

HARFORD COUNTY
BOOK OF STANDARD DETAILS

DECEMBER 2, 2008

HARFORD COUNTY
BOOK OF STANDARD DETAILS

HARFORD COUNTY BOOK OF STANDARD DETAILS

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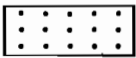
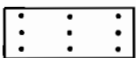
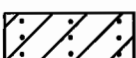
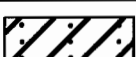
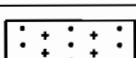
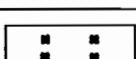
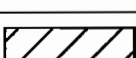
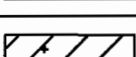
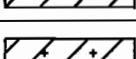
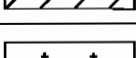
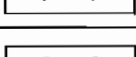
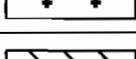
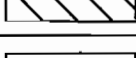
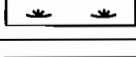
Standard "Year Built" Numerals.....ST-1

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Standard "Year Built" Numerals.....ST-4

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Barrier DetailsST-5

A-3 SAND		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		L.L. = 22 P.I. = 2 S.L. = 18	SAND-53% MIN. %-#200-20% MAX. P.I.-7 MAX. L.L.-34 MAX. (MUST HAVE L.L.)
A-2-4 SILTY SAND		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		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		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		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		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		L.L. = 33 P.I. = 11 S.L. = 18	SAND-47% MAX. CLAY-25% MIN. P.I.-14 MAX. L.L.-40 MAX.
A-7-4 SILTY CLAY		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		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		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		L.L. = 35 P.I. = 4 S.L. = 26	GRAD. NOT SIGNIFICANT P.I.-LOW L.L.-HIGH S.L.-26 MIN. (VISUAL INSPECTION NECESSARY FOR TYPE)
A-8 SWAMP MUCK		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			

[Signature] 5-2-00
DIRECTOR OF PUBLIC WORKS DATE
[Signature] 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

SOILS & SOIL- AGGREGATE MIXTURE DESIGNATIONS

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE G-1



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

SOILS & SOIL-AGGREGATE
MIXTURES CHARACTERISTICS &
PERFORMANCE

ISSUED _____ 5-2-00
REVISED _____
REVISED _____
PLATE G-2

DIRECTOR OF PUBLIC WORKS

5-2-00

DATE

DER. DIRECTOR, PUBLIC WORKS

4-12-00

GENERAL CLASSIFICATION	GRANULAR MATERIALS						SILT-CLAY MATERIALS							
GROUP CLASSIFICATION	A-2		A-3	A-2-4	A-4-2	A-2-7	A-7-2	A-4	A-4-7	A-7-4	A-7	A-6	A-5	A-8
GENERAL DESCRIPTION	SAND			SILTY-SAND	SANDY-SILT	CLAYEY-SAND	SANDY CLAY	SILT	CLAYEY SILT	SILTY-CLAY	CLAY	COLLODAL CLAY	MICA DIATOMS & SILT	SWAMP MUCK
STABILITY	WHEN N.P. HIGH	WHEN PLASTIC, GOOD WHEN DRY	IDEAL WHEN CONFINED	GOOD WHEN DRY	GOOD WHEN DRY	GOOD WHEN DRY & PROPERLY COMPACTED	GOOD WHEN PROPERLY COMPACTED OR UNDISTURBED				POOR		GOOD TO POOR	NONE
USE AS A BASE	FAIR	FAIR	EXCELL.	FAIR	FAIR	POOR	UNSATISFACTORY							
USE AS A SUB-BASE	EXCELL.	GOOD	EXCELL.	FAIR	FAIR	FAIR	UNSATISFACTORY							
USE AS A SUB-GRADE	EXCELL.	EXCELL.	EXCELL.	FAIR	FAIR	FAIR	POOR				VERY POOR	POOR		UNSATISFACTORY
FILLS UNDER 50'	EXCELL.	GOOD	GOOD	GOOD	POOR	FAIR	GOOD TO POOR				POOR	VERY POOR	POOR	UNSATISFACTORY
FILLS OVER 50'	GOOD	GOOD TO FAIR	GOOD TO FAIR	FAIR	POOR	FAIR	POOR TO VERY GOOD				VERY POOR	VERY POOR	POOR	UNSATISFACTORY
FROST ACTION	NONE TO LOW			MEDIUM	HIGH	MEDIUM	MEDIUM	HIGH	MEDIUM TO HIGH		MEDIUM		HIGH	MEDIUM
RANGE OF MAX. DRY DENSITY (AASHD T-180) (PCF)	115-135	115-135	105-130	110-130	110-135	115-135	115-130	110-135	110-135	105-130	100-120	90-115	100-135	LESS THAN 100
RANGE OF OPTIMUM MOISTURE CONTENTS (AASHD T-180) (%)	9-12	8-12	8-15	8-15	9-15	6-12	9-15	8-15	10-15	10-17	12-25	14-30	11-18	—
REQUIRED COMPACTION (AASHD T-180) (%)	92-95	92-95	92-95	92-95	92-95	92-95	92-95			≥95%				WASTE
COMPACTION METHODS	ROLLING WITH SMOOTH FACE TAMPING RUBBER TIRED ROLLER OR VIBRATORY COMPACTOR		TRACTOR DISKING VIBRATION	TAMPING OR RUBBER-TIRED ROLLER	TAMPING OR RUBBER-TIRED ROLLER	TAMPING OR RUBBER-TIRED ROLLER	TAMPING, SHEEPFOOT ROLLER OR RUBBER-TIRED ROLLER					TAMPING OR RUBBER-TIRED ROLLER	WASTE	
COMPACTION ABILITIES	GOOD WITH CLOSE CONTROL		GOOD	GOOD TO POOR	GOOD TO POOR	GOOD TO POOR	GOOD TO POOR				POOR	POOR	VERY POOR	WASTE
PUMPING ACTION	SLIGHT TO NONE						FAIR TO POOR				POOR			WASTE
BEARING VALUE	EXCELLENT TO FAIR			GOOD TO FAIR			FAIR TO POOR				POOR			WASTE
DRAINAGE	GOOD		DRAINS FREELY	FAIR TO PRACTICALLY IMPERVIOUS			FAIR TO IMPERVIOUS				POOR	IMPERVIOUS	FAIR TO IMPERVIOUS	POOR

NOTES :

A-2 TO A-3 SOILS: WHEN USED AS A BASE PLASTICITY INDEX AND LIQUID LIMIT SHOULD NOT EXCEED 6 AND 25 RESPECTIVELY BEST FOR SOIL - CEMENT STABILIZATION. GENERALLY 8 TO 12 % CEMENT BY WEIGHT WILL BE SUFFICIENT.

NON - PLASTIC A-2 TO A-3 SOILS: MAY REQUIRE VIBRATION FOR COMPACTION.

A-4 TO A-7 SOILS: FILLS SHOULD BE PLACED IN DRY SEASON.

A-4 SILTS: SUSCEPTIBLE TO SETTLEMENT AND EROSION.

A-5 SOILS: WHEN MICA IS PRESENT. VERY DIFFICULT TO COMPACT BECAUSE OF EXPANSION AND REBOUND.

A-6 SOILS (CLAY): WILL PUMP IN POROUS BASES FORMING CRACKS. FILLS WILL SETTLE OVER LONG PERIODS OF TIME. HIGH BANKS IN CUTS AND FILLS VERY LIABLE TO SLIDE.

TYPE	TREATMENT & USE
<u>A-2 SOILS</u>	WELL GRADED TO POORLY GRADED SAND AND GRAVELS. GOOD BASE FOR MODERATE FLEXIBLE OR THIN RIGID PAVEMENT. GOOD FILL. FROST HEAVE, BREAK-UP IF PLASTIC. SOFTENS WHEN WET IF PLASTIC. USE BASE COURSE WHEN SUB-GRADE P.I. IS GREATER THAN 6. SUB-DRAINAGE EFFECTIVE. STABILIZE WITH BITUMEN, CHLORIDES. CEMENT OR ADMIXTURE SOIL.
<u>A-3 SOILS</u>	CLEAN SANDS AND GRAVELS. IDEAL BASE FOR MODERATE FLEXIBLE OR THIN RIGID PAVEMENT. GOOD FILL. NO FROST HEAVE OR BREAK-UP. SUB-DRAINAGE ONLY THROUGH IMPERVIOUS SHOULDERS. STABILIZE, WITH SOIL BINDER. BITUMINOUS, OR CHEMICAL ADMIXTURES.
<u>A-4 SOILS</u>	SILTY SOILS. NOT GOOD FOR SURFACE. POOR BASE. ABSORBS WATER. UNSTABLE WHEN WET. BAD FROST HEAVE AND BREAK-UP. USE SUB-DRAINAGE AND/OR BASE AND SUB-BASE WITH FLEXIBLE PAVEMENT. USE BITUMINOUS SUB-GRADE PRIME. USE THICK CONCRETE PAVEMENT (7" TO 10") WITH STEEL REINFORCEMENT AND CRACK CONTROL.
<u>A-5 SOILS</u>	ELASTIC SILTS. USE SUB-DRAINAGE AND/OR GRANULAR BASE AND SUB-BASE WITH BITUMINOUS SUB-GRADE PRIME. USE THICK CONCRETE PAVEMENT, REINFORCED WITH CRACK CONTROL.
<u>A-6 SOILS</u>	CLAYS. IMPERMEABLE AND STABLE WHEN DRY AND UNDISTURBED (HARD CLAY). PLASTIC AND ABSORBENT IF DISTURBED. BAD PUMPING INTO POROUS BASE. MACADAM OR PAVEMENT JOINTS. SHRINKS OR CRACKS WHEN DRY. USE GRANULAR BASE AND SUBBASE. USE SUB-DRAINAGE ONLY WHEN MADE PERVIOUS BY CRACKS, ROOT HOLES AND LAMINATIONS. FROST HEAVE SLIGHT WHEN IMPERMEABLE. BAD WHEN PERVIOUS. USE SUB-GRADE PRIME. USE THICK, STRONG, DENSE FLEXIBLE PAVEMENT OR REINFORCED CRACK CONTROLLED CONCRETE.
<u>A-7 SOILS</u>	EXPANSIVE. PLASTIC CLAYS. EXCESSIVE VOLUME CHANGE. BAD FROST HEAVE AND BREAK-UP. SUB-DRAINAGE NOT EFFECTIVE. USE THICK, DENSE, FLEXIBLE PAVEMENT WITH BASE AND SUB-BASE OVER SUB-GRADE PRIME OR REINFORCED CRACK CONTROLLED CONCRETE PLACED ON IMPERVIOUS PAPER.
<u>A-8 SOILS</u>	MUCK AND PEAT. UNFIT FOR CONSTRUCTION PURPOSES. EXCAVATE TO SOLID STRATUM AND REPLACE WITH SELECTED FILL. DISPLACEMENT BY SUPERIMPOSED FILL IS DOUBTFUL. DISPLACEMENT BY EXPLOSIVE UNDER SUPERIMPOSED FILL IS SOMETIMES EFFECTIVE.

<i>[Signature]</i>	05.02.00
DIRECTOR OF PUBLIC WORKS	DATE
<i>[Signature]</i>	04.12.00
DEP. DIRECTOR, PUBLIC WORKS	DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

SOIL & SOIL-AGGREGATE MIXES TREATMENT & USE

ISSUED	05.02.00
REVISED	
REVISED	
PLATE	G-3

SECTION II

BARRICADES

Plate

Barricade

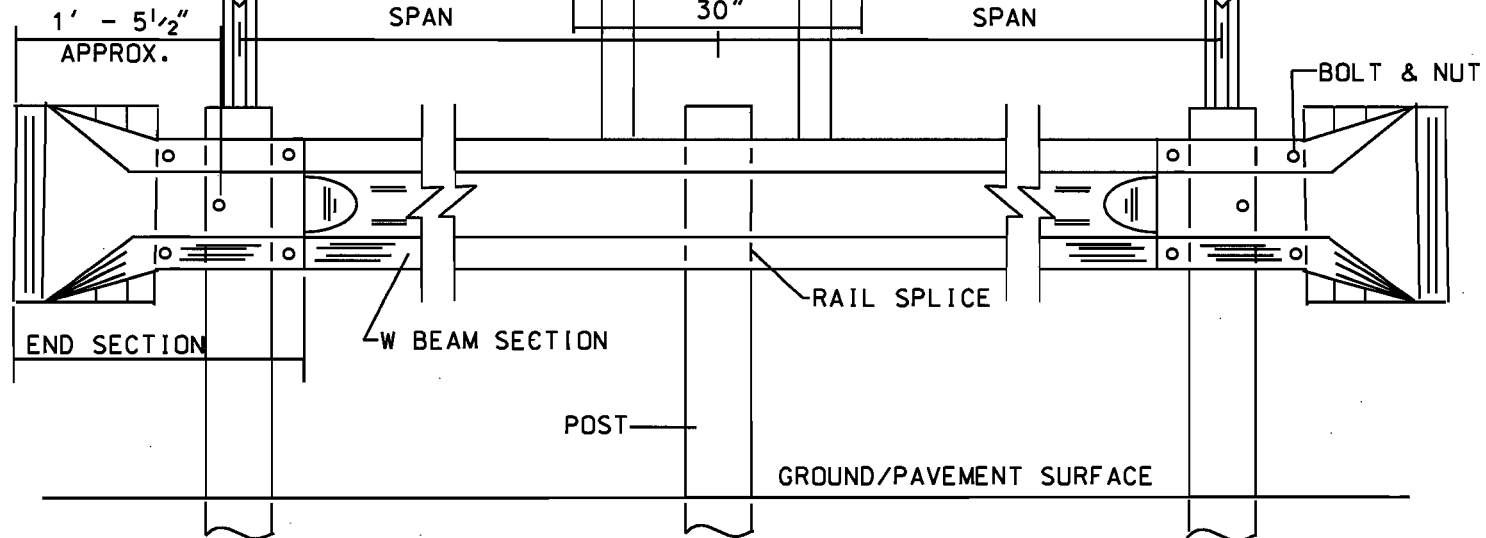
Typical County Road Closure..... P-1

W16-1 MODIFIED
18" X 18"
SOLID RED
REFLECTIVE

CENTERLINE

WHITE ON GREEN

W16-1 MODIFIED
18" X 18"
SOLID RED
REFLECTIVE



SEE S.H.A. STANDARDS FOR HIGHWAYS
& INCIDENTAL STRUCTURES FOR DETAILS
OF CONNECTIONS, FIXTURES & ASSEMBLY

LENGTH OF BARRICADE NOTED ON PLANS
CENTER TO CENTER OF END POSTS
ALL SPANS TO BE EQUAL IN LENGTH
NUMBER OF POSTS NOTED ON PLANS

BARRICADED ROADWAY FOR ODD NUMBER POST BARRICADE
(FOR EVEN NUMBER POST BARRICADE CENTERLINE ROAD = CENTER SPAN)

MINIMUM NUMBER OF SPANS - 4
MINIMUM NUMBER OF POSTS - 5
MAXIMUM SPAN: 6'-3"

* WHEN THE GRADE BEYOND THE END OF PAVEMENT IS
4:1 1' FLATTER FOR AT LEAST 100' THE GUARDRAIL
SHALL BE REMOVED AND ONLY THE SIGNS INSTALLED.



HARFORD COUNTY, MD
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5-2-00
DATE
4/12/00
DATE

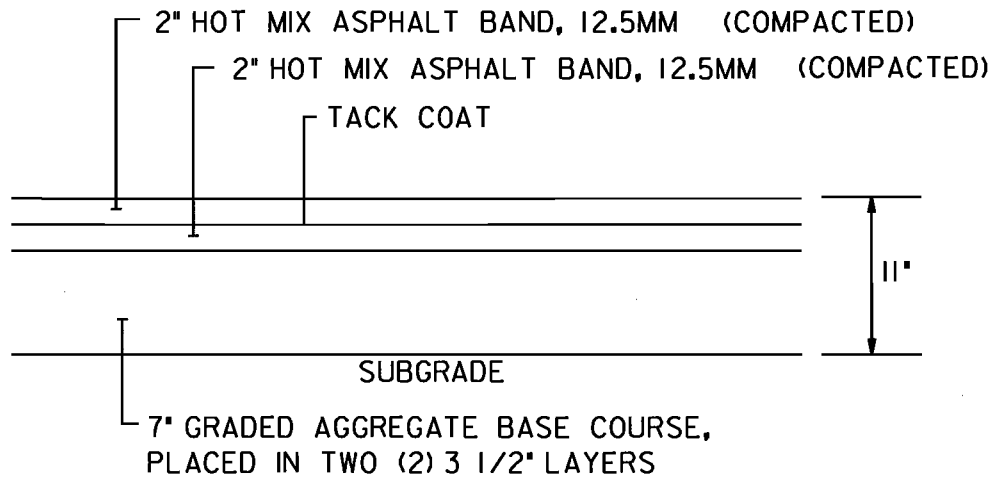
BARRICADE
TYPICAL COUNTY ROAD CLOSURE

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE P-1

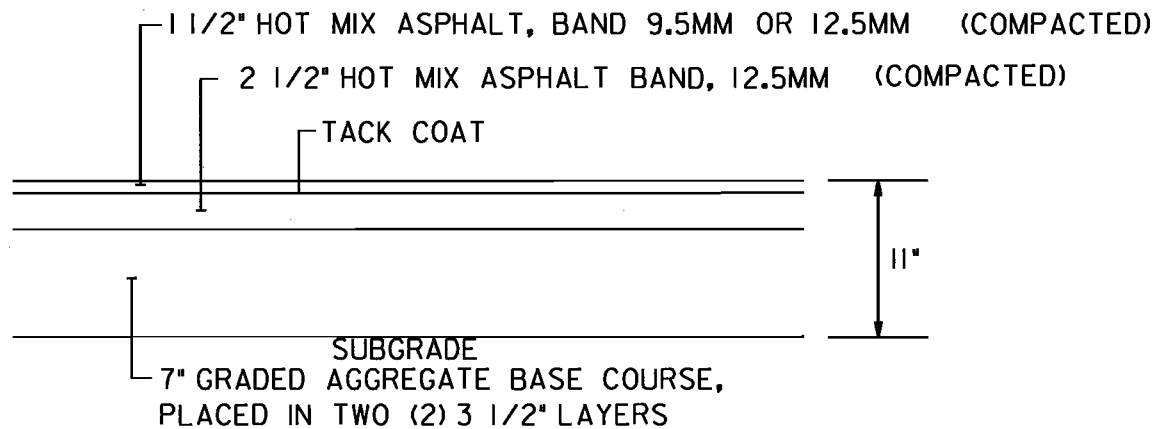
SECTION III
ROADS AND STREETS

Plate

Residential and Townhouse Roads Paving Section	R-1 and R-2
Business, Commercial, and Industrial Roads Paving Section (Non-Residential)	R-3
Method of Cutting and Repairing Openings in Existing Roadways	R-4
Modified Method of Cutting and Repairing Openings in Existing Roadways	R-5
Method of Cutting and Repairing a Road	R-6
Method of Cutting and Repairing a Gravel Road	R-7
Trenches Cradle and Encasement	R-8
Capping Existing Dug Wells	R-9

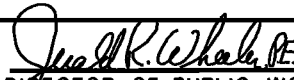
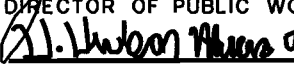


ALTERNATE A



ALTERNATE B

FOR NOTES SEE PLATE R-1A

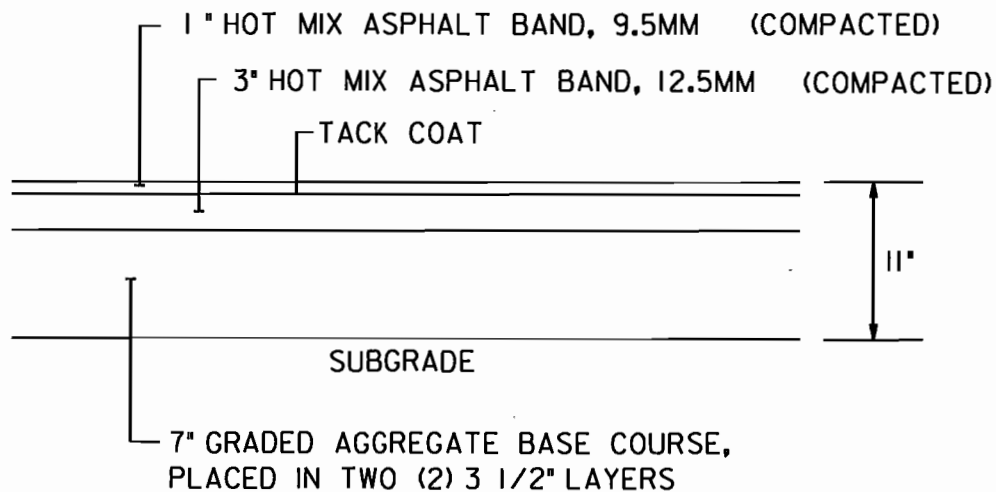
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	1/7/03
DEP. DIRECTOR, PUBLIC WORKS	DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

RESIDENTIAL & TOWNHOUSE ROADS
PAYING SECTION

ISSUED	1/7/03
REVISED	2/15/03
REVISED	
PLATE	R-1



ALTERNATE C

NOTES:

1. SUPERPAVE PERFORMANCE GRADE ASPHALT CEMENTS SHALL BE PERFORMANCE GRADES PG 64-22 AND DESIGNED AS LEVEL 1 MIXES @ 50 GYRATIONS N-DESIGN.
2. THE DIRECTOR MAY REQUIRE WETTING OF THE BASE COURSE BEFORE LAYING THE FIRST LIFT.
3. HARFORD COUNTY RESERVES THE RIGHT TO ENTER THE PROPERTY FOR THE PURPOSE OF TAKING "CORE BORINGS."

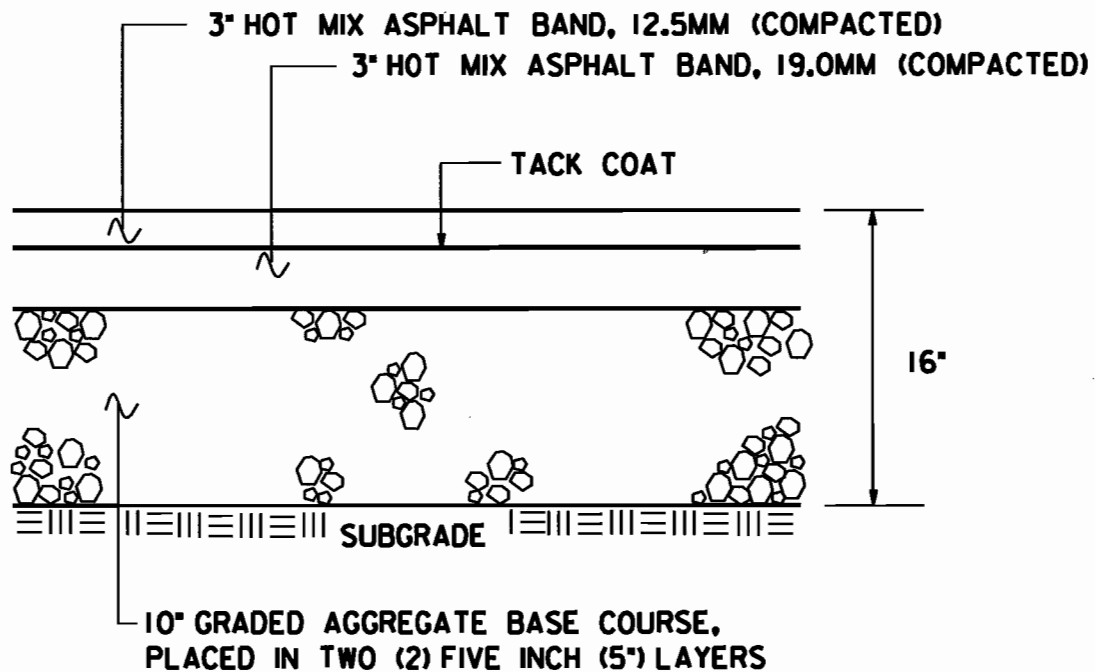
James R. White Jr. 1/7/03
DIRECTOR OF PUBLIC WORKS
D. Wilson 1/7/03
DEP. DIRECTOR, PUBLIC WORKS



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

RESIDENTIAL & TOWNHOUSE ROADS
PAVING SECTION

ISSUED 1/7/03
REVISED 2/5/03
REVISED
PLATE R-2



SUPERPAVE PERFORMANCE GRADE ASPHALT CEMENTS SHALL
BE PERFORMANCE GRADE PG 70-22.

NOTES:

1. THE DIRECTOR MAY REQUIRE WETTING OF THE
BASE COURSE BEFORE LAYING THE FIRST LIFT.
2. HARFORD COUNTY RESERVES THE RIGHT TO
ENTER THE PROPERTY FOR THE PURPOSE OF
TAKING "CORE BORINGS."

[Signature] 5/2/00
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

BUSINESS, COMMERCIAL
AND INDUSTRIAL ROADS
PAVING SECTION
(NON-RESIDENTIAL)

ISSUED 5/2/00
REVISED 5/31/07
REVISED
PLATE R-3

ALL EDGES SHALL BE SEALED WITH
A RUBBERIZED ASPHALT SEALER.

IF LESS THAN 3'-0"
REMOVE EXISTING
PAVING AND REPAVE
TRENCH AND THIS
AREA AS ONE.

3'-0" MIN. TO ϕ OR
PAVING JOINT.

3'-0" MIN.

5'-0" MIN.

TO EDGE
OF PAVING

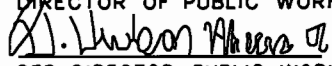
9.5 MM HOT MIX ASPHALT
TO ADJACENT PAVING (3" MIN.)

6" MIN. OF 12.5 MM HOT MIX ASPHALT
PLACED IN TWO LIFTS
NOT TO EXCEED 3" COMPACTED

EXISTING MACADAM OR
CONCRETE BASE

1'-0"
TYP.

COMPACTED CRUSHED STONE
CR-6 TO LIMIT SHOWN
ON UTILITY BEDDING DETAIL

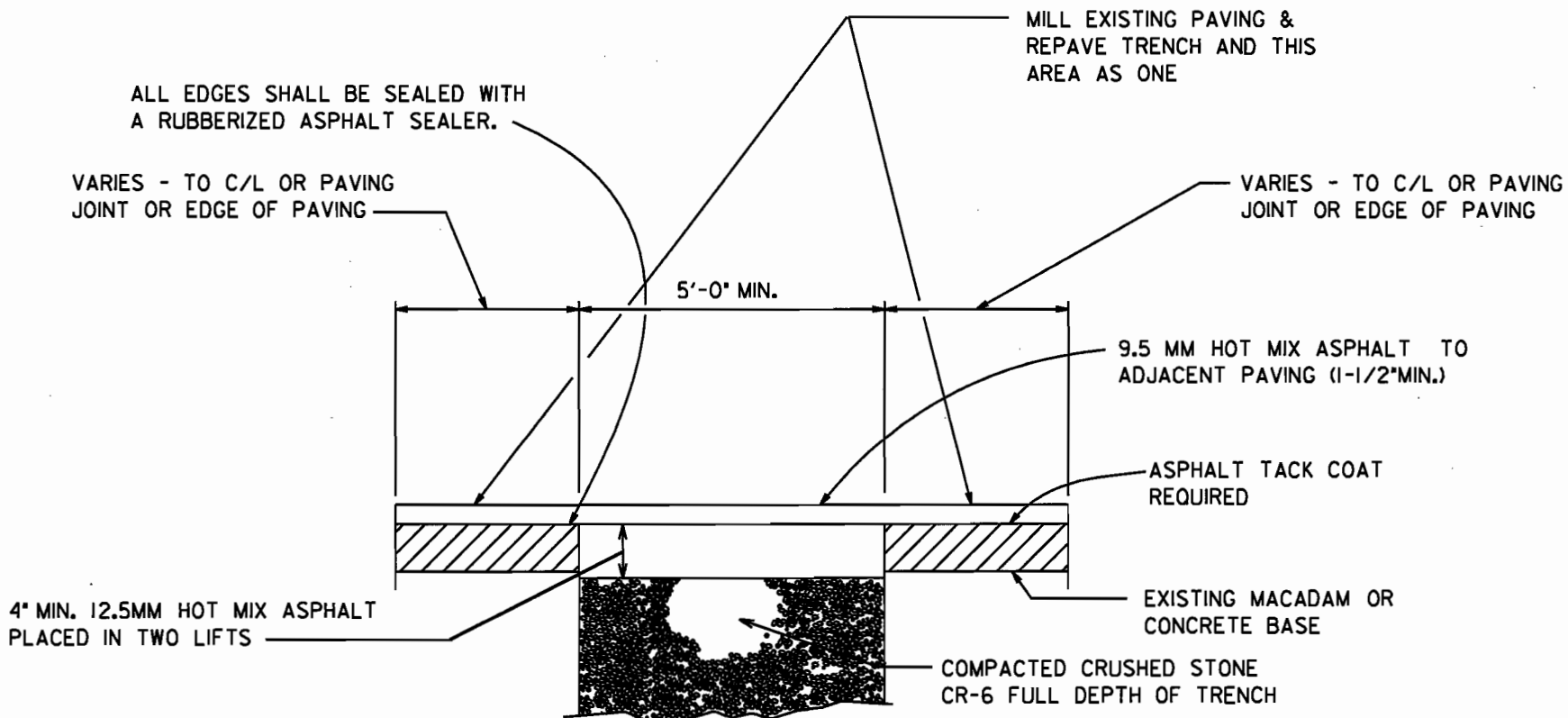
	1/7/03
DIRECTOR OF PUBLIC WORKS	DATE
	1/7/03
DEP. DIRECTOR, PUBLIC WORKS	DATE

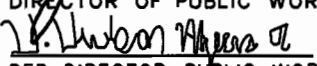


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

METHOD OF CUTTING AND REPAIRING OPENINGS IN EXISTING ROADWAYS

ISSUED	1/7/03
REVISED	2/15/03
REVISED	5/31/07
PLATE	R-4



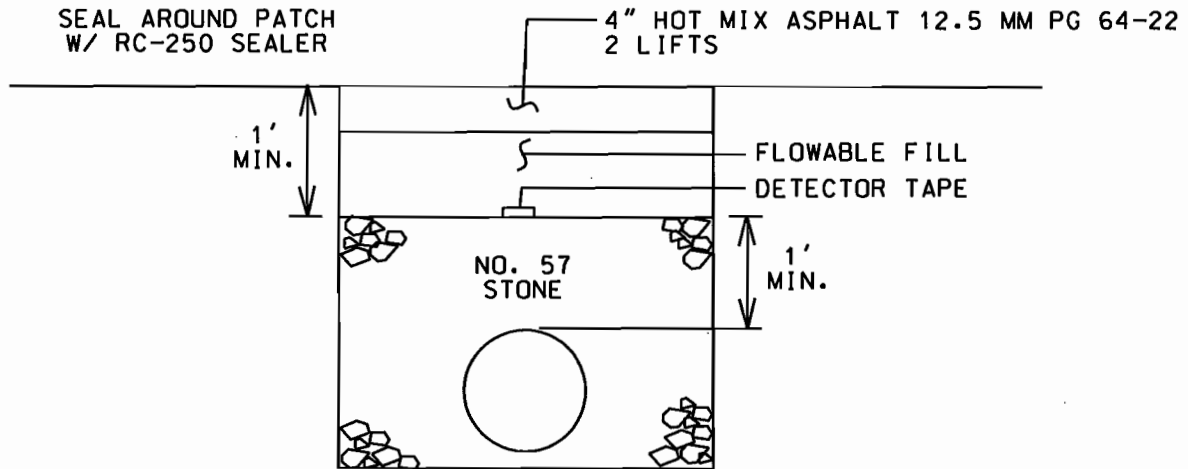
	5/18/06
DIRECTOR OF PUBLIC WORKS	DATE
	5/18/06
DEP. DIRECTOR, PUBLIC WORKS	DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

MODIFIED
METHOD OF CUTTING AND REPAIRING
OPENINGS IN EXISTING ROADWAYS

ISSUED	5/18/06
REVISED	8/30/08
REVISED	
PLATE	R-5



NOTES:

FLOWABLE FLY ASH FILL FULL DEPTH (EXCLUDING 1' BEDDING) EXCEPT FOR LAST 4" OF HOT MIX ASPHALT SURFACE SHALL MEET AASHTO REQUIREMENTS.

TWO (2) TEST CYLINDERS TO BE PROVIDED TO HARFORD COUNTY MATERIALS AND TESTING SECTION AT 2220 ADY ROAD, FOREST HILL, MD 21050. PHONE NUMBER: 638-3562.

TRENCH TO BE COVERED WITH STEEL PLATES DURING THE CURING PERIOD OF 24 HOURS. PLATES SHALL BE PINNED AND RAMPED.

MAINTAIN ONE FOOT (1') VERTICALLY AND FIVE FEET (5') HORIZONTALLY FROM WATER AND SEWER LINES.

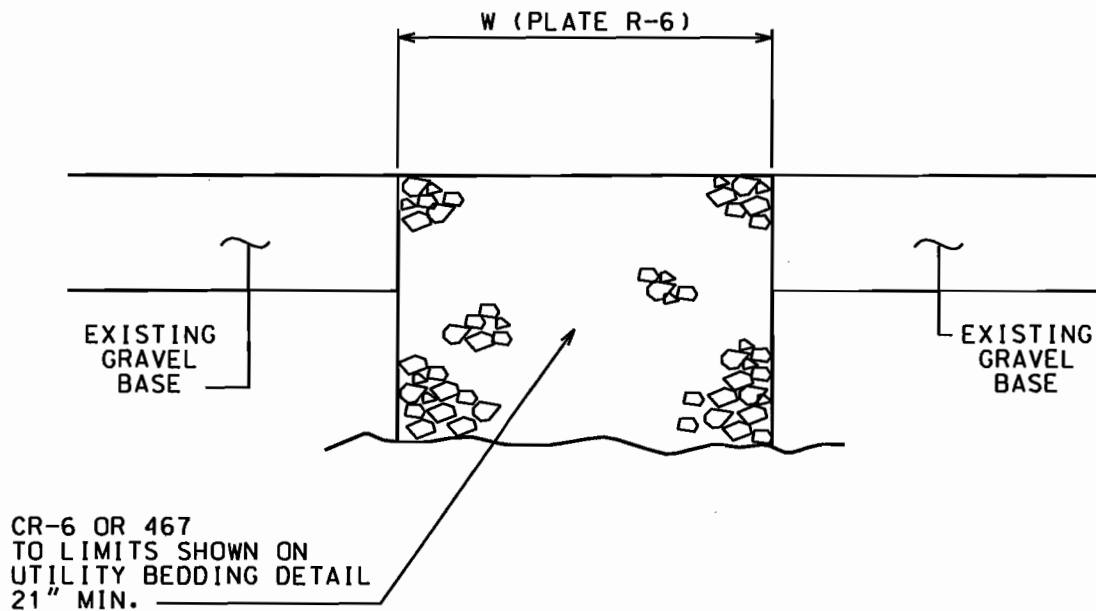
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DIRECTOR OF PUBLIC WORKS DATE
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REVISED 5/31/07
REVISED _____
PLATE R-6



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

**METHOD OF CUTTING
AND REPAIRING A ROAD**



NOTES:

SUB-GRADE BASE AND STONE
BASE TO BE COMPACTED TO 95%
OF MAXIMUM DENSITY PLACED IN
LAYERS - NOT TO EXCEED 6" LIFTS.

BACKFILL SHALL MEET THE REQUIREMENTS
OF SECTION 602.03.04 OF THE STANDARD
SPECIFICATIONS FOR CONSTRUCTION AND
MATERIALS.

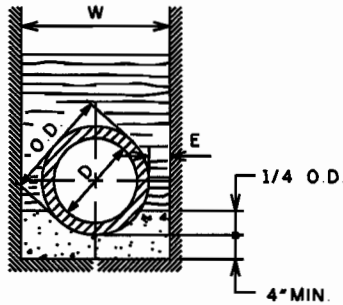
James R. Walsh, Jr. 1-7-03
DIRECTOR OF PUBLIC WORKS DATE
D. Wilson 1-7-03
DEP. DIRECTOR, PUBLIC WORKS DATE



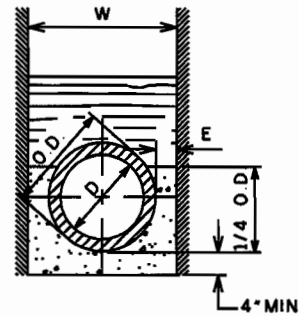
HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

**METHOD OF CUTTING
AND REPAIRING A
GRAVEL ROAD**

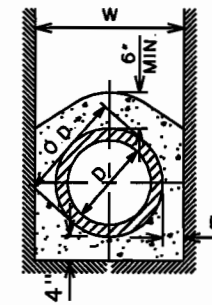
ISSUED 1/7/03
REVISED 2/15/03
REVISED
PLATE R-7



CONCRETE LOW GRADLE



CONCRETE HIGH GRADLE



ENCASEMENT CONCRETE

CONCRETE QUANTITIES - CU. FT. PER LINEAR FOOT

PIPE DIAMETER (D)	LOW CRADLE	HIGH CRADLE	ENCASEMENT
12"	1.62	2.65	4.03
15"	1.91	3.18	4.83
18"	2.22	3.73	5.66
21"	2.51	4.30	6.53
24"	2.85	4.80	7.42
27"	3.72	6.71	10.05
30"	4.12	7.45	11.17
33"	4.55	8.20	12.33
36"	4.98	8.98	13.53
42"	6.59	12.35	18.44
48"	7.67	14.26	21.38
54"	8.75	16.26	24.46
60"	9.97		
66"	11.24		
72"	12.55		

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

NOTE: Quantities are for estimating only.

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DATE

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DEP. DIRECTOR, PUBLIC WORKS

04.12.00
DATE

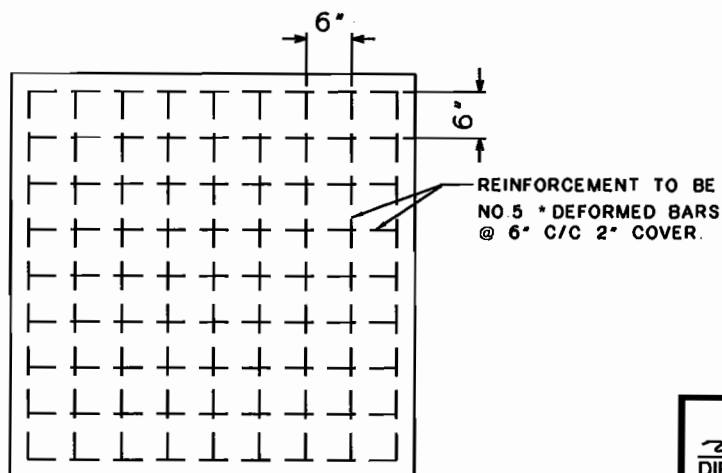
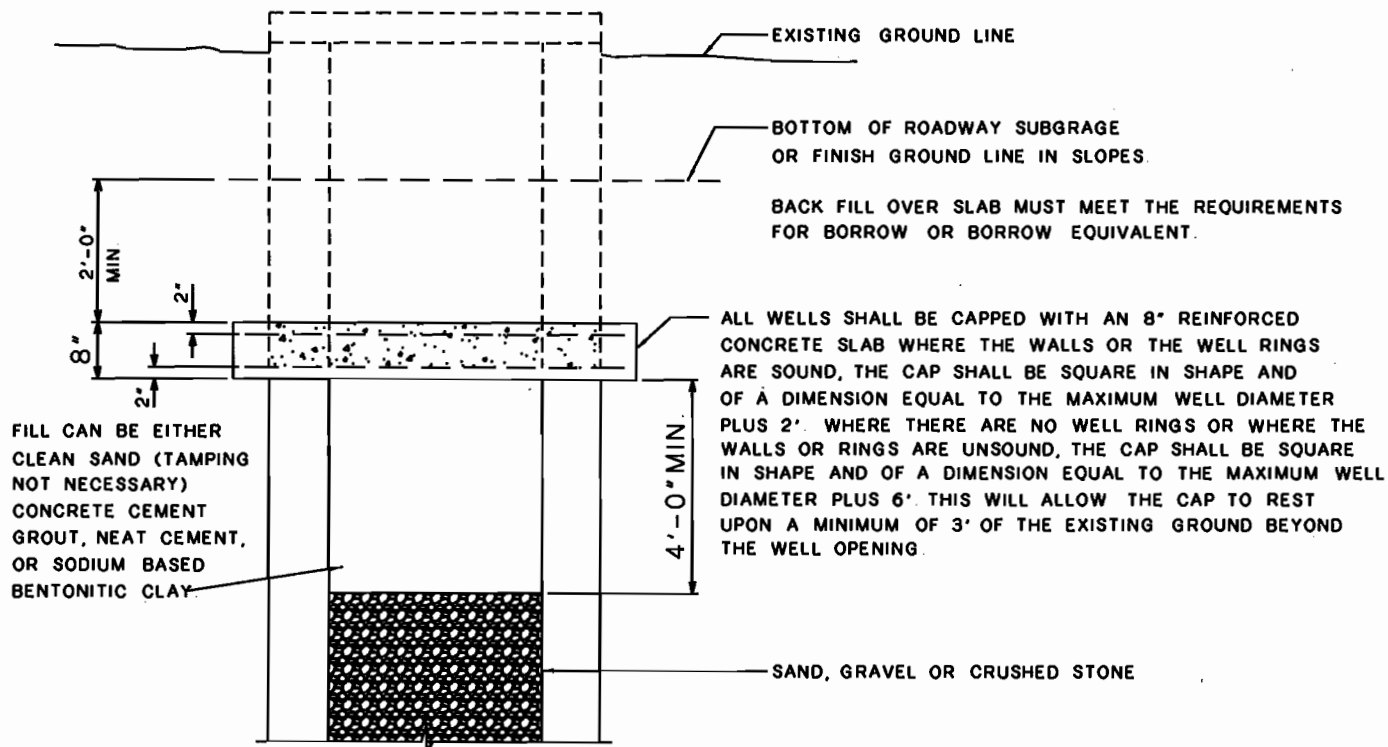


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

**TRENCHES
CRADLE AND ENCASEMENT**

ISSUED 05.02.00
REVISED
REVISED

PLATE R-8



[Signature] 05.02.00
 DIRECTOR OF PUBLIC WORKS DATE
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 DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD
 DEPARTMENT OF
 PUBLIC WORKS

CAPPING EXISTING DUG WELLS

ISSUED 05.02.00
 REVISED _____
 REVISED _____
 PLATE R-9

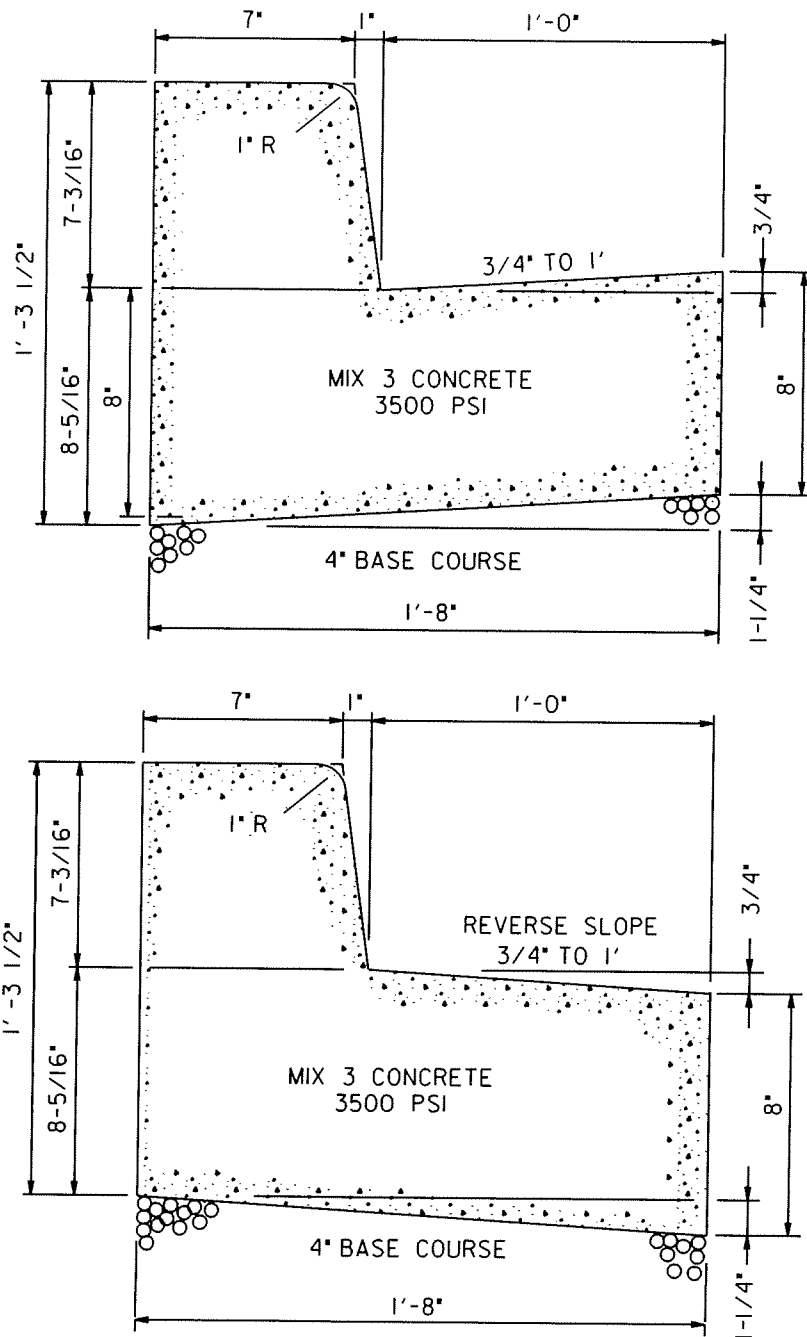
SECTION IV

SHOULDERS

Plate

7" Combination Curb and Gutter	S-1
Mountable Curb and Gutter	S-2
Extruded Curb (Temporary Installations Only)	S-3
Standard Type "C" Combination Curb and Gutter	S-4
Valley Gutter (For Replacement Purposes Only)	S-5
Standard Monolithic Concrete Median.....	S-6
Sidewalk Ramp Detail Perpendicular	S-7
Sidewalk Ramps Parallel	S-8
Sidewalk Ramps Parallel	S-9
Detectable Warning Surface	S-10
Standard 5" Sidewalk.....	S-11
Cut-Through Median and Island Openings.....	S-12
Ramped Median and Island Openings	S-13
Typical Driveway Entrance for 7" Concrete Curb and Gutter with Sidewalk.....	S-14
Typical Driveway Entrance Detail for Mountable Curb and Gutter.....	S-15
Typical Driveway Entrance for Extruded Curbed Street with Sidewalk.....	S-16
Typical Driveway Entrance for Open Section Road - Pipe Required	S-17
Typical Driveway Entrance for Open Section Road - Pipe Not Required	S-18
Typical Driveway Entrance for Common Drive (2-5 Homes) Open Section Road	S-19
Industrial/Commercial Entrance Detail (Non-Residential)	S-20

Industrial/Commercial Entrance for Open Section Road Pipe Required (Non-Residential).....	S-21
Industrial/Commercial Entrance Open Section Road (Drain Pipe Not Required) (Non Residential)	S-22
Guard Rail with Beam Replacement Details	S-23
Chain Link Fence Typical 5 Foot, Rural 6 Foot and 8 Foot	S-24
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4 Foot Farm-Type Fence.....	S-26
Chain Link Fence Brace & Rod Attachments - Road Construction	S-27
Chain Link Fence Brace & Rod Attachments - Square Construction	S-28
Chain Link Fence Drive Anchor & Post Attachment at Bridge	S-29
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Chain Link Fence Double Drive Anchor and Ditch Treatment	S-31
Chain Link Fence Drive Anchor Shoe Assembly.....	S-32
Chain Link Fence Drive Anchor Adapter.....	S-33
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Precast Concrete Barrier Double Face.....	S-35
Curb and Gutter Transition at Inlets	S-36
Extruded Curb Transition at Inlets.....	S-37
Standard Curb Opening Detail Curb & Gutter Section 1	S-38
Precast Concrete Wheel Stops	S-39



AREA = 0.16 ± S.Y. 18.75 ± L.F./C.Y.

A BITUMINOUS SEAL SHALL BE PLACED AT ALL CURB JOINTS ALONG THE GUTTER PAN.

[Signature] 5-2-00
DIRECTOR OF PUBLIC WORKS DATE
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DEP. DIRECTOR, PUBLIC WORKS DATE

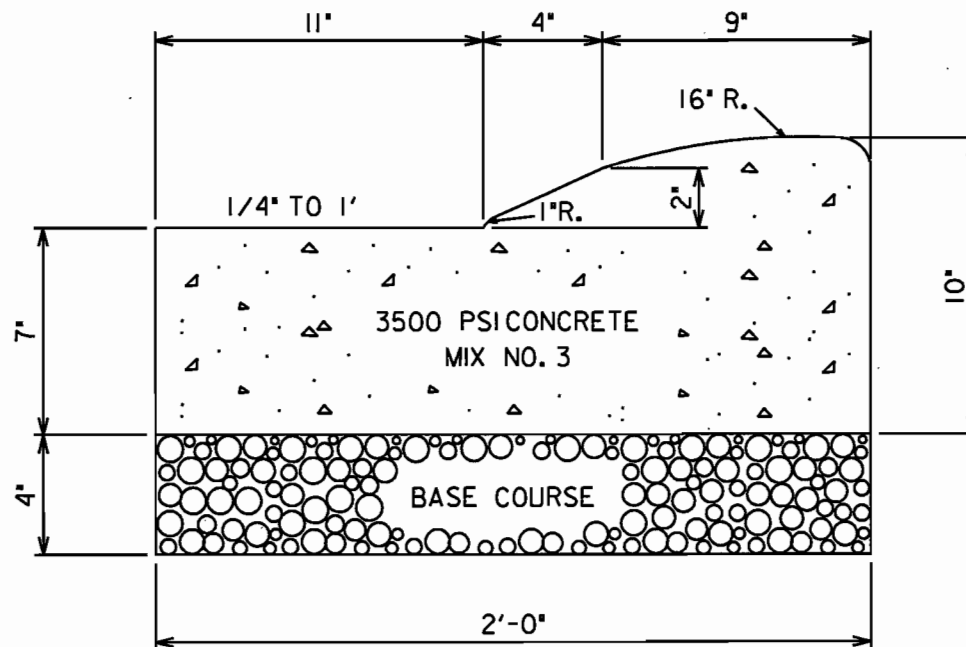


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

7" COMBINATION CURB AND GUTTER

ISSUED 5/2/00
REVISED 5/31/07
REVISED
PLATE S-1

USER\DETAILS\SPEC\ROADCODE\STANDARD DETAILS\SHOULDER\S-1.DGN



CONCRETE MOUNTABLE CURB AND GUTTER

A BITUMINOUS SEAL SHALL BE PLACED AT ALL CURB JOINTS ALONG THE GUTTER PAN.

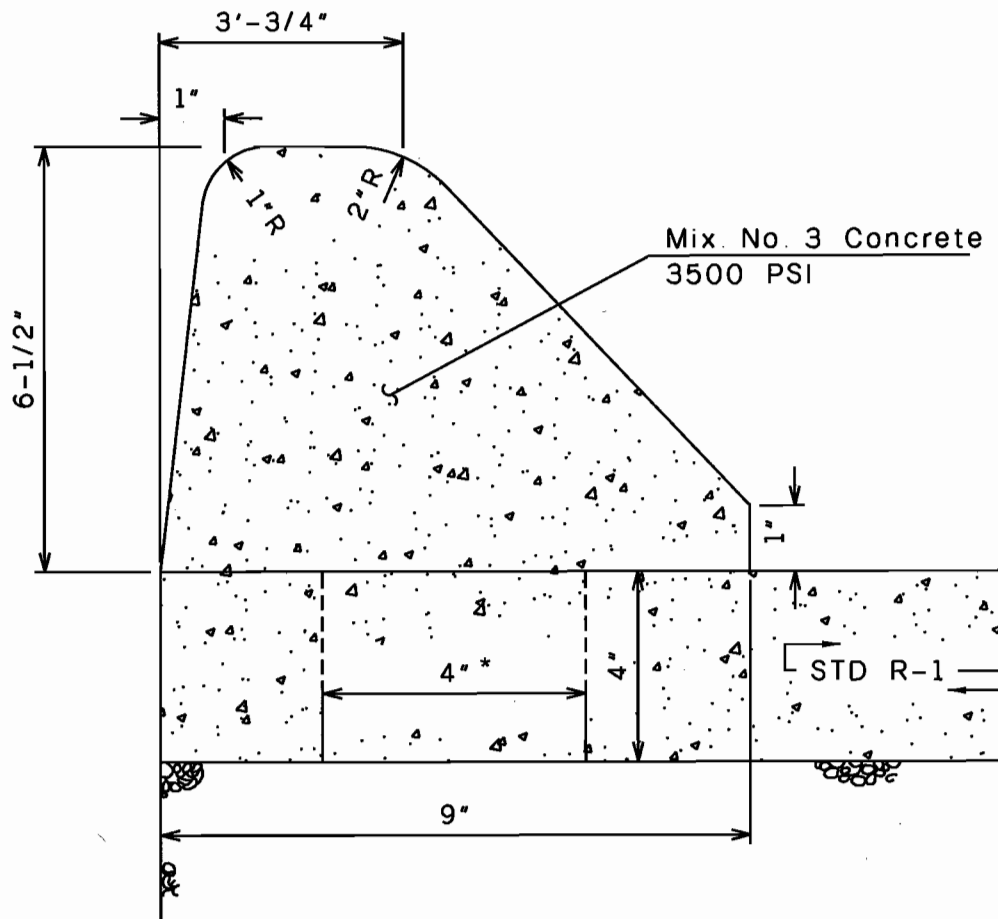
<i>[Signature]</i>	5/2/00
DIRECTOR OF PUBLIC WORKS	DATE
<i>[Signature]</i>	4/12/00
DEP. DIRECTOR, PUBLIC WORKS	DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

MOUNTABLE CURB & GUTTER

ISSUED	5/02/00
REVISED	5/31/07
REVISED	
PLATE	S-2



* 4"x4"x4" concrete key way spaced 4' on center will be required to anchor curb to pavement section. Expansion joint material, to be placed every 50' and at P.C.'s and P.T.'s of all curves.

<i>[Signature]</i>	05.02.00
DIRECTOR OF PUBLIC WORKS	DATE
<i>[Signature]</i>	04.12.00
DEP. DIRECTOR, PUBLIC WORKS	DATE

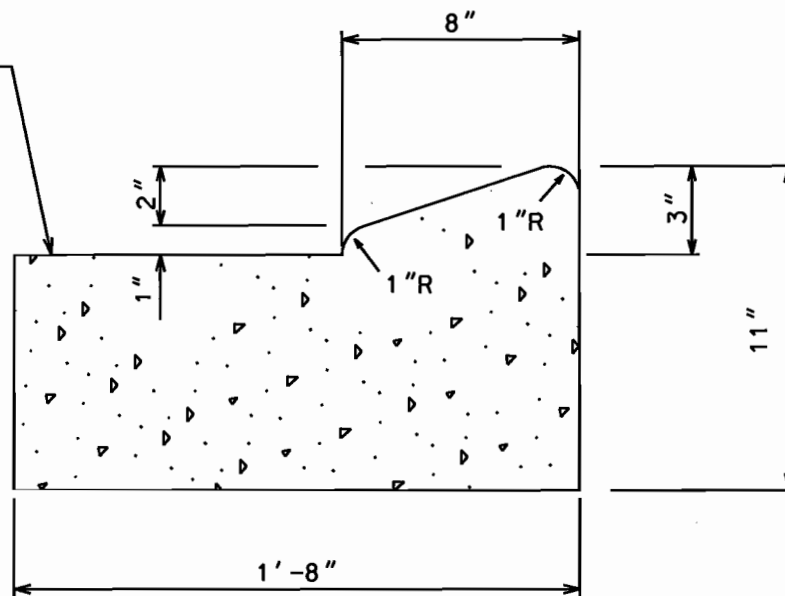


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

EXTRUDED CURB
(TEMPORARY INSTALLATIONS ONLY)

ISSUED	05.02.00
REVISED	05.31.07
REVISED	
PLATE	S-3

MATCH ROADWAY
PAVEMENT SLOPE



NOTE:
THIS CURB SHALL ONLY BE USED
AROUND THE TRUCK APRONS
ON ROUNDABOUTS AND THE MEDIAN/NOSE
OF THE MEDIAN ON ISLANDS.

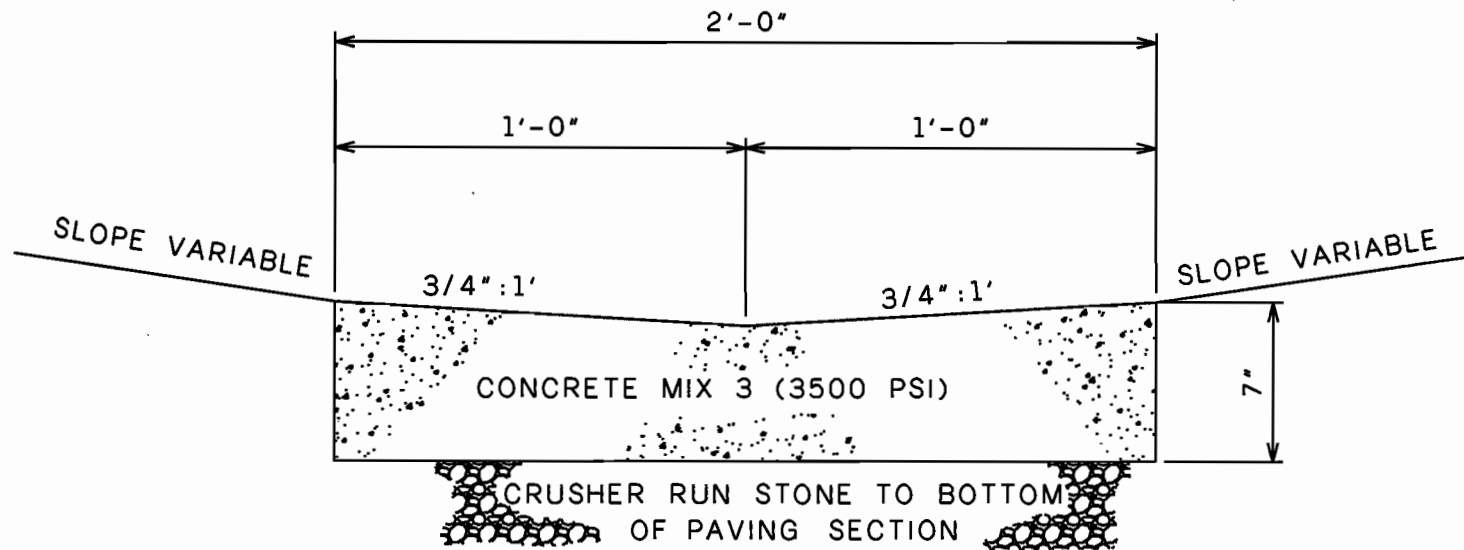
James R. White 1-7-03
DIRECTOR OF PUBLIC WORKS DATE
D. Wilson 1-7-03
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

STANDARD TYPE 'C' COMBINATION
CONCRETE CURB & GUTTER

ISSUED 1-7-03
REVISED 2/15/03
REVISED
PLATE S-4



[Signature] 05.02.00
 DIRECTOR OF PUBLIC WORKS DATE
[Signature] 04.12.00
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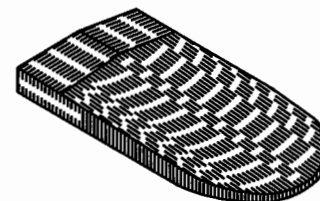
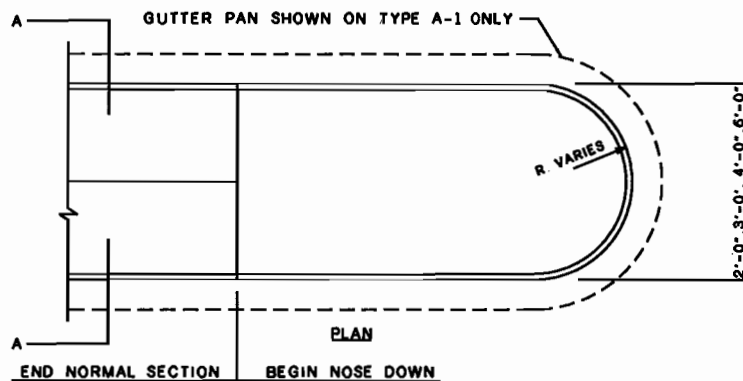
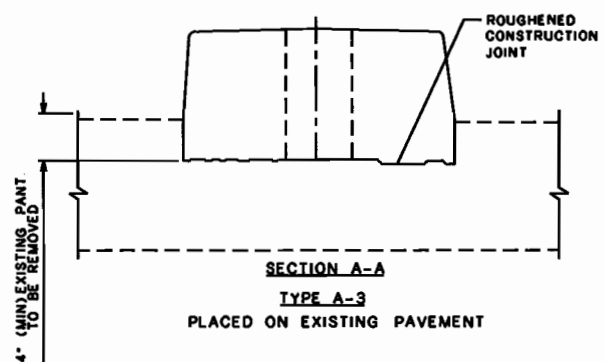
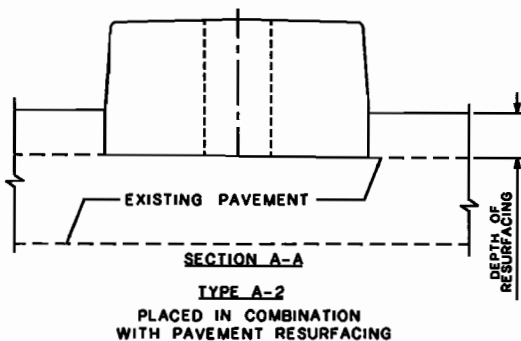
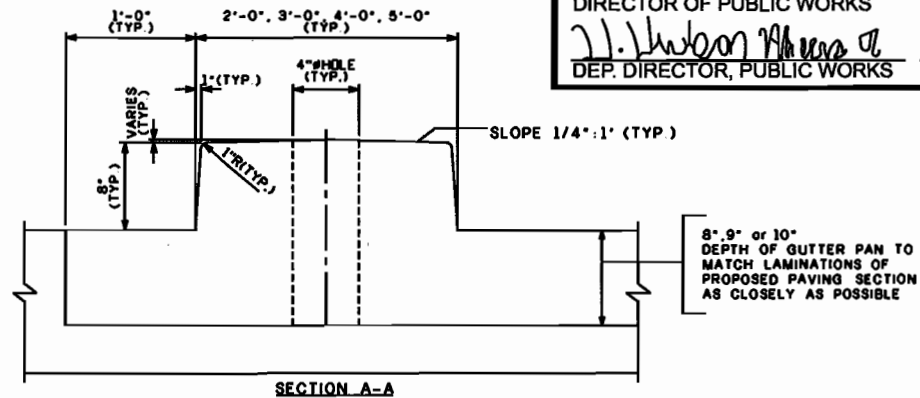
HARFORD COUNTY, MD
 DEPARTMENT OF
 PUBLIC WORKS

VALLEY GUTTER
 (FOR REPLACEMENT PURPOSES ONLY)

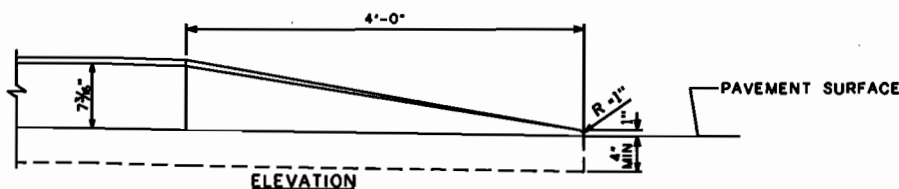
ISSUED 05.02.00
 REVISED 05.31.07
 REVISED
 PLATE S-5

W. J. Johnson
 DIRECTOR OF PUBLIC WORKS
 21. Johnson
 DEP. DIRECTOR, PUBLIC WORKS

05.02.00
 DATE
 04.12.00
 DATE



ISOMETRIC-NOSE DOWN
 (SHOWN WITHOUT GUTTER PAN)



NOSE DOWN AT APPROACH END OF MEDIAN

NOTES:

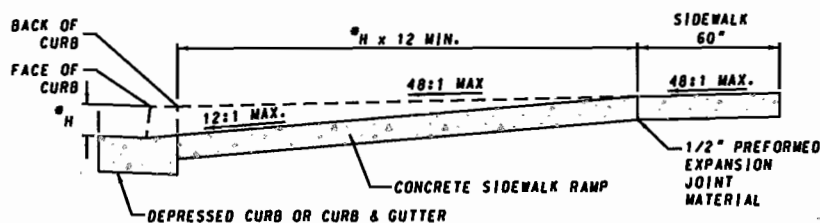
JOINT SPACING WILL BE A MAXIMUM OF 10'-0" APART. SEE SPECIFICATIONS FOR LOCATION AND DESCRIPTION OF TREATMENT FOR THE TYPES OF JOINTS USED IN THE CASE OF PAVED PAVEMENT. JOINTS SHALL MATCH PAVEMENT JOINTS.
 ALLOW 4" HOLES IN MEDIAN FOR SIGNS. SPACED AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

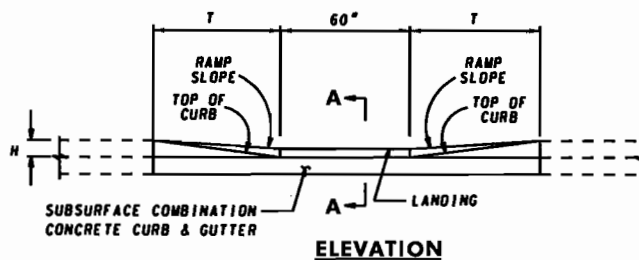
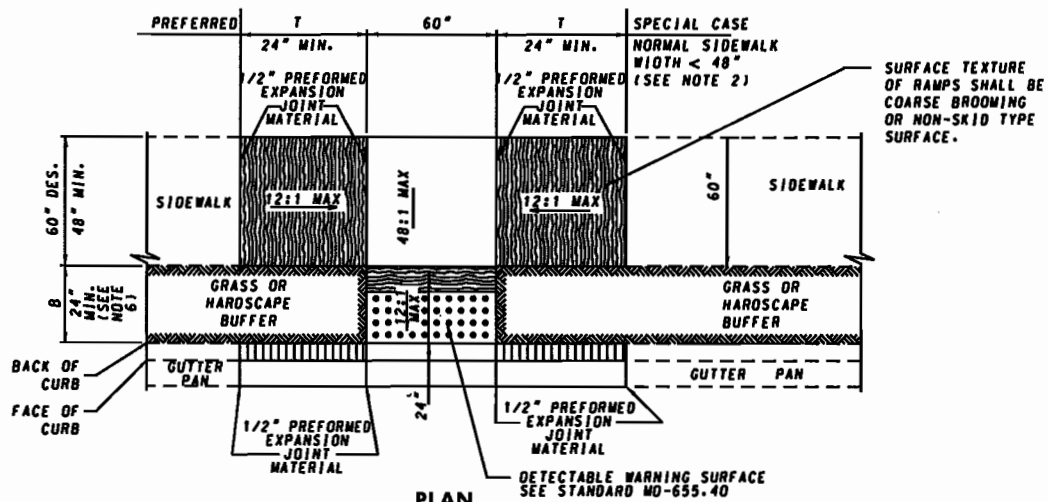


HARFORD COUNTY, MD
 DEPARTMENT OF
 PUBLIC WORKS

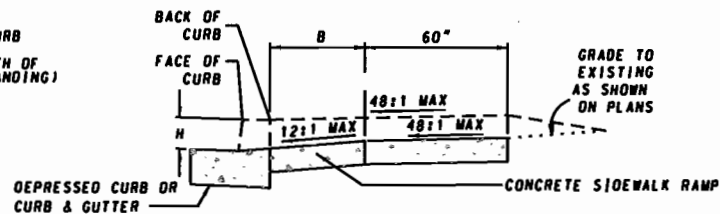
STANDARD MONOLITHIC
 CONCRETE MEDIAN

ISSUED 5/2/00
 REVISED
 REVISED
 PLATE S-6





H = HEIGHT OF CURB
B = BUFFER WIDTH (BACK OF CURB TO FRONT OF SIDEWALK)
T = TRANSITION LENGTH (LENGTH OF RAMP FROM SIDEWALK TO LANDING)
 $T = (12 \times H) - B$
ALL MEASUREMENTS IN INCHES



SECTION A-A

NOTES

1. TO BE USED WHERE AT LEAST 7'-0" EXISTS BETWEEN THE BACK OF CURB AND THE BACK OF SIDEWALK. THIS STANDARD MAY BE MODIFIED TO SUIT A PARTICULAR LOCATION.
2. WHERE 60" SIDEWALK CAN NOT BE PROVIDED, A DESIGN WAIVER MUST BE REQUESTED.
3. NO TRAVERSABLE SLOPE ON THE RAMP OR SIDEWALK SHALL EXCEED 12:1 IN THE DIRECTION OF PEDESTRIAN TRAVEL, OR 48:1 PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.
4. SIDEWALK RAMPS TO BE SHOWN ON PLANS SYMBOLICALLY AND REFERENCED WITH THE CENTER OF THE RAMP ALIGNED TO A STATION ON THE CONSTRUCTION CENTERLINE. SEPARATE DETAILS SHALL BE SHOWN WHERE PROPOSED RAMP VARIES FROM STANDARD CASES.
5. FOR BUFFER WIDTHS LESS THAN 24", WIDEN SIDEWALK TO BACK OF CURB AS SHOWN FOR THE SPECIAL CASE, THEN BUILD PARALLEL RAMP USING PLATE S-8.

