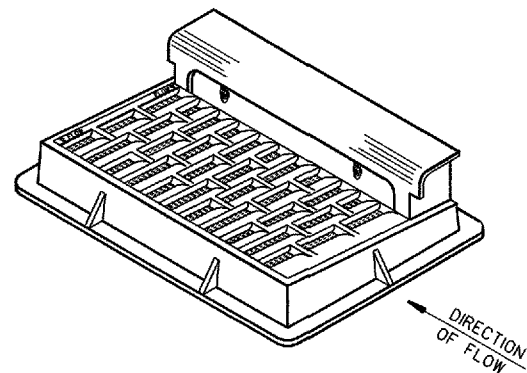
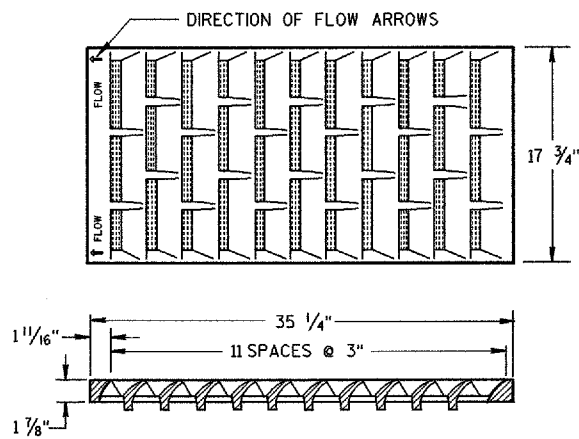
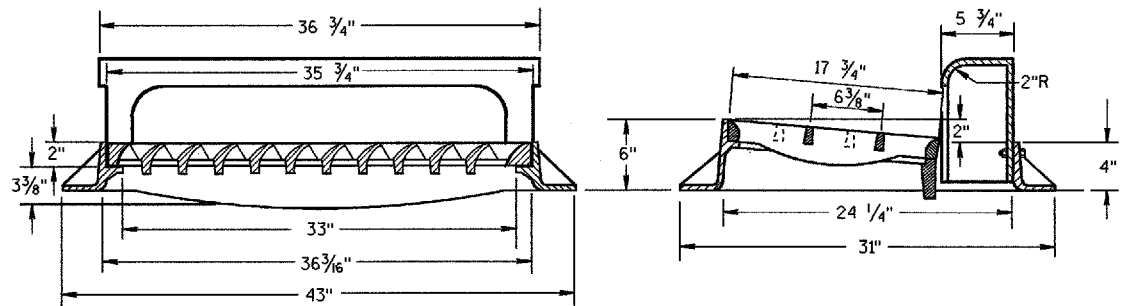


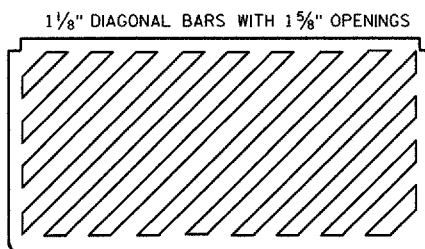
NOTE:
GRATE IS REVERSIBLE.



NOTE: CURB BOX HEIGHT ADJUSTABLE 6" TO 9"



TYPE "H"
(APPROXIMATE WEIGHT 422 LBS.)
FRAME..... 175 LBS.
GRATE..... 138 LBS.
CURB BOX..... 109 LBS.



**SPECIAL GRATE FOR
TYPE "H" COVER**

(MEASURES 35 1/4" X 17 3/4" X 2")
(APPROXIMATE WEIGHT 172 LBS.)
GRATE..... 172 LBS.

(NOTED AS TYPE H-S ON DRAINAGE TABLE)

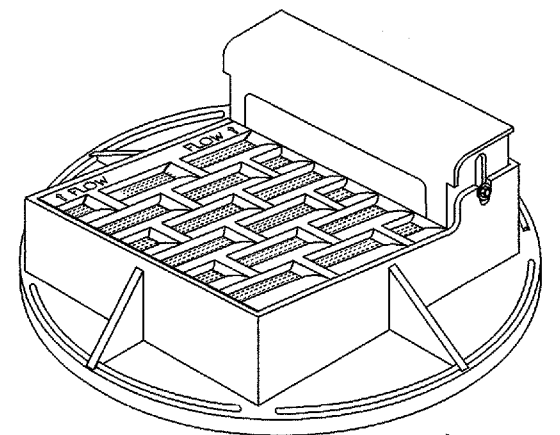
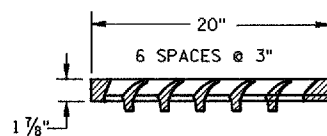
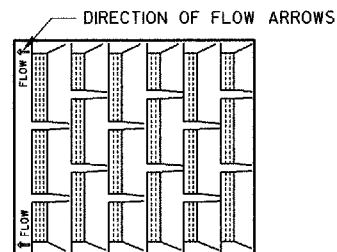
GENERAL NOTES

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.

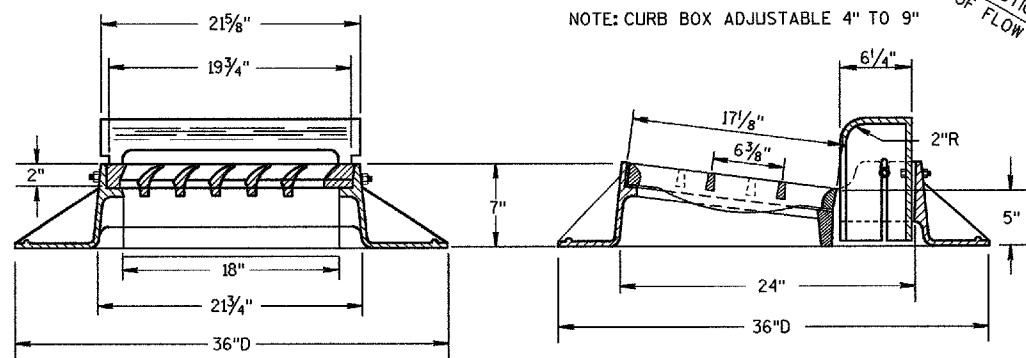
DETAIL DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR CATCH BASIN, MANHOLE AND INLET COVERS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

ROUND FRAMES AND COVERS SHALL HAVE CONTINUOUSLY MACHINED BEARING SURFACES TO PREVENT ROCKING AND RATTLING.

THE ACTUAL WEIGHT OF COVERS MAY VARY WITHIN 5 PERCENT, PLUS OR MINUS, OF THE APPROXIMATE WEIGHT.



NOTE: CURB BOX ADJUSTABLE 4" TO 9"

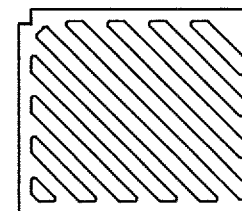


TYPE "A"

(APPROXIMATE WEIGHT 325 LBS.)
FRAME..... 157 LBS.
GRATE..... 84 LBS.
CURB BOX..... 84 LBS.

NOTE:
GRATE IS REVERSIBLE.

1" DIAGONAL BARS
WITH 1 1/2" OPENINGS



**SPECIAL GRATE FOR
TYPE "A" COVER**

(MEASURES 19 3/4" X 17" X 1 7/8")

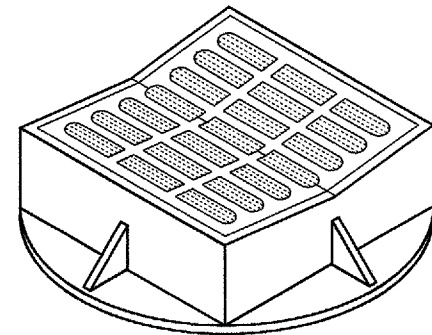
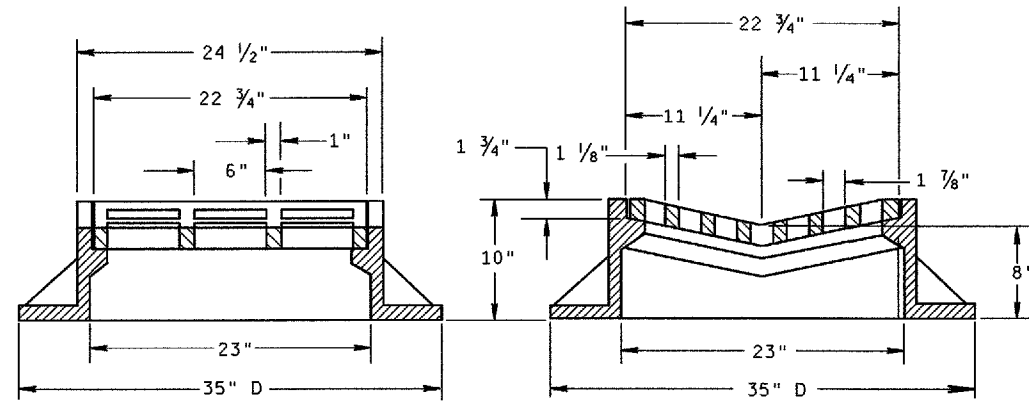
GRATE..... 84 LBS.

(NOTED AS TYPE A-S ON DRAINAGE TABLE)

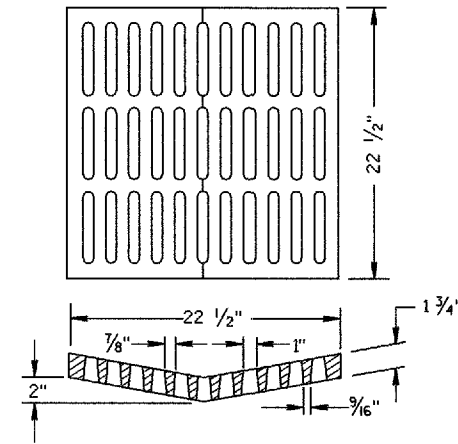
**INLET COVERS
TYPE A, H, A-S, & H-S**

**STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION**

APPROVED
10/04/99
DATE
FHW
Chief Roadway Development Engineer

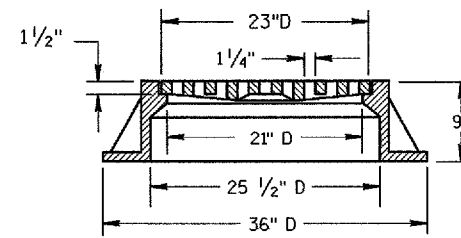
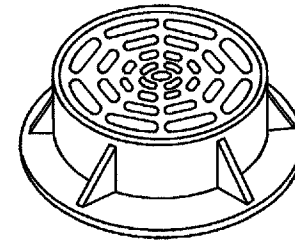


TYPE "B"
 (APPROXIMATE WEIGHT 395 LBS.)
 FRAME..... 285 LBS.
 GRATE..... 110 LBS.



ALTERNATIVE GRATE FOR TYPE "B" COVER

(APPROXIMATE GRATE WEIGHT 125 LBS.)
 GRATE..... 125 LBS.
 USE WHERE PEDESTRIAN OR BICYCLE TRAFFIC IS POSSIBLE.
 NOTED AS TYPE B-A ON THE DRAINAGE TABLE



TYPE "C"
 (APPROXIMATE WEIGHT 340 LBS.)

FRAME..... 235 LBS.
 GRATE..... 105 LBS.

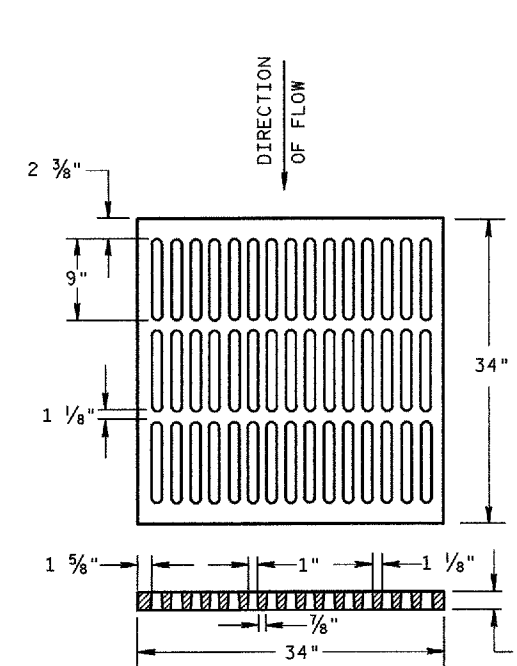
GENERAL NOTES

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.

ROUND FRAMES AND COVERS SHALL HAVE CONTINUOUSLY MACHINED BEARING SURFACES TO PREVENT ROCKING AND RATTLING.

THE ACTUAL WEIGHT OF COVERS MAY VARY WITHIN 5 PERCENT, PLUS OR MINUS, OF THE APPROXIMATE WEIGHT.

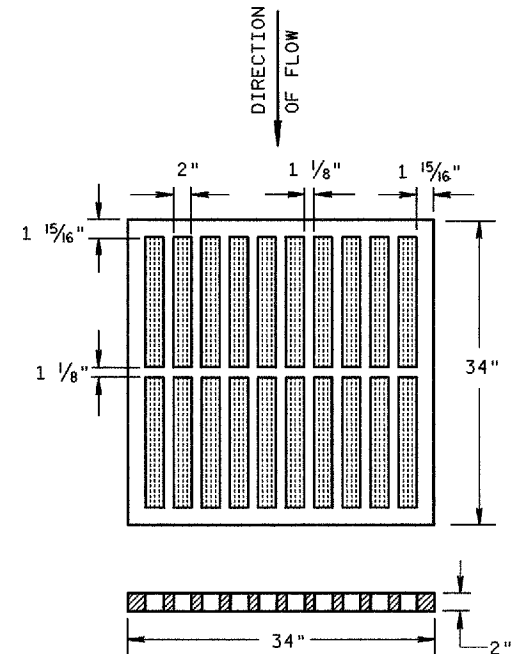


ALTERNATIVE TYPE "MS"

(APPROXIMATE GRATE WEIGHT 365 LBS.)

GRATE..... 365 LBS.

