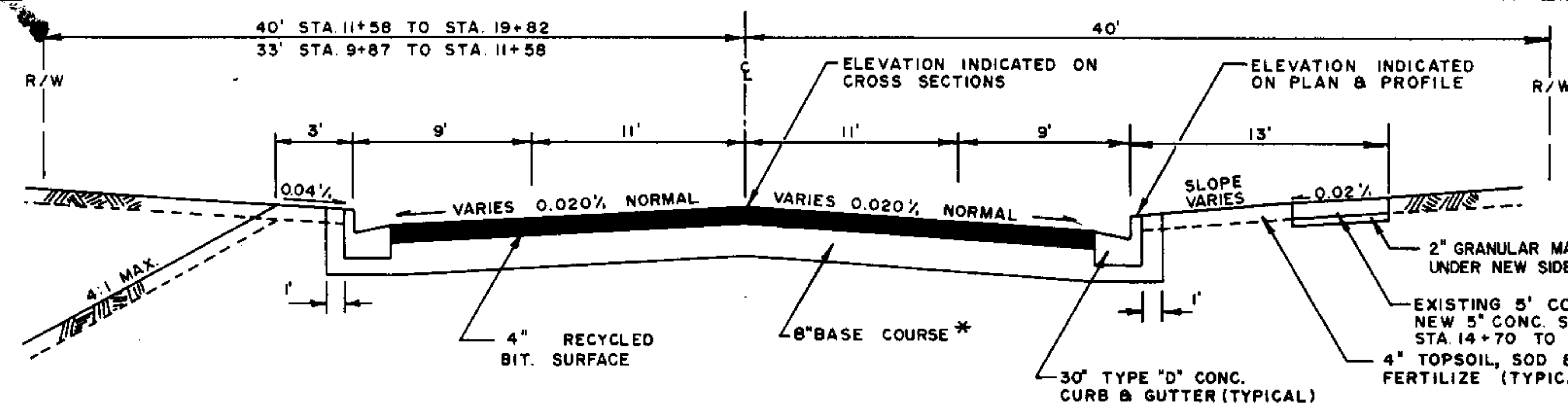
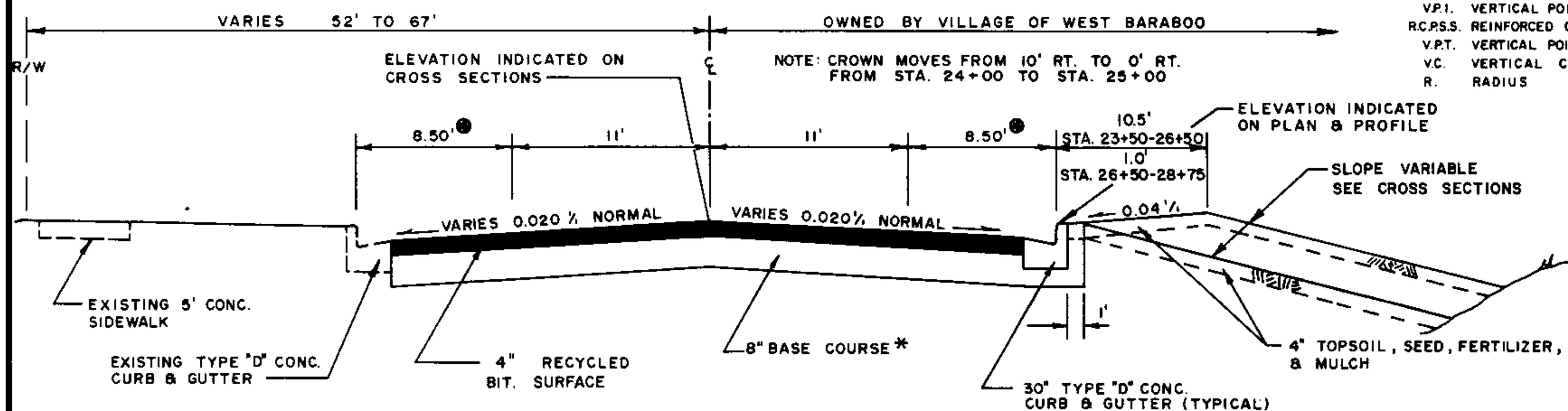




TYPICAL SECTION

STA. 9+92.28 TO STA. 19+82

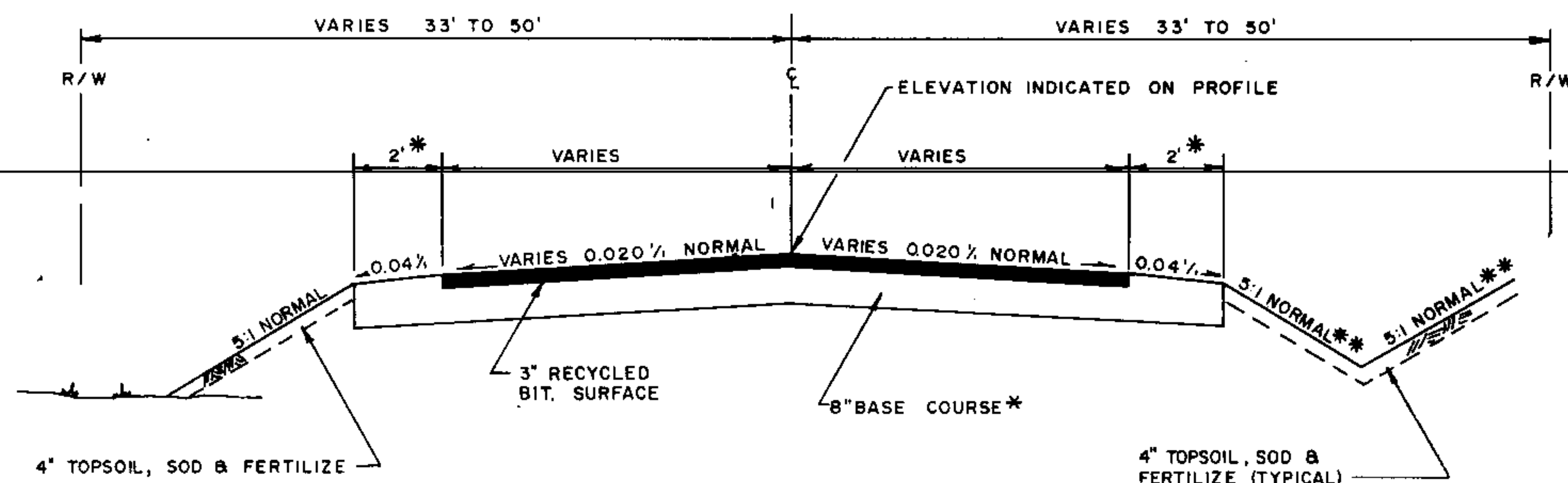


TYPICAL SECTION

STA. 23+50 TO STA. 28+75

● NOTE: 8.5' NORMAL - TAPERS 8.5' TO 4' FROM STA. 26+50 TO STA. 28+00

* 8" BASE COURSE SHALL BE CRUSHED AGGREGATE BASE COURSE UPPER LAYER AND BREAKER RUN LOWER LAYER.



TYPICAL SECTION

SIDE STREETS
(BEYOND CURB & GUTTER LIMITS)

* NOTE: 2'-0" NORMAL - TAPERS 2'-0" TO 0' IN LAST 10'

** NOTE: 5:1 NORMAL - 4:1 MAX. IF REQUIRED TO MAINTAIN DRAINAGE.

STANDARD DETAIL DRAWINGS

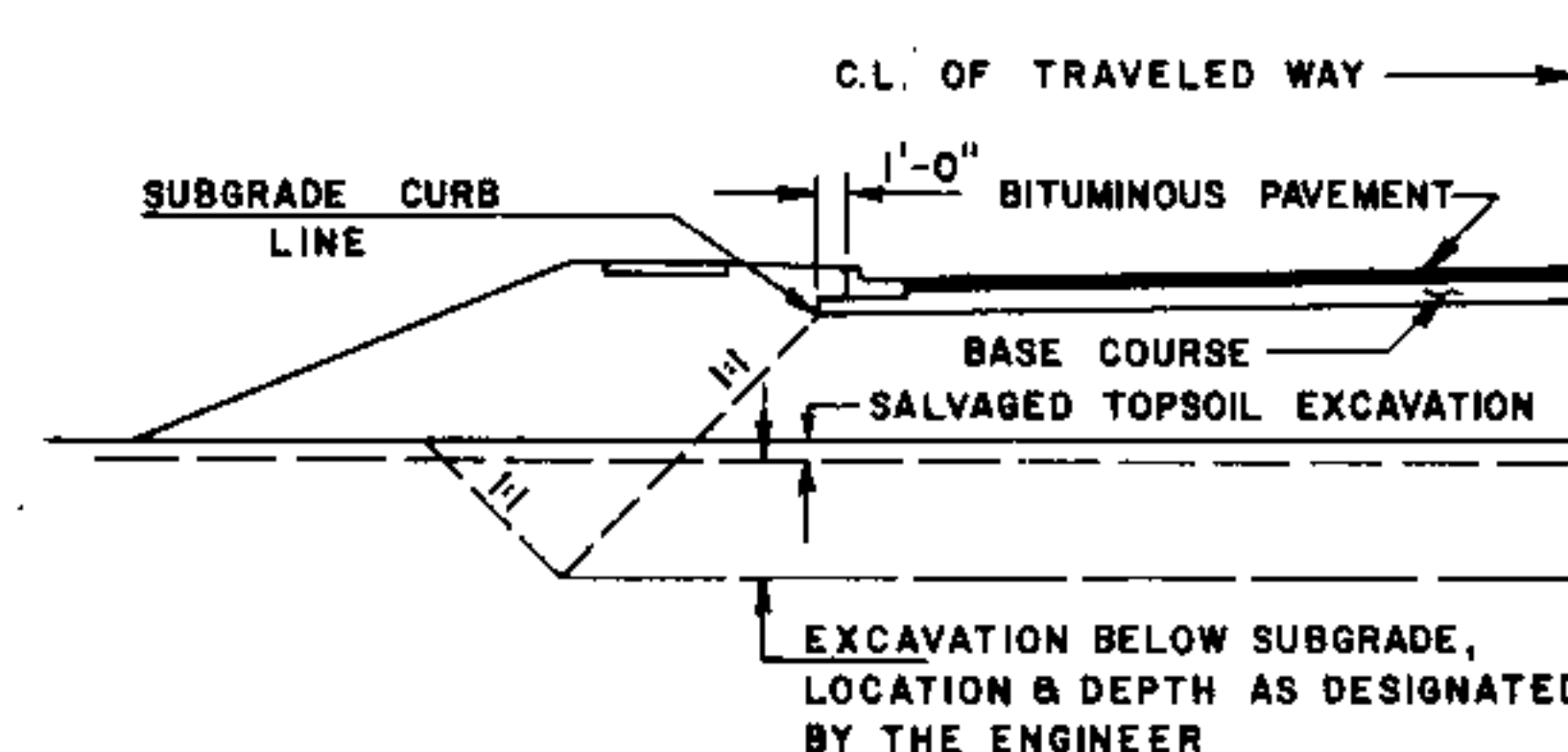
- 8A 5-3AB8 CATCH BASIN, MANHOLE & INLET COVERS
- 8B 6-3 MANHOLES, TYPE 1
- 8C 1-4 INLETS TYPE 1, 2, & 3
- 8C 5-1 INLETS TYPE 8, 9, 10 & 11
- 8D 1-6 CONCRETE CURB, CONCRETE CURB & GUTTER AND PAVEMENT TIES
- 8D 5-6 CURB RAMPS
- 8E 8-1 EROSION BALES
- 8F 1-9 APRON ENDWALLS FOR CULVERT PIPE & PIPE ARCHES
- 8F 4-2 JOINT TIES FOR CONCRETE PIPE
- 14B 2-5a,b CLASS A STEEL PLATE BEAM GUARD
- 15 C 1-7 CONSTRUCTION BARRICADES & STANDARD SIGNS

STANDARD ABBREVIATIONS

C.P.	CONSTRUCTION PERMIT	STA.	STATION
B.M.	BENCHMARK	T.O.C.	TOP OF CURB
CL	CENTERLINE	CONC.	CONCRETE
ELEV.	ELEVATION	EXIST.	EXISTING
P.E.	PRIVATE ENTRANCE	BIT.	BITUMINOUS
V.P.C.	VERTICAL POINT OF CURVATURE	GRA.	GRAVEL
V.P.I.	VERTICAL POINT OF INTERSECTION	R.P.	RADIUS POINT
R.C.P.S.S.	REINFORCED CONCRETE PIPE STORM SEWER	L.F.	LINEAR FEET
V.P.T.	VERTICAL POINT OF TANGENCY		
V.C.	VERTICAL CURVE		
R.	RADIUS		

UTILITIES

- WISCONSIN POWER & LIGHT COMPANY (GAS & ELECTRIC)
MR. HENRY RATHJEN
401 OAK STREET
BARABOO, WISCONSIN 53913
608-356-5537
- WISCONSIN TELEPHONE COMPANY
MADISON OFFICE
MR. JIM BARDON, ENGINEER
608-252-2261
LOCATING 608-252-2484
- CITY OF BARABOO WATER DEPARTMENT
MR. ROBERT WOLKOWSKI
135 FOURTH STREET
BARABOO, WISCONSIN 53913
608-356-4143
- CITY OF BARABOO SANITARY SEWERS, STORM SEWERS, AND DEPARTMENT OF PUBLIC WORKS
MR. LEONARD COOK
407 BRIAR STREET
BARABOO, WISCONSIN 53913
608-356-4188
- CITY OF BARABOO ENGINEERING DEPARTMENT
MR. HAROLD PLATT, P.E., CITY ENGINEER
MUNICIPAL BUILDING
135 FOURTH STREET
BARABOO, WISCONSIN 53913
- VILLAGE OF WEST BARABOO
MR. DON KALSCHUR
MID-STATE ASSOCIATES
1111 EIGHTH STREET
BARABOO, WISCONSIN 53915
608-356-3996
- HERITAGE CABLEVISION, INC.
MR. HARLOW JARVIS
413 OAK STREET
BARABOO, WISCONSIN 53913
608-356-4838



DETAIL FOR EXCAVATION BELOW SUBGRADE

STATE PROJECT NUMBER SHEET NO.

5988 - 2 - 16 2

SHAW AND WILLOW STREET IMPROVEMENTS
WEST BARABOO, WISCONSIN
TYPICAL FINISHED SECTIONS & NOTES

GENERAL NOTES

NO TREES OR SHRUBS ARE TO BE REMOVED WITHOUT THE APPROVAL OF THE ENGINEER.

TOP OF CATCH BASINS AND MANHOLES IN STREET PAVING AREAS ARE TO BE ADJUSTED SO THEY MATCH FINISH GRADE OF THIS CONTRACT.

MISCELLANEOUS REMOVAL ITEMS REQUIRING RESTORATION OF CONCRETE OR BITUMINOUS CONCRETE DRIVEWAYS, SIDEWALKS OR SIDE STREETS SHALL BE REMOVED TO AN EXISTING JOINT OR SAWED AS DETERMINED BY THE ENGINEER. THE COST OF SAWING TO BE INCIDENTAL TO OTHER CONTRACT ITEMS.

PROPERTY CORNER IRON PINS WILL BE REFERENCED BY THE ENGINEER PRIOR TO GRADING OPERATIONS.

TYPICAL FINISHED SECTIONS SHOW THE GENERAL ROADWAY FEATURES THROUGHOUT THE PROJECT. PAVEMENT SLOPES, BORDER SLOPES, ETC., MAY VARY WITHIN THE STATION LIMITS OF THE STATION SECTIONS.

ALL PRIVATE EXISTING UTILITY FACILITIES TO BE ADJUSTED BY THE UTILITIES CONCERNED.

THE LOCATIONS OF EXISTING AND PROPOSED UTILITY INSTALLATION AS SHOWN ON THE PLANS ARE APPROXIMATE. THERE MAY BE ADDITIONAL UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN ON THE PLANS.

RADIUS DIMENSIONS FOR THE CURB AND GUTTER ARE TO THE BACK OF CURB.

EXCAVATION BELOW SUBGRADE (EBS) IS NOT SHOWN ON THE CROSS SECTIONS BUT IS MEASURED AND PAID FOR AS UNCLASSIFIED EXCAVATION. THE LOCATION FOR EBS WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.

EXPANSION JOINTS TO BE PLACED AT ALL RADIUS POINTS IN CURB AND GUTTER.

BITUMINOUS MATERIAL FOR TACK COAT SHALL BE APPLIED AT A RATE OF 0.015 TO 0.025 GAL/SY.

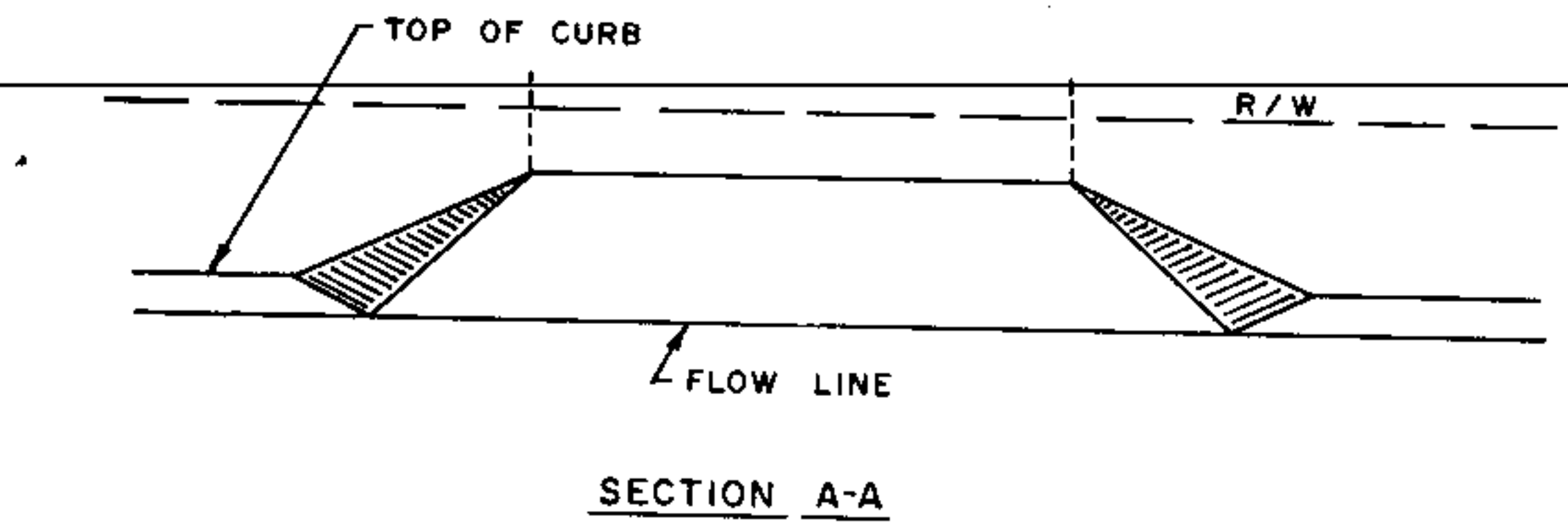
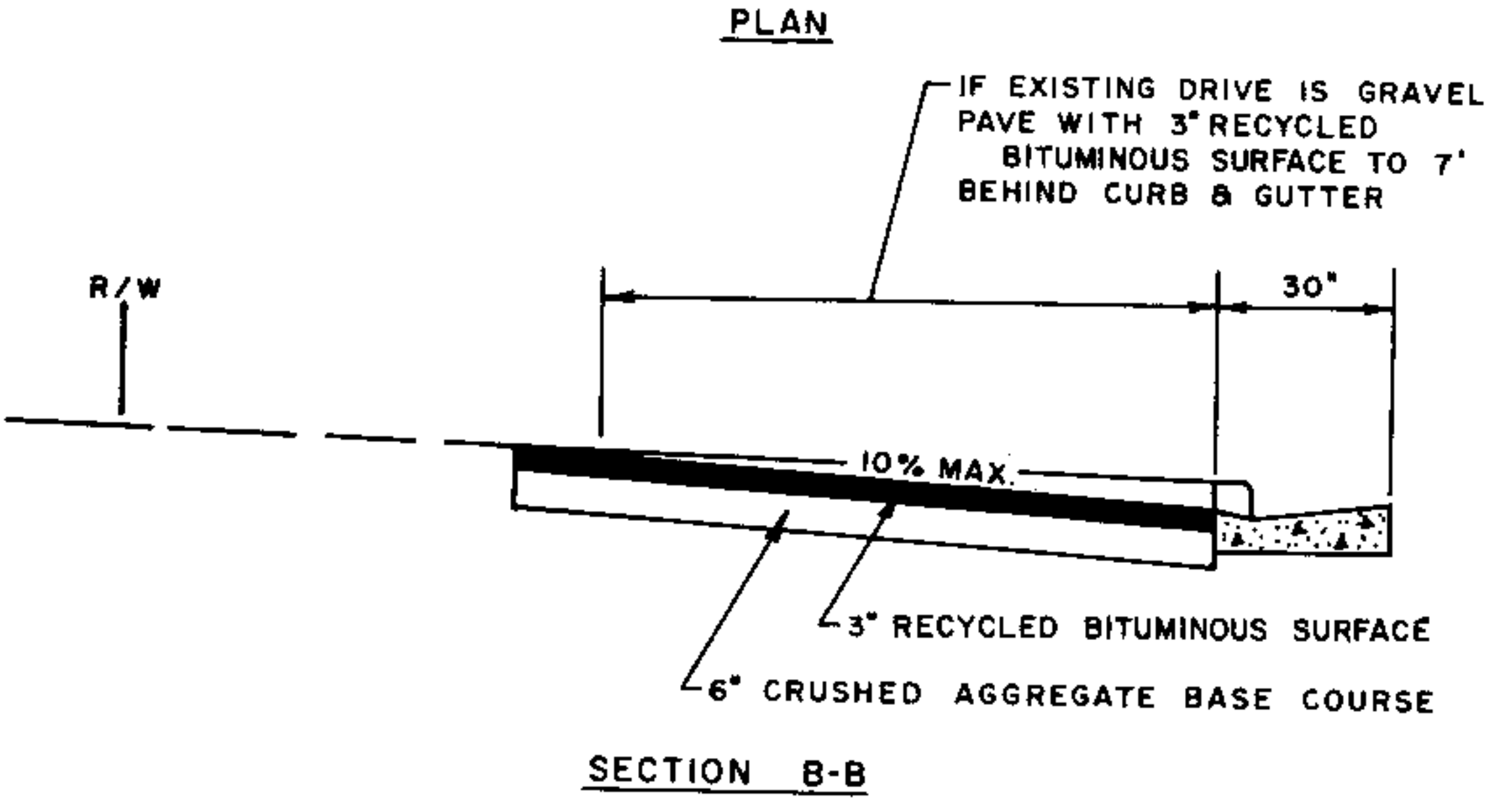
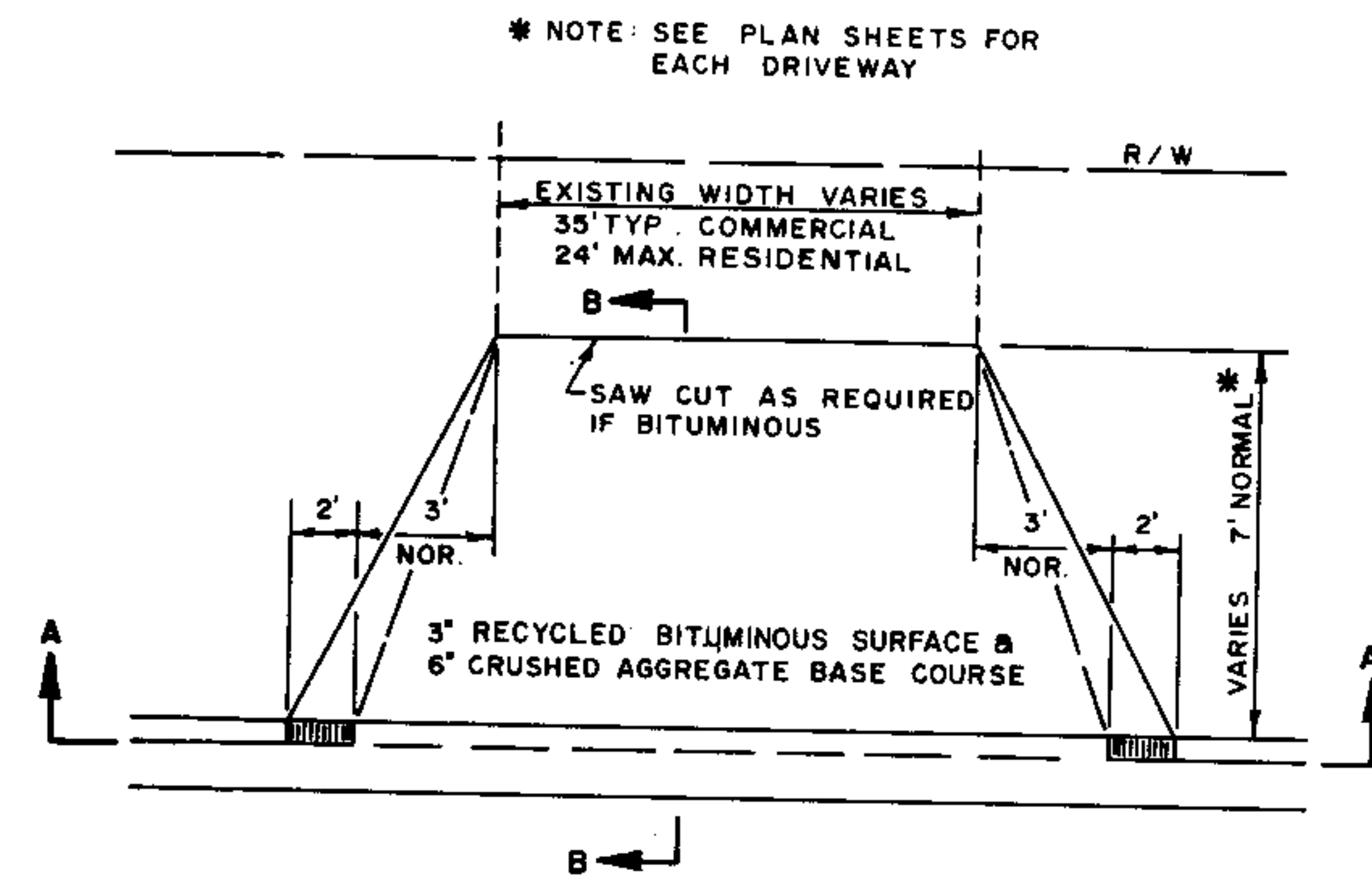
EXACT LOCATION AND WIDTH OF ALL DRIVEWAY ENTRANCES TO BE DETERMINED BY THE ENGINEER IN THE FIELD.

CONTRACTION JOINTS SHALL BE SPACED IN SIDEWALK AT 5-FOOT INTERVAL (4.5 MINIMUM AND 5.5 MAXIMUM).

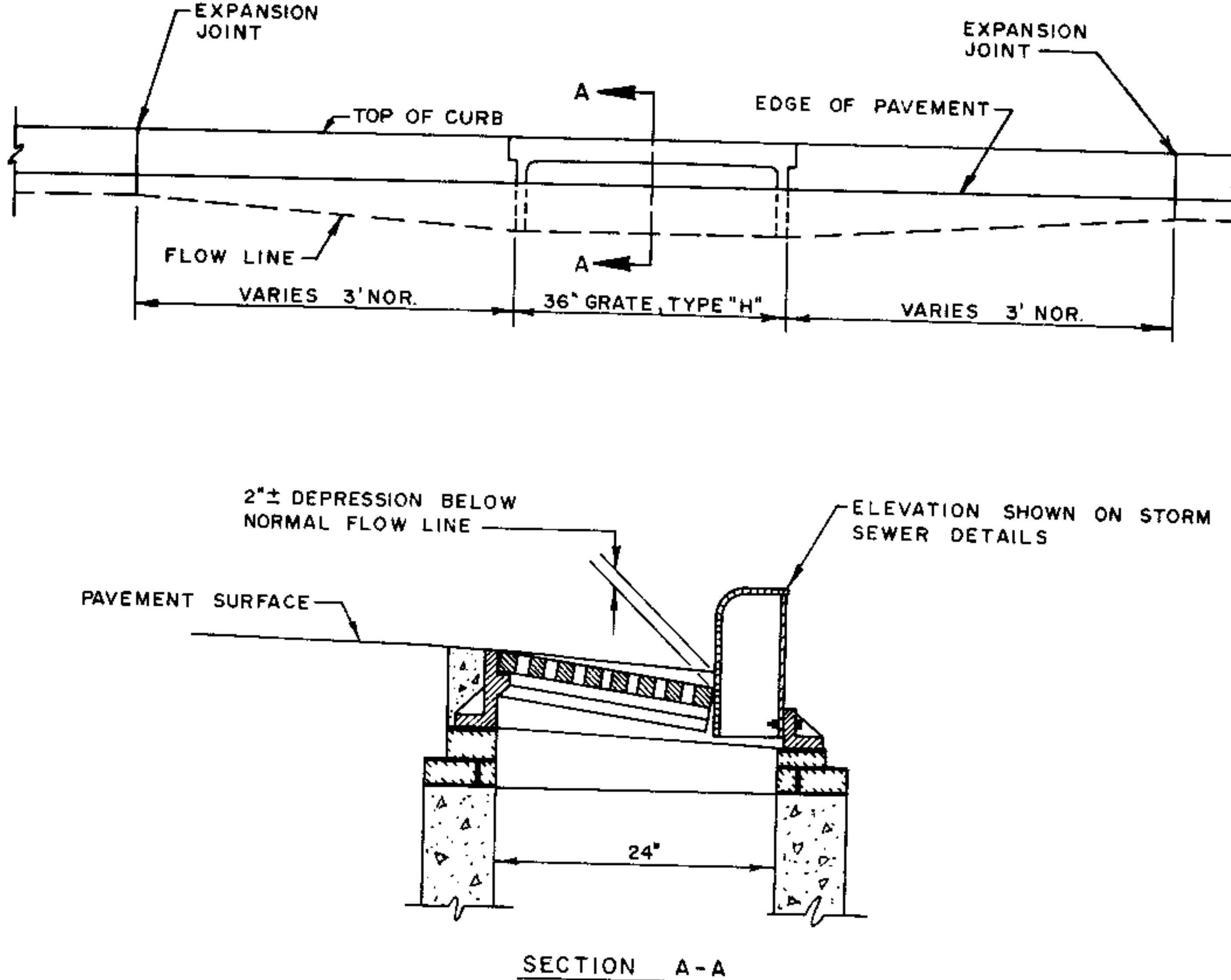
ALL SIDEWALK SHALL BE PLACED ON 2 INCHES OF GRANULAR MATERIAL AS INCIDENTAL TO SIDEWALK ITEM.

SHRINKAGE FOR UNCLASSIFIED IS ESTIMATED AT 35%.

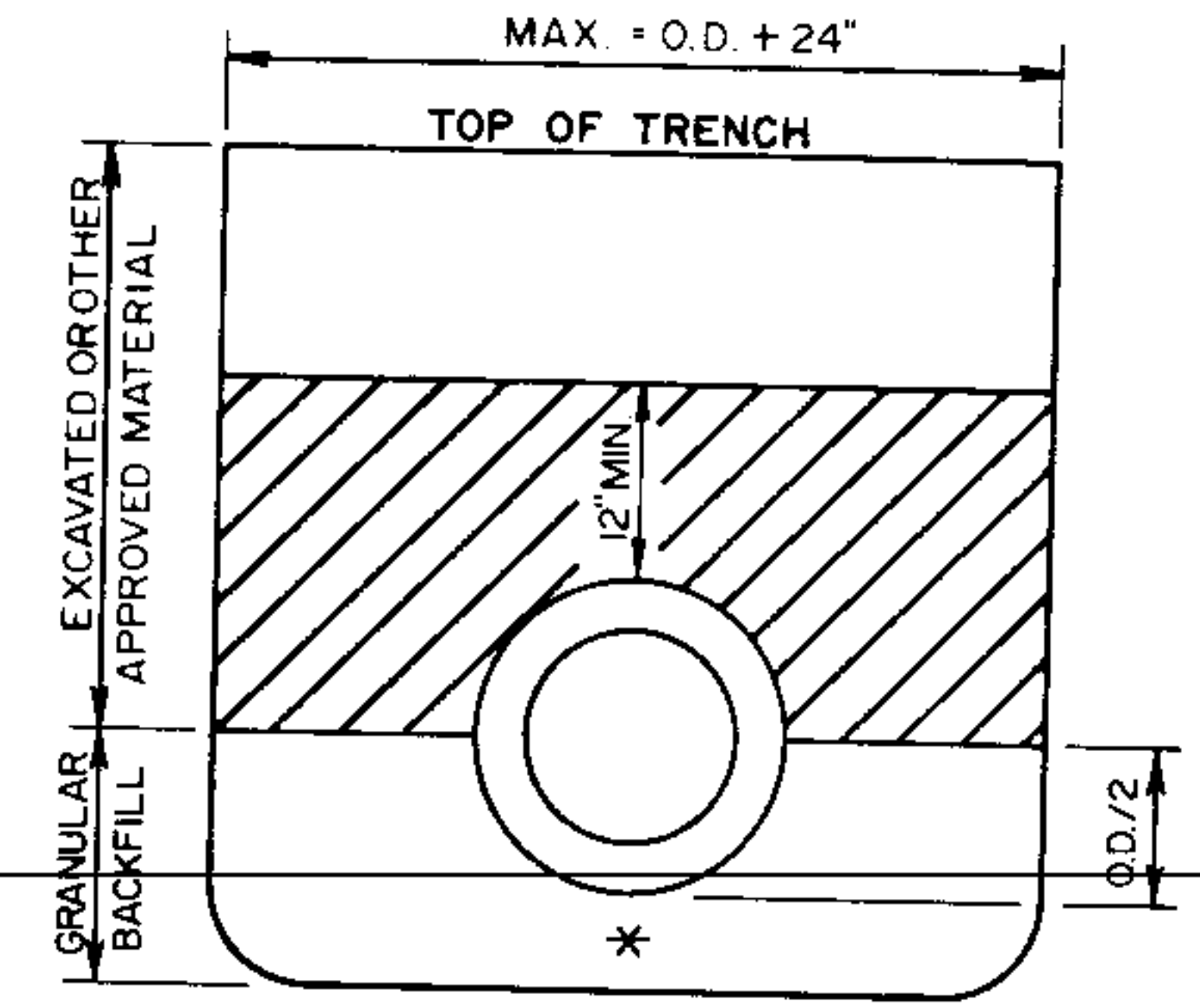
REMOVAL OF CONCRETE BLOCKS AND LOG RETAINING WALLS SHALL BE INCIDENTAL TO THE ITEM OF UNCLASSIFIED EXCAVATION.



DRIVEWAY DETAIL
(UNLESS OTHERWISE SHOWN ON PLANS)



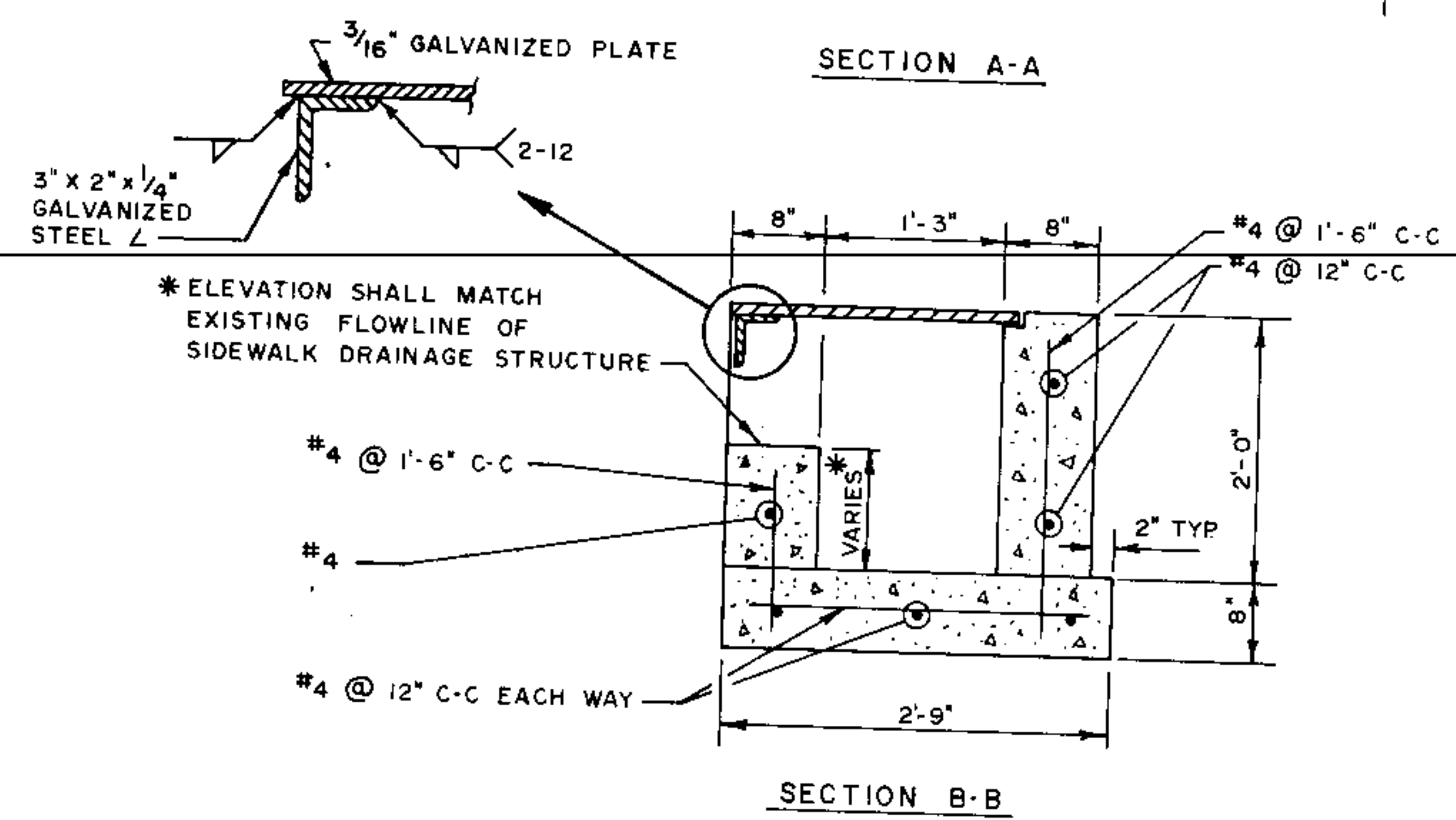
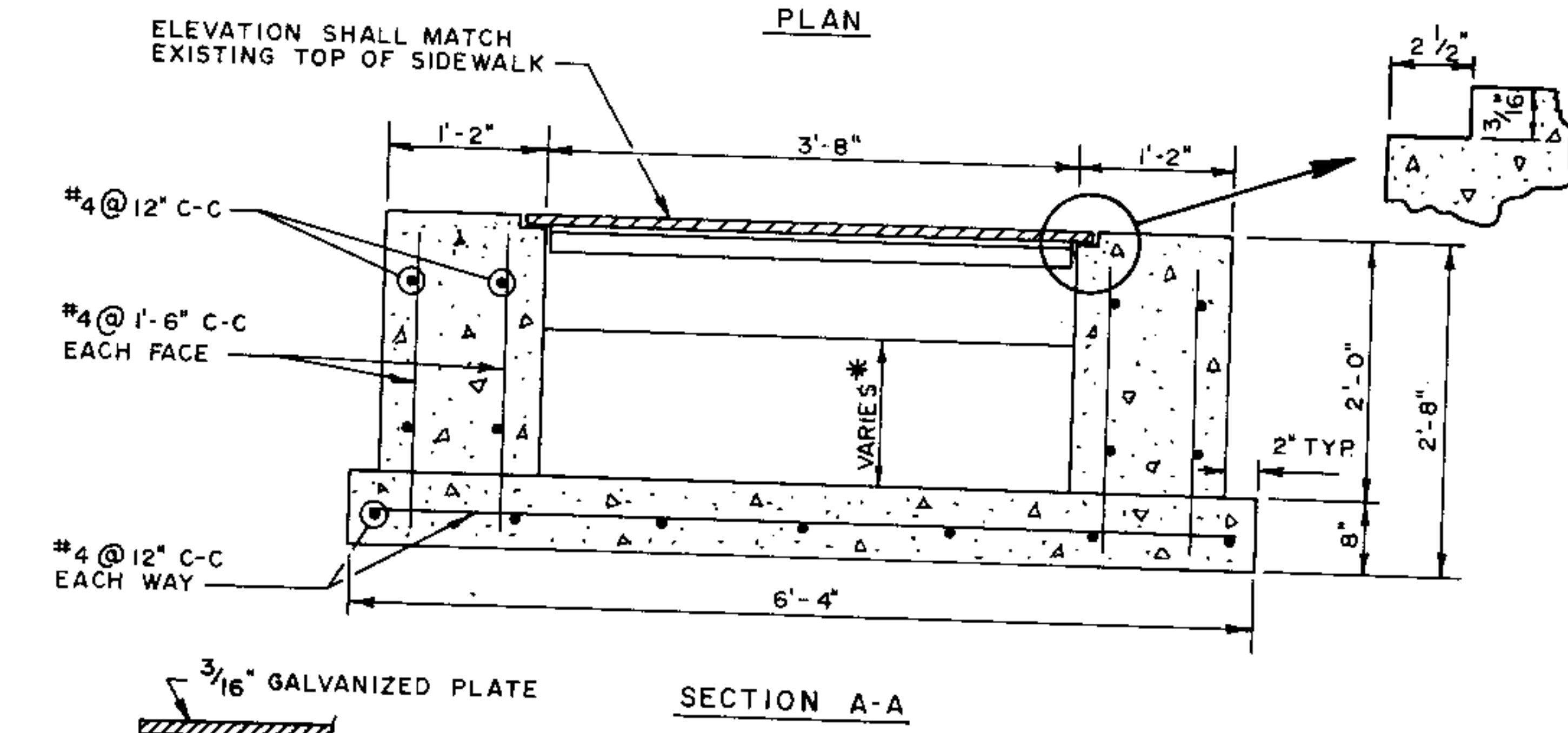
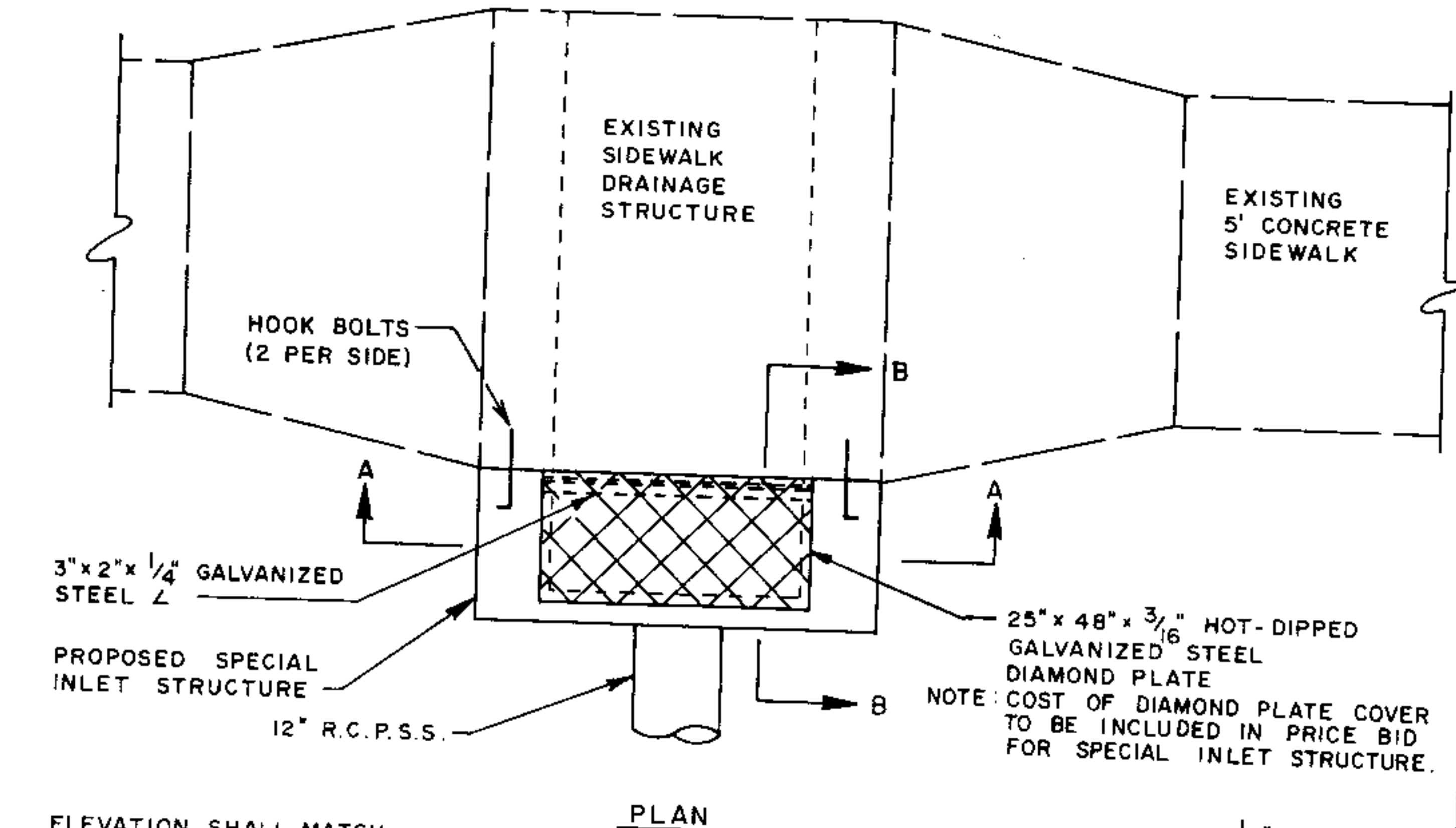
DETAIL OF CURB & GUTTER AT INLETS



BACKFILL MATERIAL CONTAINING NO
STONES LARGER THAN 3 INCHES OR
HARD OR FROZEN LUMPS OF EARTH.

* BEDDING AS DEFINED UNDER SUPPLE-
MENTAL SPECIFICATIONS NO. 3,
EXCEPT AS MODIFIED BY THIS DETAIL
IF GROUND WATER IS ENCOUNTERED, NO.
1 CONCRETE AGGREGATE SHALL BE
USED (NON-BID ITEM).

**BEDDING AND BACKFILLING FOR
REINFORCED CONCRETE PIPE STORM SEWER**



SPECIAL INLET STRUCTURE

ESTIMATE OF QUANTITIES

DATE 04/18/83

PROJECT ID: 5988-02-16
SAUK COUNTY
SHAW AND WILLOW STREETS, VILLAGE OF WEST BARABOO
LOCAL STREETS
LOCAL STREET

ITEM	ITEM DESCRIPTION	UNIT	TOTAL	5988-02-16 QUANTITY
20102	CLEARING	I.D.	122.00	~~122.00~~ 110.0
20105	GRUBBING	I.D.	215.00	~~215.00~~ 216.0
20301	REMOVING OLD CULVERT, STATION 11+57	L.S.	1.00	1.00
20405	REMOVING CURB AND GUTTER	L.F.	75.00	~~75.00~~ 79.0
20406	REMOVING CONCRETE SIDEWALK	S.Y.	104.00	~~104.00~~ 132.0
20503	UNCLASSIFIED EXCAVATION	C.Y.	3,300.00	~~3,300.00~~ 3168.0
21301	FINISHING ROADWAY	L.S.	1.00	1.00
30404	CRUSHED AGGREGATE BASE COURSE	TON	1,750.00	~~1,750.00~~ 2152.0
40204	BITUMINOUS MATERIAL FOR TACK COAT	GAL.	120.00	~~120.00~~ 177.0
40501	BITUMINOUS MATERIAL FOR PLANT MIXES	TON	67.00	~~67.00~~ 68.0
41001	RECYCLED BITUMINOUS SURFACE	TON	1,700.00	~~1,700.00~~ 1648.0
41010	SALVAGED BITUMINOUS PAVEMENT	TON	1,000.00	~~1,000.00~~ 1048.0
52261	REINFORCED CONCRETE APRON ENDWALLS FOR CULVERT PIPE, 15-INCH	EACH	2.00	2.00
52262	REINFORCED CONCRETE APRON ENDWALLS FOR CULVERT PIPE, 18-INCH	EACH	1.00	1.00
60133	CONCRETE CURB AND GUTTER, 30-INCH, TYPE D	L.F.	2,360.00	~~2,360.00~~ 2440.0
60205	CONCRETE SIDEWALK, 5-INCH	S.F.	1,200.00	~~1,200.00~~ 1319.0
60601	RIPRAP	C.Y.	5.00	~~5.00~~ 4.4
60825	REINFORCED CONCRETE PIPE, CLASS III, STORM SEWER, 12-INCH	L.F.	212.00	~~212.00~~ 190.0
60826	REINFORCED CONCRETE PIPE, CLASS III, STORM SEWER, 15-INCH	L.F.	276.00	~~276.00~~ 266.0
60827	REINFORCED CONCRETE PIPE, CLASS III, STORM SEWER, 18-INCH	L.F.	194.00	~~194.00~~ 180.0
60829	REINFORCED CONCRETE PIPE, CLASS III, STORM SEWER, 24-INCH	L.F.	545.00	~~545.00~~ 534.0
6110	MANHOLES, TYPE 1	EACH	2.00	2.00

SHEET 3

DATE 04/18/83

ITEM	ITEM DESCRIPTION	UNIT	TOTAL	5988-02-16 QUANTITY
61122	INLETS, TYPE 3	EACH	9.00	9.00
61123	INLETS, TYPE 8	EACH	1.00	1.00
61151	MANHOLE COVERS, TYPE J	EACH	1.00	1.00
61167	INLET COVERS, TYPE H	EACH	10.00	10.00
61170	INLET COVERS, TYPE MS	EACH	1.00	1.00
61182	ADJUSTING MANHOLE COVERS	EACH	6.00	6.00
61183	ADJUSTING INLET COVERS	EACH	3.00	~~3.00~~ 7.0
61910	MOBILIZATION	L.S.	1.00	1.00
62301	CALCIUM CHLORIDE SURFACE TREATMENT	TON	10.00	~~10.00~~ 0.0
62501	TOPSOIL	S.Y.	3,300.00	~~3,300.00~~ 3432.0
62702	MULCHING	S.Y.	1,300.00	~~1,300.00~~ 2406.0
62810	EROSION BALES	EACH	15.00	~~15.00~~ 0.0
62905	FERTILIZER, TYPE B	CWT.	2.00	~~2.00~~ 3.0
63002	SEEDING	LB.	20.00	~~20.00~~ 30.0
63101	SODDING	S.Y.	2,000.00	~~2,000.00~~ 1920.0
64202	FIELD OFFICE, TYPE B	L.S.	1.00	1.00
64301	TRAFFIC CONTROL	L.S.	1.00	1.00
90001	SPECIAL INLET STRUCTURE	EACH	2.00	2.00
90002	REMOVE AND RESET GUARDRAIL	L.F.	50.00	~~50.00~~ 64.0
90003	REMOVE CONCRETE APPROACH SLAB	S.Y.	65.00	~~65.00~~ 62.0
90004	BREAKER RUN BASE COURSE	TON	1,750.00	~~1,750.00~~ 1267.0

STATE PROJECT NUMBER	SHEET NO.
5988 - 2 - 16	3A
SHAW AND WILLOW STREET IMPROVEMENTS WEST BARABOO, WISCONSIN MISCELLANEOUS QUANTITIES	

CLEARING & GRUBBING			
Station	Loc.	Clearing In. Diam.	Grubbing In. Diam.
9+96	LT.	18	18
10+74	LT.	50	50
11+41	LT.	16	16
11+57	LT.		18
11+82	LT.	8	8
12+10	LT.	9	9
12+18	LT.	10	10
12+39	LT.	11	11
14+36	LT.		36
14+76	LT.		15
15+15	LT.		24

REMOVING CURB & GUTTER		
Station - Station	Loc.	L.F.
9+92 - 10+02	LT.	10
9+92 - 10+02	RT.	10
18+97 - 19+00	LT.	3
19+52 - 19+55	RT.	3
23+67 - 23+70	RT.	3
26+44 - 26+60	LT.	16
28+66 - 28+96	LT.	30

REMOVING CONCRETE SIDEWALK		
Station - Station	Loc.	S. Y.
12+47 - 12+62	RT.	8
14+42 - 14+55	LT.	4
14+69 - 16+16	RT.	80
16+67 - 16+82	RT.	8
13+07 - 13+17	RT.	4

REMOVING CONCRETE APPROACH SLAB	
Station	S. Y.
20+85	65

Note: Slab is 12 inches thick and has two layers of reinforcement.

