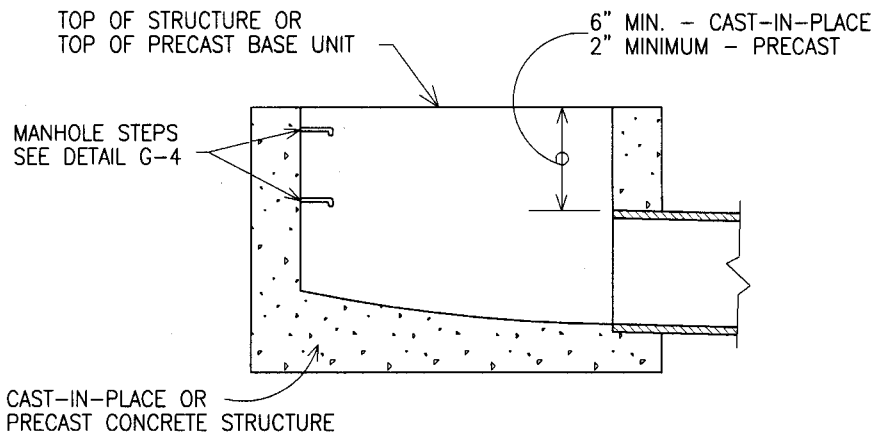
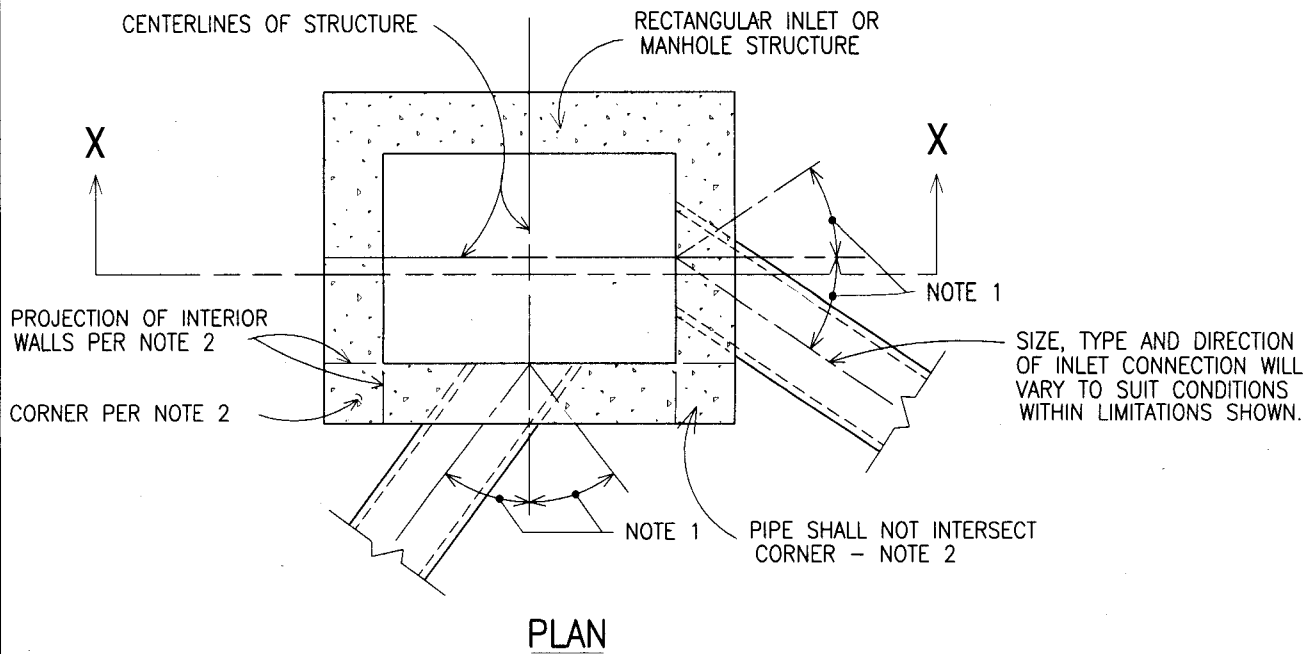


General Standard Details

PLATE #	TITLE	SIGNATURE DATE	STD. SPECS. REFERENCE	COMMODITY CODE
G-1	Pipe Entrances-Rect.Util	3/10/2005	305, 1008	-
G-1A	Rebar @ Wall Openings	6/20/2001	305, 1008	-
G-2	Utility Structures In Roads	7/24/2006	305, 1008	-
G-3	Precast Grade Adj.Ring	3/18/2002	305, 1008	381960, 2, 4, 6
G-3A	Adjustable Riser Ring	12/4/2001	305, 1008	381970
G-3B	Rubber Grade Adjust. Ring	2/7/2000	305, 1008	
G-4	Ladder Step/Misc.Str.	12/4/2001	305.04.04, 1008.02.03	381980
G-4A	Polypropylene Ladder Step	10/23/1997	1008.02.03	381980
G-5	UG Utility Accommodation	1/2/2007	-	-
G-5A	Street Tree Locations	1/2/2007	710	720000-720999
G-6	Trench Payment Widths	10/23/1997	303, 1001	-
G-6A	Flowable Fill Trench Rep	3/18/2002	313	-
G-7	Trench Repaving-Pymt Qty	10/23/1997	505, 1002	301100, 800000
G-8	Trench-Cradle & Encasemt	10/23/1997	303, 305	301311, 800050
G-9	Concrete Stairs	11/24/1999	305.04.03	657000
G-10	Pipe Railing/Conc.Stairs	11/24/1999	422	657060
G-11	Pipe Rail-Welded Constr.	10/23/1997	422	657060
G-12	Ornam.Rail/Conc.Stairs	11/24/1999	422	657050
G-13	Typ. MH not in Road	3/10/2005	305, 1008	-
G-14	MH Frame, Straight Sides	2/14/2000		
G-15	Invert Plans-MHs W/Lat'l	3/18/2002	305, 1008	-
G-16	Conn.Locations/Bend Str.	10/23/1997	305	-
G-17	Wood Access Gate	11/24/1999	-	696010
G-18	Wood Access Gate Details	11/24/1999	-	696010
G-19	Tubular Metal Access Gate	11/24/1999	-	696020
G-20	Metal Access Gate Details	11/24/1999	-	696020



NOTES

1. CENTER LINE PIPE ALLOWABLE RANGE:
 $\pm 30^\circ$ FROM PERPENDICULAR, AND
2. NO PART OF 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 D-3.00.

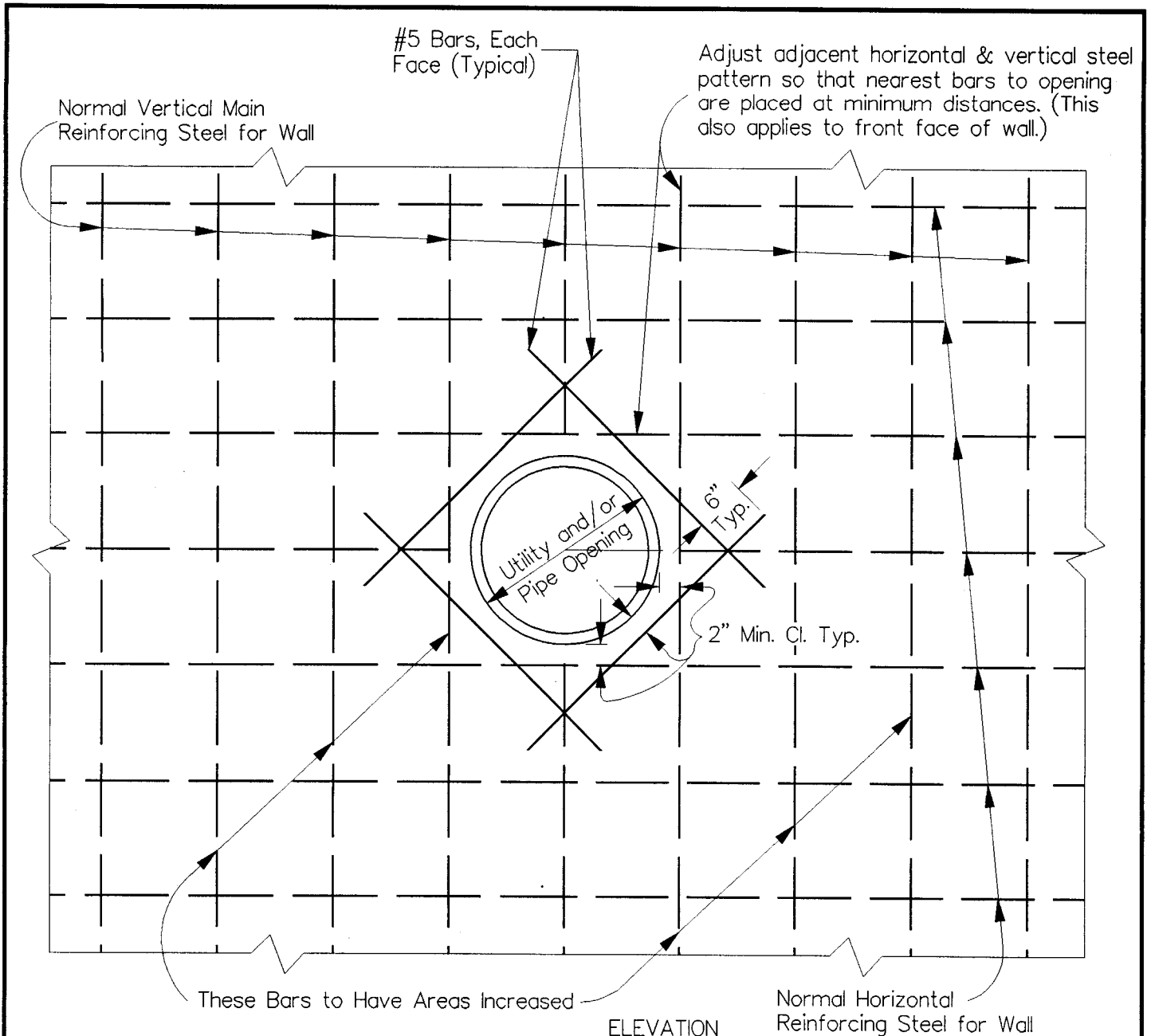


APPROVAL
Ed Adams
DIRECTOR
Phil Senn
BUR. OF ENGINEERING/CONSTRUCTION
3/10/05
DATE

DEPARTMENT OF PUBLIC WORKS
GENERAL DETAILS
**PIPE ENTRANCES
RECTANGULAR UTILITY STRUCTURES**

ISSUED: OCTOBER 28, 1996
REVISED: AUGUST, 1997
REVISED: FEBRUARY, 2005

PLATE
G-1



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".

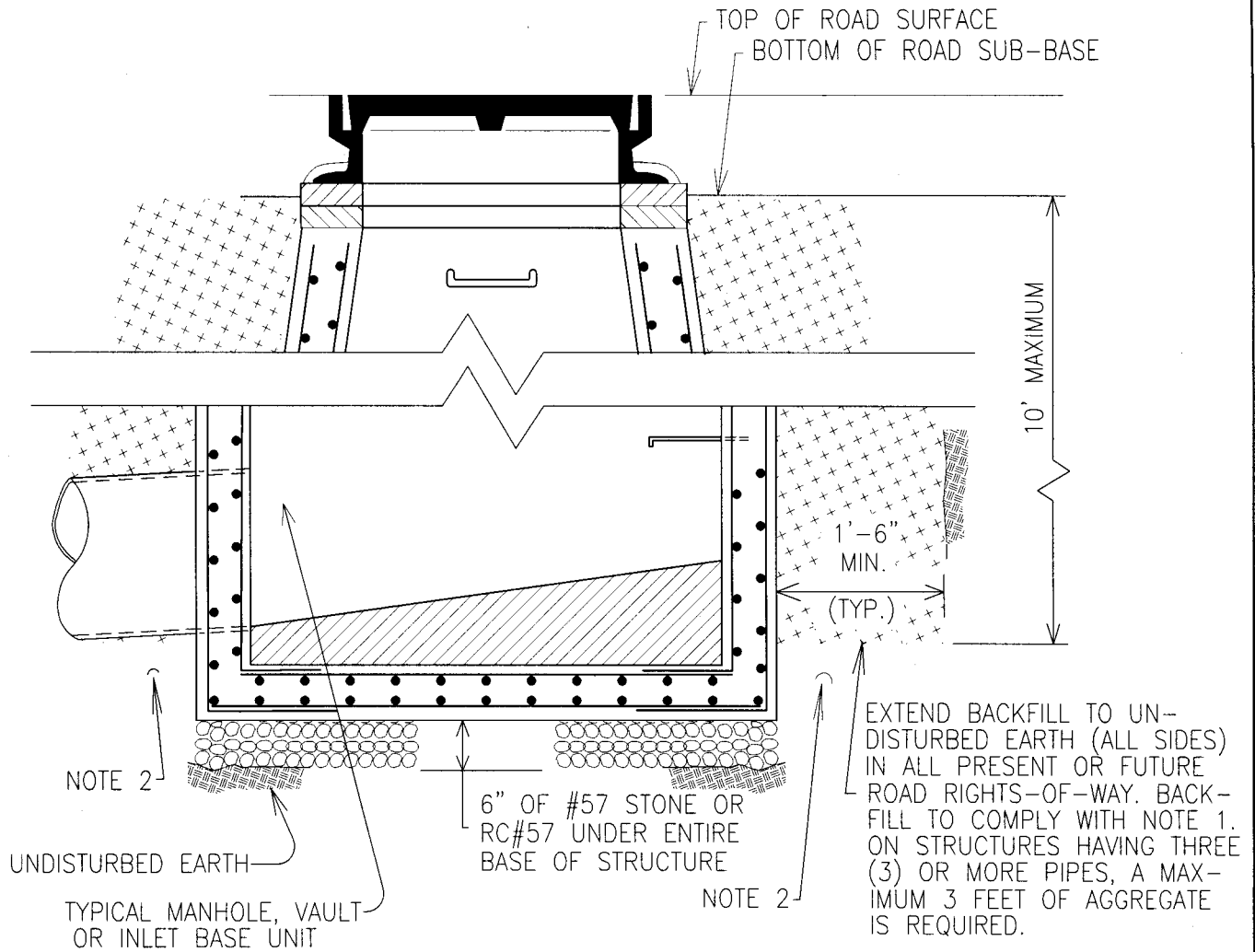


APPROVAL
William B. Moore
 DIRECTOR
 BUR. OF ENGINEERING/CONSTRUCTION
 6/20/01
 DATE

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

ISSUED: June 2001
 REVISED:
 REVISED:

PLATE
G-1A



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. WITH APPROVAL OF THE ENGINEER, RECYCLED CONCRETE MEETING CR-1 OR CR-6 GRADATIONS (RC-1 OR RC-6) MAY BE SUBSTITUTED.
2. EXCAVATION BELOW 10 FEET SHALL BE BACKFILLED WITH SUITABLE NATIVE MATERIAL OR COMMON BORROW AND SHALL BE FULLY COMPACTED TO SPECIFICATION.
3. THIS DETAIL SHALL APPLY TO ALL STORM DRAIN, WATER SUPPLY AND SANITARY SEWER STRUCTURES CONSTRUCTED WITHIN PUBLIC OR PRIVATE ROAD RIGHT-OF-WAY.
4. REFER TO SECTIONS 305.03.05 & 06 (PRECAST DRAIN-AGE STRUCTURES), 303.03.02 (PIPE CULVERT BEDDING), 1004.03.02(d) (VAULTS AROUND VALVES 16", 20", 24" & 30"), 1008.03.01 (SANITARY SEWER MANHOLES) AND 901.06 (RECYCLED CONCRETE FOR AGGREGATE).



