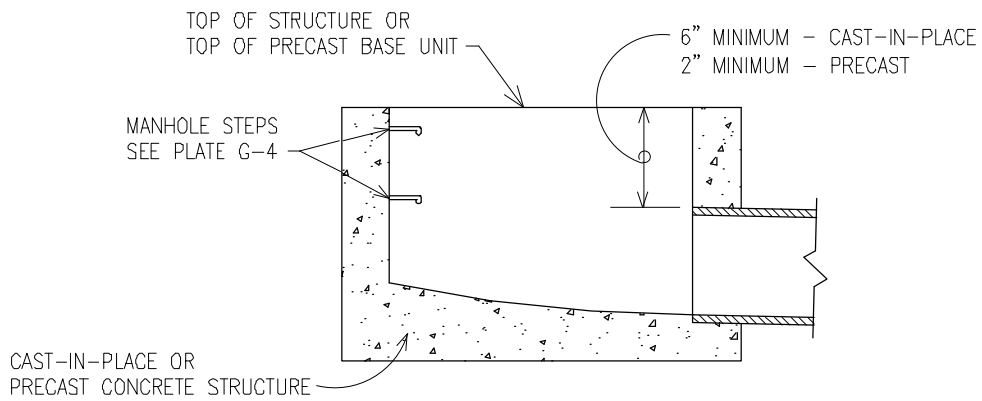
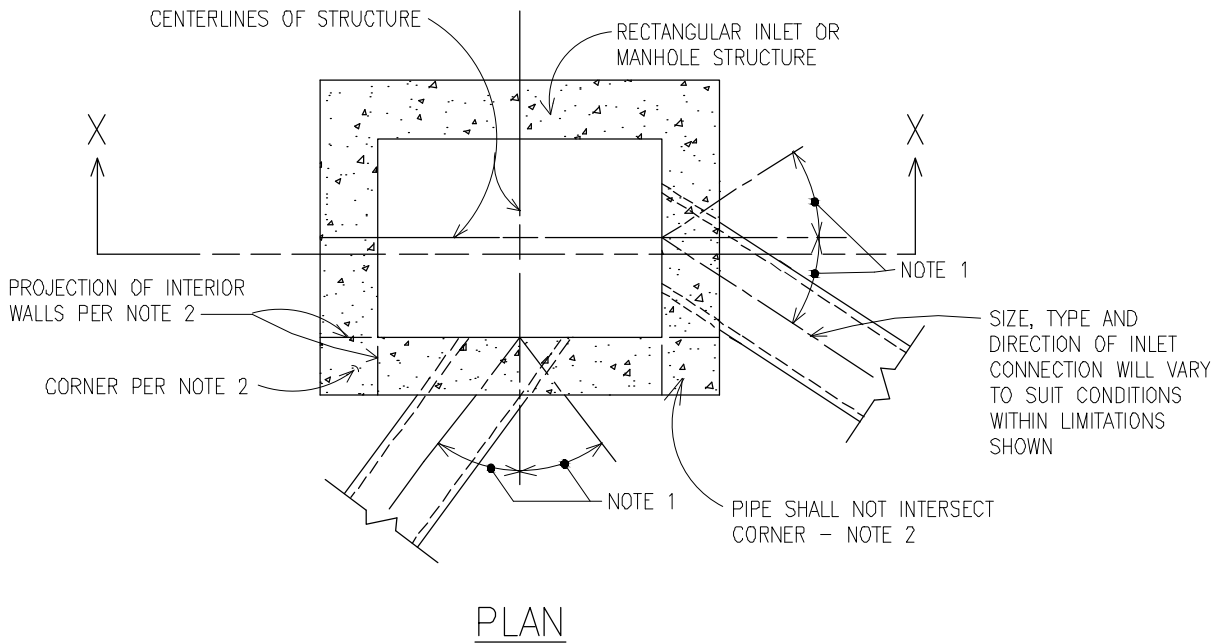


GENERAL STANDARD DETAIL INDEX

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PLATE NUMBER	TITLE	SIGNATURE DATE	SPEC REF#
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G-29	RESTORATION FOR TRENCHES (AT STREET INTERSECTIONS)	09/28/2023	----
G-D	UNIFIED SOIL CLASSIFICATIONS (CRITERIA AND SYMBOL CHARTS)	09/28/2023	----
G-E	GEOTEXTILE SELECTION	09/28/2023	----



NOTES:

1. CENTER LINE PIPE ALLOWABLE RANGE: $\pm 30^\circ$ FROM PERPENDICULAR.
2. NO PART OF THE PIPE SHALL PASS THROUGH ANY CORNER OF STRUCTURE AS DEFINED BY PROJECTION OF INTERIOR WALLS.
3. BENCH SIMILAR TO TYPE A MANHOLE SHALL BE BUILT INTO INLET WHERE DRAINS 24" AND LARGER RUN THROUGH INLET. SEE DETAIL PLATE D-3.00.



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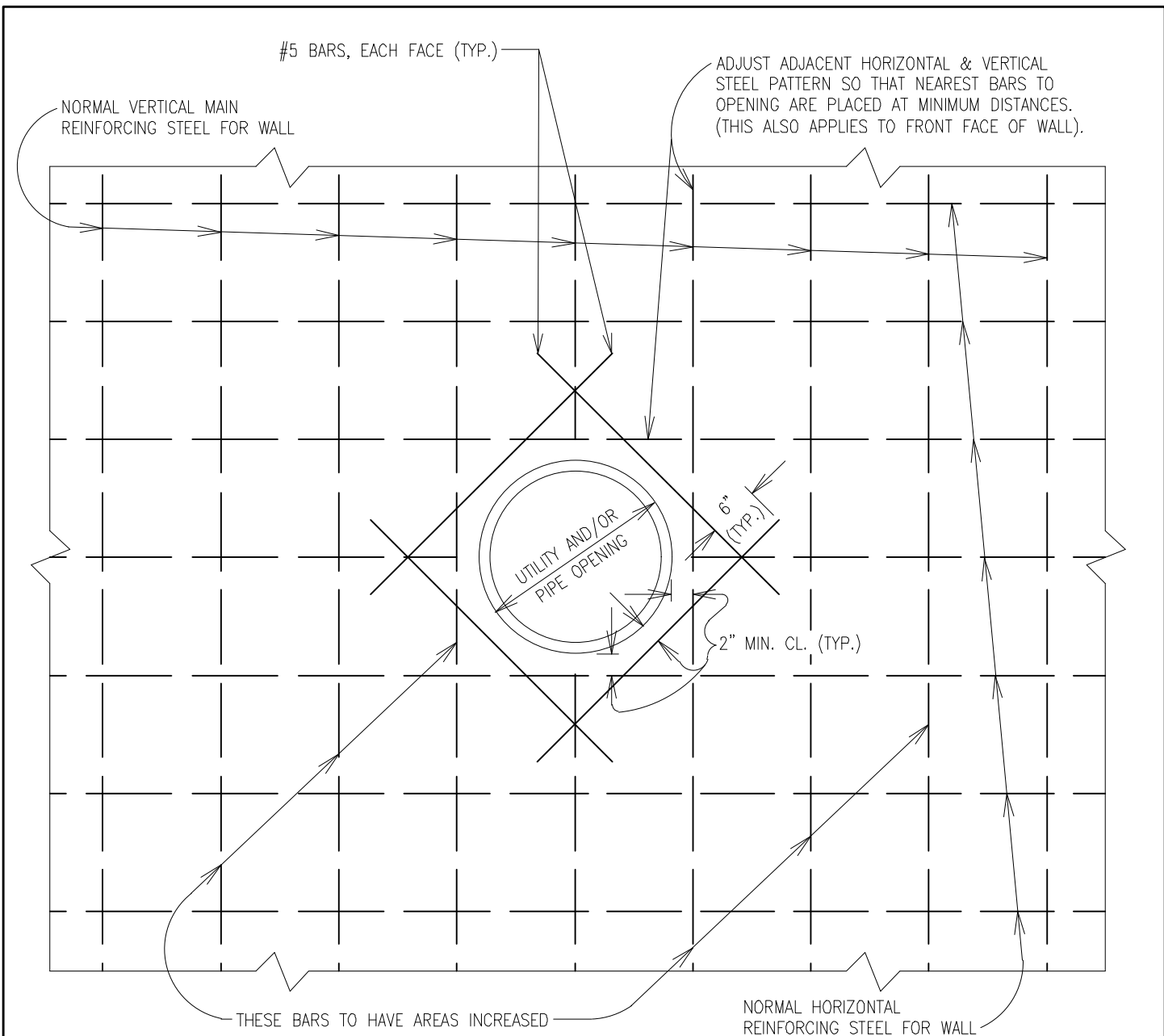
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
GENERAL DETAILS
PIPE ENTRANCES
RECTANGULAR UTILITY STRUCTURES

ISSUED: SEPTEMBER 2023

PLATE
G-1

DATE: 08/28/2023

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ELEVATION
NOT TO SCALE

NOTES:

1. INCREASE THE SIZE OF EACH OF THE FIRST THREE NORMAL MAIN VERTICAL REINFORCING STEEL BARS ON EACH SIDE OF THE WALL OPENING. NEW BAR SIZE SHALL BE INCREASED BY AT LEAST 1/6 OF THE TOTAL AREA OF THE MAIN REINFORCING STEEL THAT HAS BEEN CUT.
2. WHEN PIPE SIZE IS OVER 3'-0", SUFFICIENT HORIZONTAL BARS SHALL BE ADDED OVER AND BELOW OPENING TO TRANSFER LOAD TO ADJACENT FULL SECTIONS OF WALL.
3. IN NO CASE SHALL CONCRETE COVER BE LESS THAN 2".

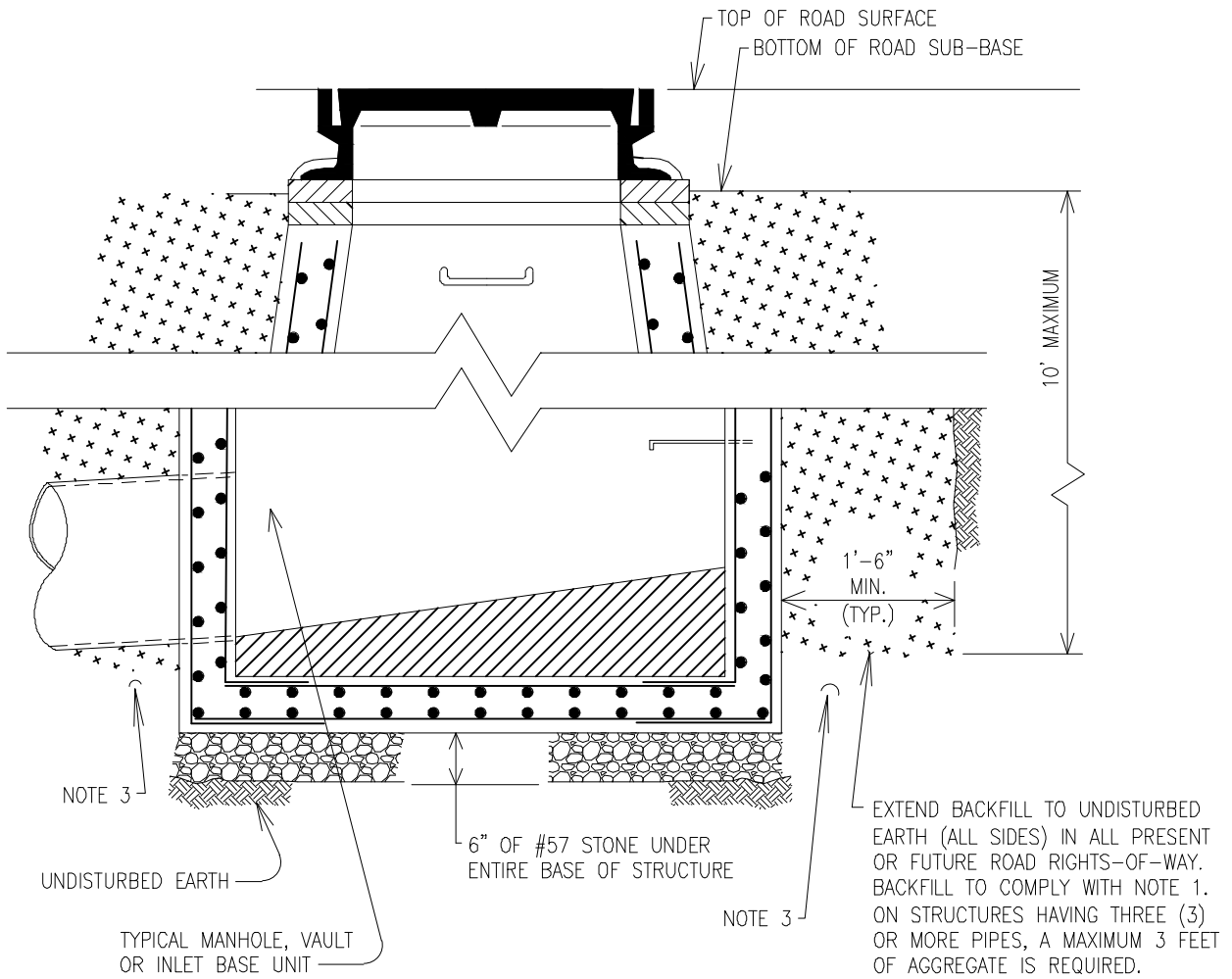


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DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
GENERAL DETAILS
REBAR ADJUSTMENT
AT OPENINGS IN CONCRETE WALLS

ISSUED: SEPTEMBER 2023
 PLATE
G-1A

DATE: 08/28/2023
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NOTES:

1. CR-6 OR CR-1 SHALL BE USED FOR THE TOP 10 FEET OF BACKFILL BELOW THE ROAD SUB-BASE. WHERE STRUCTURE IS LESS THAN 10 FEET IN DEPTH, THIS MATERIAL SHALL BE USED FOR THE FULL DEPTH OF STRUCTURE.
2. WITH APPROVAL OF THE ENGINEER, RECYCLED CONCRETE RC-1, RC-6 OR RC #57 MAY BE SUBSTITUTED FOR CR-1, CR-6 OR #57 STONE, RESPECTIVELY.
3. EXCAVATION BELOW 10 FEET SHALL BE BACKFILLED WITH SUITABLE NATIVE MATERIAL OR COMMON BORROW AND SHALL BE FULLY COMPACTED TO SPECIFICATION.
4. THIS PLATE SHALL APPLY TO ALL STORM DRAIN, WATER SUPPLY AND SANITARY SEWER STRUCTURES CONSTRUCTED WITHIN PUBLIC OR PRIVATE ROAD RIGHT-OF-WAY.
5. REFER TO SECTIONS 305.03.05 & 06 (DRAINAGE STRUCTURES & PRECAST DRAINAGE STRUCTURES), 303.03.02 (PIPE CULVERT BEDDING), 352.03.03(d) (VAULTS AROUND VALVES 16", 20" 24" & 30"), AND 362.03.01 (SANITARY SEWER MANHOLES).



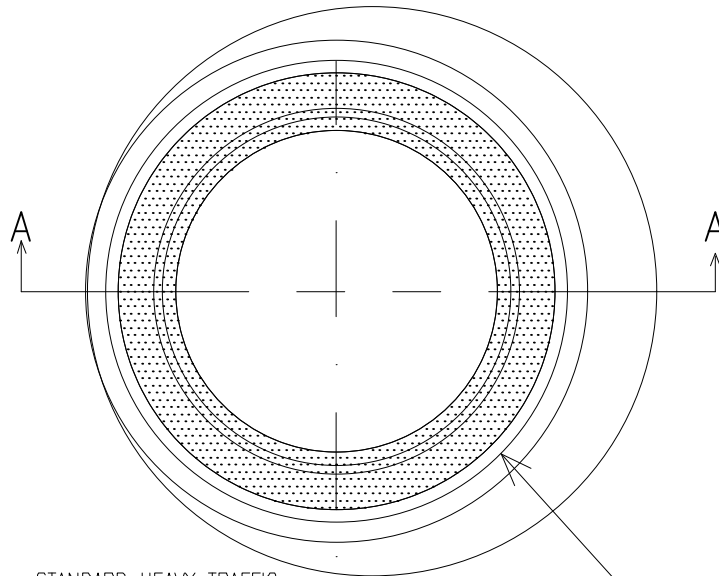
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DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
GENERAL DETAILS
UTILITY STRUCTURES
IN ROADS

ISSUED: SEPTEMBER 2023
 PLATE
G-2

DATE: 08/28/2023 FILE: GEN_MASTER.dwg

TOP VIEW



STANDARD HEAVY TRAFFIC
MANHOLE FRAME AND
COVER (FRAME SHOWN)

PRECAST CONCRETE
GRADE ADJUSTMENT RING
(THREE RINGS MAX.)

GRADE ADJUSTMENT VARIES
MAX. = 16 INCHES
MIN. = 2+ INCHES

NOTE 1

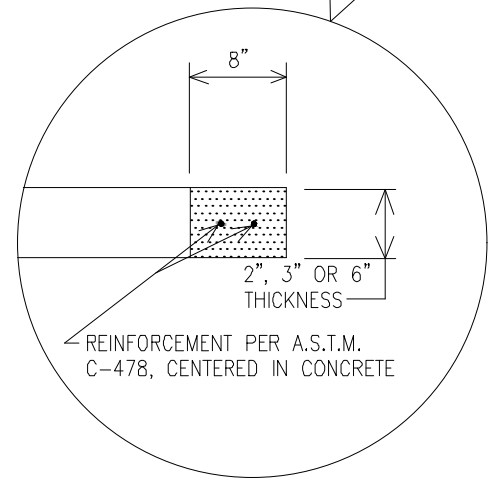
ECCENTRIC CONE SHOWN.
GRADE ADJUSTMENT RINGS
MAY ALSO BE USED OVER
FLAT SLABS, NON-ECCENTRIC
CONES & BRICK MANHOLES.

2'-0"
OR 2'-6"

SECTION A-A

NOTES:

1. SEE STANDARD DETAIL PLATE G-4 FOR MANHOLE STEP SPECIFICATIONS, AND SPACING.
2. GRADE RING TO BE PLACED FLUSH WITH EDGES OF MANHOLE RISER OPENING.
3. REINFORCEMENT SHALL BE CONTINUOUS AROUND ENTIRE RING. MINIMUM CIRCUMFERENTIAL REINFORCEMENT PER A.S.T.M. C-478.
4. GRADE ADJUSTMENT RINGS SHALL BE MORTARED IN PLACE. REFER TO SECTION 903.06.
5. GRADE ADJUSTMENT RINGS SHALL BE ONE-PIECE EXCEPT AS NOTED: 2" THICK RINGS (24" & 30" INNER DIAMETER) AND 3" THICK RINGS (30" INNER DIAMETER ONLY) SHALL BE CONSTRUCTED AS TWO SEMICIRCULAR SEGMENTS.
6. USE 4500 psi CONCRETE (MIX #6) FOR ADJUSTMENT RINGS.



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GENERAL DETAILS
PRECAST CONCRETE GRADE
ADJUSTMENT RING

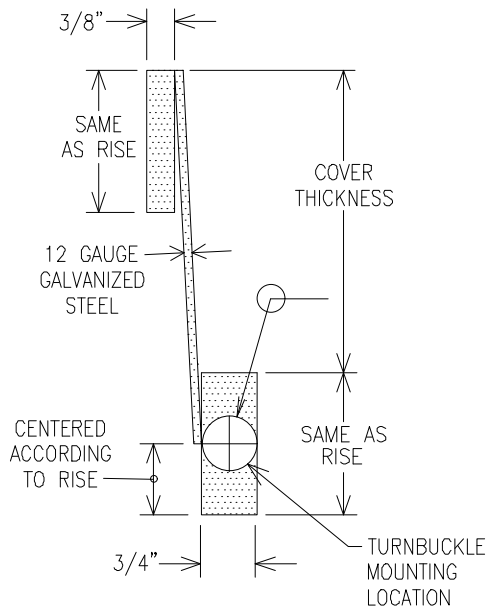
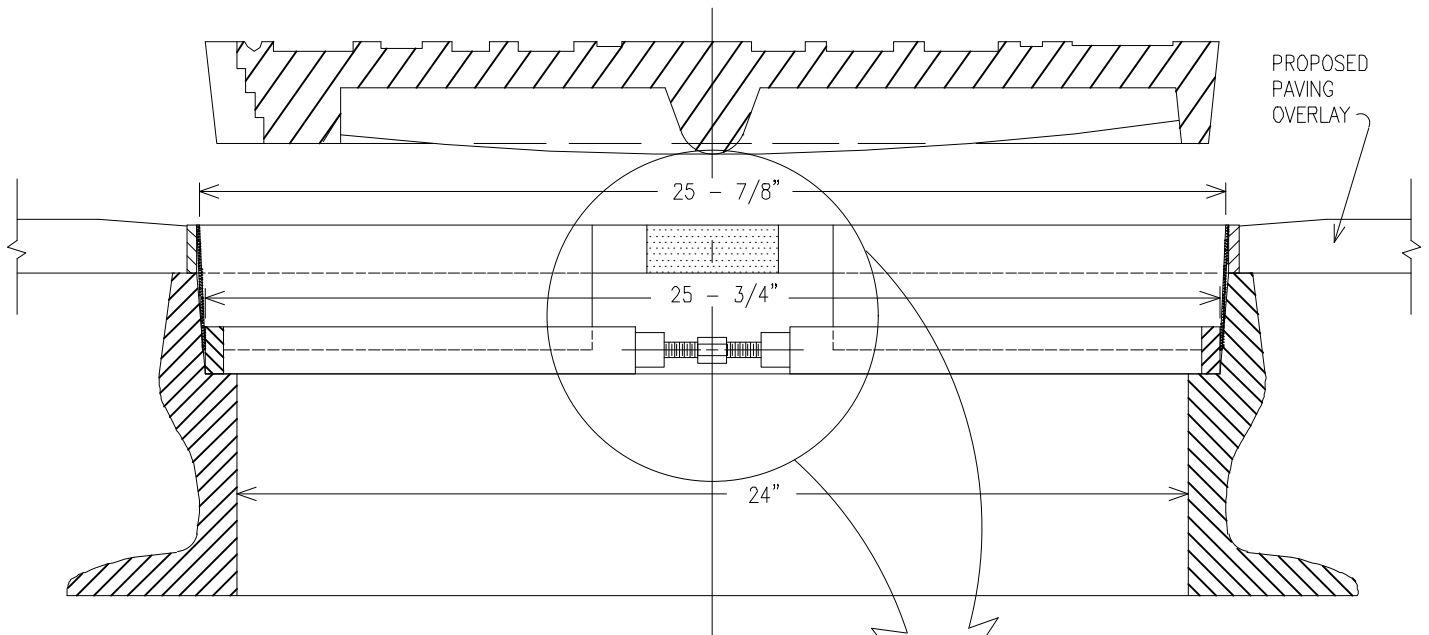
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PLATE
G-3

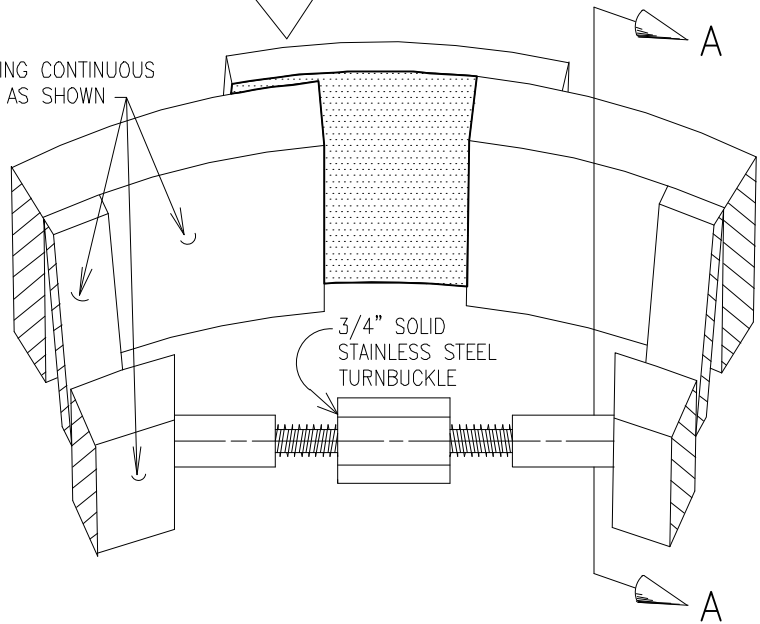
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SECTIONAL VIEW THROUGH CENTER OF MANHOLE



EACH RING CONTINUOUS EXCEPT AS SHOWN





SECTION A-A
(RADIAL THROUGH RING)

NOTES:

1. ADJUSTABLE RISER RING SHALL BE USED ONLY ON PAVING OVERLAY CONTRACTS NOT INVOLVING UTILITIES. MANHOLE ADJUSTMENT OTHERWISE REQUIRED.
2. ADJUSTABLE RISER RING SHALL BE WARRANTED FREE OF DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF 10 YEARS. DEFECTIVE UNITS WILL BE REPLACED IN KIND.
3. ADJUSTABLE RISER RINGS WILL BE CERTIFIED TO SUPPORT HS-20 LOADS.
4. PAVING OVERLAY SHALL BE FLUSH WITH TOP OF UPPER RING AROUND ENTIRE CIRCUMFERENCE.
5. USE WITH PORTLAND CEMENT CONCRETE ONLY WITH PERMISSION OF ENGINEER.




