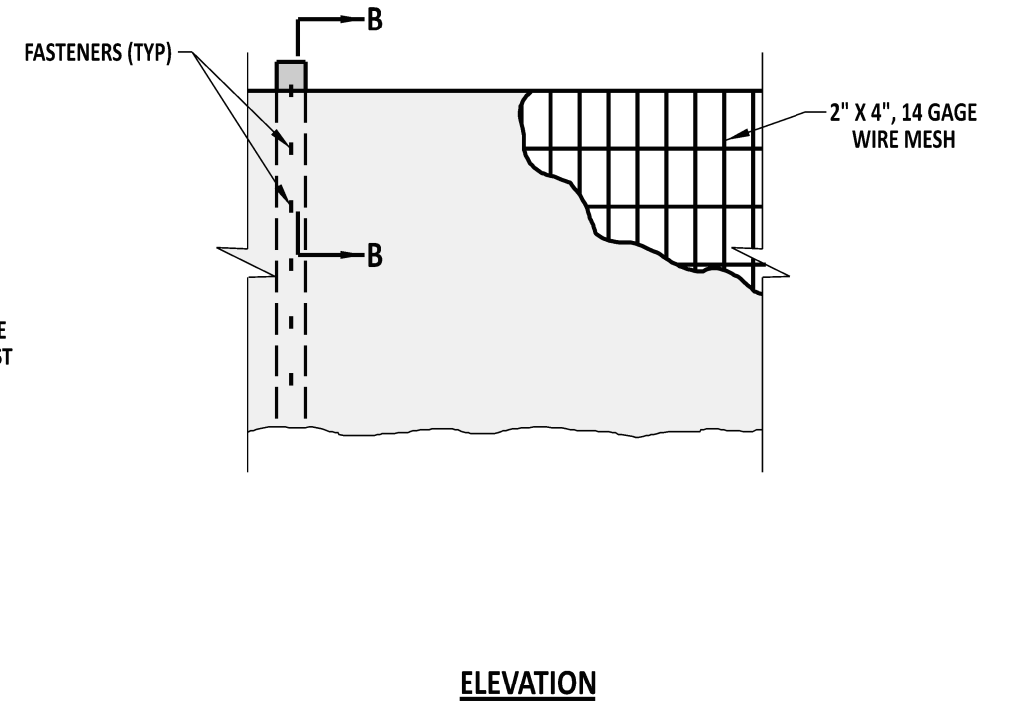
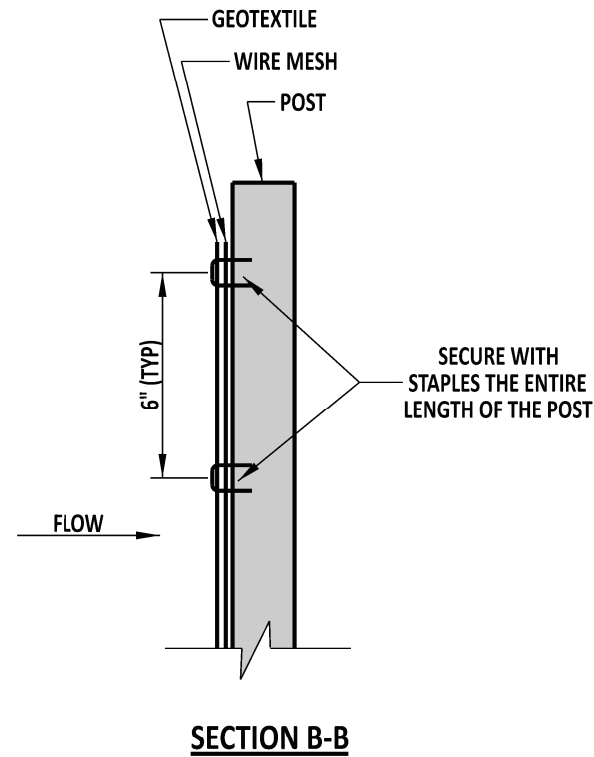
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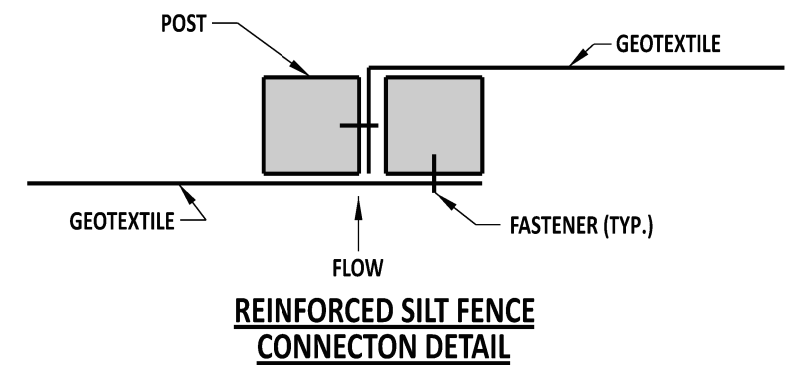
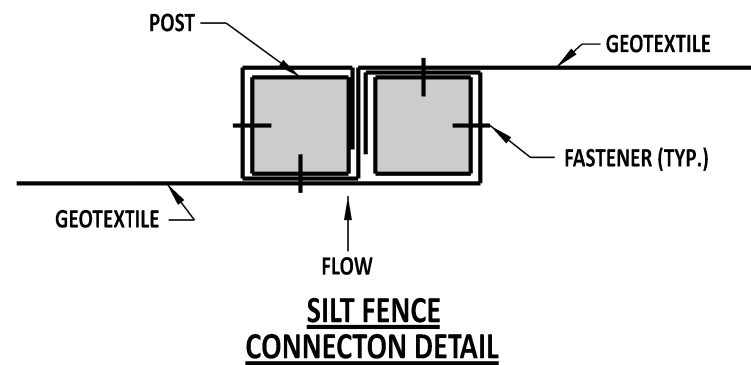
12/20/2018
DATE



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



WIRE MESH DETAIL
(REINFORCED SILT FENCE ONLY)