Robert P. Cooper
Director of Public Works

10/09/08
Date

W. William Myers, III
DEP. DIRECTOR, PUBLIC WORKS

9/29/08
Date

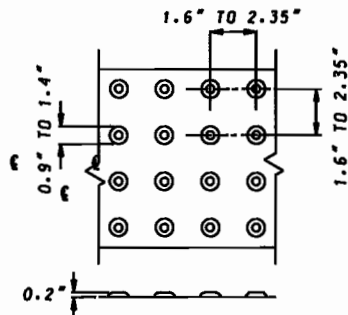


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

SIDEWALK RAMPS
PARALLEL

ISSUED _____
REVISED _____
REVISED _____
PLATE **S-9**

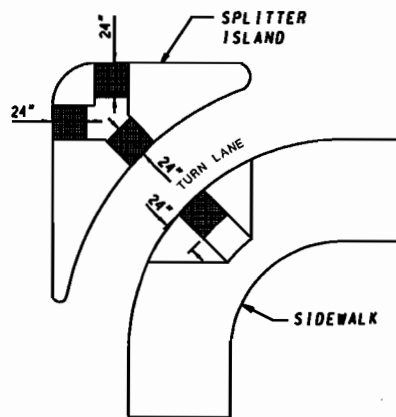
SEE PLACEMENT GUIDELINES BELOW



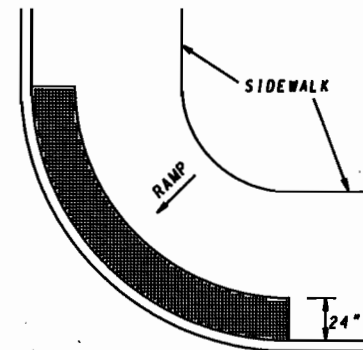
DOME SECTION

Diagram illustrating a Shared Curb Ramp. The diagram shows a cross-section of a sidewalk and a ramp. The ramp is labeled "RAMP" and has a width dimension of "24\"". The ramp is positioned between the "BACK OF CURB" and the "FACE OF CURB". A note points to the ramp area, stating "SEE NOTE". The entire structure is labeled "SHARED CURB RAMP".

SHARED CURB RAMP



REFUGE ISLAND



BLENDED CURB

WHERE ISLANDS OR MEDIANS ARE LESS THAN 6 FEET WIDE, THE DETECTABLE WARNING SHOULD EXTEND ACROSS THE FULL LENGTH OF THE CUT THROUGH THE ISLAND OR MEDIAN

1. DETECTABLE WARNING SURFACES SHALL CONSIST OF RAISED TRUNCATED DOMES WITH NOMINAL DIMENSIONS AS SHOWN AND SHALL BE CAST IN PLACE INTO THE RAMP. SURFACE APPLIED DETECTABLE WARNING SURFACES SHALL NOT BE PERMITTED ON NEW OR RECONSTRUCTED CURB RAMPS.
2. DETECTABLE WARNING SURFACES SHALL BE A "BRICK" OR "RUST" RED COLOR.
3. THE DETECTABLE WARNING SURFACES SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS 6 TO 8 INCHES FROM THE FACE OF CURB.
4. FOR SKEWED APPLICATIONS DETECTABLE WARNING SHALL BE PLACED SUCH THAT THE DOMES CLOSEST TO THE BACK OF CURB ARE NO LESS THAN 0.5" AND NO MORE THAN 3.0" FROM THE BACK OF CURB. TRUNCATED DOME SURFACES SHALL BE FABRICATED TO PROVIDE FULL DOMES ONLY.
5. DETECTABLE WARNING SURFACES ARE REQUIRED AT STREET CROSSING & SIGNALIZED INTERSECTIONS.

Robert B. Cooper
Director of Public Works

10/09/08
Date

W. Hudson Myers, III
 DEP. DIRECTOR, PUBLIC WORKS

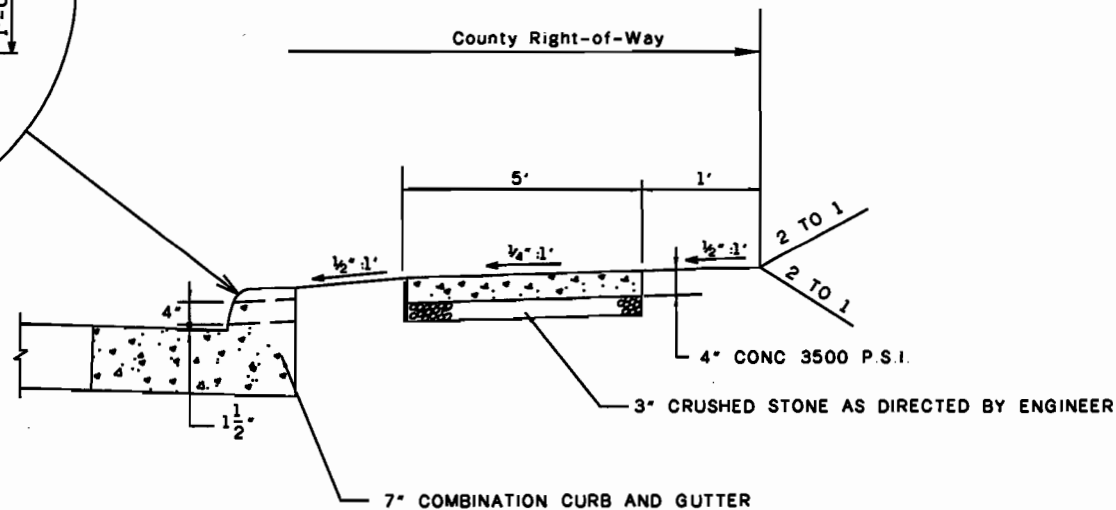
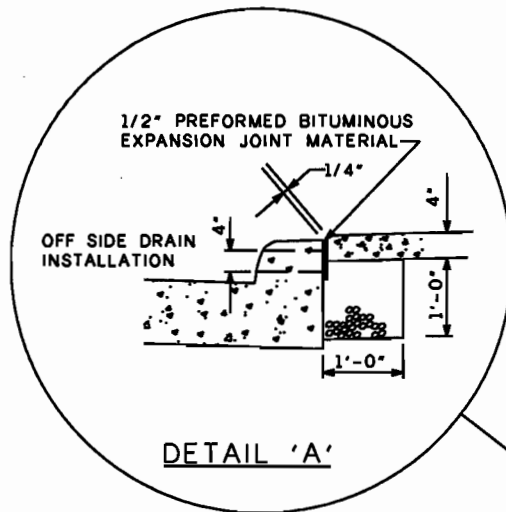
9/29/08
Date



**HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS**

DETECTABLE WARNING SURFACE

ISSUED _____
 REVISED _____
 REVISED _____
 PLATE S-10



NOTES:

1. SIDEWALK TO BE SCRIBED IN 5' SQUARES.
2. EXPANSION JOINTS ACROSS THE SIDEWALK NOT MORE THAN 16' APART.
3. 1/2" PREFORMED BITUMINOUS EXPANSION JOINT MATERIAL IN EXPANSION JOINTS TO BE 1/4" BELOW SURFACE OF SIDEWALK.
4. CONCRETE TO BE MIX 3. (3500 P.S.I.)
5. WHEN SIDEWALK ABUTS CURB, WALK SHALL BE 1/4" ABOVE CURB WITH 1/2" PREFORMED BITUMINOUS EXPANSION JOINT BETWEEN THEM AND RESTING ON A COMPACTED CRUSHED STONE BASE. SEE DETAIL 'A' THIS SHEET.
6. OFF SITE DRAIN TO BE 3" DIAMETER PLASTIC OR FIBER PIPE TO 1' BEHIND WALKS WHERE THEY ARE ADJACENT TO CURB.



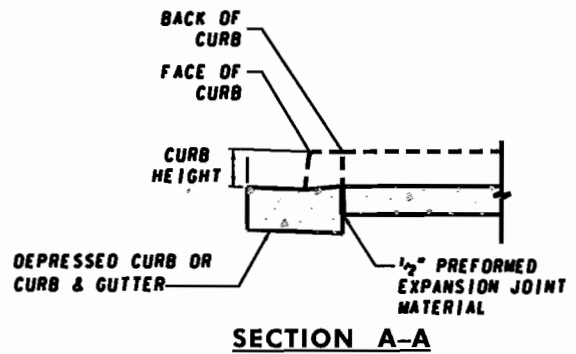
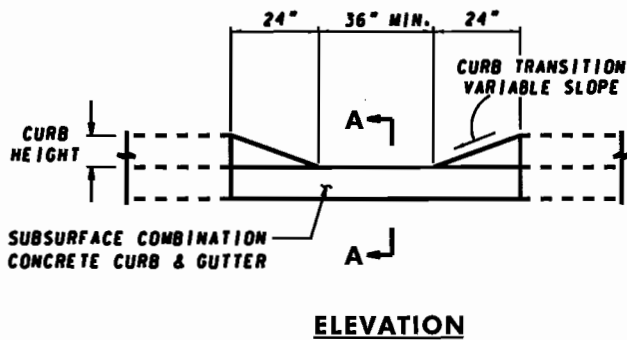
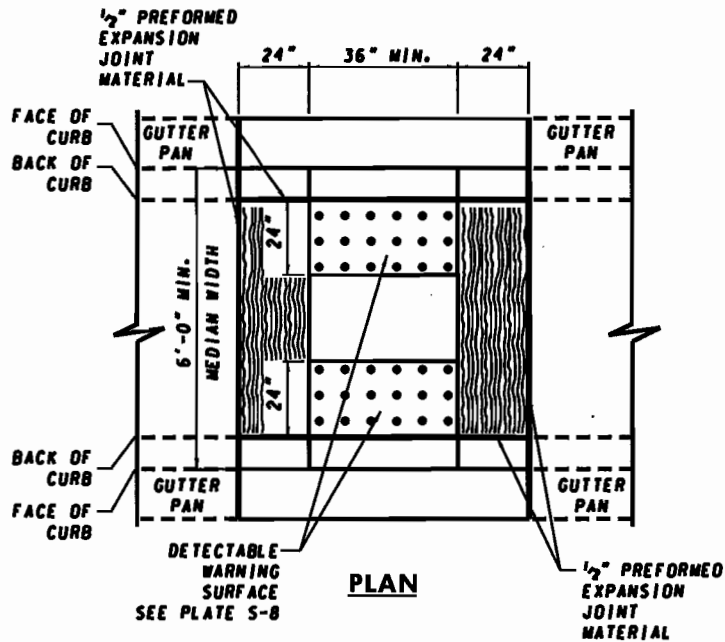
HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

W. A. Allen, Jr.
DIRECTOR OF PUBLIC WORKS
W. L. Wilson
DEP. DIRECTOR, PUBLIC WORKS

5-2-00
DATE
4/12/00
DATE

STANDARD 5' SIDEWALK

ISSUED 5-02-00
REVISED 5-31-07
REVISED
PLATE S-11



NOTES

1. TO BE USED WHERE A STREET-LEVEL PEDESTRIAN CROSSING IS REQUIRED THROUGH RAISED MEDIANS OR RAISED ISLANDS AND THERE IS INSUFFICIENT WIDTH TO PROVIDE A RAMPED MEDIAN OR ISLAND OPENING.
2. WHERE PHYSICAL CONSTRAINTS PRECLUDE USE OF 6 FT. MEDIAN, A 4 FT. MEDIAN WIDTH IS ACCEPTABLE.
3. CUT-THROUGH MEDIAN AND ISLAND OPENINGS TO BE SHOWN ON PLANS SYMBOLICALLY AND REFERENCED WITH THE CENTER OF THE OPENING ALIGNED TO A STATION ON THE CONSTRUCTION CENTERLINE. SEPARATE DETAILS SHALL BE SHOWN WHERE PROPOSED OPENING VARIES FROM STANDARD METHODS.

Robert B. Cooper
Director of Public Works

10/09/08
Date

W. Dudley Myers, III
DEP. DIRECTOR, PUBLIC WORKS

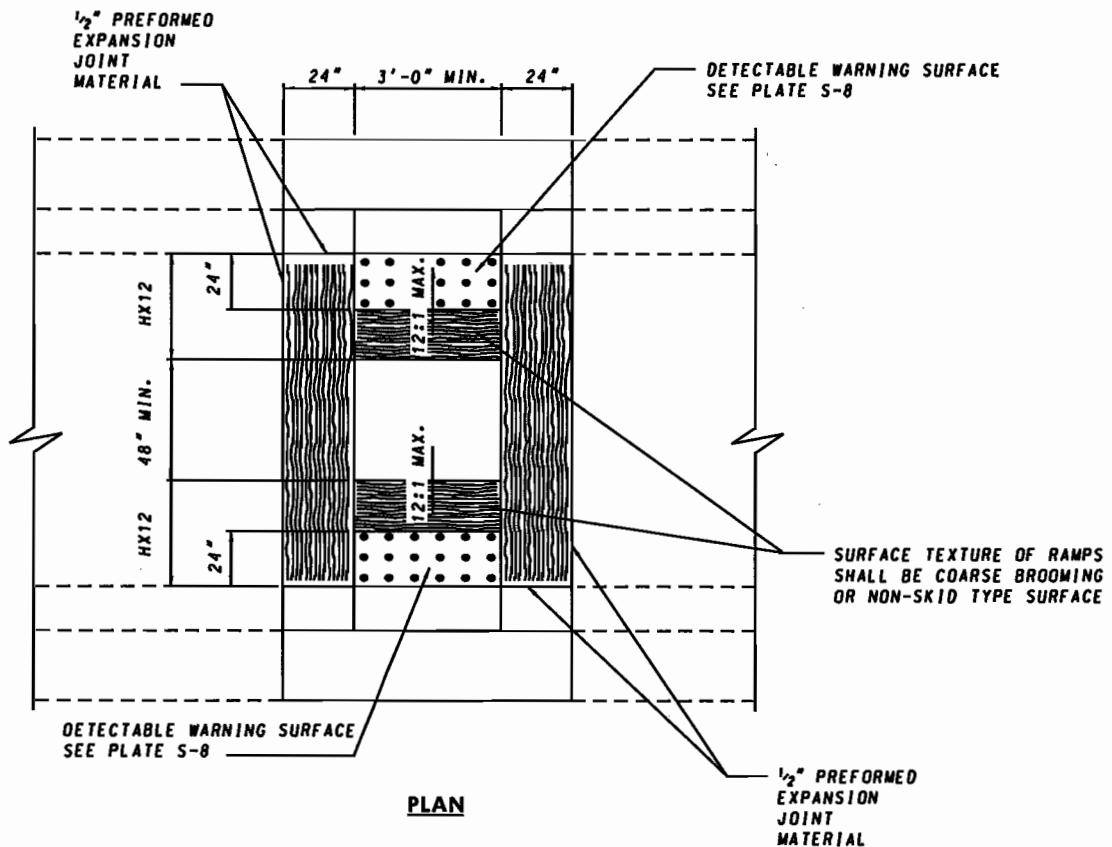
9/29/08
Date



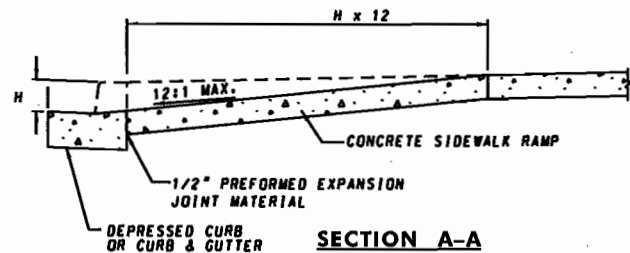
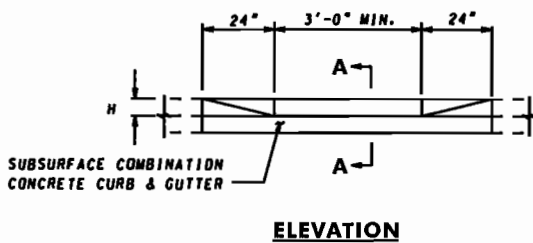
HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

CUT-THROUGH
MEDIAN AND ISLAND OPENINGS

ISSUED _____
REVISED _____
REVISED _____
PLATE S-12



H = HEIGHT OF CURB
ALL MEASUREMENTS IN INCHES



NOTES

1. TO BE USED WHERE A PEDESTRIAN ACCESS ROUTE CROSSES RAISED MEDIANS OR RAISED ISLANDS AND THERE IS SUFFICIENT WIDTH TO SATISFY THE GEOMETRY OUTLINED IN THIS STANDARD.
2. RAMPED MEDIAN AND ISLAND OPENINGS TO BE SHOWN ON PLANS SYMBOLICALLY AND REFERENCED WITH THE CENTER OF THE OPENING ALIGNED TO A STATION ON THE CONSTRUCTION CENTERLINE. SEPARATE DETAILS SHALL BE SHOWN WHERE PROPOSED OPENING VARIES FROM STANDARD METHODS.

Robert B. Cooper
Director of Public Works

10/09/08
Date

H. Hudson Myers III
DEP. DIRECTOR, PUBLIC WORKS

9/29/08
Date



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

RAMPED MEDIAN AND
ISLAND OPENINGS

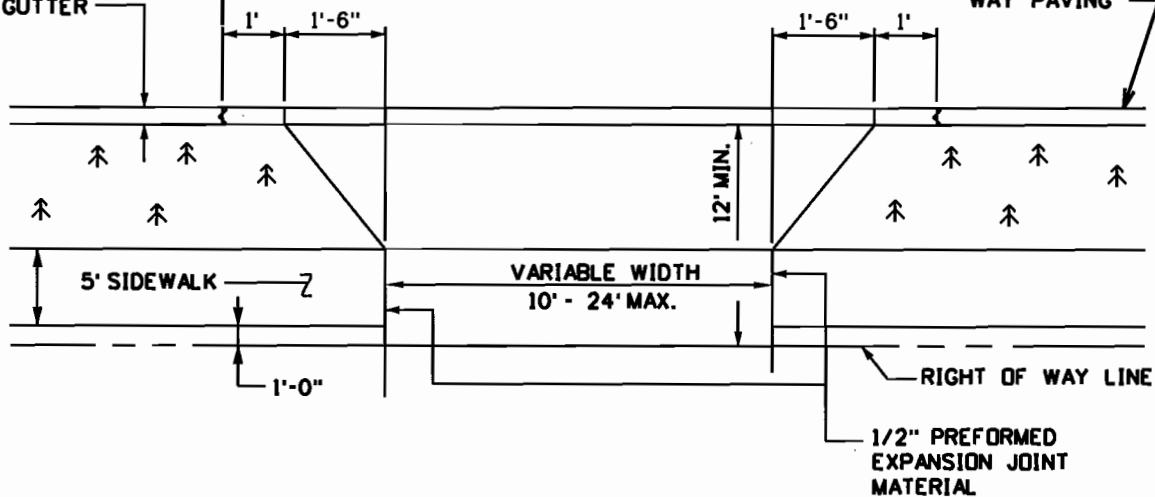
ISSUED _____
REVISED _____
REVISED _____
PLATE S-13

REMOVE EXISTING CURB
TO JOINT WITHIN 3'
OR BREAK CURB HERE

DRIVEWAY ENTRANCE

7" CONCRETE CURB
& GUTTER

EDGE OF TRAFFIC
WAY PAVING



PLAN

NOTES:

1. THE ACCESS (DRIVEWAY) MUST BE PAVED WITH PORTLAND CEMENT (7") (MIX 3) OR HOT MIX ASPHALT (3") COMPACTED MINIMUM, WITH (6") GRADED AND COMPACTED AGGREGATE BASE, FROM EDGE OF THE COUNTY ROAD A MINIMUM OF TWELVE (12) FEET, OR TO THE RIGHT-OF-WAY LINE, WHICHEVER IS GREATER.
2. HOT MIX ASPHALT (3") MAY ONLY BE USED WHERE SIDEWALKS ARE NOT PRESENT. THREE (3) INCH MINIMUM THICKNESS IS THE COMPACTED AND COMPLETED THICKNESS THROUGHOUT.
3. PORTLAND CEMENT (7") MUST BE POURED USING SEVEN (7) INCH HIGH FORMS, MINIMUM.
4. ALL ACCESSES (DRIVEWAYS) MUST MAINTAIN A FIVE (5) FOOT MINIMUM CLEARANCE FROM ALL ABOVE GROUND UTILITIES, (e.g., CABLE, TELEPHONE, AND ELECTRIC BOXES, HYDRANTS, POLES, STORM DRAINS, ETC.)
5. ACCESS WILL RISE FROM 1/2" TO 1" PER FOOT SLOPE FROM THE 1/2" LIP TO THE RIGHT-OF-WAY LINE OR 12', WHICHEVER IS GREATER. THE ACCESS MAY THEN SLOPE TO MEET EXISTING GRADES, BUT MAY NOT EXCEED 15% GRADE WITHOUT SPECIFIC APPROVAL OF THE DIRECTOR.
6. JOINTS MUST BE SAW CUT WHEN THREE (3) FEET OR GREATER FROM AN EXISTING JOINT. WHEN WITHIN THREE (3) FEET, CURB MUST BE REMOVED TO THE JOINT.
7. COUNTY ROAD EDGE TIE IN MUST BE SAW CUT TO DEPTH OF APPROVED CONSTRUCTION MATERIAL. SEALER MUST BE APPLIED TO THE JOINT DURING CONSTRUCTION UPON COMPLETION.
8. SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WHEN CROSSING DRIVEWAY. IF NECESSARY, THE SIDEWALK MAY BE "BENCHED" THRU THE DRIVEWAY TO MAINTAIN THE CROSS SLOPE. A 5' WIDE "BENCH" IS PREFERRED, BUT MAY BE REDUCED TO 3' IF DRIVEWAY GRADE EXCEEDS 10%.
9. EXISTING SIDEWALK MUST BE REMOVED AND CONSTRUCTED TO MEET THESE SPECIFICATIONS.

Robert B. Cooper
Director of Public Works

10/09/08
Date

W. V. Vukobratovic, Jr.
DEP. DIRECTOR, PUBLIC WORKS

9/29/08
Date

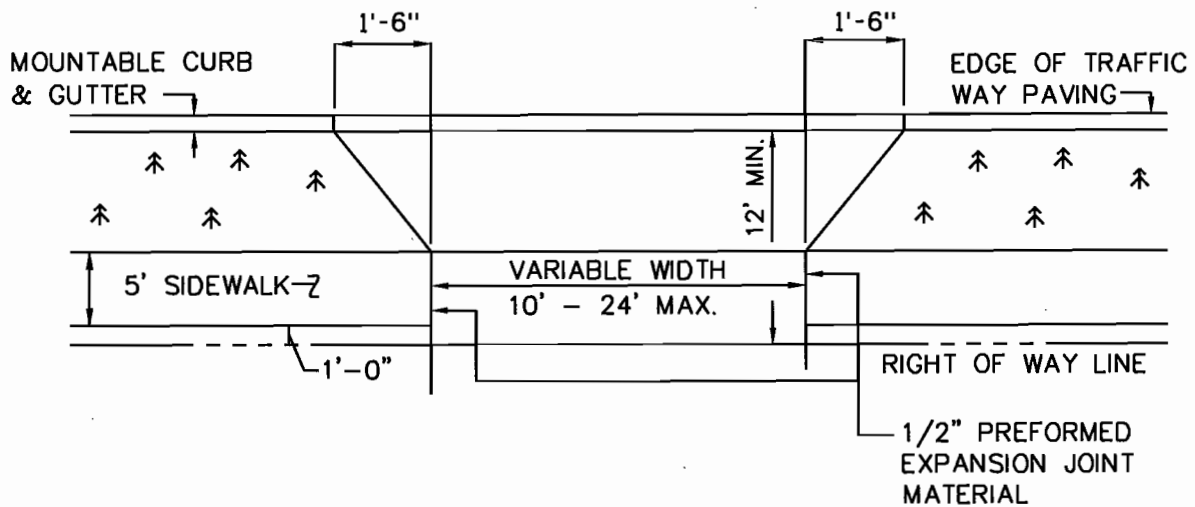


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

TYPICAL DRIVEWAY ENTRANCE
FOR 7" CONCRETE CURB AND
GUTTER WITH SIDEWALK

ISSUED _____
REVISED _____
REVISED _____
PLATE S-14

DRIVEWAY ENTRANCE



PLAN

NOTES:

1. THE ACCESS (DRIVEWAY) MUST BE PAVED WITH PORTLAND CEMENT (7") (MIX#3) OR HOT MIX ASPHALT (3") MINIMUM, WITH (6") GRADED AND COMPACTED AGGREGATE BASE, FROM THE EDGE OF THE COUNTY ROAD A MINIMUM OF TWELVE (12) FEET, OR TO THE RIGHT-OF-WAY LINE, WHICHEVER IS GREATER.
2. HOT MIX ASPHALT (3") MAY ONLY BE USED WHERE SIDEWALKS ARE NOT PRESENT. THREE (3) INCH MINIMUM THICKNESS IS THE COMPACTED AND COMPLETED THICKNESS THROUGHOUT.
3. PORTLAND CEMENT (7") MUST BE POURED USING SEVEN (7) INCH HIGH FORMS, MINIMUM.
4. ALL ACCESSES (DRIVEWAYS) MUST MAINTAIN A FIVE (5) FOOT MINIMUM CLEARANCE FROM ALL ABOVE GROUND UTILITIES, (e.g. CABLE, TELEPHONE, AND ELECTRIC BOXES, HYDRANTS, POLES, STORM DRAINS, ETC.)
5. ACCESS WILL RISE FROM 1/2" TO 1" PER FOOT SLOPE FROM THE CURB BACK TO THE RIGHT-OF-WAY LINE OR 12', WHICHEVER IS GREATER. THE ACCESS MAY THEN SLOPE TO MEET EXISTING GRADES, BUT MAY NOT EXCEED 15% GRADE WITHOUT SPECIFIC APPROVAL OF DIRECTOR.
6. MOUNTABLE CURB AND GUTTER MAY NOT BE REMOVED OR MODIFIED FOR ACCESS CONSTRUCTION WITHOUT SPECIFIC APPROVAL BY THE DIRECTOR. MATERIALS MAY NOT BE PLACED ALONG CURB FACE TO DECREASE IMPACT SLOPE.
7. SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WHEN CROSSING DRIVEWAY. IF NECESSARY, THE SIDEWALK MAY BE "BENCHED" THRU THE DRIVEWAY TO MAINTAIN THE CROSS SLOPE. A 5' WIDE "BENCH" IS PREFERRED BUT MAY BE REDUCED TO 3' IF DRIVEWAY GRADE EXCEEDS 10%.
8. EXISTING SIDEWALK MUST BE REMOVED AND CONSTRUCTED TO MEET THESE REQUIREMENTS.

<i>Robert B. Cooper</i> DIRECTOR OF PUBLIC WORKS	10/03/08 DATE
<i>J. Hickory Myers</i> DEP. DIRECTOR, PUBLIC WORKS	9/29/08 DATE



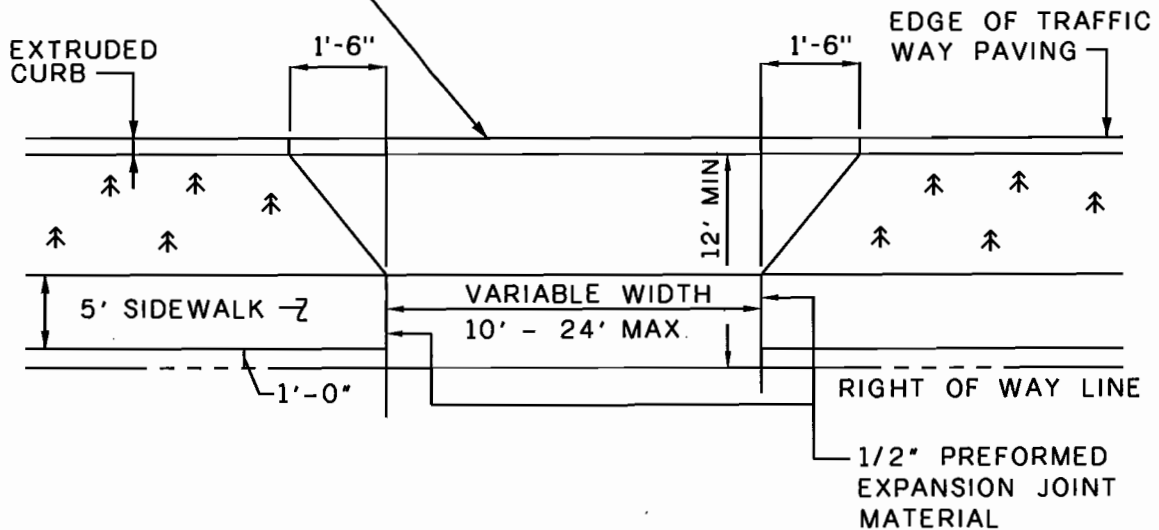
HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

TYPICAL DRIVEWAY ENTRANCE
DETAIL FOR MOUNTABLE CURB
AND GUTTER

ISSUED	_____
REVISED	_____
REVISED	_____
PLATE	S-15

REMOVE EXISTING CURB
AND TIE IN SMOOTH
TRANSITION

DRIVEWAY ENTRANCE



PLAN

NOTES:

1. THE ACCESS (DRIVEWAY) MUST BE PAVED WITH PORTLAND CEMENT (7") (MIX #3) OR HOT MIX ASPHALT (3") MINIMUM, WITH (6") GRADED AND COMPACTED AGGREGATE BASE, FROM THE EDGE OF THE COUNTY ROAD A MINIMUM OF TWELVE (12) FEET, OR TO THE RIGHT-OF-WAY LINE, WHICHEVER IS GREATER.
2. HOT MIX ASPHALT (3") MAY ONLY BE USED WHERE SIDEWALKS ARE NOT PRESENT. THREE (3) INCH MINIMUM THICKNESS IS THE COMPACTED AND COMPLETED THICKNESS THROUGHOUT.
3. PORTLAND CEMENT (7") MUST BE POURED USING SEVEN (7) INCH HIGH FORMS, MINIMUM.
4. ALL ACCESSES (DRIVEWAYS) MUST MAINTAIN A FIVE (5) FOOT MINIMUM CLEARANCE FROM ALL ABOVE GROUND UTILITIES, (e.g., CABLE, TELEPHONE, AND ELECTRIC BOXES, HYDRANTS, POLES, STORM DRAINS, ETC.)
5. ACCESS WILL RISE FROM 1/2" TO 1" PER FOOT SLOPE FROM THE CURB BACK TO THE RIGHT-OF-WAY LINE OR 12', WHICHEVER IS GREATER. THE ACCESS MAY THEN SLOPE TO MEET EXISTING GRADES, BUT MAY NOT EXCEED 15% GRADE WITHOUT SPECIFIC APPROVAL OF THE DIRECTOR.
6. EXTRUDED CURB MUST BE SAW CUT AND REMOVED FOR ACCESS CONSTRUCTION. HOT MIX ASPHALT MUST BE FORMED BACK INTO EXTRUDED CURB ON BOTH SIDES OF ACCESS.
7. COUNTY ROAD EDGE TIE IN MUST BE SAW CUT TO DEPTH OF APPROVED CONSTRUCTION MATERIAL. SEALER MUST BE APPLIED TO THE JOINT DURING CONSTRUCTION UPON COMPLETION.
8. SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WHEN CROSSING DRIVEWAY. IF NECESSARY, THE SIDEWALK MAY BE "BENCHED" THRU THE DRIVEWAY TO MAINTAIN THE CROSS SLOPE. A 5' WIDE "BENCHED" IS PREFERRED, BUT MAY BE REDUCED TO 3' IF DRIVEWAY GRADE EXCEEDS 10%.
9. EXISTING SIDEWALK MUST BE REMOVED AND CONSTRUCTED TO MEET THESE SPECIFICATIONS.

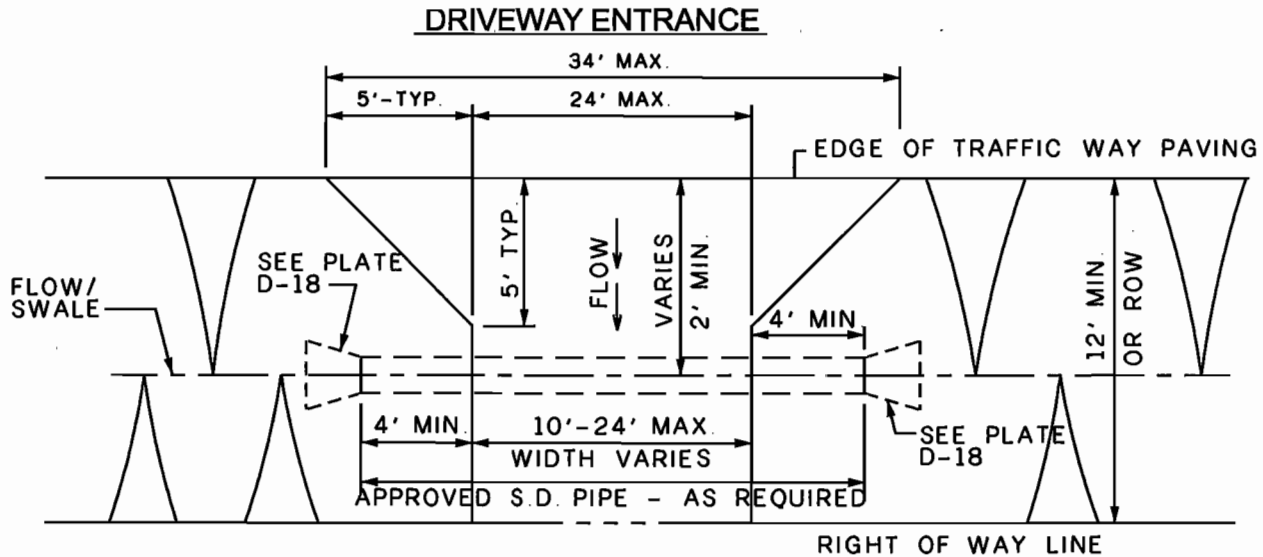
Robert B. Goff 10/09/08
DIRECTOR OF PUBLIC WORKS DATE
W. William Mays, Jr. 9/29/08
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

TYPICAL DRIVEWAY
ENTRANCE FOR EXTRUDED
CURBED STREET W/SIDEWALK

ISSUED _____
REVISED _____
REVISED _____
PLATE S-16



NOTES:

1. THE ACCESS (DRIVEWAY) MUST BE PAVED WITH PORTLAND CEMENT (7") (MIX #3) OR HOT MIX ASPHALT (3") MINIMUM, WITH (6") GRADED AND COMPACTED AGGREGATE BASE, FROM THE EDGE OF THE COUNTY ROAD A MINIMUM OF TWENTY (20) FEET, OR TO THE RIGHT-OF-WAY LINE, WHICHEVER IS GREATER.
2. HOT MIX ASPHALT (3") MAY ONLY BE USED WHERE SIDEWALKS ARE NOT PRESENT. THREE (3) INCH MINIMUM THICKNESS IS THE COMPACTED AND COMPLETED THICKNESS THROUGHOUT.
3. PORTLAND CEMENT (7") MUST BE POURED USING SEVEN (7) INCH HIGH FORMS, MINIMUM.
4. ALL ACCESSES (DRIVEWAYS) MUST MAINTAIN A FIVE (5) FOOT MINIMUM CLEARANCE FROM ALL ABOVE GROUND UTILITIES, (e.g. CABLE, TELEPHONE, AND ELECTRIC BOXES, HYDRANTS, POLES, STORM DRAINS, ETC.)
5. ACCESS WILL FALL FROM 1/2" TO 1" PER FOOT SLOPE FROM THE EDGE OF COUNTY ROAD FOR A MINIMUM OF TWO (2) FEET, AND THEN RISE FROM 1/2" TO 1" PER FOOT SLOPE TO RIGHT-OF-WAY LINE OR 12', WHICHEVER IS GREATER. THE ACCESS MAY THEN SLOPE TO MEET EXISTING GRADES, BUT MAY NOT EXCEED 15% GRADE WITHOUT SPECIFIC APPROVAL OF THE DIRECTOR.
6. APPROVED CONCRETE OR CORRUGATED METAL PIPE SHALL BE USED FOR ACCESS CONSTRUCTION. FLUME TYPE END SECTIONS DESIGNED AND APPROVED FOR EACH TYPE AND SIZE OF PIPE, SHALL BE INSTALLED ON EACH END AND STABILIZATION COMPLETED.
7. DRIVEWAY PIPES MAY NOT BE CONNECTED TO ANY OTHER DRIVEWAY PIPE OR STORM DRAIN WITHOUT PRIOR APPROVAL OF THE DIRECTOR.
8. COUNTY ROAD EDGE TIE IN MUST BE SAW CUT TO DEPTH OF APPROVED CONSTRUCTION MATERIAL. SEALER MUST BE APPLIED TO THE JOINT DURING CONSTRUCTION AND UPON COMPLETION.

Robert G. Cooper
DIRECTOR OF PUBLIC WORKS

10/09/08
DATE

D. William Myers, III
DEP. DIRECTOR, PUBLIC WORKS

9/29/08
DATE

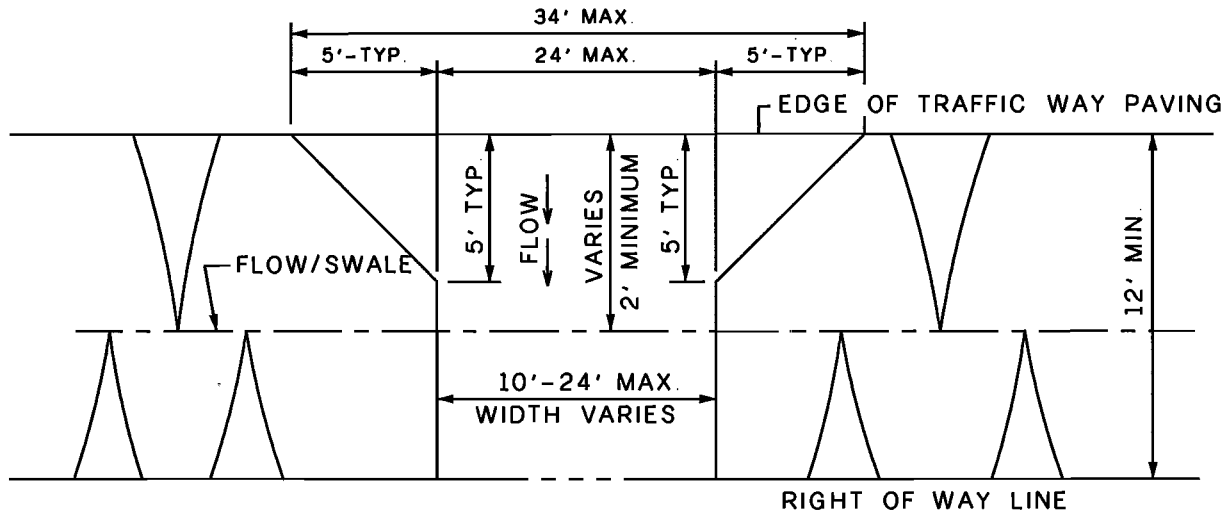


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

**TYPICAL DRIVEWAY ENTRANCE
FOR
OPEN SECTION ROAD-
PIPE REQUIRED**

ISSUED _____
REVISED _____
REVISED _____
PLATE **S-17**

DRIVEWAY ENTRANCE



PLAN

NOTES:

1. THE ACCESS (DRIVEWAY) MUST BE PAVED WITH PORTLAND CEMENT (7") (MIX #3) OR HOT MIX ASPHALT (3") MINIMUM, WITH (6") GRADED AND COMPACTED AGGREGATE BASE, FROM THE EDGE OF THE COUNTY ROAD A MINIMUM OF TWELVE (12) FEET, OR TO THE RIGHT-OF-WAY LINE, WHICHEVER IS GREATER.
2. HOT MIX ASPHALT (3") MAY ONLY BE USED WHERE SIDEWALKS ARE NOT PRESENT. THREE (3) INCH MINIMUM THICKNESS IS THE COMPACTED AND COMPLETED THICKNESS THROUGHOUT.
3. PORTLAND CEMENT (7") MUST BE POURED USING SEVEN (7) INCH HIGH FORMS, MINIMUM.
4. ALL ACCESSES (DRIVEWAYS) MUST MAINTAIN A FIVE (5) FOOT MINIMUM CLEARANCE FROM ALL ABOVE GROUND UTILITIES, (e.g. CABLE, TELEPHONE, AND ELECTRIC BOXES, HYDRANTS, POLES, STORM DRAINS, ETC.)
5. ACCESS WILL FALL FROM 1/2" TO 1" PER FOOT SLOPE FROM THE EDGE OF COUNTY ROAD FOR A MINIMUM OF TWO (2) FEET, AND THEN RISE FROM 1/2" TO 1" PER FOOT SLOPE TO RIGHT-OF-WAY LINE OR 12', WHICHEVER IS GREATER TO CREATE A DRAINAGE SWALE. THE ACCESS MAY THEN SLOPE TO MEET EXISTING GRADES, BUT MAY NOT EXCEED 15% GRADE WITHOUT SPECIFIC APPROVAL OF THE DIRECTOR.
6. DRAINAGE SWALE LOCATION AND/OR DEPTH MAY BE GREATER AND/OR DEEPER AS DETERMINED BY ROAD DESIGN OR THE INSPECTOR PRIOR TO PAVING.
7. COUNTY ROAD EDGE TIE IN MUST BE SAW CUT TO DEPTH OF APPROVED CONSTRUCTION MATERIAL. SEALER MUST BE APPLIED TO THE ROADWAY JOINT DURING CONSTRUCTION AND UPON COMPLETION.

Robert B. Cooper
DIRECTOR OF PUBLIC WORKS

10/09/08
DATE

H. Muelberg Myer, Jr.
DEP. DIRECTOR, PUBLIC WORKS

9/29/08
DATE

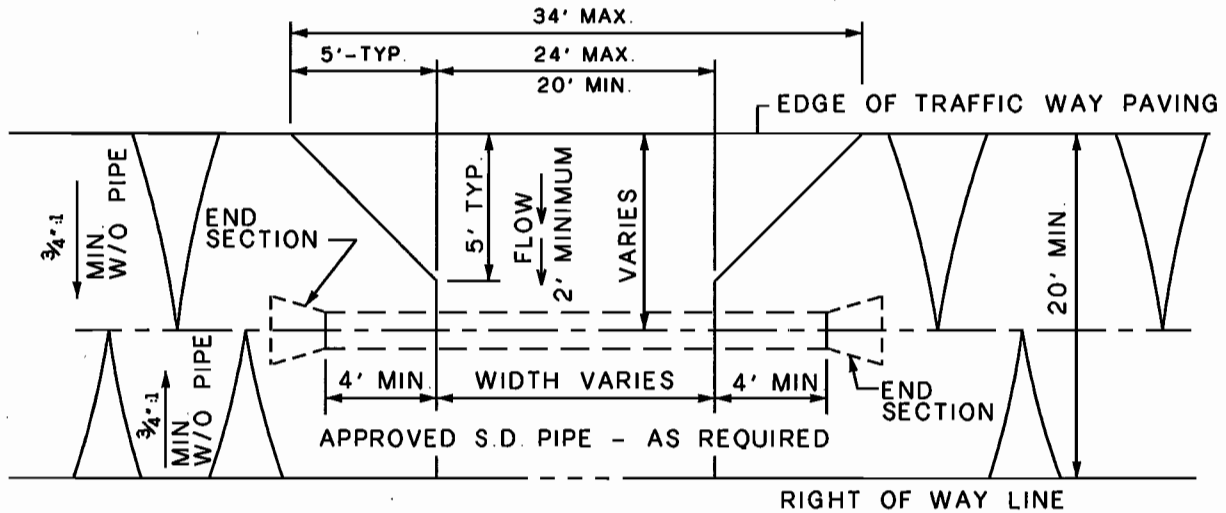


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

TYPICAL DRIVEWAY ENTRANCE
FOR
OPEN SECTION ROAD -
PIPE NOT REQUIRED

ISSUED _____
REVISED _____
REVISED _____
PLATE S-18

DRIVEWAY ENTRANCE



PLAN

NOTES:

1. THE ACCESS (DRIVEWAY) MUST BE PAVED WITH PORTLAND CEMENT (7") (MIX #3) OR HOT MIX ASPHALT (3") MINIMUM, WITH 6" GRADED AND COMPACTED AGGREGATE BASE, FROM THE EDGE OF THE COUNTY ROAD A MINIMUM OF TWELVE (12) FEET, OR TO THE RIGHT-OF-WAY LINE, WHICHEVER IS GREATER.
2. HOT MIX ASPHALT (3") MAY ONLY BE USED WHERE SIDEWALKS ARE NOT PRESENT. THREE (3) INCH MINIMUM ASPHALT THICKNESS IS THE COMPACTED AND COMPLETED THICKNESS THROUGHOUT.
3. PORTLAND CEMENT (7") MUST BE POURED USING SEVEN (7) INCH HIGH FORMS, MINIMUM, AND EXPANSION JOINT AS NOTED.
4. ALL ACCESSES (DRIVEWAYS) MUST MAINTAIN A FIVE (5) FOOT MINIMUM CLEARANCE FROM ALL ABOVE GROUND UTILITIES, (e.g. CABLE, TELEPHONE, AND ELECTRIC BOXES, HYDRANTS, POLES, STORM DRAINS, ETC.)
5. ACCESS WILL FALL FROM 3/4" TO 1" PER FOOT SLOPE FROM THE EDGE OF COUNTY ROAD FOR A MINIMUM OF TWO (2) FEET, AND THEN RISE FROM 3/4" TO 1" PER FOOT SLOPE TO RIGHT-OF-WAY LINE OR 12', WHICHEVER IS GREATER. THE ACCESS MAY THEN SLOPE TO MEET EXISTING GRADES, BUT MAY NOT EXCEED 15% GRADE WITHOUT SPECIFIC APPROVAL OF THE DIRECTOR.
6. APPROVED CONCRETE OR CORRUGATED METAL PIPE SHALL BE USED FOR ACCESS CONSTRUCTION. FLUME TYPE END SECTIONS DESIGNED AND APPROVED FOR EACH TYPE AND SIZE OF PIPE, SHALL BE INSTALLED ON EACH END AND STABILIZATION COMPLETED.
7. DRIVEWAY PIPES MAY NOT BE CONNECTED TO ANY OTHER DRIVEWAY PIPE OR STORM DRAIN WITHOUT PRIOR APPROVAL OF THE DIRECTOR.
8. COUNTY ROAD EDGE TIE IN MUST BE SAW CUT TO DEPTH OF APPROVED CONSTRUCTION MATERIAL SEALER MUST BE APPLIED TO THE ROADWAY JOINT DURING CONSTRUCTION AND UPON COMPLETION.

Robert B. Cooper

DIRECTOR OF PUBLIC WORKS

10/09/08

DATE

W. Undermy Mynors, Jr.

DEP. DIRECTOR, PUBLIC WORKS

9/29/08

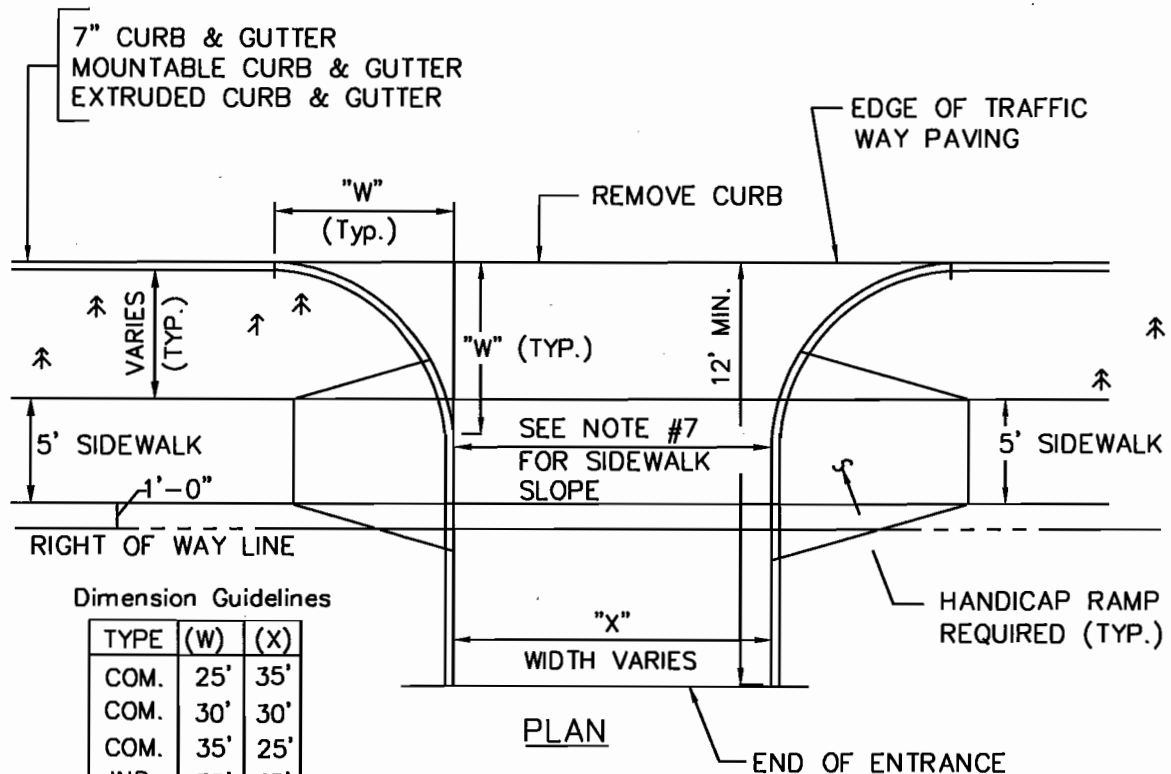
DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

TYPICAL DRIVEWAY ENTRANCE
FOR
COMMON DRIVE (2-5 HOMES)
OPEN SECTION ROAD

ISSUED _____
REVISED _____
REVISED _____
PLATE S-19



NOTES:

1. THE ACCESS (DRIVEWAY) MUST BE PAVED WITH PORTLAND CEMENT(9") (MIX#3) OR HOT MIX ASPHALT (6") MINIMUM, WITH 10" MINIMUM GRADED AND COMPACTED AGGREGATE BASE, FROM THE EDGE OF THE COUNTY ROAD A MINIMUM OF TWENTY FIVE (25) FEET, OR TO THE RIGHT-OF-WAY LINE, WHICHEVER IS GREATER.
2. PORTLAND CEMENT (9") MUST BE POURED USING NINE (9) INCH HIGH FORMS, MINIMUM.
3. ALL ACCESSES (DRIVEWAYS) MUST MAINTAIN A FIVE (5) FOOT MINIMUM CLEARANCE FROM ALL ABOVE GROUND UTILITIES, (e.g. CABLE, TELEPHONE, AND ELECTRIC BOXES, HYDRANTS, POLES, STORM DRAINS, ETC.)
4. ACCESS WILL RISE FROM 1/2" TO 1" PER FOOT SLOPE FROM THE EDGE OF TRAFFIC WAY PAVING TO THE RIGHT-OF-WAY LINE OR 12', WHICHEVER IS GREATER.
THE ACCESS MAY THEN SLOPE TO MEET EXISTING GRADES, BUT MAY NOT EXCEED 15% GRADE WITHOUT SPECIFIC APPROVAL OF DIRECTOR.
5. JOINT MUST BE SAW CUT WHEN THREE (3) FEET OR GREATER FROM AN EXISTING JOINT WHEN WITHIN THREE(3) FEET, CURB MUST BE REMOVED TO THE JOINT EXCEPT FOR EXTRUDED CURB WHICH MUST BE SAWED CUT AND REMOVED.
6. EXISTING COUNTY ROAD EDGE TIE IN MUST BE SAW CUT TO DEPTH OF APPROVED CONSTRUCTION MATERIAL.
SEALER MUST BE APPLIED TO THE JOINT DURING CONSTRUCTION AND UPON COMPLETION.
7. SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WHEN CROSSING DRIVEWAY. IF NECESSARY, THE SIDEWALK MAY BE "BENCHED" THROUGH THE DRIVEWAY TO MAINTAIN THE CROSS SLOPE.
- 8 EXISTING SIDEWALK MUST BE REMOVED AND CONSTRUCTED TO MEET THESE SPECIFICATIONS.

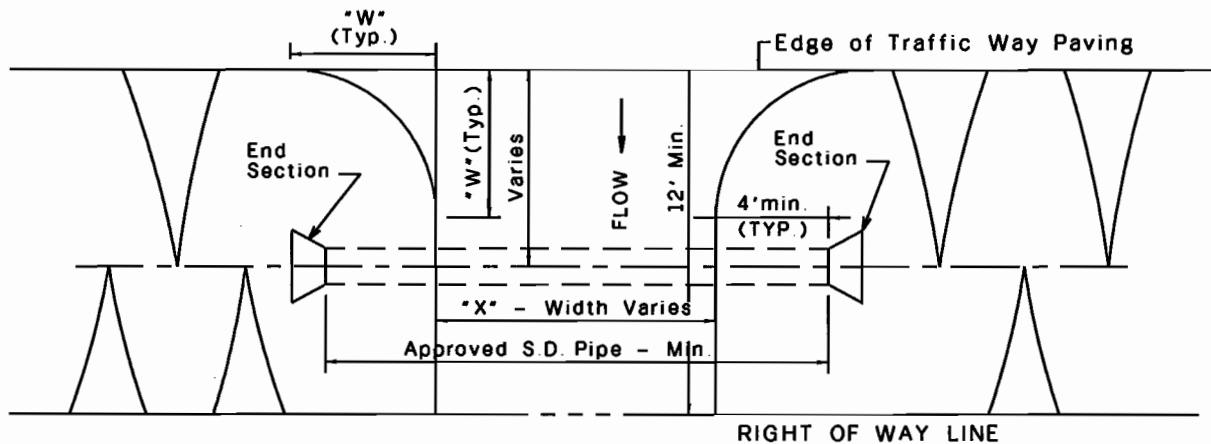
Robert B. Goggin 10/09/08
DIRECTOR OF PUBLIC WORKS DATE
D. Nelson 10/9/08
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

INDUSTRIAL/COMMERICAL
ENTRANCE DETAIL
(NON - RESIDENTIAL)

ISSUED _____
REVISED _____
REVISED _____
PLATE S-20



Dimension Guidelines

PLAN

TYPE	(W)	(X)
COM.	25'	35'
COM.	30'	30'
COM.	35'	25'
IND.	35'	35'

NOTES:

1. THE ACCESS (DRIVEWAY) MUST BE PAVED WITH PORTLAND CEMENT (9") (MIX #3) OR HOT MIX ASPHALT (6") MINIMUM, WITH 10" (MIN.) GRADED AND COMPACTED AGGREGATE BASE, FROM THE EDGE OF THE COUNTY ROAD A MINIMUM OF TWELVE (12) FEET, OR TO THE RIGHT-OF-WAY LINE, WHICHEVER IS GREATER.
2. PORTLAND CEMENT (9") MUST BE POURED USING NINE (9) INCH HIGH FORMS, MINIMUM.
3. ALL ACCESSES (DRIVEWAYS) MUST MAINTAIN A FIVE (5) FOOT MINIMUM CLEARANCE FROM ALL ABOVE GROUND UTILITIES, (e.g. CABLE, TELEPHONE, AND ELECTRIC BOXES, HYDRANTS, POLES, STORM DRAINS, ETC.)
4. ACCESS WILL FALL FROM 1/2" TO 1" PER FOOT SLOPE FROM THE EDGE OF COUNTY ROAD FOR A MINIMUM OF TWO (2) FEET, AND THEN RISE FROM 1/2" TO 1" PER FOOT SLOPE TO RIGHT-OF-WAY LINE OR 12', WHICHEVER IS GREATER.
THE ACCESS MAY THEN SLOPE TO MEET EXISTING GRADES, BUT MAY NOT EXCEED 15% GRADE WITHOUT SPECIFIC APPROVAL OF DIRECTOR.
5. APPROVED CONCRETE OR CORRUGATED METAL PIPE SHALL BE USED FOR ACCESS CONSTRUCTION. FLUME TYPE END SECTIONS DESIGNED AND APPROVED FOR EACH TYPE OF PIPE, SHALL BE INSTALLED ON EACH END AND STABILIZATION INSTALLED AND COMPLETED.
6. DRIVEWAY PIPES MAY NOT BE CONNECTED TO ANY OTHER DRIVEWAY PIPE OR STORM DRAIN WITH PRIOR APPROVAL OF THE DIRECTOR.
7. EXISTING COUNTY ROAD EDGE TIE IN MUST BE SAW CUT TO DEPTH OF APPROVED CONSTRUCTION MATERIAL. SEALER MUST BE APPLIED TO THE JOINT DURING CONSTRUCTION AND UPON COMPLETION.

Robert B. Cooper
DIRECTOR OF PUBLIC WORKS

10/09/08
DATE

J. Hudson Myers Jr.
DEP. DIRECTOR, PUBLIC WORKS

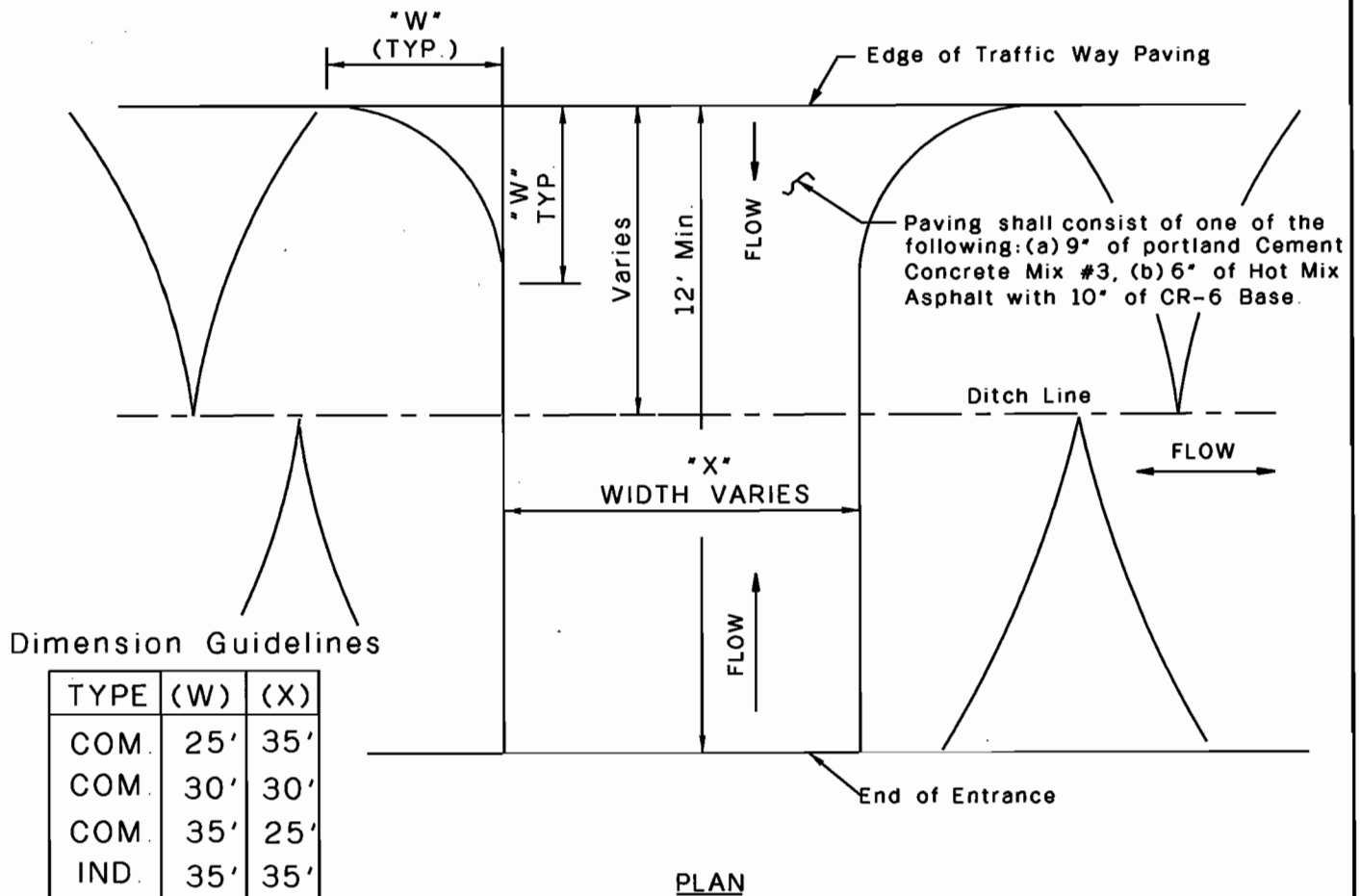
10/9/08
DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

INDUSTRIAL /
COMMERCIAL ENTRANCE
FOR
OPEN SECTION ROAD PIPE REQUIRED
(NON - RESIDENTIAL)

ISSUED _____
REVISED _____
REVISED _____
PLATE S-21



NOTES:

1. THE ACCESS (DRIVEWAY) MUST BE PAVED WITH PORTLAND CEMENT (9") (MIX #3) OR HOT MIX ASPHALT (6") MINIMUM, WITH 10" (MIN.) GRADED AND COMPACTED AGGREGATE BASE, FROM THE EDGE OF THE COUNTY ROAD A MINIMUM OF TWELVE (12) FEET, OR TO THE RIGHT-OF-WAY LINE, WHICHEVER IS GREATER.
2. PORTLAND CEMENT (9") MUST BE POURED USING NINE (9) INCH HIGH FORMS, MINIMUM.
3. ALL ACCESSES (DRIVEWAYS) MUST MAINTAIN A FIVE (5) FOOT MINIMUM CLEARANCE FROM ALL ABOVE GROUND UTILITIES, (e.g. CABLE, TELEPHONE, AND ELECTRIC BOXES, HYDRANTS, POLES, STORM DRAINS, ETC.)
4. ACCESS WILL FALL FROM 1/2" TO 1" PER FOOT SLOPE FROM THE EDGE OF COUNTY ROAD FOR A MINIMUM OF TWO (2) FEET, AND THEN RISE FROM 1/2" TO 1" PER FOOT SLOPE TO RIGHT-OF-WAY LINE OR 12', WHICHEVER IS GREATER, TO CREATE A DRAINAGE SWALE. THE ACCESS MAY THEN SLOPE TO MEET EXISTING GRADES, BUT MAY NOT EXCEED 15% GRADE WITHOUT SPECIFIC APPROVAL OF DIRECTOR.
5. DRAINAGE SWALE LOCATION AND/OR DEPTH MAY BE GREATER AND/OR DEEPER AS DETERMINED BY ROAD DESIGN OR THE INSPECTOR, PRIOR TO PAVING.
6. EXISTING COUNTY ROAD EDGE TIE IN MUST BE SAW CUT TO DEPTH OF APPROVED CONSTRUCTION MATERIAL SEALER MUST BE APPLIED TO THE JOINT DURING CONSTRUCTION AND UPON COMPLETION.