USE WHERE PEDESTRIAN OR BICYCLE TRAFFIC IS PERMITTED
 NOTED AS TYPE MS-A ON THE DRAINAGE TABLE

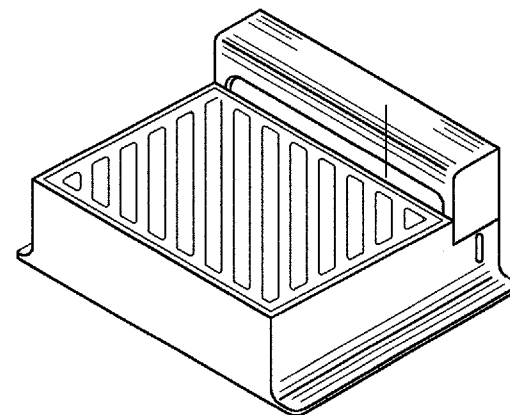


TYPE "MS"

(APPROXIMATE GRATE WEIGHT 270 LBS.)

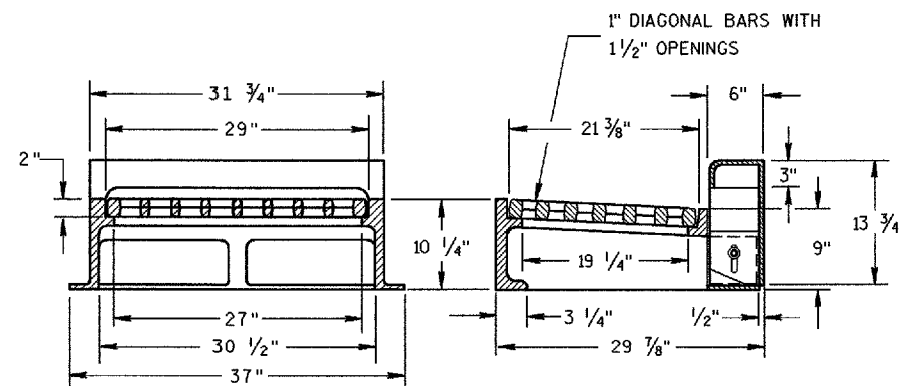
GRATE..... 270 LBS.

USE ON FREEWAYS AND EXPRESSWAYS
 NOTED AS TYPE MS ON DRAINAGE TABLE



DIRECTION OF FLOW

DIAGONAL SLOTS, SHALL BE ORIENTED TO THE DIRECTION OF FLOW AS ILLUSTRATED. GRATES ARE MANUFACTURED TO BE REVERSIBLE.



NOTE: CURB BOX HEIGHT ADJUSTABLE 6" TO 9"

TYPE "WM"

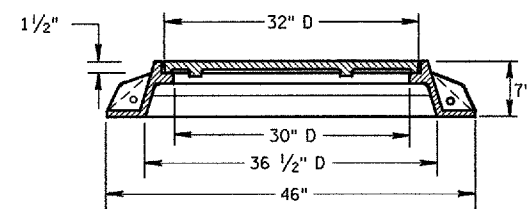
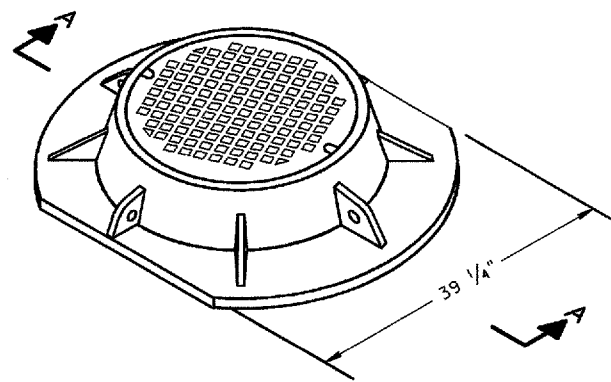
(APPROXIMATE WEIGHT 670 LBS.)

FRAME..... 360 LBS.
 GRATE..... 160 LBS.
 CURB BOX..... 150 LBS.

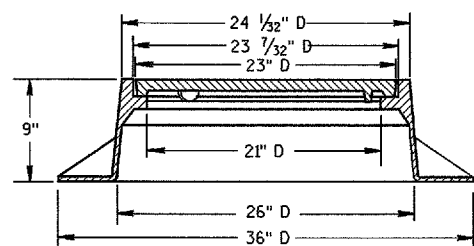
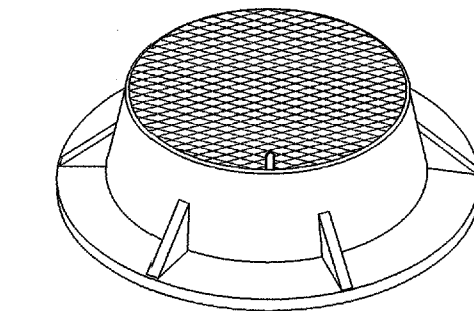
INLET COVERS
TYPE B, B-A, C, MS, MS-A, & WM

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION

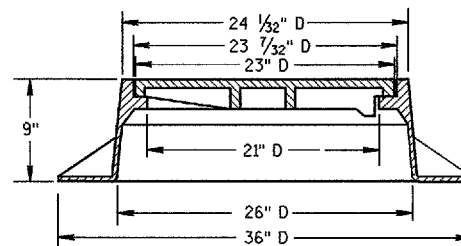
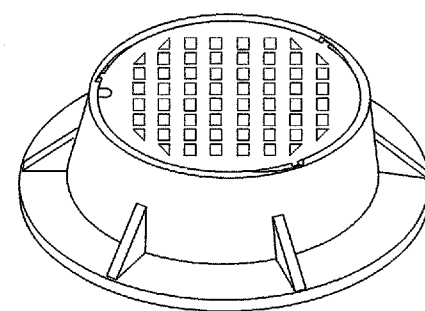
APPROVED 10/04/99 DATE
 CHIEF ROADWAY DEVELOPMENT ENGINEER
 FHWA



SECTION A-A
TYPE "K"
 (APPROXIMATE WEIGHT 415 LBS.)
 FRAME.....210 LBS.
 LID.....205 LBS.



TYPE "J"
 (APPROXIMATE WEIGHT 250 LBS.)
 FRAME.....135 LBS.
 LID.....115 LBS.



TYPE "J" SPECIAL
 TYPE "B" NON-ROCKING SELF-SEAL LID
 (APPROXIMATE WEIGHT 245 LBS.)
 FRAME.....145 LBS.
 LID.....100 LBS.
 (NOTED AS TYPE J-S ON THE DRAINAGE TABLE)

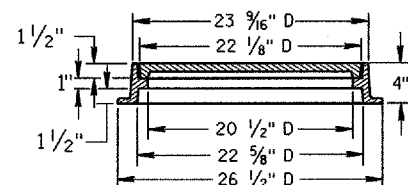
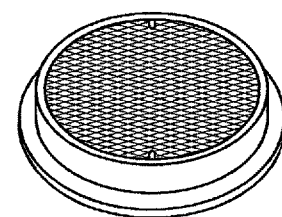
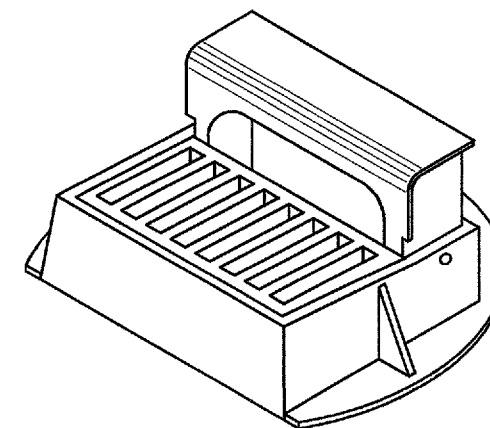
GENERAL NOTES

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.

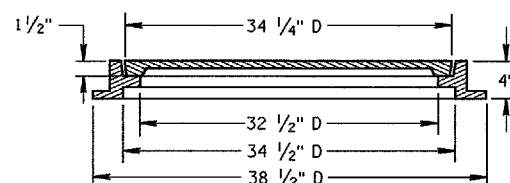
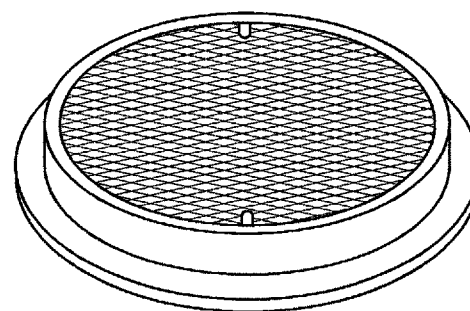
DETAIL DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR MANHOLE COVERS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

ROUND FRAMES AND COVERS SHALL HAVE CONTINUOUSLY MACHINED BEARING SURFACES TO PREVENT ROCKING AND RATTLING.

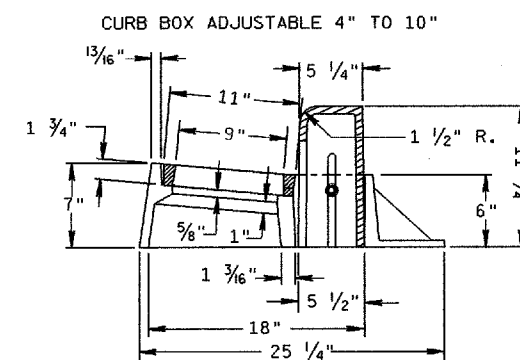
THE ACTUAL WEIGHT OF COVERS MAY VARY WITHIN 5 PERCENT, PLUS OR MINUS, OF THE APPROXIMATE WEIGHT.



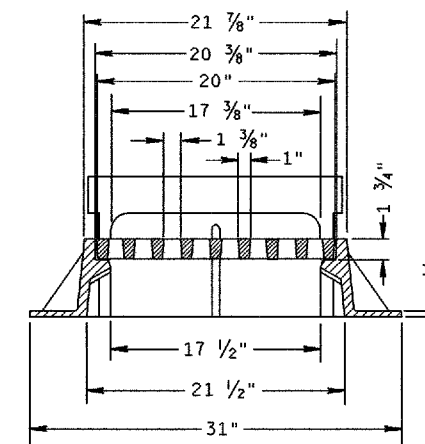
TYPE "L"
 (APPROXIMATE WEIGHT 145 LBS.)
 FRAME.....75*
 LID.....70*



TYPE "M"
 (APPROXIMATE WEIGHT 385 LBS.)
 FRAME.....125*
 LID.....260*



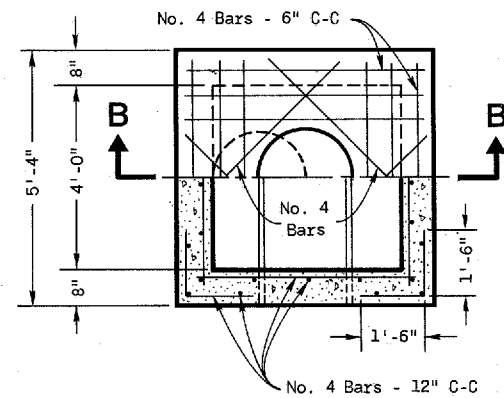
INLET COVER TYPE "Z"
 (APPROXIMATE WEIGHT 340 LBS.)
 FRAME.....198 LBS.
 GRATE.....50 LBS.
 CURB BOX.....92 LBS.



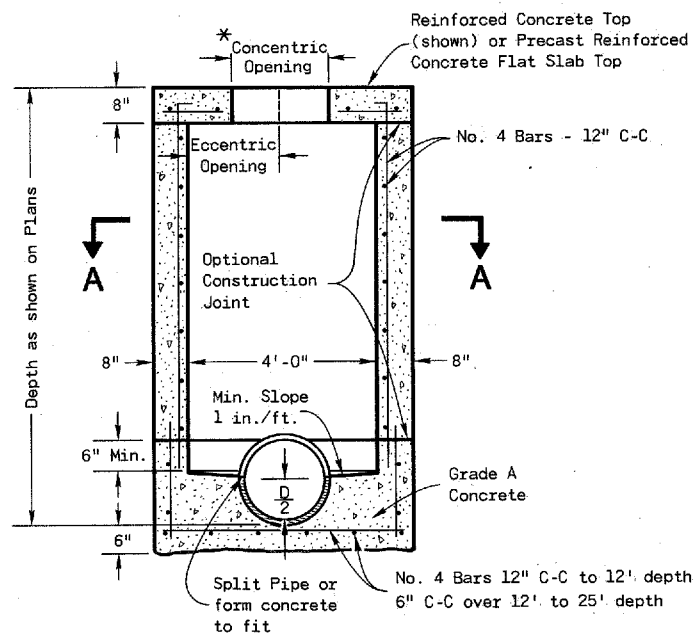
INLET COVER, TYPE Z
MANHOLE COVERS, TYPE
K, J, J-S, L & M

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

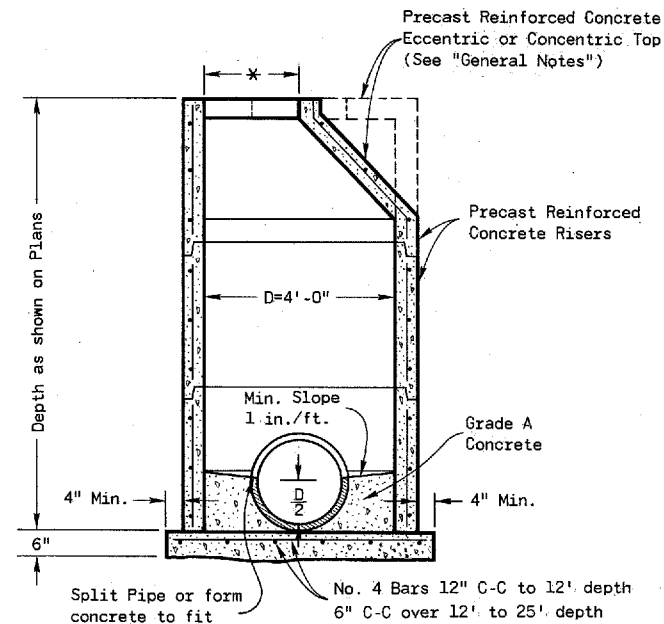
APPROVED
 10/04/99
 DATE
 FHWA
 Chief Roadway Development Engineer