DELAWARE
DEPARTMENT OF TRANSPORTATION

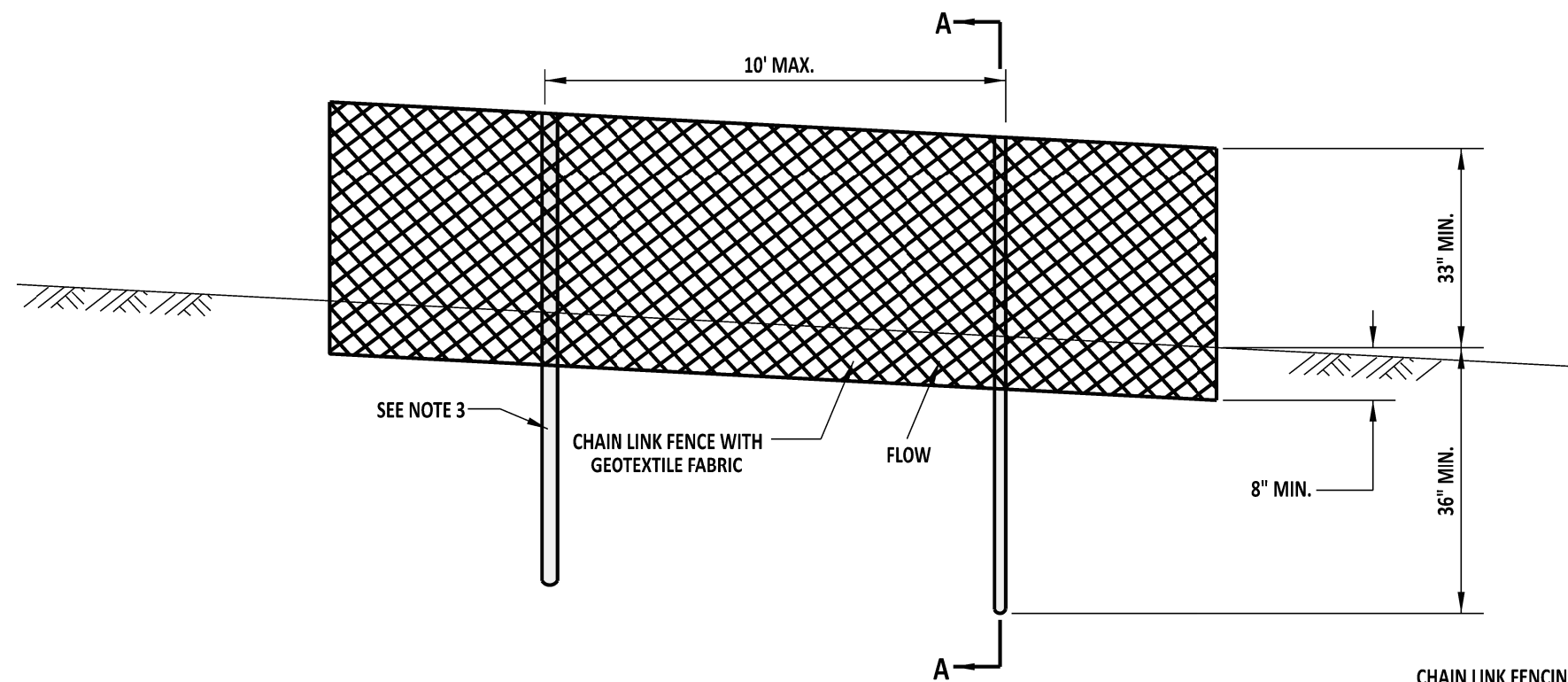
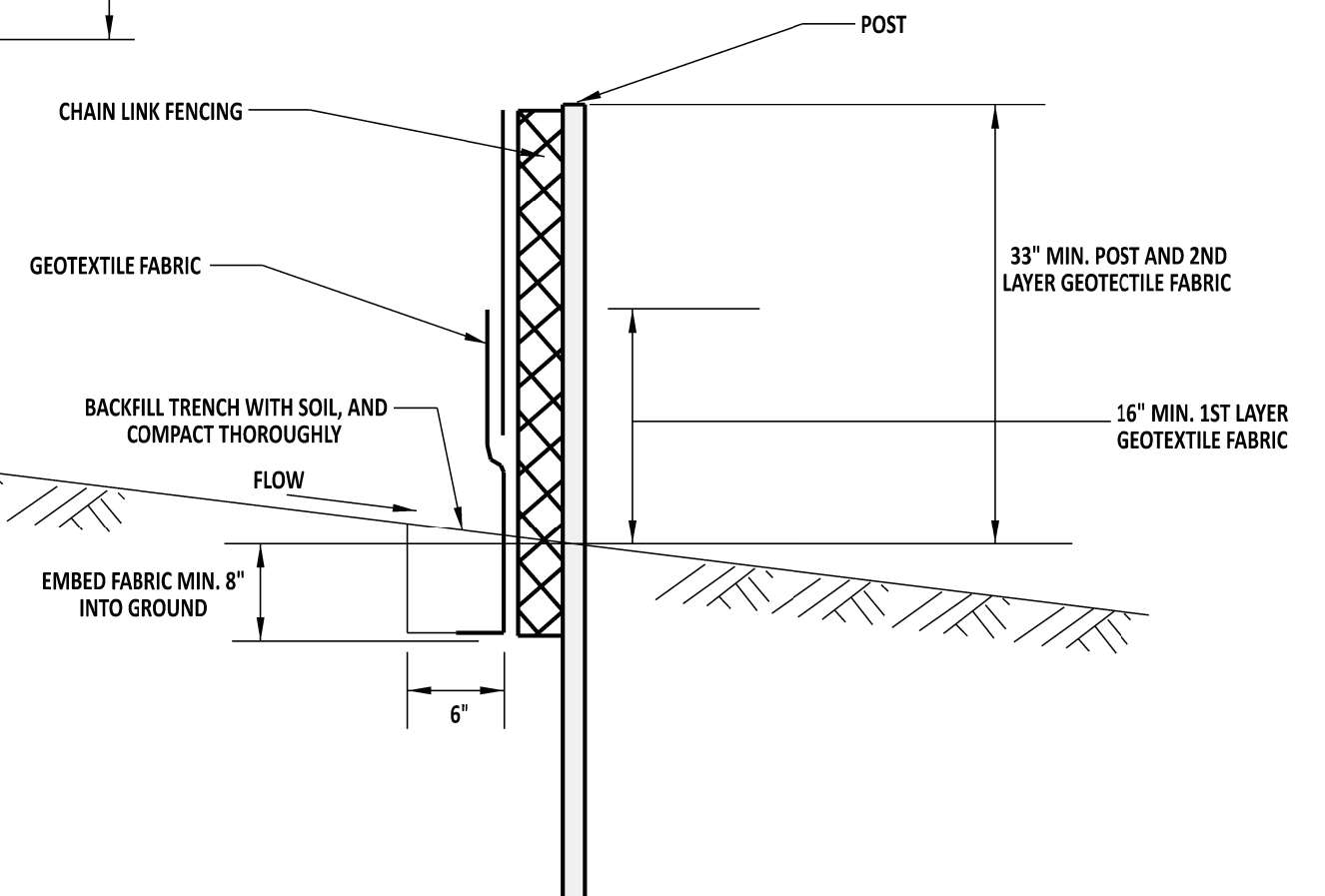
SILT FENCE
STANDARD NO. E-2 (2018)

SHT. 1 OF 2

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RECOMMENDED

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CHIEF ENGINEER
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DESIGN ENGINEER

1/04/2019
DATE
12/20/2018
DATE

**SUPER SILT FENCE CONSTRUCTION DETAIL****SECTION A-A****NOTES:**

- 1). THIS DEVICE IS INTENDED TO CONTROL SHEET FLOW ONLY AND IS NOT TO BE USED IN AREAS OF CONCENTRATED FLOW.
- 2). TURN ENDS OF SILT FENCE UPSLOPE TO CONTAIN RUNOFF.
- 3). 2½" DIAMETER GALVANIZED OR ALUMINUM POSTS. POSTS DO NOT NEED TO BE SET IN CONCRETE.
- 4). FASTEN CHAIN LINK FENCE SECURELY TO FENCE POSTS WITH WIRE TIES.
- 5). FASTEN GEOTEXTILE FABRIC SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24" AT THE TOP AND MID SECTION.
- 6). WHEN TWO SECTIONS OF GEOTEXTILE FABRIC ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.