Robert S. Sloop 10/09/08
 DIRECTOR OF PUBLIC WORKS DATE
D. D. D. D. D. 10/9/08
 DEP. DIRECTOR, PUBLIC WORKS DATE

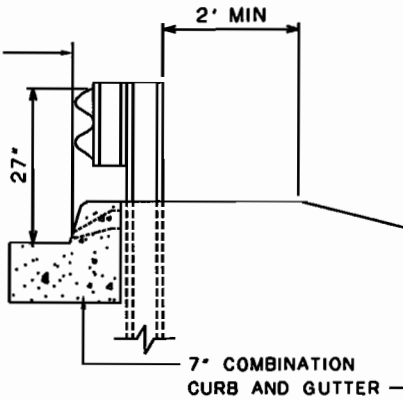


HARFORD COUNTY, MD
 DEPARTMENT OF
 PUBLIC WORKS

INDUSTRIAL/
 COMMERCIAL ENTRANCE
 OPEN SECTION ROAD
 (DRAIN PIPE NOT REQUIRED)
 (NON-RESIDENTIAL)

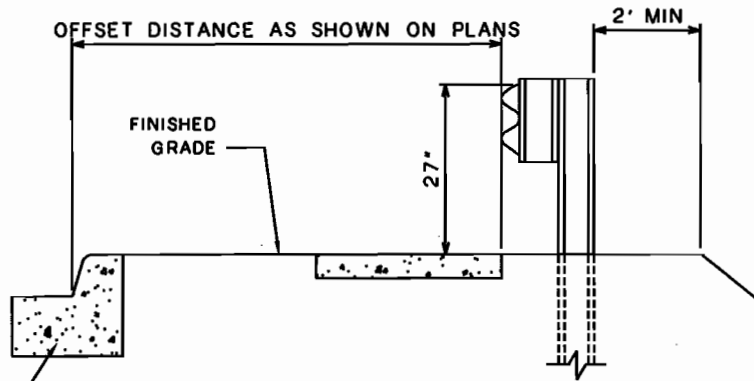
ISSUED _____
 REVISED _____
 REVISED _____
 PLATE S-22

FACE OF RAIL
PLACED OVER
CENTER OF
FACE OF CURB

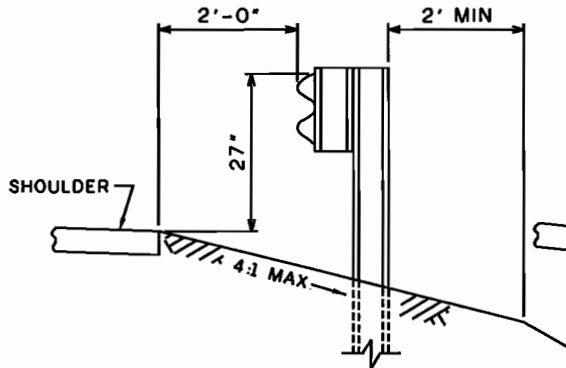


**PLACEMENT AT CURBS
(WITHOUT SIDEWALKS)**

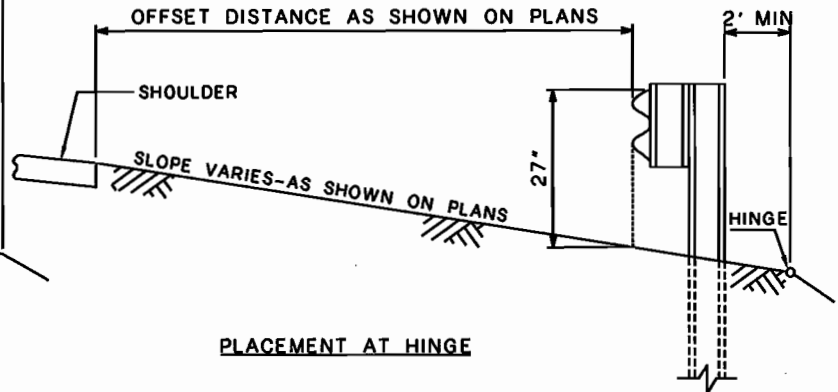
OFFSET DISTANCE AS SHOWN ON PLANS



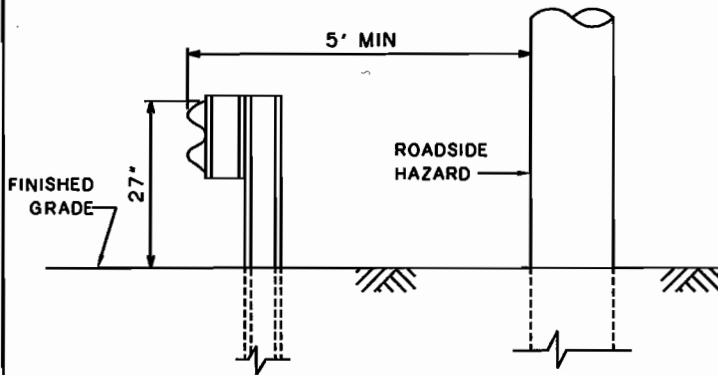
PLACEMENT BEHIND SIDEWALK AREA



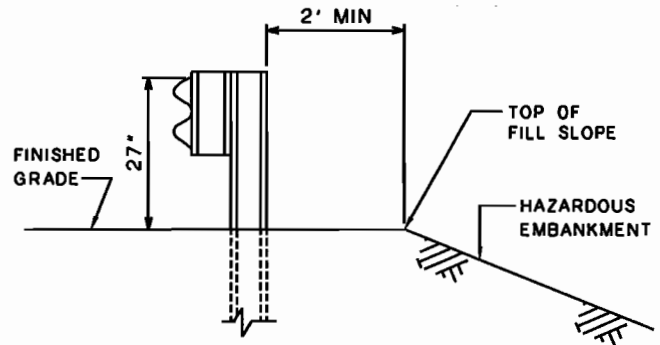
PLACEMENT AT EDGE OF SHOULDER



PLACEMENT AT HINGE



MINIMUM OFFSET TO HAZARD



MINIMUM OFFSET TO SLOPE



HARFORD COUNTY, MD
 DEPARTMENT OF
 PUBLIC WORKS

GUARD RAIL WITH BEAM PLACEMENT DETAILS

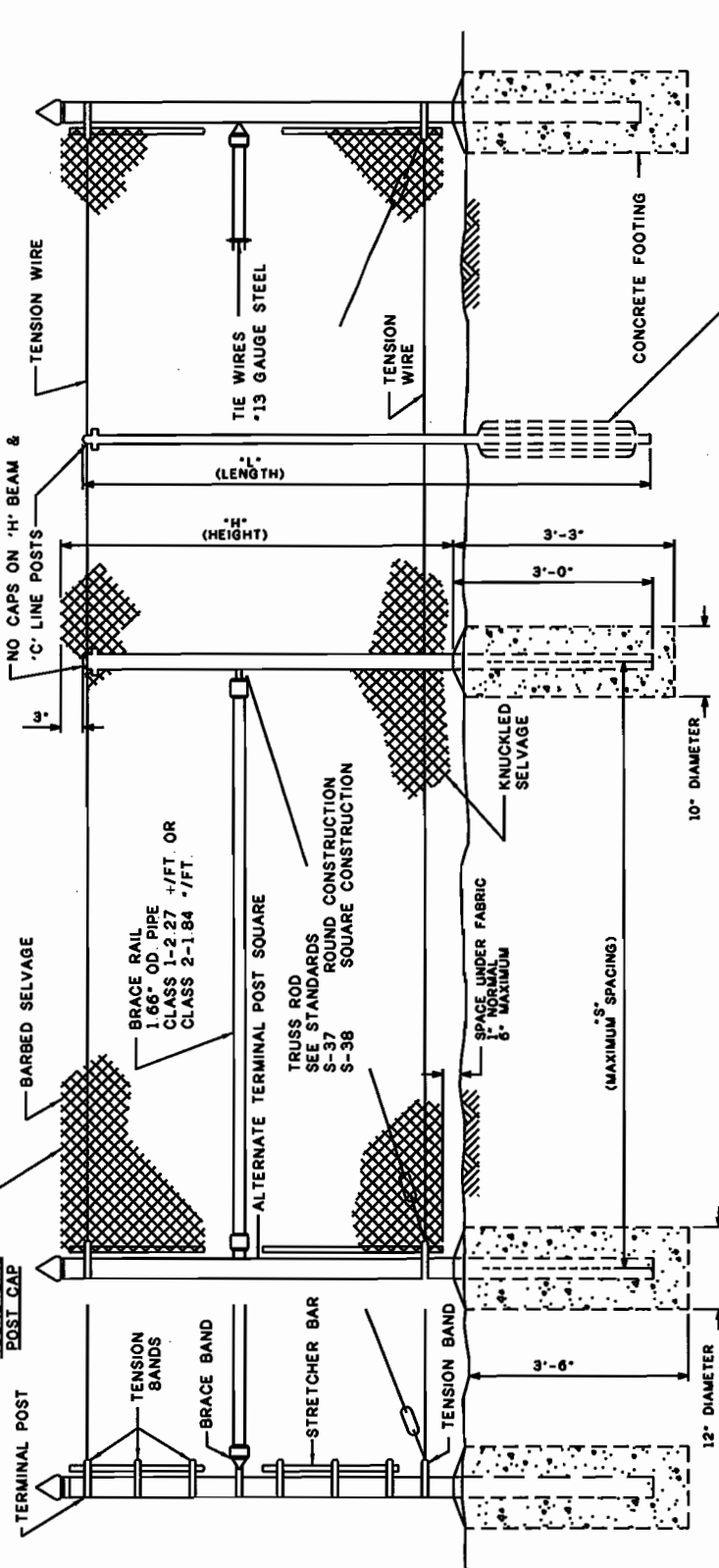
ISSUED 5/2/00
 REVISED 2/27/08
 REVISED
 PLATE S-23



ROUND TERMINAL POST CAP

ROUND LINE POST CAP

2" MESH WIRE GAUGE PER SPECIFICATIONS CHAIN LINK FENCE



DRIVE ANCHOR SQUARE OR ROUND TERMINAL POST CONSTRUCTION ALTERNATE TO CONCRETE FOOTING SEE DETAIL STANDARD

NOTES

- ALL ROUND LINE POSTS TO BE CAPPED WITH LOOP CAPS TENSION WIRE TO RULE THROUGH LOOPS CAPS TO BE FASTENED TO ALL TERMINAL POSTS WITH TENSION BANDS.
- FASTEN FABRIC TO TENSION WIRE WITH HOG RINGS @ 18" C/O HOG RINGS TO BE 12/2 GAUGE GALVANIZED STEEL WIRE
- MATERIALS TO MEET REQUIREMENTS OF AASHTO M 181.
- COLOR OF VINYL SHALL BE WARM GREY OR BLACK SEE SPECIAL PROVISIONS.

	H HEIGHT OF FENCE		5'-0" RURAL		6'-0"		8'-0"	
	S POST SPACING - MAX.		12'-0"		10'-0"		10'-0"	
LINE POSTS	*L* LENGTH INCL CAP		7'-8" MIN.		8'-0" MIN.		10'-8"	
	ROUND - CLASS 1		190" O.D @ 2.72 #/FT.		2.375" O.D @ 3.65 #/FT.		2.375" O.D @ 3.65 #/FT.	
	ROUND - CLASS 2		190" O.D @ 2.28 #/FT.		2.375" O.D @ 3.12 #/FT.		2.375" O.D @ 3.12 #/FT.	
	H-BEAM - STEEL		1.875"x1.625" @ 2.70 #/FT.		1.875"x1.625" @ 2.70 #/FT.		1.875"x1.625" @ 2.70 #/FT.	
	H-BEAM - ALUM		2.25"x1.95" @ 1.25 #/FT.		2.25"x1.95" @ 1.25 #/FT.		2.25"x1.95" @ 1.25 #/FT.	
TERM POSTS	C - POST - STEEL		2.25"x1.70" @ 2.73 #/FT.		2.25"x1.70" @ 2.73 #/FT.		2.25"x1.70" @ 2.73 #/FT.	
	ROUND - CLASS 1		2.375" O.D @ 3.65 #/FT.		2.875" O.D @ 5.79 #/FT.		2.875" O.D @ 5.79 #/FT.	
	ROUND - CLASS 2		2.375" O.D @ 3.12 #/FT.		2.875" O.D @ 4.64 #/FT.		2.875" O.D @ 4.64 #/FT.	
	SQUARE - ALT.		2.00" SO. @ 3.60 #/FT.		2.50" SO. @ 5.70 #/FT.		2.50" SO. @ 5.70 #/FT.	



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

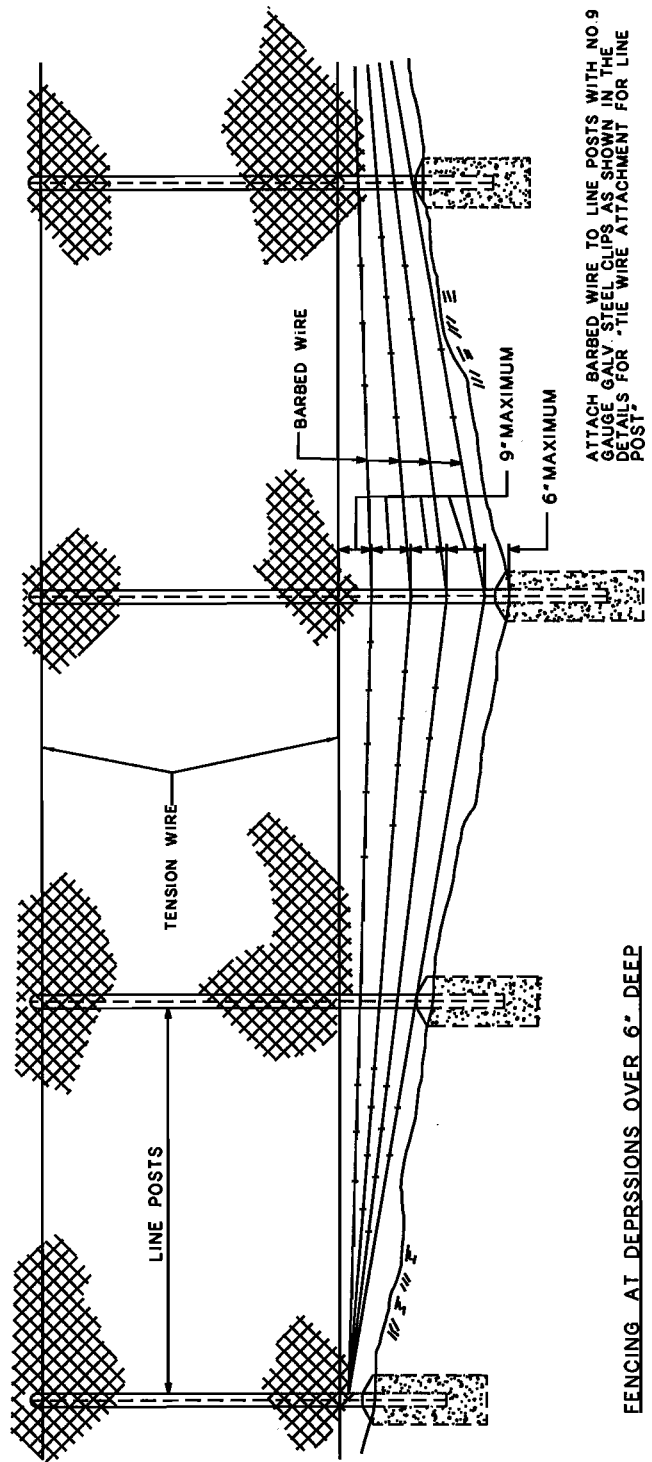
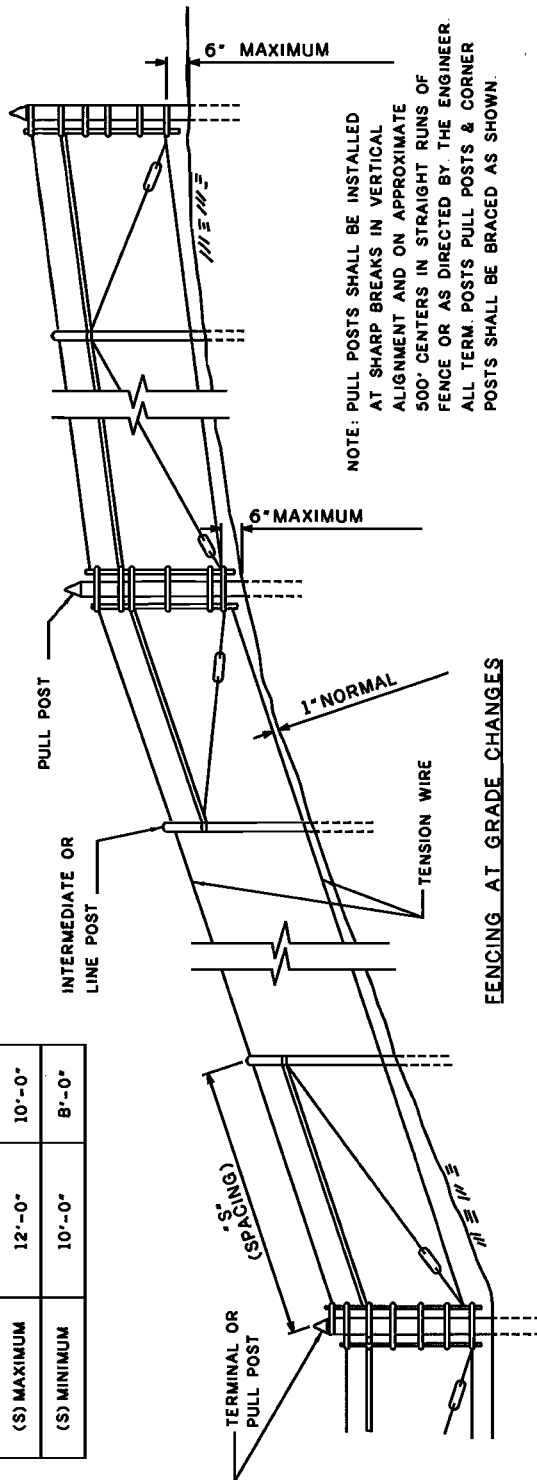
CHAIN LINK FENCE
TYPICAL 5 FT. RURAL 6 FT.
AND 8 FT.

[Signature]
DIRECTOR OF PUBLIC WORKS
[Signature]
DEP. DIRECTOR, PUBLIC WORKS

5/2/00
DATE
4/12/00
DATE

ISSUED 5/2/00
REVISED
REVISED
PLATE S-24

(S) MAXIMUM	5'-0" RURAL	6'-0"
(S) MINIMUM	12'-0"	10'-0"
	10'-0"	8'-0"



ATTACH BARBED WIRE TO LINE POSTS WITH NO 9 GAUGE GALV. STEEL CLIPS AS SHOWN IN THE DETAILS FOR "TIE WIRE ATTACHMENT FOR LINE POST"

William A. J.
DIRECTOR OF PUBLIC WORKS
05.02.00
DATE

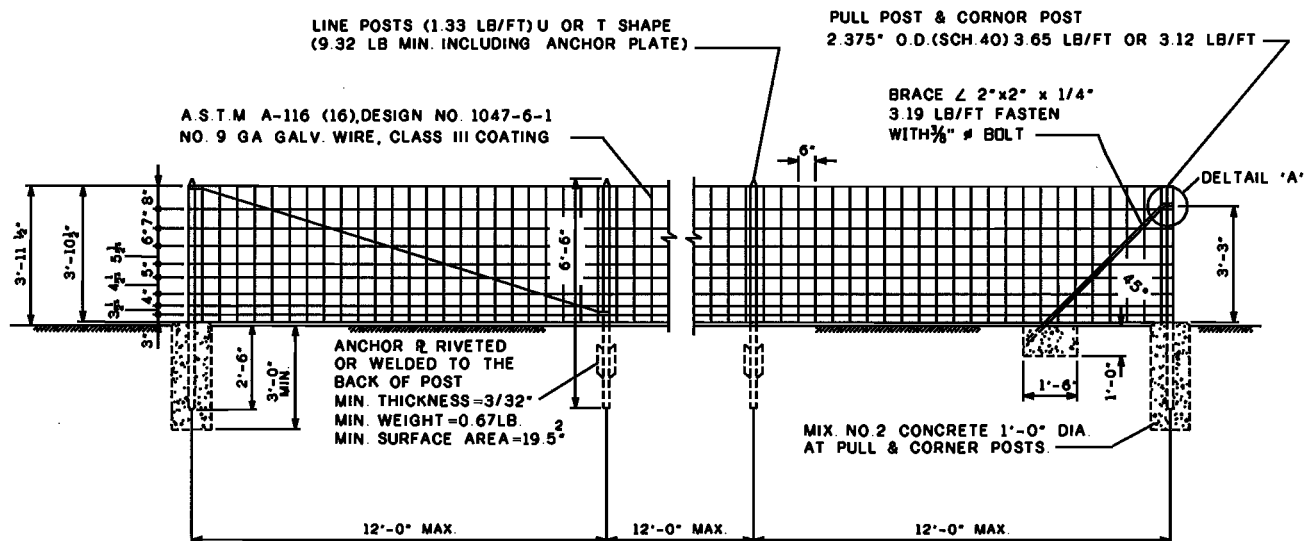
William A. J.
DEP. DIRECTOR, PUBLIC WORKS
04.12.00
DATE



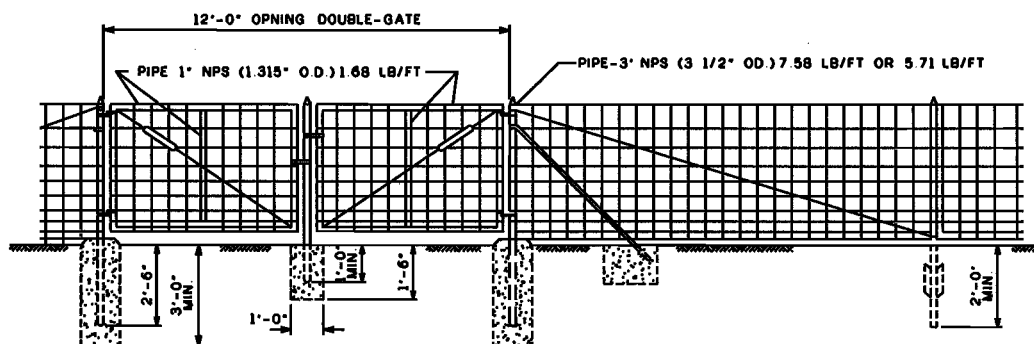
HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

CHAIN LINK FENCE AT GRADE CHANGES AND DEPRESSIONS

ISSUED 05.02.00
REVISED
REVISED
PLATE S-25

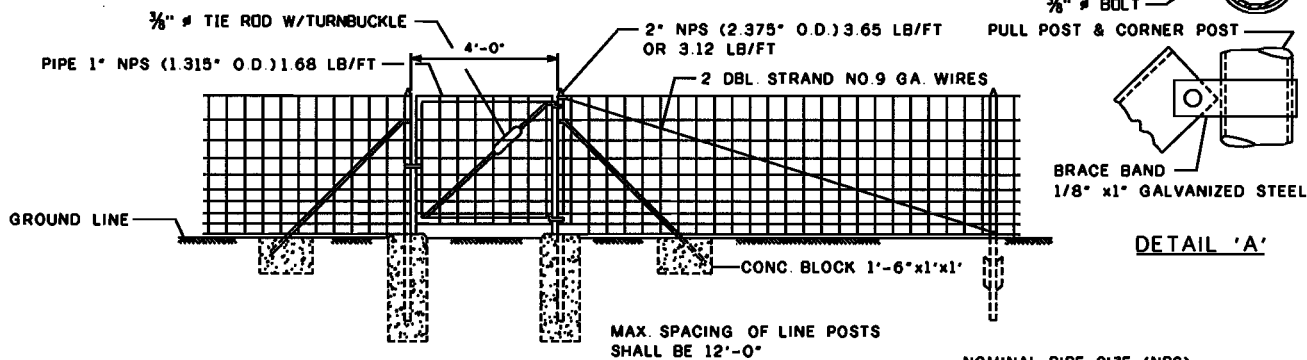


GENERAL DETAILS



GRATE FRAMES & POSTS SHALL BE OF A.S.T.M. A-120 HOT DIPPED GALV. PIPE.

DOUBLE SWING GATE



SINGLE GATE

NOTES:

POSTS IN ROCK-WHERE SUBSTANTIAL ROCK IS ENCOUNTERED A HOLE ONE (1") INCH LARGER IN DIAMETER THAN THE POST AND OF 12" MINIMUM DEPTH FOR LINE POSTS AN 18" MINIMUM DEPTH FOR TERMINAL POSTS, SHALL BE MADE AFTER INSERTING THE POSTS, THE HOLES SHALL BE BACKFILLED WITH A HANDMIXED 1:2 MORTAR CONSISTING OF ONE PART PORTLAND CEMENT AND TWO PARTS FINE AGGREGATES MIXED TO A PLASTIC CONSISTENCY SHOWING NO SIGNS OF FREE WATER. THE HANDMIXING AND CONSOLIDATION OF THE MORTAR SHALL BE PERFORMED IN A MANNER APPROVED BY THE ENGINEER.

THE WEIGHT OF STEEL PIPE CALLED FOR ON THIS STANDARD SHALL NOT VARY MORE THAN-5% FROM THE INDICATED WEIGHT, BUT MAY EXCEED SUCH INDICATED WEIGHT. THE WEIGHT OF STEEL SHAPES CALLED FOR ON THIS STANDARD SHALL NOT VARY MORE THAN-2.5% FROM THE INDICATED WEIGHT, BUT MAY EXCEED SUCH INDICATED WEIGHT.



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

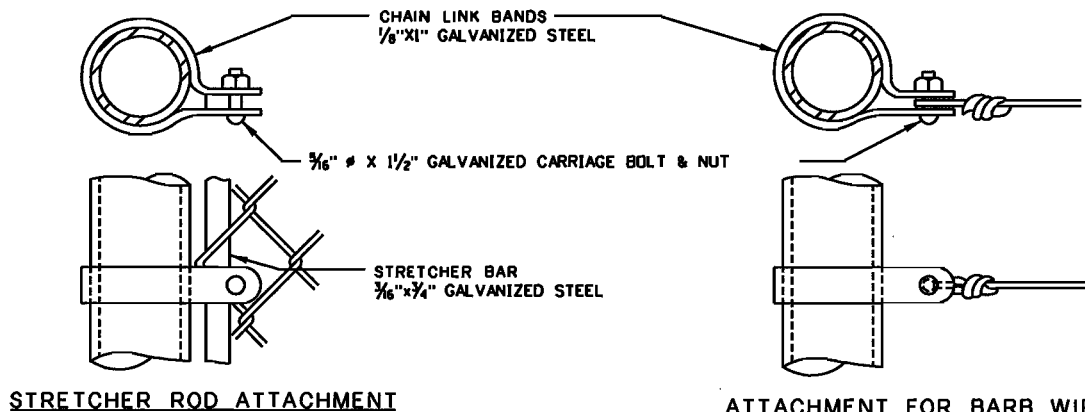
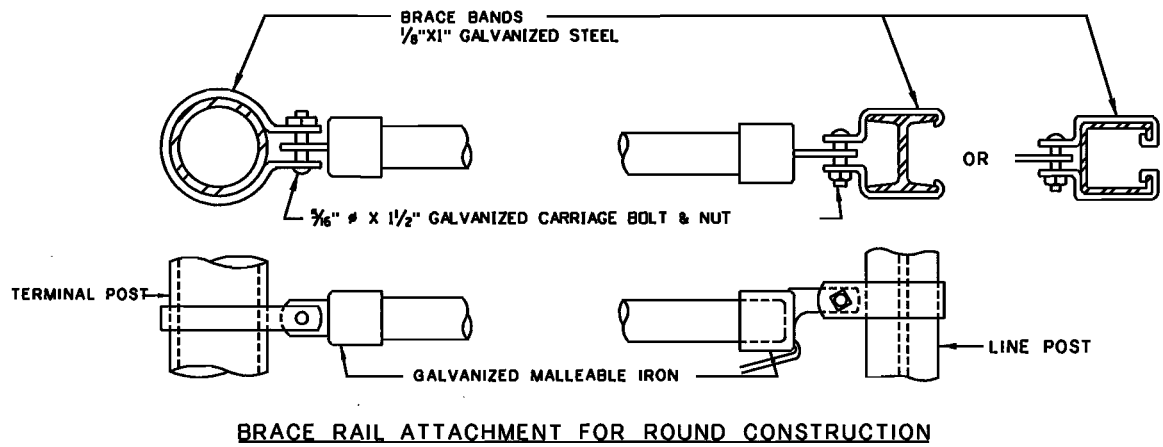
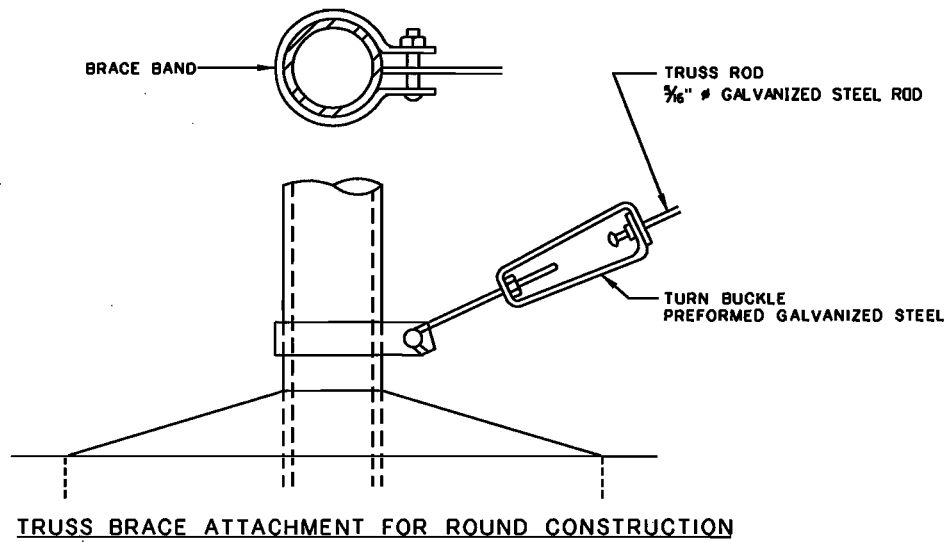
4'-0" FARM TYPE FENCE

ISSUED 05.02.00

REVISED

REVISED

PLATE S-26



**ATTACHMENT FOR BARB WIRE OR
TENSION WIRE**

[Signature]
DIRECTOR OF PUBLIC WORKS
05.02.00
DATE

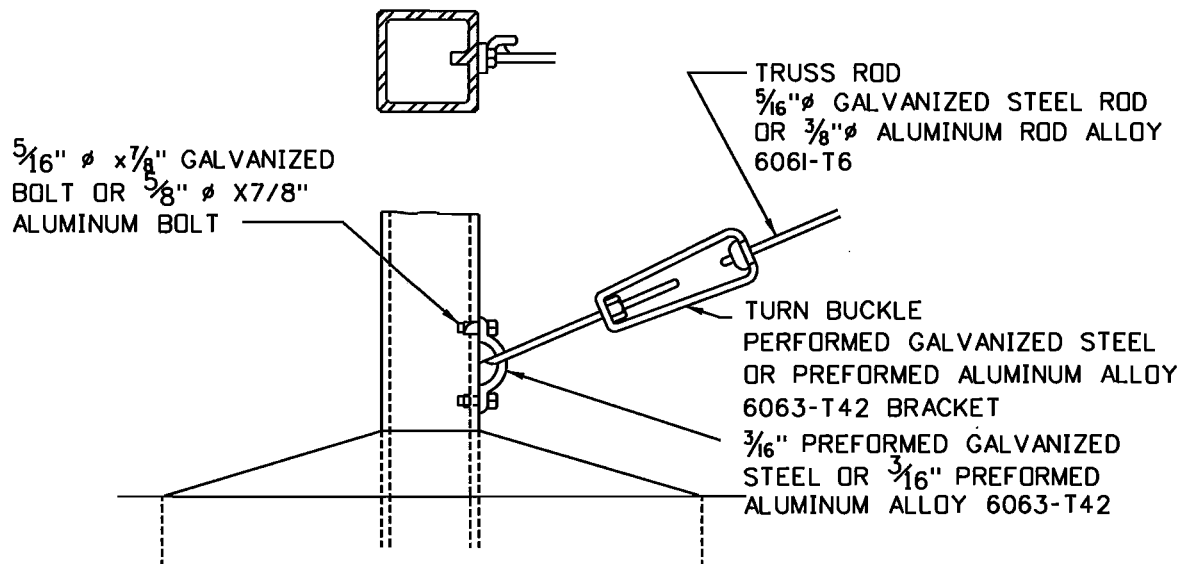
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DEP. DIRECTOR, PUBLIC WORKS
04.12.00
DATE



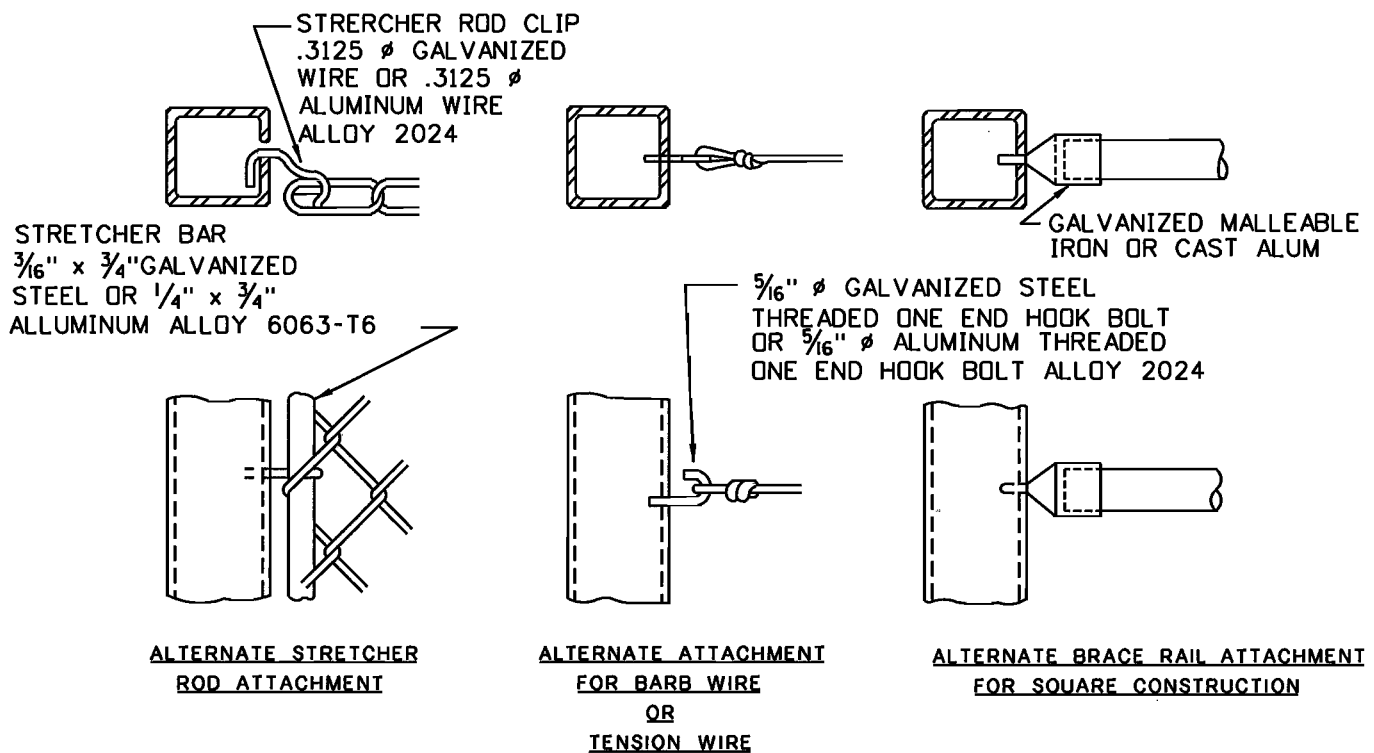
HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

CHAIN LINK FENCE
BRACE & ROD ATTACHMENTS -
ROUND CONSTRUCTION

ISSUED 05.02.00
REVISED
REVISED
PLATE S-27



ALTERNATE TRUSS BRACE ATTACHMENT FOR SQUARE CONSTRUCTION



[Signature]
DIRECTOR OF PUBLIC WORKS
05.02.00
DATE

[Signature]
DEP. DIRECTOR, PUBLIC WORKS
04.12.00
DATE

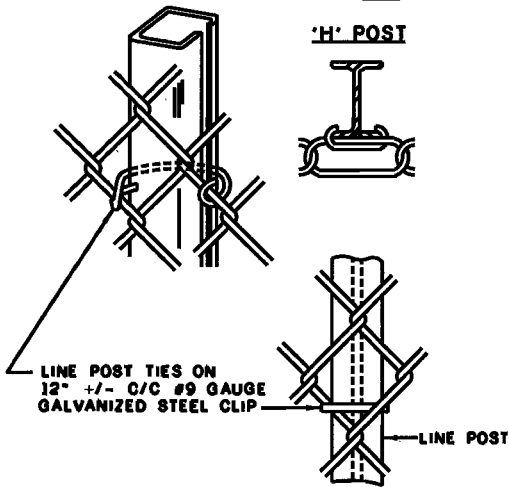


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

CHAIN LINK FENCE
BRACE & ROD ATTACHMENTS-
SQUARE CONSTRUCTION

ISSUED 05.02.00
REVISED
REVISED
PLATE S-28

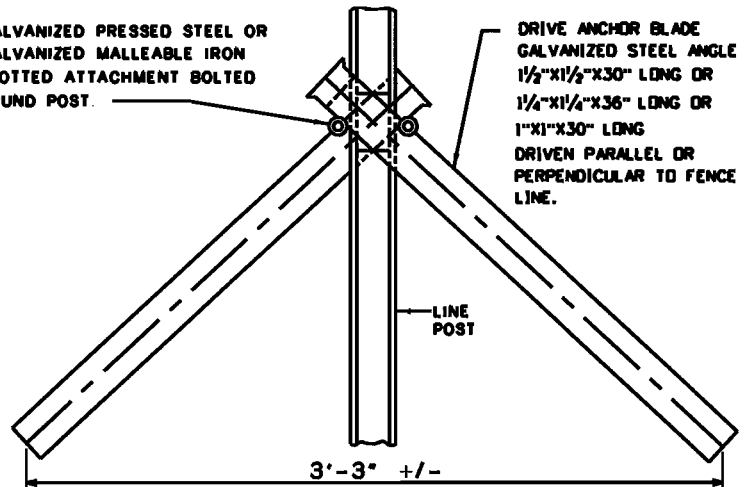
'C' POST OR 'ROUND' POST



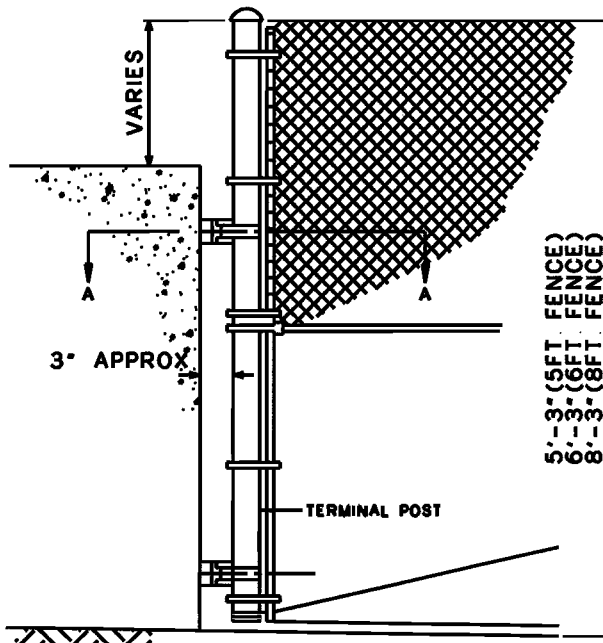
TIE WIRE ATTACHMENT FOR LINE POST



GALVANIZED PRESSED STEEL OR GALVANIZED MALLEABLE IRON SLOTTED ATTACHMENT BOLTED AROUND POST.

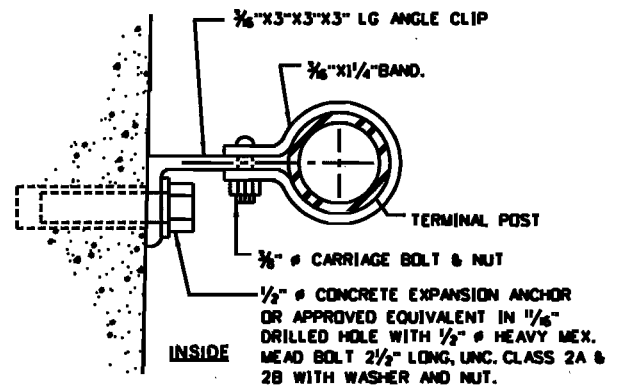


DRIVE ANCHOR FOR LINE POST ALTERNATE TO CONCRETE FOOTING



ALTERNATE POST ATTACHMENT AT BRIDGE END

OUTSIDE



SECTION A-A

[Signature]
DIRECTOR OF PUBLIC WORKS
[Signature]
DEP. DIRECTOR, PUBLIC WORKS

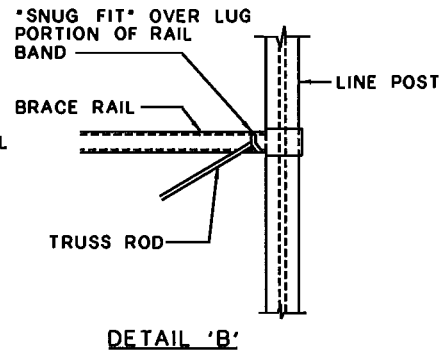
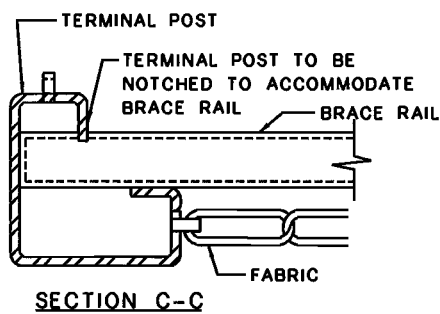
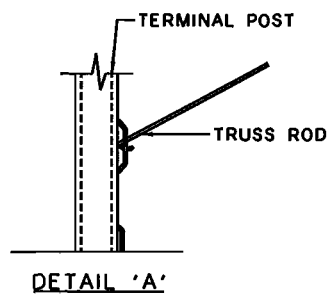
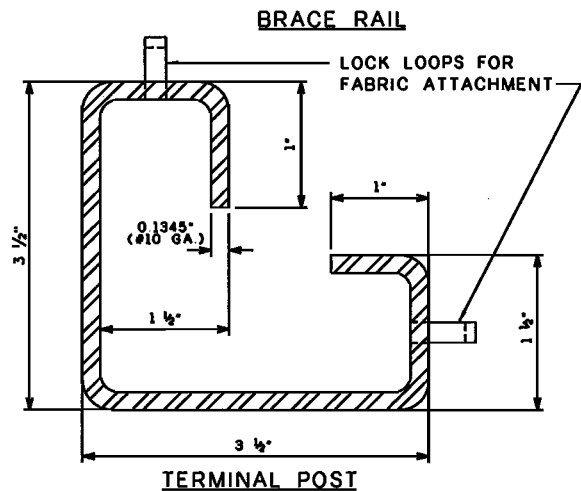
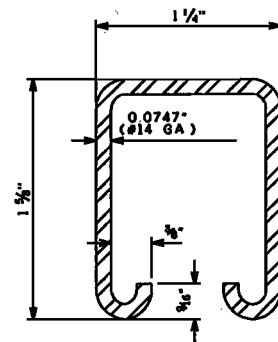
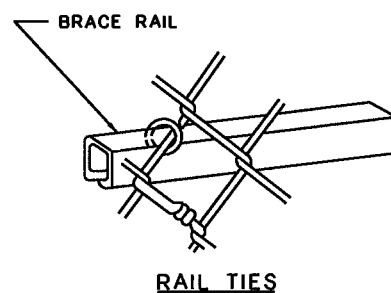
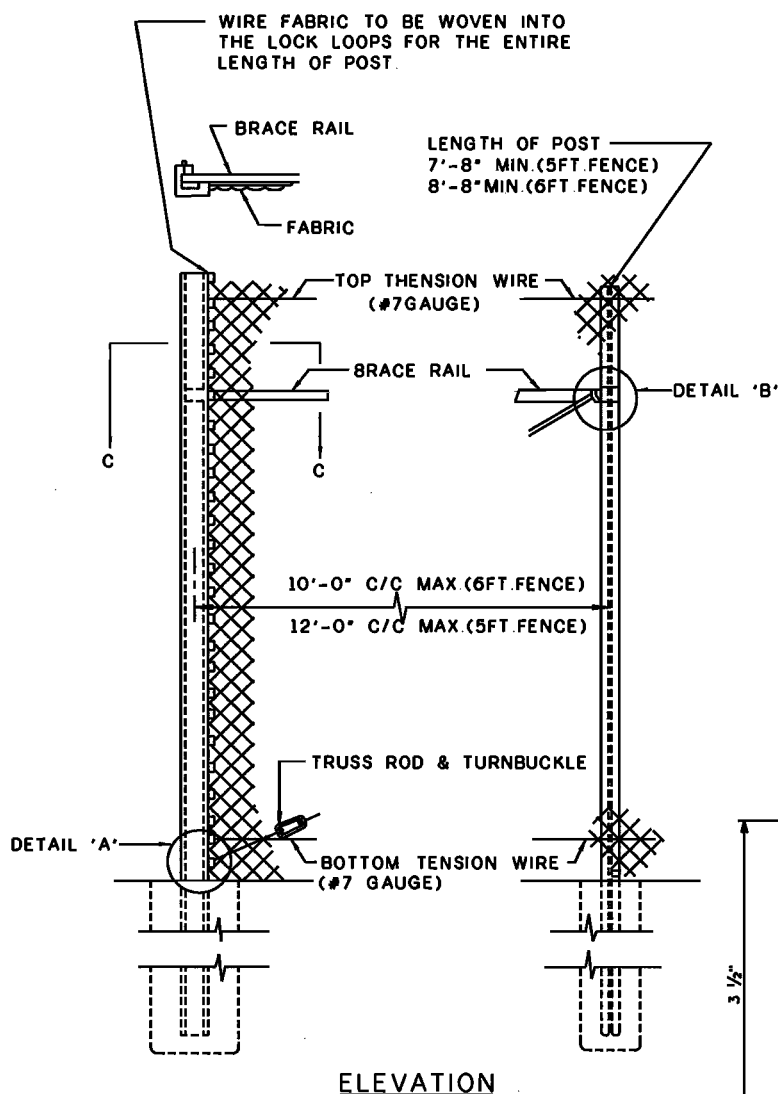
05.02.00
DATE
04.12.00
DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

CHAIN LINK FENCE
DRIVE ANCHOR & POST
ATTACHMENT AT BRIDGE

ISSUED 05.02.00
REVISED
REVISED
PLATE S-29



<i>[Signature]</i> DIRECTOR OF PUBLIC WORKS	5-2-00 DATE	<i>[Signature]</i> DEP. DIRECTOR, PUBLIC WORKS	4/12/00 DATE
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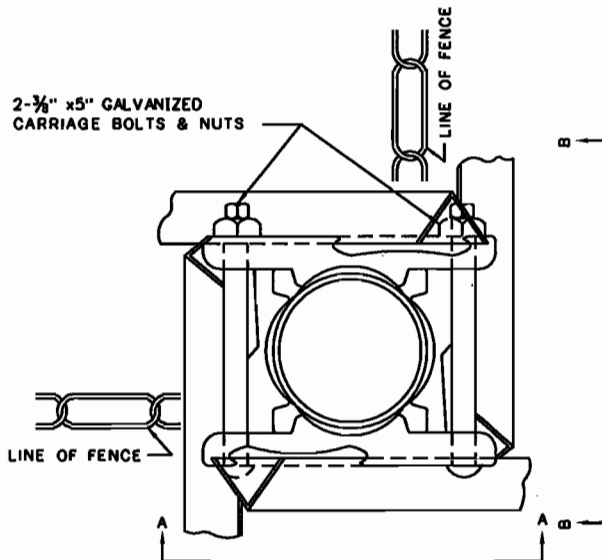


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

CHAIN LINE FENCE ALTERNATE TERMINAL POST

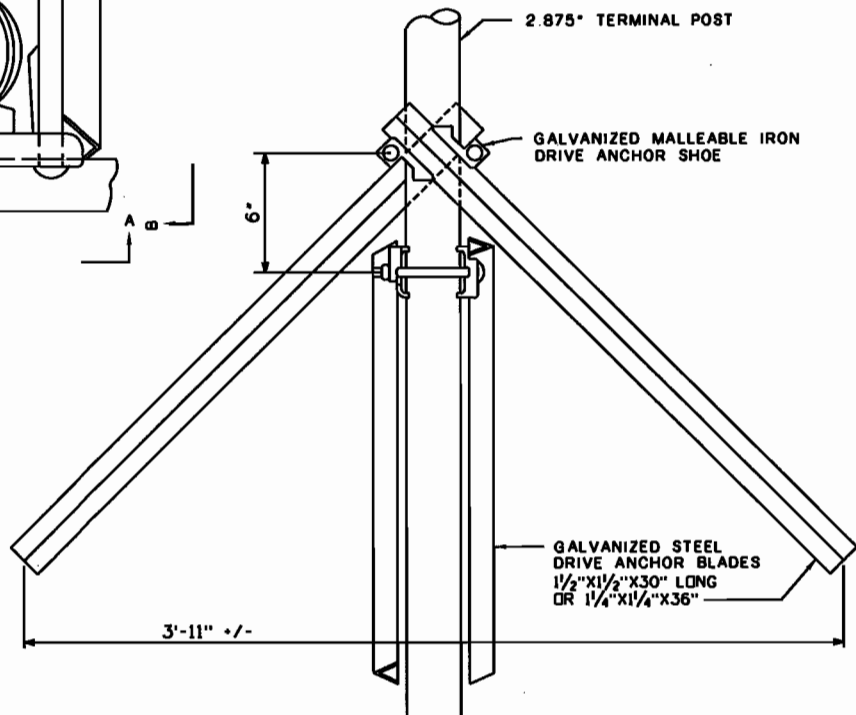
ISSUED	5-2-00
REVISED	
REVISED	
PLATE	S-30

2- $\frac{3}{8}$ " x 5" GALVANIZED
CARRIAGE BOLTS & NUTS

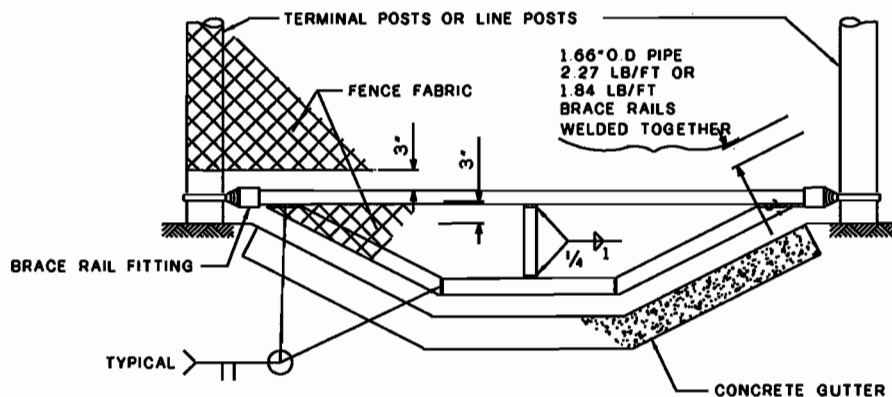


PLAN

NOTE: DOUBLE DRIVE ANCHOR
TO BE USED AT ALL TERMINAL POSTS.



SECTION A-A & SECTION B-B SIMILAR
ELEVATION



FENCE TREATMENT AT CONCRETE DITCHES

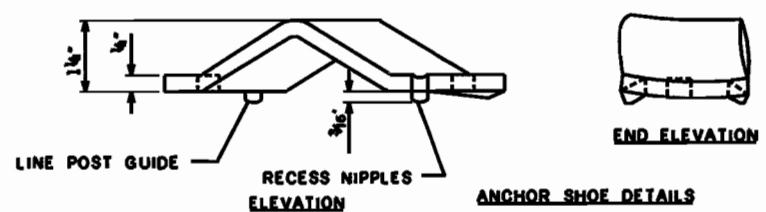
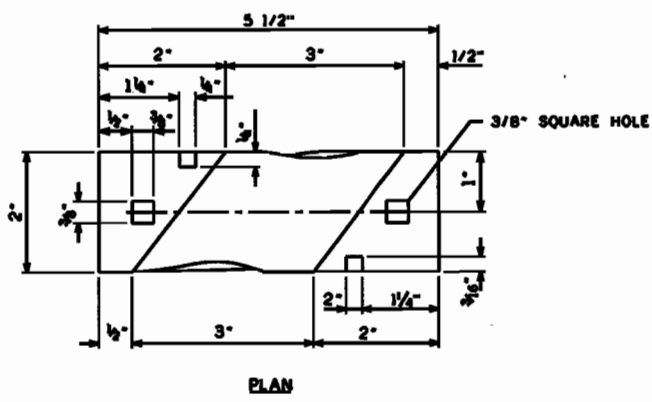
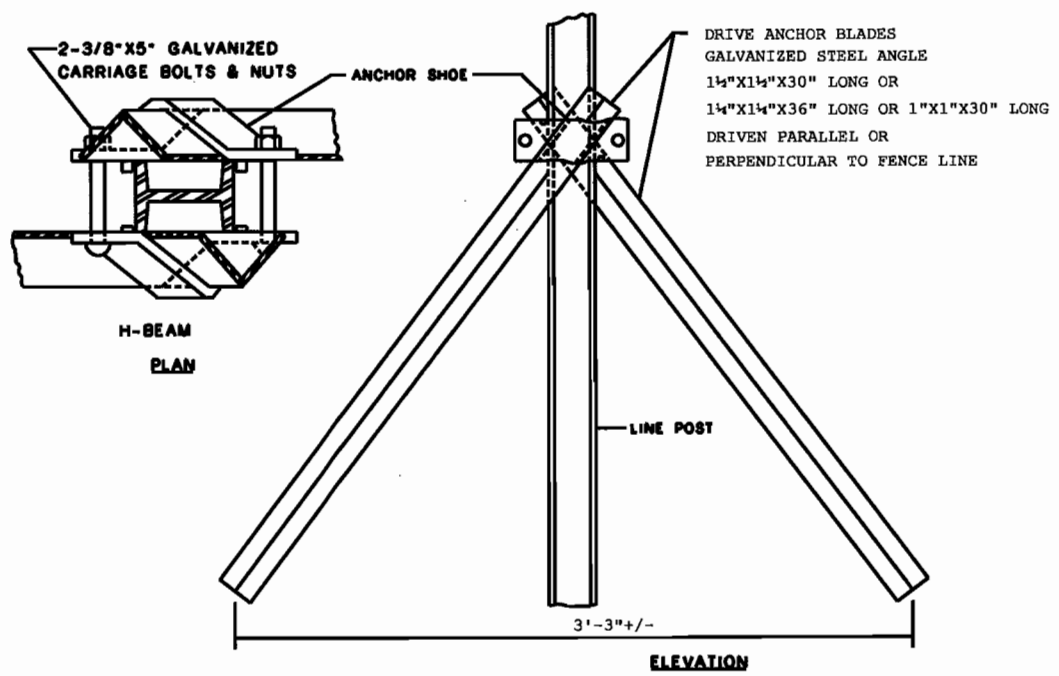
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DIRECTOR OF PUBLIC WORKS	DATE
<i>[Signature]</i>	04.12.00
DEP. DIRECTOR, PUBLIC WORKS	DATE



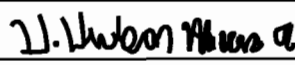
HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

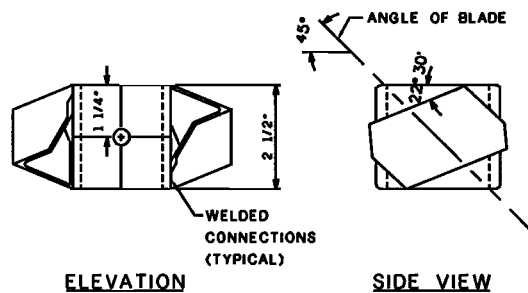
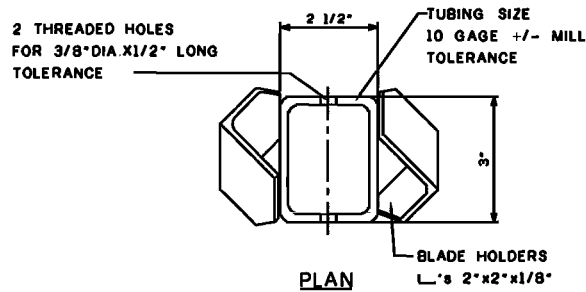
CHAIN LINK FENCE DOUBLE DRIVE ANCHOR AND DITCH TREATMENT

ISSUED	05.02.00
REVISED	
REVISED	
PLATE	S-31

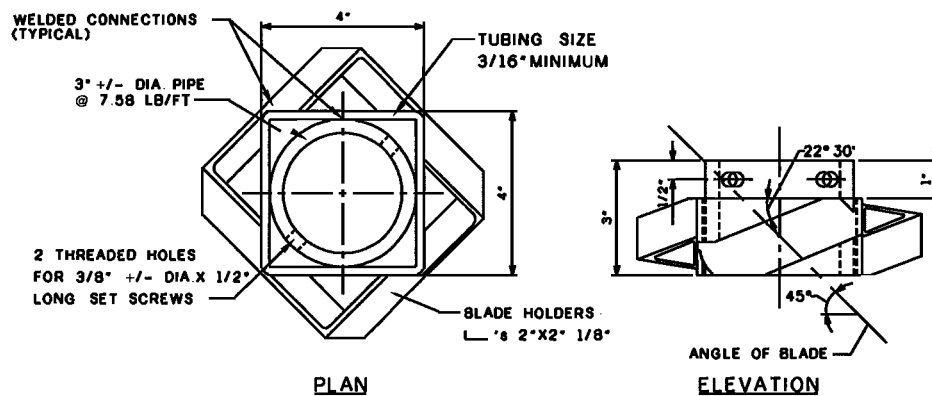


NOTE: THIS SHOE ASSEMBLY MAY BE USED IN PLACE OF THE ASSEMBLY SHOWN ON STANDARD PLATE S-22

 DIRECTOR OF PUBLIC WORKS		5/2/00 DATE		 DEP. DIRECTOR, PUBLIC WORKS		4/12/00 DATE	
 HARFORD COUNTY, MD DEPARTMENT OF PUBLIC WORKS		CHAIN LINK FENCE DRIVE ANCHOR SHOE ASSEMBLY				ISSUED <u>5/2/00</u> REVISED _____ REVISED _____ PLATE <u>S-32</u>	



DRIVE ANCHOR ADAPTER FOR LINE POSTS



DRIVE ANCHOR ADAPTER FOR TERMINAL POSTS

[Signature]

DIRECTOR OF PUBLIC WORKS

5/2/00

DATE

[Signature]

DEP. DIRECTOR, PUBLIC WORKS

4/12/00

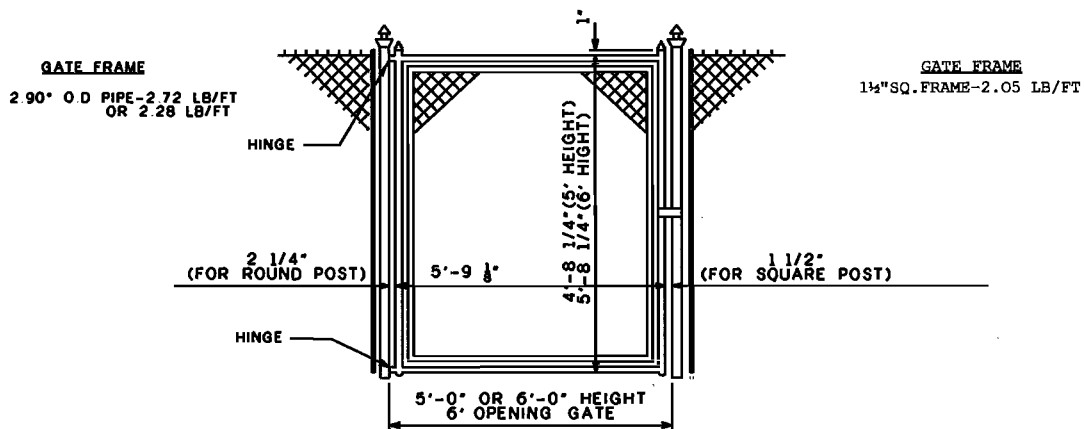
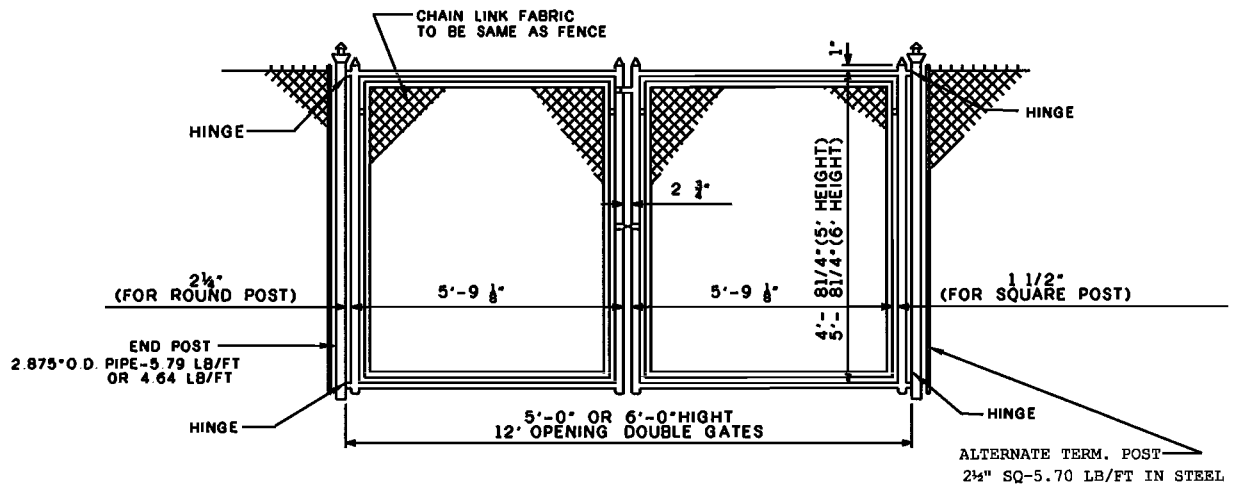
DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

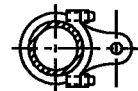
CHAIN LINK FENCE
DRIVE ANCHOR ADAPTER

ISSUED 5/2/00
REVISED _____
REVISED _____
PLATE S-33



SQUARE POST HINGE

ECCENTRIC



ROUND POST HINGE

W. L. Adams, Jr.

DIRECTOR OF PUBLIC WORKS

5/2/00

DATE

W. L. Adams, Jr.

DEP. DIRECTOR, PUBLIC WORKS

4/12/00

DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

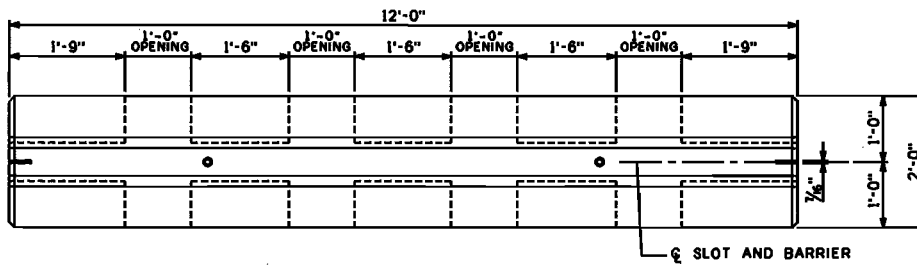
CHAIN LINK FENCE GATE DETAILS

ISSUED 5/2/00

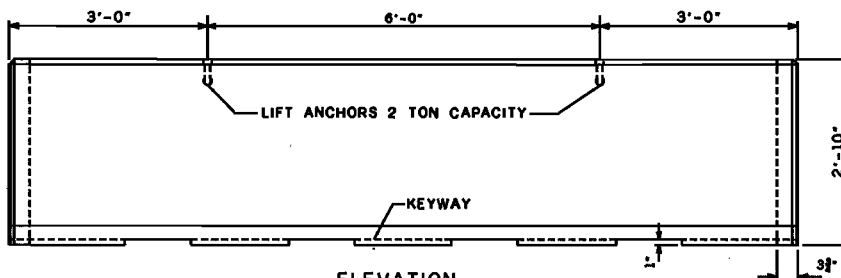
REVISED

REVISED

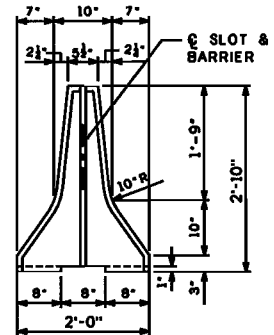
PLATE S - 34



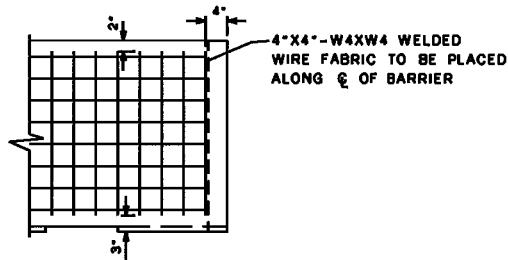
PLAN



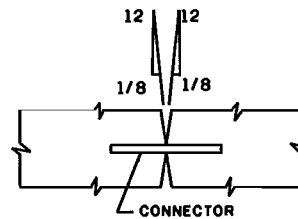
ELEVATION
PRECAST CONCRETE BARRIER



END VIEW



REINFORCING STEEL DETAILS



CONNECTION DETAIL

GENERAL NOTES:

1. ALL CONCRETE FOR BARRIER TO BE MIX. NO. 6 (4500 PSI)
2. EXPOSED FACE AND TOP OF PRECAST BARRIER TO BE COVERED WITH TWO COATS OF WHITE EPOXY PAINT IN ACCORDANCE WITH THE PROVISIONS OR THE SUPPLEMENT TO THE SPECIFICATIONS.
3. 27"x7"x5/16" GALVANIZED STEEL PLATE - TO BE FURNISHED AS CONNECTOR AND INCIDENTAL TO THE CONCRETE BARRIER.