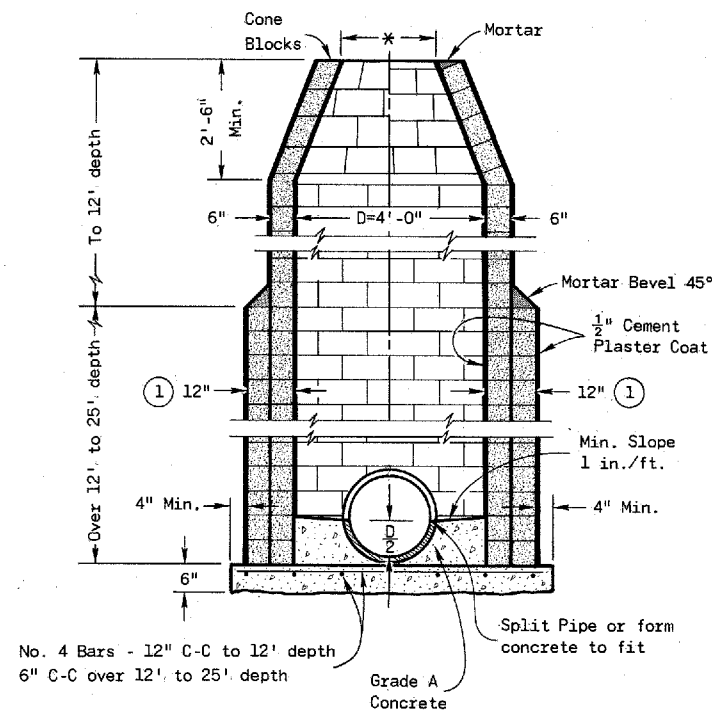
HALF SECTION A-A



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

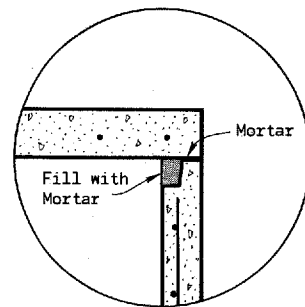
State of Wisconsin
Department of Transportation

APPROVED
4-13-82

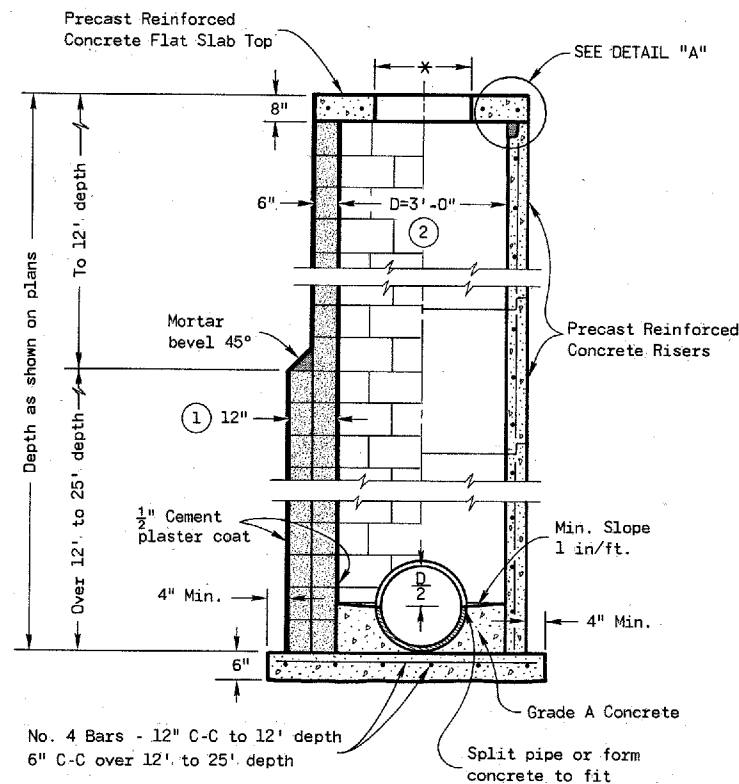
DATE
FHWA

D. J. Strand
CHIEF DESIGN ENGINEER

MANHOLES TYPE 1

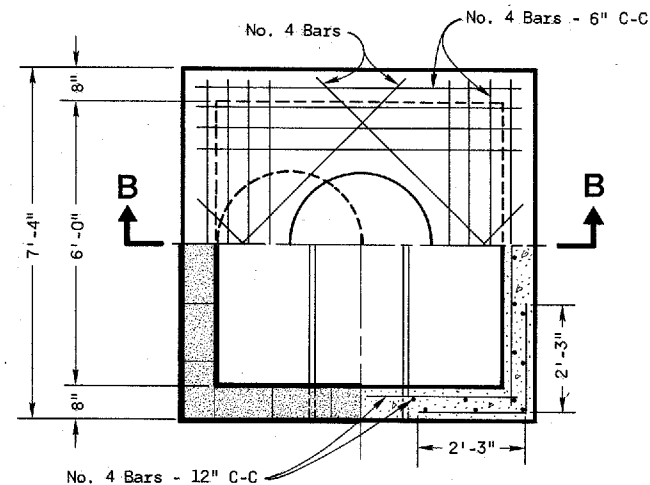


DETAIL "A"

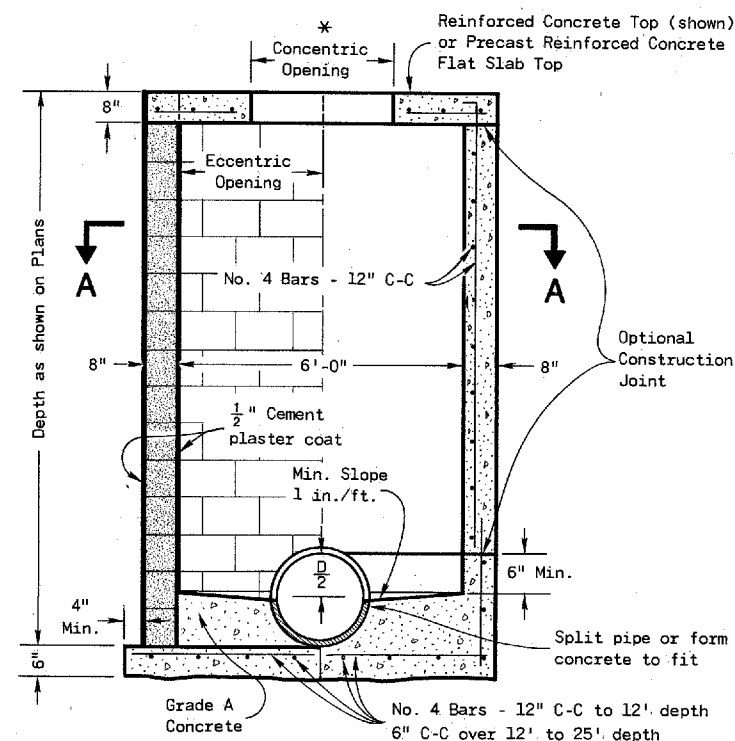


CONCRETE BLOCK (1) PRECAST REINFORCED CONCRETE (2)

MANHOLES TYPE 2



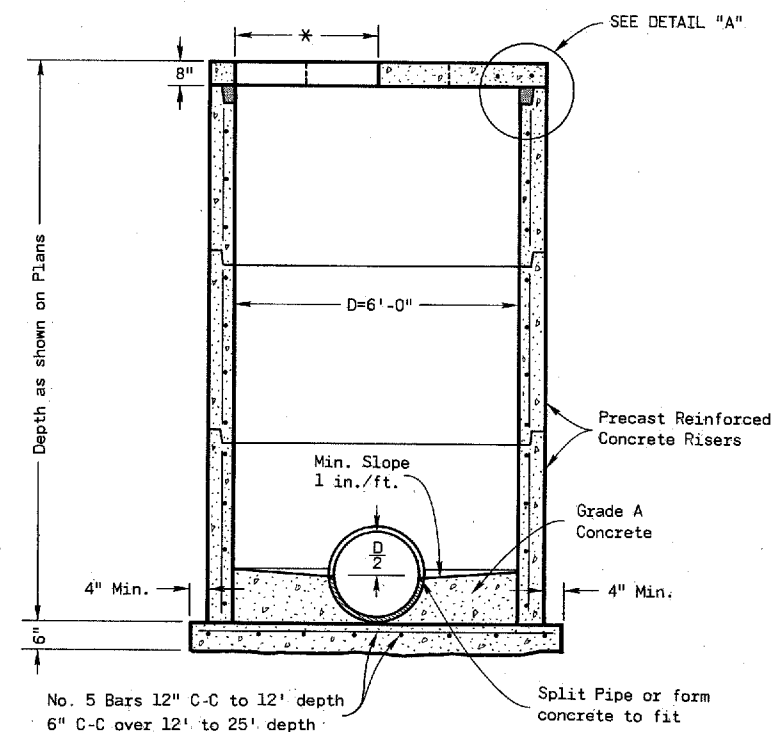
HALF SECTION A-A



SECTION B-B

CONCRETE BLOCK REINFORCED CONCRETE

MANHOLES TYPE 3



PRECAST REINFORCED 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.

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" 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.

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 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 are acceptable.

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.

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.

(2) When connecting pipes are 24" or larger the Precast Manholes may be increased to 42" diameter.

MANHOLES TYPE 2 & 3

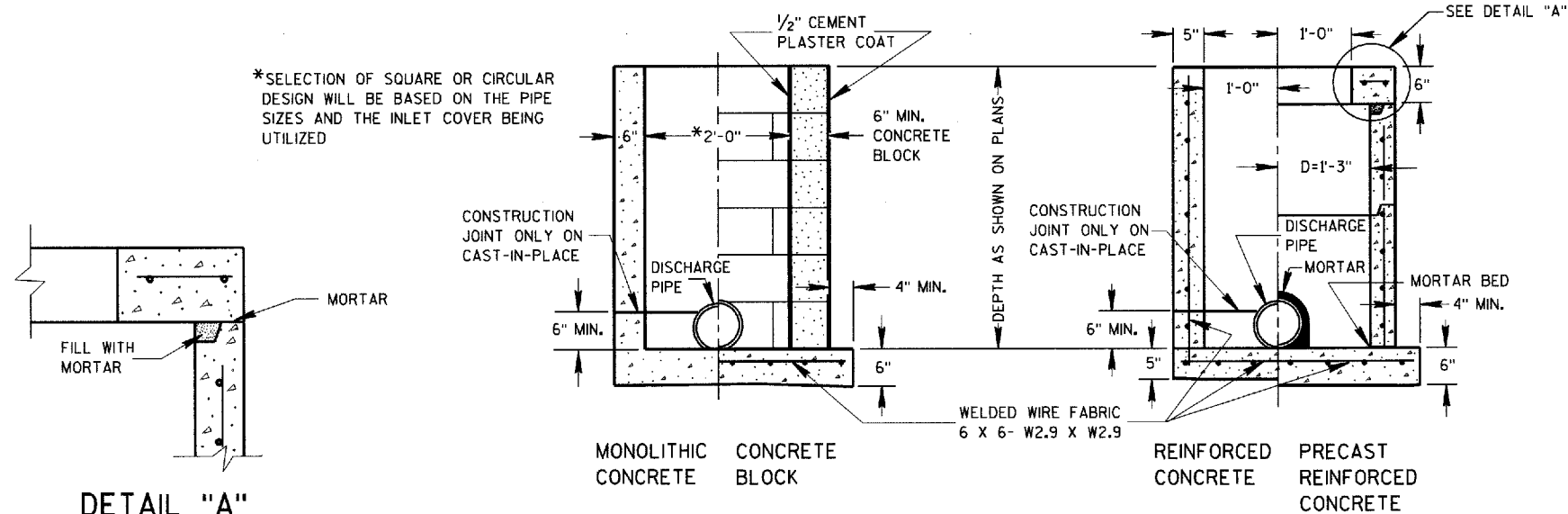
State of Wisconsin
Department of Transportation

APPROVED
4-13-82

DATE
CHIEF DESIGN ENGINEER

FHWA

S.D.D. 8 B 7-3



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.