DELAWARE
DEPARTMENT OF TRANSPORTATION

SUPER SILT FENCE

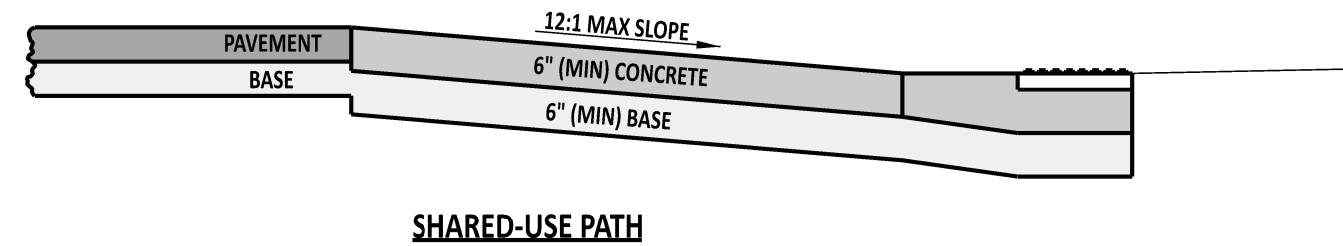
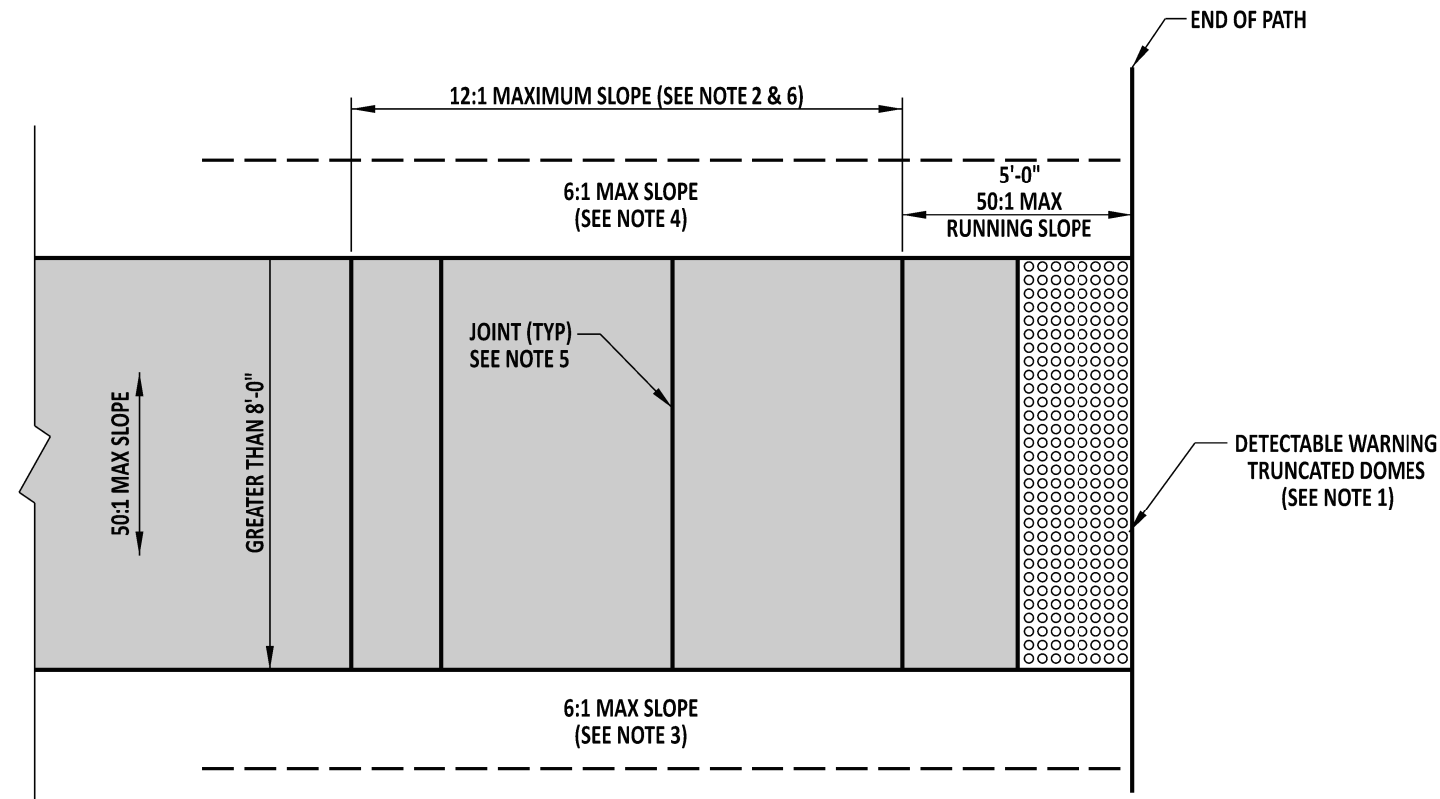
STANDARD NO.

E-2 (2018)

SHT. 2

OF 2

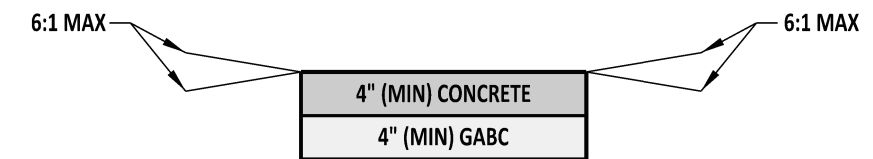
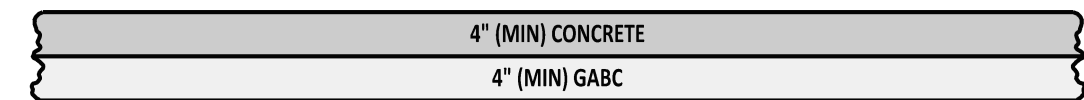
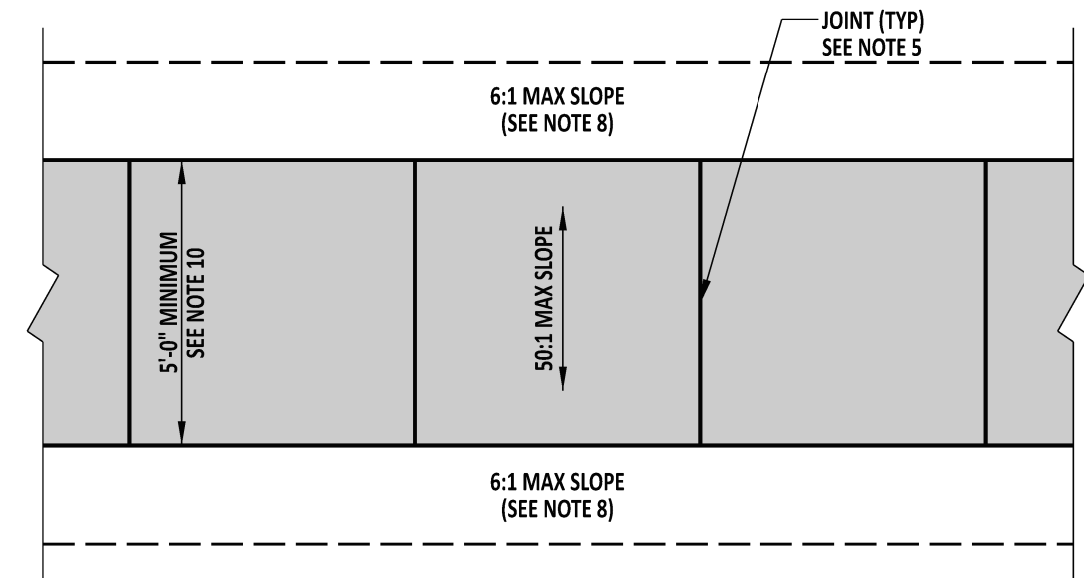
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DATE**RECOMMENDED**SIGNATURE ON FILE
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DATE



SHARED-USE PATH

NOTES:

- 1). IF THE SHARED-USE PATH ENDS AT A ROADWAY OR RAILROAD CROSSING, THEN DETECTABLE WARNING TRUNCATED DOMES 24" LONG AND THE FULL WIDTH OF THE PATH SHALL BE INSTALLED. SEE DETAIL C-2.
- 2). FOR ALTERATIONS WHERE THE MAXIMUM ALLOWABLE 12:1 RUNNING SLOPE WILL NOT MEET THE EXISTING SIDEWALK OR SHARED USE PATH GRADE WITHIN A LENGTH OF 15'-0", THE SLOPED SEGMENT OF THE PEDESTRIAN CONNECTION MAY BE LIMITED TO 15'-0" AT A CONSTANT SLOPE, AND ALLOWED TO EXCEED THE 12:1 MAXIMUM SLOPE.
- 3). A 6:1 MAX SLOPE IS REQUIRED FOR 2'-0" ON BOTH SIDES OF THE SHARED-USE PATH.
- 4). TOPSOIL, SEED, & MULCH ANY DISTURBED AREA ADJACENT TO THE SHARED-USE PATH UP TO A MAXIMUM OF 2'-0".
- 5). FOR SIDEWALKS AND CONCRETE SHARED-USE PATHS, CONSTRUCTION JOINTS SHALL BE PLACED EVERY 10'-0" AND EXPANSION MATERIAL EVERY 20'-0". HOWEVER, EXPANSION MATERIAL SHALL NOT BE USED IN THE SLOPED SECTION.
- 6). IF THE RUNNING SLOPE IS LESS THAN 20:1 (5%) THEN THE 50:1 (2%) LANDING CAN BE OMITTED. DETECTABLE WARNING SYSTEM MUST STILL BE PLACED.



SIDEWALK

- 7). SEE DETAIL C-2, SHEETS 1, 2 OR 3 FOR PEDESTRIAN CONNECTION TREATMENTS WHEN THE SIDEWALK OR SHARED-USE PATH INTERSECTS WITH A TRAVELWAY.
- 8). A 6:1 MAX SLOPE IS REQUIRED FOR 2'-0" ON BOTH SIDES OF THE SIDEWALK.
- 9). TOPSOIL, SEED, & MULCH ANY DISTURBED AREA ADJACENT TO THE SIDEWALK UP TO A MAXIMUM OF 2'-0".
- 10). ON REHABILITATION PROJECTS, WHEN EXISTING OBSTRUCTIONS (FIRE HYDRANT, UTILITY POLE, ETC...) ARE LOCATED IN THE SIDEWALK, THE SIDEWALK PATH SHALL NOT BE LESS THAN 34" WIDE FOR NO MORE THEN 24".