[Signature]
DIRECTOR OF PUBLIC WORKS

5/2/00
DATE

[Signature]
DEP. DIRECTOR, PUBLIC WORKS

4/12/00



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

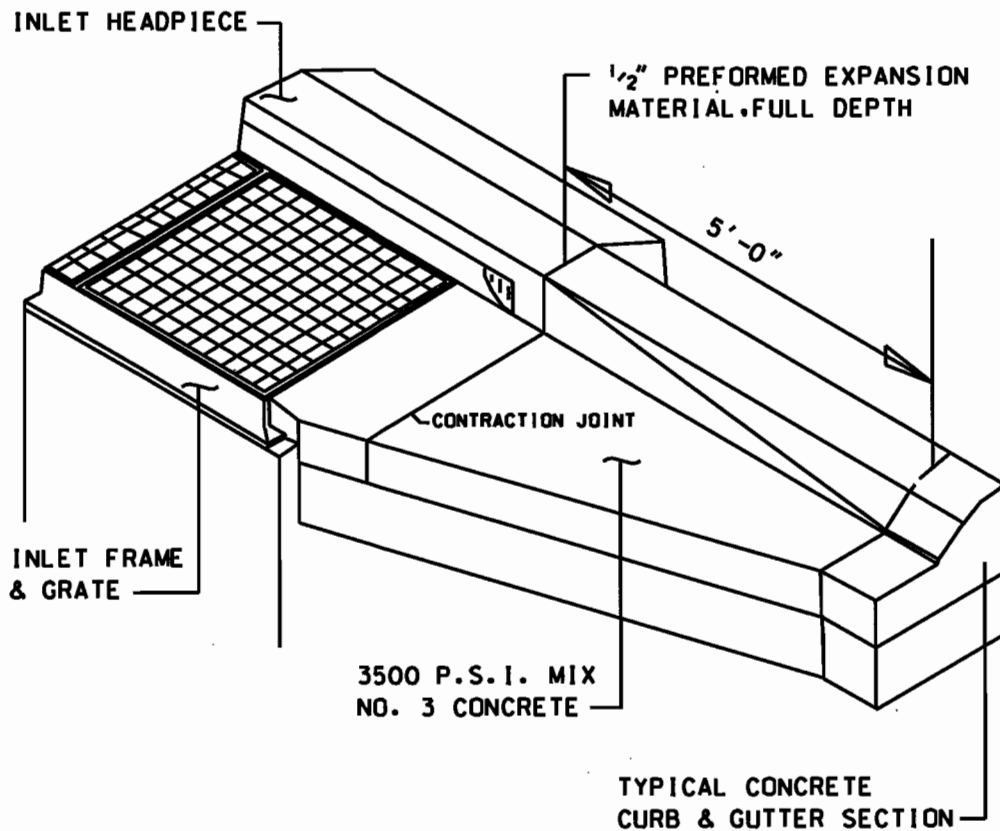
PRECAST CONCRETE BARRIER
DOUBLE FACE

ISSUED 5/2/00

REVISED

REVISED

PLATE S - 35



NOTES:

1. TYPICAL BOTH SIDES OF INLET
2. FOR CONSTRUCTION DETAILS, SEE PLATE S-1 AND S-2.

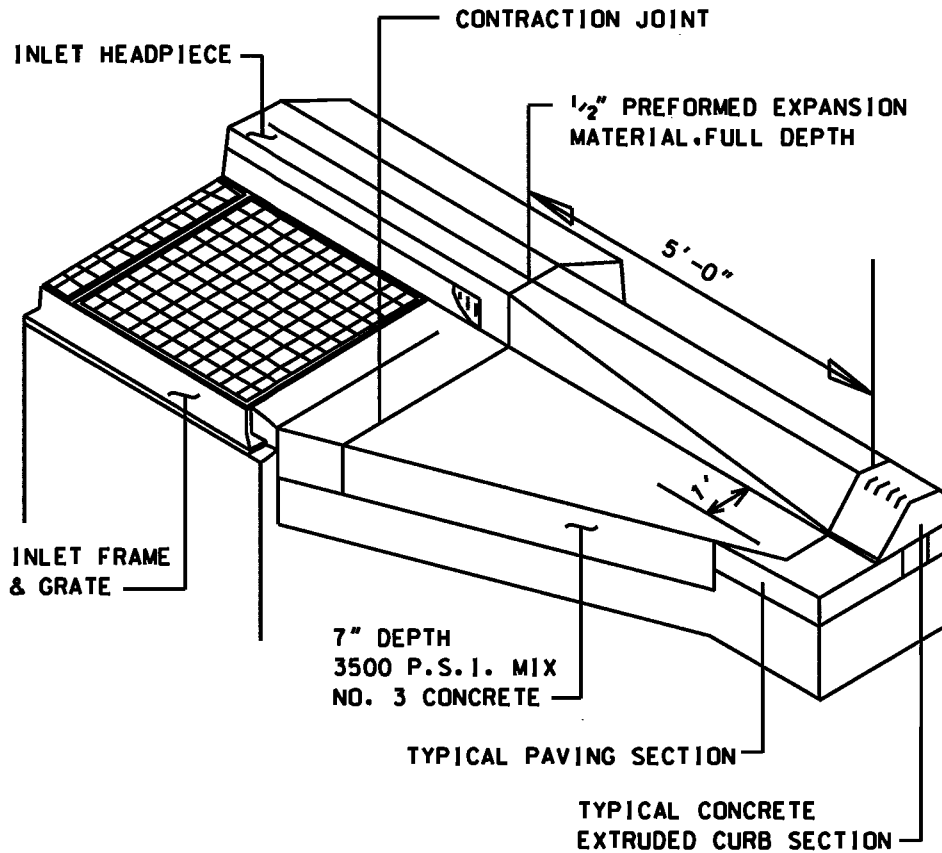
[Signature] 5-2-00
 DIRECTOR OF PUBLIC WORKS DATE
[Signature] 4/12/00
 DEP. DIRECTOR, PUBLIC WORKS DATE



**HARFORD COUNTY, MD
 DEPARTMENT OF
 PUBLIC WORKS**

**CURB & GUTTER
 TRANSITION @ INLETS**

ISSUED 5-2-00
 REVISED 5/31/07
 REVISED _____
 PLATE S-36



- NOTES:
1. TYPICAL BOTH SIDES OF INLET
 2. FOR CONSTRUCTION DETAILS, SEE PLATE S-3.

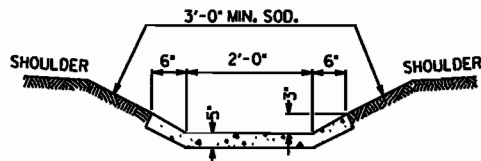
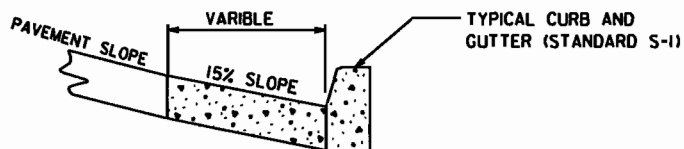
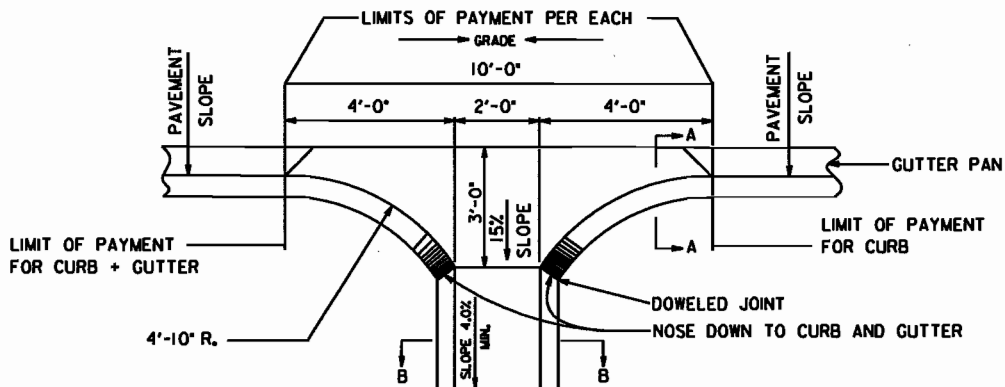
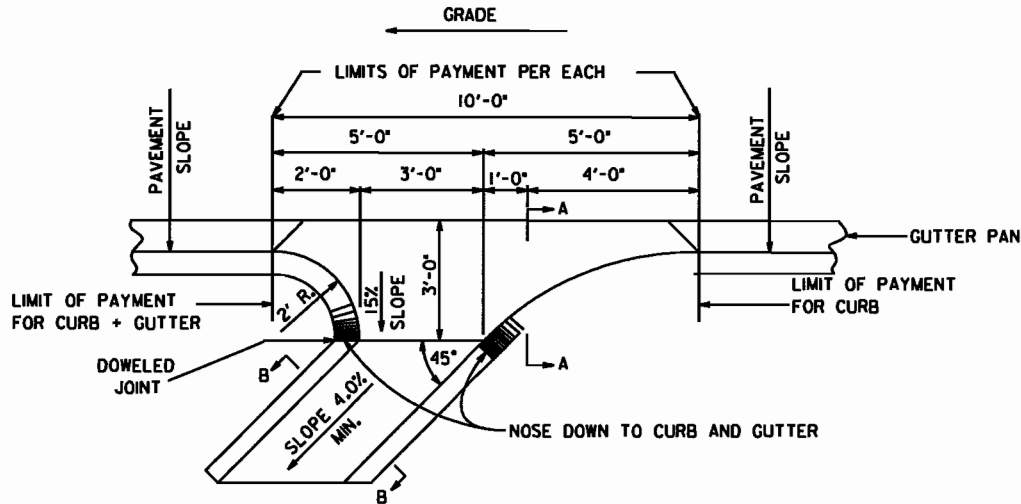
<i>[Signature]</i>	5-2-00
DIRECTOR OF PUBLIC WORKS	DATE
<i>[Signature]</i>	4/12/00
DEP. DIRECTOR, PUBLIC WORKS	DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

EXTRUDED CURB TRANSITION @ INLETS

ISSUED	5-2-00
REVISED	5/31/07
REVISED	
PLATE	S-37



[Signature] 5-2-00
 DIRECTOR OF PUBLIC WORKS DATE
[Signature] 4/12/00
 DEP. DIRECTOR, PUBLIC WORKS DATE

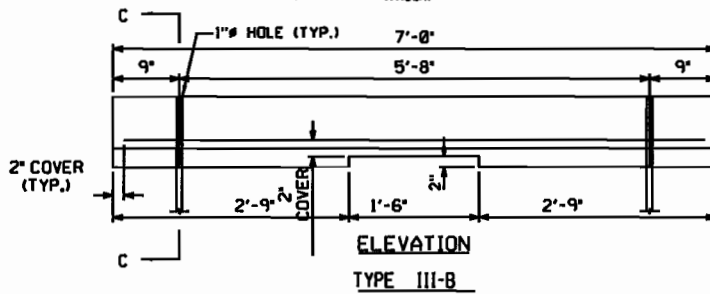
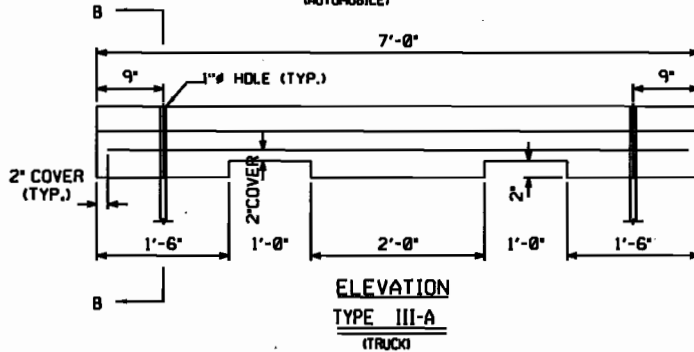
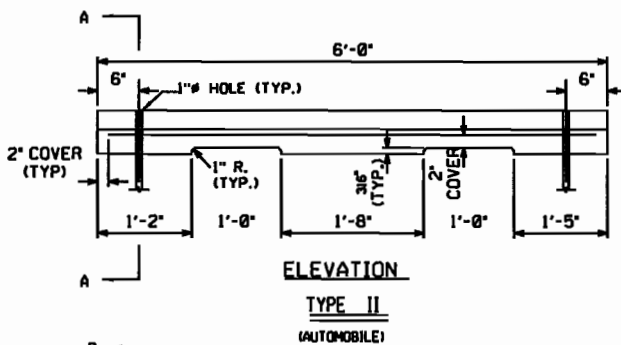
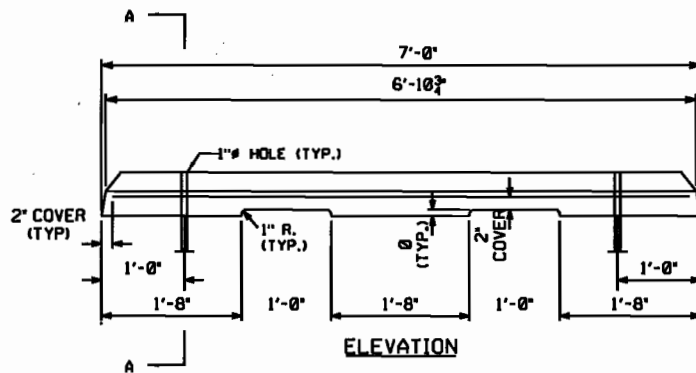


HARFORD COUNTY, MD
 DEPARTMENT OF
 PUBLIC WORKS

STANDARD CURB OPENING DETAIL
 CURB & GUTTER SECTION 1

ISSUED 5-2-00
 REVISED _____
 REVISED _____
 PLATE S-38

5/2/00
 DIRECTOR OF PUBLIC WORKS
 DATE
 4/12/00
 DEP. DIRECTOR, PUBLIC WORKS
 DATE

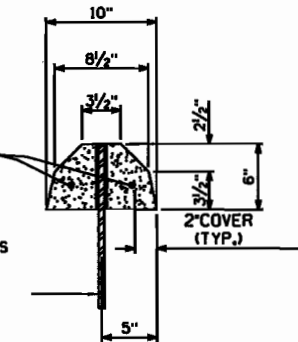


NOTE:

PRECAST CONCRETE WHEEL STOPS SHALL BE LOCATED AS SHOWN ON THE PLANS,
 THEN SECURED IN PLACE WITH TWO (2) NO. 7 REINFORCEMENT BARS PER WHEEL STOP.

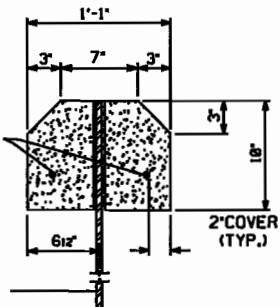
REINFORCEMENT
 2-NO. 3
 DEFORMED BARS

ANCHORAGE PINS
 NO. 7 RE-BARS
 15" LONG (MIN.)



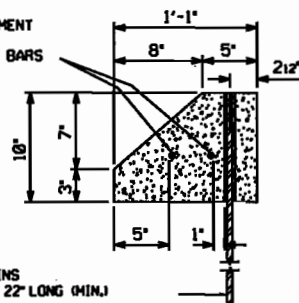
REINFORCEMENT
 2-NO. 6
 DEFORMED BARS

ANCHORAGE PINS
 NO. 7 RE-BARS
 22" LONG (MIN.)



REINFORCEMENT
 2-NO. 6
 DEFORMED BARS

ANCHORAGE PINS
 NO. 7 RE-BARS 22" LONG (MIN.)



HARFORD COUNTY, MD
 DEPARTMENT OF
 PUBLIC WORKS

PRECAST CONCRETE
 WHEEL STOPS

ISSUED 5/2/00

REVISED

PLATE S-39

SECTION V

DRAINAGE

Plate

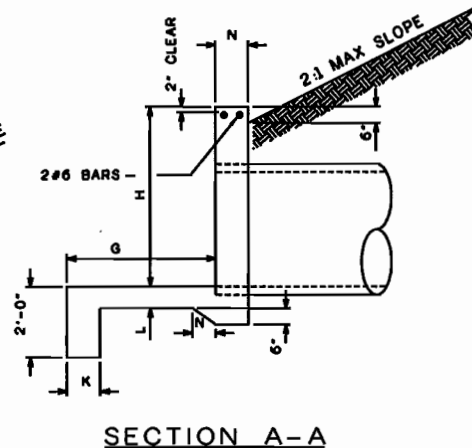
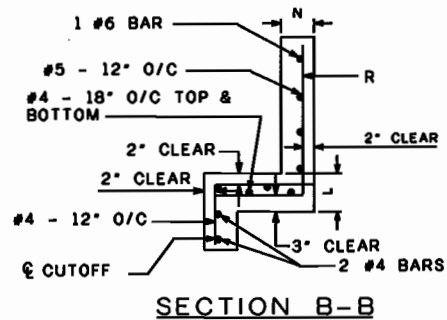
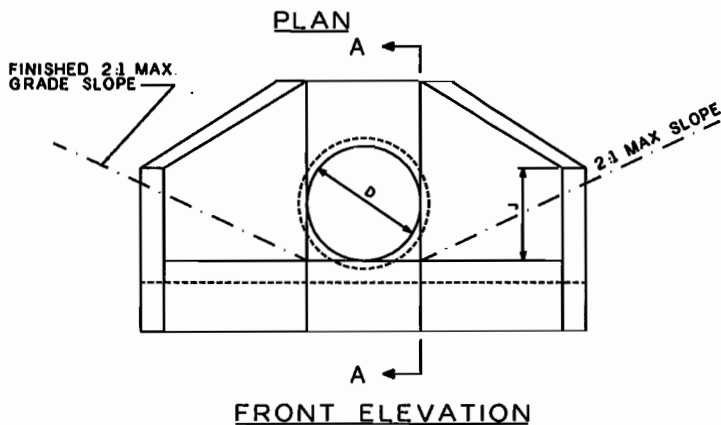
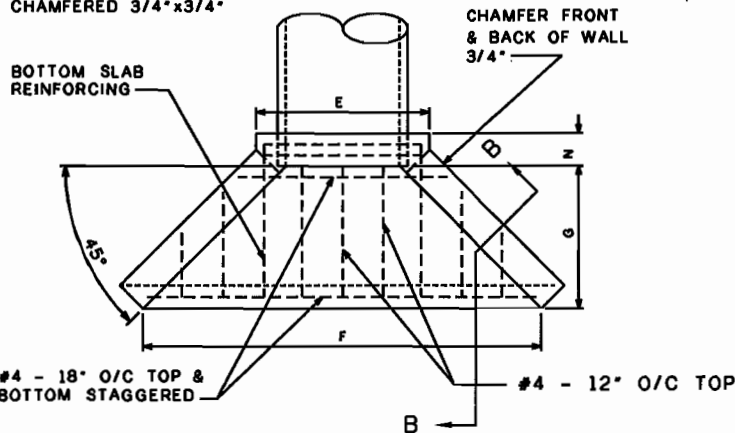
Type "A" Headwall Circular Pipe.....	D-1
Type "A" Headwall Metal Pipe Arch	D-2
Type "A" Headwall Elliptical Concrete Pipe	D-3
End Support Wall Round Pipe.....	D-4
End Support Wall Arch Pipe.....	D-5
Standard Headwalls B-48, B-54, B-60	D-6
Standard Headwalls B-66, B-72, B-78, B-84	D-7
Type "A" Headwall Pipe Arch 73" x 55", 84" x 61"	D-8
Type "A" Headwall Pipe Arch 95" x 67", 106" x 73", 117" x 79", 131" x 85"	D-9
Hook Bolt Detail Structural Plate Pipe and Pipe Arches.....	D-10
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EXPOSED EDGES TO BE
CHAMFERED 3/4"x3/4"



D	E	F	G	H	J	K	L	N	R	ΔVOL. C.Y.
15" - 18"	3'-0"	7'-6"	3'-0"	3'-0"	2'-0"	8"	8"	8"	#5-12" O/C	1.70
21"	3'-4"	7'-9"	3'-0"	3'-3"	2'-0"	8"	8"	8"	#5-12" O/C	1.80
24"	3'-8"	8'-0"	3'-0"	3'-6"	2'-0"	8"	8"	8"	#5-12" O/C	1.90
27"	3'-11"	8'-3"	3'-0"	3'-9"	2'-0"	8"	8"	8"	#5-12" O/C	2.00
30"	4'-2"	8'-6"	3'-0"	3'-6"	2'-0"	8"	8"	10"	#5-12" O/C	2.85
36"	4'-8"	10'-0"	3'-6"	4'-6"	2'-3"	8"	10"	10"	#5-12" O/C	3.15
42"	5'-3"	11'-6"	4'-0"	5'-0"	2'-9"	8"	10"	10"	#5-12" O/C	3.87
48"	5'-10"	13'-0"	4'-6"	5'-6"	3'-0"	8"	10"	12"	#5-12" O/C	5.08
54"	6'-5"	14'-6"	5'-0"	6'-0"	3'-3"	9"	12"	12"	#6-8" O/C	6.50
60"	7'-0"	16'-0"	5'-6"	6'-6"	3'-6"	9"	12"	12"	#6-8" O/C	7.98
66"	7'-7"	17'-6"	6'-0"	7'-0"	3'-9"	9"	12"	14"	#6-8" O/C	9.14
72"	8'-2"	19'-0"	6'-6"	7'-6"	4'-3"	9"	12"	14"	#6-8" O/C	11.10

Δ BASED ON 2:1 CHANNEL SIDE
SLOPES

NOTE:

HEADWALL TO BE PARALLEL
TO C OF ROADWAY UNLESS
OTHERWISE NOTED IN THE
CONTRACT DRAWINGS.

CONCRETE VOLUME BASED ON
2:1 SIDE SLOPES TO BE USED FOR
ESTIMATING ONLY.

CONCRETE MIX #3

PRECASTING THIS ENDWALL: SEE
NOTE 4. DETAIL D-3



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TYPE "A" HEADWALL
CIRCULAR PIPE

ISSUED 05.02.00

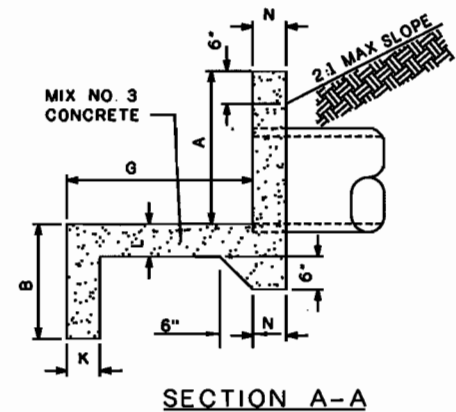
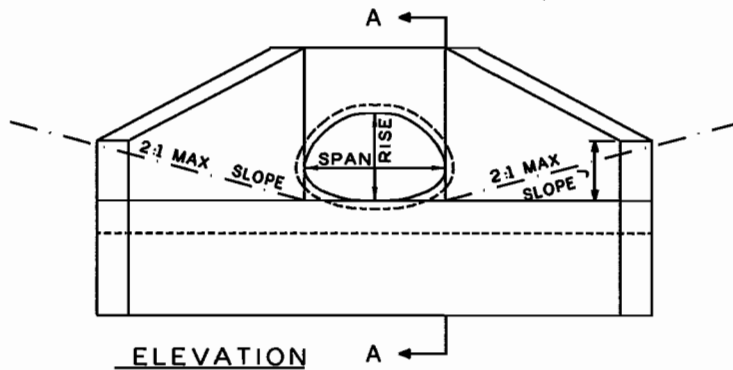
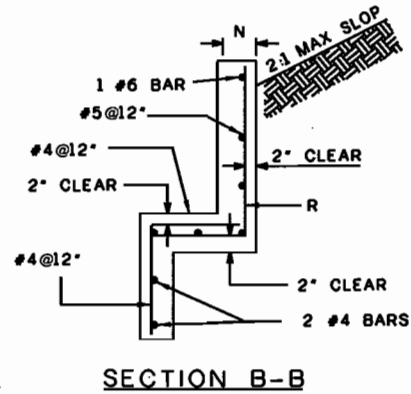
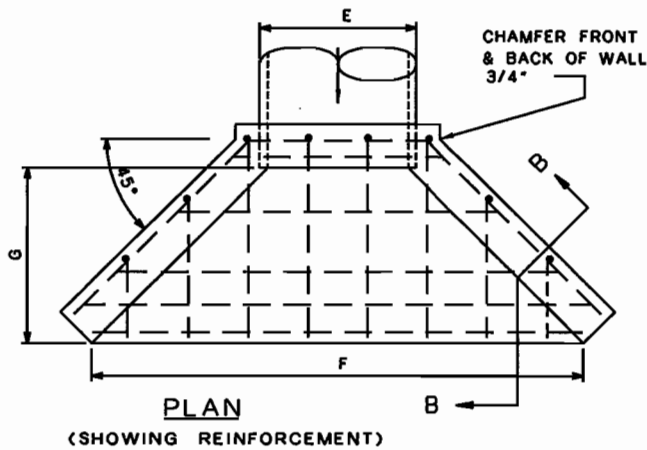
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PLATE D-1

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DATE



Δ BASED ON 2:1 CHANNEL SIDE SLOPES. SEE NOTE 2

EQ. NO.	SP. AN.	RISE	A	B	E	F	G	J	K	L	N	R	Δ CONC. C.Y.
18"	21"	15"	2'-3"	2'-0"	2'-9"	7'-9"	3'-0"	1'-0"	8"	8"	8"	#5@12"	1.12
24"	28"	20"	2'-8"	2'-0"	3'-4"	8'-4"	3'-0"	1'-4"	8"	8"	8"	#5@12"	1.29
30"	35"	24"	3'-0"	2'-0"	3'-11"	8'-11"	3'-0"	1'-4"	8"	8"	8"	#5@12"	1.45
36"	42"	29"	3'-5"	2'-0"	4'-5"	9'-6"	3'-0"	1'-11"	8"	10"	8"	#5@12"	1.74
42"	49"	33"	3'-9"	2'-0"	5'-1"	10'-1"	3'-0"	2'-3"	8"	10"	8"	#5@12"	1.93
48"	57"	38"	4'-2"	2'-0"	5'-9"	11'-9"	3'-6"	2'-5"	8"	10"	8"	#5@12"	2.46
54"	64"	43"	4'-7"	2'-0"	6'-4"	13'-0"	3'-10"	2'-8"	9"	12"	10"	#5@12"	3.47
60"	71"	47"	4'-11"	2'-0"	6'-11"	14'-3"	4'-2"	2'-10"	9"	12"	10"	#5@12"	4.02

- NOTES
1. CHAMFER EXPOSED EDGES 3/4" X 3/4"
 2. CONCRETE QUANTITIES TO BE USED FOR ESTIMATING ONLY.
 3. HEADWALL TO BE PARALLEL TO C OF ROADWAY UNLESS OTHERWISE NOTED ON CONTRACT DRAWINGS.
 4. PRECASTING THIS ENDWALL. SEE NOTE 4, DETAIL D-3

[Signature]
DIRECTOR OF PUBLIC WORKS 05.02.00
DATE

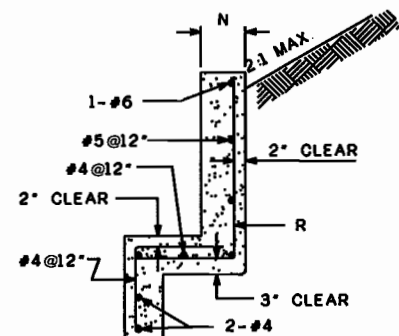
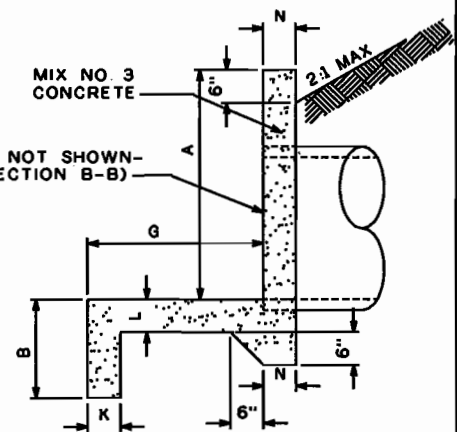
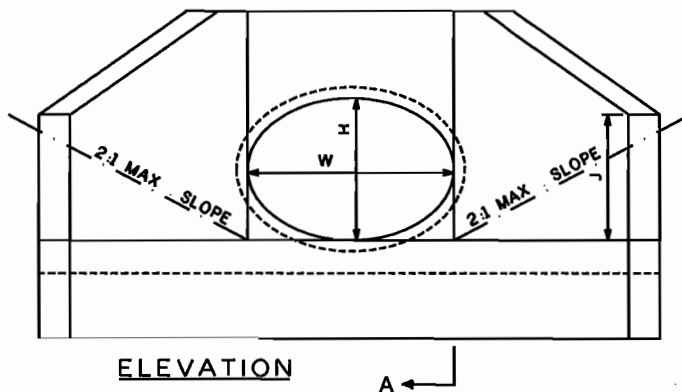
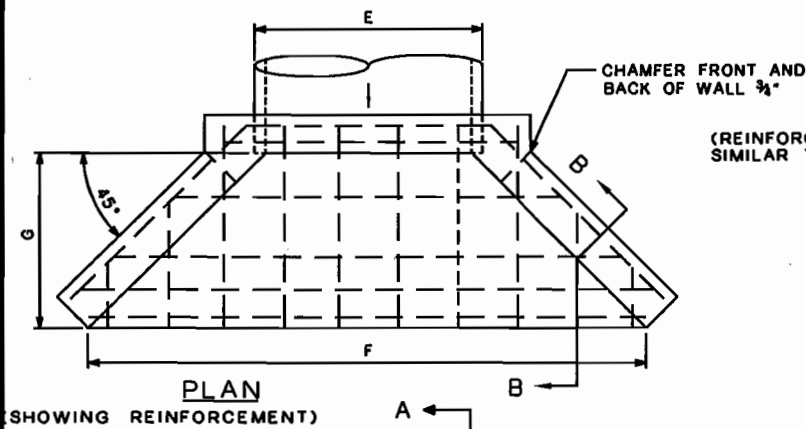
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HARFORD COUNTY, MD
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PUBLIC WORKS

TYPE "A" HEADWALL METAL PIPE ARCH

ISSUED 05.02.00
REVISED _____
REVISED _____
PLATE D-2



EQ. RD.	W	H	A	B	E	F	G	J	K	L	N	R	Δ VOL. C.Y.
36"	45°	29"	3'-9"	2'-0"	5'-6"	9'-9"	3'-0"	2'-0"	8"	10"	8"	#5@12"	2.17
42"	53°	34"	4'-3"	2'-0"	6'-3"	11'-5"	3'-6"	2'-3"	8"	10"	10"	#5@12"	2.99
48"	60°	38"	4'-8"	2'-0"	7'-0"	12'-4"	3'-8"	2'-6"	8"	10"	10"	#5@12"	3.38
54"	68°	43"	5'-3"	2'-0"	7'-8"	13'-8"	4'-0"	2'-9"	9"	12"	10"	#5@12"	4.53
60"	76°	48"	5'-6"	2'-0"	8'-5"	15'-4"	4'-6"	3'-0"	9"	12"	10"	#5@12"	5.32
66"	83°	53"	6'-0"	2'-0"	9'-1"	17'-0"	5'-0"	3'-3"	9"	12"	12"	#6@8"	7.07
72°	91°	58"	6'-6"	2'-0"	9'-10"	18'-3"	5'-4"	3'-6"	9"	12"	12"	#6@8"	7.88

Δ SEE NOTE 2

NOTES:

1. CHAMFER EXPOSED EDGES $\frac{3}{4}$ "x $\frac{3}{4}$ "
2. CONCRETE QUANTITIES TO BE USED FOR ESTIMATING ONLY.
3. HEADWALL TO BE PARALLEL TO C. OF ROADWAY UNLESS OTHERWISE NOTED IN THE CONTRACT DRAWINGS.
4. PRECAST WALL WITH DIMENSIONS AND REINFORCEMENT EQUIVALENT TO CAST IN PLACE WALL SHOWN WILL BE CONSIDERED. PROVIDE SHOP DRAWING SHOWING REINFORCEMENT AND MEANS OF WALL-TO-TOE CONNECTION. PLACE ON UNDISTURBED EARTH OR POUR CONCRETE FOOTING TO SAME PRECAST WALLS THAT ARE CUT OR BROKEN FOR ANY REASON WILL BE REJECTED. PRECAST CONCRETE: 4500 psi MIN.

[Signature]
DIRECTOR OF PUBLIC WORKS 05.02.00
DATE

[Signature]
DEP. DIRECTOR, PUBLIC WORKS 04.12.00
DATE

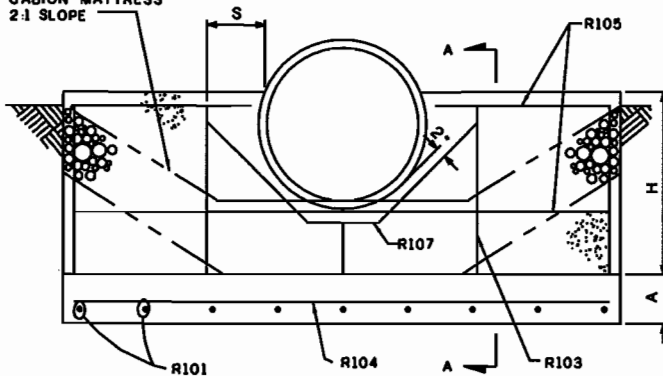


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

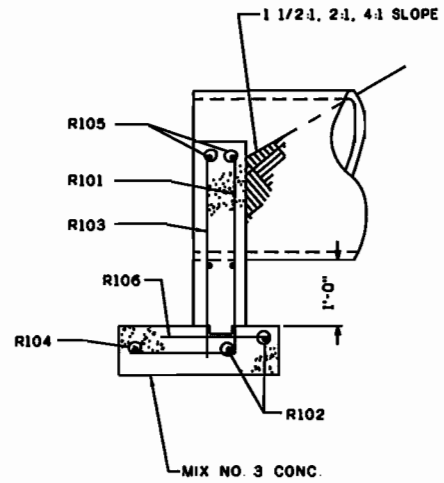
TYPE "A" HEADWALL
ELLIPTICAL CONCRETE PIPE

ISSUED 05.02.00
REVISED _____
REVISED _____
PLATE D-3

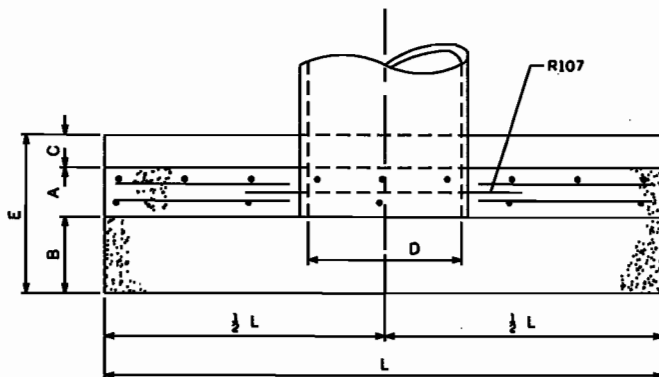
GABION MATTRESS
2:1 SLOPE



ELEVATION (SURFACE REMOVED)



SECTION A-A



PLAN (SURFACE REMOVED)

S = Distance from inside surface of pipe
to vertical bars in front and rear face:
4" for 12" - 18" dia. pipes
6" for 24" - 36" dia. pipes
8" for 42" - 60" dia. pipes

NOTE: KEY TO BE 4" W. x 2" D., CENTERED
IN ENDWALL.

Openings		Dimensions						Vol.	Steel
D	Area	A	B	C	E	H	L	Conc	LBS
Inches	Sq. Ft.							C.Y.	
12"	0.79	9"	6"	6"	1'9"	1'10"	4'0"	0.38	29
15"	1.23	9"	6"	6"	1'9"	2'0"	4'9"	0.47	34
18"	1.79	9"	6"	6"	1'9"	2'3"	5'6"	0.56	41
24"	3.14	9"	14"	6"	2'5"	2'6"	7'0"	0.88	56
30"	4.91	9"	14"	6"	2'5"	2'9"	8'6"	1.12	79
36"	7.07	12"	16"	10"	3'2"	3'0"	10'0"	2.11	115
42"	9.52	12"	16"	10"	3'2"	3'3"	11'6"	2.50	124
48"	12.57	12"	16"	10"	3'2"	3'6"	13'0"	2.91	151
54"	15.90	12"	20"	12"	3'8"	3'9"	14'6"	3.62	168
60"	19.64	12"	20"	12"	3'8"	4'0"	16'0"	4.09	196

REINFORCING BARS					
REBAR NO.	SIZE	TYPE	C/C	AMT.	USE
R101	#4	BENT	1'-0"	VARIE	A
R102	#4	STR.	—	2	D
R103	#4	STR.	—	VARIE	B
R103	#4	STR.	2'-0" max.	VARIE	C
R104	#4	STR.	—	1	A
R105	#4	STR.	1'-7" max.	VARIE	A
R106	#4	STR.	1'-0"	VARIE	D
R107	#4	BENT	—	1	A

USES:
A = ALL ENDWALLS
B = 12" - 18" DIA. PIPES
C = 24" - 60" DIA. PIPES
D = 36" - 60" DIA. PIPES

W. L. Wilson
DIRECTOR OF PUBLIC WORKS

5-2-00
DATE

W. L. Wilson
DEP. DIRECTOR, PUBLIC WORKS

4/12/00
DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

END SUPPORT WALL
ROUND PIPE

ISSUED 5-2-00

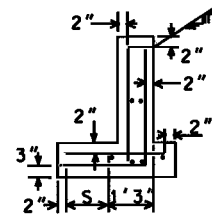
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REVISED

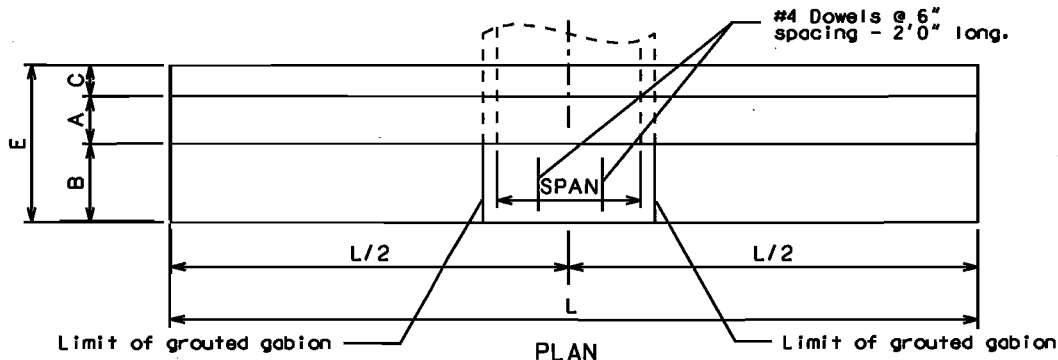
PLATE D-4

Openings		Dimensions						Vol.	Steel
Size	Area	A	B	C	E	H	L	Conc.	
Inches	Sq. Ft.							C.Y.	Lbs.
28"x20"	2.2	9"	14"	6"	2'5"	2'0"	6'0"	0.68	49
35"x24"	4.4	9"	14"	6"	2'5"	2'3"	7'6"	0.88	59
42"x29"	4.8	12"	16"	10"	3'2"	2'6"	8'11"	1.70	81
47"x33"	6.5	12"	16"	10"	3'2"	2'9"	10'5"	2.05	129
57"x38"	8.7	12"	16"	10"	3'2"	3'0"	12'2"	2.46	164
64"x43"	11.0	12"	20"	12"	3'8"	3'3"	13'8"	3.10	189
71"x47"	13.5	12"	20"	12"	3'8"	3'6"	15'2"	3.53	214

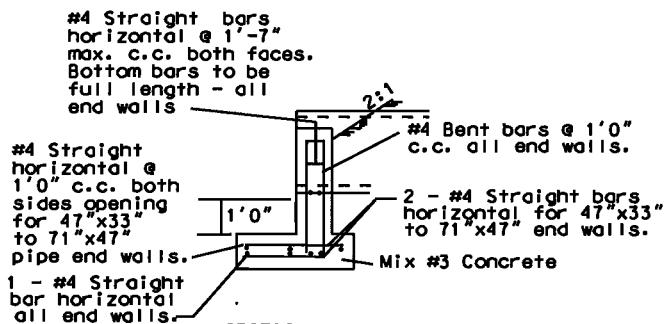
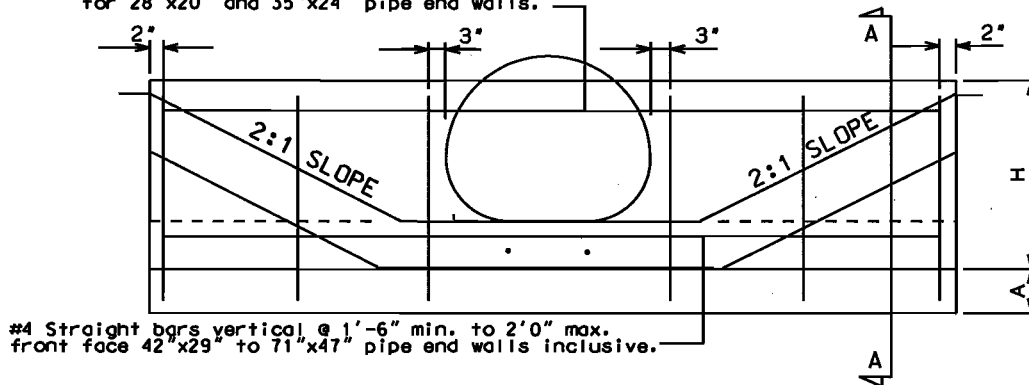
5 Distances
 6" for 28"x20"
 to 42"x29" incl.
 8" for 47"x33"
 to 71"x47" incl.



DISPOSITION OF BARS



4 - #4 Straight bars vertical in front face
 for 28"x20" and 35"x24" pipe end walls.



W. H. Allen, Jr. 5-2-00
 DIRECTOR OF PUBLIC WORKS DATE
W. H. Allen, Jr. 4/12/00
 DEP. DIRECTOR, PUBLIC WORKS DATE

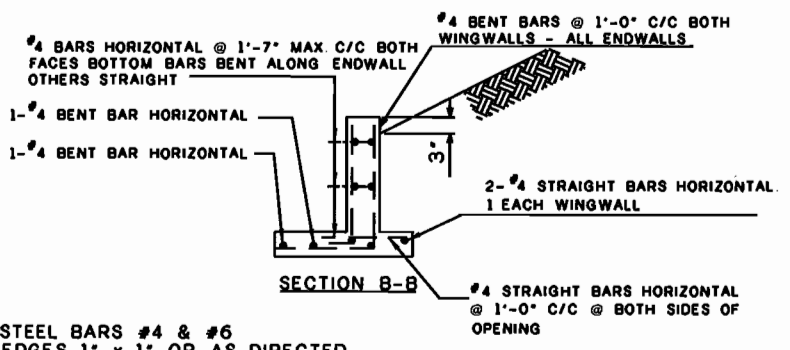
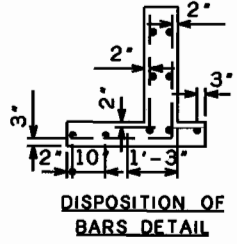
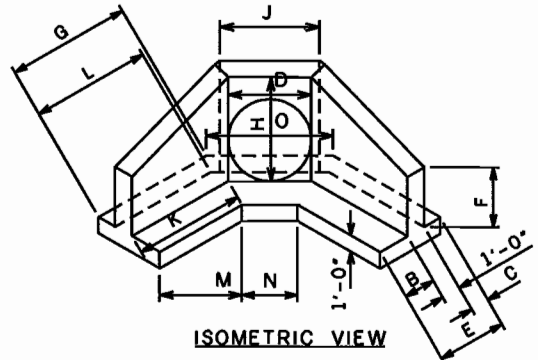
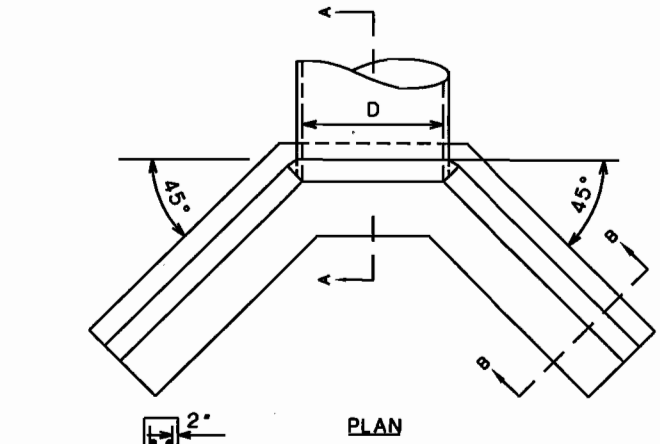
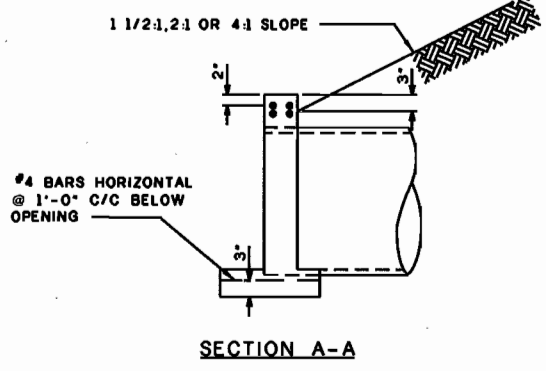
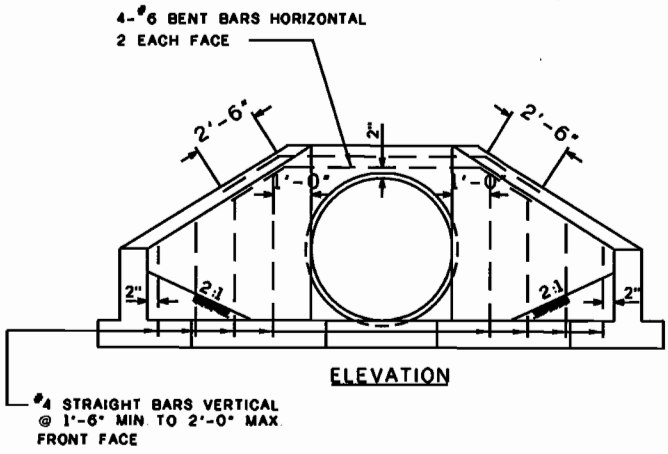


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END SUPPORT WALL
 ARCH PIPE

ISSUED 5-2-00
 REVISED
 REVISED
 PLATE D-5

05.02.00
 DIRECTOR OF PUBLIC WORKS
 DATE
 04.12.00
 DEP. DIRECTOR, PUBLIC WORKS
 DATE



GENERAL NOTES:
 CONCRETE MIX NO. 3
 REINFORCING: DEFORMED STEEL BARS #4 & #6
 CHAMFER: ALL EXPOSED EDGES 1" x 1" OR AS DIRECTED

OPENING		DIMENSIONS												VOL. CONC. C.Y.	STEEL LBS.
D INCHES	AREA SQ. FT.	B	C	E	F	G	H	J	K	L	M	N	O		
48	12.57	1'-4"	10"	3'-2"	2'-9"	7'-0 1/4"	5'-0"	4'-10"	6'-3 1/2"	6'-8 1/4"	5'-9"	2'-10 3/4"	5'-6"	4.3	262
54	15.9	1'-8"	1'-0"	3'-8"	3'-0"	7'-8 1/2"	5'-6"	5'-4"	6'-10 1/2"	7'-3 1/2"	6'-2 1/4"	3'-1 1/2"	6'-2"	5.3	301
60	19.64	1'-8"	1'-0"	3'-8"	3'-3"	8'-5"	6'-0"	5'-10"	7'-7 1/4"	8'-0 1/4"	6'-11"	3'-7 1/2"	6'-8"	6.0	361

QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY



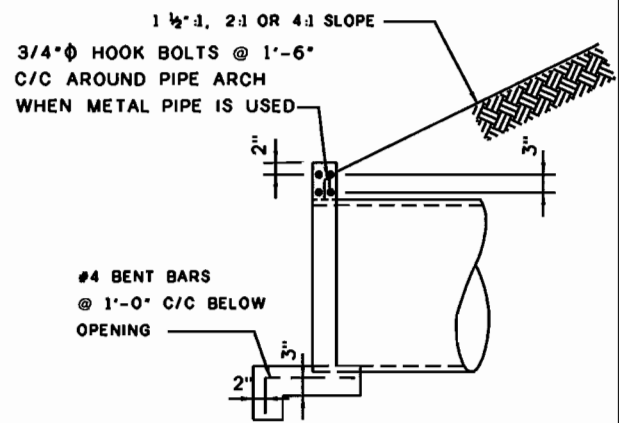
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STANDARD HEADWALLS
 B- 48 B- 54 B- 60

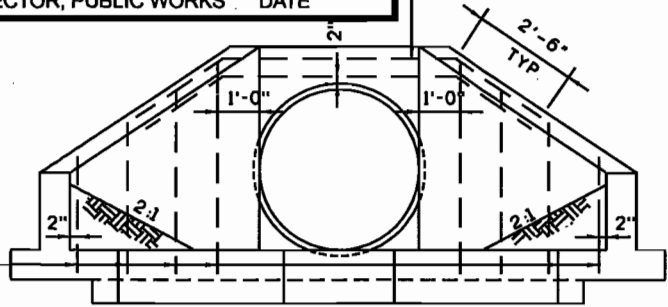
ISSUED 05.02.00
 REVISED
 REVISED
 PLATE D-6

05.02.00
 DATE
 04.12.00
 DATE
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4-#6 BENT BARS HORIZ.
 2 EACH FACE

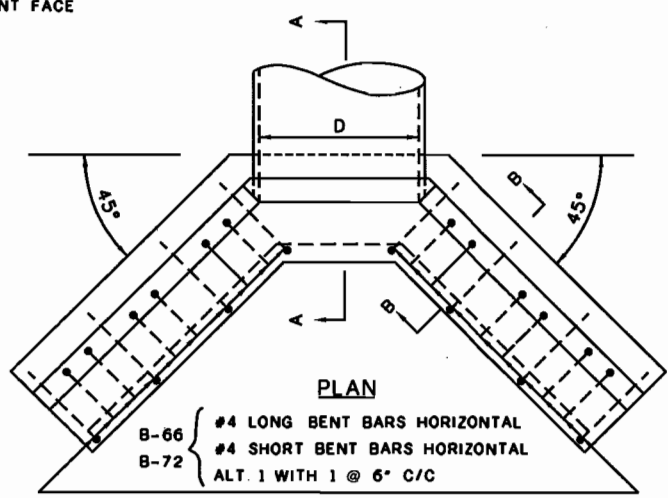


SECTION A-A



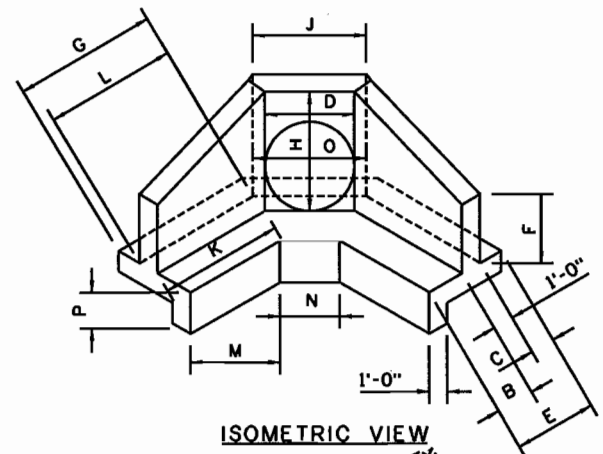
ELEVATION

#4 STRAIGHT BARS VERTICAL
 @ 1'-6" MIN. TO 2'-0" MAX.
 IN FRONT FACE

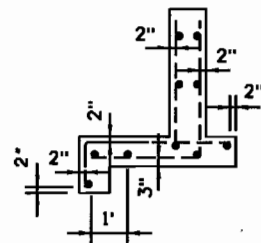


PLAN

B-66 { #4 LONG BENT BARS HORIZONTAL
 B-72 { #4 SHORT BENT BARS HORIZONTAL
 ALT. 1 WITH 1 @ 6" C/C
 B-78 { #4 LONG BENT BARS HORIZONTAL
 B-84 { #4 SHORT BENT BARS HORIZONTAL
 ALT. 1 WITH 2 RESP. 4" C/C



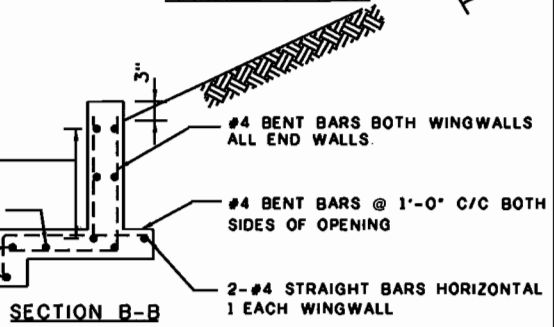
ISOMETRIC VIEW



DISPOSITION OF BARS DETAIL

#4 BARS HORIZONTAL @ 1'-7" MAX. C/C BOTH
 FACES BOTTOM BARS BENT ALONG ENDWALL
 OTHERS STRAIGHT.

1-#4 BENT BAR HORIZONTAL
 2-#4 BENT BARS HORIZONTAL



SECTION B-B

GENERAL NOTES:
 CONCRETE MIX NO 3
 REINFORCING: DEFORMED STEEL BARS #4 & #6
 CHAMFER: ALL EXPOSED EDGES 1" x 1" OR AS DIRECTED

OPENING		DIMENSIONS													VOL. CONC. CY	STEEL LBS.
D INCHES	AREA SQ. FT.	B	C	E	F	G	H	J	K	L	M	N	O	P		
66	23.80	2'-6"	1'-3"	4'-9"	3'-0"	11'-2 1/2"	6'-8 1/2"	6'-4"	10'-3/4"	10'-8 1/2"	9'-3"	3'-5"	7'-4 1/2"	2'-0"	9.7	585
72	28.27	2'-6"	1'-3"	4'-9"	3'-3"	12'-1"	7'-3"	6'-10"	11'-1 1/4"	11'-6 3/4"	10'-1 1/4"	3'-11"	7'-10 1/2"	2'-0"	10.9	645
78	33.20	3'-0"	1'-6"	5'-6"	3'-6"	13'-0 1/2"	7'-9 1/2"	7'-4"	12'-0"	12'-5"	10'-9"	4'-0"	8'-6 3/4"	2'-6"	13.3	865
84	38.48	3'-0"	1'-6"	5'-6"	3'-9"	13'-10"	8'-4"	7'-10"	12'-9 1/2"	13'-2 1/2"	11'-8 1/2"	4'-6"	9'-0 3/4"	2'-6"	14.7	984

QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

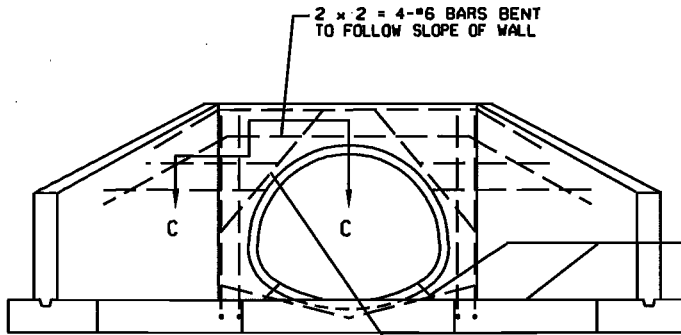


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STANDARD HEADWALLS
 B- 66, B- 72, B- 78, B- 84.

ISSUED 05.02.00
 REVISED
 REVISED
 PLATE D-7

NOTE: OTHER BARS NOT SHOWN IN FRONT ELEVATION



4 BARS EACH FACE
2' CLEAR OF PIPE ARCH

FRONT ELEVATION

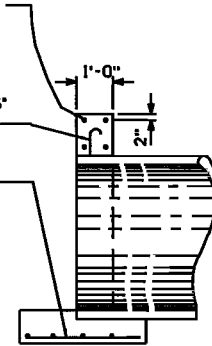
LONGITUDINAL BARS IN FOOTING
UNDER PIPE TO BE
#4 BARS SPACED AS SHOWN.

4-#6 HORIZONTAL BARS, ABOVE TOP OF
PIPE ARCH, TO EXTEND 2'-6" BEYOND
TURN IN WING.

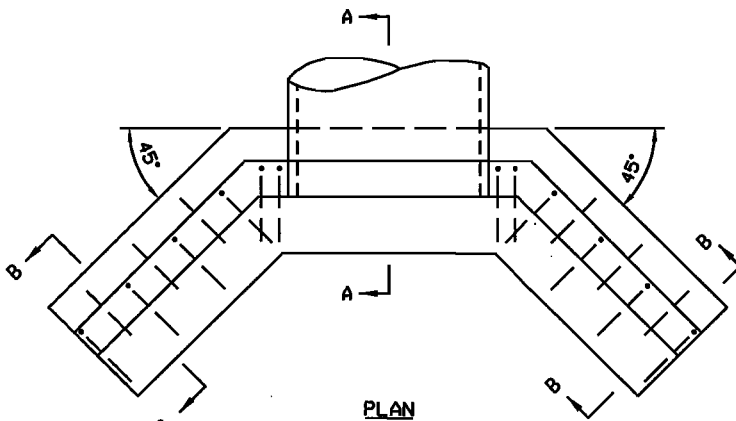
3/4" HOOK BOLTS @ 1'-6"
C/C AROUND PIPE ARCH

#4 BARS @ 1'-0" C/C

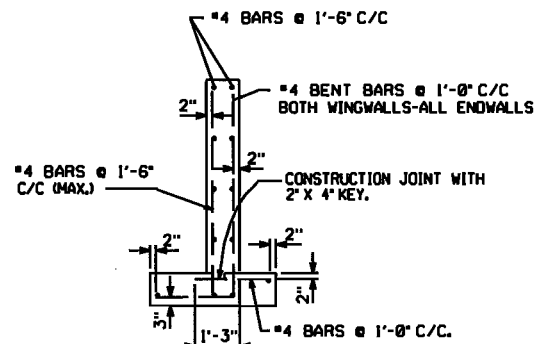
CONSTRUCTION JOINT



SECTION A-A

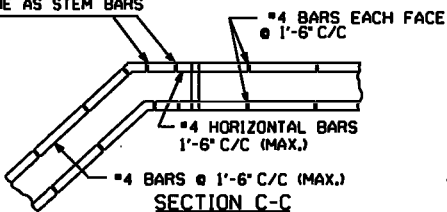


PLAN



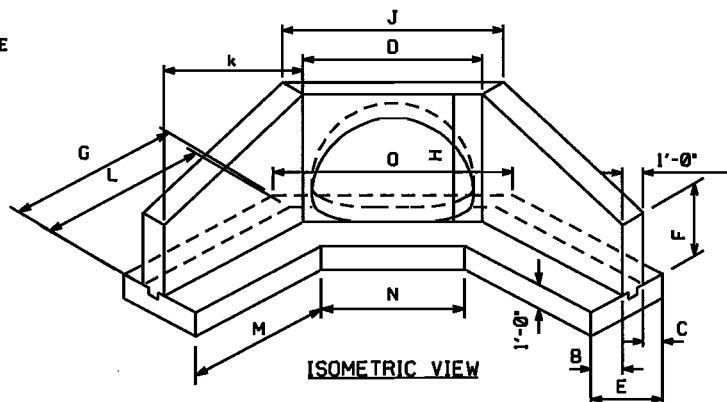
SECTION B-B

2-#4 BARS, REAR FACE
BEND SAME AS STEM BARS



SECTION C-C

CHAMFER: ALL EXPOSED EDGES 1' X 1' OR AS DIRECTED
HEADWALL SIZE: FOR INTERMEDIATE SIZE PIPE ARCHES
USE NEXT LARGER SIZE HEADWALL
CONCRETE: MIX NO. 3



ISOMETRIC VIEW

MAX. SPAN	MAX. RISE	MAX. AREA	D	B	C	E	F	G	H	J	K	L	M	N	O	ONE HEADWALL	
																VOL. CONC.	STEEL LBS.
73'	55'	220'	7'-9"	1'-8"	1'-8"	3'-8"	3'-8"	7'-8"	5'-9"	6'-7"	6'-10"	7'-3"	6'-2"	6'-4"	9'-5"	6.8	430
84'	61'	280'	8'-8"	1'-8"	1'-8"	3'-8"	3'-3"	8'-5"	6'-3"	9'-6"	7'-7"	8'-8"	6'-11"	7'-3"	10'-4"	7.8	480

[Signature]

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05.02.00

DATE

[Signature]

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04.12.00

DATE

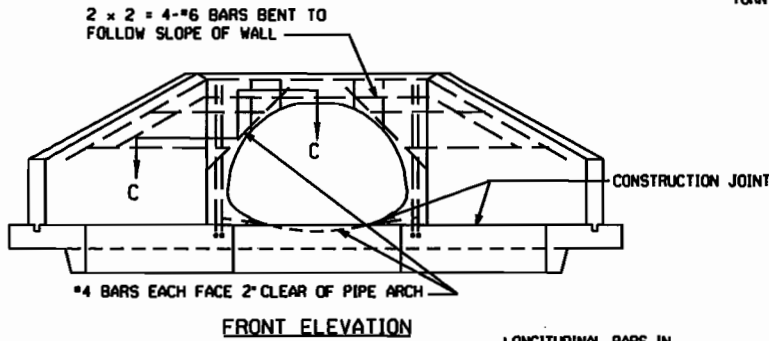


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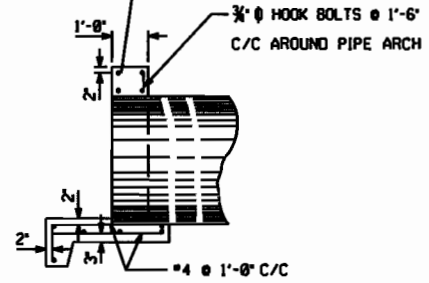
TYPE 'A' HEADWALL
PIPE ARCH
73'x55'; 84'x61'

ISSUED 05.02.00
REVISED
REVISED
PLATE D-8

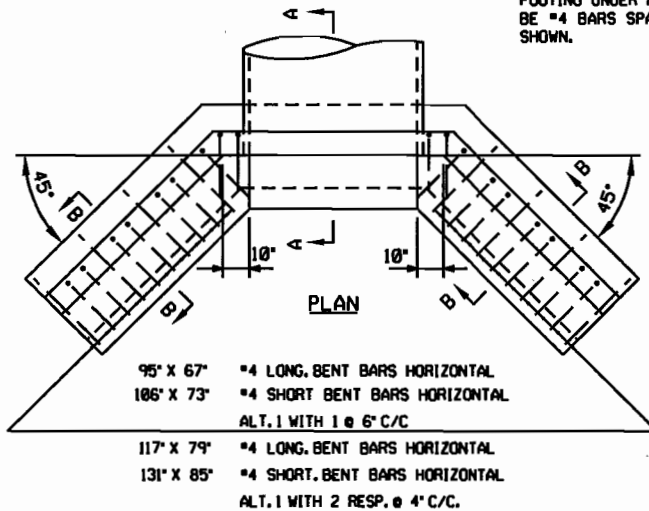
NOTE: OTHER BARS NOT SHOWN IN FRONT ELEVATION



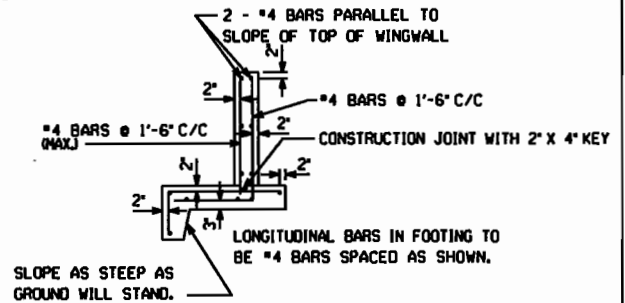
4 - #6 HORIZONTAL BARS, ABOVE TOP OF PIPE ARCH, TO EXTEND 2'-6" BEYOND TURN IN WING.