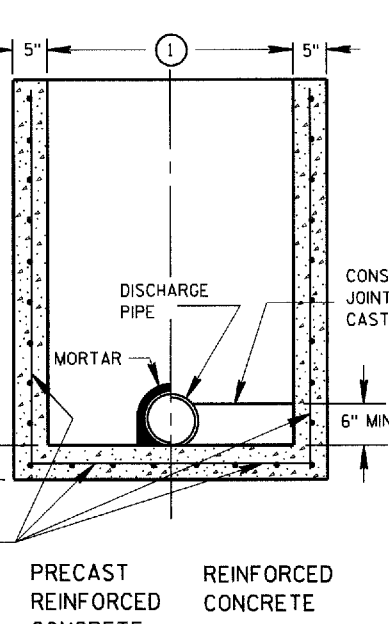
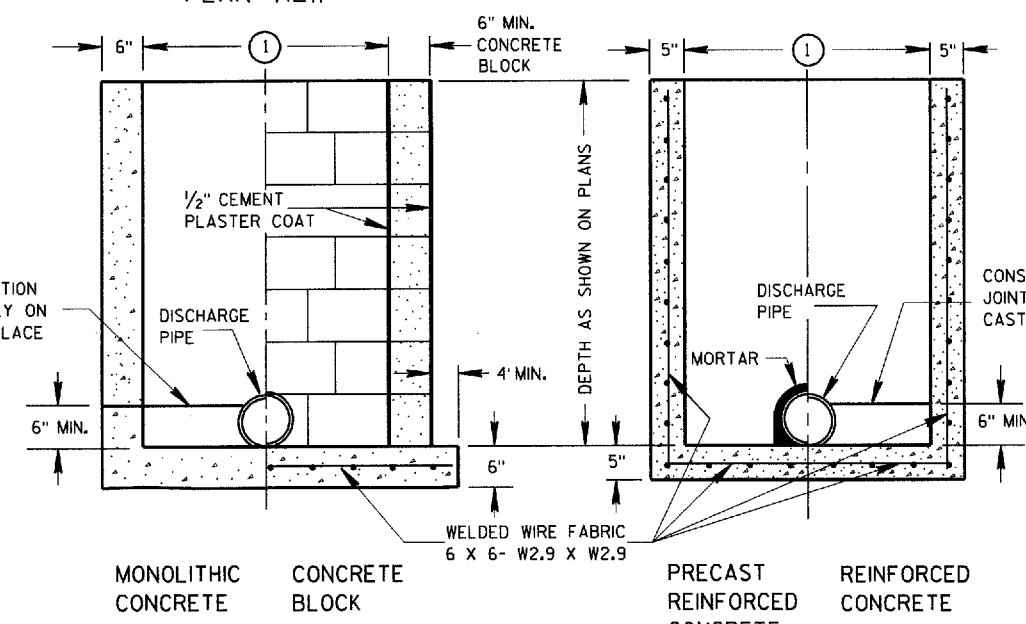
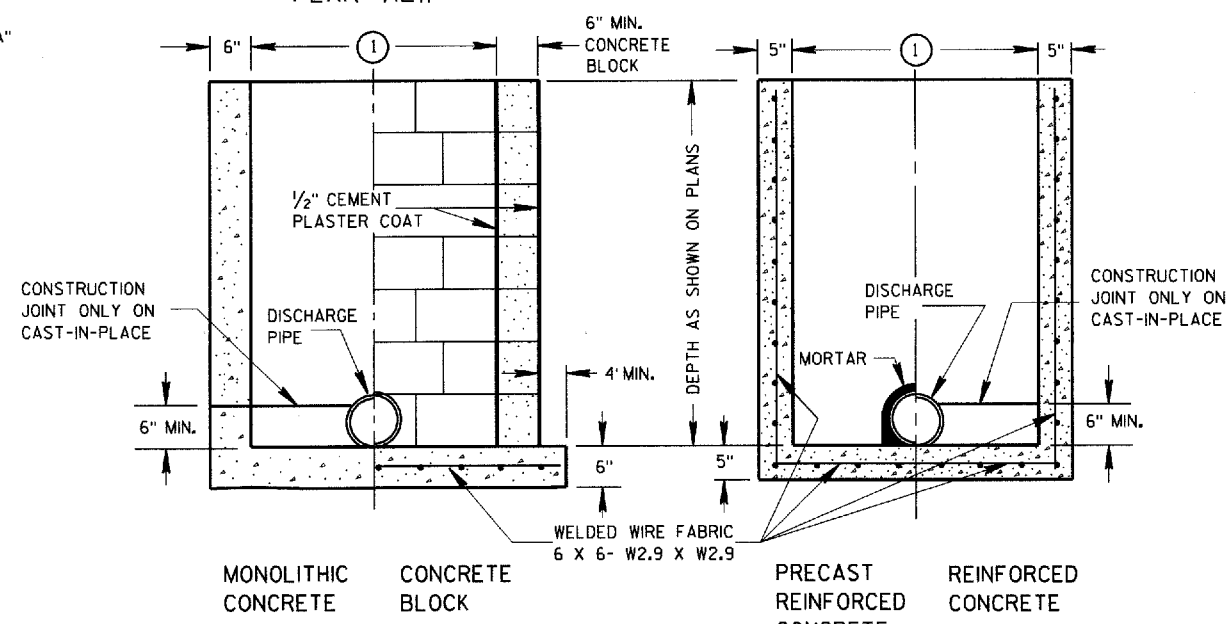
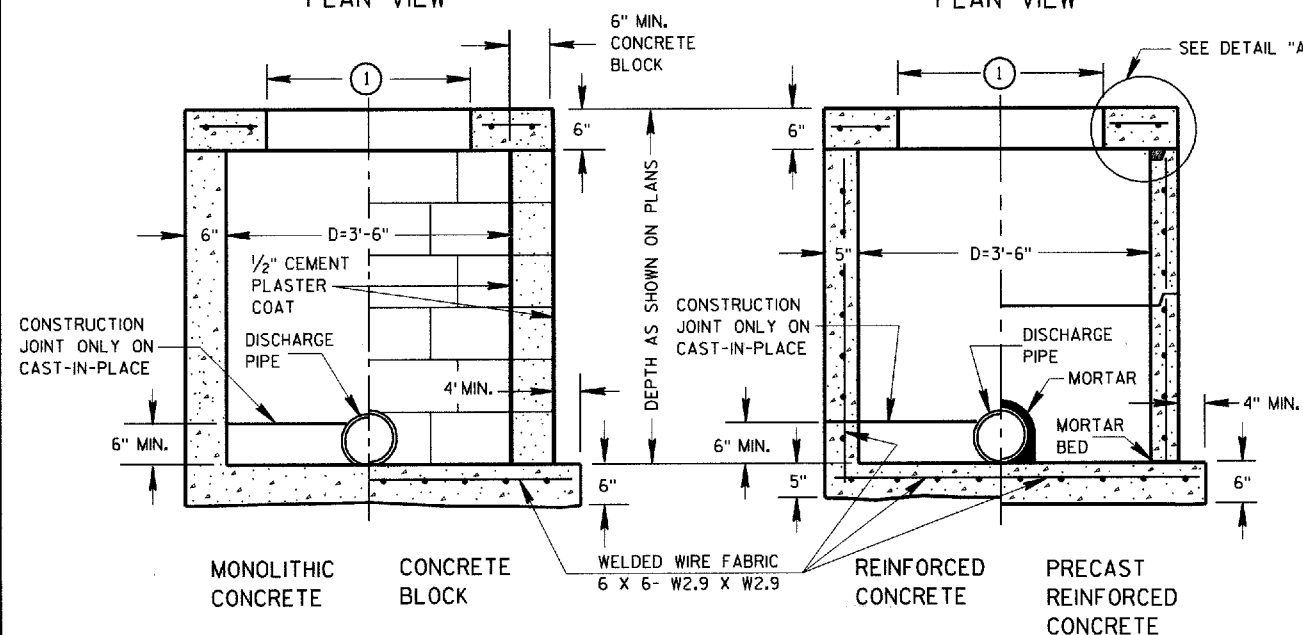
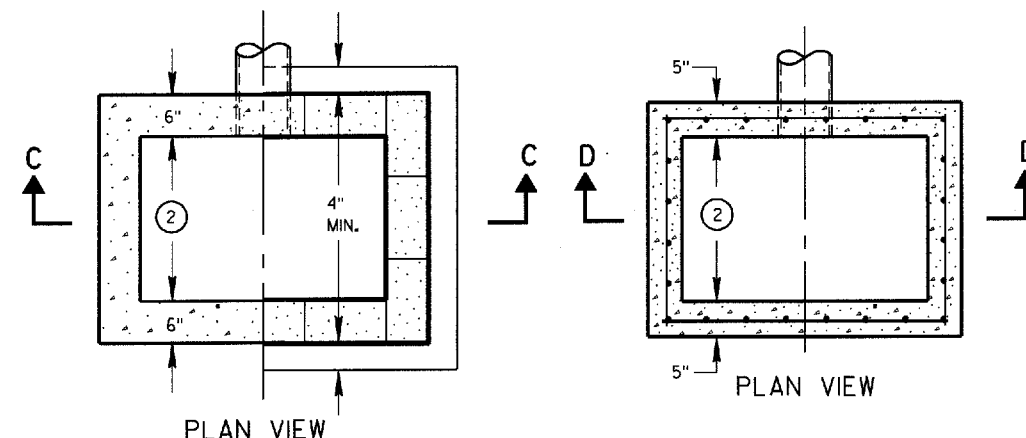
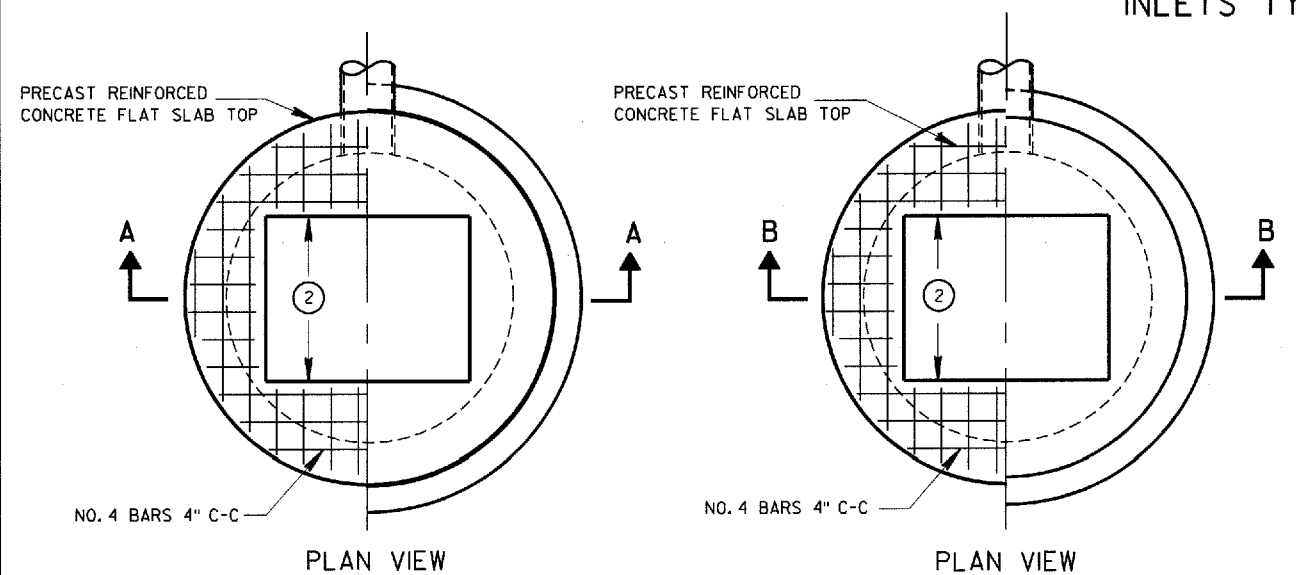
PRECAST REINFORCED BASES SHALL BE PLACED ON A BED OF MATERIAL AT LEAST 6 INCHES IN DEPTH, WHICH MEETS THE REQUIREMENTS OF GRANULAR BACKFILL. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.

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, 3'-0" OPENING FOR TYPE 3 INLETS, AND 2'-11" FOR TYPE 4 INLETS.
- ② USE 2'-0" OPENING FOR TYPE 1, 2 & 3 INLETS, 2'-6 1/2" OPENING FOR TYPE 4 INLETS.



SECTION A-A

SECTION B-B

SECTION C-C

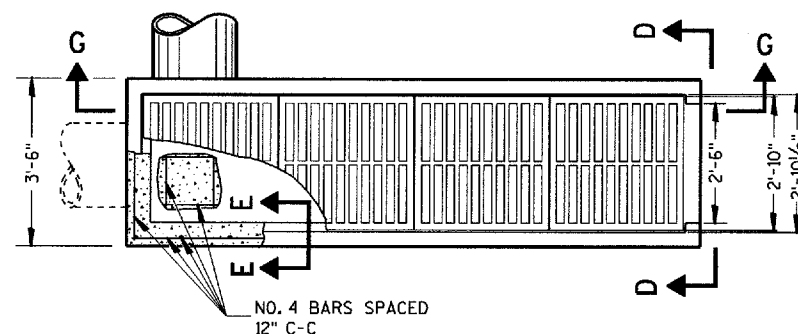
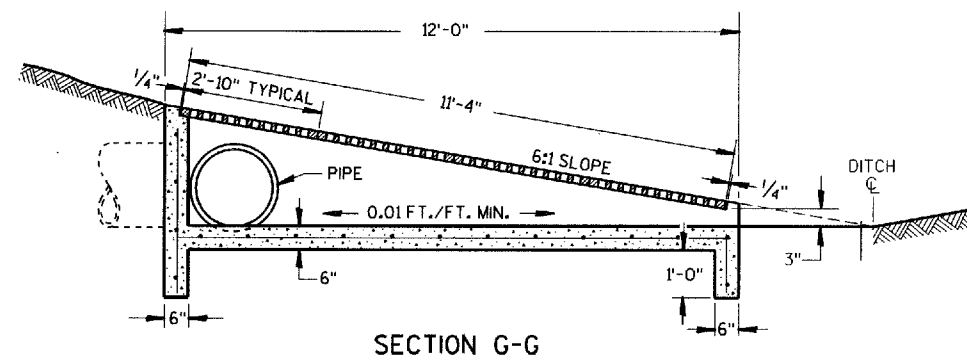
SECTION D-D

INLETS TYPE 2, 3 & 4

INLETS TYPE 1, 2, 3 & 4

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8/26/94
DATE
Roy L. Hines
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA



REINFORCED CONCRETE INLET TYPE 11

GENERAL NOTES

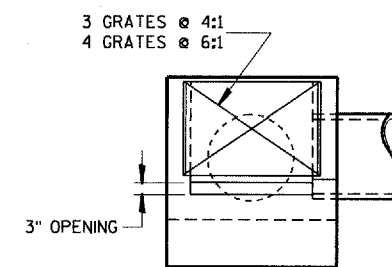
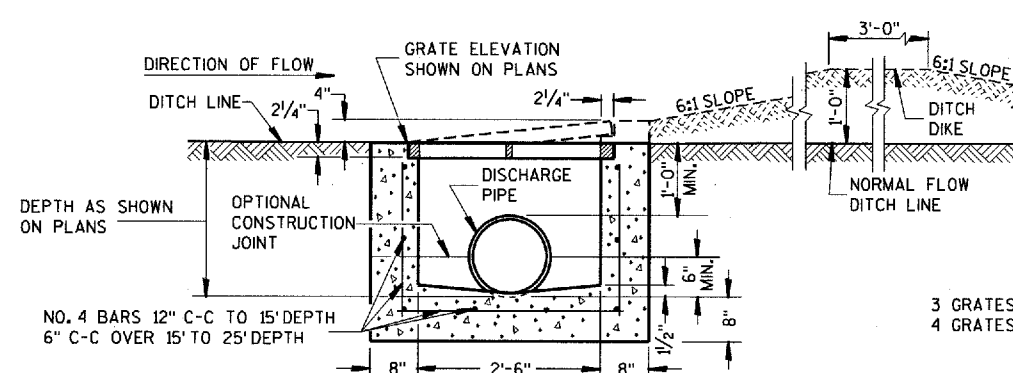
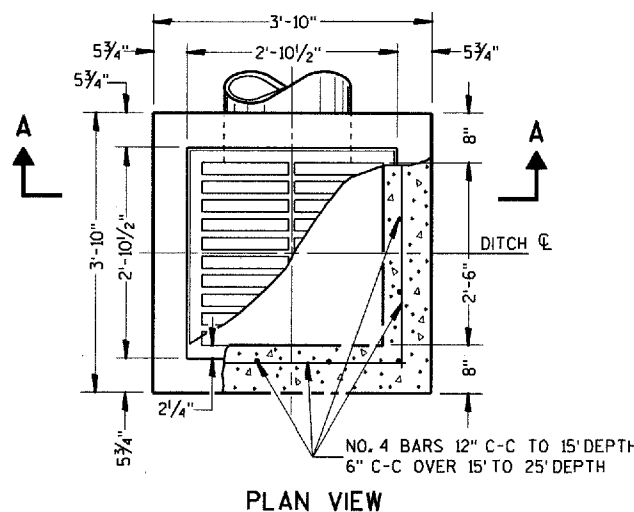
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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.