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DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
GENERAL DETAILS
ADJUSTABLE RISER RING
HEAVY TRAFFIC MANHOLE
FRAME AND COVER

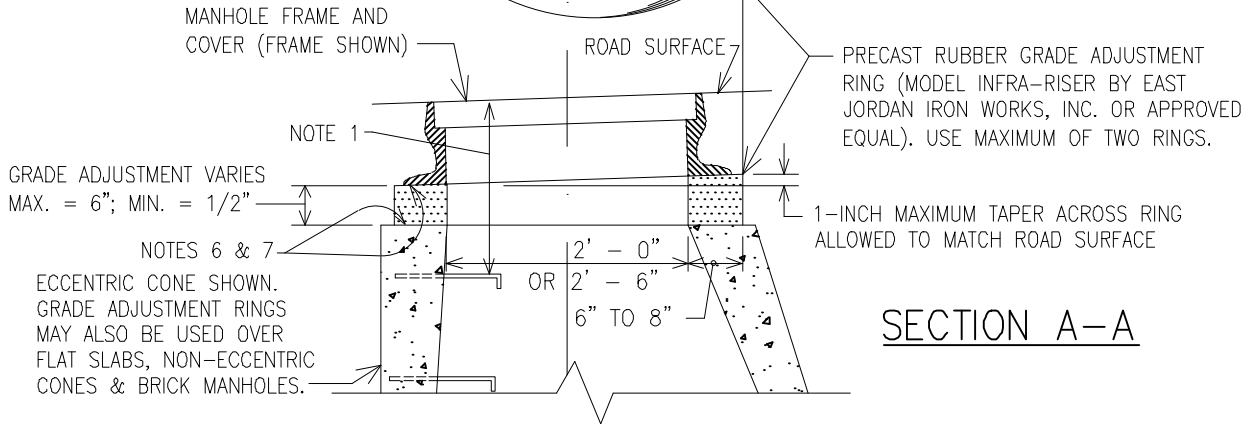
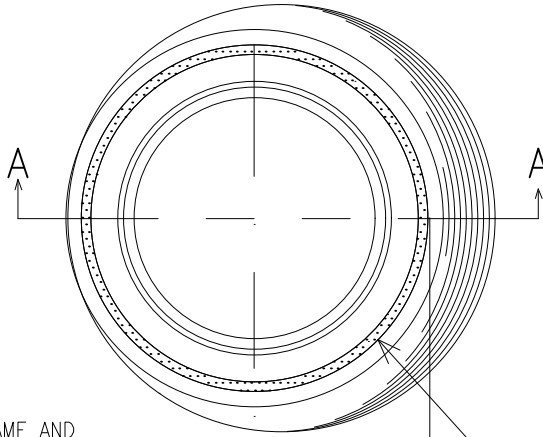
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PLATE
G-3A

DATE: 08/28/2023

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TOP VIEW



SECTION A-A

PHYSICAL PROPERTIES - RUBBER RING		
CRITERIA	REQUIREMENTS	ASTM TEST
DENSITY	64.21 LBS/FT ³	D3574-08, TEST A
DUROMETER HARDNESS (MOLDED SURFACES)	77A ± 5 POINTS	BASED ON D2240-05
TENSILE STRENGTH	304 PSI	D412-06
HEAT AGE PROPERTIES	70 HOURS @ 158°; 3 HOURS @ 300°f	D573-04

NOTES:

1. SEE STANDARD DETAIL PLATE G-4 FOR MANHOLE STEP SPECIFICATIONS AND SPACING.
2. GRADE RING TO BE PLACED FLUSH WITH EDGES OF MANHOLE RISER OPENING.
3. ONE RUBBER GRADE ADJUSTMENT RING MAY BE USED WITH ONE PRECAST CONCRETE GRADE ADJUSTMENT RING (STD. DETAIL PLATE G-3).
4. RUBBER GRADE ADJUSTMENT RINGS SHALL BE SEALED TO THE CONCRETE (OR BRICK) STRUCTURE AND TO THE FRAME USING ELASTOMERIC JOINT SEALANT CONFORMING TO ASTM C 920-08 (LATEST REVISED), TYPE S, GRADE NS, CLASS 25, USE NT, M AND A.
5. SEE PHYSICAL PROPERTIES TABLE FOR REQUIREMENTS FOR PRECAST RUBBER GRADE ADJUSTMENT RINGS.
6. CLEAN AND WIREBRUSH SURFACES CONTACTING RUBBER RING. APPLY SEALANT BEAD (NOTE 4) GENEROUSLY 1-INCH INSIDE OUTER EDGE OF CONTACT AREA & ALSO AS NECESSARY TO FILL IRREGULARITIES.
7. FOR EXISTING BRICK/BLOCK MANHOLES: REMOVE ALL LOOSE OR BROKEN BRICKS OR WEDGES USED IN ORIGINAL INSTALLATION. RE-MORTAR TOP SURFACE USING POLYMER MODIFIED NON-SHRINK PATCHING MATERIAL (OCTACRETE OR APPROVED EQUAL) TO PROVIDE SMOOTH, LEVEL TOP SURFACE. INSTALL SEALANT PER NOTE 6 AFTER PATCHING MATERIAL HAS CURED.



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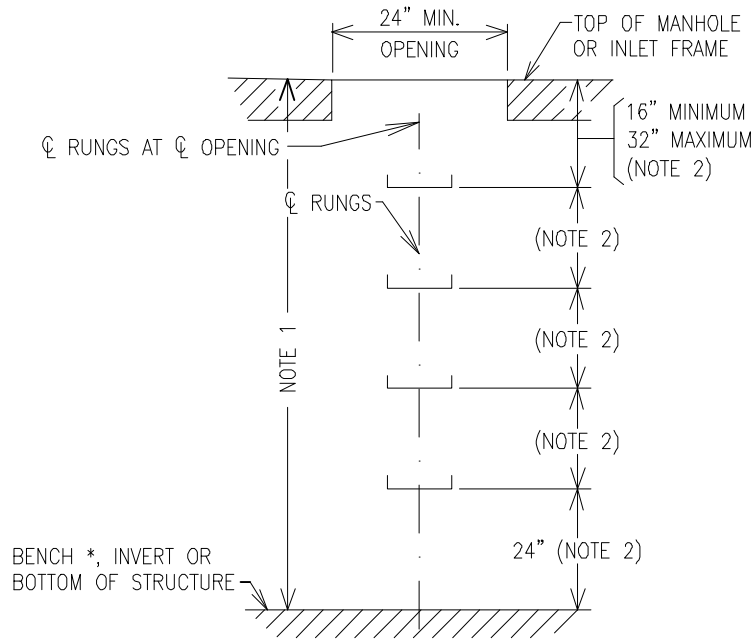
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
GENERAL DETAILS
PRECAST RUBBER GRADE
ADJUSTMENT RING

ISSUED: SEPTEMBER 2023

PLATE
G-3B

DATE: 08/28/2023

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NOTES:

- LADDER STEPS SHALL BE USED IN ALL MANHOLES, INLETS, JUNCTION BOXES, VALVE VAULTS, ETC., WHERE DEPTH MEASURED FROM STREET SURFACE TO INVERT (OR TOP OF BOTTOM SLAB) IS GREATER THAN 3 FEET, OR WHERE DIRECTED BY THE ENGINEER.
- STEP SPACING (MEASURED VERTICALLY): 10-INCHES (MIN.) TO 14-INCHES (MAX.) APART, SPACED UNIFORMLY. 12-INCH STEP SPACING IS PREFERRED.

MINIMUM 16-INCHES, MAXIMUM 32-INCHES BETWEEN FIRST STEP AND TOP OF MANHOLE OR GRATE FRAME. DO NOT INSTALL A STEP IN THE MANHOLE PRECAST ADJUSTMENT RING OR BRICK ADJUSTMENT AREA UNDER A MANHOLE OR GRATE FRAME.

24-INCHES SPACING FROM LAST STEP TO BENCH OR BOTTOM OF STRUCTURE, AS APPLICABLE. *BENCH MUST BE UNDER FULL WIDTH OF BOTTOM STEP IN ORDER TO BE CONSIDERED AS STRUCTURE BOTTOM.

- MINIMUM STANDARDS FOR ALTERNATE DESIGNS SHALL COMPLY WITH ASTM C478-09, SEC. 16, OR LATEST EDITION, AND WITH O.S.H.A. INSTRUCTION STD 1-1.9, DATED DECEMBER 29, 1978.

TREAD WIDTH: 10-INCHES MINIMUM

EMBEDMENT DEPTH IN WALL: 3-INCHES MINIMUM

END OF TREAD DESIGNED TO PREVENT FOOT FROM SLIDING OFF.

RUNG TO PROJECT 4-INCHES MINIMUM CLEAR FROM WALL, MEASURED AT EMBEDMENT.



TESTING PER ASTM C 478-09 SECTION 16.6, OR LATEST EDITION.

MATERIAL: POLYPROPYLENE-COATED DEFORMED STEEL OR APPROVED EQUAL. EXPOSED SURFACE TO BE FREE OF SHARP EDGES, SPLINTERS, BURRS OR OTHER HAZARDS.

DETAIL DRAWINGS AND CERTIFIED LOAD TEST RESULTS TO BE SUBMITTED FOR APPROVAL.

- WHERE BRICK CONSTRUCTION IS EMPLOYED, ADJUST MORTAR JOINTS TO ACCOMMODATE LADDER STEPS.
- COPOLYMER POLYPROPYLENE ENCAPSULATED 1/2-INCH DIAMETER STEEL REINFORCING BAR SHALL CONFORM TO ASTM A-615 GRADE 60.
- COPOLYMER POLYPROPYLENE SHALL BE CERTIFIED BY THE MANUFACTURER TO CONFORM TO ASTM D-4101, LATEST EDITION, AND HAVE A MINIMUM EXPOSED SECTION THICKNESS OF 1/8-INCH.
- INSTALLATION SHALL CONFORM TO MANUFACTURER'S RECOMMENDATIONS.
- TOP STEP SHALL PROJECT A MINIMUM OF 2-INCHES INTO THE ACCESS OPENING.
- SEE STANDARD PLATE G-4A FOR DRAWINGS AND DIMENSIONS OF LADDER STEPS FOR USE IN VARIOUS APPLICATIONS.



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 GENERAL DETAILS
 LADDER STEPS
 FOR MISCELLANEOUS STRUCTURES

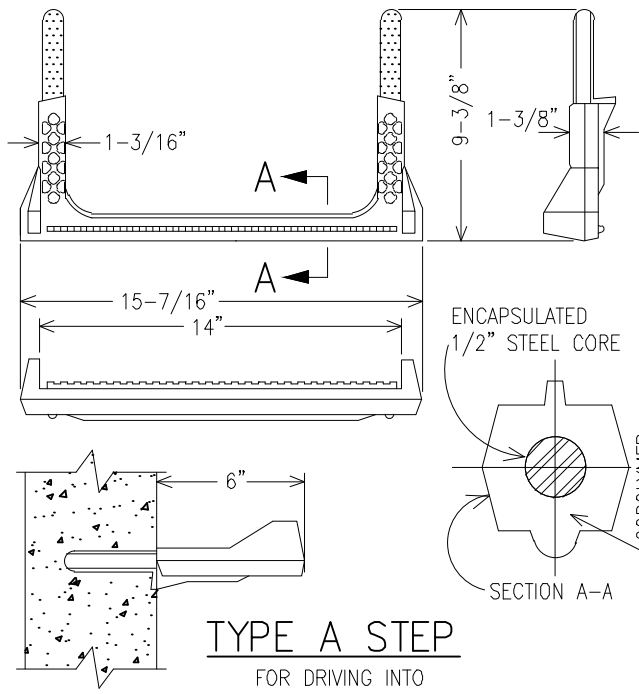
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PLATE

G-4

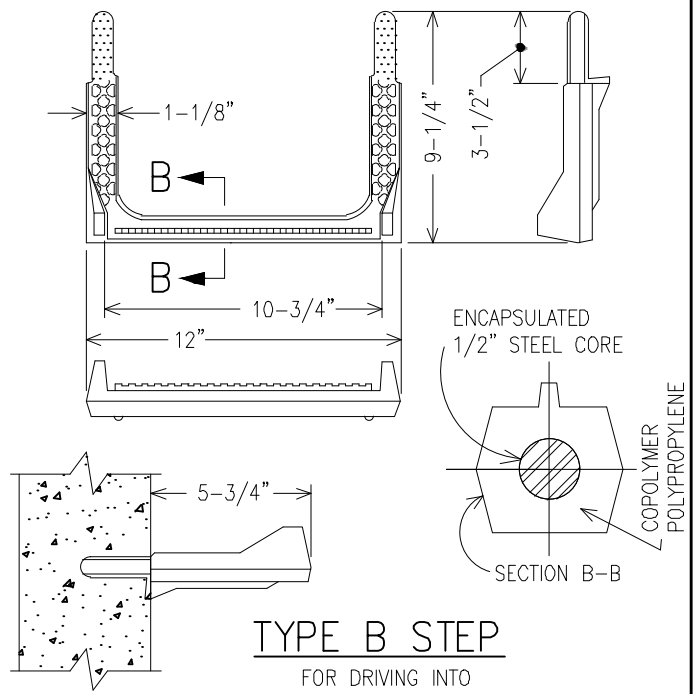
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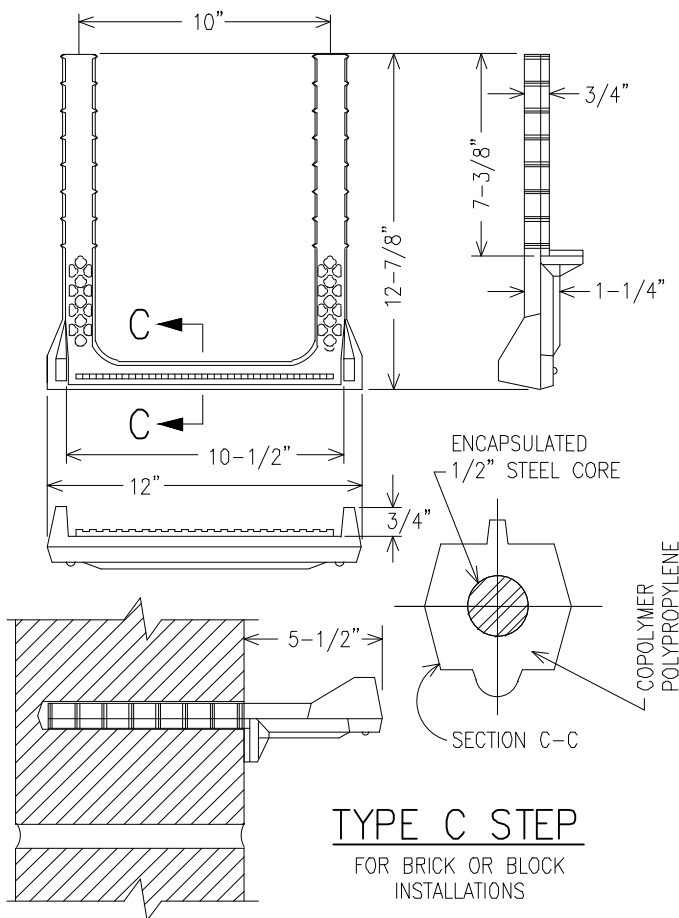
TYPE A STEP

FOR DRIVING INTO RECEPTACLES CAST INTO WALL



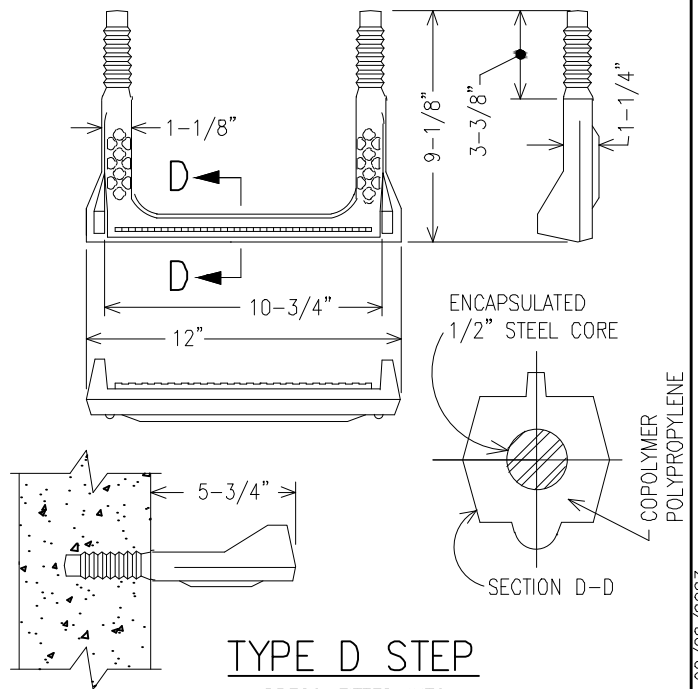
TYPE B STEP

FOR DRIVING INTO RECEPTACLES CAST INTO WALL



TYPE C STEP

FOR BRICK OR BLOCK INSTALLATIONS



TYPE D STEP

PRESS-FITTED INTO PRE-FORMED CONCRETE HOLES

SEE DETAIL PLATE G-4 FOR PLACEMENT DIAGRAM AND NOTES

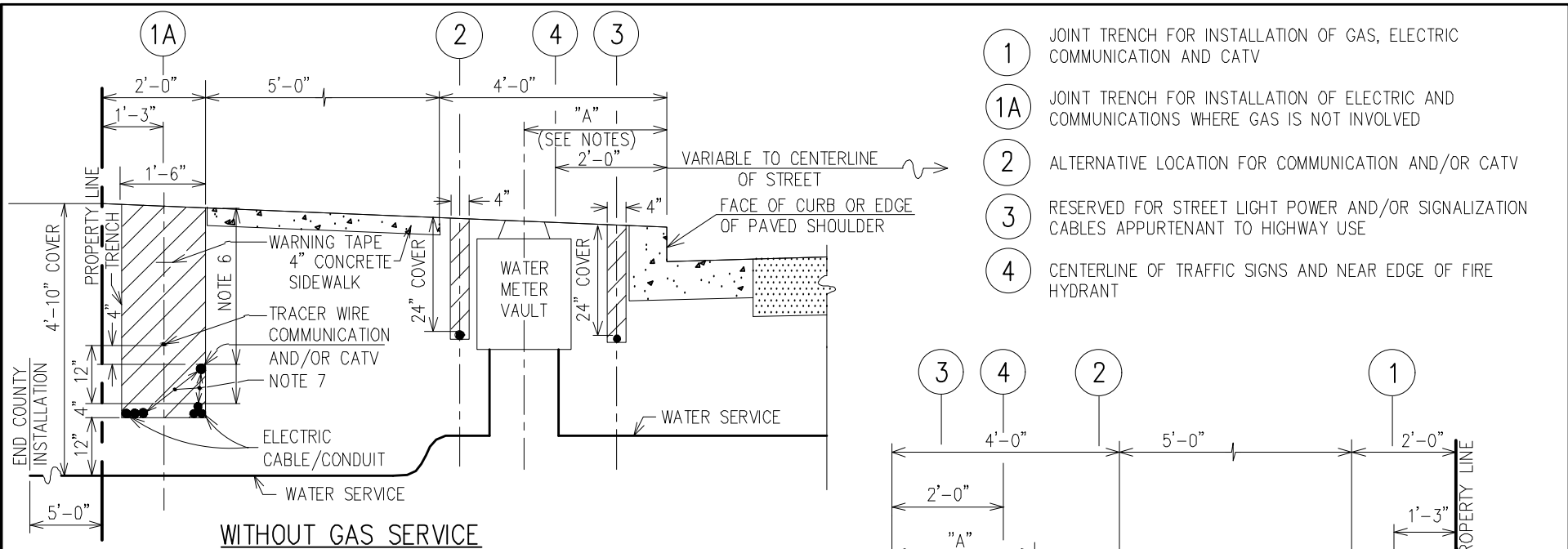


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DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
GENERAL DETAILS
LADDER STEPS
 COPOLYMER POLYPROPYLENE
 FOR MANHOLES AND INLETS

ISSUED: SEPTEMBER 2023

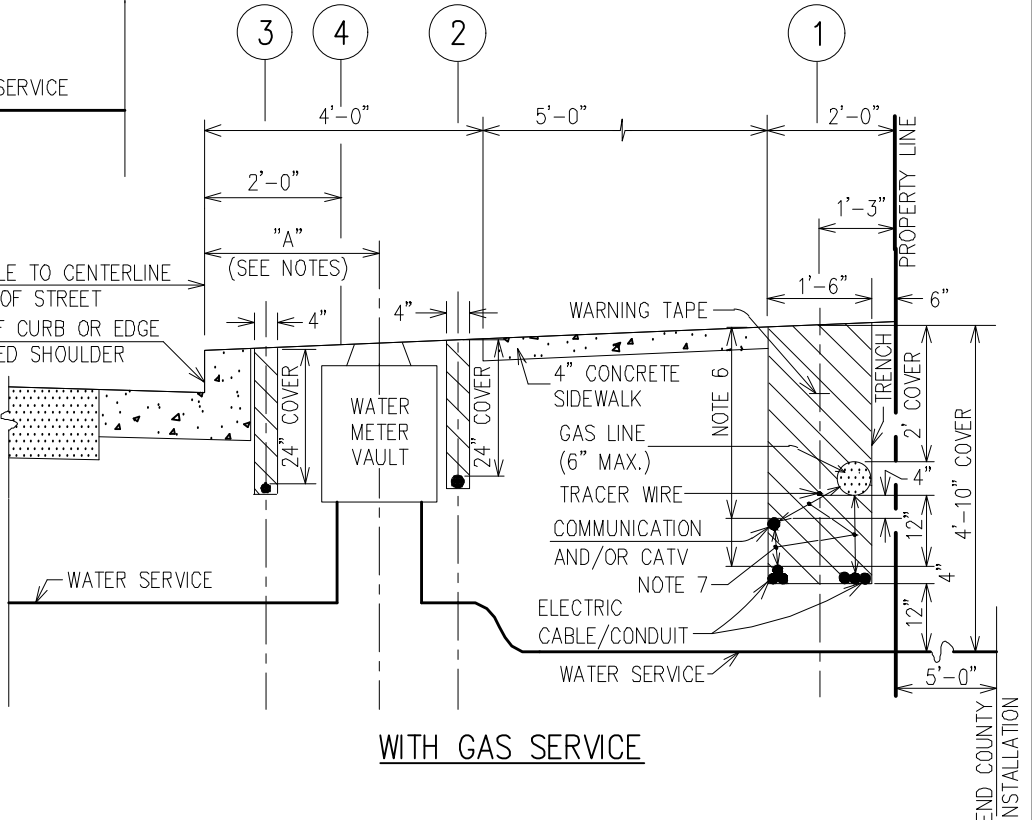
PLATE
G-4A



- 1 JOINT TRENCH FOR INSTALLATION OF GAS, ELECTRIC COMMUNICATION AND CATV
- 1A JOINT TRENCH FOR INSTALLATION OF ELECTRIC AND COMMUNICATIONS WHERE GAS IS NOT INVOLVED
- 2 ALTERNATIVE LOCATION FOR COMMUNICATION AND/OR CATV
- 3 RESERVED FOR STREET LIGHT POWER AND/OR SIGNALIZATION CABLES APPURTENANT TO HIGHWAY USE
- 4 CENTERLINE OF TRAFFIC SIGNS AND NEAR EDGE OF FIRE HYDRANT

NOTES:

1. UTILITY TRENCHES AND INSTALLATIONS OF GAS, ELECTRIC, COMMUNICATION AND CATV ARE TO BE MADE BY OTHERS.
2. STANDARD SHOWN IS BASED ON MINIMUM 10'-0" SPACING BETWEEN CURB AND PROPERTY LINE.
3. THIS STANDARD IS MANDATORY FOR FIVE OR MORE DWELLING UNITS.
4. "A" = 2'-6" FROM EDGE OF PAVED SHOULDER ON OPEN SECTION ROADS.
 = 2'-6" FROM FACE OF EXISTING OR PROPOSED CONCRETE CURB.
 = 3'-0" FROM FACE OF EXISTING OR PROPOSED BITUMINOUS CURB.
 = 4'-0" OR MORE FROM FACE OF CURB WHERE PARKING IS PERPENDICULAR.
5. ABOVE-GRADE UTILITIES ARE EXPECTED TO BE INSTALLED OUTSIDE THE HIGHWAY IN PRIVATE EASEMENTS OBTAINED FOR THAT PURPOSE. EXCEPTIONS WILL BE CONSIDERED ON A CASE-BY-CASE BASIS. TRAFFIC SAFETY (SIGHT DISTANCE AT INTERSECTIONS), PUBLIC CONVENIENCE AND COMMUNITY AESTHETICS ARE TO BE CONSIDERED.
6. MINIMUM COVER FOR PHASE TO PHASE DIRECT BURY SUPPLY CABLE: 24" (0-600V), 30" (601V-50kV) OR 42" (>50kV) PER NESC 352D2.
7. MAINTAIN 12" MINIMUM CLEARANCE BETWEEN DIRECT BURY CABLES AND OTHER PARALLEL & CROSSING UTILITIES (NESC 353). MINIMUM CLEARANCE MAY BE REDUCED WHERE UTILITIES ARE INSTALLED IN ACCORDANCE WITH NESC 354D.