DELAWARE
DEPARTMENT OF TRANSPORTATION

SHARED-USE PATH & SIDEWALK DETAILS

STANDARD NO.

M-3 (2018)

SHT. 1

OF 1

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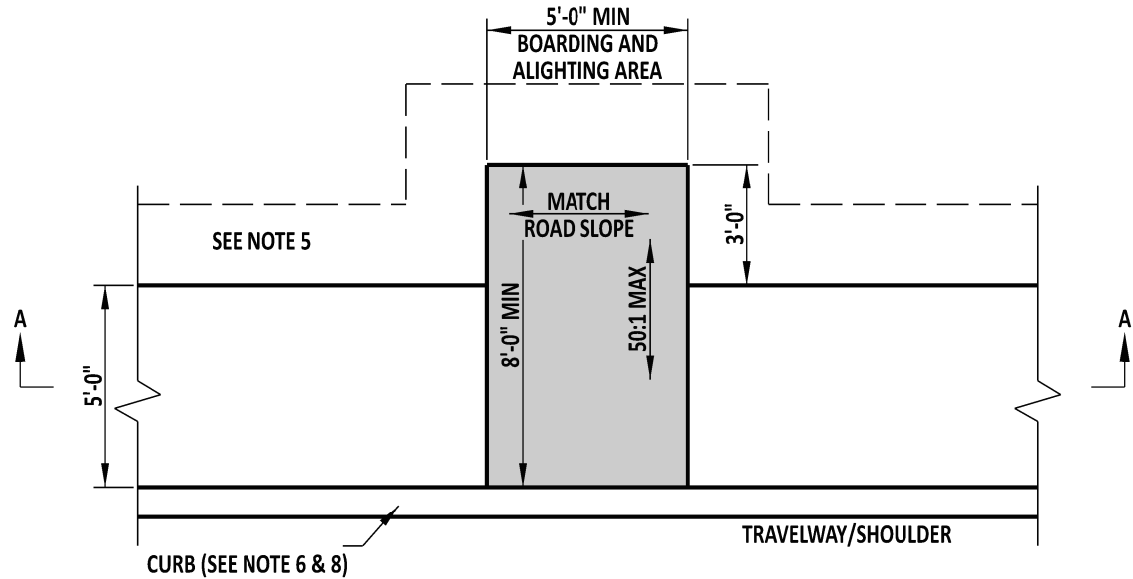
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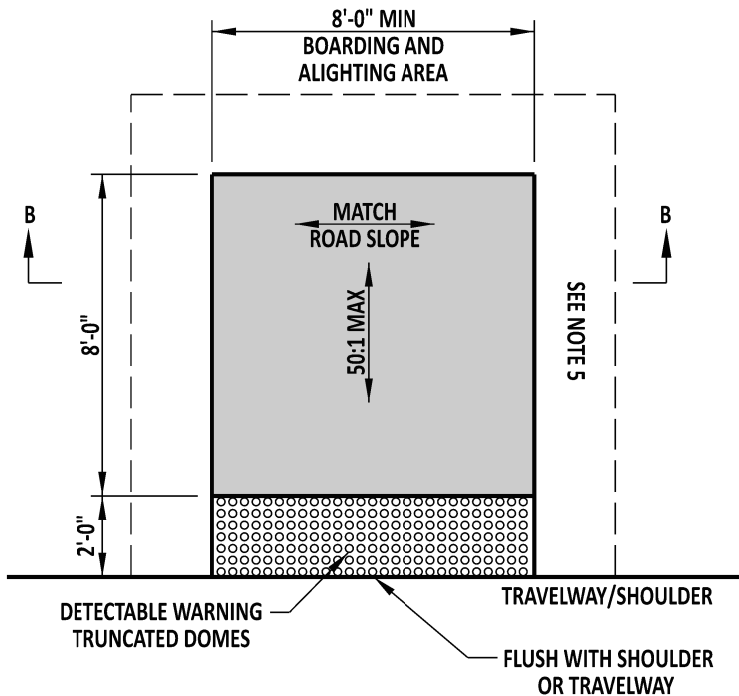
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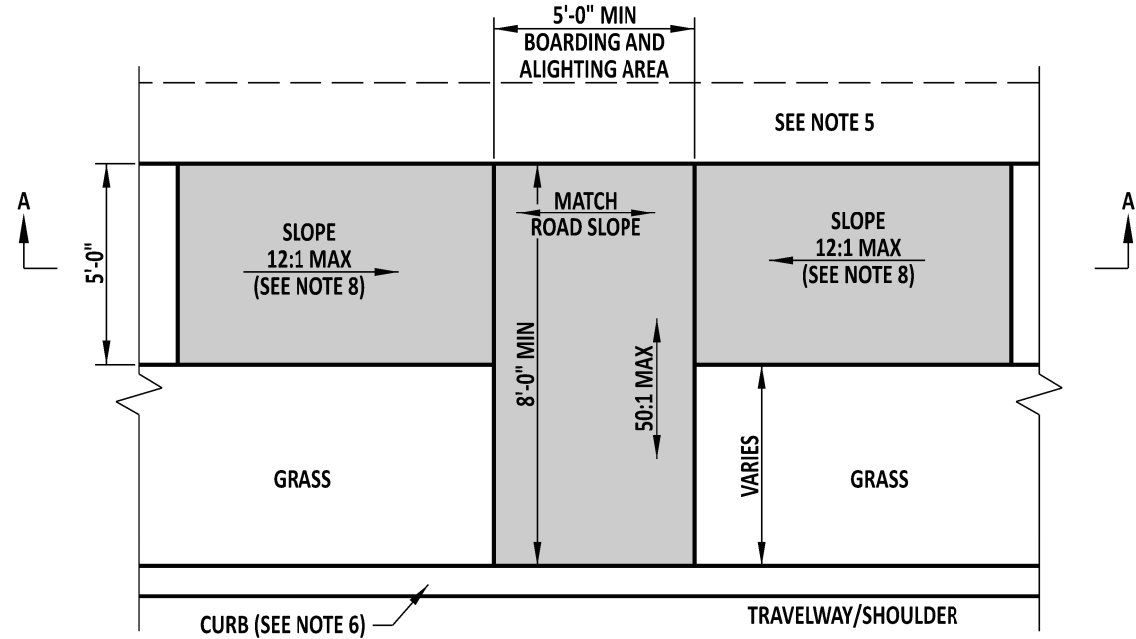
BUS STOP PAD, TYPE 1

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



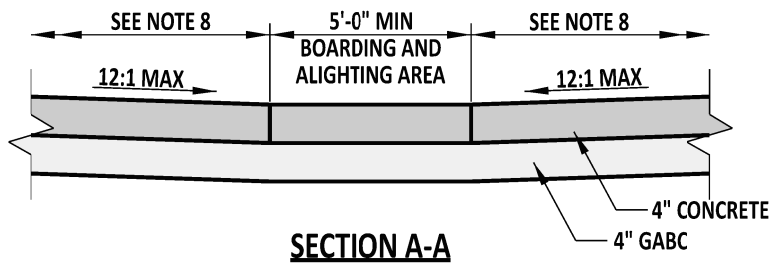
BUS STOP PAD, TYPE 3

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

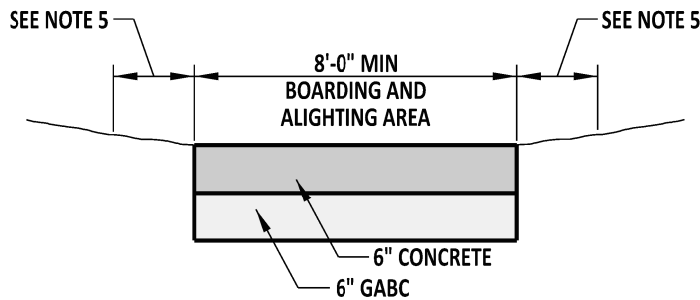


BUS STOP PAD, TYPE 2

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



SECTION A-A



SECTION B-B

- NOTES:**

- 1). BUS STOP PAD LOCATIONS MUST BE APPROVED BY BOTH DART AND DELDOT PRIOR TO ANY CONSTRUCTION.
- 2). REFERENCE THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES 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 MAX SLOPE IS REQUIRED FOR 2'-0" ON ALL SIDES OF THE BUS STOP PAD AND APPROACHING SIDEWALK.
- 6). CURB TYPE VARIES, SEE PLANS FOR CORRECT CURB TYPE.
- 7). SEE DETAIL M-3, SHEET 1 OF 1 FOR ADDITIONAL SIDEWALK DETAILS AND REQUIREMENTS.
- 8). THE MAXIMUM RUNNING SLOPE TO TRANSITION THE SIDEWALK TO MEET BUS STOP PAD ELEVATION IS 12:1 (8.3%), HOWEVER, 20:1 (5%) IS PREFERRED.