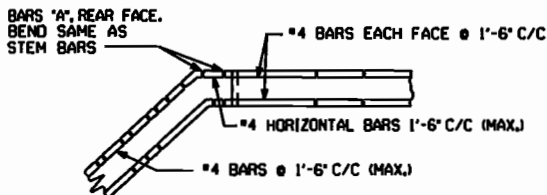
SECTION A-A



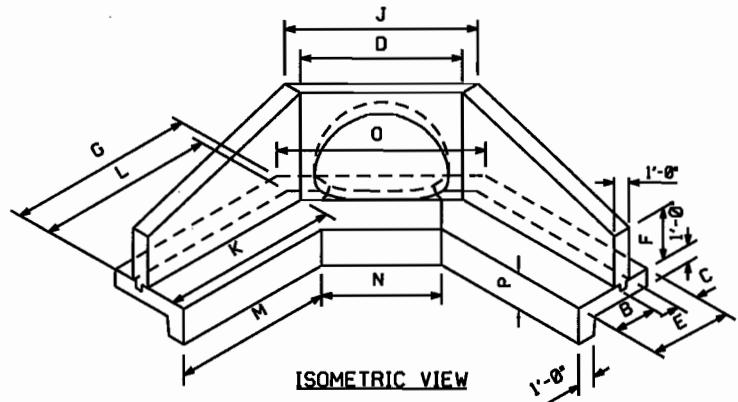
LONGITUDINAL BARS IN FOOTING UNDER PIPE TO BE #4 BARS SPACED AS SHOWN.



SECTION B-B



SECTION C-C



CONCRETE: MIX. NO. 3
CHAMFER: ALL EXPOSED EDGES 1" x 1" OR AS DIRECTED.
HEADWALL SIZE: FOR INTERMEDIATE SIZE PIPE ARCHES USE NEXT LARGER SIZE HEADWALL

MAX. SPAN	MAX. RISE	MAX. AREA	D	B	C	E	F	G	H	J	K	L	M	N	O	P	ONE HEADWALL VOL. CONC.	STEEL LBS.	BAR A
95'	67'	35 a'	9'-7"	2'-6"	1'-3"	4'-9"	3'-0"	11'-2 1/2"	6'-9"	10'-5"	10'-3 1/4"	10'-0 1/2"	9'-3 3/4"	7'-6"	11'-5 1/2"	2'-0"	11.3	700	2-#5 BARS
106'	73'	43 a'	10'-6"	2'-6"	1'-3"	4'-9"	3'-3"	12'-1"	7'-3"	11'-4"	11'-1 3/4"	11'-0 3/4"	10'-1 1/4"	8'-5"	12'-4 1/2"	2'-0"	12.6	760	2-#5 BARS
117'	79'	52 a'	11'-5"	3'-0"	1'-6"	5'-6"	3'-6"	13'-0 1/2"	7'-9"	12'-3"	12'-0"	12'-5"	10'-9"	8'-11"	13'-5 3/4"	2'-6"	15.5	1088	2-#6 BARS
131'	85'	61 a'	12'-7"	3'-0"	1'-6"	5'-6"	3'-9"	13'-10"	8'-3"	13'-5"	12'-9 1/2"	13'-2 1/2"	11'-6 1/2"	10'-1"	14'-7 3/4"	2'-6"	17.0	1220	2-#7 BARS

W. H. Allen, Jr.

05.02.00

W. H. Allen, Jr.

04.12.00

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DATE

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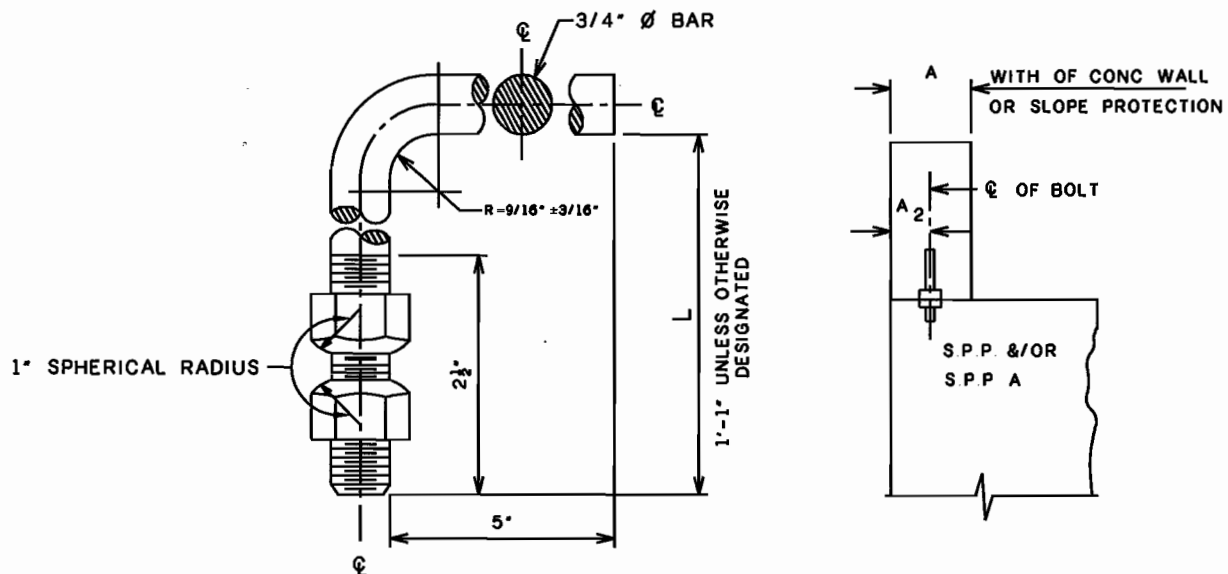
DATE



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TYPE 'A' HEADWALL
PIPE ARCH
95' x 67'; 106' x 73'; 117' x 79'; 131' x 85'

ISSUED 05.02.00
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REVISED
PLATE D-9



NOTE: PLACE 3/4" Ø HOOK BOLTS AT 1'-6" C/C AROUND PERIPHERY OF EACH STRUCTURAL PLATE PIPE, PIPE ARCH, OR CMP $\geq 48"$ DIAMETER, AT EACH HEADWALL, JUNCTION BOX, &/OR SLOPE PROTECTION AS CASE MAY BE. SET BOLTS IN PIPE (OR PIPE ARCH) AT MID POINT OF WALL OR SLOPE PROTECTION.

COST OF ALL BOLTS COMPLETE IN PLACE TO BE INCLUDED IN CONTRACT PRICE BID ON PERTINENT PIPE ITEM.

BOLTS & NUTS SHALL BE GALVANIZED AFTER THREADING.

THE GALVANIZING ON THE THREADED PORTION SHALL NOT PREVENT TURNING THE NUT BY HAND.



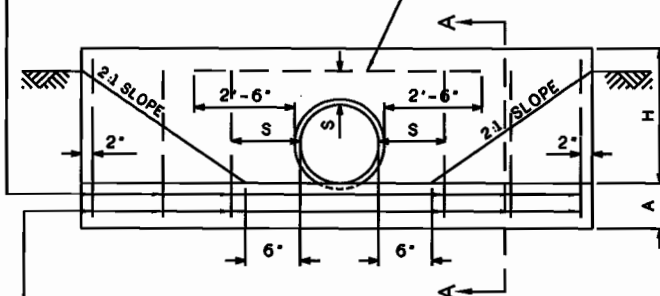
HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

HOOK BOLT DETAIL STRUCTURAL PLATE PIPE & PIPE ARCHES

ISSUED 5-2-00
 REVISED _____
 REVISED _____
 PLATE D-10

4 - #4 STRAIGHT BARS VERTICAL IN FRONT FACE
FOR 12" TO 18" DIA. PIPE ENDWALLS INCLUSIVE

#2 - #4 STRAIGHT BARS HORIZONTAL 1 EACH FACE
FOR 36" DIAMETER TO 60" DIAMETER PIPE
ENDWALLS INCLUSIVE



#4 STRAIGHT BARS VERTICAL @ 1'-6" MIN. TO 2'-0" MAX.
FRONT FACE FOR 24" DIAMETER TO 60" DIAMETER.
PIPE ENDWALLS INCLUSIVE

ELEVATION

#4 STRAIGHT BARS HORIZONTAL
@ 1'-7" C/C BOTH SIDES-
TOP AND BOTTOM BARS TO BE
FULL LENGTH - ALL ENDWALLS.

#4 STRAIGHT BARS HORIZONTAL
@ 1'-0" C/C BOTH SIDES
OF OPENING FOR 36" TO
60" DIAMETER PIPE
ENDWALLS.

1-#4 STRAIGHT BAR
HORIZONTAL - ALL
ENDWALLS

2 - #4 STRAIGHT BARS HORIZONTAL
FOR 36" TO 60" DIAMETER PIPE ENDWALLS.

SECTION A-A

"S" DISTANCES FROM INSIDE SURFACE OF PIPE
TO VERTICAL BARS IN FRONT AND REAR FACE.

4" FOR 12" DIAMETER TO 18" DIAMETER PIPES INCLUSIVE

6" FOR 24" DIAMETER TO 36" DIAMETER PIPES INCLUSIVE

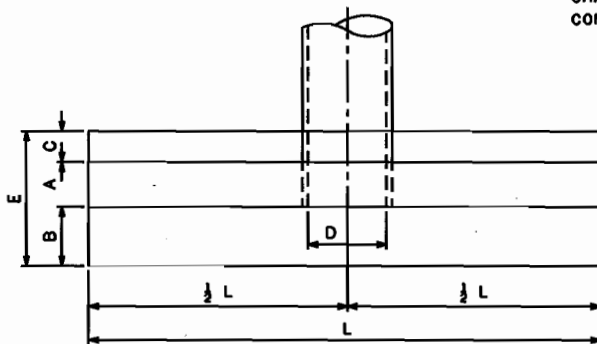
8" FOR 42" DIAMETER TO 60" DIAMETER PIPES INCLUSIVE

GENERAL NOTES:

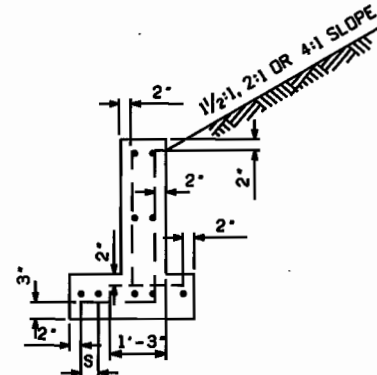
REINFORCING: DEFORMED STEEL BARS: #4 ϕ BARS

CHAMFER: ALL EXPOSED EDGES 1" x 1" OR AS DIRECTED

CONCRETE: MIX. NO. 2



PLAN



DISPOSITION OF BARS-DETAIL

QUANTITIES IN TABLE TO BE USED FOR EST. ONLY

OPENINGS		DIMENSIONS							VOLUME	STEEL
D	AREA	A	B	C	E	F	H	L	CONC.	LBS.
INCHES	SO. FT.								C. Y.	
12	0.79	9"	6"	6"	1'-9"	9"	1'-9"	6'-6"	0.61	38
15	1.23	9"	6"	6"	1'-9"	9"	2'-0"	7'-9"	0.78	55
18	1.78	9"	6"	6"	1'-9"	9"	2'-3"	9'-0"	0.95	62
24	3.14	9"	14"	6"	2'-5"	9"	2'-9"	11'-6"	1.56	91
30	4.91	9"	14"	6"	2'-5"	12"	3'-6"	14'-2"	2.19	136
36	7.07	12"	16"	10"	3'-2"	12"	4'-0"	16'-8"	4.18	222
42	9.62	12"	16"	10"	3'-2"	12"	4'-6"	19'-2"	5.13	265
48	12.57	12"	16"	10"	3'-2"	12"	5'-0"	21'-2"	6.12	326
54	15.90	12"	20"	12"	3'-8"	12"	5'-6"	24'-2"	7.68	384
60	19.64	12"	20"	12"	3'-8"	12"	6'-0"	26'-8"	8.86	428

[Signature]
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05.02.00
DATE

[Signature]
DEP. DIRECTOR, PUBLIC WORKS

04.12.00
DATE



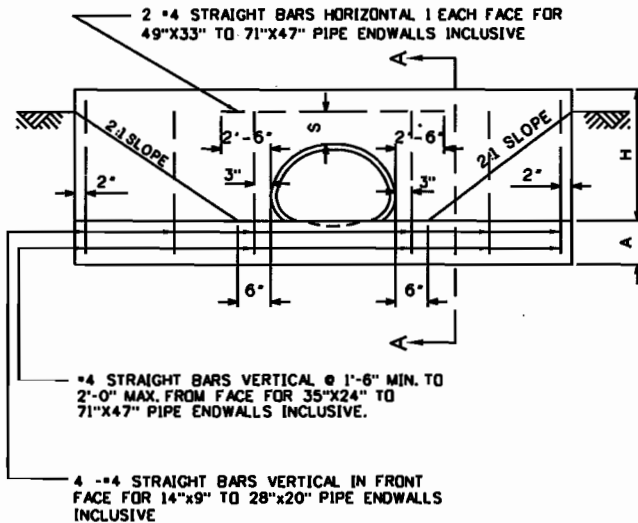
HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

STANDARD TYPE 'C' ENDWALL
ROUND PIPE

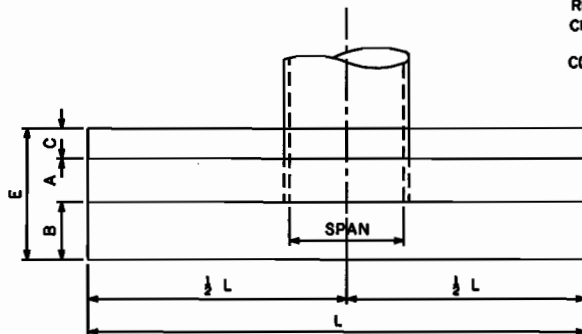
ISSUED 05.02.00
REVISED
REVISED
PLATE D-11

W. L. Wilson
 DIRECTOR OF PUBLIC WORKS
 05.02.00
 DATE

W. L. Wilson
 DEP. DIRECTOR, PUBLIC WORKS
 04.12.00
 DATE



ELEVATION



PLAN

GENERAL NOTES:
 REINFORCING: DEFORMED STEEL BARS: #4 # BARS
 CHAMFER: ALL EXPOSED EDGES 1" x 1" OR AS
 DIRECTED
 CONCRETE: MIX. NO. 2

#4 STRAIGHT BARS HORIZONTAL
 @ 1'-7" C/C BOTH FACES-
 TOP & BOTTOM BARS TO BE
 FULL LENGTH - ALL ENDWALLS.

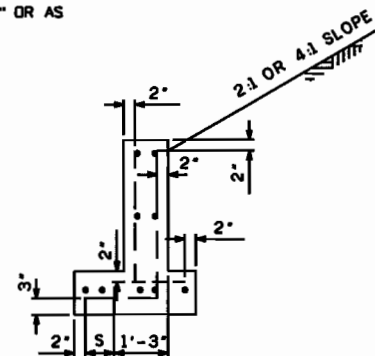
#4 STRAIGHT BARS HORIZONTAL
 @ 1'-0" C/C BOTH SIDES OF
 OF OPENING FOR 49"X33" TO
 71"X47" PIPE ENDWALLS
 INCLUSIVE.

1 - #4 STRAIGHT BAR
 HORIZONTAL - ALL
 ENDWALLS

2 - #4 STRAIGHT BARS HORIZONTAL
 FOR 49"X33" TO 71"X47" PIPE
 ENDWALLS INCLUSIVE

SECTION A-A

S DISTANCES FROM INSIDE SURFACE OF PIPE
 TO VERTICAL BARS IN FRONT AND REAR FACE
 4" FOR 14"X 9" TO 21"X15" INCLUSIVE
 6" FOR 28"X20" TO 42"X29" INCLUSIVE
 8" FOR 49"X33" TO 71"X47" INCLUSIVE



DISPOSITION OF BARS-DETAILS

OPENINGS		DIMENSIONS								VOLUME	STEEL
SIZE	AREA	A	B	C	E	F	H	L		CONC.	ST. LBS.
INCHES	SO. FT.									C. Y.	
14"x9"	0.8	9"	6"	6"	1'-9"	8"	1'-5"	6'-4"		.54	41
17"x13"	1.1	9"	6"	6"	1'-9"	6"	1'-5"	6'-4"		.53	41
21"x15"	1.6	9"	6"	6"	1'-9"	11"	2'-0"	9'-7"		.95	68
28"x20"	2.8	9"	6"	6"	1'-9"	6"	2'-0"	9'-7"		.92	67
35"x24"	4.4	9"	14"	6"	2'-5"	14"	3'-0"	13'-9"		1.95	120
42"x29"	6.4	9"	14"	6"	2'-5"	9"	3'-0"	13'-9"		1.89	126
49"x33"	8.7	12"	16"	10"	3'-2"	14"	3'-9"	18'-0"		4.29	226
57"x38"	11.4	12"	16"	10"	3'-2"	9"	3'-9"	18'-0"		4.19	226
64"x43"	14.3	12"	20"	12"	3'-8"	13"	4'-5"	21'-10"		6.01	310
71"x47"	17.6	12"	20"	12"	3'-8"	9"	4'-5"	21'-10"		5.89	310

QUANTITIES IN TABLE TO BE USED FOR EST. ONLY



HARFORD COUNTY, MD
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STANDARD TYPE 'C' ENDWALL
 ARCH PIPE

ISSUED 05.02.00

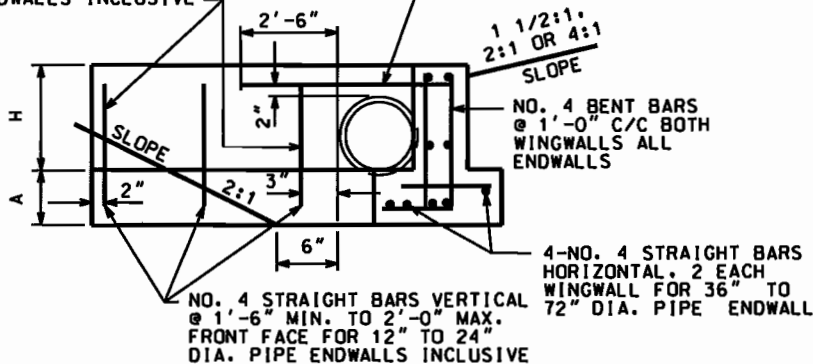
REVISED

REVISED

PLATE D-12

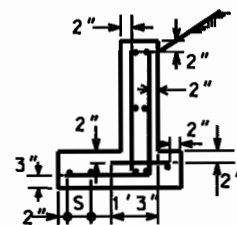
2-NO. 4 BENT BARS HORIZONTAL
1 EACH FACE FOR 36" TO 72"
DIA. PIPE ENDWALLS INCLUSIVE.

2-NO. 4 STRAIGHT BARS VERTICAL
FRONT FACE FOR 12" TO 24" DIA.
PIPE ENDWALLS INCLUSIVE



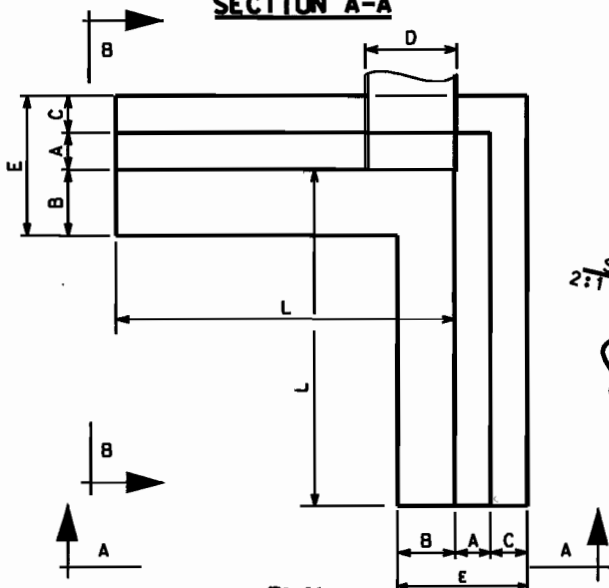
S Distance

4" for 12" to 16" diameter inclusive
6" for 24" to 36" diameter inclusive
8" for 42" to 60" diameter inclusive



DISPOSITION OF BARS

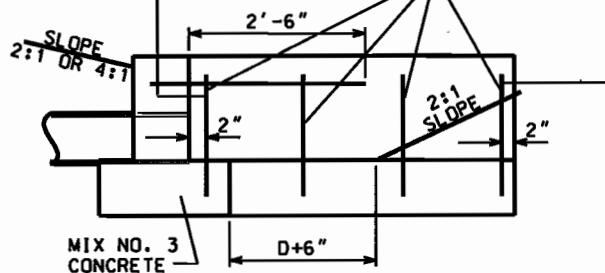
SECTION A-A



PLAN

2-NO. 4 STRAIGHT BARS VERTICAL
IN FRONT FACE FOR 12" TO 18"
DIA. PIPE ENDWALLS - INCLUSIVE

NO. 4 STRAIGHT BARS
VERTICAL @ 1'-6" MIN.
TO 2'-0" MAX. FRONT
FACE FOR 24" TO 60"
DIA. PIPE ENDWALLS
INCLUSIVE.



SECTION B-B

Openings		Dimensions						Vol.	Steel
D	Area							Conc.	
Inches	Sq. Ft.	A	B	C	E	H	L	C.Y.	Lbs.
12"	0.79	9"	6"	6"	1'9"	1'9"	3'6"	0.73	56
15"	1.23	9"	6"	6"	1'9"	2'0"	4'3"	0.93	77
18"	1.78	9"	6"	6"	1'9"	2'3"	5'0"	1.14	89
24"	3.14	9"	14"	6"	2'5"	2'9"	6'6"	1.8	124
30"	4.91	9"	14"	6"	2'5"	3'6"	8'0"	2.6	160
36"	7.07	12"	16"	10"	3'2"	4'0"	9'6"	5.0	287
42"	9.62	12"	16"	10"	3'2"	4'6"	11'0"	6.2	333
48"	12.57	12"	16"	10"	3'2"	5'0"	12'6"	7.4	387
54"	15.90	12"	20"	12"	3'8"	5'6"	14'0"	9.2	458
60"	19.64	12"	20"	12"	3'8"	6'0"	15'6"	10.7	519

[Signature] 5-2-00
DIRECTOR OF PUBLIC WORKS DATE
[Signature] 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE



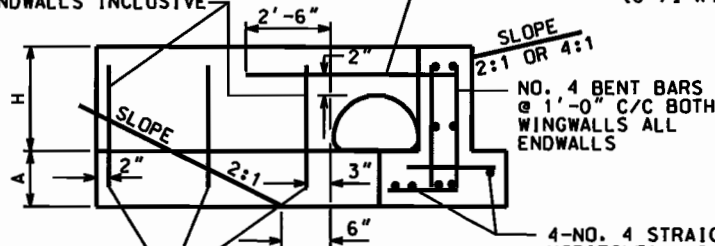
HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

TYPE E ENDWALL
ROUND PIPE

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE D-13

2-NO. 4 BENT BARS HORIZONTAL
1 EACH FACE FOR 49"x33" TO
71"x47" ENDWALLS INCLUSIVE.

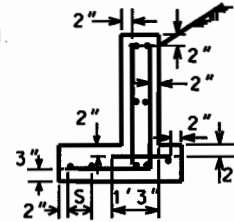
2-NO. 4 STRAIGHT BARS VERTICAL IN
FRONT FACE FOR 14"x9" TO 28"x20"
ENDWALLS INCLUSIVE



NO. 4 STRAIGHT BARS VERTICAL
@ 1'-6" MIN. TO 2'-0" MAX.
FRONT FACE FOR 35"x24" TO
71"x47" ENDWALLS INCLUSIVE

S Distances

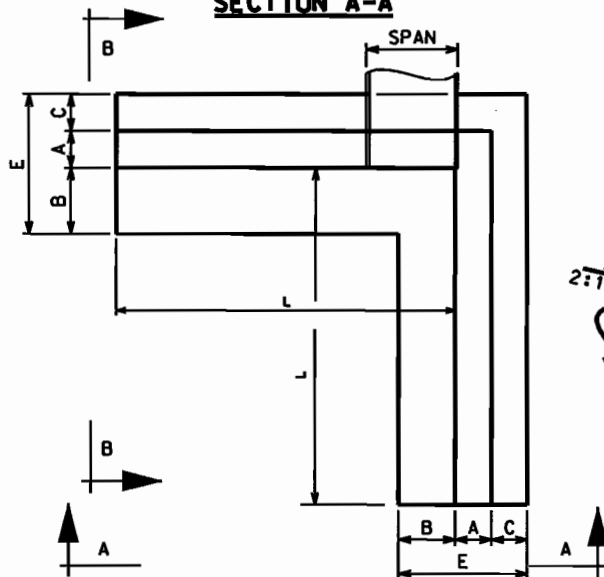
- 4" for 14"x9"
to 21"x15" Incl.
- 6" for 28"x20"
to 42"x29" Incl.
- 8" for 49"x33"
to 71"x47"



DISPOSITION OF BARS

4-NO. 4 STRAIGHT BARS
HORIZONTAL, 2 EACH
WINGWALL FOR 49"x33" TO
71"x47" ENDWALLS INCLUSIVE

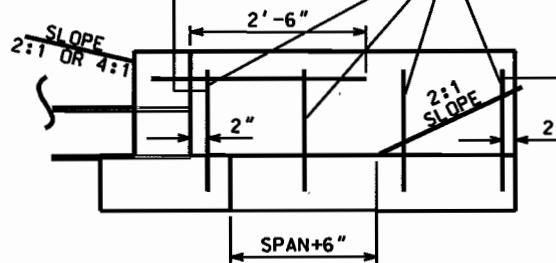
SECTION A-A



PLAN

2-NO. 4 STRAIGHT BARS VERTICAL
IN FRONT FACE FOR 14" x 9" TO
28" x 20" ENDWALLS - INCLUSIVE

NO. 4 STRAIGHT BARS
VERTICAL @ 1'-6" MIN.
TO 2'-0" MAX. FRONT
FACE FOR 35" x 24" TO
71" x 47" ENDWALLS
INCLUSIVE.



SECTION B-B

Openings		Dimensions						Vol.	Steel
Size	Area							Conc.	
Inches	Sq. Ft.	A	B	C	E	H	L	C.Y.	Lbs.
14"x 9"	0.8	9"	6"	6"	1'9"	1'5"	3'10"	0.72	56
17"x13"	1.1	9"	6"	6"	1'9"	1'5"	3'10"	0.71	56
21"x15"	1.6	9"	6"	6"	1'9"	2'0"	5'11"	1.27	90
28"x20"	2.8	9"	6"	6"	1'9"	2'0"	5'11"	1.23	87
35"x24"	4.4	9"	14"	6"	2'5"	3'0"	8'7"	2.53	173
42"x29"	6.4	9"	14"	6"	2'5"	3'0"	8'7"	2.47	167
49"x33"	8.7	12"	16"	10"	3'2"	3'9"	11'4"	5.68	334
57"x38"	11.4	12"	16"	10"	3'2"	3'9"	11'4"	5.58	331
64"x43"	14.3	12"	20"	12"	3'8"	4'5"	13'10"	7.97	451
71"x47"	17.6	12"	20"	12"	3'8"	4'5"	13'10"	7.85	442

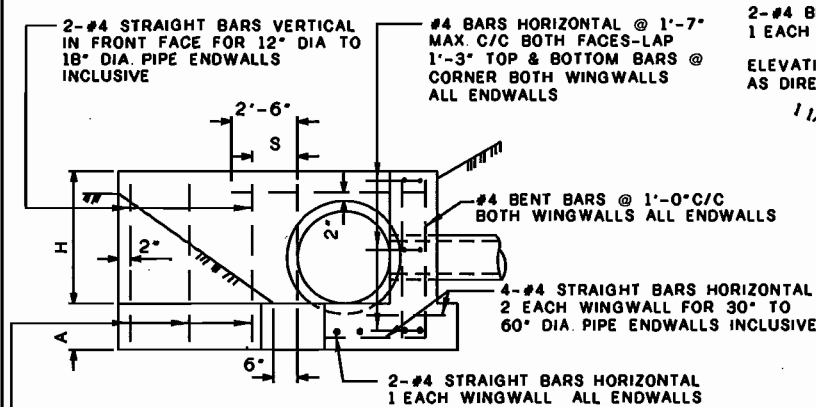
W. J. Johnson 5-2-00
DIRECTOR OF PUBLIC WORKS DATE
W. J. Johnson 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD
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TYPE E ENDWALL
ARCH PIPE

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE D-14

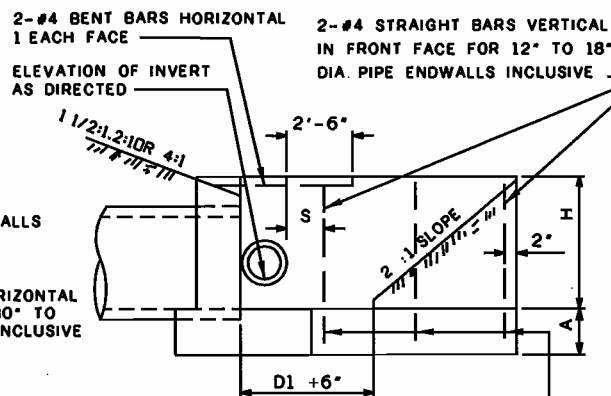


#4 STRAIGHT BARS VERTICAL @ 1'-6\"/>

SECTION A-A

'S' DISTANCES FROM INSIDE SURFACE OF PIPE TO VERTICAL BARS IN FRONT & REAR FACE.

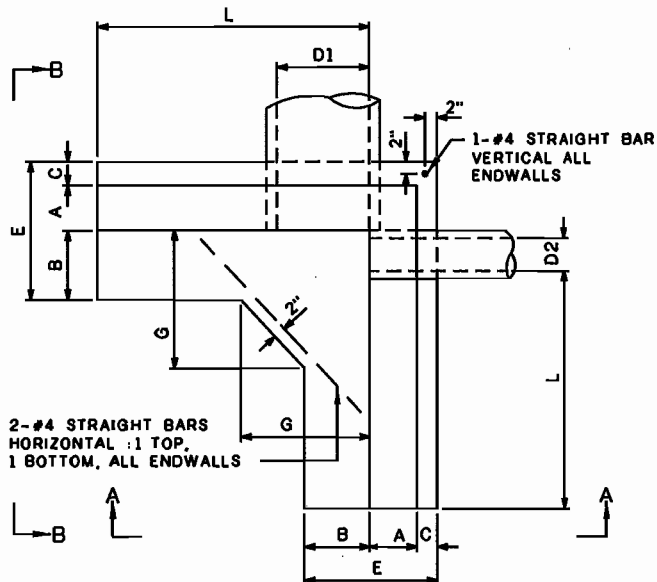
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#4 STRAIGHT BARS VERTICAL @ 1'-6\"/>

SECTION B-B

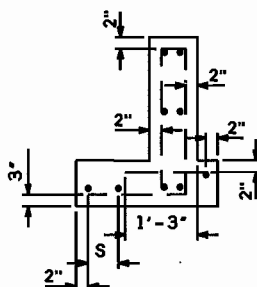
QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY



PLAN

GENERAL NOTES:

REINFORCING: DEFORMED STEEL BARS: #4 Ø BARS
CHAMFER: ALL EXPOSED EDGES 1\"/>



DISPOSITION OF BARS DETAIL

D	D	A	B	C	E	H	L	G	VOL. CONC. C.Y.	STEEL LBS.
12"	12"	9"	6"	6"	1'-9"	1'-9"	3'-6"	1'-6"	0.7	62
15"	12"	9"	6"	6"	1'-9"	2'-0"	4'-3"	2'-0"	0.9	76
15"	15"	9"	6"	6"	1'-9"	2'-0"	4'-3"	2'-0"	0.9	76
18"	12"	9"	6"	6"	1'-9"	2'-3"	5'-0"	2'-3"	1.1	88
18"	15"	9"	6"	6"	1'-9"	2'-3"	5'-0"	2'-3"	1.1	85
18"	15"	9"	6"	6"	1'-9"	2'-3"	5'-0"	2'-3"	1.1	85
24"	12"	9"	14"	6"	2'-5"	2'-9"	6'-6"	3'-0"	1.8	123
24"	15"	9"	14"	6"	2'-5"	2'-9"	6'-6"	3'-0"	1.8	122
24"	18"	9"	14"	6"	2'-5"	2'-9"	6'-6"	3'-0"	1.8	117
24"	24"	9"	14"	6"	2'-5"	2'-9"	6'-6"	3'-0"	1.8	116
30"	12"	9"	14"	6"	2'-5"	3'-6"	8'-0"	3'-9"	2.6	172
30"	15"	9"	14"	6"	2'-5"	3'-6"	8'-0"	3'-9"	2.6	171
30"	18"	9"	14"	6"	2'-5"	3'-6"	8'-0"	3'-9"	2.5	171
30"	24"	9"	14"	6"	2'-5"	3'-6"	8'-0"	3'-9"	2.5	166
30"	30"	9"	14"	6"	2'-5"	3'-6"	8'-0"	3'-9"	2.5	164
36"	12"	12"	16"	10"	3'-2"	4'-0"	9'-6"	4'-6"	5.0	279
36"	15"	12"	16"	10"	3'-2"	4'-0"	9'-6"	4'-6"	5.0	279
36"	18"	12"	16"	10"	3'-2"	4'-0"	9'-6"	4'-6"	5.0	274
36"	24"	12"	16"	10"	3'-2"	4'-0"	9'-6"	4'-6"	4.9	272
36"	30"	12"	16"	10"	3'-2"	4'-0"	9'-6"	4'-6"	4.9	262
36"	36"	12"	16"	10"	3'-2"	4'-0"	9'-6"	4'-6"	4.8	260
42"	12"	12"	16"	10"	3'-2"	4'-6"	11'-0"	5'-3"	6.1	328
42"	15"	12"	16"	10"	3'-2"	4'-6"	11'-0"	5'-3"	6.1	328
42"	18"	12"	16"	10"	3'-2"	4'-6"	11'-0"	5'-3"	6.1	327
42"	24"	12"	16"	10"	3'-2"	4'-6"	11'-0"	5'-3"	6.1	317
42"	30"	12"	16"	10"	3'-2"	4'-6"	11'-0"	5'-3"	6.0	315
42"	36"	12"	16"	10"	3'-2"	4'-6"	11'-0"	5'-3"	5.9	308
42"	42"	12"	16"	10"	3'-2"	4'-6"	11'-0"	5'-3"	5.8	307
48"	12"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.4	404
48"	15"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.4	404
48"	18"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.4	393
48"	24"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.3	391
48"	30"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.2	383
48"	36"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.2	381
48"	42"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.1	373
48"	48"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.0	371

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DATE



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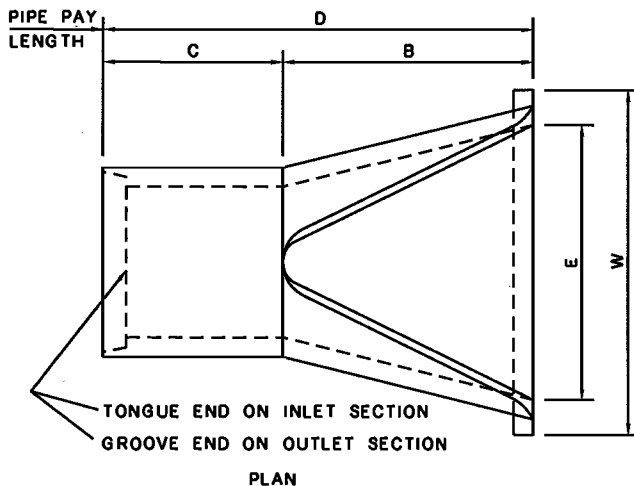
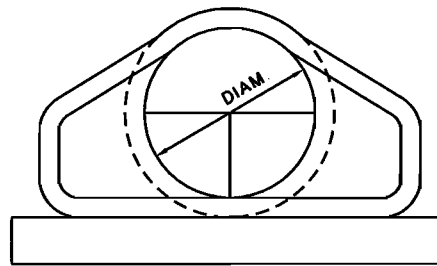
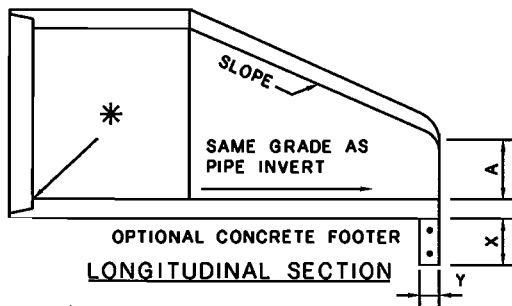
STANDARD TYPE H ENDWALL ROUND PIPE

ISSUED 05.02.00

REVISED

REVISED

PLATE D-15



NOTE: CONTRACTOR HAS OPTION OF FURNISHING END SECTIONS CONFORMING TO DETAILS ON THIS SHEET OR END SECTIONS CONFORMING TO DETAILS ON D-17

NOTES:

1. END SECTIONS MUST BE REINFORCED TO CONFORM WITH CLASS IV PIPE.
2. CONCRETE FOOTER SHALL BE USED WHEN SPECIFIED ON THE PLANS. COST OF CONCRETE FOOTER TO BE PAID PER CUBIC YARD OF MIX 2 CONCRETE FOR MISCELLANEOUS STRUCTURES. REINFORCEMENT TO BE #3 BARS.

TABLE OF DIMENSIONS									
CONCRETE END SECTION						CONCRETE FOOTER			
DIAM.	SLOPE	A	B	C	D	E	W	X	Y
12"	3:1	4"	2'-0"	4'-0 ⁷ / ₈ "	6'-0 ⁷ / ₈ "	2'-0"	3'-0"	12"	9"
15"	3:1	6"	2'-3"	3'-10"	6'-1"	2'-6"	3'-6"	12"	9"
18"	3:1	9"	2'-3"	3'-10"	6'-1"	3'-0"	4'-0"	12"	9"
21"	3:1	9"	3'-0"	3'-1 ¹ / ₂ "	6'-1 ¹ / ₂ "	3'-6"	4'-6"	12"	9"
24"	3:1	9 ¹ / ₂ "	3'-7 ¹ / ₂ "	2'-6"	6'-1 ¹ / ₂ "	4'-0"	5'-0"	15"	9"
27"	3:1	10 ¹ / ₂ "	4'-1 ¹ / ₂ "	2'-0"	6'-1 ¹ / ₂ "	4'-6"	5'-6"	15"	9"
30"	3:1	1'-0"	4'-6"	1'-7 ³ / ₄ "	6'-1 ³ / ₄ "	5'-0"	6'-0"	15"	9"
36"	3:1	1'-3"	5'-3"	2'-10 ³ / ₄ "	8'-1 ³ / ₄ "	6'-0"	7'-3"	15"	9"
42"	3:1	1'-6" or 1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	7'-9"	15"	9"
48"	3:1	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	8'-6"	18"	12"
54"	2.4:1	2'-3"	5'-5"	2'-9 ¹ / ₄ "	8'-2 ¹ / ₄ "	7'-6"	9'-0"	18"	12"

* INVERT ELEVATION TO BE AT THE PIPE END OF THE END SECTION. ELEVATIONS TO BE NOTED ON CONSTRUCTION PLANS

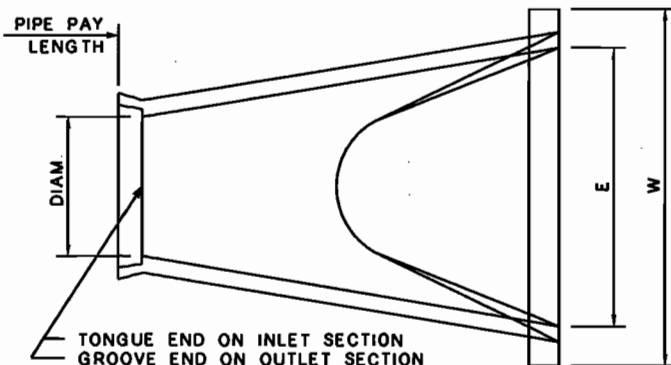
[Signature] 5-2-00
DIRECTOR OF PUBLIC WORKS DATE
[Signature] 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE



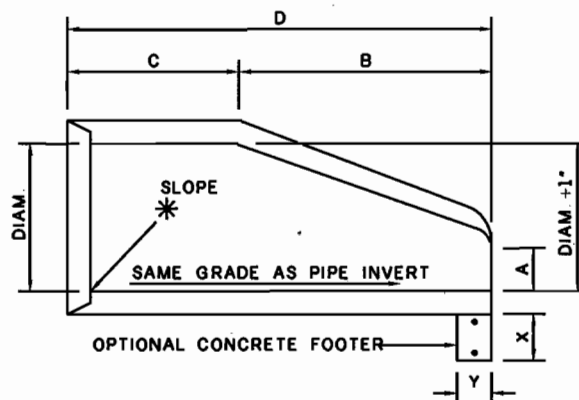
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DEPARTMENT OF
PUBLIC WORKS

CONCRETE END SECTION
ROUND CONCRETE PIPE

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE D-16



PLAN



LONGITUDINAL SECTION

NOTES:

1. END SECTIONS MUST BE REINFORCED TO CONFORM WITH CLASS IV PIPE.
2. CONCRETE FOOTER SHALL BE USED WHEN SPECIFIED ON THE PLANS COST OF CONCRETE FOOTER TO BE PAID PER CUBIC YARD OF MIX 2 CONCRETE FOR MISCELLANEOUS STRUCTURES. REINFORCEMENT TO BE #3 BARS.

* INVERT ELEVATION TO BE AT THE PIPE END OF THE END SECTION ELEVATIONS TO BE NOTED ON CONSTRUCTION PLANS.

TABLE OF DIMENSIONS									
CONCRETE END SECTION						CONCRETE FOOTER			
DIAM.	SLOPE	A	B	C	D	E	W	X	Y
15"	3:1	6'-2"	2'-4"	3'-10"	6'-2"	2'-6"	3'-6"	12"	9"
18"	3:1	10'-4"	2'-2"	4'-0"	6'-2"	3'-0"	4'-0"	12"	9"
24"	3:1	11"	3'-7"	2'-8"	6'-3"	4'-0"	5'-0"	15"	9"
30"	3:1	1'-1"	4'-5"	1'-10"	6'-3"	5'-0"	6'-0"	15"	9"
36"	3:1	1'-3 1/2"	5'-3"	3'-1"	8'-1 1/2"	6'-0"	7'-3"	15"	9"
42"	3:1	1'-9 1/4"	5'-5"	2'-10"	8'-3"	6'-6"	7'-9"	15"	9"
48"	3:1	2'-1"	6'-0"	2'-2"	8'-2"	7'-0"	8'-6"	18"	12"
54"	2.4:1	2'-5"	5'-2"	2'-10"	8'-0"	7'-6"	9'-0"	18"	12"
60"	2:1	2'-7"	4'-11"	3'-8 1/2"	8'-7 1/2"	8'-0"	9'-6"	18"	12"
66"	2:1	2'-4"	6'-6"	1'-9"	8'-3"	8'-6"	10'-0"	18"	12"
72"	2:1	2'-10"	6'-6"	1'-9"	8'-3"	9'-0"	10'-9"	18"	12"

NOTE: CONTRACTOR HAS OPTION OF FURNISHING END SECTIONS CONFORMING TO DETAILS ON THIS SHEET OR END SECTIONS CONFORMING TO DETAILS ON D-16

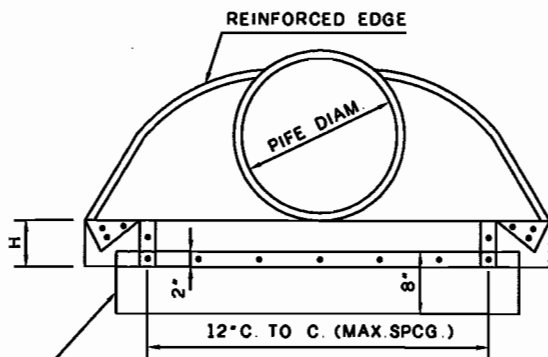
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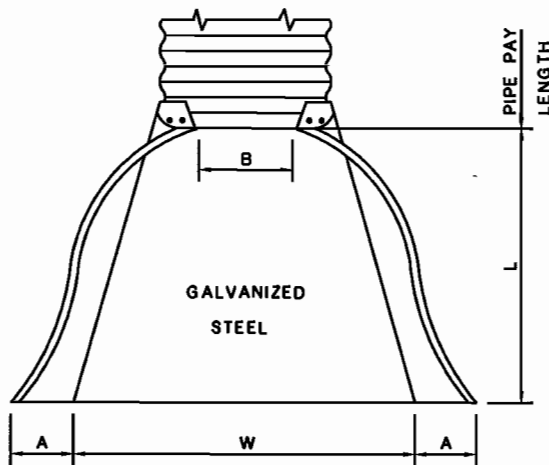
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CONCRETE END SECTION
ROUND CONCRETE PIPE

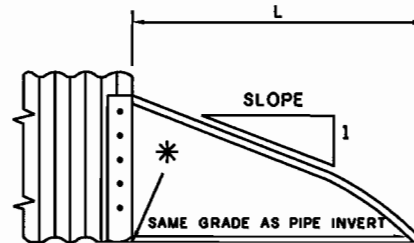
ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE D-17



END VIEW



PLAN



LONGITUDINAL SECTION

* INVERT ELEVATION TO BE AT THE PIPE END OF THE END SECTION. ELEVATIONS TO BE NOTED ON CONSTRUCTION PLANS

TABLE OF DIMENSIONS

PIPE DIAM.	GA.	A 1 +/-	B MAX.	H 1 +/-	L 1 1/2 +/-	W 2 +/-	APPROX SLOPE	BODY
12"	16"	6"	6"	6"	21"	24"	2 1/2	1 PC
15"	16"	7"	8"	6"	26"	30"	2 1/2	1 PC
18"	16"	8"	10"	6"	31"	36"	2 1/2	1 PC
21"	16"	9"	12"	6"	36"	42"	2 1/2	1 PC
24"	16"	10"	13"	6"	41"	48"	2 1/2	1 PC
30"	14"	12"	16"	8"	51"	60"	2 1/2	1 PC
36"	14"	14"	19"	9"	60"	72"	2 1/2	2 PC
42"	12"	16"	22"	11"	69"	84"	2 1/2	2 PC
48"	12"	18"	27"	12"	78"	90"	2 1/4	2 PC
54"	12"	18"	30"	12"	84"	102"	2	2 PC
60"	12"	18"	33"	12"	87"	114"	1 3/4	3 PC
66"	12"	18"	36"	12"	87"	120"	1 1/2	3 PC
72"	12"	18"	39"	12"	87"	126"	1 1/3	3 PC
78"	12"	18"	42"	12"	87"	132"	1 1/4	3 PC
84"	12"	18"	45"	12"	87"	138"	1 1/6	3 PC

NOTES:

- ALL 3 PIECE BODIES TO HAVE 12 GA. SIDES AND 10 GA. CENTER PANELS. WIDTH OF CENTER PANELS TO BE GREATER THAN 20% OF THE PIPE PERIPHERY. MULTIPLE PANEL BODIES TO HAVE LAP SEAMS WHICH ARE TO BE TIGHTLY JOINED BY 3/8" Ø GALVANIZED RIVETS OR BOLTS.
- FOR 60" THRU 84" SIZES REINFORCED EDGES TO BE SUPPLEMENTED WITH GALVANIZED STIFFENER ANGLES. THE ANGLES WILL BE 2"x2"x1/4" 60" THRU 72" DIAMETER AND 2 1/2"x2 1/2"x1/4" FOR 78" AND 84" DIAMETER. THE ANGLES TO BE ATTACHED BY 3/16" Ø GALVANIZED NUTS AND BOLTS.
- TOE PLATE SHALL BE USED WHEN SPECIFIED ON THE PLANS.
- TYPE 3 CONNECTION INCLUDES ONE FOOT OF PIPE LENGTH FOR 42" THRU 84" DIAMETER AS A CONNECTOR SECTION. THE CONNECTOR SECTION WILL BE ATTACHED TO THE END SECTION BY GALVANIZED RIVETS OR BOLTS.

[Signature] 5-2-00
DIRECTOR OF PUBLIC WORKS DATE

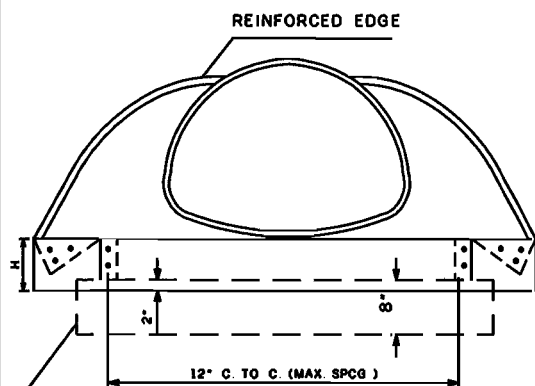
[Signature] 4/12/00
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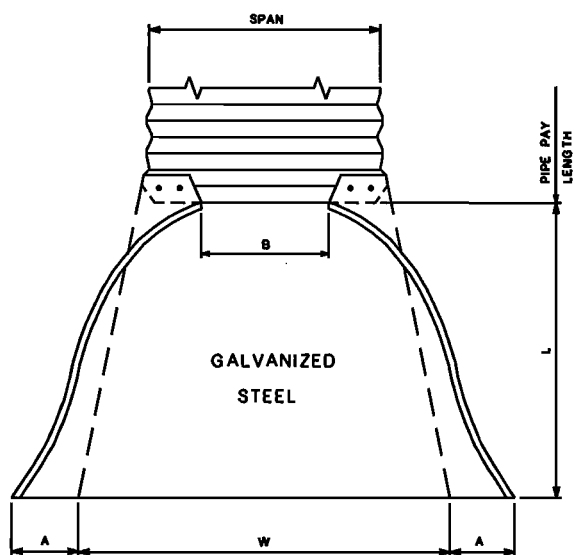
METAL END SECTION
ROUND METAL PIPE

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE D-18

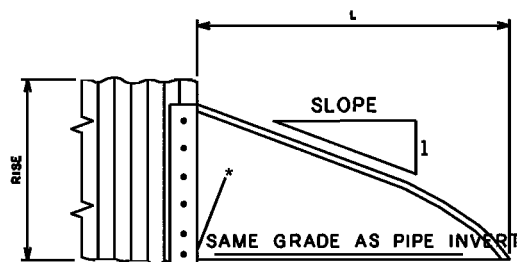


OPTIONAL GALVANIZED TOE PLATE
(SEE NOTE 4)

END VIEW



PLAN



LONGITUDINAL SECTION

* INVERT ELEVATION TO BE AT THE PIPE END OF THE
END SECTION ELEVATIONS TO BE NOTED ON CONSTRUCTION PLANS

TABLE OF DIMENSIONS

TABLE OF DIMENSIONS										
PIPE ARCH DIMENSION		GA.	A	B	H	L	W	APPROX SIDE	BOOT	
SPAN	RISE		1" ±	MAX.	1" ±	11/2" ±	2" ±			
17"	13"	16"	7"	9"	6"	19"	30"	2½	1 PC	
21"	15"	16"	7"	10"	6"	23"	36"	2½	1 PC	
24"	18"	16"	8"	12"	6"	26"	42"	2½	1 CP	
26"	20"	16"	9"	14"	6"	32"	48"	2½	1 PC	
25"	24"	14"	10"	16"	6"	39"	60"	2½	1 PC	
42"	29"	14"	12"	18"	8"	46"	75"	2½	1 PC	
49"	33"	12"	13"	21"	9"	53"	85"	2½	2 PC	
57"	38"	12"	18"	26"	12"	63"	90"	2½	2 PC	
64"	43"	12"	18"	30"	12"	70"	102"	2¼	2 PC	
71"	47"	12"	18"	33"	12"	77"	114"	2¼	3 PC	
77"	52"	12"	18"	36"	12"	77"	126"	2	3 PC	
83"	57"	12"	18"	39"	12"	77"	136"	2	3 PC	

NOTES:

- ALL 3 PIECE BODIES TO HAVE 12 GA. SIDES AND 10 GA. CENTER PANELS
WIDTH OF CENTER PANELS TO BE GREATER THAN 20% OF THE PIPE PERIPHERY
MULTIPLE PANEL BODIES TO HAVE LAP SEAMS WHICH ARE TO BE TIGHTLY JOINED
BY 3/8" Ø GALVANIZED RIVETS OR BOLTS.
- FOR THE 77"X52" AND 83"X57" SIZES. REINFORCED EDGE TO BE SUPPLEMENTED BY
2"X2" X1/4" GALVANIZED ANGLES. THE ANGLES TO BE ATTACHED BY 3/8" Ø GALVANIZED
NUTS AND BOLTS.
- ANGLE REINFORCEMENT WILL BE PLACED UNDER THE CENTER PANEL SEAMS ON THE
77"X52" AND 83"X57" SIZES
- TOE PLATE SHALL BE USED WHEN SPECIFIED ON THE PLANS.
- ALL RODS, BOLTS, NUTS, ETC. TO BE HOT DIP GALVANIZED.
- SPECIFICATIONS. ASSHTO DESIGNATION M36-57.

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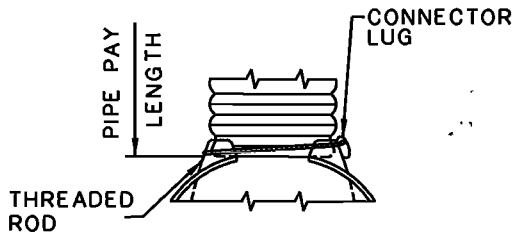


HARFORD COUNTY, MD
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METAL END SECTION
ARCH METAL PIPE

ISSUED 05.02.00
REVISED _____
REVISED _____
PLATE D-19

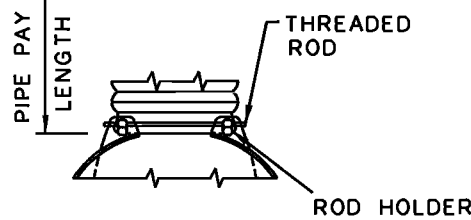
CONNECTIONS FOR ROUND PIPE



THREADED
ROD

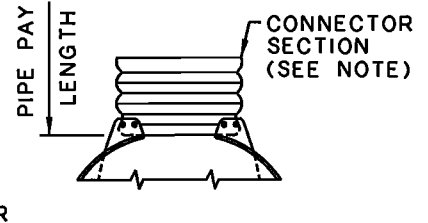
TYPE 1

FOR ONLY 12" THRU 24" ONLY



TYPE 2

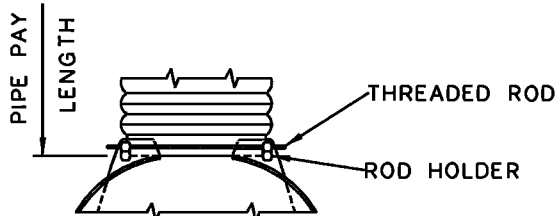
FOR 30" AND 36" ONLY



TYPE 3

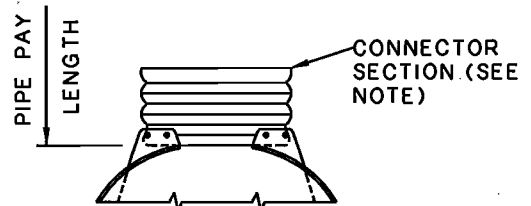
FOR 42" THRU 84" ONLY

CONNECTIONS FOR ARCH PIPE



TYPE 2

FOR 17"x13" THRU 57"x38" ONLY



TYPE 3

FOR 64"x43" THRU 83"x57" ONLY

NOTES: A. TYPE 3 CONNECTION INCLUDES ONE FOOT OF THE PIPE LENGTH FOR 64"x43" THRU 83"x57" ARCH SIZES AND 42" THRU 84" ROUND SIZES AS A CONNECTOR SECTION. THE CONNECTOR SECTION WILL BE ATTACHED TO THE END SECTION BY GALVANIZED RIVETS OR BOLTS.

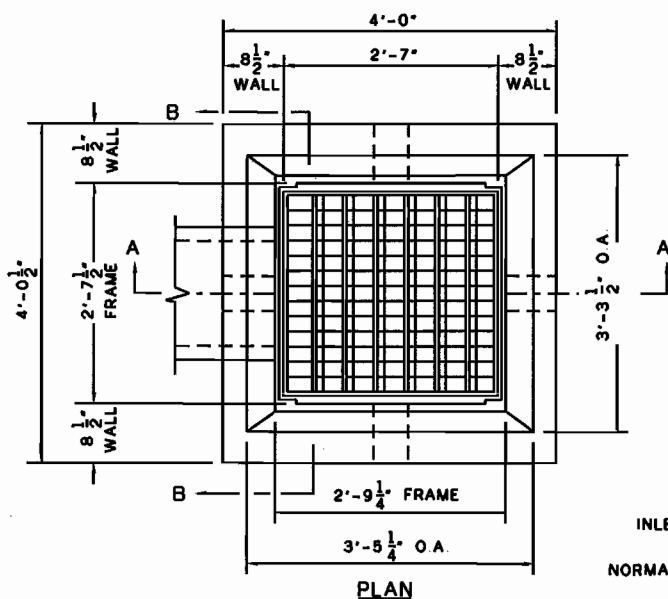
B. WHERE END SECTION IS TO BE APPLIED TO A STRUCTURAL PLATE PIPE OR STRUCTURAL PLATE ARCH PIPE THE END SECTION SHALL BE ORDERED WITHOUT THE ONE FOOT OF PIPE LENGTH. INSTEAD, DRILL HOLES AND FIELD BOLT THE END SECTION DIRECTLY TO THE STRUCTURAL PLATE PIPE OR STRUCTURAL PLATE ARCH PIPE.



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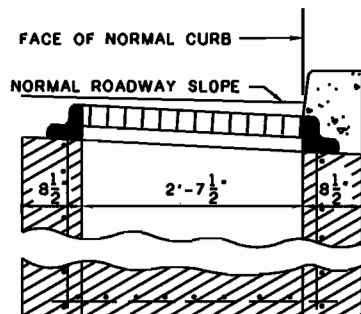
CONNECTIONS
METAL END SECTIONS

ISSUED 05.02.00
REVISED _____
REVISED _____
PLATE D-20

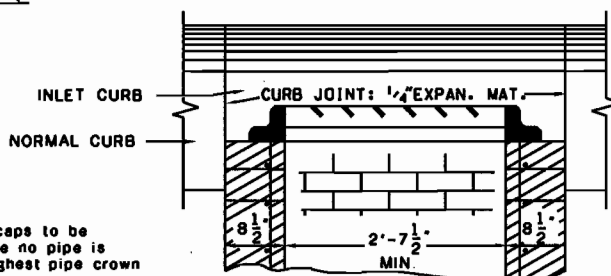


6" KNOCKOUTS FOR UNDERDRAIN W/CAPS TO BE PLACED AS DIRECTED

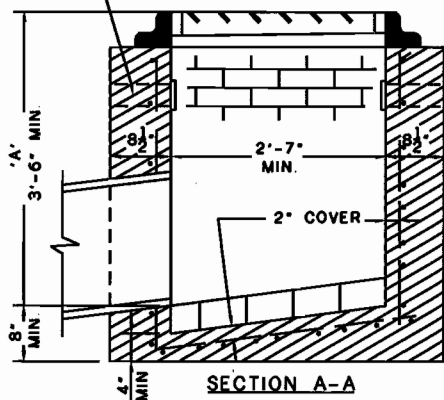
6" Knockouts for underdrain w/caps to be placed on all walls of inlet where no pipe is present invert of knockout = highest pipe crown



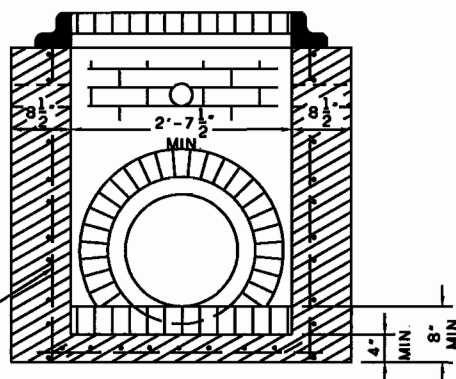
SECTION B-B ADJACENT TO CURB



SECTION A-A ADJACENT TO CURB



SECTION A-A



SECTION B-B

NO 4 Ø DEFORMED BARS, 2 WAYS @ 6" C/C

INVERT MAY BE PLAIN CONCRETE, OR 4" BRICK LAID ON EDGE. INVERT TO SLOPE DOWN TOWARDS OUTLET, AT THE RATE OF 2" PER FOOT, OR AS DIRECTED.

GENERAL NOTES:

INLET MAY BE CONSTRUCTED OF BRICK OR REINFORCED CONCRETE SEE HARFORD COUNTY SPECIFICATIONS FOR INLETS. TOP 4" OF WALLS MAY BE BRICK MASONRY. ADDITIONAL BRICK MAY BE USED TO BRING THE GRATE TO GRADE, IF REQUIRED. REINFORCEMENT REQUIRED ON OUTSIDE, AS WELL AS ON INSIDE OF WALLS BELOW 7'-0" WHEN 'A' IS GREATER THAN 7'-0" SPACING. SAME AS FOR INSIDE OF WALL. PLACE 1/4" EXPANSION MATERIAL OF SAME TYPE APPROVED FOR PAVEMENT BETWEEN THE FRAME AND ABUTTING RIGID PAVEMENT, AND BETWEEN ENDS OF INLET CURB AND NORMAL CURB SIZE. TYPE AND DIRECTION OF INLET CONNECTION WILL VARY TO SUIT CONDITIONS. WHEN INLET IS USED ADJACENT TO CURB, SLOPE CURB FACE TO MEET INSIDE EDGE OF FRAME AS SHOWN IN SECTION 'B-B' ADJACENT TO CURB. "BRICK FOR MASONRY" TO COMPLY WITH THE HARFORD CO. SPECIFICATIONS. INLETS TO BE BENCHED WHEN PIPES PASS THROUGH. PRECAST INLETS MUST COMPLY WITH STRUCTURAL REQUIREMENTS OF PLATE D-27 PROVIDE 1" DIAMETER WEEP HOLE 6" ABOVE HIGHEST CROWN OF PIPE OR AS DIRECTED FOR BRICK MASONRY STRUCTURE ONLY.

[Signature] 5-2-00
DIRECTOR OF PUBLIC WORKS DATE
[Signature] 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE

ISSUED 5-2-00

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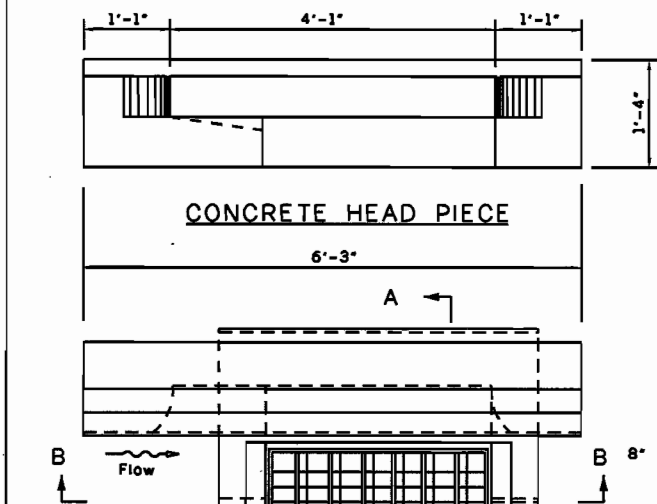
REVISED _____

PLATE D-21

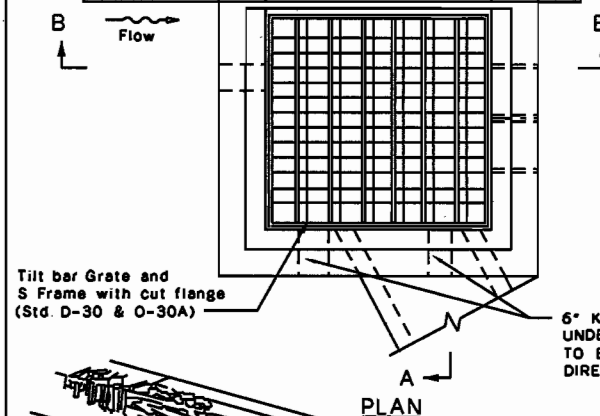


HARFORD COUNTY, MD
DEPARTMENT OF
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TYPE 'S' INLET



CONCRETE HEAD PIECE

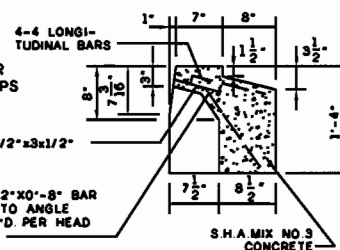


PLAN

6" KNOCKOUTS FOR UNDERDRAIN W/CAPS TO BE PLACED AS DIRECTED

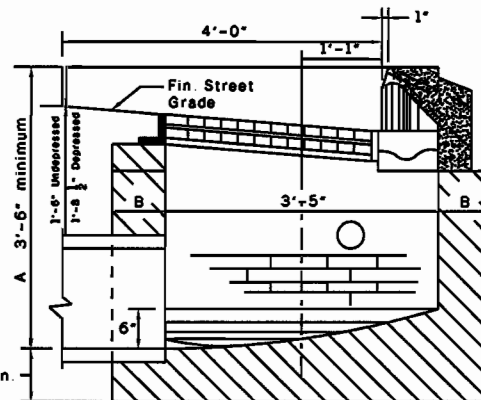
4 - 3 1/2" x 3 1/2"

3/16" x 2" x 0'-8" BAR WELD TO ANGLE 4-REQ'D. PER HEAD PIECE

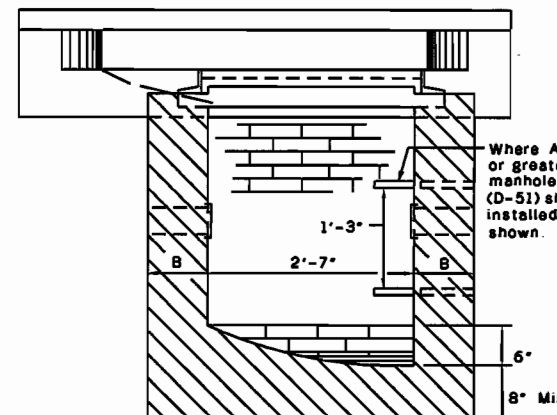


SECTION C-C

Provide 1" diameter weep hole 6" above highest crown of pipe or as directed for brick masonry structure only.