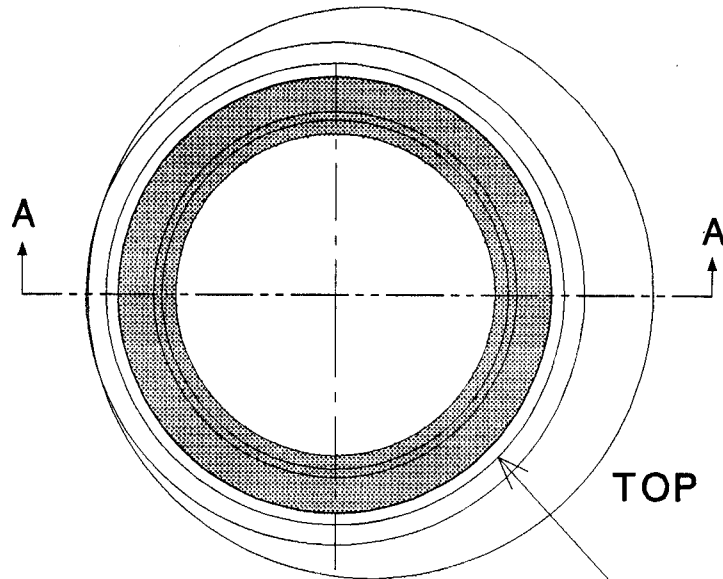
APPROVAL
[Signature]
DIRECTOR
[Signature]
BUR. OF ENGINEERING/CONSTRUCTION
7/24/06
DATE

DEPARTMENT OF PUBLIC WORKS
GENERAL DETAILS

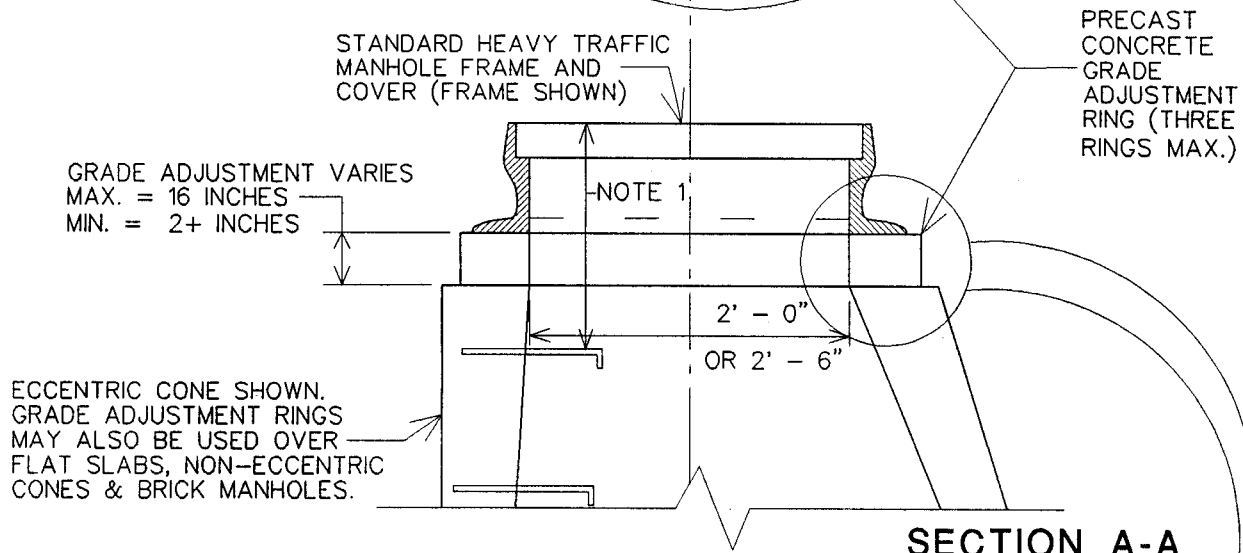
UTILITY STRUCTURES
IN ROADS

ISSUED: AUGUST, 1997
REVISED: JULY, 2006
REVISED:

PLATE
G-2



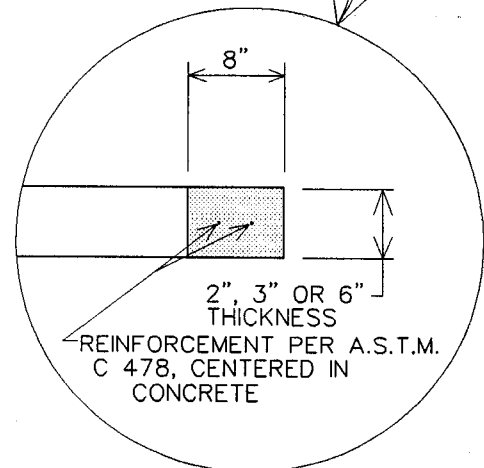
TOP VIEW



SECTION A-A

NOTES

1. SEE STANDARD DETAIL PLATE G-4 FOR MANHOLE STEP SPECIFICATIONS, 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.
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.



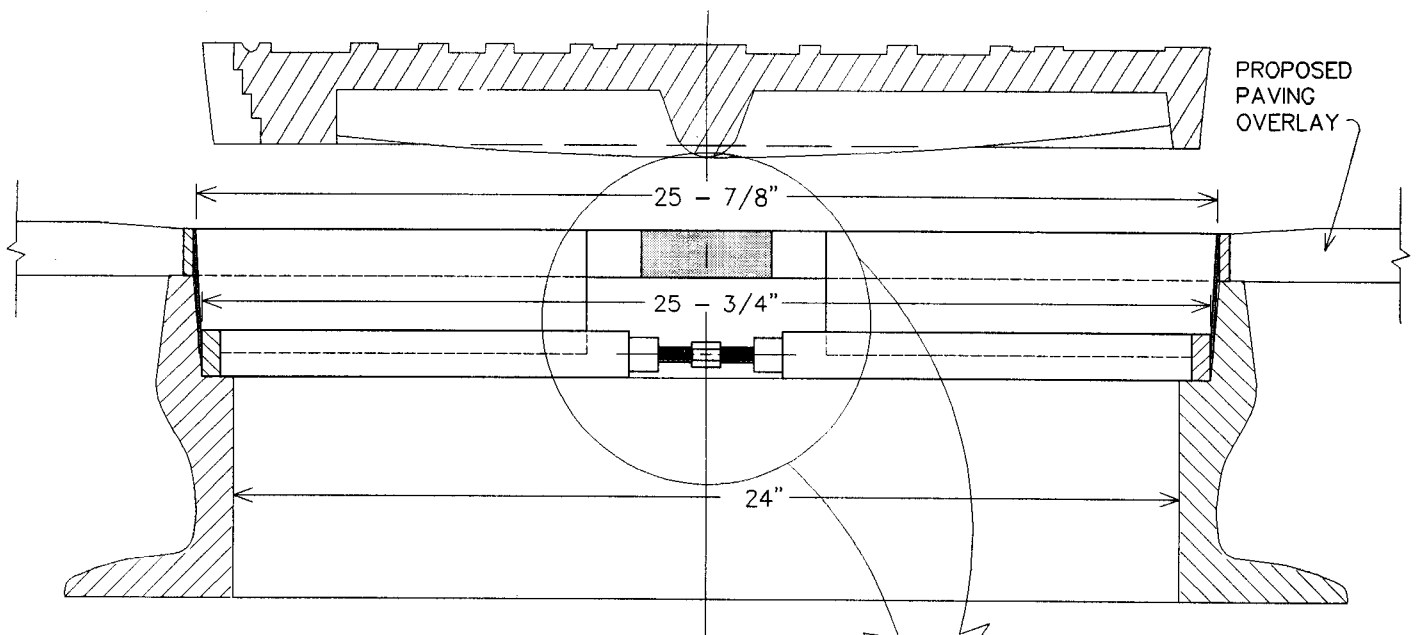
APPROVAL
William K. Ryan
 DIRECTOR
 BUR. OF ENGINEERING CONSTRUCTION
 3/18/02
 DATE

DEPARTMENT OF PUBLIC WORKS
 GENERAL DETAILS
**PRECAST CONCRETE GRADE
 ADJUSTMENT RING**

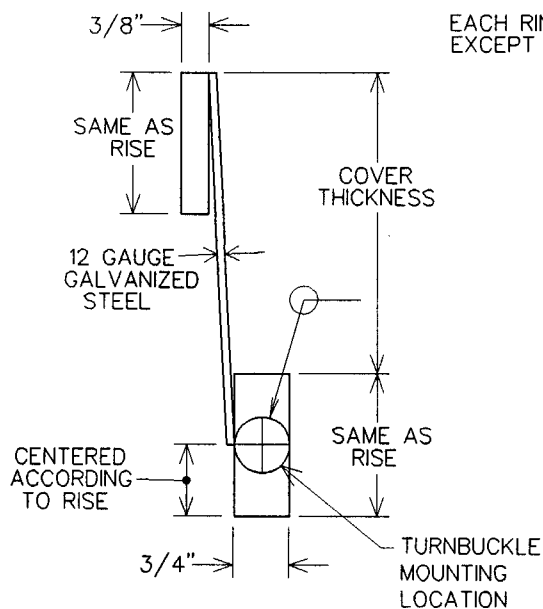
ISSUED: AUGUST, 1997
 REVISED: FEBRUARY, 2002
 REVISED:

PLATE

G-3

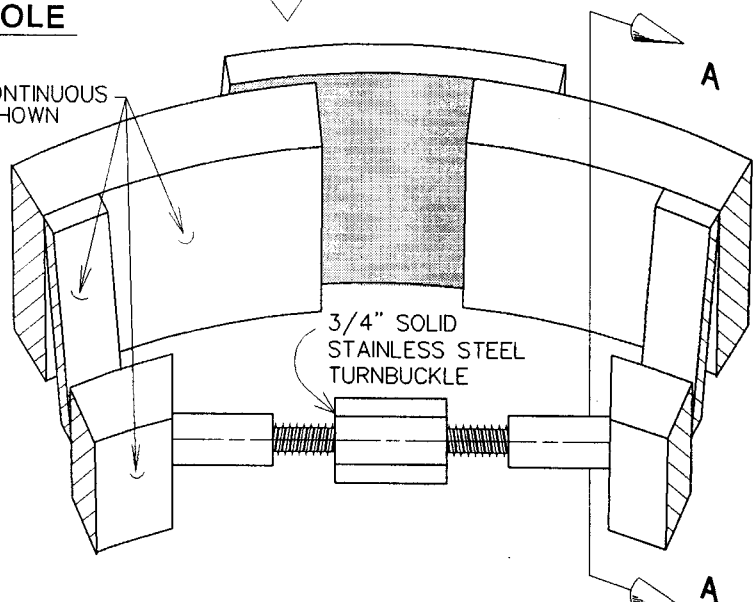


**SECTIONAL VIEW
THROUGH
CENTER OF MANHOLE**



**SECTION A - A
(RADIAL THROUGH RING)**

EACH RING CONTINUOUS
EXCEPT AS SHOWN



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.



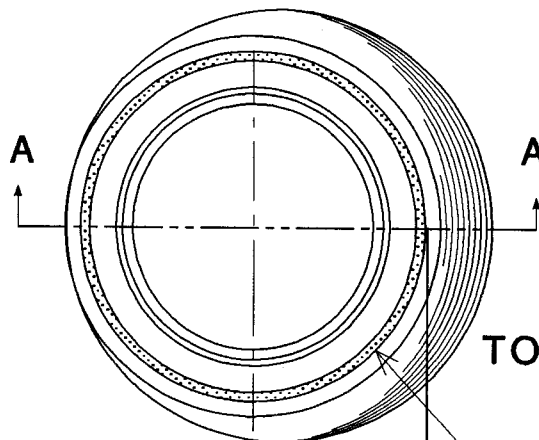
APPROVAL
David L. Adams Jr.
DIRECTOR
William K. Hysman
BUR. OF ENGINEERING/CONSTRUCTION
12/4/01
DATE

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

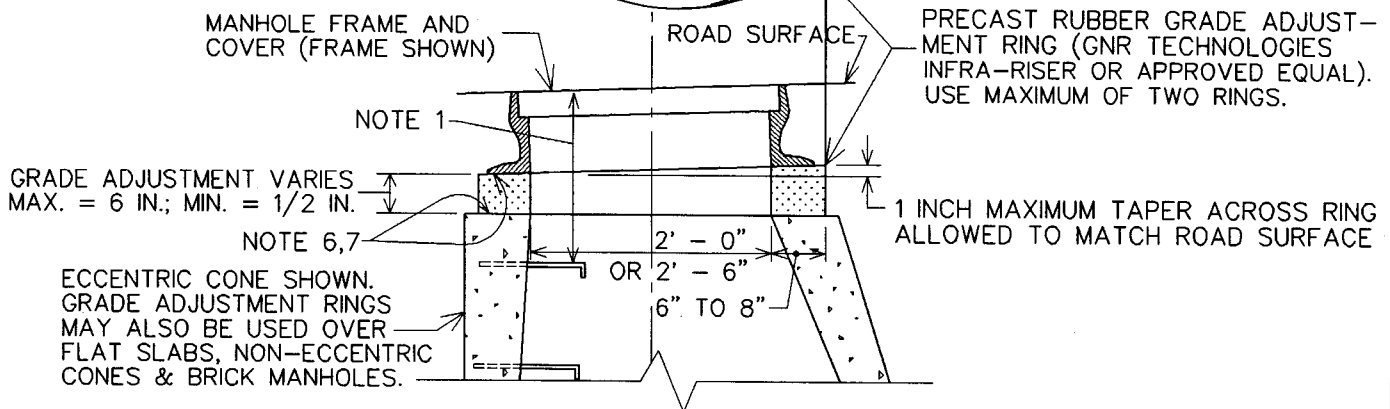
ISSUED: AUGUST, 1997
REVISED: OCTOBER, 2001
REVISED:

PLATE

G-3A



TOP VIEW



SECTION A-A

NOTES

1. SEE STANDARD DETAIL PLATE G-4 FOR MANHOLE STEP SPECIFICATIONS, 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 G-3).
4. RUBBER GRADE ADJUSTMENT RINGS SHALL BE SEALED TO THE CONCRETE (OR BRICK) STRUCTURE AND TO THE FRAME USING URETHANE-BASED SEALANT CONFORMING TO ASTM C 920-87, TYPE S, GRADE NS, CLASS 25, USE NT, M AND A (GNR TECHNOLOGIES CHEMREX CX-22 OR APPROVED EQUAL).
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 1/2 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.

