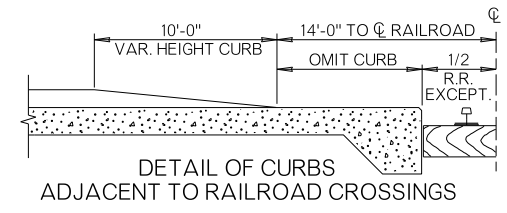
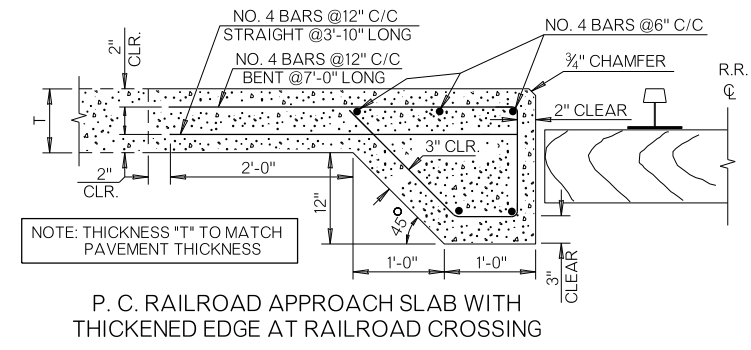
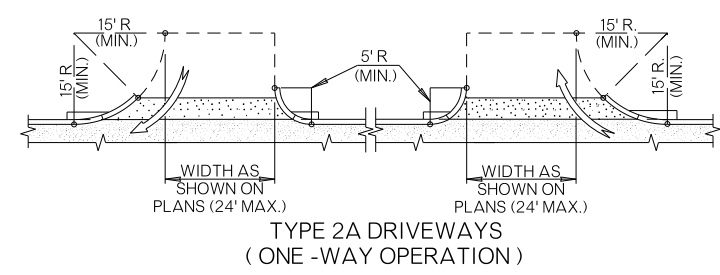
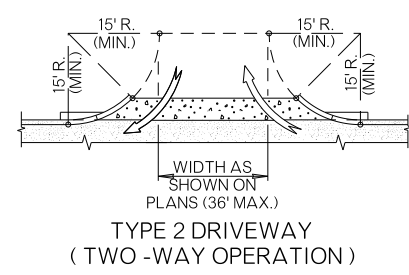


- GENERAL NOTES
1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
 2. COST OF TEMPORARY DIVERSION DIKES TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS OF WORK.

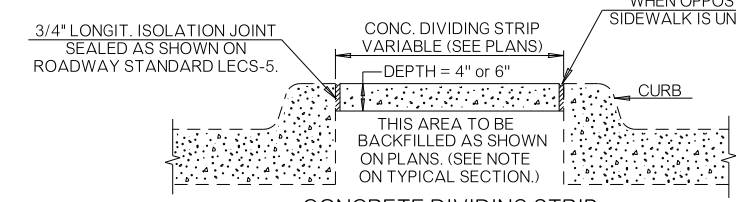
BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
221 (A)	TEMPORARY SLOPE DRAINS	LF
221 (B)	TEMPORARY SILT FENCE	LF
221 (C)	TEMPORARY SEDIMENT FILTER	EA

APPROVED BY ROADWAY ENGINEER: *[Signature]* DATE: 5/27/20
 ROADWAY DESIGN DIVISION STANDARD

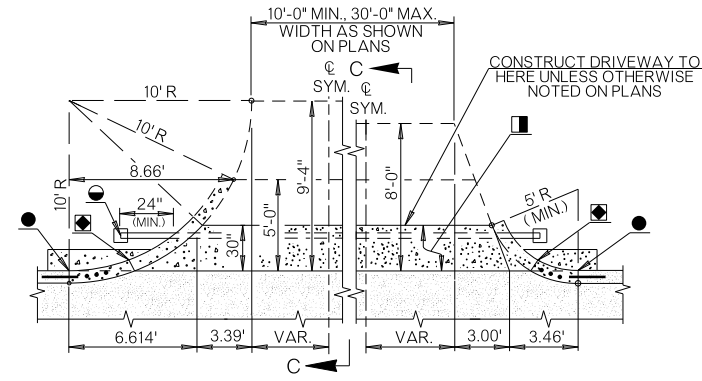
STANDARD REVISIONS	
DESCRIPTION	DATE



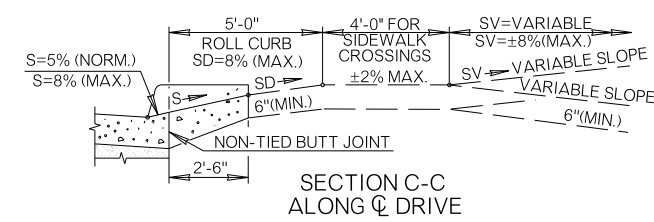
IN CURB/SIDEWALK APPLICATIONS SEALANT AND EXPANSION MATERIAL NOT REQUIRED BETWEEN STRAIGHT SECTIONS OF CURB/SIDEWALK COMBINATIONS WHEN OPPOSING EDGE OF SIDEWALK IS UNCONSTRAINED



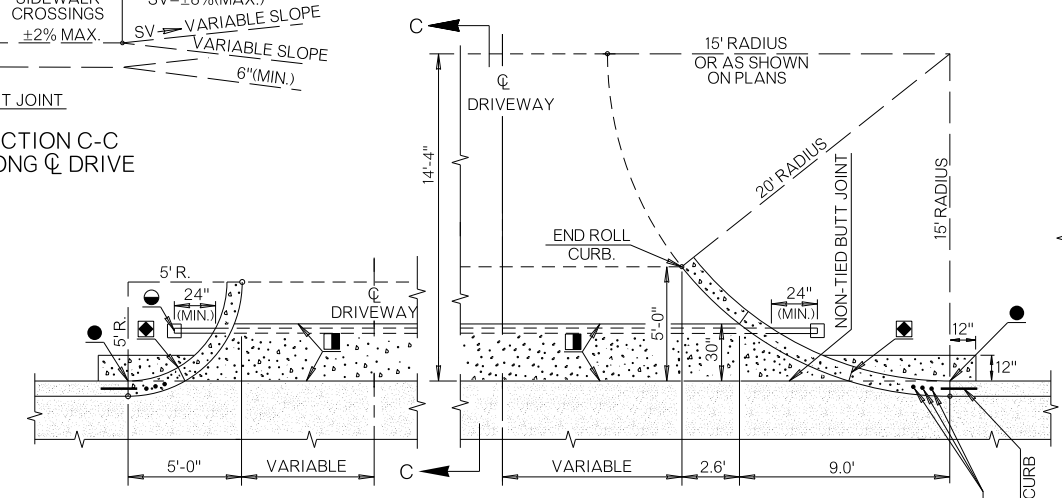
TRANSVERSE EXPANSION JOINTS TO BE 1/2" WIDE. EXPANSION JOINT FILLER AT 50'-0" C/C, AND 1/4" EXPANSION JOINT MATERIAL AT 1/3 POINTS BETWEEN EXPANSION JOINTS. FILLER MATERIAL TO BE PREMOLDED AND JOINTS TO BE SEALED AS SHOWN ON STANDARD DRAWING LECS-5. JOINTS IN DIVIDING STRIP SHOULD ALIGN WITH CURB EXPANSION JOINTS.



- 3/4" EXPANSION JOINT NO LOAD TRANSFER DEVICES
- PAID FOR AS CONCRETE DRIVEWAY (INCLUDES CURB)
- BEGIN ROLL CURB & TERMINATE INTEGRAL CURB. POUR APRON & CURB INTEGRAL WITH DRIVEWAY
- IF SPECIFIED IN THE PLANS, CONSTRUCT CONDUIT CROSSING OF THE SAME SIZE AND TYPE SPECIFIED AT APPROXIMATELY 30" BELOW FINISHED GRADE OF RAMP. SEE GENERAL NOTES FOR DETAILS.

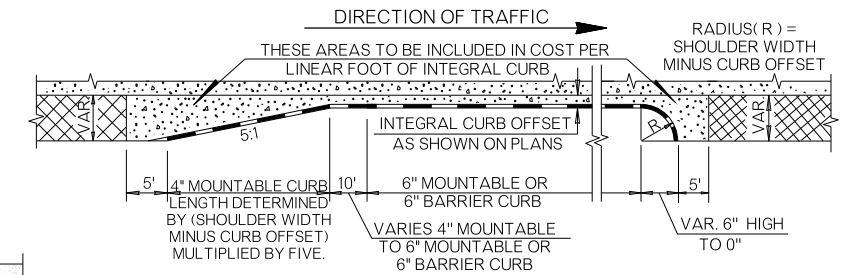


FOR STREET RETURN DETAILS SEE ROADWAY STD. ASCD-6.



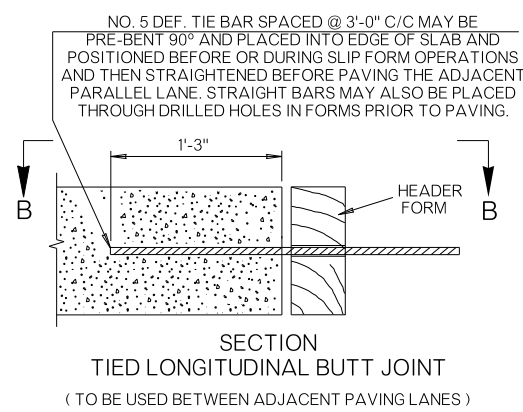
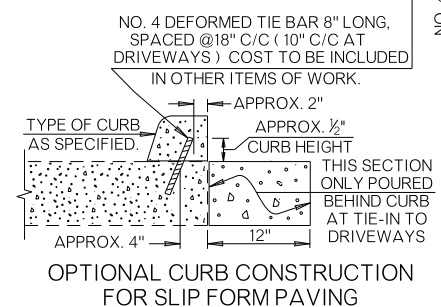
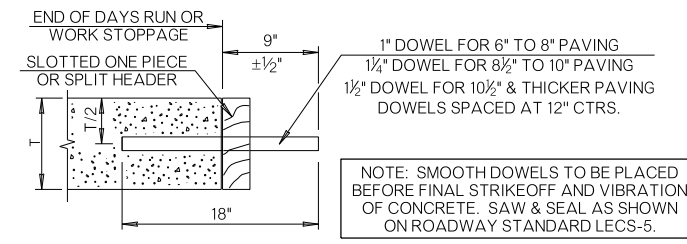
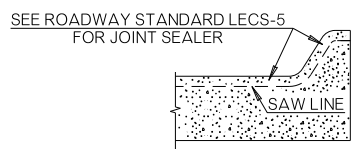
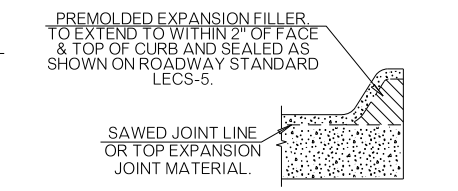
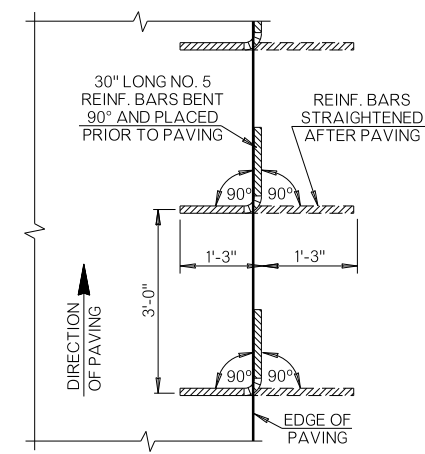
- 3/4" EXPANSION JOINT NO LOAD TRANSFER DEVICES
- PAID FOR AS CONCRETE DRIVEWAY (INCLUDES CURB)
- BEGIN ROLL CURB & TERMINATE INTEGRAL CURB. POUR APRON & CURB INTEGRAL WITH DRIVEWAY
- IF SPECIFIED IN THE PLANS, CONSTRUCT CONDUIT CROSSING OF THE SAME SIZE & TYPE SPECIFIED AT APPROXIMATELY 30" BELOW FINISHED GRADE OF RAMP. SEE GENERAL NOTES FOR DETAILS.

NOTE: WHEN SIDEWALK IS BUILT DIRECTLY BEHIND THE CURB, THE CONCRETE DRIVEWAY SHOULD BE CONSTRUCTED AND EXTENDED TO THE BACK EDGE OF SIDEWALK.

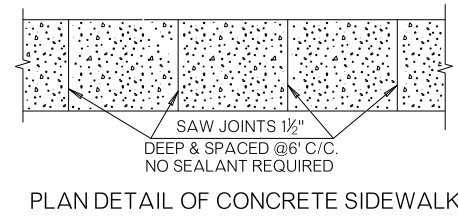
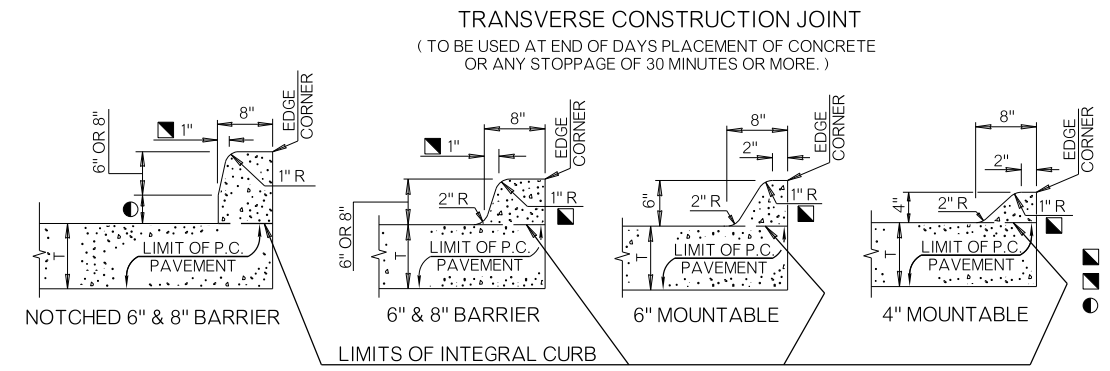


GENERAL NOTES

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
- ALL COST OF CLASS A CONCRETE & REINFORCING STEEL IN THICKENED EDGE AT RAILROAD CROSSINGS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR APPROACH SLAB-RAILROAD.
- COST OF JOINT FILLERS, SEALING AND REINFORCING STEEL SHALL BE INCLUDED IN PRICE BID FOR OTHER ITEMS OF WORK.
- CONTRACTION JOINTS IN JOINTED P.C. PAVEMENT SHALL BE AT APPROXIMATELY 15'-0" CENTERS, UNLESS OTHERWISE SHOWN ON THE PLANS.
- CURB & GUTTER SHALL BE PLACED INTEGRAL WITH THE PAVING SLAB UNLESS OTHERWISE SHOWN IN THE PLANS. TRANSVERSE JOINTS SHALL MATCH PAVEMENT JOINTS AND PLACED AT DRAINAGE STRUCTURES. LONGITUDINAL JOINTS SHALL BE TIED WITH #5 DEFORMED TIE BARS 2'-6" LONG AT 3'-0" CTRS. SEE TIED BUTT AND LONGITUDINAL CONSTRUCTION JOINT DETAIL ON ROADWAY STANDARD LECS-5.
- ALL CONDUIT CROSSINGS ARE TO BE TRENCHED, PLACED, BACKFILLED, AND COMPACTED PRIOR TO SURFACING. BORING OR PUSHING PROCEDURES MAY BE USED WHERE SURFACING IS ALREADY IN PLACE AND IF APPROVED BY THE ENGINEER.
- IF CONDUIT IS NOT CONTINUOUS BETWEEN DRIVEWAYS/RAMPS, CAP BOTH ENDS OF EACH CONDUIT CROSSING AND PLACE MARKER TO PREVENT DAMAGE DURING CONSTRUCTION.
- CONDUIT SHALL NOT TERMINATE BELOW A SURFACED AREA, BUT SHALL EXTEND MINIMUM OF 24" PAST EDGE OF PAVING.
- FOR PULL BOX INSTALLATION DETAILS, SEE TRAFFIC STANDARD PBD1-1.



NO. 5 DEF. TIE BAR SPACED @ 3'-0" C/C MAY BE PRE-BENT 90° AND PLACED INTO EDGE OF SLAB AND POSITIONED BEFORE OR DURING SLIP FORM OPERATIONS AND THEN STRAIGHTENED BEFORE PAVING THE ADJACENT PARALLEL LANE. STRAIGHT BARS MAY ALSO BE PLACED THROUGH DRILLED HOLES IN FORMS PRIOR TO PAVING.

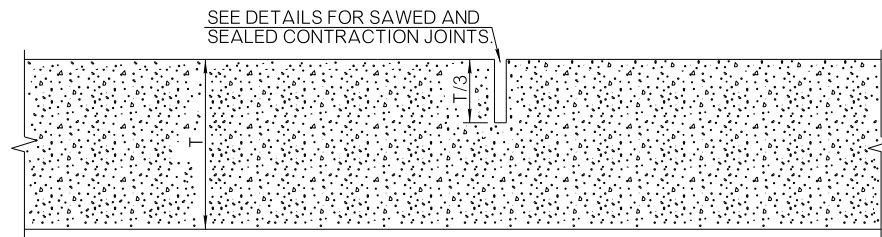


- RADIUS OF 2" MAY BE USED IF APPROVED BY THE ENGINEER.
- BATTER OF 2" MAY BE USED IF APPROVED BY THE ENGINEER.
- DIMENSION EQUALS THICKNESS OF ASPHALT CONCRETE SHOWN ON TYPICAL SECTION ASPHALT CONCRETE THICKNESS (2" MIN.; 4" MAX.)

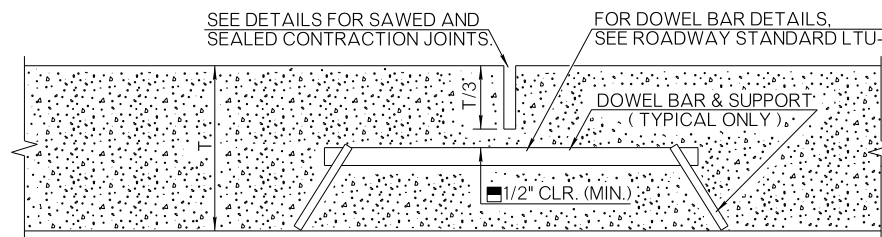
BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
414 (G)	P.C. CONCRETE FOR PAVEMENT	CY
414 (H)	P. C. RAILROAD APPROACH SLABS	SY
609 (A)	CONCRETE CURB (INTEGRAL)	LF
610 (A)	CONCRETE SIDEWALK	SY
610 (B)	CONCRETE DRIVEWAY	SY
610 (C)	CONCRETE DIVIDING STRIP	SY

HEIGHT & TYPE OF CURB SHALL BE SPECIFIED.
THICKNESS SHALL BE SPECIFIED IN INCHES.

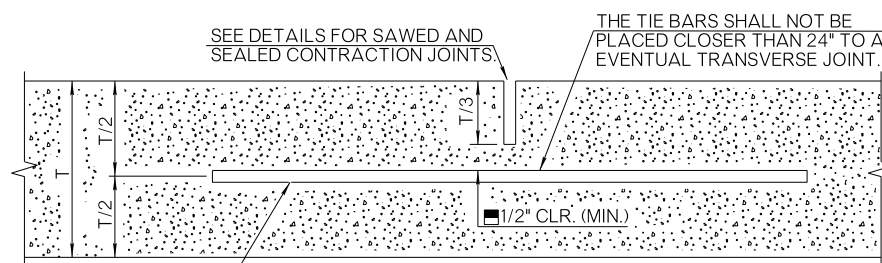
APPROVED BY ROADWAY ENGINEER: *[Signature]* DATE: 5/27/20
ROADWAY DESIGN DIVISION STANDARD



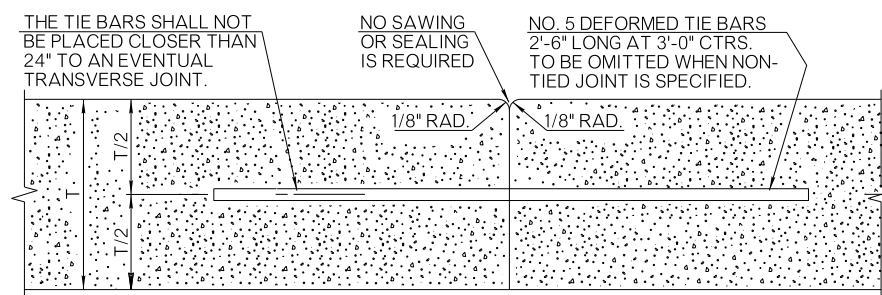
NON-DOWELED CONTRACTION JOINT



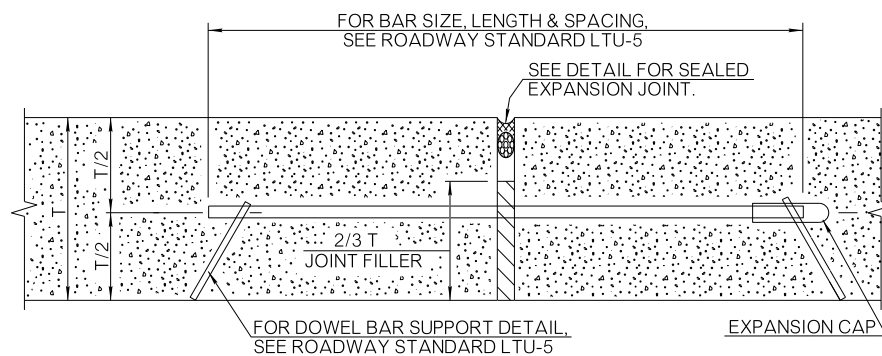
DOWELED CONTRACTION JOINT



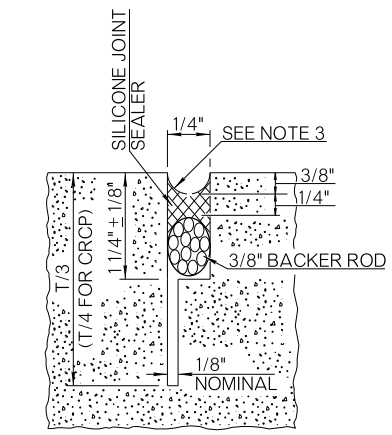
LONGITUDINAL JOINT



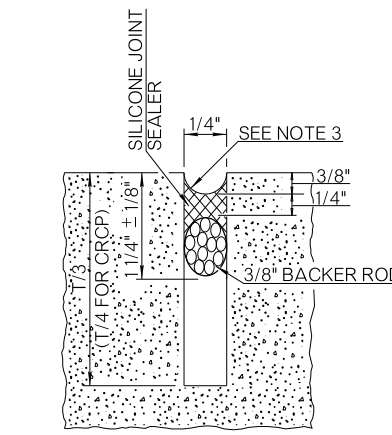
TIED BUTT JOINT AND LONGITUDINAL CONSTRUCTION JOINT



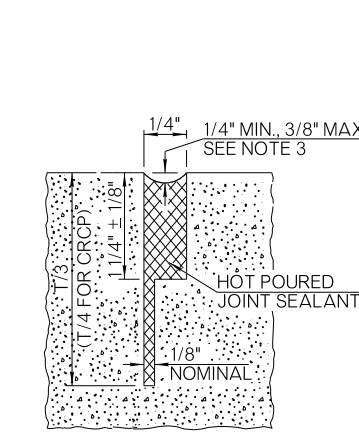
EXPANSION JOINT / ISOLATION JOINT
 OMIT DOWEL BARS, CAPS & SUPPORTS FOR ISOLATION JOINTS



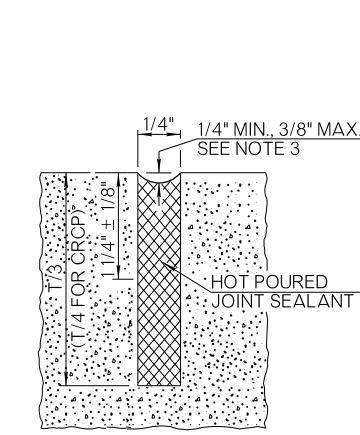
SILICONE SEALANT OPTION



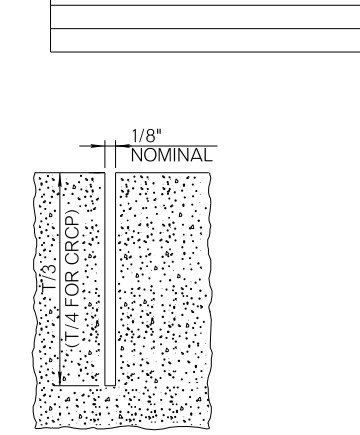
SILICONE SEALANT OPTION



HOT POUR OPTION

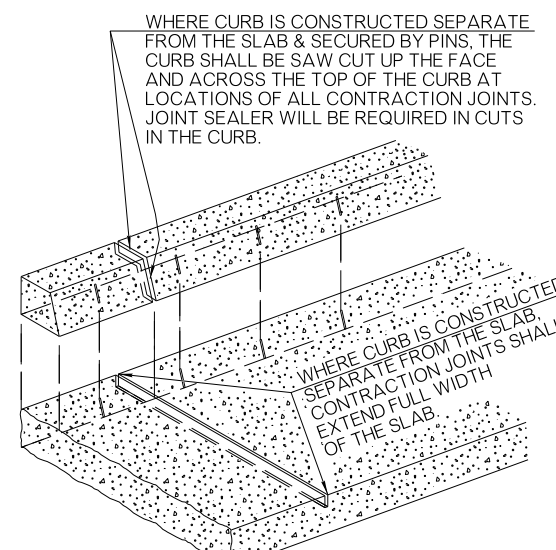


HOT POUR OPTION

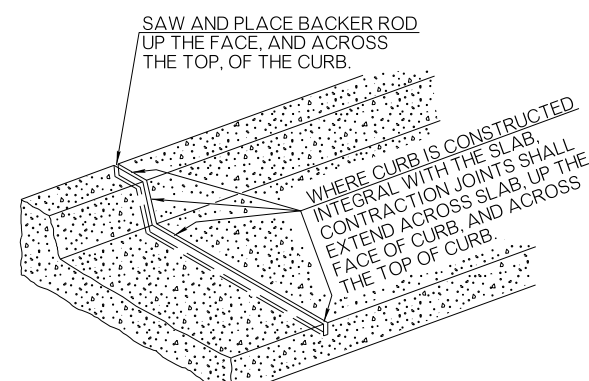


NO SEALANT OPTION

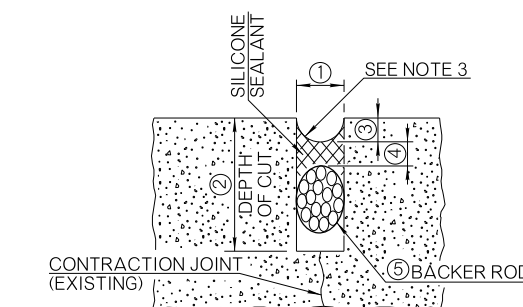
SAWED AND SEALED, CONTRACTION AND LONGITUDINAL JOINTS ALTERNATE DETAILS
 UNLESS OTHERWISE SPECIFIED IN THE PLANS, ONLY THE SILICONE SEALANT OPTIONS WILL BE ALLOWED.