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DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
GENERAL DETAILS
UNDERGROUND UTILITY ACCOMMODATION
IN PUBLIC ROADS FOR NEW SUBDIVISIONS

ISSUED: SEPTEMBER 2023
 PLATE
G-5

DATE: 08/28/2023
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NOTES:

1. TREES WITHIN BALTIMORE COUNTY R/W REQUIRE DEPARTMENT OF PUBLIC WORKS APPROVAL. AN APPROVED LANDSCAPE PLAN IS REQUIRED FOR DEVELOPMENT PROJECTS.
2. TREE LOCATION:
8' MINIMUM (ALONG CURB) FROM SANITARY HOUSE CONNECTION;
8' MINIMUM (ALONG CURB) FROM WATER SERVICE;
8' MINIMUM FROM STORM DRAIN INLET OR PIPE.
3. APPROVED TREE ROOT BARRIER SHALL BE PRESENT AT ALL TREE LOCATIONS. IF NOT PLACED WHEN TREE IS PLANTED, IT SHALL BE PLACED WITH SUBSEQUENT SIDEWALK/ UTILITY INSTALLATION. PROVIDE ROOT BARRIER ALONG NEAR EDGE OF SIDEWALK TO POINT 5' ON EITHER SIDE OF TREE. USE 10 MIL PLASTIC SHEETING TO 12" DEPTH OR AN EQUIVALENT APPROVED BARRIER.
4. TREE SHALL BE PLACED 5' (ALONG CURB) MINIMUM FROM JOINT IN CURB & GUTTER.
5. ENCASE SANITARY HOUSE CONNECTION (SEE STD. DETAIL PLATE G-8) IF H.C. MUST BE NEARER THAN SPECIFIED IN NOTE 2.
6. TREES APPROVED FOR USE SHALL:

- * BE 40' TO 60' IN HEIGHT AT MATURITY TO BE CONSIDERED A SUBSTANTIAL STREET TREE, BUT NOT SO LARGE THAT THEY OVERWHELM AVAILABLE SPACE.
- * HAVE PROVEN ABILITY TO WITHSTAND DRY URBAN CONDITIONS.
- * HAVE NON-AGGRESSIVE ROOT GROWTH, TO PROTECT CURBS, SIDEWALKS & SEWER HOUSE CONNECTIONS.
- * HAVE UPRIGHT, ASCENDING & COMPACT LIMB STRUCTURE. AT MATURITY, TREES MUST ALLOW FOR ACCEPTABLE SIGHT DISTANCE, MUST RESIST WIND & ICE BREAKAGE & MUST NOT CROWD THE VEHICLE - PEDESTRIAN ZONE.
- * NOT HAVE EXCESSIVE LITTER NOR BE EXCESSIVELY DIFFICULT TO CLEAN UP.

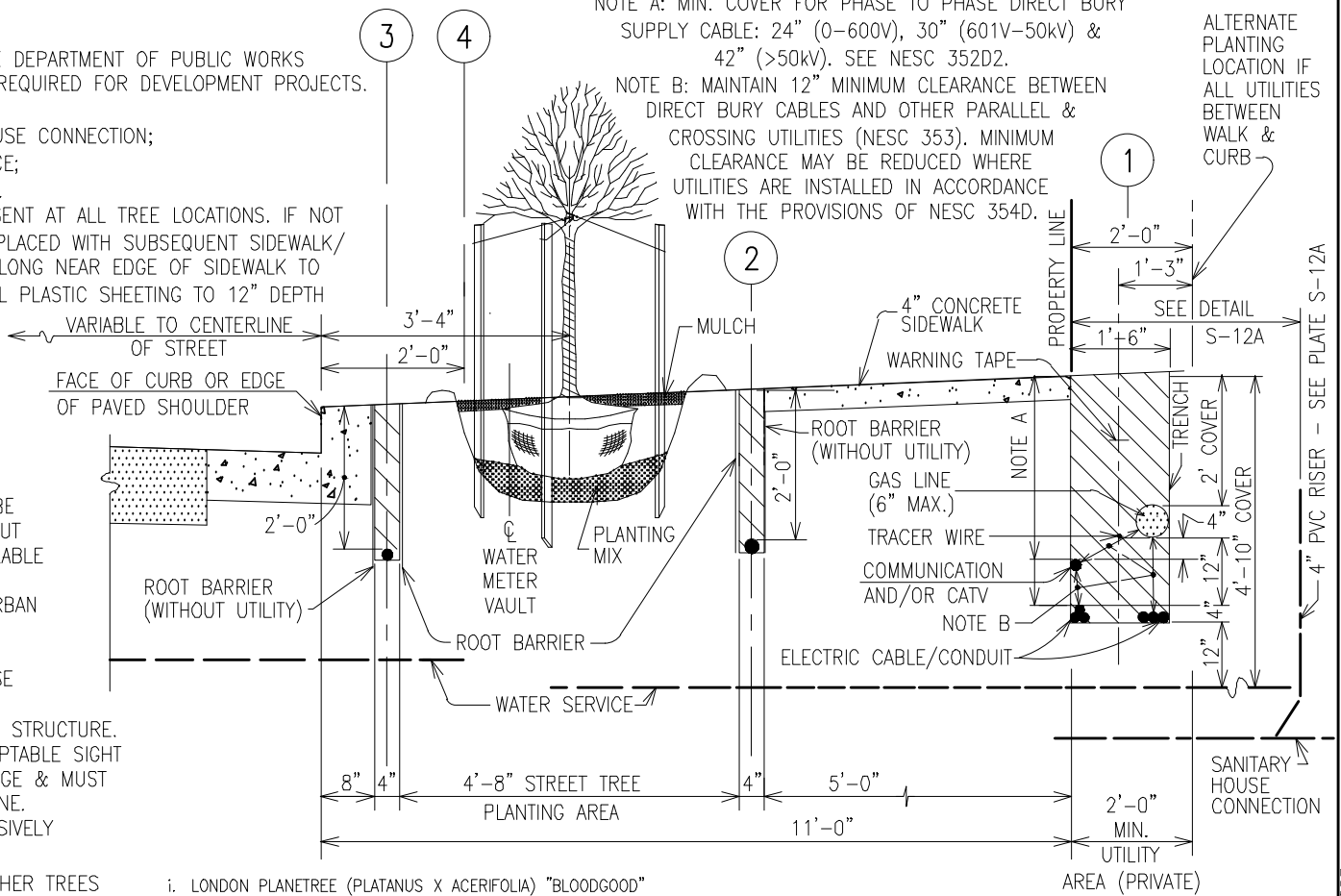
7. A LIST OF RECOMMENDED TREES FOLLOWS. OTHER TREES MAY BE USED BASED UPON NOTE 6 & WITH THE ENGINEER'S APPROVAL. SUBSTITUTIONS ONLY WITH ENGINEER'S APPROVAL.
 - a. RED MAPLE (ACER RUBRUM) "OCTOBER GLORY" BRAND, "RED SUNSET"
 - b. SUGAR MAPLE (ACER SACCARUM) "LEGACY"
 - c. HACKBERRY (CELTIS OCCIDENTALIS) "HACKBERRY", "PRAIRIE PRIDE", "MAGNIFICA"
 - d. KATSURA-TREE (CERCIDIPHYLLUM JAPONICUM)
 - e. WHITE ASH (FRAXINUS AMERICANA) "AUTUMN APPLAUSE", "AUTUMN BLAZE"
 - f. GREEN ASH (FRAXINUS PENNSYLVANICA) "NEWPORT", "PATMORE", "SUMMIT", "MARSHALLS SEEDLESS", "PRAIRIE SPIRE"
 - g. GINKGO (GINKGO BILOBA) "MAGYAR" UPRIGHT
 - h. THORNLESS HONEYLOCUST (GLEDITSIA TRIACANTHOS INERMIS) "SKYLINE"

- i. LONDON PLANETREE (PLATANUS X ACERIFOLIA) "BLOODGOOD"
 - j. CHERRY (PRUNUS SARGENTII) SARGENT
 - k. PEAR (PYRUS CALLERYANA) "CHANTICLEER"
 - l. PIN OAK (QUERCUS PALUSTRIS)
 - m. NORTHERN RED OAK (QUERCUS RUBRA)
 - n. SCHOLARTREE (SOPHORA JAPONICA) "PRINCETON UPRIGHT"
 - o. JAPANESE PAGODA TREE (SOPHORA JAPONICA) "REGENT"
 - p. LINDEN: (TILIA AMERICANA) "BOULEVARD", "FASTIGLIATA", "REDMOND"; (TILIA CORDATA) "GREENSPIRE" BRAND, LITTLELEAF; (TILIA TOMENTOSA) "GREEN MOUNTAIN" BRAND, SILVER; (TILIA X EUCHLORA) CRIMEAN
 - q. ZELKOVA (ZELKOVA SERRATA) "GREEN VASE", "VILLAGE GREEN"
- INFORMATION ABOUT THIS LIST MAY BE OBTAINED FROM THE COUNTY LANDSCAPE ARCHITECT.

NOTE A: MIN. COVER FOR PHASE TO PHASE DIRECT BURY SUPPLY CABLE: 24" (0-600V), 30" (601V-50kV) & 42" (>50kV). SEE NESC 352D2.

NOTE B: MAINTAIN 12" MINIMUM CLEARANCE BETWEEN DIRECT BURY CABLES AND OTHER PARALLEL & CROSSING UTILITIES (NESC 353). MINIMUM CLEARANCE MAY BE REDUCED WHERE UTILITIES ARE INSTALLED IN ACCORDANCE WITH THE PROVISIONS OF NESC 354D.

ALTERNATE PLANTING LOCATION IF ALL UTILITIES BETWEEN WALK & CURB

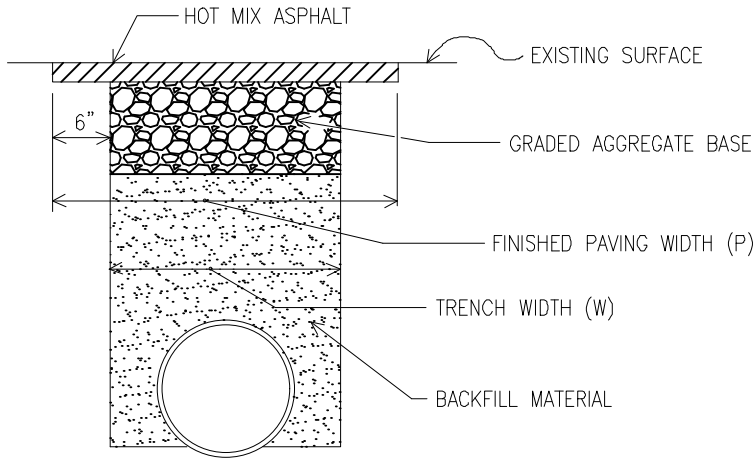


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DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
GENERAL DETAILS
PUBLIC ROAD UTILITY AND STREET TREE LOCATIONS

ISSUED: SEPTEMBER 2023
 PLATE
G-5A

DATE: 08/28/2023
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NOTES:

1. WHEN BOTTOM OF TRENCH IS IN ROCK, UNDERCUT 6" BELOW BOTTOM OF BARREL AND REPLACE WITH TAMPED SUITABLE MATERIAL.
2. WHERE TRENCH BRACING IS UTILIZED, ADDITIVES ARE PROVIDED FOR INCREASED TRENCH WIDTH & FINISHED PAVING PURSUANT TO THE SPECIFICATIONS.
3. GRADED AGGREGATE BASE SHALL BE PLACED UNIFORMLY AT THE SPECIFIED DEPTH OVER THE FULL WIDTH OF THE TRENCH.

PIPE DIAMETER (INCHES)	TRENCH WIDTH W (INCHES)	FINISHED PAVING WIDTH P (INCHES)
6"	36"	48"
8"	36"	48"
10"	36"	48"
12"	36"	48"
15" & 16"	36"	48"
18"	42"	54"
20" & 21"	42"	54"
24"	48"	60"
27"	60"	72"
30"	60"	72"
33"	66"	78"
36"	66"	78"
42"	78"	90"
48"	84"	96"
54"	96"	108"
60"	102"	114"
66"	108"	120"
72"	120"	132"
78"	132"	144"
84"	138"	150"
90"	144"	156"
102"	156"	168"
108"	168"	180"
BRACING ADDITIVES		
SINGLE TIER	ADD 24"	ADD 24"
DOUBLE TIER*	ADD 48"	ADD 48"

*12' TO INVERT OF PIPE



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DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

GENERAL DETAILS

**TRENCHING
 TRENCH PAYMENT WIDTH**

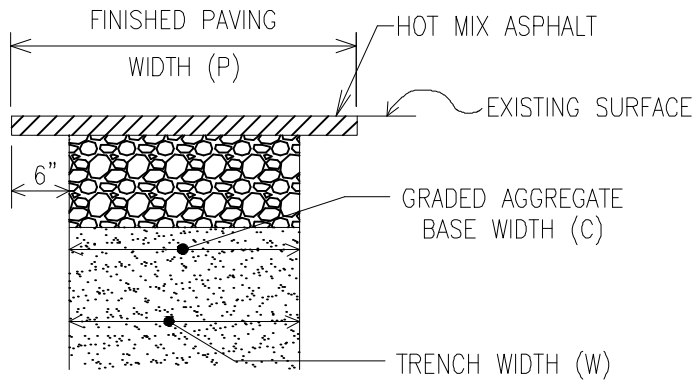
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PLATE

G-6

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REPAVING QUANTITIES
SHOWN IN TONS PER LINEAR FOOT

GRADED AGGREGATE BASE = 150 LB./CU.FT.
HOT MIX ASPHALT = 160 LB./CU.FT.

PIPE DIAMETER (INCHES)	12-INCH GRADED* AGGREGATE BASE (TONS/LINEAR FOOT)	2-INCH HOT MIX* ASPHALT PAVING (TONS/LINEAR FOOT)	3-INCH HOT MIX** ASPHALT PAVING (TONS/LINEAR FOOT)
6"	0.225	0.04	0.08
8"	0.225	0.04	0.08
10"	0.225	0.04	0.08
12"	0.225	0.04	0.08
15" & 16"	0.225	0.04	0.08
18"	0.263	0.047	0.09
20" & 21"	0.263	0.047	0.09
24"	0.30	0.053	0.10
27"	0.375	0.067	0.12
30"	0.375	0.067	0.12
33"	0.413	0.073	0.13
36"	0.413	0.073	0.13
42"	0.488	0.087	0.15
48"	0.525	0.093	0.16
54"	0.60	0.107	0.18
60"	0.638	0.113	0.19
66"	0.675	0.12	0.20
72"	0.75	0.133	0.22
78"	0.825	0.147	0.24
84"	0.863	0.153	0.25
90"	0.90	0.16	0.26
102"	0.975	0.173	0.28
108"	1.05	0.187	0.30
BRACING ADDITIVES			
SINGLE TIER	ADD 0.15	ADD 0.027	ADD 0.04
DOUBLE TIER	ADD 0.30	ADD 0.053	ADD 0.08

*BASED ON TRENCH WIDTH (W)
**BASED ON FINISHED WIDTH (P)

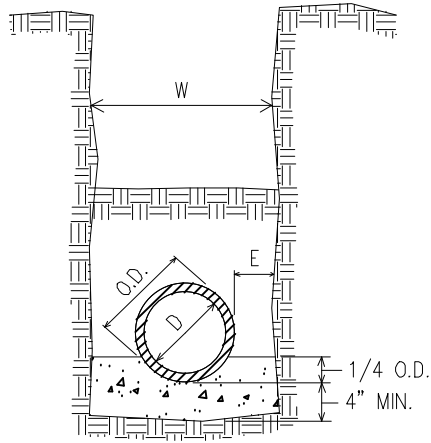


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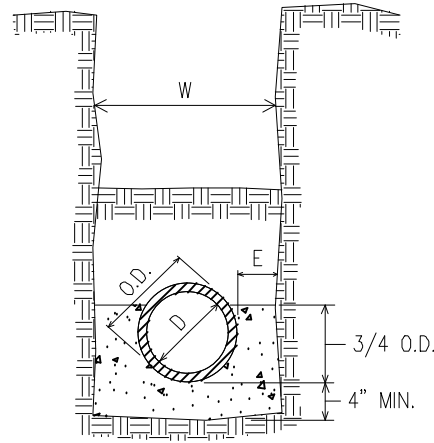
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
GENERAL DETAILS
PAYMENT QUANTITIES
FOR REPAVING TRENCHES

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PLATE
G-7

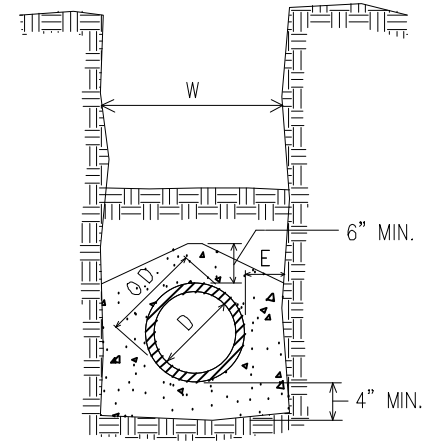
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CONCRETE LOW CRADLE



CONCRETE HIGH CRADLE



CONCRETE ENCASEMENT

CONCRETE QUANTITIES – CUBIC FT. PER LINEAR FT.			
PIPE DIAMETER (D)	LOW CRADLE	HIGH CRADLE	ENCASEMENT
6"	0.94	1.38	2.15
8"	1.09	1.67	2.57
12"	1.40	2.25	3.43
16"	1.73	2.87	4.35
20"	2.09	3.51	5.32
24"	2.47	4.18	6.35
30"	3.6	6.4	9.6
36"	4.3	7.7	11.6
42"	5.7	10.7	15.9
48"	6.6	12.3	18.4
	①	②	③

- ① $CF/F = (W \times (0.333 + OD/4)) - 0.154 \times (OD)^2$
- ② $CF/F = (W \times (0.333 + (0.750 \times OD))) - 0.632 \times (OD)^2$
- ③ $CF/F = (W \times (0.833 + OD)) - 0.785 \times (OD)^2 - 0.25 \times W$

W = CRADLE PAYMENT WIDTH (TRENCH WIDTH)
W = O.D. + 2E

E = 9" FOR 6" TO 24" PIPES
E = 12" FOR 27" TO 36" PIPES
E = 15" FOR 42" TO 72" PIPES

NOTES:

1. QUANTITIES ARE FOR ESTIMATING ONLY.
2. QUANTITIES BASED ON DUCTILE IRON PIPE.
3. FORMULAS SHOWN MAY BE USED FOR PIPE OTHER THAN D.I.P AND/OR FOR SIZES NOT SHOWN.
4. ALL CONCRETE TO BE MIX #1.



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GENERAL DETAILS
TRENCH CRADLE AND ENCASEMENT

ISSUED: SEPTEMBER 2023

PLATE
G-8

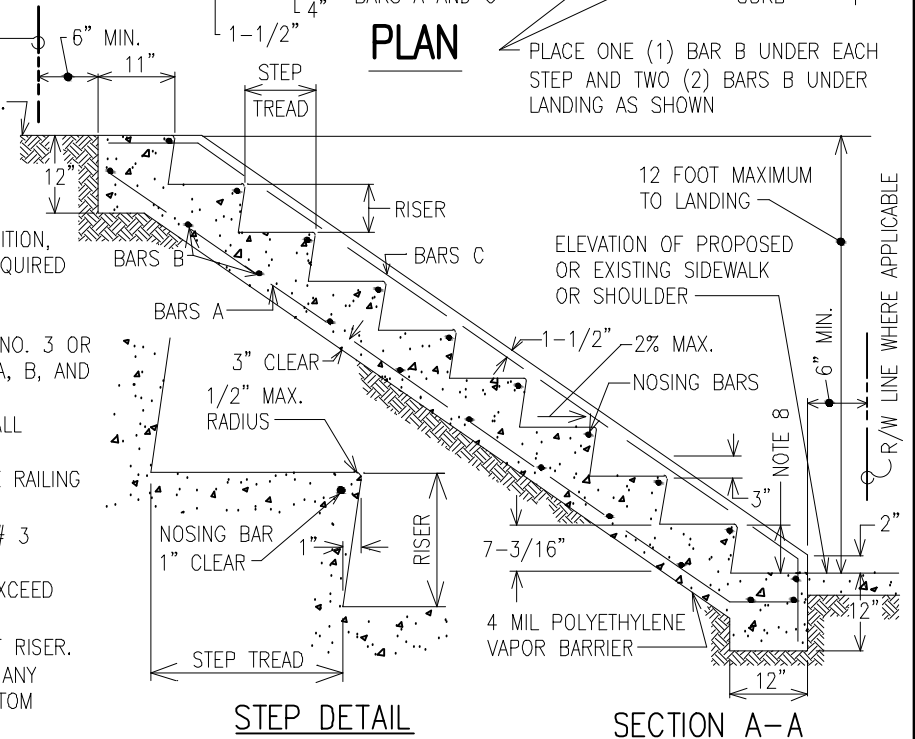
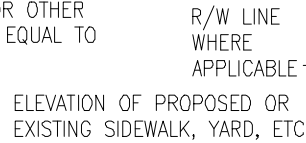
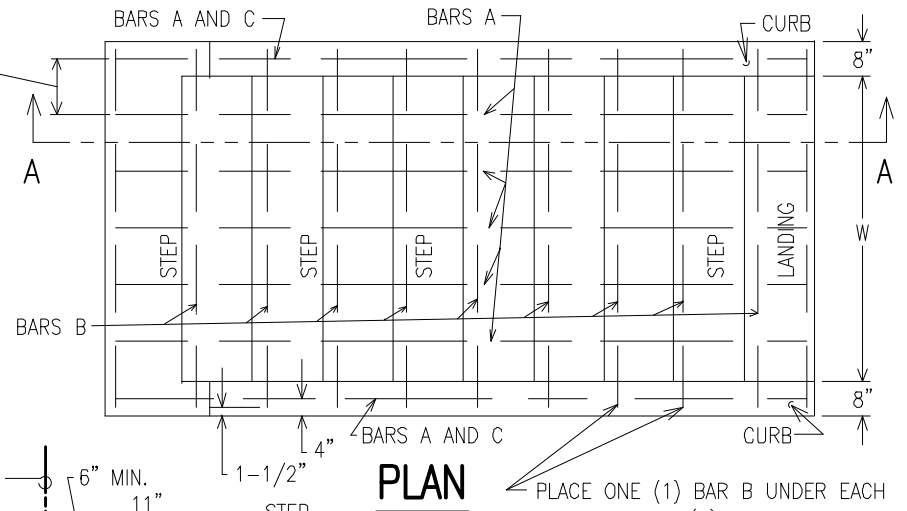
TABLE A: STAIRWAYS		
SLOPE	RISER	STEP TREAD
1.57:1*	7"	11" MIN.*
2:1	6"	12"
4:1	4"	16"

*11" MINIMUM PER IBC

TABLE B: NUMBER OF BARS									
WIDTH W	NUMBER OF STEPS**								
	N=1-5	N=6	N=7	N=8	N=9	N=10	N=11	N=12	N=13-25
W=3'		4	5	5	6	6	7	7	8
W=4'		5	6	7	7	8	8	9	10
W=5'		6	7	8	9	9	10	11	12

**N INDICATES THE NUMBER OF STEPS EXCLUSIVE OF "LANDING". FOR OTHER WIDTHS, THE APPROXIMATE SPACING OF BARS A IN INCHES WILL BE EQUAL TO 80/'N' WITH A MINIMUM SPACING OF 6".