PHYSICAL PROPERTIES - RUBBER RING

CRITERIA	REQUIREMENTS	ASTM TEST
Density	$\pm 1.098 \text{ g/cm}^3$	C 642-90
Durometer Hardness		Based on D 2240
Molded Surface	75A ± 10 points	
Interior Surface	73A ± 10 points	
Tensile Strength	1.6MPa (232psi) ($\geq 1 \text{ MPa}$)	D 412-87
Compression Deformation	under 1 MPa (145psi)	Based on D 575
Initial	6 \pm 2%	
Final	6 \pm 2%	
Compression Set	0.4% under 1 MPa (145 psi)	Based on D 395
Freeze/Thaw When Exposed to De-icing Chem.	No Loss After 50 Cycles	C 672-91
Coefficient of Thermal Expansion	1.08x10mm/mm/°C (6x10in/in/°F)	C 531-85
Weathering (70Hrs @ 70°C)		D 573-88
Hardness Retained	100% \pm 5%	
Compressive Strength retained	100% \pm 5%	
Tensile Str. Retained	100% \pm 5%	
Elongation Retained	100% \pm 5%	

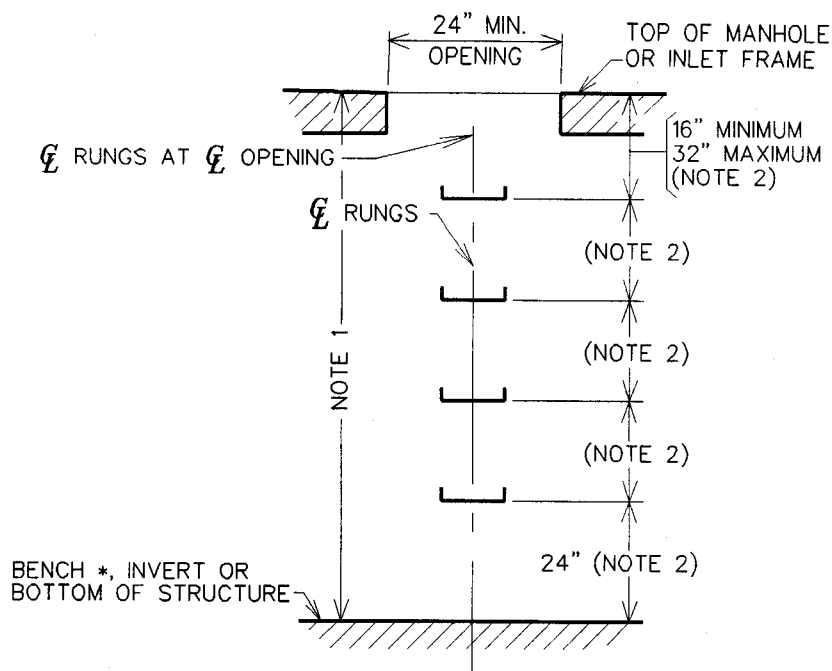


APPROVAL
Frank P. [Signature]
 DIRECTOR
William [Signature]
 BUR. OF ENGINEERING/CONSTRUCTION
 2/7/2000
 DATE

DEPARTMENT OF PUBLIC WORKS
 GENERAL DETAILS
**PRECAST RUBBER GRADE
 ADJUSTMENT RING**

ISSUED: JANUARY, 1999
 REVISED:
 REVISED:

PLATE
G-3B



NOTES

1. 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.
2. 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.
3. MINIMUM STANDARDS FOR ALTERNATE DESIGNS SHALL COMPLY WITH A.S.T.M. C-478, SEC. 13, 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 A.S.T.M. C 478 SECTION 13.6, 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.
4. WHERE BRICK CONSTRUCTION IS EMPLOYED. ADJUST MORTAR JOINTS TO ACCOMMODATE LADDER STEPS.
5. COPOLYMER POLYPROPYLENE ENCAPSULATED 1/2" DIAMETER STEEL REINFORCING BAR SHALL CONFORM TO ASTM A-615 GRADE 60.
6. COPOLYMER POLYPROPYLENE SHALL BE CERTIFIED BY THE MANUFACTURER TO CONFORM TO ASTM D 4101 AND HAVE A MINIMUM EXPOSED SECTION THICKNESS OF 1/8 INCH.
7. INSTALLATION SHALL CONFORM TO MANUFACTURER'S RECOMMENDATIONS.
8. TOP STEP SHALL PROJECT A MINIMUM OF 2 INCHES INTO THE ACCESS OPENING.
9. SEE STANDARD DETAIL G-4A FOR DRAWINGS AND DIMENSIONS OF LADDER STEPS FOR USE IN VARIOUS APPLICATIONS.



APPROVAL
Edward C. Adenot
 DIRECTOR
William J. Brown
 BUR. OF ENGINEERING/CONSTRUCTION
 12/4/01
 DATE

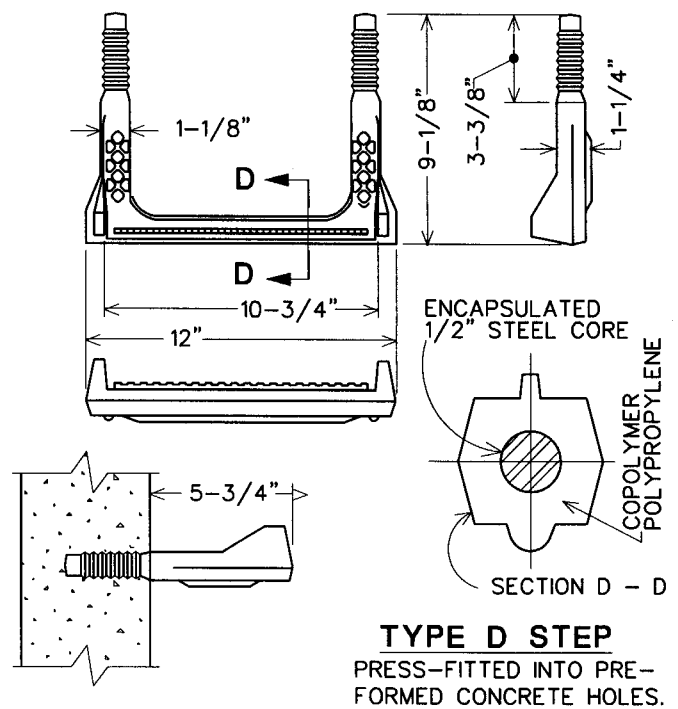
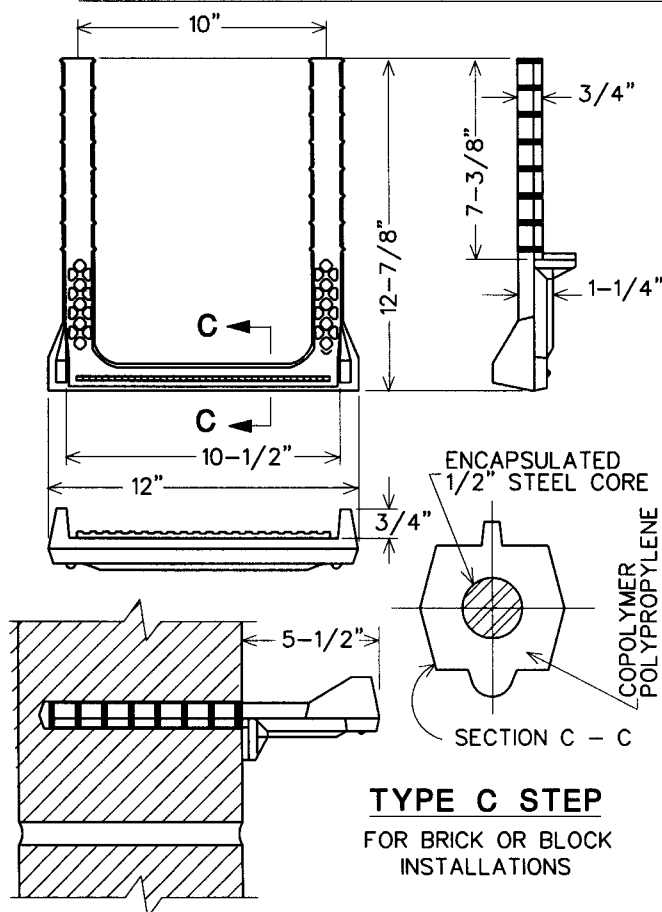
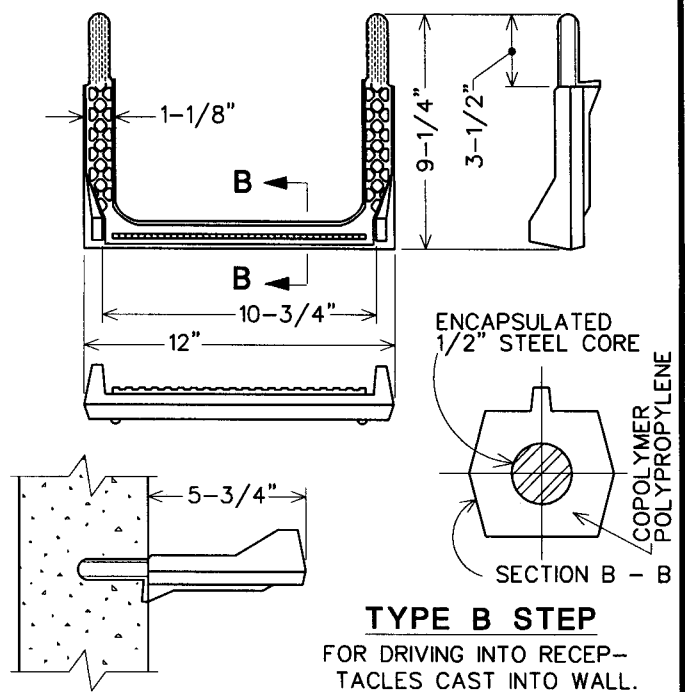
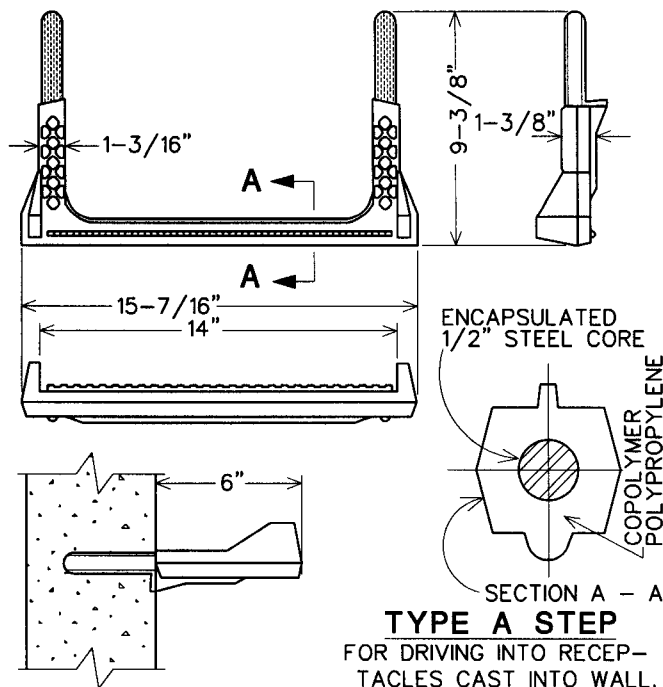
DEPARTMENT OF PUBLIC WORKS
 GENERAL DETAILS

LADDER STEPS
FOR MISC. STRUCTURES

ISSUED: OCTOBER 1977
 REVISED: JULY 1985
 REVISED: OCTOBER 2001

PLATE

G-4



SEE DETAIL PLATE G-4 FOR PLACEMENT DIAGRAM
AND NOTES.

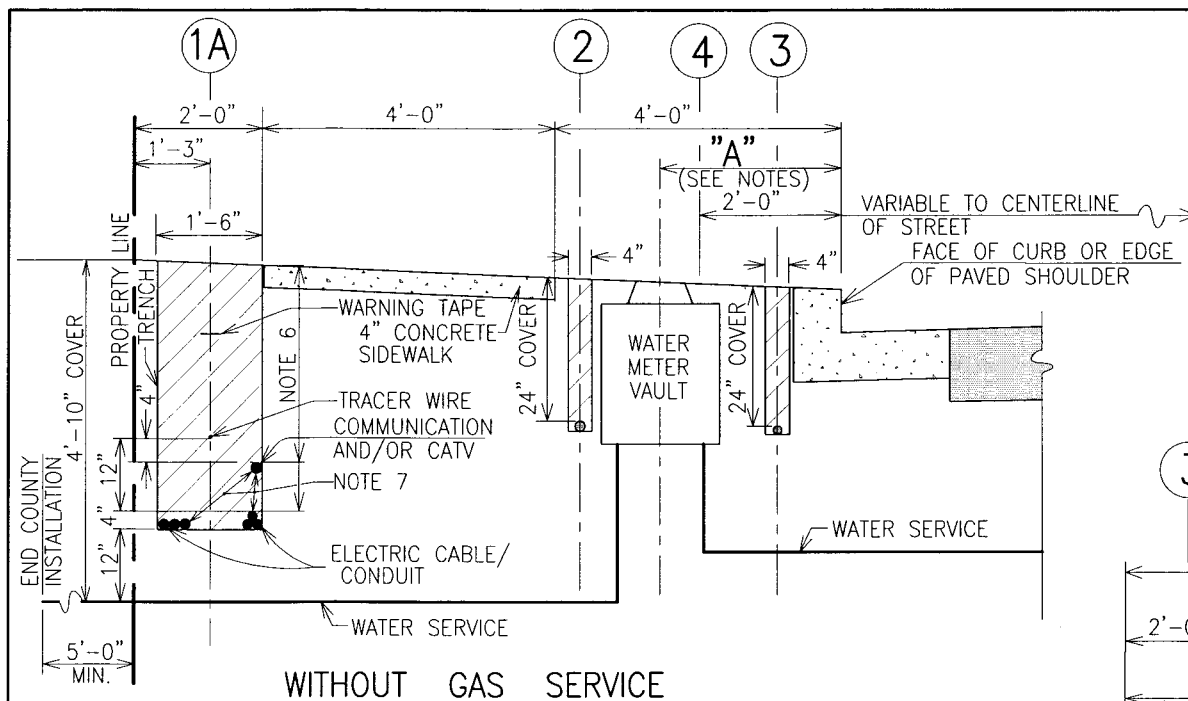


APPROVAL
William Korman
DIRECTOR
BUR. OF ENGINEERING / CONSTRUCTION
10/23/97
DATE

DEPARTMENT OF PUBLIC WORKS
GENERAL DETAILS
**COPOLYMER POLYPROPYLENE
LADDER STEPS**
FOR MANHOLES & INLETS

ISSUED: AUGUST, 1997
REVISED:
REVISED:

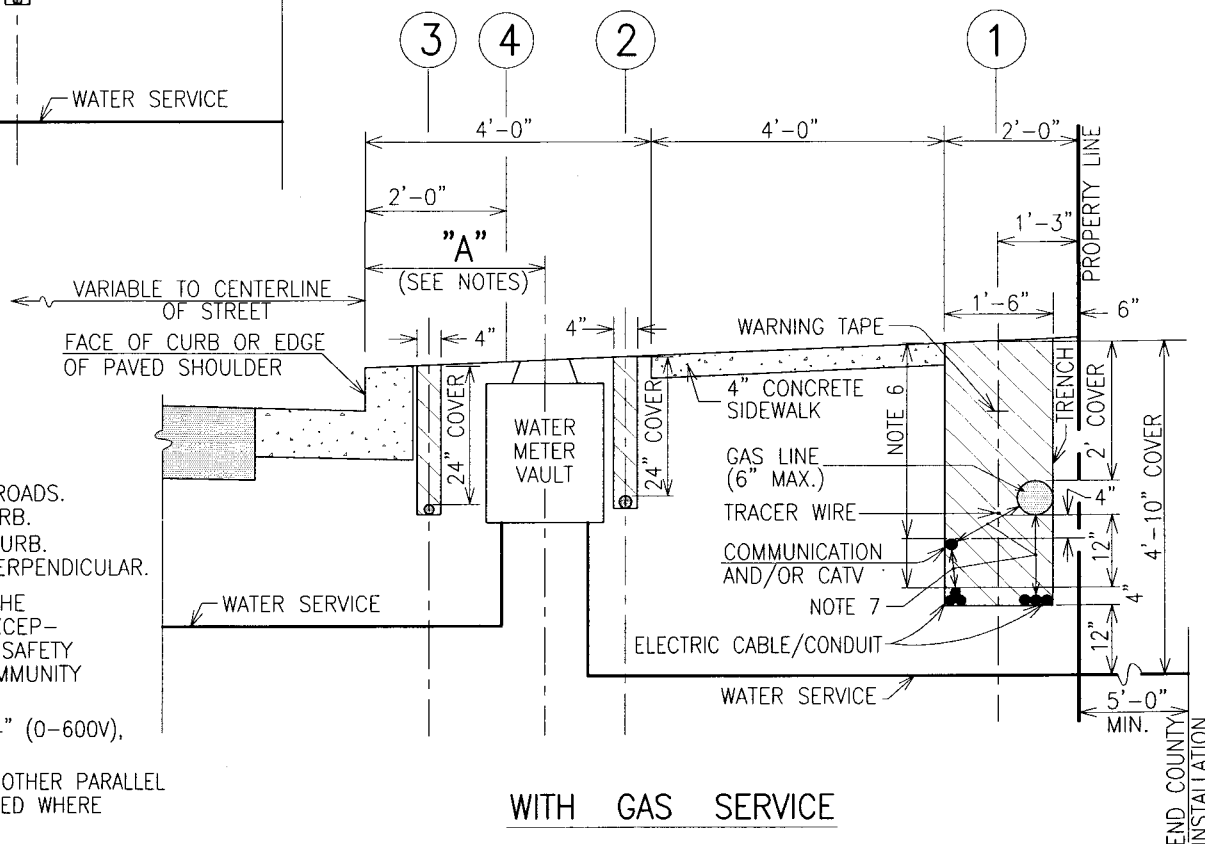
PLATE
G-4A



- 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 ALTERNATE LOCATION FOR COMMUNICATION AND/OR CATV
- 3 RESERVED FOR STREET LIGHT POWER AND/OR SIGNALIZATION CABLES APPURTENANT TO HIGHWAY USE
- 4 CENTERLINE OF FIRE HYDRANT & TRAFFIC SIGNS

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.



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



APPROVAL
[Signature]
DIRECTOR
[Signature]
BUR. OF ENGINEERING/CONSTRUCTION
1-2-02
DATE

ISSUED: OCTOBER 1977
REVISED: NOVEMBER 1983
REVISED: NOVEMBER 2006

PLATE

G-5

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.
RED MAPLE (*Acer rubrum*) "October Glory" brand, "Red Sunset"
SUGAR MAPLE (*Acer saccharum*) "Legacy"
HACKBERRY (*Celtis occidentalis*) "Hackberry", "Prairie Pride"
"Magnifica"
KATSURA-TREE (*Cercidiphyllum japonicum*)
WHITE ASH (*Fraxinus americana*) "Autumn Applause", "Autumn Blaze"
GREEN ASH (*Fraxinus pennsylvanica*) "Newport", "Patmore", "Summit", "Marshall's Seedless", "Prairie Spire"
GINKGO (*Ginkgo biloba*) "Magyar upright"
THORNLESS HONEYLOCUST (*Gleditsia triacanthos inermis*) "Skyline"

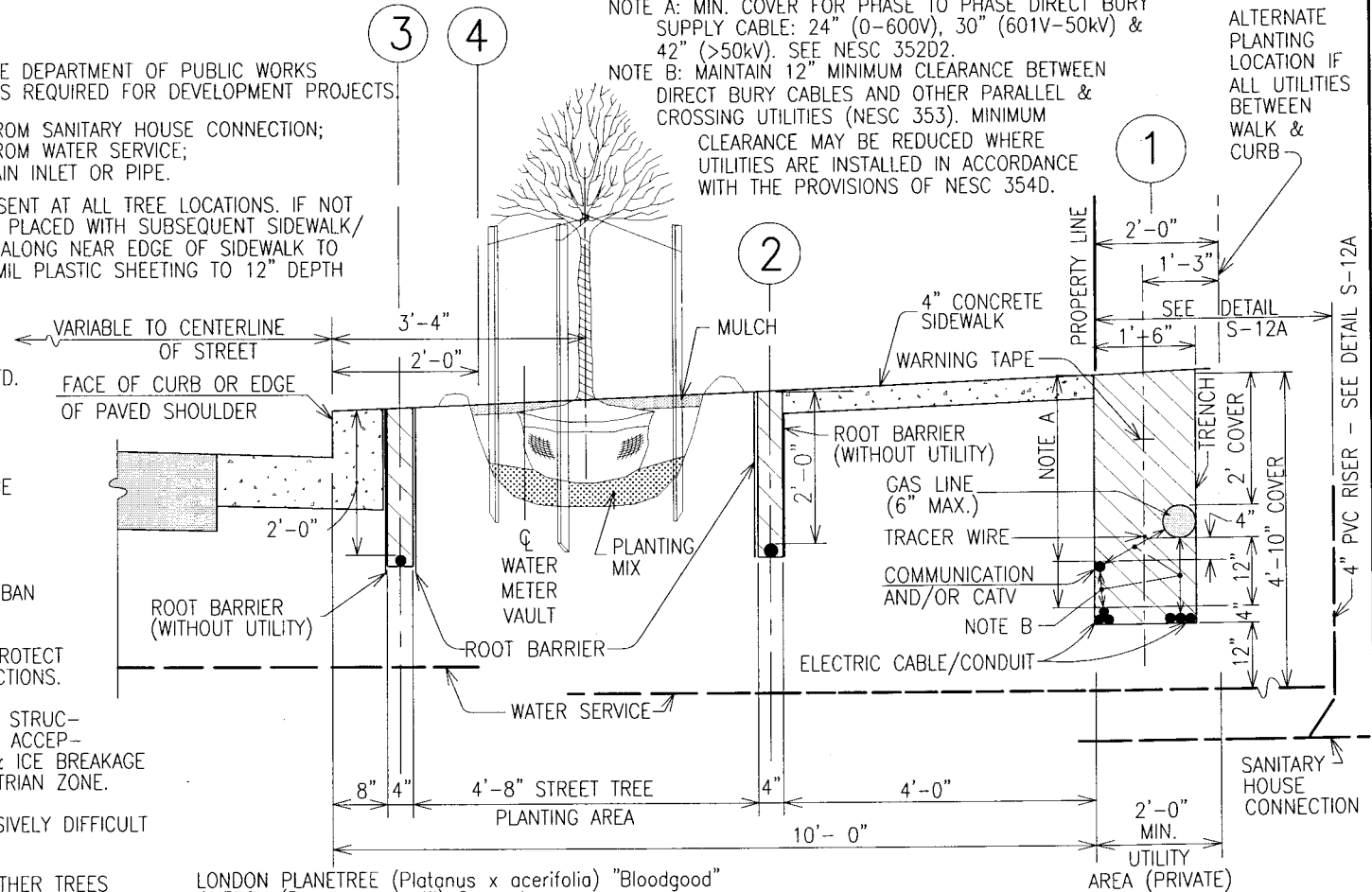
LONDON PLANETREE (*Platanus x acerifolia*) "Bloodgood"
CHERRY (*Prunus sargentii*) Sargent
PEAR (*Pyrus calleryana*) "Chanticleer"
PIN OAK (*Quercus palustris*)
NORTHERN RED OAK (*Quercus rubra*)
SCHOLARTREE (*Sophora japonica*) "Princeton Upright"
JAPANESE PAGODA TREE (*Sophora japonica*) "Regent"
LINDEN (*Tilia americana*) "Boulevard", "Fastigiata", "Redmond"
(*Tilia cordata*) "Greenspire" brand littleleaf
(*Tilia tomentosa*) "Green Mountain" brand silver
(*Tilia x euchlora*) Crimean
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



- 1 JOINT TRENCH FOR INSTALLATION OF GAS, ELECTRIC COMMUNICATION AND CATV IN BG&E EASEMENT
- 2 ALTERNATE LOCATION FOR COMMUNICATION AND/OR CATV
- 3 RESERVED FOR STREET LIGHT POWER AND/OR SIGNALIZATION CABLES APPURTENANT TO HIGHWAY USE
- 4 FIRE HYDRANTS & TRAFFIC SIGNS

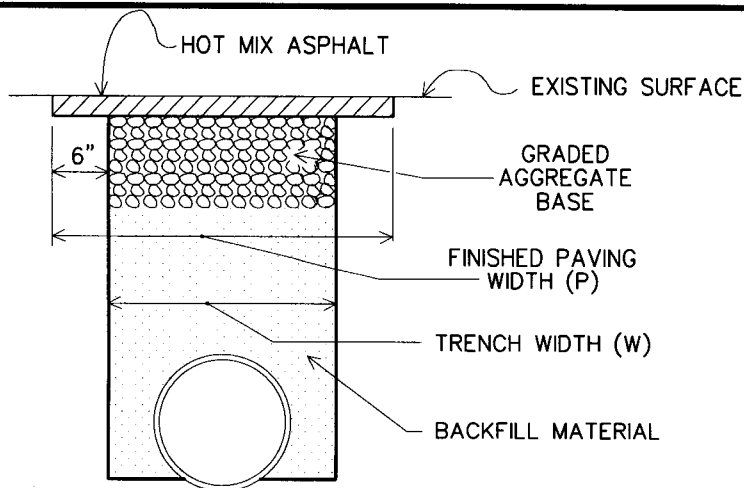


Pat All
DIRECTOR
Pat All
BUR. OF ENGINEERING/CONSTRUCTION
1-2-07
DATE

DEPARTMENT OF PUBLIC WORKS GENERAL DETAILS PUBLIC ROAD UTILITY & STREET TREE LOCATIONS

ISSUED: OCTOBER 28, 1996
REVISED: AUGUST, 1997
REVISED: SEPTEMBER, 2006

PLATE
G-5A



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"

* 16' TO INVERT OF PIPE



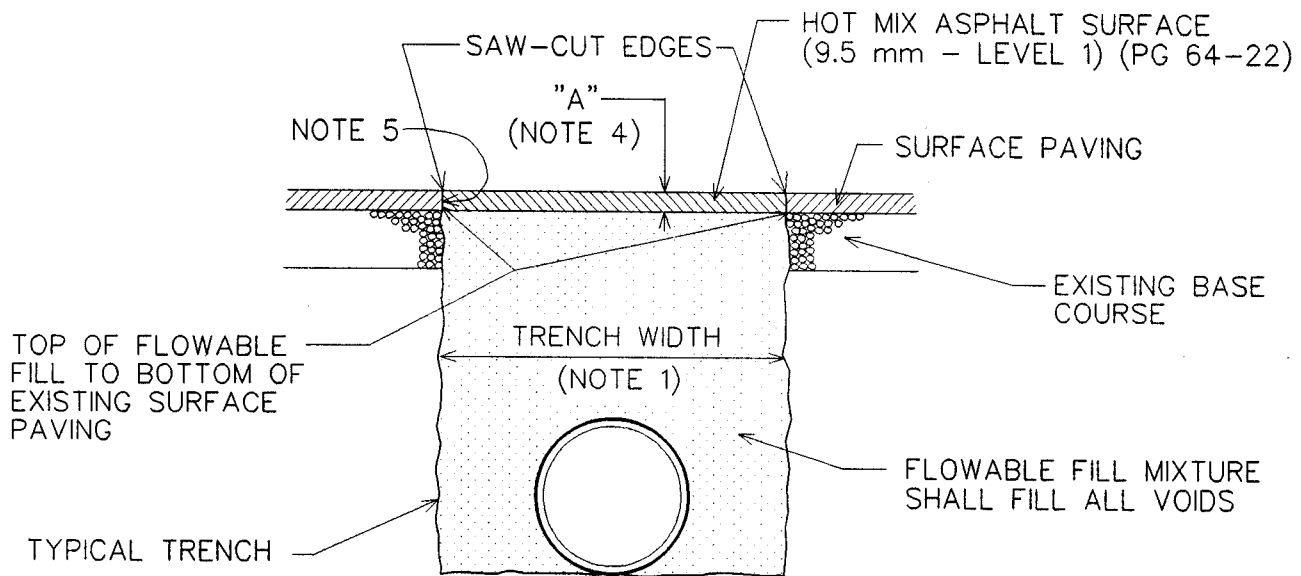
APPROVAL

 DIRECTOR
 BUR. OF ENGINEERING/CONSTRUCTION
 DATE 10/23/97

DEPARTMENT OF PUBLIC WORKS
 GENERAL DETAILS
**TRENCH AND
 TRENCH PAYMENT WIDTH**

ISSUED: OCTOBER 1977
 REVISED: JUNE 1985
 REVISED: AUGUST 1997

PLATE
G-6



NOTE

1. MINIMUM TRENCH WIDTH SHALL BE OUTSIDE DIAMETER OF PIPE PLUS 4" (2" ON EITHER SIDE OF PIPE). MAXIMUM TRENCH PAYMENT WIDTH PER STANDARD DETAIL G-6.
2. PIPE SHALL NOT BE ALLOWED TO MOVE DURING PLACEMENT OF FLOWABLE FILL. SUITABLE ANCHORING OR WEIGHTING SHALL BE PROVIDED TO PREVENT SUCH MOVEMENT.
3. TRENCH SHALL BE PLATED OVER DURING 24 HOUR CURING PERIOD.
4. DIMENSION "A" SHALL BE SUFFICIENT TO MATCH THE THICKNESS OF ADJACENT EXISTING BOUND PAVING WITHIN BOTH BALTIMORE COUNTY AND MARYLAND S.H.A. RIGHT OF WAY. DIMENSION "A" WITHIN MARYLAND S.H.A. RIGHT OF WAY SHALL BE A MINIMUM OF 9 INCHES AND A MINIMUM OF 3" WITHIN BALTIMORE COUNTY RIGHT-OF-WAY.
5. TACK COAT EDGE OF EXISTING HOT MIX ASPHALT PAVING IMMEDIATELY PRIOR TO PLACING SURFACE COURSE OVER TRENCH.
6. FLOWABLE FILL SHALL BE FURNISHED AND PLACED AS SPECIFIED IN SECTION 313, "FLOWABLE BACKFILL FOR UTILITY CUTS", IN THE "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS".