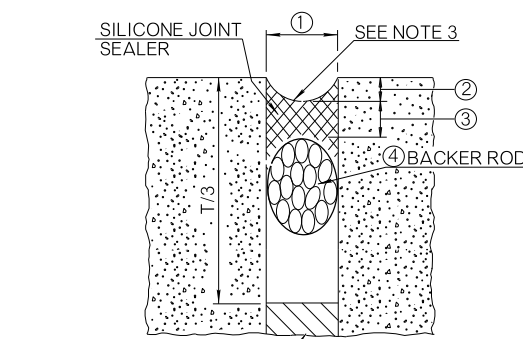
CONTRACTION JOINT WITH SEPARATE CURB



CONTRACTION JOINT WITH INTEGRAL CURB



JOINT REHABILITATION DETAILS



EXPANSION JOINTS / ISOLATION JOINTS
 HOT POURED JOINT SEALANT MAY BE USED IN LIEU OF BACKER ROD AND SILICONE SEALANT, IF APPROVED BY THE ENGINEER

EXPANSION JOINT / ISOLATION JOINT TREATMENT TABLE

JOINT WIDTH ①	SEALANT RECESS DEPTH ②	SILICONE SEALANT THICKNESS ③	BACKER ROD DIAMETER ④
1/2"	3/8"	1/4"	5/8"
3/4"	3/8"	3/8"	7/8"
1"	3/8"	1/2"	1 1/4"
1 1/2"	1/2"	3/4"	2"
2"	1/2"	3/4"	2 1/2"

EXPANSION OR ISOLATION JOINT WIDTH SHALL BE 1/2", UNLESS OTHERWISE SPECIFIED ON THE PLANS. TABLE VALUES, AS SHOWN THIS TABLE, SHALL BE USED IN THOSE SPECIFIED CASES.

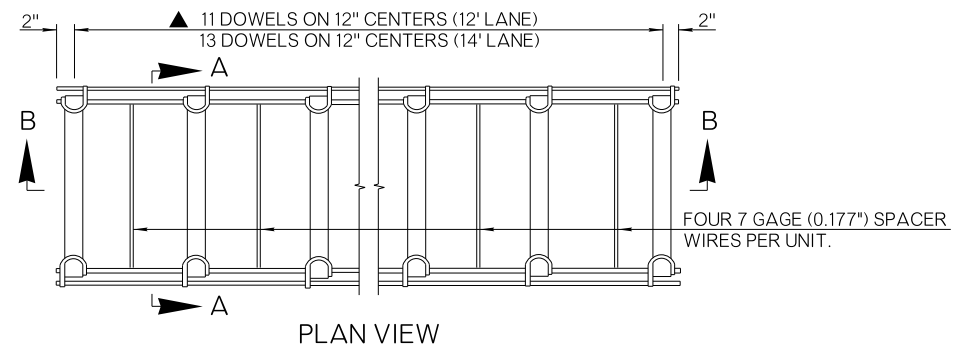
JOINT REHABILITATION TREATMENT TABLE
 SILICONE SEALANT

JOINT WIDTH ①	DEPTH OF CUT ②	SEALANT RECESS DEPTH ③	SEALANT THICKNESS ④	BACKER ROD DIAMETER ⑤
3/8"	1 1/4"	3/8"	3/16"	1/2"
1/2"	1 3/4"	3/8"	1/4"	5/8"
3/4"	1 3/4"	3/8"	3/8"	7/8"
7/8"	1 3/4"	1/2"	7/16"	1"
1"	2"	1/2"	1/2"	1 1/8"
OVER 1"	OVER 2"	1/2"	1/2"	1 1/4"

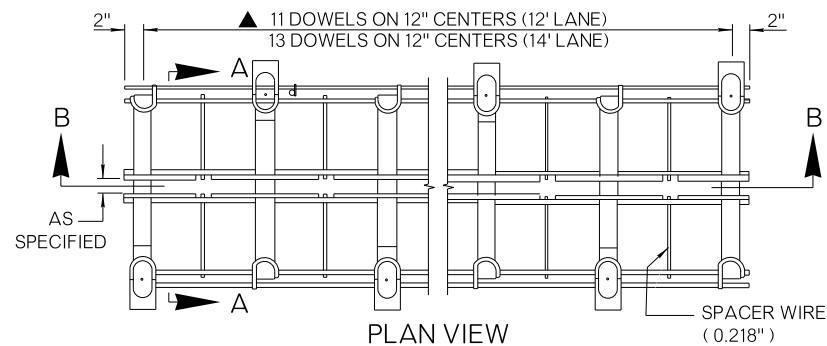
GENERAL NOTES

- ALL CONSTRUCTION AND MATERIALS REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
- ALL CONCRETE JOINT SEALING SHALL BE IN ACCORDANCE WITH SECTION 415 OF THE SPECIFICATIONS.
- THE SHAPE FACTOR, COMBINED WITH THE JOINT CLEANLINESS, IS THE CRITICAL COMBINATION NECESSARY TO GUARANTEE DESIRED BONDING AND FUNCTION OF SEALED JOINTS. THE JOINT SHAPE FACTOR IS DEFINED AS THE FINAL PRESSED SHAPE OF THE SILICONE MATERIAL. THE TOOLING OPERATION WILL FIRMLY PRESS THE FRESHLY APPLIED MATERIAL INTIMATELY AGAINST THE CUT SIDES OF THE RECESS AND THE BACKER ROD SURFACES. THE ROUNDED SHAPE ON TOP AND BOTTOM OF THE SILICONE ALLOWS THE SEALANT TO PROPERLY FLEX BUT MAINTAIN ADHERENCE TO THE PAVING. SELF LEVELING SEALANTS WILL BE INSTALLED TO BE FLUSH WITH THE PAVEMENT SURFACE.
- ON JOINTED PORTLAND CEMENT CONCRETE PAVEMENTS, DOWELED CONTRACTION JOINTS SHALL BE USED ON DRIVING LANES ONLY. CONCRETE SHOULDERS SHALL NOT BE DOWELED UNLESS SPECIFIED ON THE PLANS.
- LONGITUDINAL JOINTS BETWEEN PAVEMENT AND TIED CONCRETE SHOULDERS SHALL NOT BE SAWED OR SEALED UNLESS OTHERWISE SHOWN ON THE PLANS.
- ON ALL SAWED JOINTS, THE KERF DEPTH SHALL CLEAR DOWEL BARS, TIE BARS AND/OR REINFORCING STEEL BY A MINIMUM OF 1/2".
- CONTRACTION JOINTS IN JOINTED P. C. PAVEMENT SHALL BE AT APPROXIMATELY 15'-0" CENTERS, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
- TRANSVERSE GROOVING SHALL BE CONSTRUCTED TO THE FOLLOWING DIMENSIONS: 1/8" TO 3/16" WIDE, 1/8" TO 3/16" DEEP, AND EQUALLY SPACED AT 1/2" TO 1" APART. GROOVES SHALL BE NEAT IN APPEARANCE, OF UNIFORM DEPTH, AND LOCATED 1" TO 3" FROM NEAREST CONTRACTION JOINTS.

APPROVED BY ROADWAY ENGINEER: *Colton A.* DATE 5/27/20
 ROADWAY DESIGN DIVISION STANDARD



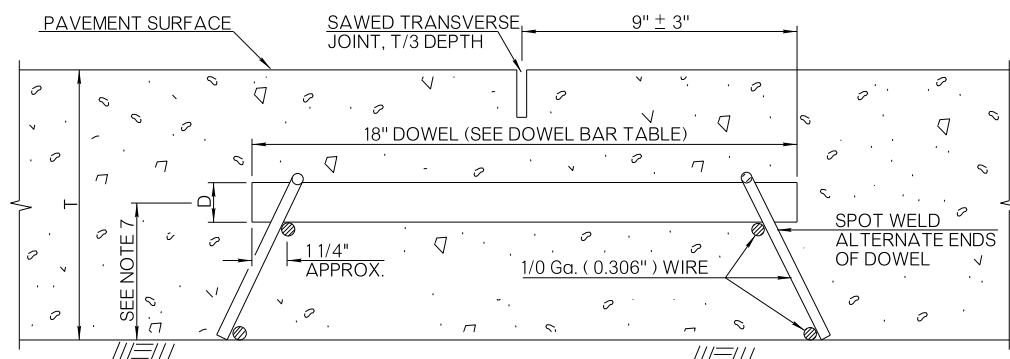
PLAN VIEW



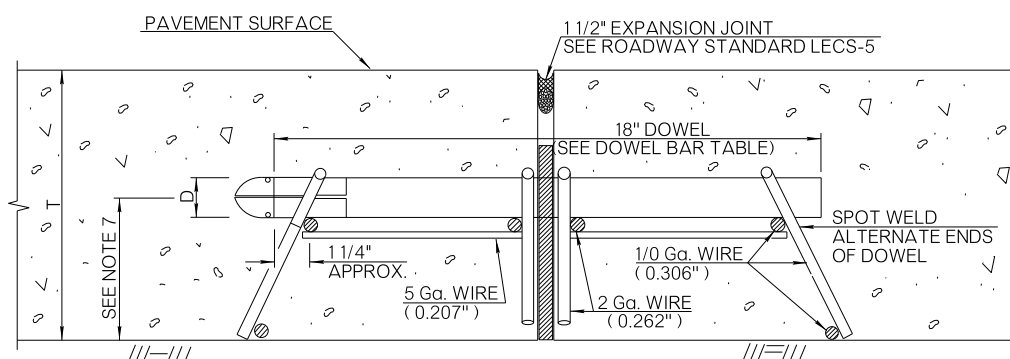
PLAN VIEW

DOWEL BAR TABLE			
▲ SPACING & SIZE DATA			
(T) SLAB DEPTH	DOWEL DIA.	TOTAL DOWEL LENGTH	C/C DOWEL SPACING
6" - 8"	1"	18"	12"
8 1/2" - 10"	1 1/4"	18"	12"
10 1/2" & UP	1 1/2"	18"	12"

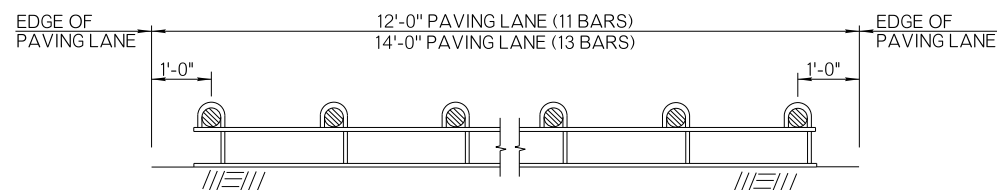
DOWEL DIAMETER WILL BE DETERMINED BY THE SLAB DEPTH (T) OR THE NOMINAL DEPTH WHEN SLAB DEPTH VARIES. WHEN NOMINAL DEPTH VALUE IS TO BE USED, THE CALCULATED NOMINAL DEPTH WILL BE SHOWN ON THE PLANS.



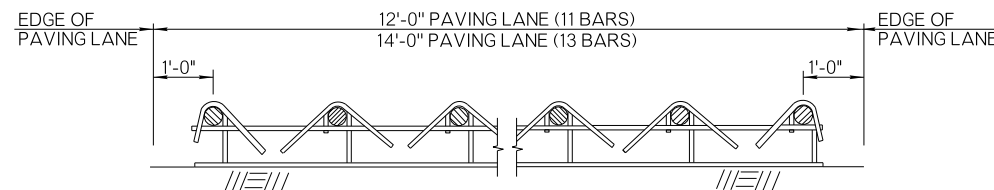
SECTION A - A



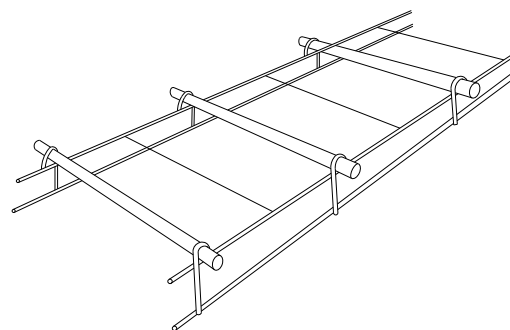
SECTION A - A



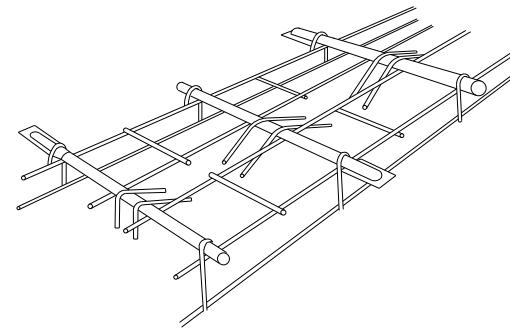
SECTION B - B



SECTION B - B



WELDED CONTRACTION JOINT ASSEMBLY



WELDED EXPANSION JOINT ASSEMBLY

GENERAL NOTES

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
- ANY DEVICE USED FOR SUPPORTING DOWELS SHALL HAVE SUFFICIENT RIGIDITY AND BE HELD IN PLACE DURING CONCRETE PLACEMENT SO THAT DOWELS WILL BE IN SPECIFIED POSITION IN THE FINISHED PAVEMENT. ANY DEVICE NOT PRODUCING THE SPECIFIED RESULTS SHALL BE REJECTED.
- PRODUCER AND CONTRACTOR SHALL AVOID PATENT INFRINGEMENT OF THE BASKET AND SHALL SAVE THE STATE HARMLESS IN THE USE OF ANY BASKET.
- THE CONTRACTOR MAY SELECT THE TYPE OF BASKET TO BE USED. AFTER THE SELECTION IS MADE, THE SAME TYPE BASKET SHALL BE USED THROUGHOUT THE PROJECT, UNLESS APPROVED OTHERWISE BY THE ENGINEER.
- COLD-DRAWN STEEL WIRE, USED FOR DOWEL BASKETS, SHALL BE ACCEPTED BY VISUAL FIELD INSPECTION, AS PROVIDING SUFFICIENT DOWEL BAR SUPPORT DURING PAVING PROCESS.
- ▲ DOWEL BARS SHALL BE GRADE 60 PLAIN BARS, IN ACCORDANCE WITH SECTION 723.01 OF THE SPECIFICATIONS. DOWEL BARS SHALL BE CENTERED ON THE BASKET REGARDLESS OF THE WIDTH OF THE BASKET OR THE LENGTH OF THE DOWEL BAR.
- THE HEIGHT OF THE LOAD TRANSFER UNIT (MEASURED TO THE CENTER OF THE DOWEL BAR FROM THE PAVEMENT SURFACE) SHALL BE 1/2 THE THICKNESS OF THE PAVEMENT, PLUS OR MINUS 1/2 THE DIAMETER OF DOWEL BAR OF THE UNIT.
- DOWEL BARS SHALL HAVE A SHOP APPLIED EPOXY COATING OVER THEIR ENTIRE LENGTH (ENDS EXCEPTED). ADDITIONALLY, DOWELS SHALL BE COMPLETELY COATED WITH A FORM RELEASE AGENT (OR APPROVED EQUIVALENT BOND BREAKER) APPLIED IN THE FIELD, IMMEDIATELY PRIOR TO PAVING. THE FORM RELEASE AGENT SHALL NOT BE ALLOWED TO EVAPORATE FROM THE BARS PRIOR TO PAVING.
- FOR EXPANSION JOINTS, THE DOWEL BARS SHALL HAVE EXPANSION CAPS WITH A MINIMUM 1" AND A MAXIMUM 2" AIR SPACE IN THE END OF THE EXPANSION CAPS (EXPANSION JOINT ASSEMBLIES).
- THE CONTRACTOR SHALL DEMONSTRATE TO THE ENGINEER A STAKING PATTERN THAT SHALL SECURE ALL DOWEL BASKETS SUCH THAT THE FINAL DOWEL POSITION IS WITHIN SPECIFICATION LIMITS.
- FOR EXPANSION JOINTS, IN ADDITION TO THE SUPPORTS INDICATED, THE CONTRACTOR SHALL PROVIDE SUITABLE INSTALLING DEVICES AND SUCH ADDITIONAL STAKES AS MAY BE REQUIRED TO HOLD THE JOINT FILLER VERTICAL AND SECURELY IN LINE AND POSITION. THE CONTRACTOR WILL ALSO BE REQUIRED TO SATISFACTORILY FORM THE UPPER PORTION OF THE JOINT FOR RECEIVING THE SEAL. SEE ROADWAY STANDARD LECS-5.

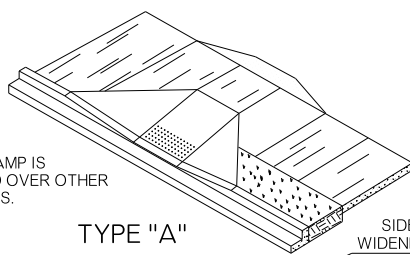
APPROVED BY ROADWAY ENGINEER: *Calvin A.* DATE: 5/27/20
 ROADWAY DESIGN DIVISION STANDARD



LOAD TRANSFER UNITS FOR
 CONCRETE PAVEMENT JOINTS

STANDARD REVISIONS	
DESCRIPTION	DATE

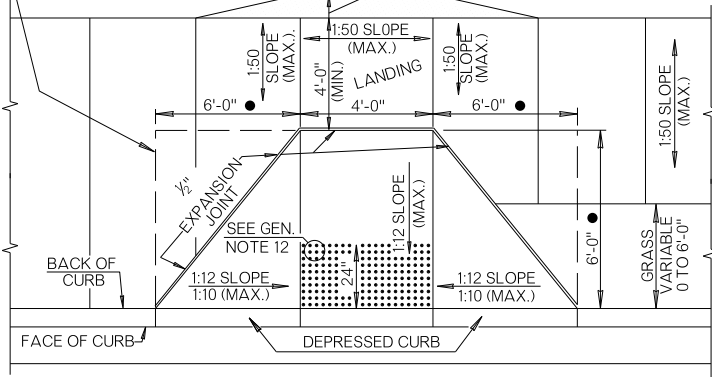
TYPE "A" RAMP IS PREFERRED OVER OTHER RAMP TYPES.



TYPE "A"

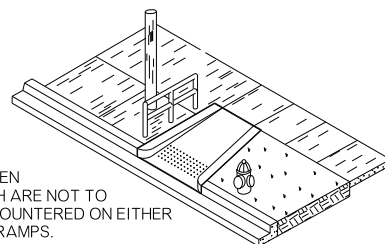
SIDEWALK MAY BE WIDENED TO CONFORM TO A.D.A. REQUIREMENTS

RAMP MAY BE CONSTRUCTED TO DASHED EXTENTS, IF NECESSARY, TO MAINTAIN 1:12 SLOPE (MAX.)

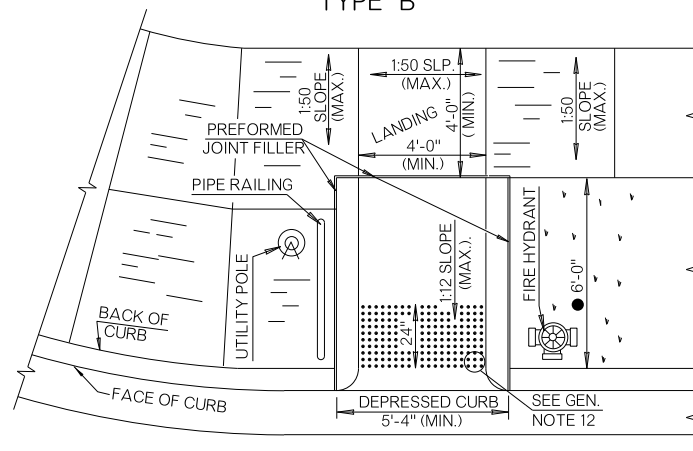


ELEVATION

USE TYPE "B" RAMP WHEN OBSTRUCTIONS, WHICH ARE NOT TO BE REMOVED, ARE ENCOUNTERED ON EITHER SIDE OF WHEELCHAIR RAMPS.

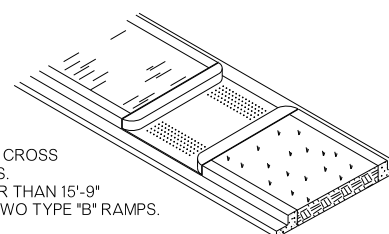


TYPE "B"

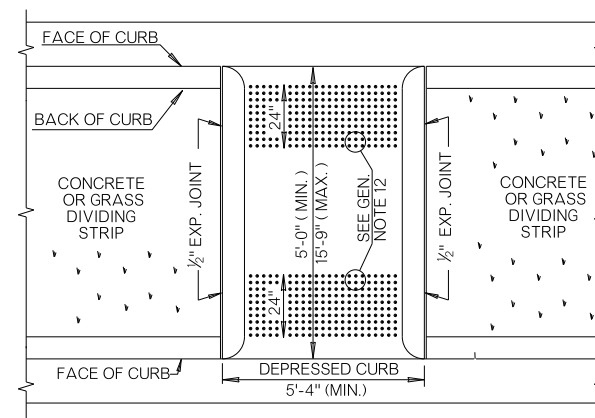


ELEVATION

USE TYPE "C" RAMP TO CROSS 15'-9" OR LESS MEDIANS. FOR MEDIANS GREATER THAN 15'-9" USE SIDEWALK WITH TWO TYPE "B" RAMPS.