REMOVE & RESET GUARDRAIL		
Station - Station	Loc.	L.F.
28+25 - 28+75	RT.	50

EARTHWORK SUMMARY				
Station - Station	Uncl. C. Y.	E. B. S. C. Y.	Fill C. Y.	Waste C. Y.
9+92 - 19+82	2051	399	263	
23+50 - 28+96	666	184	534	1640

BREAKER RUN AND CRUSHED AGGREGATE BASE COURSE	
Station - Station	Ton
9+92 - 19+82	2260
Driveways	140
23+50 - 28+96	1100

RECYCLED BITUMINOUS SURFACE	
Station - Station	Ton
9+92 - 19+82	850
Driveways	100
23+50 - 28+96	500
Side Streets	250

CONCRETE CURB & GUTTER, 30-INCH, TYPE D			
Station - Station	Loc.	L.F.	
9+92 - 12+66	LT.	286	
9+92 - 12+70	RT.	295	
13+04 - 16+19	RT.	344	
13+07 - 16+19	LT.	333	
16+80 - 19+00	LT.	231	
16+80 - 19+55	RT.	292	
26+44 - 26+60	LT.	16	
28+66 - 28+96	LT.	30	
23+67 - 28+96	RT.	533	

CONCRETE SIDEWALK, 5-INCH			
Station - Station	Loc.	S.F.	
12+47 - 12+67	RT.	140	
13+07 - 13+17	RT.	90	
14+70 - 16+11	RT.	745	
15+13	RT.	30	
15+43	RT.	60	
16+62 - 16+82	RT.	135	

BITUMINOUS PAVEMENT CORINGS		
Station	Loc.	Thickness
10+26	9.5' RT.	4"
11+36	10.0' RT.	5"
12+59	9.0' RT.	7.5"
13+53	4.0' LT.	4"
14+79	9.0' RT.	5.5"
16+85	4.0' LT.	4"
19+42	9.0' RT.	5.5"
21+30	9.0' RT.	3.5"
23+96	9.5' LT.	3.5"
25+29	7.0' RT.	3"
26+53	11.0' LT.	2.5"
28+72	6.0' LT.	4"

RIPRAP			
Station	DIMENSIONS	Location	C. Y.
28+58	10'W X 13.5'L X 1'T	RT. (S. S. Disch.)	5

SODDING		
Station - Station	Loc.	S. Y.
9+92 - 12+82	LT.	276
9+92 - 12+82	RT.	293
13+03 - 16+32	LT.	373
13+03 - 16+32	RT.	373
16+51 - 19+00	LT.	343
16+51 - 19+62	RT.	293
Undistributed		49

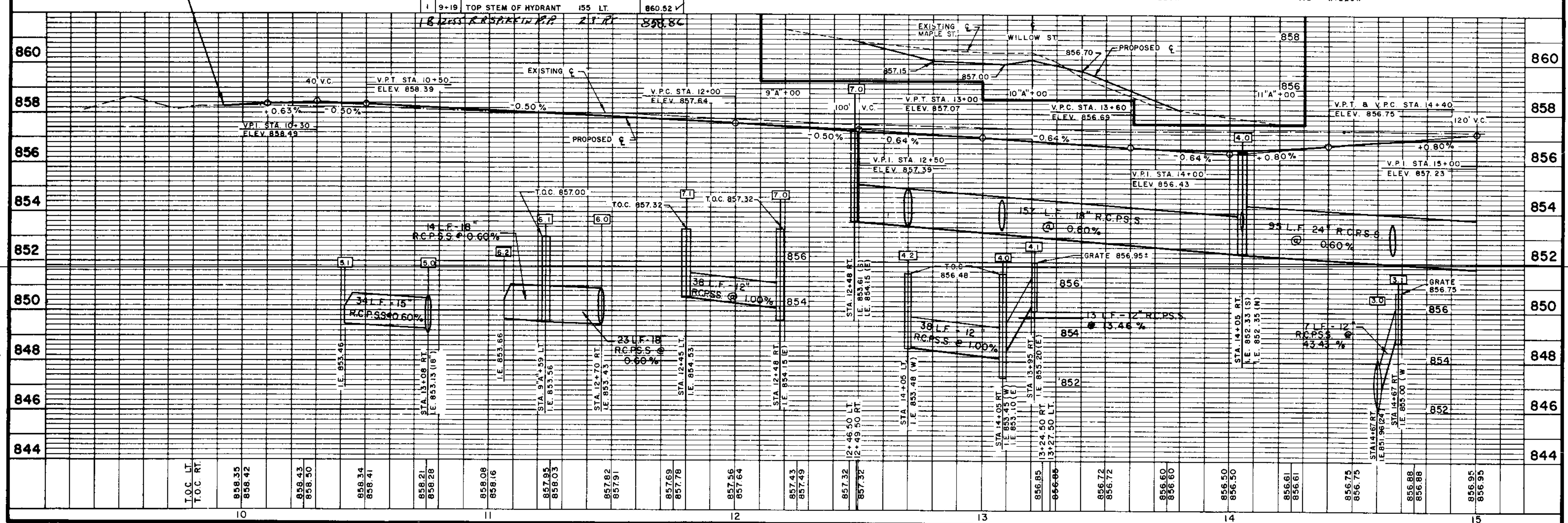
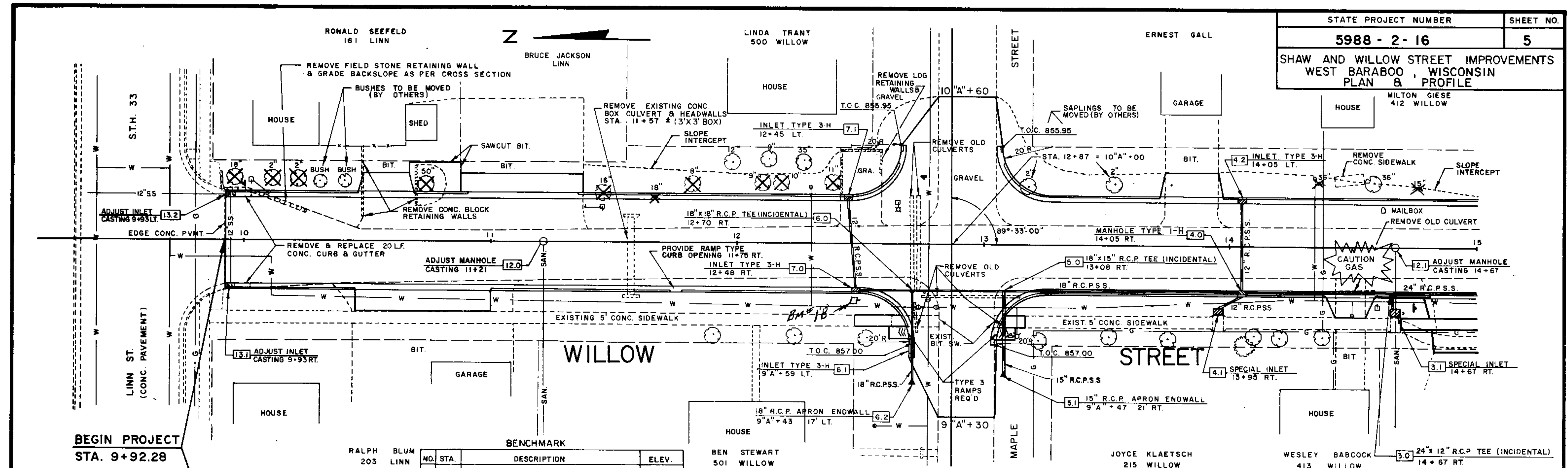
ADJUSTING INLET COVERS				
Station	Str. No.	Loc.	Type	Each
9+93	13.1	RT.	H	1
9+93	13.2	LT.	H	1
28+82	13.3	LT.	A	1

ADJUSTING MANHOLE COVERS				
Station	Str. No.	Loc.	Type	Each
11+21	12.0	¢	San. S.	1
14+67	12.1	¢	San. S.	1
16+40	12.2	¢	San. S.	1
18+19	12.3	¢	San. S.	1
24+32	12.4	RT.	San. S.	1
26+16	12.5	RT.	San. S.	1

REINFORCED CONCRETE PIPE, CLASS III, STORM SEWER					
Station	Str. - Str.	Dia. Inch	Length Lin. Ft.	Loc.	Apron Endwalls
12+45	7.1 - 7.0	12	38	LT.	
12+48	7.0 - 4.0	18	157	RT.	
12+70	6.0 - 6.1	18	23	RT.	
12+70	6.1 - 6.2	18	14	RT.	1
13+08	5.0 - 5.1	15	34	RT.	1
14+05	4.0 - 4.1	12	13	RT.	
14+05	4.0 - 4.2	12	38	RT.	
14+05	4.0 - 2.0	24	215	RT.	
14+67	3.0 - 3.1	12	7	RT.	
16+20	2.0 - 2.1	12	23	RT.	
16+20	2.0 - 2.2	12	45	RT.	
16+20	2.0 - 0.0	24	330	RT.	
16+58	1.0 - 1.1	15	23	RT.	
9'B'+58	1.1 - Stub	15	7	RT.	
26+50	8.1 - 8.2	12	38	RT.	
26+50	8.1 - 8.3	12	10	RT.	
26+50	8.1 - 8.0	15	212	RT.	1

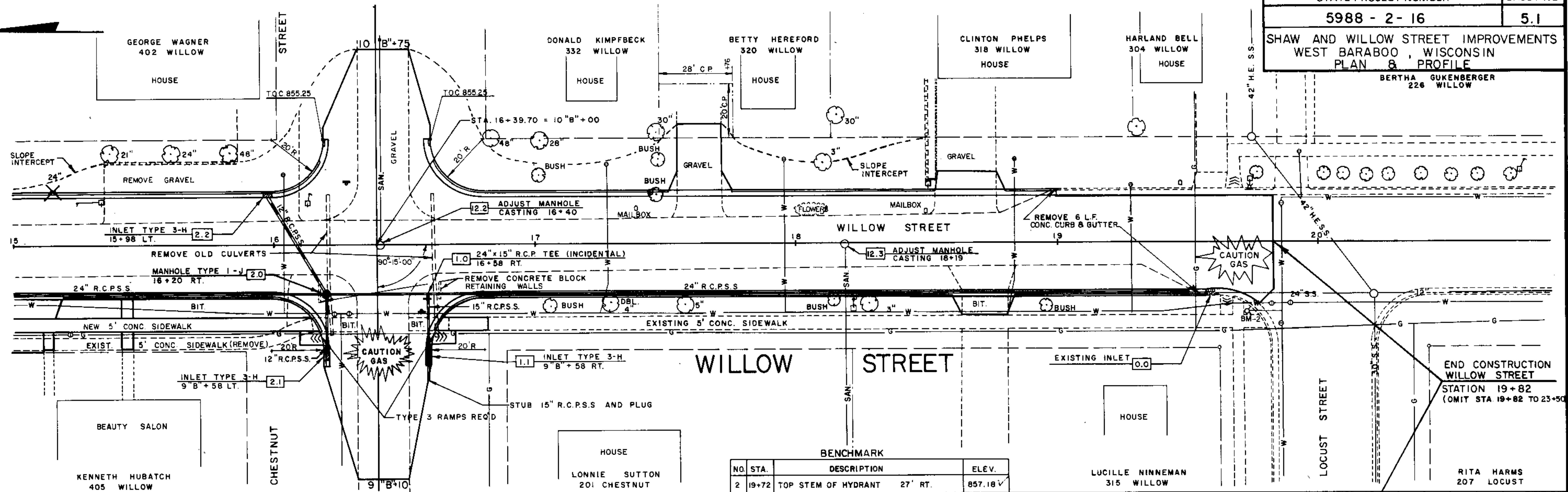
DRAINAGE STRUCTURES						
Station	Loc.	Str. No.	Manhole Type	Inlet Type	Cover Type	Depth Feet
12+45	LT.	7.1				
12+48	RT.	7.0		3	H	2.8
12+70	RT.	6.0 (tee)		3	H	3.8
12+70	RT.	6.1		3	H	3.4
13+08	RT.	5.0 (tee)				
13+95	RT.	4.1		Special	Special	1.8
14+05	RT.	4.0	1 *		H	4.2
14+05	LT.	4.2		3	H	3.0
14+67	RT.	3.0 (tee)				
14+67	RT.	3.1		Special	Special	1.8
15+98	LT.	2.2		3	H	3.0
9'B'+58	LT.	2.1		3	H	3.4
16+20	RT.	2.0	1		J	4.6
9'B'+58	RT.	1.1		3	H	3.9
16+58	RT.	1.0 (tee)				
26+50	RT.	8.1		3	H	3.5
26+50	RT.	8.2		3	H	3.0
26+50	LT.	8.3		8	MS	2.3

* MUST BE FORMED TO FIT TYPE H COVER

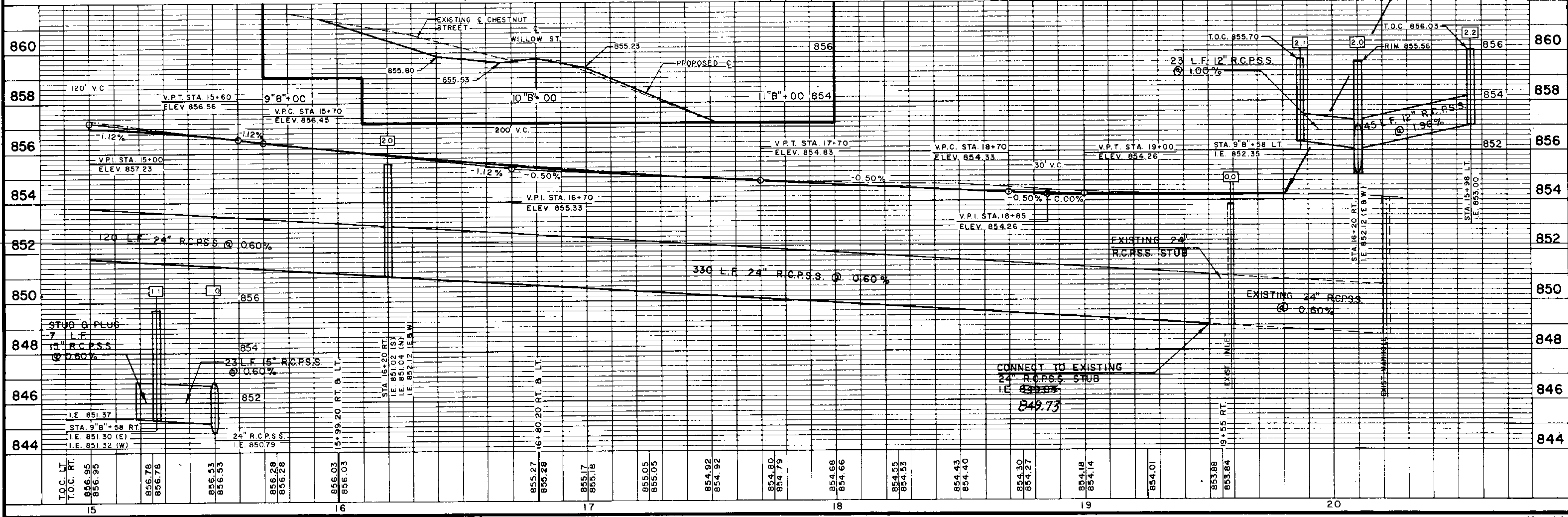


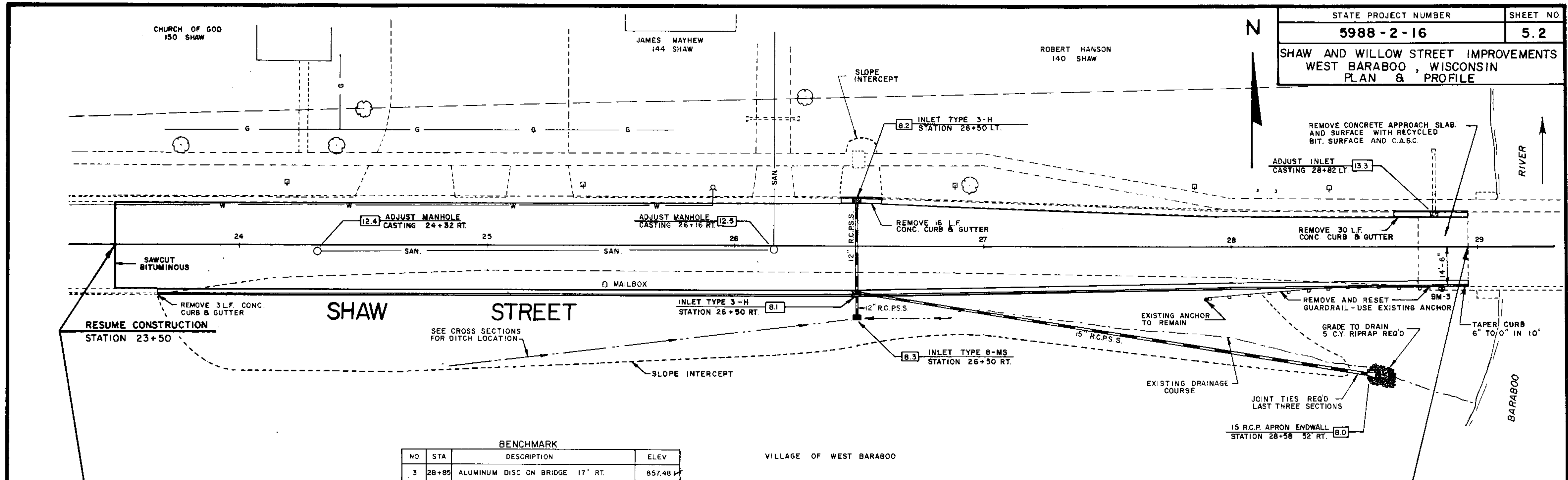


STATE PROJECT NUMBER	SHEET NO
5988 - 2 - 16	5.1
SHAW AND WILLOW STREET IMPROVEMENTS WEST BARABOO, WISCONSIN PLAN & PROFILE	
BERTHA GUKENBERGER 226 WILLOW	

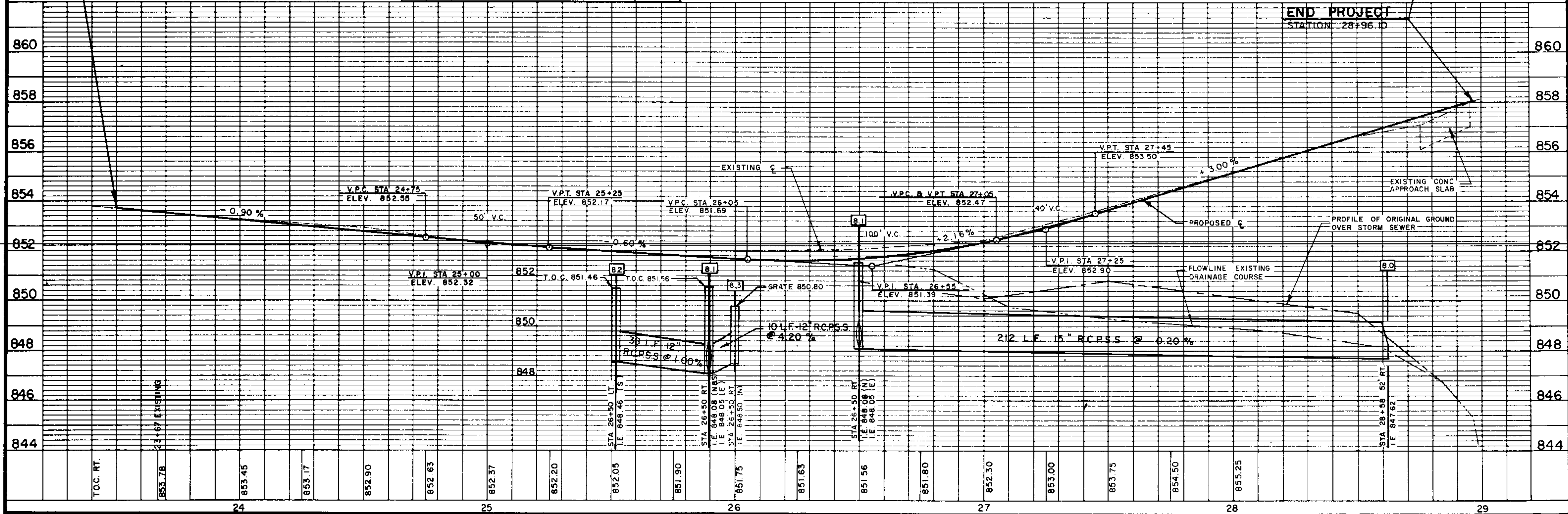


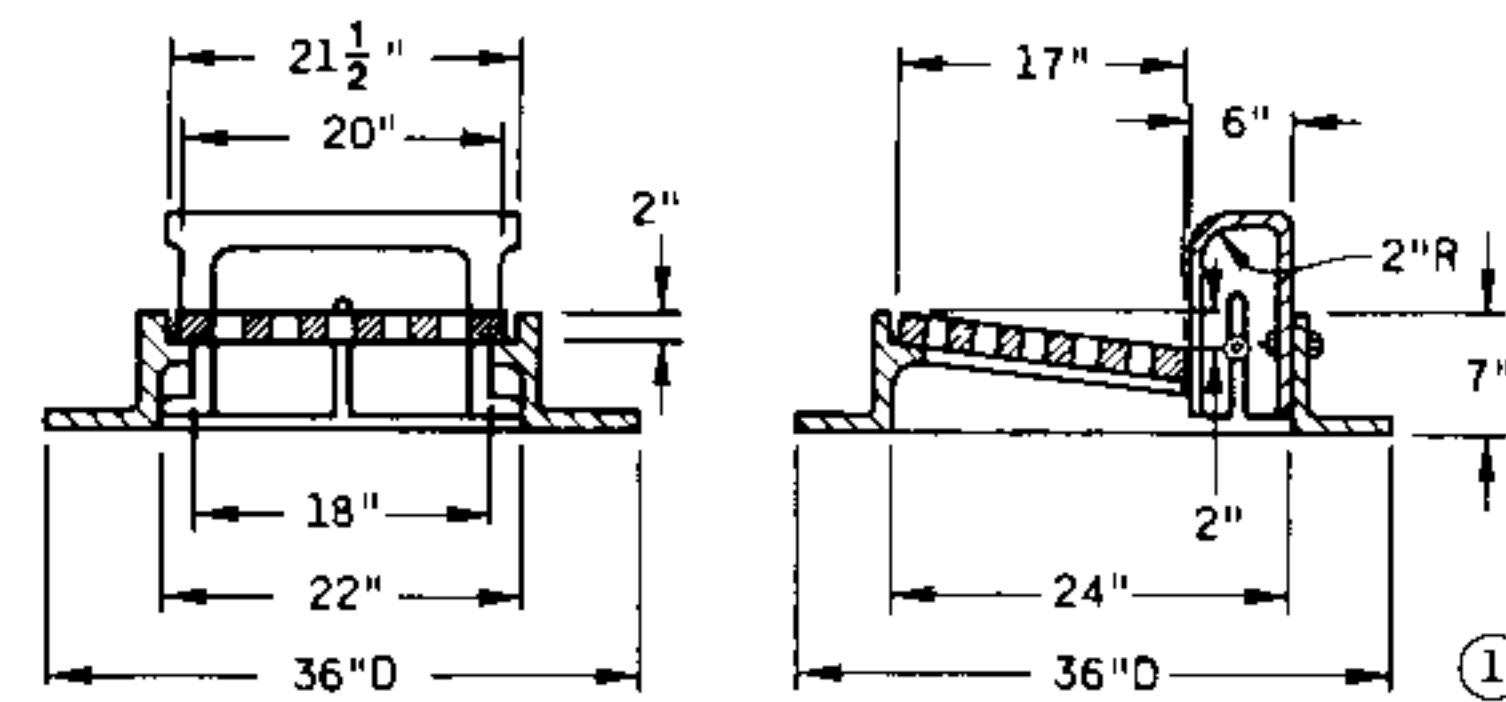
BENCHMARK		
NO.	STA.	DESCRIPTION
2	19+72	TOP STEM OF HYDRANT 27' RT.
		ELEV. 857.18



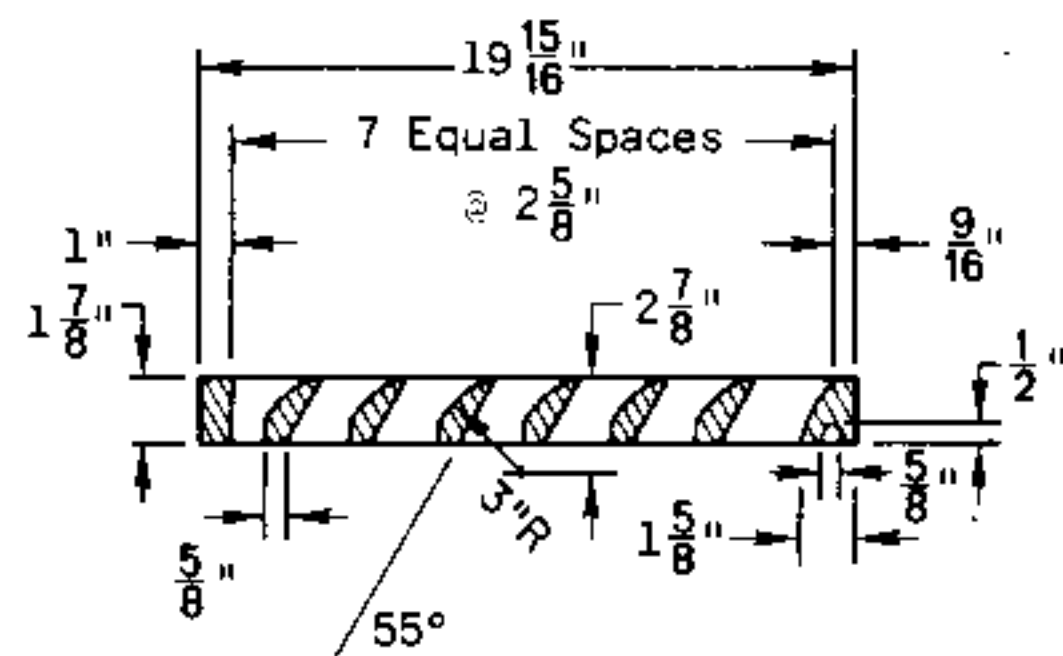
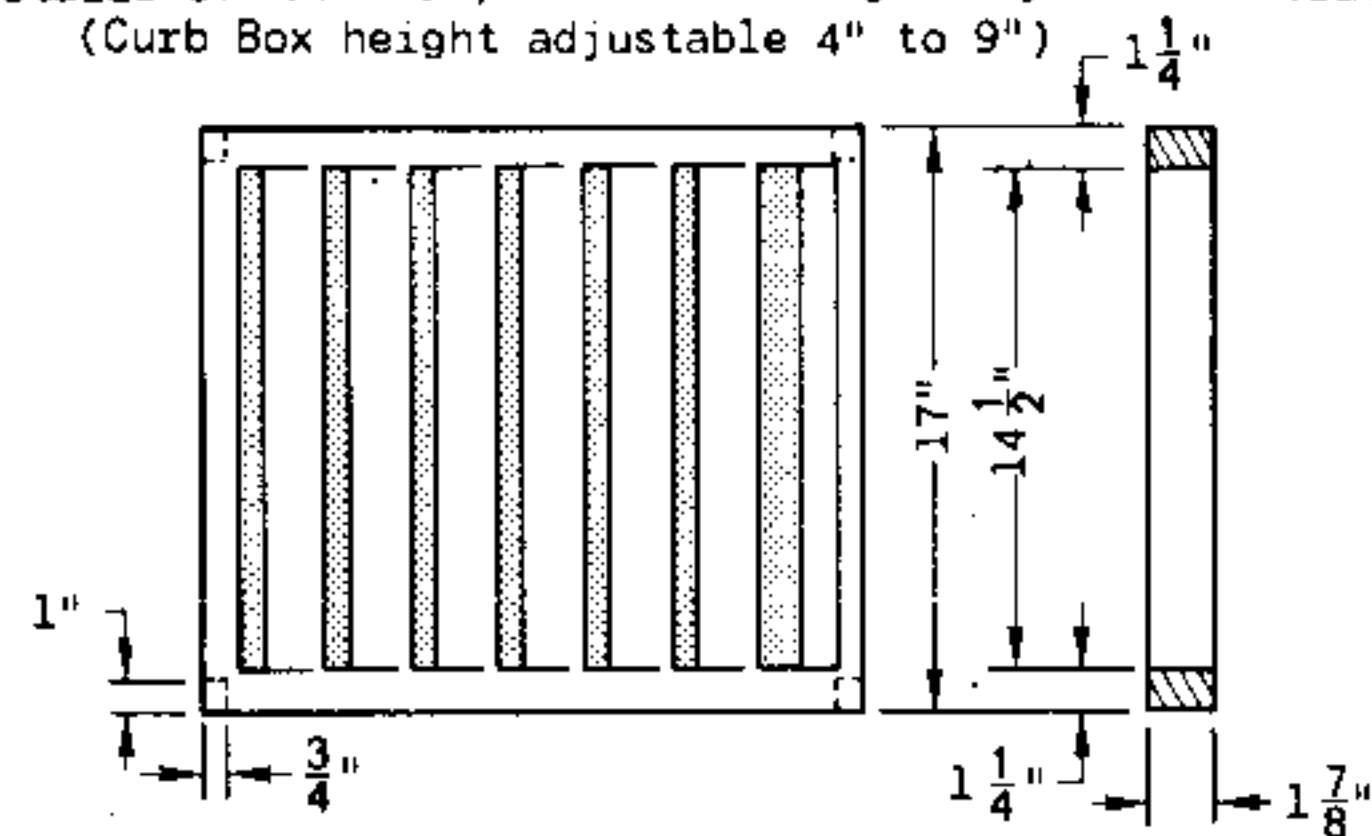


BENCHMARK			
NO.	STA	DESCRIPTION	ELEV
3	28+85	ALUMINUM DISC ON BRIDGE 17' RT.	857.48



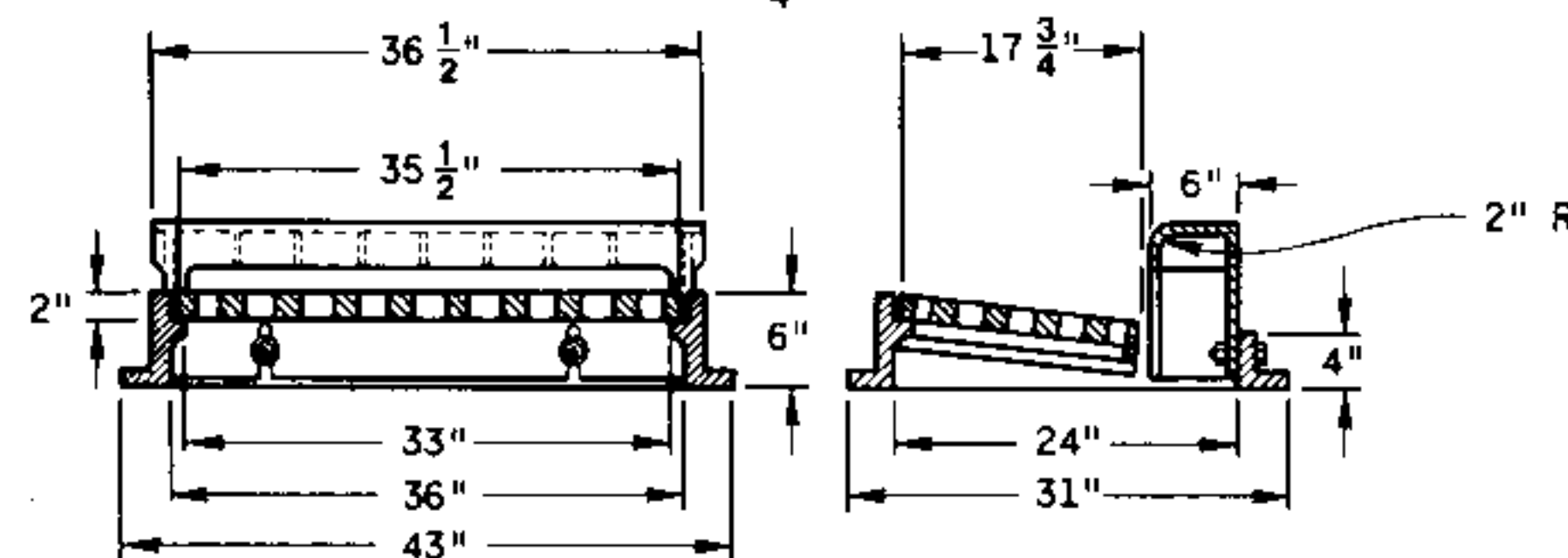


Details of Curb Box, Frame and Diagonally Slotted Grate
(Curb Box height adjustable 4\"/>

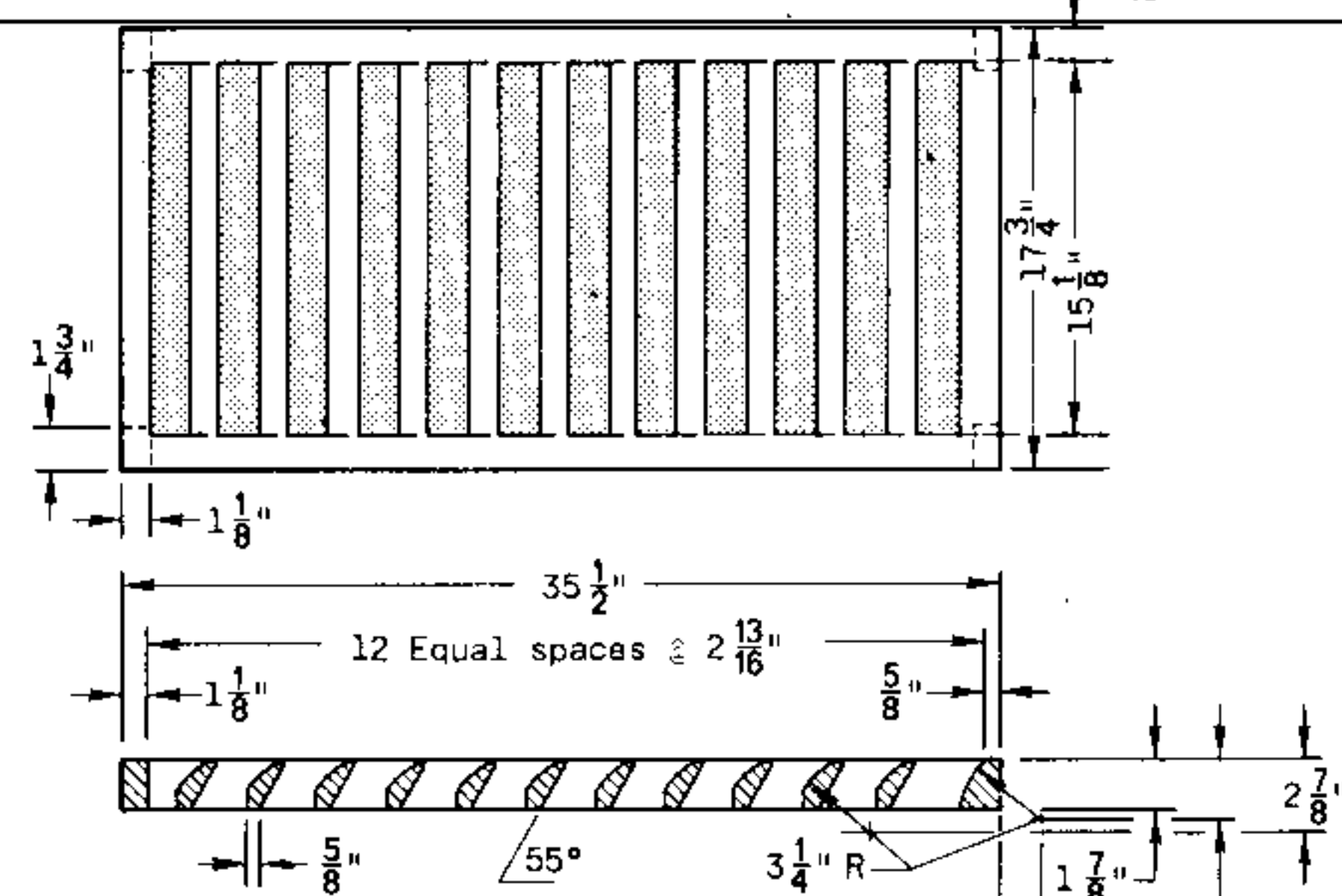


**SPECIAL GRATE NO. 1
FOR TYPE "A" COVER**
(Approximate Weight 70 lbs.)

1 3/8\"/>



Details of Curb Box, Frame and Diagonally Slotted Grate
(Curb Box height adjustable 6\"/>

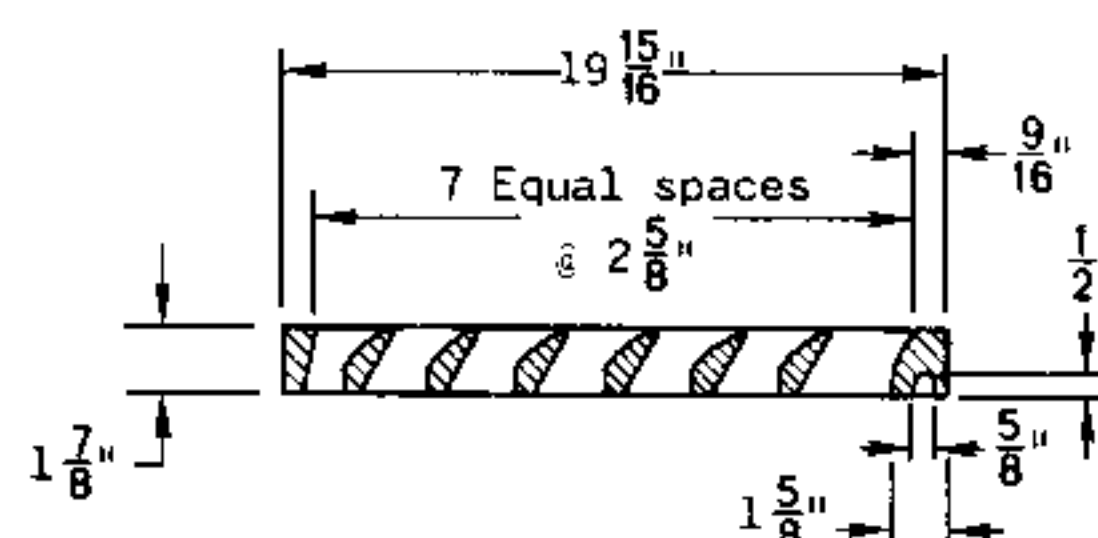
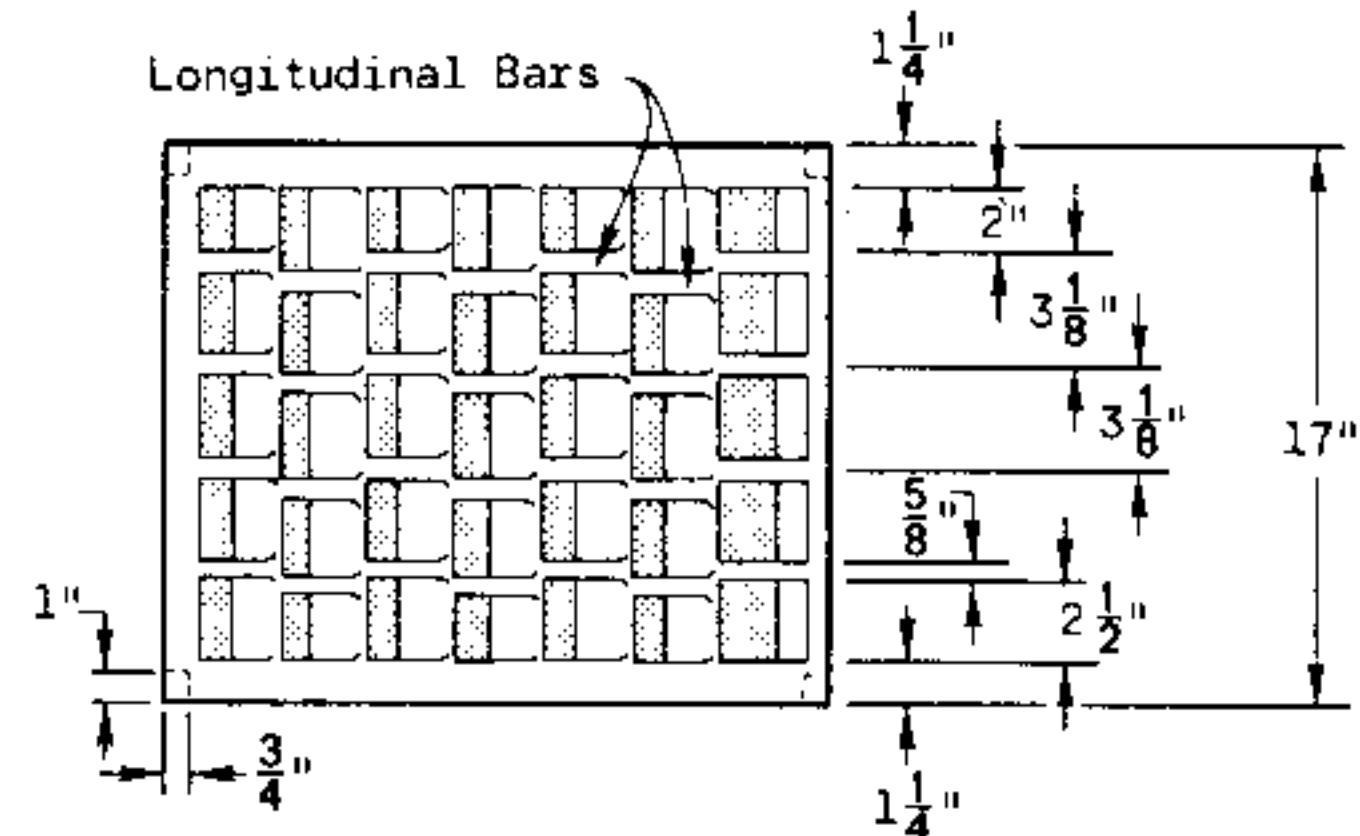
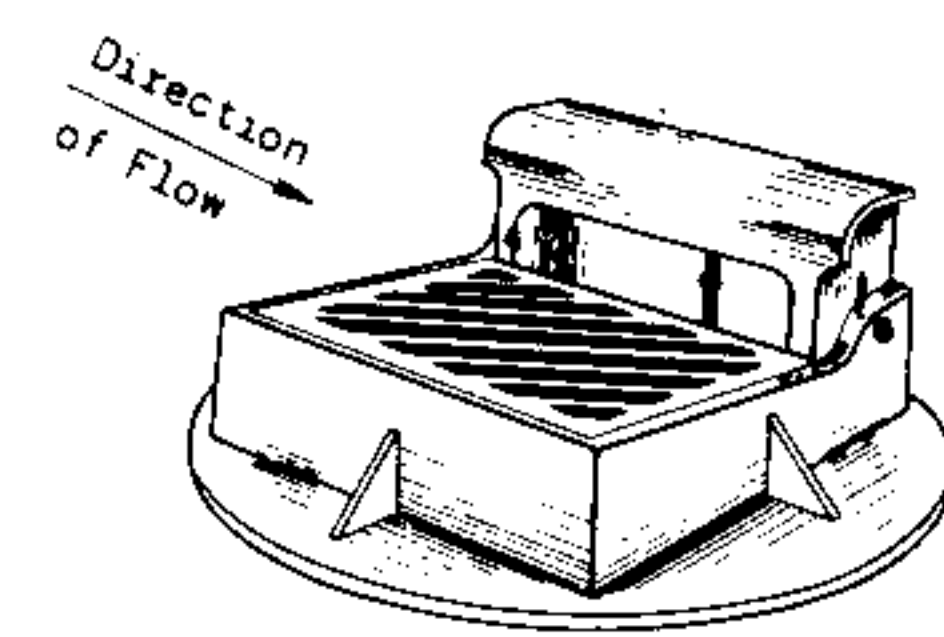


**SPECIAL GRATE NO. 1
FOR TYPE "H" COVER**
(Approximate Weight 140 lbs.)

1\"/>

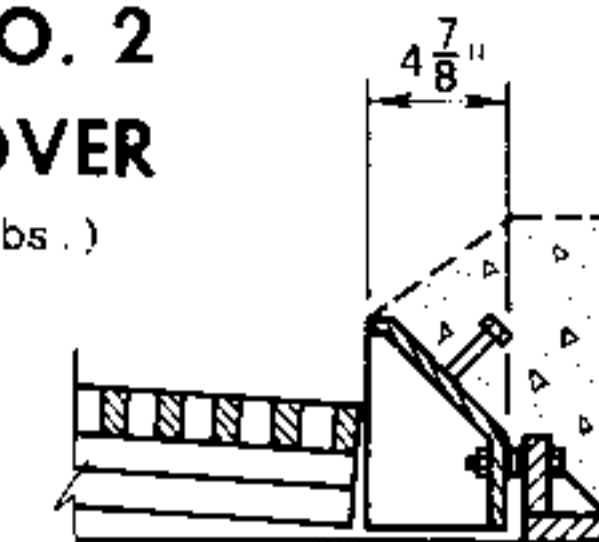
TYPE "A"

(Approximate Weight 405 lbs.)
Frame Weight 250 lbs.
Grate Weight 85 lbs.
Box Weight 70 lbs.



**SPECIAL GRATE NO. 2
FOR TYPE "A" COVER**
(Approximate Weight 84 lbs.)

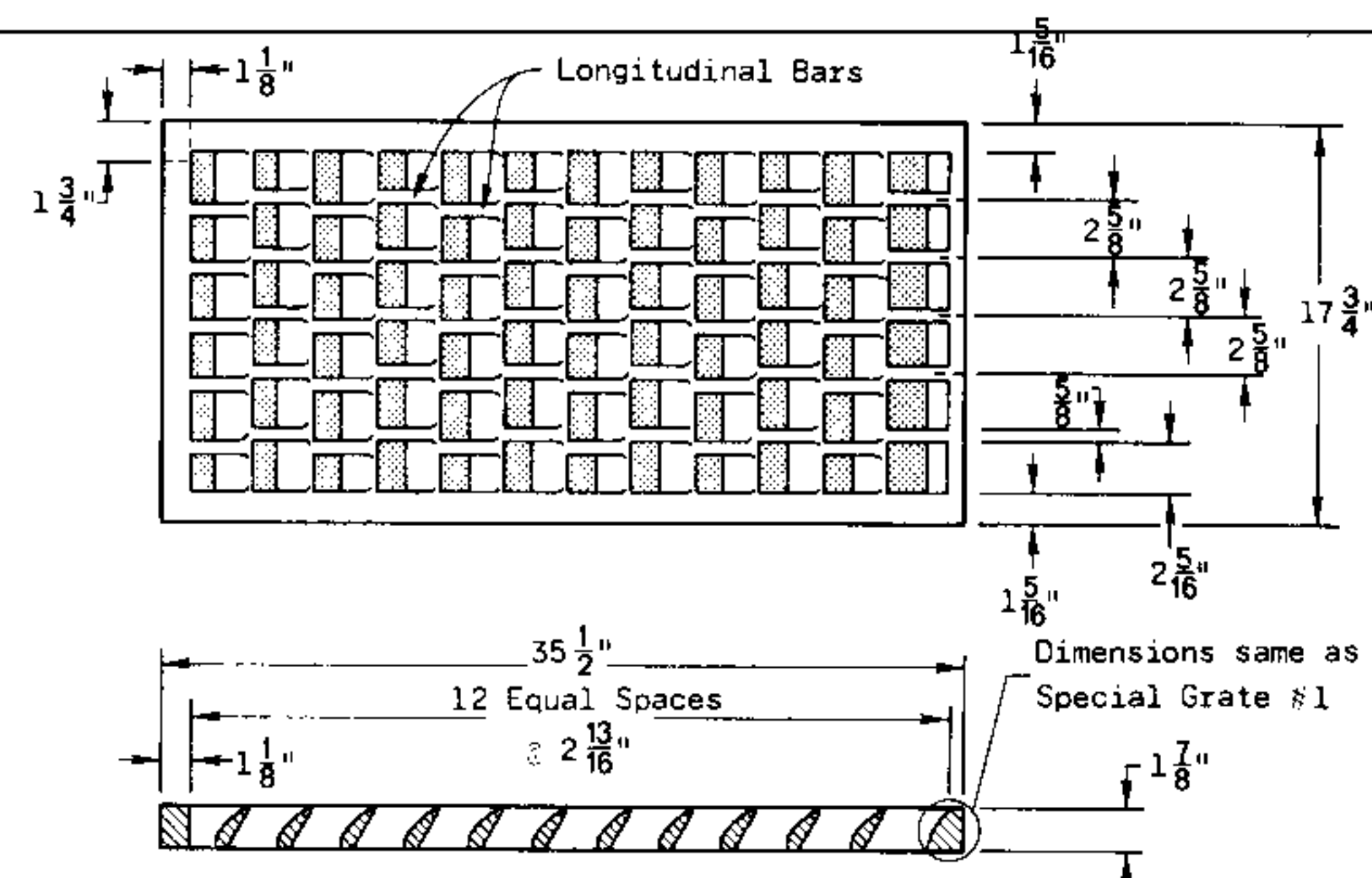
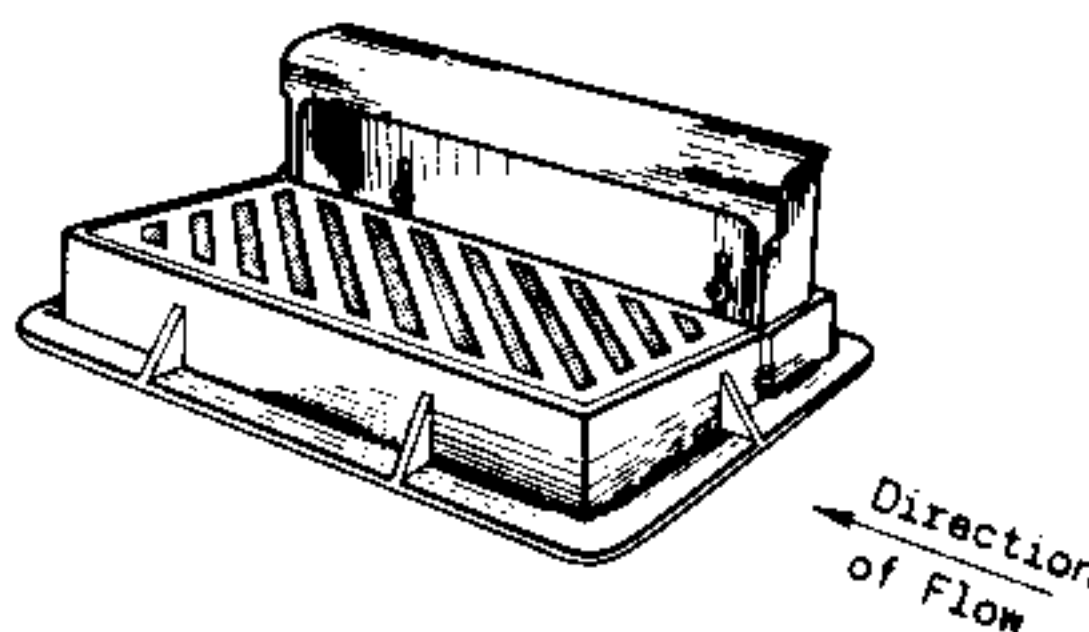
①
TYPES "A" AND "H" COVERS SHALL BE
FURNISHED WITH DIAGONALLY SLOTTED
GRATES UNLESS OTHERWISE SPECIFIED
IN THE CONTRACT



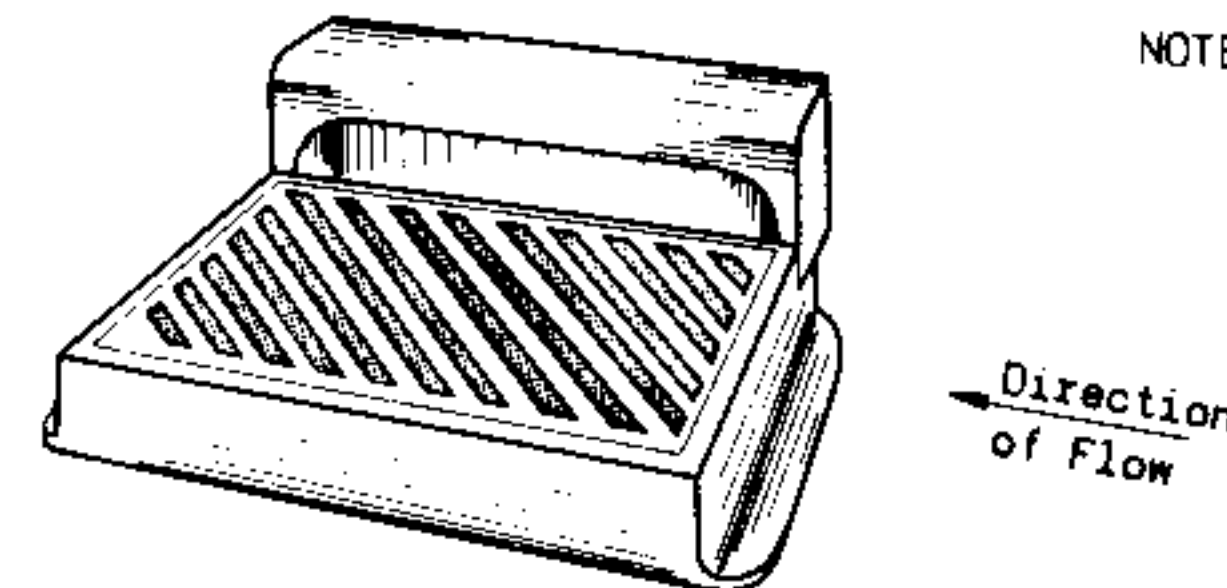
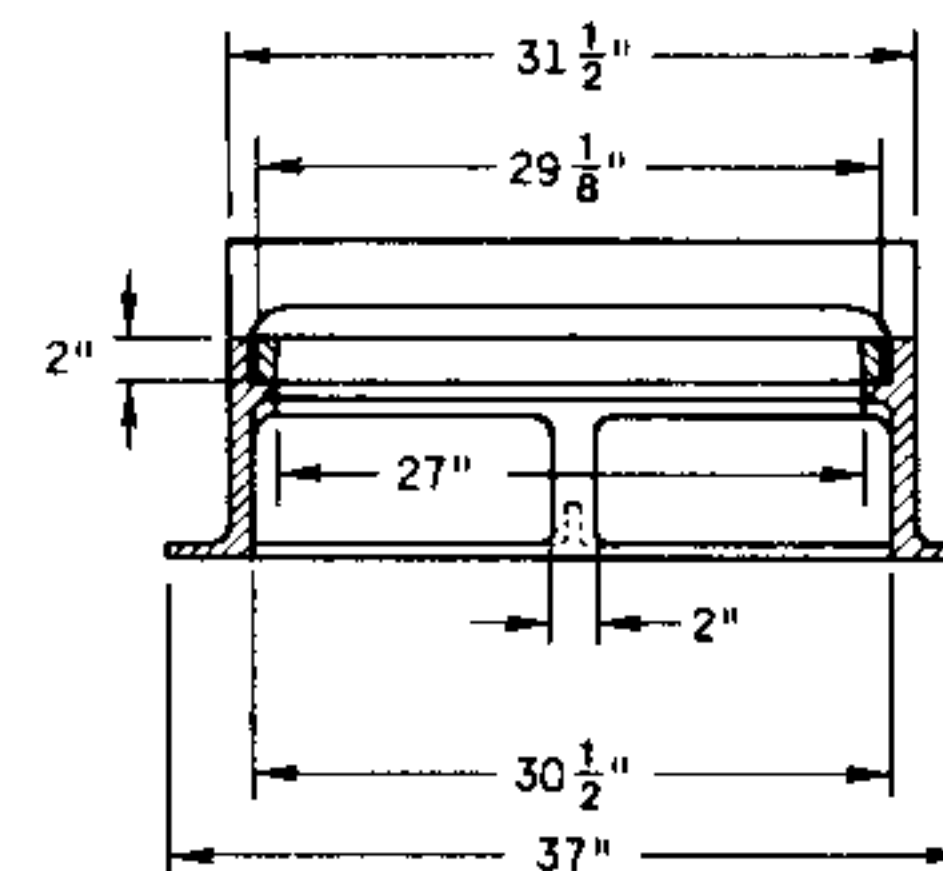
MOUNTABLE CURB BOX FOR TYPES "A" & "H" COVERS

TYPE "H"

(Approximate Weight 510 lbs.)
Frame Weight 220 lbs.
Grate Weight 175 lbs.
Box Weight 115 lbs.



**SPECIAL GRATE NO. 2
FOR TYPE "H" COVER**
(Approximate Weight 165 lbs.)

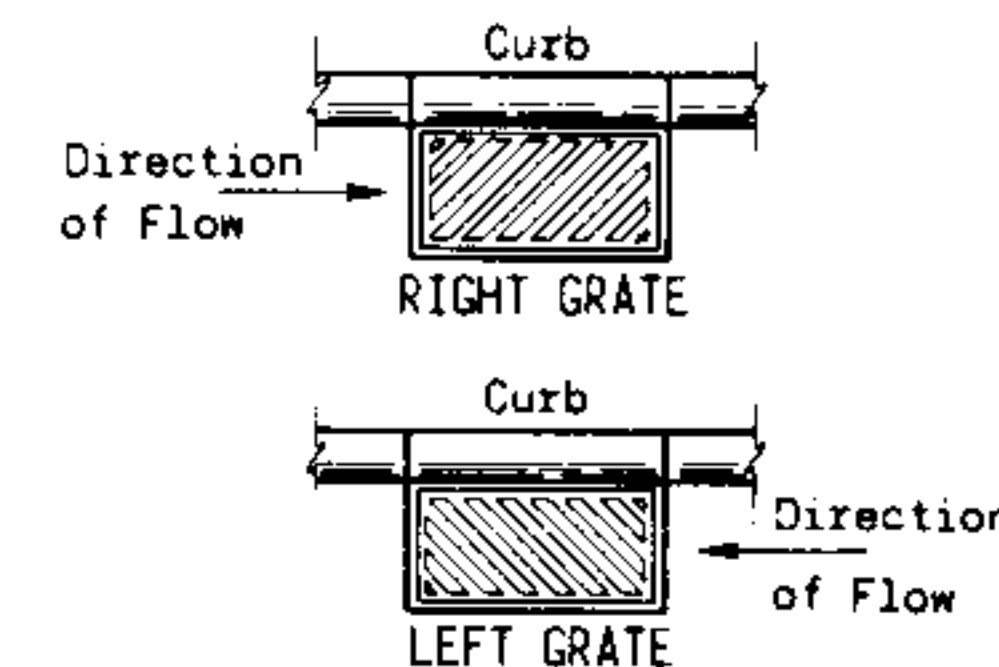


TYPE "WM"

(Approximate Weight 670 lbs.)
Frame Weight 350 lbs.
Grate Weight 185 lbs.
Box Weight 135 lbs.

NOTE: Curb Box height adjustable 6\"/>

Diagonal Slots shall be oriented
to the direction of flow RIGHT
and LEFT grates or grates that are
manufactured to be reversible and
can be used as either RIGHT or
LEFT grates shall be furnished
depending on direction of flow
(See sketch below)



GENERAL NOTES

Details of construction, materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the Standard Specifications and the applicable Special Provisions.

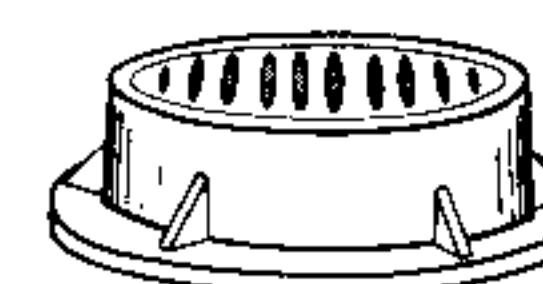
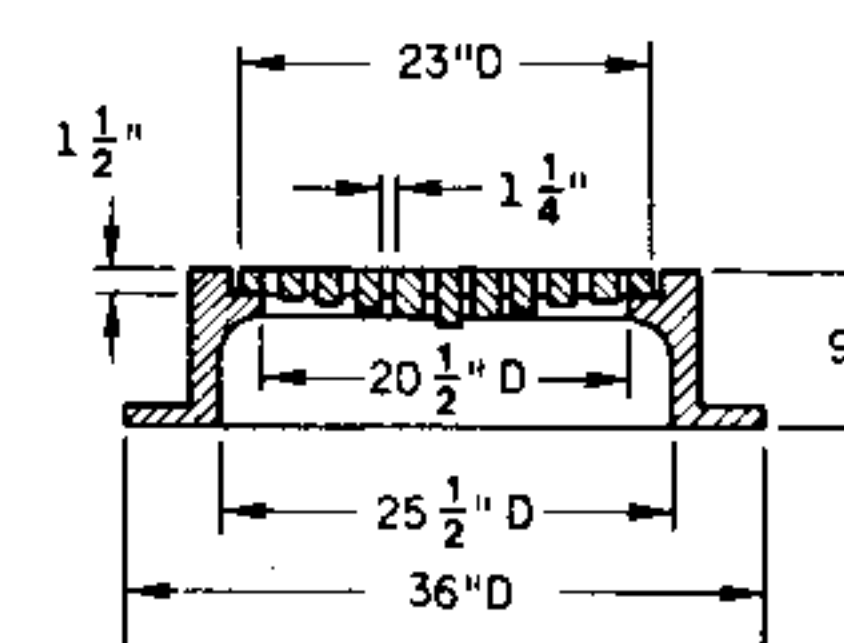
Detail drawings for proposed alternate designs for Catch Basin, Manhole and Inlet Covers shall be submitted to the Engineer for approval providing that such alternate designs make provision for equivalent capacity and strength.

All Catch Basin, Manhole and Inlet Covers which are placed in vehicular traffic areas shall be "Non-Rocking" type.

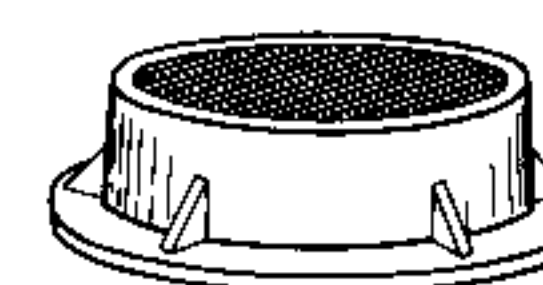
Adjustment of the cover to grade may be accomplished by the use of mortar and brick, or by precast concrete grade rings. Precast concrete grade rings shall conform to the specifications for Precast Reinforced Concrete Manhole Sections, AASHTO Designation M199, except that when such units are wet cast, they shall be made with air-entraining portland cement. Maximum adjustment shall be 8 inches.

The actual weight of covers may vary within 5 percent, plus or minus, of the approximate weight.

CAUTION: DO NOT USE GRATES WITH
LONGITUDINAL SLOTS WHERE BICYCLE
TRAFFIC IS PERMITTED.



TYPE "C"
Slotted Grate



TYPE "J"
Solid Cover

TYPE "C" - TYPE "J"

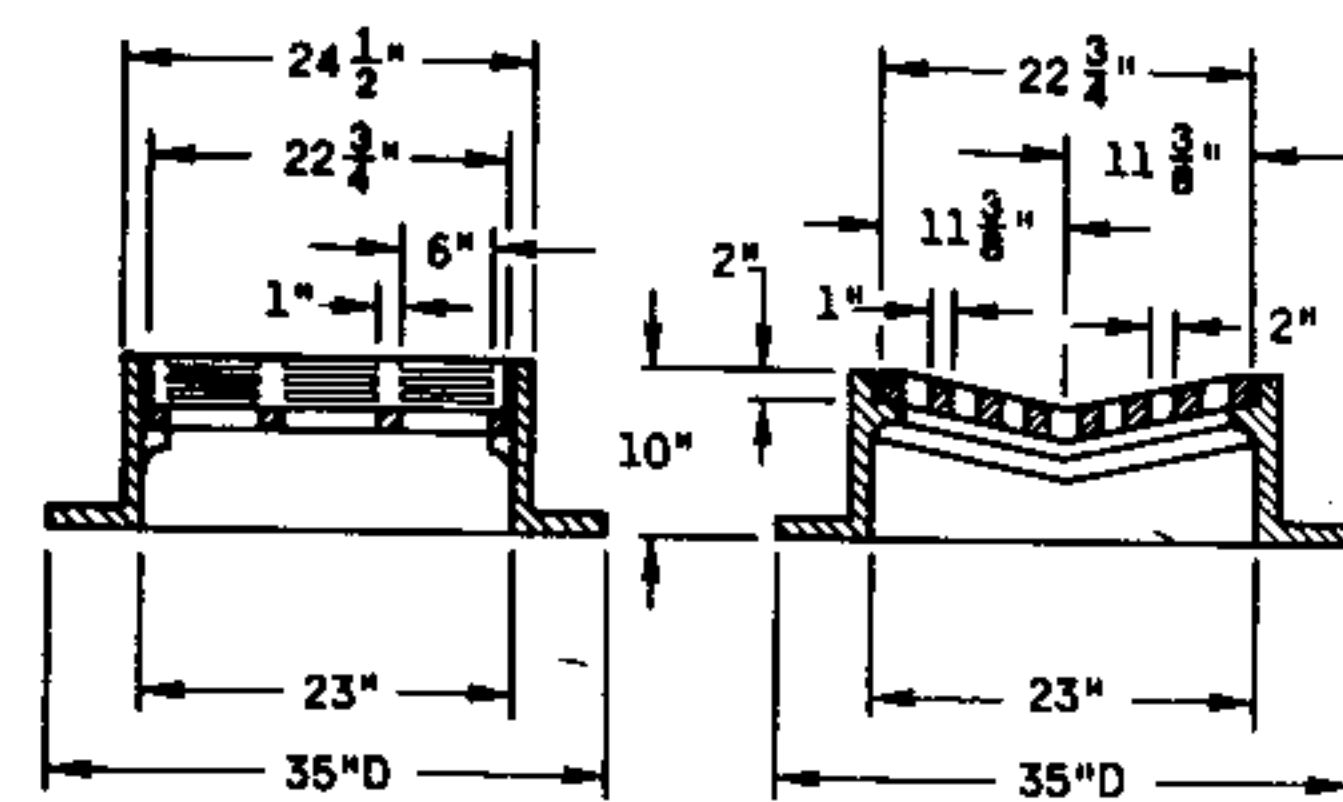
Frame Weight 250 lbs.
Slotted Grate Weight 125 lbs.
Solid Cover Weight 150 lbs.

CATCH BASIN MANHOLE AND INLET COVERS

State of Wisconsin
Department of Transportation
Division of Highways

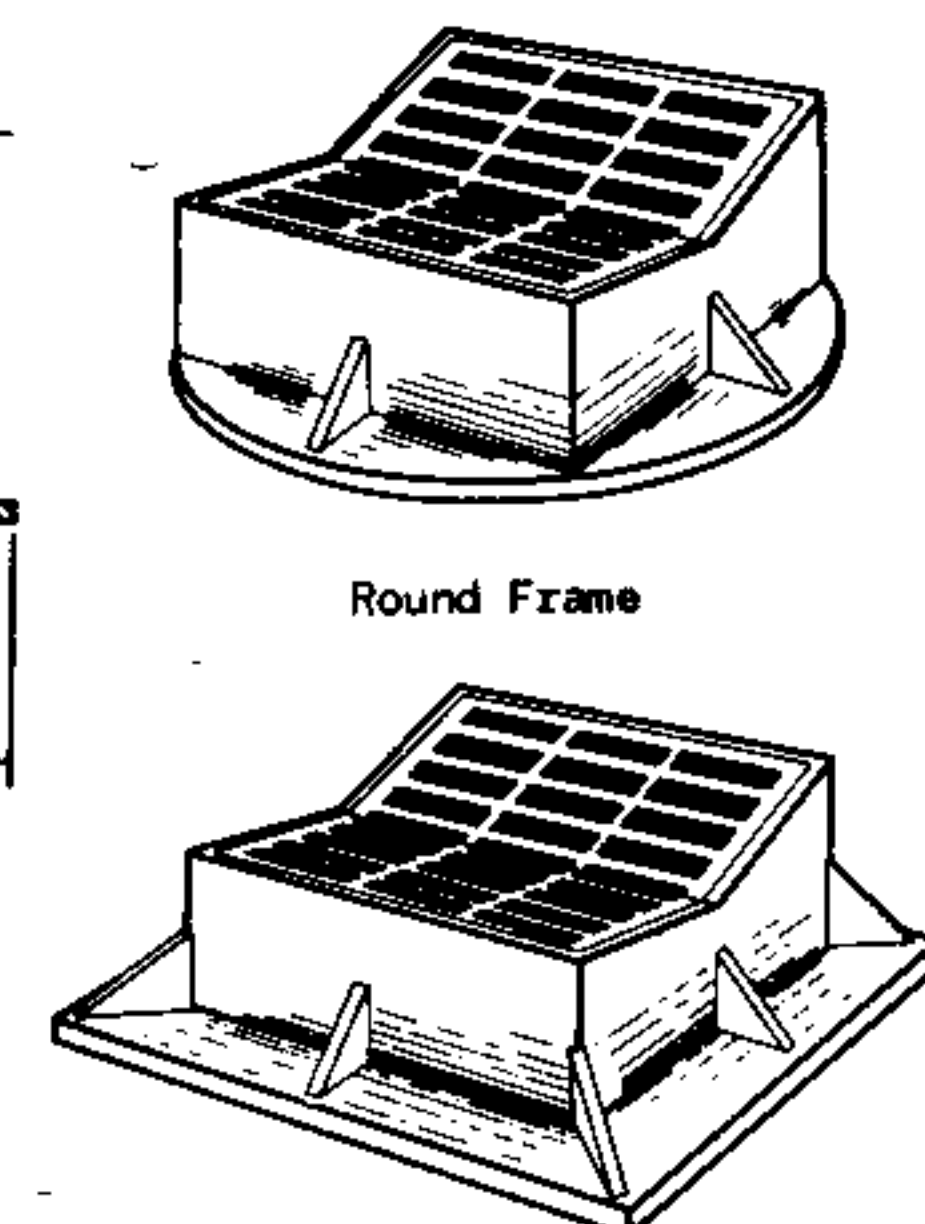
APPROVED
11-23-77
DATE
APPROVED
11-25-77
DATE
FHWA

P. W. Baker
SUPERVISING DEVELOPMENT ENGINEER
D. J. Stank
CHIEF OF FACILITIES DEVELOPMENT



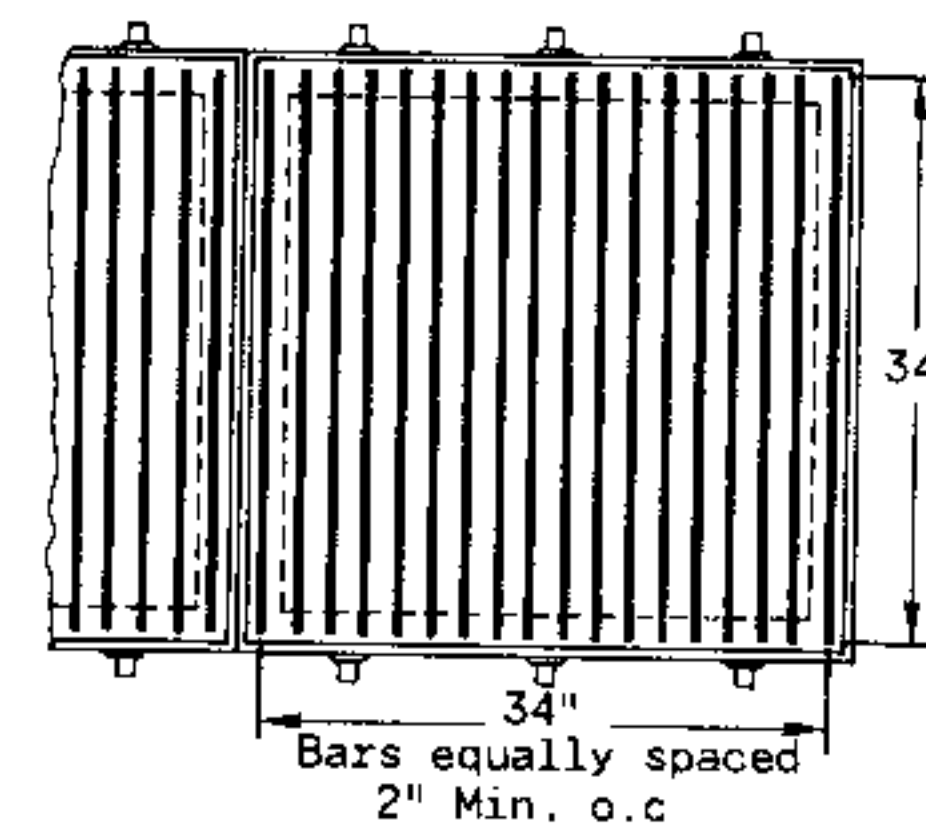
TYPE "B"

(Approximate Weight 395 lbs.)
Frame Weight 285 lbs.
Grate Weight 110 lbs.