DELAWARE
DEPARTMENT OF TRANSPORTATION

BUS STOP PAD DETAILS

STANDARD NO. M-9 (2018)

SHT. 1 OF 2

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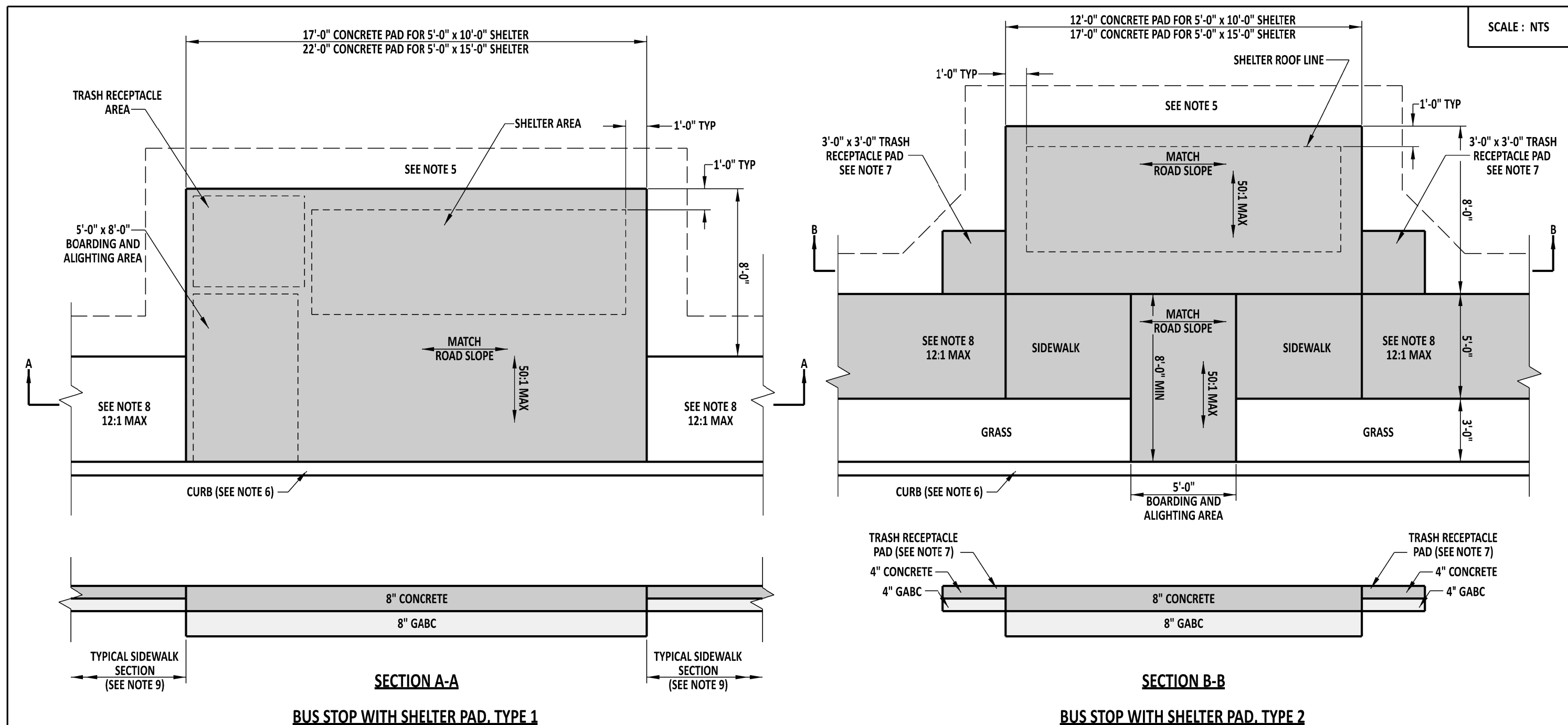
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12/20/2018
DATE



- NOTES:**
- 1). BUS STOP SHELTER PAD LOCATIONS MUST BE APPROVED BY DART AND DELDOT PRIOR TO ANY CONSTRUCTION.
 - 2). REFERENCE THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR GENERAL INFORMATION ON PLACEMENT OF SIGNS.
 - 3). SEE CONSTRUCTION PLANS SIGNING AND STRIPING SHEETS FOR SPECIFIC SIGN AND SIGN LOCATION DETAILS
 - 4). BUS STOP CONFIGURATIONS MAY VARY DUE TO TOPOGRAPHIC OBSTRUCTIONS OR GRADES. CONSULT DART OR DELDOT FOR OPTIONAL PAD DETAILS.
 - 5). A 6:1 MAX SLOPE IS REQUIRED FOR 2'-0" ON ALL SIDES OF THE BUS STOP PAD AND APPROACHING SIDEWALKS.
 - 6). CURB TYPE VARIES. SEE PLANS FOR CORRECT CURB TYPE.
 - 7). TRASH RECEPTACLE PAD CAN BE PLACED ON EITHER SIDE OF THE SHELTER PAD, AT THE DIRECTION OF THE ENGINEER IN THE FIELD.
 - 8). THE RUNNING SLOPE TO TRANSITION THE SIDEWALK TO MEET BUS STOP ELEVATION IS 12:1 (8.3%), HOWEVER, 20:1 (5%) IS PREFERRED.
 - 9). SEE DETAIL M-3, SHEET 1 FOR ADDITIONAL SIDEWALK DETAIL.



DELAWARE
DEPARTMENT OF TRANSPORTATION

BUS STOP PAD WITH SHELTER DETAILS

STANDARD NO. M-9 (2018)

SHT. 2 OF 2

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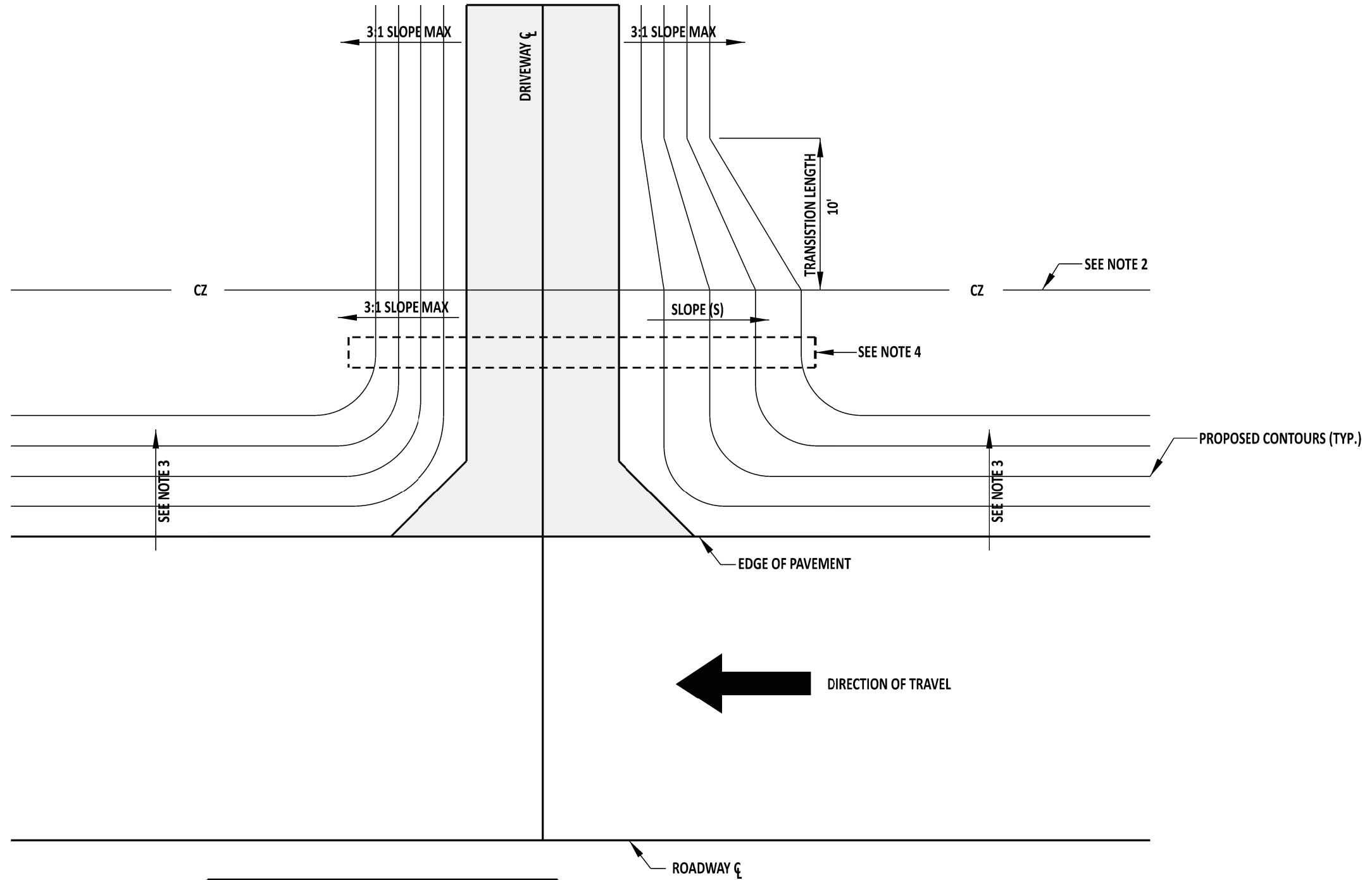
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DESIGN SPEED	S (H:V)
< 50 MPH	4:1
≥ 50 MPH	6:1