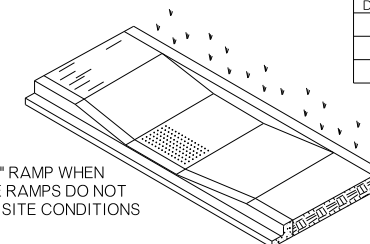


TYPE "C"

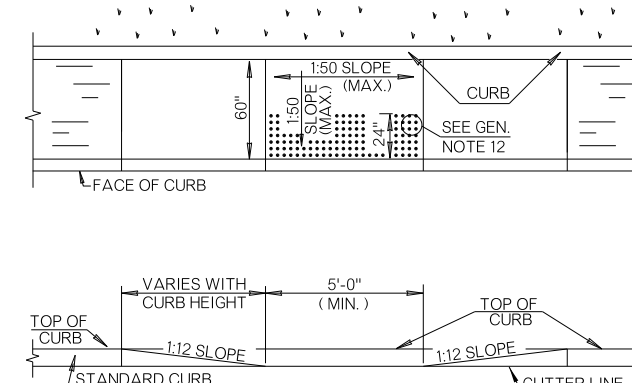


ELEVATION

USE TYPE "D" RAMP WHEN OTHER TYPE RAMPS DO NOT WORK WITH SITE CONDITIONS



TYPE "D"



ELEVATION

GENERAL NOTES

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
- THERE WILL BE NO DEDUCTION OF PAYMENT FOR CONCRETE CURB & GUTTER AND/OR INTEGRAL CURB FOR THE LENGTH OF THE DEPRESSED CURB.
- RAMP DIMENSIONS SHOWN ARE BASED ON A CURB HEIGHT OF SIX INCHES. THE DIMENSIONS SHOULD BE ADJUSTED FOR OTHER CURB HEIGHTS. THE MAXIMUM PERMISSIBLE SLOPES OF THE WHEELCHAIR RAMPS IS 8.33% (1:12). RAMP SLOPE MAY BE 1:10 (MAX.) ALONG FACE OF TAPERED CURB.
- DRAINAGE STRUCTURES SHALL NOT BE PLACED IN LINE WITH THE RAMPS.
- THE NORMAL GUTTER LINE PROFILE SHALL BE MAINTAINED THROUGH THE AREA OF THE RAMP WITH A 1:50 SLOPE (MAX.). SEE NOTE NO. 10.
- WHEELCHAIR RAMPS SHOULD BE LOCATED SO THAT THE RAMP WILL BE ON THE TRAFFIC APPROACH SIDE OF ANY OBSTACLE.
- WHEELCHAIR RAMPS SHOULD BE BUILT AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THE TYPE OF RAMP WILL BE DESIGNATED ON THE PLANS. IF A RAMP IS TO BE CONSTRUCTED AS A COMBINATION OF TWO TYPES, (ONE SIDE TYPE A AND ONE SIDE TYPE B) THE RAMP SHALL BE DESIGNATED AS TYPE "A-B".
- PIPE RAILING CONSTRUCTION DETAILS, WHEN REQUIRED AT TYPE B WHEEL CHAIR RAMPS, WILL BE SHOWN ON THE PLANS.
- EXCAVATION, BACKFILL, EXPANSION JOINT MATERIAL, SEALERS, AND OTHER RELATED MISCELLANEOUS ITEMS WILL NOT BE PAID FOR SEPARATELY BUT THE COST THEREOF SHALL BE INCLUDED IN THE COST OF THE SIDEWALK.
- ALL FEATURES OF CONSTRUCTION INCLUDING, BUT NOT LIMITED TO, SIDEWALKS, CURB RAMPS AND CROSSWALK MARKINGS SHALL COMPLY WITH THE PUBLIC RIGHT-OF-WAY ACCESSIBILITY GUIDELINES (PROWAG) WHERE SPATIAL LIMITATIONS OR EXISTING FEATURES WITHIN THE LIMITS OF THE PROJECT PREVENT FULL COMPLIANCE WITH THE PROWAG. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER UPON DISCOVERY OF SUCH FEATURE(S). THE CONTRACTOR SHALL NOT PROCEED WITH ANY ASPECT OF THE WORK WHICH IS NOT IN FULL COMPLIANCE WITH THE PROWAG WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER. ANY WORK WHICH IS NOT PERFORMED WITHIN THE GUIDELINES OF THE PROWAG, FOR WHICH THE CONTRACTOR DOES NOT HAVE WRITTEN APPROVAL, SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.
- ALL WHEELCHAIR RAMP CURBS SHALL BE INCLUDED IN COST OF SIDEWALK.
- FOR DETAILS OF TACTILE WARNING DEVICES, SEE STANDARD TWD-2.

BASIS OF PAYMENT

ITEM NO.	ITEM	UNIT
610 (A)	CONCRETE SIDEWALK	SY
622 (A)	PIPE RAILING	LF

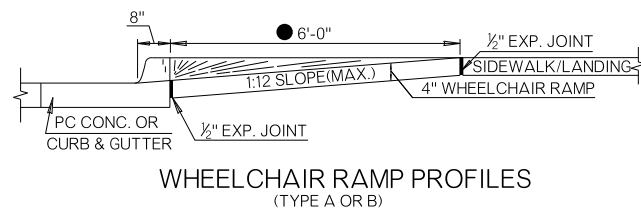
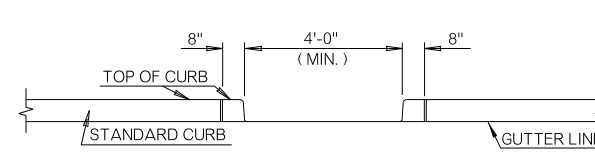
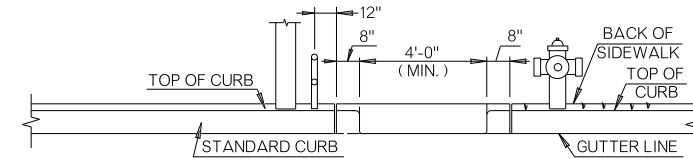
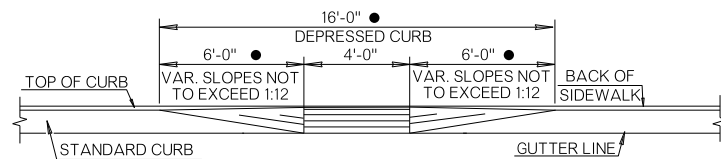
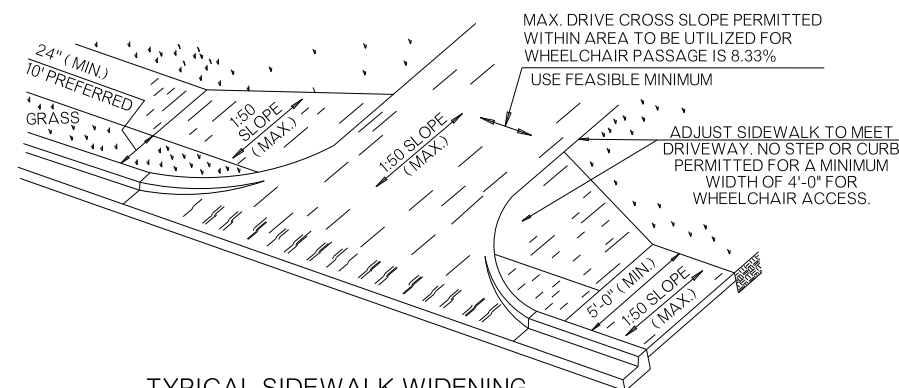
■ SIDEWALK THICKNESS SHALL BE SPECIFIED IN INCHES.

APPROVED BY ROADWAY ENGINEER: *[Signature]* DATE: 5/27/20
ROADWAY DESIGN DIVISION STANDARD

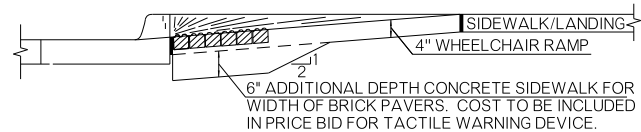
WHEELCHAIR RAMPS



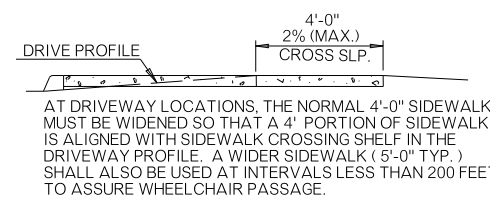
TYPICAL SIDEWALK WIDENING AT DRIVEWAY



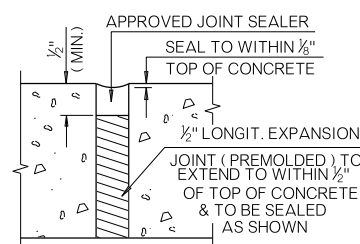
WHEELCHAIR RAMP PROFILES (TYPE A OR B)



SIDEWALK THICKENING FOR TYPE A TACTILE WARNING DEVICES



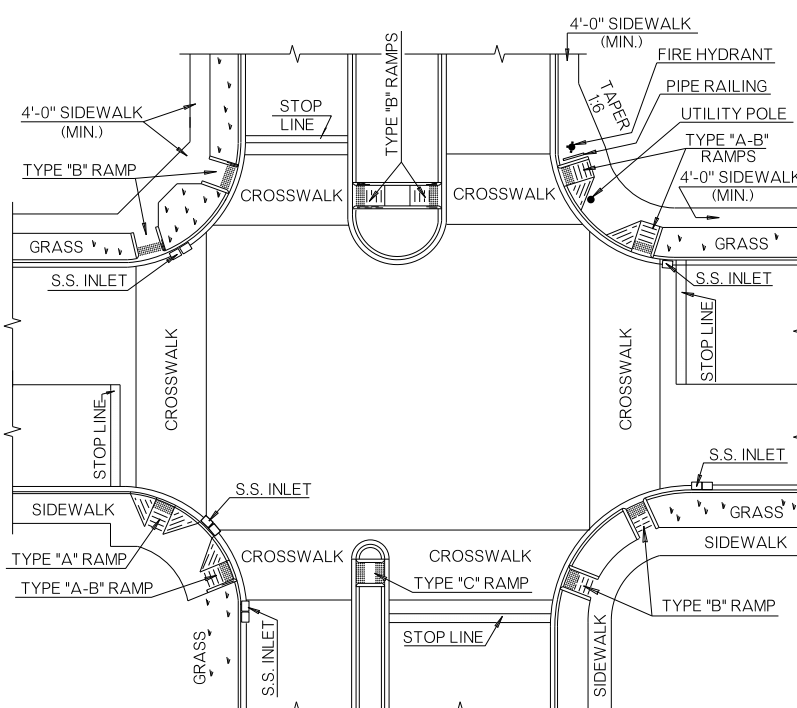
AT DRIVEWAY LOCATIONS, THE NORMAL 4'-0" SIDEWALK MUST BE WIDENED SO THAT A 4' PORTION OF SIDEWALK IS ALIGNED WITH SIDEWALK CROSSING SHELF IN THE DRIVEWAY PROFILE. A WIDER SIDEWALK (5'-0" TYP.) SHALL ALSO BE USED AT INTERVALS LESS THAN 200 FEET, TO ASSURE WHEELCHAIR PASSAGE.



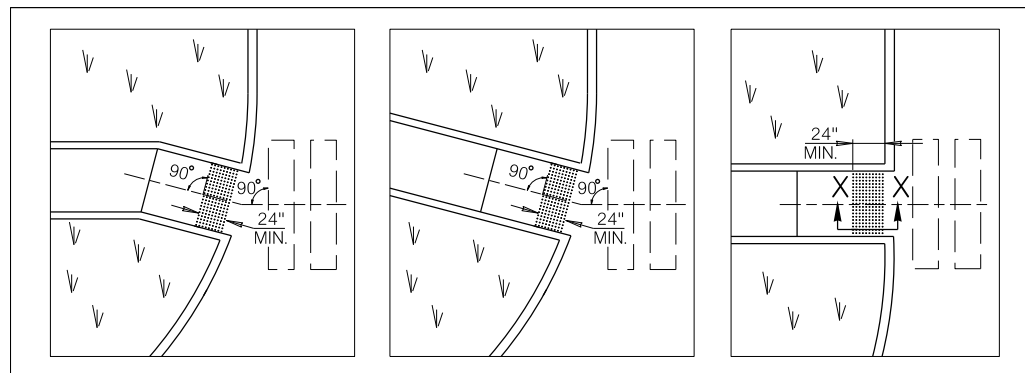
1/2" EXPANSION JOINT

JOINT FILLER SHALL MEET THE REQUIREMENTS OF SECTION 701.08 OF THE SPECIFICATIONS.

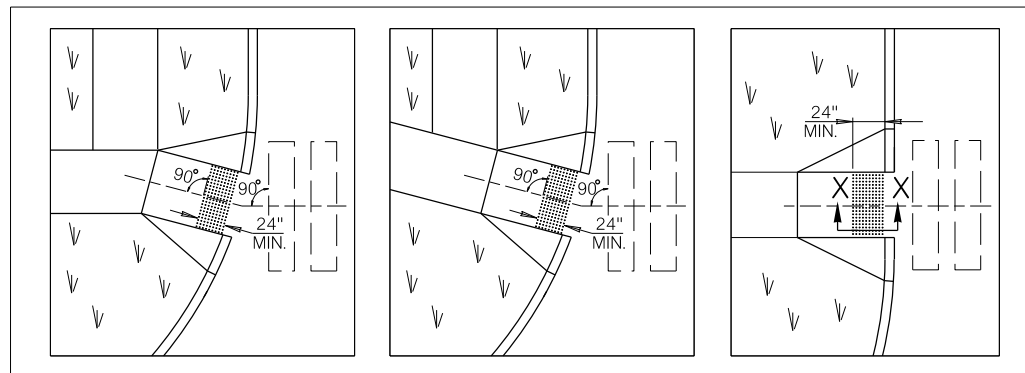
JOINT FILLER SHALL BE USED BETWEEN SIDEWALK AND CURBS, WHEELCHAIR RAMPS, DRIVEWAYS, STREETS, RETAINING WALLS, ETC.



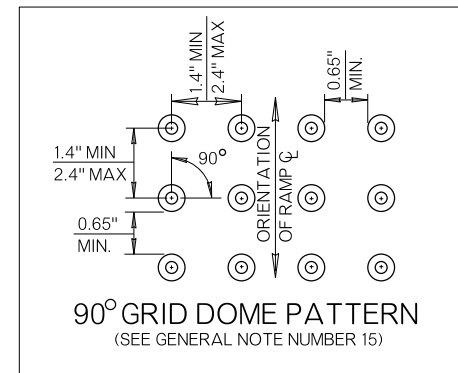
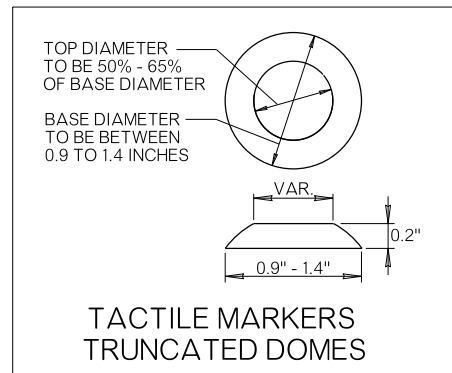
THE ABOVE EXAMPLES ARE TYPICAL ONLY AND ARE SHOWN TO ILLUSTRATE POSSIBLE RAMP TYPES, POSSIBLE RAMP LOCATIONS, POSSIBLE INLET LOCATIONS, AND HOW THE RAMP WILL BE DESIGNATED ON THE PLANS. CARE SHOULD BE EXERCISED TO ASSURE THAT MEDIAN RAMP AND CURB RAMP LINE UP, AND THAT RAMPS THROUGHOUT A PROJECT ARE LOCATED WITH SOME DEGREE OF UNIFORMITY.



TACTILE SYSTEM ORIENTATION - TYPICAL CURBED RAMPS

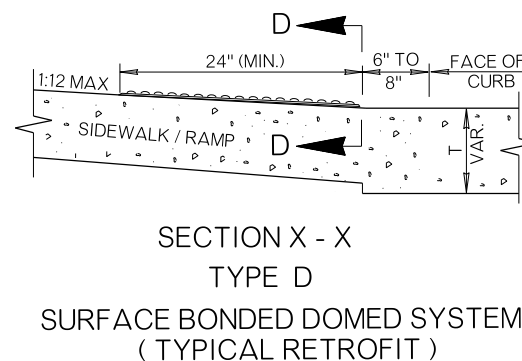
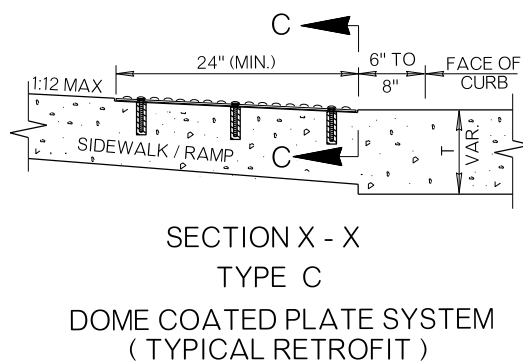
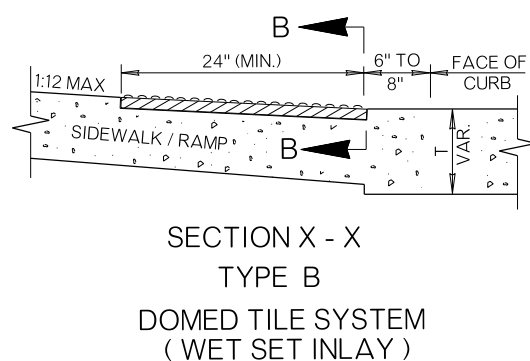
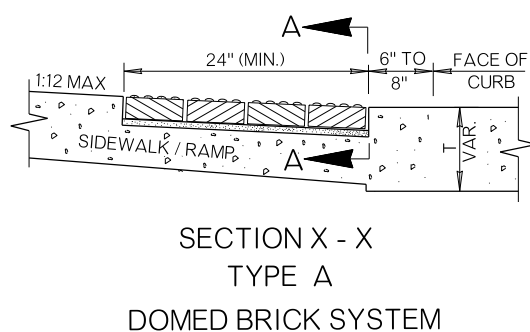
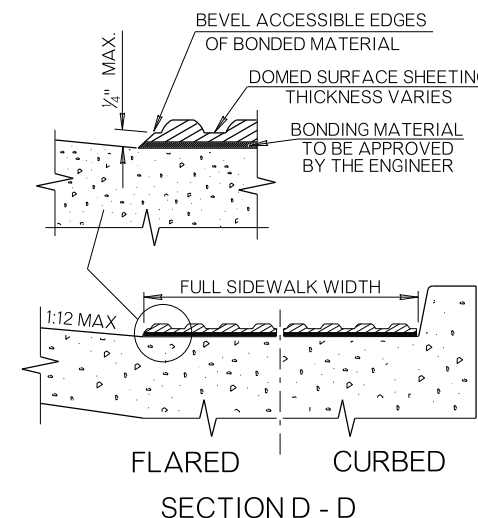
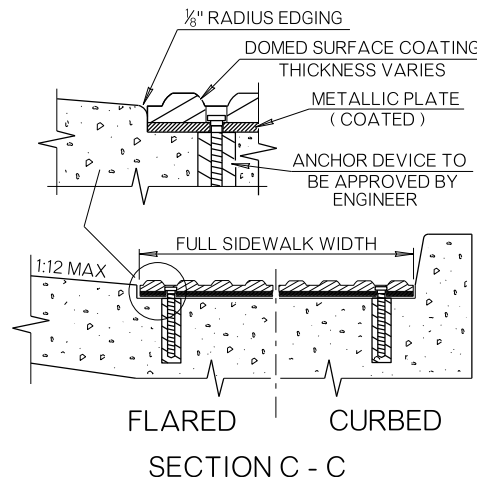
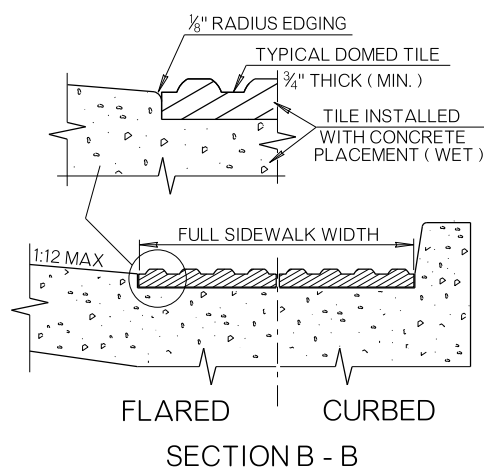
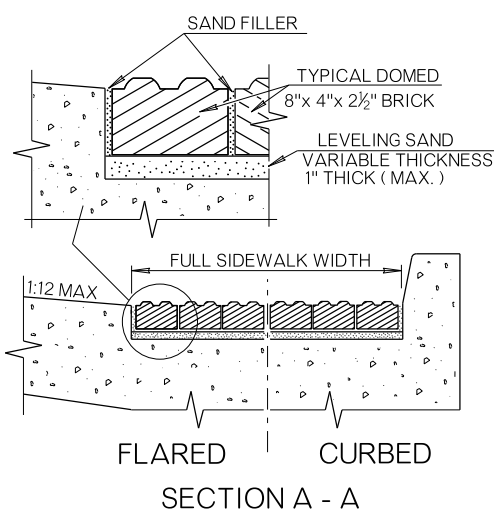


TACTILE SYSTEM ORIENTATION - TYPICAL FLARED RAMPS



GENERAL NOTES

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
- ALL FEATURES OF TACTILE WARNING DEVICE DESIGN AND FINAL INSTALLATION SHALL COMPLY WITH THE PUBLIC RIGHT-OF-WAY ACCESSIBILITY GUIDELINES (PROWAG). WHERE SPATIAL LIMITATIONS OR EXISTING FEATURES WITHIN THE LIMITS OF THE PROJECT PREVENT FULL COMPLIANCE WITH THE PROWAG, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER UPON DISCOVERY OF SUCH FEATURE(S). THE CONTRACTOR SHALL NOT PROCEED WITH ANY ASPECT OF THE WORK WHICH IS NOT IN FULL COMPLIANCE WITH THE PROWAG WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER. ANY WORK WHICH IS NOT PERFORMED WITHIN THE GUIDELINES OF THE PROWAG, FOR WHICH THE CONTRACTOR DOES NOT HAVE WRITTEN APPROVAL, SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.
- TACTILE WARNING SURFACE SHALL EXTEND FROM EDGE TO EDGE OF WALKWAY ENTERING THE CROSSWALK, AT STREET LEVEL.
- CURB IS NOT SHOWN IN THE SECTION X-X DETAIL ON THIS SHEET.
- THICKNESS 'T' OF PAVEMENT ABUTTING SIDEWALK/RAMP VARIES.
- SIDEWALK, RAMP AND FLARE THICKNESS SHALL BE 4" MINIMUM THICKNESS AFTER INSTALLATION OF TACTILE WARNING TREATMENT.
- TRUNCATED DOME SURFACE SHALL CONTRAST VISUALLY WITH THE ADJOINING WALKING SURFACES EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE TRUNCATED SURFACE.
- LEVELING SAND FOR DOMED BRICK SYSTEMS SHALL MEET THE REQUIREMENTS OF SECTION 703.06B(2) OF THE SPECIFICATIONS.
- SURFACE BONDED TACTILE SYSTEMS MAY ONLY BE PLACED ON NEWLY POURED CONCRETE AFTER AN APPROPRIATE PERIOD OF CURING, IN ACCORDANCE WITH MANUFACTURE'S SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER.
- ROWS OF TACTILE DOME TREATMENT SHOULD BE ORIENTED PARALLEL WITH CENTERLINE OF SIDEWALK/RAMP OR TOWARD THE CENTERLINE OF MARKED CROSSWALK.
- EXPANSION JOINTS DEEMED NECESSARY, BUT NOT SHOWN ON THE PLANS, MAY BE ADDED AND PLACED DURING CONSTRUCTION, AS DIRECTED BY THE ENGINEER.
- TACTILE SYSTEMS, DOME PATTERNS OR FEATURES DIFFERING FROM THOSE SHOWN ON THIS DETAIL, BUT MEETING CURRENT PROWAG SPECIFICATIONS, SHALL BE SUBMITTED TO AND APPROVED BY THE ENGINEER BEFORE INSTALLATION.
- THE SAME TACTILE DOME PATTERN AND COLOR SHALL BE USED THROUGHOUT ANY NEW OR RETROFIT PROJECT. DOME PATTERN AND LOCATION OF EXISTING RAMPS TO BE RETROFIT WITH TACTILE DEVICES SHALL BE DESIGNATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
- RETROFIT INSTALLATIONS WILL NOT REQUIRE REPLACING EXISTING DEPRESSED CURBING. A NOMINAL 6 TO 8 INCH SETBACK FROM FACE OF CURB SHALL BE ENFORCED FOR NEAR EDGE OF TACTILE DOMES.
- TYPES A & B TACTILE SYSTEMS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 10,000 PSI. TYPES C & D SYSTEMS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI. COMPRESSIVE TESTS MEET ASTM D695.
- TACTILE WARNING SURFACES MAY NOT BE STAMPED IN WET CONCRETE.



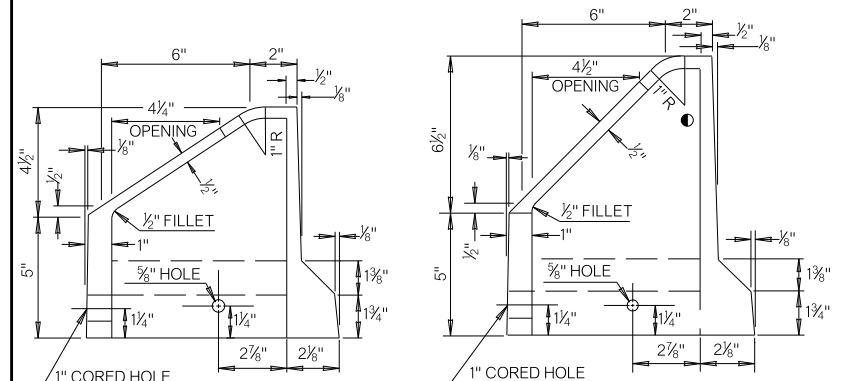
BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
610 (1)	TACTILE WARNING DEVICE - NEW	SF
610 (1)	TACTILE WARNING DEVICE - RETROFIT	SF

NOTE: TYPE A OR B TACTILE WARNING DEVICE SHALL BE SPECIFIED ON THE PLANS FOR NEW CONSTRUCTION & TYPE C OR D SHALL BE SPECIFIED ON THE PLANS FOR RETROFIT CONSTRUCTION.