BARS A TO BE EQUALLY SPACED.
FOR NUMBER OF BARS, SEE
TABLE B.



NOTES:

- CONCRETE IS MIX NO. 2. CHAMFERS SHALL BE 3/4" x 3/4".
- STAIR WIDTH 'W' SHALL BE IN COMPLIANCE WITH INTERNATIONAL BUILDING CODE (IBC), LATEST EDITION, FOR MEANS OF EGRESS STAIRWAY. LEAST DIMENSION OF LANDINGS SHALL NOT BE LESS THAN REQUIRED WIDTH 'W' OF STAIRWAY, EXCEPT 4' MAXIMUM FOR STRAIGHT RUN BETWEEN LANDINGS.
- REINFORCING STEEL: PER ASTM A-615.
ALL REINFORCEMENT SHALL BE NO. 4 BARS, EXCEPT NOSING BARS. NOSING BARS SHALL BE NO. 3 OR NO. 4 BARS AND SHALL BE PLACED IN ALL STEPS REGARDLESS OF STAIR LENGTH. BARS A, B, AND C SHALL BE USED IN INSTALLATIONS OF SIX (6) OR MORE STEPS.
- EXPOSED SURFACES SHALL RECEIVE AN ORDINARY SURFACE FINISH. UNLESS OTHERWISE NOTED, ALL TREADS SHALL BE FINISHED WITH A LIGHTLY BROOMED FINISH.
- FOR RAILING DETAILS, SEE "ORNAMENTAL RAILING FOR CONCRETE STAIRS", PLATE G-12, OR "PIPE RAILING FOR CONCRETE STAIRS", PLATE G-10.
- THE STAIRS SHALL BE PAID FOR BASED UPON THE UNIT PRICE BID PER CUBIC YARD FOR "MIX # 3 CONCRETE FOR STEPS AND MISCELLANEOUS STRUCTURES", COMPLETE IN PLACE.
- STEP TREADS AND LANDINGS SHALL BE GRADED TO DRAIN, BUT IN NO CASE SHOULD GRADING EXCEED TWO (2) PERCENT IN ANY DIRECTION FOLLOWING CURING AND ANY SETTLEMENT.
- TOLERANCES: 3/16" MAX. VARIATION IN DEPTH OF ADJACENT TREADS OR IN HEIGHT OF ADJACENT RISER. 3/8" MAX. VARIATION BETWEEN LARGEST & SMALLEST RISER OR LARGEST & SMALLEST TREAD IN ANY FLIGHT OF STAIRS. AT SLOPING PUBLIC WAY SERVING AS LANDING WITH ESTABLISHED GRADE, BOTTOM RISER'S HEIGHT MAY VARY 3-INCHES OR LESS IN 3 FEET OF STAIR WIDTH.



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GENERAL DETAILS
CONCRETE STAIRS

ISSUED: SEPTEMBER 2023

PLATE
G-9

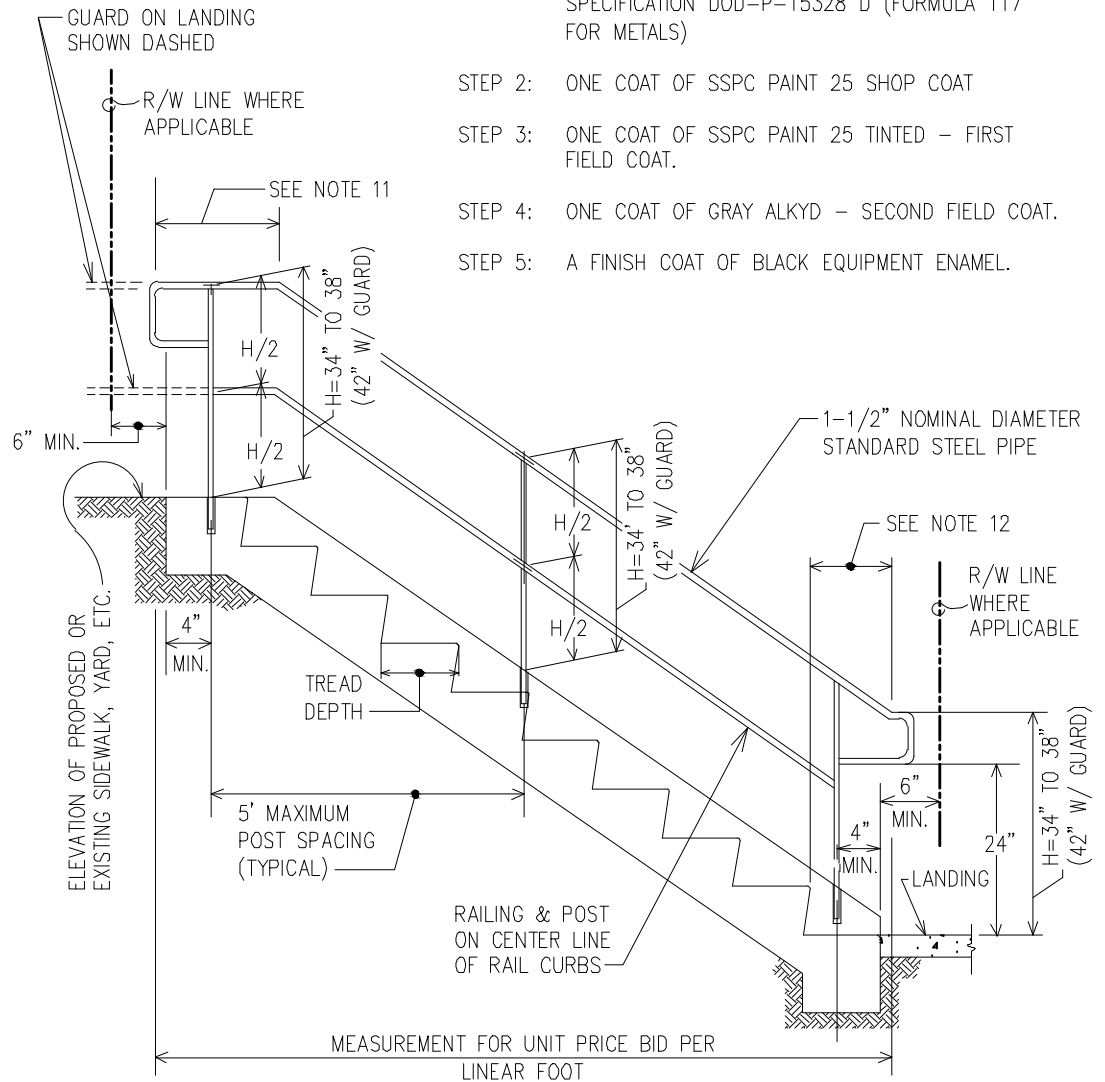
DATE: 08/28/2023 FILE: GEN_MASTER.dwg

NOTES:

1. UNLESS OTHERWISE NOTED, PAINTED RAILING SHALL BE FURNISHED.
2. RAILINGS AND POSTS TO BE PAINTED SHALL CONFORM TO ASTM DESIGNATION A-36. SEE PAINTING NOTES.
3. RAILING AND POSTS TO BE GALVANIZED SHALL CONFORM TO ASTM DESIGNATION A-572. GALVANIZED RAILINGS SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM DESIGNATION A-123, COATING GRADE 50.
4. HANDRAILS ARE REQUIRED FOR STAIRS WITH THREE (3) OR MORE RISERS. STEP WIDTHS GREATER THAN 5' REQUIRE AN INTERMEDIATE HANDRAIL.
5. RAILING SHALL BE ALL WELDED, WITH ALL JOINTS GROUND SMOOTH AND FREE OF BURRS.
6. RAILING POSTS SHALL BE SET IN 8" DEEP METAL SLEEVES WHICH SHALL BE FILLED WITH HOT POURED SULFUR OR AN EQUIVALENT EPOXY COMPOUND.
7. THIS HANDRAIL IS TO BE USED ONLY FOR PEDESTRIAN PROTECTION. USE TRAFFIC BARRIER W-BEAM WHERE VEHICULAR PROTECTION IS REQUIRED.
8. THE RAILING SHALL BE PAID FOR AT THE UNIT PRICE BID PER LINEAR FOOT, MEASURED HORIZONTALLY, FOR "STANDARD PIPE RAILING" COMPLETE IN PLACE; OR ITS COST SHALL BE INCLUDED IN THE CUBIC YARD PRICE BID FOR "MIX #3 CONCRETE FOR STEPS AND MISCELLANEOUS STRUCTURES", COMPLETE IN PLACE.
9. UNLESS OTHERWISE NOTED, RAILINGS SHALL BE PROVIDED ON BOTH SIDES OF ALL STAIRS INCLUDING, BUT NOT LIMITED TO, STAIRS CONSTRUCTED ADJACENT TO WALLS.
10. WALL-MOUNTED HANDRAILS (NOT SHOWN) SHALL HAVE 90-DEGREE RETURN TO WALL AT ENDS. MINIMUM CLEARANCE FROM WALL TO BE 1.5-INCHES; MAXIMUM PROJECTION FROM WALL TO BE 4.5-INCHES.
11. HANDRAILS SHALL EXTEND HORIZONTALLY ABOVE THE LANDING FOR 12-INCHES MINIMUM BEGINNING DIRECTLY ABOVE THE FIRST RISER NOSING.
12. HANDRAILS SHALL EXTEND AT THE SLOPE OF THE STAIR FLIGHT FOR A HORIZONTAL DISTANCE EQUAL TO ONE TREAD DEPTH BEYOND THE LAST RISER NOSING.
13. HANDRAIL EXTENSIONS ARE MEASURED BASED ON CONTINUOUSLY GRIPPABLE AREA; CURVED SECTIONS AND RADII SHALL NOT BE INCLUDED IN THE MEASUREMENT.

PAINTING NOTES

- STEP 1: PRIMER PRETREATMENT CONFORMING TO FEDERAL SPECIFICATION DOD-P-15328 D (FORMULA 117 FOR METALS)
- STEP 2: ONE COAT OF SSPC PAINT 25 SHOP COAT
- STEP 3: ONE COAT OF SSPC PAINT 25 TINTED - FIRST FIELD COAT.
- STEP 4: ONE COAT OF GRAY ALKYD - SECOND FIELD COAT.
- STEP 5: A FINISH COAT OF BLACK EQUIPMENT ENAMEL.



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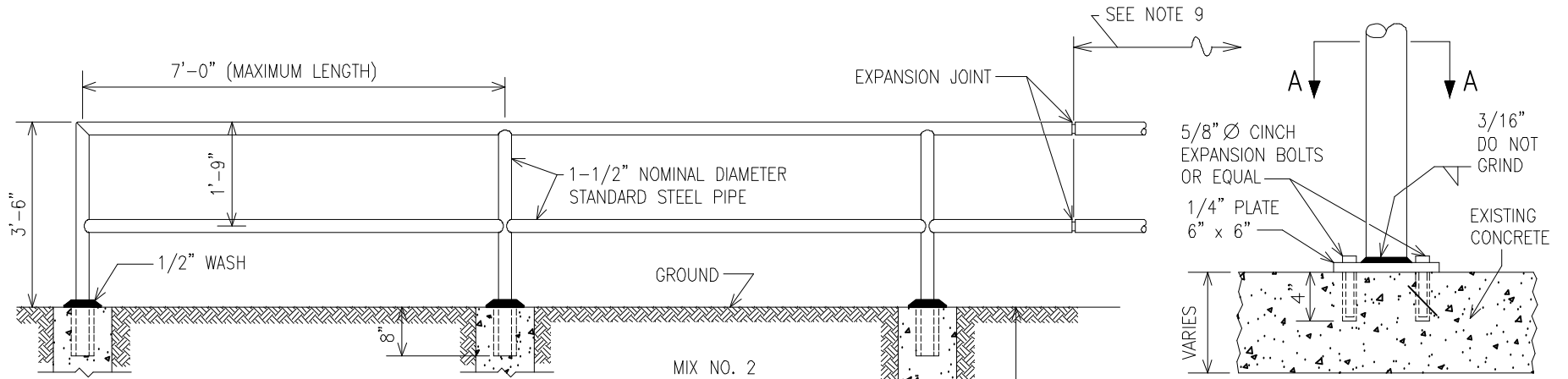
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
GENERAL DETAILS
PIPE RAILING FOR CONCRETE STAIRS

ISSUED: SEPTEMBER 2023

PLATE
G-10

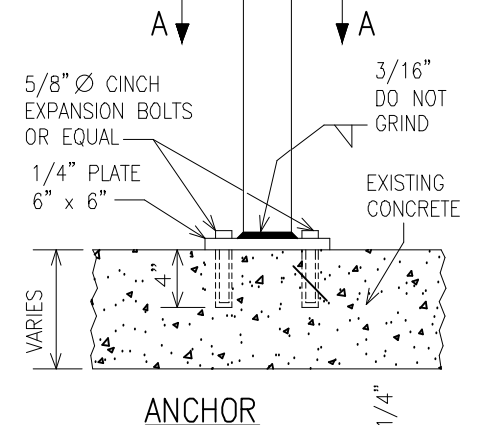
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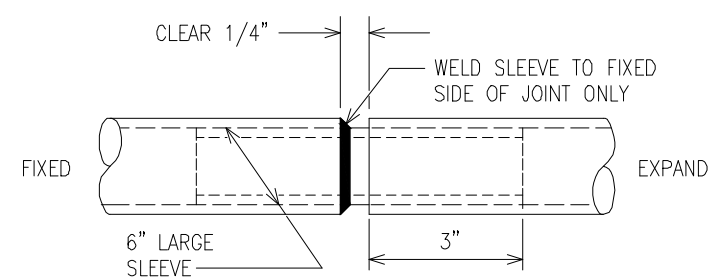
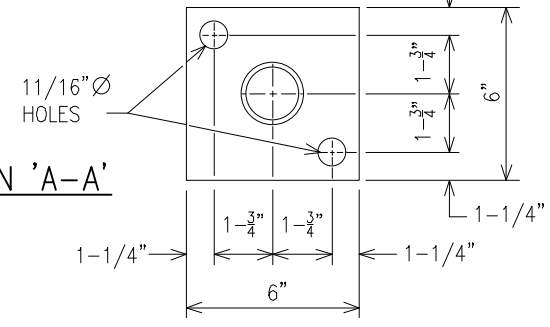


NOTES:

1. UNLESS OTHERWISE NOTED, PAINTED RAILING SHALL BE FURNISHED.
2. RAILING AND POSTS TO BE PAINTED SHALL CONFORM TO ASTM DESIGNATION A-36. SEE PAINTING NOTES, STD. PLATE G-10.
3. RAILING AND POSTS TO BE GALVANIZED SHALL CONFORM TO ASTM DESIGNATION A-572. GALVANIZED RAILINGS SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM DESIGNATION A-123, COATING GRADE 50.
4. RAILING SHALL BE ALL WELDED, WITH ALL JOINTS GROUND SMOOTH AND FREE OF BURRS.
5. RAILING POSTS SHALL BE SET IN 8" DEEP METAL SLEEVES WHICH SHALL BE FILLED WITH HOT POURED SULFUR OR AN EQUIVALENT EPOXY COMPOUND.
6. THIS HANDRAIL IS TO BE USED ONLY FOR PEDESTRIAN PROTECTION. USE TRAFFIC BARRIER W-BEAM WHERE VEHICULAR PROTECTION IS REQUIRED.
7. THE RAILING SHALL BE PAID FOR AT THE UNIT PRICE BID PER LINEAR FOOT. MEASURED HORIZONTALLY, FOR "STANDARD PIPE RAILING" COMPLETE IN PLACE; OR ITS COST SHALL BE INCLUDED IN THE LUMP SUMP PRICE BID FOR OTHER ITEMS, COMPLETE IN PLACE.
8. CONSTRUCTION ON PRIVATE PROPERTY SHALL CONFORM TO LATEST EDITION, INTERNATIONAL BUILDING CODE (IBC).
9. WITHIN EACH 20 LINEAR FEET OF RAILING, PROVIDE FOR 1/4" EXPANSION.



SECTION 'A-A'



EXPANSION JOINT

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 GENERAL DETAILS
PIPE RAILING WELDED CONSTRUCTION

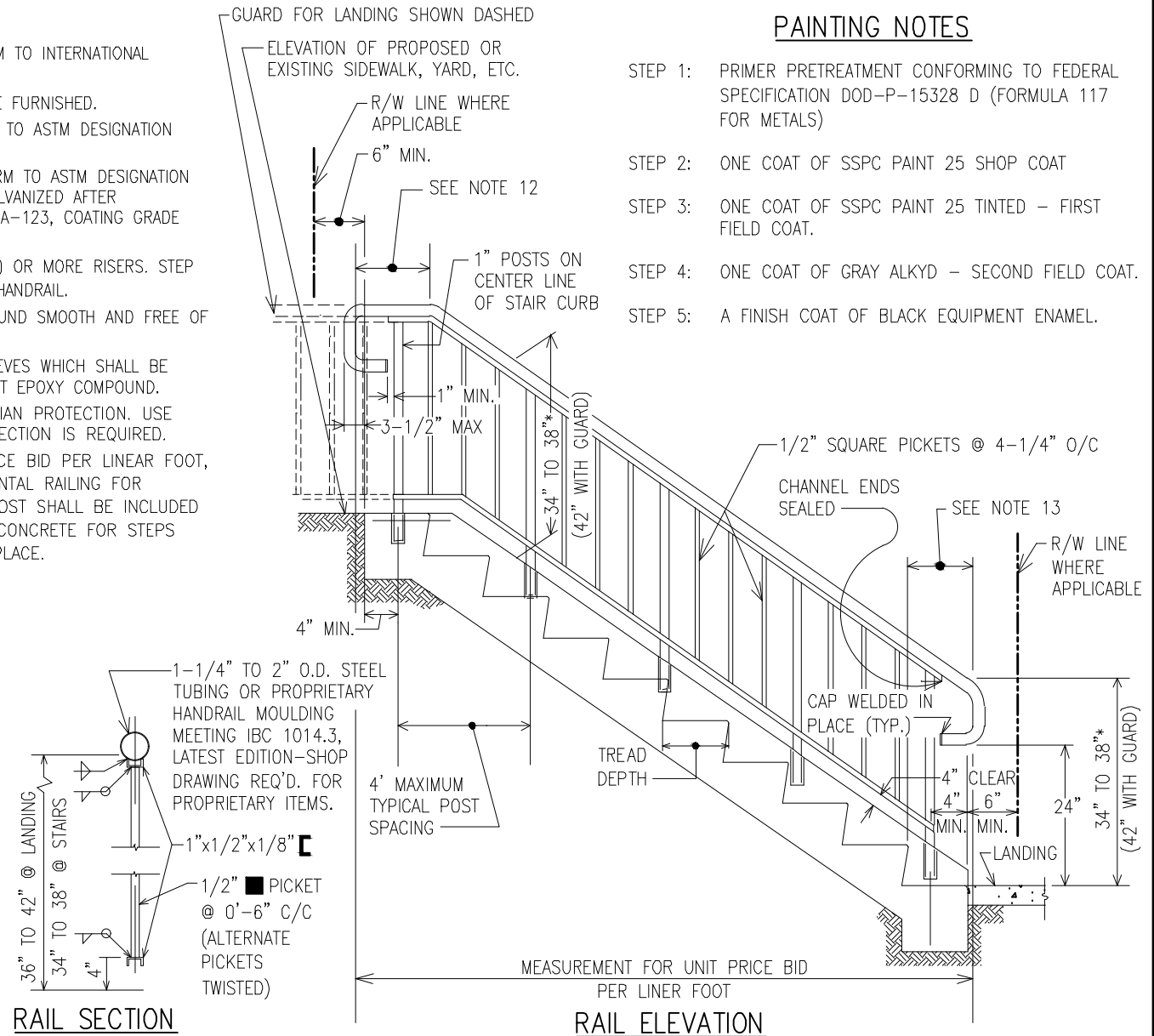
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 PLATE
G-11

NOTES:

- CONSTRUCTION ON PRIVATE PROPERTY SHALL CONFORM TO INTERNATIONAL BUILDING CODE (IBC), LATEST EDITION.
- UNLESS OTHERWISE NOTED, PAINTED RAILING SHALL BE FURNISHED.
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- UNLESS OTHERWISE NOTED, RAILINGS SHALL BE PROVIDED ON BOTH SIDES OF ALL STAIRS INCLUDING, BUT NOT LIMITED TO, STAIRS CONSTRUCTED ADJACENT TO WALLS.
- WALL-MOUNTED HANDRAILS (NOT SHOWN) SHALL HAVE 90-DEGREE RETURN TO WALL AT ENDS. MINIMUM CLEARANCE FROM WALL TO BE 1.5-INCHES; MAXIMUM PROJECTION FROM WALL TO BE 4.5-INCHES.
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- HANDRAIL EXTENSIONS ARE MEASURED BASED ON CONTINUOUSLY GRIPPABLE AREA; CURVED SECTIONS AND RADII SHALL NOT BE INCLUDED IN THE MEASUREMENT.

PAINTING NOTES

- STEP 1: PRIMER PRETREATMENT CONFORMING TO FEDERAL SPECIFICATION DOD-P-15328 D (FORMULA 117 FOR METALS)
- STEP 2: ONE COAT OF SSPC PAINT 25 SHOP COAT
- STEP 3: ONE COAT OF SSPC PAINT 25 TINTED - FIRST FIELD COAT.
- STEP 4: ONE COAT OF GRAY ALKYD - SECOND FIELD COAT.
- STEP 5: A FINISH COAT OF BLACK EQUIPMENT ENAMEL.