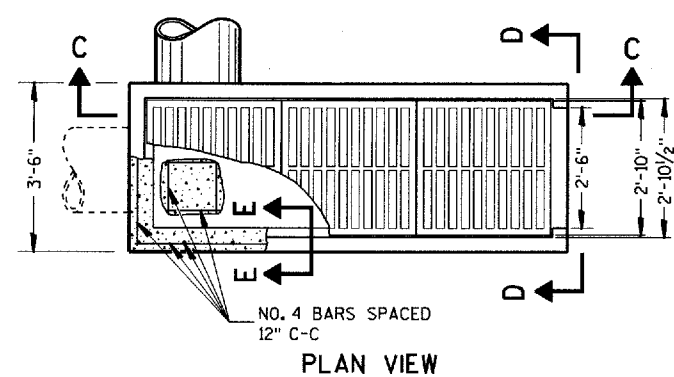
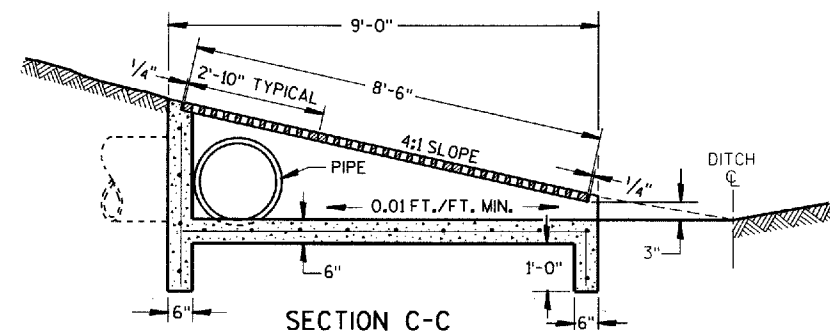
PRECAST REINFORCED CONCRETE INLET UNITS, IF USED, SHALL CONFORM TO THE REQUIREMENTS OF THE CATCH BASINS, MANHOLES AND INLETS SECTION OF THE STANDARD SPECIFICATIONS. UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE ENGINEER, THE CONTRACTOR SHALL NOT ORDER AND DELIVER PRECAST INLET UNITS REQUIRED FOR THE PROJECT UNTIL A CORRECTED LIST OF SIZES IS FURNISHED BY THE ENGINEER.

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.

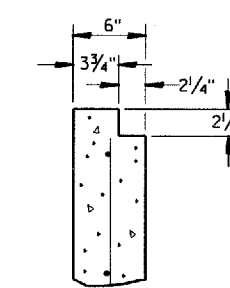
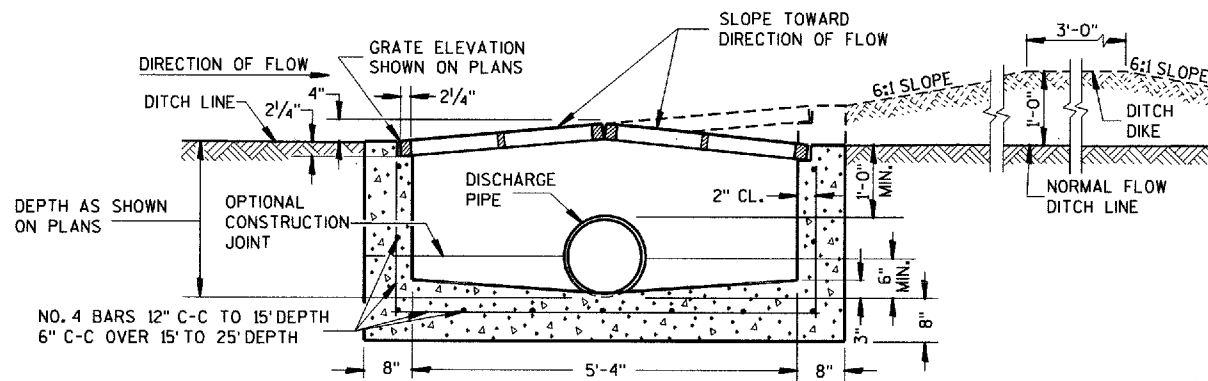
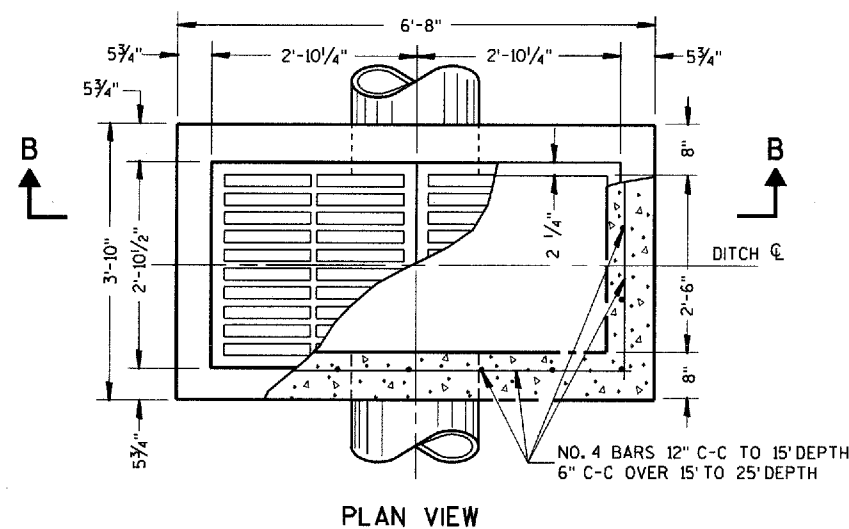
ALL BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE SHOWN OR NOTED.



REINFORCED CONCRETE INLET TYPE 8



REINFORCED CONCRETE INLET TYPE 10



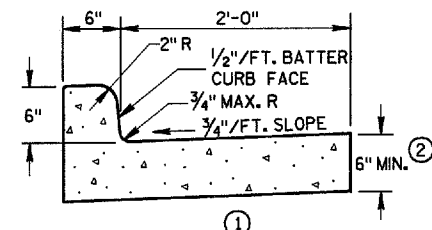
REINFORCED CONCRETE INLET TYPE 9

INLETS TYPE 8, 9, 10 AND 11

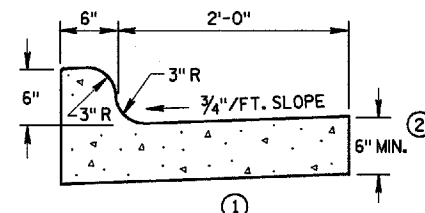
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
DATE 8/10/94
CHIEF ROADWAY DEVELOPMENT ENGINEER

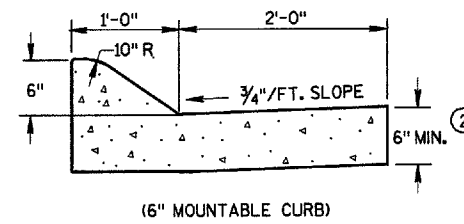
FHWA



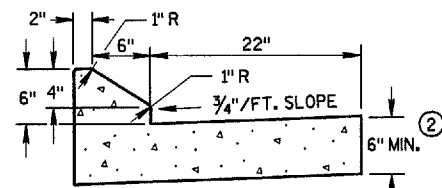
TYPES A & D



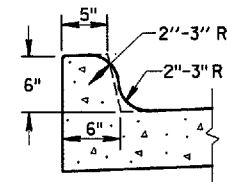
TYPES K & L



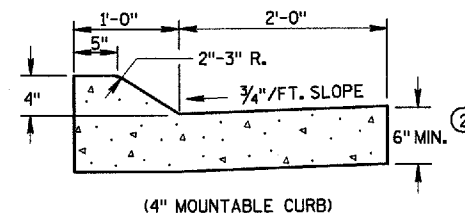
(6" MOUNTABLE CURB)



TYPES G & J



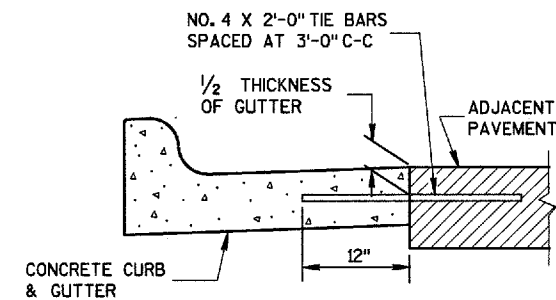
OPTIONAL CURB SHAPE
FOR TYPES K & L



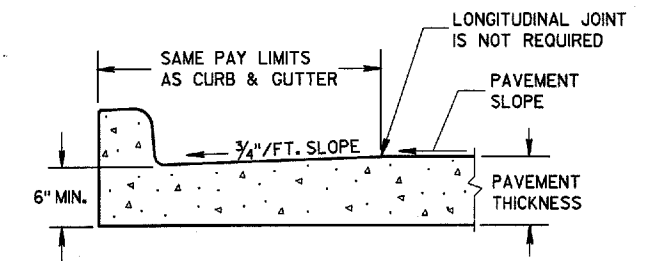
(4" MOUNTABLE CURB)

TYPES A & D
CONCRETE CURB & GUTTER 36"

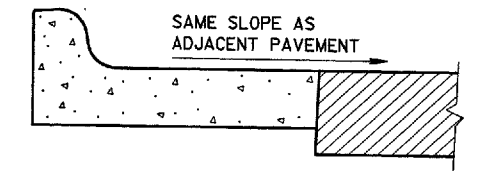
CONCRETE CURB & GUTTER 30"



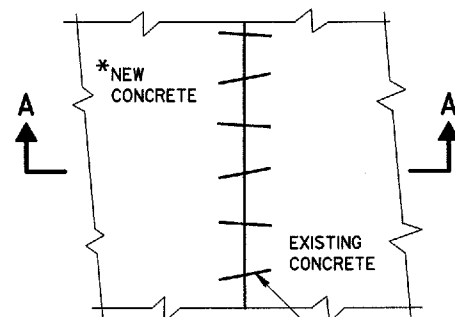
TYPICAL TIE BAR LOCATION



PARTIAL SECTION OF PAVEMENT
WITH INTEGRAL CURB & GUTTER



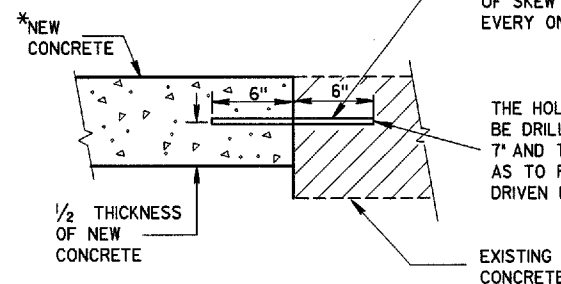
REVERSE SLOPE GUTTER
(TYPICAL FOR ALL CURB & GUTTER TYPES)



PLAN VIEW

*NEW CURB & GUTTER,
SURFACE DRAINS,
CONCRETE PAVEMENT
OR OTHER NEW CONCRETE.

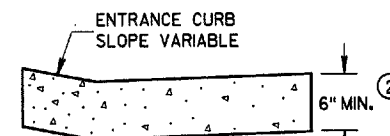
NO. 6 X 12" DEF. BARS
SPACED 3'-0" C-C,
INSTALLED ON 6:1 SKEW
HORIZONTALLY. DIRECTION
OF SKEW ALTERNATING AFTER
EVERY ONE OR TWO BARS.



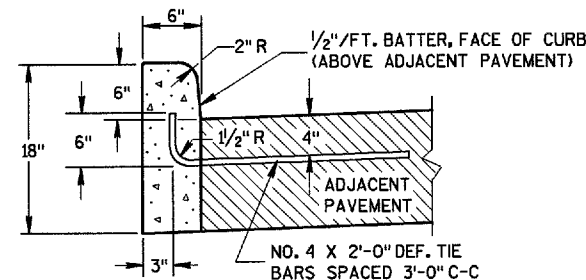
SECTION A-A
PAVEMENT TIES

THE HOLE FOR THE BAR SHALL
BE DRILLED TO A DEPTH OF
7" AND TO SUCH A DIAMETER
AS TO PROVIDE A TIGHT
DRIVEN FIT

EXISTING
CONCRETE

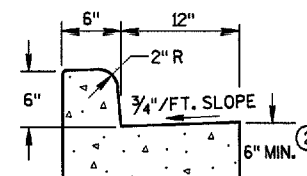


DRIVEWAY ENTRANCE CURB
(WHEN DIRECTED BY THE ENGINEER)

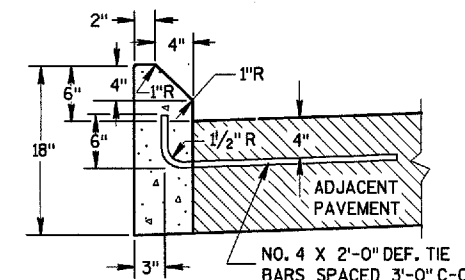


TYPES A & D

CONCRETE CURB



TYPES A & D
CONCRETE CURB & GUTTER 18"



TYPES G & J

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

INTEGRAL CURB & GUTTER SHALL CONFORM TO THE DETAILS SHOWN FOR CONCRETE CURB & GUTTER INCLUDING THE TRANSVERSE GUTTER SLOPE. A LONGITUDINAL CONSTRUCTION JOINT IS NOT REQUIRED WITH INTEGRAL CURB AND GUTTER.

WHERE THE TRANSVERSE JOINTS IN THE PAVEMENT ARE REQUIRED TO BE SEALED, THE JOINTS IN THE INTEGRAL CURB AND GUTTER SHALL BE SEALED TO THE FACE OF CURB WITH THE SAME TYPE OF SEALANT. THE COST OF FURNISHING AND INSTALLING THIS SEALANT SHALL BE INCIDENTAL TO THE ITEM CONCRETE CURB AND GUTTER.