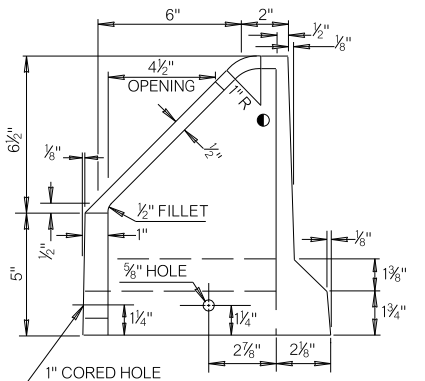
APPROVED BY ROADWAY ENGINEER: *[Signature]* DATE 5/27/20
ROADWAY DESIGN DIVISION STANDARD



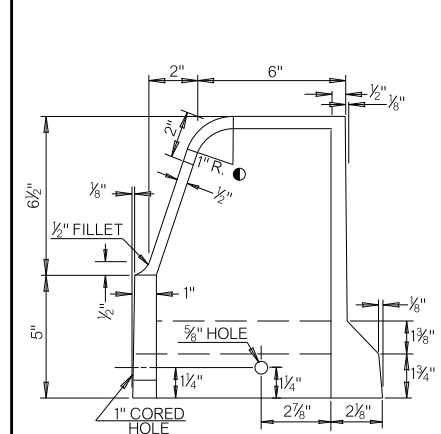
TACTILE WARNING DEVICES



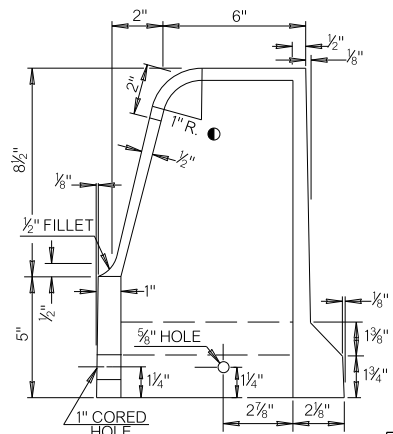
4" MOUNTABLE CURB HOOD



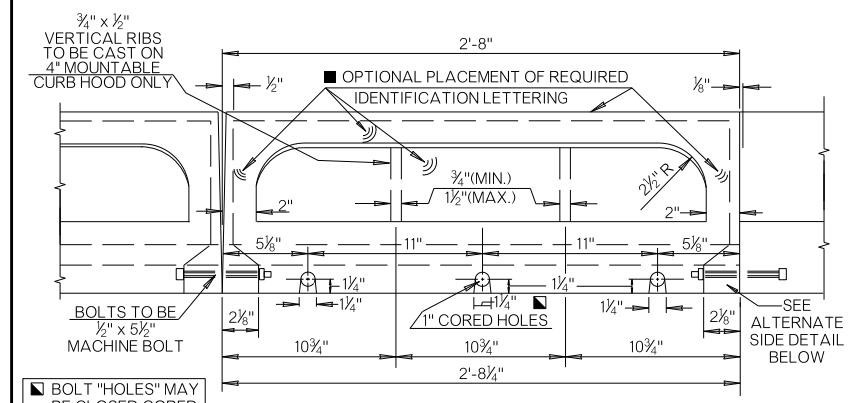
6" MOUNTABLE CURB HOOD



6" BARRIER CURB HOOD

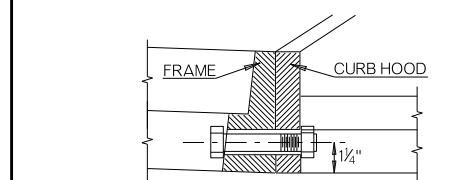


8" BARRIER CURB HOOD



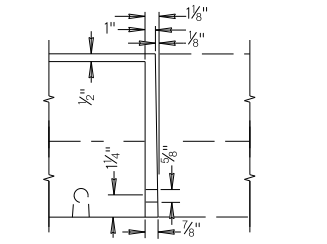
CAST IRON HOOD ELEVATION

■ BOLT "HOLES" MAY BE CLOSED CORED HOLES OR SLOTS.

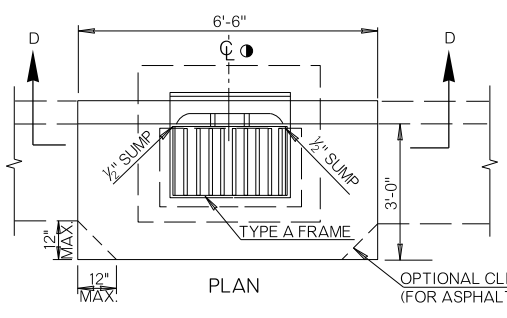


DETAIL OF CONNECTION FRAME & CAST IRON HOOD

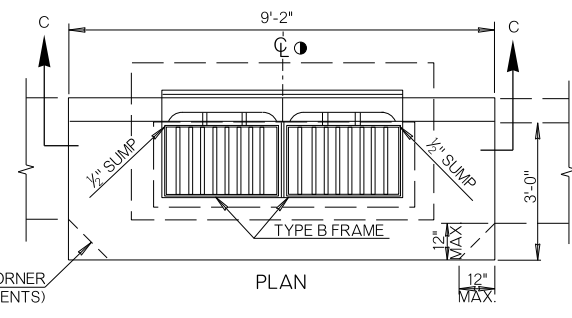
FRAME TO BE BOLTED TO THE HOOD WITH 3 EA. - 3/4" x 4 1/2" MACHINE BOLTS. FOR FRAME DETAILS, SEE ROADWAY STANDARD SSIF-5.



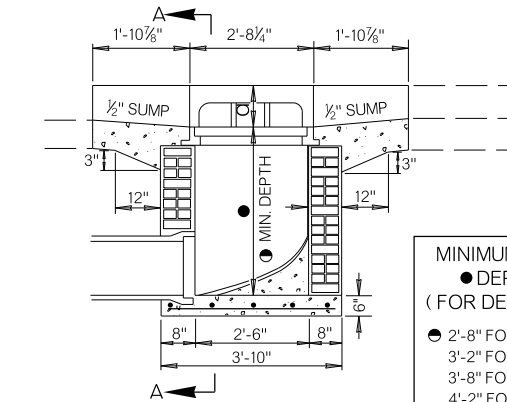
ALTERNATE SIDE DETAIL



PLAN TYPE A FRAME (OPTIONAL CLIPPED CORNER FOR ASPHALT PAVEMENTS)

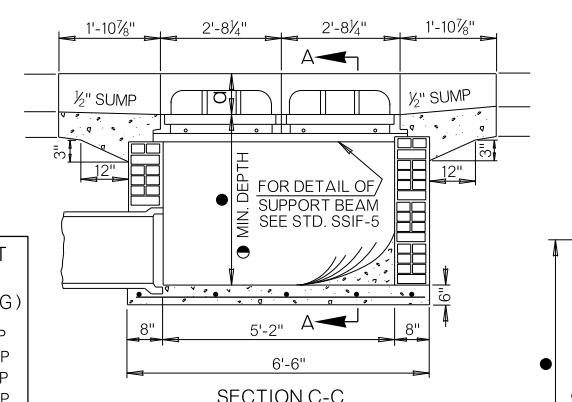


PLAN TYPE B FRAME

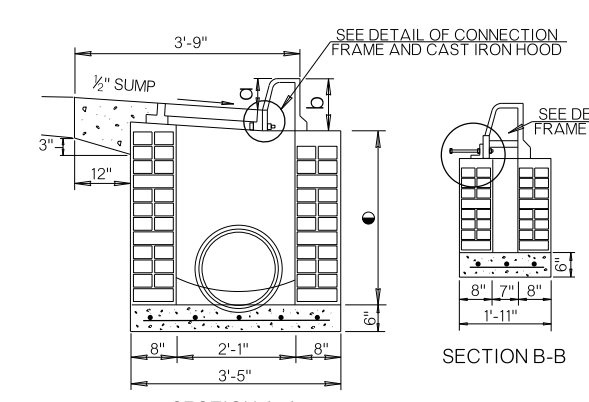


SECTION D-D DESIGN 1 (SINGLE GRATE)

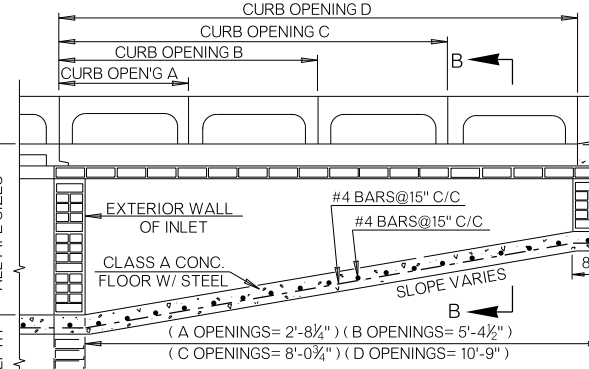
MINIMUM INLET DEPTH (FOR DETAILING)
● 2'-8" FOR 18" RCP
● 3'-2" FOR 24" RCP
● 3'-8" FOR 30" RCP
● 4'-2" FOR 36" RCP



SECTION C-C DESIGN 2 (DOUBLE GRATING) DESIGN 3 (MULTIPLE DOUBLE GRATING)

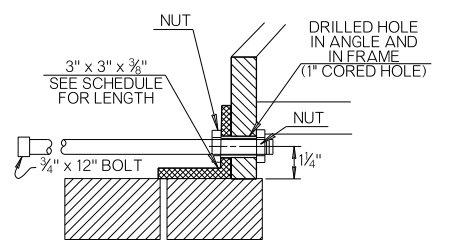


SECTION A-A SECTION B-B



ADDITIONAL OPENINGS

MINIMUM DEPTH MASONRY OR PRECAST WALLS
2'-3" FOR 18" RCP
2'-9" FOR 24" RCP
3'-3" FOR 30" RCP
3'-9" FOR 36" RCP



DETAIL OF CONNECTION ANGLE IRON & CAST IRON HOOD
NOTE: ANGLE IRON TO BE BOLTED TO HOOD WITH 3 EACH - 3/4" x 12" MACHINE BOLTS IN EACH HOOD SECTION.

QUANTITIES (FOR 18" R.C. PIPE AND MIN. DEPTH)								
DESIGN	INLET	CURB OPENING	CLASS A CONCRETE	INLET	INLET FRAME & GRATE	CAST IRON HOOD	ANGLE IRON	
	DESIGNATION	CU. YD.	BASE AMT.	ADD'L CF PER VERT FT.	EACH	EACH	NO.	LENGTH
1	STD.	0.24	17.76	7.89	1	1	-	-
	A	0.34	23.84	7.89	1	2	1	2'-5 3/8"
	B	0.43	30.11	7.89	1	3	1	5'-1 1/2"
	C	0.53	36.38	7.89	1	4	1	7'-9 1/8"
	D	0.63	42.66	7.89	1	5	1	10'-6 1/8"
	2A	0.43	29.91	7.89	1	3	2	2'-5 3/8" 2'-5 3/8"
	A-B	0.53	36.19	7.89	1	4	2	2'-5 3/8" 5'-1 1/2"
	A-C	0.62	42.46	7.89	1	5	2	2'-5 3/8" 7'-9 1/8"
	2B	0.62	42.46	7.89	1	5	2	5'-1 1/2" 5'-1 1/2"
	B-C	0.72	48.74	7.89	1	6	2	5'-1 1/2" 7'-9 1/8"
2	2C	0.82	55.01	7.89	1	7	2	7'-9 1/8" 7'-9 1/8"
	STD.	0.41	25.76	11.45	2	2	-	-
	B	0.60	38.11	11.45	2	4	1	5'-1 1/2" -
	C	0.73	44.39	11.45	2	5	1	7'-9 1/8" -
	D	0.79	50.66	11.45	2	6	1	10'-6 1/8" -
	2B	0.79	50.46	11.45	2	6	2	5'-1 1/2" 5'-1 1/2"
3	2C	0.98	63.01	11.45	2	8	2	7'-9 1/8" 7'-9 1/8"
	B-D	0.98	63.01	11.45	2	8	2	5'-1 1/2" 10'-6 1/8"
	2D	1.17	75.56	11.45	2	10	2	10'-6 1/8" 10'-6 1/8"
	STD.	0.74	41.27	18.34	4	4	-	-
	B	0.93	53.62	18.34	4	6	1	5'-1 1/2" -
	D	1.12	66.17	18.34	4	8	1	10'-6 1/8" -
	2B	1.12	65.98	18.34	4	8	1	5'-1 1/2" 5'-1 1/2"
	B-D	1.31	78.52	18.34	4	10	2	5'-1 1/2" 10'-6 1/8"
2D	1.50	91.07	18.34	4	12	2	10'-6 1/8" 10'-6 1/8"	

■ DEPTH OF 2'-8" SHALL BE USED FOR STANDARD DEPTH FOR ALL PIPE SIZES AND/OR PIPE TYPES. FOR INLET DEPTHS GREATER THAN STANDARD DEPTH, A PAY ITEM FOR ADDITIONAL DEPTH, PAID AS VERTICAL FEET, SHALL BE USED. TO DETERMINE TOTAL INLET QUANTITY FOR INLET DEPTHS GREATER THAN 2'-8", MULTIPLY ADDITIONAL DEPTH BY ADDITIONAL CU. FT. PER VERTICAL FOOT AND ADD TO THE BASE AMOUNT.

■ QUANTITIES SHOWN ARE FOR 2 DOUBLE GRATED INLETS.

PAYMENT FOR ALL CLASS A CONCRETE AND ANY REINFORCING STEEL USED TO CONSTRUCT CAST-IN-PLACE INLET WALLS OR FLOORS SHALL BE INCLUDED IN THE PRICE BID FOR THE INLET. PRECAST INLET ALTERNATIVES ARE ACCEPTED, BUT ONLY IF THEIR DESIGNS FOLLOW ROADWAY STANDARD PCI-1.

SPECIAL DESIGN CASTINGS, HOODS, FRAMES OR GRATES MAY BE USED, IN LIEU OF STANDARD DESIGNS SHOWN ON THIS SHEET, IF APPROVED BY THE ENGINEER.

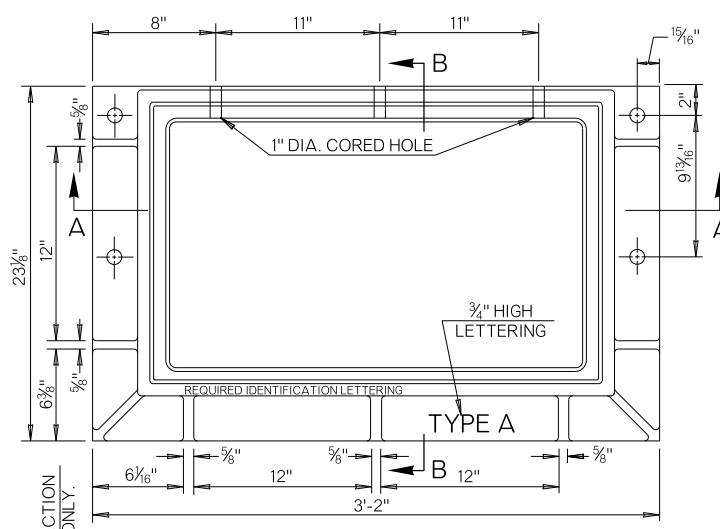
GENERAL NOTES

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
- STANDARD SSIF-5 FRAMES AND STANDARD CIG-4 GRATES TO BE USED WITH THESE INLETS UNLESS OTHERWISE SPECIFIED. COST OF THESE ITEMS AND HOODS SHALL BE INCLUDED IN THE COST OF INLET.
- WHEN THE INLET IS BUILT IN NEW CONCRETE PAVEMENT, THE APRON AROUND THE INLET MAY BE BUILT INTEGRAL WITH PAVEMENT OR MAY BE SEPARATE AND OF THE SIZE AS SHOWN. THE THICKNESS SHALL BE THE SAME AS THE CONCRETE PAVEMENT OR CURB AND GUTTER. IF CONSTRUCTED IN ANY OTHER AREA OR IN EXISTING PAVEMENT, THE APRON AROUND THE INLET SHALL BE THE SIZE AS SHOWN AND BUILT OF P.C. CONCRETE TO A MINIMUM 8 INCH THICKNESS.
- THERE WILL BE NO DEDUCTION OF PAYMENT FOR CONCRETE CURB AND GUTTER OR P.C. CONCRETE THRU THE EXTENTS OF THE INLET HOODS. DEDUCTION WILL BE MADE FOR THE PAYMENT OF INTEGRAL CURB THROUGH THE EXTENTS OF THE INLET HOODS.
- ALL LETTERING TO BE RECESSED 1/8 INCH AND SHALL NOT EXCEED ONE INCH IN HEIGHT. INFORMATION REQUIRED SHALL BE AS STATED IN THE SPECIFICATIONS. LOCATION OF LETTERING TO BE AS SHOWN, WITH ADDITIONAL IDENTIFICATION LETTERING AT OTHER LOCATIONS PERMITTED.
- CAST IN PLACE CONCRETE WALLS MEETING MIX REQUIREMENTS OF CLASS A CONCRETE MAY BE BUILT IN LIEU OF THE BRICK MASONRY TO THE SAME DIMENSIONS AS SHOWN. NO. 4 REINFORCING STEEL BARS SPACED 30" VERTICALLY AND 12" HORIZONTALLY WILL BE REQUIRED FOR ALL CAST IN PLACE INLET WALLS EXCEEDING 5.0 FEET IN DEPTH (GUTTERLINE TO FLOWLINE). COST OF STEEL REINFORCING TO BE INCLUDED IN THE COST OF THE INLET.
- ALL CAST-IN-PLACE CLASS A CONCRETE INLET FLOORS SHALL HAVE NO. 4 REINFORCING STEEL PLACED AT 15" MAXIMUM C/C SPACING IN BOTH DIRECTIONS.
- THE STANDARD DRAWING, DESIGN NO., DESIGNATION NO., AND NUMBER OF ADDITIONAL OPENINGS SHALL BE INDICATED ON THE PLANS, I.E. EXAMPLE: STD. CI-1, DES. 1 (A-B).
- TYPE B & C FRAMES TO BE USED FOR MULTIPLE DOUBLE GRATES. SEE ROADWAY STD. SSIF-5 FOR DETAILS.
- BOLT(S) WITH EXPANSION DEVICES OR EPOXY-TYPE PUTTY TO BE USED TO INSTALL CAST IRON HOOD INTO CONCRETE CURB. COST OF INSTALLATION TO BE INCLUDED IN PRICE BID FOR THE CURB INLET.
- CASTINGS AS SHOWN HERE SHALL BE CAST STEEL, DUCTILE IRON OR GRAY IRON CONFORMING TO SECTION 725 OF THE SPECIFICATIONS.
- TWO INCH RADIUS MAY BE USED IF APPROVED BY THE ENGINEER.
- CONSTRUCTION STATIONING OF CURB INLETS IS DETERMINED BY THE CENTERLINE (C) OF THE SURFACE GRATES.

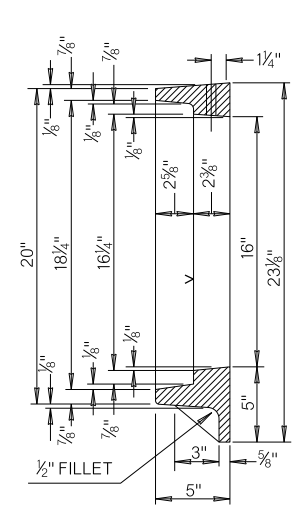
BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
611 (G)	INLET (CI DES. ▲)	EA
611 (H)	ADDITIONAL DEPTH IN INLET (CI DES. ▼)	VF
611 (I)	REPLACEMENT OF INLET FRAME AND GRATE▲	EA
611 (J)	REPLACEMENT OF INLET FRAME	EA
611 (K)	REPLACEMENT OF INLET GRATE	EA
611 (M)	REPLACEMENT OF CAST IRON HOOD	EA

▲ SPECIFY INLET DESIGN & CURB OPENING DESIGNATION.
▼ SPECIFY INLET DESIGN 1, 2 OR 3.
▲ TYPE OF FRAME AND TYPE OF GRATE SHALL BE SPECIFIED.

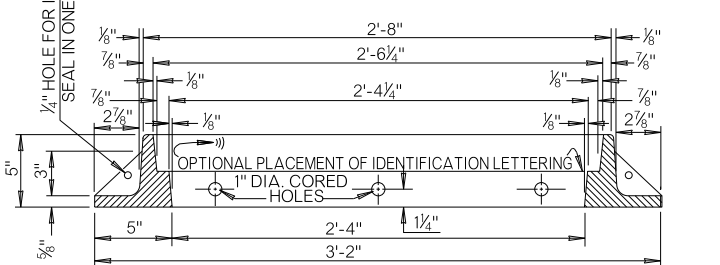
APPROVED BY ROADWAY ENGINEER: *[Signature]* DATE 5/27/20
ROADWAY DESIGN DIVISION STANDARD



PLAN



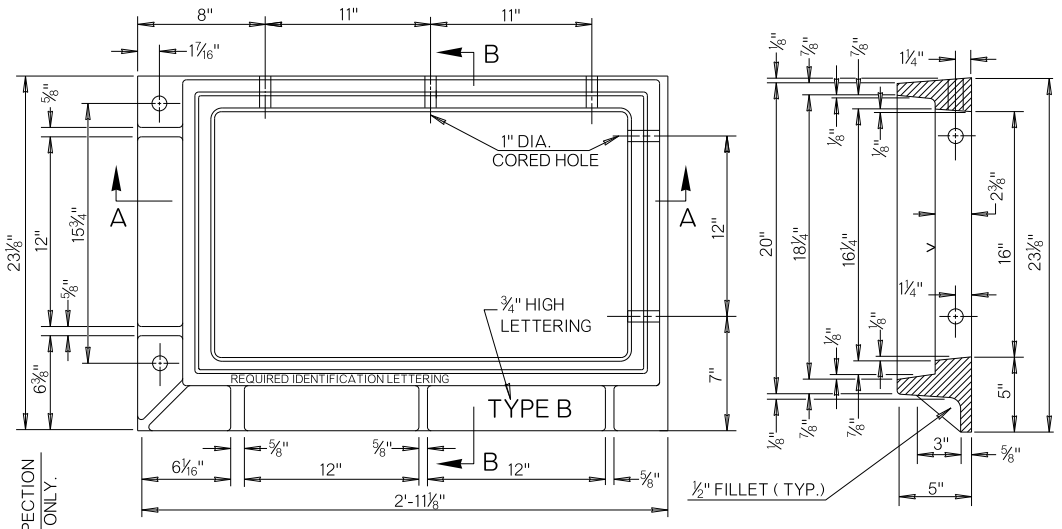
SECTION B-B



SECTION A-A

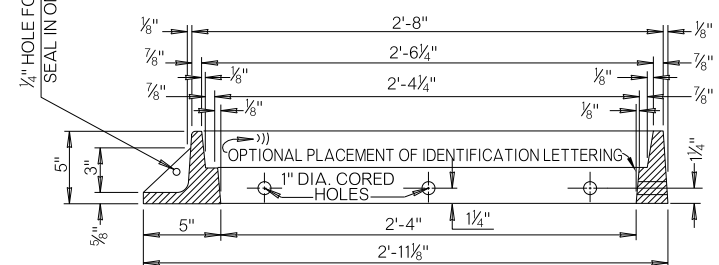
STORM SEWER INLET FRAME TYPE A FOR INLET DESIGN NO. 1

NOTE: ONLY ONE TYPE A FRAME FOR INLET DESIGN NO. 1



PLAN

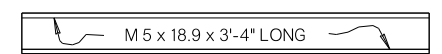
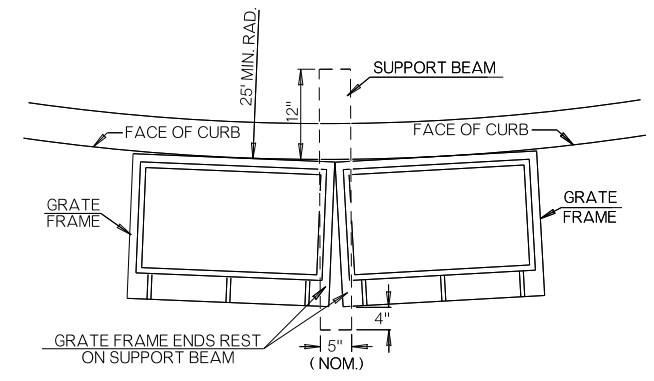
SECTION B-B