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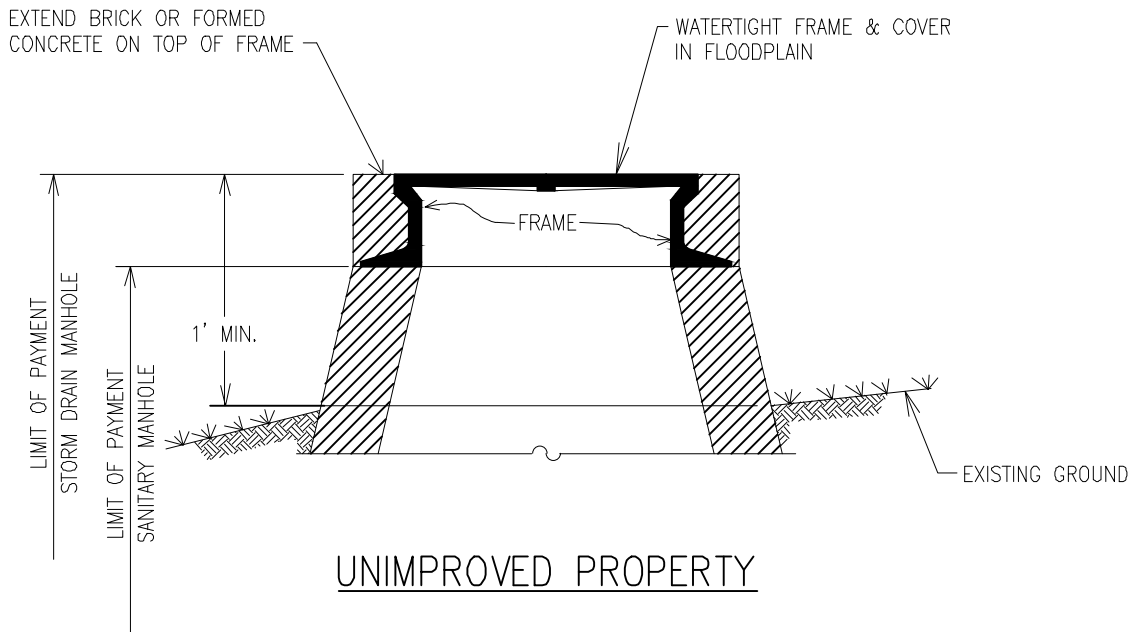
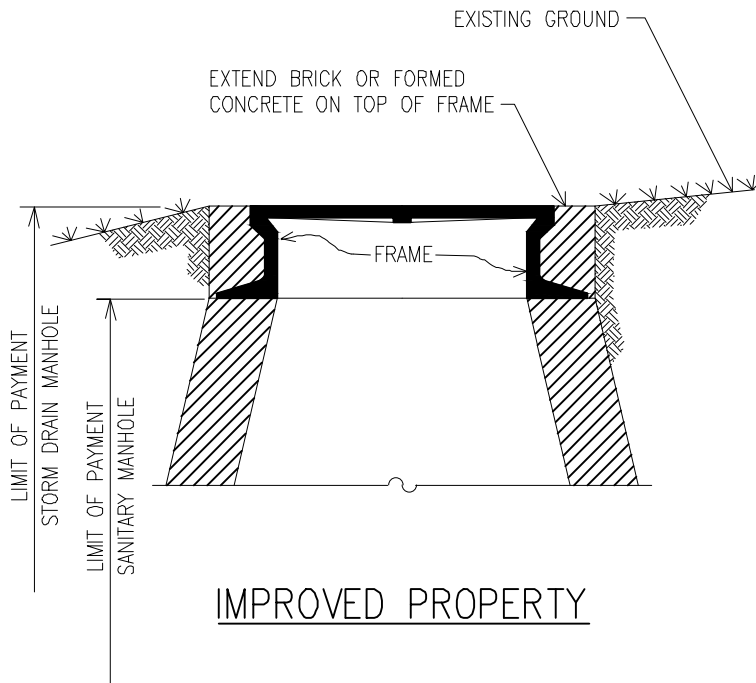
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DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
GENERAL DETAILS
ORNAMENTAL RAILING FOR CONCRETE STAIRS

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G-12



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DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
 GENERAL DETAILS
 TYPICAL MANHOLE
 WHEN NOT IN ROADWAY

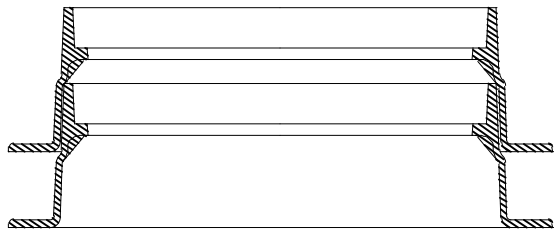
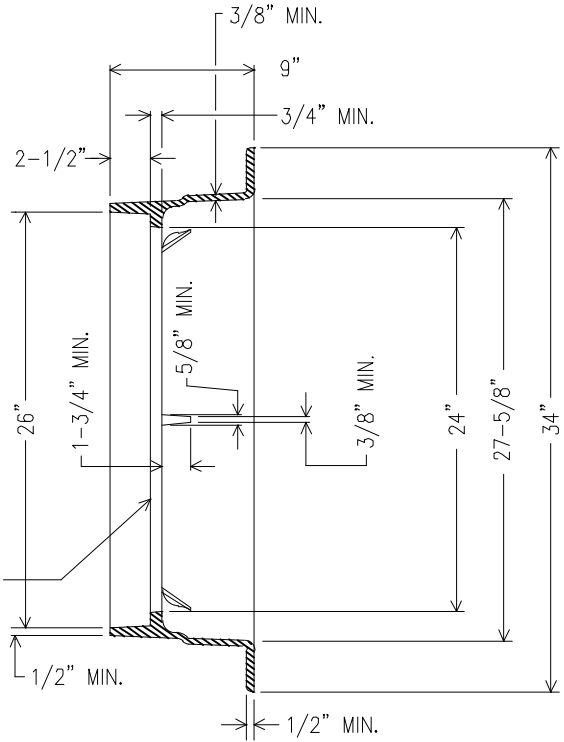
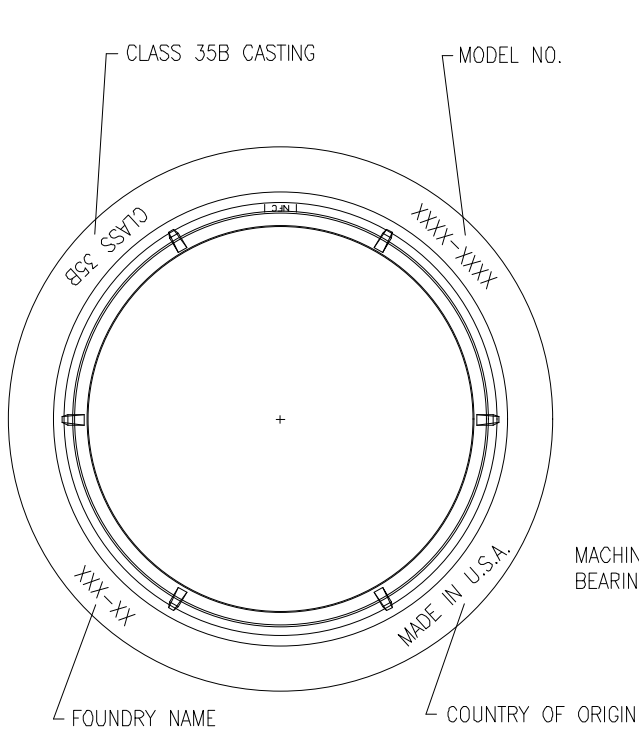
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PLATE
 G-13

DATE: 08/28/2023

FILE: GEN_MASTER.dwg

FRAME:



OPTIONAL FRAME STACKABILITY

NOTES:

- MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
- FINISH: NOT PAINTED
- FRAME WEIGHT: APPROXIMATELY 140 LBS MINIMUM
- COVER: PER STANDARD PLATES S-8B OR D-3.05B AS APPLICABLE.
- ANCHOR BOLT HOLES: (4) 1" ON 30 1/4" DIA. BOLT HOLE CIRCLE ARE OPTIONAL



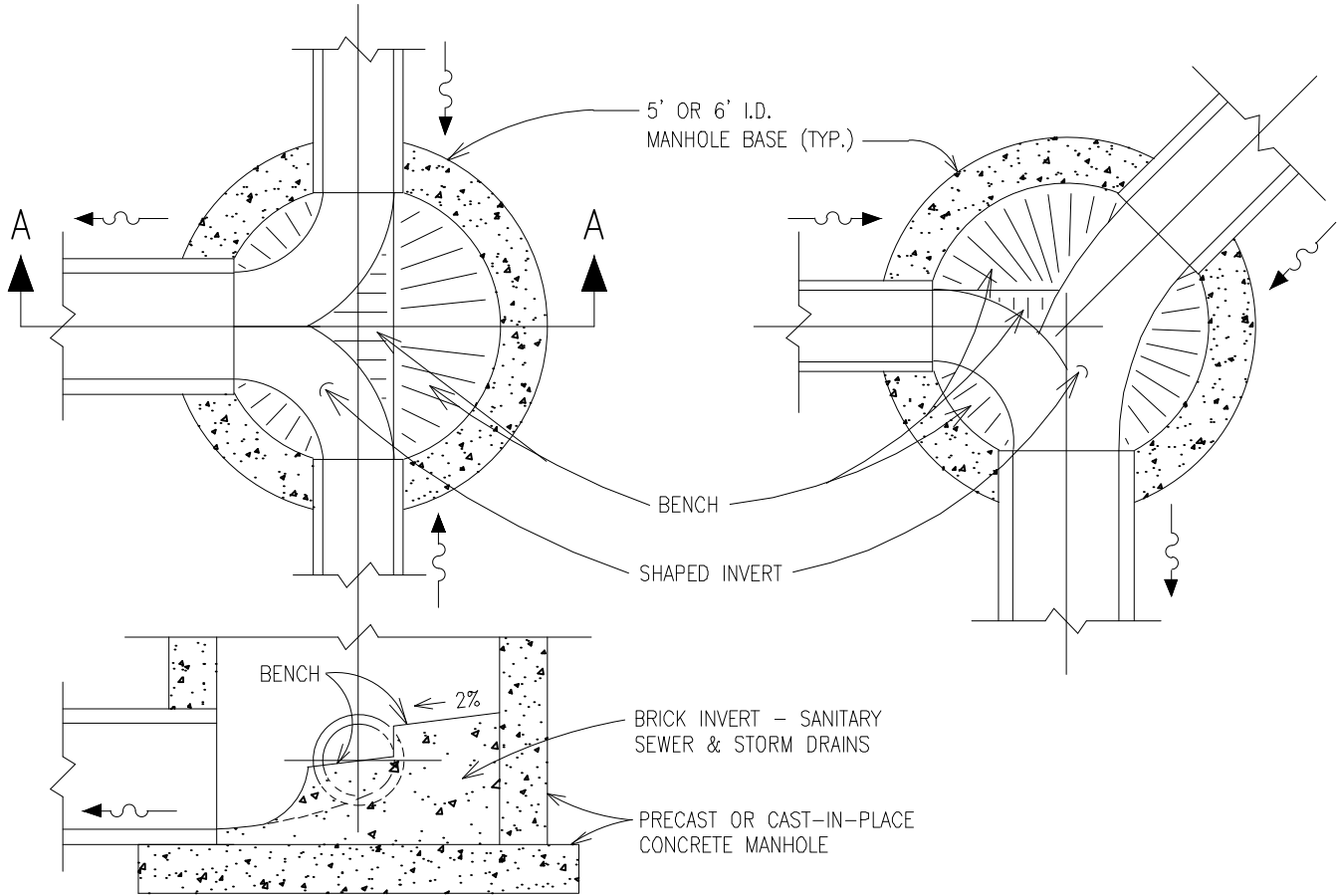
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DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
 GENERAL DETAILS
 MANHOLE FRAME
 STRAIGHT SIDES, CLASS 35B

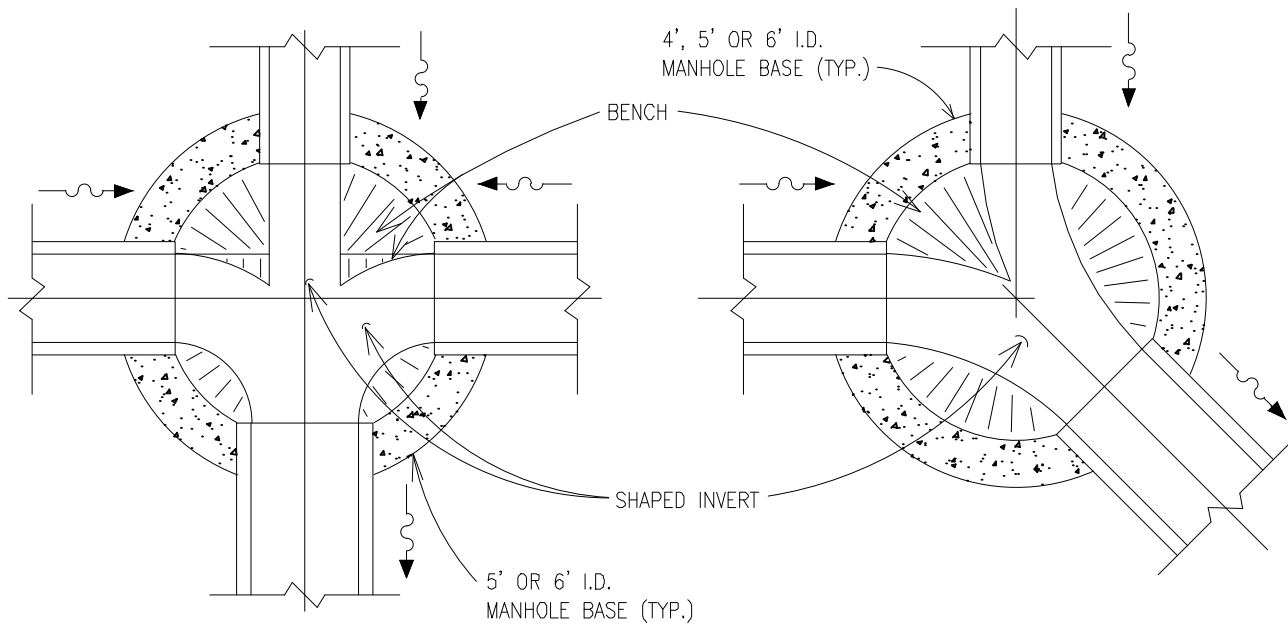
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 PLATE
 G-14

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SECTION A-A



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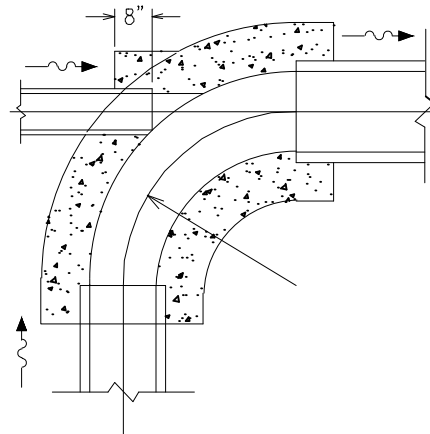
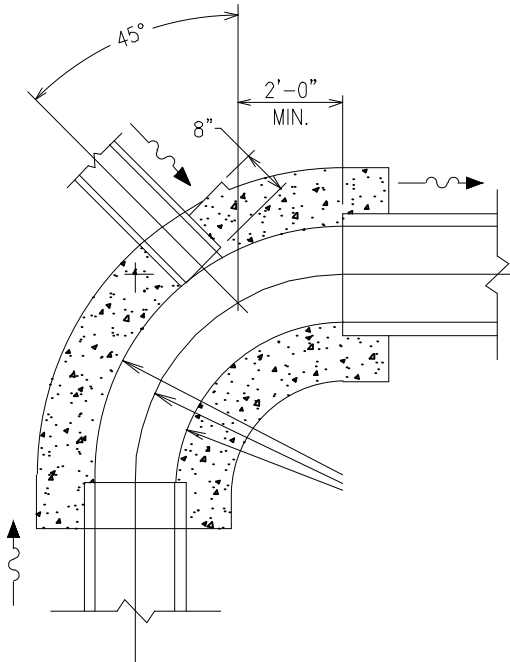
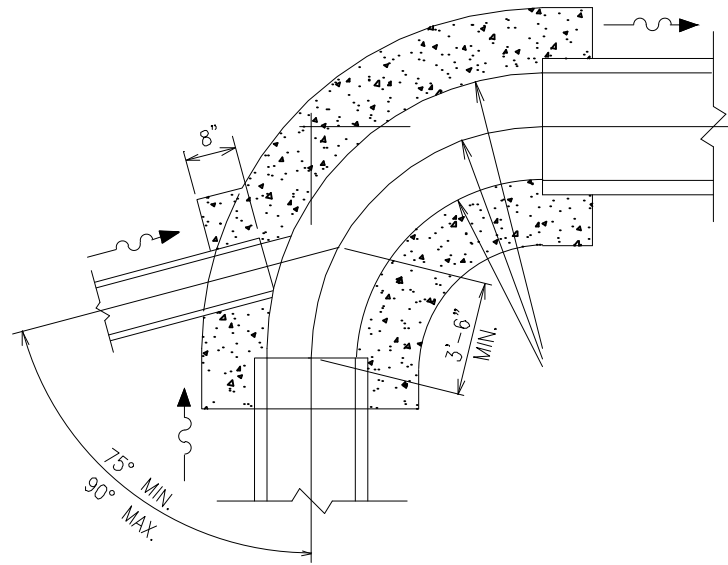
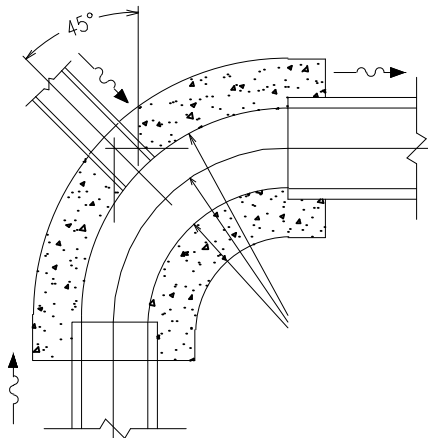
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 GENERAL DETAILS
 INVERT PLANS
 MANHOLES WITH LATERALS

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 G-15

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MANHOLE LOCATION, SIZE AND DETAILS, CONCRETE & REINFORCING STEEL REQUIREMENTS, CENTERLINE RADIUS AND OTHER DETAILS SHALL BE IN ACCORDANCE WITH BEND STRUCTURE DETAIL PLATES D-4.01 AND D-4.02.



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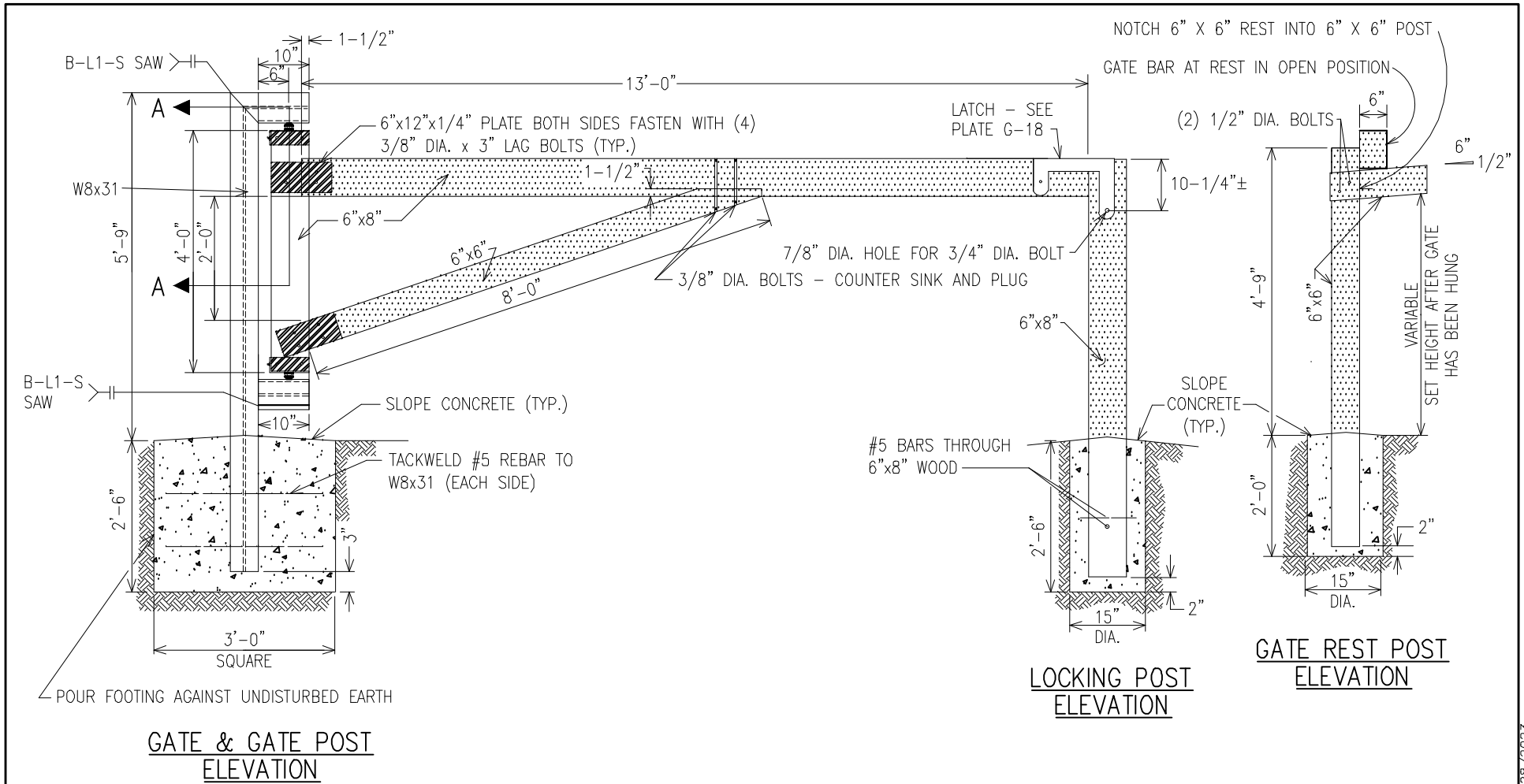
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
 GENERAL DETAILS
 CONNECTION LOCATIONS
 TO BEND STRUCTURES

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PLATE
 G-16


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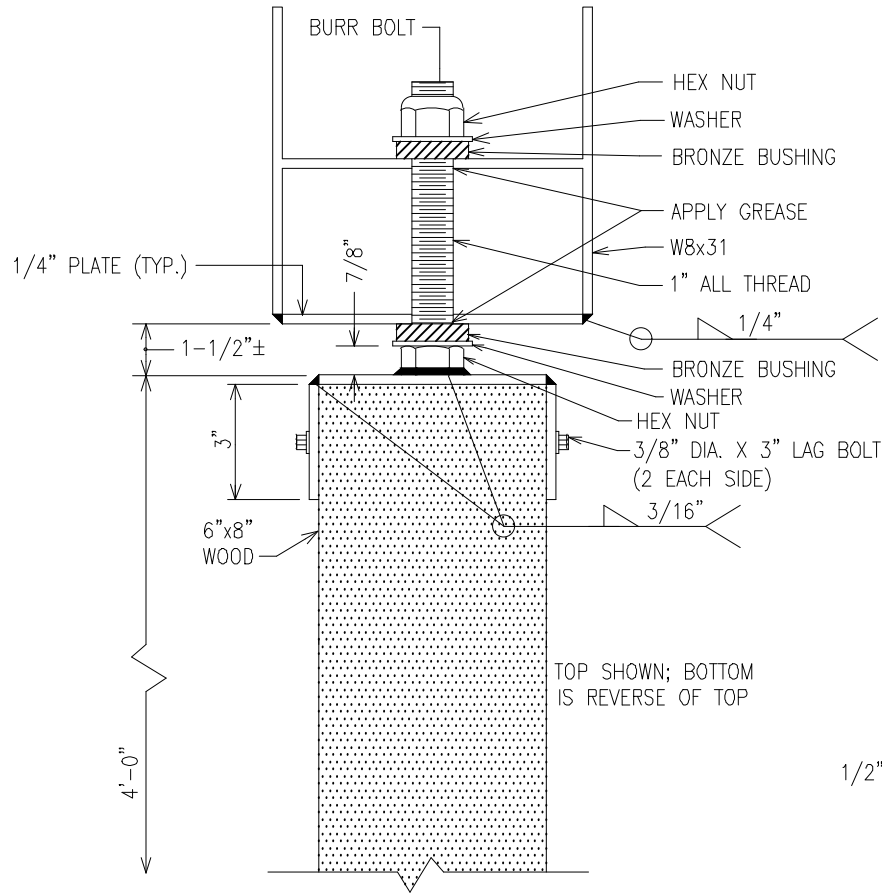
NOTES:

1. TIMBERS TO BE FULL CUT AND PRESERVATIVE TREATED. USE MINIMUM SP#2 OR HEM FIR #2.
2. ALL WOOD TO RECEIVE 2 COATS OF EXTERIOR BROWN LATEX PAINT.
3. THE STEEL IS TO RECEIVE 1 COAT OF METAL PRIMER AND 2 COATS OF METAL PAINT (BLACK).
4. ALL STEEL TO BE A-36 - REBAR GRADE 60.
5. CONCRETE TO BE MIX # 2.
6. FOR SECTION A - A, SEE STANDARD DETAIL PLATE G-18.