UNLESS OTHERWISE SHOWN ON THE TYPICAL CROSS SECTIONS, THE BASE COURSE AND UNCLASSIFIED EXCAVATION LIMITS ARE 2'-0" BEHIND THE BACK OF CURBS.

- ① TIE BARS ARE REQUIRED FOR CURB AND GUTTER TYPES A, G AND K.
- ② THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE COURSE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ③ WHEN REVERSE SLOPE GUTTER IS REQUIRED, THE LOCATION(S) WILL BE SHOWN ELSEWHERE IN THE PLAN.

CONCRETE CURB, CONCRETE
CURB & GUTTER AND
PAVEMENT TIES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
04/16/99
DATE
FHW
CHIEF ROADWAY DEVELOPMENT ENGINEER

GENERAL NOTES

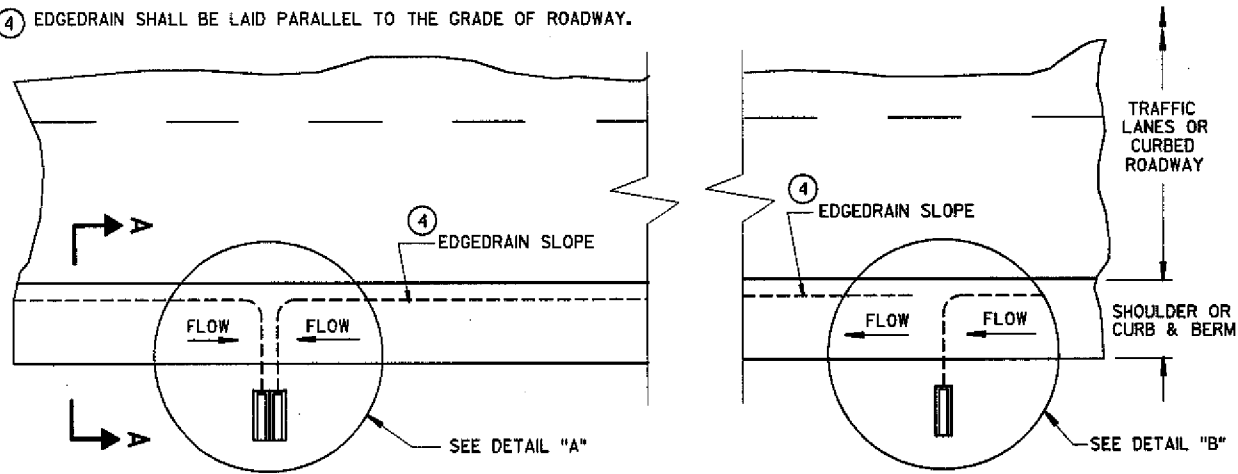
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

- ① UNPERFORATED PIPE UNDERDRAIN AND FITTINGS FURNISHED FOR OUTFALL PIPE SHALL MEET THE REQUIREMENTS OF ONE OF THE FOLLOWING SPECIFICATIONS:

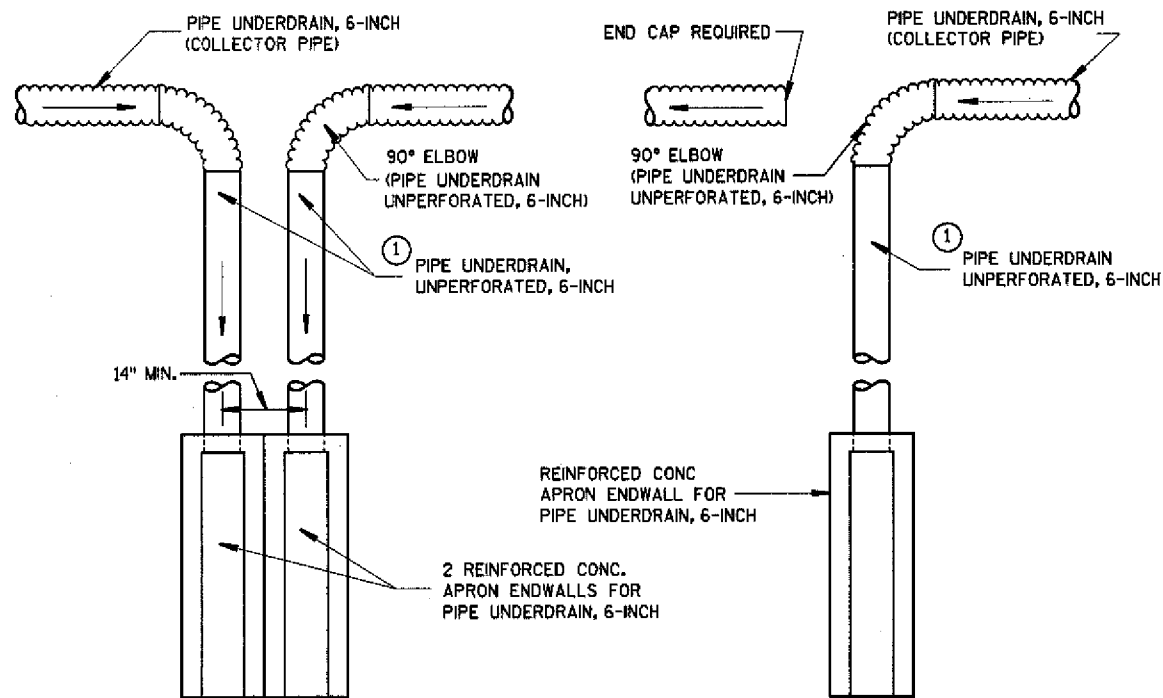
POLYVINYL CHLORIDE (PVC) PLASTIC DRAIN, WASTE, AND VENT PIPE AND FITTINGS, ASTM D 2665, SCHEDULE 40 PVC.

TYPE PSM POLYVINYL CHLORIDE (PVC) SEWER PIPE AND FITTINGS, ASTM D 3034, SDR 23.5 PVC SEWER PIPE.

- ② MAXIMUM SPACING OF EDGEDRAIN OUTLETS SHALL BE 250 FEET UNLESS OTHERWISE SPECIFIED IN THE CONTRACT OR DIRECTED BY THE ENGINEER.
- ③ EDGEDRAIN SHALL BE CONNECTED TO INLETS REGARDLESS OF FLOW DIRECTION FOR DRAINAGE AND MAINTENANCE ACCESS.
- ④ EDGEDRAIN SHALL BE LAID PARALLEL TO THE GRADE OF ROADWAY.

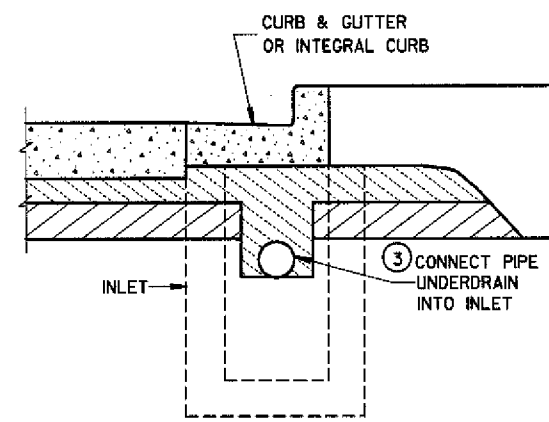


PLAN VIEW
ROADWAY WITH SHOULDERS OR CURBS
(EDGEDRAIN OUTLETS TO ROADSIDE)②

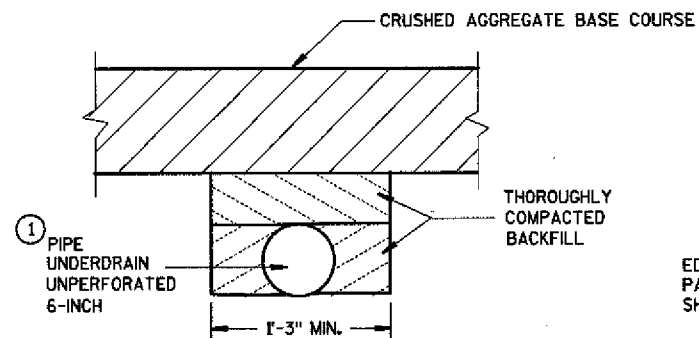


DETAIL "A" TO BE USED AT LOW POINT LOCATIONS
DETAIL "B" TO BE USED AT INTERMEDIATE LOCATIONS

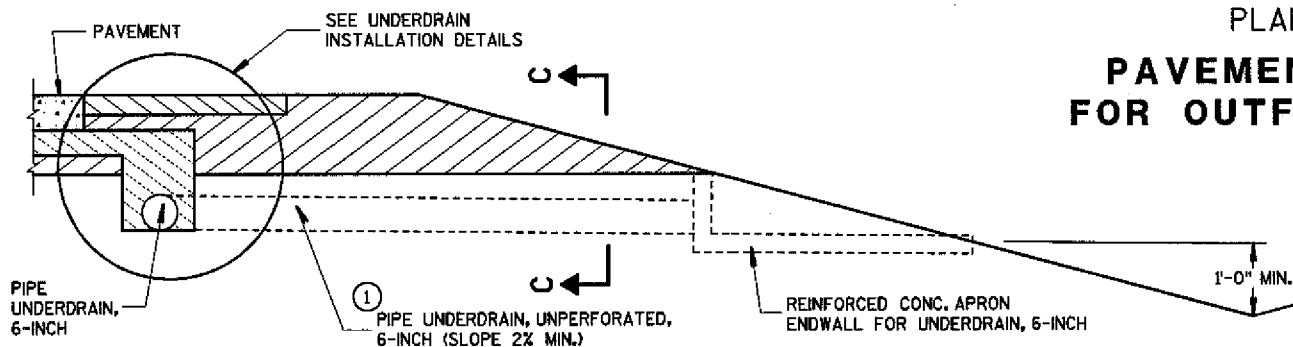
TYPICAL DRAIN OUT DETAILS



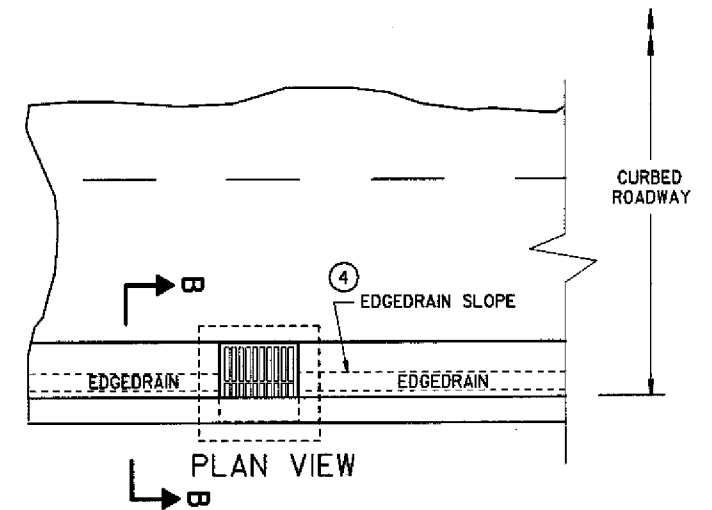
SECTION B-B
URBAN CROSS SECTION



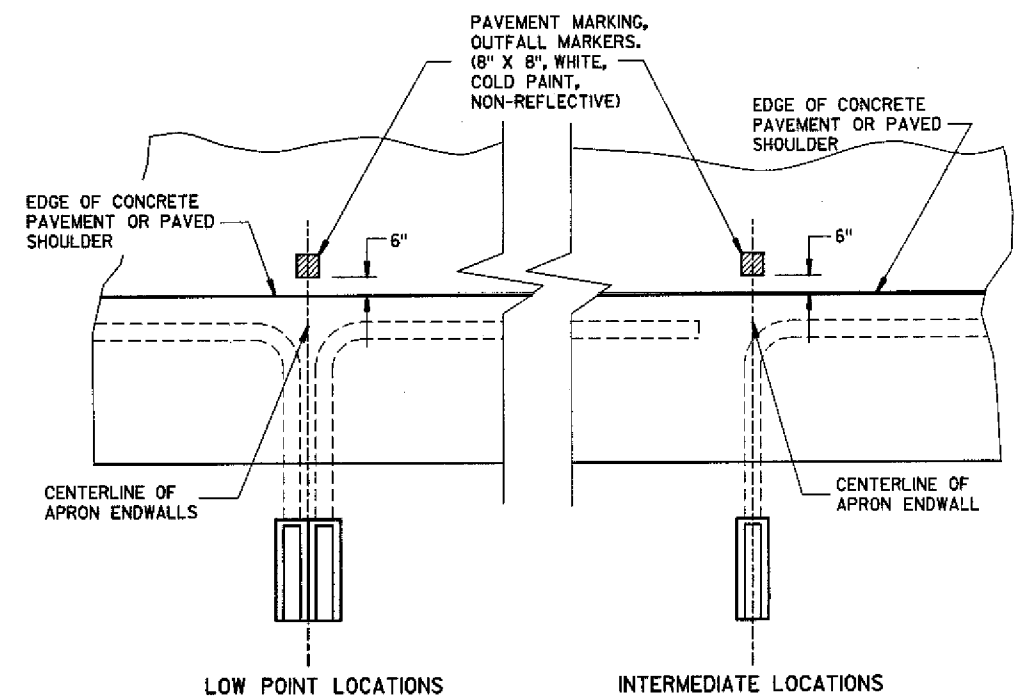
SECTION C-C
(TRENCH FOR OUTFALL PIPE)