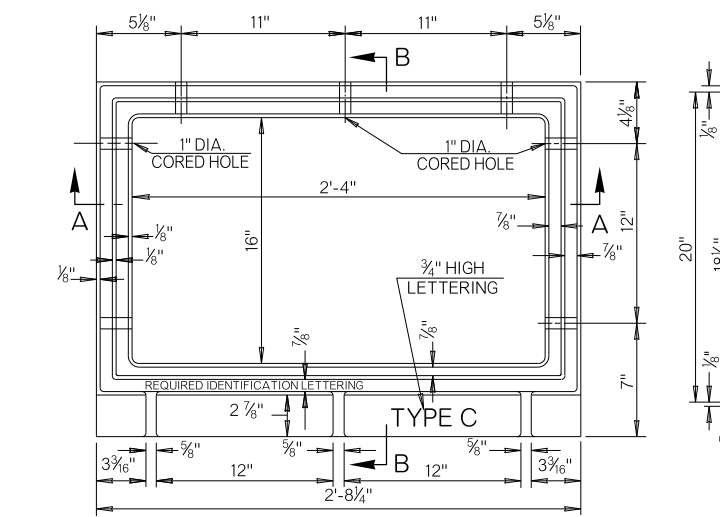
SECTION A-A

NOTE: MAKE ONE FRAME AS SHOWN AND ONE REVERSED FOR DOUBLE FRAMES

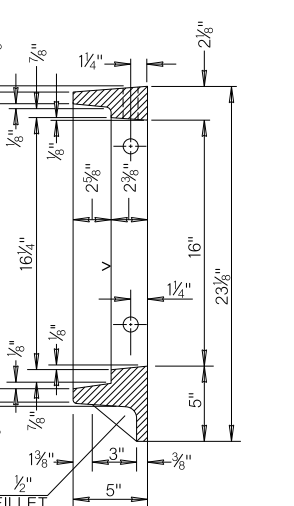
STORM SEWER INLET FRAME TYPE B FOR INLET DESIGN NOS. 2 AND 3



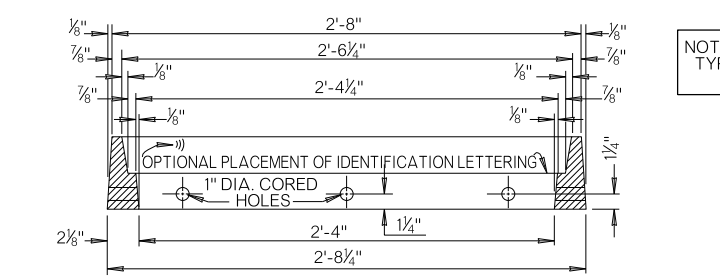
ALTERNATE SUPPORT BEAM TO BE USED IN LIEU OF S 4 x 7.7, WHEN STRUCTURE IS BUILT ALONG CURVED CURB



PLAN



SECTION B-B

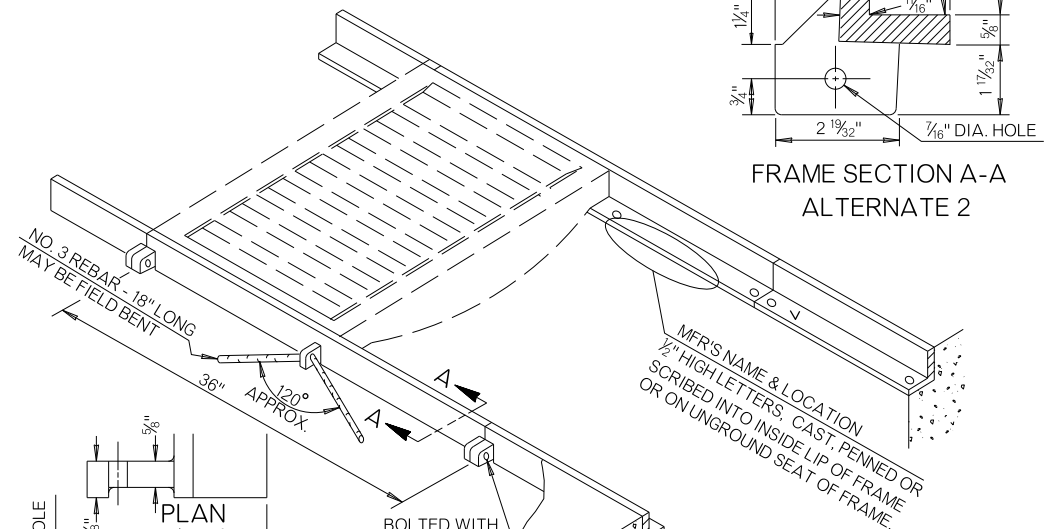


SECTION A-A

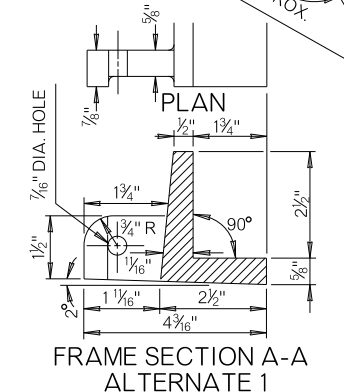
STORM SEWER INLET FRAME TYPE C FOR INLET DESIGN NO. 3

NOTE: TWO TYPE B FRAMES AND TWO TYPE C FRAMES ARE REQUIRED FOR INLET DESIGN NO. 3

NOTE: ONE PAY UNIT OF TYPE 'TR' FRAME IS COMPOSED OF TWO 36" LONG SECTIONS OF FRAME. ONE TYPE 'TR' FRAME REQUIRES TWO TRENCH TYPE GRATES (SEE ROADWAY STANDARD CIG-4). DO NOT USE FRAME TYPE GRATES IN A TRENCH INSTALLATION. COST OF BOLTS AND REBARS TO BE INCLUDED IN PRICE BID FOR INLET FRAME. FRAME MEMBERS MAY BE FURNISHED AS TWO 18" LONG PIECES, END-MATCHED, TO PROVIDE ONE 36" LONG UNIT.



FRAME SECTION A-A ALTERNATE 2



FRAME SECTION A-A ALTERNATE 1

STORM SEWER INLET FRAME TYPE TR FOR TRENCH INLET
 INLET FOR USE WITH INLET FRAME TR WILL NORMALLY BE A SPECIAL DESIGN REINFORCED CONCRETE BOX WITH PART(S) OF THE TOP REMOVED.

GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
2. INLET DESIGN NO. 1 REQUIRES ONE TYPE 'A' FRAME.
3. INLET DESIGN NO. 2 REQUIRES TWO TYPE 'B' FRAMES AND 2 EA. -3/4" x 5" BOLTS WITH NUTS AND ONE S 4 x 7.7 x 3'-4" LONG SUPPORT BEAM. IF BUILT ON CURVED CURB, THE INLET REQUIRES 1 EA. 3/4" x 5" BOLT WITH NUT AND 1 EA. 3/4" x 6 1/2" BOLT WITH NUT AND ONE M 5 x 18.9 x 3'-4" LONG SUPPORT BEAM.
4. INLET DESIGN NO. 3 REQUIRES THE SAME APPURTENANCES AS DESIGN NO. 2 WITH TWO OR MORE TYPE 'C' FRAMES LOCATED BETWEEN THE TWO TYPE 'B' FRAMES AND ONE ADDITIONAL SUPPORT BEAM AND A PAIR OF BOLTS WITH NUTS FOR EACH ADDED TYPE 'C' FRAME, PLUS ONE ADDITIONAL PAIR OF BOLTS AND SUPPORT BEAM.
5. ALL LETTERING TO BE RECESSED 1/16" AND SHALL NOT EXCEED 1" IN HEIGHT. INFORMATION REQUIRED SHALL BE STATED IN THE SPECIFICATIONS. LOCATION OF LETTERING TO BE AS SHOWN WITH ADDITIONAL IDENTIFICATION LETTERING AT OTHER LOCATIONS ACCEPTABLE.
6. FRAMES SHALL BE CAST STEEL, DUCTILE IRON, OR GRAY IRON CONFORMING TO SECTION 725 OF THE SPECIFICATIONS.
7. INLET FRAMES AND GRATES INSTALLED DURING ORIGINAL CONSTRUCTION SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE OF THE ORIGINAL INLET.

NOTE: MACHINING (SYMBOL ^) MAY BE ACCOMPLISHED BY MILLING OR BY LEVEL GRINDING.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
611 (I)	REPLACEMENT OF INLET FRAME AND GRATE (■)	EA
611 (J)	REPLACEMENT OF INLET FRAME (■)	EA

■ TYPE OF FRAME AND TYPE OF GRATE SHALL BE SPECIFIED.

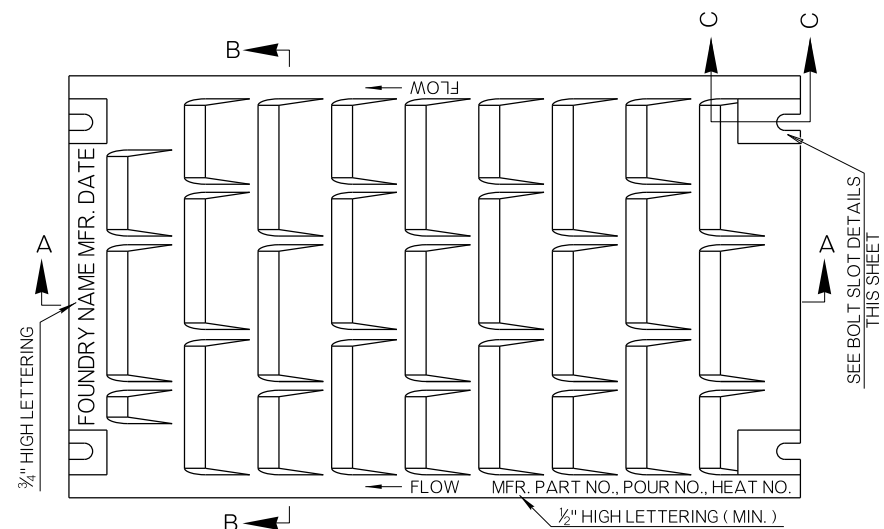
TYPE A, B, OR C FRAMES AS SHOWN HERE WITH GRATES FROM STANDARD CIG-4 (TYPE VG-F OR RVG-F) COMPRISE THE PAY ITEM. SEE NOTE THIS SHEET FOR PAY UNIT.

APPROVED BY ROADWAY ENGINEER: *Calvin A.* DATE: 5/27/20
 ROADWAY DESIGN DIVISION STANDARD



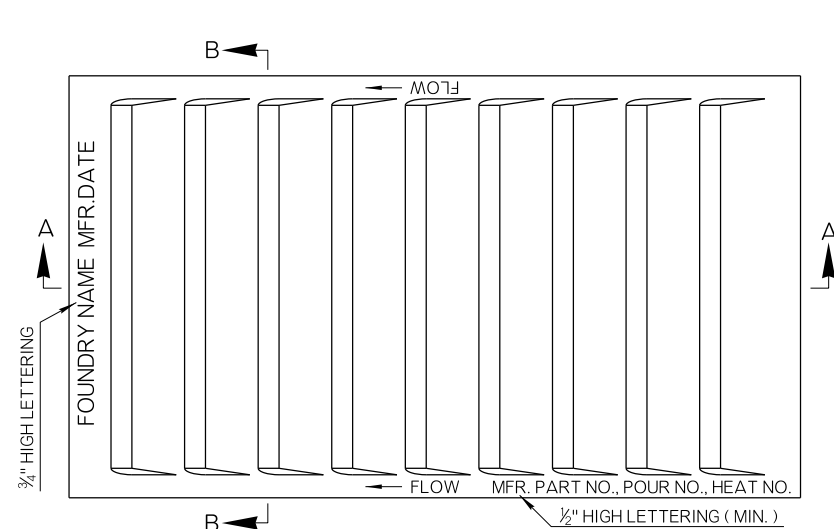
STORM SEWER INLET FRAMES (CURB INLETS)

OKLAHOMA DEPARTMENT OF TRANSPORTATION	
STANDARD REVISIONS	
DESCRIPTION	DATE



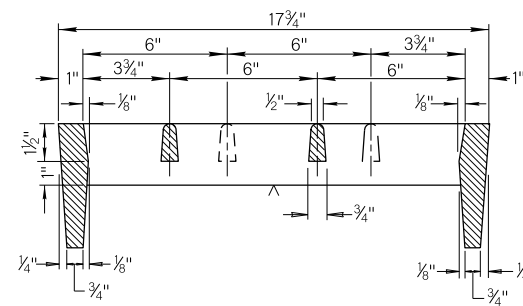
PLAN - RIBBED VANE GRATE
(SHOWN FOR TRENCH INSTALLATION)

TYPE RVG-F (FRAME INSTALLATION)
TYPE RVG-T (TRENCH INSTALLATION)

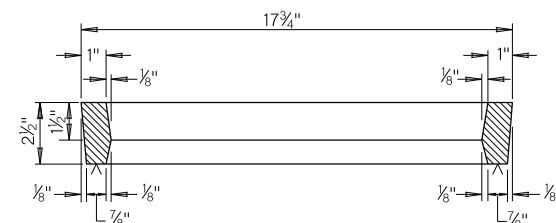


PLAN - VANE GRATE
(SHOWN FOR FRAME INSTALLATION)

TYPE VG-F (FRAME INSTALLATION)
TYPE VG-T (TRENCH INSTALLATION)



SECTION B - B (TRENCH INSTALLATION)

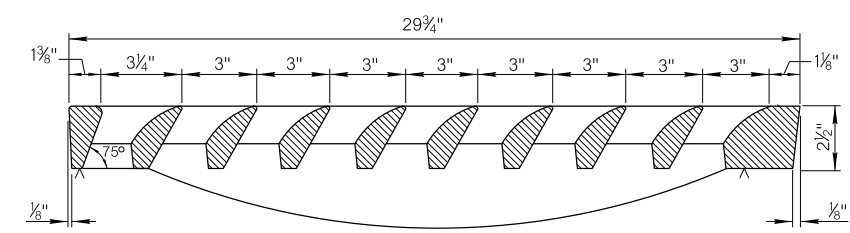


SECTION B - B (FRAME INSTALLATION)

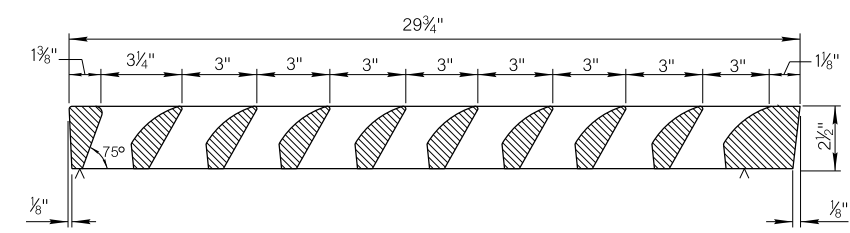
GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
2. FRAME TYPE GRATES SHALL NOT TO BE USED IN TRENCH INSTALLATIONS.
3. GRATES SHALL BE INSTALLED IN THE FRAME WITH FLOW ARROW POINTING DOWNSTREAM OR TOWARD THE LOW POINT IN A SUMP.
4. ALL LETTERING IS TO BE RECESSED 1/16". ALL INFORMATION REQUIRED SHALL BE SUFFICIENT FOR IDENTIFICATION, AS SHOWN.
5. GRATES SHALL BE CAST STEEL, DUCTILE IRON, OR GRAY IRON CONFORMING TO SECTION 725 OF THE SPECIFICATIONS.
6. ALL GRATES INSTALLED IN A TRENCH FRAME (STD. SSIF-5) SHALL HAVE A BOLTED HOLD-DOWN FEATURE. IF INSTALLED IN AN ANGLE IRON FRAME OR RESTING ON A CONCRETE SHOULDER, A POSITIVE HOLD-DOWN FEATURE, APPROVED BY THE ENGINEER, SHALL BE USED.
7. INLET FRAMES, GRATES AND COVER GRATES INSTALLED DURING ORIGINAL CONSTRUCTION SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE OF THE ORIGINAL INLET OR MANHOLE.

NOTE: MACHINING (SYMBOL ^) MAY BE ACCOMPLISHED BY MILLING OR BY LEVEL GRINDING.

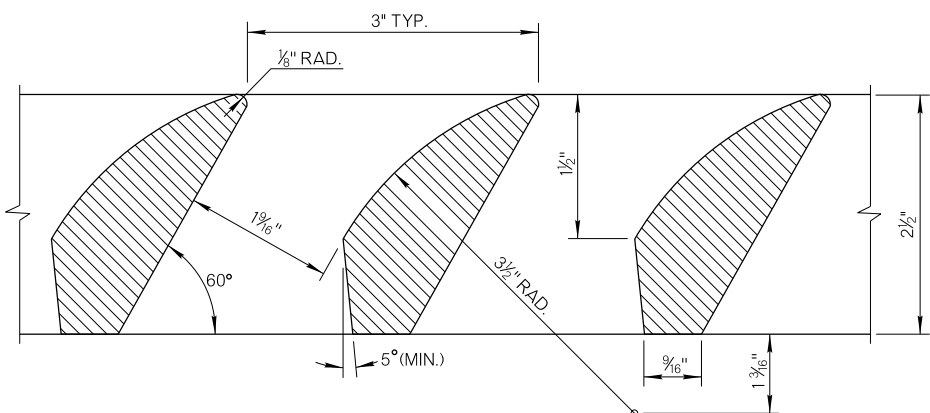


SECTION A - A (TRENCH INSTALLATION)

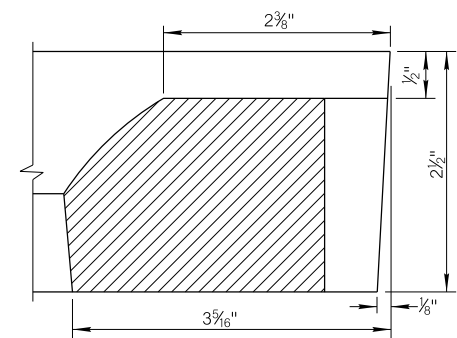


SECTION A - A (FRAME INSTALLATION)

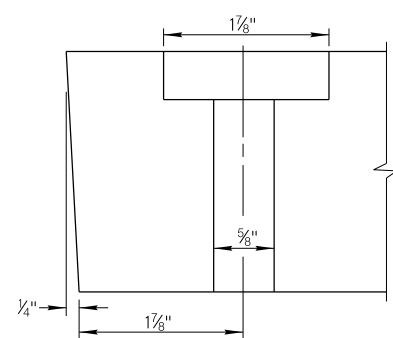
^ MACHINING ONLY ON END BEARING AREAS



TYPICAL SECTION THRU VANES



SECTION C - C



END VIEW

BOLT SLOT DETAILS

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
611 (I)	REPLACEMENT OF INLET FRAME AND GRATE	EA
611 (K)	REPLACEMENT OF INLET GRATE (TYPE ■)	EA

▼ ANY FRAME TYPE GRATE ON THIS DRAWING INSTALLED IN A PROPER FRAME, AS SHOWN ON ROADWAY STANDARD SSIF-5 (TYPES A, B AND C) WILL COMPRISE THE PAY ITEM.

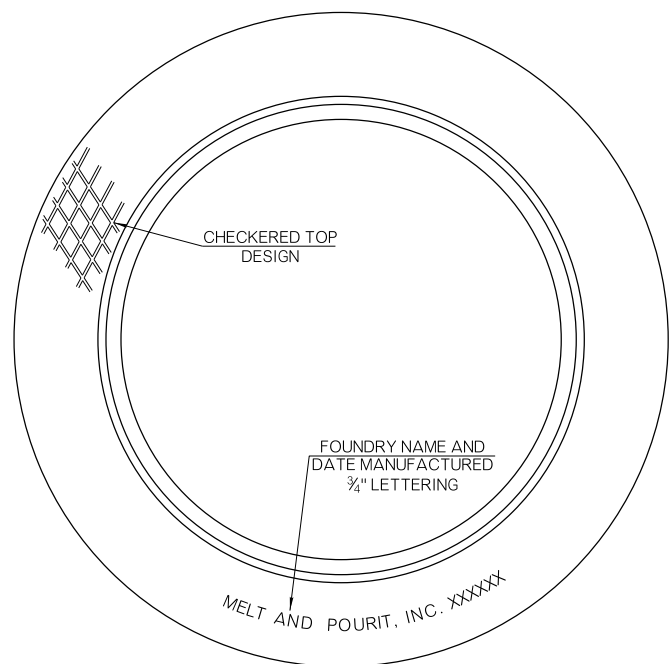
■ CAST INLET GRATE NOMENCLATURE	
TYPE VG-F	VANE GRATE - FRAME TYPE
TYPE VG-T	VANE GRATE - TRENCH TYPE
TYPE RVG-F	RIBBED VANE GRATE - FRAME TYPE
TYPE RVG-T	RIBBED VANE GRATE - TRENCH TYPE

APPROVED BY ROADWAY ENGINEER: *Calvin A.* DATE: 5/27/20
ROADWAY DESIGN DIVISION STANDARD

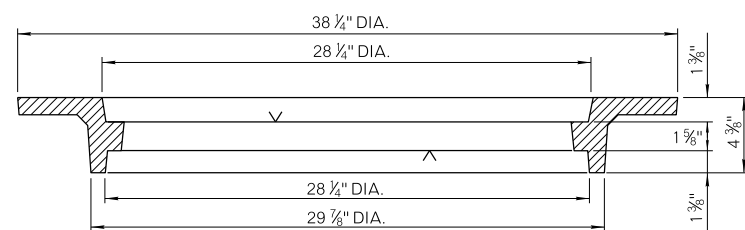


CAST IRON GRATES
(CURB INLETS)

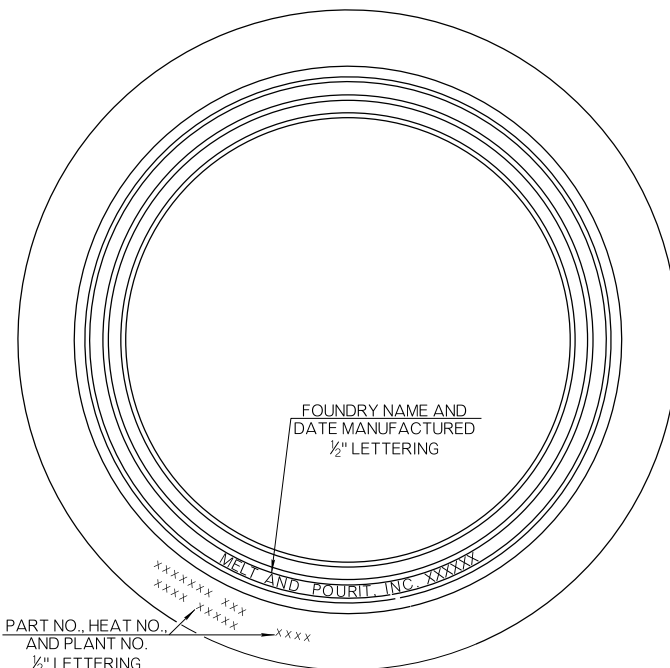
STANDARD REVISIONS	
DESCRIPTION	DATE



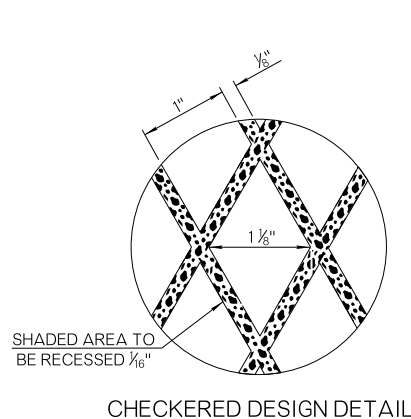
TOP SIDE OF FRAME FOR OUT OF PAVING INSTALLATION



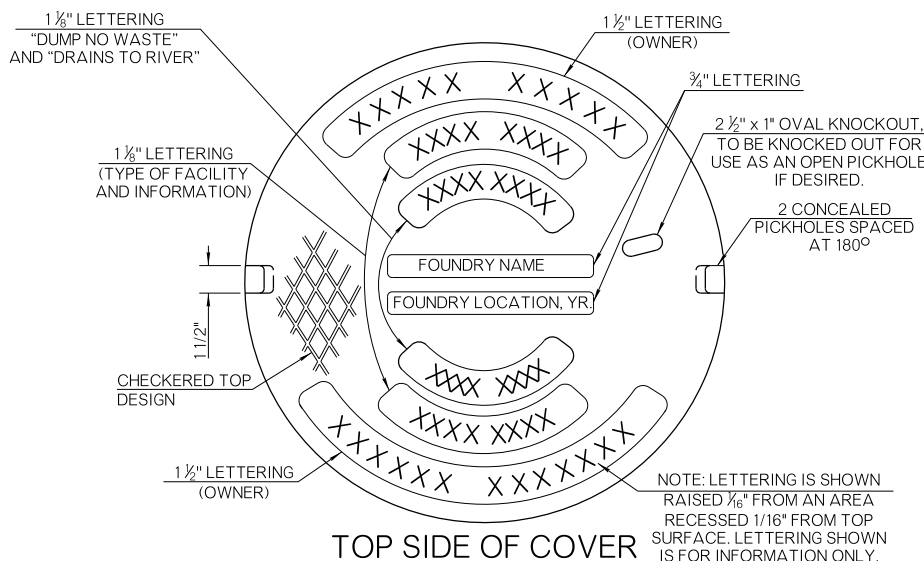
REVERSIBLE FRAME



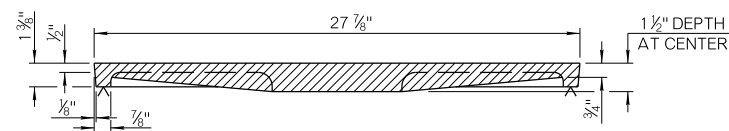
TOP SIDE OF FRAME FOR IN PAVING INSTALLATION