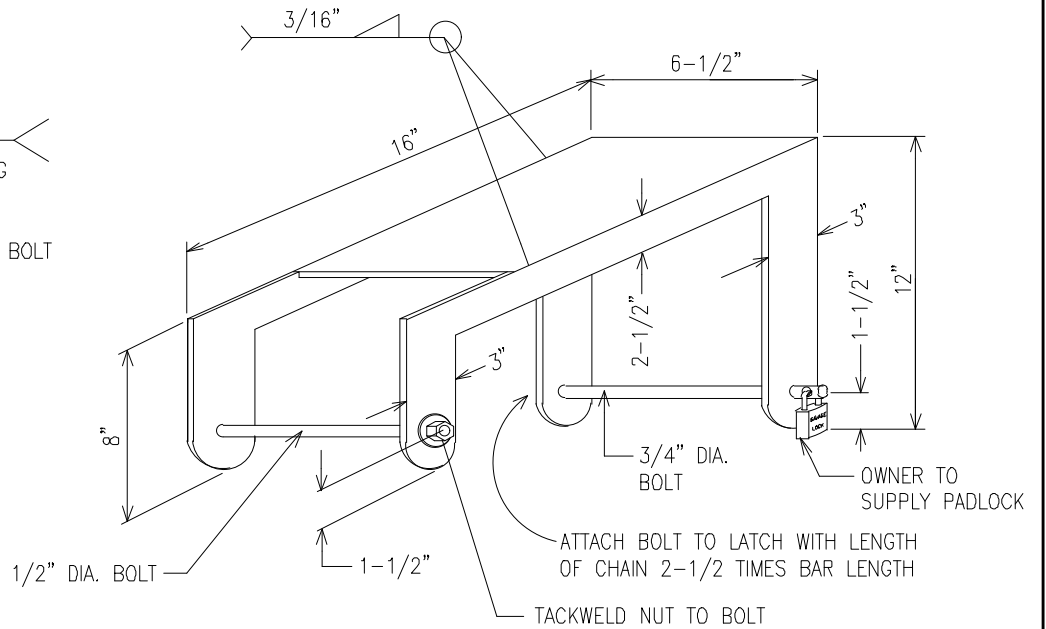

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GENERAL DETAILS
WOOD ACCESS GATE

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 PLATE
G-17



SECTION A-A



LATCH DETAIL - 1/4" THICK PLATE

SEE DETAIL PLATE G-17 FOR ACCESS GATE



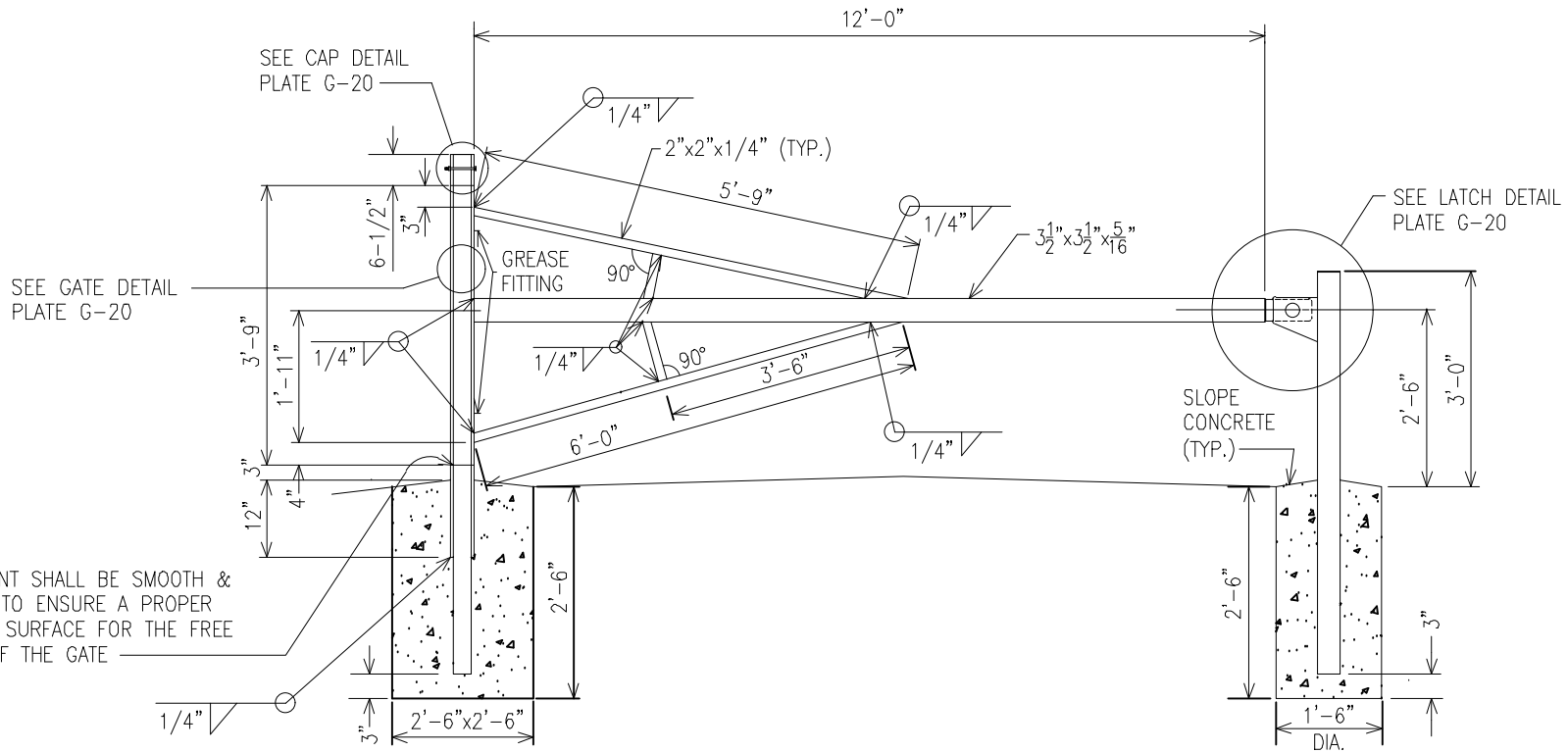
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 GENERAL DETAILS
 WOOD ACCESS GATE DETAILS

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PLATE
G-18

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NOTES:

1. ALL CONCRETE TO BE MIX #2.
2. ALL FOOTINGS TO BE POURED AGAINST UNDISTURBED EARTH.
3. STEEL PIPE SHALL MEET ASTM A-501; STEEL TUBING SHALL MEET ASTM A-500, GRADE B.
4. STEEL SHALL RECEIVE 1 COAT OF METAL PRIMER & 1 COAT OF METAL PAINT (GREEN, UNLESS OTHERWISE SPECIFIED).
5. OWNER SHALL SUPPLY LOCK & CHAIN FOR GATE.
6. BEFORE PLACING GATE ASSEMBLY, SURFACE OF 3" NOMINAL DIA. PIPE COLUMN SHALL BE COATED WITH GREASE.
7. POSTS SHALL BE FILLED WITH MIX #2 CONCRETE TO WITHIN 12" OF TOP OF POST.
8. DIRECTION OF GATE SWING TO BE AS SHOWN ON PLANS OR AS DIRECTED BY ENGINEER IN FIELD.



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 TUBULAR METAL ACCESS GATE

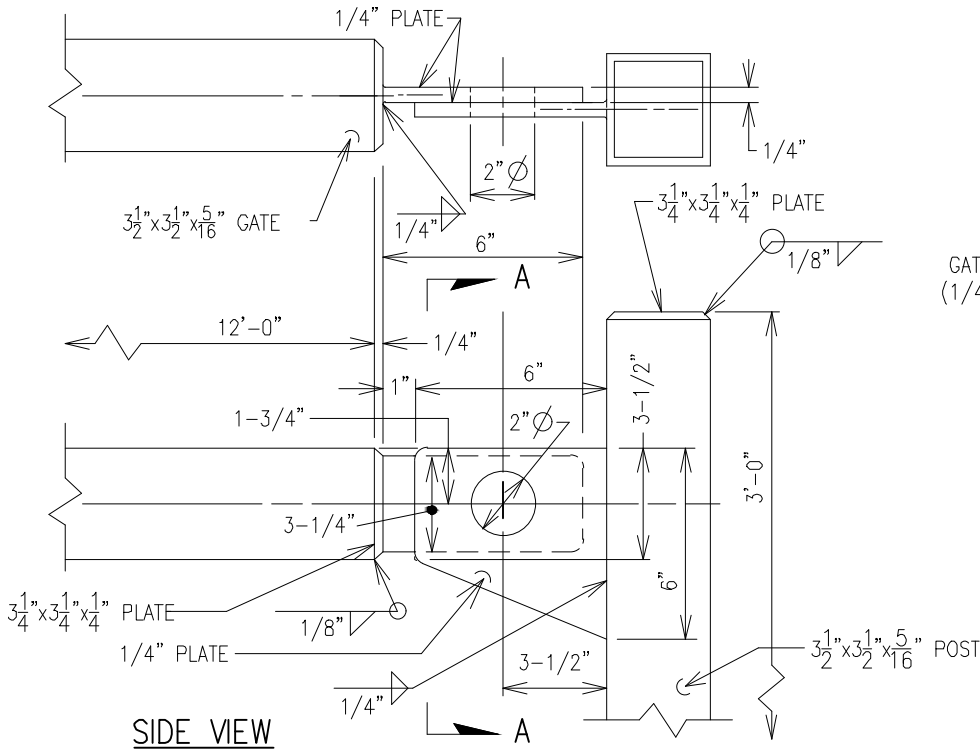
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PLATE
 G-19

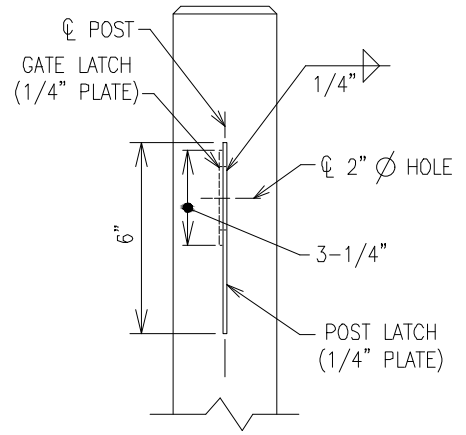
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TOP VIEW

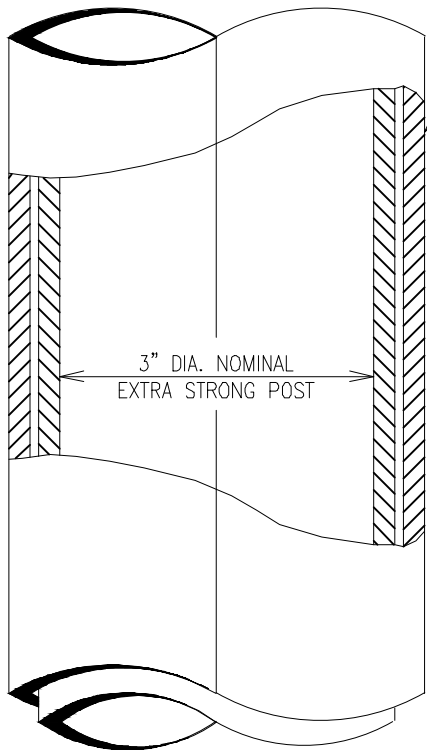


LATCH DETAIL

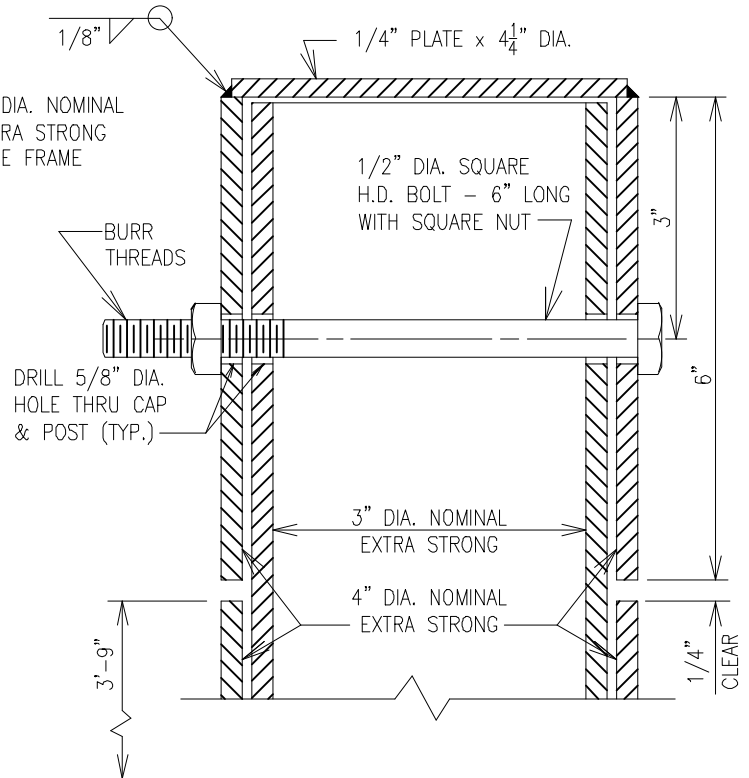


ELEV. A-A

SIDE VIEW



GATE DETAIL



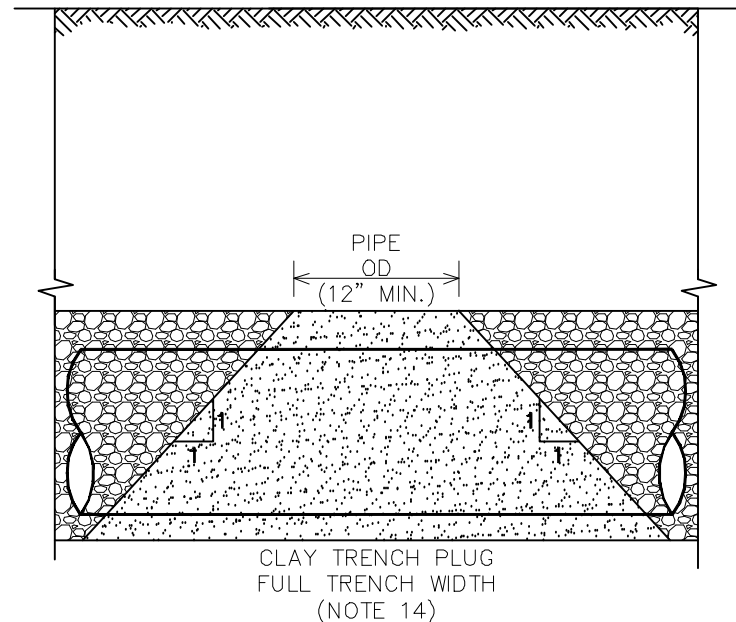
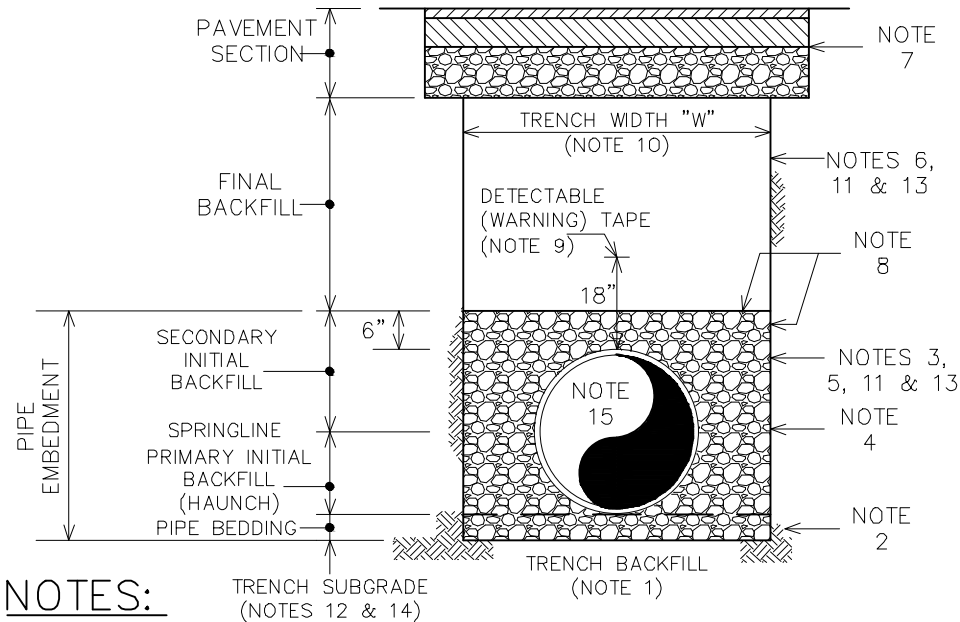
CAP DETAIL



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DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
GENERAL DETAILS
METAL ACCESS GATE
DETAILS

ISSUED: SEPTEMBER 2023
 PLATE
G-20



NOTES:

1. TRENCH BACKFILL TO BE NO. 67 COARSE AGGREGATE FOR PIPES LESS THAN 15 INCHES IN DIAMETER OR NO. 57 COARSE AGGREGATE FOR PIPES 15 INCHES IN DIAMETER OR GREATER. SEE NOTE 8.
2. STANDARD PIPE BEDDING DEPTH IS 4-INCHES. WHEN TRENCH SUBGRADE IS COMPOSED OF ROCK, EXTEND BEDDING DEPTH DOWN AN ADDITIONAL 2-INCHES (6-INCHES TOTAL). LEAVE THE CENTER THIRD OF THE BEDDING UNCOMPACTED (LOOSE). OUTER TWO-THIRDS PORTION OF TRENCH SHALL BE CONSOLIDATED USING RODDING OR OTHER METHOD APPROVED BY THE ENGINEER.
3. THE PRICE FOR BACKFILL IN THE PIPE EMBEDMENT ZONE, INCLUDING PIPE BEDDING, SHALL BE CONSIDERED INCIDENTAL TO THE PRICE BID FOR THE PIPE.
4. IN HAUNCH ZONE AND SECONDARY INITIAL BACKFILL ZONE, BRING BACKFILL UP UNIFORMLY ON BOTH SIDES OF THE PIPE IN MAXIMUM 6-INCH LIFTS (LOOSE MATERIAL) AND A CONSOLIDATE AS DIRECTED BY THE ENGINEER.
 - a. IN HAUNCH ZONE, SHOVEL SLICE OR ROD MATERIAL TO CONSOLIDATE.
 - b. DO NOT PERMIT COMPACTION EQUIPMENT TO CONTACT (AND POSSIBLY DAMAGE) THE PIPE. ALL COMPACTION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER.
5. MOVEABLE TRENCH BOXES OR SHIELDS SHALL NOT BE USED BELOW THE TOP OF THE PIPE.
6. FINAL BACKFILL TO CONSIST OF SUITABLE MATERIAL. IF SUITABLE NATIVE MATERIAL IS NOT AVAILABLE, USE SELECT BACKFILL OR GAB, AS DIRECTED BY THE ENGINEER. BACKFILL IN ACCORDANCE WITH STANDARD SPECIFICATION 300.03.04(h)(4). (AS DESCRIBED FOR RIGID PIPE)
7. PROVIDE PAVING SECTION (SHOWN) OR TOPSOIL PER CONTRACT DOCUMENTS.
8. WRAP BOTTOM, TOP AND BOTH SIDES OF COARSE AGGREGATE WITH GEOTEXTILE FABRIC, TYPE SE
9. PROVIDE MAGNETICALLY DETECTABLE TAPE PER STANDARD SPECIFICATIONS.
10. TRENCH WIDTH "W" PER STANDARD DETAIL PLATES G-6 AND G-7.
11. BACKFILL SHALL NOT BE ALLOWED TO FREE-FALL INTO THE TRENCH. VEHICLES OR CONSTRUCTION EQUIPMENT SHALL NOT TRAFFIC THE TRENCH UNTIL AT LEAST 2- FEET OF COVER IS PROVIDED OVER THE TOP OF THE PIPE.
12. IF THE TRENCH SUBGRADE IS UNSTABLE, CONSULT THE DESIGN DIVISION OF THE BUREAU OF ENGINEERING AND CONSTRUCTION FOR DIRECTION.
13. IF TRENCH AND NATIVE SOIL CANNOT SUSTAIN A VERTICAL CUT, CONSULT THE DESIGN DIVISION OF THE BUREAU OF ENGINEERING AND CONSTRUCTION.
14. IN NON-PAVED AREAS ONLY, TRENCHING INSTALLED IN ROCK SHALL BE PROVIDED WITH CLAY TRENCH PLUGS (SOIL CLASSIFICATION CL) TO REDUCE THE FLOW OF WATER IN THE TRENCH. INSTALL TRENCH PLUGS: EVERY 300 FEET FOR SLOPES 15-PERCENT OR LESS, EVERY 200 FEET FOR SLOPES GREATER THAN 15-PERCENT, OR HALFWAY BETWEEN THE MANHOLES, WHICHEVER IS LESS. COST SHALL BE INCIDENTAL TO PRICE BID FOR PIPE.
15. IN ADDITION TO TELEVISION INSPECTION REQUIREMENTS AS DESCRIBED IN THE STANDARD SPECIFICATIONS, ALL THERMOPLASTIC STORM DRAIN PIPE SHALL BE TESTED FOR DEFLECTION. AFTER THERMOPLASTIC STORM DRAIN PIPE HAS BEEN INSTALLED A MINIMUM OF 30 DAYS, AND BEFORE THE HMA BASE HAS BEEN PLACED, THE CONTRACTOR SHALL CHECK DEFLECTION BY PERFORMING A MANDREL TEST. THE MANDREL DEVICE SHALL HAVE A MINIMUM OF NINE (9) ARMS OR PRONGS AND A DIAMETER THAT IS 95-PERCENT OF THE NOMINAL PIPE DIAMETER. THE CONTRACTOR SHALL PROVIDE A PROVING RING THAT IS 95-PERCENT OF THE NOMINAL PIPE DIAMETER FOR EACH MANDREL. THE CONTRACTOR SHALL PULL THE MANDREL THROUGH THE PIPE BY HAND. IF THE MANDREL DOES NOT PASS THROUGH THE PIPE, THE DEFICIENT PIPE SHALL BE REMOVED AND REPLACED.

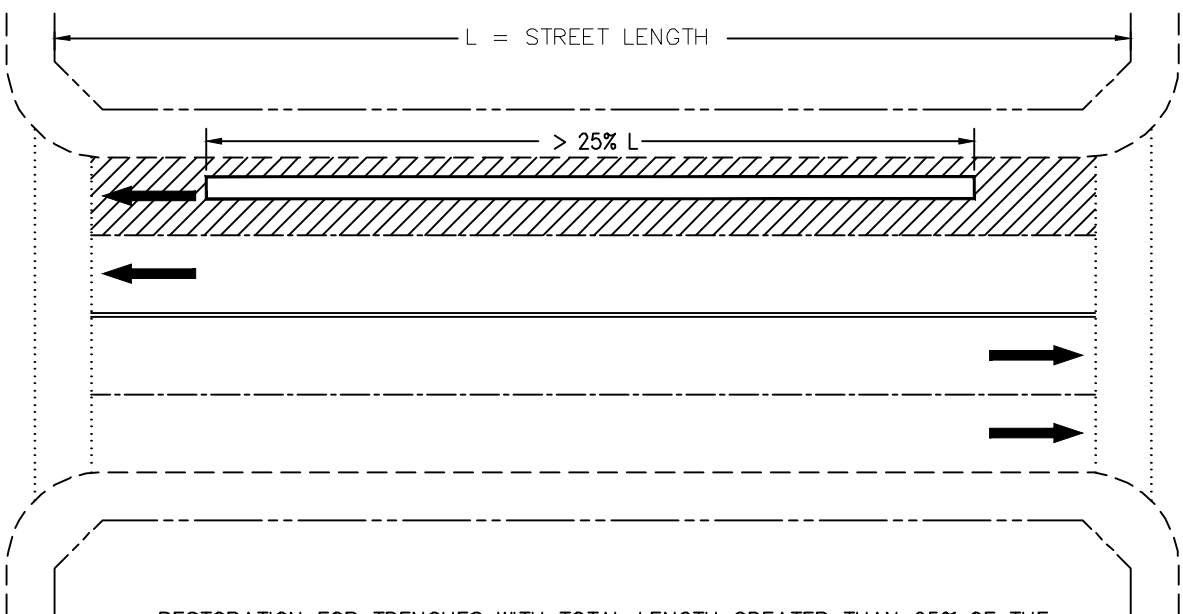

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GENERAL DETAILS
TRENCH BACKFILL FOR THERMOPLASTIC PIPE
(FOR STORM DRAIN AND WATER PIPES ≤ 24")

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 PLATE
G-21

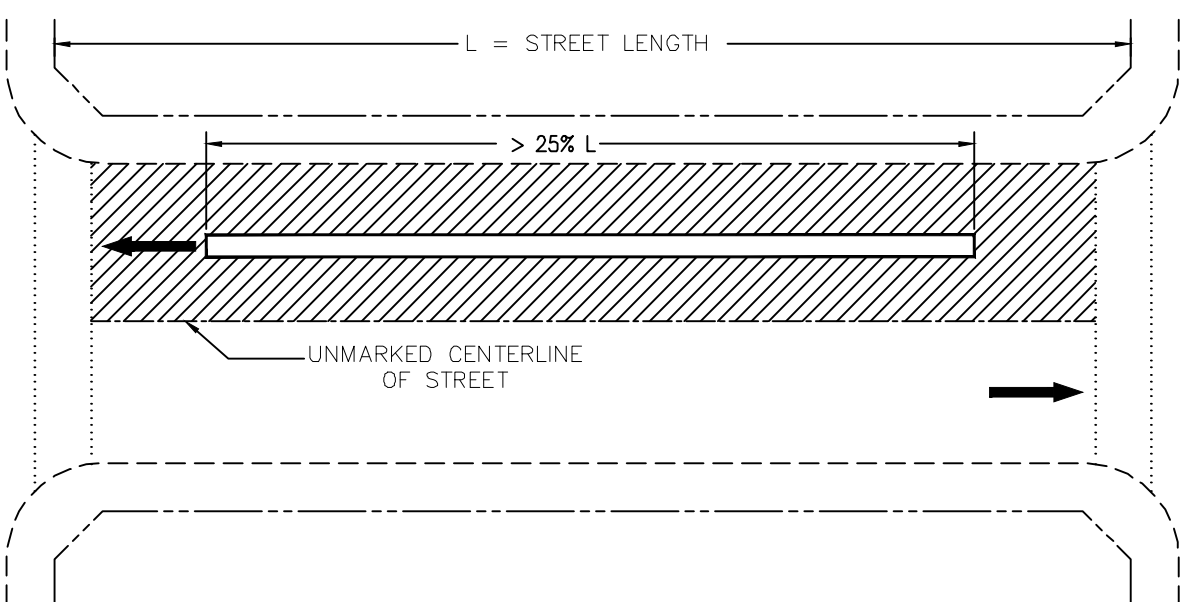
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A



RESTORATION FOR TRENCHES WITH TOTAL LENGTH GREATER THAN 25% OF THE STREET LENGTH ON A LANE DELINEATED STREET WITH TRENCH WHOLLY IN ONE DELINEATED LANE WITH ONE SIDE OF RESTORATION TO THE EDGE OF THE LANE.