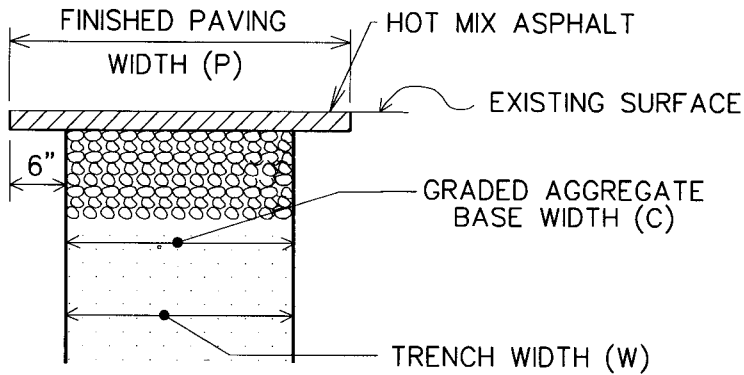


APPROVAL
 DIRECTOR
 William Koppman
 BUR. OF ENGINEERING/CONSTRUCTION
 3/18/02
 DATE

DEPARTMENT OF PUBLIC WORKS
 GENERAL DETAILS
 OPEN CUT TRENCH REPAIR
 USING FLOWABLE FILL

ISSUED: AUGUST, 1997
 REVISED: MARCH, 2002
 REVISED:

PLATE
 G-6A



REPAVING QUANTITIES SHOWN IN TONS PER LINEAR FOOT

Graded Aggregate Base =
145 Lb./Cu.Ft.

Hot Mix Asphalt = 150 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"	0.218	0.037	0.075
8"	0.218	0.037	0.075
10"	0.218	0.037	0.075
12"	0.218	0.037	0.075
15" & 16"	0.218	0.037	0.075
18"	0.254	0.044	0.084
20" & 21"	0.254	0.044	0.084
24"	0.290	0.050	0.094
27"	0.363	0.062	0.112
30"	0.363	0.062	0.112
33"	0.399	0.069	0.122
36"	0.399	0.069	0.122
42"	0.471	0.081	0.140
48"	0.508	0.087	0.150
54"	0.580	0.100	0.168
60"	0.616	0.106	0.178
66"	0.653	0.112	0.187
72"	0.725	0.125	0.206
78"	0.798	0.137	0.225
84"	0.834	0.144	0.234
90"	0.870	0.150	0.243
102"	0.943	0.162	0.262
108"	1.015	0.175	0.281
BRACING ADDITIVES			
SINGLE TIER	ADD 0.145	ADD 0.025	ADD 0.037
DOUBLE TIER	ADD 0.290	ADD 0.050	ADD 0.075



APPROVAL

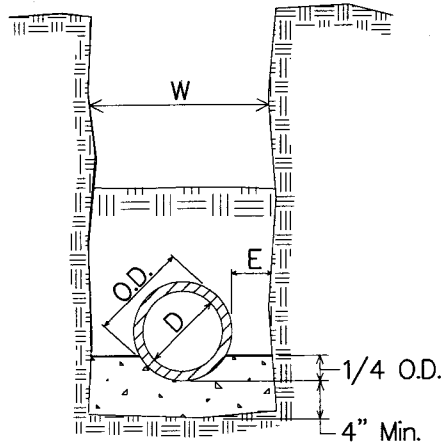
DIRECTOR
BUR. OF ENGINEERING / CONSTRUCTION
10/23/97
DATE

DEPARTMENT OF PUBLIC WORKS GENERAL DETAILS PAYMENT QUANTITIES FOR REPAVING TRENCHES

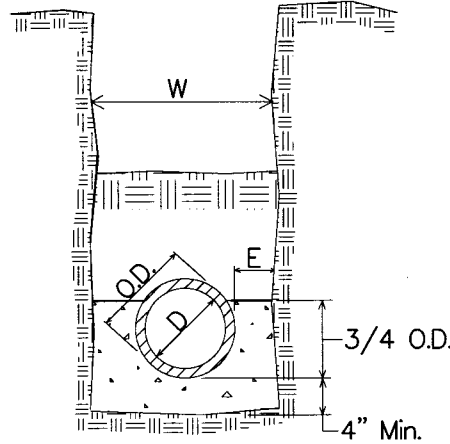
ISSUED: OCTOBER 1977
REVISED: JUNE 1985
REVISED: AUGUST 1997

PLATE

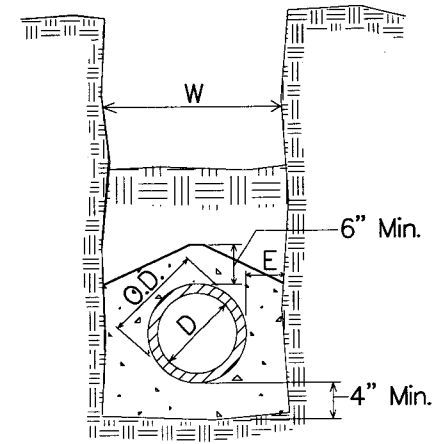
G-7



CONCRETE LOW CRADLE



CONCRETE HIGH CRADLE



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.



APPROVAL
 DIRECTOR
William J. [Signature]
 BUR. OF ENGINEERING/CONSTRUCTION
 10/23/97
 DATE

DEPARTMENT OF PUBLIC WORKS
 GENERAL DETAILS
TRENCH CRADLE AND ENCASEMENT

ISSUED: OCTOBER 1977
 REVISED: AUGUST 1997
 REVISED:

PLATE
G-8

TABLE A: STAIRWAYS		
Slope	Riser	Step Tread
1.57:1*	7"	11" Min.*
2:1	6"	12"
4:1	4"	16"

Bars A to be equally spaced.
For number of bars, see
Table B.

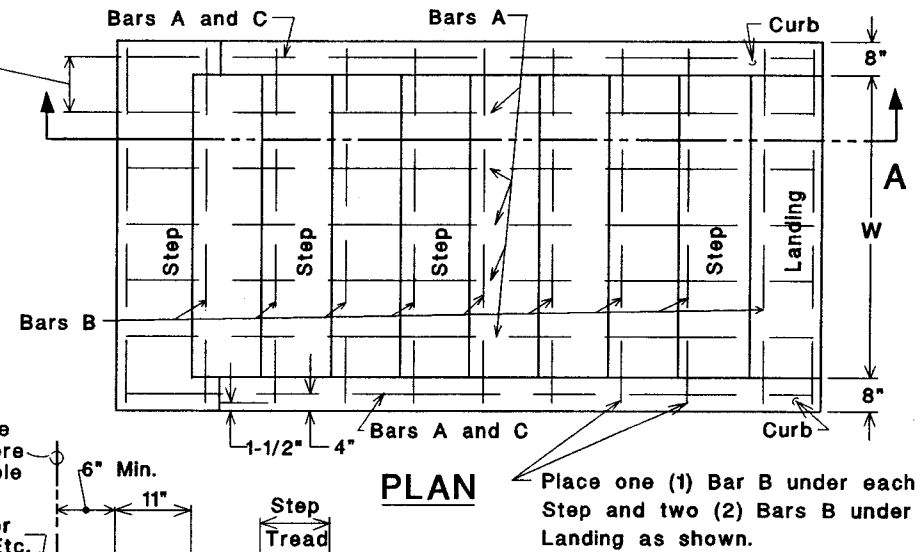
* 11" Minimum per BOCA

TABLE B: NUMBER OF BARS									
NO. OF STEPS: * WIDTH W	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

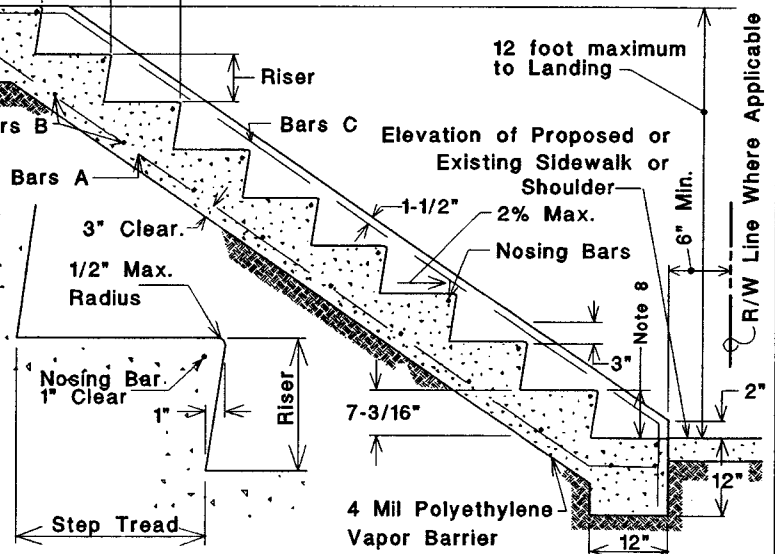
N indicates the number of steps exclusive of "Landing".
For other widths, the approximate spacing of Bars A in inches
will be equal to $80 / N$ with a minimum spacing of 6".

NOTES:

- Concrete is Mix No. 2. Chamfers shall be $3/4"$ x $3/4"$.
- Stair width W shall be in compliance with BOCA, latest edition, for means of egress stairway. Least dimension of landings shall not be less than req'd. 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 No. — 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.



Elevation of Proposed or
Existing Sidewalk, Yard, Etc.



STEP DETAIL

SECTION A - A



APPROVAL
William H. Appman
DIRECTOR
BUREAU OF ENGINEERING/CONSTRUCTION
11/24/99
DATE

DEPARTMENT OF PUBLIC WORKS
GENERAL DETAILS

CONCRETE STAIRS

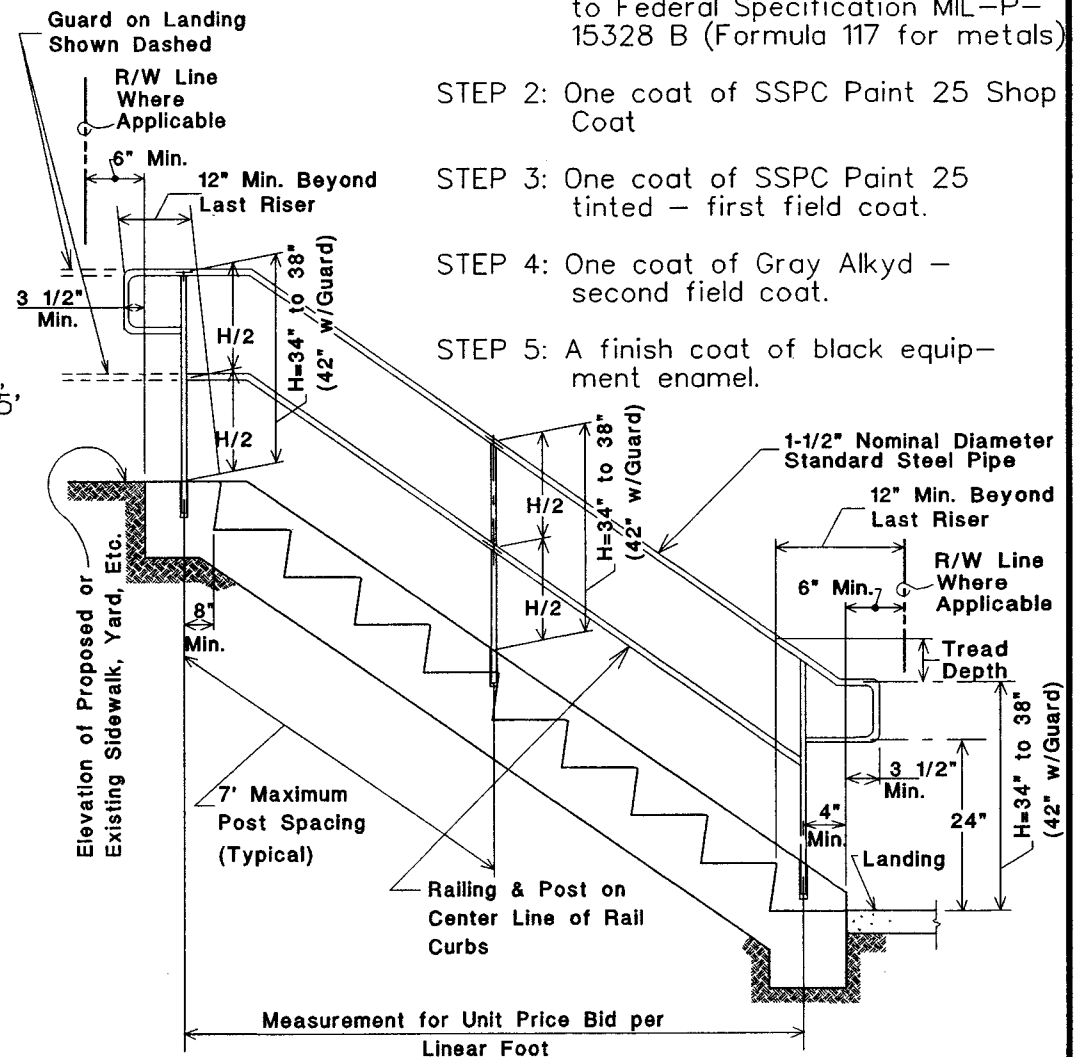
ISSUED: OCTOBER, 1977
REVISED: FEBRUARY, 1981
REVISED: AUGUST, 1997

PLATE

G-9

NOTES

1. Unless otherwise noted, painted railing shall be furnished.
2. Railings and posts to be painted shall conform to A.S.T.M. Designation A-36. See painting notes.
3. Railing and posts to be galvanized shall conform to A.S.T.M. Designation A-441. Galvanized railings shall be hot-dip galvanized after fabrication.
4. Handrails are required for stairs with three (3) or more risers. Stairs having a step width of 40 inches or less shall have handrail on one side only, unless otherwise noted. 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 lead or 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 # - Concrete for Steps & Miscellaneous Structures", complete in place.



PAINTING NOTES

- STEP 1: Primer pretreatment conforming to Federal Specification MIL-P-15328 B (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.