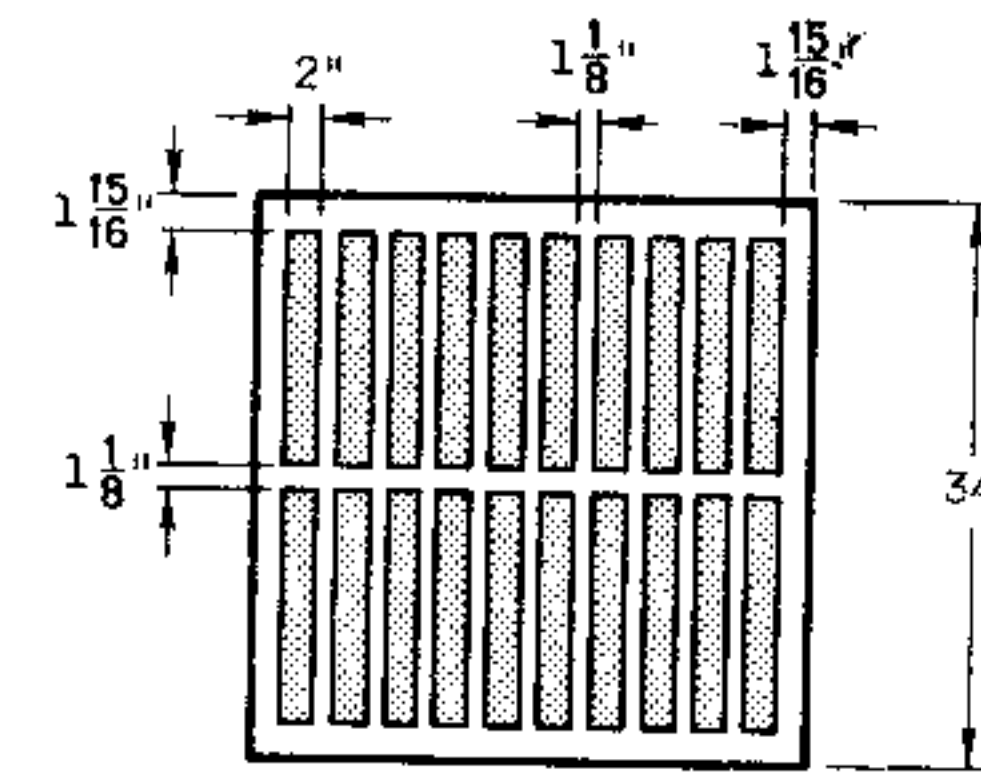
Round Frame

Alternate Frame
(Square type)
35" Square



STEEL GRATE

(Approximate Weight 209 lbs.)

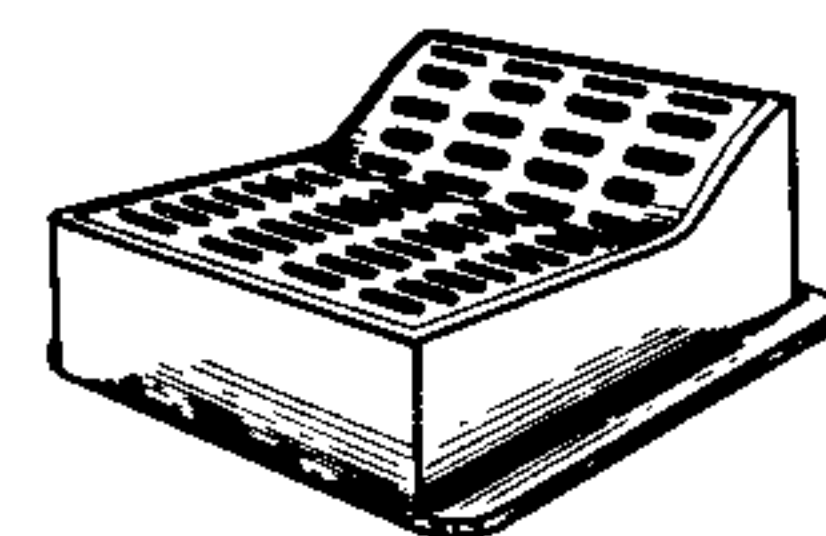
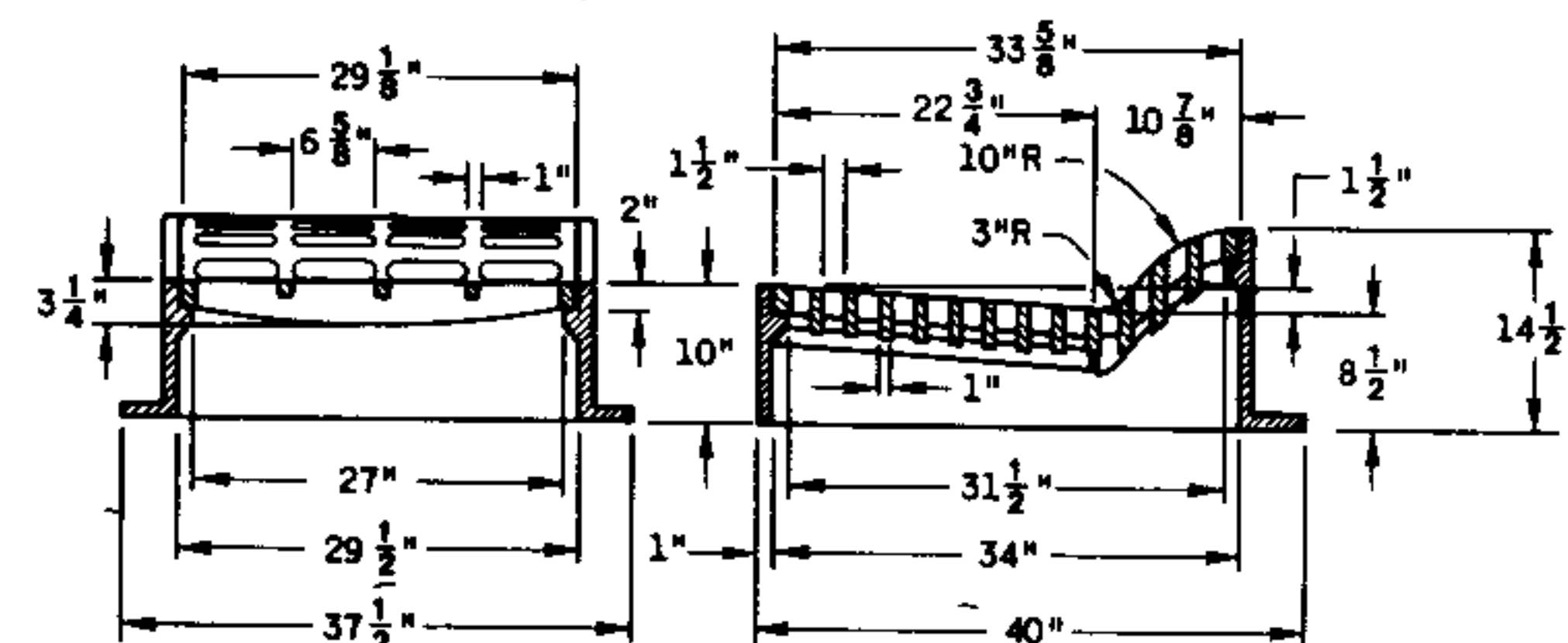


CAST IRON GRATE

(Approximate Grate Weight 285 lbs)

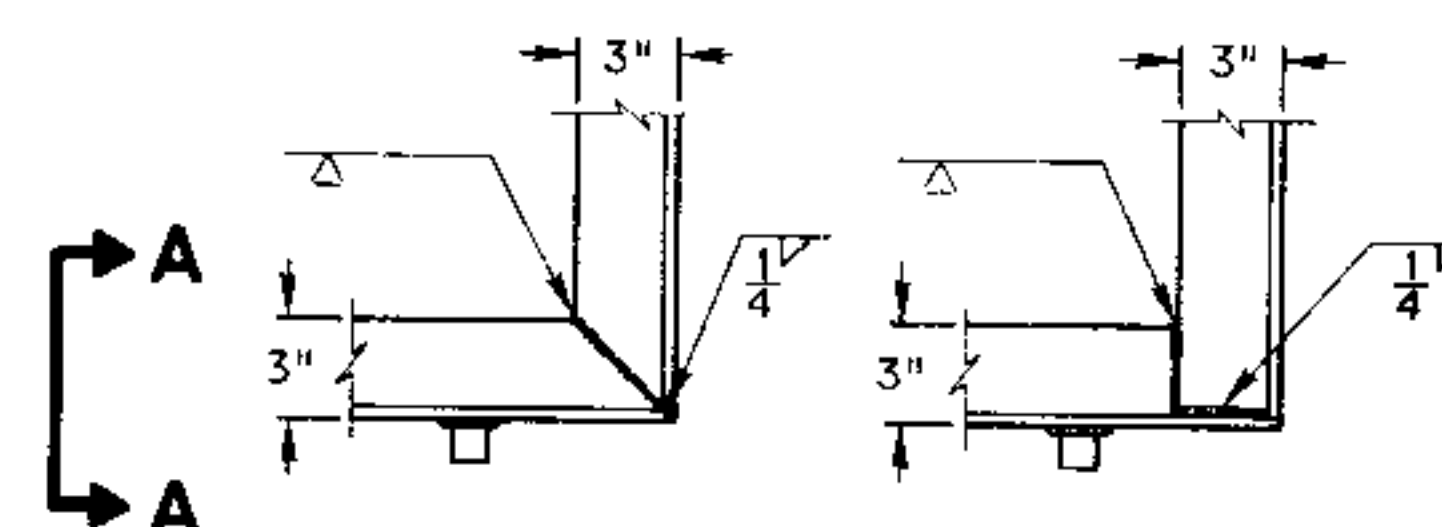
TYPE "MS"

CAUTION: DO NOT USE GRATES WITH
LONGITUDINAL SLOTS WHERE BICYCLE
TRAFFIC IS PERMITTED.

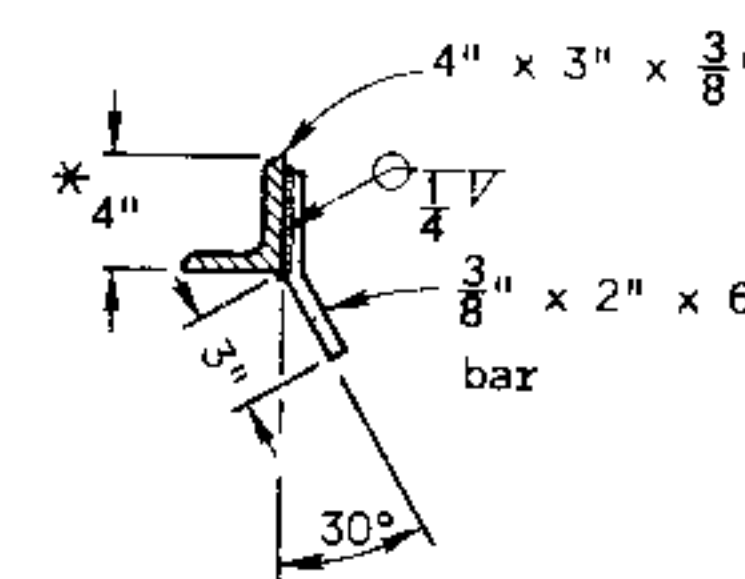


TYPE "F"

(Approximate Weight 850 lbs.)
Frame 515 lbs.
Back grate 160 lbs.
Front grate 175 lbs.



TYPICAL CORNER OF FRAME FOR STEEL GRATE



SECTION A-A

*4" dimension may vary according
to type of grating used

GENERAL NOTES

Details of construction, materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the Standard Specifications and the applicable Special Provisions.

Detail drawings for proposed alternate designs for Catch Basin, Manhole and Inlet Covers shall be submitted to the Engineer for approval providing that such alternate designs make provision for equivalent capacity and strength.

All Catch Basin, Manhole and Inlet Covers which are placed in vehicular traffic areas shall be "Non-Rocking" type.

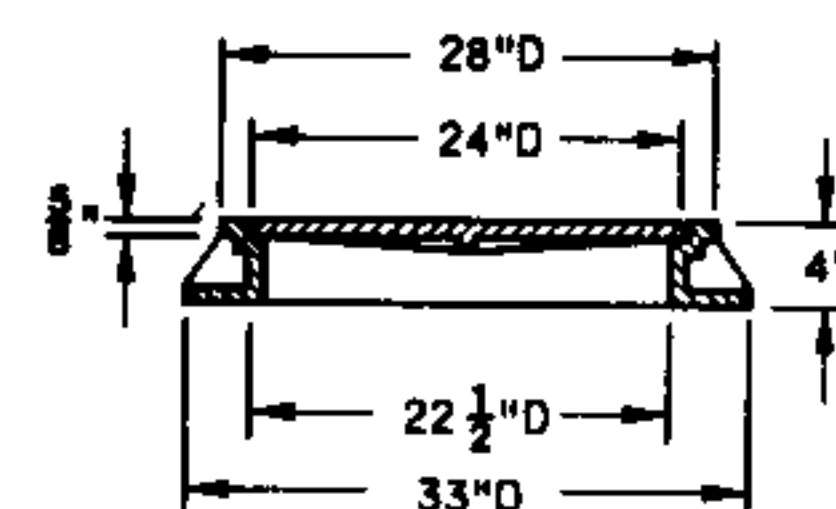
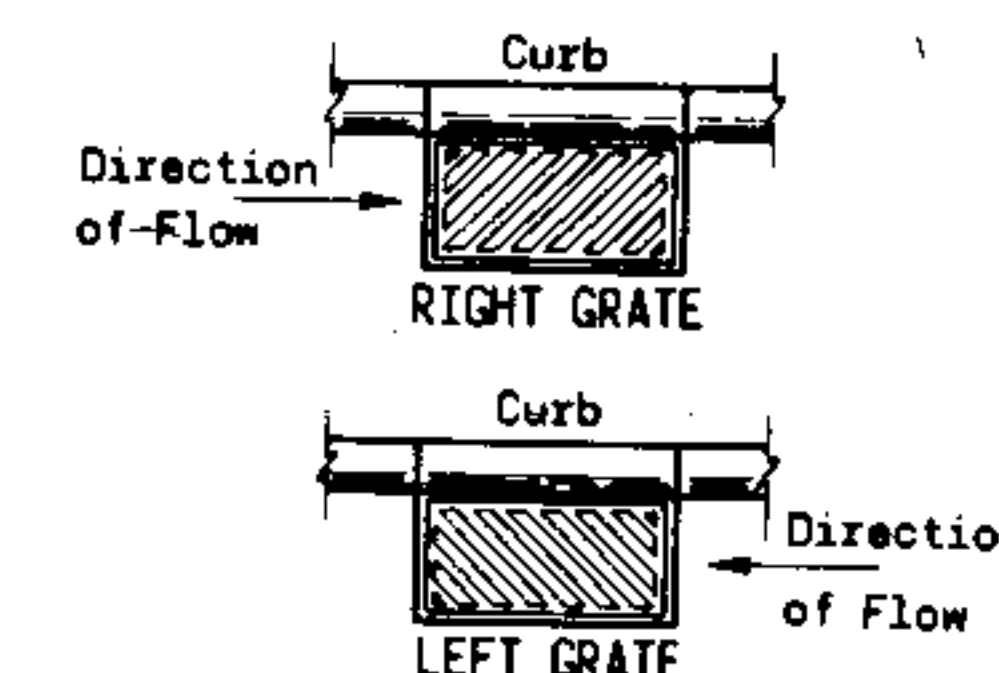
Adjustment of the cover to grade may be accomplished by the use of mortar and brick, or by precast concrete grade rings. Precast concrete grade rings shall conform to the specifications for Precast Reinforced Concrete Manhole Sections, AASHTO Designation M199, except that when such units are wet cast, they shall be made with air-entraining portland cement. Maximum adjustment shall be 8 inches.

The actual weight of covers may vary within 5 percent, plus or minus, of the approximate weight.

The Type "MS" cover may either be a cast iron grate or a steel grate and frame at the contractors option. A frame is not required with the cast iron cover.

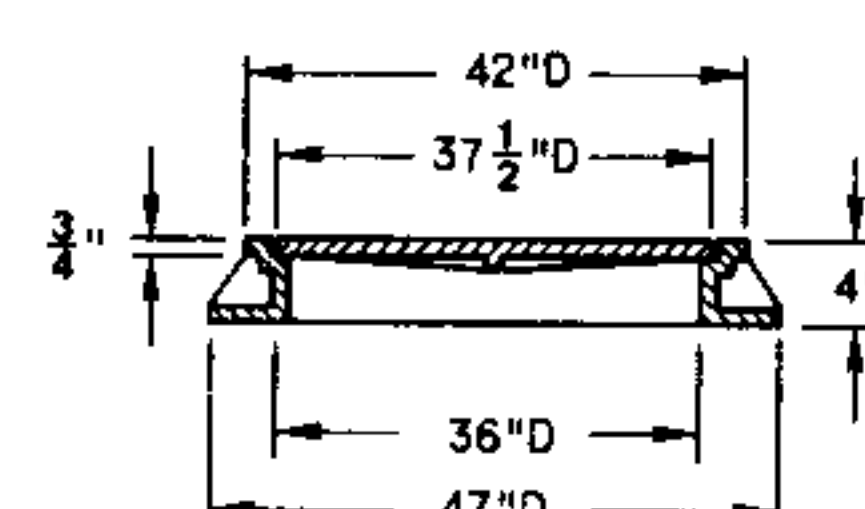
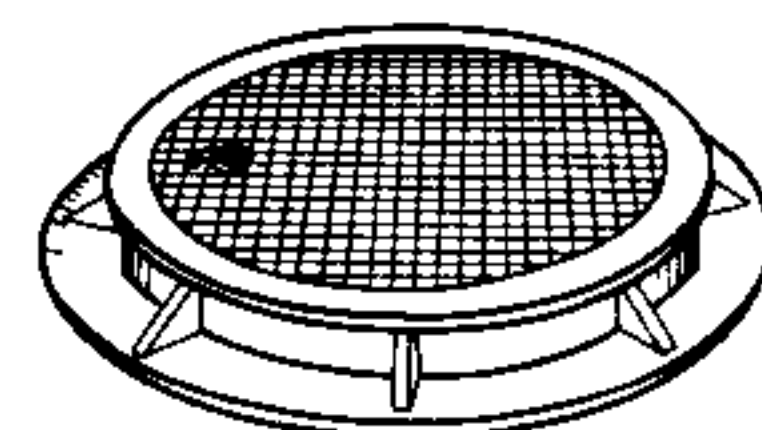
The steel grating shall be capable of carrying an H20 load on a 2'-10" max. clear span and shall have a minimum section modulus thru the main bearing bars of 3.80 inches³ per ft. of width. The grating shall be cut in such a manner that all riveted or welded connections are left intact. End banding with a 3/8" min. thickness is required. The size of the frame shall be such that when the grate is in place, the clearance between the grate and the frame will not exceed 5/8" on any side. Main bars shall be laterally supported by transverse bars. Grating and frame shall be galvanized as specified in AASHTO Designation M-111 after fabrication. Grating shall be approved by the Engineer.

Diagonal Slots shall be oriented to the direction of flow. RIGHT and LEFT grates or grates that are manufactured to be reversible and can be used as either RIGHT or LEFT grates shall be furnished depending on direction of flow. (See sketch below)



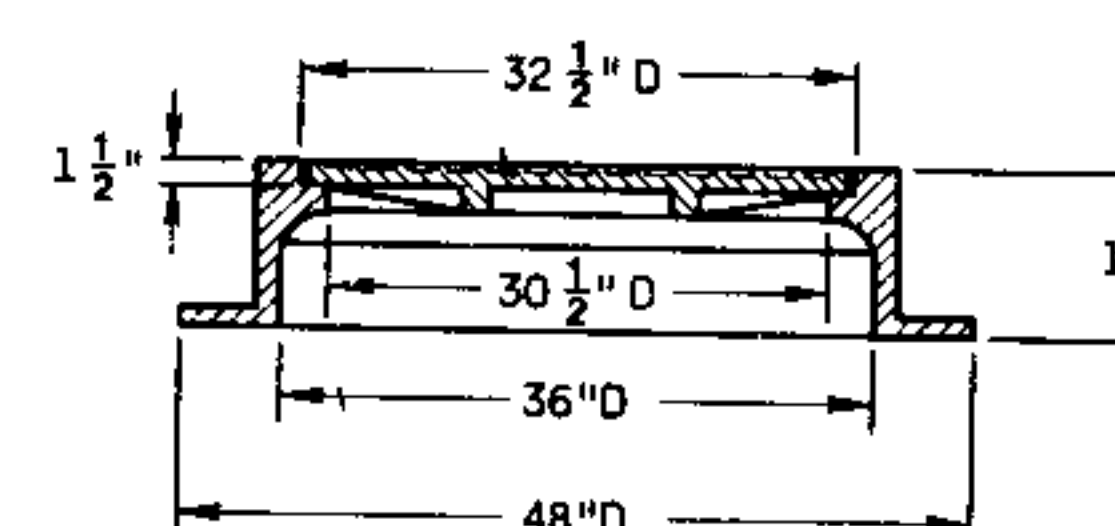
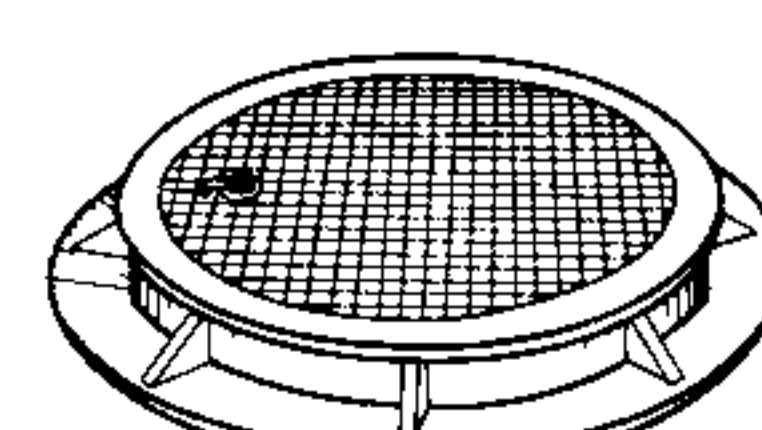
TYPE "L"

(Approximate Weight 220 lbs.)



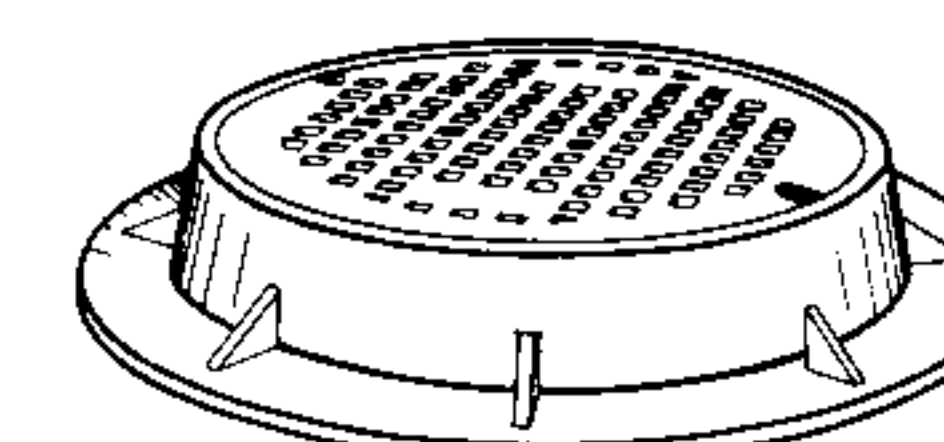
TYPE "M"

(Approximate Weight 535 lbs.)



TYPE "K"

(Approximate Weight 785 lbs.)

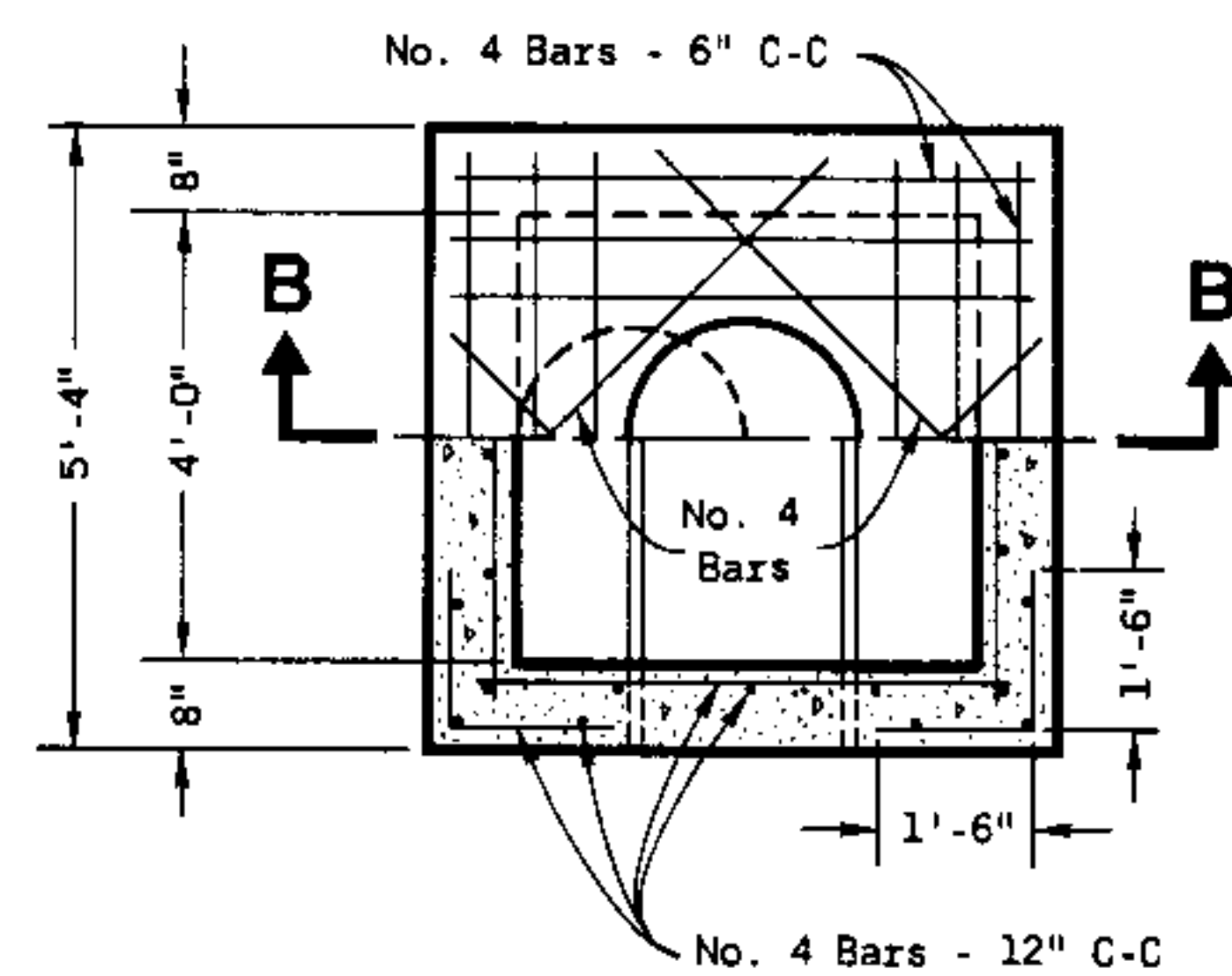


CATCH BASIN MANHOLE AND INLET COVERS

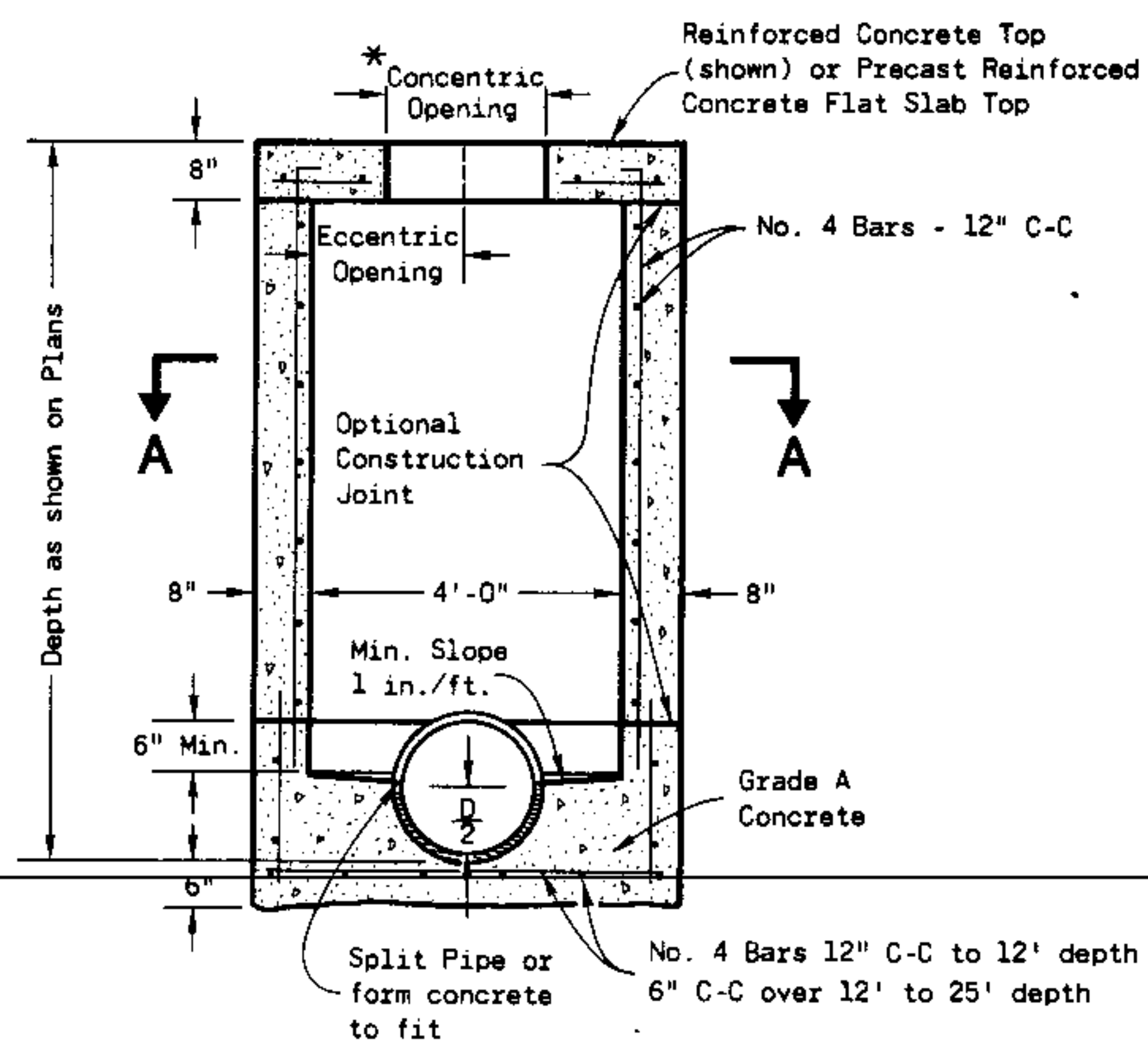
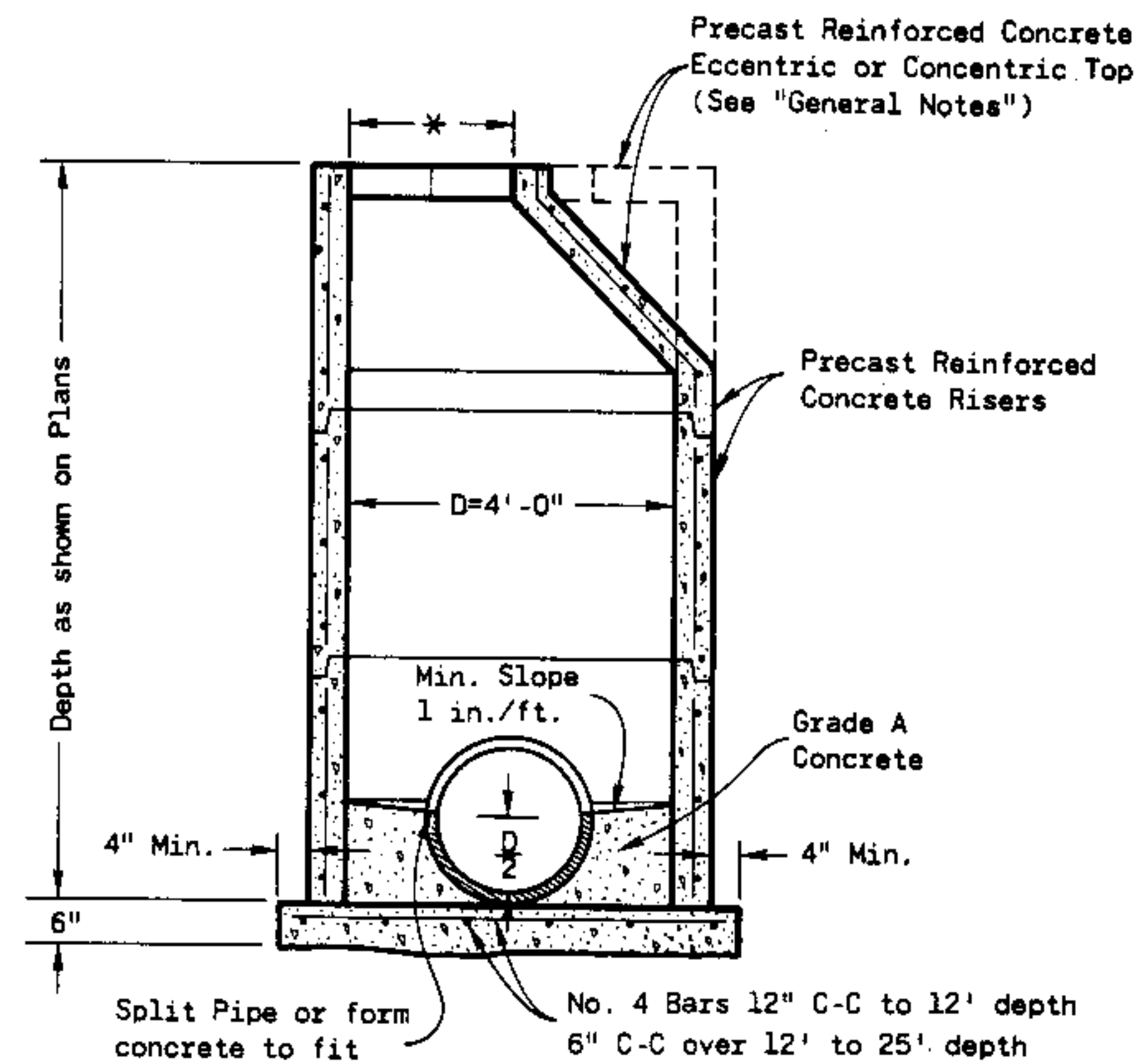
State of Wisconsin
Department of Transportation
Division of Highways

APPROVED
11-23-77
DATE
APPROVED
11-25-77
DATE
FHWA

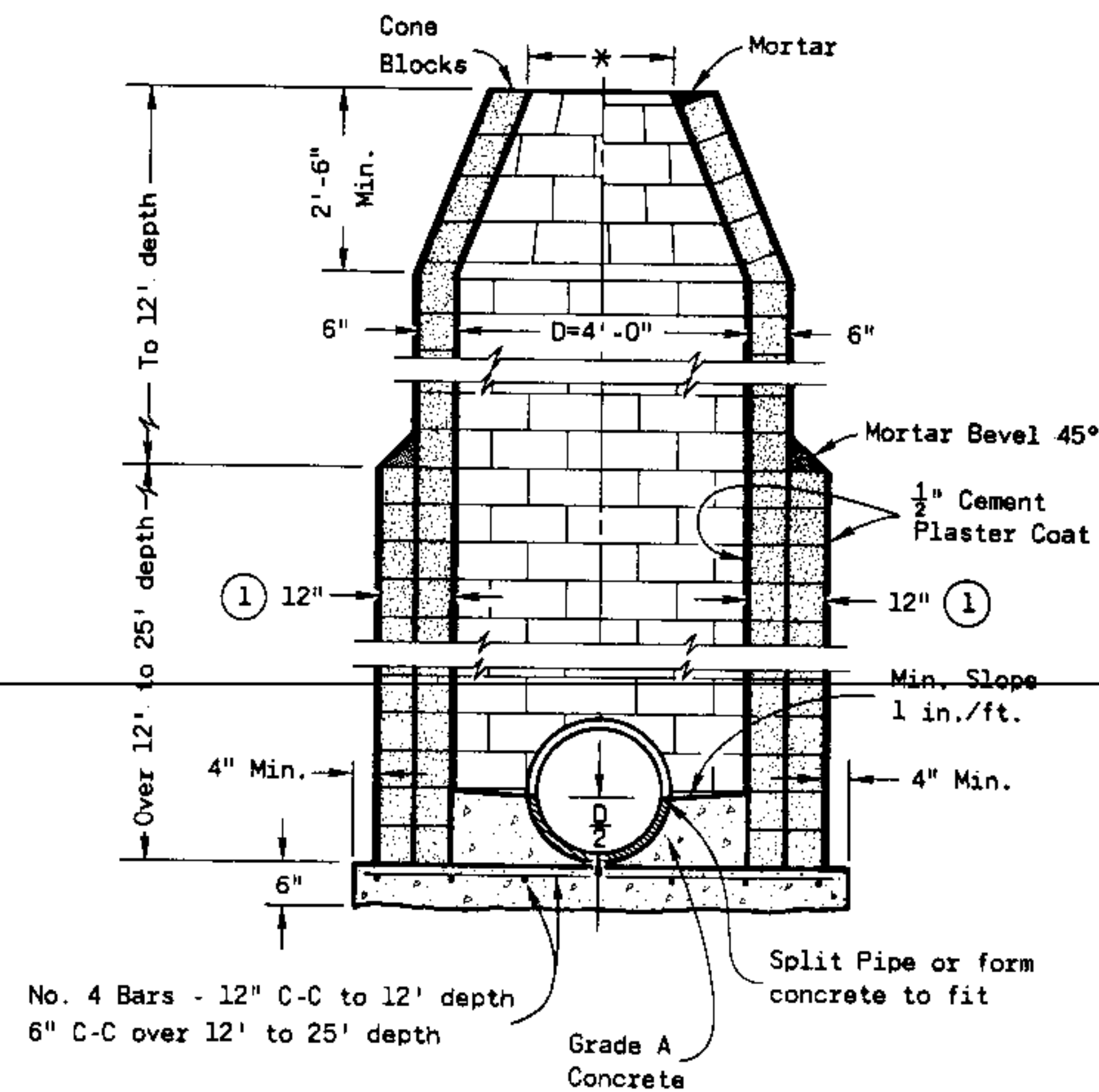
P. W. Baker
SUPERVISING DEVELOPMENT ENGINEER
D. J. Starnes
CHIEF OF FACILITIES DEVELOPMENT



HALF SECTION A-A

SECTION B-B
REINFORCED CONCRETE

PRECAST REINFORCED CONCRETE



CONCRETE BLOCK

GENERAL NOTES

Details of construction, materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the Standard Specifications and the applicable Special Provisions.

Detailed drawings for proposed alternate designs for underground drainage structures shall be submitted to the Engineer for approval providing that such alternate designs make provision for equivalent capacity and strength.

All drainage structures are designated on the plans as "Manholes 1-C", "Catch Basins 1-B", "Inlets 3-H", etc. The first digit designates the masonry portion of the structure, and the following letter designates the type of cover to be used to comprise the complete unit.

Precast Reinforced Bases shall be placed on a bed of material at least 6 inches in depth, which meets the requirements for Granular Backfill. This bedding shall be compacted and provide uniform support for the entire area of the base.

Precast Reinforced Concrete Cone Tops (Eccentric or Concentric) may be used on concrete block structures. The Cone Tops shall be installed on a bed of mortar.

Eccentric Cone Tops may be used on all structures, and Concentric Cone Tops shall be used only on structures 5 feet or less in depth, unless otherwise directed by the Engineer.

Steps meeting the following requirements shall be installed in all structures over 5 feet in depth: 16 inch C-C maximum spacing; project a minimum clear distance of 4 inches from the wall at the point of embedment; minimum length of 10 inches; minimum wall embedment of 3 inches; and be capable of supporting a concentrated load of 300 lbs. Ferrous metal steps not painted or treated to resist corrosion shall have a minimum cross sectional dimension of 1 inch.

Solid Aluminum steps shall have a minimum cross sectional dimension of 0.75 inch. Aluminum surfaces to be embedded in concrete shall be given one coat of suitable quality paint, such as zinc chromate primer conforming to Federal Specification TT-P-645 or equivalent. Steps of approved Polypropylene plastic coated reinforcement bar will be acceptable.

All bar steel reinforcement shall be embedded 2 inches clear unless otherwise shown or noted.

Precast Reinforced Concrete Risers may be placed with tongue up or down.

All Precast Inlet Units shall conform to the pertinent requirements of AASHTO Designation M 199.

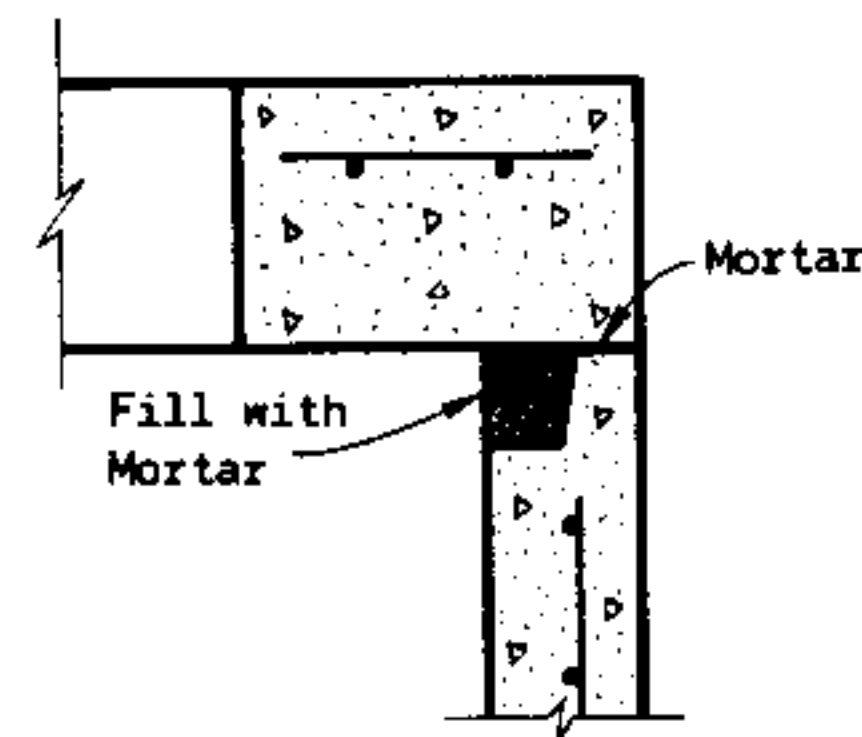
- * Use 2'-0" diameter opening with Type "C", "L" and "J" covers, or 3'-0" diameter with Type "K" and "M" covers.
- ① 2 courses 6" block.

MANHOLES TYPE 1

State of Wisconsin
Department of TransportationAPPROVED
4-13-82
DATE

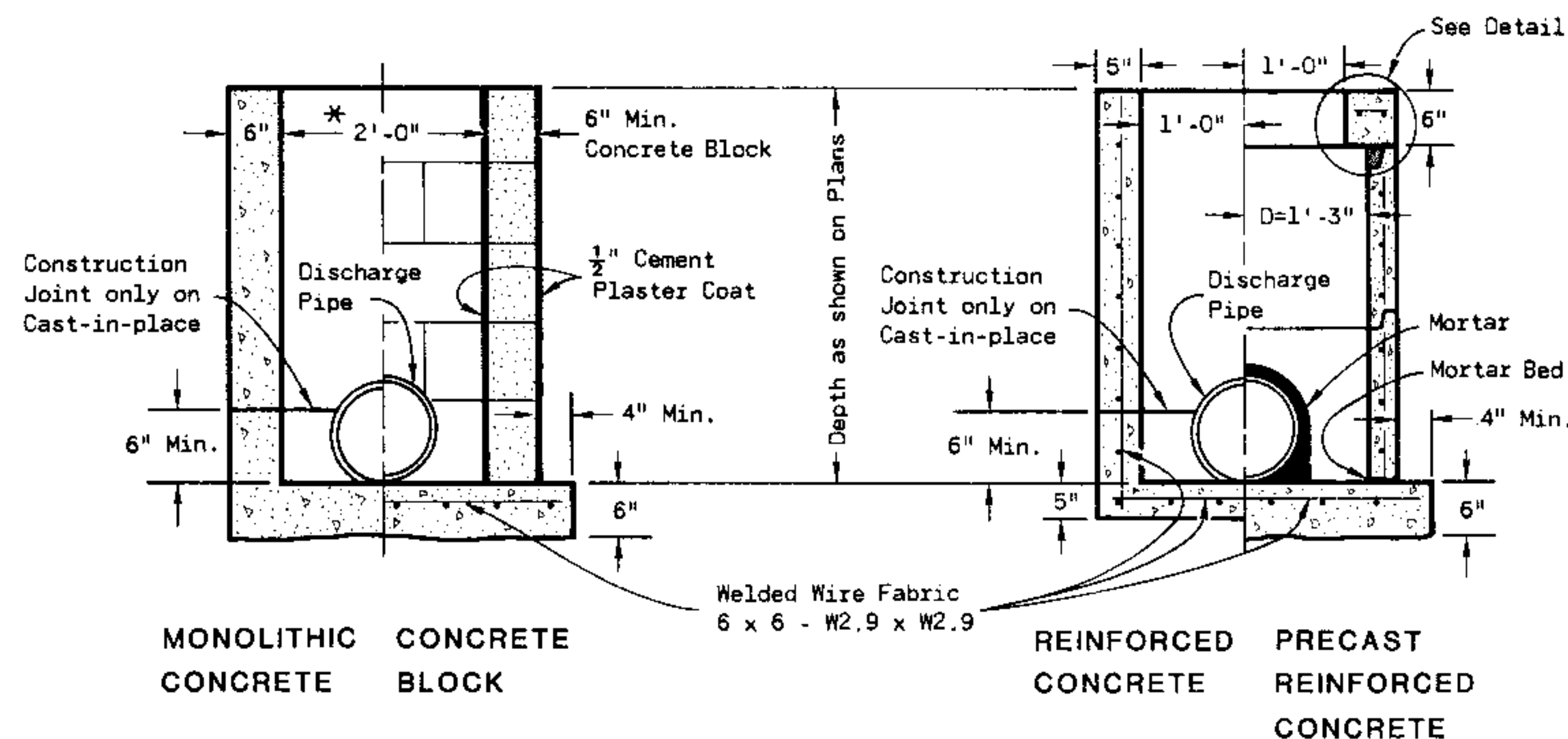
FHWA

D. J. Strand
CHIEF DESIGN ENGINEER



DETAIL "A"

* Selection of square or circular design will be based on the pipe sizes and the Inlet Cover being utilized.



INLETS TYPE 1

GENERAL NOTES

Details of construction, materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the Standard Specifications and the applicable Special Provisions.

Detailed drawings for proposed alternate designs for underground drainage structures shall be submitted to the Engineer for approval providing that such alternate designs make provision for equivalent capacity and strength.

All Precast Inlet units shall conform to the pertinent requirements of AASHTO Designation M 199.

All drainage structures are designated on the plans as "Manholes 1-C", "Catch Basins 1-B", "Inlets 3-H", etc. The first digit designates the masonry portion of the structure, and the following letter designates the type of cover to be used to comprise the complete unit.

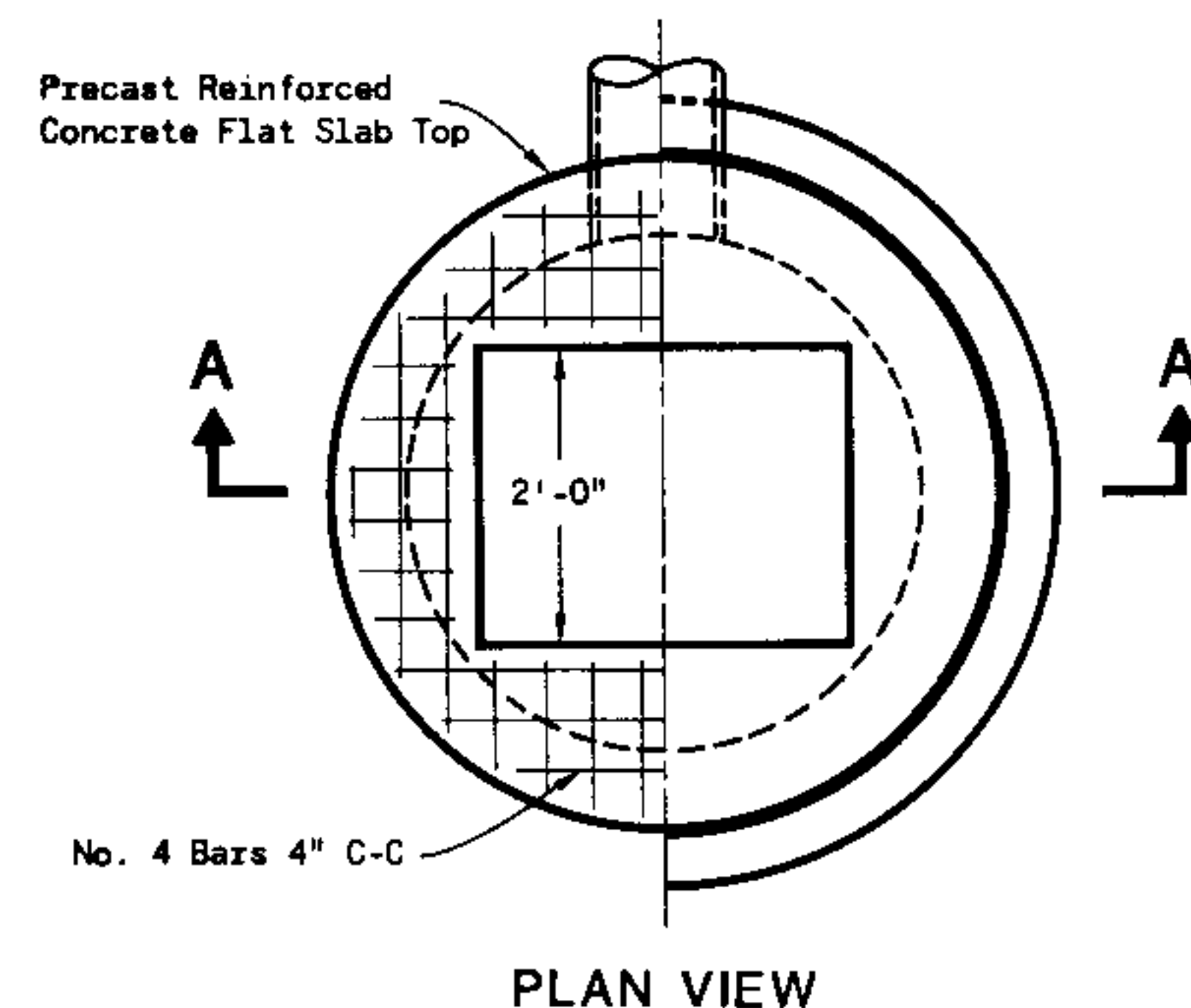
Precast Reinforced Bases shall be placed on a bed of material at least 6 inches in depth, which meets the requirements for Granular Backfill. This bedding shall be compacted and provide uniform support for the entire area of the base.

Precast Reinforced Concrete Flat Slab Tops may be used on the structures. The Tops shall be installed on a bed of mortar.

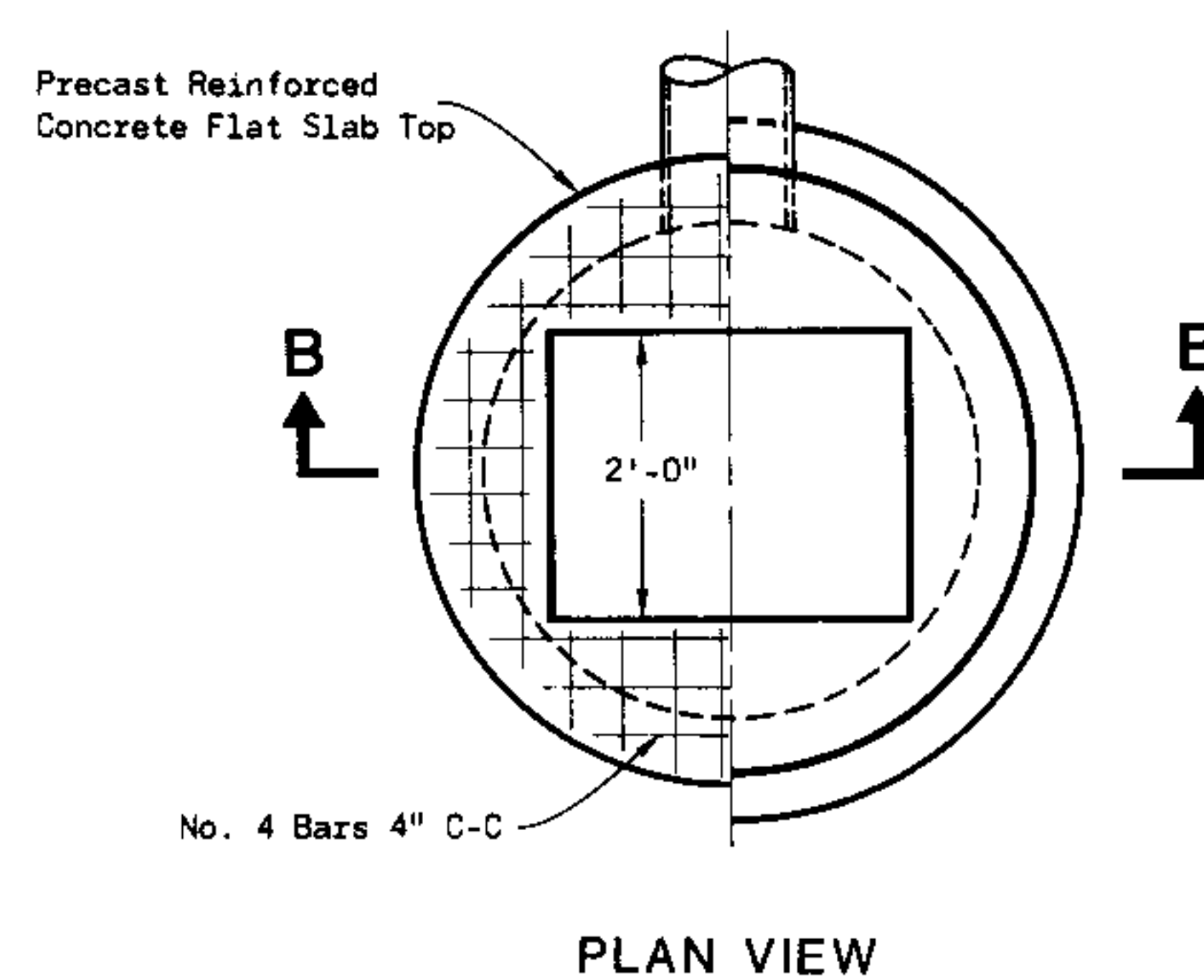
All Bar Steel reinforcement shall be embedded 2 inches clear unless otherwise shown or noted.

Precast Reinforced Concrete Risers shall be placed with tongue down.

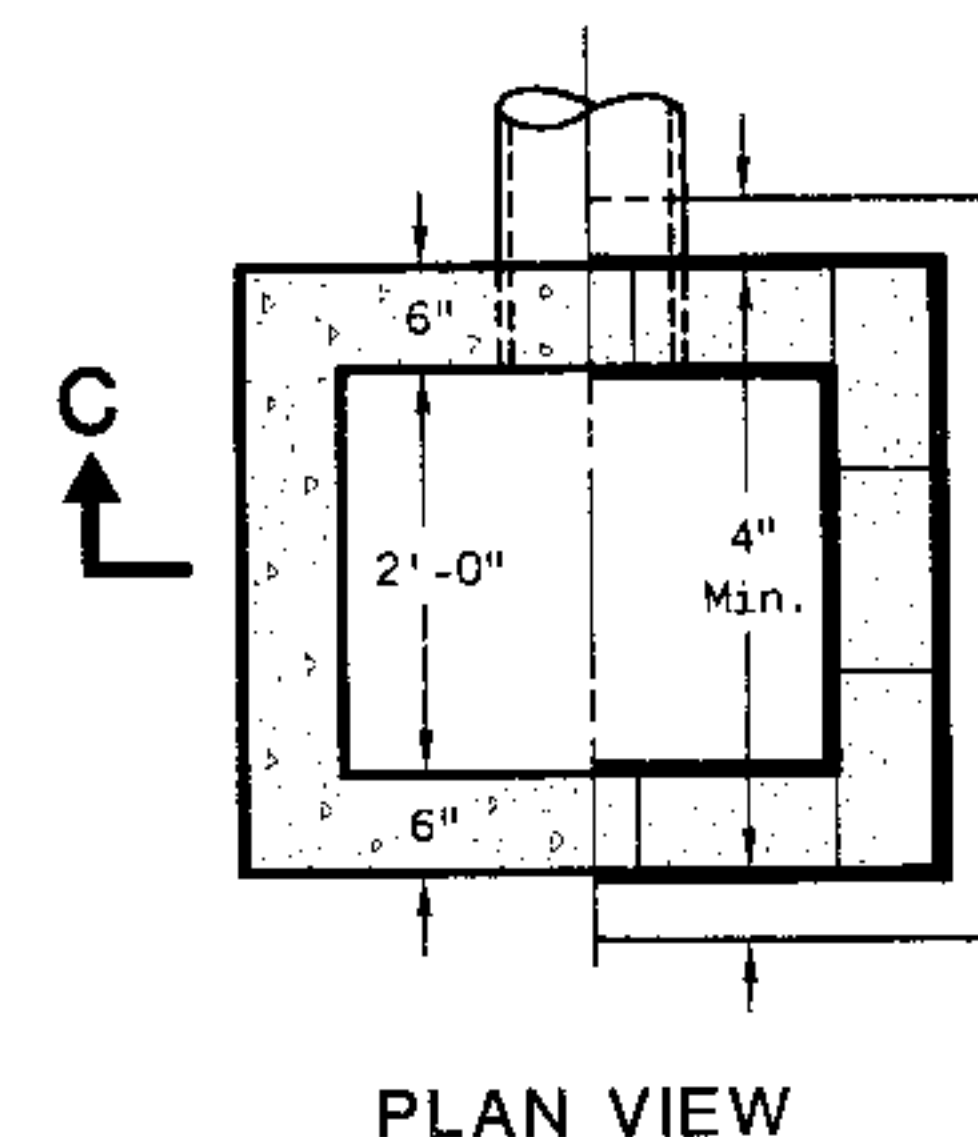
① Use 2'-6" opening for Type 2 Inlets and 3'-0" opening for Type 3 Inlets.