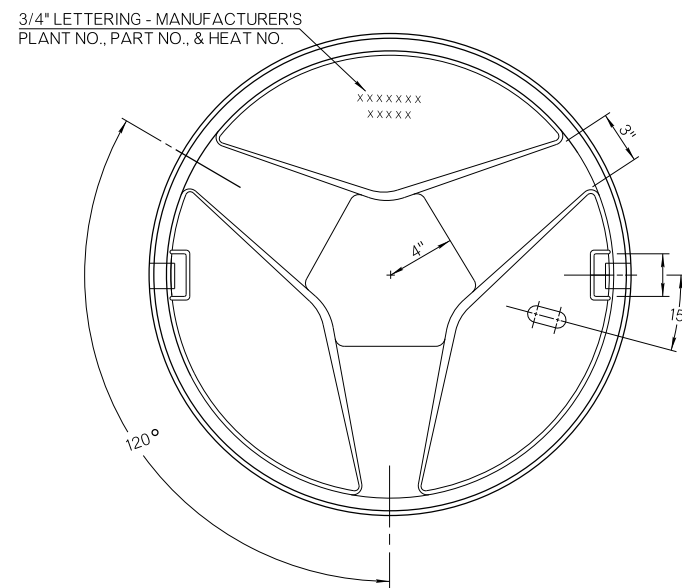
CHECKERED DESIGN DETAIL



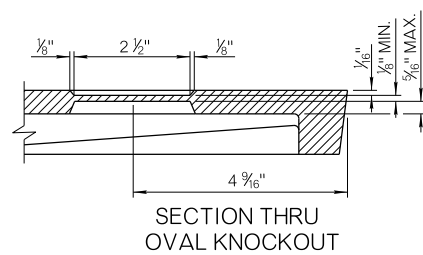
TOP SIDE OF COVER



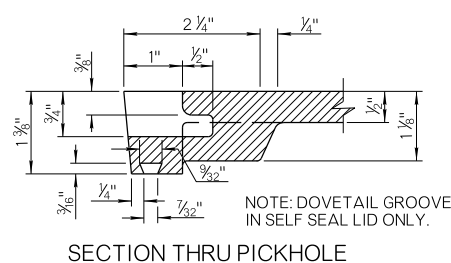
SECTION THRU COVER



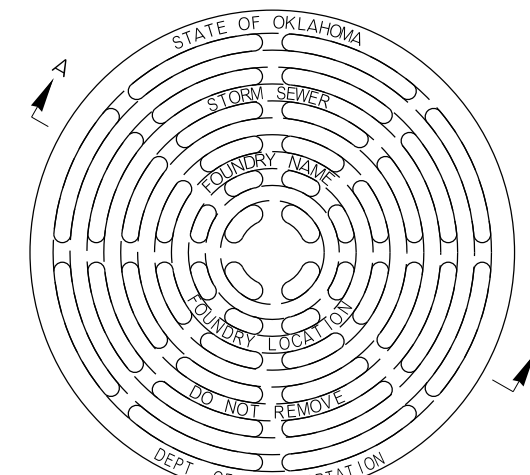
BOTTOM SIDE OF COVER



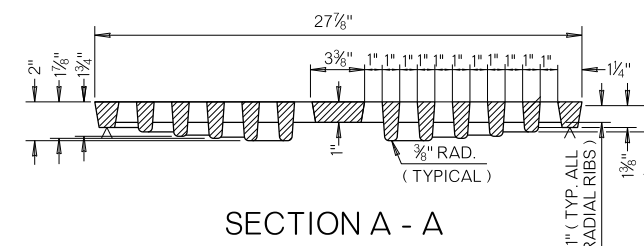
SECTION THRU OVAL KNOCKOUT



SECTION THRU PICKHOLE



TOP SIDE OF COVER GRATE



SECTION A - A

GENERAL NOTES

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
- COVERS WILL BE FURNISHED WITH A PLAIN SEAT, UNLESS A SELF-SEAL SEAT OR A LOCKING DEVICE IS SPECIFIED IN THE PLANS.
- LETTERING TO DENOTE OWNERSHIP AND TYPE OF USAGE WILL BE AT THE DISCRETION OF THE OWNER.
- FRAMES AND COVERS SHALL BE CAST STEEL, DUCTILE IRON, OR GRAY IRON CONFORMING TO SECTION 725 OF THE SPECIFICATIONS.
- MANHOLE FRAMES, COVERS AND COVER GRATES INSTALLED DURING ORIGINAL CONSTRUCTION SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE OF THE ORIGINAL MANHOLE.

NOTE: MACHINING (SYMBOL ^) MAY BE ACCOMPLISHED BY MILLING OR BY LEVEL GRINDING.

BASIS OF PAYMENT

ITEM NO.	ITEM	UNIT
611 (C)	REPLACEMENT OF MANHOLE FRAME AND COVER	EA
611 (D)	REPLACEMENT MANHOLE FRAME	EA
611 (E)	REPLACEMENT OF MANHOLE COVER	EA
611 (F)	REPLACEMENT OF MANHOLE COVER GRATE	EA

APPROVED BY ROADWAY ENGINEER: *[Signature]* DATE: 5/27/20
ROADWAY DESIGN DIVISION STANDARD

GENERAL NOTES

STANDARD REVISIONS	DATE
DESCRIPTION	DATE
XXXXXXXXXX	XX/XX/XX

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
- FOR DETAILS OF FRAME AND COVER, SEE THE CURRENT VERSION OF ROADWAY STANDARD MFC-5. PRICE BID OF MANHOLE SHALL INCLUDE PAYMENT FOR THESE ITEMS AND ALL OTHER ITEMS AND LABOR NECESSARY TO COMPLETE THE INSTALLATION. PRICE BID OF ADDITIONAL DEPTH SHALL INCLUDE PAYMENT FOR ALL MATERIAL AND LABOR, PERTAINING ONLY TO THE ADDITIONAL DEPTH, NECESSARY TO COMPLETE ITS INSTALLATION.
- SQUARE MANHOLES MAY BE SUBSTITUTED PER THE MANUFACTURER'S RECOMMENDATION. SEE THE CURRENT VERSION OF ROADWAY STANDARD PSM-1 FOR MATERIAL AND INSTALLATION DETAILS.
- PIPE OPENINGS SHALL NOT BE LOCATED IN A CONE SECTION.
- THERE SHALL BE A MINIMUM DISTANCE OF 6" BETWEEN AN OPENING AND ANY JOINT.
- PROVIDE LIFTING DEVICES IN CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE GRADE 60 REINFORCING STEEL CONFORMING TO ASTM A615 OR EQUIVALENT AREA OF WELDED WIRE REINFORCING CONFORMING TO ASTM A1064. PROVIDE CIRCUMFERENTIAL REINFORCING STEEL IN VERTICAL WALLS OF BASE, RISER, AND CONE IN ACCORDANCE WITH ASTM C478.
- PROVIDE A MINIMUM CLEAR COVER OF 1 1/2" TO REINFORCING STEEL.
- WALLS OR SLABS WITH A THICKNESS OF 8" OR GREATER REQUIRE A SECONDARY LAYER OF REINFORCING STEEL. PROVIDE AN AREA OF REINFORCING STEEL EQUAL TO 0.11 SQ. IN./FT EACH WAY IN THE SECONDARY LAYER.
- DESIGN TONGUE AND GROOVE JOINTS FOR FULL CLOSURE ON RISER SHOULDERS, CONICAL TOPS, AND FLAT SLABS. MINIMUM SPIGOT DEPTH IS 3/4".
- MAXIMUM OPENING SHALL BE 4" LARGER THAN OUTSIDE PIPE DIAMETER. REFER TO THE MOST CURRENT VERSION OF ROADWAY DESIGN STANDARD PMD-1 FOR PIPE CONNECTION MATERIAL.
- SEAL TONGUE AND GROOVE JOINTS WITH PREFORMED OR BULK MASTIC IN CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. TONGUE AND GROOVE JOINTS MAY BE GROUDED NO MORE THAN 1" BETWEEN EACH SECTION OR 1/2 THE JOINT DEPTH, WHICHEVER IS GREATER. JOINT SEALING SHALL BE INCLUDED IN THE COST OF THE MANHOLE.
- DO NOT GROUT RUBBER GASKET JOINTS WITHOUT THE MANUFACTURER'S RECOMMENDATIONS.
- THE FOUNDATION SHALL BE STABILIZED OR REMOVED AND REPLACED WITH FIRM AND STABLE FOUNDATION MATERIAL. A MINIMUM 3" THICK LEVELING COURSE SHALL BE PROVIDED BELOW THE BASE AREA OF THE MANHOLE AND EXTEND 6" BEYOND THE BASE AREA. THE LEVELING COURSE SHALL BE CONSTRUCTED WITH AGGREGATE BASE TYPE A. COSTS ASSOCIATED WITH THE FOUNDATION AND LEVELING COURSES SHALL BE INCLUDED IN THE PRICE BID OF THE MANHOLE.
- OPENINGS IN FLAT SLAB TOPS SHALL BE ADDITIONALLY REINFORCED WITH A MINIMUM OF 0.20 SQ. IN. OF REINFORCING STEEL AT 90 DEGREES.
- REFER TO PROJECT PLAN SHEETS FOR NUMBER, LOCATION, AND SIZE OF PIPE.
- FLEXURAL REINFORCING STEEL SHALL NOT EXCEED SPACING OF 9" CENTER TO CENTER.
- PRECAST CONCRETE GRADE RING WALL THICKNESS SHALL BE 1/2 OF INTERNAL DIAMETER OR 4", WHICHEVER IS GREATER.
- THE ENGINEER MAY SPECIFY THE USE OF STEPS OR LADDERS AND SHALL CONFORM TO ASTM C478.
- THE ORIENTATION OF THE SPIGOT IS SHOWN FOR INFORMATIONAL PURPOSES ONLY AND IS AT THE DISCRETION OF THE MANUFACTURER.

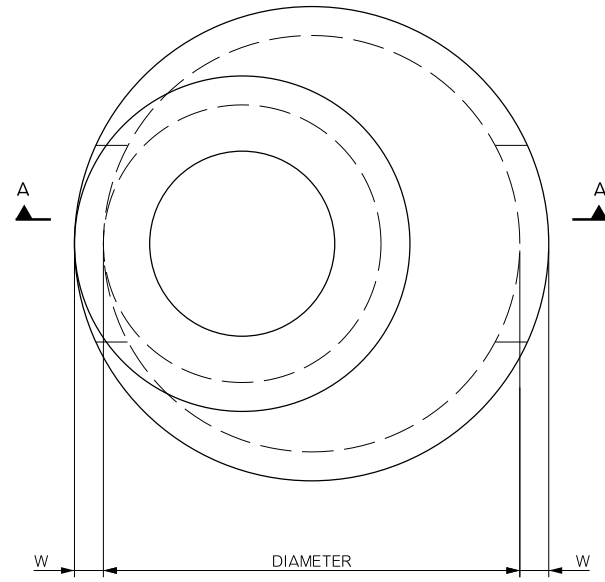
DESIGN DATA

MATERIAL:
 CLASS A CONCRETE
 REINFORCING STEEL

LOADING:
 HL-93

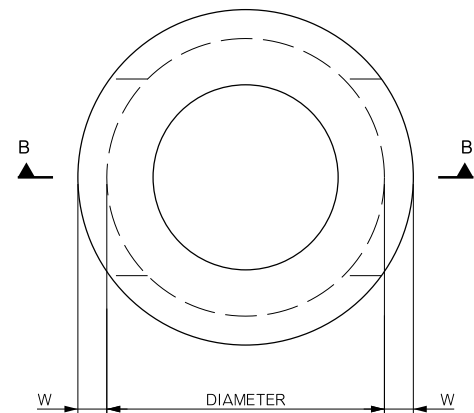
f'c = 4 KSI
 fy = 60 KSI

DESIGN:
 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, LATEST EDITION
 ASTM C478
 ASTM C890
 ASTM C913



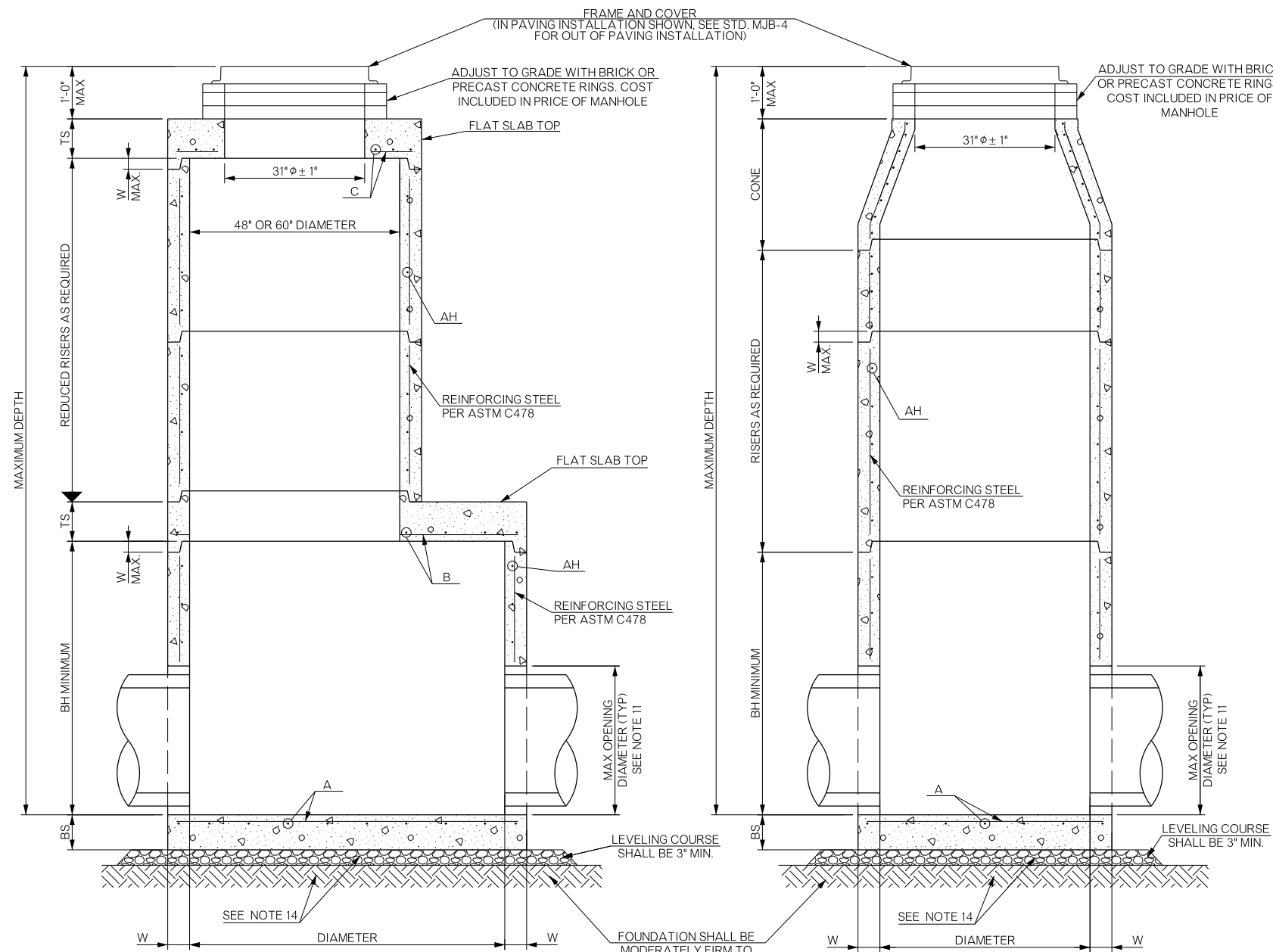
PLAN VIEW - ROUND REDUCED RISER

ROUND MANHOLE, TYPE I



PLAN VIEW - ROUND RISER

ROUND MANHOLE, TYPE II



TYPE I SECTION A-A
 ROUND REDUCED RISER OPTION
 SHOWING FLAT SLAB TOP.
 CONE MAY BE USED.

TYPE II SECTION B-B
 ROUND RISER OPTION
 SHOWING CONE.
 FLAT SLAB TOP MAY BE USED.

DIAMETER	SCHEDULE OF DIMENSIONS AND REINFORCING STEEL							
	DEPTH ≤ 25 FT.							
	BH	BS	TS	W	A	B	C	AH
48"	12"	6"	6"	5"	0.27 IN ² /FT	-	0.28 IN ² /FT	0.12 IN ² /FT
60"	36"	8"	8"	6"	0.27 IN ² /FT	0.41 IN ² /FT	0.30 IN ² /FT	0.15 IN ² /FT
72"	36"	8"	8"	7"	0.35 IN ² /FT	0.48 IN ² /FT	0.41 IN ² /FT	0.18 IN ² /FT

TO INCLUDE A REDUCED RISER, DEPTH OF MANHOLE MUST BE A MINIMUM OF 52 INCHES.

VALUES LISTED IN "SCHEDULE OF DIMENSIONS AND REINFORCING STEEL" ARE MINIMUM VALUES. STRUCTURES THAT PROVIDE LARGER VALUES THAN THOSE SHOWN WILL BE CONSIDERED ACCEPTABLE.

THE DETAILS SHOWN ON THIS SHEET ARE FOR STORM SEWER APPLICATIONS ONLY AND ARE NOT INTENDED FOR SANITARY SEWER APPLICATIONS.

DEPTH OF UP TO, AND INCLUDING, 6' SHALL BE INCLUDED IN PRICE BID PER MANHOLE. ANY DEPTH ABOVE 6' SHALL BE PAID FOR AS 'ADDITIONAL DEPTH.'

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
611(A)	PRECAST CONC RND 4' DIA MANHOLE	EACH
611(A)	PRECAST CONC RND 5' DIA MANHOLE	EACH
611(A)	PRECAST CONC RND 6' DIA MANHOLE	EACH
611(B)	ADD'L DEPTH PRECAST RND 4' MANHOLE	VF
611(B)	ADD'L DEPTH PRECAST RND 5' MANHOLE	VF
611(B)	ADD'L DEPTH PRECAST RND 6' MANHOLE	VF

APPROVED BY ROADWAY ENGINEER: *[Signature]* DATE: 5/27/20

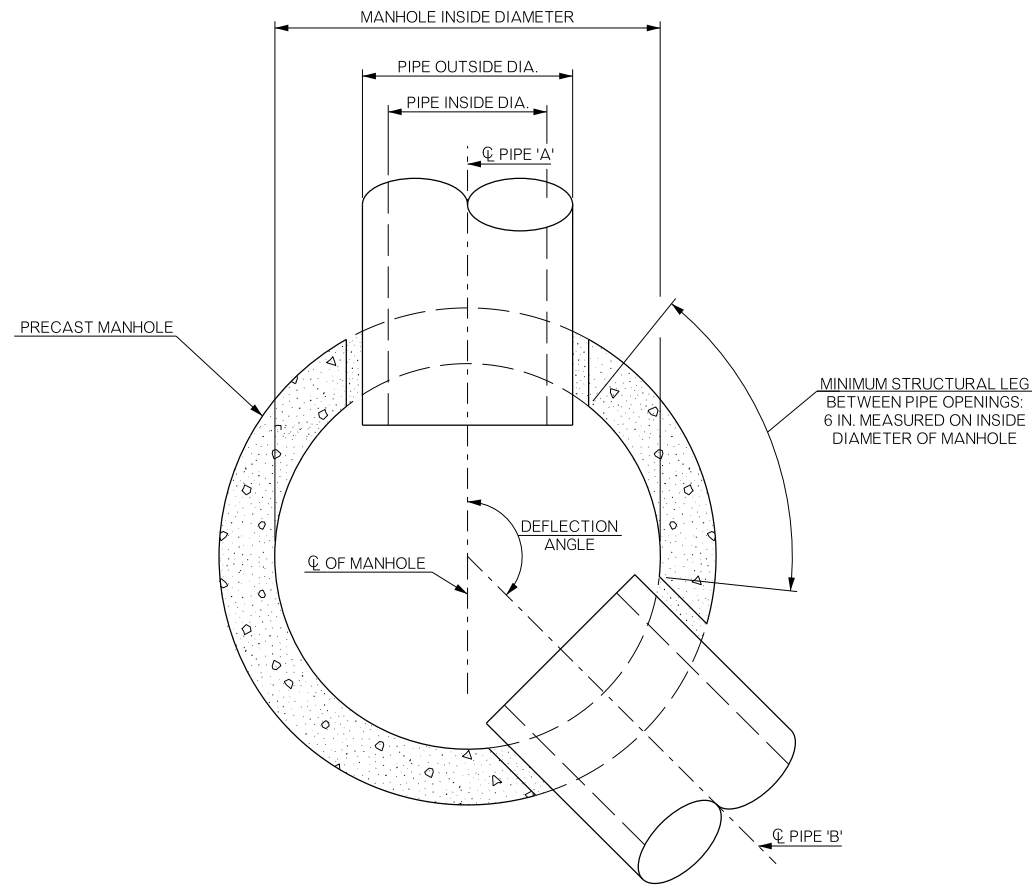
ROADWAY DESIGN DIVISION STANDARD



PRECAST ROUND MANHOLE

2019 SPECIFICATIONS

PRM-1	0
	R-44

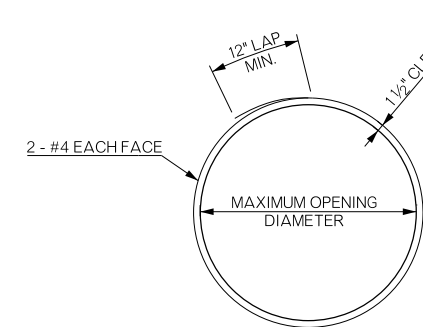


MANHOLE STRUCTURE SIZING DETAIL

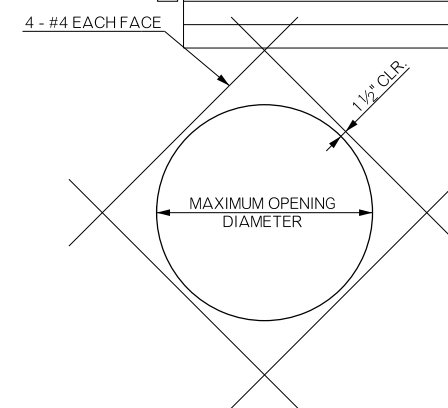
MANHOLE STRUCTURE SIZE SCHEDULE			
MANHOLE INSIDE DIAMETER	90° DEFLECTION	135° DEFLECTION	180° DEFLECTION
48"	18"	27"	30"
60"	27"	36"	42"
72"	33"	48"	48"

NOTE: DIAMETER SHOWN IN MANHOLE STRUCTURE SIZE SCHEDULE IS THE INTERNAL PIPE DIAMETER. TABLE VALUES ARE DETERMINED BY ASSUMING ADJOINING PIPES ARE EQUAL IN DIAMETER AND ARE THE MAXIMUM SIZE ALLOWED FOR ADJOINING PIPES OF EQUAL DIAMETER. PIPES MAY HAVE DIFFERENT DIAMETERS THAN SHOWN IN THE TABLE AS LONG AS THEY PROVIDE A MINIMUM STRUCTURAL LEG OF 6 INCHES.

FOR STRUCTURES WITH DIFFERENT DEFLECTION ANGLES, PIPE DIAMETERS, OR COMBINATIONS REFER TO THE NATIONAL PRECAST CONCRETE ASSOCIATION MANHOLE SIZING RECOMMENDATIONS AT: <https://precast.org/wp-content/uploads/2014/08/Precast-concrete-manhole-sizing-recommendations.pdf>

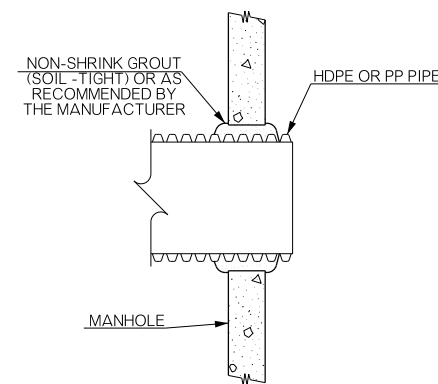


CIRCULAR



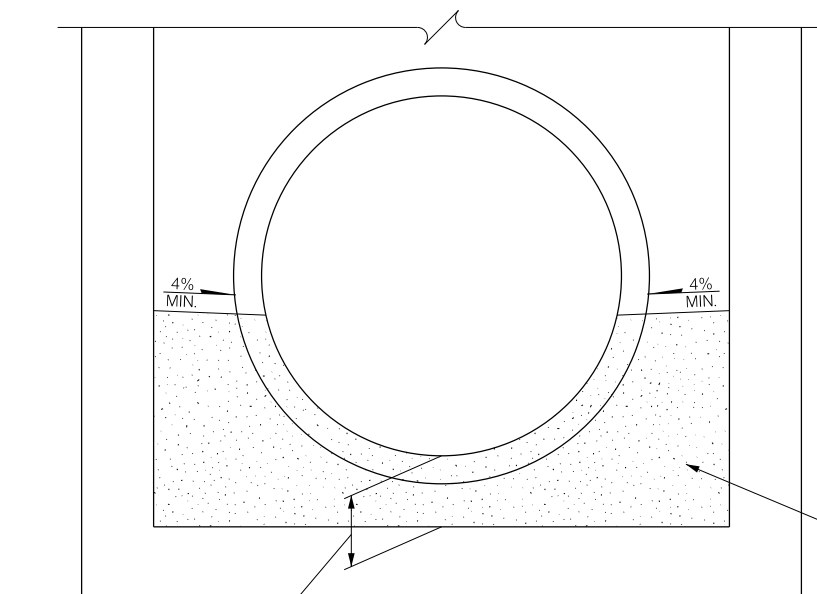
DIAMOND

TYPICAL PIPE PENETRATION
NOTE: ADDITIONAL REINFORCING SHOWN IS AT THE DISCRETION OF THE MANUFACTURER.