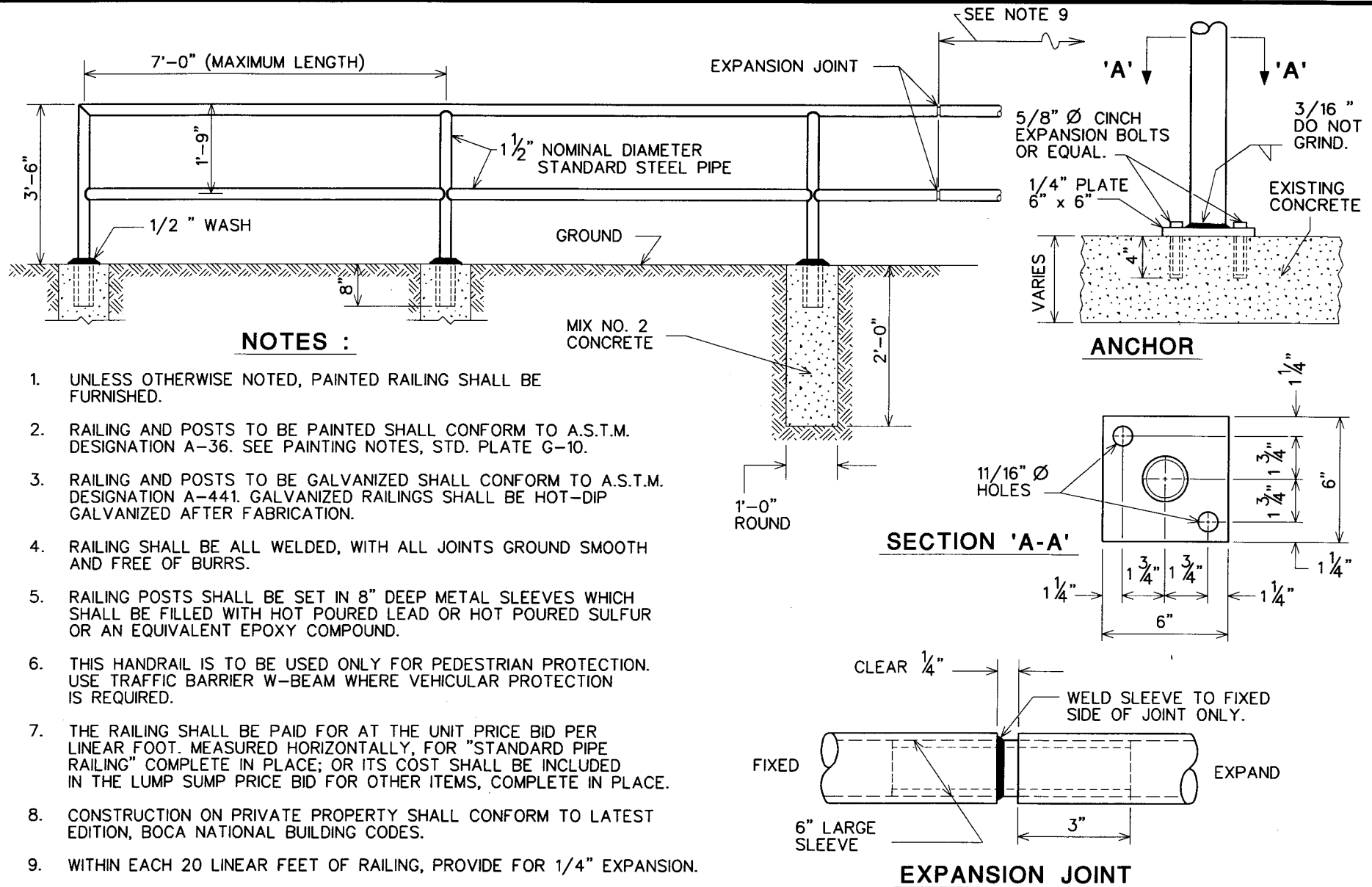
APPROVAL
William J. Hoffman
 DIRECTOR
 BUR. OF ENGINEERING/CONSTRUCTION
 11/24/99
 DATE

DEPARTMENT OF PUBLIC WORKS
 GENERAL DETAILS

PIPE RAILING FOR CONCRETE STAIRS

ISSUED: OCTOBER, 1977
 REVISED: FEBRUARY, 1981
 REVISED: AUGUST, 1997

PLATE
G-10



NOTES :

1. UNLESS OTHERWISE NOTED, PAINTED RAILING SHALL BE FURNISHED.
2. RAILING AND POSTS TO BE PAINTED SHALL CONFORM TO A.S.T.M. DESIGNATION A-36. SEE PAINTING NOTES, STD. PLATE G-10.
3. RAILING AND POSTS TO BE GALVANIZED SHALL CONFORM TO A.S.T.M. DESIGNATION A-441. GALVANIZED RAILINGS SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
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 LEAD OR 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, BOCA NATIONAL BUILDING CODES.
9. WITHIN EACH 20 LINEAR FEET OF RAILING, PROVIDE FOR 1/4" EXPANSION.



APPROVAL
William J. Logan
 DIRECTOR
 BUR. OF ENGINEERING/CONSTRUCTION
 10/23/97
 DATE

DEPARTMENT OF PUBLIC WORKS
 GENERAL DETAILS

PIPE RAILING WELDED CONSTRUCTION

ISSUED: MAY, 1979
 REVISED: FEBRUARY, 1981
 REVISED: AUGUST, 1997

PLATE

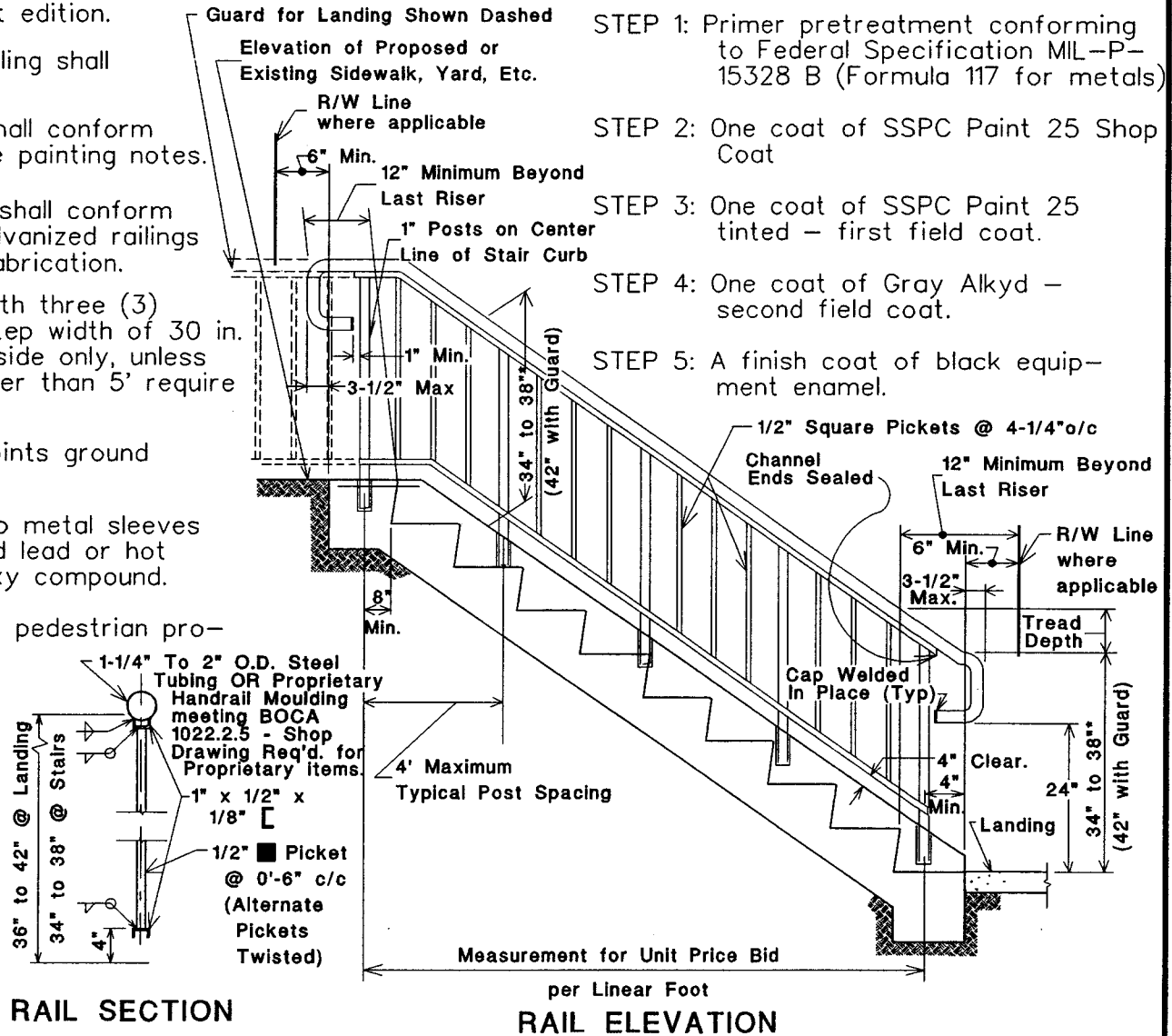
G-11

NOTES

1. Construction on private property shall conform to BOCA National Building Code, latest edition.
 2. Unless otherwise noted, painted railing shall be furnished.
 3. Railings and posts to be painted shall conform to A.S.T.M. Designation A-36. See painting notes.
 4. Railing and posts to be galvanized shall conform to A.S.T.M. Designation A-441. Galvanized railings shall be hot-dip galvanized after fabrication.
 5. Handrails are required for stairs with three (3) or more risers. Stairs having a step width of 30 in. or less shall have handrail on one side only, unless otherwise noted. Step widths greater than 5' require an intermediate handrail.
 6. Railing shall be all welded, with all joints ground smooth and free of burrs.
 7. Railing posts shall be set in 6" deep metal sleeves which shall be filled with hot poured lead or hot poured sulfur or an equivalent epoxy compound.
 8. This handrail is to be used only for pedestrian protection. Use Traffic Barrier W-Beam where vehicular protection is required.
 9. The railing shall be paid for at the Unit Price bid per Linear Foot, measured horizontally, for for "Standard Ornamental Railing for Concrete Stairs", complete in place; or its cost shall be included in the price bid per Cubic Yard for "Mix #__ Concrete for Steps and Miscellaneous Structures", complete in place.
-
- Guaranteed
- 1022.2.5
Drawing
Proprietary
- 1" x 1/8"
@
(A)
P
T
- RAIL SECTION**

PAINTING NOTES

- STEP 1: Primer pretreatment conforming to Federal Specification MIL-P-15328 B (Formula 117 for metals)
- STEP 2: One coat of SSPC Paint 25 Shop Coat
- d
- STEP 3: One coat of SSPC Paint 25 tinted — first field coat.
- er
- b
- STEP 4: One coat of Gray Alkyd — second field coat.
- STEP 5: A finish coat of black equipment enamel.



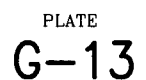
APPROVAL
William J. Ryan
 DIRECTOR
 BUR. OF ENGINEERING/CONSTRUCTION
 11/24/99
 DATE

DEPARTMENT OF PUBLIC WORKS
GENERAL DETAILS

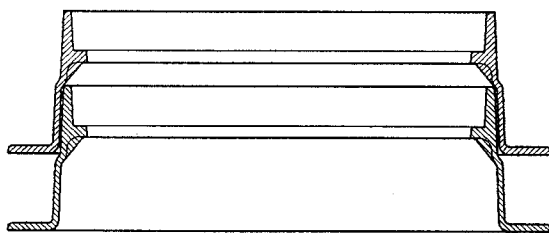
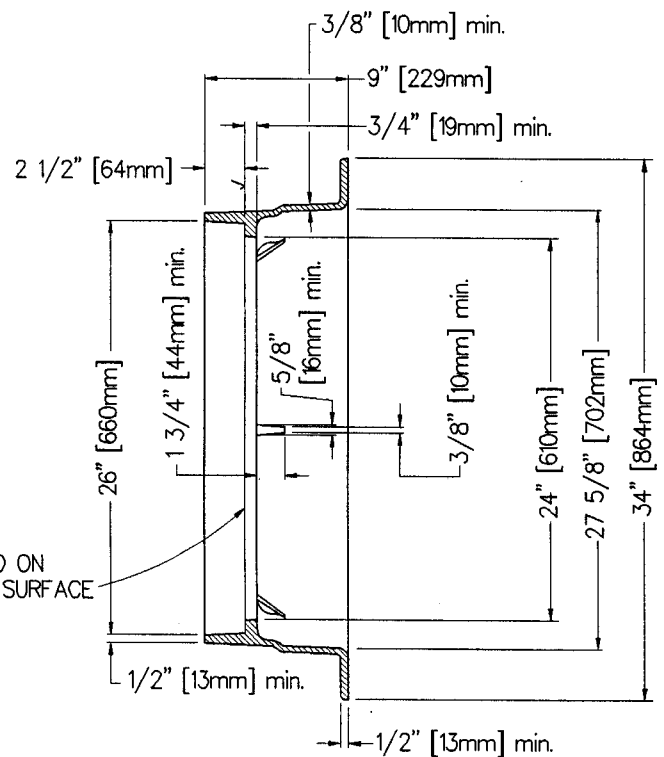
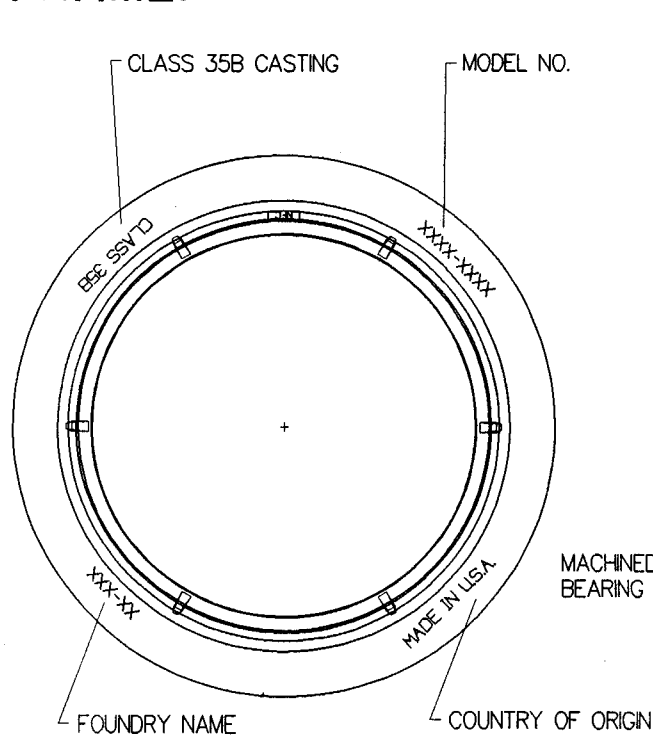
ORNAMENTAL RAILING FOR CONCRETE STAIRS

ISSUED:	OCTOBER 1977
REVISED:	AUGUST 1997
REVISED:	

PLATE
G-12



FRAME:



OPTIONAL FRAME STACKABILITY

NOTE: ALL DIMENSIONS ARE SHOWN IN ENGLISH AND [METRIC].
 MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
 FINISH: NOT PAINTED
 FRAME WEIGHT: APPROXIMATELY 140 LBS MINIMUM
 COVER: PER STANDARD DETAILS S-8B OR D-305B AS APPLICABLE.
 ANCHOR BOLT HOLES: (4) 1" [25mm] ON 30 1/4" DIA. BOLT HOLE CIRCLE
 ARE OPTIONAL