B



RESTORATION FOR TRENCHES WITH TOTAL LENGTH GREATER THAN 25% OF THE STREET LENGTH ON AN UNMARKED STREET.

- | | | | |
|-------|---------------------|--|---|
| | CROSS WALK | | TRAFFIC FLOW |
| --- | LANE LINE | | CURB RAMP AND CROSSWALK AREAS TO BE EVALUATED FOR RESTORATION |
| --- | PROPERTY LINE | | AREA OF RESTORATION |
| - - - | EXISTING FACILITIES | | TRENCH EXCAVATION AREA |
| == | CENTER LINE | | |

PAVING, CURB RAMPS, CROSSWALKS AND STRIPING TO BE RESTORED IN KIND.



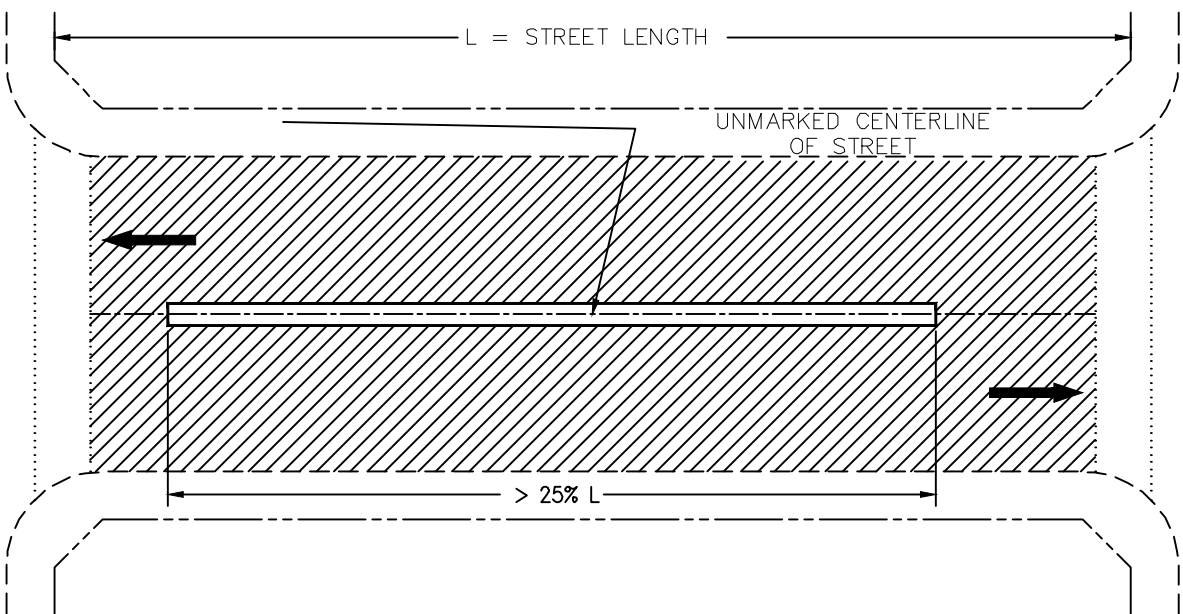
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 GENERAL DETAILS
 RESTORATION FOR TRENCHES
 GREATER THAN 25% OF STREET LENGTH

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 PLATE
 G-22

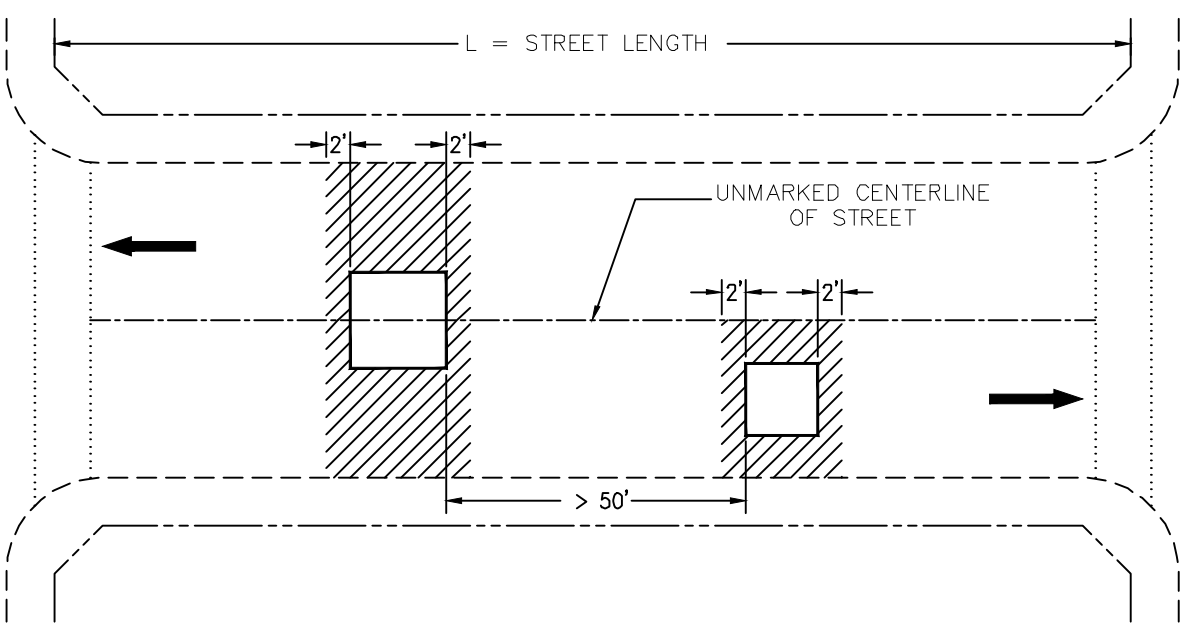
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RESTORATION FOR TRENCHES WITH TOTAL LENGTH GREATER THAN 25% OF THE STREET LENGTH ON AN UNMARKED STREET.

B



RESTORATION FOR SEVEN OR FEWER TRENCHES NOT CONTIGUOUS WITH GUTTER PAN AND GREATER THAN FIFTY FEET APART ON AN UNMARKED STREET.

- CROSS WALK
- LANE LINE
- PROPERTY LINE
- EXISTING FACILITIES
- ===== CENTER LINE
- ➔ TRAFFIC FLOW
- CURB RAMP AND CROSSWALK AREAS TO BE EVALUATED FOR RESTORATION
- ▨ AREA OF RESTORATION
- TRENCH EXCAVATION AREA

PAVING, CURB RAMPS, CROSSWALKS AND STRIPING TO BE RESTORED IN KIND.



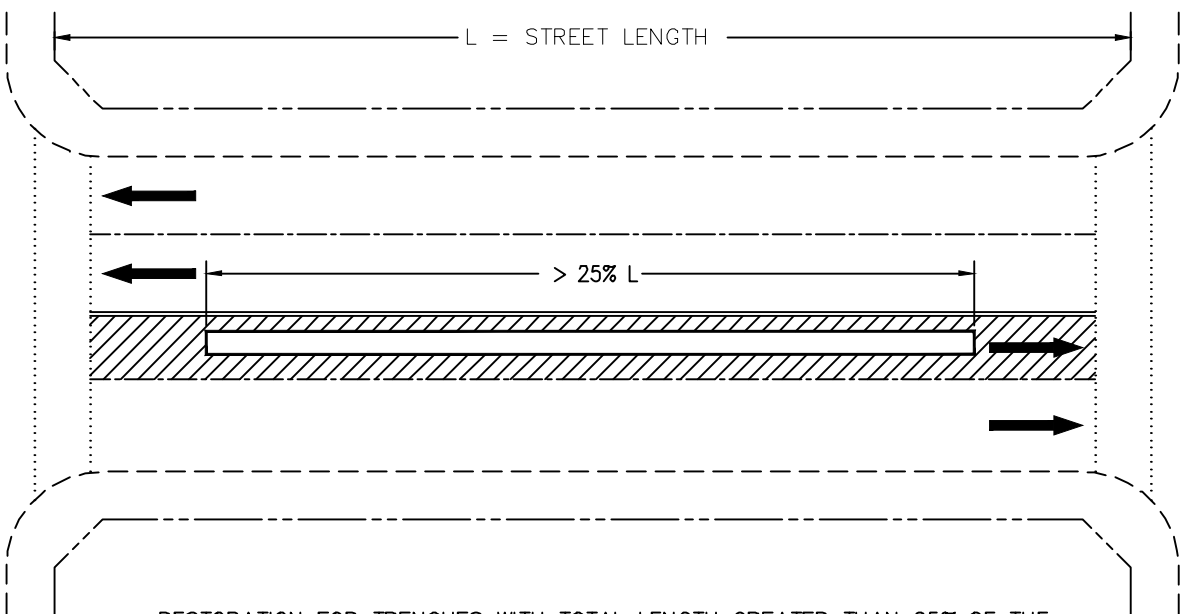
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 GENERAL DETAILS
 RESTORATION FOR TRENCHES
 GREATER THAN 50 FEET APART

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 PLATE
 G-24

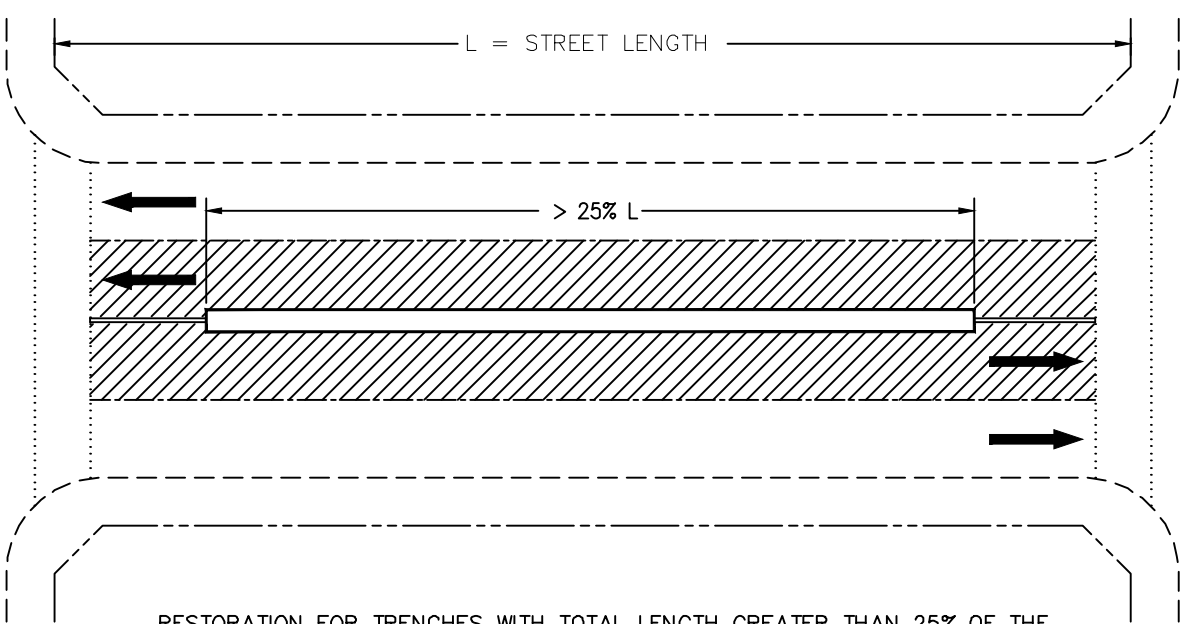
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A



RESTORATION FOR TRENCHES WITH TOTAL LENGTH GREATER THAN 25% OF THE STREET LENGTH ON A LANE DELINEATED STREET WITH TRENCH WHOLLY IN ONE DELINEATED LANE.

B



RESTORATION FOR TRENCHES WITH TOTAL LENGTH GREATER THAN 25% OF THE STREET LENGTH ON A LANE DELINEATED STREET WITH TRENCH IN MORE THAN ONE DELINEATED LANE.

- CROSS WALK
- LANE LINE
- PROPERTY LINE
- EXISTING FACILITIES
- ===== CENTER LINE
- ➔ TRAFFIC FLOW
- CURB RAMP AND CROSSWALK AREAS TO BE EVALUATED FOR RESTORATION
- ▨ AREA OF RESTORATION
- TRENCH EXCAVATION AREA

PAVING, CURB RAMPS, CROSSWALKS AND STRIPING TO BE RESTORED IN KIND.



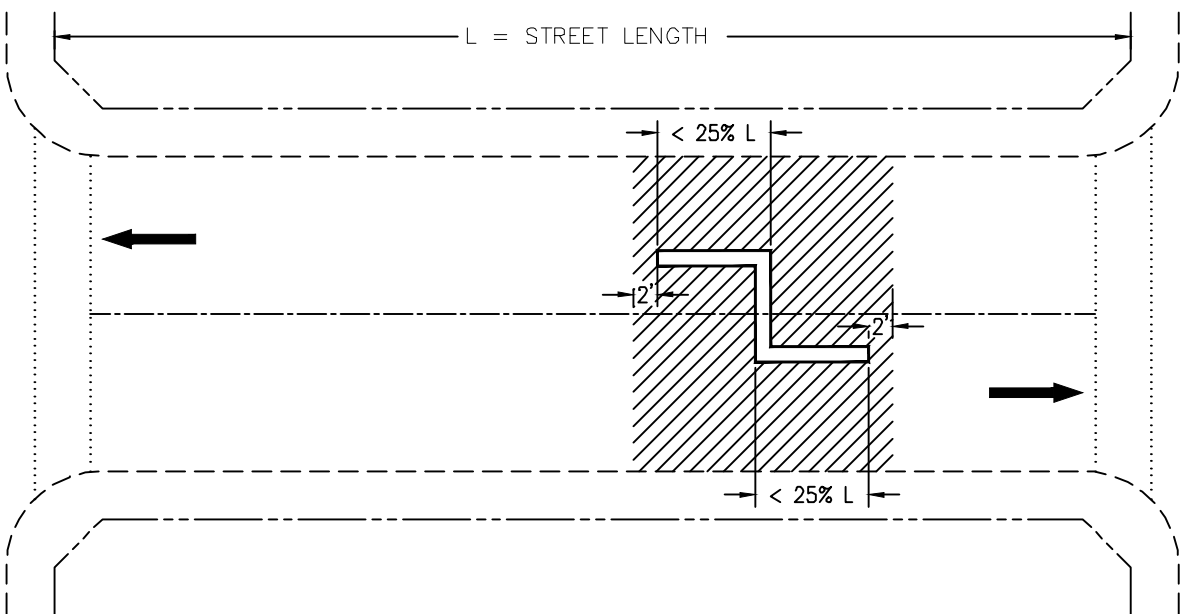
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 GENERAL DETAILS
 RESTORATION FOR TRENCHES
 GREATER THAN 25% OF STREET LENGTH

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 PLATE
 G-23

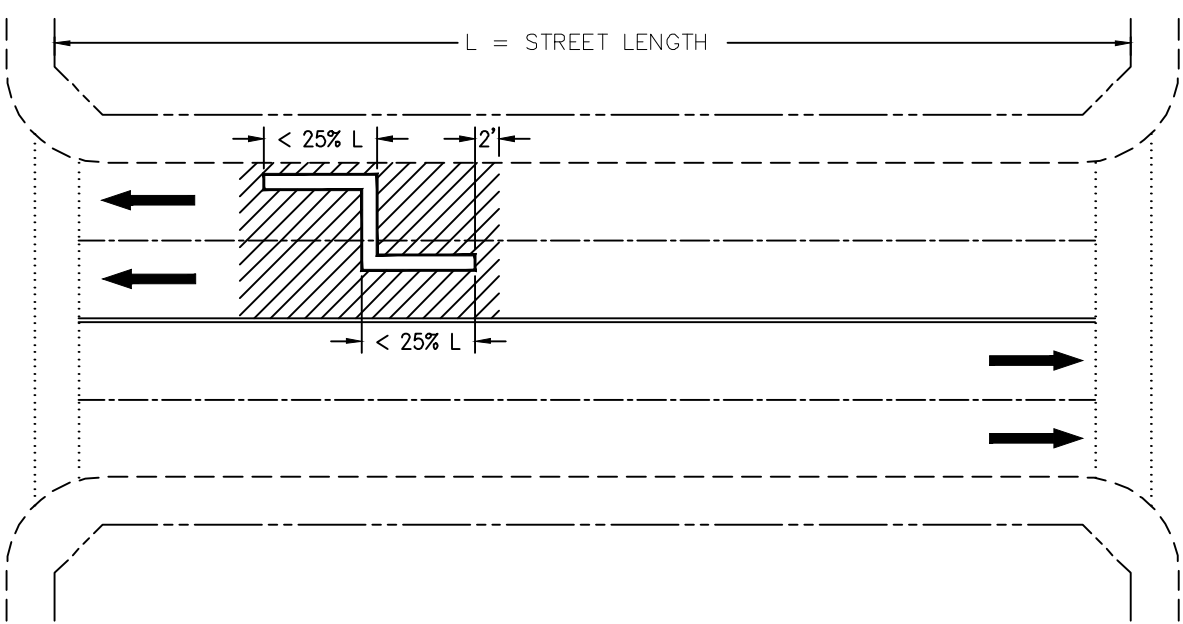
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A



RESTORATION FOR TRENCHES WITH TOTAL LENGTH LESS THAN 25% OF THE STREET LENGTH ON AN UNMARKED STREET.

B



RESTORATION FOR TRENCHES WITH TOTAL LENGTH LESS THAN 25% OF THE STREET LENGTH ON A LANE DELINEATED STREET.

- CROSS WALK
- LANE LINE
- PROPERTY LINE
- EXISTING FACILITIES
- ===== CENTER LINE
- ➔ TRAFFIC FLOW
- CURB RAMP AND CROSSWALK AREAS TO BE EVALUATED FOR RESTORATION
- ▨ AREA OF RESTORATION
- TRENCH EXCAVATION AREA

PAVING, CURB RAMPS, CROSSWALKS AND STRIPING TO BE RESTORED IN KIND.



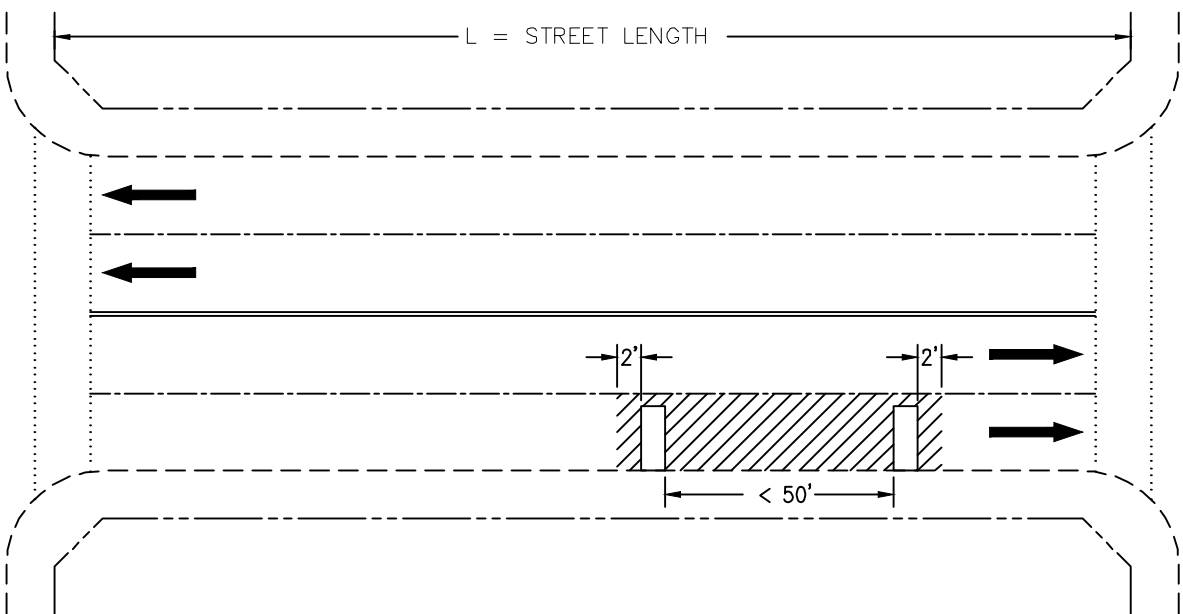
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 GENERAL DETAILS
 RESTORATION FOR TRENCHES
 LESS THAN 25% OF STREET LENGTH

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 PLATE
 G-25

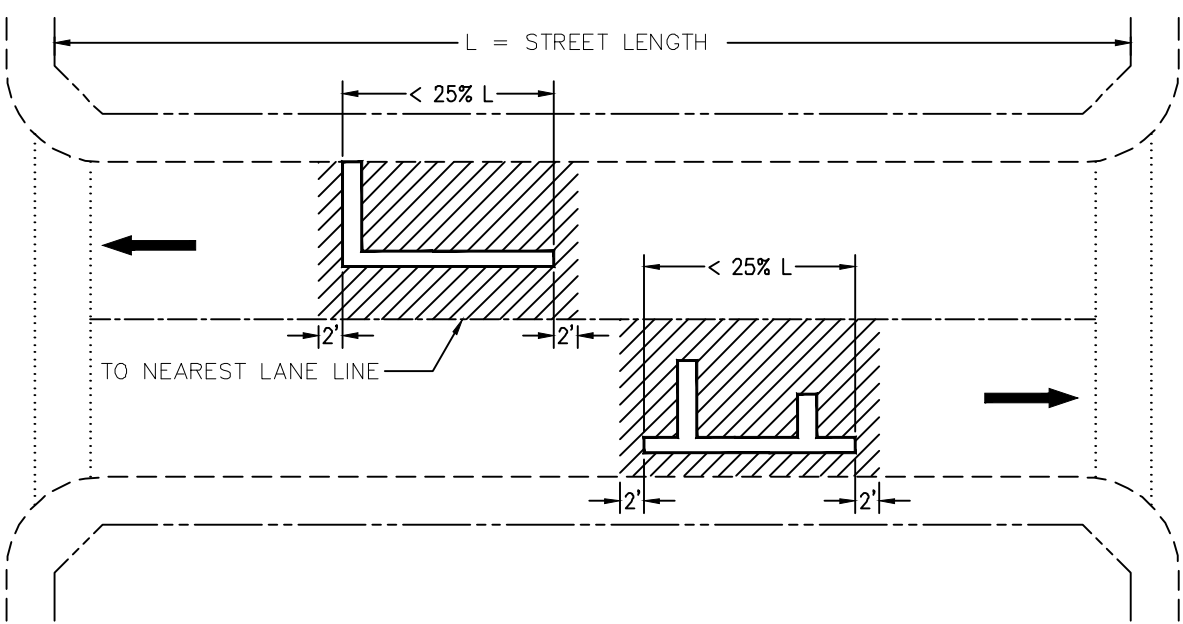
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A



RESTORATION FOR LATERAL TRENCHES FIFTY FEET OR LESS APART.

B



RESTORATION FOR MULTIPLE TRENCHES WITH TOTAL LENGTH LESS THAN 25% OF THE STREET LENGTH ON AN UNMARKED STREET.