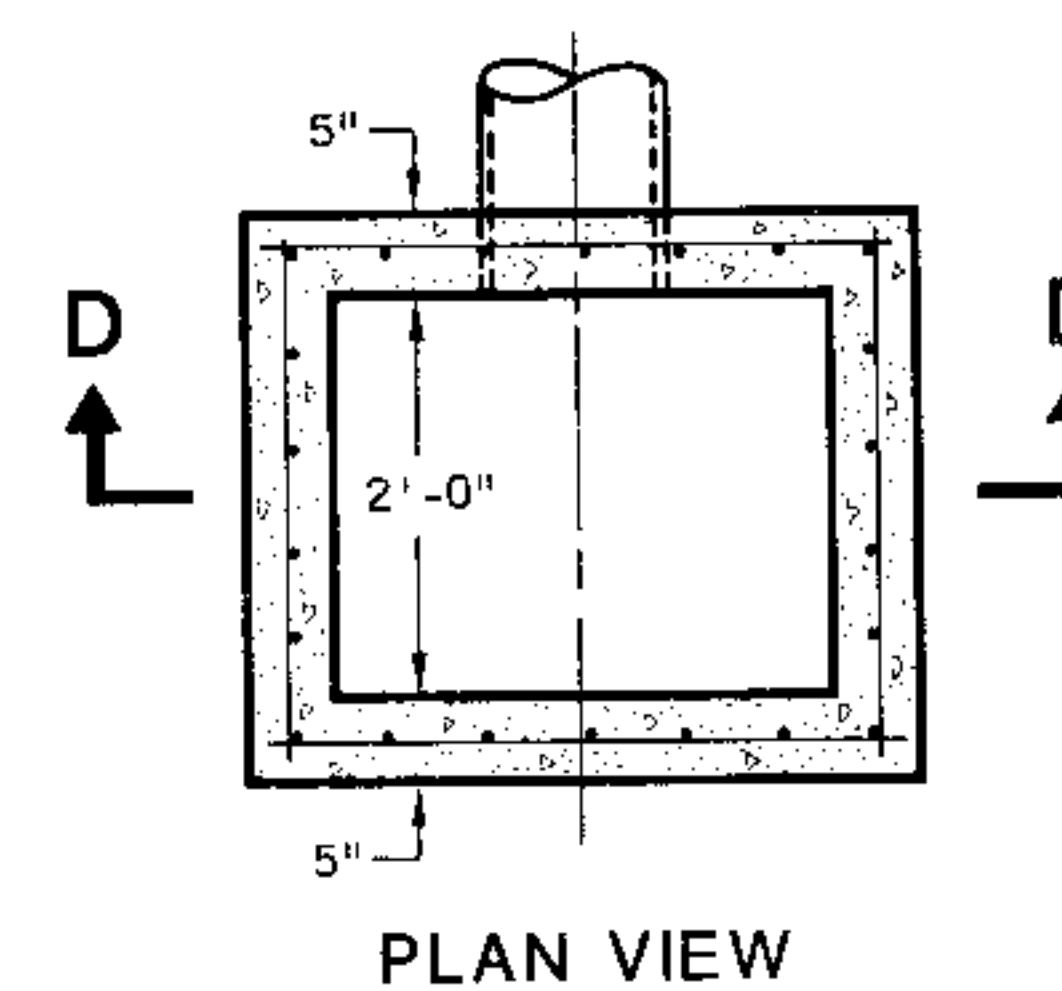
PLAN VIEW



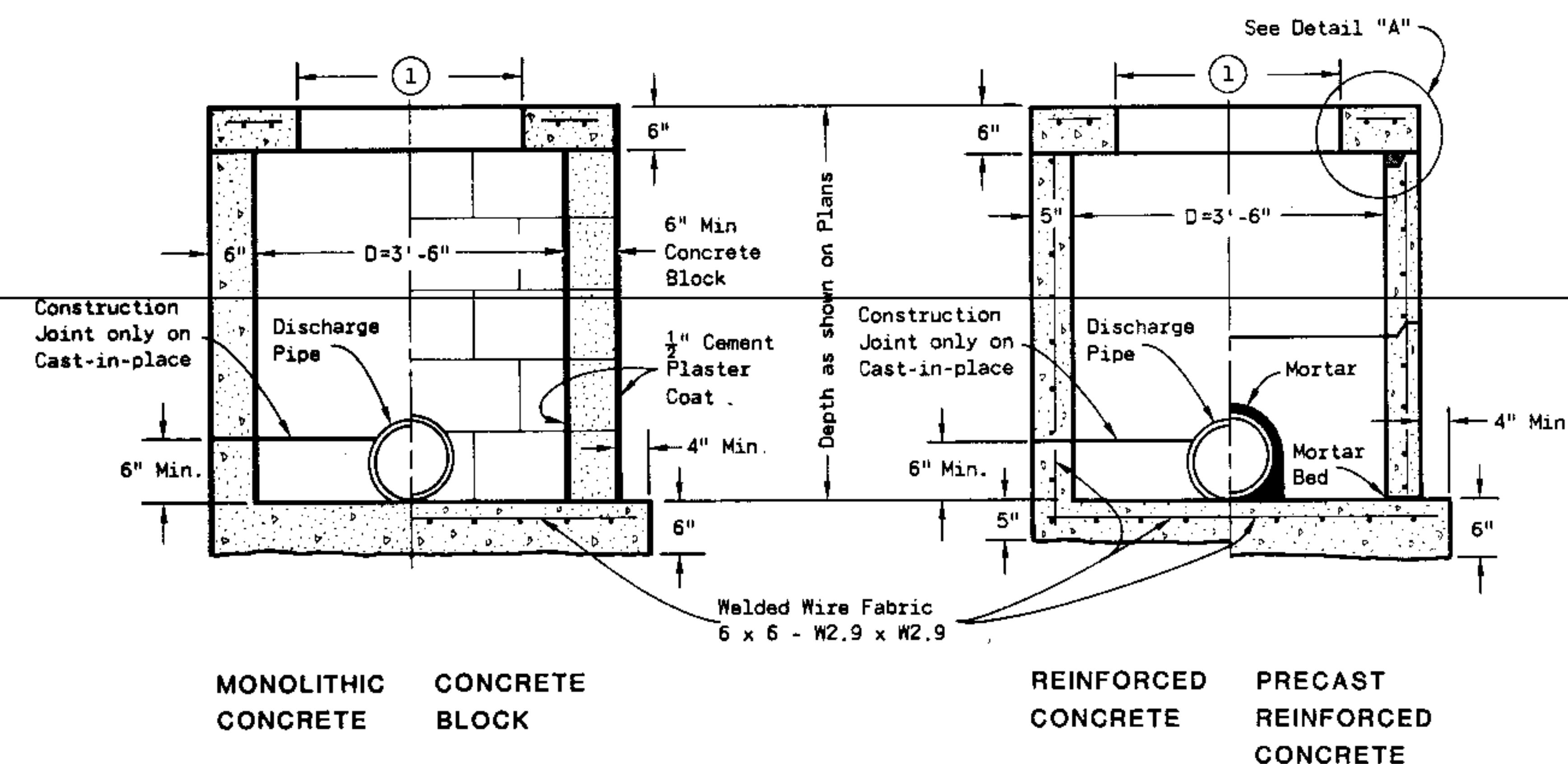
PLAN VIEW



PLAN VIEW

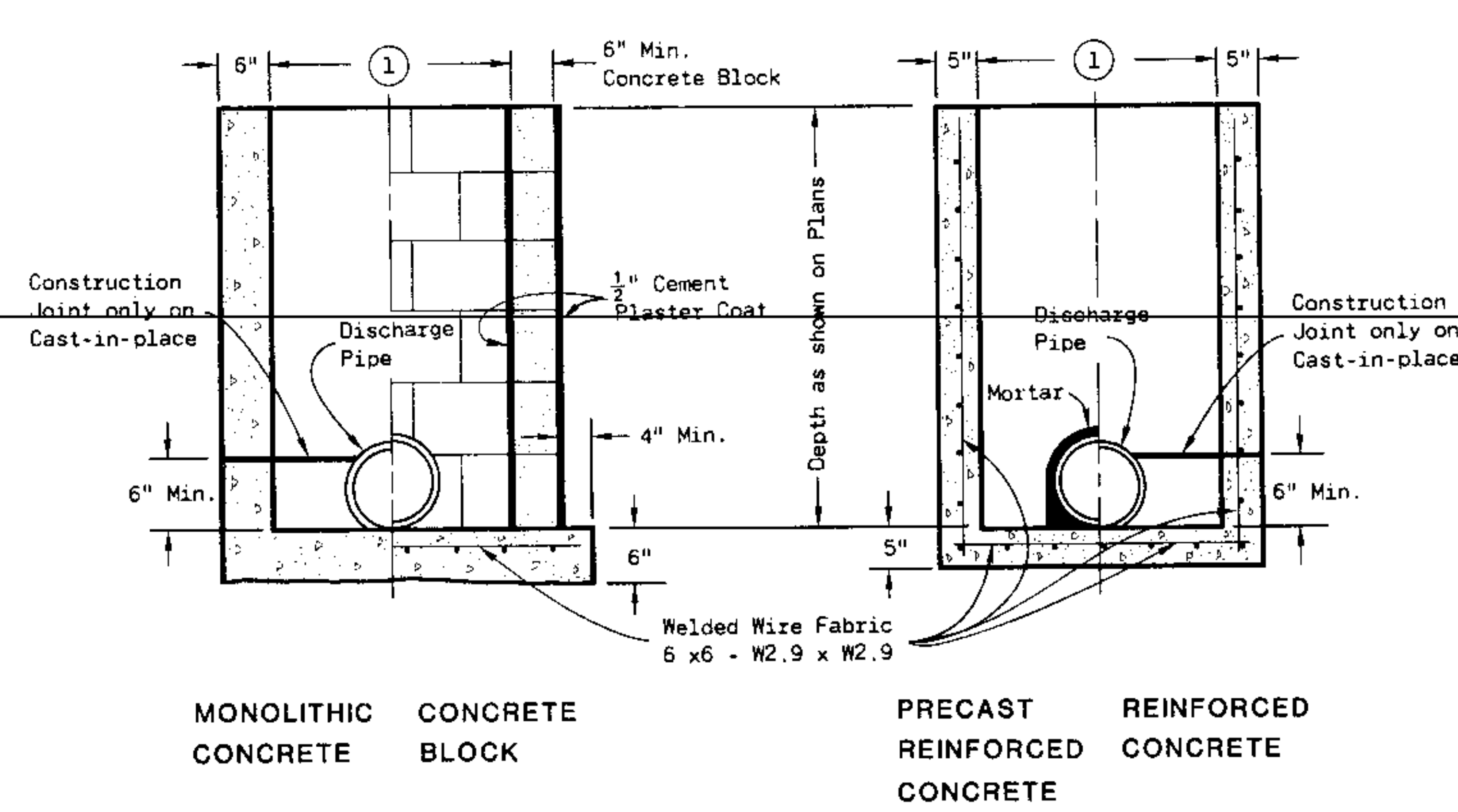


PLAN VIEW



SECTION A-A

SECTION B-B



SECTION C-C

SECTION D-D

INLETS TYPE 2 & 3

INLETS TYPE 1, 2 & 3

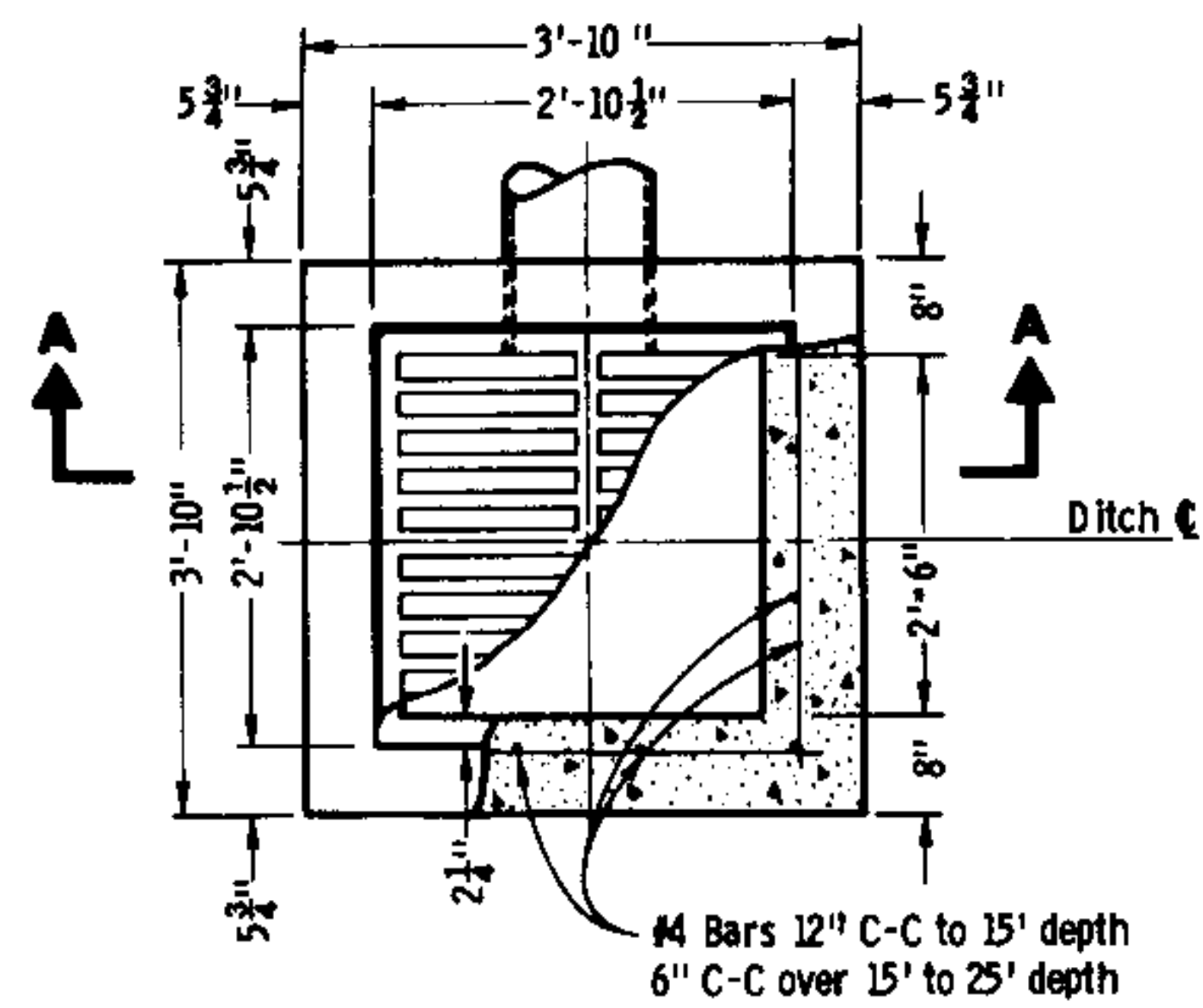
State of Wisconsin
Department of Transportation

APPROVED
4-13-82
DATE

CHIEF DESIGN ENGINEER

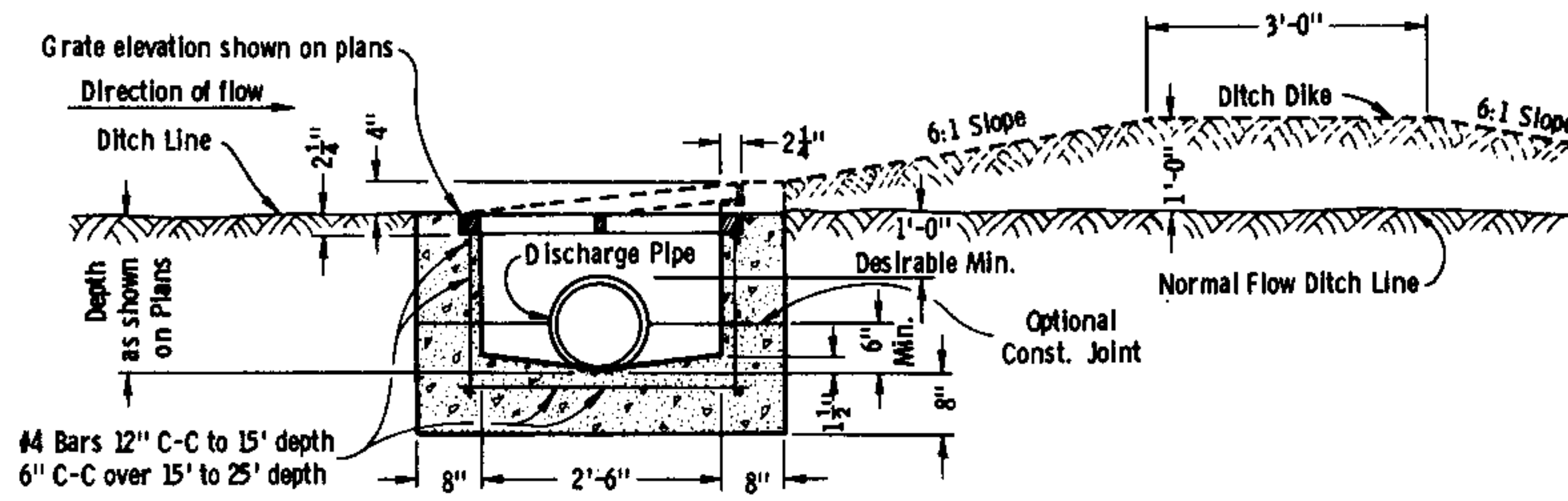
FHWA

S.D.D. 8 C 1-4

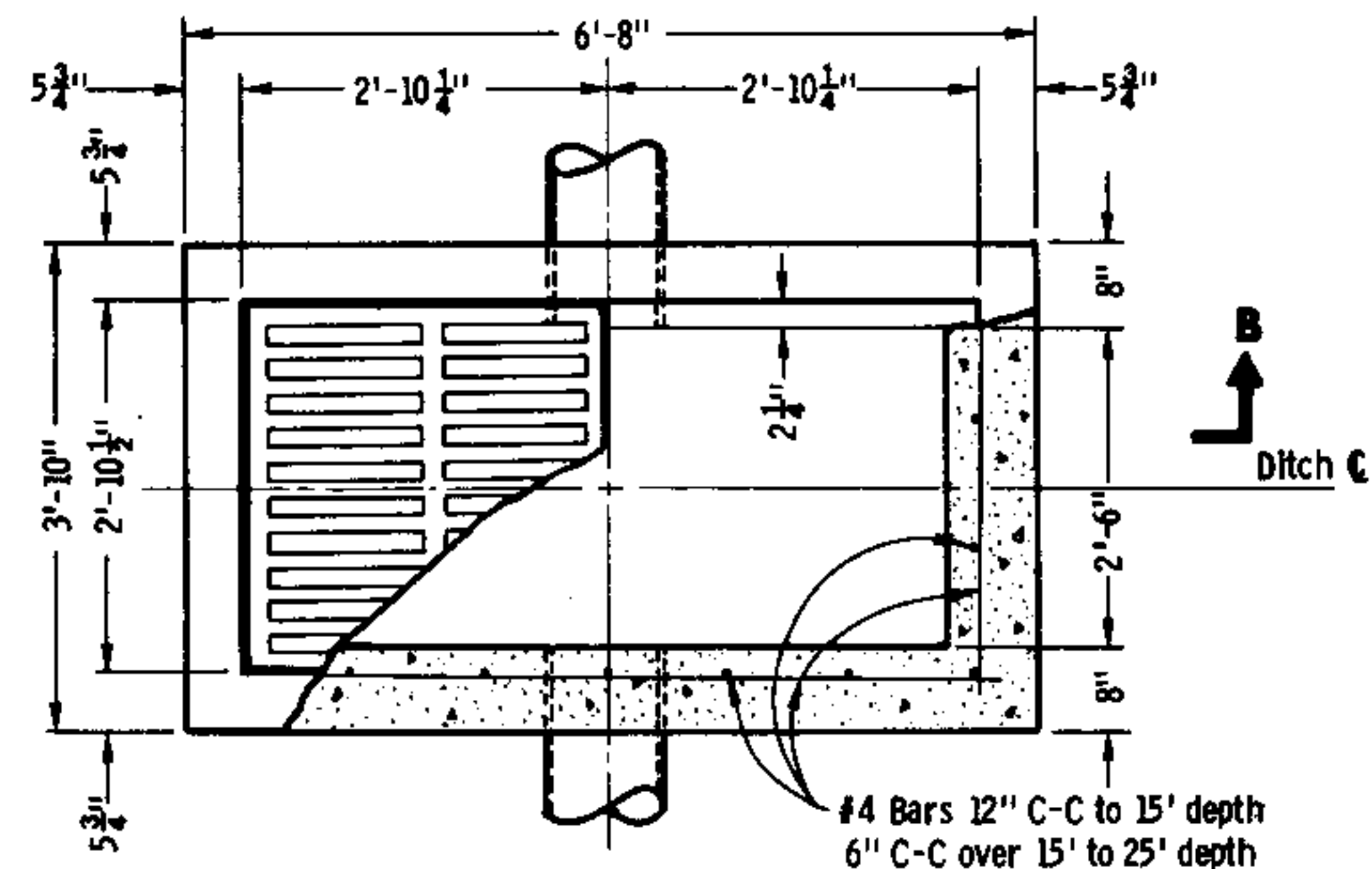


PLAN VIEW

INLET TYPE 8
REINFORCED CONCRETE

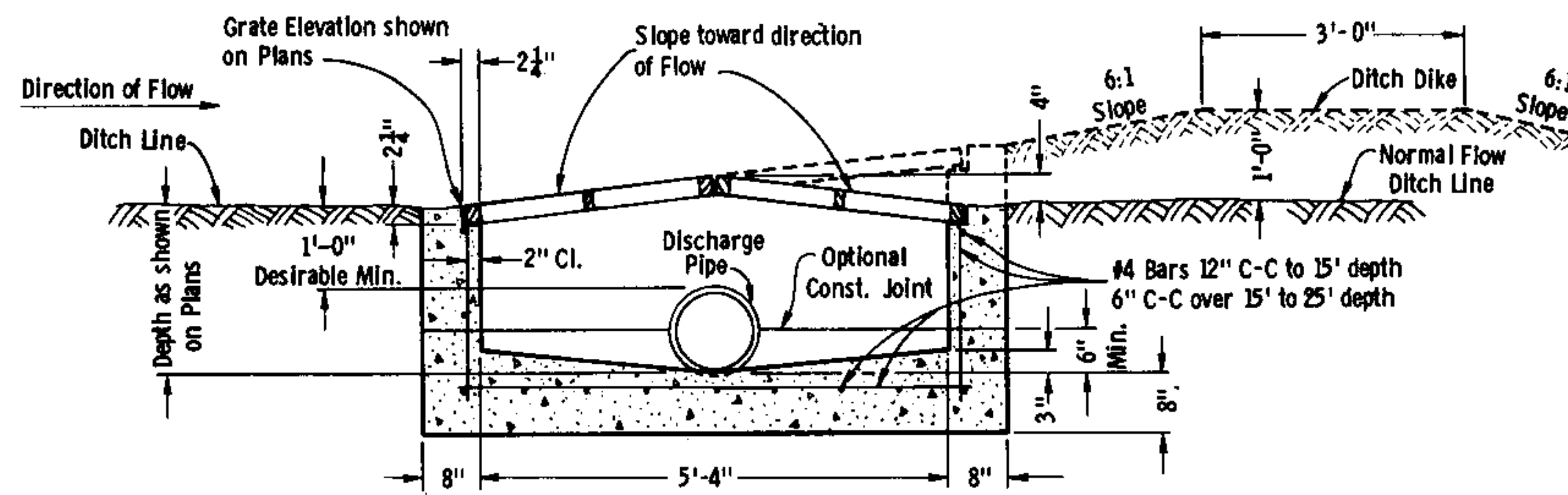


SECTION A-A

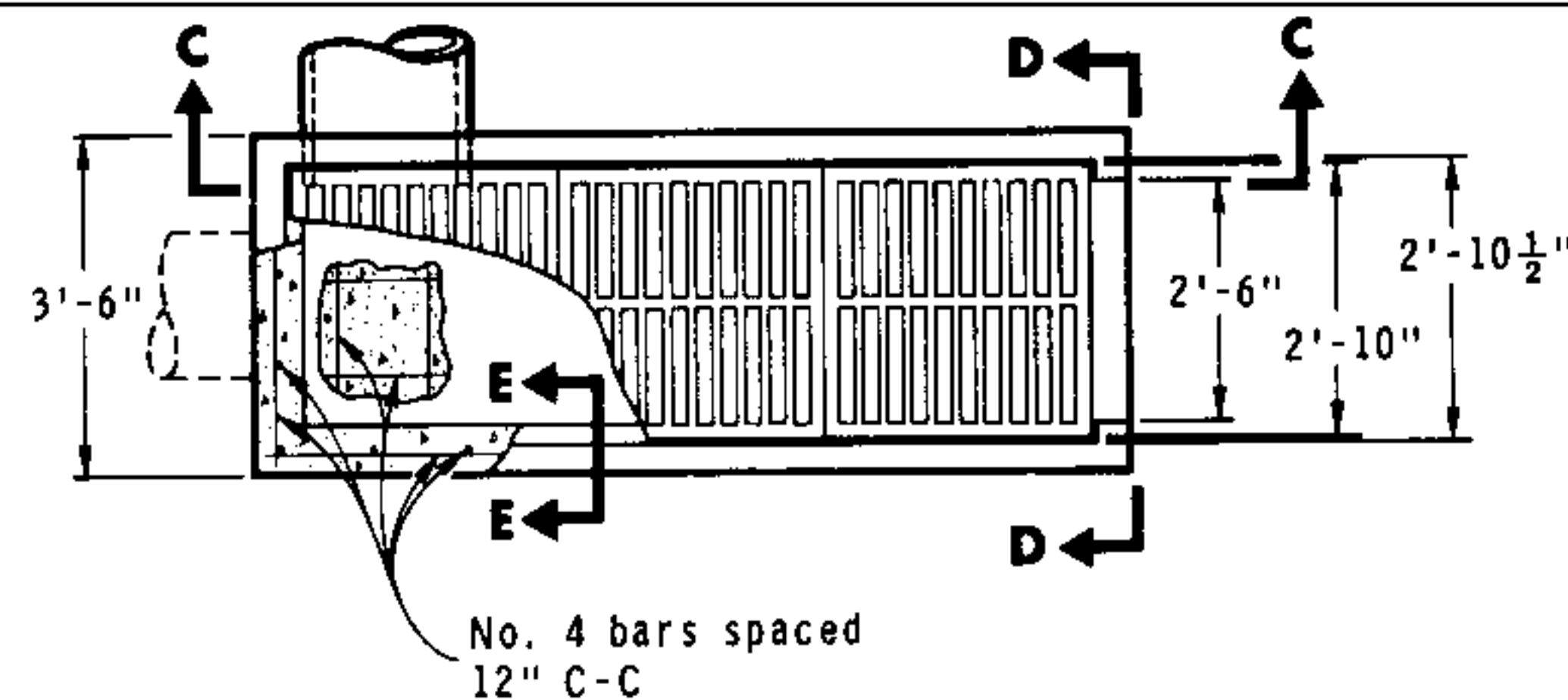


PLAN VIEW

INLET TYPE 9
REINFORCED CONCRETE

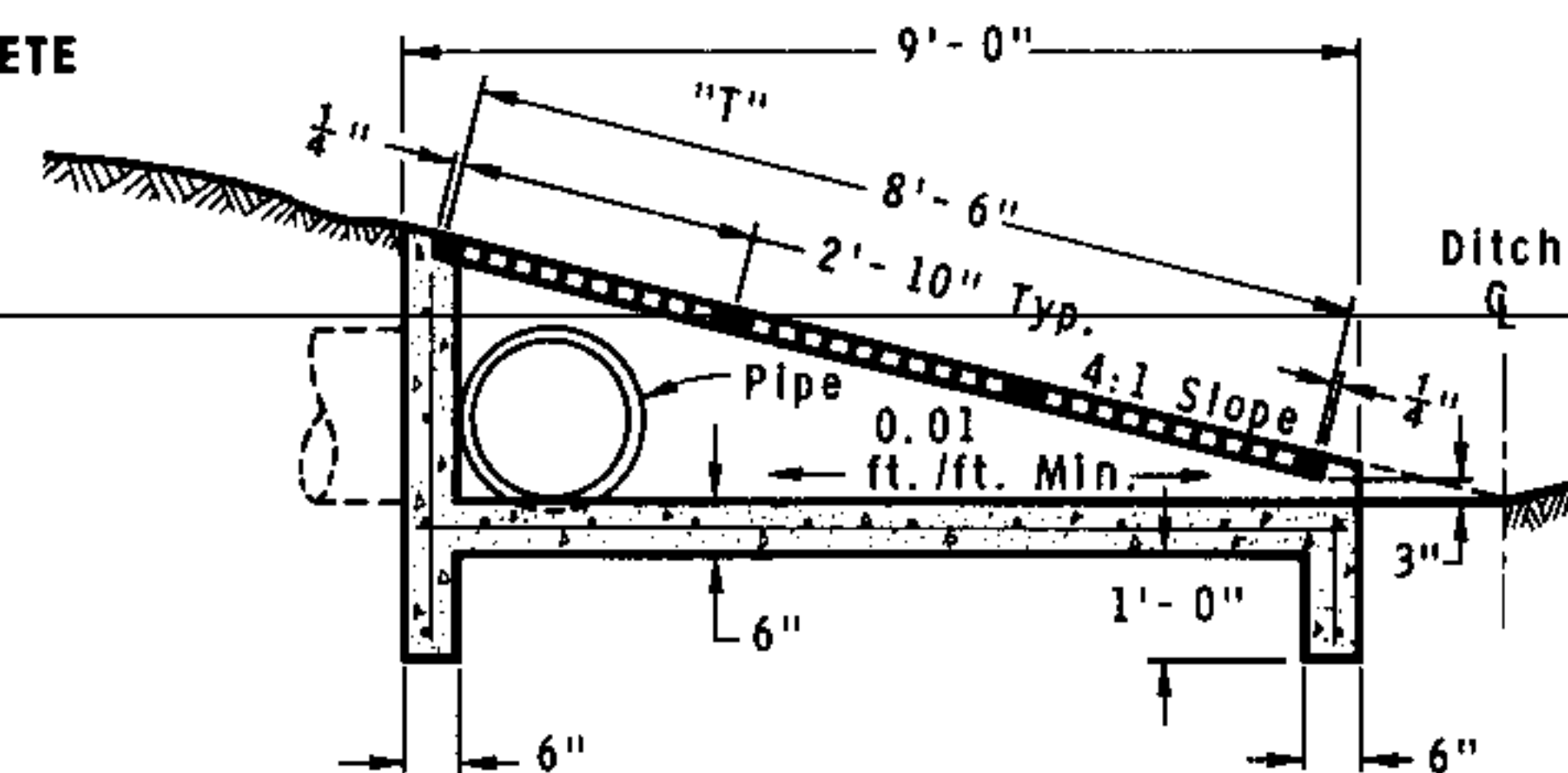


SECTION B-B

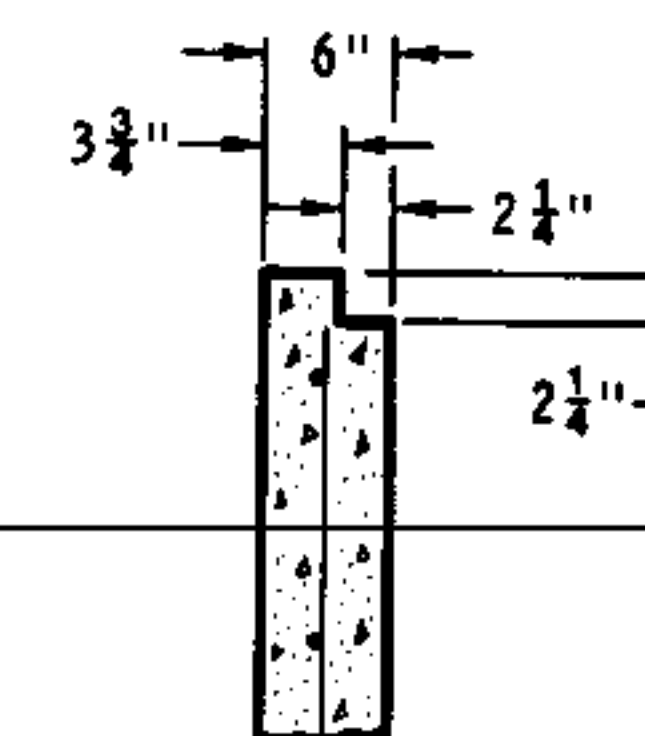


PLAN VIEW

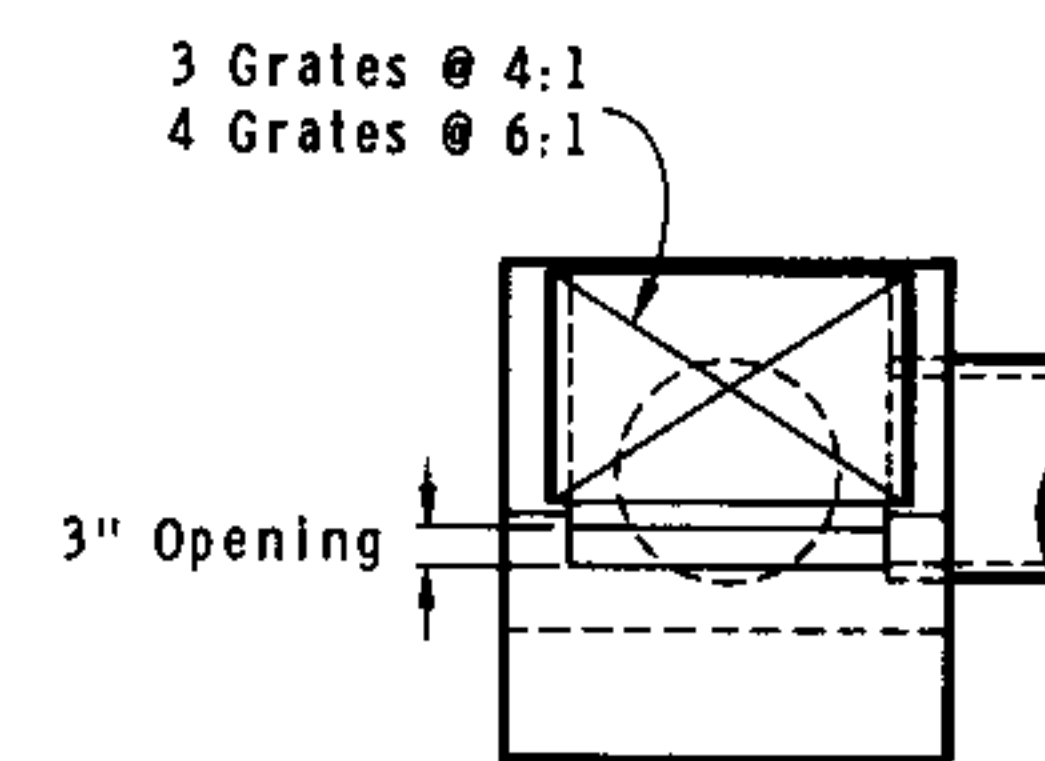
INLET TYPE 10
REINFORCED CONCRETE



SECTION C-C



SECTION E-E



VIEW D-D

GENERAL NOTES

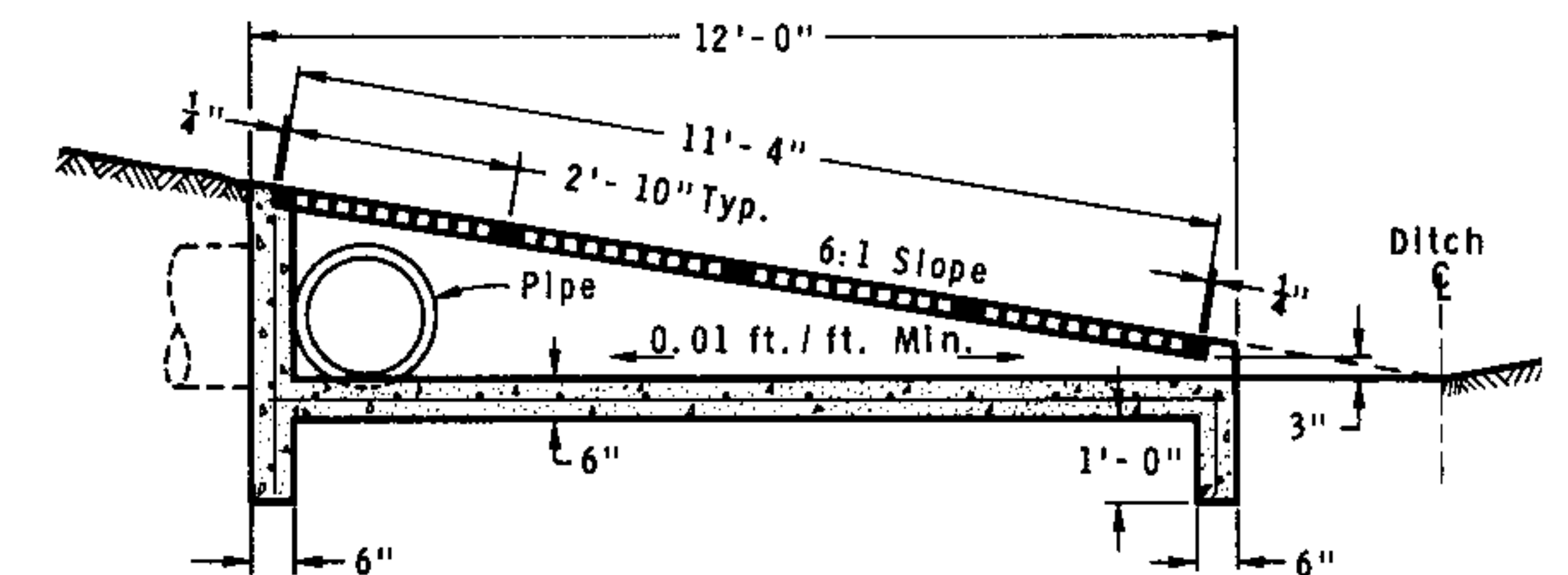
Details of construction, materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the Standard Specifications and the applicable Special Provisions.

Detailed drawings for proposed alternate designs for Inlets which may include precast reinforced concrete inlets, shall be submitted to the Engineer for approval providing that such alternate designs make provision for equivalent capacity and strength.

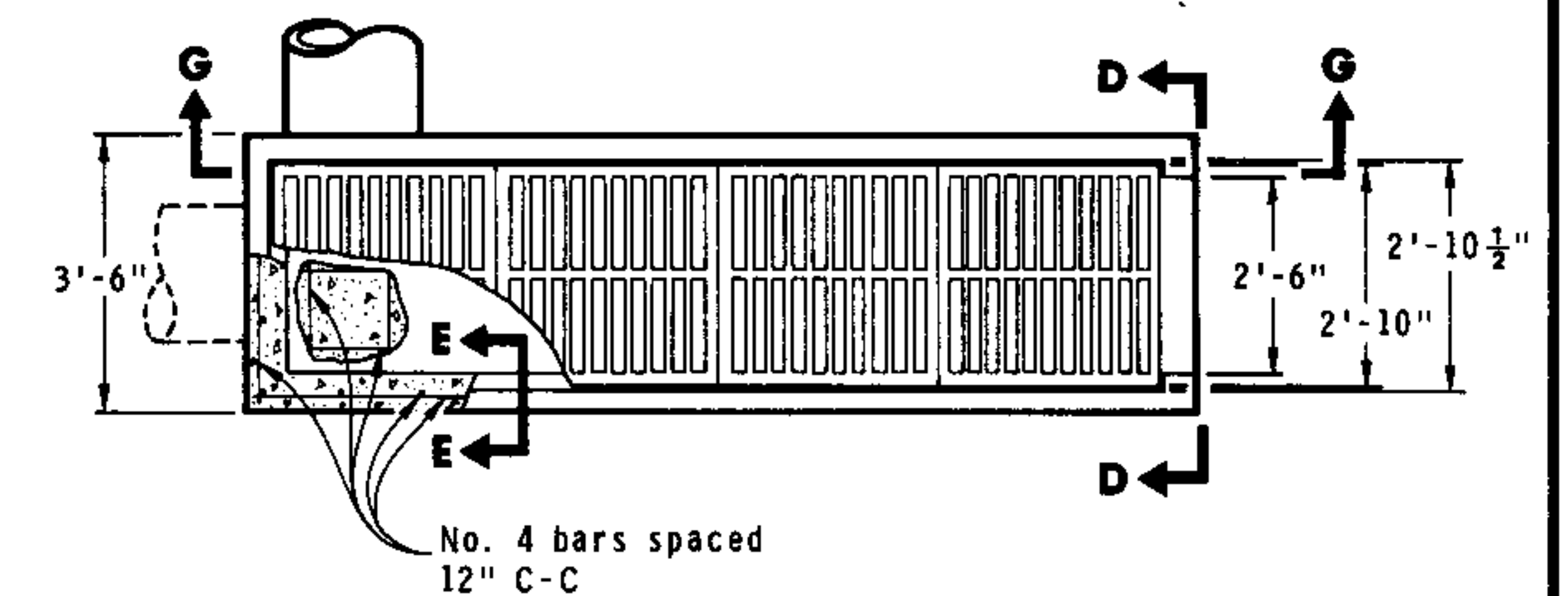
Precast reinforced concrete inlet units, if used, shall conform to the requirements of the Catch Basins, Manholes and Inlets Section of the Standard Specification's.

All Inlets are designated on the Plans as "Inlets, 8-MS", etc. This designation is interpreted to mean that the number, or first digit designates the masonry portion of the structure and the following letter designates the type of cover or iron casting to be used therewith to comprise the complete unit.

All bar steel reinforcement shall be embedded 2 inches clear unless otherwise shown or noted.



SECTION G-G



PLAN VIEW
INLET TYPE 11
REINFORCED CONCRETE

INLETS TYPE 8, 9, 10 and 11

State of Wisconsin
Department of Transportation
Division of Highways

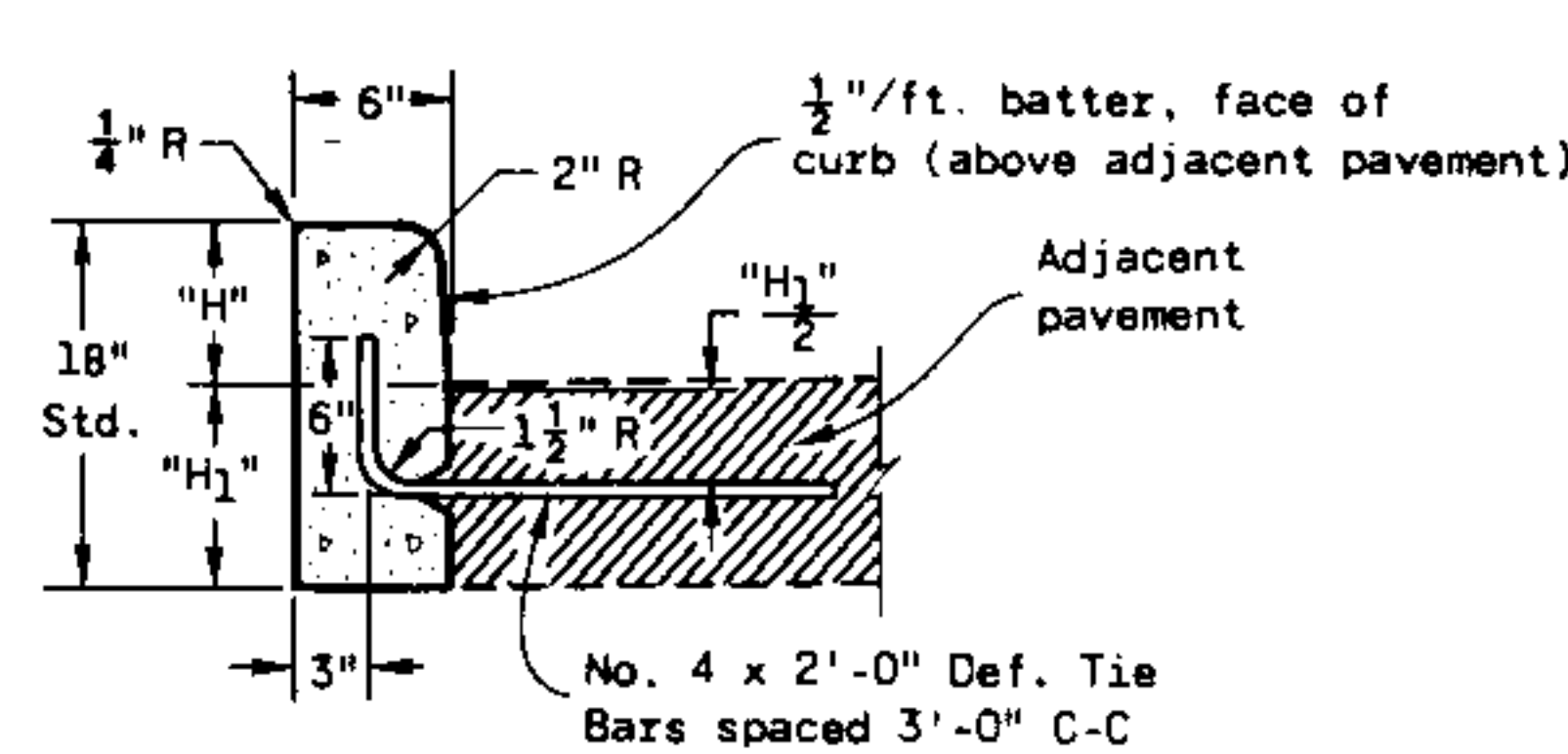
RECOMMENDED FOR APPROVAL:

4-30-74
DATE

5-02-74
DATE

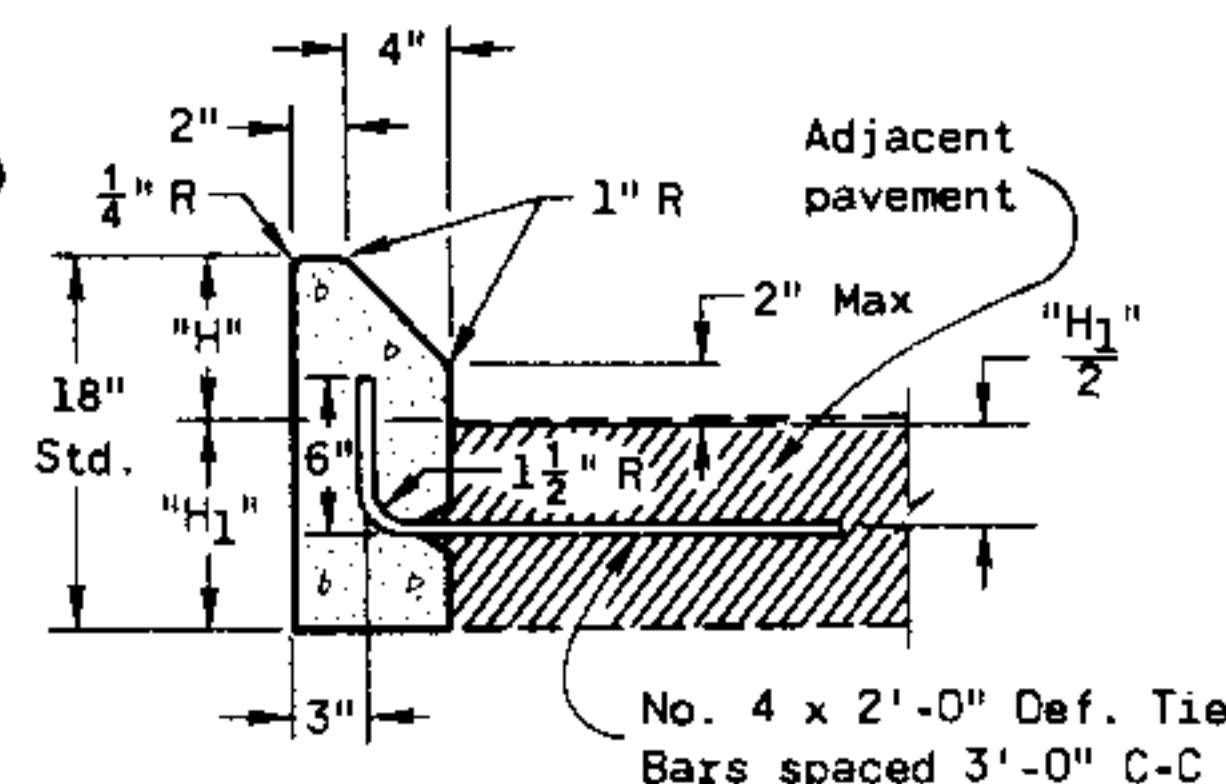
J. C. Hennel
CHIEF OF FACILITIES DEVELOPMENT

W. J. Fisher
STATE HIGHWAY ENGINEER



"H" = 9" Max. and $3\frac{1}{2}$ " Min. and shall be 6" unless otherwise shown on the plans.
 "H₁" = Same as adjacent pavement thickness for rigid pavement and 12" for non-rigid pavement (Tie Bars omitted).

TYPE "A"
 (INCLUDING TIE BARS)



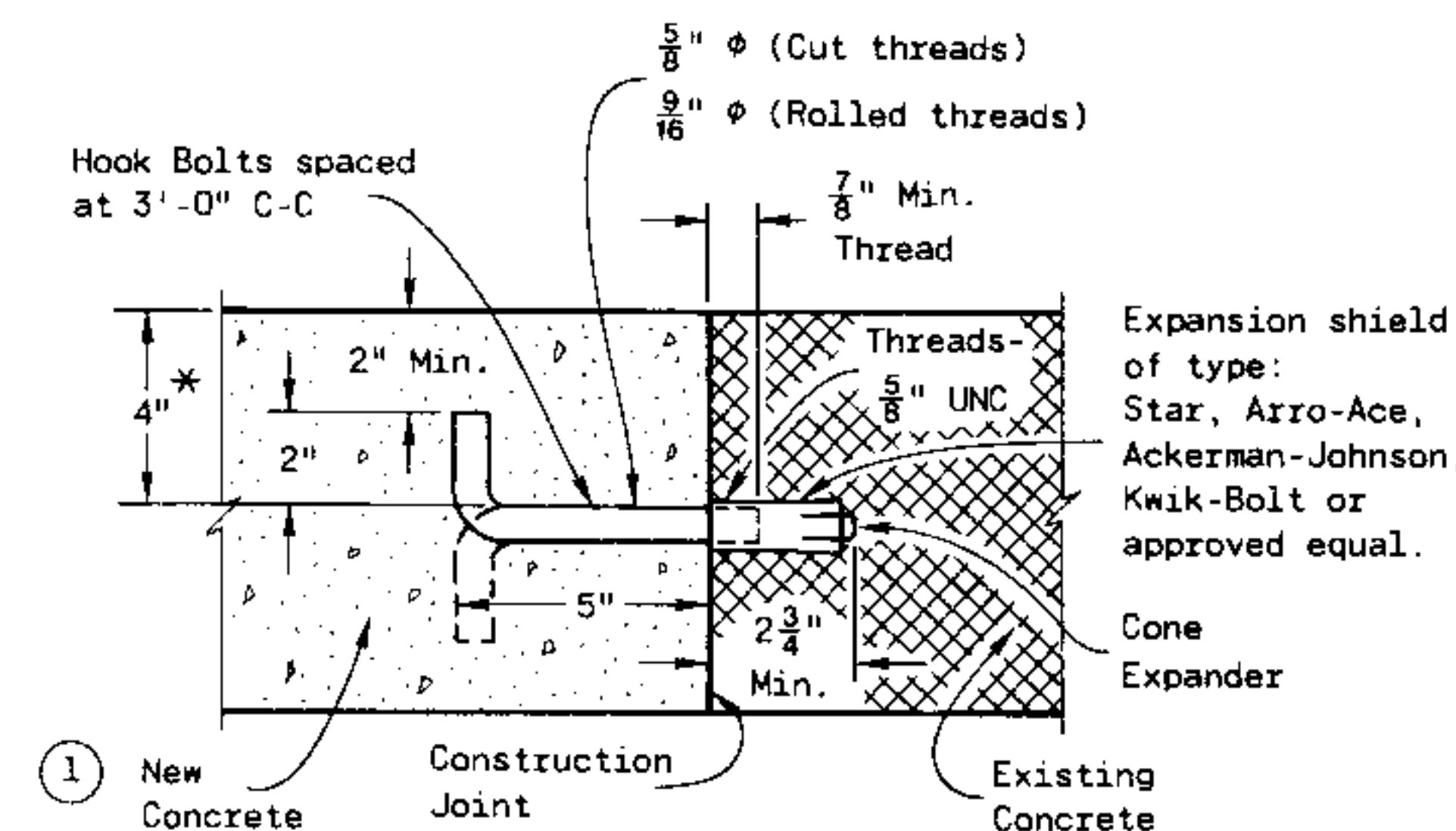
"H" = 6" Max. and 4" Min. and shall be 6" unless otherwise shown on the plans.
 "H₁" = Same as adjacent pavement thickness for rigid pavement and 12" for non-rigid pavement (Tie Bars omitted).