SECTION A-A



SECTION B-B

6" knockouts for underdrain w/caps to be placed on all walls of inlet where no pipe is present invert of knockout = highest pipe crown

General Notes:

Inlet may be constructed of brick or reinforced concrete. See latest Harford County specifications for inlets. Top 4" of walls may be brick masonry. Additional brick may be used to bring the grate to grade, if required. Reinforcement is required on outside as well as inside of walls below 7' when A is greater than 7'. Spacing is the same as for inside of wall.

Place 1/2" expansion joint material of same type approved for pavement between the frame and abutting rigid pavement and between ends of inlet curb and normal curb.

Size, type, and direction of inlet connection will vary to suit conditions.

When inlet is used adjacent to curb, slope curb face to meet inside edge of frame, as shown in section B-B.

"Brick for Masonry" to comply with latest Harford Co. specs. Inlet to be benched when pipes pass through.

Invert may be plain concrete or 4" brick laid on edge. Invert to slope down towards outlet at the rate of 2" per foot, or as directed.

Precast inlets must comply with structural requirements of Plate D-27

PERSPECTIVE VIEW

NOTE: NO INLETS SHALL BE DEPRESSED

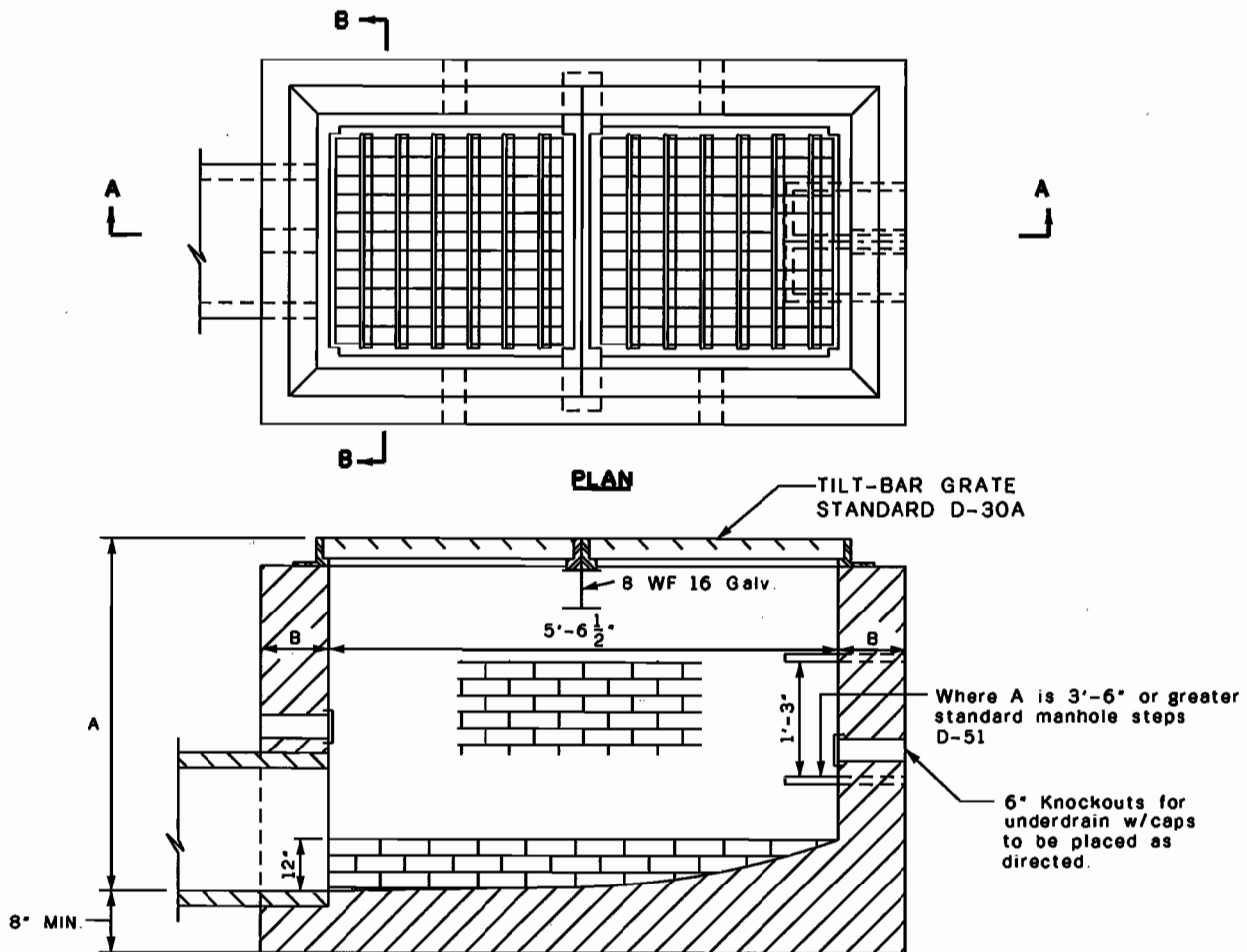


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

Will Allen Jr. 5-2-00
DIRECTOR OF PUBLIC WORKS DATE
W. Wilson Phares Jr. 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE

TYPE 'S'
COMBINATION INLET

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE D-22



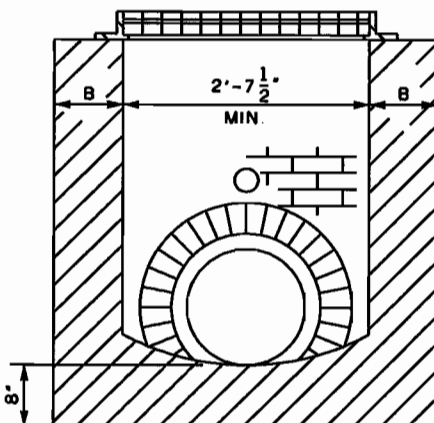
SECTION "A-A"

6" Knockouts for underdrain w/caps to be placed on all walls of inlet where no pipe is present invert of knockout=highest pipe crown

NOTES:

1. Invert shall be Brick of 3000 psi Concrete.
2. Walls shall be Brick (Br.), 3000 psi Concrete (PC), or Reinforced Concrete (RC). See table for dimensions.
3. * Reinforcing=#4 at 10" o/c E.W. in $\frac{1}{2}$ of walls. Reinforcing continuous at corners. All laps 1'-4".
4. Top 4" of walls shall be brick masonry. Additional brick shall be used to bring the grate to existing grade if required.
5. Where brick is used, invert shall be brick laid on edge.
6. Bench (as per Type A manhole) shall be built into inlet where drains run through inlet.
7. Precast inlets shall meet the structural requirements of Plate D-29

A	B	Walls
< 6'	8"	Br. or PC
6' to 10'	12"	Br. or PC
6' to 15'	8"	RC *



SECTION "B-B"

Provide 1" diameter Weep hole 6" above highest crown of pipe or as directed for brick masonry structure only.

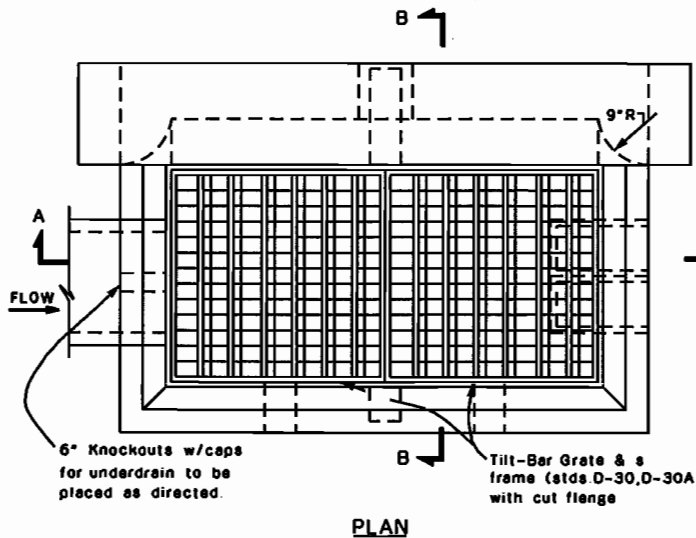
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[Signature] 4/12/00
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DEPARTMENT OF
PUBLIC WORKS

DOUBLE TYPE "S" INLET

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE D-23



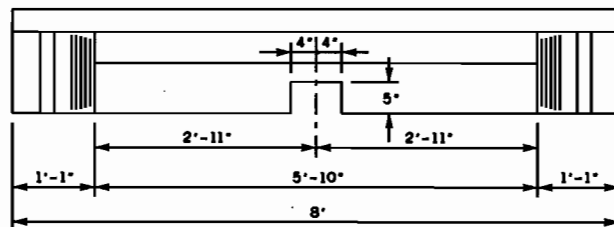
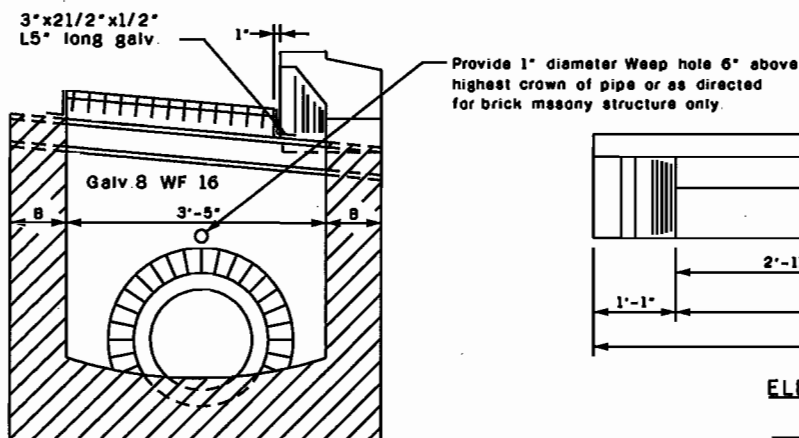
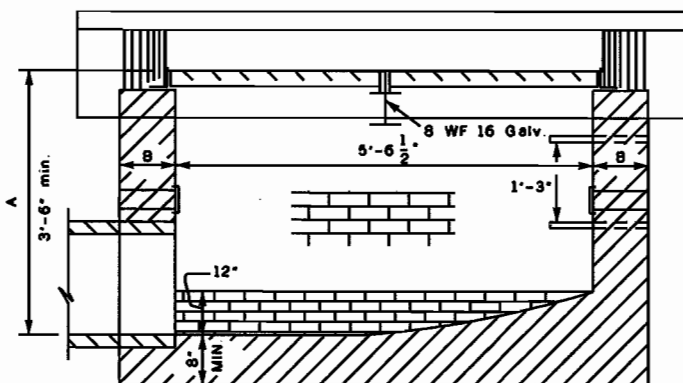
6" Knockouts for underdrain w/caps to be placed on all walls of inlet where no pipe is present invert of knockout=highest pipe crown

NOTES:

1. Invert shall be brick of 3000 p.s.i. concrete.
2. Walls shall be Brick (Br.), 3000 p.s.i. concrete (P.C.), or Reinforced Concrete (R.C.). See table for dimensions.

A	B	Walls
<5'	8"	Br. or P.C.
5'to 9'	12"	Br. or P.C.
5'to 14'	8"	R.C.*

3. * Reinforcing - #4 at 10" o/c E.W. in C of walls. Reinforcing continuous at corners. All laps 1'-4".
4. Top 4" of walls shall be brick masonry. Additional brick shall be used to bring the grate to existing grade if required.
5. Where brick is used, invert shall be brick laid on edge.
6. Inlet to be benched when pipes pass thru.
7. Where A is 3'-6" or greater, standard manhole steps to be installed as shown.
8. For headpiece detail see D-22
9. Precast inlets shall meet the structural requirements of Plate D-29



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DIRECTOR OF PUBLIC WORKS DATE
[Signature] 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD
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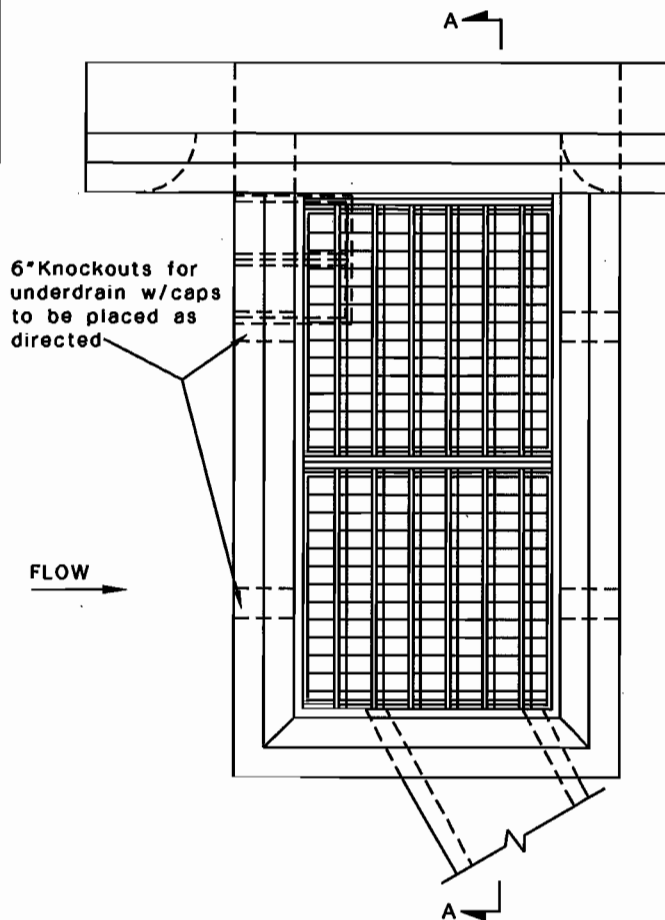
DOUBLE TYPE 'S' COMB INLET

ISSUED 5-2-00

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REVISED

PLATE D-24



NOTES:

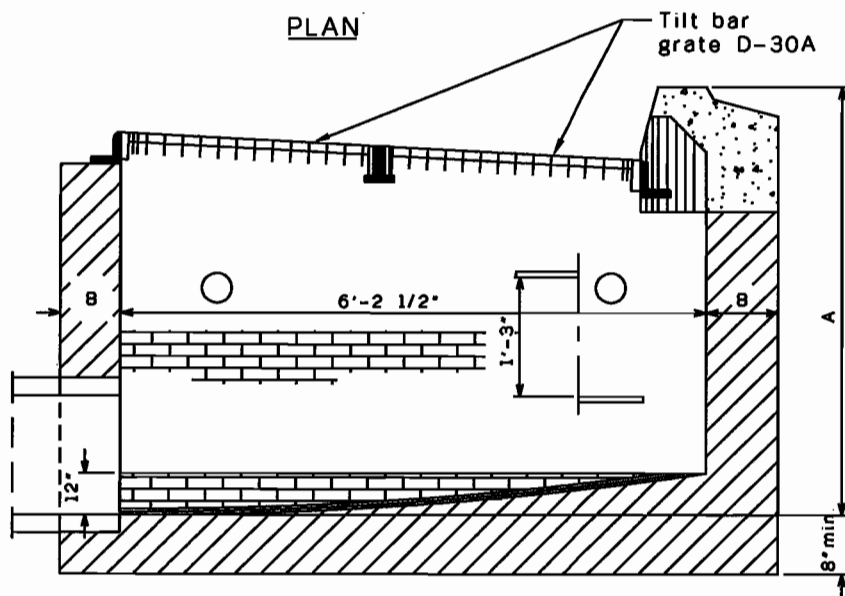
1. See detail D-22 perspective view, headpiece details and inlet cross section.
2. Slab and invert - brick or 3000 p.s.i. concrete.
3. Walls shall be brick (Br.), 3000 p.s.i. concrete (PC), or reinforced concrete (R.C). See table for dimensions.

A	B	Walls
<5'	8"	Br. or PC
5'to9'	12"	Br. or PC
5'to14'	8"	RC*

4. * Reinforcing = #4 at 10" o/c E.W. in E. of walls. Reinforcing continuous at corners. All laps 1'-4".
5. Top 4" of walls shall be brick masonry. Additional brick shall be used to bring the grate to existing grade if required.
6. Where brick is used, invert shall be brick laid on edge.
7. Where A is 3'-6" or larger, standard manhole steps shall be installed as shown.

Provide 1" diameter Weep hole 6" above highest crown of pipe or as directed for brick masonry structure only.

6" knockouts for underdrain w/caps to be placed on all walls of inlet where no pipe is present invert of knockout = highest pipe crown



SECTION 'A-A'

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05.02.00
 DATE
 04.12.00
 DATE



HARFORD COUNTY, MD
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 PUBLIC WORKS

DOUBLE TYPE 'S' COMB INLET
 PERPENDICULAR TO CURB

ISSUED 05.02.00

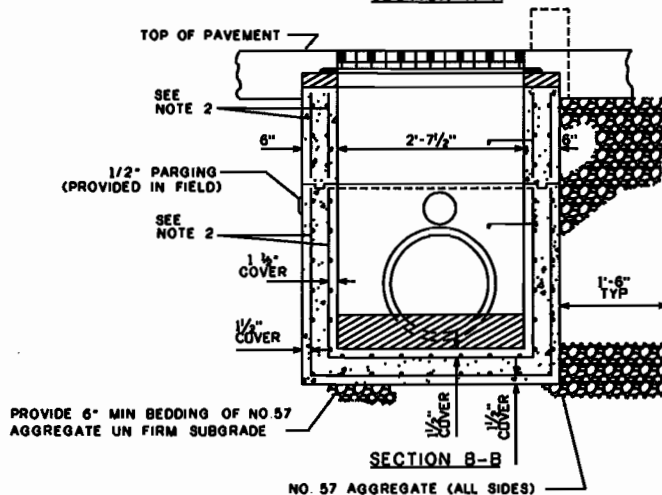
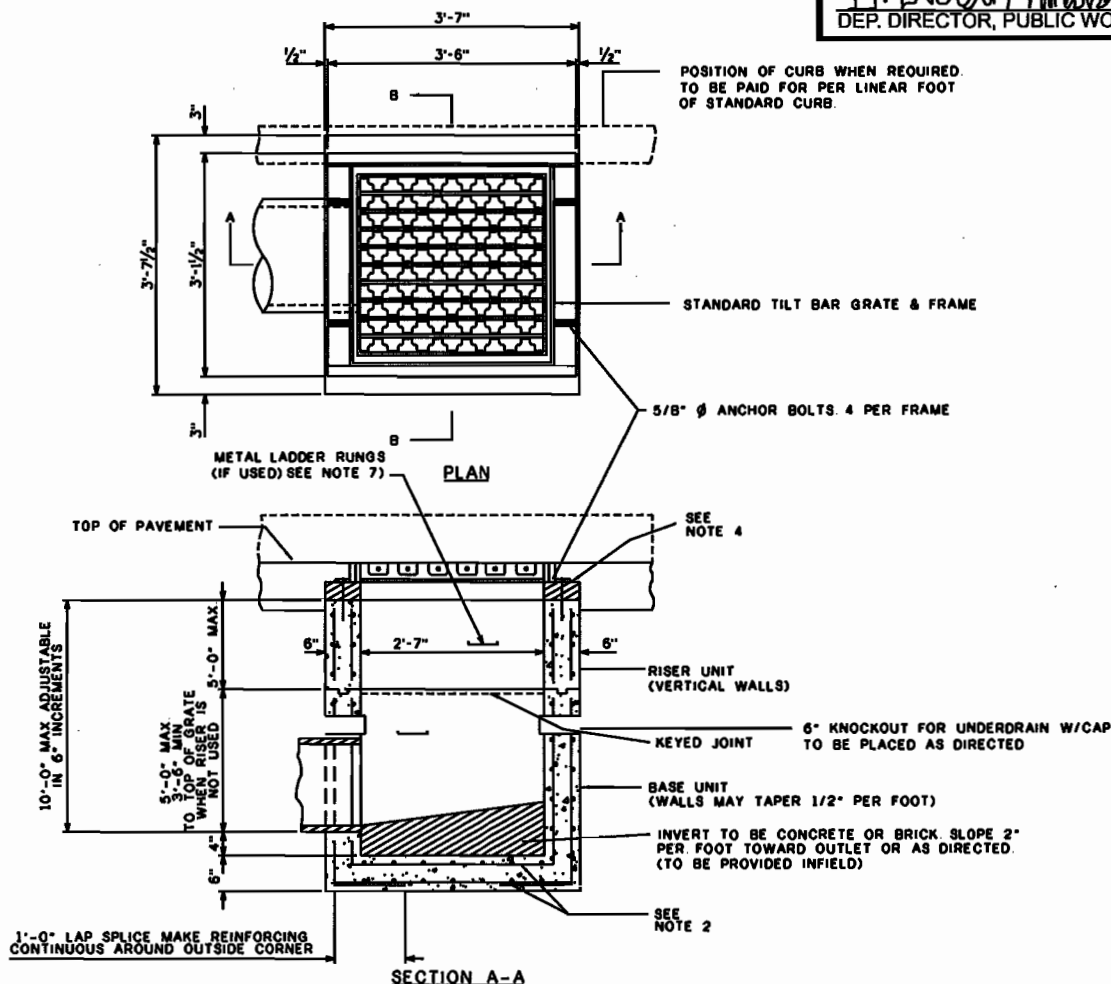
REVISED

REVISED

PLATE D-25

W. J. Wilson
 DIRECTOR OF PUBLIC WORKS
W. J. Wilson
 DEP. DIRECTOR, PUBLIC WORKS

05.02.00
 DATE
 04.12.00
 DATE



GENERAL NOTES

1. CONCRETE TO BE MIX NO. 6 (4500PSI).
2. REINFORCING-2 LAYERS OF 4X4-W4.0XW4.0 86"/□FT. WELDED WIRE FABRIC.
3. THREADED PLASTIC INSERTS TO BE PROVIDED FOR HANDLING.
4. GRADE AND SLOPE ADJUSTMENTS COMPLETED IN FIELD USING CONCRETE MIX NO. 6 OR BRICK AND MORTAR.
5. PIPE OPENINGS TO BE PROVIDED AS REQUIRED, FOR SIZE, LOCATION AND INVERT ELEVATIONS REFER TO CONSTRUCTION PLANS.
6. PLACEMENT OF SUBGRADE DRAINAGE WILL BE AS DIRECTED BY THE ENGINEER OR AS NOTED ON THE CONSTRUCTION PLANS.
7. LADDER RUNGS SHALL BE IN ACCORDANCE WITH STANDARD AS SHOWN, OR AS DIRECTED BY THE ENGINEER.
8. MINIMUM DEPTH PAYMENT PER EACH" INLET INCLUDES DEPTHS UP TO 3'-6". VERTICAL DEPTH PAYMENT PER LINEAR FOOT INCLUDES DEPTHS IN EXCESS OF 3'-6".
9. A 6" PERFORATED CIRCULAR PIPE, FOR EROSION AND SEDIMENT CONTROL, SHALL BE PLACED IN THE INLET WALL AT ALL INLET SEDIMENT TRAPS AS SHOWN ON THE PLANS.

Provide 1" diameter Weep hole 6" above highest crown of pipe on all four sides for brick masonry structure only.



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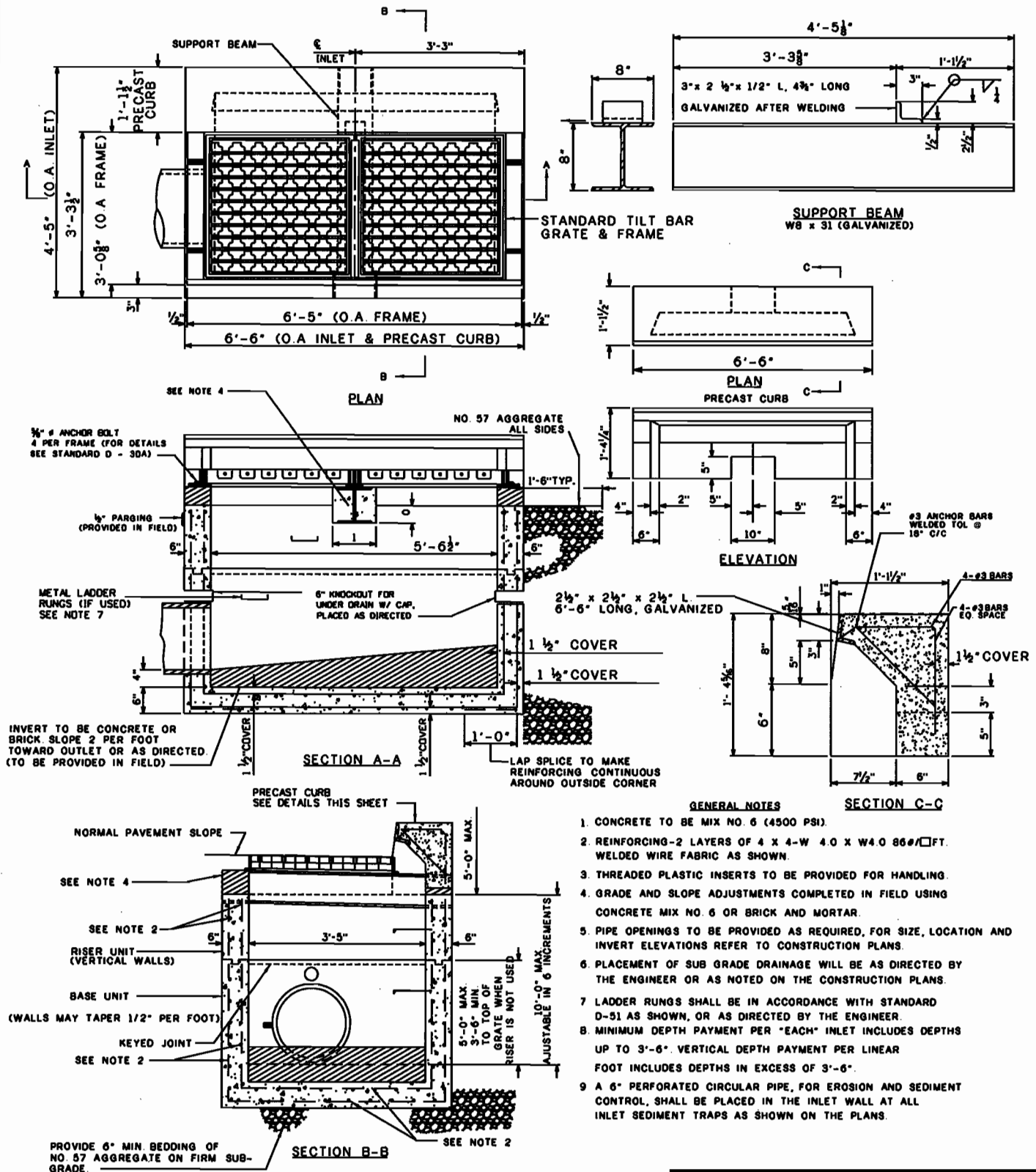
STRUCTURAL REQUIREMENTS PRECAST SINGLE TYPE 'S' & COMBINATION TYPE 'S' INLET

ISSUED 05.02.00

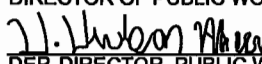
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REVISED

PLATE D-26




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 05.02.00
 DATE

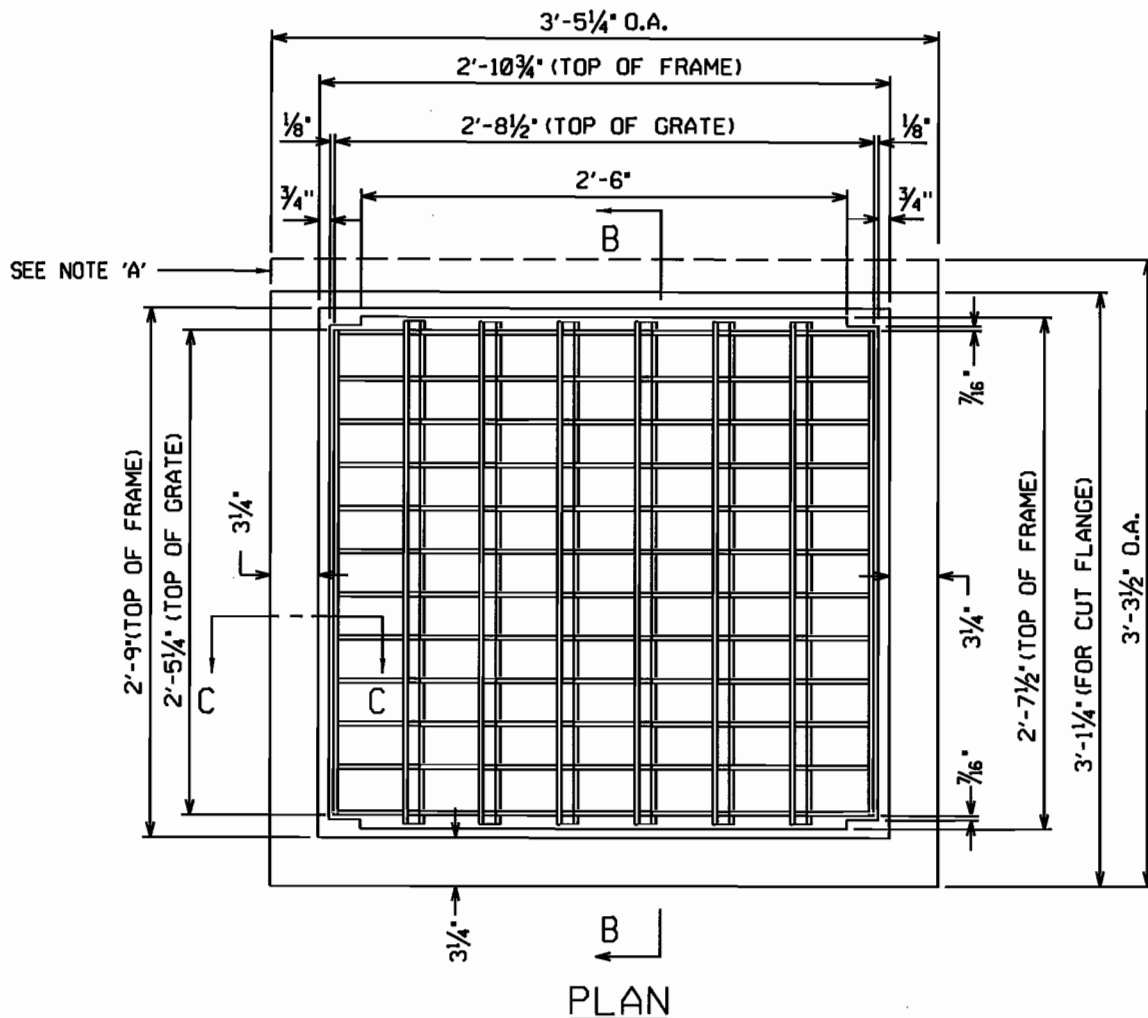

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 04.12.00
 DATE



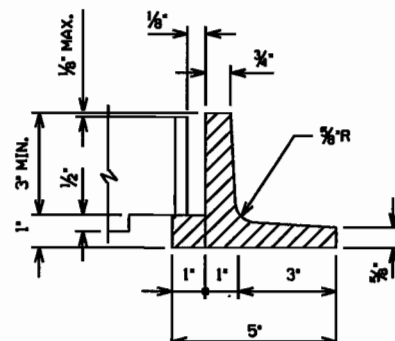
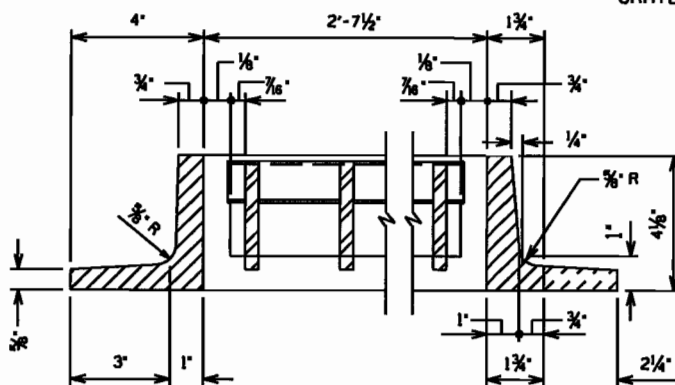
HARFORD COUNTY, MD
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STRUCTURAL REQUIREMENTS
 PRECAST DOUBLE TYPE 'S' &
 DOUBLE TYPE 'S' COMBINATION INLETS

ISSUED 05.02.00
 REVISED
 REVISED
 PLATE D-28



FRAME MATERIAL : GALVANIZED STEEL
 GRATE MATERIAL : SEE STD. D-30A



NOTE 'A' FRAME TO BE CASTING WITH FLANGE CUT, AS SHOWN, WHEN INLET IS TO BE USED ADJACENT TO CURB OPENING.

W. J. Johnson
 DIRECTOR OF PUBLIC WORKS
 05.02.00
 DATE

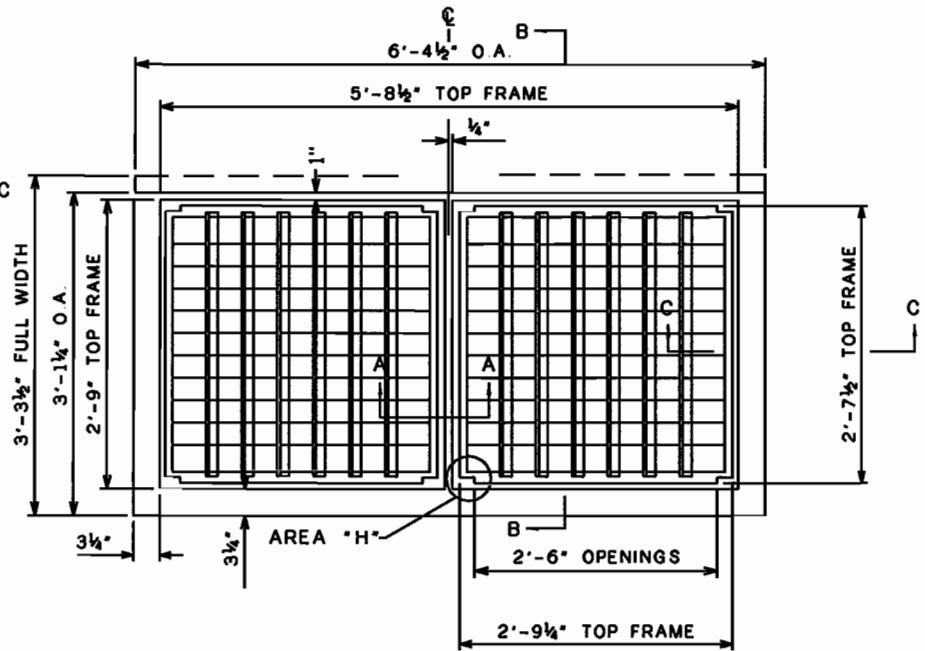
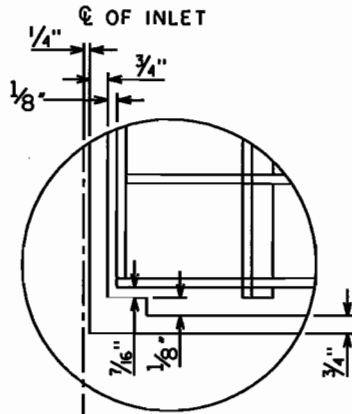
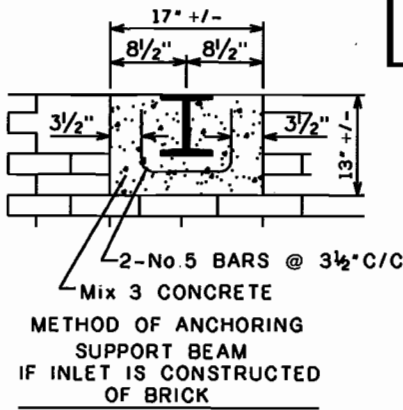
W. J. Johnson
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 DATE



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FRAME AND GRATE
 SINGLE TYPE S INLET
 & COMBINATION

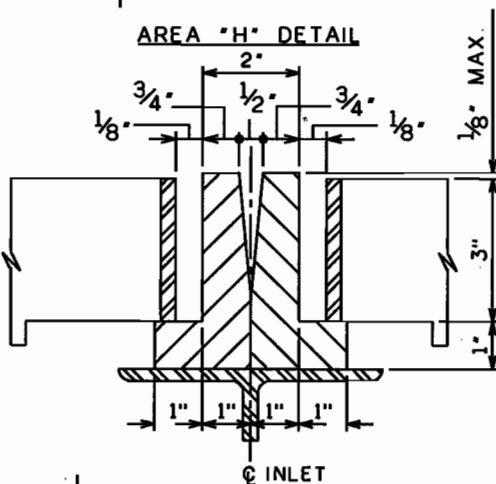
ISSUED 05.02.00
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 REVISED
 PLATE D-29



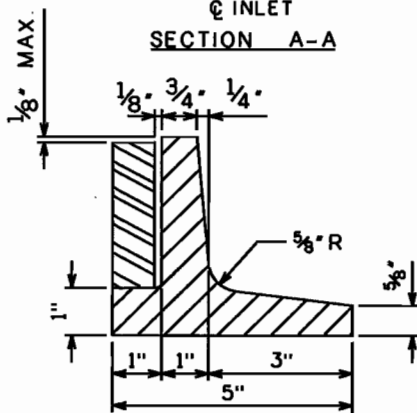
PLAN

NOTE: CASTING MATERIALS
SHALL BE GALVANIZED
STEEL

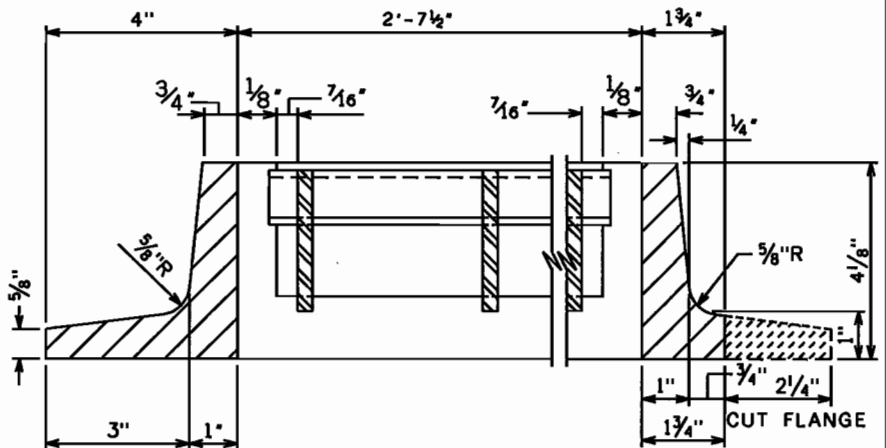
AREA "H" DETAIL



SECTION A-A

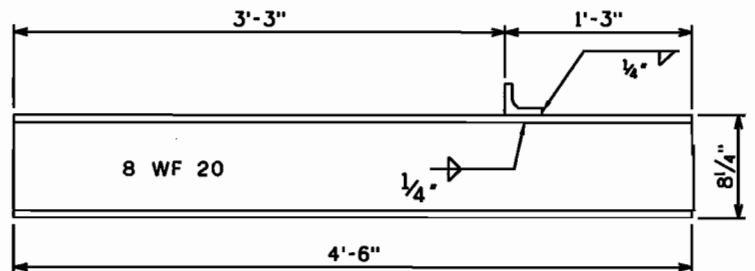


SECTION C-C



SECTION B-B

3"x2 1/2"x1/4" L, 4 3/4" LONG
GALVANIZED AFTER WELDING



SUPPORT BEAM



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FRAME & GRATE
DOUBLE 'S' INLET & COMBO.

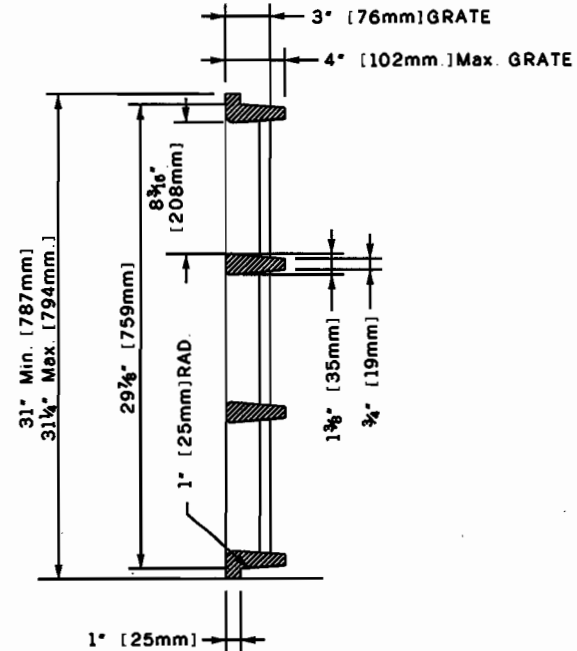
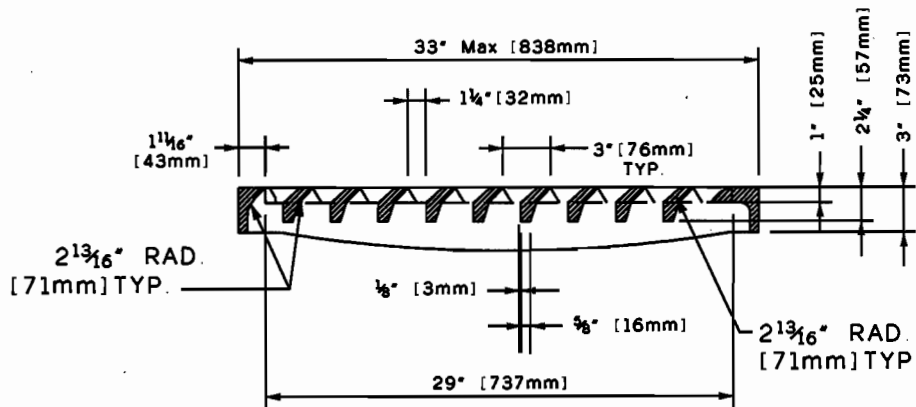
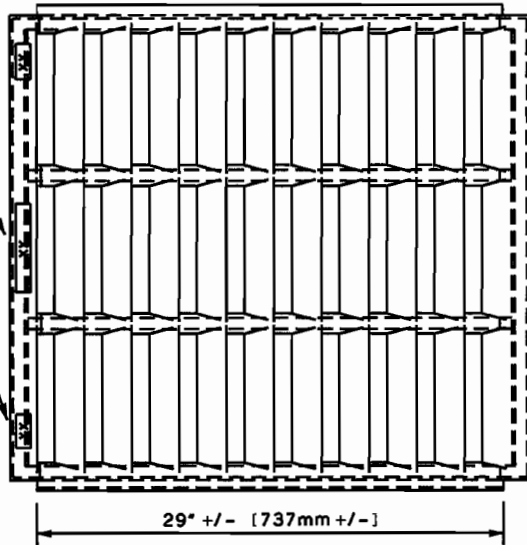
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PLATE D-31

PROVIDE FOUNDRY NAME & FLOW DIRECTION
AS SHOWN IN $\frac{1}{2}$ " +/- [13 mm +/-] LETTERS



NOTE: ALL DIMENSIONS ARE SHOWN IN ENGLISH AND [METRIC]
MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
WEIGHT: GRATE APPROX. 338#
GRATE SHALL SIT SQUARE UPON FRAME SUPPORTS WITHOUT
ROCKING OR SHIFTING UNDER LOAD, GRATE SHALL MEET OR
EXCEED AASHTO HS20 LOAD STANDARDS.
FRAME: PER DETAIL D-30 AND D-31

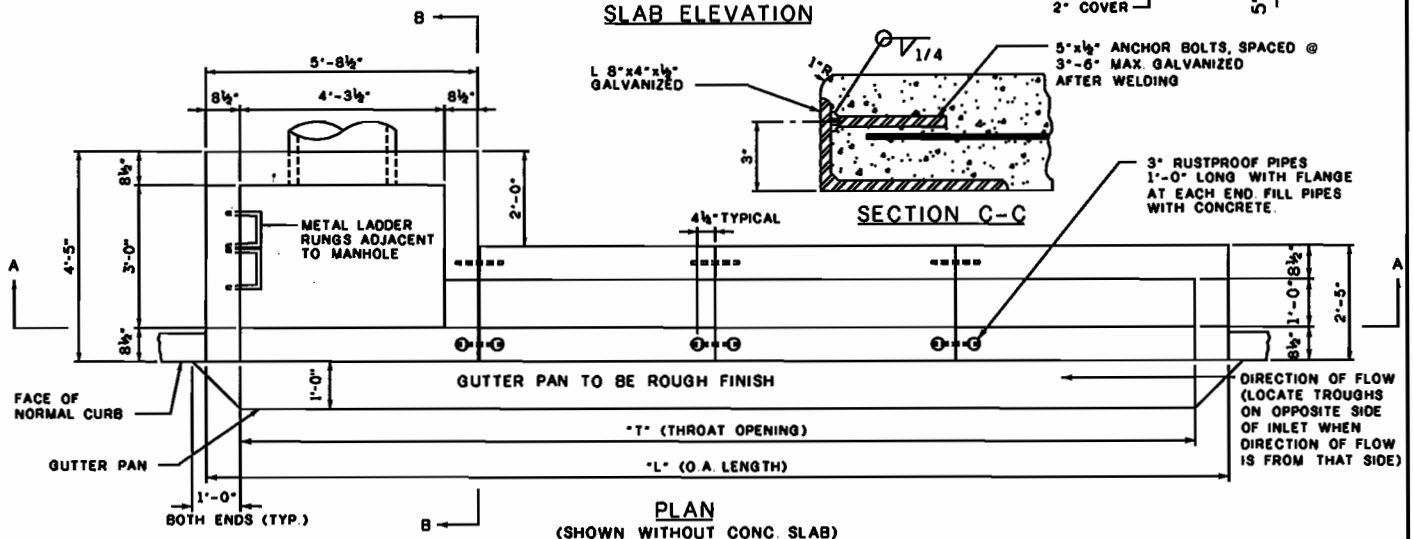
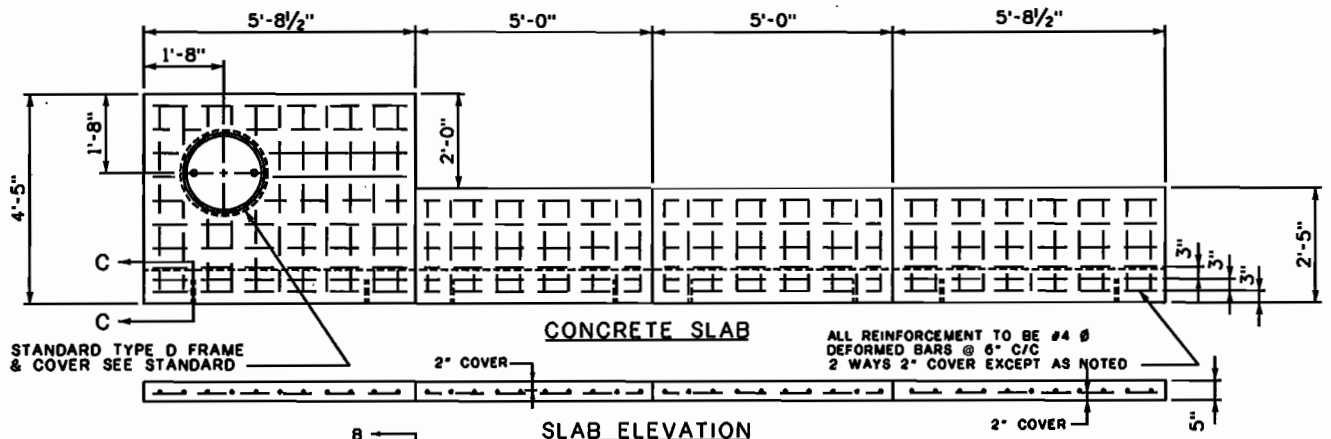
<i>[Signature]</i> DIRECTOR OF PUBLIC WORKS	05.02.00 DATE
<i>[Signature]</i> DEP. DIRECTOR, PUBLIC WORKS	04.12.00 DATE



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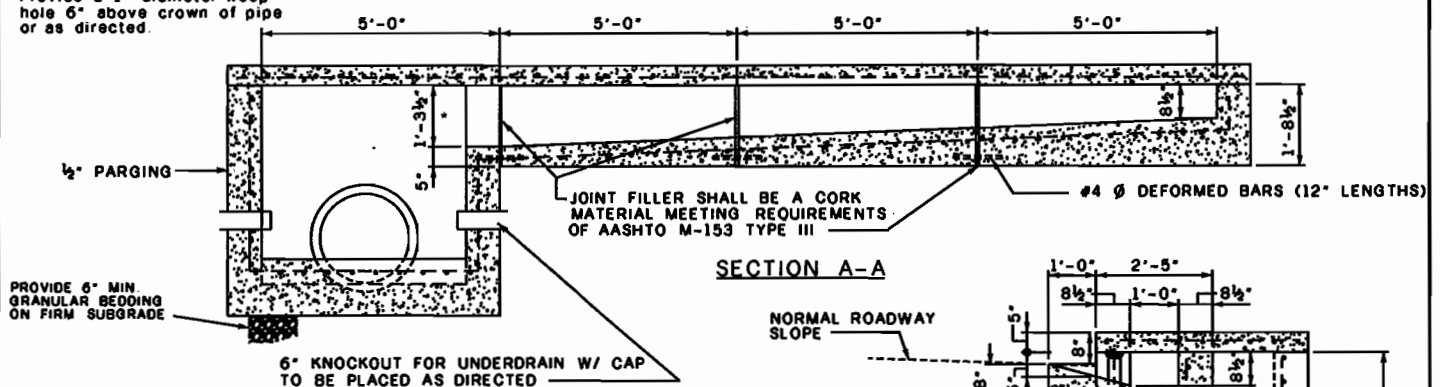
CURVED VANE (S-CV) GRATE FOR TYPE INLET FRAMES

ISSUED	05.02.00
REVISED	
REVISED	
PLATE	D-32



Provide a 1" diameter weep hole 6" above crown of pipe or as directed.

FOR STRIPING DETAILS REFER TO STANDARD D-34

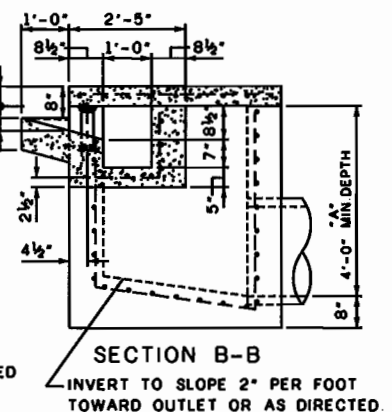


NOTE:

CURB OPENING SHOULD NOT ENCRONCH ON CROSSWALK AREAS. INLETS SHALL BE CONSTRUCTED OF REINFORCED CONCRETE (MIX NO. 2) SIZE, TYPE & DIRECTION OF INLET CONNECTION WILL VARY TO SUIT CONDITIONS REINFORCEMENT REQUIRED ON OUTSIDE, AS WELL AS ON INSIDE OF WALLS WHEN "A" IS GREATER THAN 7'-0". SPACING, SAME AS FOR INSIDE OF WALL. PLACE EXPANSION MATERIAL (SAME TYPE APPROVED FOR PAVEMENT) AS INDICATED. METAL LADDER RUNGS SHALL BE IN ACCORDANCE WITH STD. D-51 AND SHALL BE INSTALLED AS SHOWN OR AS DIRECTED BY THE ENGINEER. ANGLES & ANCHOR BOLTS TO BE GALVANIZED IN ACCORDANCE WITH ASTM A-123, AFTER WELDING.

INLET	"T"	"L"
COG-5	4'-3 1/2"	5'-8 1/2"
COG-10	10'-0"	11'-5"
COG-15	15'-0"	16'-5"
COG-20	20'-0"	21'-5"

* THIS DIMENSION TO BE MAINTAINED FOR ALL STANDARD COG INLET



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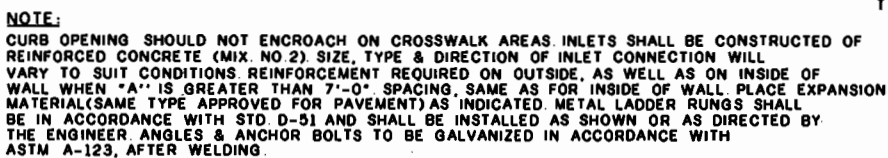
[Signature] 04.12.00
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STANDARD C O G INLETS
5', 10', 15' & 20'

ISSUED 05.02.00
REVISED
REVISED
PLATE D-33



• THIS DIMENSION TO BE MAINTAINED FOR ALL STANDARD COS INLETS



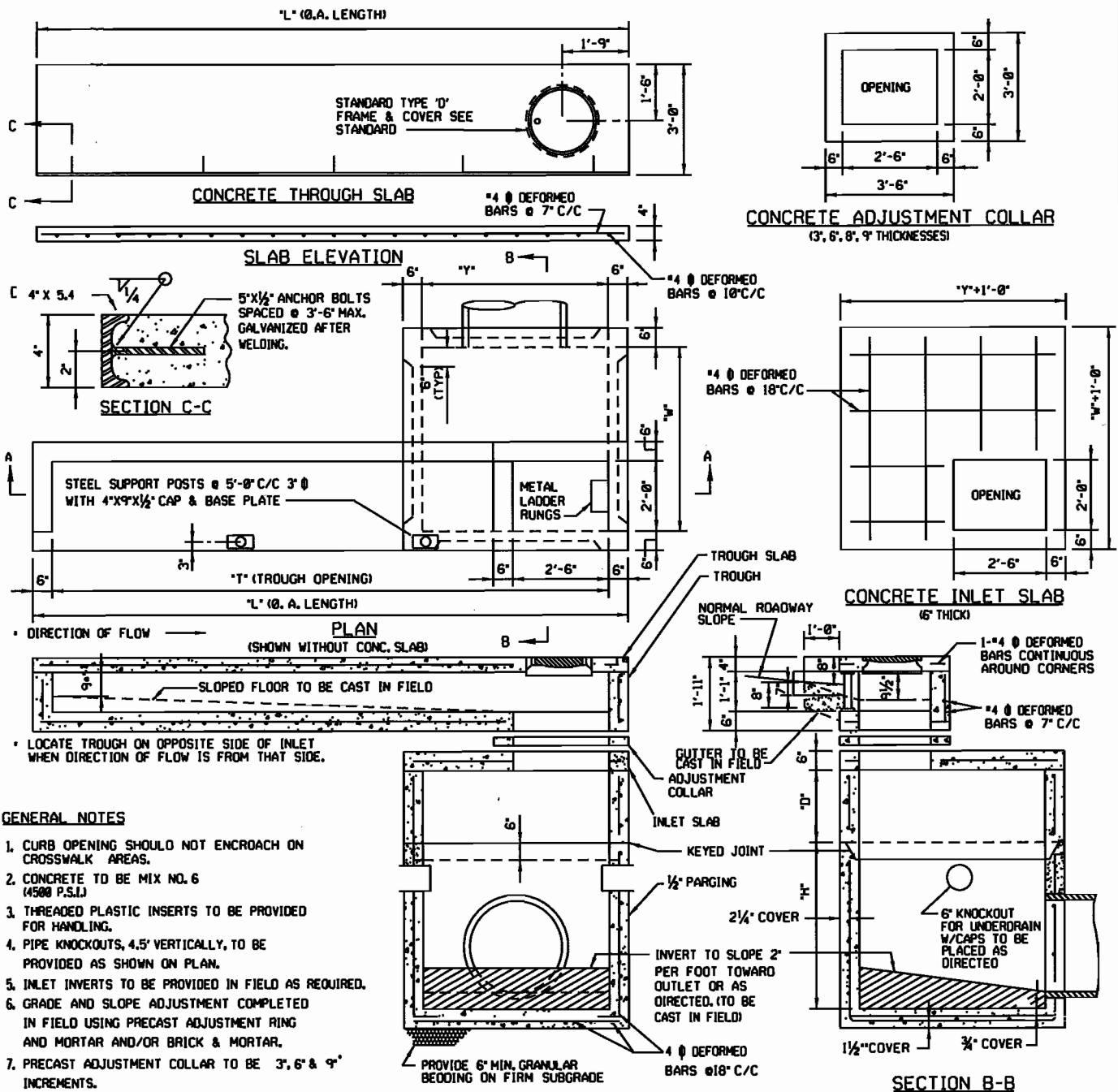
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DIRECTOR OF PUBLIC WORKS	DATE	DEP. DIRECTOR, PUBLIC WORKS	DATE



STANDARD COS INLETS

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REVISÉ _____

PLATE D - 34



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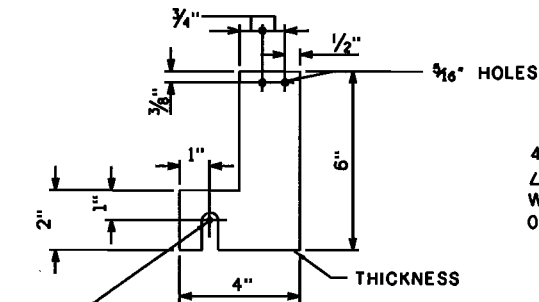
04.12.00
DATE



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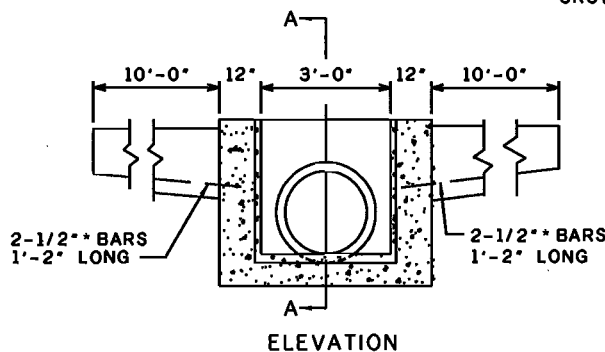
PRECAST COG INLETS
5', 10', 15' & 20'

ISSUED 05.02.00
REVISED
REVISED
PLATE D-35



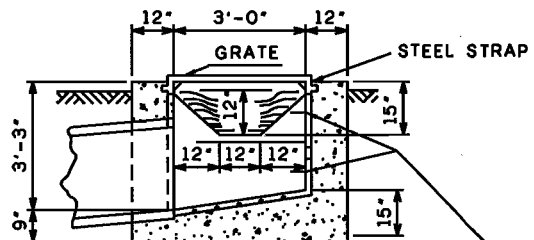
SLOTTED HOLE TO RECEIVE
 1/2"x4" MACHINE BOLT (GALV.) IM-
 BEDDED 3" IN CONC. WALL NUT TO BE
 PLACED ON END OF BOLT AFTER GRATE
 IS INSTALLED.

END STRAP DETAIL



ELEVATION

PROVIDE A 1" DIAMETER WEEP HOLE 6" ABOVE
 CROWN OF PIPE OR AS DIRECTED.



SECTION A-A

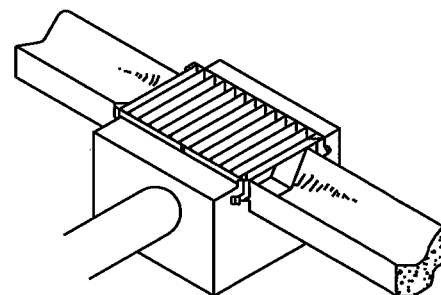
MANHOLE STEPS
 1'-3" O/C

NOTE: THE CONCRETE VALLEY GUTTER TO BE USED IN
 CONNECTION WITH THIS INLET WILL BE WARPED FROM THE
 STANDARD SECTION TO MEET THE SECTION AT THE END OF
 THE INLET. THIS TRANSITION WILL TAKE PLACE WITHIN
 A DISTANCE OF TEN FEET FROM THE INLET. *PAVING
 WITHIN TEN FEET OF THE INLET TO BE INCLUDED IN THE
 UNIT PRICE BID FOR THE INLET.

PIPE OUTLETS AND GUTTER APPROACHES CAN BE REVISED
 TO MEET EXISTING CONDITIONS.

INLET REINFORCEMENT - 1/2" ϕ BARS AT 6" C. TO C. 2" COVER.

GRATINGS ARE SUBJECT TO APPROVAL FOR EACH JOB. ANY TYPE OF
 SUBSTANTIAL TRANSVERSE BARS MAY BE USED WHICH WILL SUPPORT
 A MINIMUM UNIFORM LOAD OF 150 LBS. /SQ. FT. THE TRANSVERSE BARS
 SHALL BE HELD RIGID BY SPACER BARS.
 AREA TO BE MADE UP OF TWO EQUAL WIDTH PANELS ARRANGED FOR
 BOLTING TOGETHER IN THE FIELD.
 ALL MATERIAL TO BE HOT DIPPED GALVANIZED



ISOMETRIC VIEW

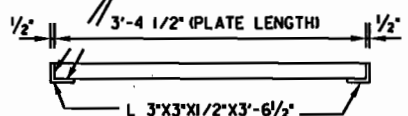
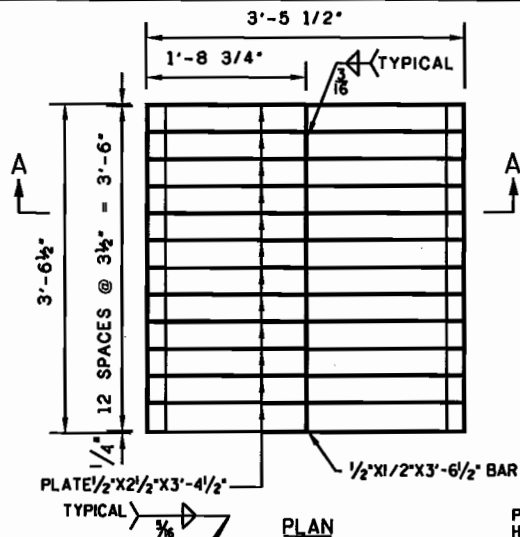
NOTE: THIS TYPE OF INLET MAY BE USED IN CONJUNCTION
 WITH BERM DITCHES, BENCHES, AND SUMP AREAS OF INNER
 LOOPS OF INTERCHANGES. IT IS NOT TO BE USED IN MEDIANS
 OR OTHER AREAS TRAVERSED BY OUT-OF-CONTROL VEHICLES.



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SPECIAL TYPE K INLET NON-TRAFFIC AREAS

ISSUED 05.02.00
 REVISED
 REVISED
 PLATE D-37

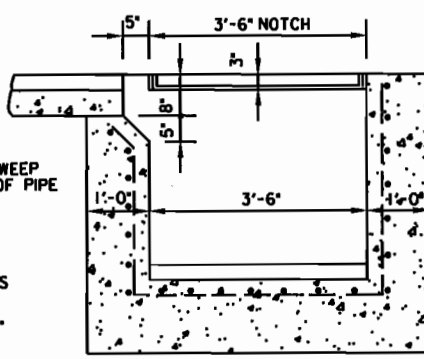


SECTION A-A

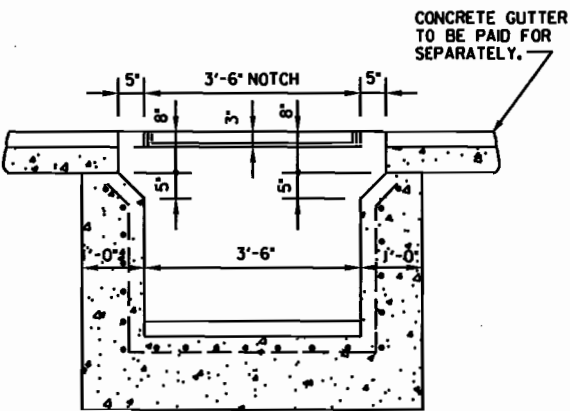
PROVIDE A 1" DIAMETER WEEP HOLE 6" ABOVE CROWN OF PIPE OR AS DIRECTED.

NOTE: GRATE TO BE AS SHOWN OR FURNISH APPROVED EQUIVALENT.