- CROSS WALK
- LANE LINE
- PROPERTY LINE
- EXISTING FACILITIES
- ===== CENTER LINE
- ➔ TRAFFIC FLOW
- CURB RAMP AND CROSSWALK AREAS TO BE EVALUATED FOR RESTORATION
- ▨ AREA OF RESTORATION
- TRENCH EXCAVATION AREA

PAVING, CURB RAMPS, CROSSWALKS AND STRIPING TO BE RESTORED IN KIND.



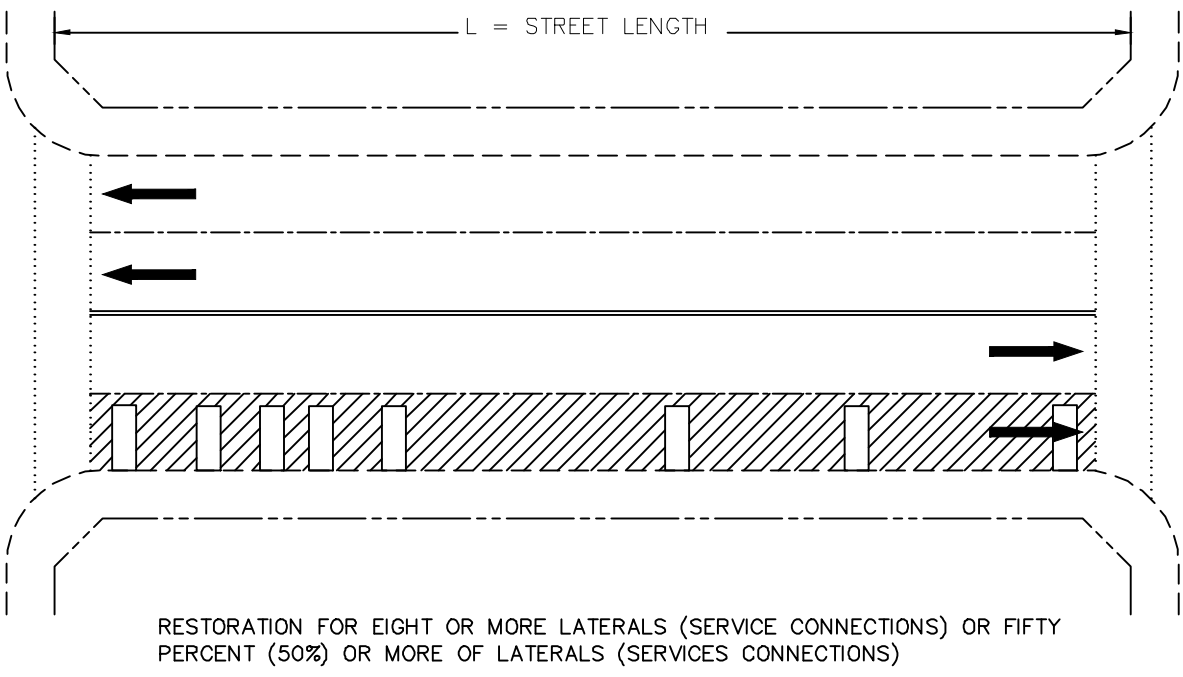
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 GENERAL DETAILS
 RESTORATION FOR TRENCHES
 LATERALS IN STREET

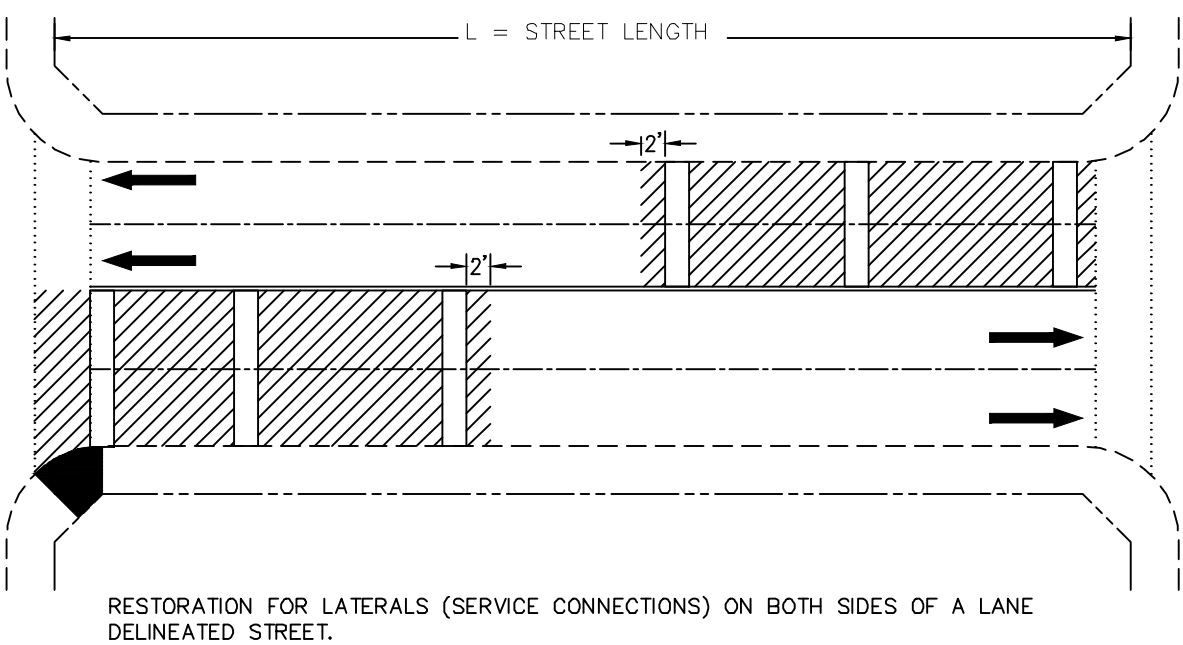
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 PLATE
 G-26

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A



B



- CROSS WALK
- LANE LINE
- PROPERTY LINE
- EXISTING FACILITIES
- ===== CENTER LINE
- ➔ TRAFFIC FLOW
- CURB RAMP AND CROSSWALK AREAS TO BE EVALUATED FOR RESTORATION
- ▨ AREA OF RESTORATION
- TRENCH EXCAVATION AREA

PAVING, CURB RAMPS, CROSSWALKS AND STRIPING TO BE RESTORED IN KIND.



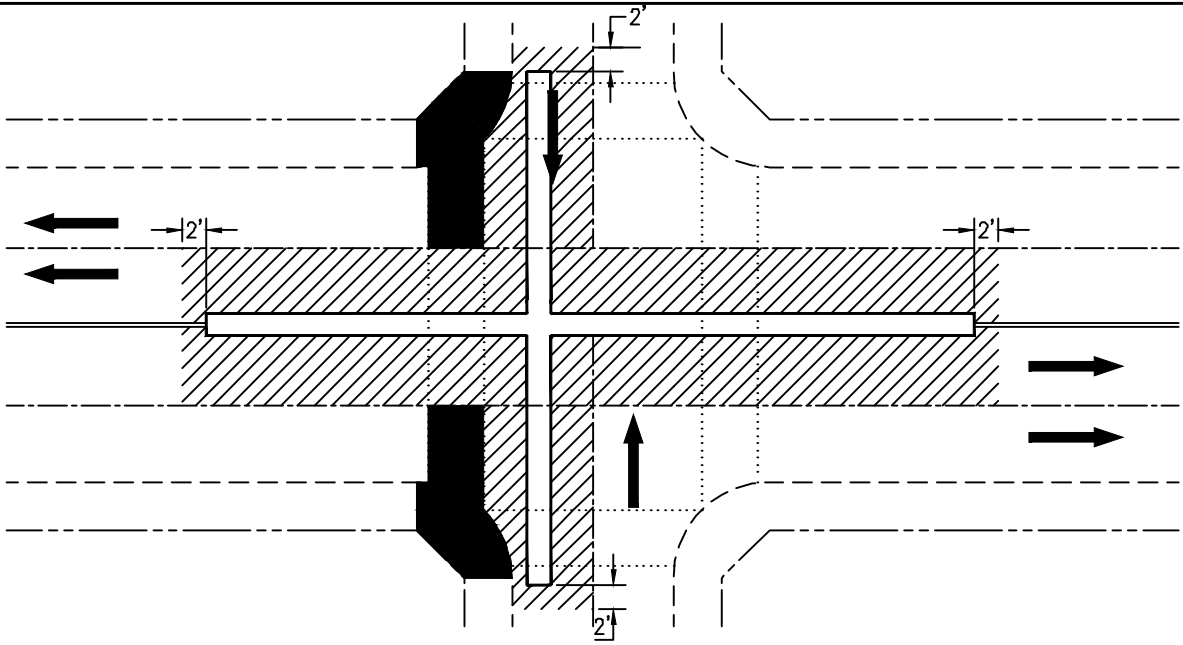
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 GENERAL DETAILS
**RESTORATION FOR TRENCHES
 EXTENDING TO CURB LINE**

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G-27

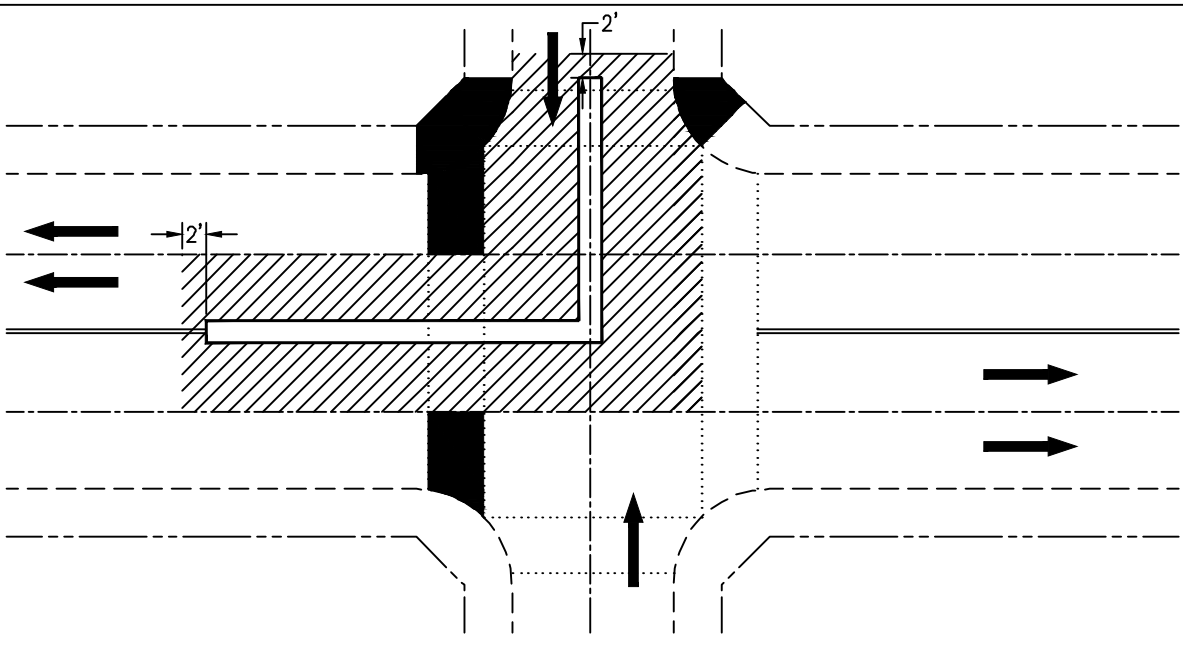
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A



RESTORATION FOR TRENCHES IN FOUR QUADRANTS. ALL AFFECTED CURB RAMP AND CROSSWALKS ARE SUBJECT TO EVALUATION.

B



RESTORATION FOR TRENCHES IN FOUR QUADRANTS. ALL AFFECTED CURB RAMP AND CROSSWALKS ARE SUBJECT TO EVALUATION.

- CROSS WALK
- LANE LINE
- PROPERTY LINE
- EXISTING FACILITIES
- ===== CENTER LINE
- ➔ TRAFFIC FLOW
- CURB RAMP AND CROSSWALK AREAS TO BE EVALUATED FOR RESTORATION
- ▨ AREA OF RESTORATION
- TRENCH EXCAVATION AREA

PAVING, CURB RAMPS, CROSSWALKS AND STRIPING TO BE RESTORED IN KIND.



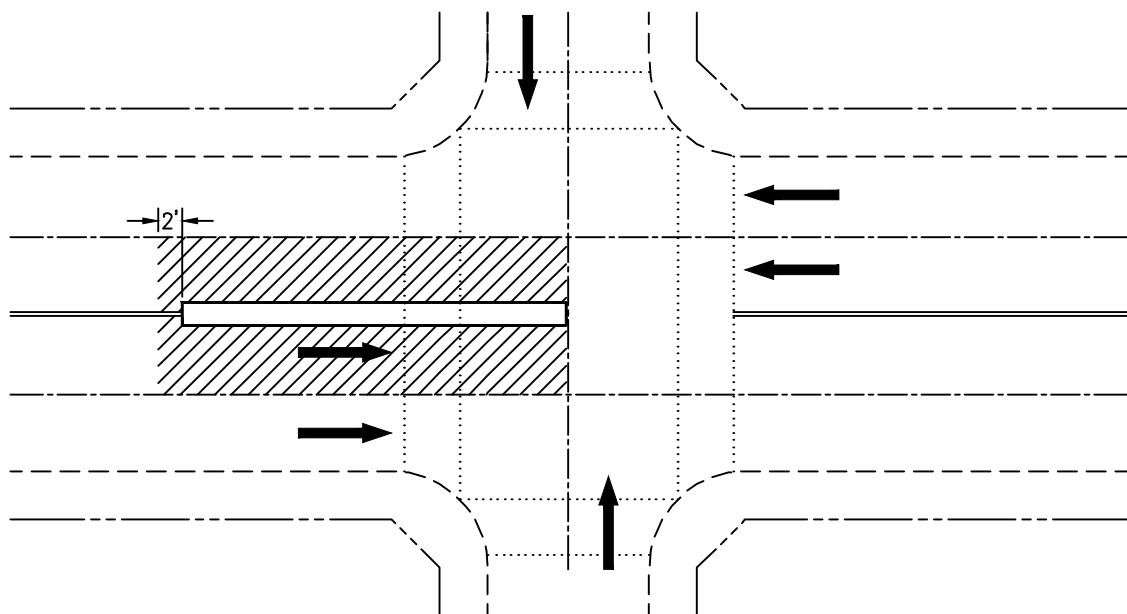
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 GENERAL DETAILS
 RESTORATION FOR TRENCHES
 AT STREET INTERSECTIONS

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 PLATE
 G-28

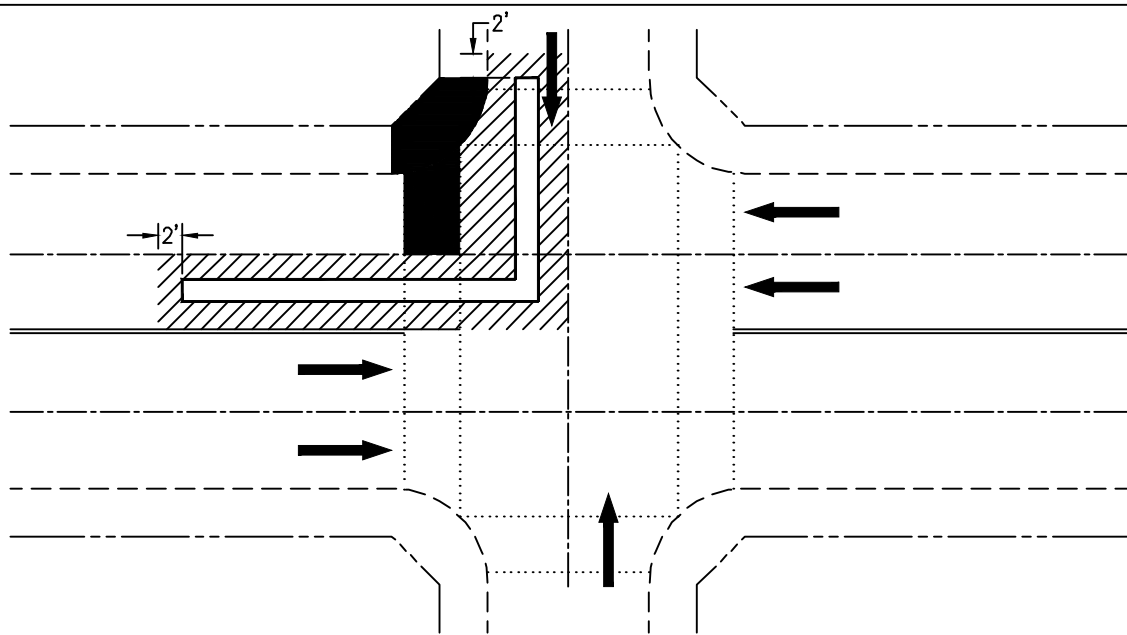
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A



RESTORATION FOR TRENCHES IN TWO QUADRANTS. ALL AFFECTED CURB RAMPS AND CROSSWALKS ARE SUBJECT TO EVALUATION.

B



RESTORATION FOR TRENCHES IN ONE QUADRANT. ALL AFFECTED CURB RAMPS AND CROSSWALKS ARE SUBJECT TO EVALUATION.

- CROSS WALK
- LANE LINE
- PROPERTY LINE
- EXISTING FACILITIES
- ===== CENTER LINE
- TRAFFIC FLOW
- CURB RAMP AND CROSSWALK AREAS TO BE EVALUATED FOR RESTORATION
- ▨ AREA OF RESTORATION
- TRENCH EXCAVATION AREA

PAVING, CURB RAMPS, CROSSWALKS AND STRIPING TO BE RESTORED IN KIND.



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DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
 GENERAL DETAILS
 RESTORATION FOR TRENCHES
 AT STREET INTERSECTIONS

ISSUED: SEPTEMBER 2023
 PLATE
 G-29

FILE: GEN_MASTER.dwg DATE: 08/28/2023

TYPE	SYMBOLS	TYPICAL GRADING	TYPICAL PHYSICALS	REMARKS
A - 3 SAND		C.S. = 22% F.S. = 48% SILT = 20% CLAY = 8% COLL. = 2%	L.L. = N.P. P.I. = N.P.	SAND - 53% MIN. % - #200 - 20% MAX. P.I. - N.P. L.L. - MUST BE N.P.
A - 2 SAND & FINES		C.S. = 20% F.S. = 43% SILT = 19% CLAY = 10% COLL. = 8%	L.L. = 22 P.I. = 2 S.L. = 18	SAND - 53% MIN. 5 - #200 - 20% MAX. P.I. - 7 MAX. L.L. - 34 MAX. (MUST HAVE L.L.)
A - 2 - 4 SILTY SAND		C.S. = 25% F.S. = 30% SILT = 32% CLAY = 7% COLL. = 6%	L.L. = 24 P.I. = 2 S.L. = 21	SAND - 53% MIN. % - #200 - 21% MIN. - 30% MAX. P.I. - 7 MAX. L.L. - 34 MAX. (MAY BE N.P.)
A - 4 - 2 SANDY SILT		C.S. = 23% F.S. = 28% SILT = 33% CLAY = 10% COLL. = 6%	L.L. = 25 P.I. = 3 S.L. = 21	SAND - 48% MIN. % - #200 - 31% MIN. P.I. - 7 MAX. L.L. - 40 MAX. (MAY BE N.P.)
A - 2 - 7 CLAYEY SAND		C.S. = 38% F.S. = 31% SILT = 15% CLAY = 8% COLL. = 8%	L.L. = 31 P.I. = 10 S.L. = 18	SAND - 48% MIN. CLAY - 29% MAX. P.I. - 8 - 14 L.L. - 40 MAX.
A - 7 - 2 SANDY CLAY		C.S. = 20% F.S. = 29% SILT = 17% CLAY = 21% COLL. = 13%	L.L. = 39 P.I. = 17 S.L. = 16	SAND - 48% MIN. CLAY - 17% - 35% P.I. - 15 MIN. L.L. - 30 MIN.
A - 4 SILT		C.S. = 20% F.S. = 22% SILT = 40% CLAY = 10% COLL. = 8%	L.L. = 30 P.I. = 6 S.L. = 19	SAND - 47% MAX. CLAY - 29% MAX. P.I. - 9 MAX. L.L. - 40 MAX.
A - 4 - 7 CLAYEY SILT		C.S. = 8% F.S. = 17% SILT = 40% CLAY = 23% COLL. = 12%	L.L. = 33 P.I. = 11 S.L. = 18	SAND - 47% MAX. CLAY - 25% MAX. P.I. - 14 MAX. L.L. - 40 MAX.
A - 7 - 4 SILTY CLAY		C.S. = 18% F.S. = 20% SILT = 35% CLAY = 12% COLL. = 15%	L.L. = 39 P.I. = 15 S.L. = 16	SAND - 47% MAX. CLAY - 29% MAX. P.I. - 15 MIN. L.L. - 30 MIN.
A - 7 CLAY		C.S. = 18% F.S. = 22% SILT = 23% CLAY = 22% COLL. = 15%	L.L. = 40 P.I. = 17 S.L. = 15	SAND - 47% MAX. CLAY - 30% - 59% P.I. - 15 MIN. L.L. - 35 MIN.
A - 6 COLLOIDAL CLAY		C.S. = 6% F.S. = 7% SILT = 18% CLAY = 33% COLL. = 36%	L.L. = 50 P.I. = 33 S.L. = 14	CLAY - 60% MIN. P.I. - 25 MIN. L.L. - 45 MIN.
A - 5 MICA, DIATOMS, DECOMPOSED ROCK		C.S. = 15% F.S. = 35% SILT = 30% CLAY = 15% COLL. = 5%	L.L. = 35 P.I. = 4 S.L. = 26	GRAD. NOT SIGNIFICANT P.I. - LOW, L.L. - HIGH S.L. - 26 MIN. VISUAL INSP. NEC. TO DET. TYPE
A - 8 SWAMP MUCK		C.S. = 18% F.S. = 26% SILT = 45% CLAY = 7% COLL. = 4%	L.L. = 52 P.I. = 7 S.L. = 38	ORGANIC CONTENT - 4% MIN. P.I. - LOW L.L. - HIGH, WHEN OBTAINABLE S.L. - 26 MIN.
ROCK REFUSAL				



APPROVAL

 DIRECTOR

 BUR. OF ENGINEERING/CONSTRUCTION
 SEPTEMBER 28, 2023
 DATE

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
 GENERAL DETAILS
 UNIFIED SOIL CLASSIFICATIONS
 WITH CRITERIA AND SYMBOL CHARTS

ISSUED: SEPTEMBER 2023

PLATE
 G-D

DATE: 08/28/2023

FILE: GEN_MASTER.dwg

GEOTEXTILE SELECTION

MARYLAND APPLICATION CLASS	GEOTEXTILE TYPE	GRAB STRENGTH (lb) D 4632	PUNCTURE STRENGTH (lb) D 6241	PERMITTIVITY sec^{-1} D 4491	APPARENT OPENING SIZE, max D mm 4751	TRAPEZOID TEAR STRENGTH (lb) D 4533	
SD	TYPE II	NONWOVEN	160	56	0.20	0.25	55
	TYPE II	WOVEN, MONOFILAMENT	250	90	0.20	0.25	90
PE	TYPE I	NONWOVEN	200	80	0.70	0.43	80
	TYPE I	WOVEN, MONOFILAMENT	250	90	0.70	0.43	90
	TYPE II	NONWOVEN	200	80	0.20	0.25	80
	TYPE II	WOVEN, MONOFILAMENT	250	90	0.20	0.25	90
	TYPE III	NONWOVEN	200	80	0.10	0.22	80
	TYPE III	WOVEN, MONOFILAMENT	250	90	0.10	0.30	90
SE		NONWOVEN	200	80	0.20	0.30	80
		WOVEN	250	90	0.20	0.30	90
ST		WOVEN	300*	110	0.05	0.15**	110
F		WOVEN	100	—	0.05	0.60	—
E		NONWOVEN	90	30	0.50	0.30	30

APPLICATION TYPES

SD = Subgrade Drainage PE = Permanent Erosion Control
 SE = Separation ST = Stabilization
 E = Filtration F = Silt Fence

Note 1: All property values are based on minimum average roll values in the weakest principle direction, except for apparent opening size.

Note 2: The ultraviolet stability shall be 50 percent after 500 hours of exposure for all classes, except Class F, which shall be 70 percent (D 4355).

* Minimum 15 percent elongation.

** This is the MINIMUM apparent opening size, not a maximum.



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 GENERAL DETAILS
 GEOTEXTILE SELECTION

ISSUED: SEPTEMBER 2023

PLATE
G-E

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