SECTION A-A
RURAL CROSS SECTION



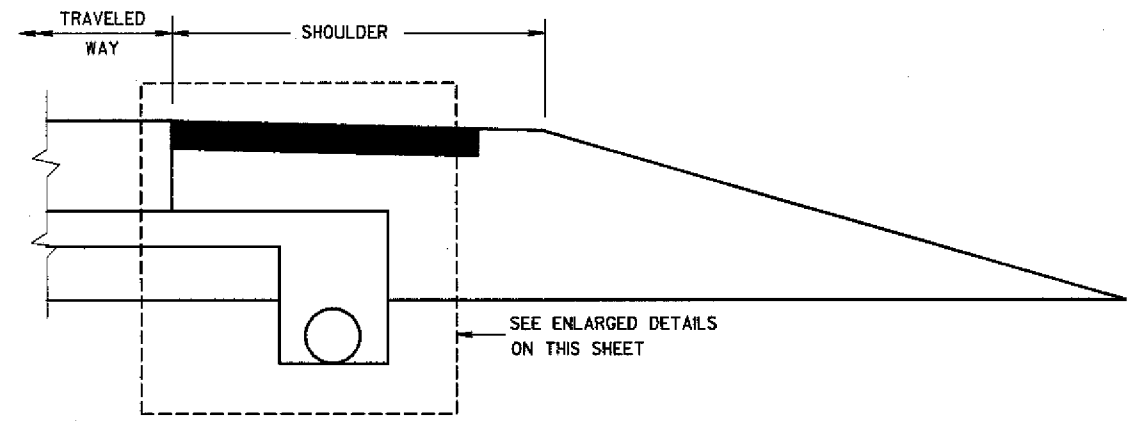
PLAN VIEW
ROADWAY WITH CURBS
(EDGEDRAIN CONNECTS INTO INLET STRUCTURE)



PLAN VIEW
PAVEMENT MARKING FOR OUTFALL MARKERS

EDGEDRAIN OUTLET AND OUTFALL MARKERS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



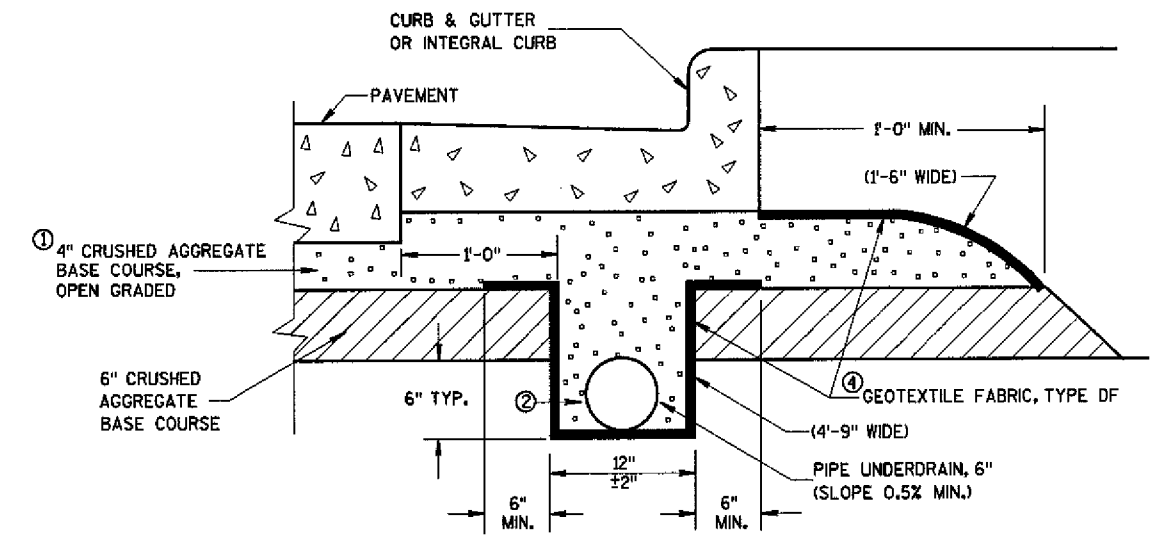
RURAL CROSS SECTION

NOTES

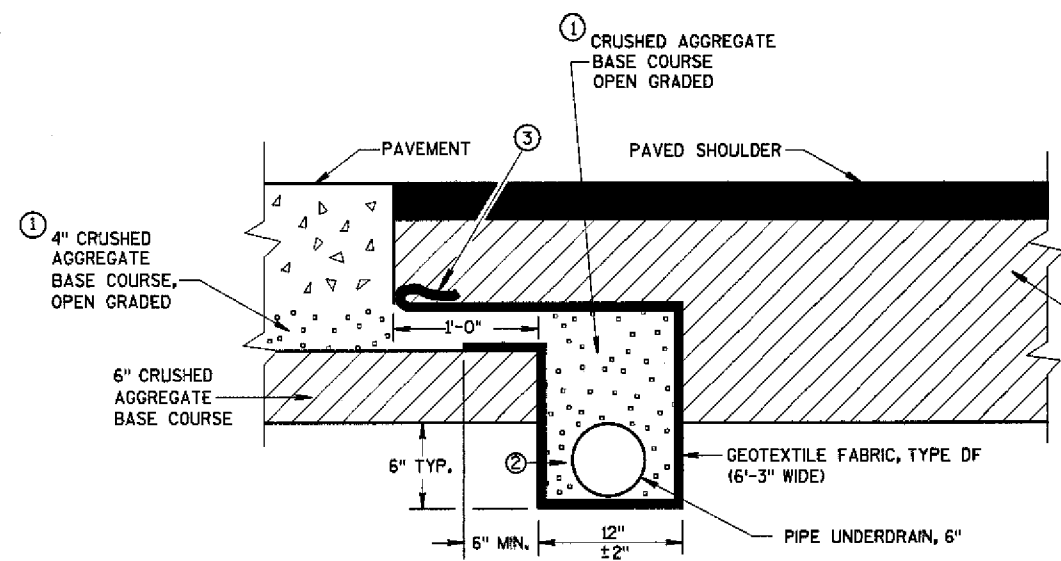
THE DIMENSIONS SHOWN ON THE TYPICAL CROSS SECTIONS WILL GOVERN IN THE EVENT THERE IS A CONFLICT WITH THE DETAILS SHOWN ON THIS DRAWING.

PIPE UNDERDRAIN SHALL BE LAID PARALLEL TO THE GRADE OF THE ROADWAY.

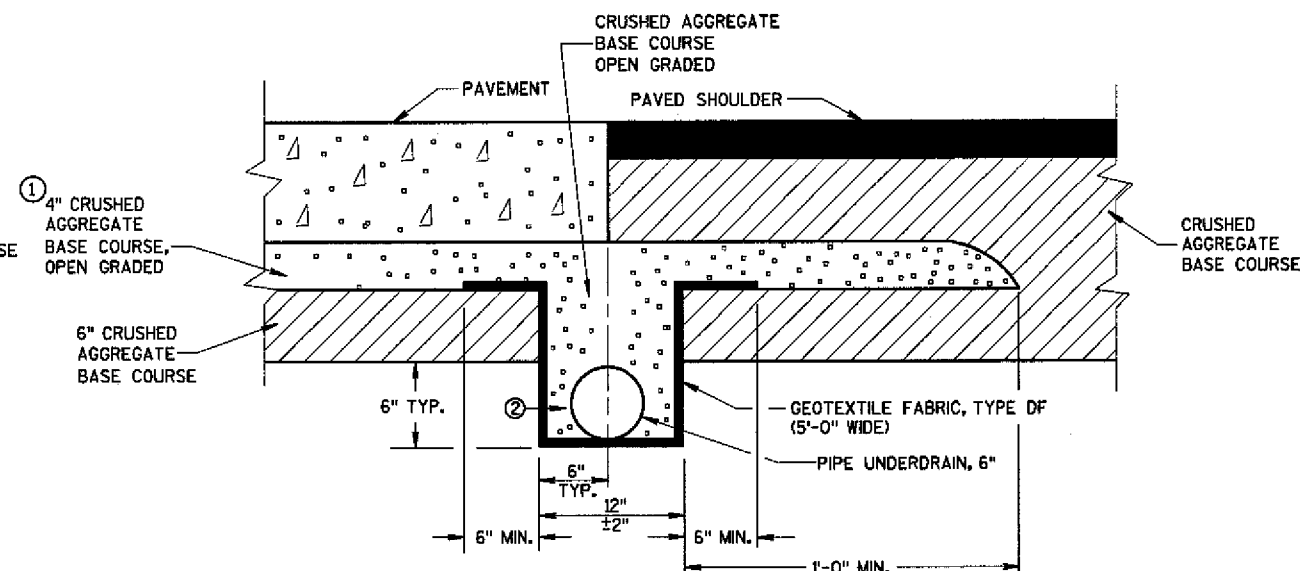
- ① THE GRADATION OF THE OPEN GRADED BASE COURSE SHALL BE EITHER NO. 1 OR NO. 2 AS SPECIFIED ELSEWHERE IN THE CONTRACT.
- ② TRENCH BACKFILL WILL BE PAID FOR AS CRUSHED AGGREGATE BASE COURSE, OPEN GRADED NO. 1 OR NO. 2 AS SPECIFIED.
- ③ FOLD OVER EXCESS GEOTEXTILE FABRIC AT THIS LOCATION.
- ④ TOTAL FABRIC WIDTH IS 6'-3" FOR PAYMENT.



EDGEDRAIN IN URBAN ROADWAY



POST PAVING INSTALLATION
(QUANTITIES ARE BASED ON THIS DETAIL)



PRE-PAVING INSTALLATION ALTERNATE

EDGEDRAIN IN RURAL ROADWAY

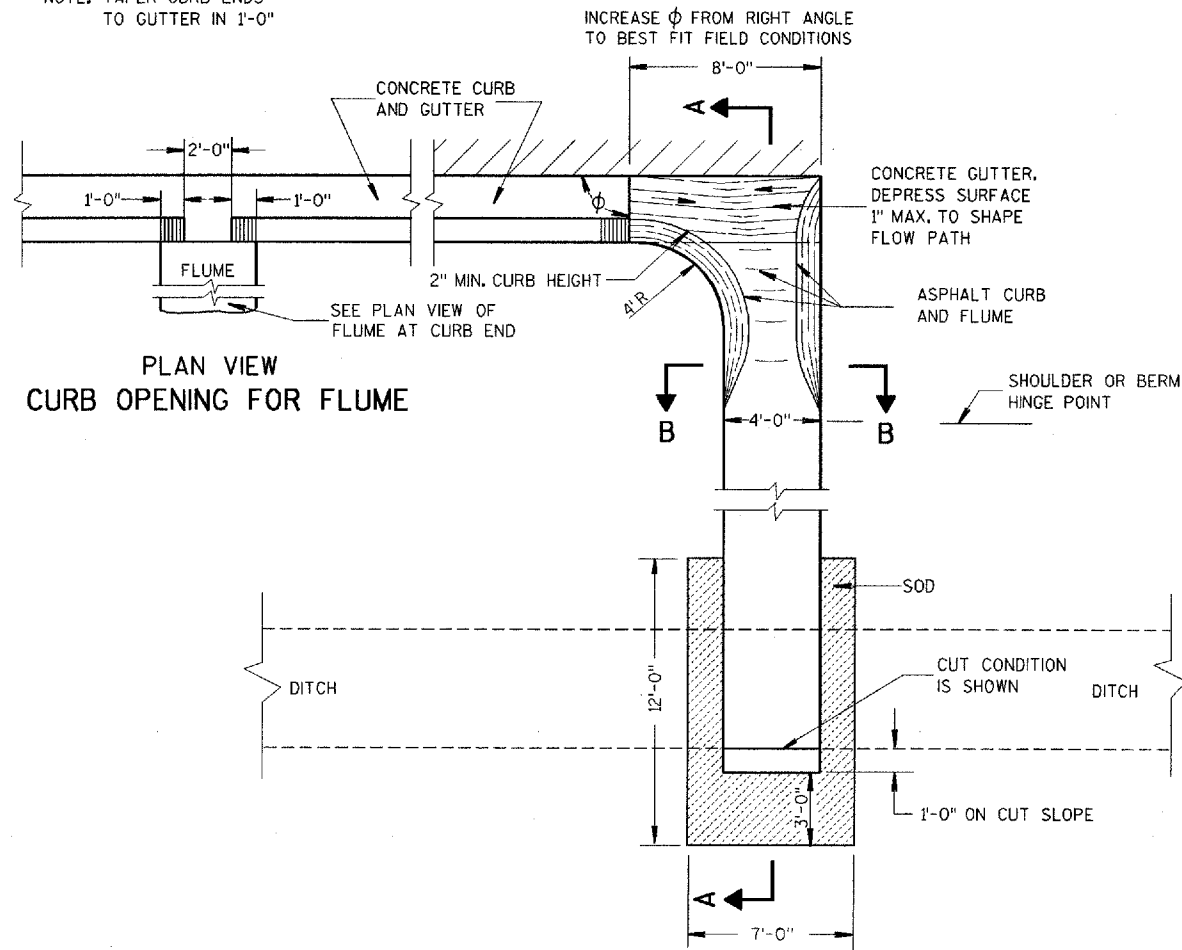
EDGEDRAIN AND CRUSHED AGGREGATE BASE COURSE, OPEN GRADED, NO. 1 OR NO. 2

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
01/13/99
DATE
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

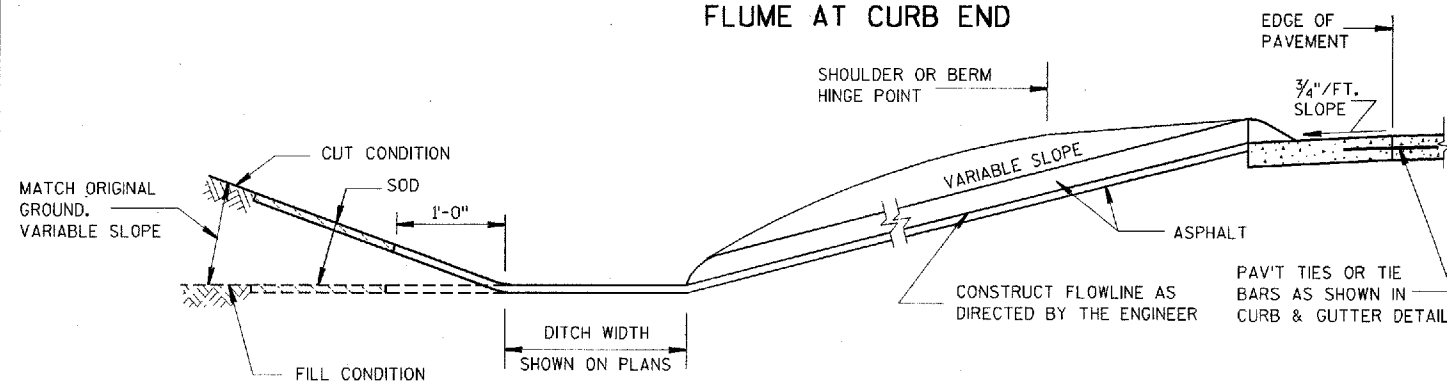
ASPHALTIC FLUME

NOTE: TAPER CURB ENDS
TO GUTTER IN 1'-0"