NOTES:

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



DELAWARE
DEPARTMENT OF TRANSPORTATION

DRIVEWAY TRANSVERSE SLOPE GRADING

STANDARD NO.

M-12 (2018)

SHT.

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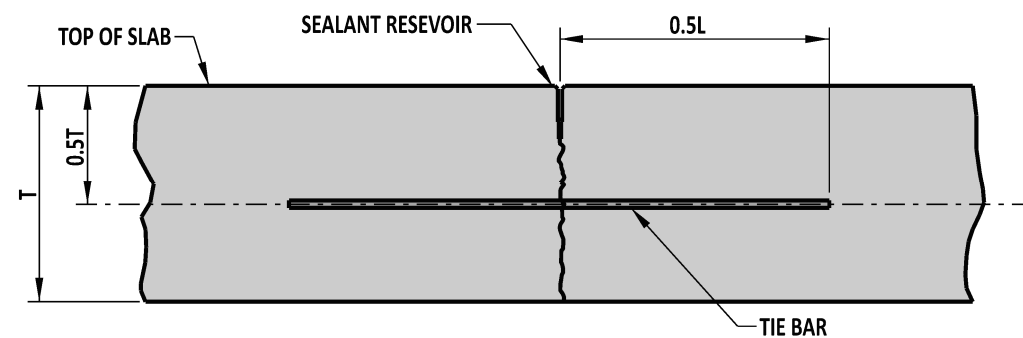
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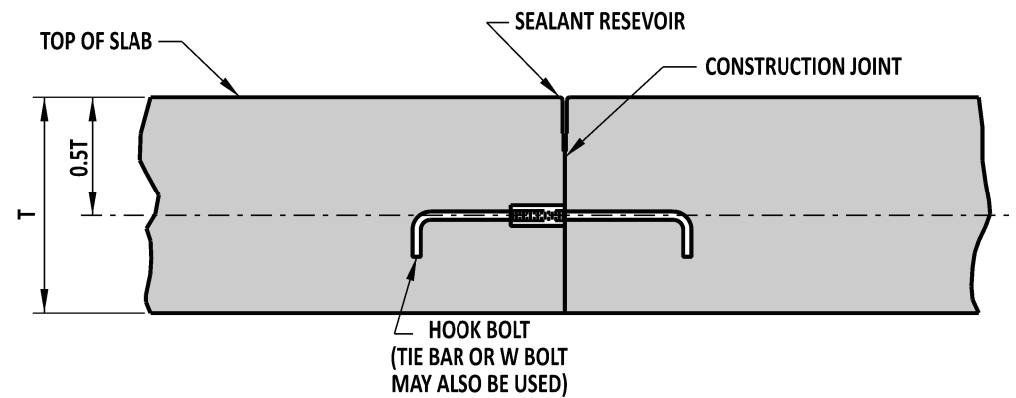
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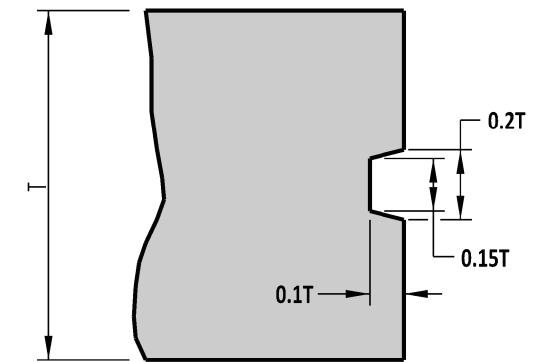
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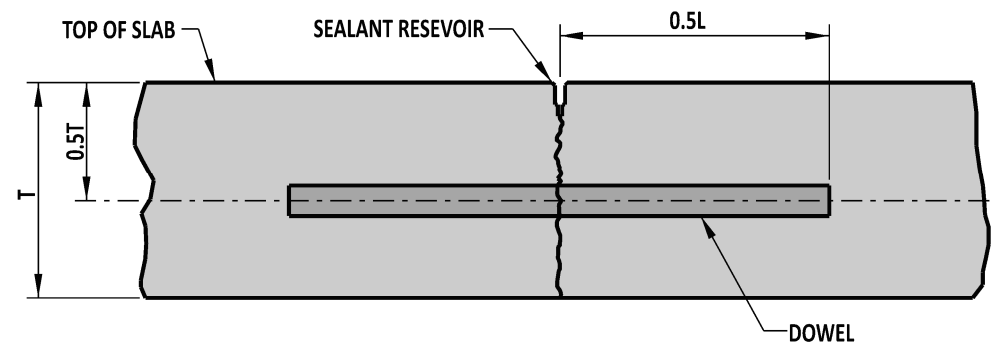
LONGITUDINAL SAW-CUT JOINT DETAIL



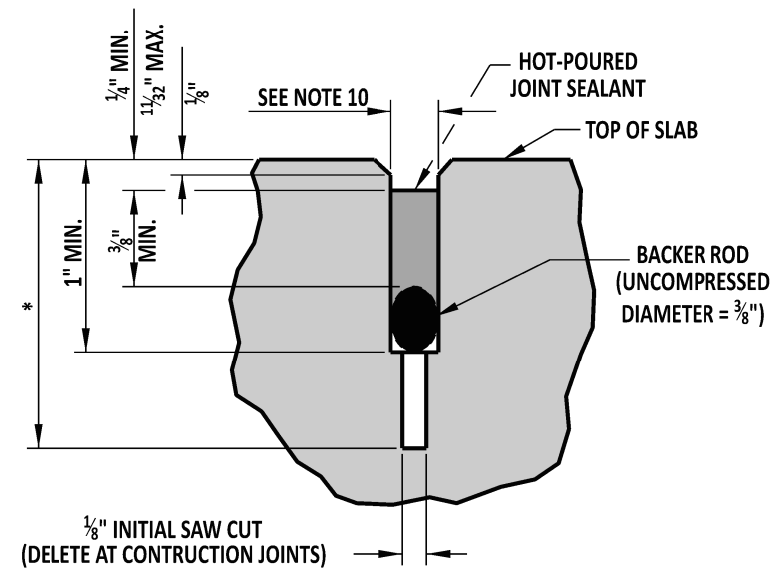
LONGITUDINAL CONSTRUCTION JOINT DETAIL



KEYWAY DETAIL
SEE NOTE 9



TRANSVERSE SAW-CUT JOINT DETAIL



**SEALANT DETAIL-
TRANSVERSE AND LONGITUDINAL JOINT**

* - 0.3T (10" P.C.C. PAVEMENT)
0.4T (12" P.C.C. PAVEMENT)