TYPE "G"
 (INCLUDING TIE BARS)

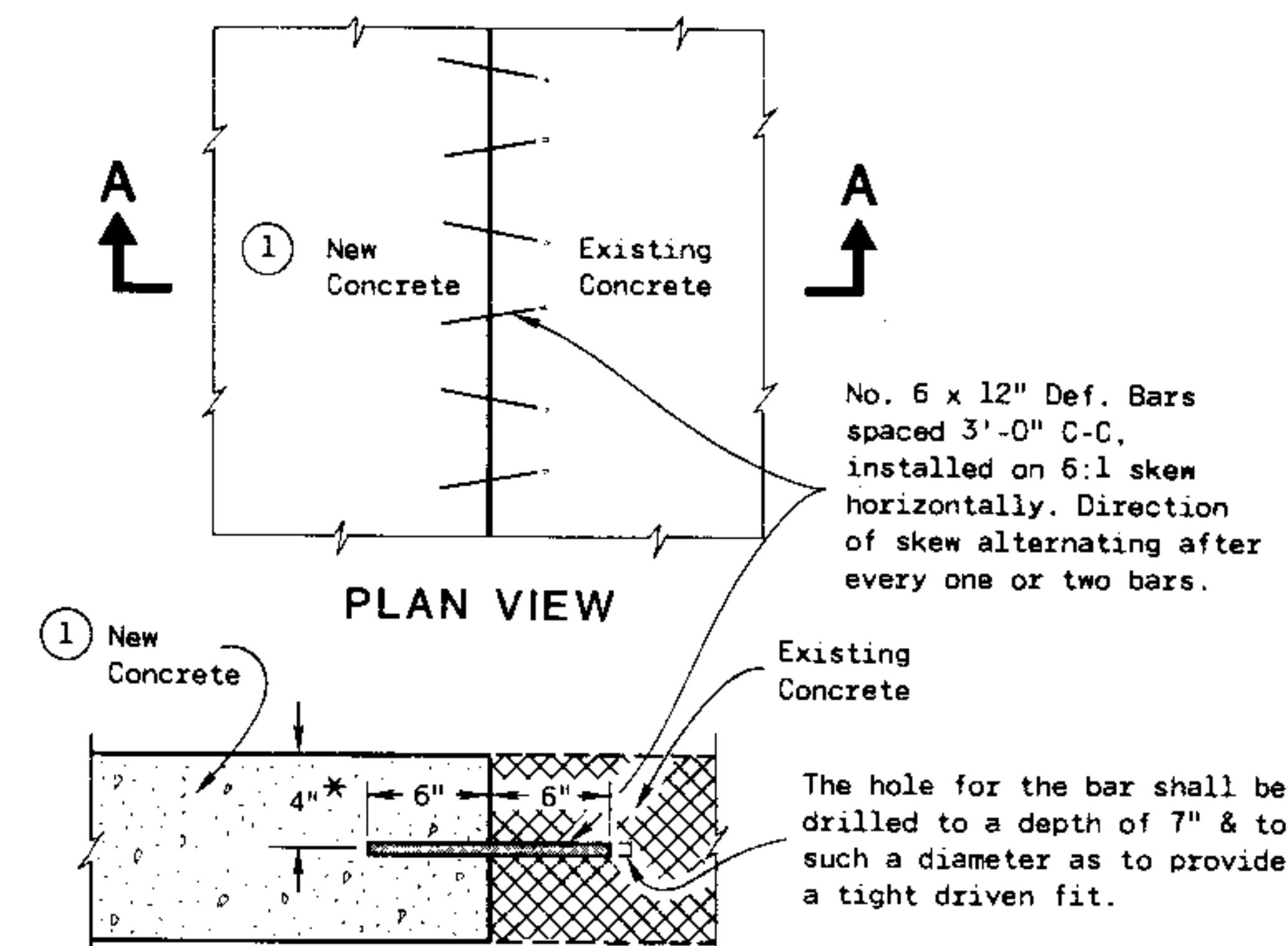
TYPE "D"
 (EXCLUDING TIE BARS)

TYPE "J"
 (EXCLUDING TIE BARS)

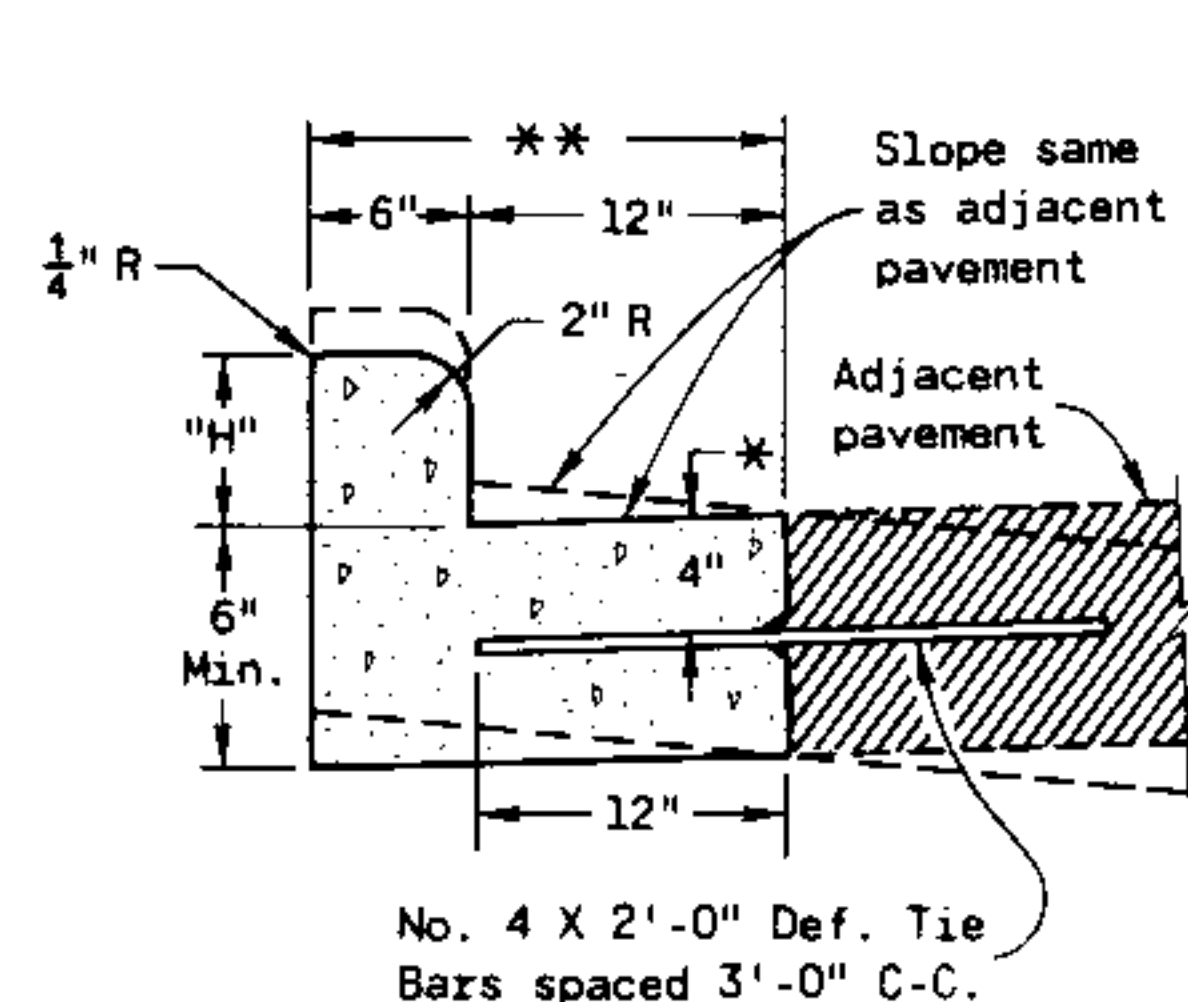
CONCRETE CURB



HOOK BOLT ALTERNATE



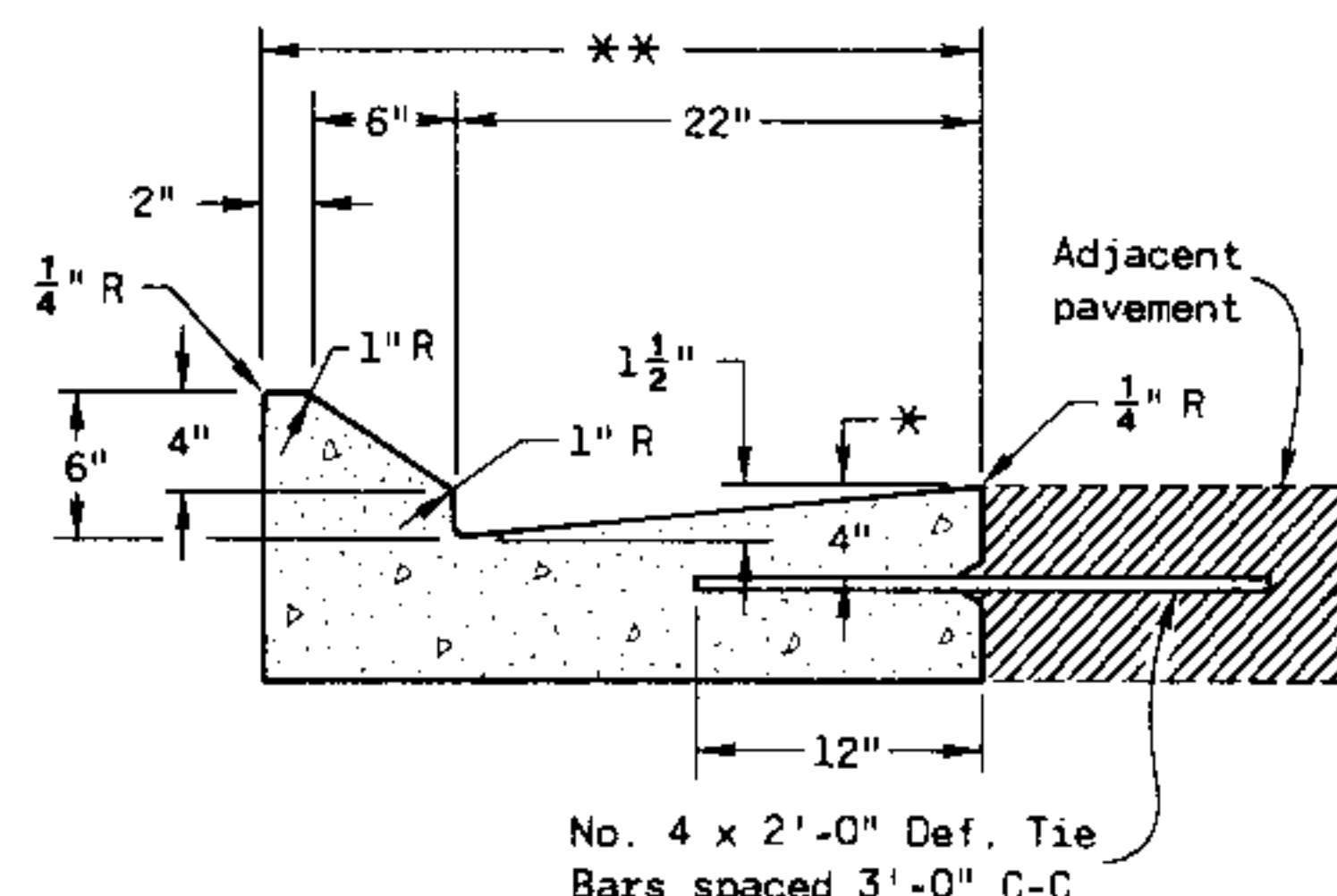
SECTION A-A
 DRIVEN TIE BAR ALTERNATE



TYPE "A"
 (INCLUDING TIE BARS)

TYPE "D"
 (EXCLUDING TIE BARS)

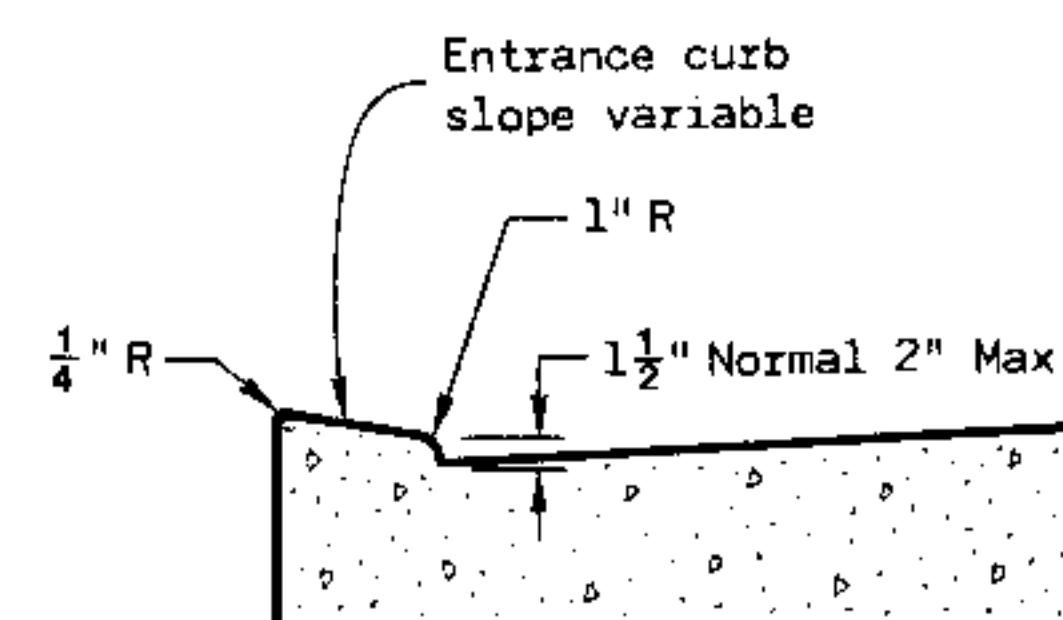
CONCRETE CURB & GUTTER 18"



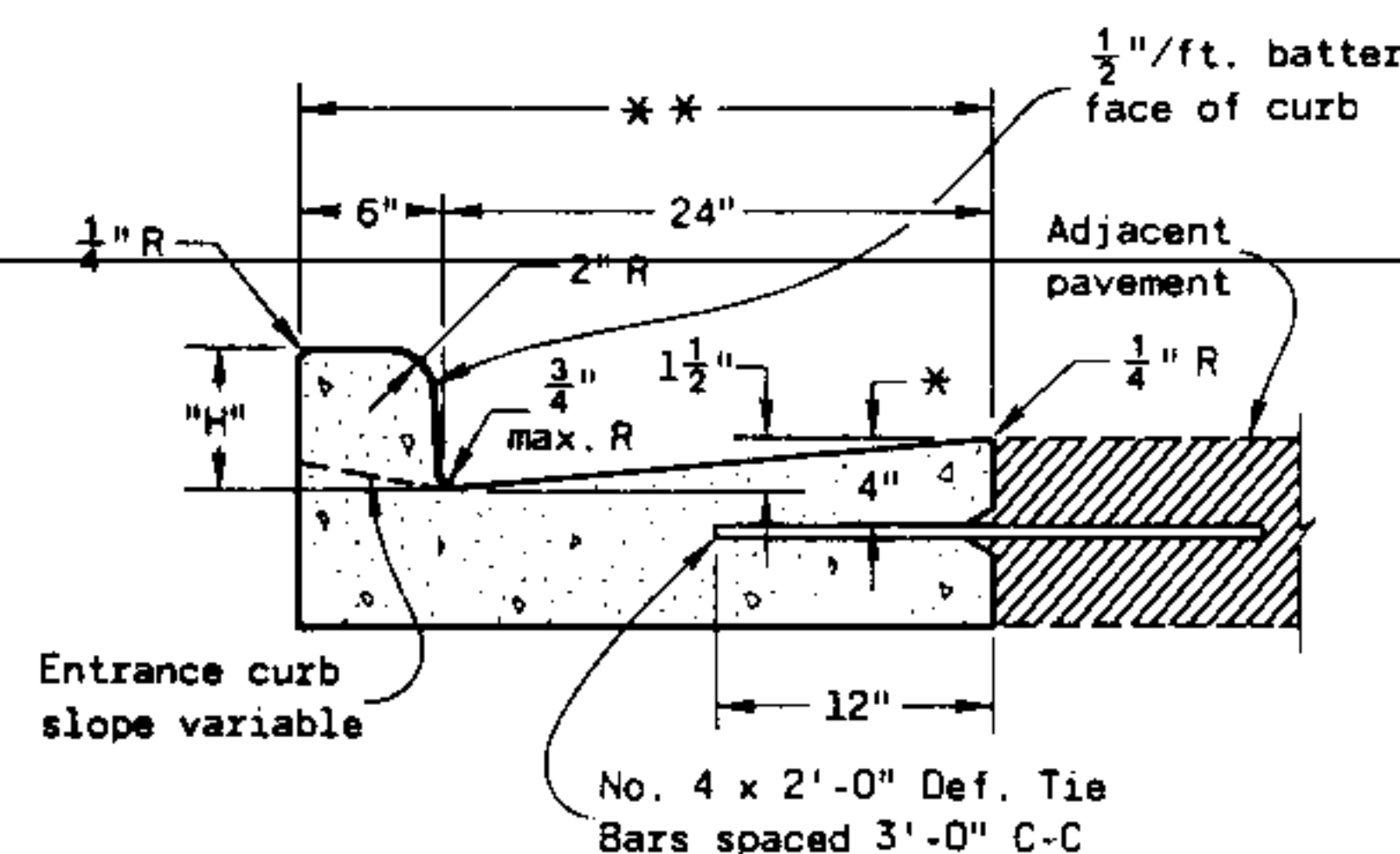
TYPE "G"
 (INCLUDING TIE BARS)

TYPE "J"
 (EXCLUDING TIE BARS)

CONCRETE CURB & GUTTER 30"



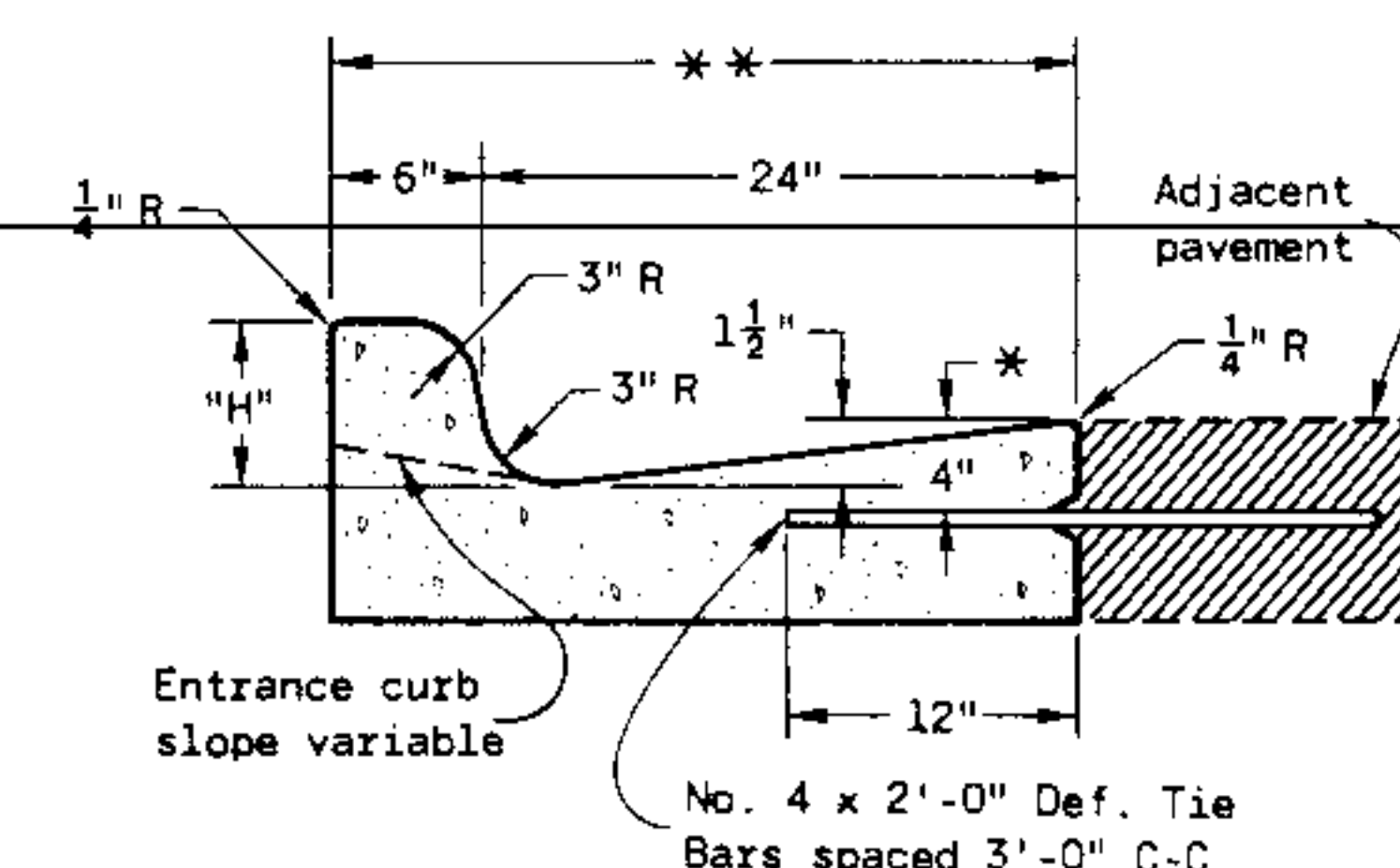
ALTERNATE ENTRANCE CURB
 (When directed by the Engineer)



TYPE "A"
 (INCLUDING TIE BARS)

TYPE "D"
 (EXCLUDING TIE BARS)

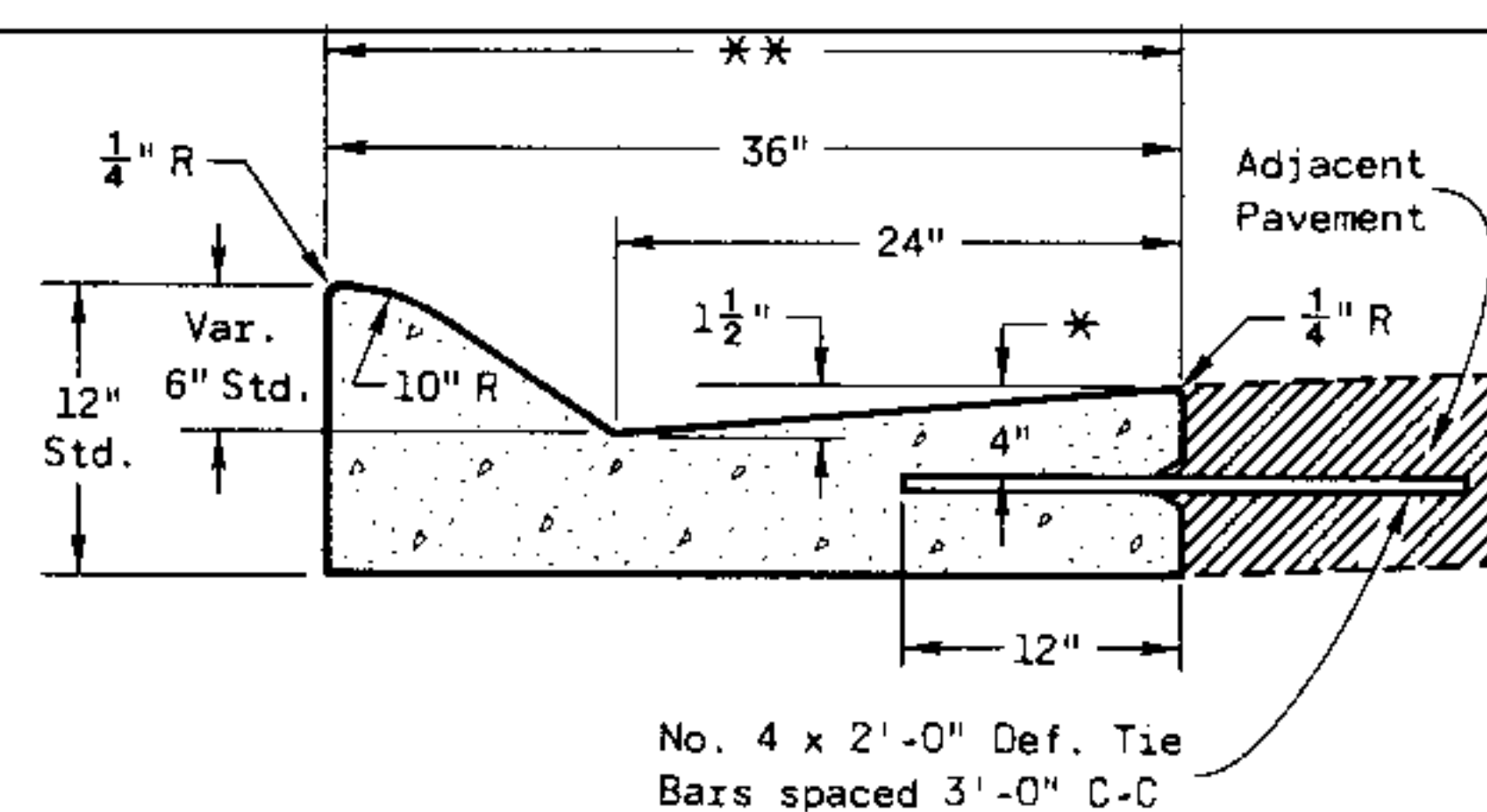
CONCRETE CURB & GUTTER 30"



TYPE "K"
 (INCLUDING TIE BARS)

TYPE "L"
 (EXCLUDING TIE BARS)

"H" = 9" Max. $3\frac{1}{2}$ " Min. and shall be 6" unless otherwise shown on the plans.
CONCRETE CURB & GUTTER



TYPE "A"
 (INCLUDING TIE BARS)

TYPE "D"
 (EXCLUDING TIE BARS)

CONCRETE CURB & GUTTER 36"

PAVEMENT TIES EXISTING CONCRETE

GENERAL NOTES

Details of construction, materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the Standard Specifications and the applicable Special Provisions.

Joints shall not be sealed in concrete curb or concrete curb & gutter

Where concrete curb, concrete curb & gutter or concrete pavement is poured adjacent to existing concrete, one of the "Pavement Tie Alternates" shown on this sheet is required.

Hook bolts shall have a minimum yield strength of 40,000 psi.

The bottom of the curb and gutter may be constructed parallel to subgrade or base course provided a minimum of 6 inches depth of concrete is maintained at the flow line.

The thickness of curb and gutter at the pavement edge shall be $7\frac{1}{2}$ " min

Integral Curb & Gutter when used shall be measured and paid for as Curb & Gutter

The limits of the base course, if used, are shown on the typical cross sections elsewhere in the plans. Any additional width of base course necessary to accommodate paving equipment will be at the contractor's expense

① = New Curb & Gutter, Surface Drains, Concrete Pavement or other New Concrete

* = Or center of pavement, whichever is less.

** = Pay limits for Concrete Integral Curb & Gutter.

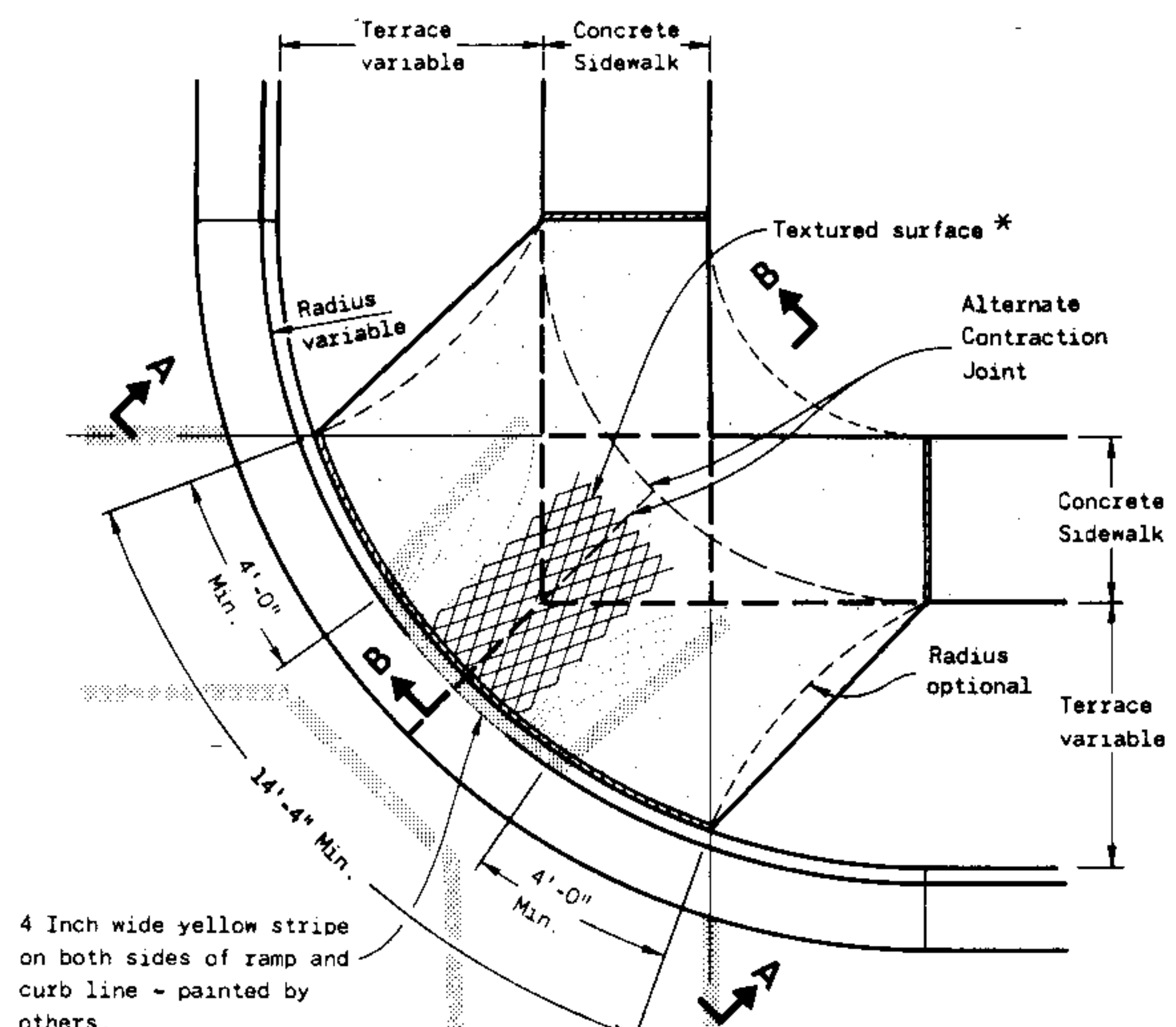
CONCRETE CURB, CONCRETE CURB & GUTTER AND PAVEMENT TIES

State of Wisconsin
 Department of Transportation

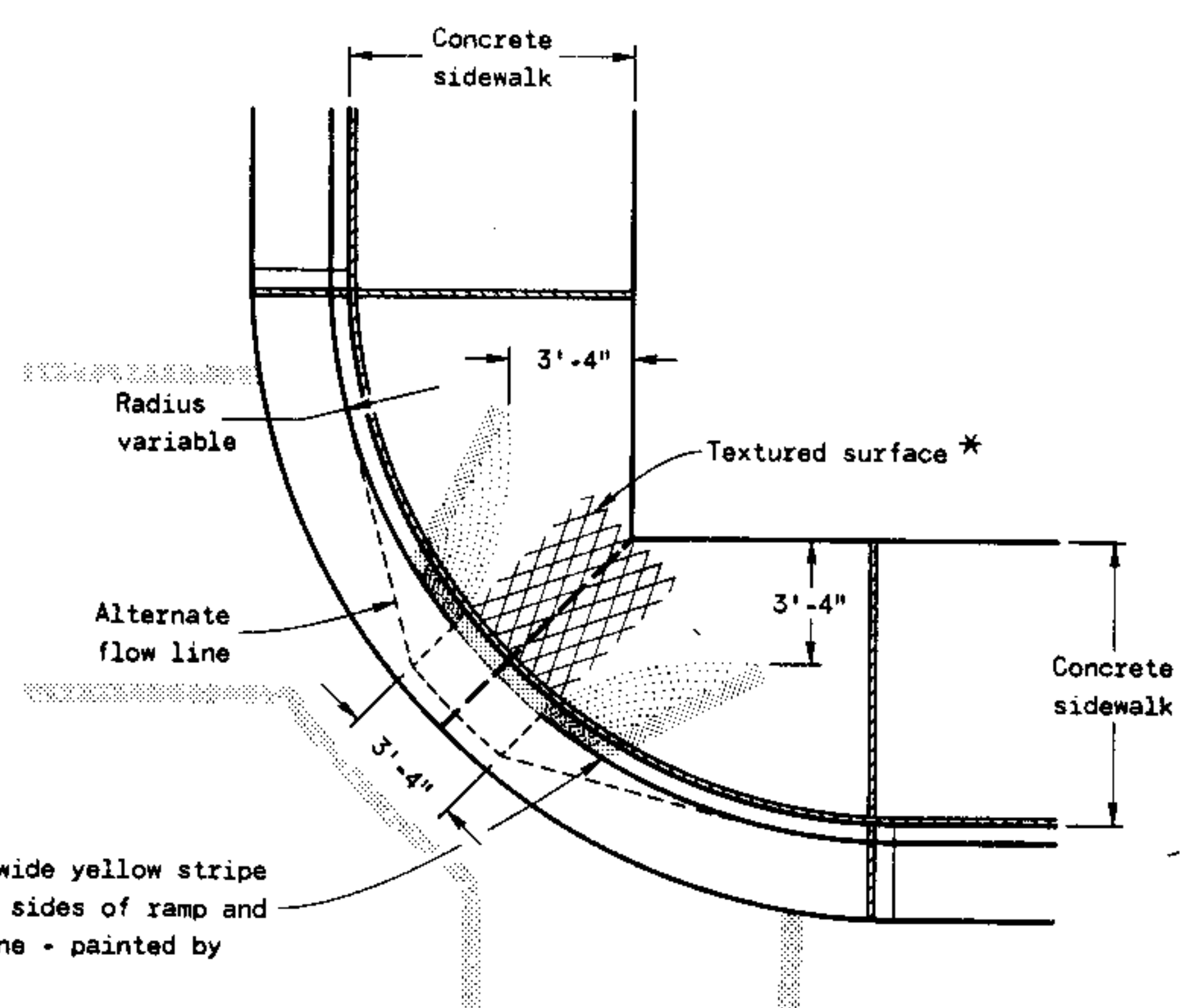
APPROVED
 2-3-82
 DATE

CHIEF DESIGN ENGINEER

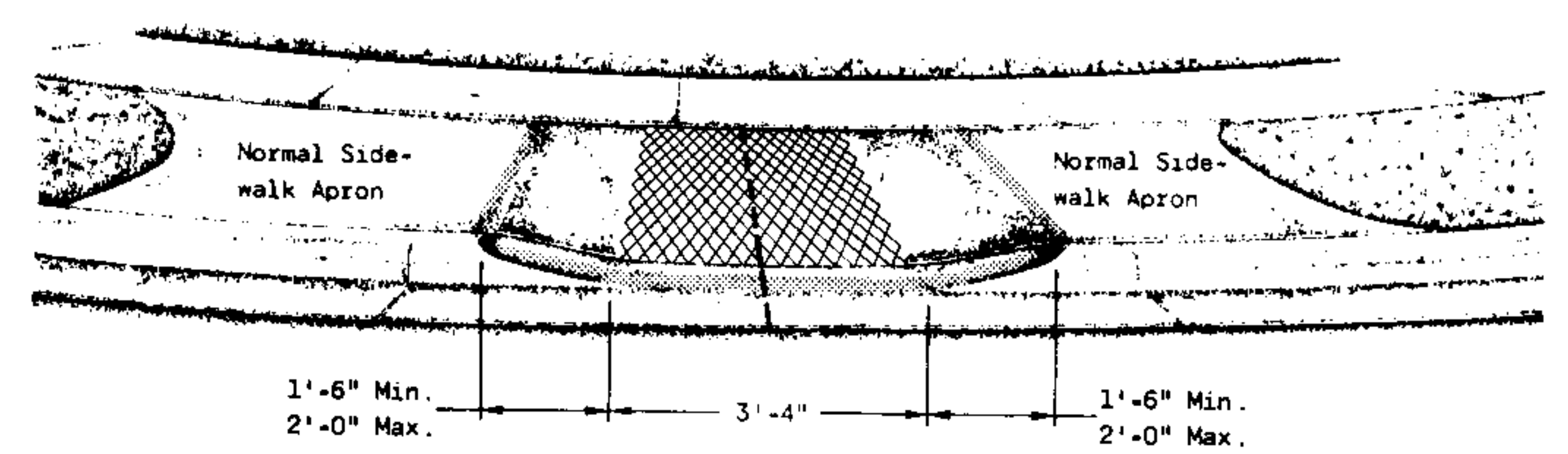
FHWA



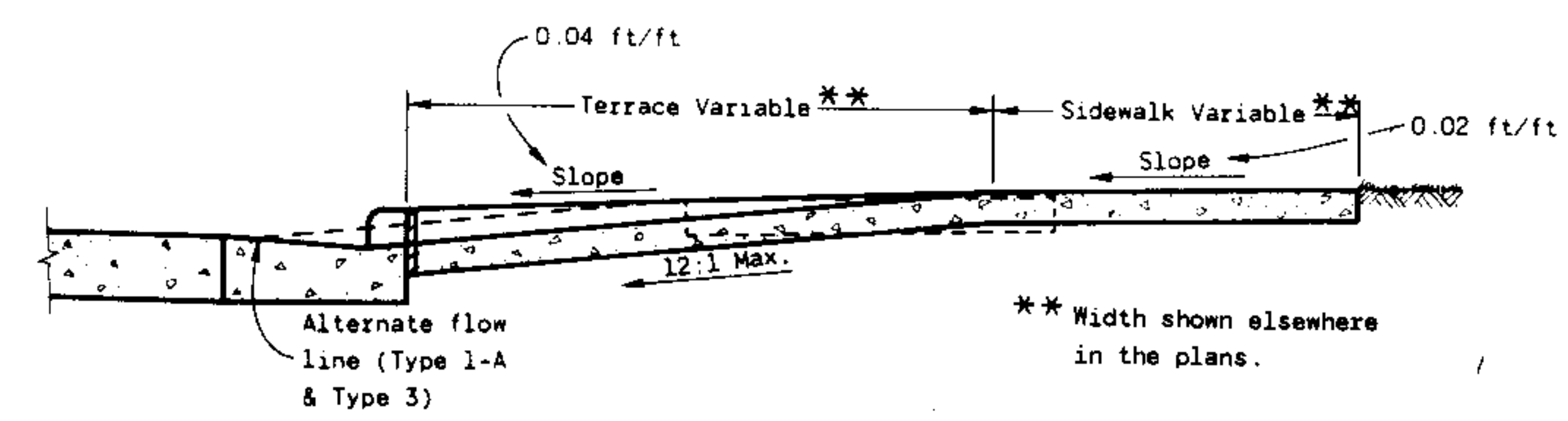
**PLAN VIEW
TYPE 1 RAMP**
(CENTER OF CORNER RADIUS)



**PLAN VIEW
TYPE 1-A RAMP**
(NO TERRACE)



VIEW A-A



SECTION B-B

===== EXPANSION JOINTS
----- CONTRACTION JOINTS
Location of joints may be varied from those shown to better fit site conditions and/or local government preference.

GENERAL NOTES

Details of construction, materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the Standard Specifications and the applicable Special Provisions.

Ramps shall be built at 12:1 or flatter. When necessary, the sidewalk elevation may be lowered to meet the high point on the ramp.

Type 1 or Type 1-A Ramps shall have a normal sidewalk apron and curb on both sides of ramp.

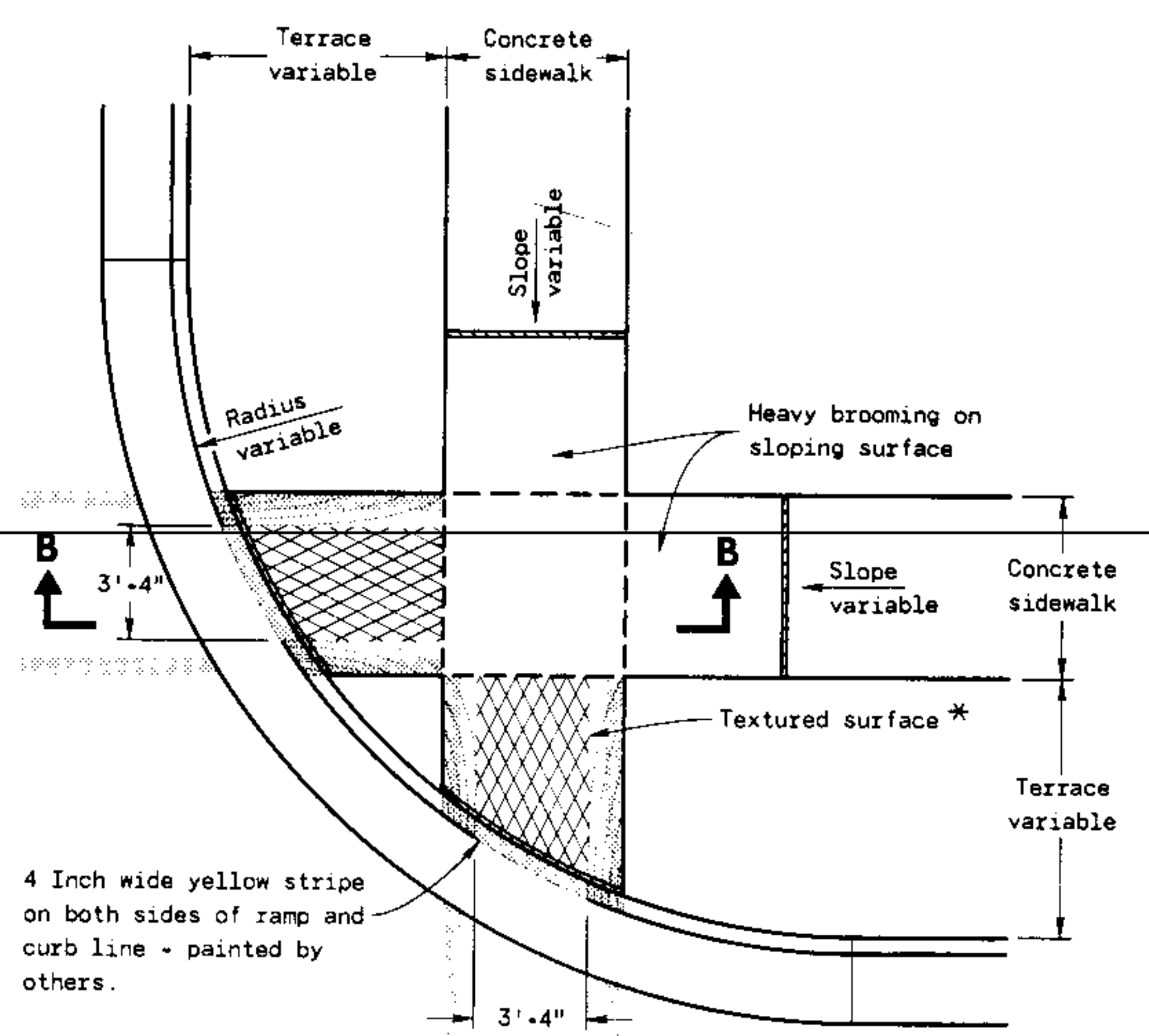
Curb ramps shall be measured and paid for as Concrete Sidewalk and Concrete Curb and Gutter.

* Surface texturing shall consist of linear impressions approximately $\frac{1}{4}$ inch to $\frac{3}{8}$ inch in depth and width, oriented to provide a uniform pattern of diamond shapes measuring approximately $1\frac{1}{4}$ inches in width by $2\frac{1}{4}$ inches in length, with the length being parallel to the direction of pedestrian movement. This surface texture may be achieved by impressing and removing a piece of expanded metal regular industrial mesh into the surface of the ramp while the concrete is in a plastic state.

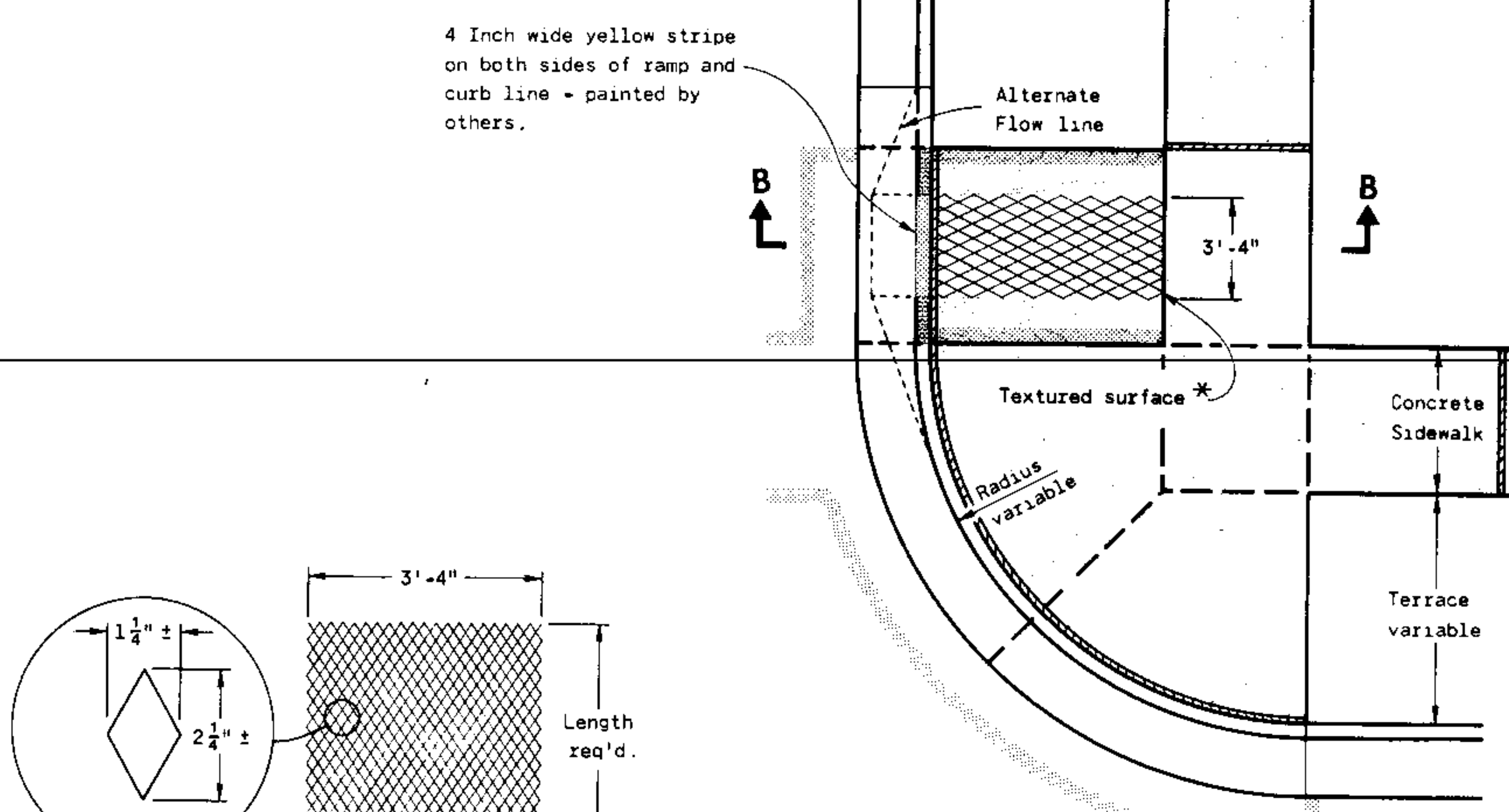
Section 66.616, Wisconsin Statutes prescribes the standards for curb ramping. This drawing reflects requirements of this law.

The law requires that the ramp be bordered on both sides and on the curb line with a 4 inch wide yellow stripe or with brick of a contrasting color. Normally the paint stripe alternate will be used. The municipality or the department will apply this striping.

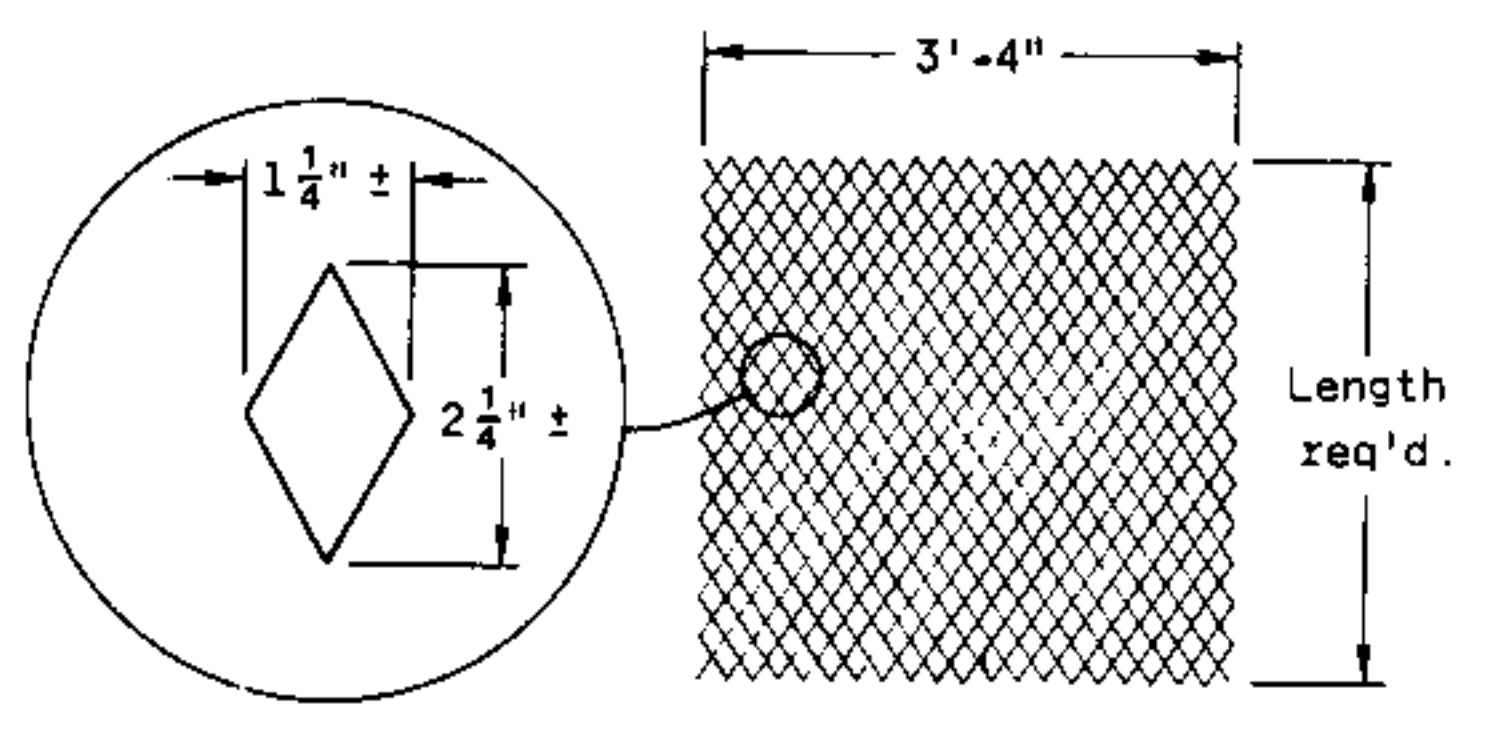
If a municipality requires the brick alternate, special details and provisions are shown elsewhere in the plans.



**PLAN VIEW
TYPE 2 RAMP**
(ON LINE WITH SIDEWALK)



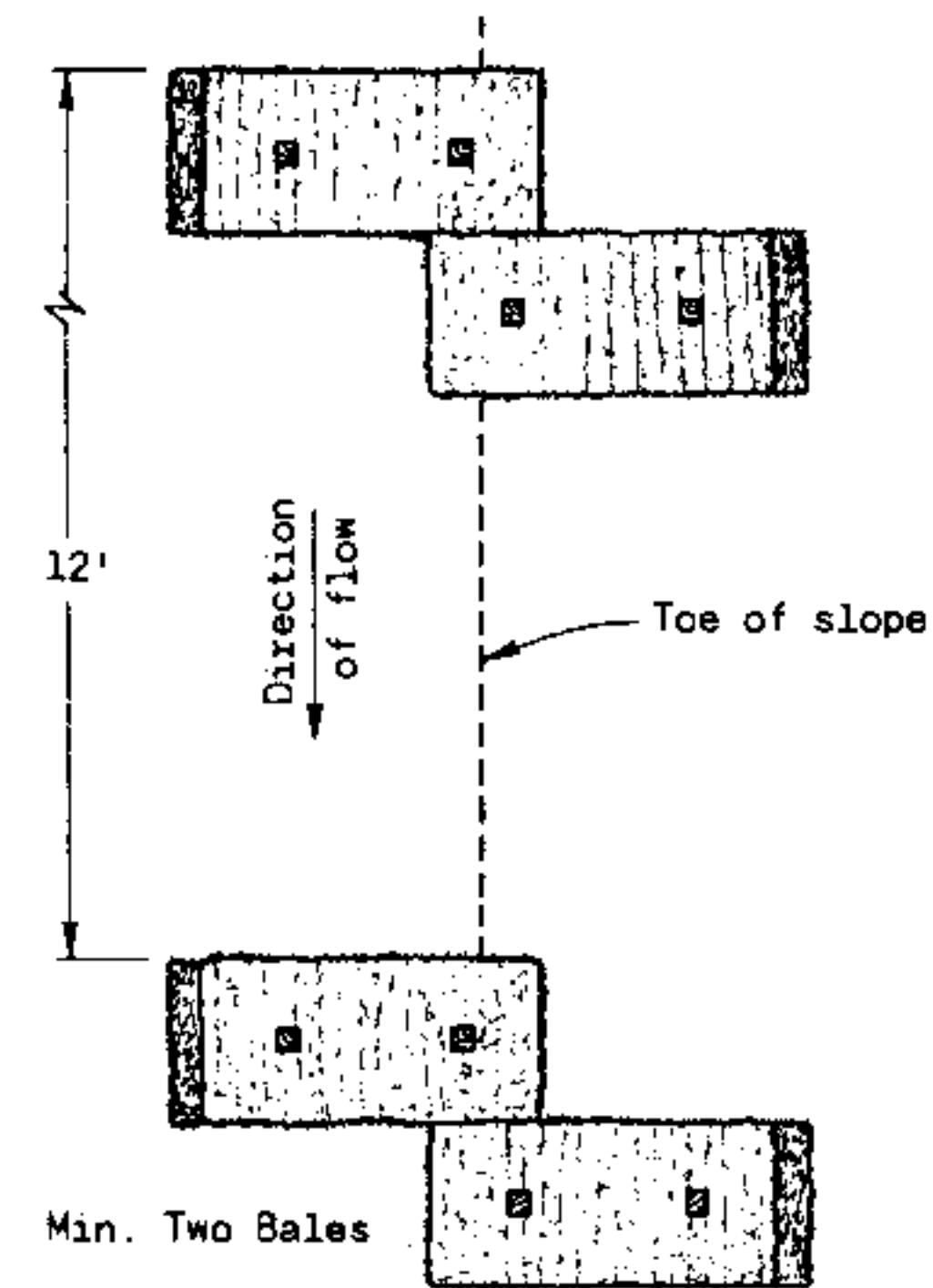
**PLAN VIEW
TYPE 3 RAMP**
(OUTSIDE OF CROSSWALK AREA)



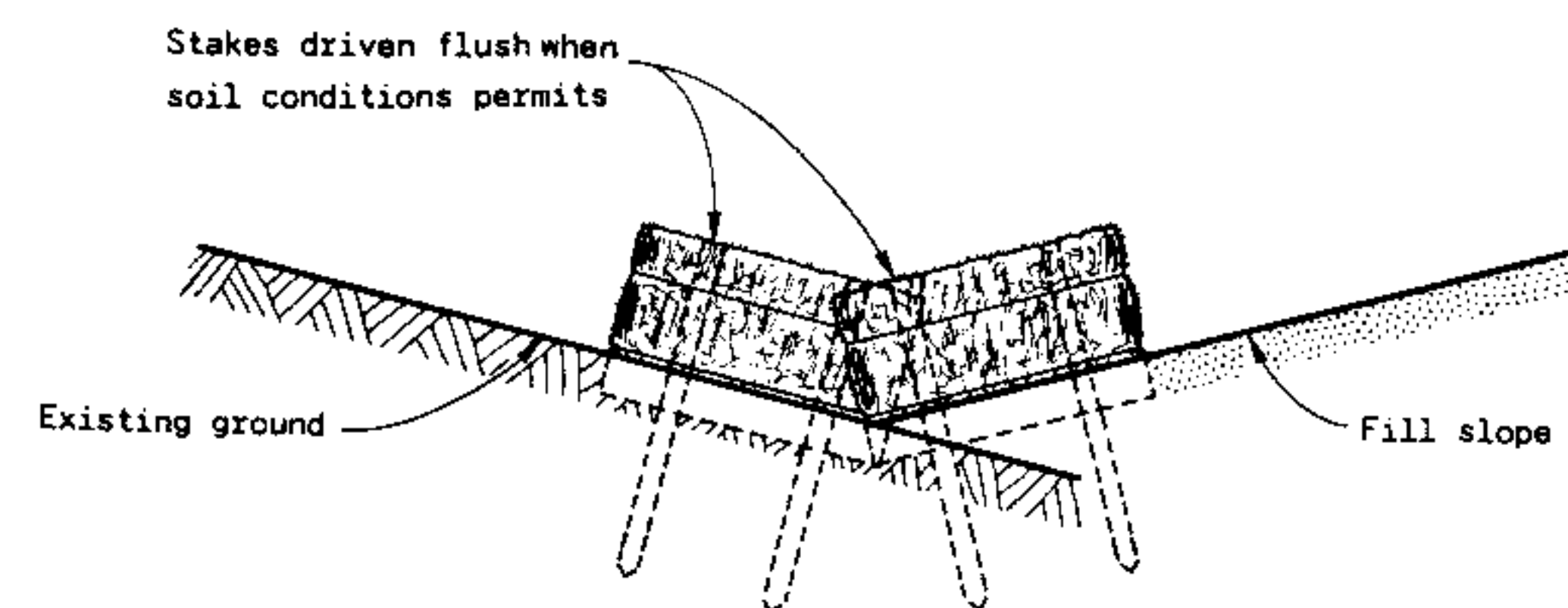
DETAIL OF DIAMOND PATTERN *

CURB RAMPS	
State of Wisconsin Department of Transportation	
APPROVED 6-26-80 DATE	<i>D. J. Strand</i> CHIEF DESIGN ENGINEER
FHWA	

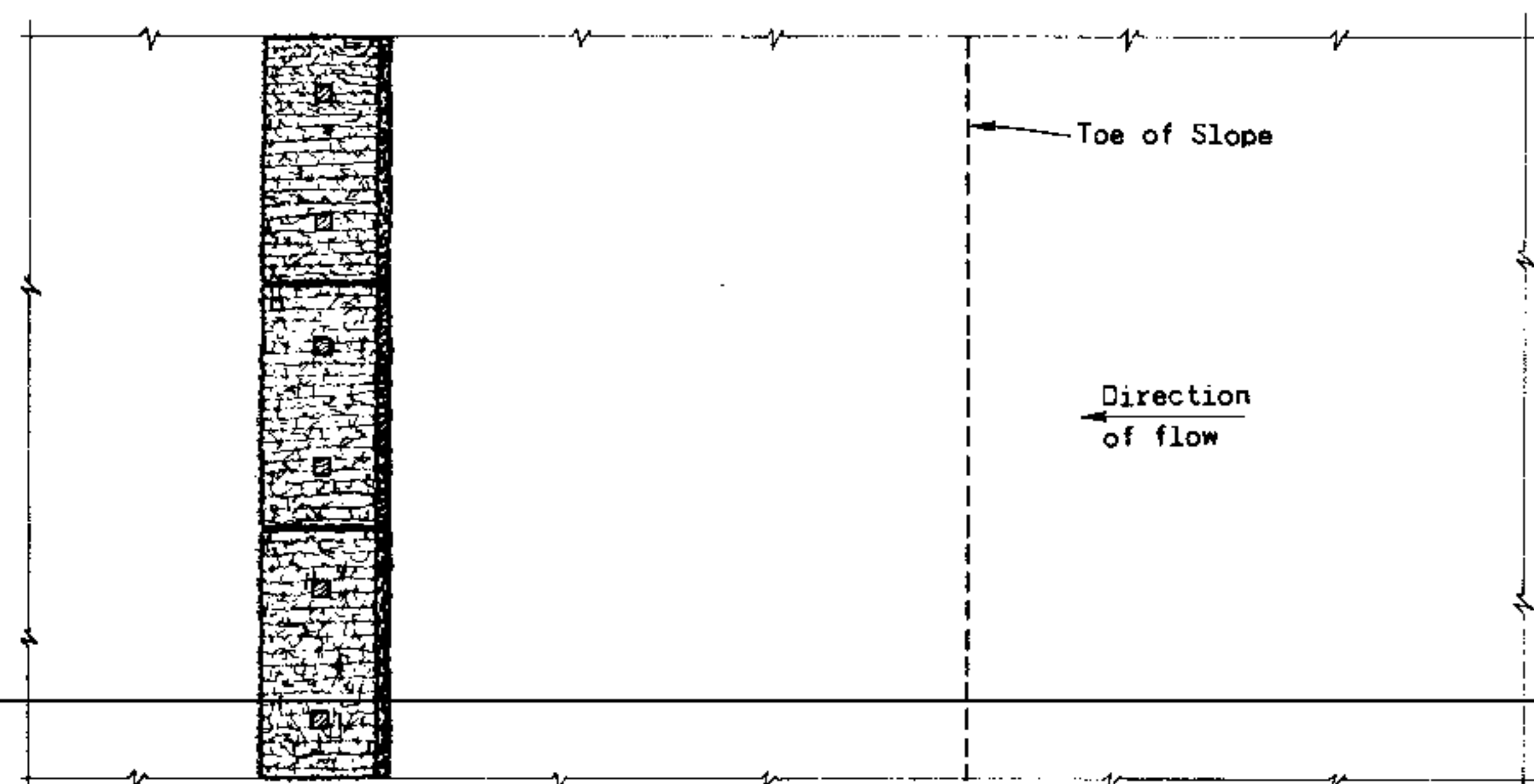
S.D.D. 8 D 5 - 6



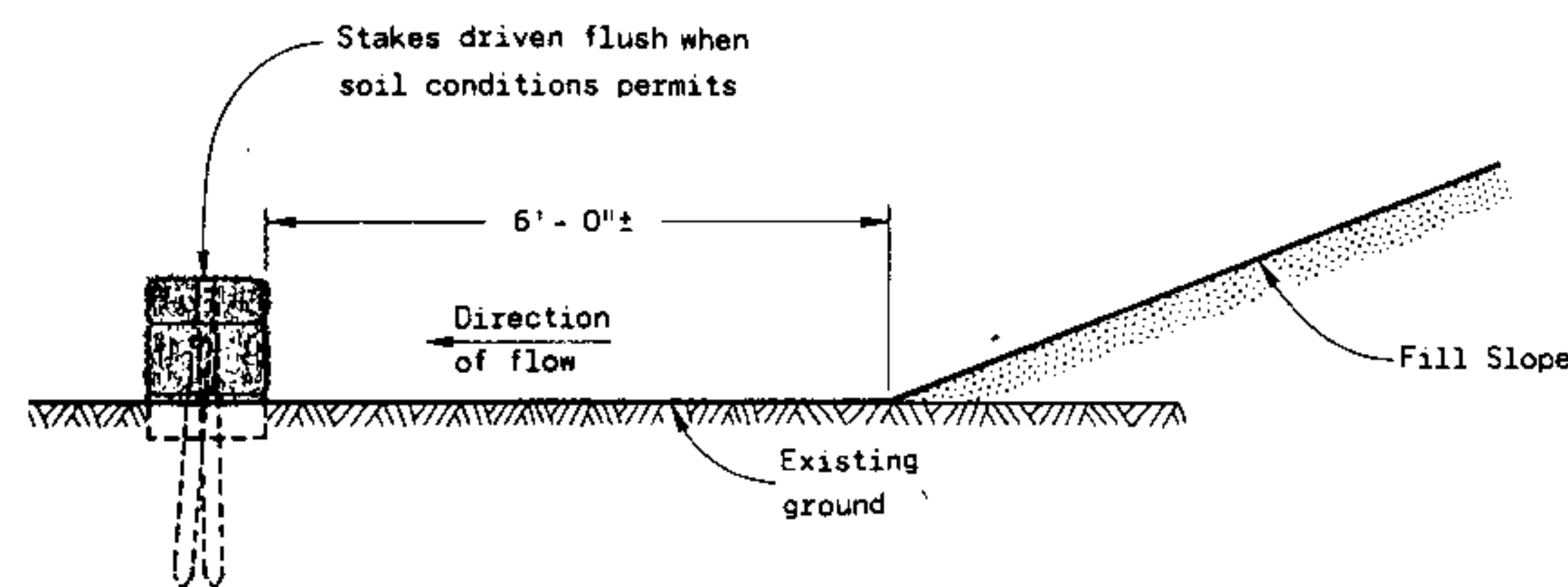
PLAN VIEW



FRONT ELEVATION
WHEN EXISTING GROUND
SLOPES TOWARD FILL SLOPE

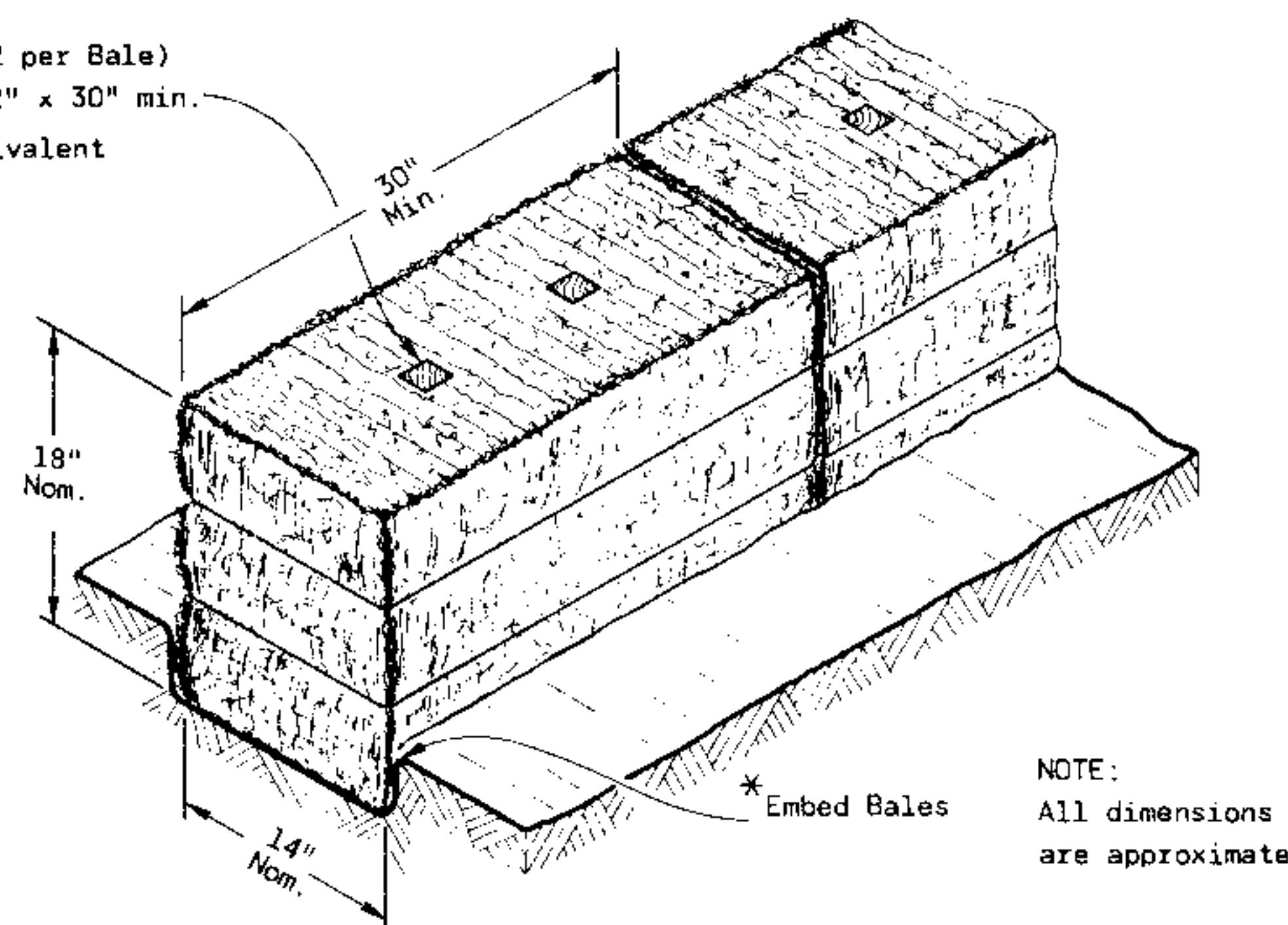


PLAN VIEW

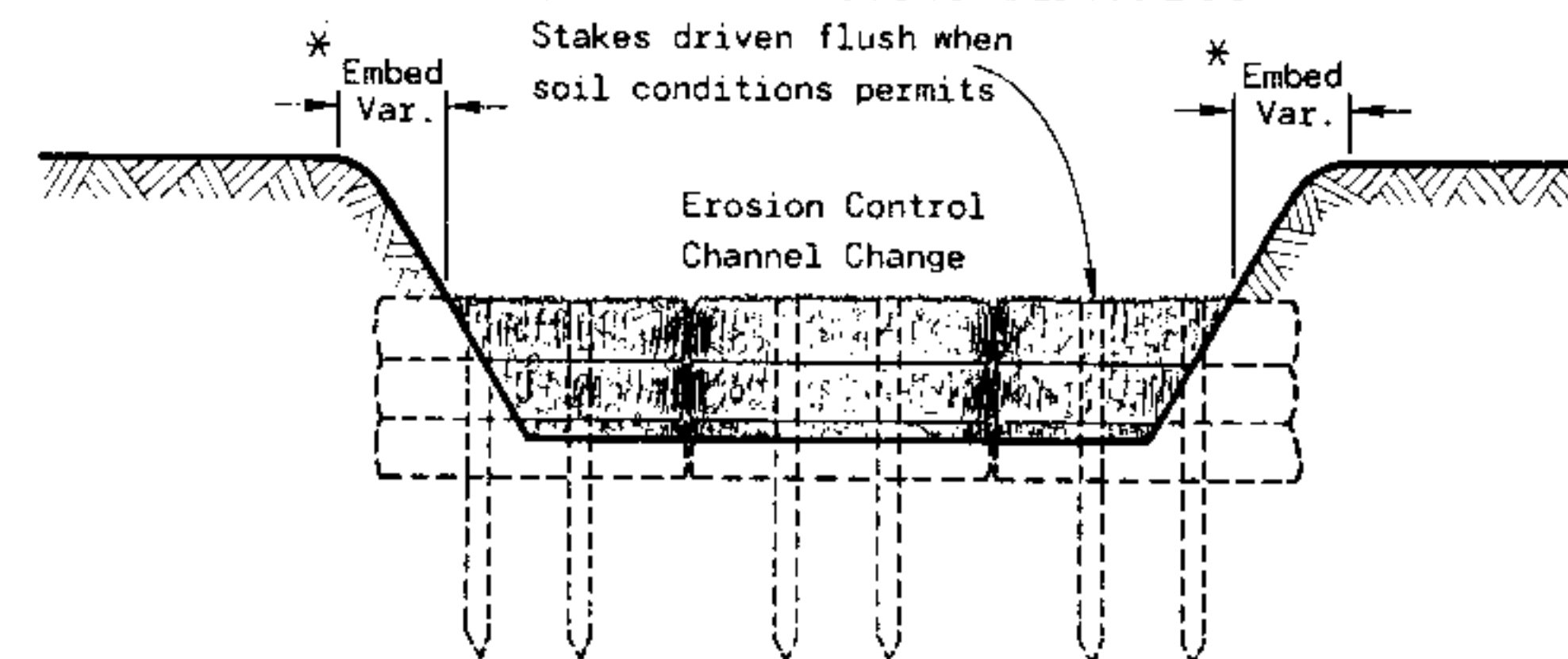


FRONT ELEVATION
EROSION BALES AT TOE OF SLOPE
WHEN EXISTING GROUND SLOPES AWAY FROM FILL SLOPE

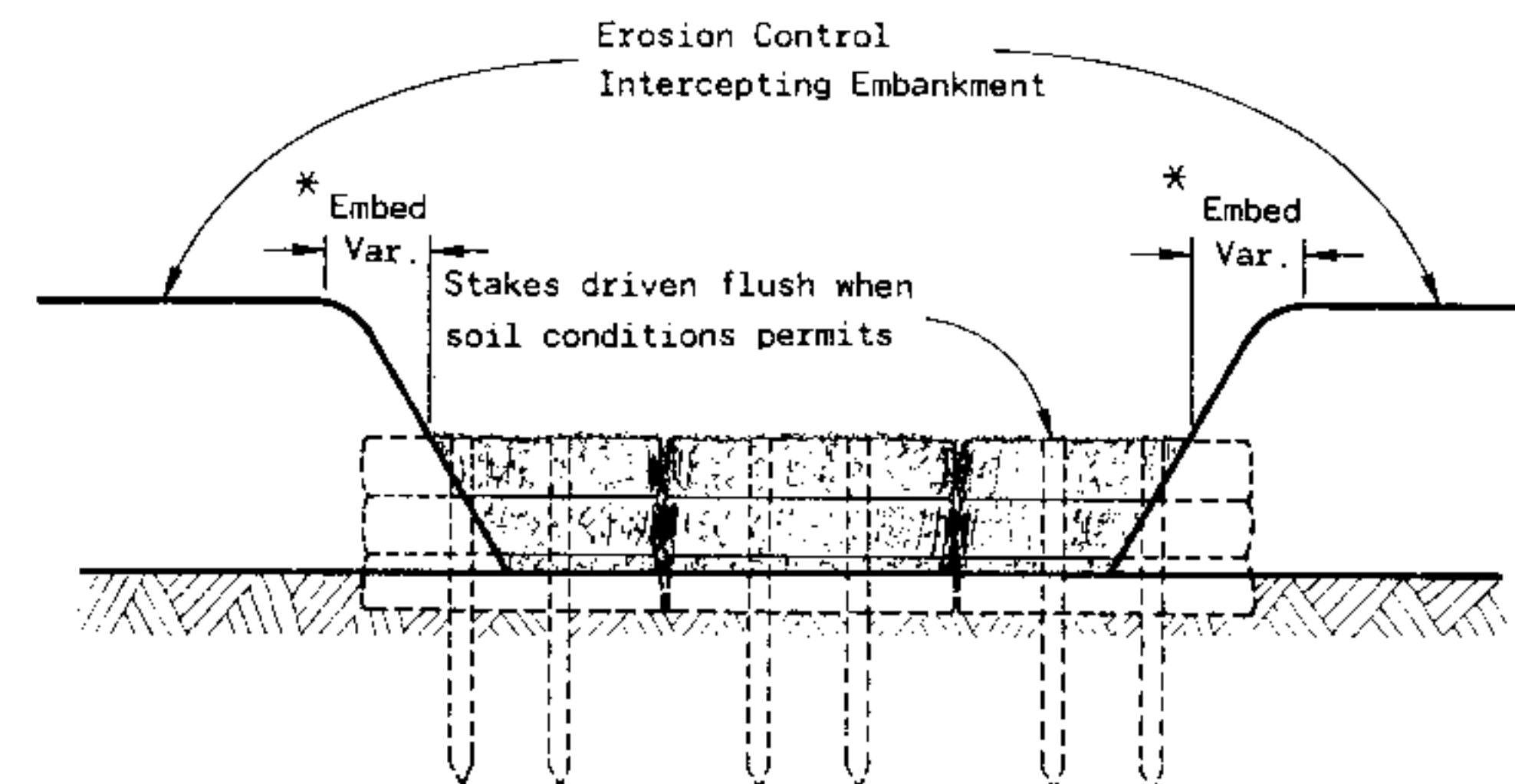
Wood Stakes (2 per Bale)
Nominal 2" x 2" x 30" min.
length or equivalent