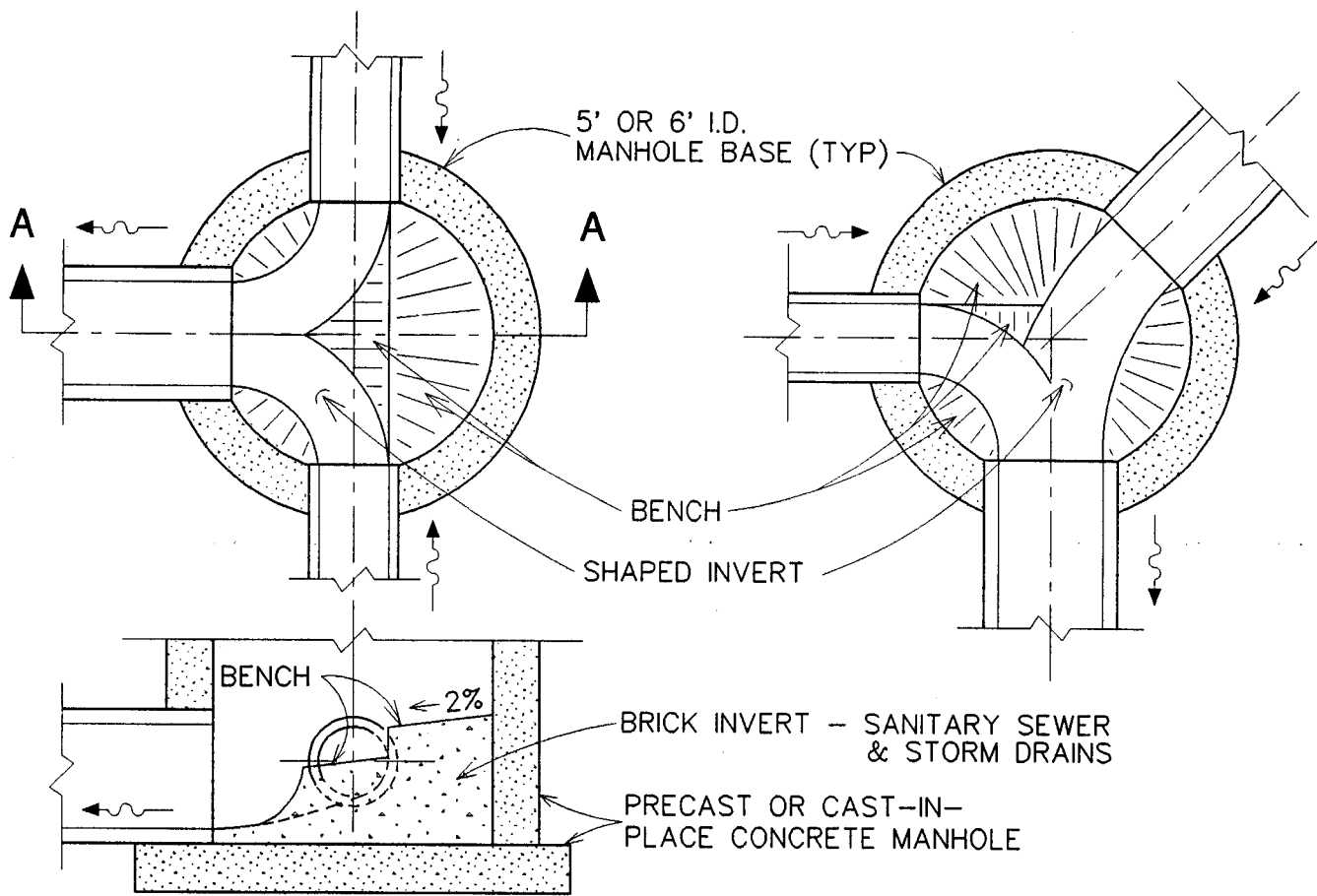


APPROVAL
William R. [Signature]
 DIRECTOR
 BUR. OF ENGINEERING/CONSTRUCTION
 2/14/00
 DATE

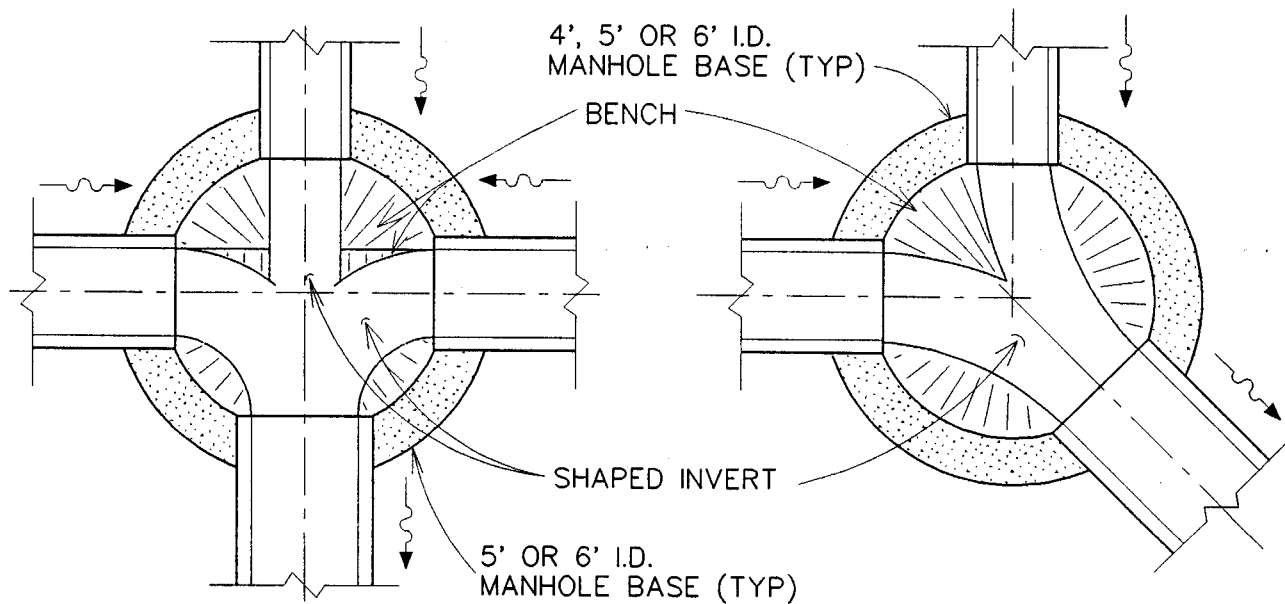
DEPARTMENT OF PUBLIC WORKS
 GENERAL DETAILS
MANHOLE FRAME
 STRAIGHT SIDES, CLASS 35B

ISSUED: DECEMBER, 1999
 REVISED:
 REVISED:

PLATE
G-14



SECTION A - A



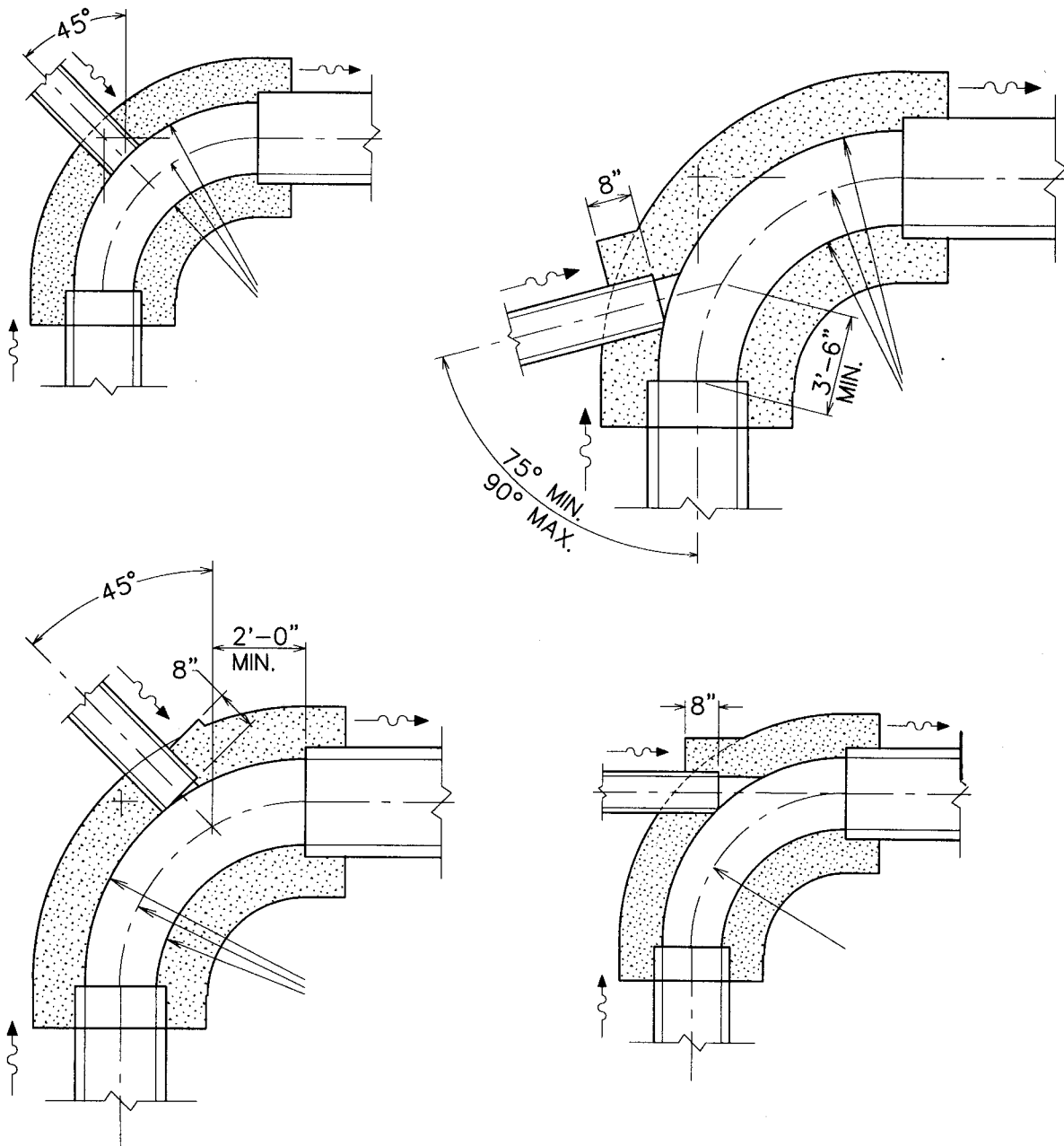
APPROVAL
William K. Kypman
 DIRECTOR
 BUR. OF ENGINEERING/CONSTRUCTION
 3/18/02
 DATE

DEPARTMENT OF PUBLIC WORKS
 GENERAL DETAILS
INVERT PLANS
 MANHOLES WITH LATERALS

ISSUED: AUGUST, 1997
 REVISED: JANUARY, 2002
 REVISED:

PLATE

G-15



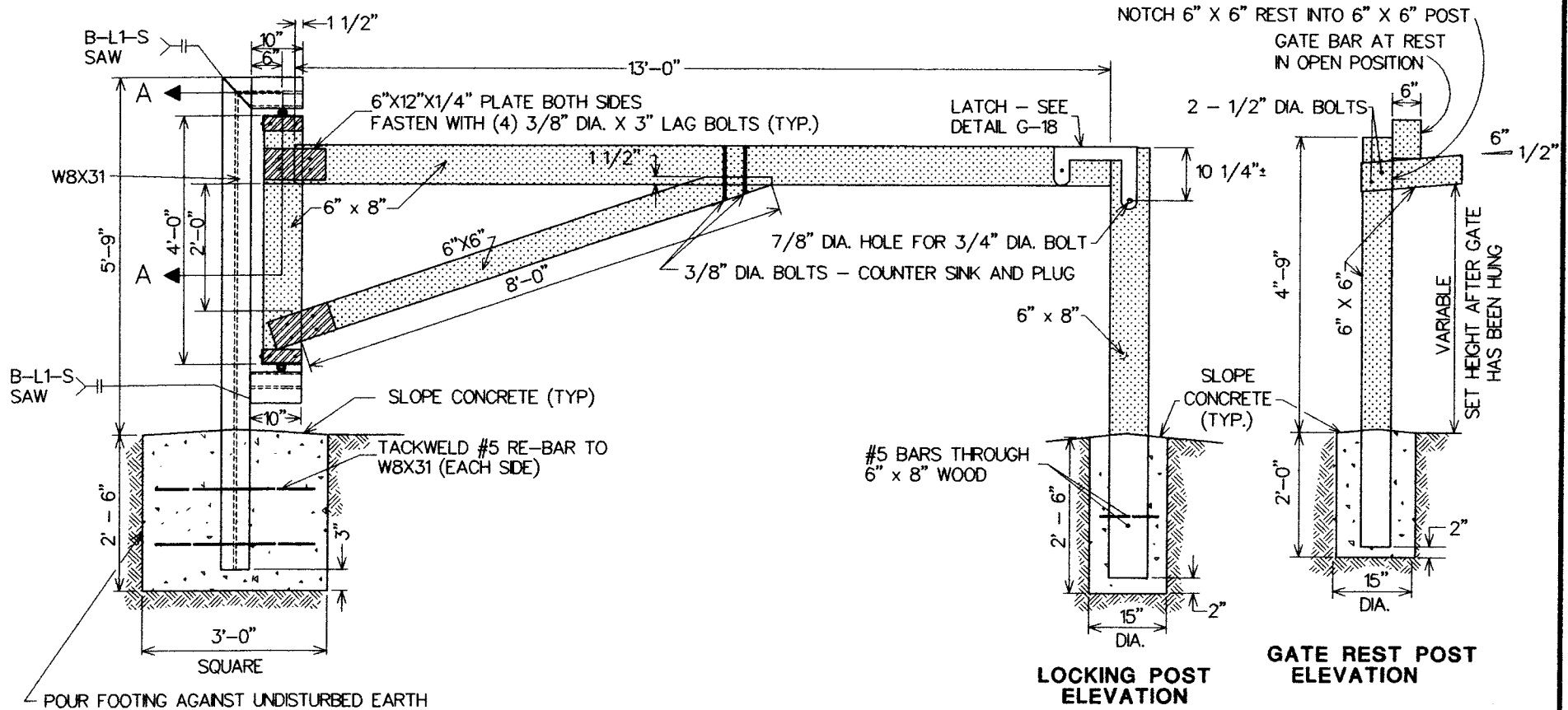
MANHOLE LOCATION, SIZE AND DETAILS, CONCRETE & REINFORCING STEEL REQUIREMENTS, CENTERLINE RADIUS AND OTHER DETAILS SHALL BE IN ACCORDANCE WITH BEND STRUCTURE DETAILS D-4.01 AND D-4.02.



APPROVAL
William J. Kopman
 DIRECTOR
 BUR. OF ENGINEERING / CONSTRUCTION
 10/23/97
 DATE

DEPARTMENT OF PUBLIC WORKS
 GENERAL DETAILS
**CONNECTION LOCATIONS
 TO BEND STRUCTURES**

ISSUED: AUGUST, 1997
 REVISED: _____
 REVISED: _____
 PLATE
G-16



**GATE & GATE POST
ELEVATION**

NOTES

1. TIMBERS TO BE FULL CUT. 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 1 COAT 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 G-18.