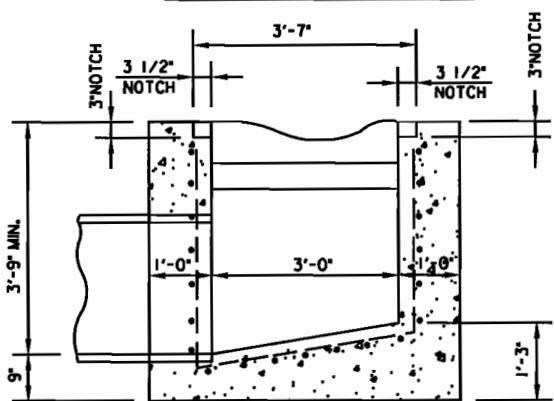
- GENERAL NOTES
- 1 CONCRETE TO BE MIX NO. 2
 - 2 REINFORCEMENT TO BE NO. 4 DEFORMED BARS AT 6 IN. C/C 2 IN. COVER
 - 3 GRATE TO BE OF STEEL CONSTRUCTION 7 SHALL BE SQUARE, FLAT AND TRUE
 - 4 STRUCTURAL STEEL SHALL BE A.S.T.M. DESIGNATION A-36
 - 5 GRATE TO BE GALV. AFTER FABRICATION IN ACCORDANCE WITH A.S.T.M. A-123 EXCEPT FOR ADHERENCE WHICH SHALL BE IN ACCORDANCE WITH A.S.T.M. DESIGNATION A-153



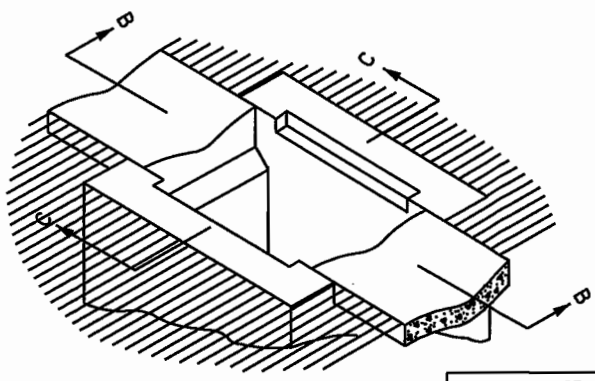
SECTION B-B SINGLE OPENING



SECTION B-B DOUBLE OPENING

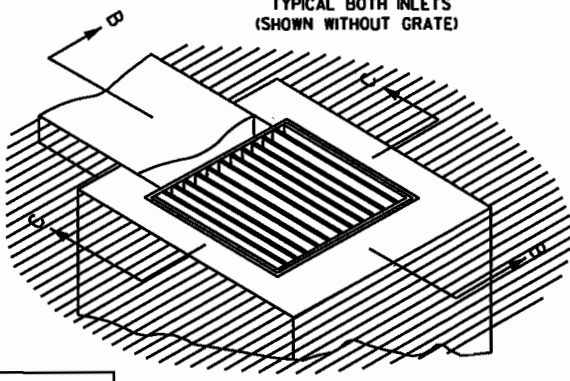


SECTION C-C
TYPICAL BOTH INLETS
(SHOWN WITHOUT GRATE)



DOUBLE OPENING
(SHOWN WITHOUT GRATE)

NOTE: FOR USE IN NON-TRAFFIC LOCATIONS ONLY



SINGLE OPENING

[Signature]
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5-2-00
DATE

[Signature]
DEP. DIRECTOR, PUBLIC WORKS

4/12/00
DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

STANDARD TYPE K INLET
OPEN-END GRATE

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE D-38

<i>[Signature]</i> DIRECTOR OF PUBLIC WORKS	05.02.00 DATE
<i>[Signature]</i> DEP. DIRECTOR, PUBLIC WORKS	04.12.00 DATE

-
- The diagram shows a cross-section of a trench. The trench has a width of 3'-6" and a depth of 3'-6". The trench is lined with a material that is 8" thick on the sides and 5" thick on the bottom. A notch is cut into the top of the trench, with a width of 3'-6" and a depth of 5". The notch is 5" wide at the top and 5" wide at the bottom. The trench is shown in a cross-section with a ground surface on either side.

CONCRETE GUTTER TO BE FIND FOR SEPARATELY

3'-6" MIN. 5'-0" MAX.

3'-6" NOTCH

5"

8"

3'-6"

8"

1'-6" TYP.

NO. 57 AGGREGATE ALL SIDES

1/2" PARING (PROVIDED IN FIELD)

Diagram illustrating the construction details of a manhole structure, showing dimensions and components:

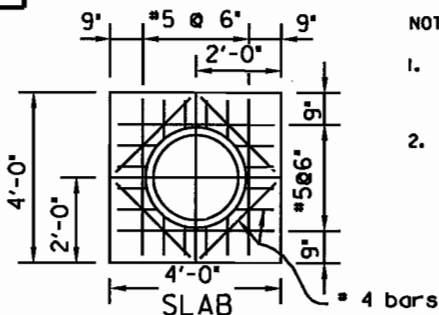
- Top Section:**
 - Overall width: $3' - 7"$
 - Notch width on each side: $3\frac{1}{2}"$ NOTCH
 - Notch depth: $3"$ NOTCH
- Side Section:**
 - Overall height: $3' - 6"$ MIN. $5' - 0"$ MAX. ADJUSTABLE IN $6"$ INCREMENTS
 - Inner wall thickness: $8"$
 - Bottom section height: $6"$
- Internal Structure:**
 - Top cover: $2"$ COVER
 - Bottom cover: $1\frac{1}{2}"$ COVER
 - Side cover: $2"$ COVER
 - Internal diameter: $3' - 0"$
- Notes:**
 - SEE NOTE 2
 - INVERT TO BE CONC. OR BRICK. SLOPE $2"$ PER FOOT TOWARD OUTLET OR AS DIRECTED

Diagram illustrating a standard type K inlet grate assembly. The assembly consists of a rectangular grate (labeled 'STANDARD TYPE K INLET GRATE. SEE STANDARD D-38') mounted on a base. A cover plate is shown partially open, revealing the grate. The grate is supported by a frame. The diagram includes dimension lines and labels 'A' and 'B' indicating specific measurements or components.

PRECAST TYPE K INLET OPEN-END GRATE

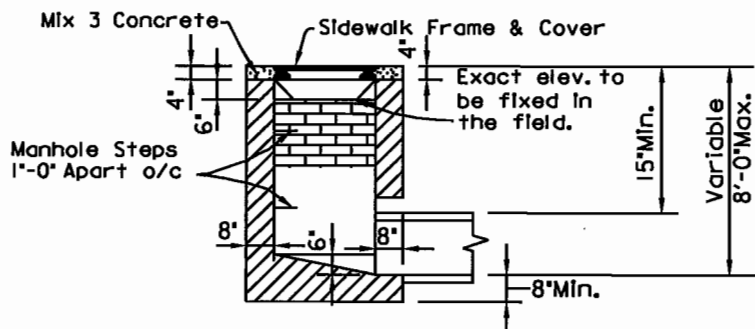
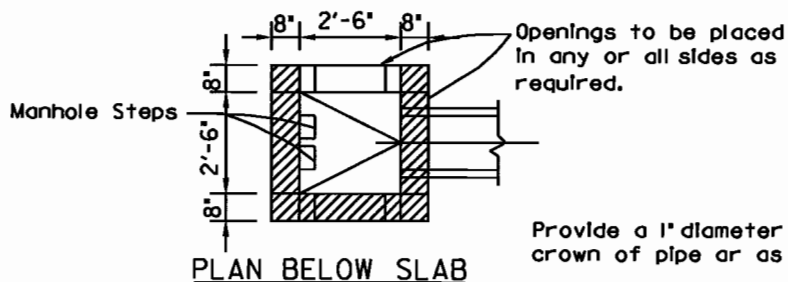
ISSUED 05.02.00
 REVISED _____
 REVISED _____
PLATE D-39

W. J. Johnson
 DIRECTOR OF PUBLIC WORKS DATE 5-2-00
W. J. Johnson
 DEP. DIRECTOR, PUBLIC WORKS DATE 4/12/00



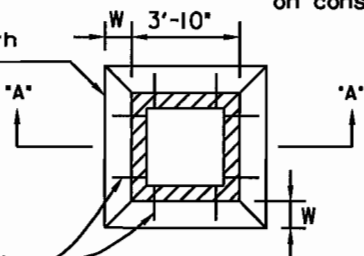
NOTES:

1. Invert shall be brick or plain Mix 3 Concrete.
2. Top 4" of walls shall be brick masonry.



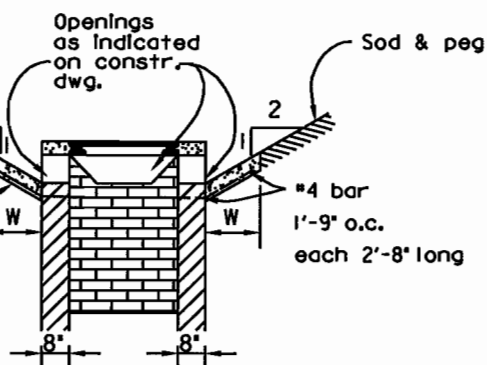
5" Reinf.
 Mix #2 conc. with
 6"x6"-W2.1 x W2.1

#4 bar
 1'-9" o.c.
 each 2'-8" long



W= 2'-0" or as indicated on constr. dwg.

5" Reinf.
 Mix #2
 Conc. with
 6"x6" -
 W2.1 x W2.1



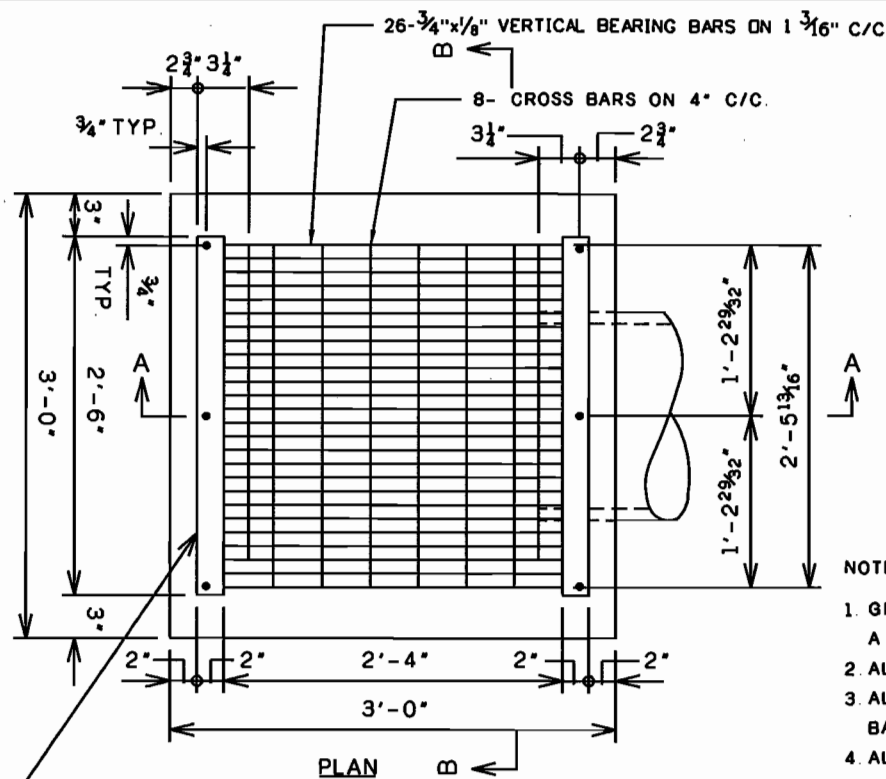
OPTIONAL CONCRETE COLLAR



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TYPE Y-1 INLET

ISSUED 5-2-00
 REVISED _____
 REVISED _____
 PLATE D-40



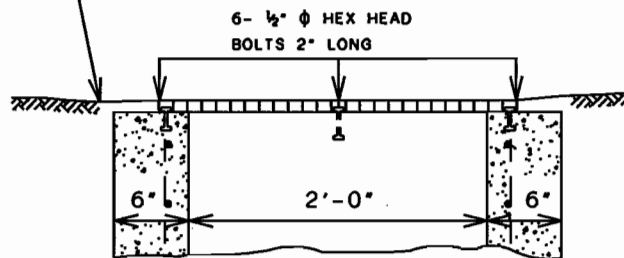
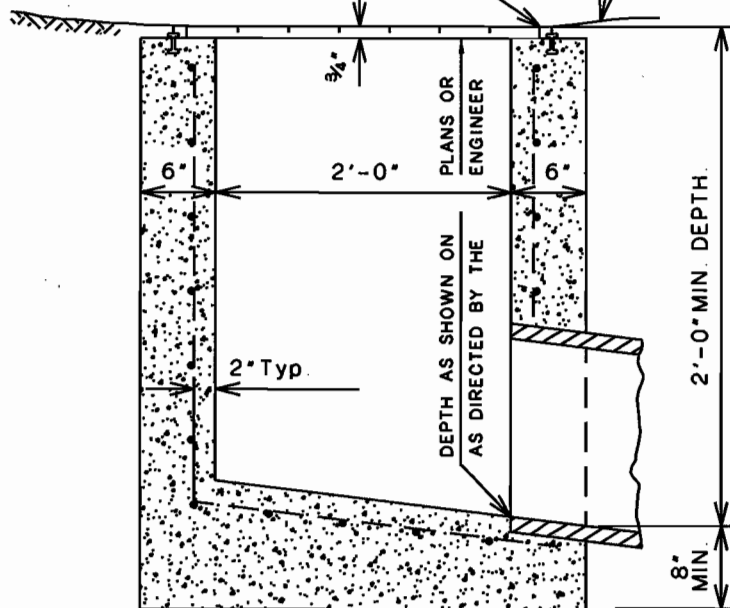
NOTE: EXPANSION ANCHORS MAY BE USED INSTEAD OF BOLTS.

NOTES:

1. GRATING SHALL BE STEEL "IRVING X - BAR TYPE A A" OR APPROVED EQUIVALENT
2. ALL MATERIAL TO BE HOT DIPPED GALVANIZED
3. ALL REINFORCEMENT TO BE NO 4 DEFORMED BARS @ 6" C/C.
4. ALL CONCRETE TO BE CONCRETE MIX NO 2

2-2"x1 $\frac{1}{4}$ "x $\frac{3}{16}$ "x2'-6" L (CENTERED ON GRATE)
TRIM VERTICAL LEG OF ANGLE TO $\frac{3}{4}$ " IN HEIGHT
WELD SECURELY TO GRATING AT EVERY 4TH BAR
(WELDED AREAS TO BE TOUCHED UP WITH ZINC
RICH PAINT AFTER WELDING.)

SLOPE GROUND
TOWARD INLET



Provide a 1" diameter weep
hole 6" above crown of pipe
or as directed

PIPE TYPE, SIZE,
SLOPE & INVERT
ELEVATION AS
SHOWN ON PLANS

[Signature]
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5-2-00
DATE

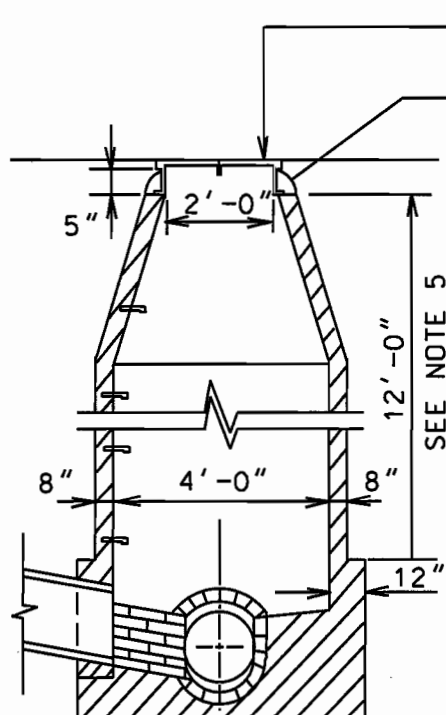
[Signature]
DEP. DIRECTOR, PUBLIC WORKS
4/12/00
DATE



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DEPARTMENT OF
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STANDARD Y - 4 INLET

ISSUED 5-2-00
REVISED
REVISED
PLATE D-41

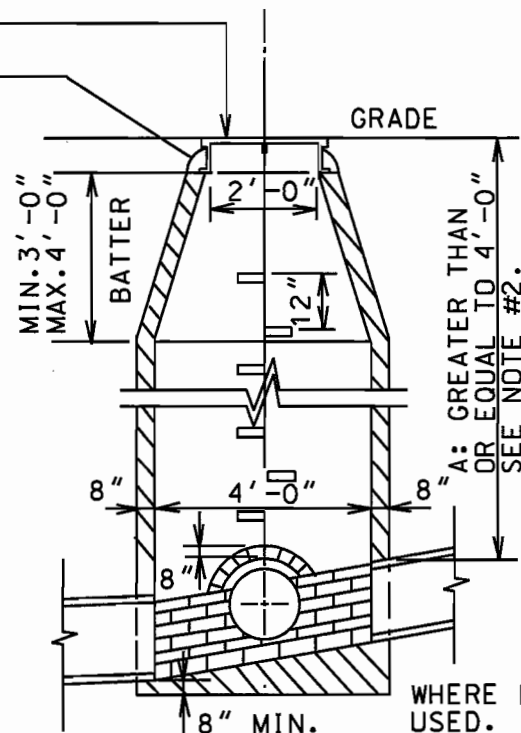


24" HEAVY MANHOLE
FRAME AND COVER

CEMENT MORTAR

4" BRICK MASONRY

ADDITIONAL 8" BRICK
SHALL BE USED TO
BRING MANHOLE
COVER TO EXISTING
GRADE.



WHERE BRICK IS
USED. INVERT
SHALL BE BRICK
LAID ON EDGE

NOTES:

1. MANHOLE MUST BE BRICK OR PLAIN MIX 3 CONCRETE, POURED IN PLACE.
2. WHERE A (COVER) IS LESS THAN 4'-0", USE TYPE B MANHOLE WHEN PIPES ARE 36" DIAMETER AND SMALLER.
3. FOR PIPE DIAMETERS 42" OR LARGER, USE A TYPE C MANHOLE.
4. FOR PIPE 30" H.D. AND LARGER, WITH CURVE CENTERLINE LENGTH GREATER THAN 4'.
5. THICKNESS OF WALLS TO BE INCREASED TO 12", 12'-0" BELOW UNDERSIDE OF FRAME.
6. FOR PRECAST ALTERNATE, SEE PLATE D-43.
7. PROVIDE STANDARD MANHOLE STEPS. SEE STANDARD D-51.
8. PROVIDE A 1" DIAMETER WEEP HOLE, 6" ABOVE THE CROWN OF PIPE OR AS DIRECTED.

W. L. Allen 5-2-00
DIRECTOR OF PUBLIC WORKS DATE
W. L. Allen 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD
DEPARTMENT OF
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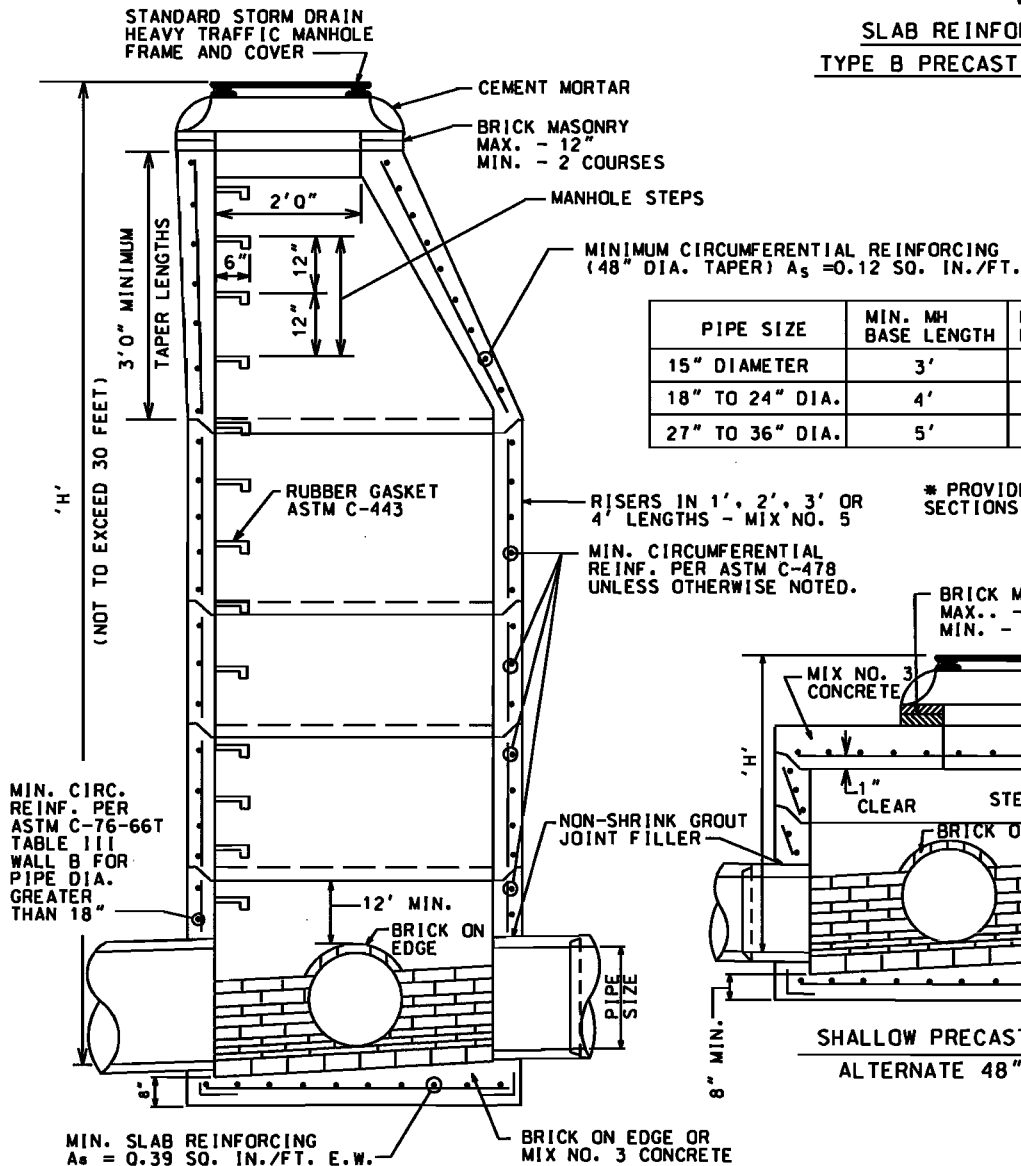
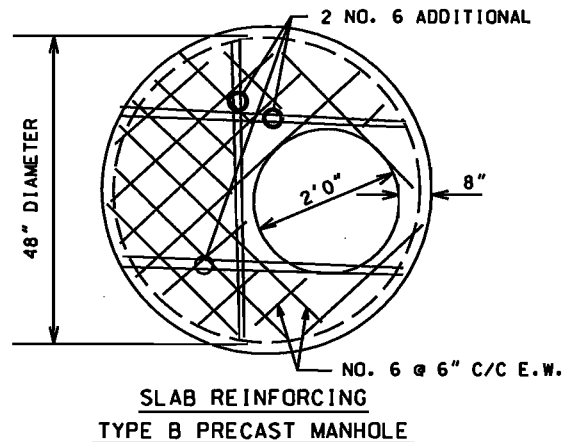
TYPE A MANHOLE
(FOR COVER 4' OR MORE)
(FOR PIPE 15" TO 36" HORIZONTAL DIA.)

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE D-42

W. J. Wilson 5-2-00
 DIRECTOR OF PUBLIC WORKS DATE
W. J. Wilson 4/12/00
 DEP. DIRECTOR, PUBLIC WORKS DATE

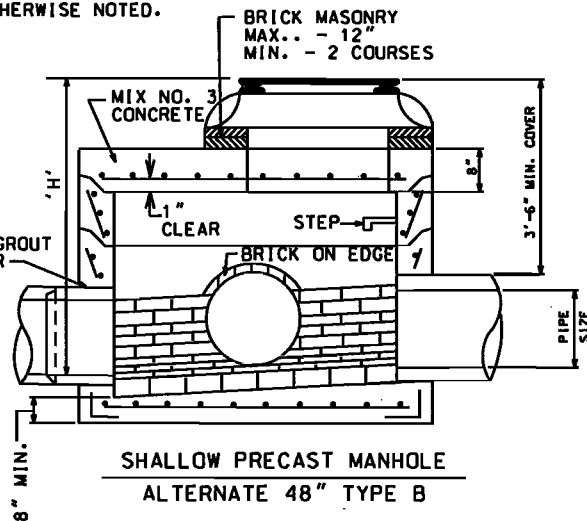
NOTES:

- EXCEPT AS NOTED, MANHOLE TAPERS, RISERS AND BASES SHALL BE FURNISHED IN STRICT ACCORDANCE WITH ASTM DESIGNATION C-478 (LATEST) FOR "PRECAST" REINFORCED CONCRETE MANHOLE SECTIONS.
- MANHOLE BASES SHALL BE OF MIX NO. 5 CONCRETE OR POURED IN-PLACE MIX NO. 3 CONCRETE OR 8" MIN. BRICK.
- PROVIDE A 1" DIAMETER WEEP HOLE 6" ABOVE CROWN OF PIPE OR AS DIRECTED.



PIPE SIZE	MIN. MH BASE LENGTH	MIN. H FOR A MAX. H FOR B
15" DIAMETER	3'	6.5'
18" TO 24" DIA.	4'	7.5'
27" TO 36" DIA.	5'	8.5'

* PROVIDE STEPS IF ADDITIONAL
 SECTIONS ARE USED.



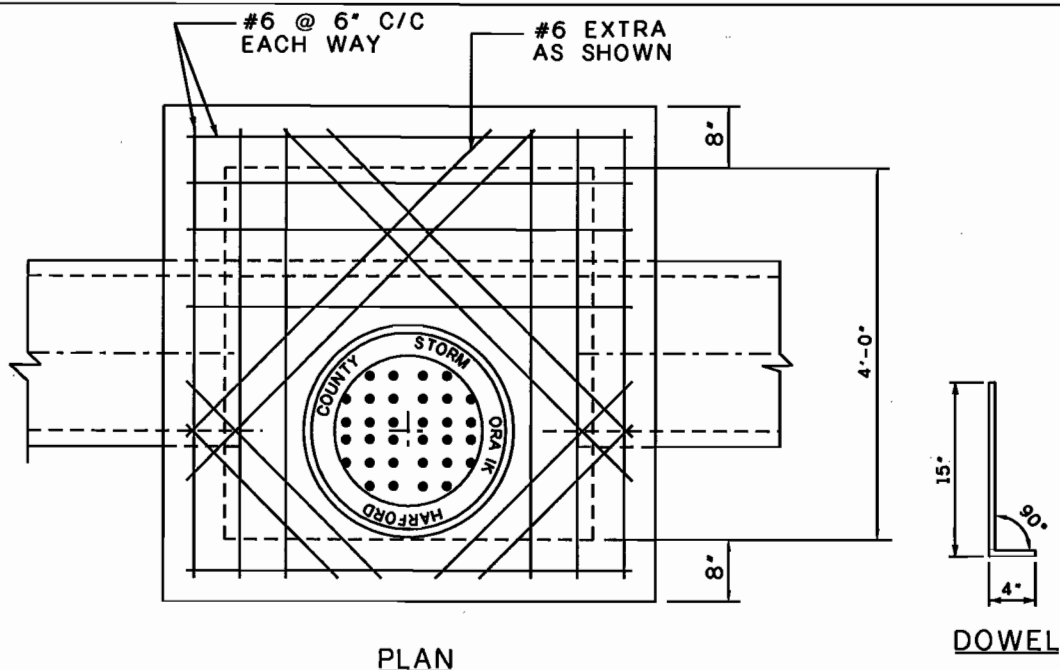
ALTERNATE 48" TYPE A



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PRECAST A & B MANHOLE
 (FOR PIPES 15" TO 36" HORIZONTAL DIAMETER)

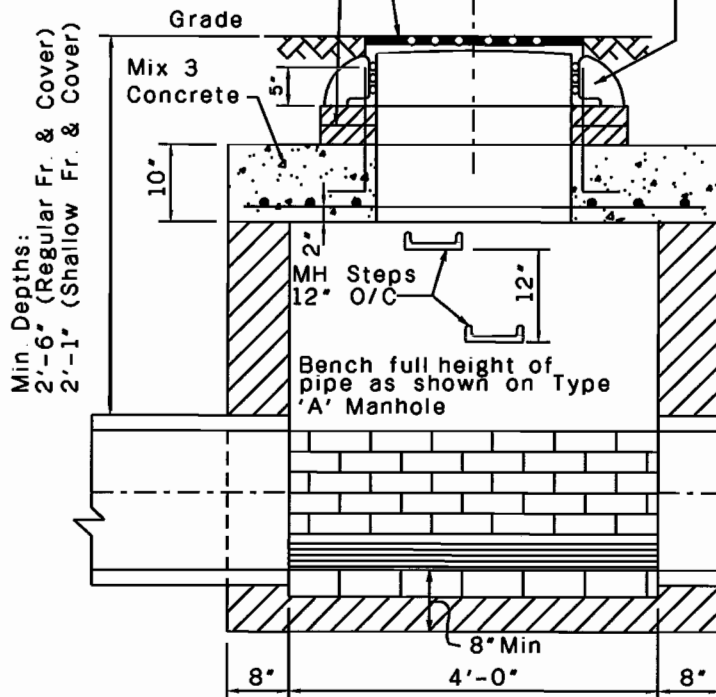
ISSUED 5-2-00
 REVISED
 REVISED
 PLATE D-43



4" Brick masonry. Additional brick shall be used to bring MH Cover to existing grade

Storm Drain Heavy Traffic Manhole Frame & Cover

Install Frame w/4 Dowels 90° apart then mortar



NOTES:

1. Walls, bottom slab and invert shall be brick or plain Mix 3 concrete poured in place.
2. Where cover is greater than 4'-0" use Type A manhole.
3. For pipe sizes 42" and larger, use Type C manhole.

PROVIDE A 1" DIAMETER WEEP HOLE 6" ABOVE CROWN OF PIPE OR AS DIRECTED.

SECTION

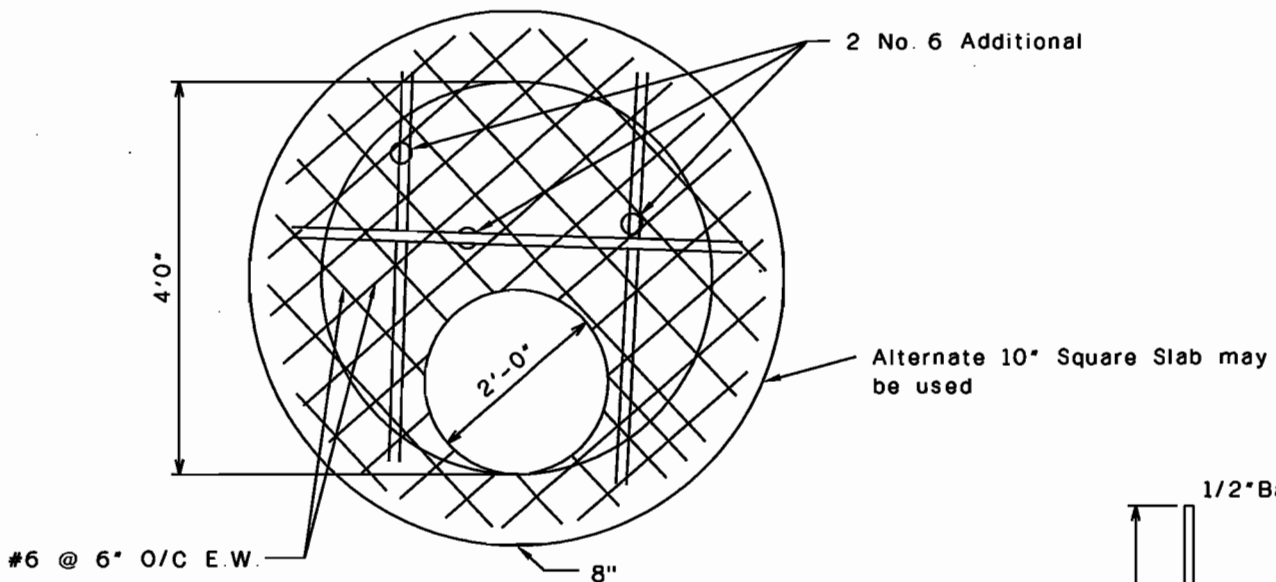
[Signature] 5-2-00
DIRECTOR OF PUBLIC WORKS
[Signature] 4/12/00
DEP. DIRECTOR, PUBLIC WORKS



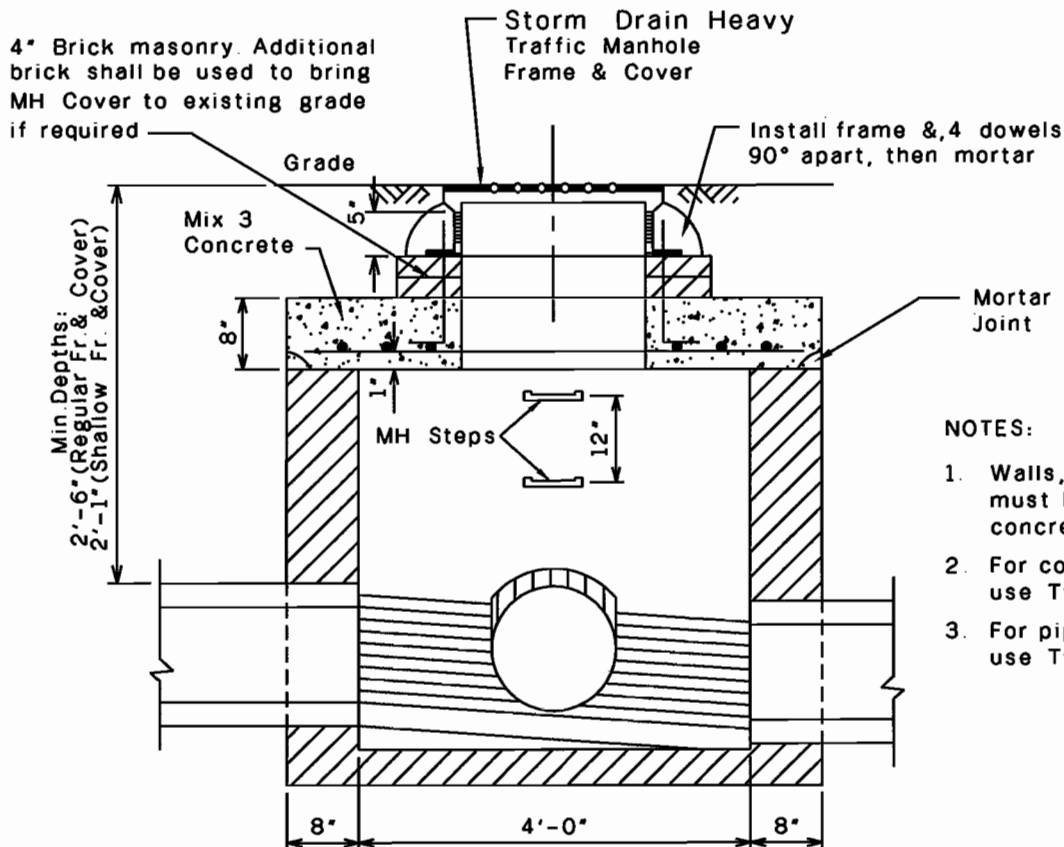
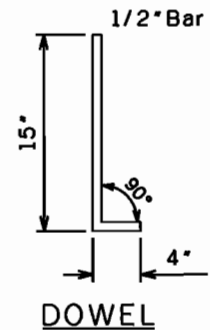
HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

TYPE B SHALLOW MANHOLE
(FOR COVER LESS THAN 4')
(FOR PIPES 15" TO 36" HORIZ. DIAM.)

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE D-44



SLAB REINFORCING FOR TYPE B PRECAST MANHOLE



SECTION

NOTES:

1. Walls, bottom slab, and invert must be brick or plain Mix #3 concrete poured in place.
2. For covers greater than 4'-0", use Type A Manhole.
3. For pipe sizes 42" and larger, use Type C Manhole.

Provide a 1" diameter weep hole 6" above crown of pipe or as directed.

<i>[Signature]</i>	05-02-00
DIRECTOR OF PUBLIC WORKS	DATE
<i>[Signature]</i>	04-12-00
DEP. DIRECTOR, PUBLIC WORKS	DATE



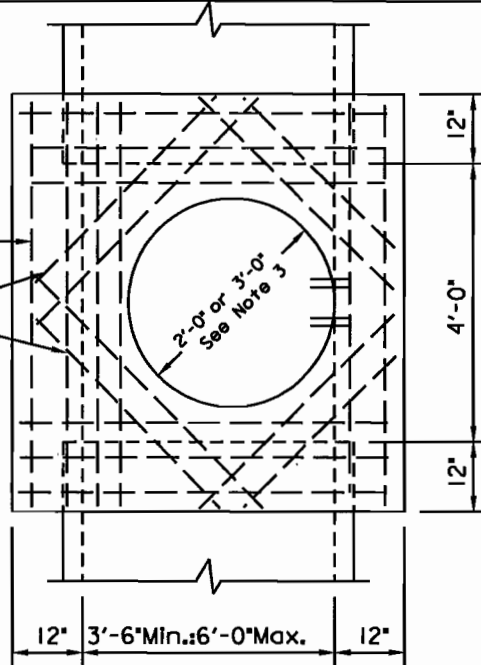
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ALTERNATE TYPE B
SHALLOW MANHOLE
(For cover less than 4')
(For Pipes 15" to 36" Horiz. Dia.)

ISSUED 05-02-00
REVISED
REVISED
PLATE D-45

#7 @ 6" O/C
Each Way

#7 Extra
as shown

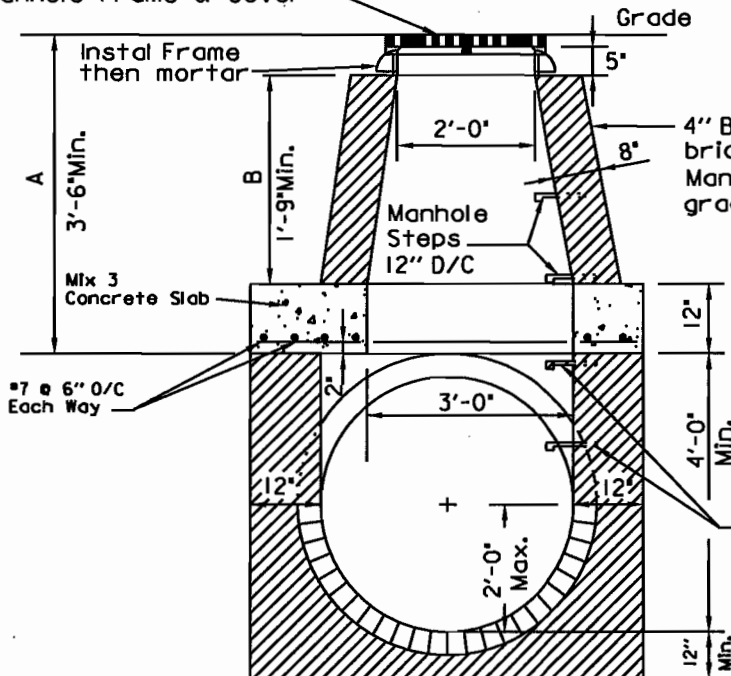


NOTES:

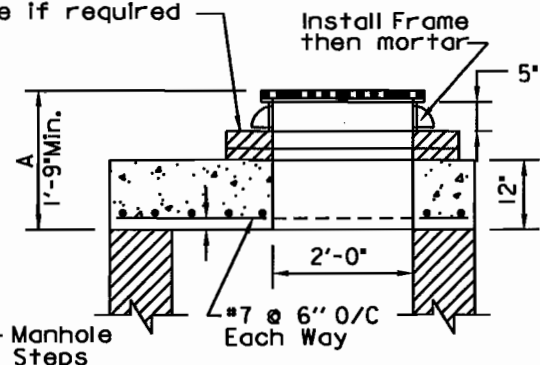
1. Walls, bottom slab and Invert shall be brick or plain Mix 3 concrete poured in place.
2. For pipes 36" and smaller, use Type A or Type B Manhole. Use Type B where A (cover) is less than 3'-6".
3. Where A is less than 3'-6", use Alternate Manhole Stack.

TOP SLAB

Storm Drain Heavy Traffic
Manhole Frame & Cover



4" Brick Masonry. Additional
brick shall be used to bring
Manhole Cover to existing
grade if required



ALTERNATE MANHOLE STACK (See Note 3)

SECTION

PROVIDE A 1" DIAMETER WEEP
HOLE 6" ABOVE CROWN OF PIPE
OR AS DIRECTED.

[Signature] 5-2-00
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE

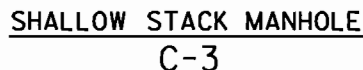


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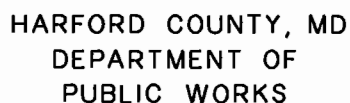
TYPE C MANHOLE -CI
42" & LARGER PIPES
(DEFLECTION & LENGTH ≤ 4')

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE D-46

1. EXCEPT AS NOTED, MANHOLE TAPERS, RISERS AND BASES SHALL BE FURNISHED IN STRICT ACCORDANCE WITH ASTM DESIGNATION C-478 (LATEST) FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS.
2. MANHOLE BASES SHALL BE OF MIX NO. 5 CONCRETE OR POURED IN PLACE MIX NO. 3 CONCRETE OR 8" MIN. BRICK.

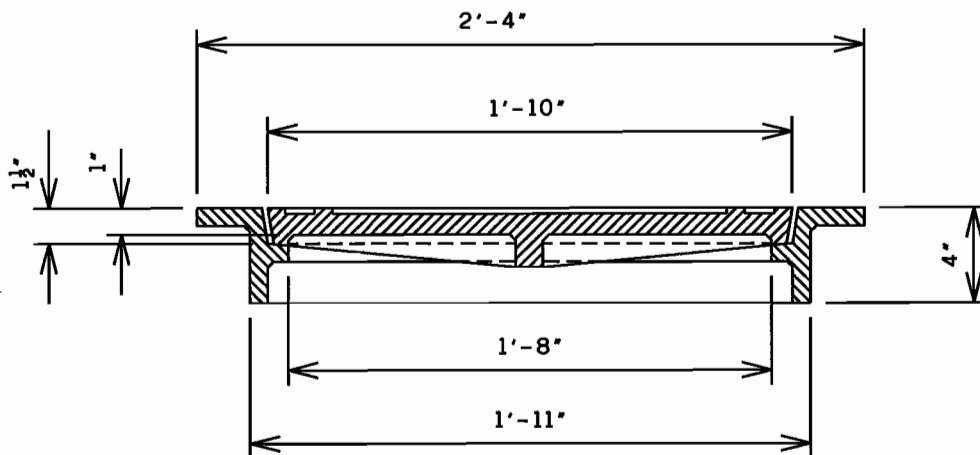
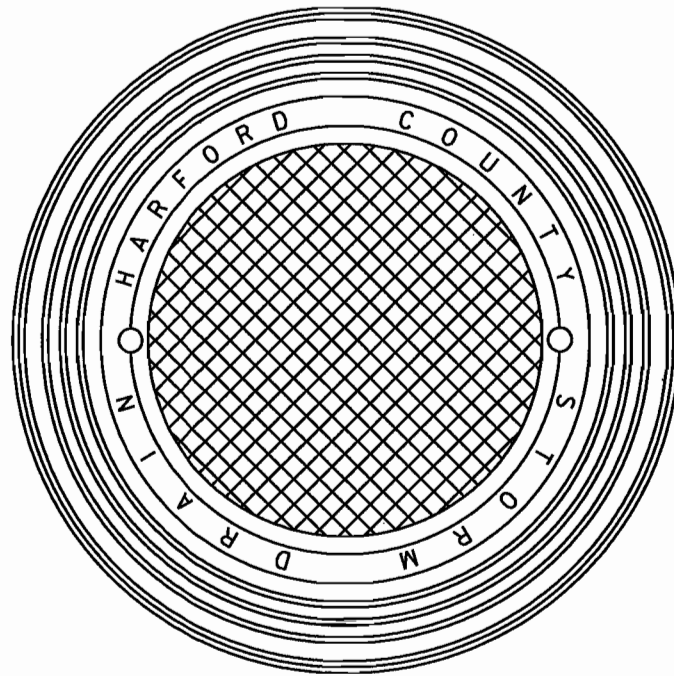


4/12/00
DATE



PRECAST ALTERNATE
TYPE C MANHOLES
(FOR PIPE 42" AND 48" HORIZ. DIAM.)

PLATE D-47



NOTE: MATERIAL SHALL BE GREY IRON CASTINGS MUST BE MACHINED ON BEARING SURFACES.

FRAME AND GRATE
WEIGHT 185 LBS.

<i>[Signature]</i>	05-02-00
DIRECTOR OF PUBLIC WORKS	DATE
<i>[Signature]</i>	04-12-00
DEP. DIRECTOR, PUBLIC WORKS	DATE

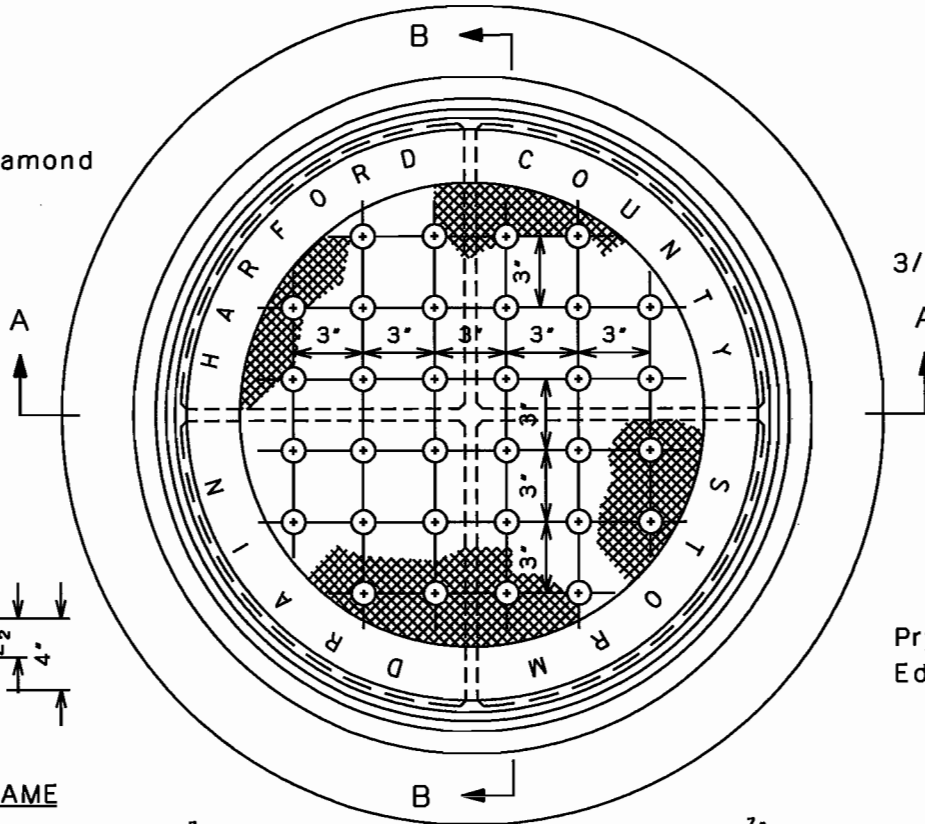


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SIDEWALK FRAME AND COVER
(FOR REPLACEMENT PURPOSES ONLY)

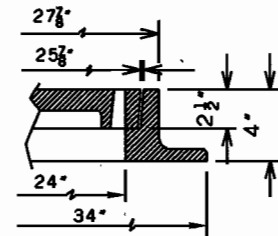
ISSUED 05-02-00
REVISED _____
REVISED _____
PLATE D-48

Standard Diamond
Grid

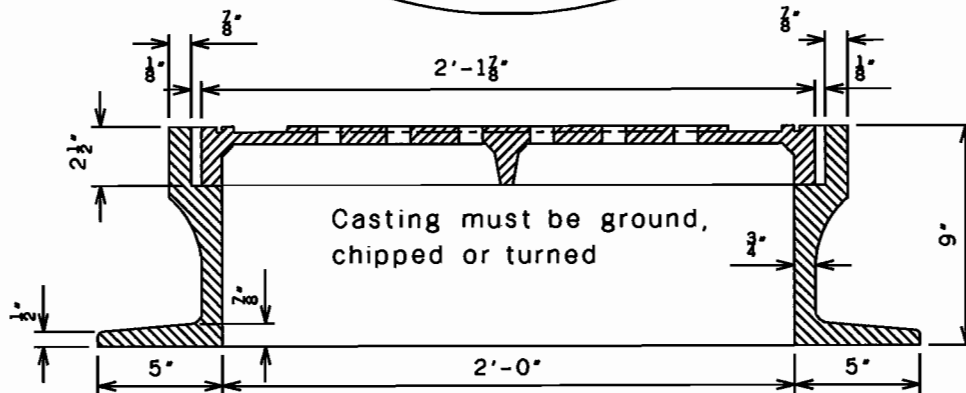


3/4" Dia. Holes

Pry Bar Holes On
Edge of Cover

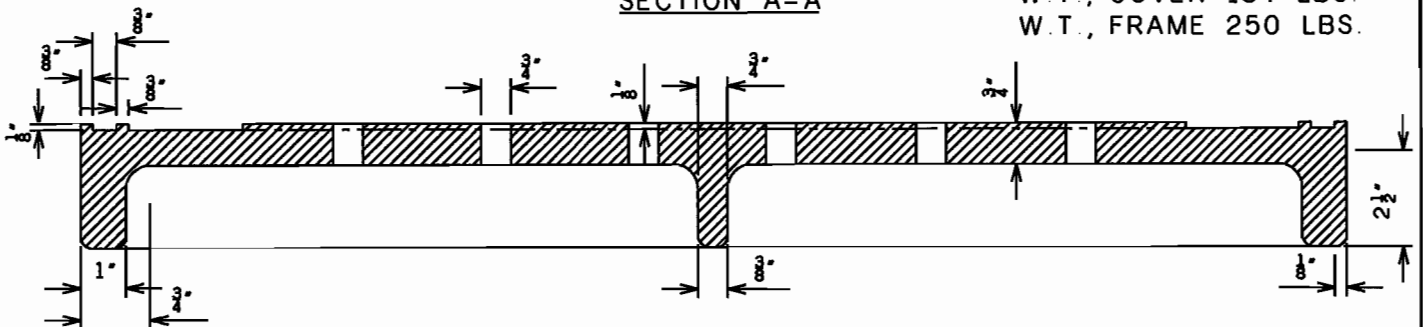


SHALLOW FRAME



SECTION A-A

W.T., COVER 134 LBS.
W.T., FRAME 250 LBS.



SECTION B-B

NOTE - Frame & Cover for 54" and
larger bends and junction chambers
shall be Dewey Bros. Inc. RCR- 62C or
equal with lettering & hole as shown for 2'-0" Frame.

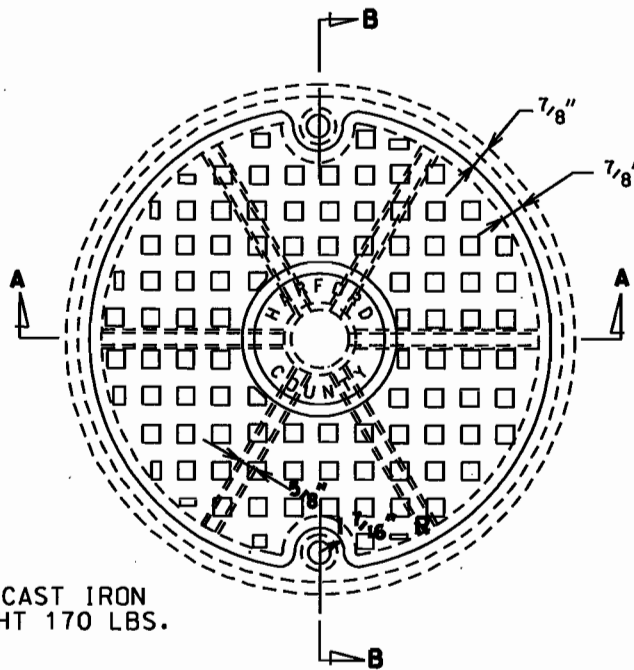
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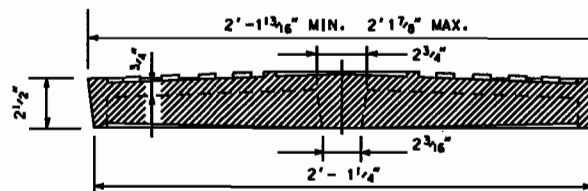
24"
HEAVY TRAFFIC MANHOLE
FRAME AND COVER

ISSUED 05-02-00
REVISED
REVISED
PLATE D-49

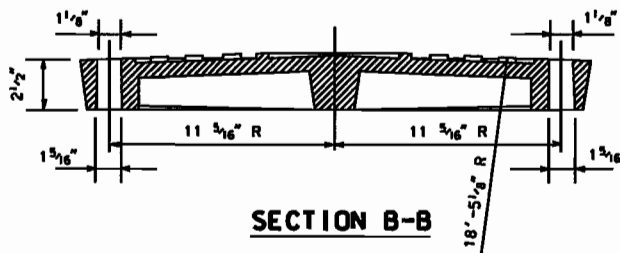


MATERIAL - CAST IRON
APPROX. WEIGHT 170 LBS.

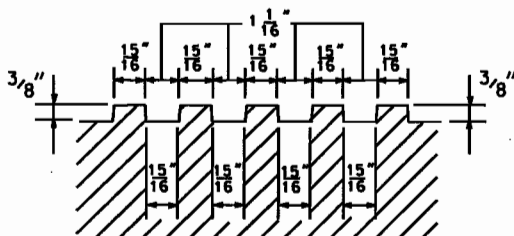
PLAN



SECTION A-A



SECTION B-B



DETAIL OF CORRUGATIONS

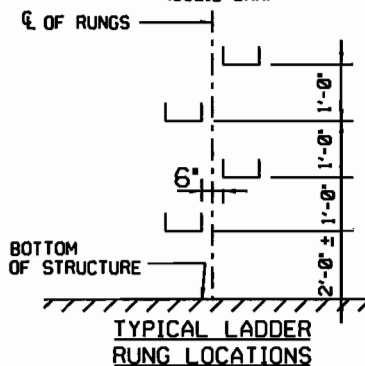
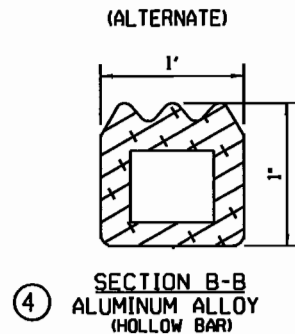
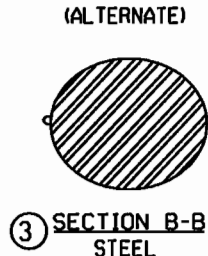
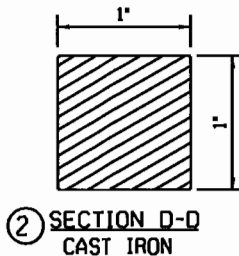
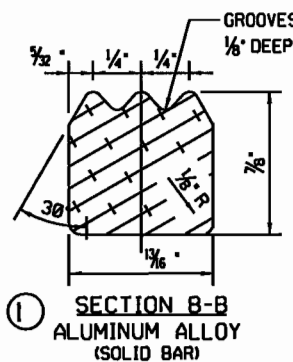
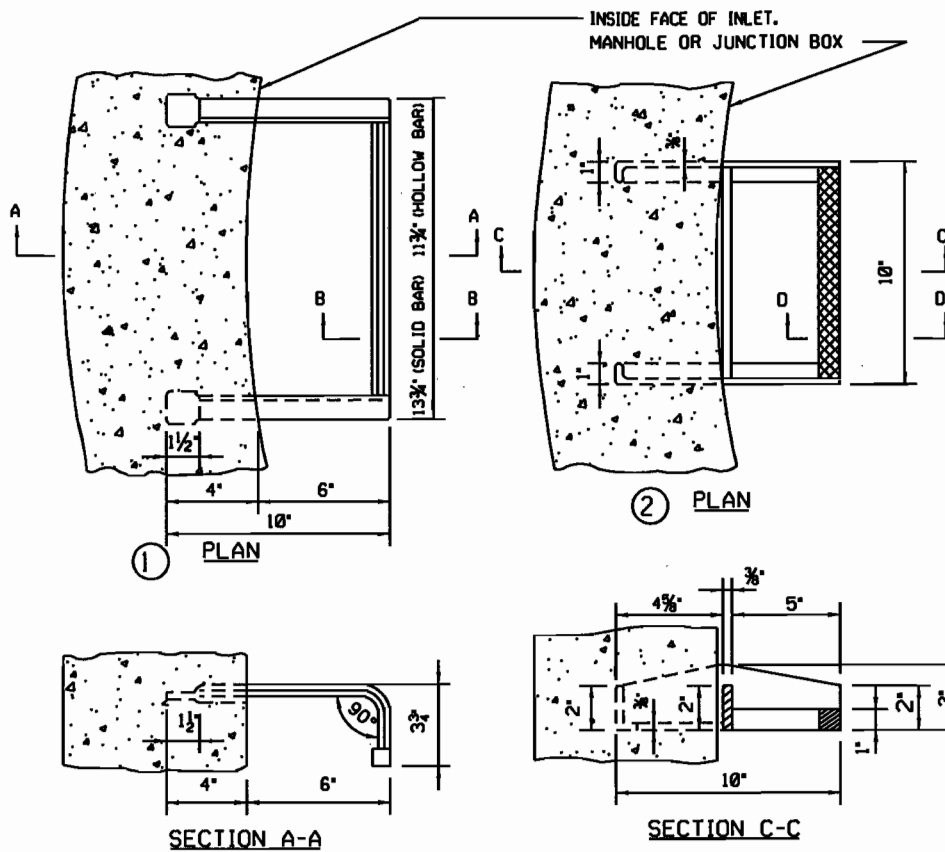
[Signature] 5-2-00
DIRECTOR OF PUBLIC WORKS DATE
[Signature] 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

STANDARD MANHOLE
TYPE A COVER

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE D-50



- NOTE: METAL LADDER RUNGS ARE TO BE USED IN INLETS, MANHOLES AND JUNCTION BOXES OVER THREE FEET IN DEPTH OR AS DIRECTED BY THE ENGINEER. USED EITHER WITH BRICK OR CONCRETE CONSTRUCTION. (WHERE BRICK CONSTRUCTION IS EMPLOYED, THE MORTAR JOINTS SHALL BE ADJUSTED TO ACCOMMODATE LADDER RUNGS.) METAL LADDER RUNGS MAY BE COMPRISED OF ONE OF THE FOLLOWING.
- 1 ALUMINUM ALLOY - SHALL CONFORM TO A.S.T.M. DESIGNATION B 221 ALLOY 6061-T6. THAT PORTION EMBEDDED IN THE STRUCTURE SHALL BE COATED WITH ZINC CHROMATE OR APPROVED EQUIVALENT COATING.
 - 2 CAST IRON - SHALL CONFORM TO A. S. T. M. A-48 CLASS 30 B
 - 3 STEEL - SHALL CONFORM TO A. S. T. M. DESIGNATION A-615 GRADE 40, GALVANIZED AFTER FABRICATION AS PER A. S. T. M. DESIGNATION A-153

Sharon A. J.
DIRECTOR OF PUBLIC WORKS

5-2-00
DATE

W. Hubert Adams Jr.
DEP. DIRECTOR, PUBLIC WORKS

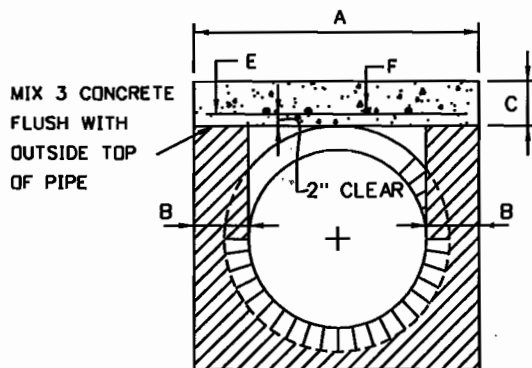
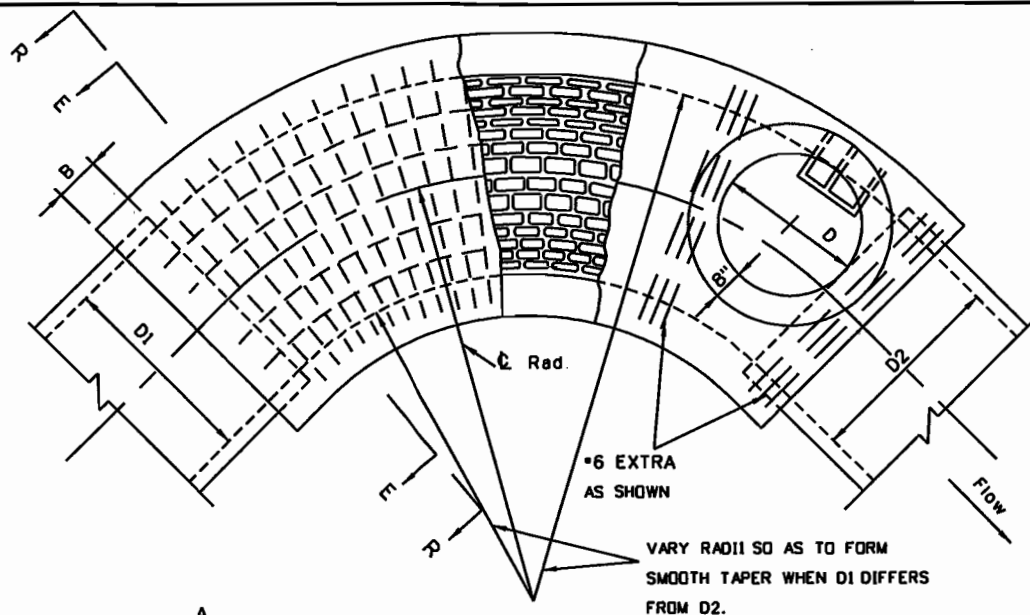
4/12/00
DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

MANHOLE & INLET STEP

ISSUED 5-2-00
REVISED
REVISED
PLATE D-51

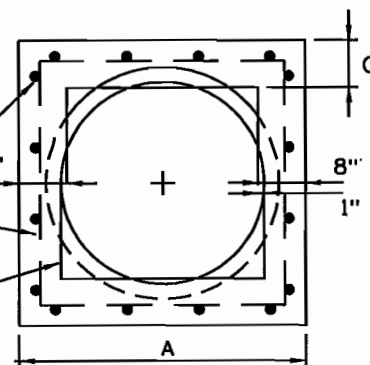


SECTION E-E

PLAN

#6 @ 12" O/c U
8" WALL

#5 @ 12" O/c
RECESS IF
POURED SEPARATELY



SECTION R-R

- NOTES: 1. **Material-** Walls and bottom shall be brick or plain concrete. (See Section E - E) Where 12" thickness is required, 8" Reinforced Concrete may be substituted. (See Section R - R.)
2. **Loads-** Super load = A. A. S. H. T. O. H-20 Fill Load = 0 to 15 ft. Earth.
3. **Manhole Details-** Steps, frame, cover, walls, max. batter shall be as shown on contract drawings for type A manhole.
4. Bend Data, centerline radius, B, C, and reinforcement shall be governed by D-1 or D-2 whichever is smaller.
5. Manhole opening d shall be based on downstream pipe size D-2.
6. Frame and Crate for manhole on 54" and larger bends shall be 2'-6" with lettering and holes as shown for 2'-0" frame.
7. Manhole stack shall conform to that of Type C manhole. minimum length of curve is 4'-0" for type c manhole stack.