DETAIL OF EROSION BALE INSTALLATION



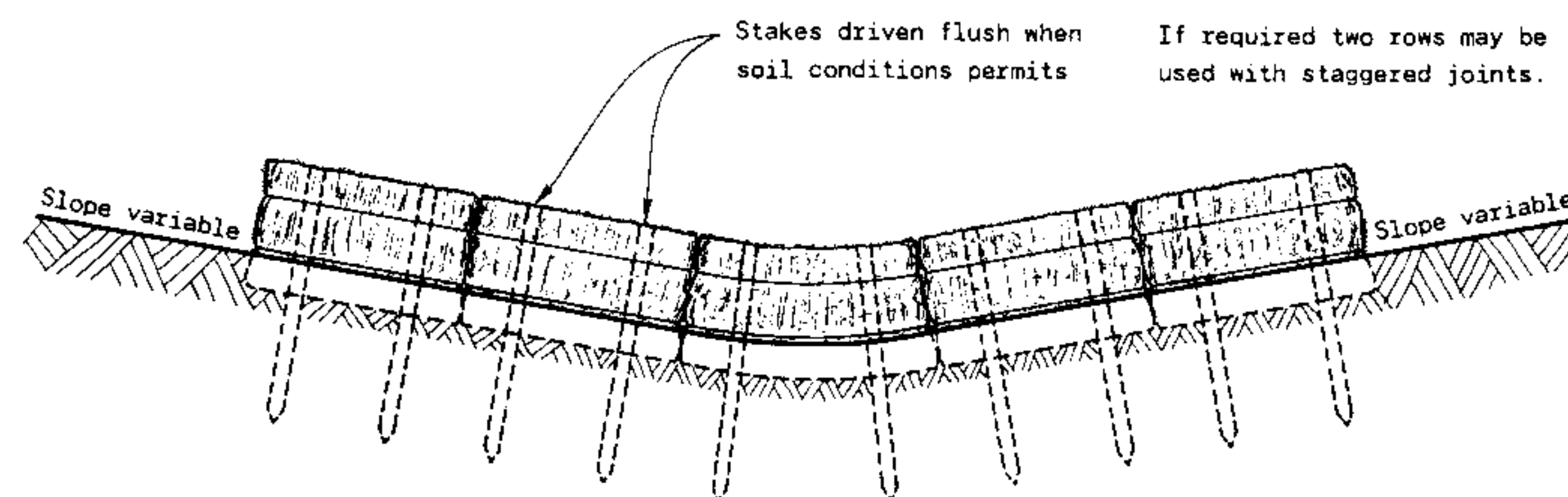
EROSION CONTROL CHANNEL CHANGE



EROSION CONTROL INTERCEPTING EMBANKMENT



PLAN VIEW



FRONT ELEVATION
EROSION BALES ACROSS DITCH BOTTOM

GENERAL NOTES

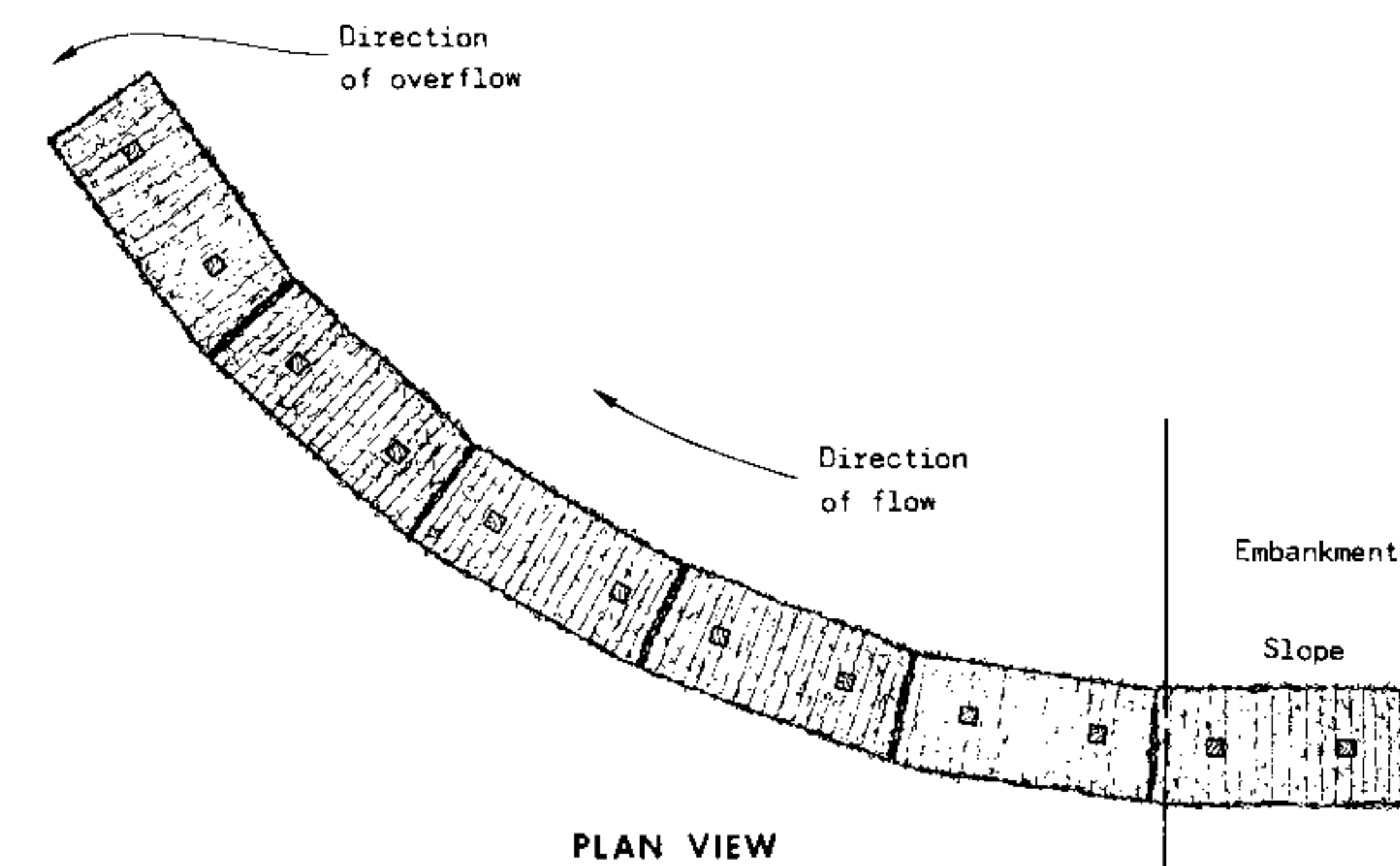
Details of construction, materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the Standard Specifications and the applicable Special Provisions.

Bales shall be placed end to end or overlapping at right angles to the direction of flow and far enough up the sides of the ditch to prevent eroding around ends.

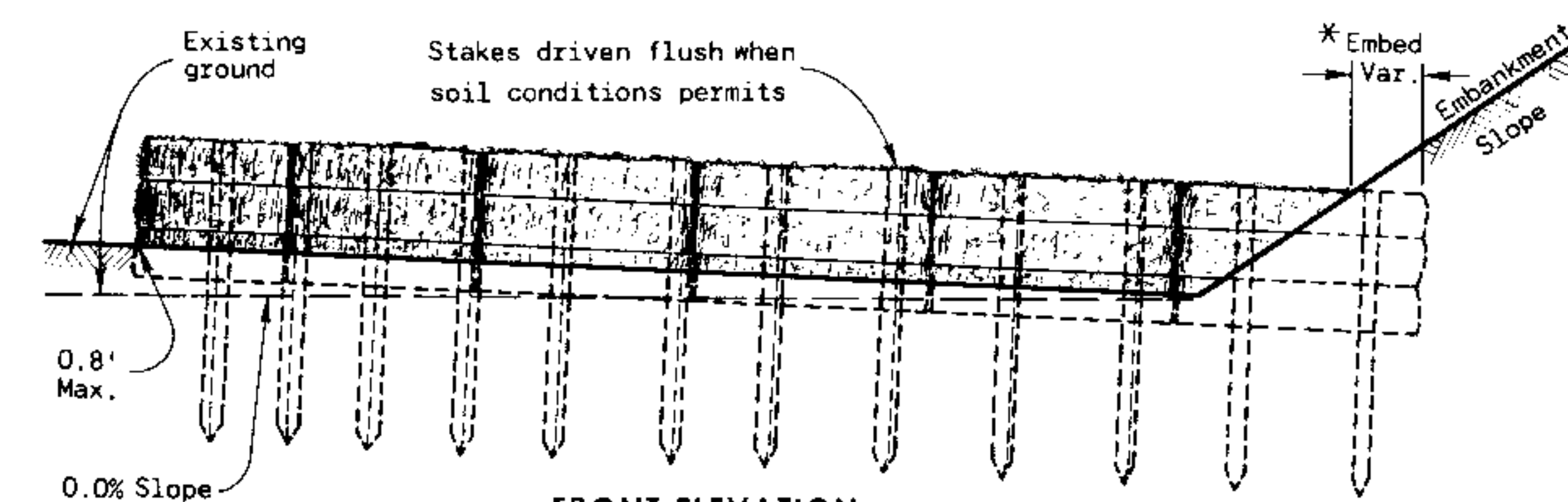
Bales shall be placed with twine or tie wires parallel to the ground.

Stakes to be battered in opposite directions.

* As determined by the Engineer.



PLAN VIEW



FRONT ELEVATION

EROSION BALES AT TOE OF SLOPE

TYPICAL INSTALLATIONS OF EROSION BALES

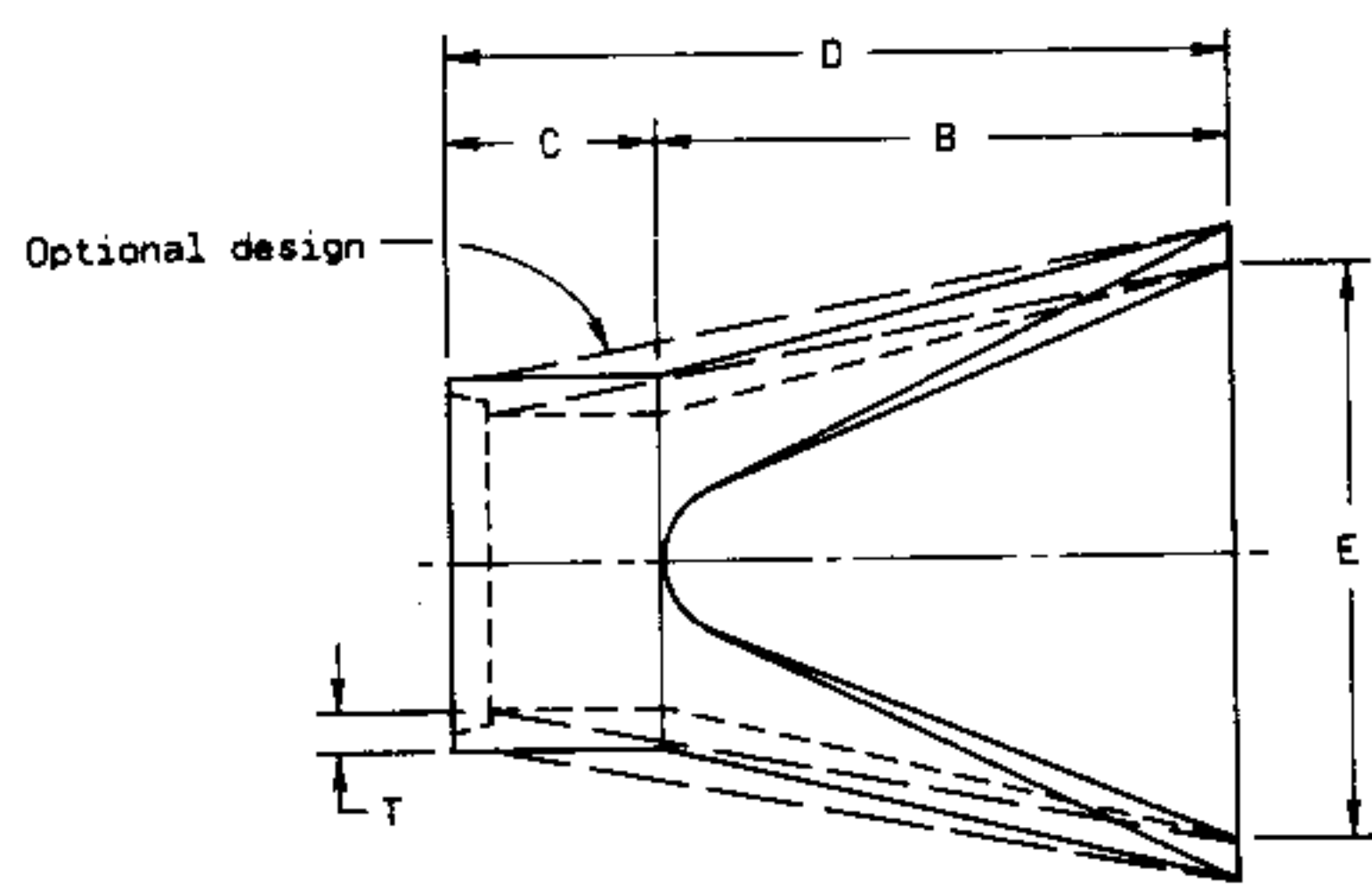
State of Wisconsin
Department of Transportation
Division of Highways

RECOMMENDED FOR APPROVAL:
10/14/75
DATE

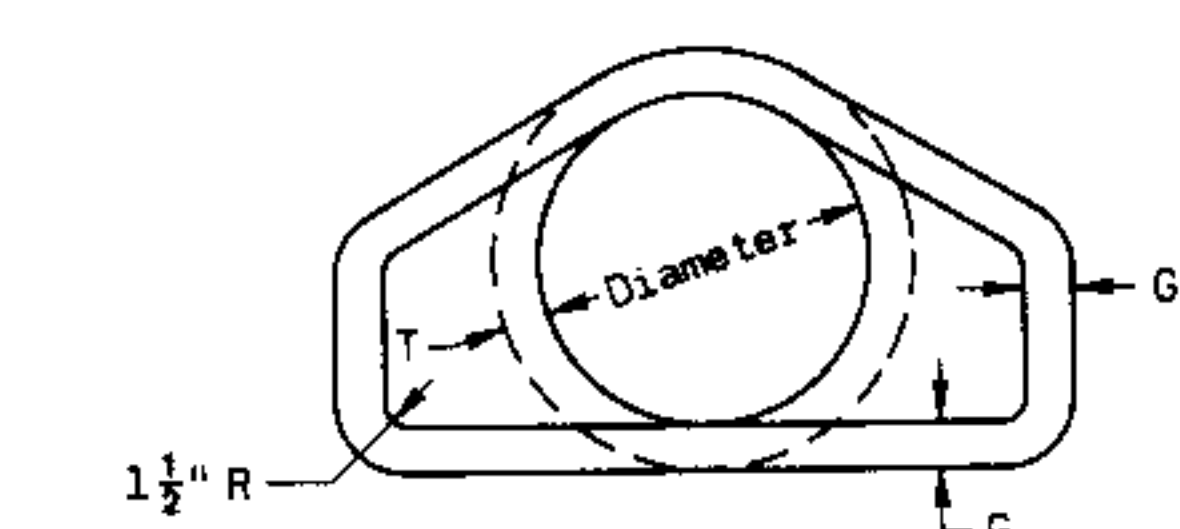
L. C. Hennrich
CHIEF OF FACILITIES DEVELOPMENT

APPROVED
10/16/75
DATE

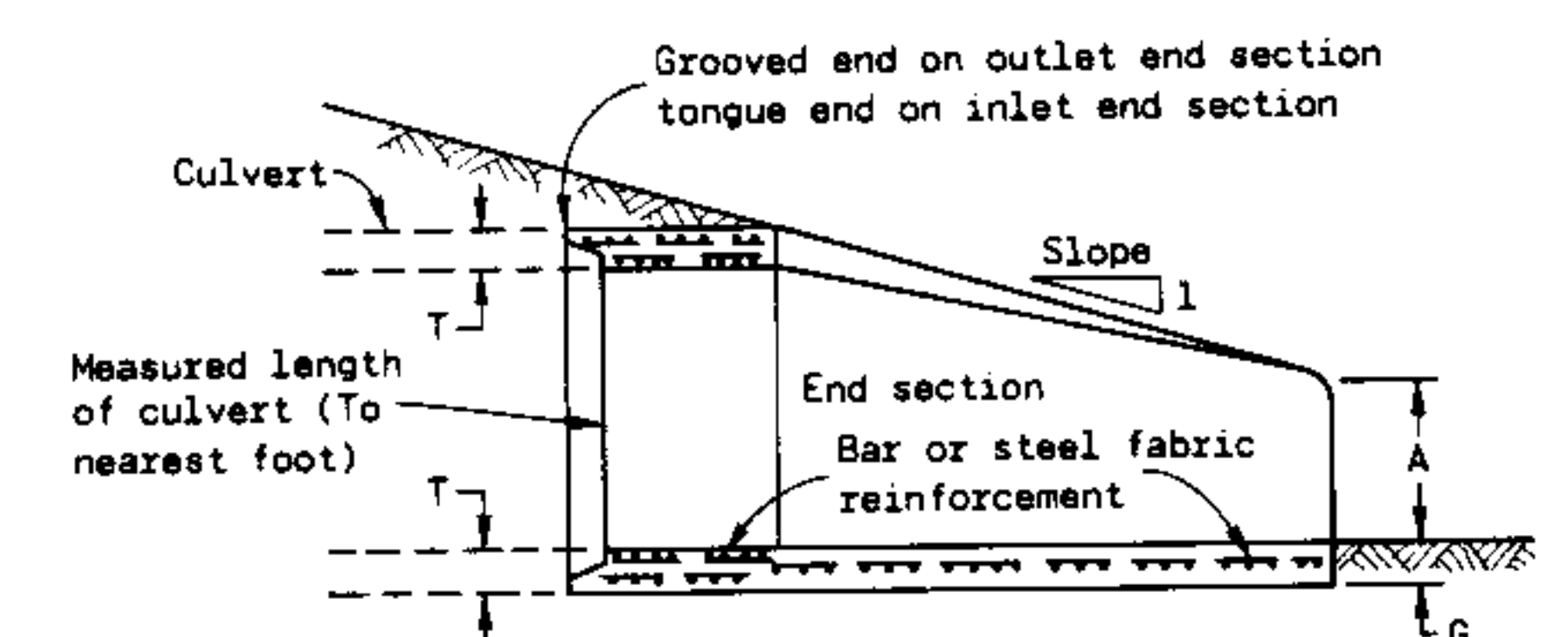
W. J. Sudler
STATE HIGHWAY ENGINEER



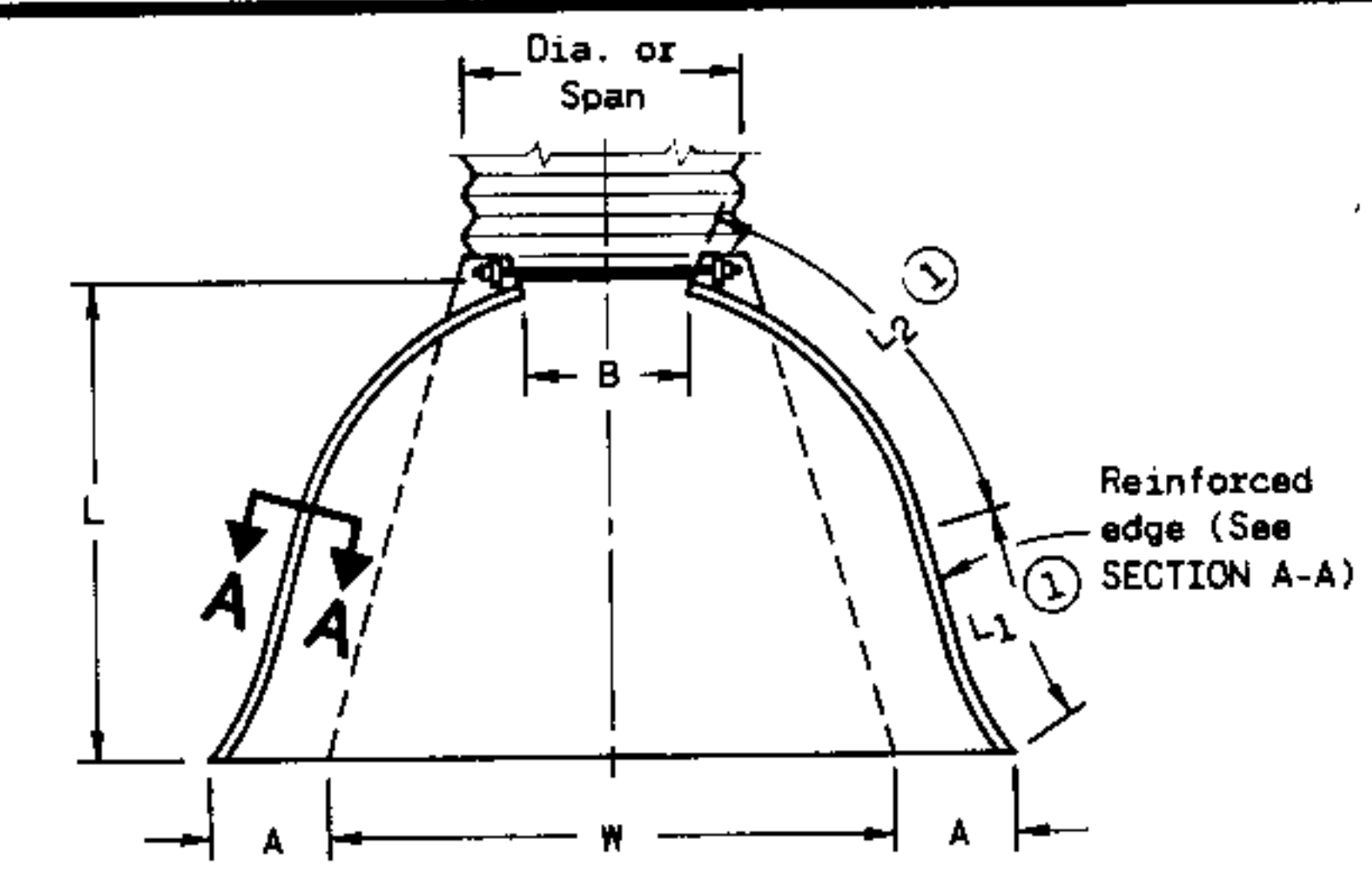
PLAN



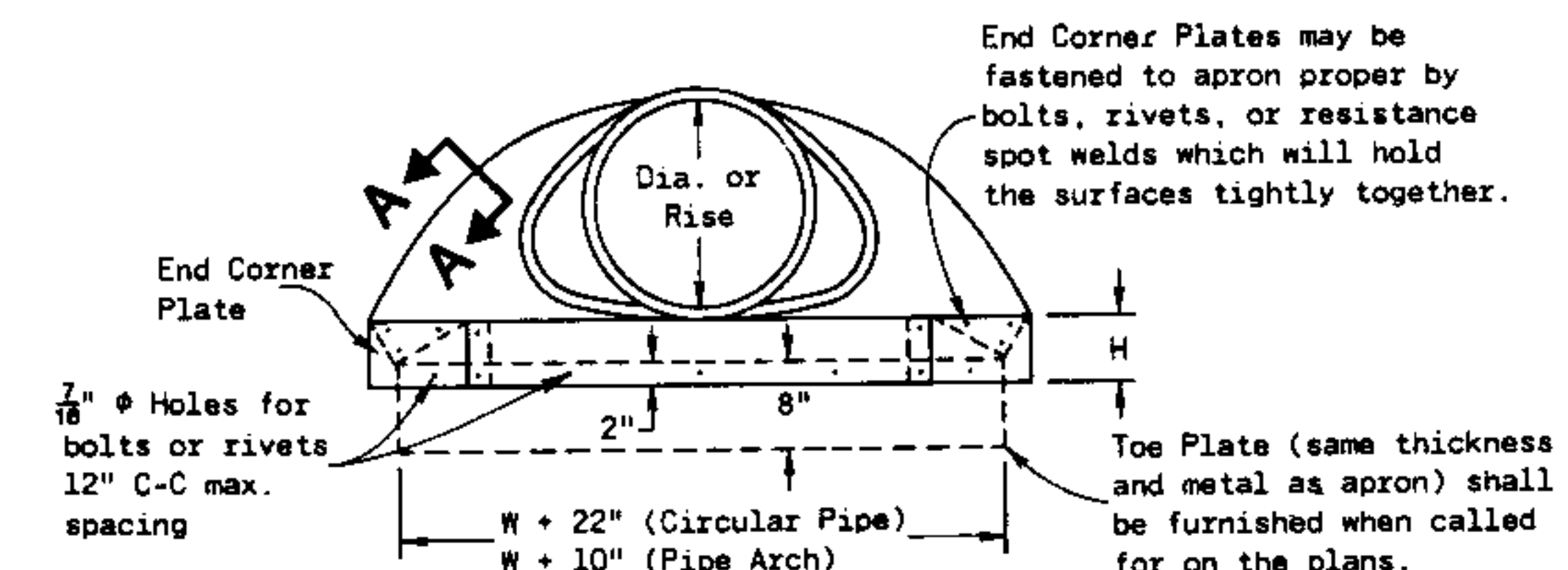
END VIEW



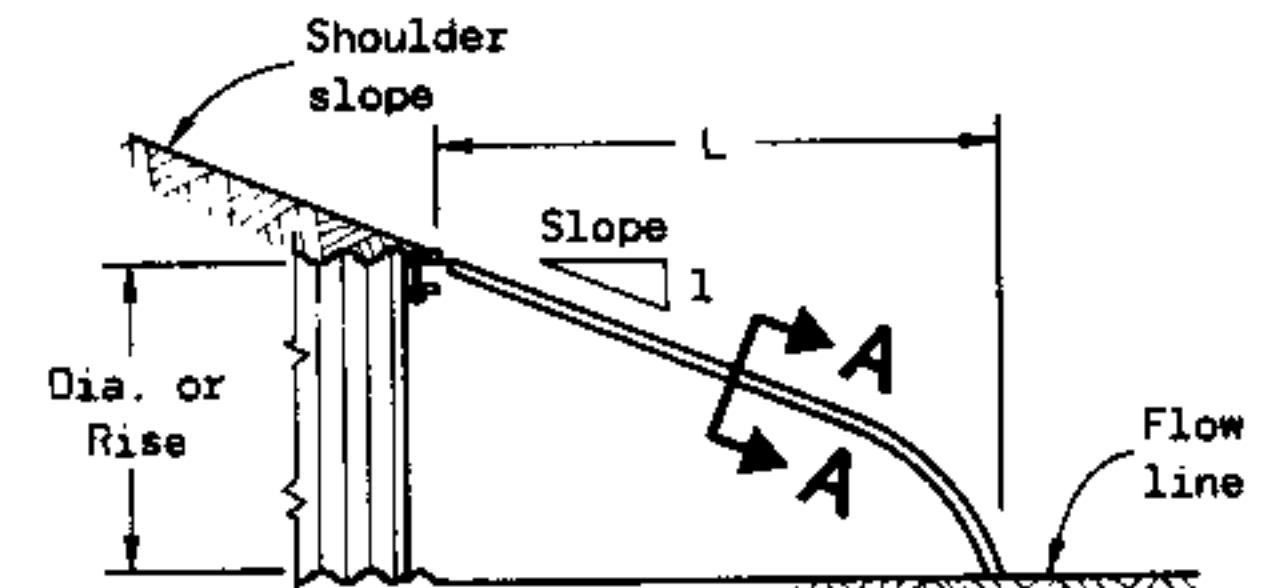
LONGITUDINAL SECTION



PLAN

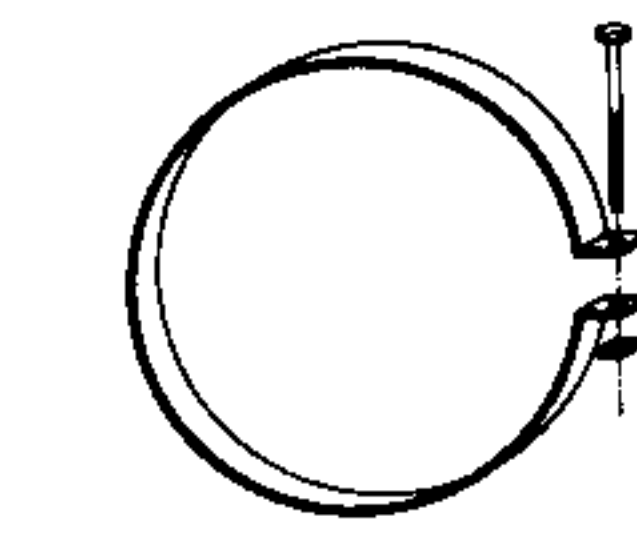


END VIEW



SIDE ELEVATION

1" Wide, 12 Ga. (0.109" thick) galvanized strap with standard 6" x 1/2" band bolt and nut.



Alternate for Type 1 Connection
END SECTION CONNECTOR STRAP

Threaded 7/8" min. ϕ rod around culvert & through Tank Type Connector Lug or alternate connector strap (See Detail)



TYPE 1

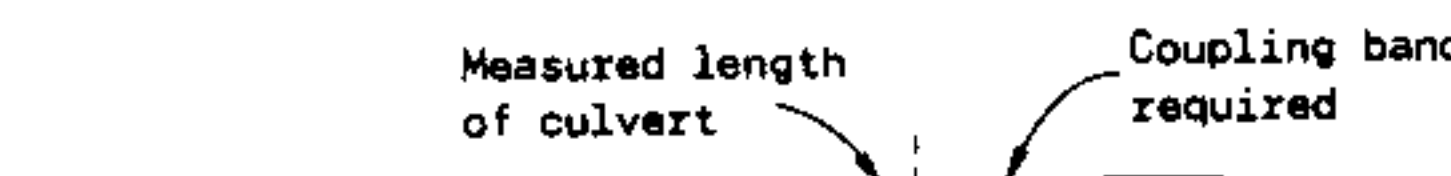
For 12" thru 24" only (Circular pipe)

Threaded 7/8" min. ϕ rod over top of apron, side lugs to be riveted to apron.



TYPE 2

For 30" & 36" only (Circular pipe)
For 17"x13" thru 57"x38" only (Pipe arch)



TYPE 3

Connector section to be paid for as part of end section

TYPE 3

For 42" thru 84" only (Circular pipe)
For 64"x43" & 71"x47" (Pipe arch)



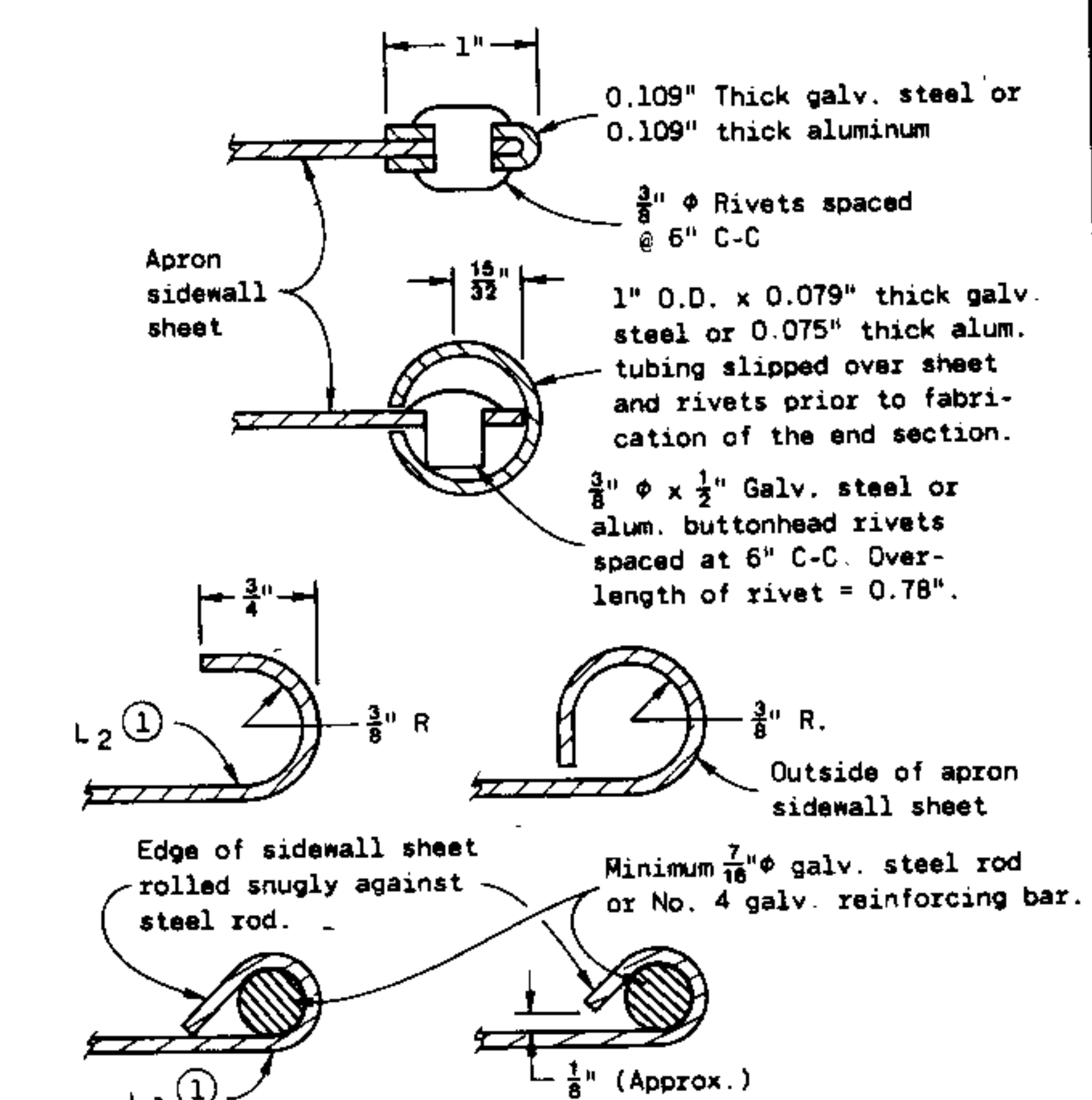
TYPE 5

Riveted or bolted at dimples (6" C-C for corrugated band)

TYPE 5

Alternate for:
All sizes corrugated circular pipe & pipe arches

NOTE: Dimpled band fits over outside of endwall, and corrugated band fits inside endwall. Dimpled band may be used with helically corrugated pipe.



SECTION A-A

GENERAL NOTES

Details of construction, materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the Standard Specifications and the applicable Special Provisions.

Variations of the dimensions and designs shown hereon will be permitted providing equivalent capacity and structural integrity are attained, and prior approval of the Engineer is obtained.

Concrete culvert endwalls may not be used with galvanized steel or aluminum culvert pipe or vice versa.

Galvanized steel or aluminum endwalls shall normally be installed on culvert pipe of the same metal. The use of galvanized steel endwalls on aluminum pipes is permitted, provided the two metals at the joint interface are kept separated by a suitable insulating material approximately 1/8" thick or greater. Such material would be an asphalt impregnated fabric, a sheet plastic, a rubber gasket or other non-degradable material of substantial strength.

When two or more pipe arches with apron endwalls are to be laid adjacent to each other, they shall be separated by the following amount:

PIPES: Total width of apron endwall less the diameter of pipe plus 6 inches.
PIPE ARCHES: Total width of apron endwall less the span dimension of the pipe arch plus 6 inches.

① A combination of steel rod rolled into edge of sidewall (L1), and 180° roll on edge of sidewall (L2), is permitted for metal apron endwalls up to 60" diameter for circular pipe, and 77" x 52" for pipe arches.

PIPE DIA. (In.)	APPROX. WEIGHT PER SECTION	DIMENSIONS (Inches)							APPROX. SLOPE
		T	A	B	C	D	E	G	
12	530	2	4	24	48 7/8	72 7/8	24	2	3 to 1
15	740	2 1/4	6	27	46	73	30	2 1/4	
18	990	2 1/2	9	27	46	73	36	2 1/2	
21	1,280	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	
24	1,520	3	9 1/2	43 1/2	30	73 1/2	48	3	
27	1,930	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	
30	2,190	3 1/2	12	54	19 3/4	73 3/4	60	3 1/2	
36	4,100	4	15	63	34 3/4	97 3/4	72	4	
42	5,380	4 1/2	21	63	35	98	78	4 1/2	
48	6,550	5	24	72	26	98	84	5	3 to 1
54	8,040	5 1/2	27	65	33 1/4 - 35	98 1/2 - 100	90	5	2 5/8 to 1
60	8,730	6	30 - 35	60	39	99	96	5	2 to 1
66	10,630	6 1/2	24 - 30	72 - 78	21 - 27		102	5 1/2	
72	12,520	7	24 - 36	78	21		108	6	
78	14,430	7 1/2	24 - 36	78	21	99	114	6 1/2	2 to 1
84	18,160	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2 to 1

* Minimum ** Maximum

REINFORCED CONCRETE APRON ENDWALLS

PIPE DIA. (In.)	MIN. THICKNESS (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE
	STEEL	ALUM.	A $\pm 1"$	B MAX.	H $\pm 1"$	L $\pm 1 1/2"$	L1 ①	L2 ①	W $\pm 2"$	
12	0.064	0.060	6	6	6	21	12	17 1/2	24	2 1/2 to 1
15			7	8		26	14	21 3/4	30	
18			8	10		31	15	28 1/4	36	
21		0.060	9	12		36	18	29 5/8	42	
24	0.064	0.075	10	13	6	41	18	37 1/4	48	
30	0.079	0.075	12	16	8	51	18	52 1/4	60	
36	0.079	0.105	14	19	9	60	24	59 3/4	72	
42	0.109	0.105	16	22	11	69	24	76 5/8	84	2 1/2 to 1
48		0.135	18	27	12	78	24	81	90	2 1/2 to 1
54		0.135	30			84	30	85 1/2	102	2 to 1
60		0.164	33			87		114	1 1/2 to 1	
66			36			87		120	1 1/2 to 1	
72			39			87		126	1 1/2 to 1	
78			42			87		132	1 1/4 to 1	
84	0.109	0.164	18	45	12	87		138	1 1/4 to 1	

NOTE: All splices to be lap riveted or bolted.

METAL APRON ENDWALLS FOR CIRCULAR PIPE

PIPE-ARCH DIMENSIONS (Inches)	SPAN	RISE	MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE
			STEEL	ALUM.	A $\pm 1"$	B MAX.	H $\pm 1"$	L $\pm 1 1/2"$	L1 ①	L2 ①	W $\pm 2"$	
17	13		0.064	0.060	7	9	6	19	14	16	30	2 1/2 to 1
21	15			0.060	7	10		23	14	19 3/8	36	
24	18			0.060	8	12		28	18	21 3/4	42	
28	20		0.064	0.075	9	14		32	18	27 1/2	48	
35	24		0.079	0.075	10	16	6	39	18	37 3/8	60	
42	29		0.079	0.105	12	18	8	46	24	45 3/8	75	
49	33		0.109	0.105	13	21	9	53		54 3/4	85	
57	38			0.135	18	26	12	63		68	90	2 1/2 to 1
64	43			0.135	30			70	24	72 3/4	102	2 1/4 to 1
71	47			0.164	33			77	30	82 1/4	114	2 1/4 to 1
77	52			0.164	36			77			126	2 to 1
83	57		0.109	0.164	18	39	12	77			138	2 to 1

NOTE: All splices to be lap riveted or bolted.

METAL APRON ENDWALLS FOR PIPE ARCHES

CONNECTION DETAILS

CIRCULAR PIPE

For circumferentially corrugated pipe use Endwall Connection Details 1, 2, 3 or 5 as applicable.

For helically corrugated pipe use Endwall Connection Details 1, 2 or 5.

For helically corrugated pipes with two circumferential corrugations at each end use Endwall Connection Details 1, 2 or 3.

PIPE ARCH

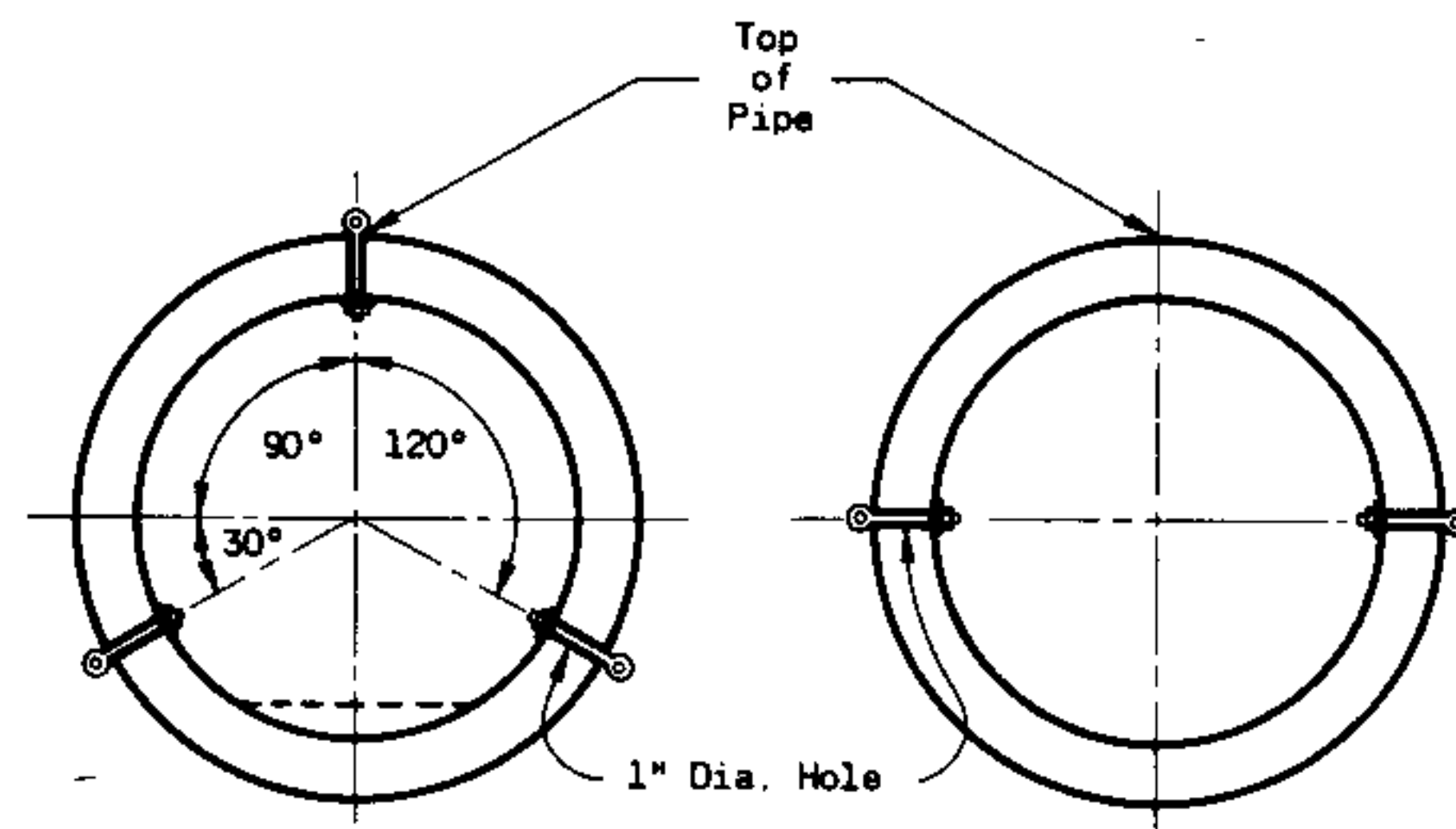
Use Endwall Connection Details 2, 3 or 5 as applicable.

APRON ENDWALLS FOR CULVERT PIPE AND PIPE ARCHES

State of Wisconsin
Department of Transportation

APPROVED
2-15-82
DATE
CHIEF DESIGN ENGINEER

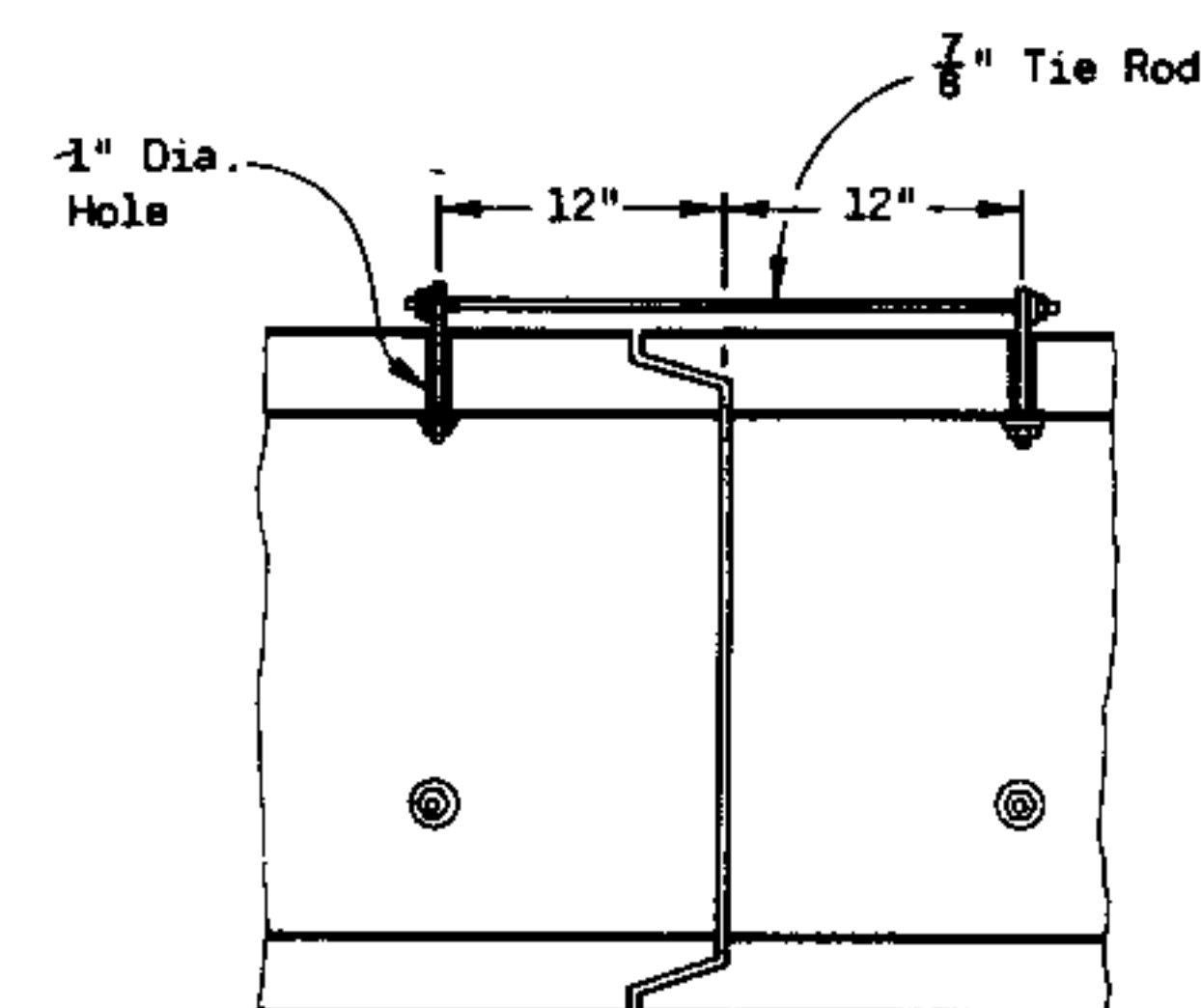
FHWA



3 CONNECTIONS
FOR
PIPES OVER 36"
OR CATTLE PASS

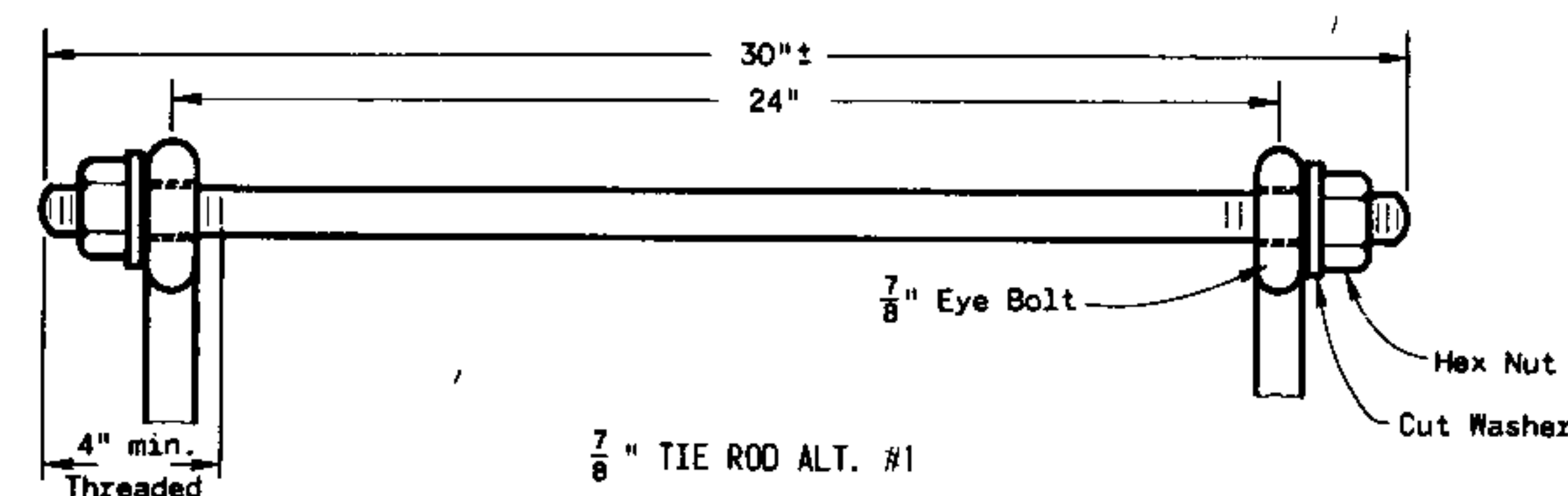
2 CONNECTIONS
FOR
PIPES 36" AND SMALLER

TRANSVERSE SECTION

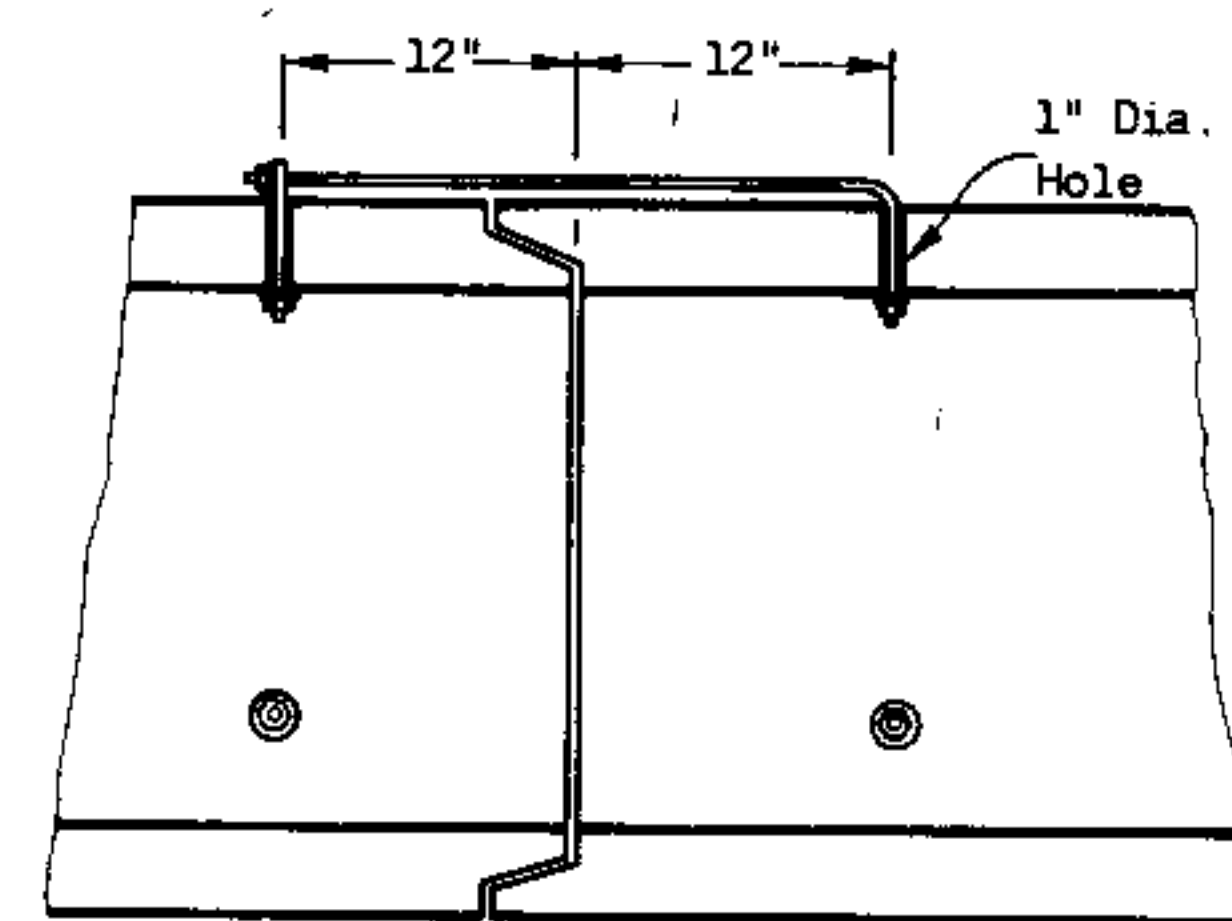


EYE BOLT AND TIE ROD ASSEMBLY ALT. #1

LONGITUDINAL SECTION

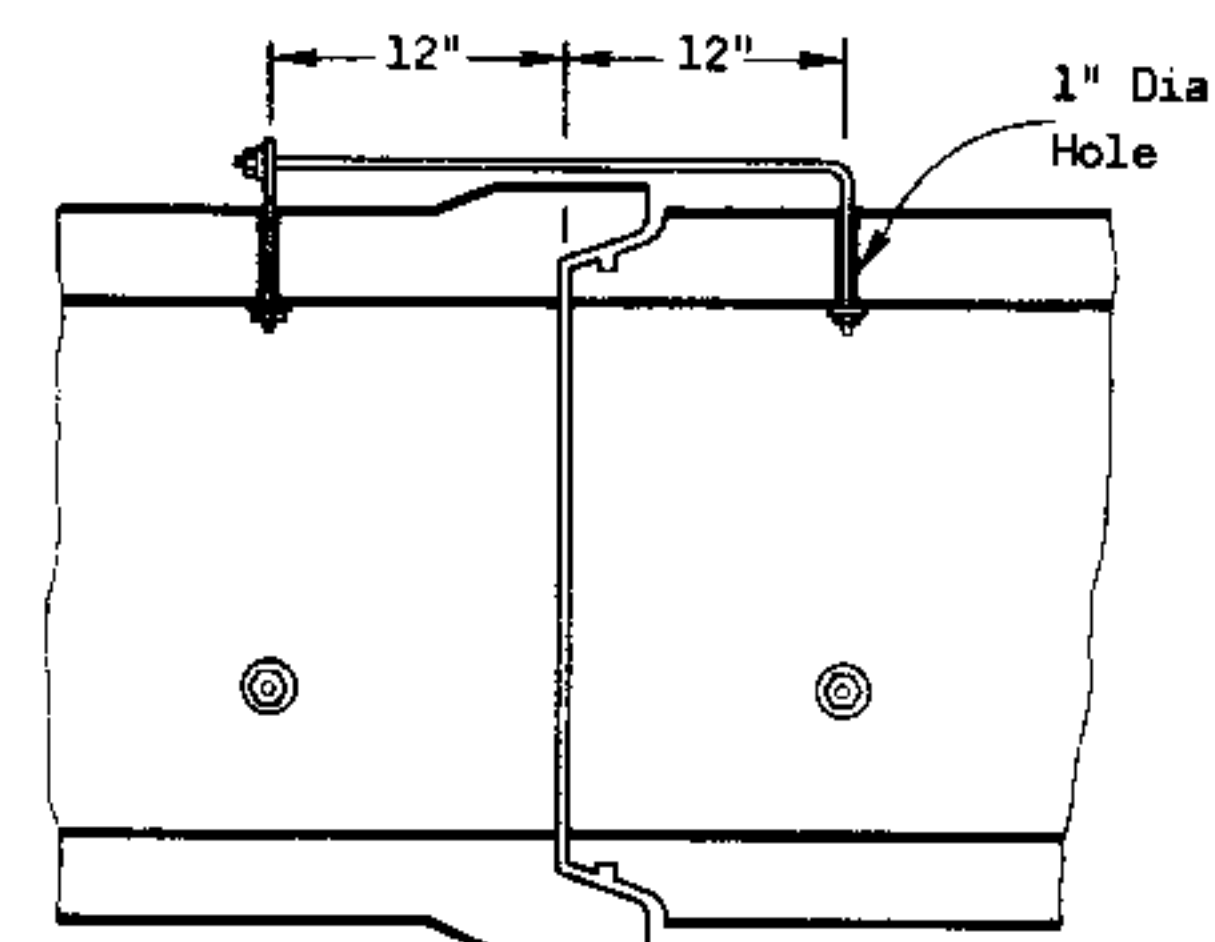


7/8" TIE ROD ALT. #1



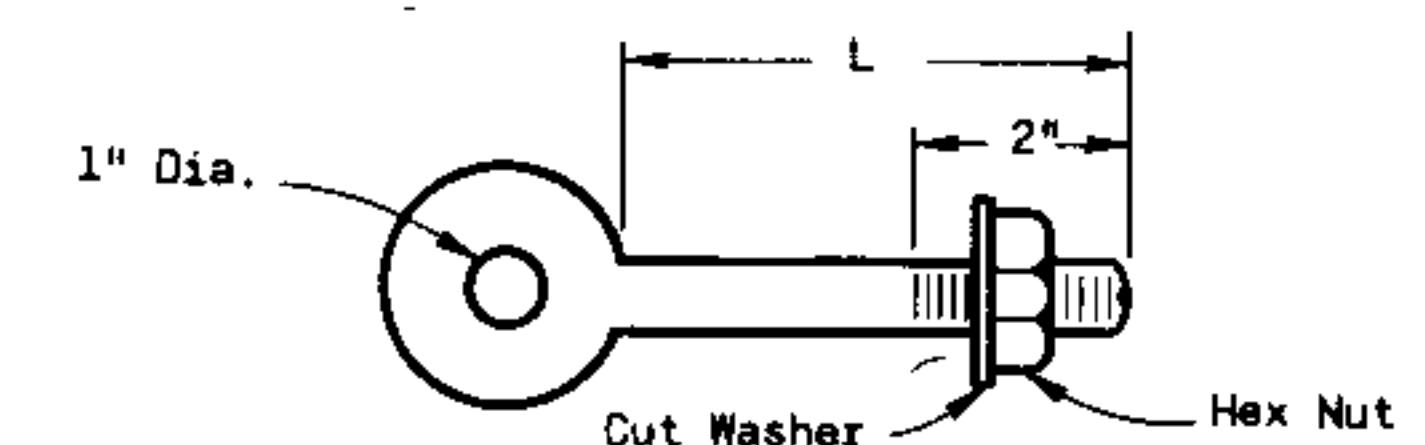
EYE BOLT AND TIE ROD ASSEMBLY ALT. #2

LONGITUDINAL SECTION



MODIFIED BELL
EYE BOLT AND TIE ROD ASSEMBLY ALT. #2

LONGITUDINAL SECTION



7/8" EYE BOLT

EYE BOLT DIMENSION TABLE

Pipe Size	Length	
	Tongue & Groove Pipe	Modified Bell Pipe
18" to 24"	4 1/2"	6 1/4"
30"	5"	7"
36"	5 1/2"	7"
42"	6"	
48"	6 1/2"	
60"	7 1/2"	
72"	8 1/2"	

GENERAL NOTES

Concrete culvert pipe shall be tied together in the manner illustrated by this detail at locations designated on the plan or directed by the Engineer.