CONNECTION DETAIL

NOTE: HDPE PIPE SHOWN, RCP SIMILAR. ALTERNATIVELY, THE MANUFACTURER MAY PROVIDE BOOTS MEETING ASTM D2321 AND ASTM C923 FOR HDPE OR PP PIPE.



BENCHING DETAIL

SEE ASTM C478 FOR INVERT DIMENSION REQUIREMENTS

APPROVED BY ROADWAY ENGINEER: *[Signature]* DATE: 5/27/20

ROADWAY DESIGN DIVISION STANDARD

PRECAST MANHOLE DETAILS



2019 SPECIFICATIONS

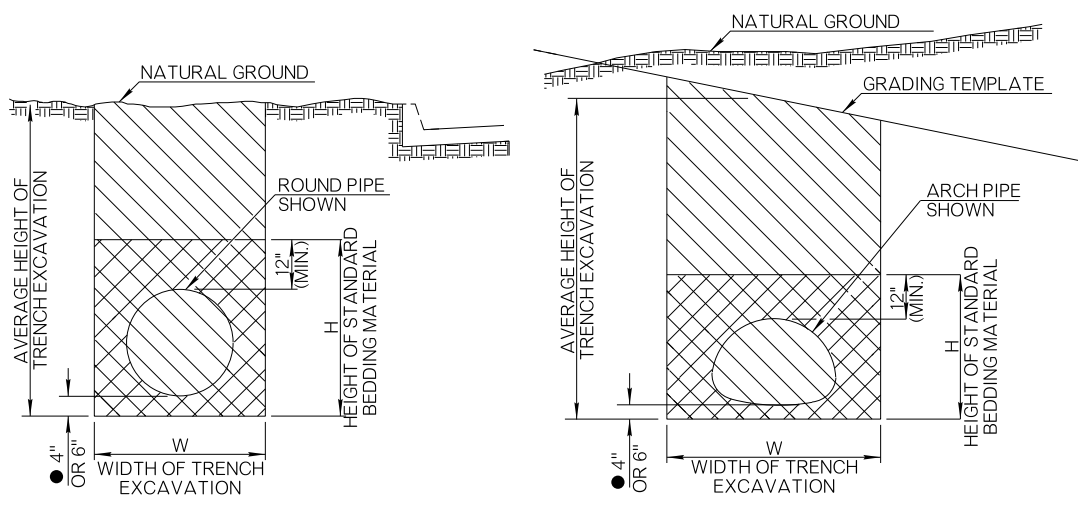
PMD-1	0
R-46	

TABLE OF TRENCHING AND STANDARD BEDDING MATERIAL QUANTITIES									
PIPE DIAM. OR DESIGN EQUIV.	H	SINGLE PIPE INSTALLATION			DOUBLE PIPE INSTALLATION		TRIPLE PIPE INSTALLATION		CLEAR SPACE BETWEEN PIPES
		W	STANDARD BEDDING MATERIAL	W	STANDARD BEDDING MATERIAL	W	STANDARD BEDDING MATERIAL		
		FT.	CY/LF	FT.	CY/LF	FT.	CY/LF		
								INCHES	
ROUND PIPE	18"	3.10	3.20	0.28	6.10	0.52	9.00	1.00	14
	24"	3.60	4.00	0.39	7.70	0.73	11.40	1.50	17
	30"	4.20	4.80	0.51	9.30	0.97	13.80	2.15	20
	36"	4.75	5.50	0.63	10.80	1.23	16.20	2.85	23
	42"	5.30	7.00	0.92	13.20	1.67	19.30	3.80	26
	48"	6.20	7.50	1.03	14.75	2.00	21.70	4.70	29
	54"	6.20	8.00	1.20	15.30	2.20	22.70	5.10	32
60"	6.75	9.50	1.60	17.60	2.75	25.90	6.30	35	
66"	7.20	10.00	1.70	18.80	3.10	27.70	7.35	38	
METAL ARCH PIPE	18"	2.80	3.20	0.27	6.20	0.52	9.20	0.77	14
	24"	3.25	4.00	0.38	7.83	0.74	11.67	1.09	17
	30"	3.60	5.50	0.57	10.20	1.03	14.87	1.49	20
	36"	4.00	6.25	0.69	11.75	1.27	17.25	1.84	23
	42"	4.40	7.00	0.82	13.33	1.53	19.66	2.24	26
	48"	4.80	8.10	1.02	15.35	1.88	22.60	2.75	29
	54"	5.25	9.50	1.32	17.58	2.36	25.66	3.40	32
60"	5.60	10.00	1.40	18.92	2.62	27.84	3.82	35	
66"	6.00	10.90	1.63	20.65	3.00	30.40	4.39	38	

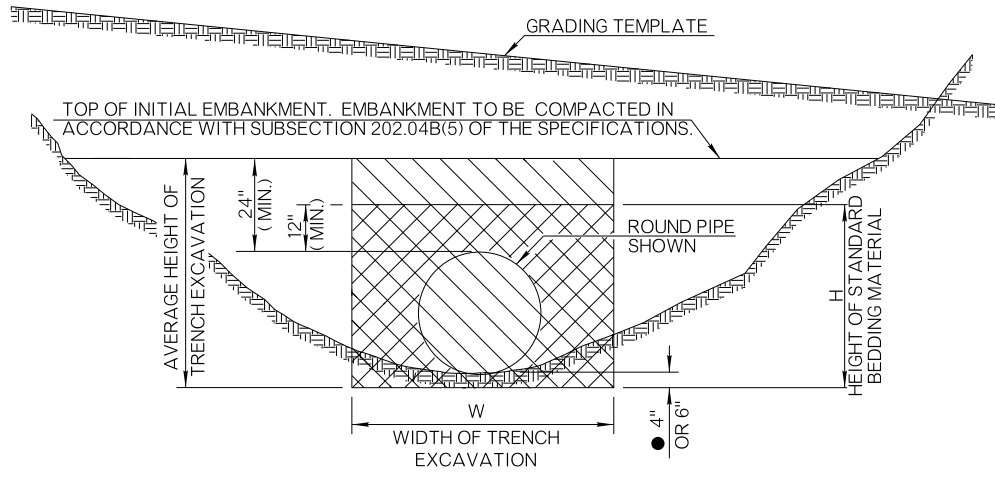
FOR PIPES UNDER PAVEMENT, THE H DIMENSION AND THE STANDARD BEDDING MATERIAL QUANTITY, SHALL BE INCREASED TO GO TO THE TOP OF THE TRENCH.

TABLE OF FILL HEIGHTS						
PIPE SIZE	MINIMUM COVER OVER TOP OF PIPE (BUOYANCY)	MAXIMUM COVER		MINIMUM METAL PIPE GAGE REQUIREMENT		
		POLYETHYLENE	METAL	UNDER PAVEMENT	ALL OTHERS	
18"	21" x 15"	15'	10'	REFER TO R.D.Y. STANDARD FHTMPP-1	REFER TO R.D.Y. STANDARD FHTMPP-1	
24"	28" x 20"	20'	10'	REFER TO R.D.Y. STANDARD FHTMPP-1	REFER TO R.D.Y. STANDARD FHTMPP-1	
30"	35" x 24"	25'	10'	REFER TO R.D.Y. STANDARD FHTMPP-1	REFER TO R.D.Y. STANDARD FHTMPP-1	
36"	42" x 29"	30'	10'	REFER TO R.D.Y. STANDARD FHTMPP-1	REFER TO R.D.Y. STANDARD FHTMPP-1	
42"	49" x 33"	35'	10'	REFER TO R.D.Y. STANDARD FHTMPP-1	REFER TO R.D.Y. STANDARD FHTMPP-1	
48"	57" x 38"	40'	10'	REFER TO R.D.Y. STANDARD FHTMPP-1	REFER TO R.D.Y. STANDARD FHTMPP-1	
54"	64" x 43"	45'	10'	REFER TO R.D.Y. STANDARD FHTMPP-1	REFER TO R.D.Y. STANDARD FHTMPP-1	
60"	71" x 47"	50'	10'	REFER TO R.D.Y. STANDARD FHTMPP-1	REFER TO R.D.Y. STANDARD FHTMPP-1	
66"	77" x 52"	55'	N/A	REFER TO R.D.Y. STANDARD FHTMPP-1	REFER TO R.D.Y. STANDARD FHTMPP-1	

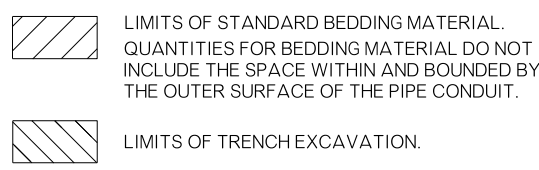
UNDER PAVEMENT IS DEFINED TO INCLUDE ALL P.C. OR A.C. SURFACING UNDER MAINLINE TRAFFIC AND MAJOR STREET RETURNS. A MINIMUM PIPE GAGE OF 16 MAY BE USED FOR INSTALLATIONS REQUIRING 30 INCH EQUIVALENT ROUND CONDUITS (MAX.) AND LIMITED TO LOW VOLUME COUNTY OR OFF-SYSTEM ROADS, MINOR STREET RETURNS, DRIVEWAYS OR TEMPORARY DETOURS, AS APPROVED BY THE ENGINEER.



TRENCH EXCAVATION IN CUT SECTIONS



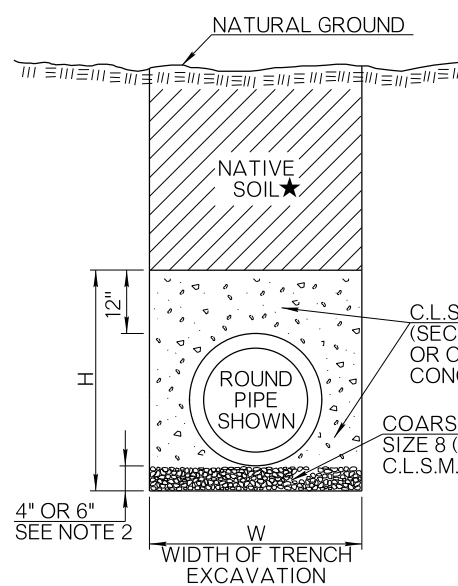
TRENCH EXCAVATION IN EMBANKMENT SECTIONS



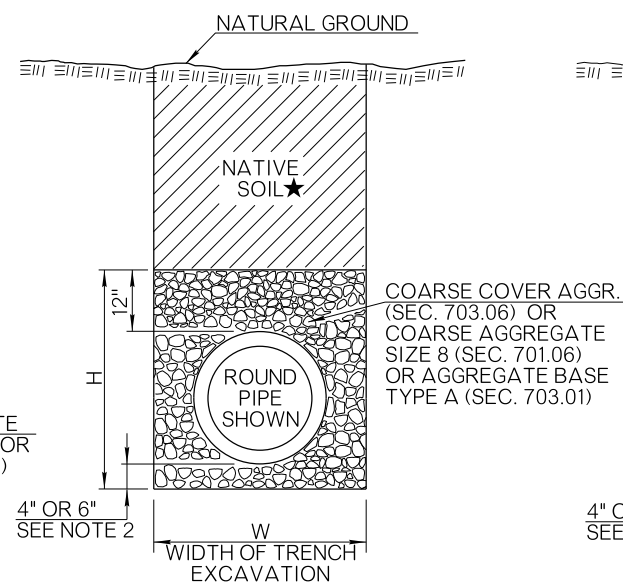
- ### GENERAL NOTES
- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
 - TRENCH EXCAVATION & STANDARD BEDDING WILL NOT BE REQUIRED FOR PIPE INSTALLATIONS ON SIDE DRAINS UNLESS OTHERWISE SPECIFIED ON THE PLANS.
 - TRENCH EXCAVATION WILL BE PAID FOR ON PIPE UNDERDRAIN. SEE ROADWAY STANDARD PUD-4.
 - TRENCHING REQUIREMENTS FOR DEPTHS OVER 5 FEET SHALL BE IN ACCORDANCE WITH, & DEFINED BY, O.S.H.A. REGS., TITLE 29 CFR, STANDARDS 1926.650, 1926.651 & 1926.652.
 - NORMAL BACKFILLING OPERATIONS SHALL FOLLOW BEDDING AND PIPE INSTALLATION AS CLOSELY AS PRACTICAL. IN NO CASE SHALL A PIPE INSTALLATION SUBJECT TO SUDDEN FLOW DEVELOPMENT BE LEFT WITHOUT SUFFICIENT BACKFILL TO RESTRAIN THE CONDUIT AND PREVENT JOINT SEPARATION AND/OR PIPING SCOUR. PHYSICALLY RESTRAINING THE CONDUIT MAY BE USED TO AUGMENT OR REPLACE THIS IMMEDIATE BACKFILL REQUIREMENT.
 - ANY EXCESS EXCAVATION NOT USED FOR BACKFILL WILL BECOME THE PROPERTY OF THE CONTRACTOR AND DISPOSED OF, BY HIM, IN A MANNER APPROVED BY THE ENGINEER.
 - INSTALLATION OF FLEXIBLE PIPE SHALL CONFORM TO SECTION 26 - DIVISION II OF AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.
 - JOINTS IN METAL PIPES SHALL CONFORM TO SECTION 26.4.2.4 OF AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES. IF A WATERTIGHT JOINT IS SPECIFIED ON THE PLANS, A 12" WIDE BY 3/4" THICK NEOPRENE SLEEVE GASKET MEETING ASTM D1056 REQUIREMENT SHALL BE USED.
 - JOINTS IN CORRUGATED POLYETHYLENE PIPES SHALL CONSIST OF A GASKETED SYSTEM WHICH CAN PASS MINIMUM OF 2 PSI HYDROSTATIC TEST WITHOUT LEAKAGE AND CONFORM TO AASHTO M 294 & SECTION 26.4.2.4 OF AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES. GASKET MATERIAL SHALL CONFORM TO EITHER ASTM D1056 OR ASTM F477 REQUIREMENTS. SIDE DRAINS ARE EXCLUDED FROM THE LEAKAGE RESISTANCE REQUIREMENTS UNLESS OTHERWISE SPECIFIED.
 - TYPE C POLYETHYLENE PIPE SHALL BE USED ONLY IN SIDE-DRAIN & SLOPLINING APPLICATIONS.
 - STANDARD BEDDING MATERIAL QUANTITIES ARE BASED ON THE TRENCH WIDTH (W), TRENCH HEIGHT (H) AND EFFECTIVE DIAMETER (D) OF ROUND CORRUGATED POLYETHYLENE PIPE MEETING THE REQUIREMENTS OF AASHTO M 294 (18"-60").
 - SPLIT COLLAR COUPLERS ARE NOT APPROVED FOR USE IN ALL CORRUGATED POLYETHYLENE PIPE INSTALLATIONS.
 - EQUIVALENT PIPE SIZES 66 INCHES AND LARGER REQUIRE 6 INCHES OF BEDDING MATERIAL BELOW PIPE CONDUIT.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
613 (R)	STANDARD BEDDING MATERIAL, CLASS A	CY
613 (S)	STANDARD BEDDING MATERIAL, CLASS B	CY
613 (T)	STANDARD BEDDING MATERIAL, CLASS C	CY
613 (V)	TRENCH EXCAVATION	CY

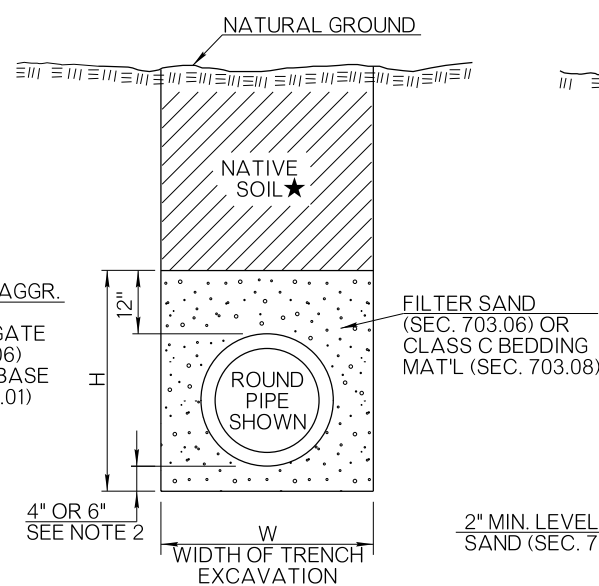
APPROVED BY ROADWAY ENGINEER: *Chris A.* DATE: 5/27/20
ROADWAY DESIGN DIVISION STANDARD



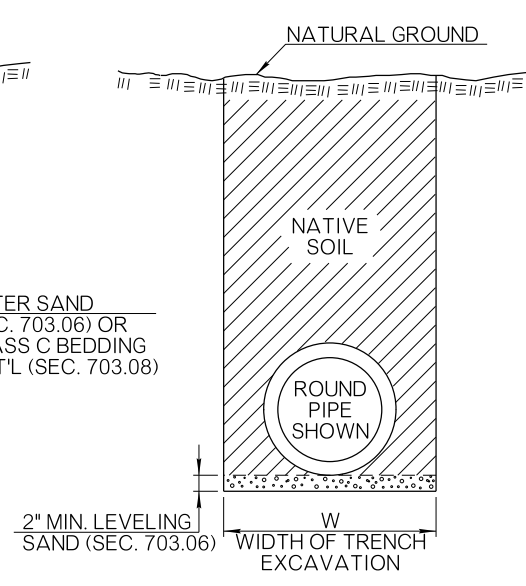
CLASS A BEDDING



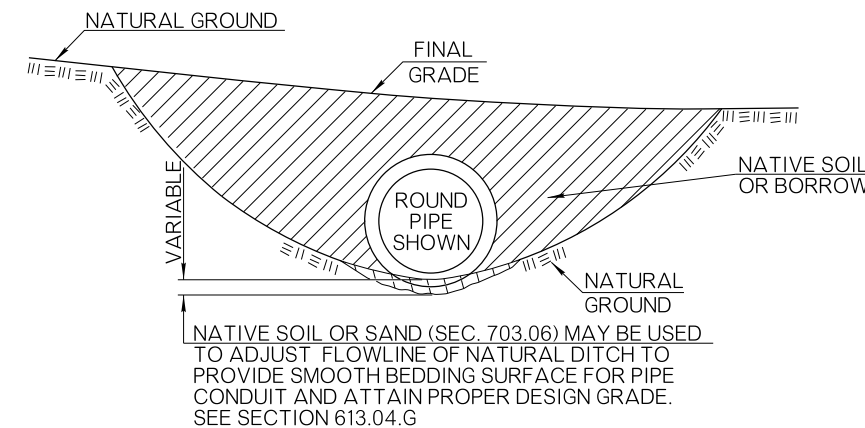
CLASS B BEDDING



CLASS C BEDDING



CLASS D BEDDING ALTERNATE 1



CLASS D BEDDING ALTERNATE 2
GENERAL NOTES

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
- EQUIVALENT PIPE SIZES 66 INCHES AND LARGER REQUIRE 6 INCHES OF BEDDING MATERIAL BELOW PIPE CONDUIT.
- NATIVE SOIL FOR BACKFILL, TO BE COMPACTED IN ACCORDANCE WITH SECTION 202.04 OF THE STANDARD SPECIFICATIONS.
- A BETTER CLASS OF BEDDING MAY BY SUBSTITUTED FOR THE NEXT LOWER CLASS. EXAMPLE: CLASS A STANDARD BEDDING CAN BE USED IN LIEU OF CLASS B STANDARD BEDDING.
- FOR TRENCH WIDTH (W), BEDDING HEIGHT (H), PIPE DATA, MULTIPLE PIPE SPACING & BEDDING DATA, SEE ROADWAY STANDARDS SPI-5 & FPI-4.
- DATA TABLE WILL DISPLAY 'NA' WHEN PIPE MATERIALS ARE NOT ALLOWED.
- STANDARD BEDDING CLASS D MATERIAL(S) (ALTERNATE 1) WILL BE CONSIDERED AS INCIDENTAL AND NOT BE PAID FOR SEPARATELY. COST FOR BORROW OR FILL MATERIAL, NEEDED FOR ALTERNATE 2, WILL BE INCLUDED IN THE PRICE OF THE PIPE.
- PIPE MATERIAL(S)/PRODUCT(S) NOT SHOWN IN THE PIPE BEDDING TABLE WILL BE EVALUATED AND APPROVED ON A CASE BY CASE BASIS.
- ALL TEMPORARY PIPES SHALL HAVE CLASS D BEDDING UNLESS OTHERWISE SHOWN IN THE PLANS.
- BEDDING MATERIAL TYPE B, C, AND D, SHALL BE PLACED IN 6" LAYERS AND COMPACTED TO THE SPECIFIED DENSITY USING HAND OPERATED EQUIPMENT ONLY.
- WHEN PIPE INSTALLATION IS UNDER PAVING, IN LIEU OF BACKFILLING WITH NATIVE SOIL, PLACE BEDDING MATERIAL ALL THE WAY TO TOP OF TRENCH.
- THE USE OF AN ALTERNATE PIPE AND ITS CORRESPONDING BEDDING MATERIAL WILL BE ACCEPTABLE PROVIDED THE CRITERIA IN THE DESIGN TABLE IS MET.
- POLYPROPYLENE PIPE SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321.

PIPE BEDDING CLASS/DESIGN TABLE							
TYPE OF PIPE	■ UNDER PAVING				OUTSIDE PAVING		
	CROSS DRAIN (NHS OR ADT > 6000 VPD)	CROSS DRAIN (OTHER)	STORM SEWER (NHS OR ADT > 6000 VPD)	STORM SEWER (OTHER)	CROSS DRAIN	SIDE DRAIN	STORM SEWER
REINFORCED CONCRETE PIPE	B	C	B	C	C	D	C
CORRUGATED GALV. STEEL PIPE (CGSP)	NA	B	NA	B	C	D	C
MILL PRECOATED CGSP	NA	B	NA	B	C	D	C
CORRUGATED GALV. STRUCT. PLATE	NA	B	NA	B	C	D	C
ALUMINIZED TYPE II CSP	NA	B	NA	B	C	D	C
CORRUGATED POLYETHYLENE / PVC	NA	A	NA	A	B	B	B
POLYVINYL CHLORIDE (SC 40/80 PVC)	NA	NA	NA	NA	NA	NA	NA
POLYPROPYLENE PIPE (PP) ▲	NA	B	NA	B	C	D	C

- WHEN THERE IS ANY POSSIBILITY OF THE PAVEMENT BEING WIDENED DURING THE LIFE OF THE DRAINAGE STRUCTURE, THE BEDDING SHALL MEET THE 'UNDER PAVING SECTION' CRITERIA FOR THE FULL EXTENT OF ANY ANTICIPATED EXPANSION TO THE FACILITY.
- ▲ BACKFILL WITH A MINIMUM OF TWO (2) FEET OF APPROVED BACKFILL MATERIAL.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
613 (R)	STANDARD BEDDING MATERIAL, CLASS A	CY
613 (S)	STANDARD BEDDING MATERIAL, CLASS B	CY
613 (T)	STANDARD BEDDING MATERIAL, CLASS C	CY

APPROVED BY ROADWAY ENGINEER:  DATE: 5/27/20
ROADWAY DESIGN DIVISION STANDARD



STANDARD PIPE BEDDING

Table: FULL CIRCLE STEEL PIPE CULVERT. Columns include PIPE DIAMETER FOR CORRUGATION PATTERN, MIN. COVER, and MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE for EQUIV. STANDARD GAGE (16, 14, 12, 10, 8, 7, 5).

Table: FULL CIRCLE ALUMINUM PIPE CULVERT. Columns include PIPE DIAMETER FOR CORRUGATION PATTERN, MIN. COVER, and MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE for EQUIV. STANDARD GAGE (16, 14, 12, 10, 8).

Table: METAL PIPE ARCH - FILLS TO 10 FT. MAX. Columns include APPROX. EQUIV. ROUND PIPE, SIZE SPAN x RISE, and MIN. GAGE/COVER for STEEL and ALUMINUM.

WHEN INSTALLED UNDER PAVEMENT INCLUDING ALL P.C. OR A.C. SURFACING UNDER MAINLINE TRAFFIC AND MAJOR STREET RETURNS. A MINIMUM PIPE GAGE OF 16 MAY BE USED FOR INSTALLATION REQUIRING 30 INCH EQUIVALENT ROUND CONDUITS (MAX.) AND LIMITED TO LOW VOLUME COUNTY OR OFF-SYSTEM ROADS, MINOR STREET RETURNS, DRIVEWAYS OR TEMPORARY DETOURS, AS APPROVED BY THE ENGINEER.