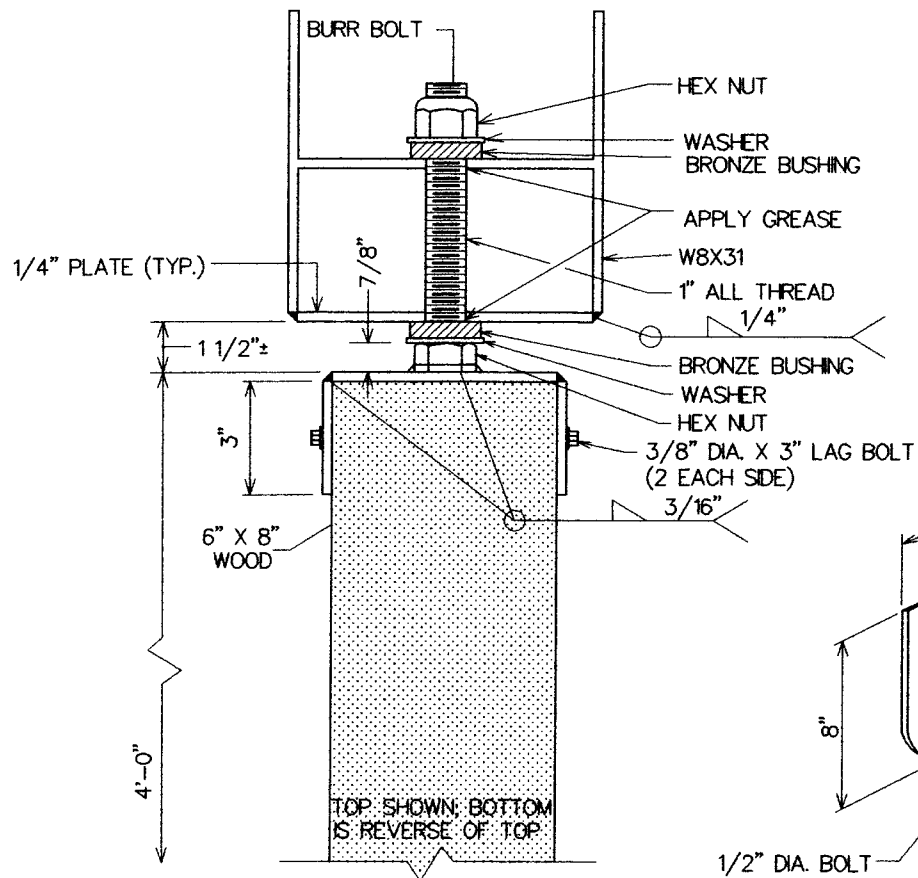


APPROVAL
Charles A. Miller
DIRECTOR
William J. Roman
BUR. OF ENGINEERING / CONSTRUCTION
11/24/99
DATE

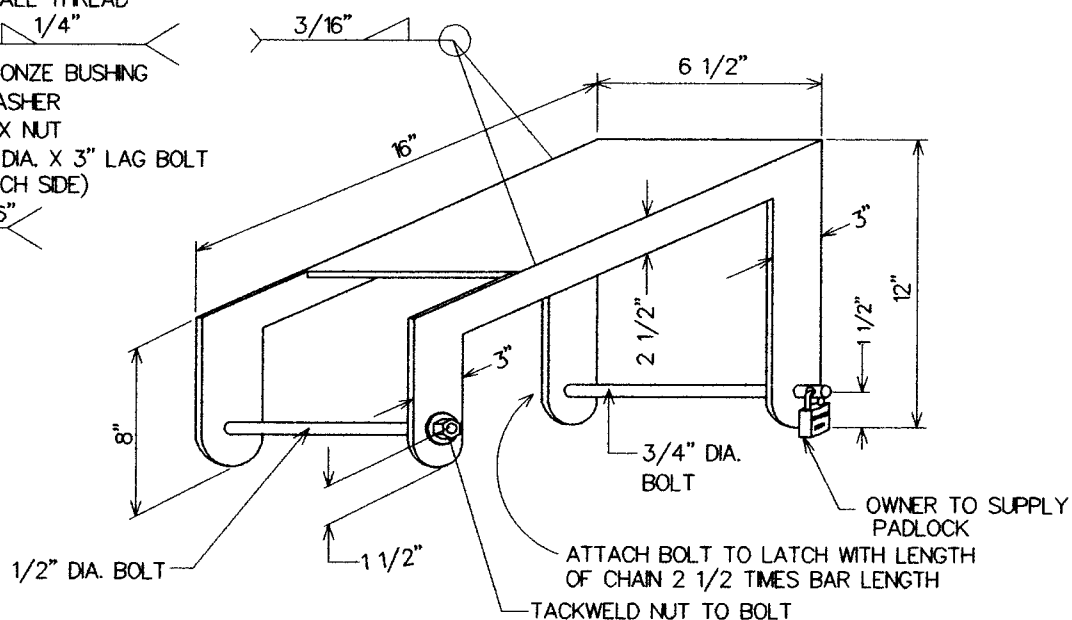
DEPARTMENT OF PUBLIC WORKS
GENERAL DETAILS
WOOD ACCESS GATE

ISSUED: NOVEMBER, 1997
REVISED:
REVISED:

PLATE
G-17



SECTION A - A



LATCH DETAIL - 1/4" THICK PLATE

SEE DETAIL G-17 FOR ACCESS GATE



APPROVAL
William J. [Signature]
 DIRECTOR
 BUR. OF ENGINEERING/CONSTRUCTION
 11/24/99
 DATE

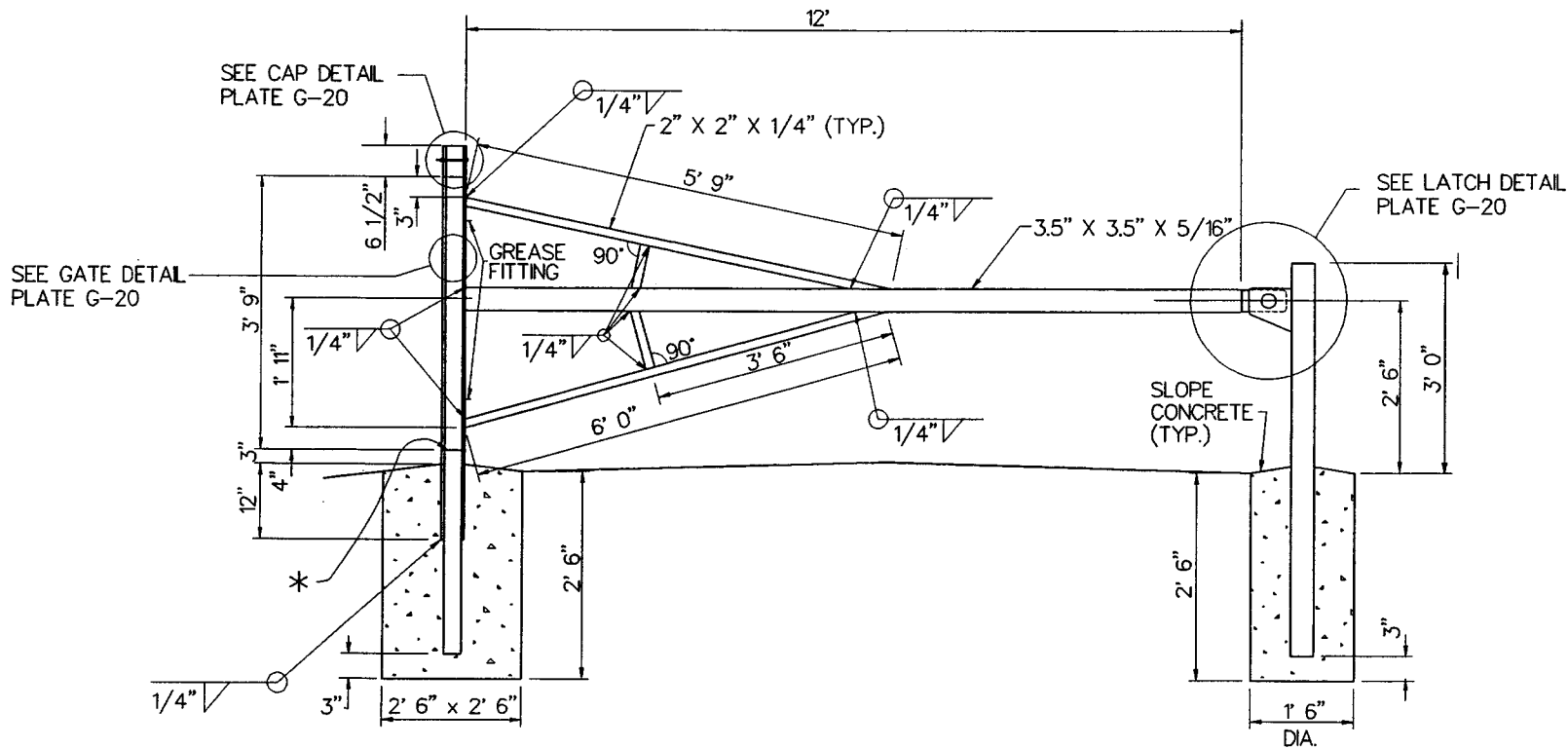
DEPARTMENT OF PUBLIC WORKS
 GENERAL DETAILS
WOOD ACCESS GATE DETAILS

ISSUED: NOVEMBER, 1997
 REVISED: _____
 REVISED: _____

PLATE
G-18

NOTES

1. ALL CONCRETE TO BE MIX No.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.



* THIS JOINT SHALL BE SMOOTH and SQUARE TO ENSURE A PROPER BEARING SURFACE FOR THE FREE SWING OF THE GATE.



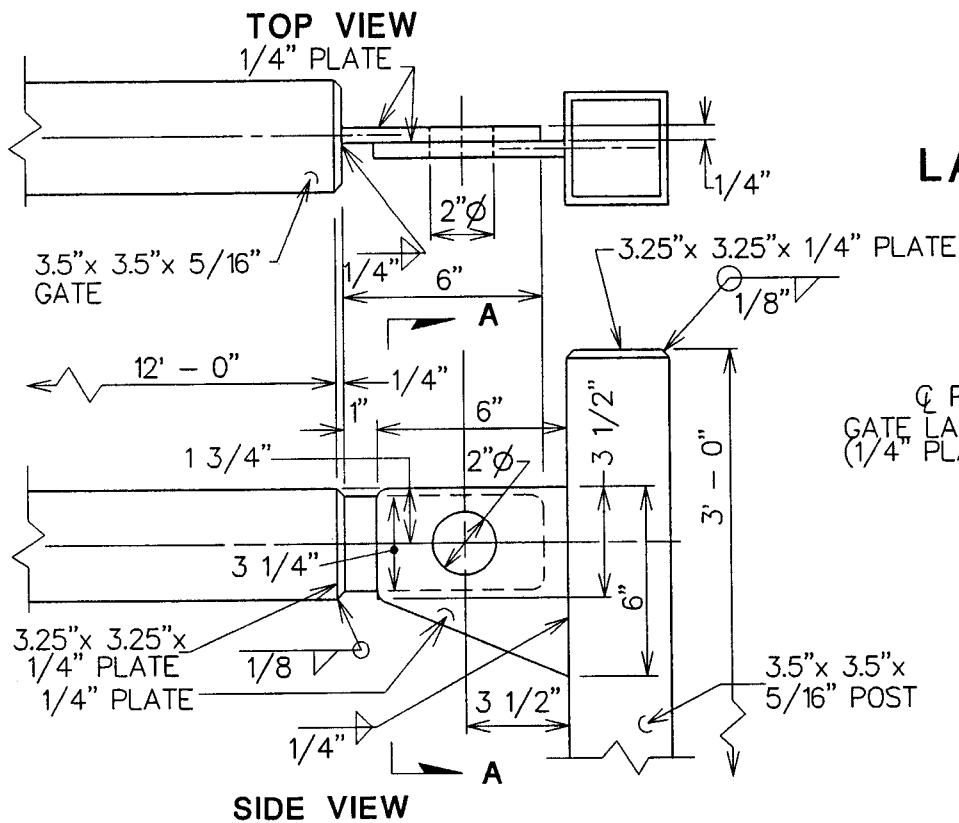
APPROVAL
William J. Hopman
DIRECTOR
William J. Hopman
BUR. OF ENGINEERING/CONSTRUCTION
11/24/99
DATE

DEPARTMENT OF PUBLIC WORKS
GENERAL DETAILS

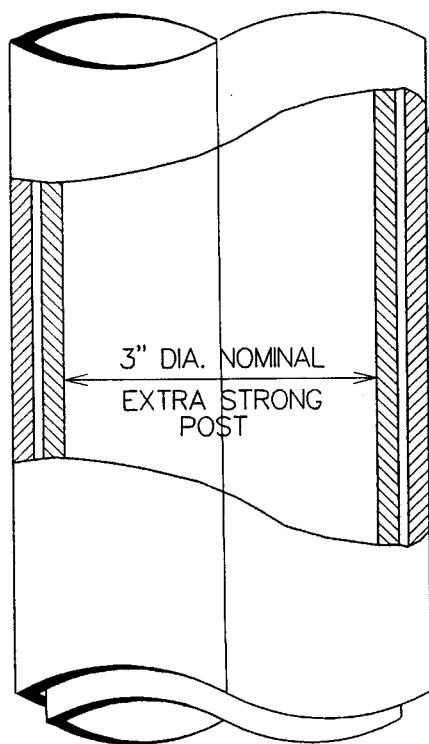
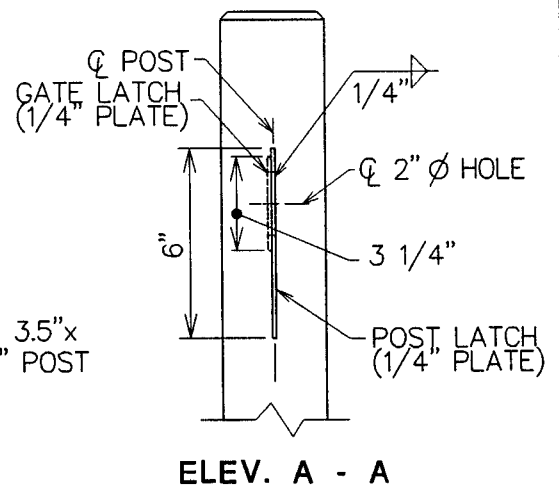
TUBULAR METAL ACCESS GATE

ISSUED: DECEMBER 1997
 REVISED: _____
 REVISED: _____

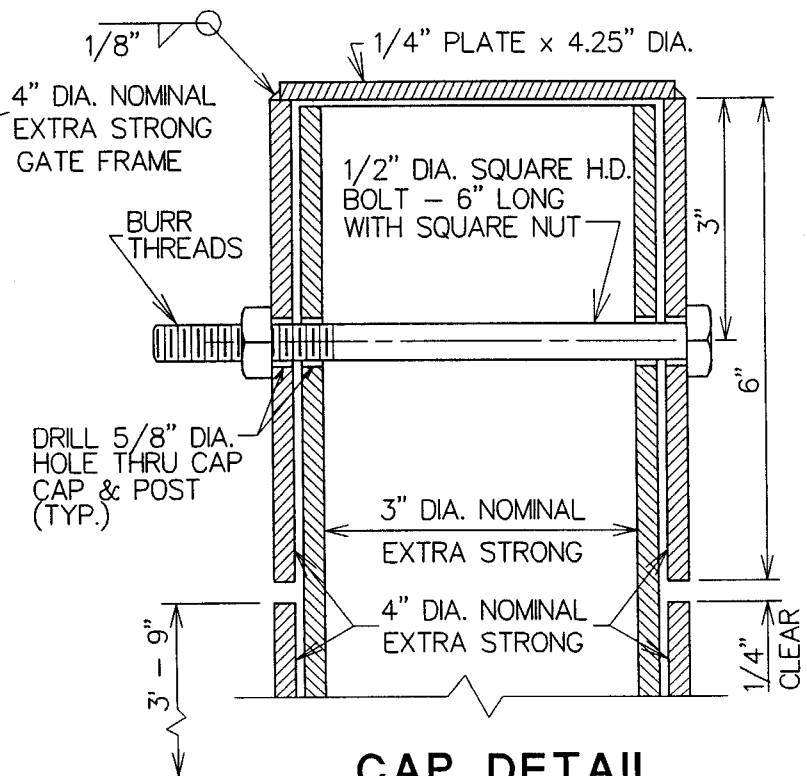
PLATE
G-19



LATCH DETAIL



GATE DETAIL



CAP DETAIL



APPROVAL
DIRECTOR
BUR. OF ENGINEERING CONSTRUCTION
11/24/99
DATE

DEPARTMENT OF PUBLIC WORKS
STORM DRAINAGE DETAILS

METAL ACCESS GATE DETAILS

ISSUED:
REVISED:
REVISED:

PLATE
G-20