Materials, fabrication and work necessary to tie culvert pipe as indicated by this detail will be considered incidental to Culvert pipe or Reinforced Concrete Culvert pipe.

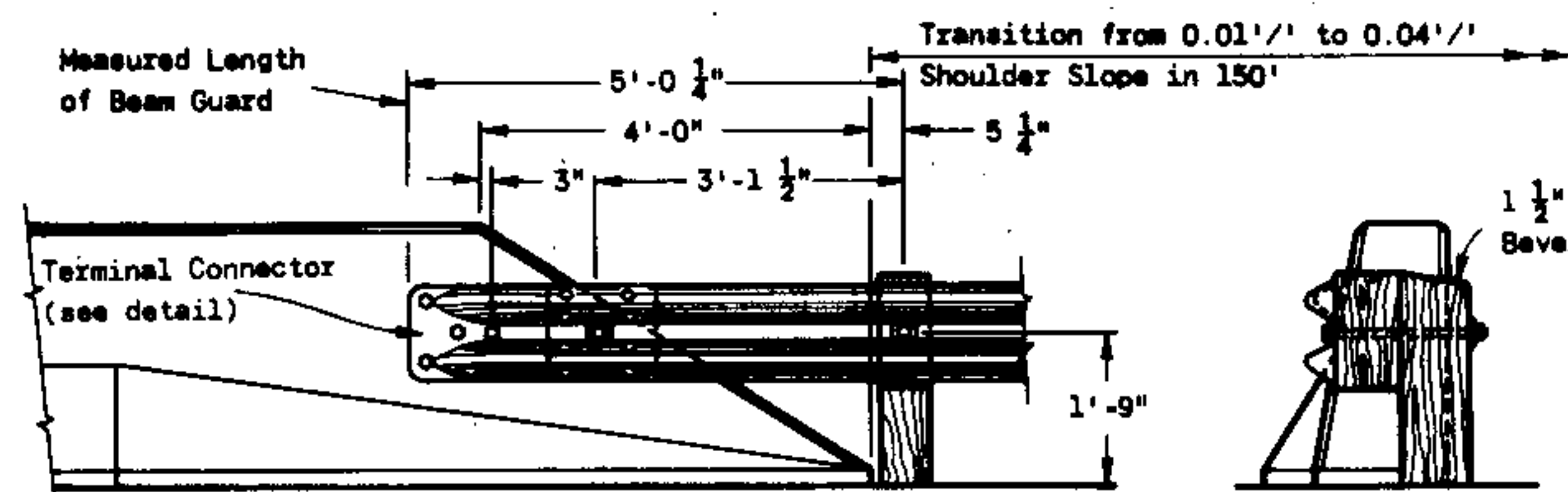
Detailed drawings for proposed alternate designs for Joint Ties shall be submitted to the Engineer for approval.

JOINT TIES FOR CONCRETE PIPE

State of Wisconsin
Department of Transportation
Division of Transportation Facilities

APPROVED
12-26-78
DATE
FHWA

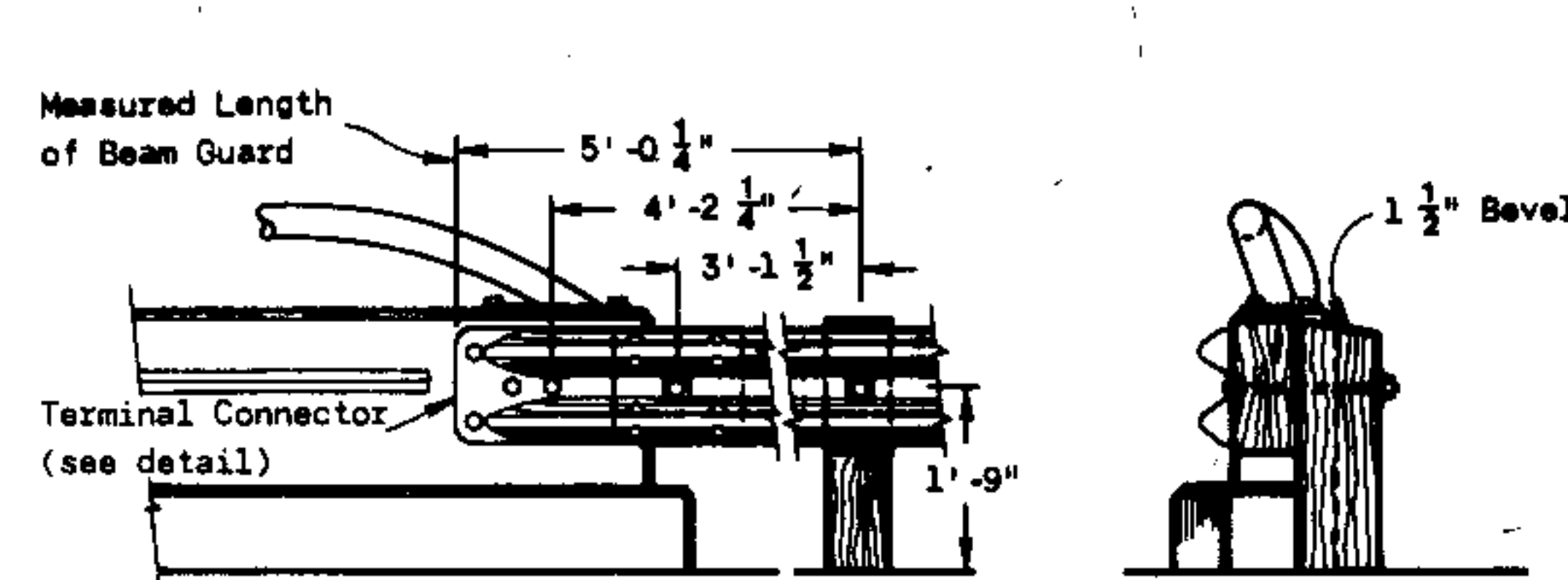
[Signature]
CHIEF DESIGN ENGINEER



FRONT VIEW

END VIEW

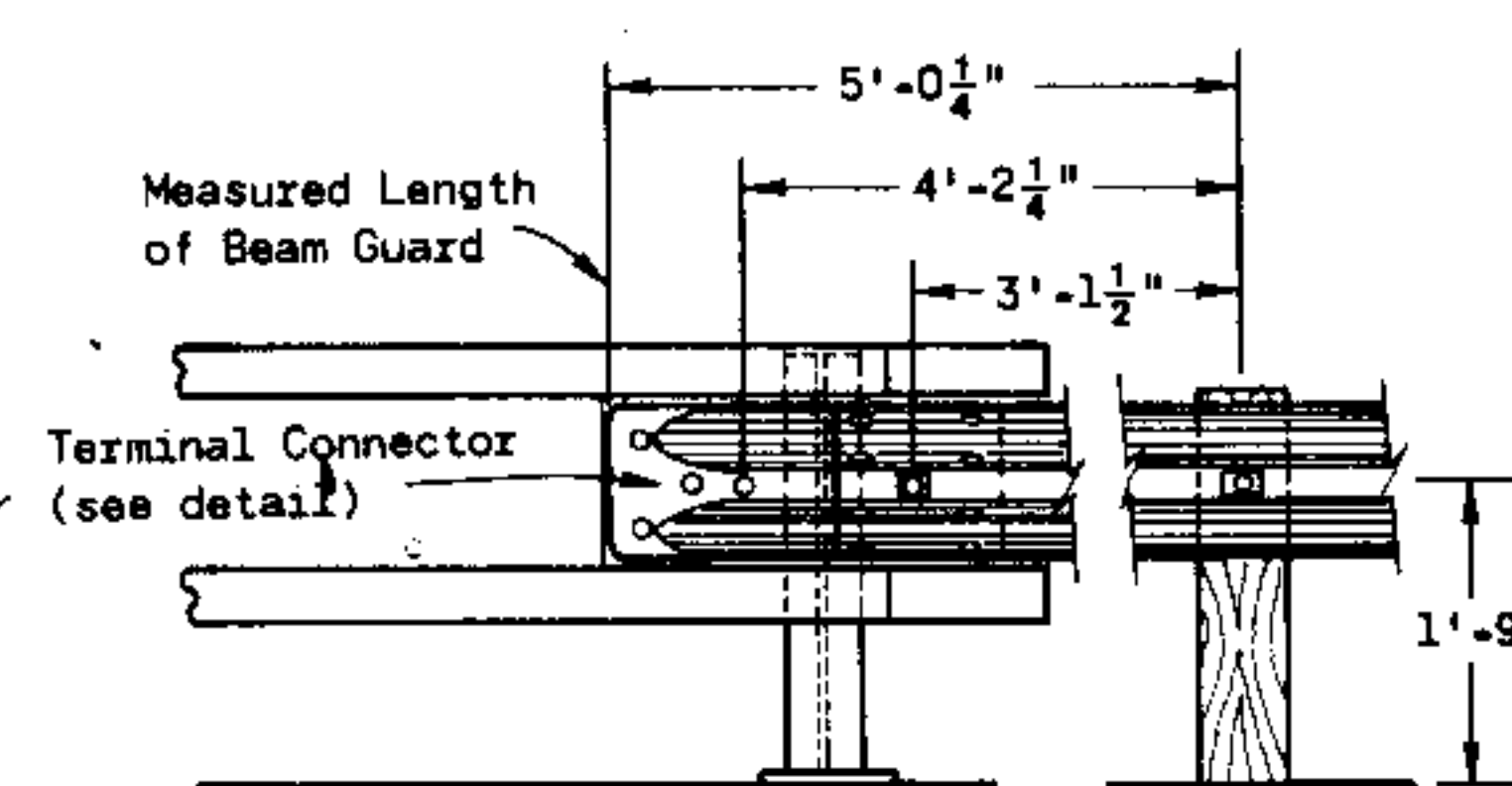
SLOPED FACE PARAPET



FRONT VIEW

END VIEW

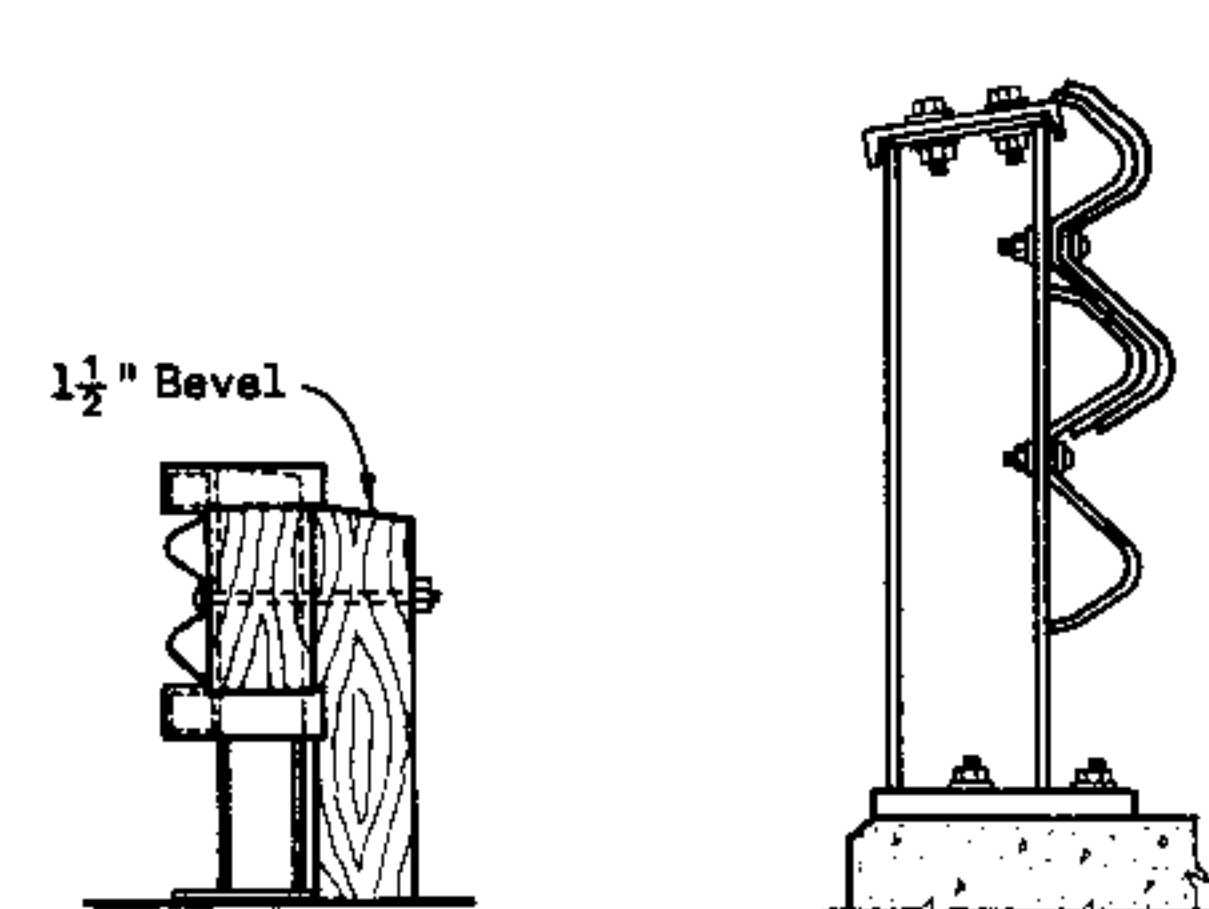
VERTICAL FACE PARAPET



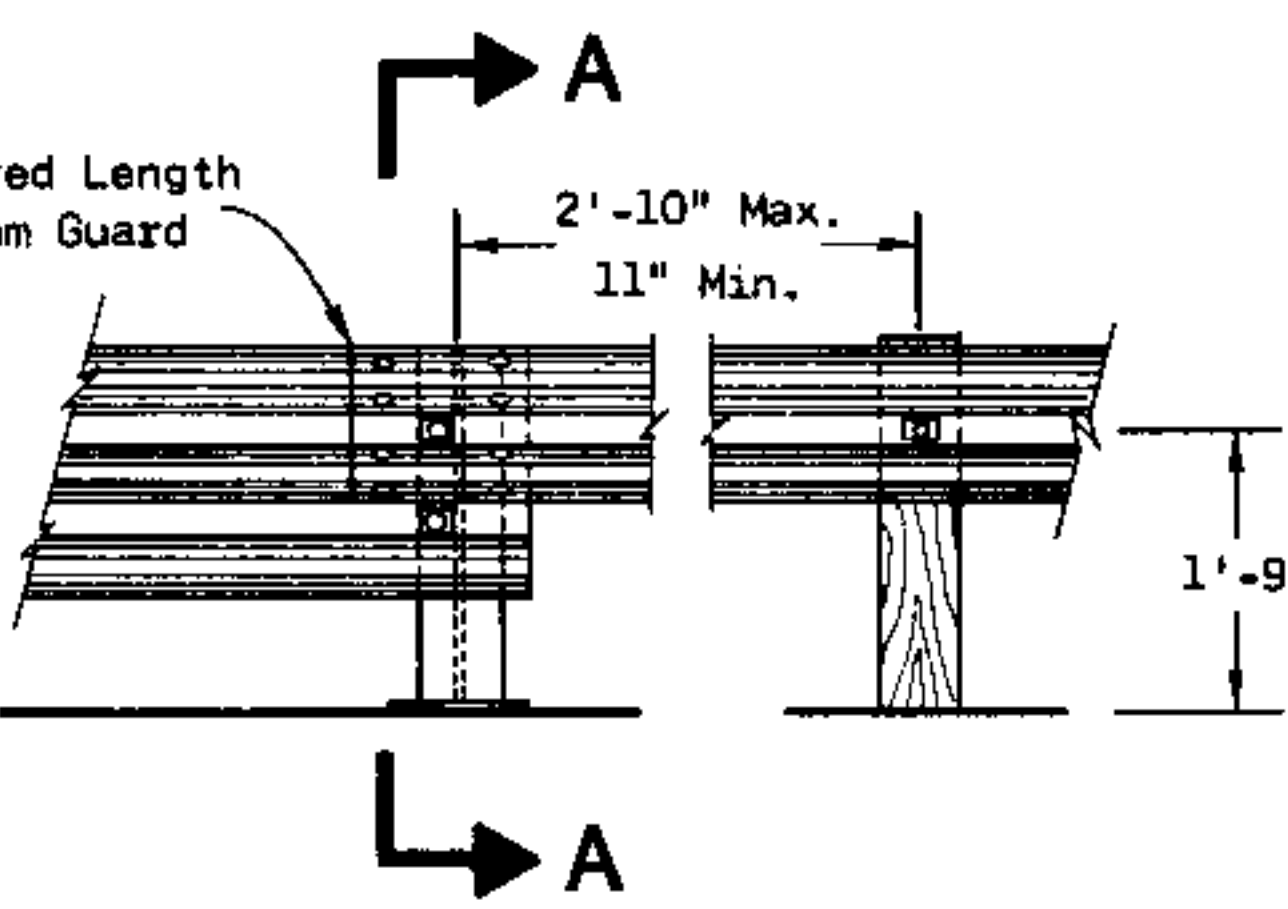
FRONT VIEW

END VIEW

RAILING TYPE "F"

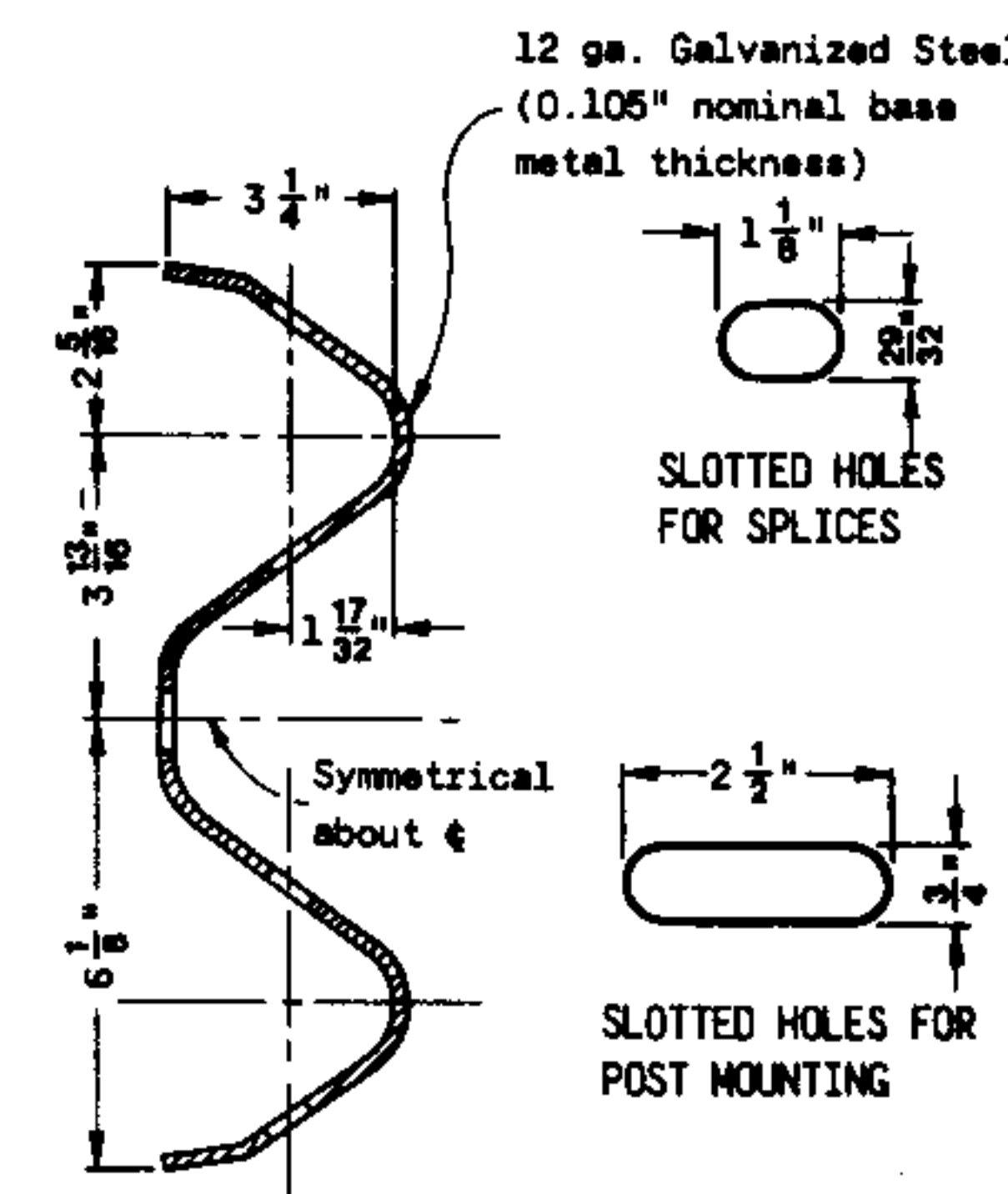


SECTION A-A



FRONT VIEW

RAILING TYPE "W"



SECTION THRU RAIL ELEMENT

GENERAL NOTES

Details of construction, materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the Standard Specifications and the applicable Special Provisions.

The type of anchorage and the exact location of the beginning and end of each beam guard installation shall be as shown on the plans or as directed by the Engineer.

Shoulder widening to accommodate the anchored end of the beam guard shall be accomplished at a rate of widening not to exceed 5 to 1.

Standard Anchorages - Upon approval of the Engineer, the 6 foot offset may be reduced to nothing where existing conditions will not permit the desirable offset. However, when no offset greater than or equal to 3 feet can be provided, the minimum length of guardrail in advance of an obstacle (obstacle to anchor) shall be 150 feet.

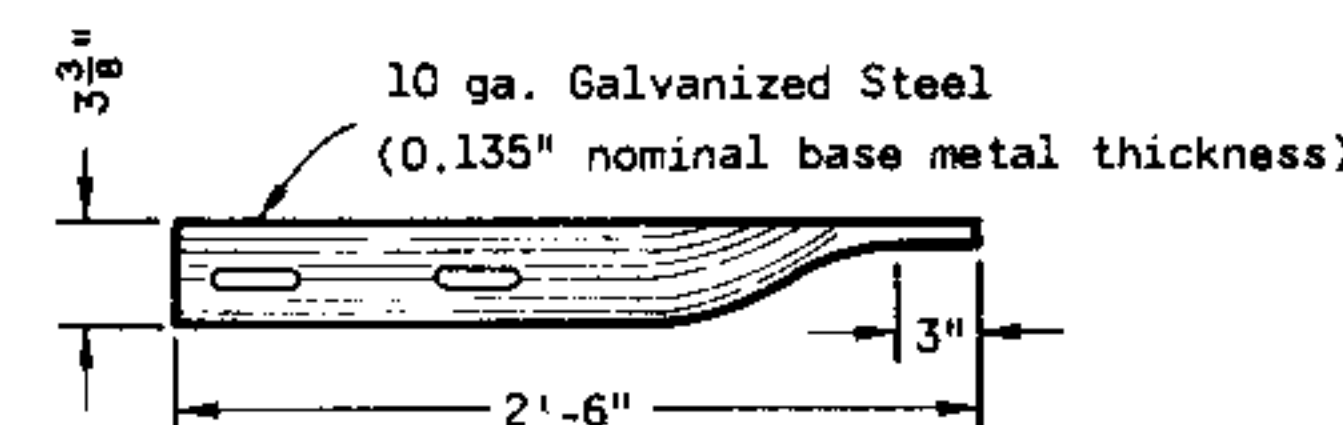
The "Post Footing Details at Piers" shall be used when beam guard posts are over structure footings and less than 3 feet - 6 inches of earth is provided over the top of the footing.

- The minimum clearance from the front face of beam guard to obstacle shall be 4 feet unless otherwise shown on contract plans. When clearance is less than 4 feet, post spacing shall be reduced to 3 feet - 1 1/2" C-C.
- This section shall include at least one 12'-6" Rail Element and a Terminal Connector when required for structure mounting.

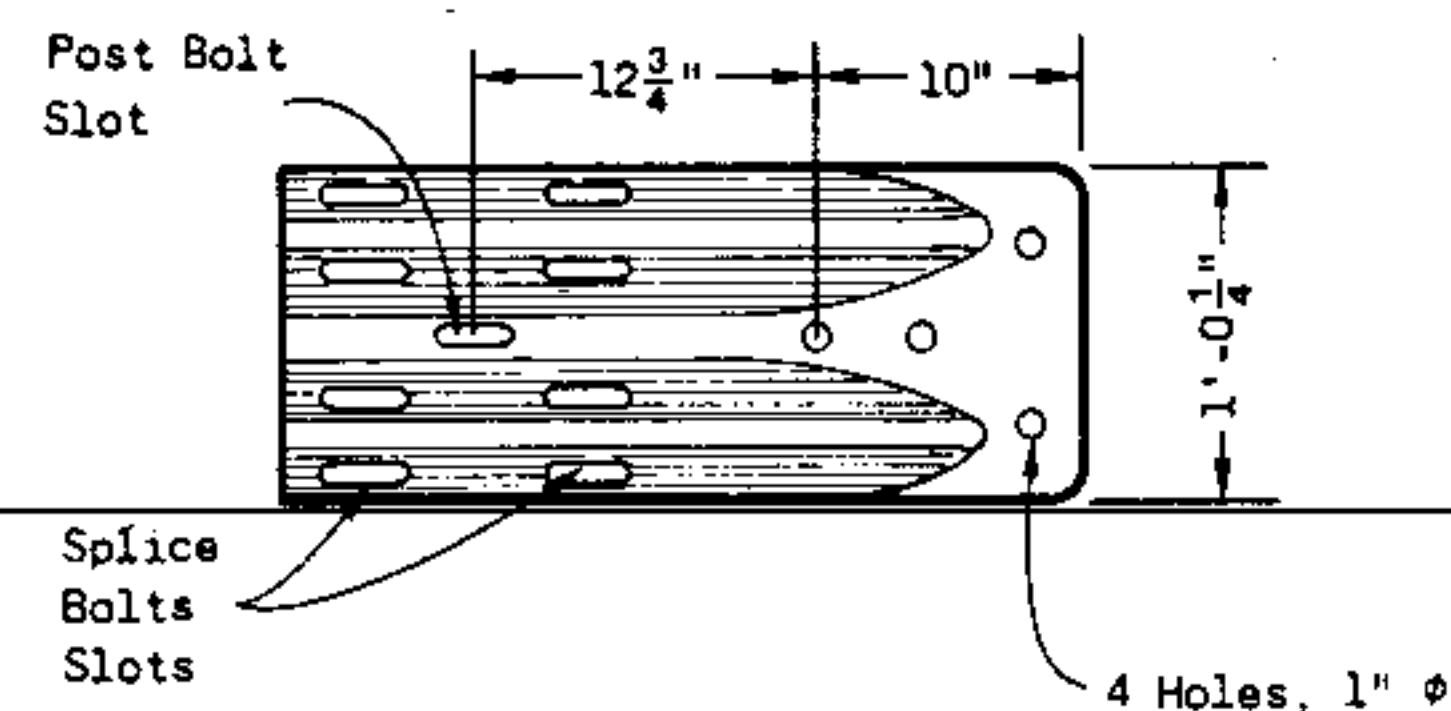
NOTE:

Drill all holes in mounting bracket 7/8" ϕ .

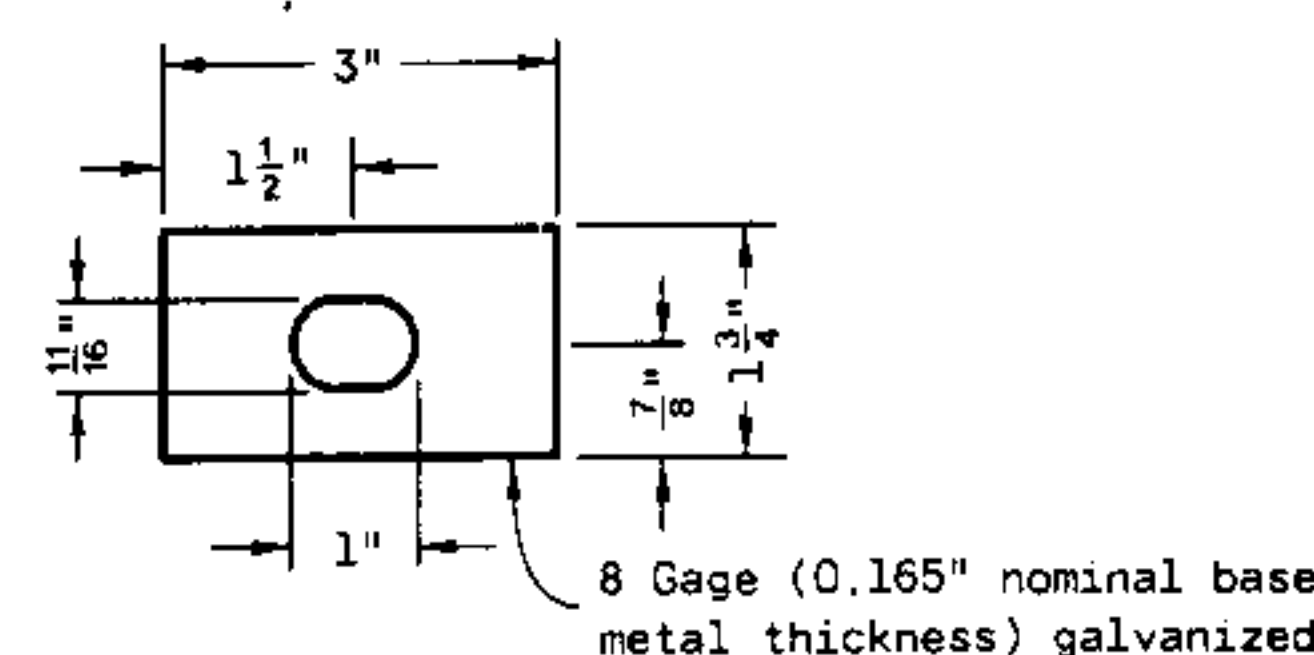
Use 3/8" minimum thickness ASTM A 36 steel plate for all pieces and galvanize after fabrication & drilling.



STRUCTURE MOUNTING DETAILS

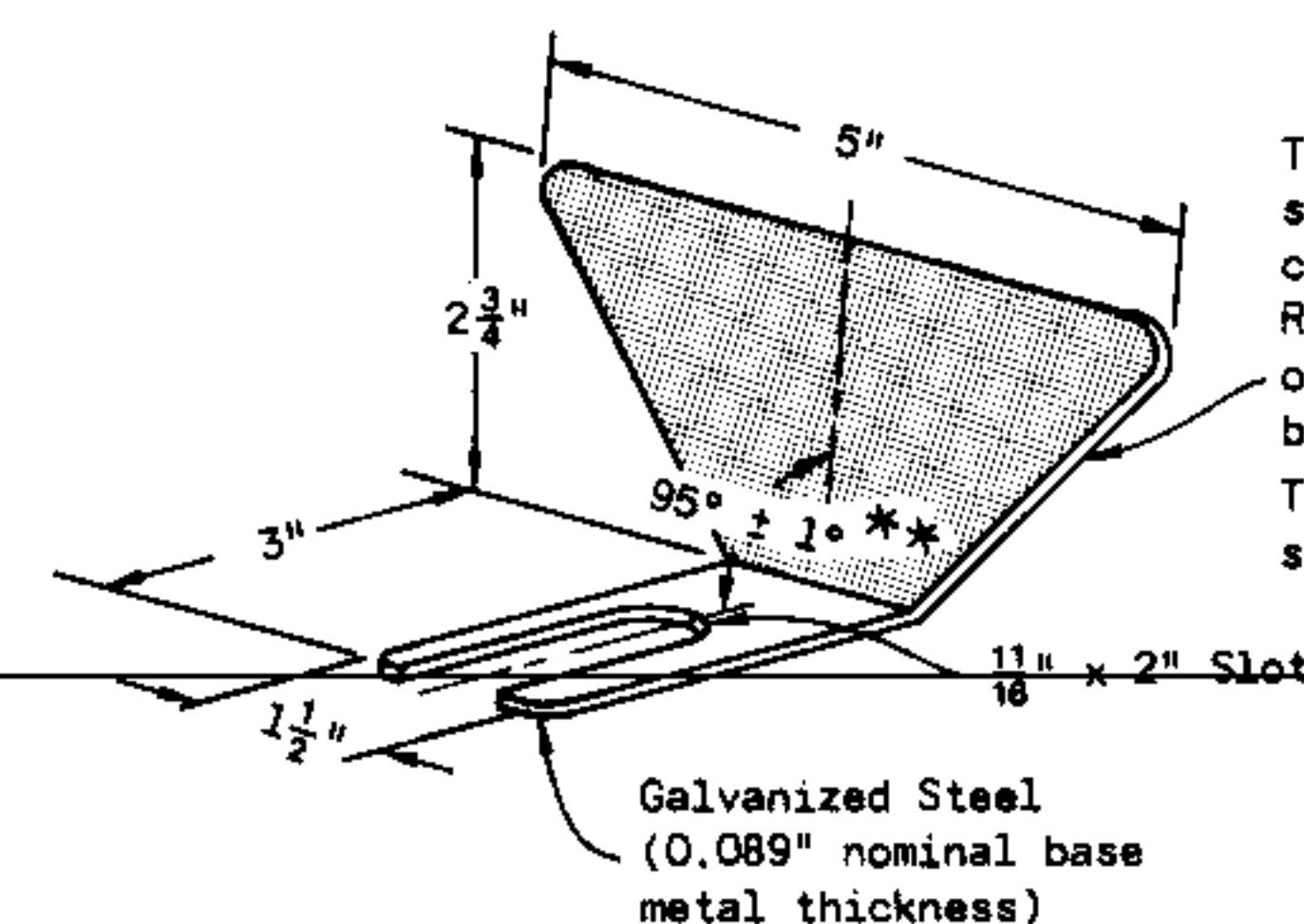


TERMINAL CONNECTOR



RECTANGULAR PLATE WASHER

(Shall be omitted at selected locations when Type 1 Anchorages are used. See TANGENT OFFSETS, Sheet 5c)



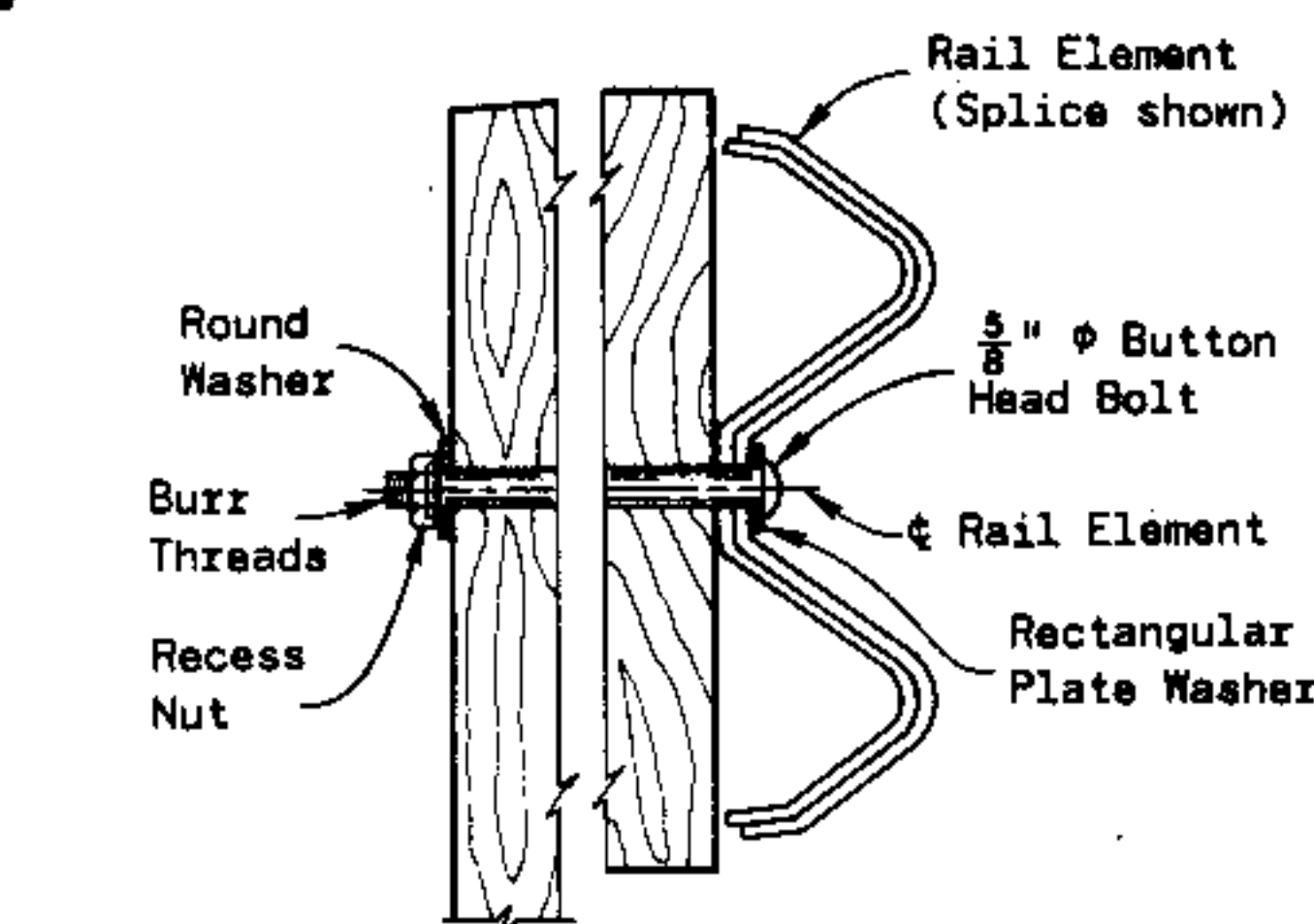
REFLECTOR SPACING

	Beam Guard Length	Reflector Spacing	No. Surfaces ReflectORIZED	Min. No. Reflectors
One Way Traffic	< 200'	50' C-C	1	3
Two Way Traffic	< 200'	25' C-C	1 *	6
Two Way Traffic	> 200'	50' C-C	1 *	3
Two Way Traffic	< 200'	50' C-C	2 **	3
Two Way Traffic	> 200'	100' C-C	2 **	

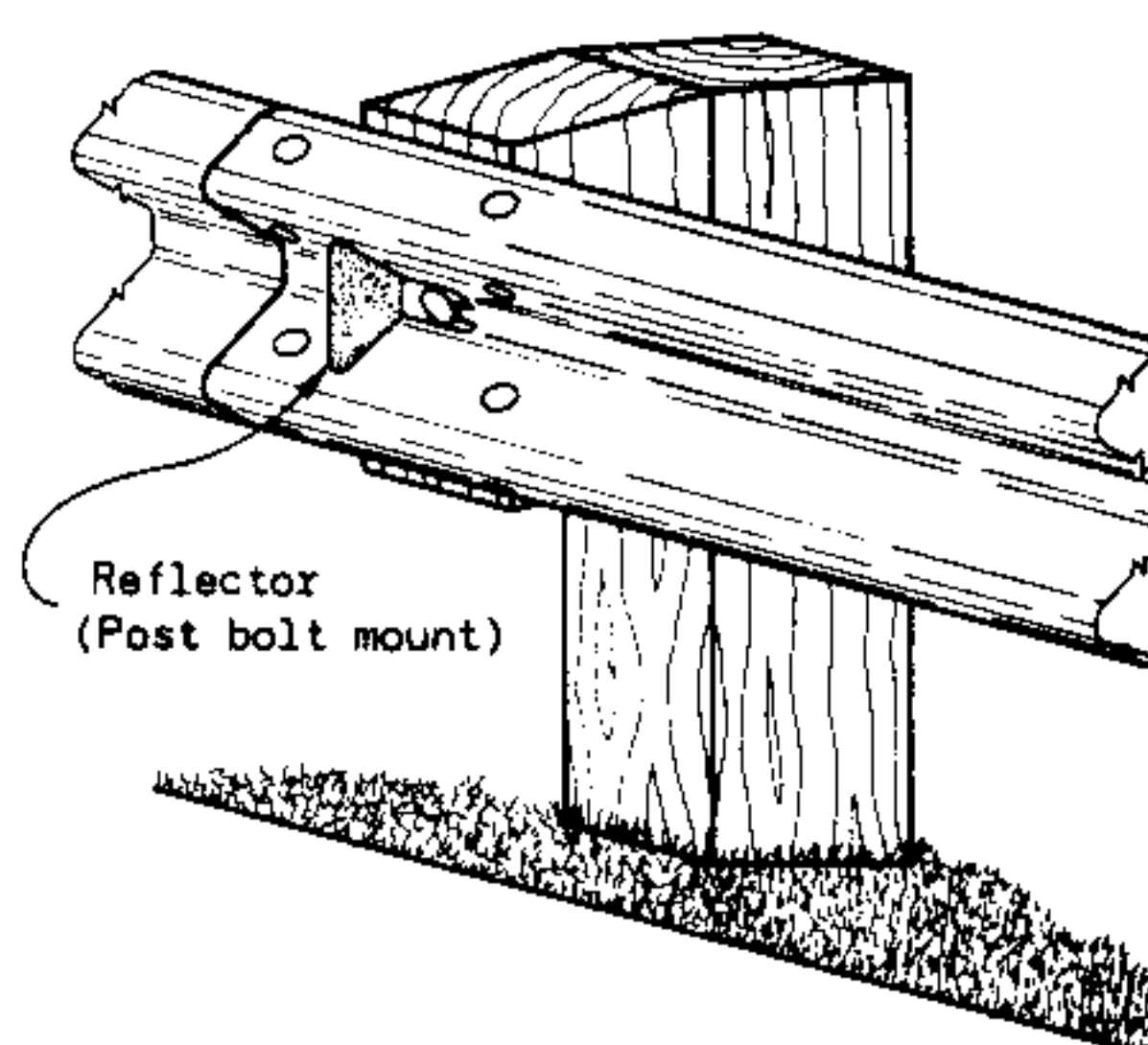
* Every other reflector reversed for 2-way visibility. Contractor may furnish two-sided reflectors in lieu of one-sided reflectors.

** Angle of bend to be 90° $\pm$ 1° for two-sided reflectors.

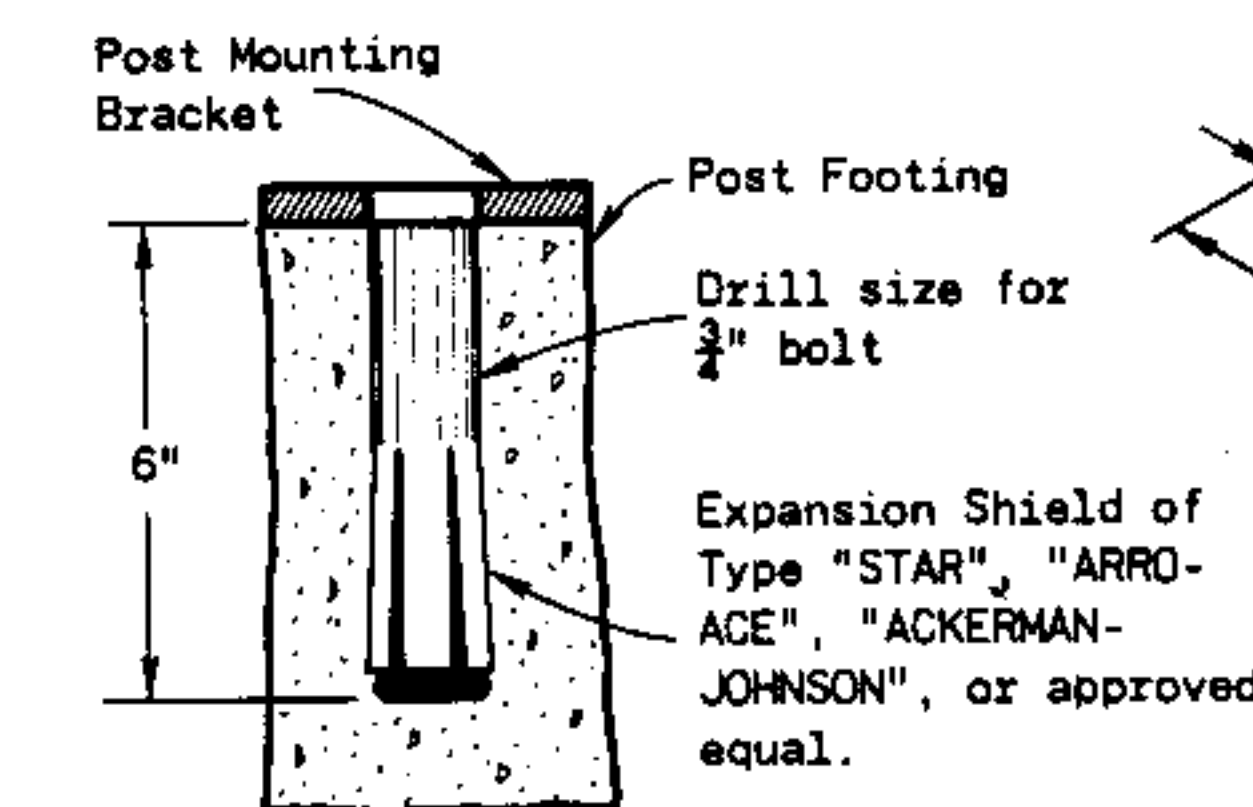
REFLECTOR DETAIL



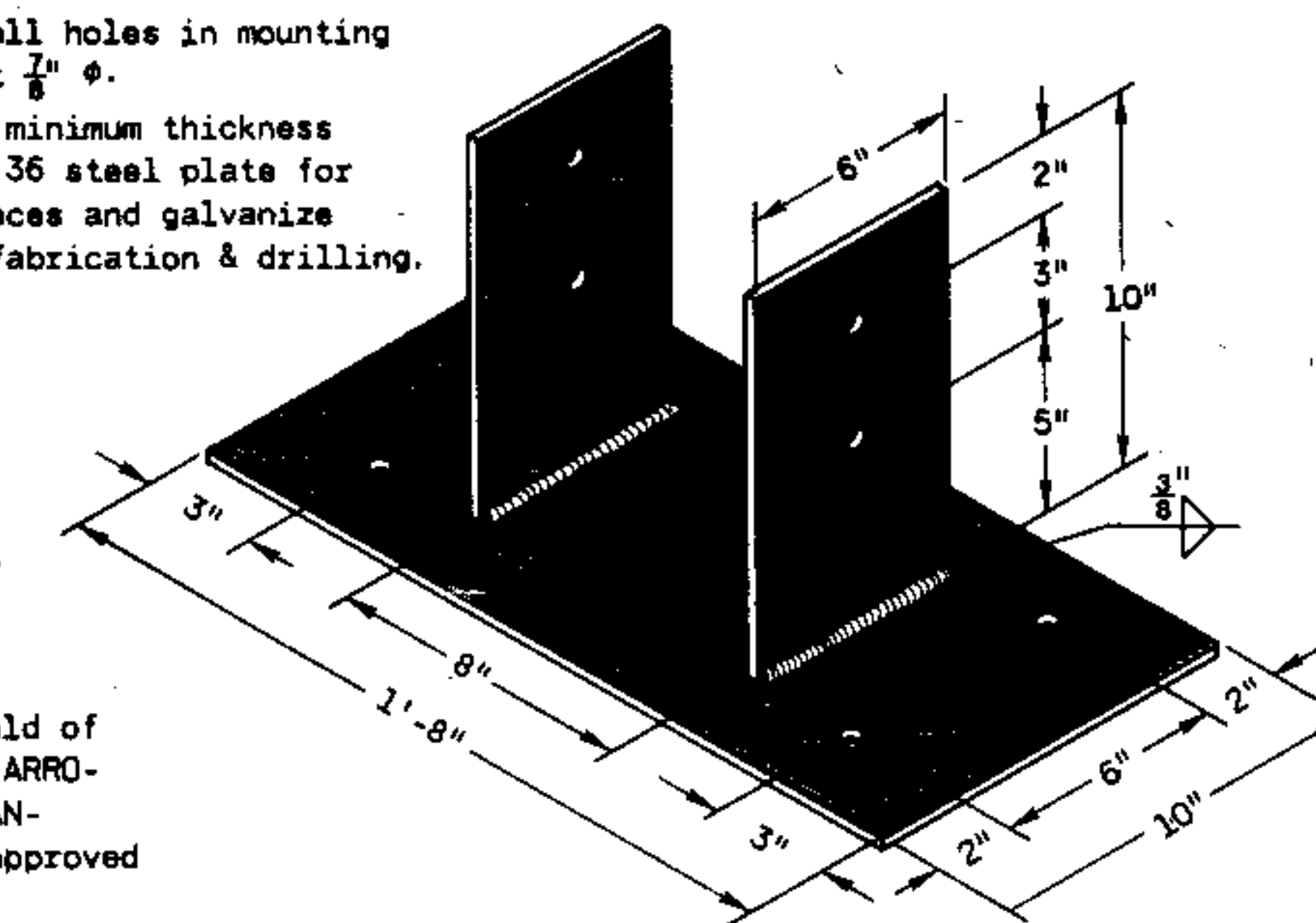
BUTTON HEAD BOLT DETAIL



TYPICAL INSTALLATION

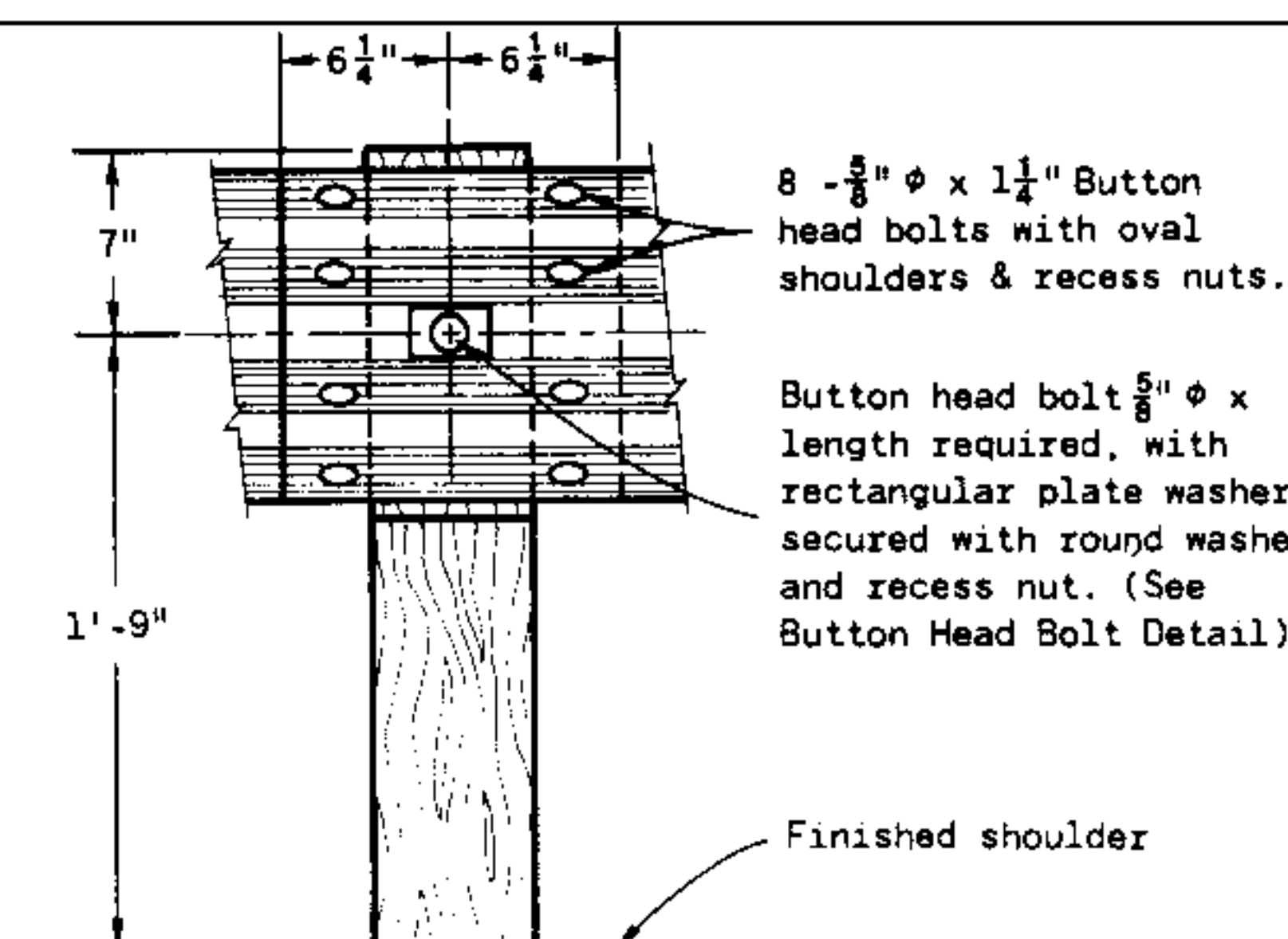


EXPANSION SHIELD DETAIL



POST MOUNTING BRACKET

POST FOOTING DETAIL AT PIERS



RAIL ELEMENT SPLICING AND POST MOUNTING DETAIL

NOTE:

THIS STANDARD DETAIL DRAWING HAS THREE SHEETS. SHEET 5c IS REQUIRED ONLY WHEN TYPE 1 OR TYPE 2 ANCHORAGES ARE SPECIFIED.