GENERAL NOTES

- 1. METAL PIPE FILL HEIGHT DESIGNS ARE BASED ON A CLASS B BEDDING, NEGATIVE PROJECTION, HS-20 LIVE LOADING AND 120 LBS/C.F. SOIL WEIGHT. POLYPROPYLENE PIPE FILL HEIGHTS ARE BASED ON AASHTO M330 FOR POLYPROPYLENE, TYPE S, PIPE WITH OUTER CORRUGATED WALL AND SMOOTH INNER WALL.
2. IN THE EVENT LOADS IN EXCESS OF HS-20 ARE TO BE OPERATED OVER OR ADJACENT TO THE PIPE INSTALLATION DURING THE CONSTRUCTION PHASE, THE CONTRACTOR SHALL PROVIDE AND MAINTAIN A MINIMUM OF FOUR FEET OF COVER OVER THE PIPE AT WHEEL OR TRACK PATHS.
3. PROPER INSTALLATION PRACTICES MUST BE ADHERED TO AS SHOWN ON ROADWAY STANDARDS SPI-5, FPI-4 AND SPB-2. POLYPROPYLENE PIPE SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321.
4. ANY PIPE DEFORMED PRIOR TO FINAL ACCEPTANCE SHALL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE. SURFACE DISTRESS MUST BE REPAIRED TO THE SATISFACTION OF THE ENGINEER OR REPLACED AT THE CONTRACTOR'S EXPENSE.
5. MAXIMUM FILL HEIGHTS ARE MEASURED TO TOP OF SUBGRADE (OR BOTTOM OF ASPHALT OR PC PAVEMENT) FOR METAL AND POLYPROPYLENE PIPES.

Table: POLY-PROPYLENE PIPE DIAMETER vs MAXIMUM FILL HEIGHT OVER CULVERT (FT.) UNDER PAVEMENT (95% COMPACT, 90% COMPACT) and OUTSIDE PAVEMENT (Class C - 85% COMPACT, Class D - 85% COMPACT).

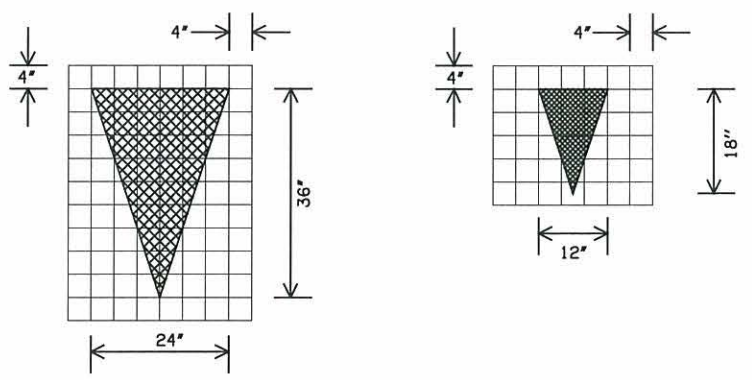
REFER TO ROADWAY DESIGN STANDARD SPB-2 FOR MINIMUM FILL HEIGHT AND OTHER POLYPROPYLENE INSTALLATION DETAILS.

Table: EQUIVALENT METAL THICKNESS AND GAGE. Columns include GAGE NUMBER and METAL THICKNESS (INCHES) for STEEL and ALUMINUM.

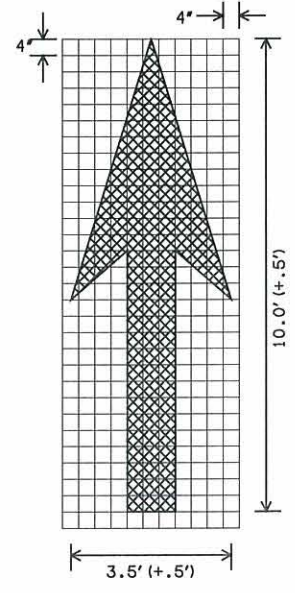
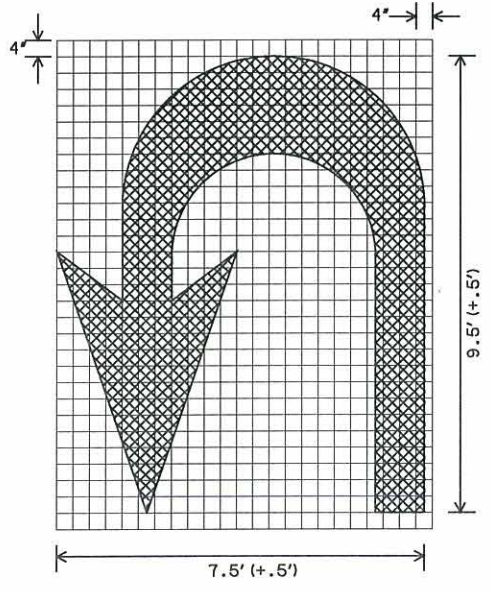
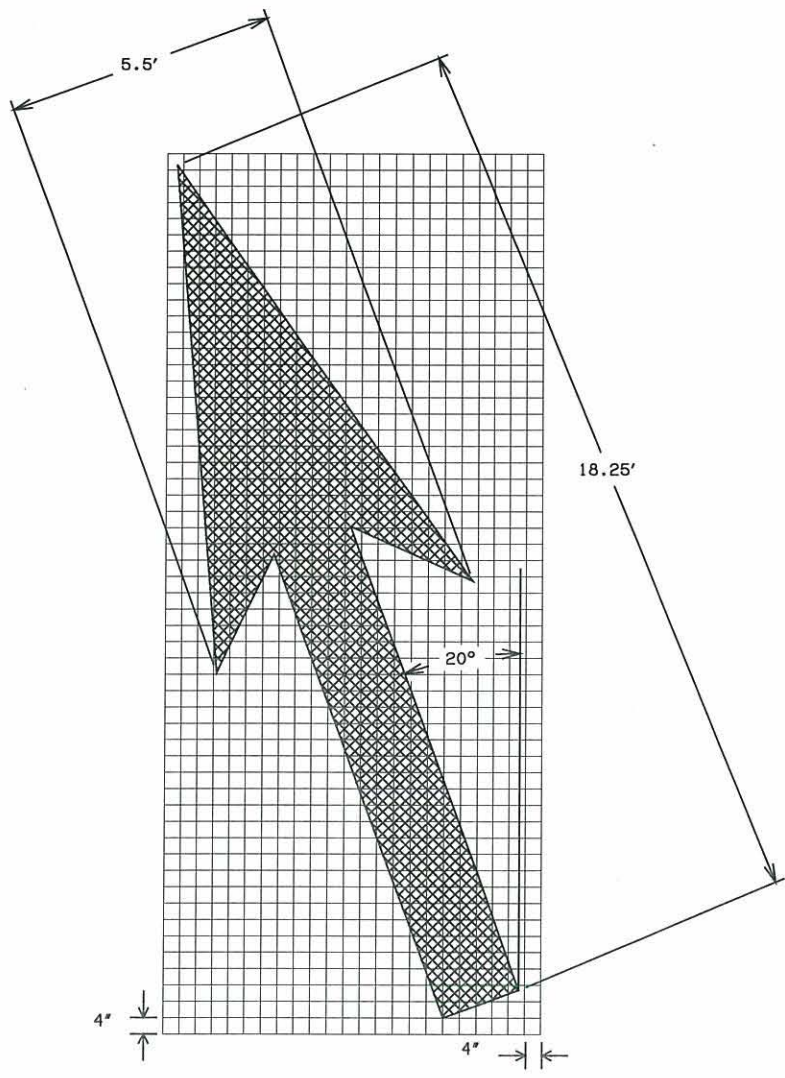
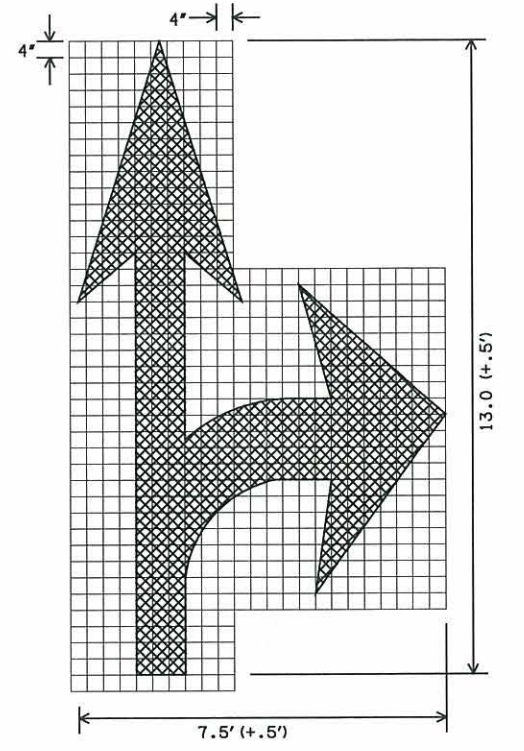
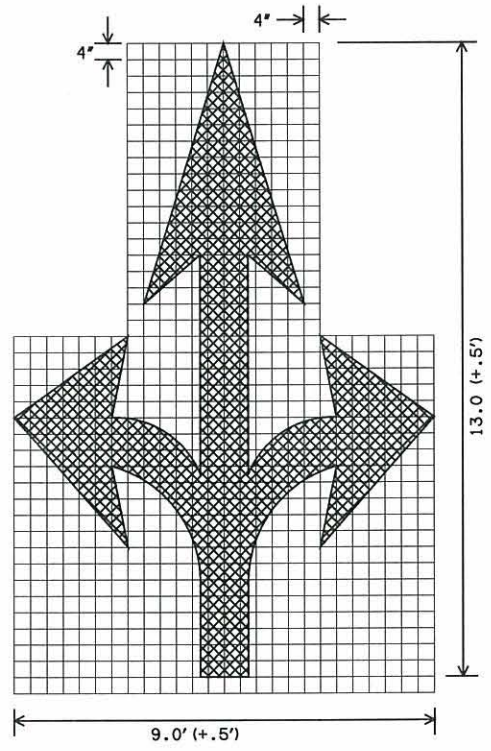
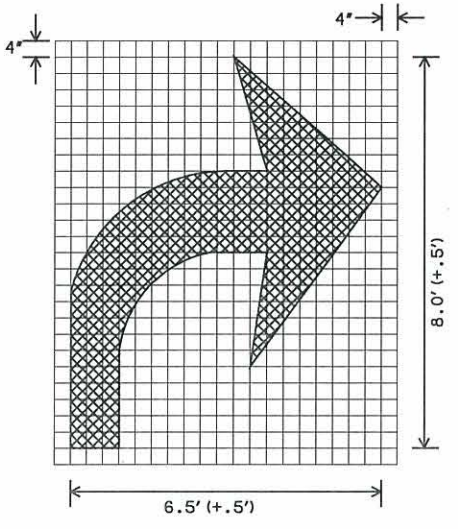
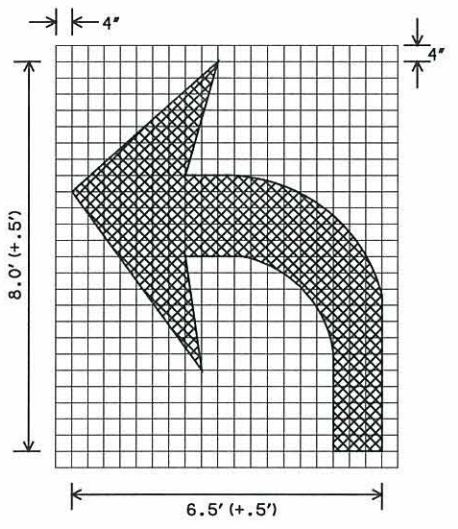
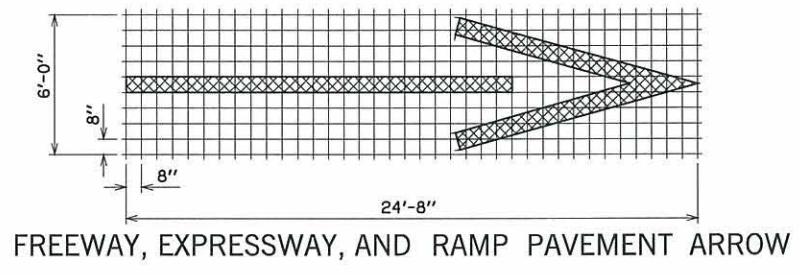
THE THICKNESS OF THE SHEET INCLUDES BOTH THE BASE STEEL AND THE COATING. THE THICKNESS SHOWN REFERS TO THE CLAD SHEET.

APPROVED BY ROADWAY ENGINEER: [Signature] DATE: 5/27/20. ROADWAY DESIGN DIVISION STANDARD. OKLAHOMA Transportation logo.

FILL HEIGHT TABLES (METAL & POLYPROPYLENE PIPES)



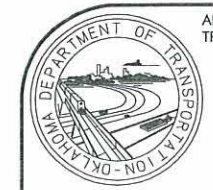
MAXIMUM YIELD LINE TRIANGLE MINIMUM YIELD LINE TRIANGLE



GENERAL NOTES

- PAVEMENT MARKINGS SHALL BE WHITE RETROREFLECTORIZED PLASTIC UNLESS OTHERWISE SPECIFIED. WHEN THE MESSAGE CONSISTS OF MORE THAN ONE WORD, IT SHOULD READ "UP" I.E. THE FIRST WORD SHOULD BE NEAREST THE DRIVER. THE SPACE BETWEEN LINES SHOULD BE AT LEAST FOUR TIMES THE HEIGHT OF THE CHARACTERS.
- ALL PAVEMENT MARKINGS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (LATEST REVISION).
- ALL DIMENSIONS ARE TYPICAL FOR SINGLE LANE UNLESS OTHERWISE NOTED.

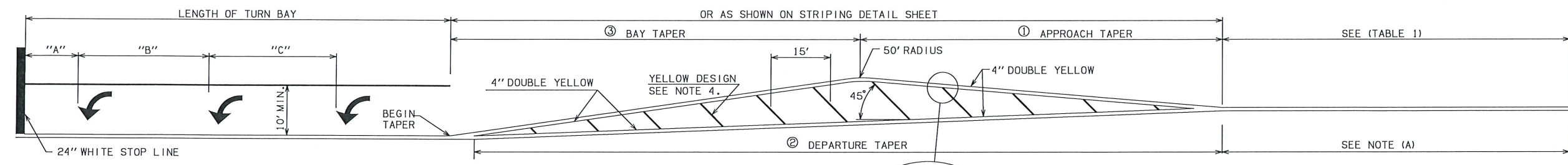
BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
854(B)	TRAFFIC STRIPE (PAINT) (ARROW, WORDS, OR SYMBOLS)	EA
855(B)	TRAFFIC STRIPE (PLASTIC) (ARROW)	EA
855(B)	TRAFFIC STRIPE (PLASTIC) (SYMBOLS)	EA
856(B)	TRAFFIC STRIPE (MULTI-POLYMER) (SYMBOLS, WORDS, ETC)	EA



APPROVED BY TRAFFIC ENGINEER *David Amah* DATE: 8/15/10

TRAFFIC STANDARD
PAVEMENT MARKING (ARROWS)

DESCRIPTION	REVISIONS	DATE
ADDED GENERAL NOTE 4.		7/08/2011
UPDATED SYMBOLS		4/2/2013
CHANGE DASHED LINE DIMENSION		7/25/2019



LEFT TURN BAY AND STRIPED MEDIAN DETAIL
SEE PLANS FOR LENGTH OF LEFT TURN BAYS AND TAPERS ON STRIPED MEDIANS

- ① THE PREFERRED APPROACH TAPER RATE IS V:1, WHERE V IS THE DESIGN SPEED. FOR V ≤ 40 MPH, IT IS ACCEPTABLE FOR THE APPROACH TAPER TO BE (V²/60):1.
- ② THE PREFERRED DEPARTURE TAPER RATE IS V:1, WHERE V IS THE DESIGN SPEED. FOR V ≤ 40 MPH, IT IS ACCEPTABLE FOR THE DEPARTURE TAPER TO BE (V²/60):1.
- ③ SEE RECOMMENDED BAY TAPER RATES TABLE.

RECOMMENDED BAY TAPER RATES

DESIGN SPEED (MPH)	TAPER RATE
V < 30	8:1
30 ≤ V ≤ 50	10:1
50 > V	15:1

THE FOLLOWING MINIMUM VALUES MAY APPLY IN RESTRICTED LOCATIONS:
 1. RIGHT-TURN LANES. A 4:1 BAY TAPER MAY BE USED WHERE PAINTED CHANNELIZATION IS USED.
 2. LEFT-TURN LANES. IN SEVERELY RESTRICTED LOCATIONS, A 4:1 BAY TAPER MAY BE USED WHERE PAINTED CHANNELIZATION IS USED.
 (A) NO PASS LINE ON APPROACH SIDE WITH SKIP CENTER LINE ON DEPARTURE SIDE UNLESS DOUBLE YELLOW CENTER LINE IS REQUIRED.

TURN BAY TABLE

LENGTH OF BAY FT.	"A" FT.	"B" FT.	"C" FT.
75 TO 99	20	35	--
100 TO 149	20	35	35
150 TO 200	30	55	55

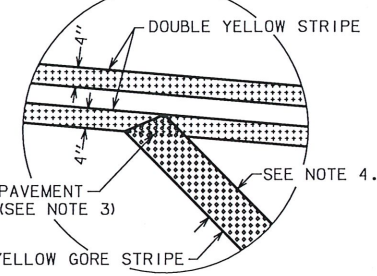
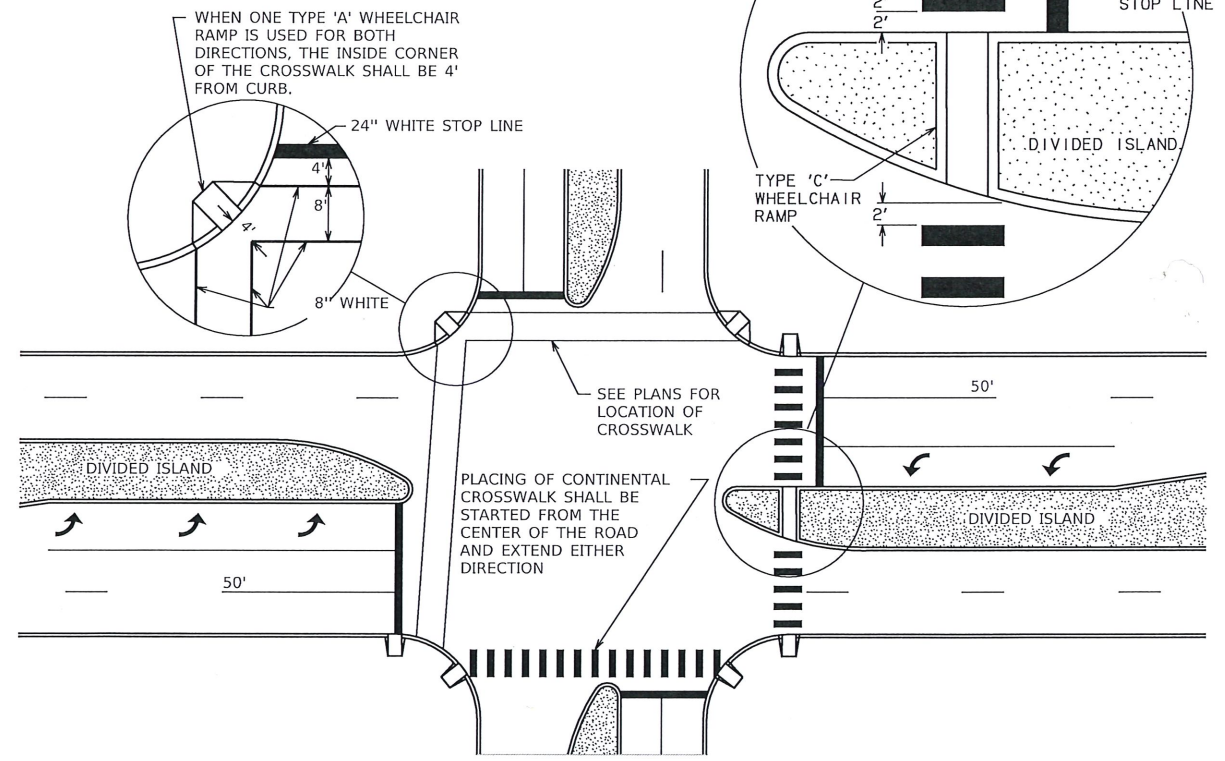
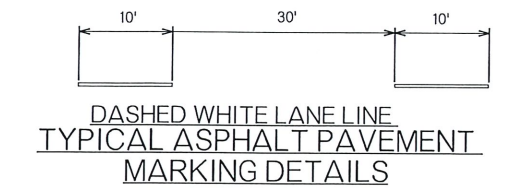
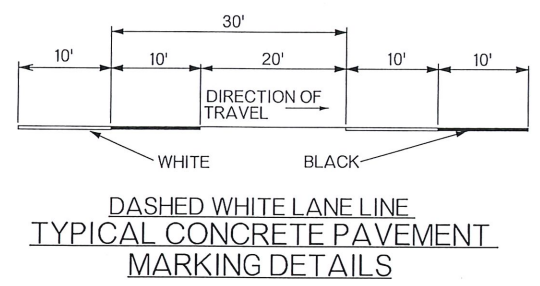


TABLE 1

POSTED SPEED	NO PASS LENGTH (MINIMUM)
60 MPH	790'
55 MPH	725'
50 MPH	660'
45 MPH	590'
40 MPH	360'
35 MPH	260'
30 MPH	200'
25 MPH	150'

- MATERIAL SPECIFICATIONS**
- A. UNLESS OTHERWISE SPECIFIED, RETROREFLECTIVE PAVEMENT MARKING SHALL BE APPLIED BY THE EXTRUSION METHOD.
 - B. THE THICKNESS OF THE PLASTIC PAVEMENT MARKING SHALL BE MEASURED FROM THE PLANE OF THE PAVEMENT SURFACE WITH A DEVICE SUPPLIED BY CONTRACTOR AND SUITABLE TO THE ENGINEER. THICKNESSES ARE AS FOLLOWS:
 LANE LINES, STOP LINES, WORDS, ARROWS AND SYMBOLS.....0.120" MIN. & 0.188" MAX.
 EDGE, GORE AND DIAGONAL LINES.... 0.090" MIN. & 0.188" MAX.
 - C. THE THICKNESS OF THE MULTI-POLYMER PAVEMENT MARKING SHALL BE MEASURED FROM THE PLANE OF THE PAVEMENT SURFACE WITH A DEVICE SUPPLIED BY CONTRACTOR AND SUITABLE TO THE ENGINEER. THICKNESSES ARE AS FOLLOWS:
 LANE LINES, STOP LINES, WORDS, ARROWS, SYMBOLS, EDGE, GORE AND DIAGONAL LINES.... 0.020" MIN. & 0.025" MAX.

- GENERAL NOTES**
- 1. LANE WIDTH IS THE DISTANCE BETWEEN PAVEMENT MARKINGS, OR PAVEMENT MARKING AND EDGE OF PAVEMENT. LANE WIDTH IS MEASURED FROM CENTER OF STRIPE TO CENTER OF STRIPE.
 - 2. LANE LINES SHALL BE PLACED LEFT OF THE LONGITUDINAL PAVEMENT JOINTS.
 - 3. ALL PAVEMENT MARKING SHALL OVERLAP WHERE IT MEETS OTHER PAVEMENT MARKING.
 - 4. WIDTH OF DIAGONALS ARE AS FOLLOWS:
 ≥ 45 MPH - 12" WIDE
 < 45 MPH - 8" WIDE



CROSSWALK INSTALLATIONS

FOR SPACING OF ARROWS
SEE "TURN BAY TABLE"

BASIS OF PAYMENT

ITEM NO.	ITEM	UNIT
854(A)	TRAFFIC STRIPE (PAINT) (4" WIDE)	LF
854(B)	TRAFFIC STRIPE (PAINT) (ARROW, WORDS, OR SYMBOLS)	EA
855(A)	TRAFFIC STRIPE (PLASTIC) (4" WIDE)	LF
855(A)	TRAFFIC STRIPE (PLASTIC) (6" WIDE)	LF
855(A)	TRAFFIC STRIPE (PLASTIC) (8" WIDE)	LF
855(A)	TRAFFIC STRIPE (PLASTIC) (24" WIDE)	LF
855(B)	TRAFFIC STRIPE (PLASTIC) (ARROW)	EA
855(B)	TRAFFIC STRIPE (PLASTIC) (WORDS)	EA
856(A)	TRAFFIC STRIPE (MULTI-POLYMER) (4" WIDE)	LF
856(A)	TRAFFIC STRIPE (MULTI-POLYMER) (6" WIDE)	LF
856(A)	TRAFFIC STRIPE (MULTI-POLYMER) (8" WIDE)	LF
856(A)	TRAFFIC STRIPE (MULTI-POLYMER) (24" WIDE)	LF
856(B)	TRAFFIC STRIPE (MULTI-POLYMER) (SYMBOLS, WORDS, ETC)	EA

APPROVED BY
TRAFFIC ENGINEER: DATE: 7/11/19

DOT TRAFFIC STANDARD
PAVEMENT MARKING
(CROSSWALKS AND LEFT
TURN BAY)