Pipe Dia.	Radius	A	B	C	Bars E Spacing	Bars F	d
30"	5'-0"	3'-10"	8"	8"	#5 @ 6" O/c	3-#5	2'-6"
33"	6'-0"	4'-1"	6"	8"	#5 @ 6" O/c	3-#5	2'-6"
36"	6'-0"	4'-4"	8"	8"	#5 @ 6" O/c	3-#5	3'-0"
42"	7'-0"	4'-10"	8"	10"	#5 @ 6" O/c	4-#5	3'-0"
48"	8'-0"	5'-4"	8"	10"	#5 @ 6" O/c	4-#5	3'-0"
54"	9'-0"	6'-6"	X 12"	10"	#5 @ 6" O/c	5-#5	3'-0"
60"	10'-0"	7'-0"	X 12"	12"	#6 @ 8" O/c	6-#5	3'-0"
66"	11'-0"	7'-6"	X 12"	12"	#6 @ 8" O/c	7-#5	3'-0"
72"	12'-0"	8'-0"	X 12"	12"	#6 @ 8" O/c	7-#5	3'-0"

(X) SEE NOTE #1

W. L. Allen 5-2-00
DIRECTOR OF PUBLIC WORKS DATE
W. L. Allen 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE

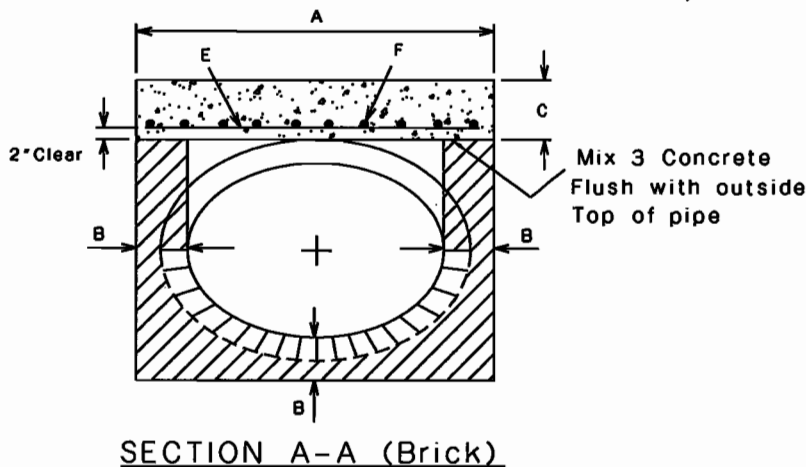
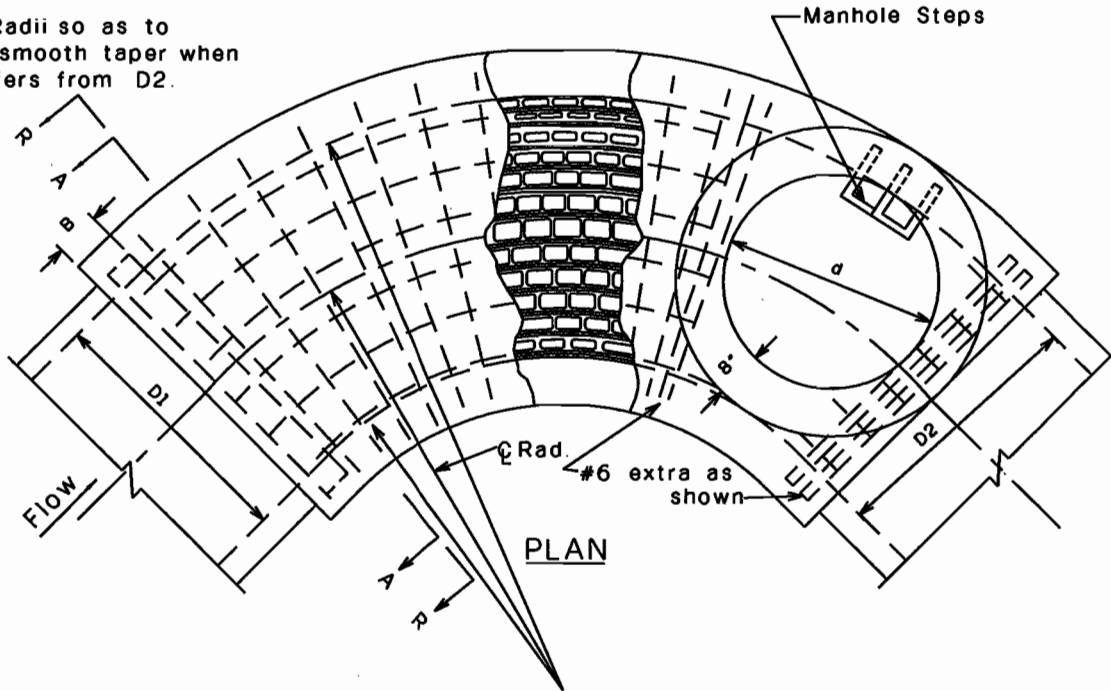


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

BEND STRUCTURE
CIRCULAR PIPE

ISSUED 05 - 02 - 00
REVISED _____
REVISED _____
PLATE D-52

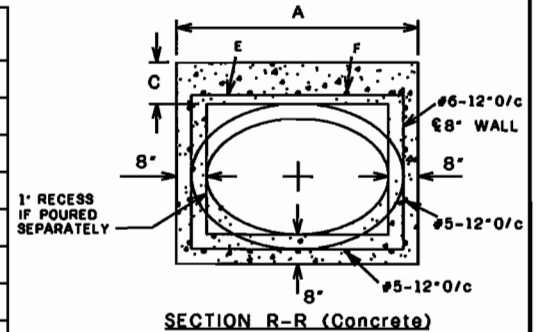
Vary Radii so as to form smooth taper when D1 differs from D2.



NOTES:

1. Walls and bottom shall be brick or concrete. Where 12" brick thickness is required, 8" Reinforced Concrete may be substituted.
2. Loads super load = A.A.S.H.T.O. H-20; Fill Load = 0 to 15 ft. Earth.
3. Bend Data, ϕ Rad., B, C and Reinforcing shall be based upon D1 or D2, whichever is smaller.

Pipe Dimen.	ϕ Rad.	A	B	C	Bars E Spacing	Bars F Spacing	d
38"x24"	6'-0"	4'-8"	8"	10"	#5 @ 6"	#5 @ 8"	3'-0"
42"x27"	7'-0"	4'-10"	8"	10"	#5 @ 6"	#5 @ 8"	3'-0"
45"x29"	8'-0"	5'-1"	8"	10"	#5 @ 6"	#5 @ 8"	3'-0"
53"x34"	9'-0"	5'-9"	8"	10"	#5 @ 6"	#5 @ 8"	3'-0"
60"x38"	10'-0"	6'-4"	8"	12"	#6 @ 8"	#6 @ 10"	3'-0"
68"x43"	11'-0"	7'-8"	12"	12"	#6 @ 8"	#6 @ 10"	3'-0"
76"x48"	12'-0"	8'-4"	12"	12"	#6 @ 8"	#6 @ 10"	3'-0"
83"x53"	13'-0"	8'-11"	12"	12"	#6 @ 8"	#6 @ 10"	3'-0"
91"x58"	14'-0"	9'-7"	12"	12"	#6 @ 8"	#6 @ 10"	3'-0"



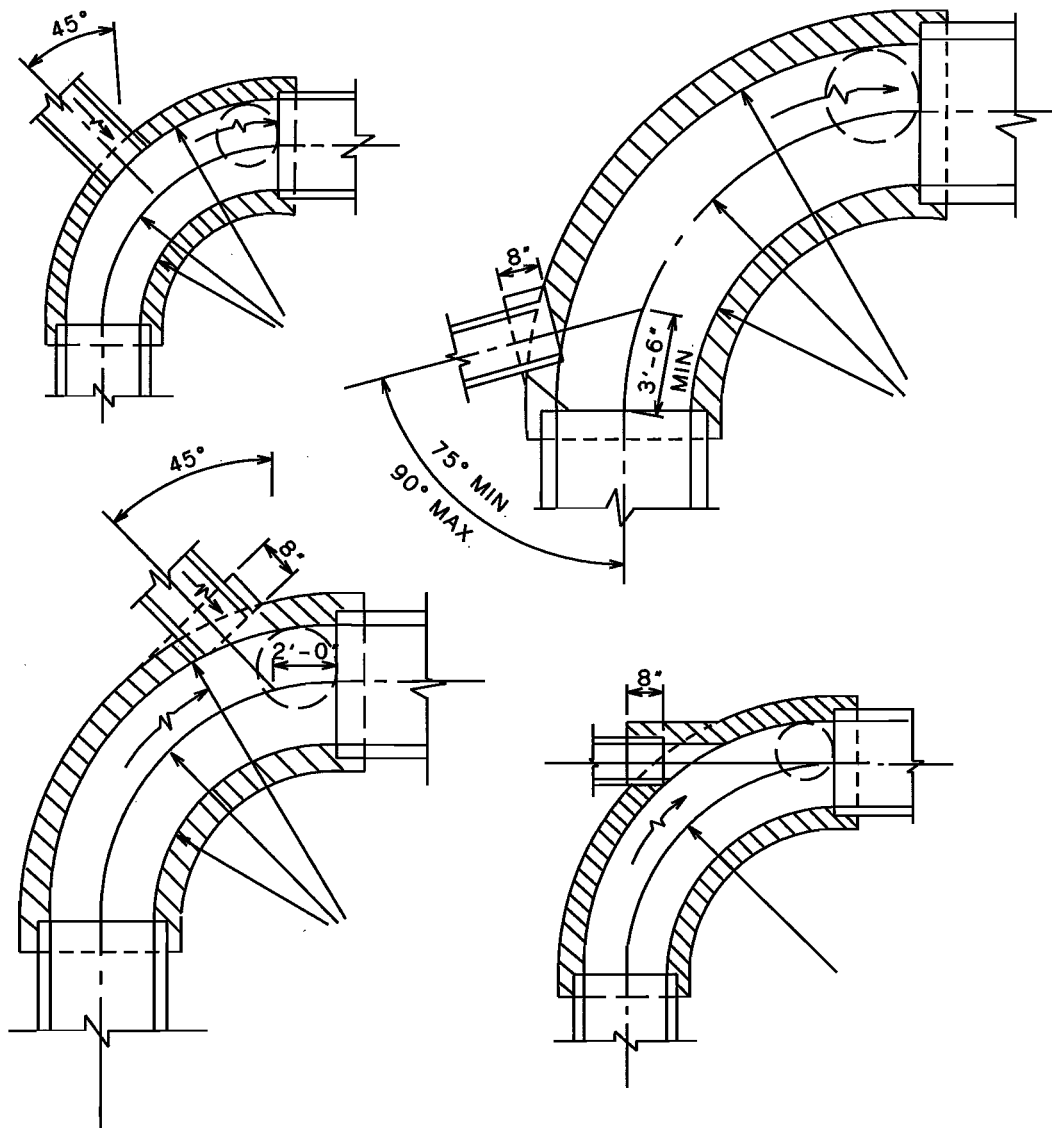
[Signature] 5-2-00
DIRECTOR OF PUBLIC WORKS DATE
[Signature] 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

BEND STRUCTURE
ELLIPTICAL PIPE

ISSUED 05-02-00
REVISED _____
REVISED _____
PLATE D-53



NOTES:

MANHOLE LOCATION, SIZE AND DETAILS, CONCRETE AND REINFORCING STEEL REQUIREMENTS, CENTER LINE RADIUS AND OTHER DETAILS SHALL BE IN ACCORDANCE WITH BEND STRUCTURE DETAIL D-52 & D-53

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 DIRECTOR OF PUBLIC WORKS DATE
[Signature] 4/12/00
 DEP. DIRECTOR, PUBLIC WORKS DATE

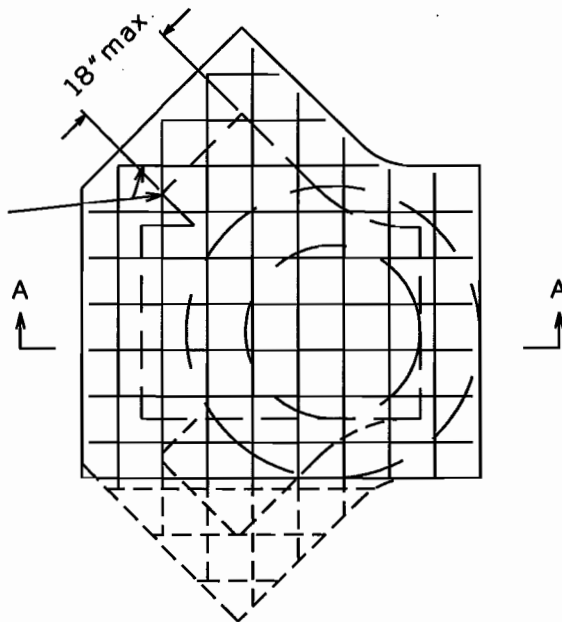


HARFORD COUNTY, MD
 DEPARTMENT OF
 PUBLIC WORKS

CONNECTION LOCATIONS
 TO BE ND STRUCTURES

ISSUED 05-02-00
 REVISED _____
 REVISED _____
 PLATE D-54

#5 @ 6" O/c E.W.

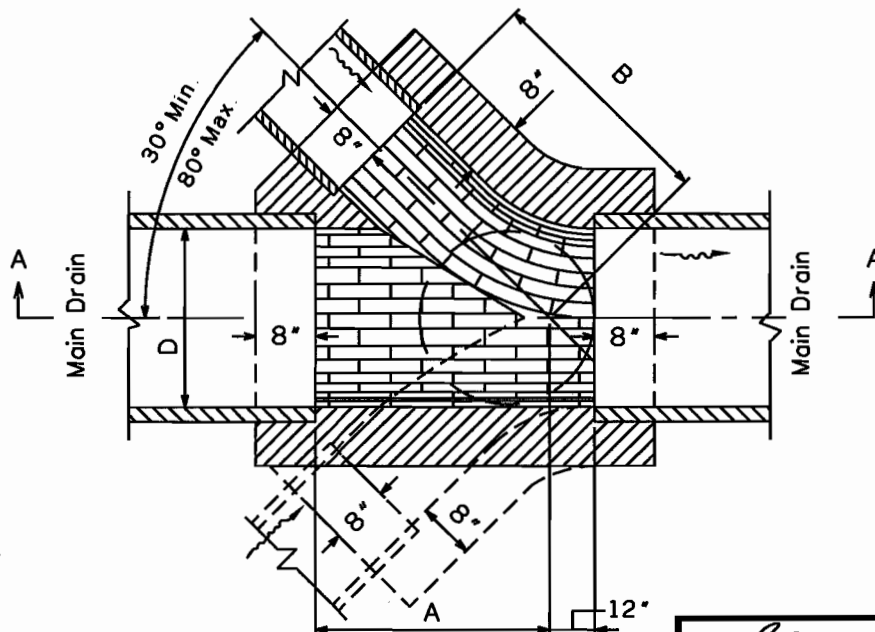
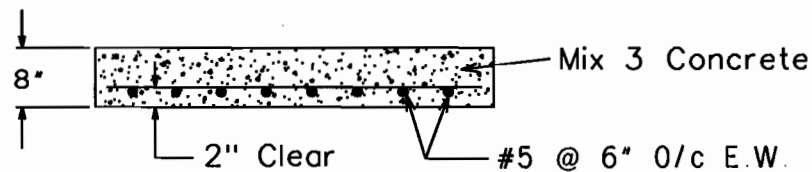


NOTES:

1. Walls and bottom shall be Brick or Mix 3 Concrete
2. Manhole stack and additional slab reinforcing shall conform to that of Type C Manhole.
3. Walls and bottom shall conform to the Standard Bend Structure Detail.

MINIMUM DIMENSIONS		
D	A	B
15'-18'	3'-9"	2'-9"
21'-30'	4'-4"	3'-7"
33'-36'	4'-7"	3'-11"

PLAN OF ROOF SLAB REINFORCING



PLAN

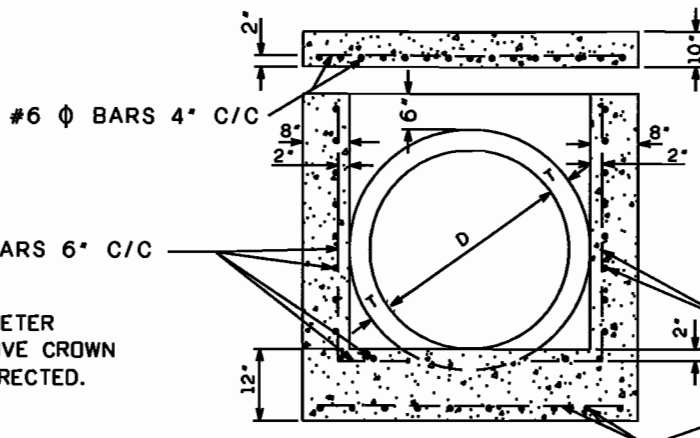
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HARFORD COUNTY, MD
 DEPARTMENT OF
 PUBLIC WORKS

JUNCTION CHAMBER
 SINGLE & DOUBLE

ISSUED 05-02-00
 REVISED _____
 REVISED _____
 PLATE D - 55

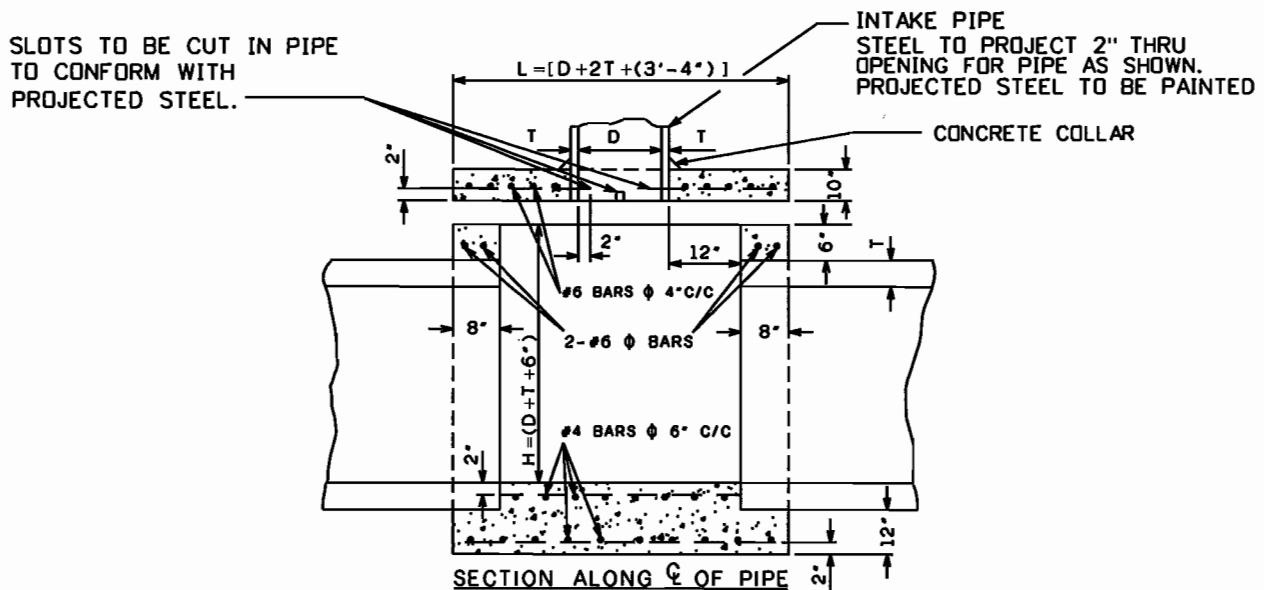


CONCRETE - SEE LATEST S.H.A. SPECIFICATIONS
REINFORCEMENT-DEFORMED BARS

NOTE: NO PROVISION IS TO BE MADE IN SLAB FOR INTAKE PIPE WHEN NOT NEEDED.

PROVIDE A 1" DIAMETER WEEP HOLE 6" ABOVE CROWN OF PIPE OR AS DIRECTED.

SECTION AT PIPE OPENING



SLOTS TO BE CUT IN PIPE TO CONFORM WITH PROJECTED STEEL.

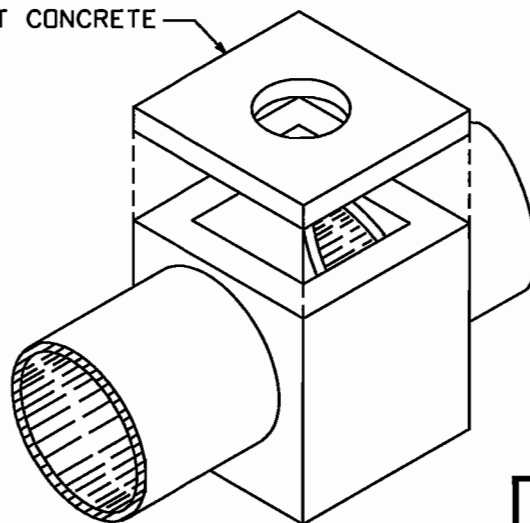
INTAKE PIPE
STEEL TO PROJECT 2" THRU OPENING FOR PIPE AS SHOWN.
PROJECTED STEEL TO BE PAINTED

CONCRETE COLLAR

SECTION ALONG C OF PIPE

TOP SLAB, PRE-CAST CONCRETE

NOTE:
PRECASTING IS
OPTIONAL.



ISOMETRIC VIEW

W. L. Allen, Jr.
DIRECTOR OF PUBLIC WORKS
W. L. Allen, Jr.
DEP. DIRECTOR, PUBLIC WORKS

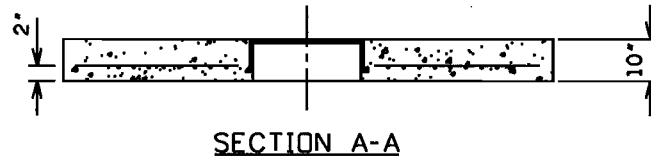
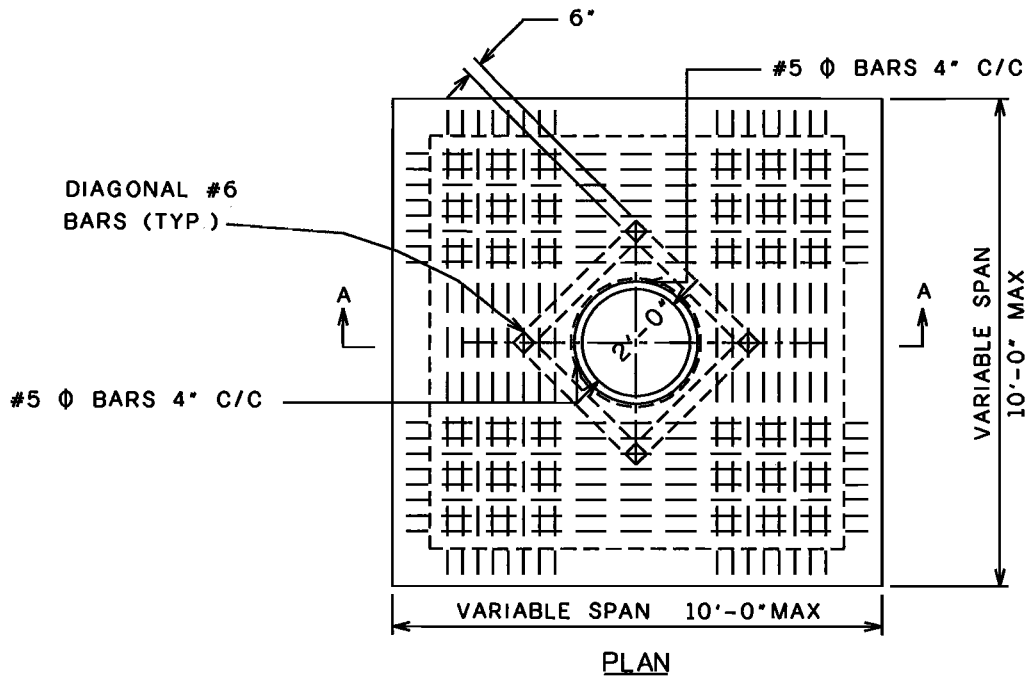
5-2-00
DATE
4/12/00
DATE



HARFORD COUNTY, MD
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PUBLIC WORKS

STANDARD JUNCTION BOX

ISSUED 05-02-00
REVISED
REVISED
PLATE D-56



GENERAL NOTES

REINFORCEMENT-DEFORMED BARS
 MANHOLE CASTINGS-INSIDE DIA. 2'-0"
 MANHOLE CASTINGS-MAX. DEPTH 0'-7"

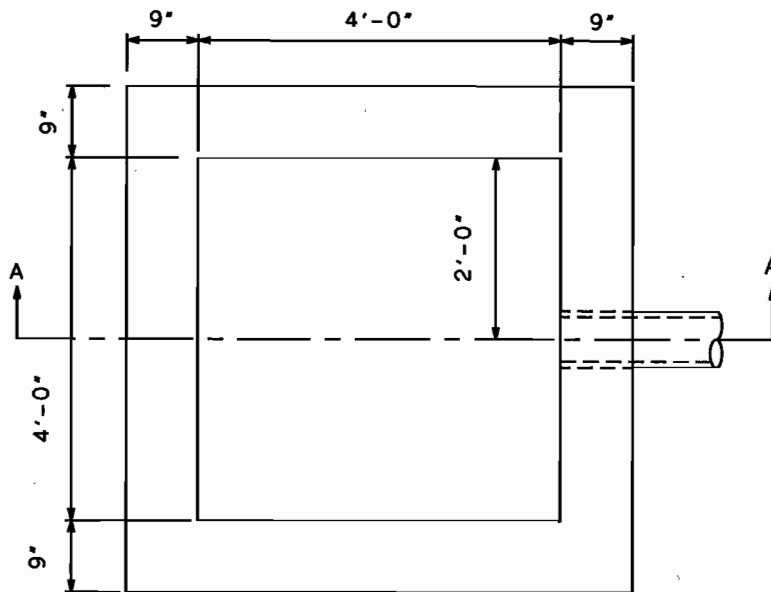
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 DIRECTOR OF PUBLIC WORKS DATE
[Signature] 4/12/00
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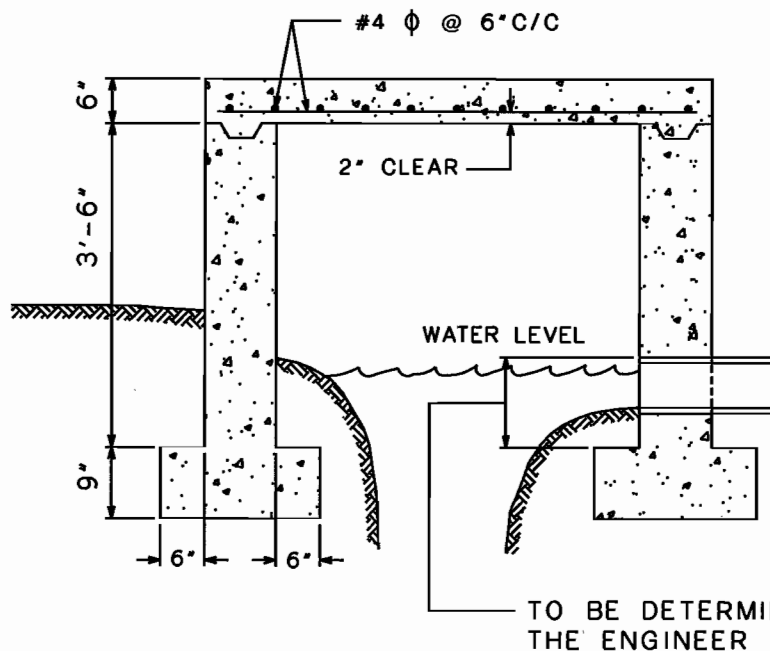
HARFORD COUNTY, MD
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PRE-CAST REINFORCED
 CONCRETE SLAB

ISSUED 05-02-00
 REVISED _____
 REVISED _____
 PLATE D-57



PLAN



CONCRETE:
SEE SPECIFICATIONS

6" VITRIFIED TILE
OUTLETS

TO BE DETERMINED BY
THE ENGINEER

SECTION A-A

W. H. H. H.
DIRECTOR OF PUBLIC WORKS
W. H. H. H.
DEP. DIRECTOR, PUBLIC WORKS

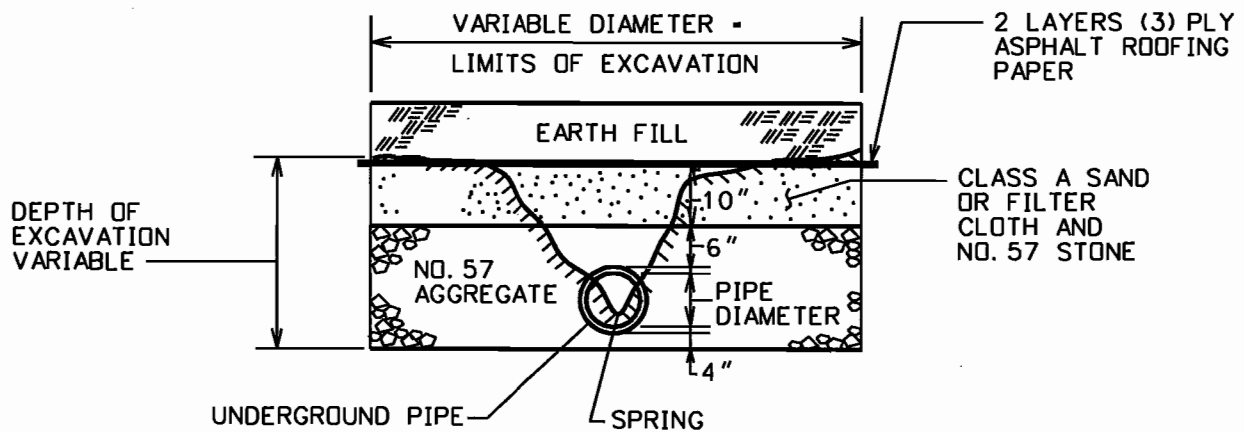
5-2-00
DATE
4/12/00
DATE



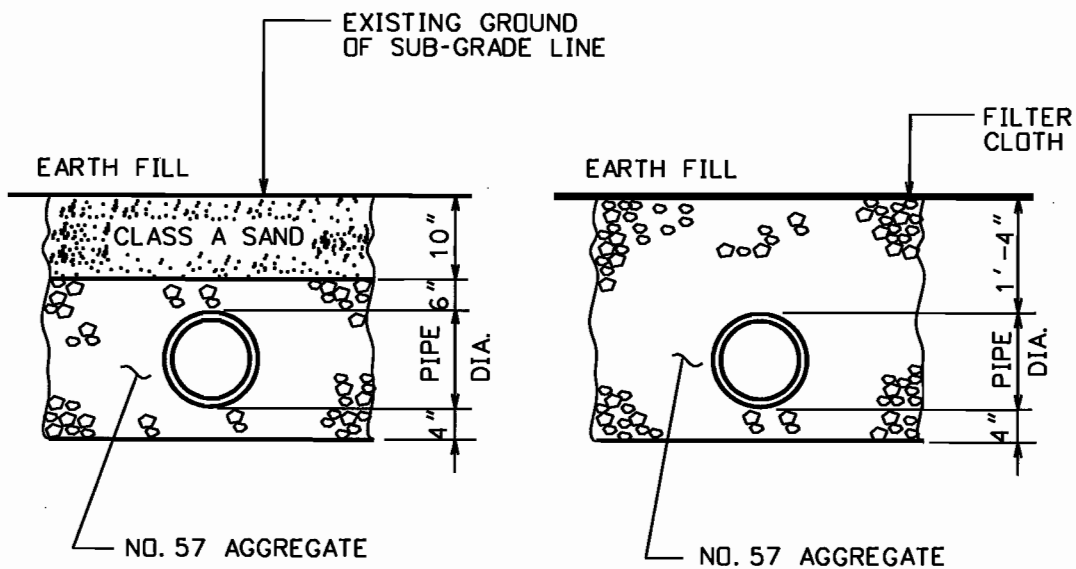
HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

STANDARD SPRING BOX
SPRING OR WELL PROTECTION

ISSUED 05-02-00
REVISED _____
REVISED _____
PLATE D-58



CIRCULAR PLAN VIEW NOT SHOWN
TO BE USED WHERE NOTED ON PLANS
OR WHERE DIRECTED BY ENGINEER



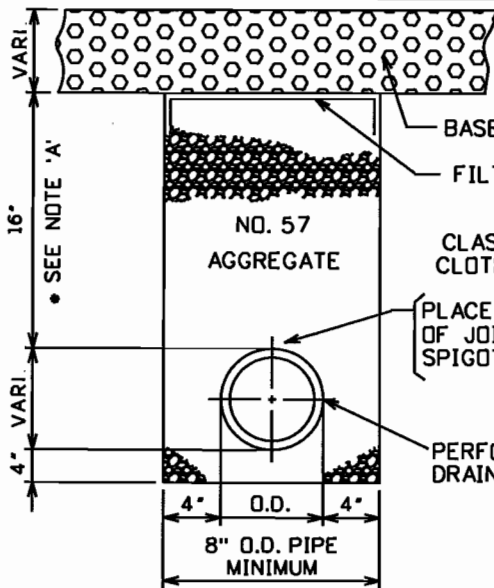
[Signature] 5-2-00
DIRECTOR OF PUBLIC WORKS DATE
[Signature] 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE



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DEPARTMENT OF
PUBLIC WORKS

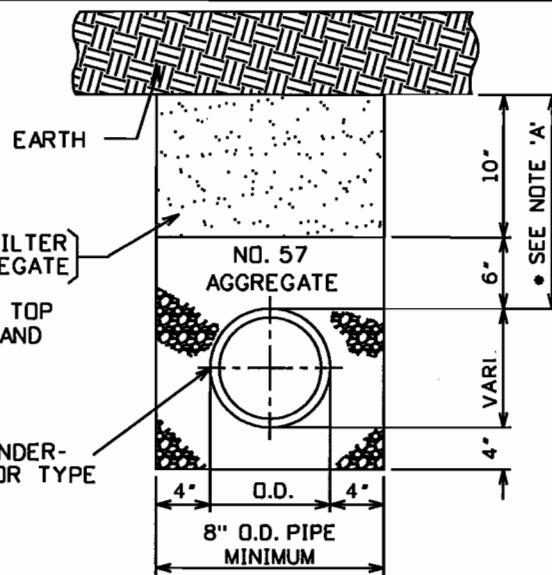
SPRING CONTROL METHOD AND DETAIL

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE D-59

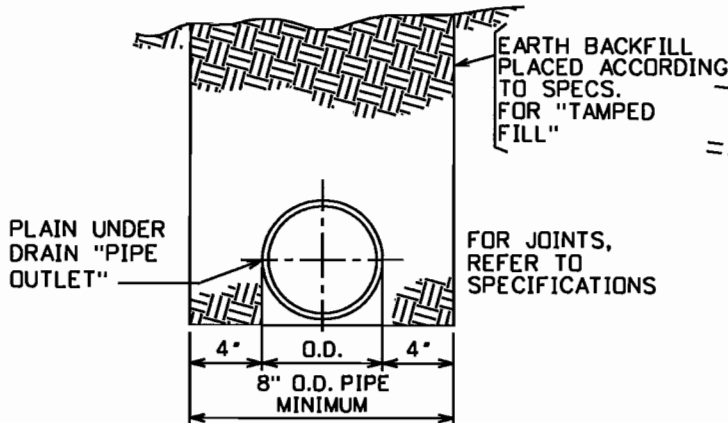


**SUB-BASE DRAINAGE
DITCH SECTION**

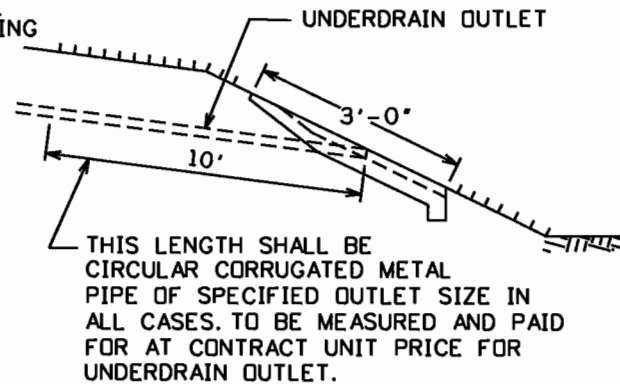
•• ALL CONCRETE DENOTED WILL BE MIX NO. 3 ••



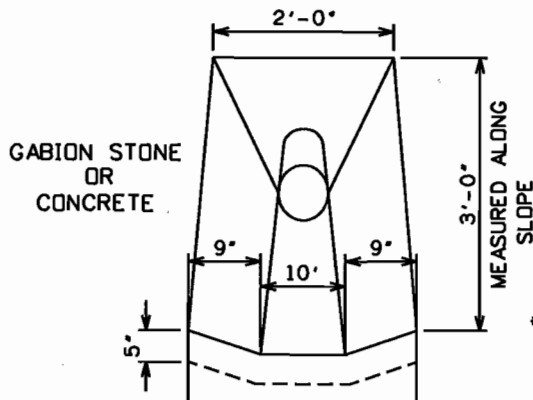
**SUB-SURFACE DRAINAGE
DITCH SECTION**



OUTLET DITCH SECTION



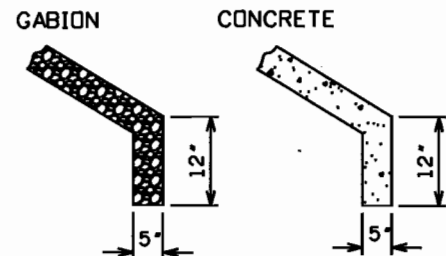
5" CONCRETE GUTTER FOR UNDERDRAIN OUTLET



ELEVATION-UNDERDRAIN OUTLET

NOTE: UNDERDRAIN TO BE LAID ON A MINIMUM OF 0.5% GRADE UNLESS OTHERWISE DIRECTED.

• NOTE 'A': WHERE AN UNDERDRAIN OUTLETS INTO AN INLET, OR WHERE ANY OTHER UNUSUAL CONDITIONS PREVAIL, THESE DIMENSIONS MAY BE VARIED AS DIRECTED.



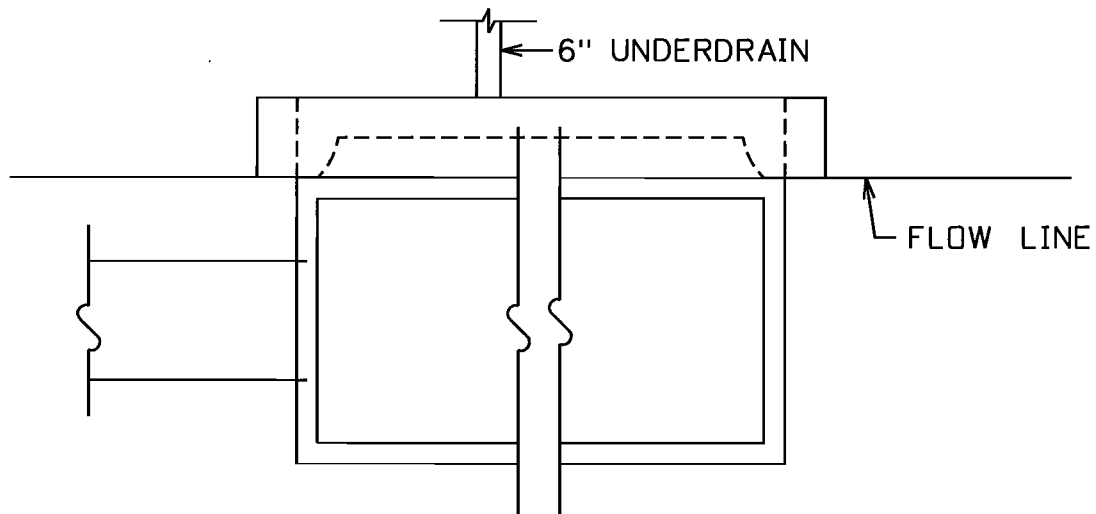
TOE WALL



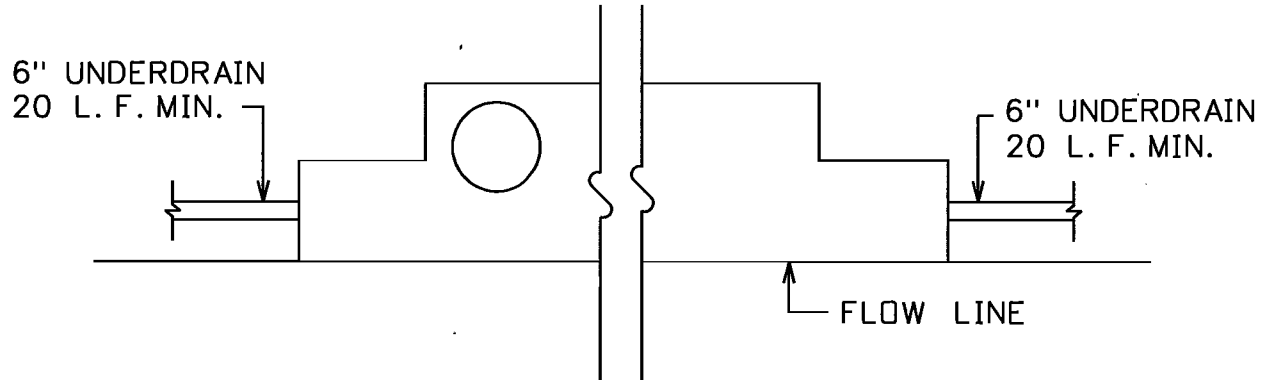
HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

STANDARD UNDERDRAINS

ISSUED 05-02-00
REVISED
REVISED
PLATE D - 60



PLACEMENT AT COMBINATION INLETS



PLACEMENT AT COS OR COG INLETS

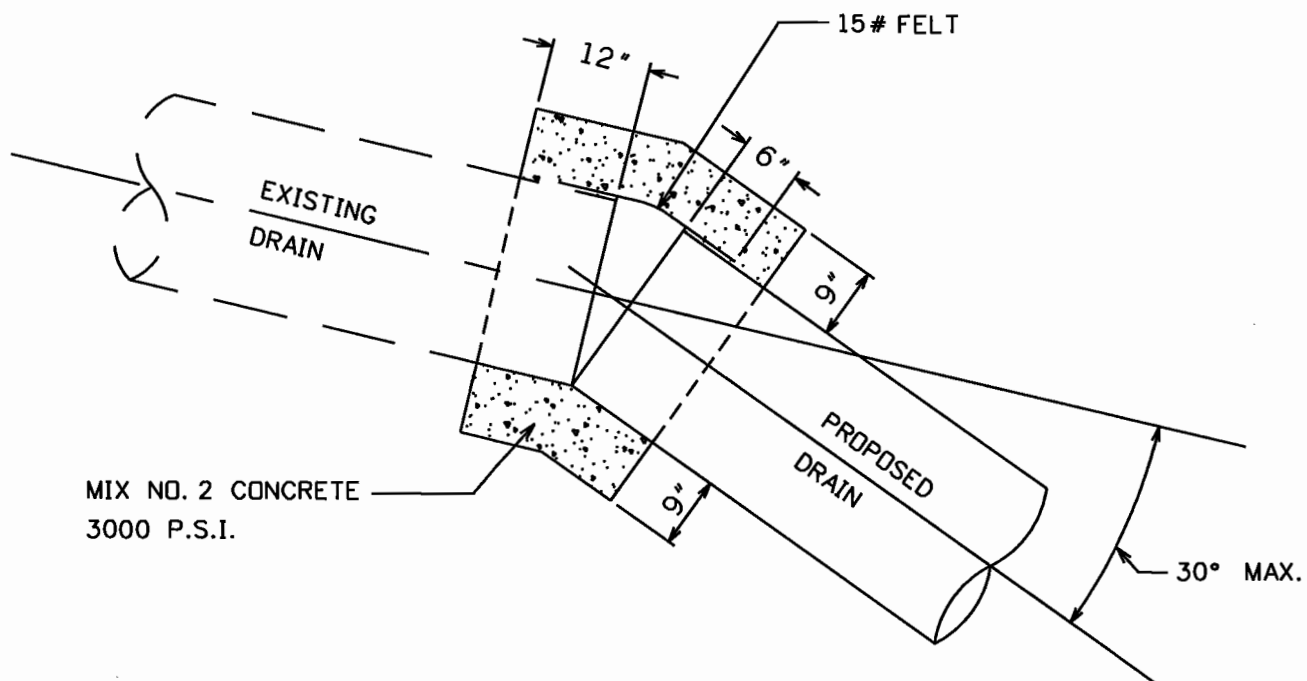
<i>[Signature]</i>	5-2-00
DIRECTOR OF PUBLIC WORKS	DATE
<i>[Signature]</i>	4/12/00
DEP. DIRECTOR, PUBLIC WORKS	DATE



HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

STANDARD PLACEMENT
UNDERDRAIN AT INLETS

ISSUED	5-2-00
REVISED	
REVISED	
PLATE	D - 61



NOTE: FOR DRAINS OVER 24" D., USE
BRICK BEND OR MANHOLE.

[Signature]
DIRECTOR OF PUBLIC WORKS
DATE 5-2-00

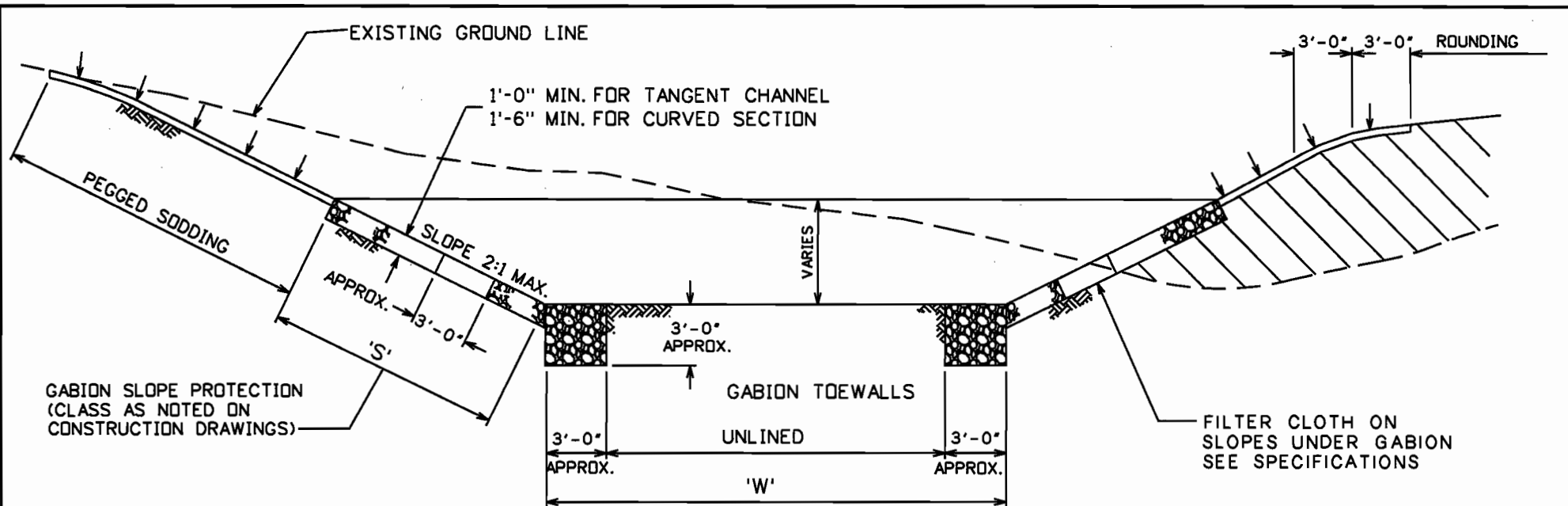
[Signature]
DEP. DIRECTOR, PUBLIC WORKS
DATE 4/12/00



HARFORD COUNTY, MD
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CONCRETE COLLAR
24" DRAIN AND UNDER

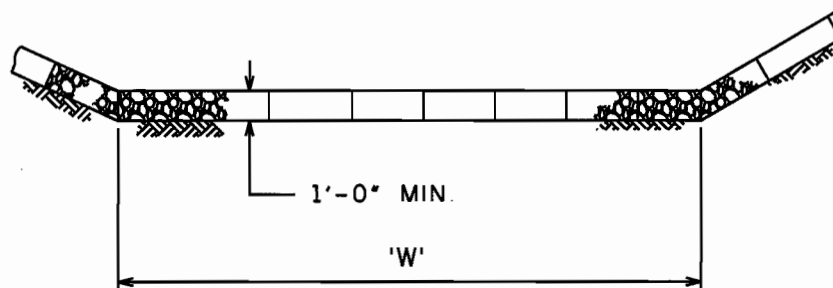
ISSUED 05-02-00
REVISED _____
REVISED _____
PLATE D - 62



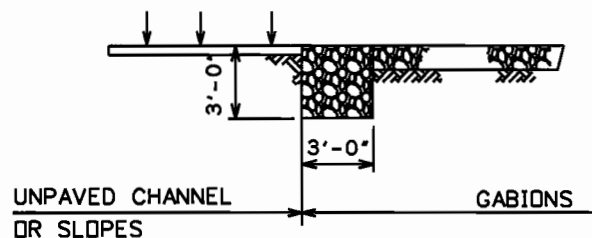
UNLINED INVERT

NOTE:

'W' DENOTES CHANNEL WIDTHS, AND
NEED NOT BE IN 3'-0" MULTIPLES



LINED INVERT



END TOEWALL DETAIL

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DIRECTOR OF PUBLIC WORKS DATE
[Signature] 4/12/00
DEP. DIRECTOR, PUBLIC WORKS DATE

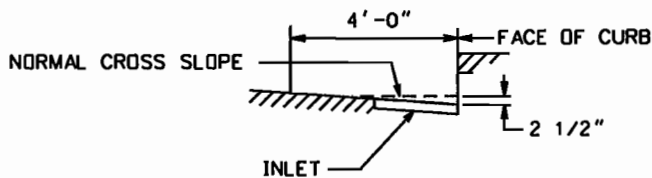
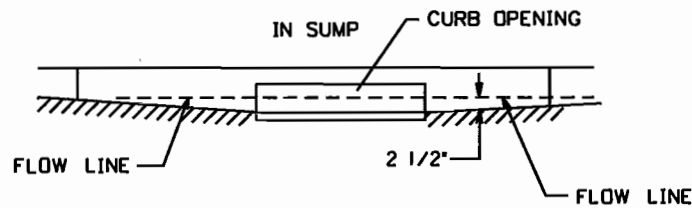
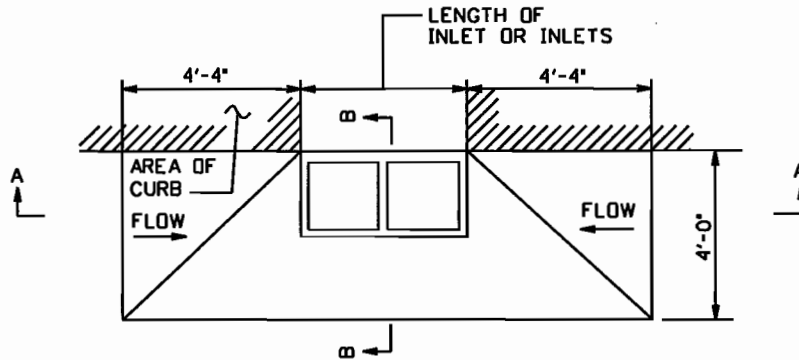
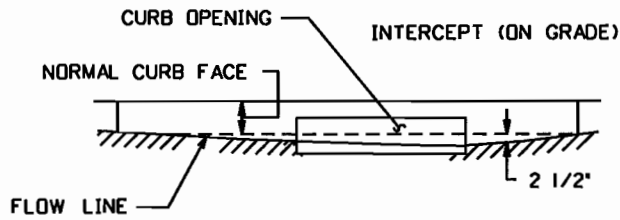
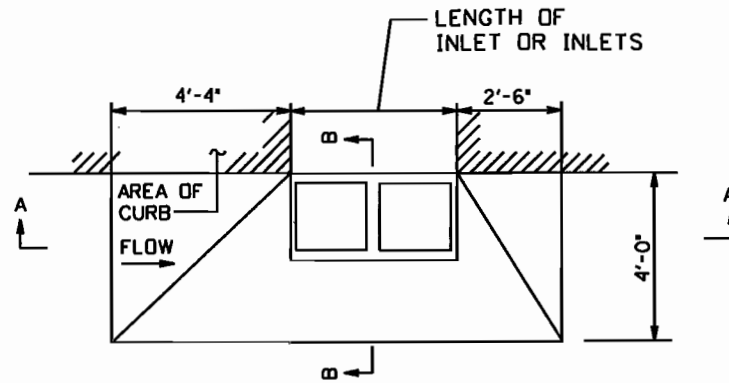


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

GABION CHANNEL LINING

ISSUED 5-2-00
REVISED
REVISED

PLATE D - 63



[Signature] 5-2-00
 DIRECTOR OF PUBLIC WORKS DATE
[Signature] 4/12/00
 DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD
 DEPARTMENT OF
 PUBLIC WORKS

METHOD FOR DEPRESSING PAVEMENT AT INLETS

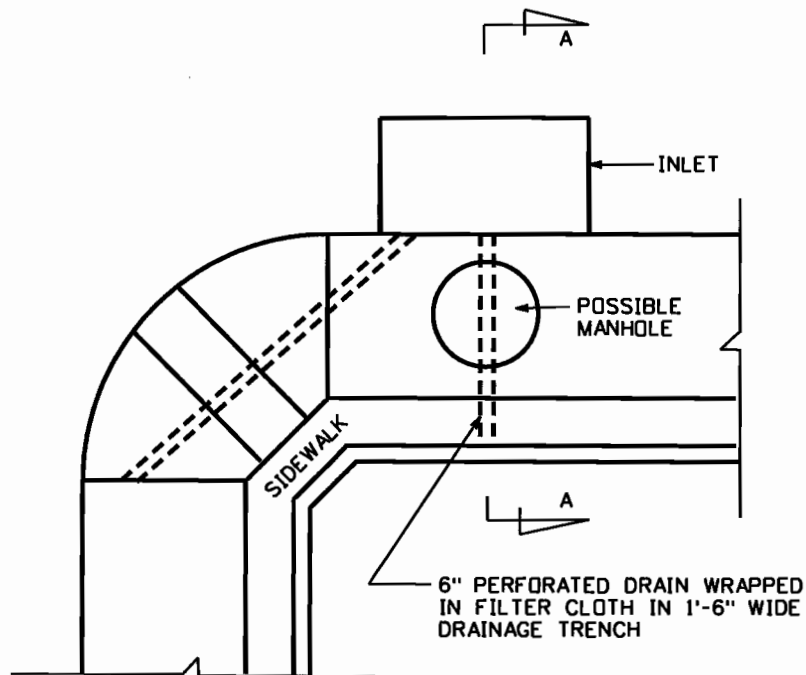
FOR USE AT EXISTING INLETS ONLY

ISSUED 05-02-00

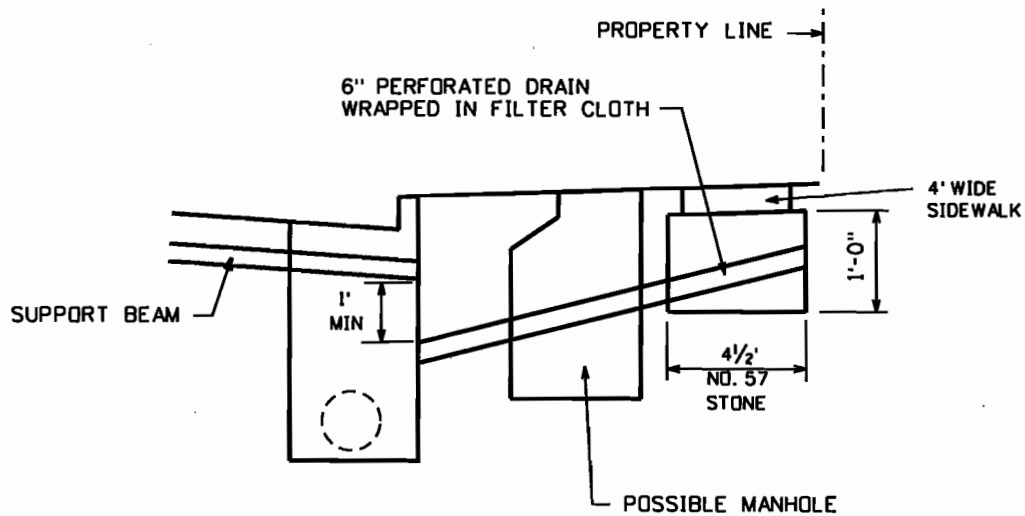
REVISED _____

REVISED _____

PLATE D-64



PLAN



SECTION A - A

W. A. G. Jr. 5-2-00
 DIRECTOR OF PUBLIC WORKS DATE
W. J. Johnson 4/12/00
 DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD
 DEPARTMENT OF
 PUBLIC WORKS

SIDEWALK
 PEDESTRIAN RAMP
 UNDERDRAIN

ISSUED 5-2-00
 REVISED _____
 REVISED _____
 PLATE D-65

SECTION VI

STRUCTURES

Plate

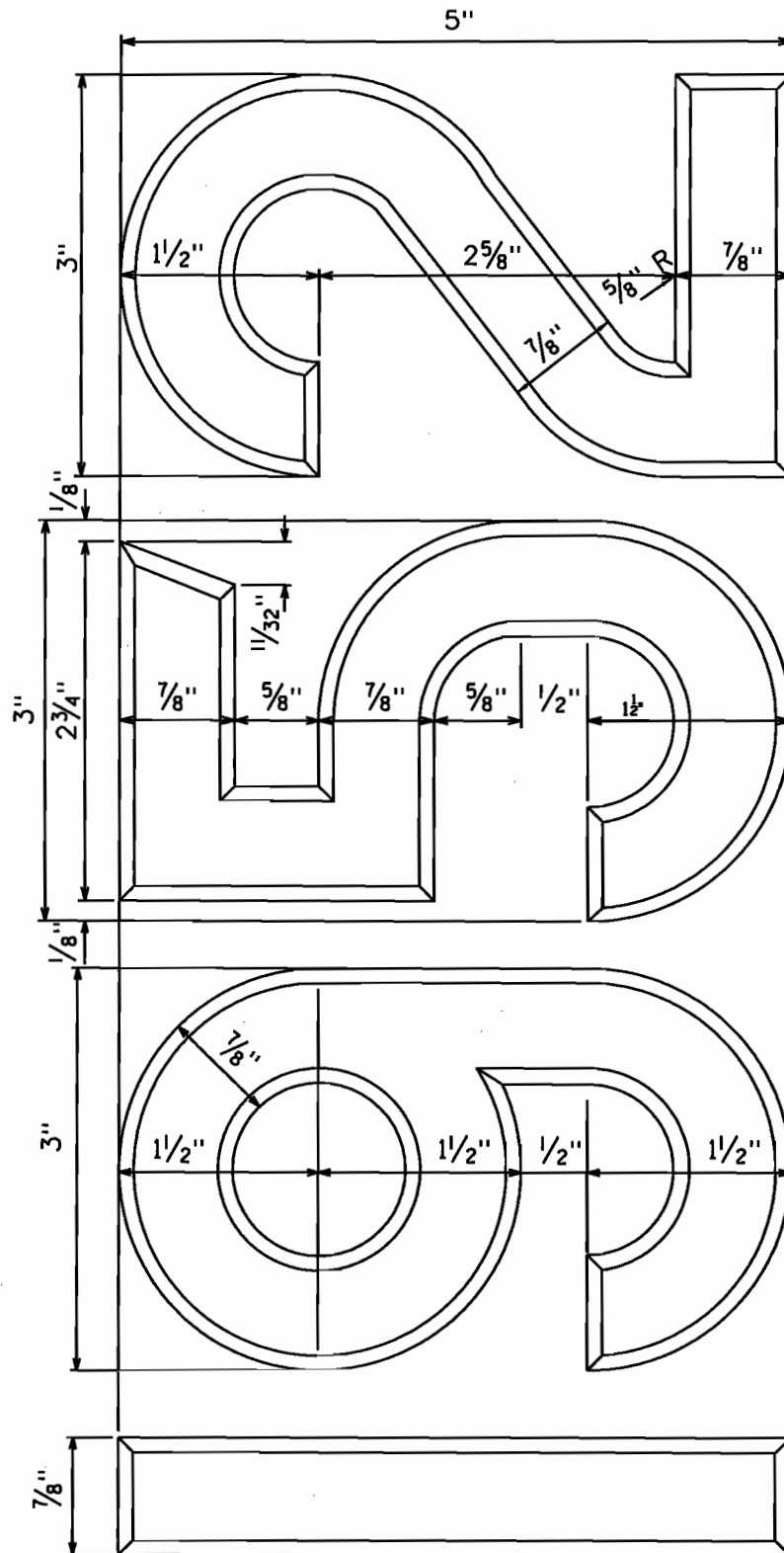
Standard "Year Built" Numerals.....ST-1

Standard "Year Built" Numerals.....ST-2

Standard "Year Built" Numerals.....ST-3

Standard "Year Built" Numerals.....ST-4

TO BE PLACED ON ALL STRUCTURES - AS DIRECTED BY THE ENGINEER



[Signature]
 DIRECTOR OF PUBLIC WORKS
 DATE 5-2-00

[Signature]
 DEP. DIRECTOR, PUBLIC WORKS
 DATE 4/12/00



HARFORD COUNTY, MD
 DEPARTMENT OF
 PUBLIC WORKS

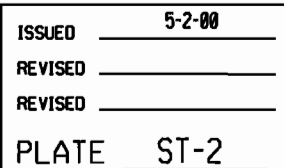
STANDARD
 "YEAR BUILT"
 NUMERALS

ISSUED 5-2-00
 REVISED _____
 REVISED _____
 PLATE ST-1

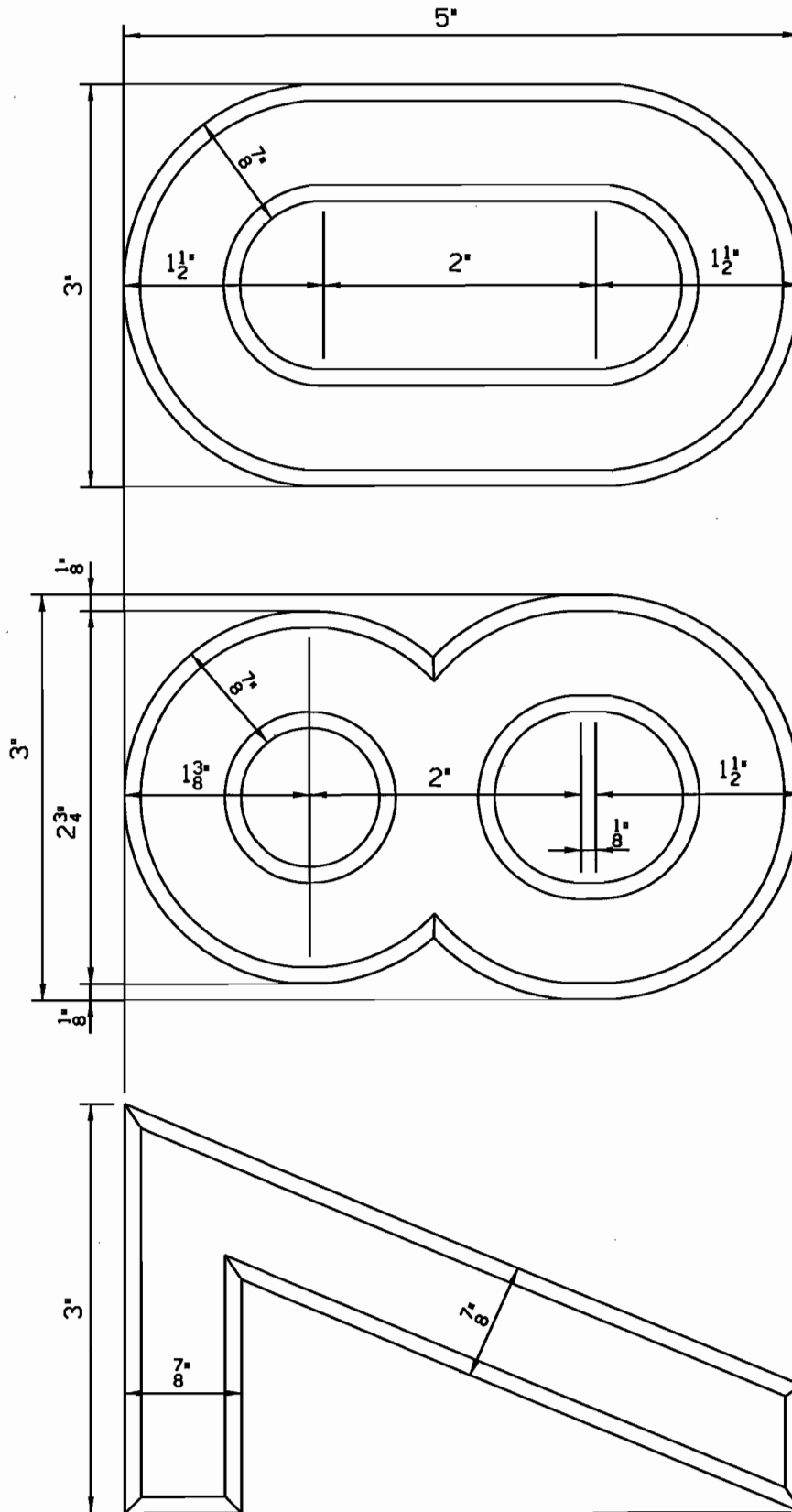
The image contains three technical drawings of letters, each with dimensions in inches:

- Letter S:** The top drawing shows a stylized letter 'S' with a total width of 5" and a total height of 3". The letter is composed of two main curved sections. The left section has a width of 1 1/2" and a height of 1 1/2". The right section has a width of 1 1/2" and a height of 1 1/2". The thickness of the letter is 1/8".
- Letter Z:** The middle drawing shows a stylized letter 'Z' with a total width of 5" and a total height of 3". The letter is composed of three main sections: a top horizontal bar, a middle diagonal bar, and a bottom horizontal bar. The top bar has a width of 5" and a height of 1/4". The middle bar has a width of 3 3/8" and a height of 7/8". The bottom bar has a width of 3 3/4" and a height of 7/8". The thickness of the letter is 1/8".
- Letter B:** The bottom drawing shows a stylized letter 'B' with a total width of 5" and a total height of 3". The letter is composed of three main sections: a top horizontal bar, a middle diagonal bar, and a bottom horizontal bar. The top bar has a width of 5" and a height of 1/4". The middle bar has a width of 3 3/8" and a height of 7/8". The bottom bar has a width of 3 3/4" and a height of 7/8". The thickness of the letter is 1/8".

4/12/00
DATE



TO BE PLACED ON ALL STRUCTURES - AS DIRECTED BY THE ENGINEER



[Signature]
DIRECTOR OF PUBLIC WORKS

5-2-00
DATE

[Signature]
DEP. DIRECTOR, PUBLIC WORKS

4/12/00
DATE

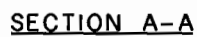


HARFORD COUNTY, MD
DEPARTMENT OF
PUBLIC WORKS

STANDARD
'YEAR BUILT'
NUMERALS

ISSUED 5-2-00
REVISED _____
REVISED _____
PLATE ST-3

DATE



STANDARD "YEAR BUILT" NUMERALS

ISSUED 5-2-00
 REVISED _____
 REVISED _____
PLATE ST-4