CLASS "A" STEEL PLATE BEAM GUARD

State of Wisconsin
Department of Transportation

APPROVED
11-13-81

DATE

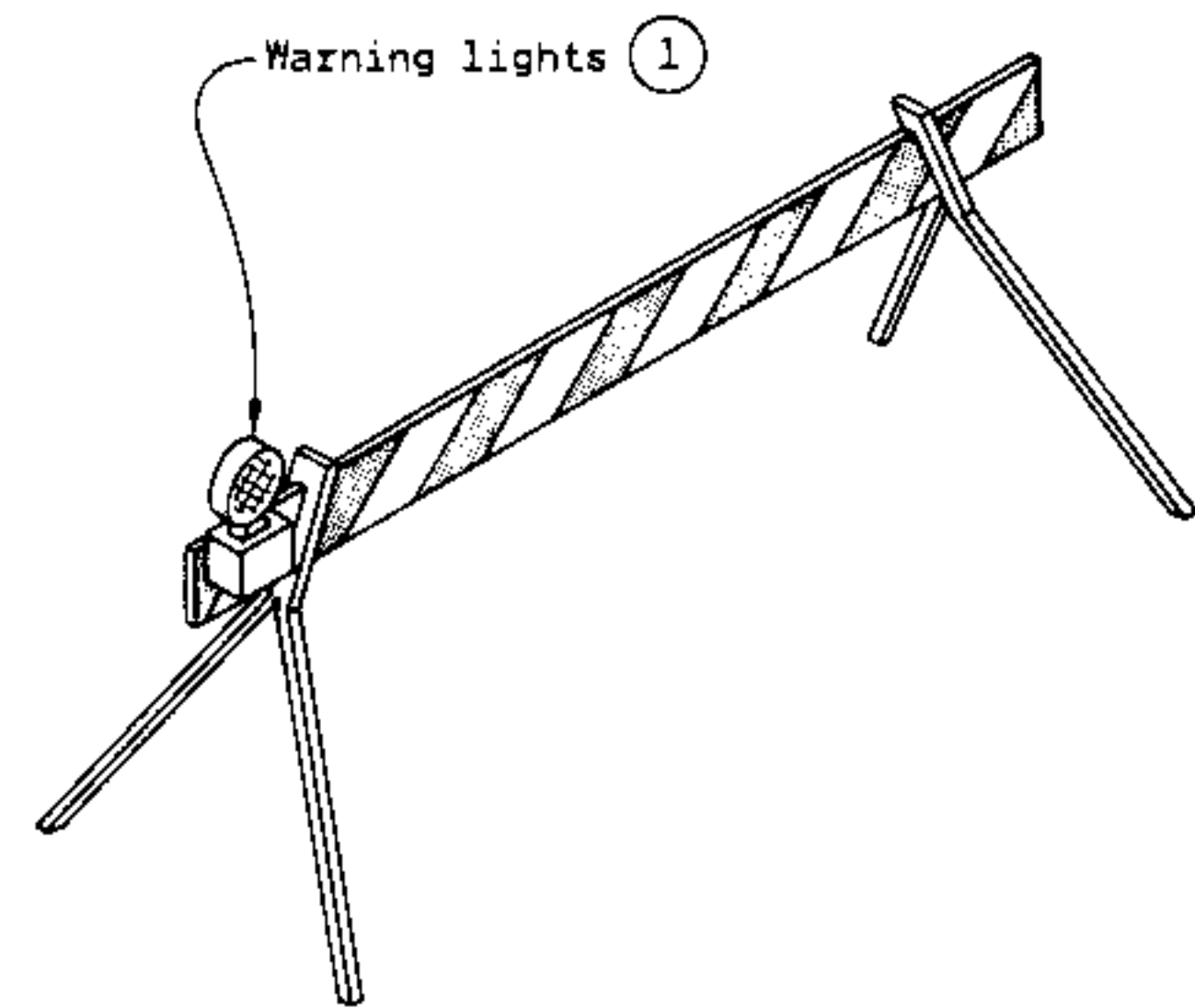
FHW

CHIEF DESIGN ENGINEER

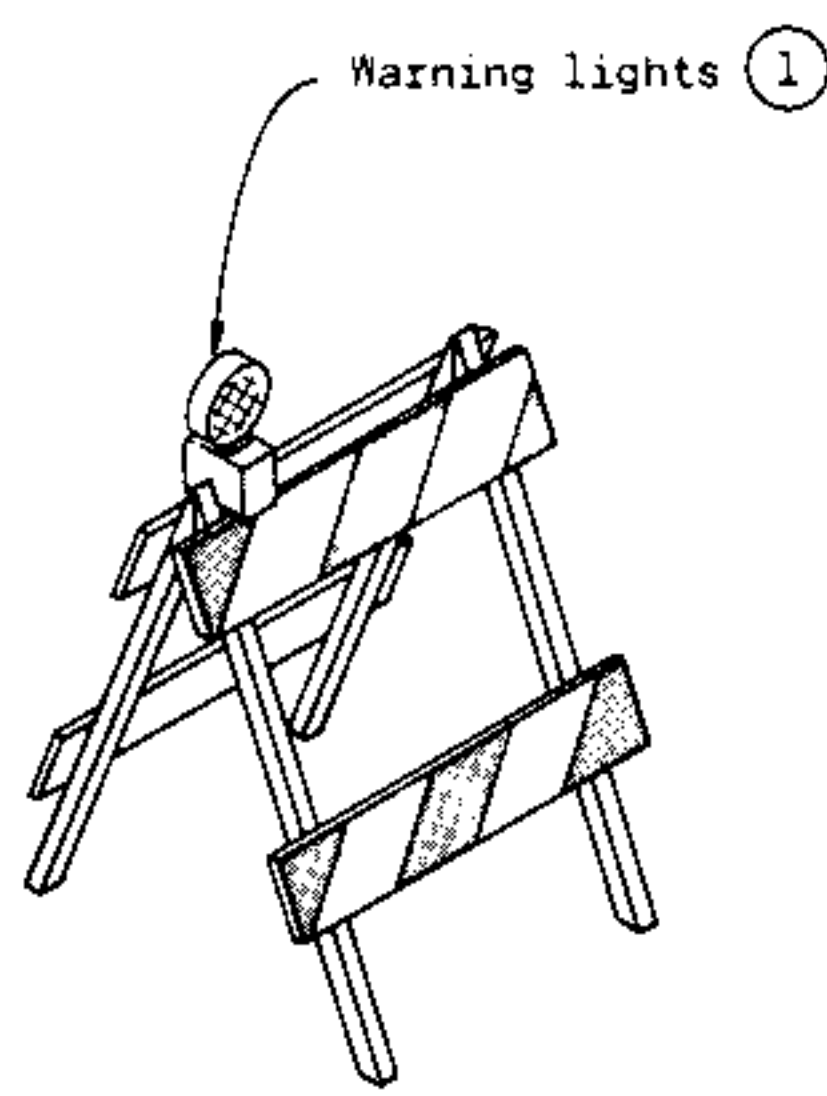
TABLE OF BARRICADE CHARACTERISTICS

BARRICADE TYPE	I	II	III
Height	3' Minimum		5' Minimum
*Rail Width	8" Minimum to 12" Maximum		
Rail Length	2' Minimum		4' Minimum
**Stripe Width	6" at 45° Angle		
Stripe Colors	Reflectorized Orange & White		

* Nominal dimensions when barricade is constructed of lumber.
 ** Shall be 4" for rail lengths less than 3'.



TYPICAL TYPE I BARRICADE



TYPICAL TYPE II BARRICADE



R11-2

48" x 30"

Black Lettering on Reflective
White Background

Letter Series "D"

Letter height 8"



W20-3

48" x 48"

Black Lettering on Reflective
Orange Background

Letter Series "D"

Letter height 7"

STANDARD SIGNS - TYPE II

GENERAL NOTES

The contractor shall furnish, erect and maintain barricades and signs. Details regarding location, spacing, dimensions, fabrication, material, sign lettering, lighting devices and color of barricades and signs shall conform to this drawing, the Manual On Uniform Traffic Control Devices, the Standard Specifications, Special Provisions and/or plans.

Type III Barricades and Signs shall be erected at the termini of projects and at other road or street locations where it is necessary to control or eliminate public access to the construction area.

Type I and II Barricades shall be used on projects when traffic is to be maintained through the construction area.

The actual field location of barricade installations and advance signs shall be as directed by the Engineer.

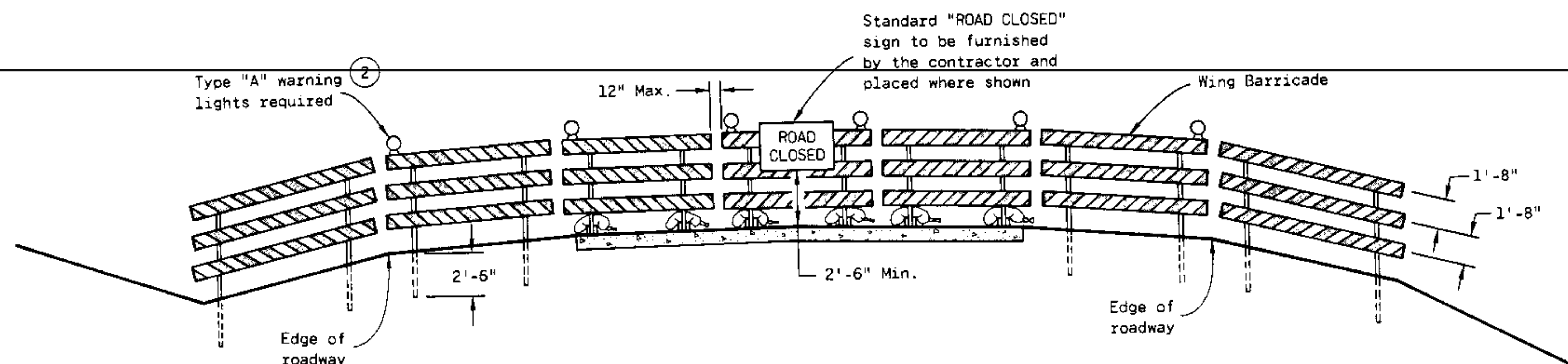
Each barricade shall have the name and telephone number of a person responsible for 24 hour emergency service printed in letters at least $\frac{3}{4}$ inch in height on the barricade rails. Prior to May 1, 1983, such information may be shown on either front or back faces of the barricade rails. After May 1, 1983, all printed information or identification markings shall be shown only on the back side of barricade rails.

Type I Barricades may include other unstriped horizontal panels necessary to provide stability.

On high speed expressways or in other situations where barricades may be susceptible to overturning in the wind, sandbags should be used for ballasting. Sandbags may be placed on lower parts of the frame or stays to provide the required ballast but shall not be placed on top of any striped rail.

① Unless otherwise provided elsewhere in the contract, warning lights are required on all barricades which will be located near traffic operations during periods of inclement weather or hours of darkness. Barricades used to shield isolated hazards shall be equipped with Type "A" (low intensity - flashing) lights unless Type "B" (high intensity) - flashing lights are specified elsewhere in the contract documents. Barricades used for channelization or delineation of the travel path shall be equipped with Type "C" (steady burn) lights except for the initial barricade(s) in sequence, which shall be equipped with Type "A" or "B" lights as previously noted.

② Two warning lights shall be provided on the center barricade and at least one warning light shall be provided on each of the other barricades within the roadway limits. Spacing of the warning lights shall be uniform to the edge of roadway as shown.



TYPICAL INSTALLATION SHOWING TYPE III BARRICADE

CONSTRUCTION BARRICADES

CONSTRUCTION BARRICADES & STANDARD SIGNS

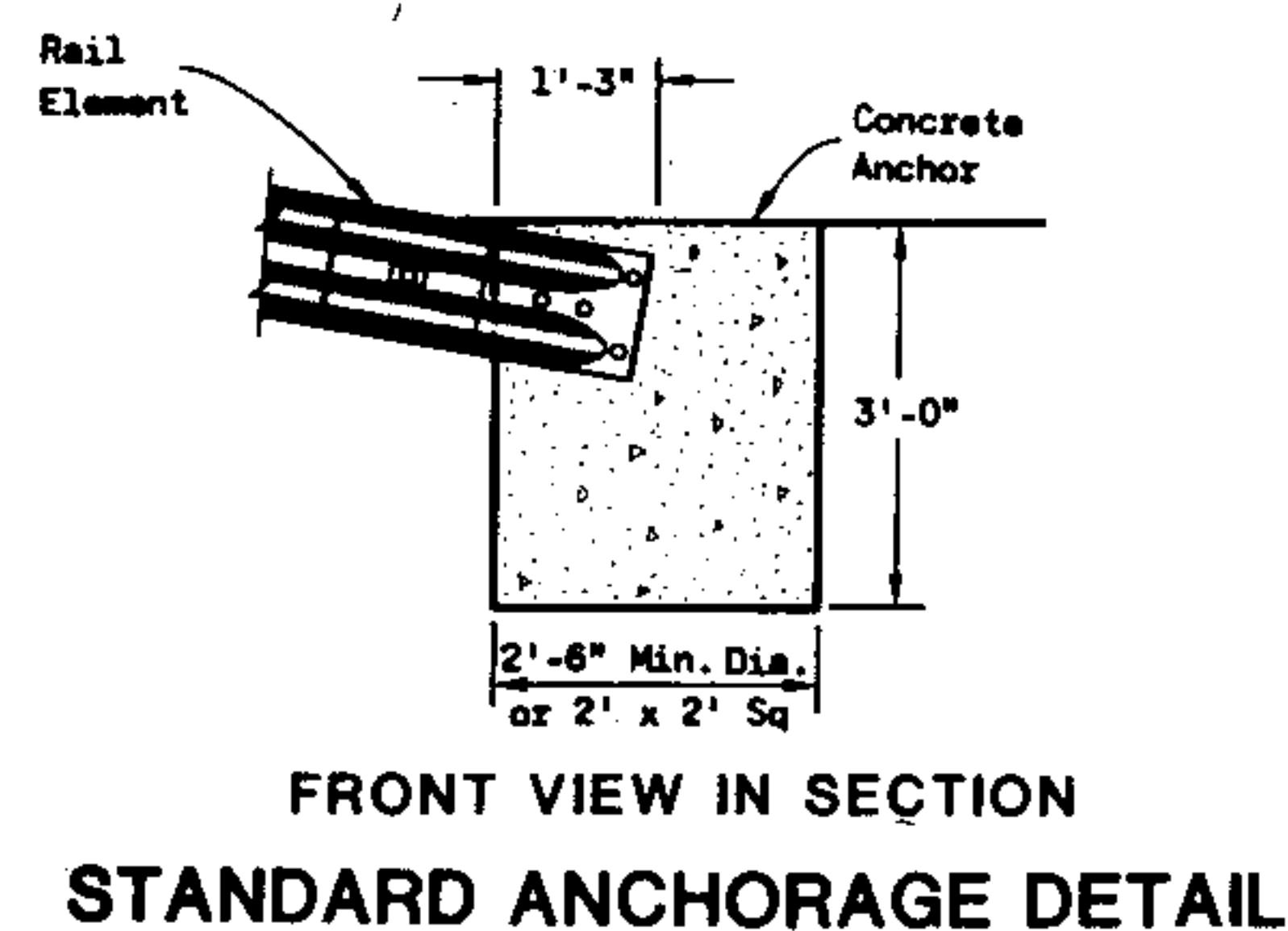
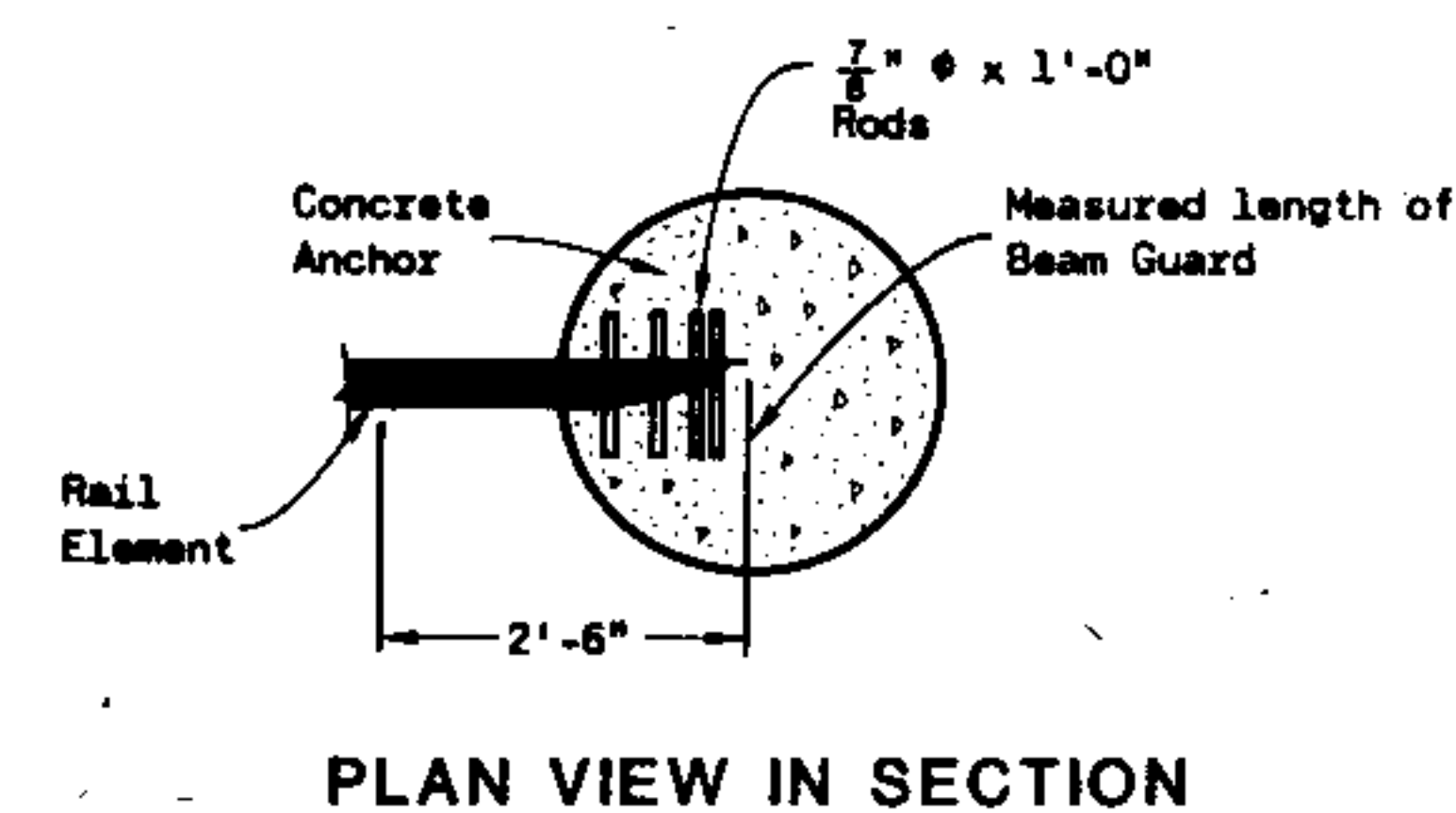
State of Wisconsin
Department of Transportation

APPROVED
9-14-81
DATE

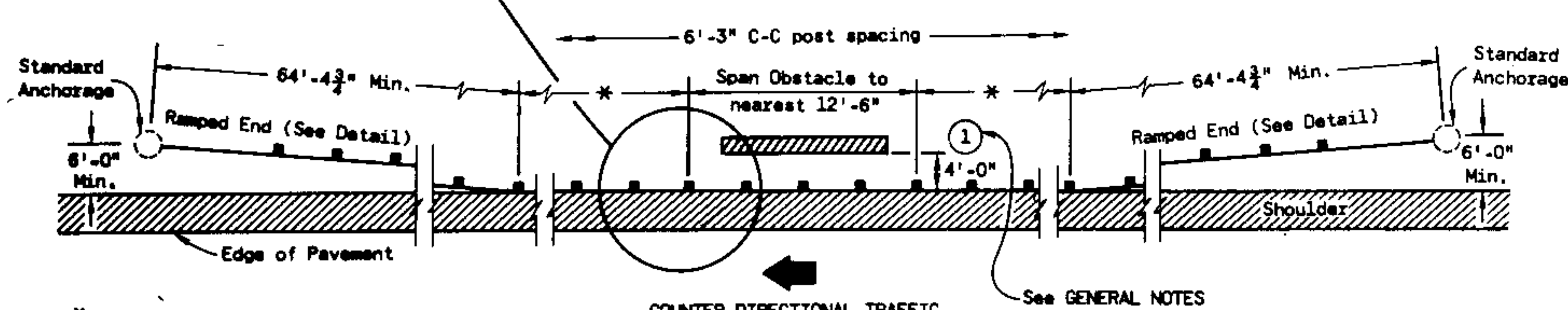
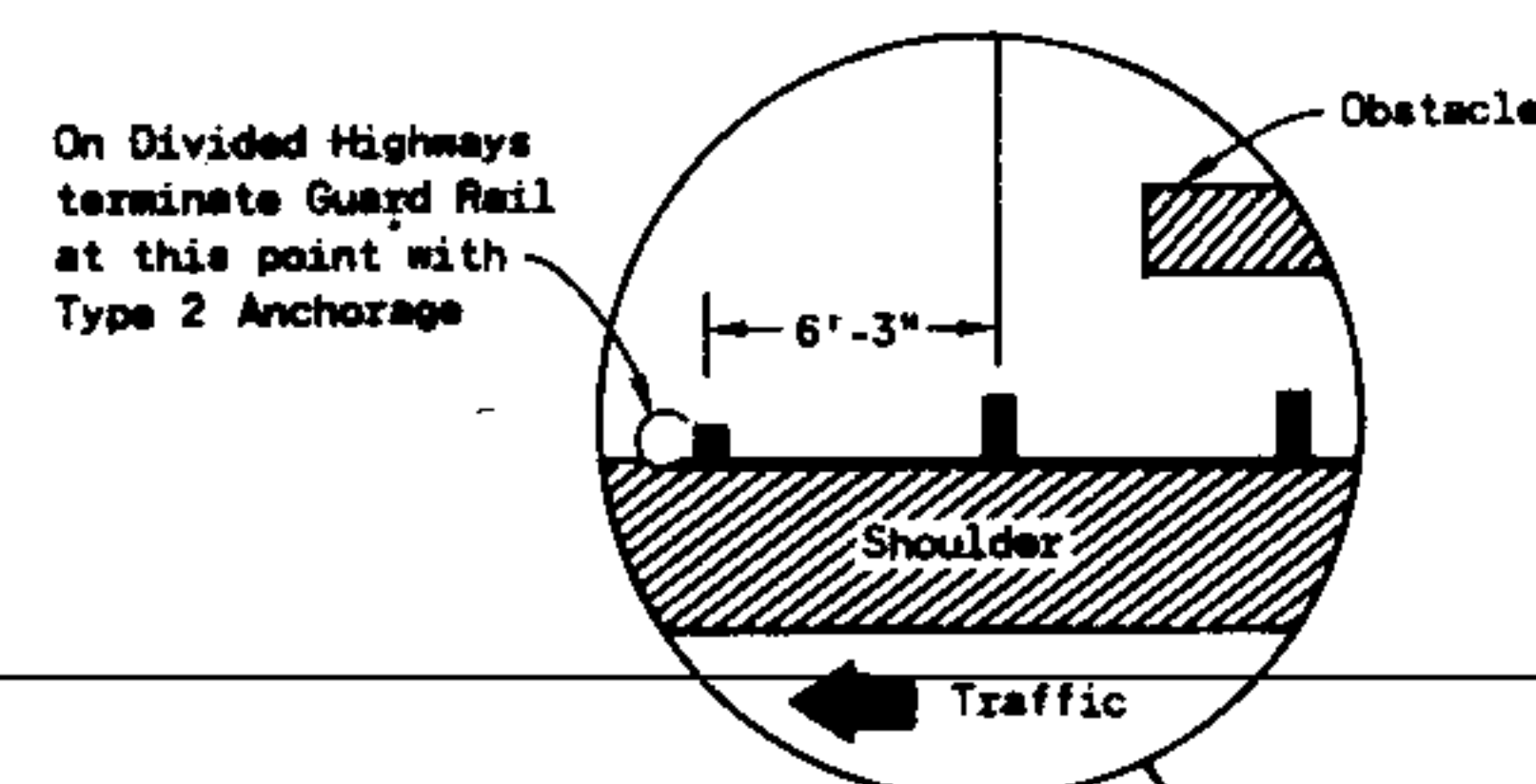
[Signature]
CHIEF DESIGN ENGINEER

FHWA

S.D.D. 15 C 1-7



(Standard Specification Item "Anchorage
for Steel Plate Beam Guard")

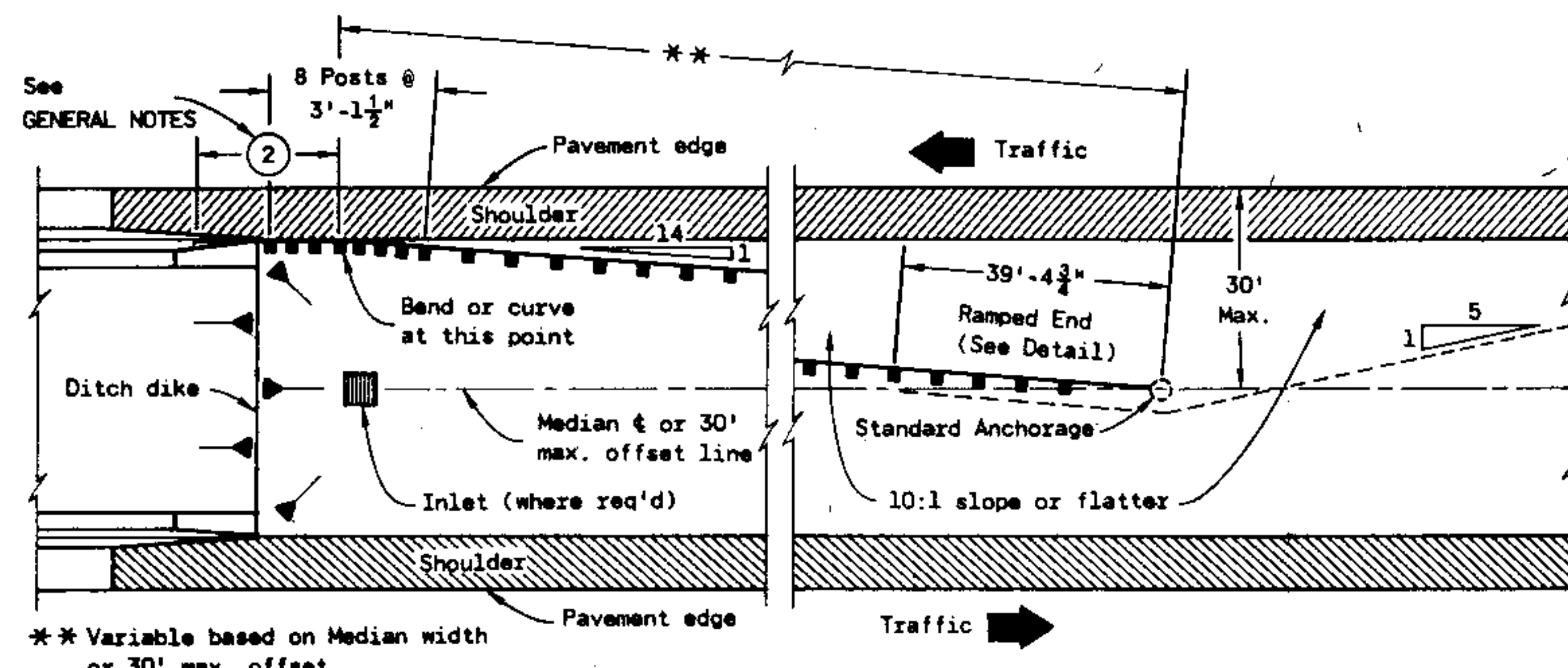


* Variable based on size and location of obstacle

COUNTER-DIRECTIONAL TRAFFIC

PLAN VIEW

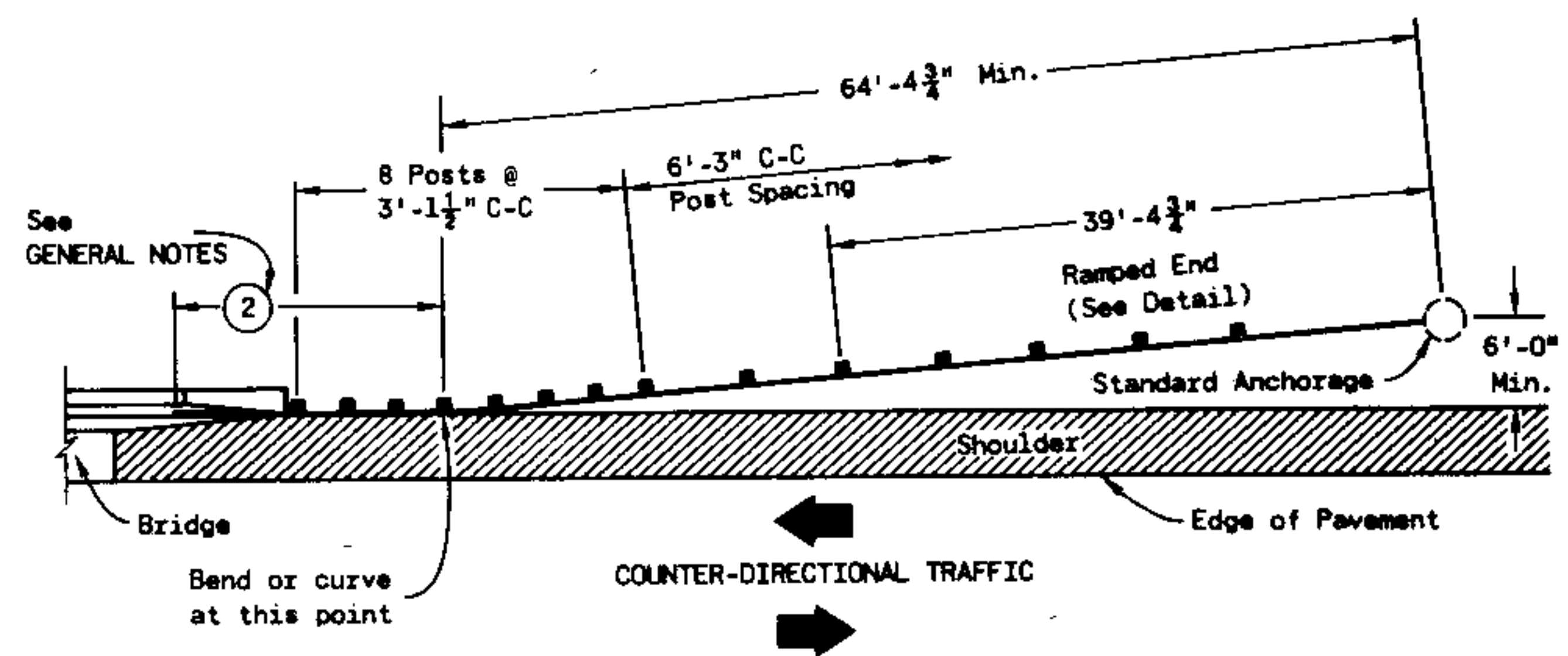
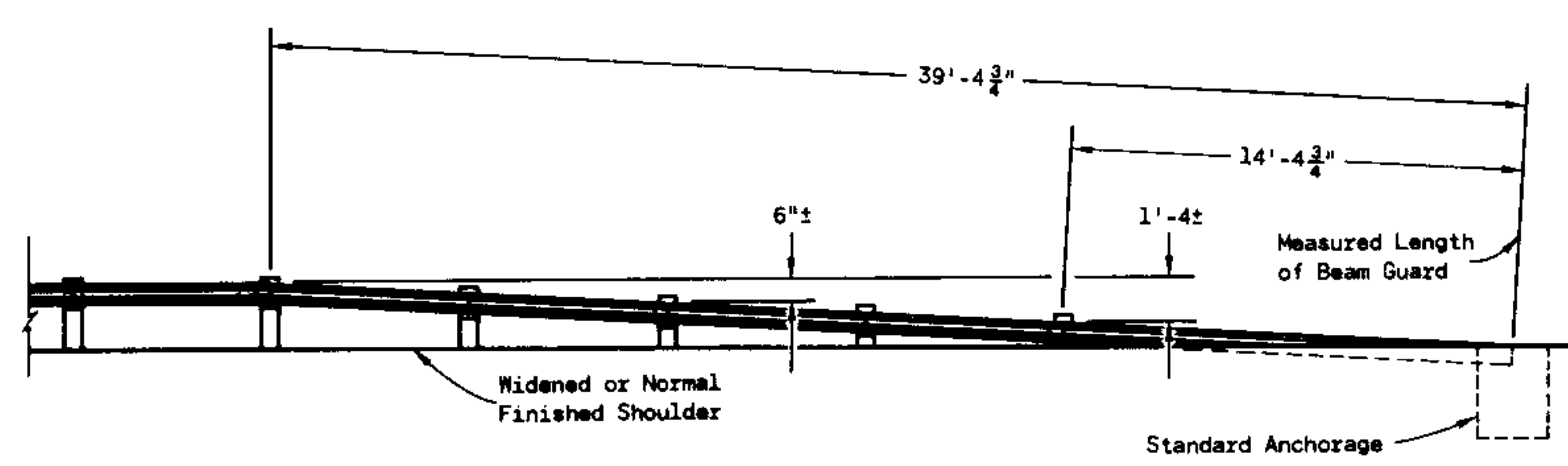
TYPICAL INSTALLATION AT OBSTACLES



** Variable based on Median width
or 30' max. offset

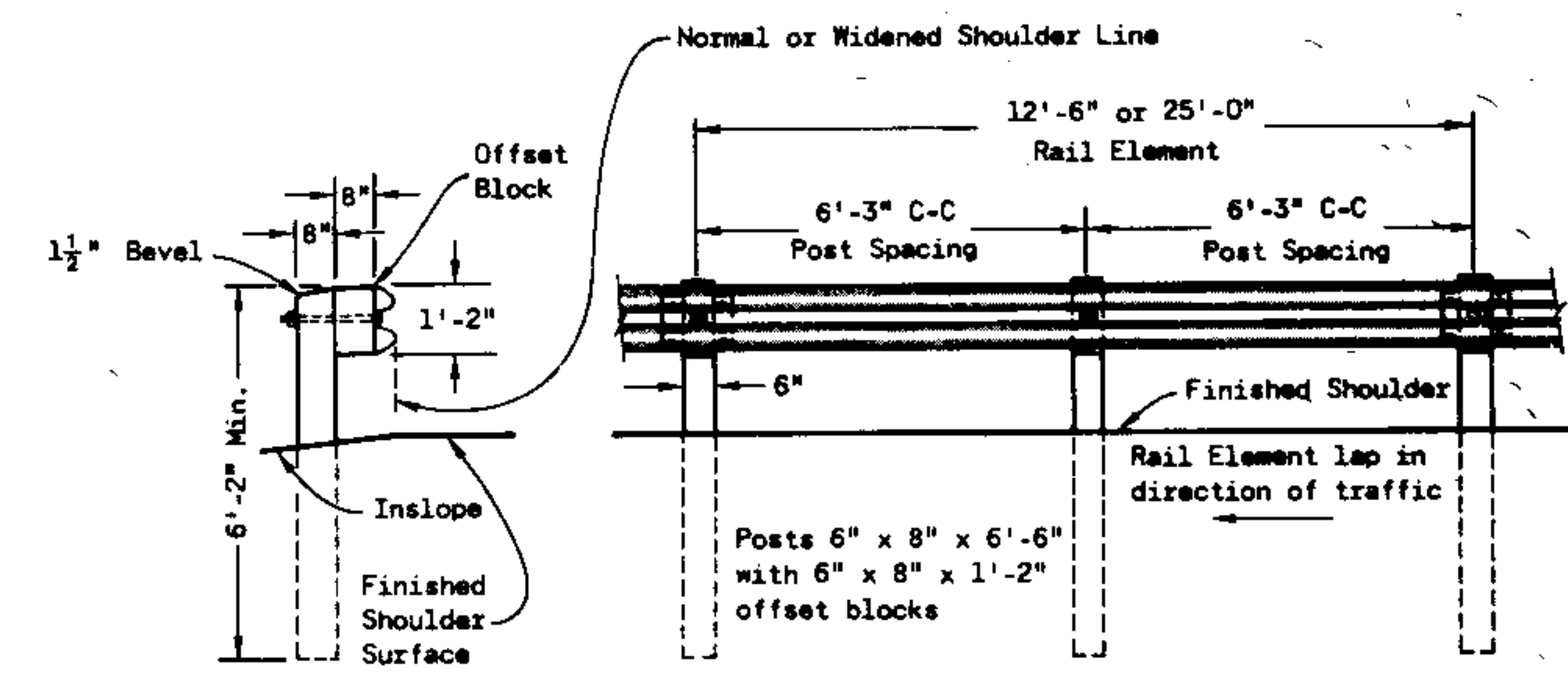
PLAN VIEW

TYPICAL MEDIAN INSTALLATION AT STRUCTURES



PLAN VIEW

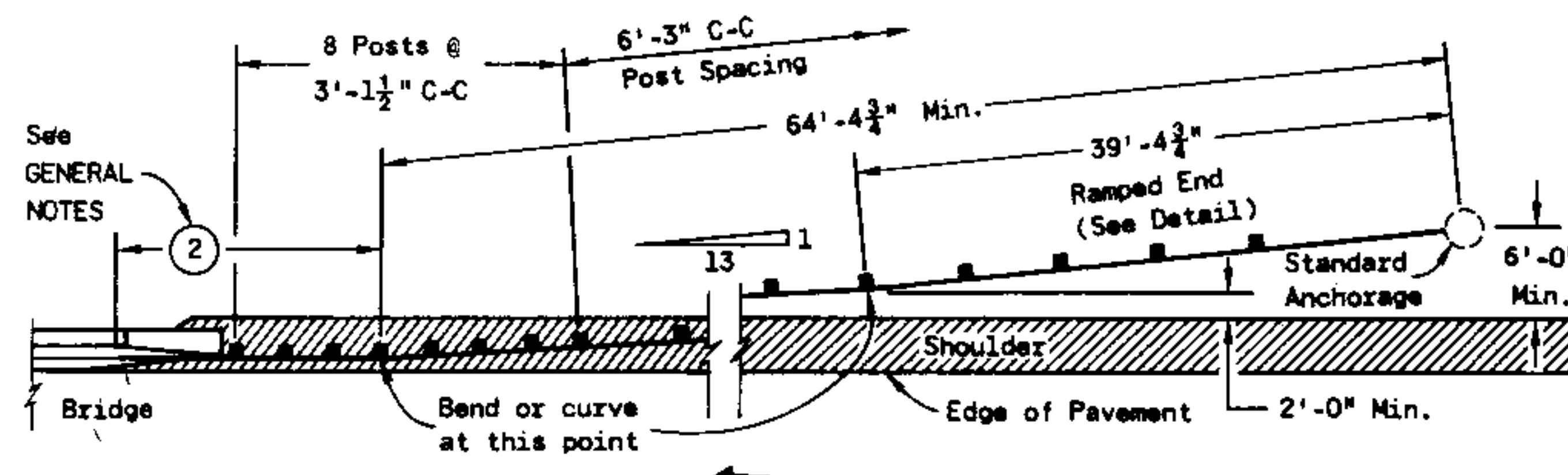
TYPICAL INSTALLATION AT FULL WIDTH STRUCTURES



END VIEW

FRONT VIEW

TYPICAL STEEL PLATE BEAM GUARD INSTALLATION



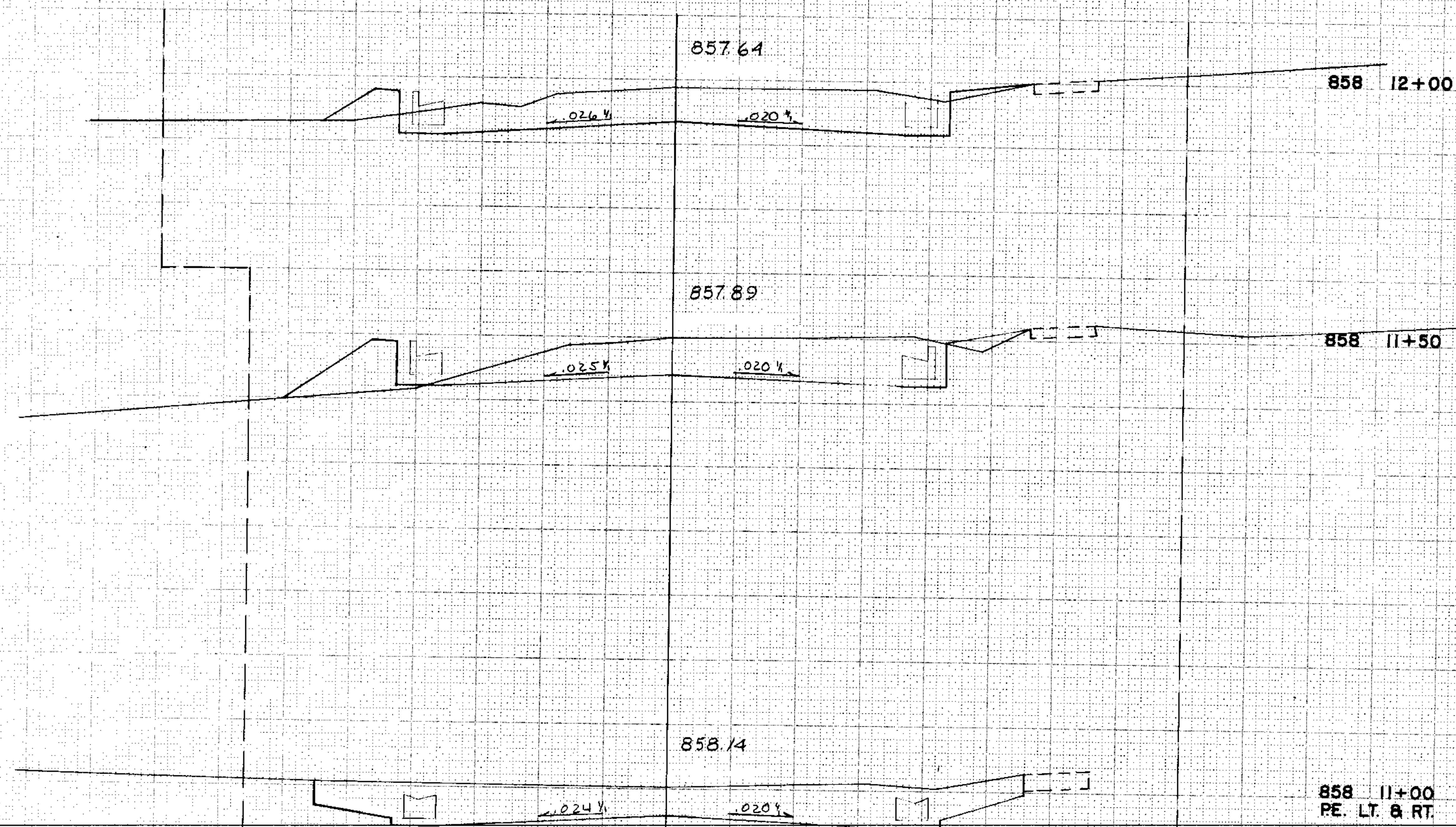
COUNTER-DIRECTIONAL TRAFFIC

PLAN VIEW

TYPICAL INSTALLATION AT NARROW STRUCTURES

CLASS "A"
STEEL PLATE BEAM GUARD

State of Wisconsin
Department of Transportation



EXISTING PROPOSED

E
R/W



R/W

WILLOW

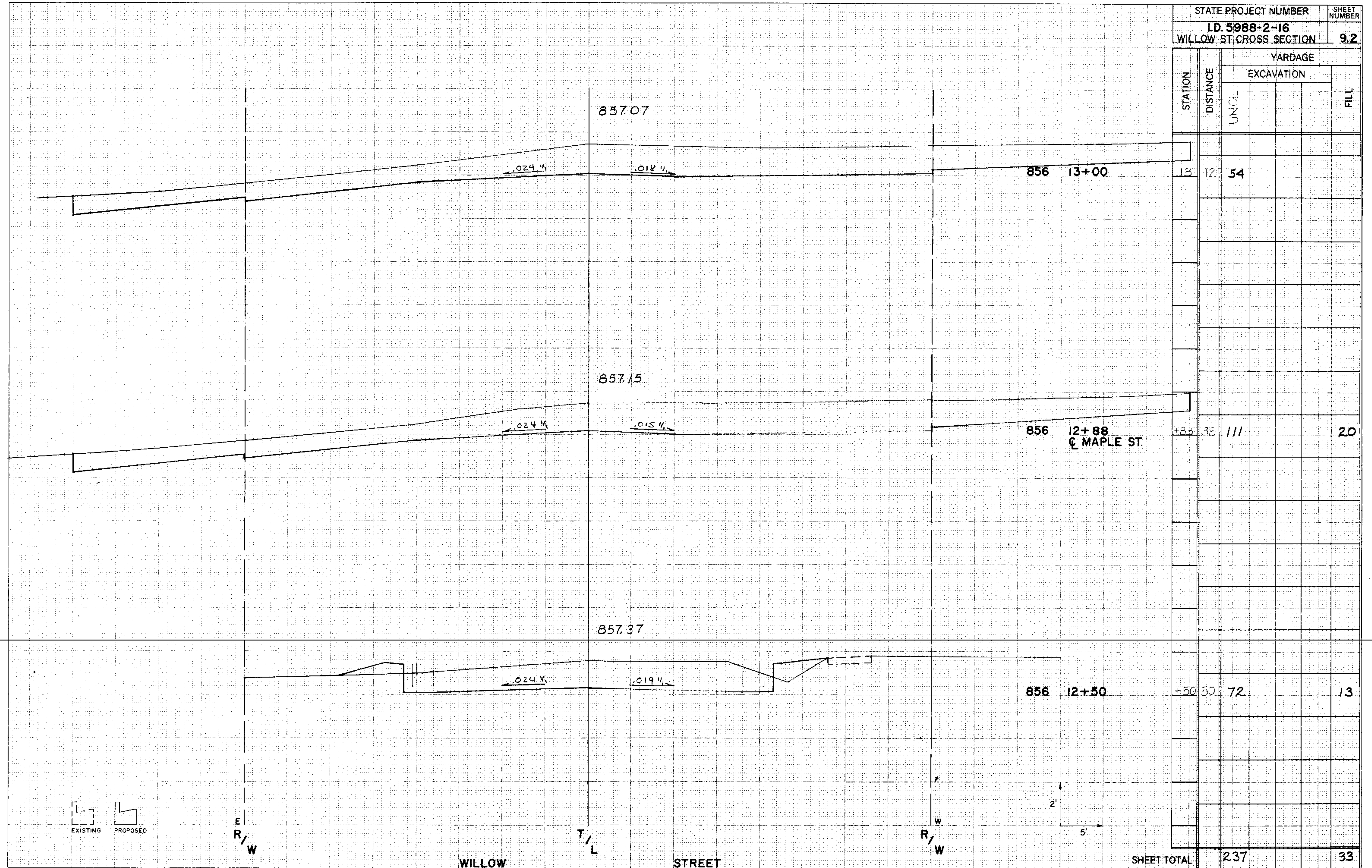
STREET

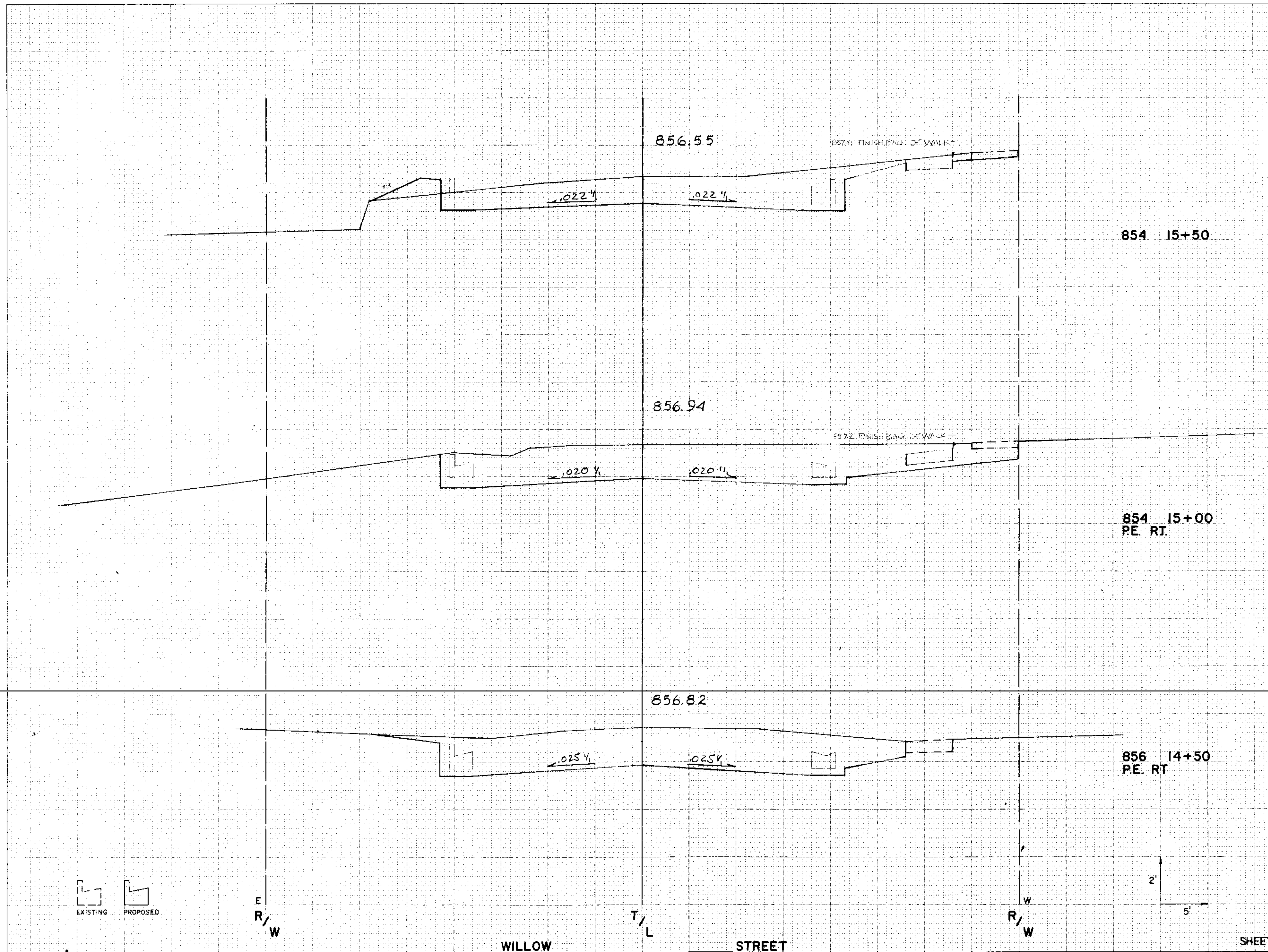
SHEET TOTAL

233

4

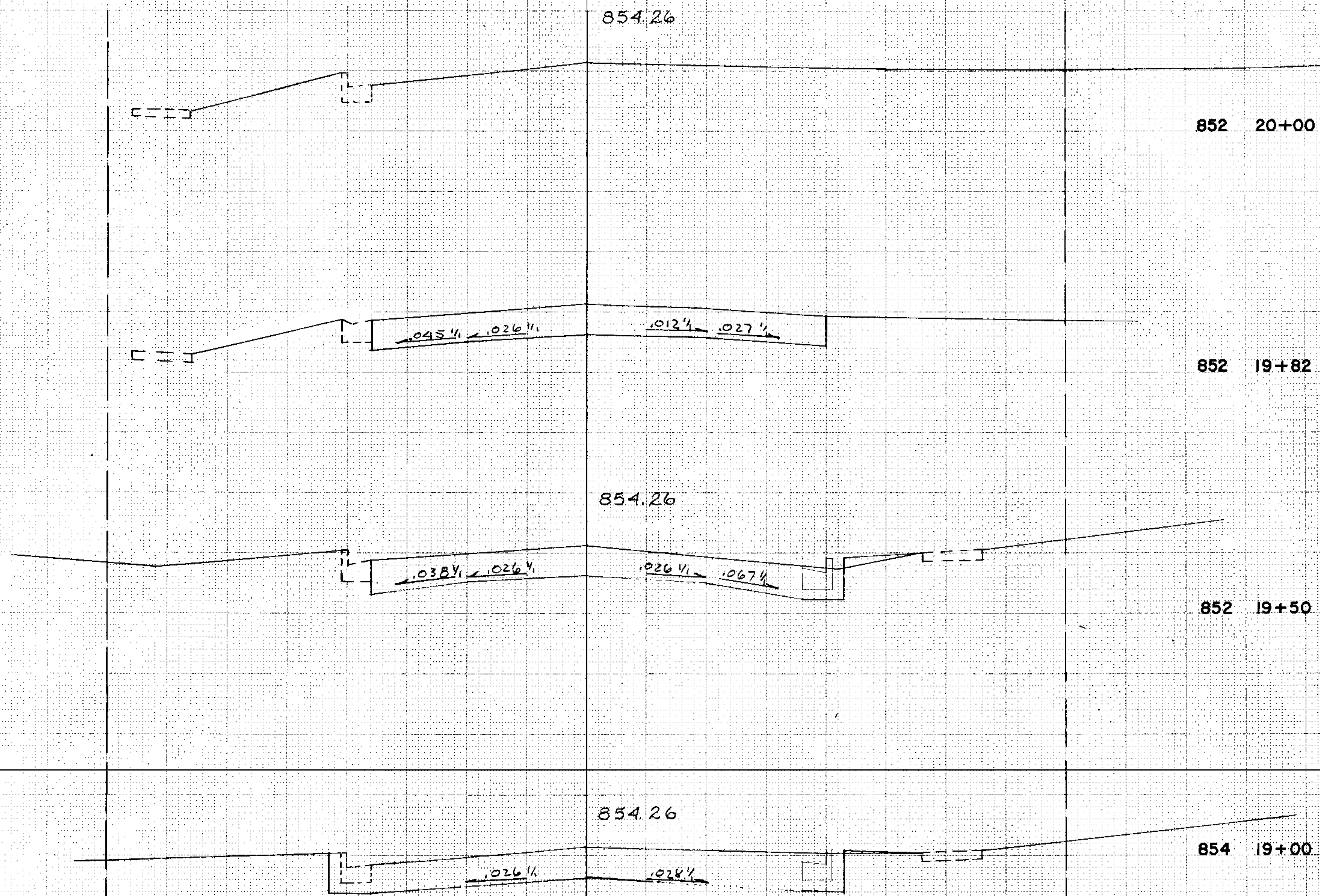
STATE PROJECT NUMBER	SHEET NUMBER
LD. 5988-2-16	
WILLOW ST CROSS SECTION	9.2





STATION	DISTANCE	YARDAGE		
		EXCAVATION		FILL
		UNCL		
15+50	50	116		5
15+00	50	136		0
14+50	50	122		7
SHEET TOTAL		374		12





STATION	DISTANCE	YARDAGE			
		EXCAVATION			FILL
		UNCL			
20	18	0			0
+82	32	32			1
-50	50	57			3
19	50	67			1
SHEET TOTAL		156			5



E
R/W

T/L

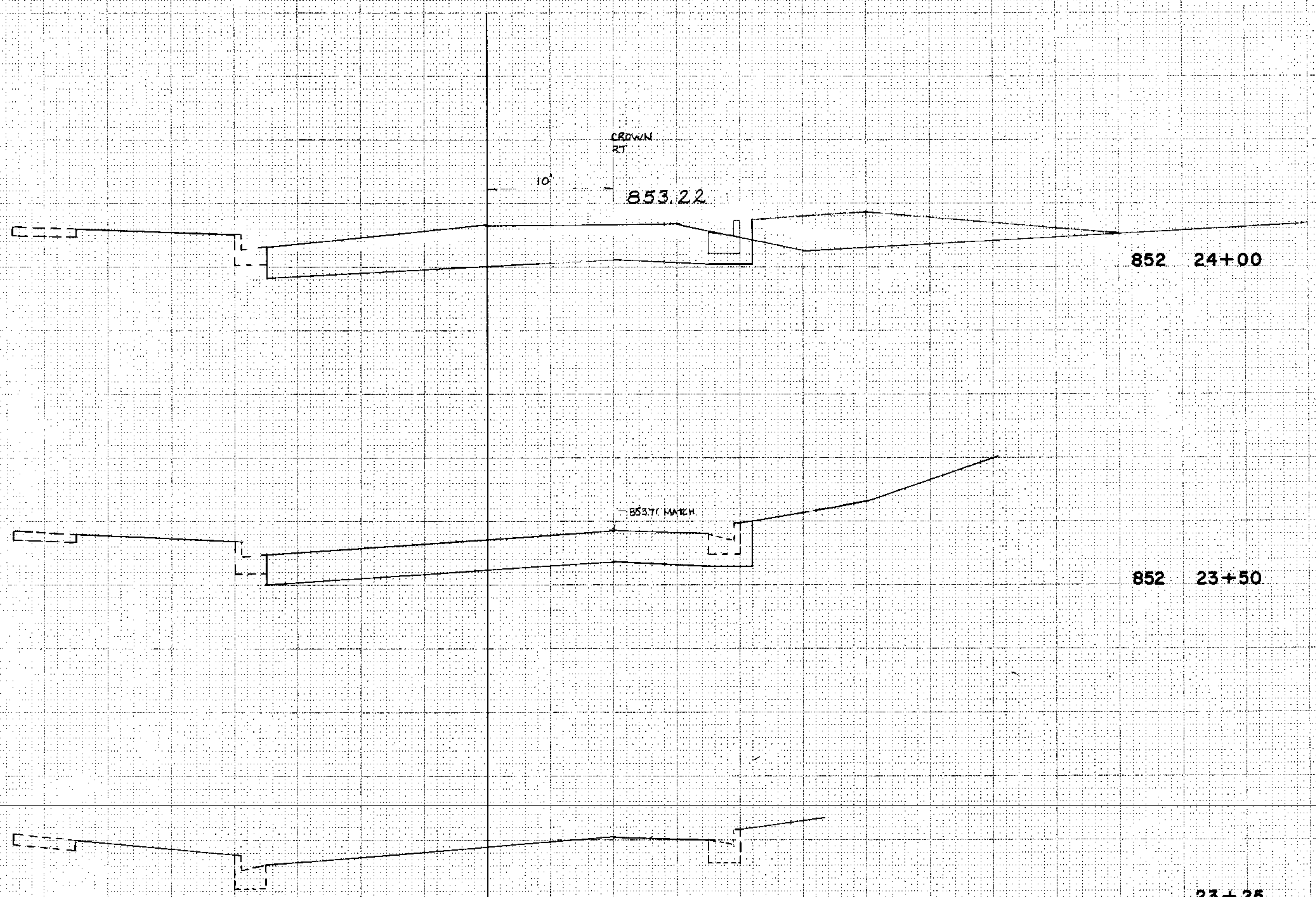
R/W

WILLOW

STREET

2'
5'

STATION	DISTANCE	YARDAGE			
		EXCAVATION			FILL
		UNCL			
24+00	50	60			28
23+50	25	0			0
23+25	25	0			0
SHEET TOTAL		60			28

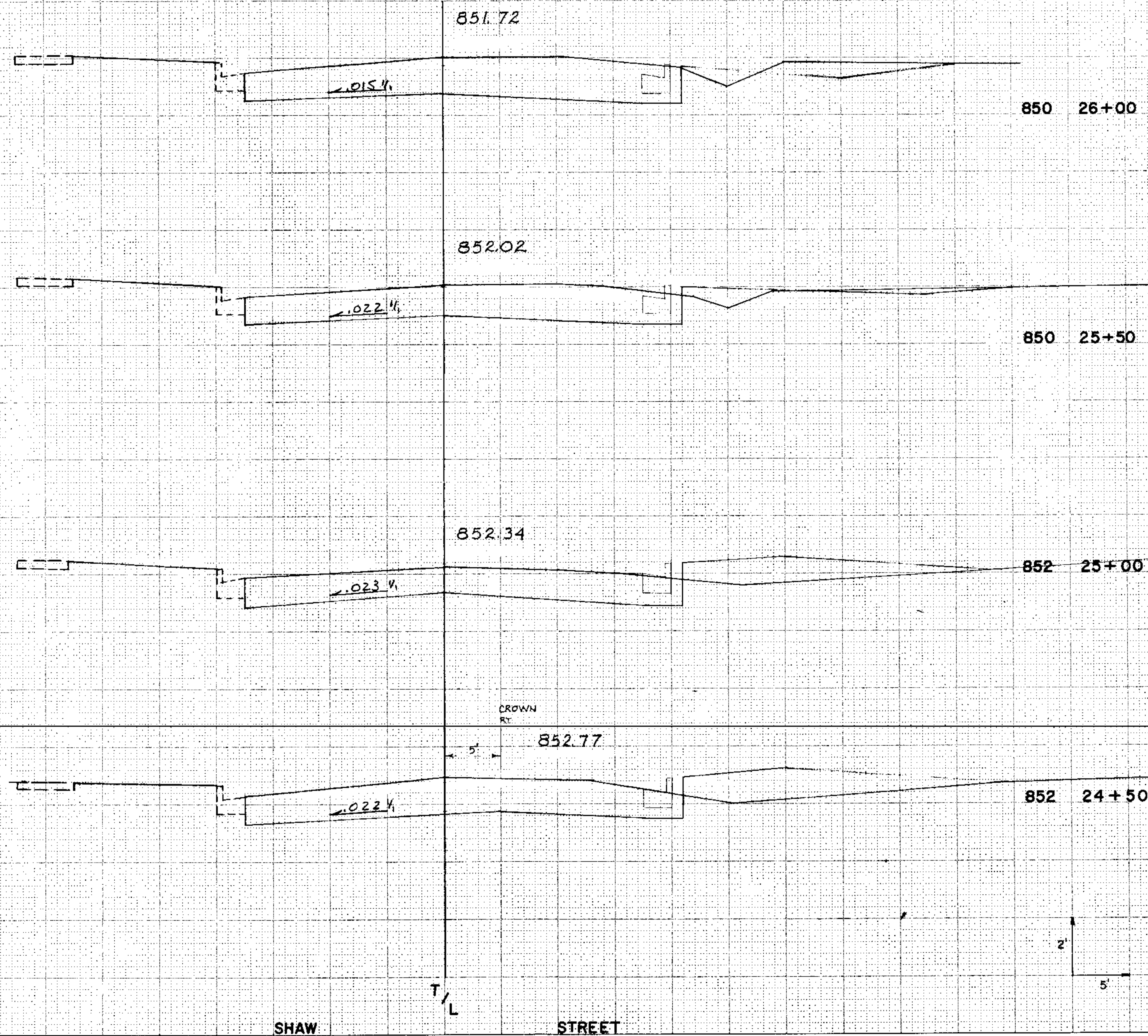


EXISTING PROPOSED

SHAW

T/L

STREET



STATION	DISTANCE	YARDAGE			
		EXCAVATION			FILL
		UNCL			
26+00	50	78			9
25+50	50	63			2.5
25+00	50	59			45
24+50	50	64			53
SHEET TOTAL		264			132



SHAW

T/L

STREET

STATION	DISTANCE	YARDAGE		
		EXCAVATION		FILL
		UNCL		
28+96.1	204	0		5
28+75.7	257	16		25
28+50	50	41		110
28+00	28	50	49	131
SHEET TOTAL		106		271

858 28+96.1

857.42

852 28+75.7

856.65

854 28+50

855.15

852 28+00



SHAW

T/L

STREET