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, THE SEALANT RESERVOIR SHALL BE CUT $\frac{1}{16}$ " WIDER. WHEN THE TEMPERATURE IS ABOVE 80°F, THE SEALANT RESERVOIR SHALL BE CUT $\frac{1}{16}$ " NARROWER.
- 2). "T" REFERS TO THE ACTUAL CONSTRUCTED SLAB THICKNESS.
- 3). TOLERANCE ON ALL JOINT SEALANT DETAIL DIMENSIONS SHOWN WITHOUT RANGES SHALL BE PLUS $\frac{1}{16}$ ", MINUS 0".
- 4). THE TOP EDGES OF THE CONTACT SURFACES OF THE SEALANT MATERIAL ON BOTH SIDES OF THE JOINT RESERVOIR SHALL BE AT THE SAME ELEVATION.
- 5). TRANSVERSE JOINT MATERIAL SHALL BE PLACED BEFORE LONGITUDINAL JOINT MATERIAL; THE TRANSVERSE JOINT MATERIAL SHALL BE CONTINUOUS FOR THE FULL WIDTH OF ALL ADJACENT P.C.C. PAVEMENT SLABS.
- 6). LONGITUDINAL JOINT MATERIAL SHALL BE PLACED WITHOUT GAPS WHENEVER INTERRUPTED BY THE TRANSVERSE JOINT MATERIAL.
- 7). TRANSVERSE JOINT SEAL TO BE RECESSED $\frac{3}{16}$ " TO $\frac{5}{16}$ " BELOW THE TOP OF THE SLAB.
- 8). A 45° CHAMFER SHALL BE CUT $\frac{1}{8}$ " TO $\frac{1}{4}$ " DEEP AT THE TOP OF THE SLAB ALONG BOTH SIDES OF THE TRANSVERSE SEALANT RESERVOIR.
- 9). USE KEYWAY WHEN HOOK BOLT, TIE BAR, OR W BOLT IS NOT USED.
- 10). DIMENSION FOR TRANSVERSE JOINTS IS $\frac{3}{8}$ " AND DIMENSION FOR LONGITUDINAL JOINT IS $\frac{1}{4}$ ".

JOINT AND SEALANT DETAILS



**DELAWARE
DEPARTMENT OF TRANSPORTATION**

P.C.C. PAVEMENT

STANDARD NO. P-1 (2018)

SHT. 2 OF 5

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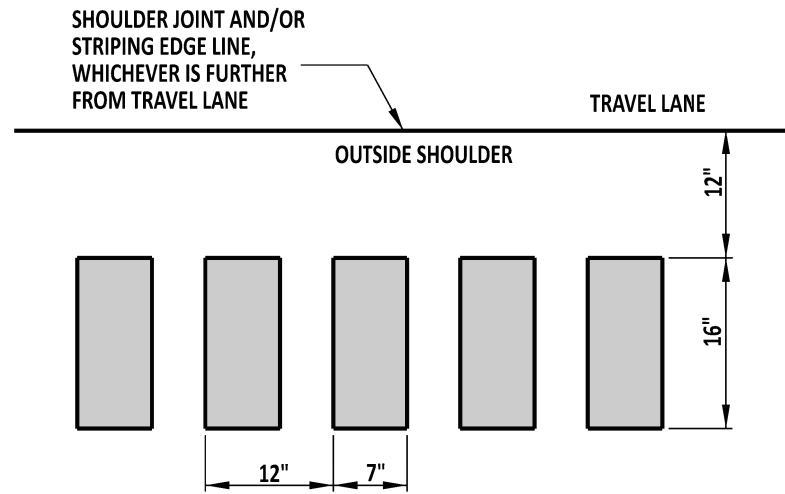
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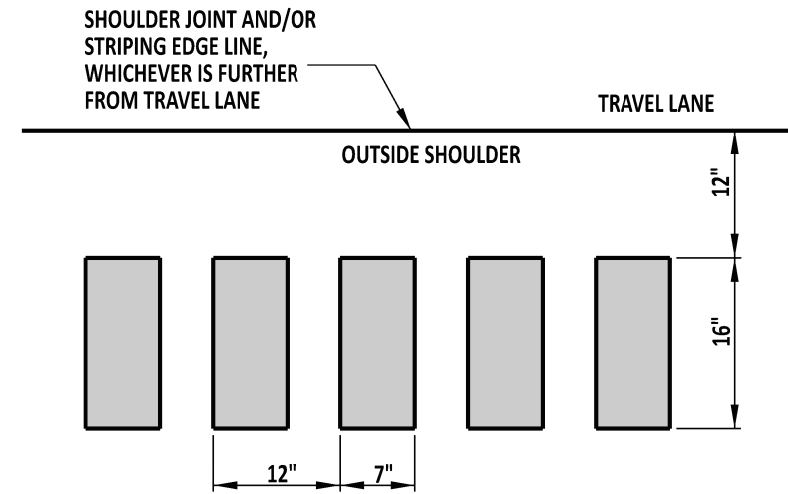
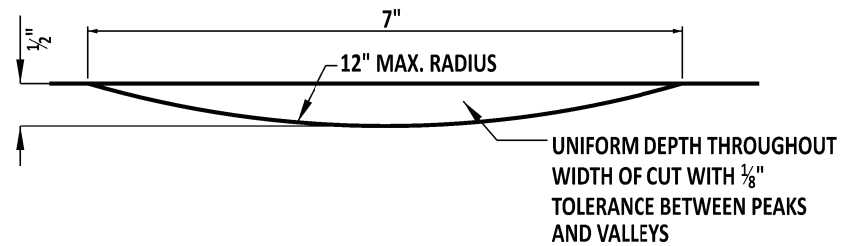
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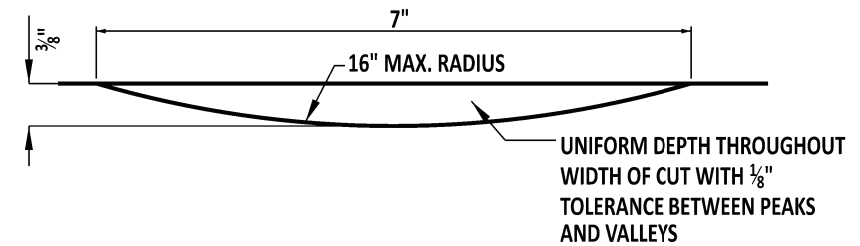
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CONTINUOUS EDGELINE RUMBLE STRIP



CONTINUOUS SHALLOW DEPTH RUMBLE STRIP



NOTES :

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



DELAWARE
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RUMBLE STRIPS

STANDARD NO. P-5 (2018)

SHT. 1 OF 2

APPROVED

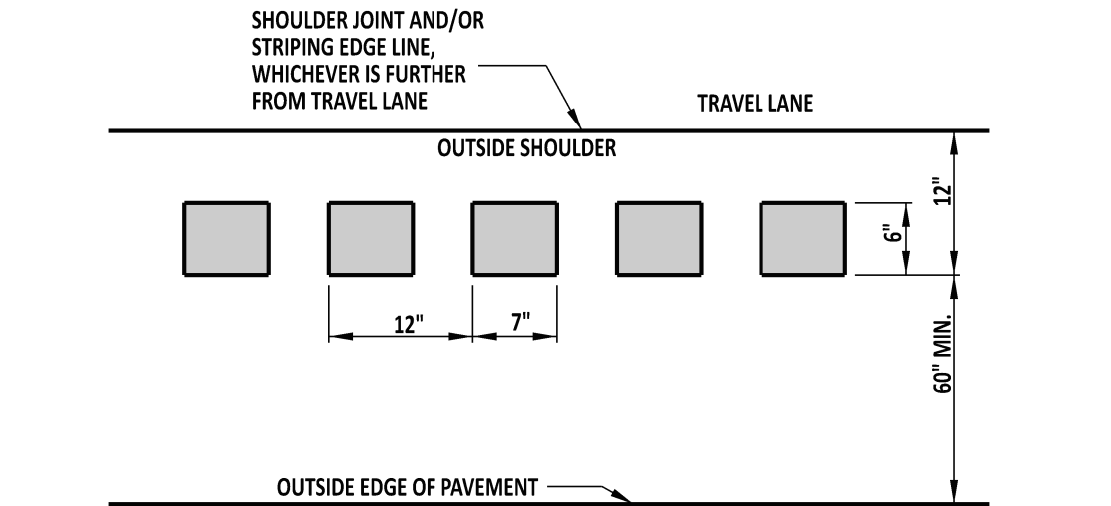
SIGNATURE ON FILE
CHIEF ENGINEER

1/04/2019
DATE

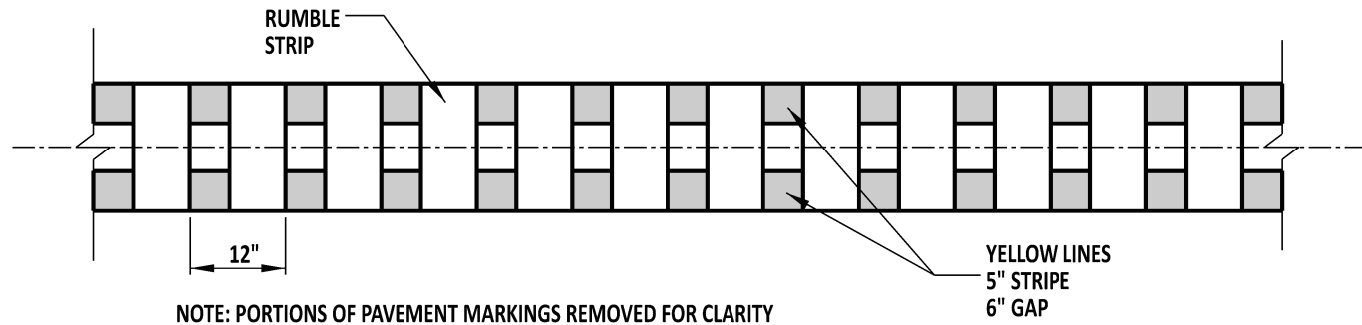
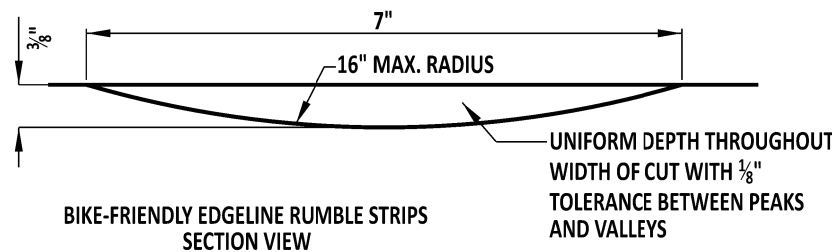
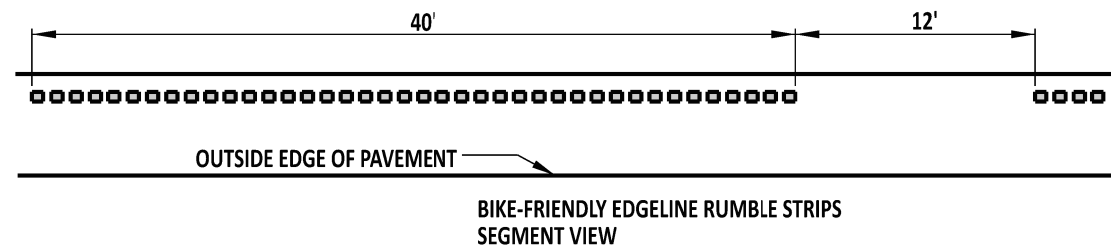
RECOMMENDED

SIGNATURE ON FILE
DESIGN ENGINEER

12/20/2018
DATE

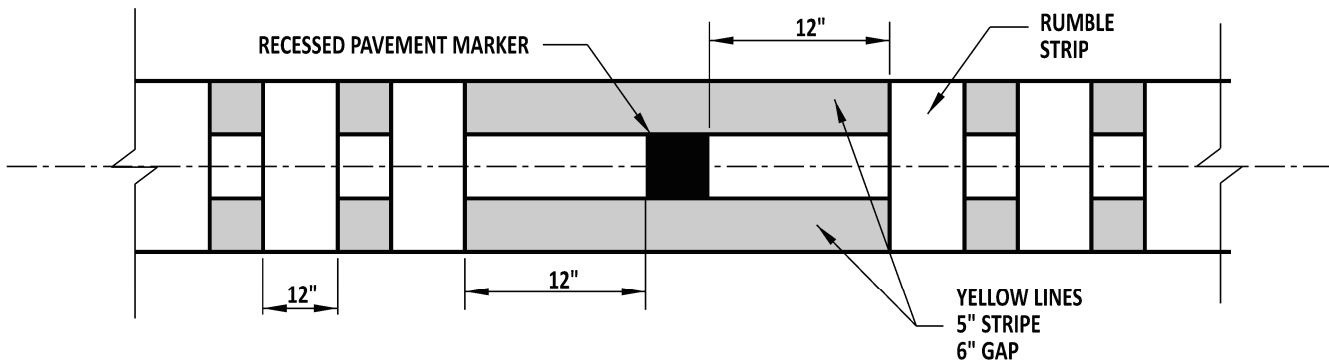


BIKE-FRIENDLY EDGELINE RUMBLE STRIPS



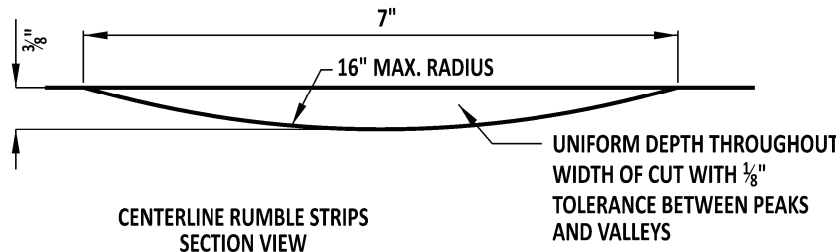
NOTE: PORTIONS OF PAVEMENT MARKINGS REMOVED FOR CLARITY

CENTERLINE RUMBLE STRIP



NOTE: PORTIONS OF PAVEMENT MARKINGS REMOVED FOR CLARITY

CENTERLINE RUMBLE STRIP AT RECESSED PAVEMENT MARKER



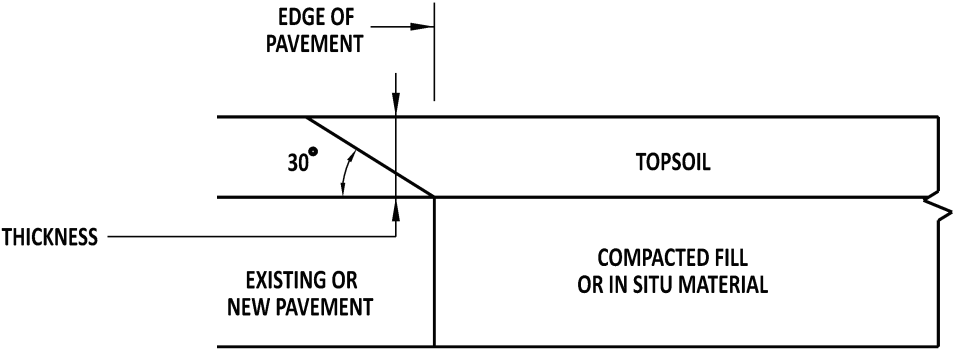
NOTES :

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



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RUMBLE STRIPS				APPROVED	SIGNATURE ON FILE	1/04/2019
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THICKNESS OF SAFETY EDGE	
CONCRETE PAVEMENT	3"
BITUMINOUS CONCRETE PAVEMENT	HEIGHT OF THE FINAL LIFT OF THE TOP WEARING COURSE

NOTES:
1). FOR ROADWAYS WHERE THE COMBINED TRAVEL LANE WIDTH AND SHOULDER WIDTH IS 11' OR LESS, THE SAFETY EDGE SHAL OVERLAP THE COMPACTED FILL OR IN-SITU MATERIAL. COMPACTED FILL OR IN-SITU MATERIAL SHALL BE LEVEL WITH THE ROADWAY PRIOR TO FINAL BITUMINOUS CONCRETE PAVING LIFT.



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PAVEMENT SAFETY EDGE				APPROVED	SIGNATURE ON FILE	1/04/2019
					CHIEF ENGINEER	DATE
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					SIGNATURE ON FILE	12/20/2018
					DESIGN ENGINEER	DATE