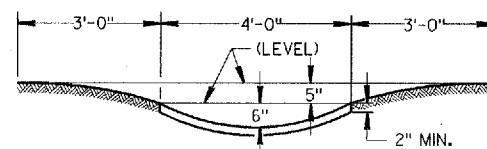


PLAN VIEW
CURB OPENING FOR FLUME

PLAN VIEW
FLUME AT CURB END



SECTION A-A



SECTION B-B

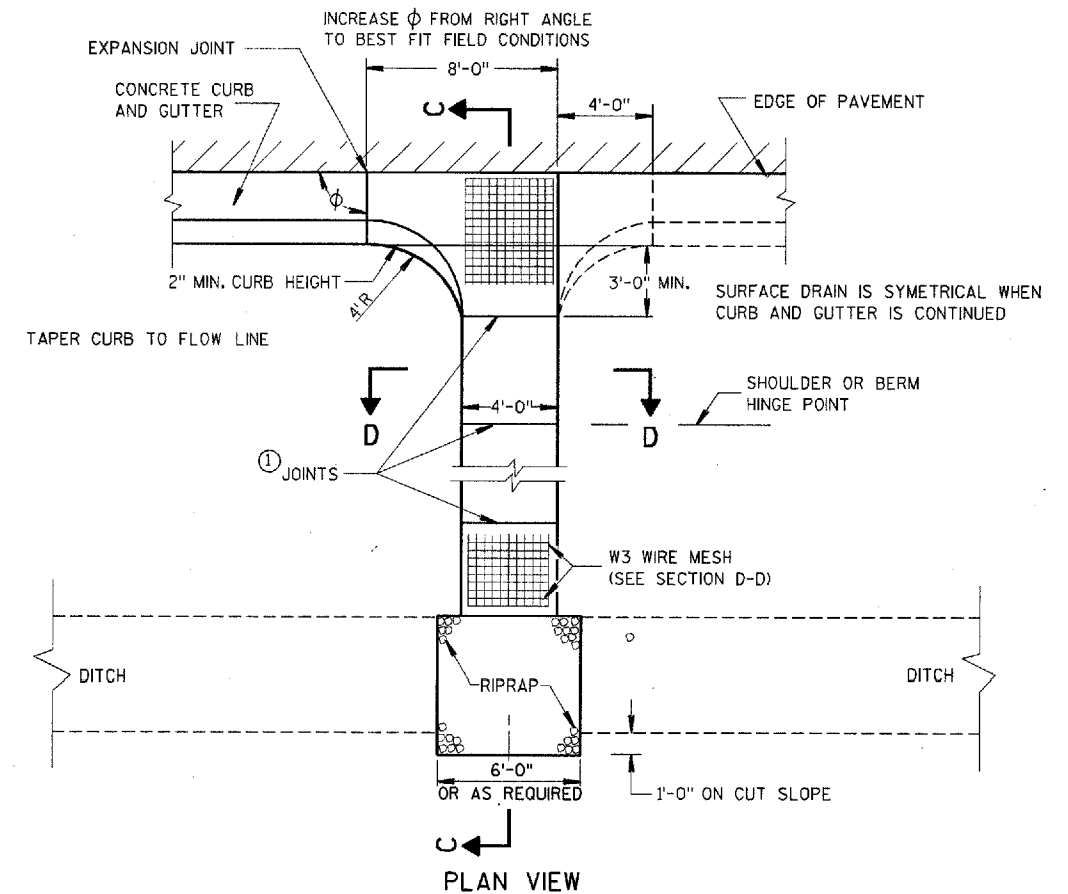
GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

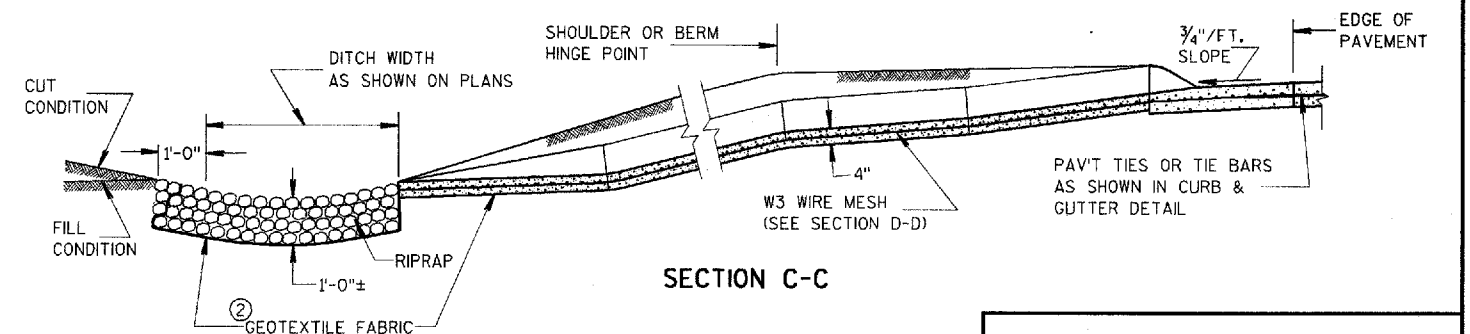
WELDED STEEL WIRE FABRIC SHALL BE IN ACCORDANCE WITH AASHTO SPECIFICATION M55.

- JOINTS SHALL BE 1/8" TO 1/4" INCH WIDE BY 1 1/2" INCHES DEEP AND SPACED AT UNIFORM INTERVALS OF APPROXIMATELY 4 FEET.
- GEOTEXTILE FABRIC TYPE "R" SHALL UNDERLAY THE FULL LENGTH AND WIDTH OF THE CONCRETE SURFACE DRAIN AND RIPRAP.
- CONCRETE SURFACE DRAIN WITHOUT CURB AND GUTTER MAY BE USED ON BACKSLOPES WHEN SPECIFIED

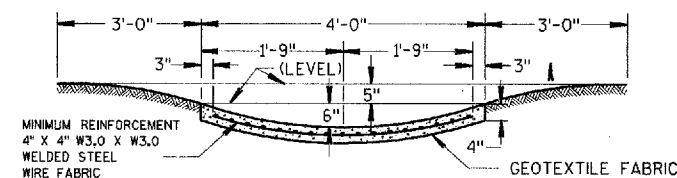
③ CONCRETE SURFACE DRAIN



PLAN VIEW



SECTION C-C



SECTION D-D

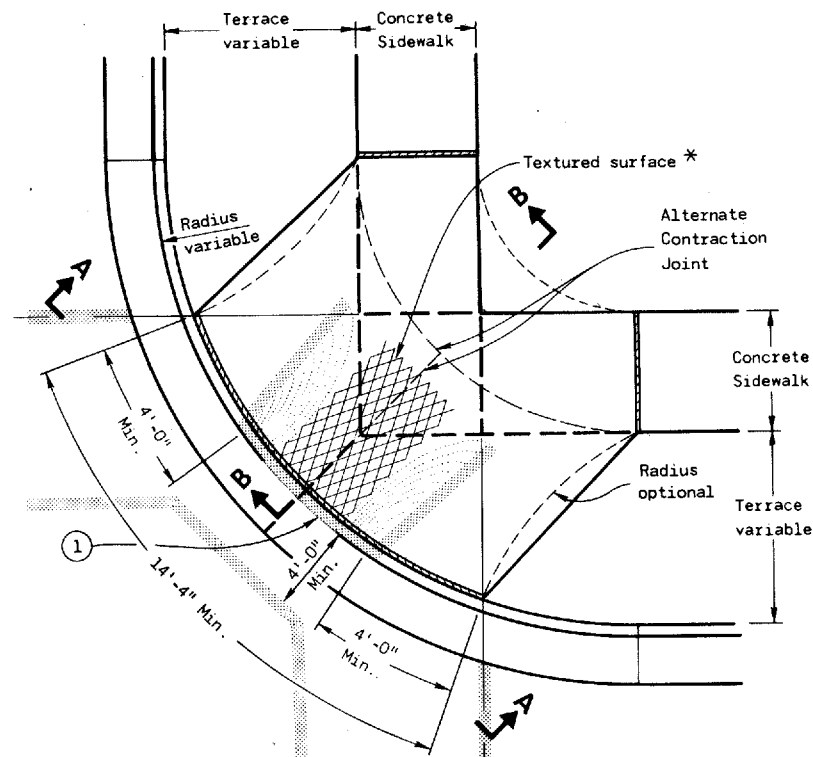
CONCRETE SURFACE DRAIN & ASPHALTIC FLUME

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

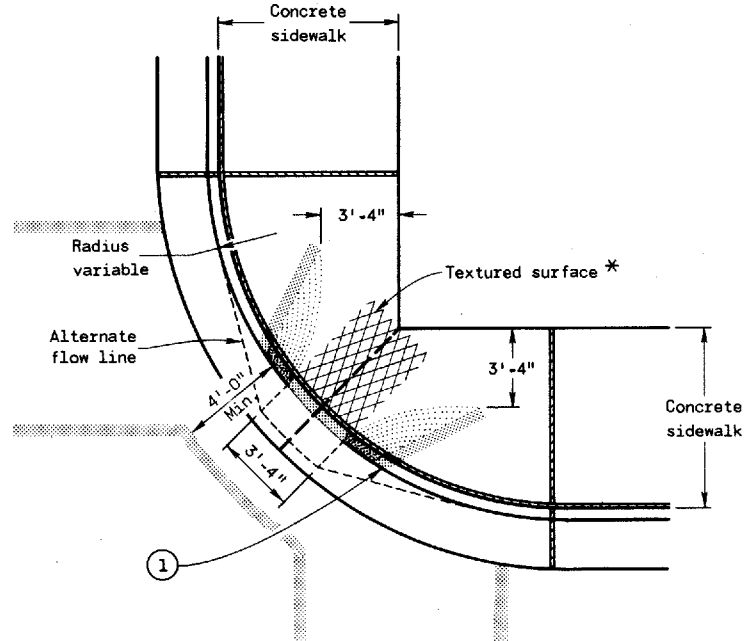
APPROVED
10/23/09
DATE

STATE DESIGN ENGINEER FOR HWYS

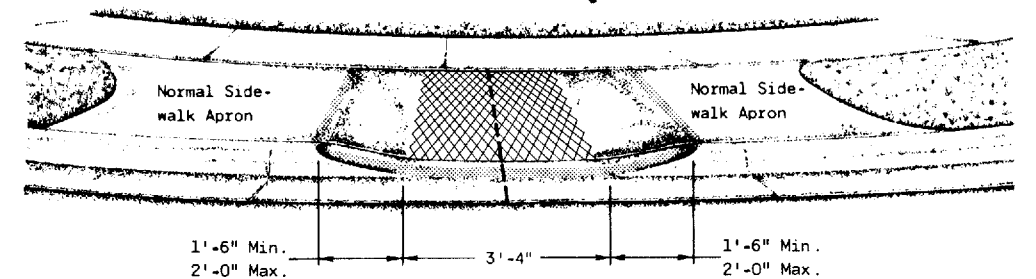
FHWA



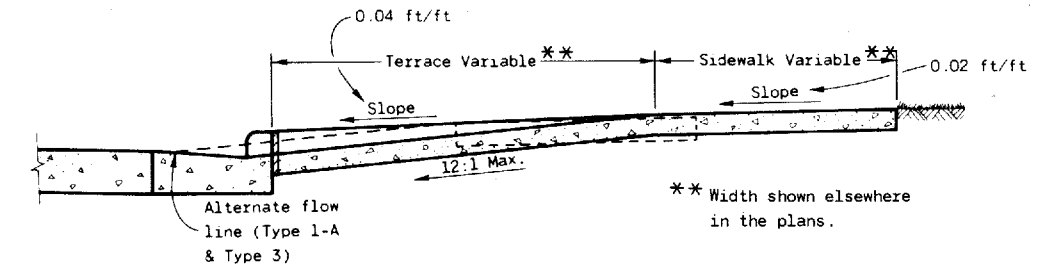
PLAN VIEW
TYPE 1 RAMP
(CENTER OF CORNER RADIUS)



PLAN VIEW
TYPE 1-A RAMP
(NO TERRACE)

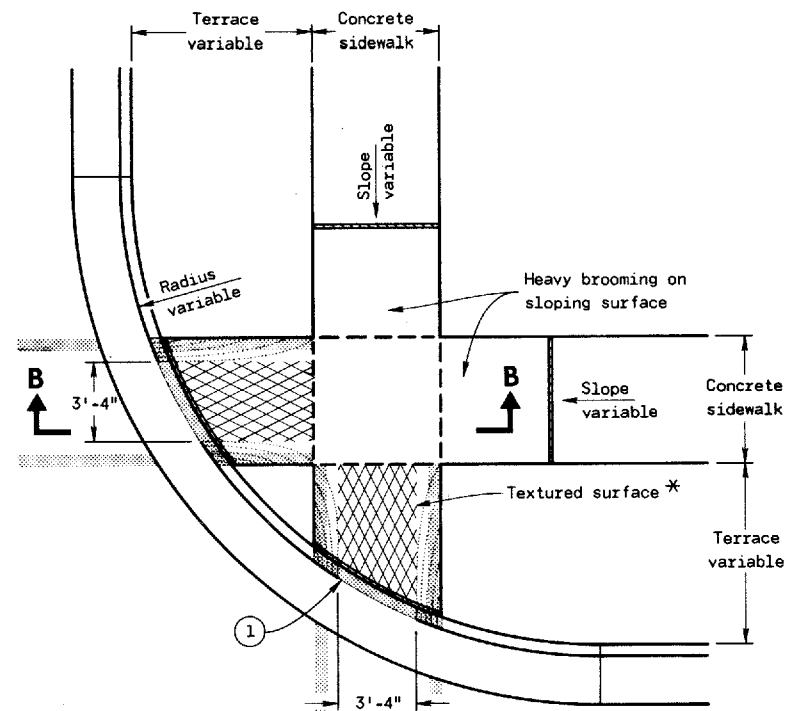


VIEW A-A

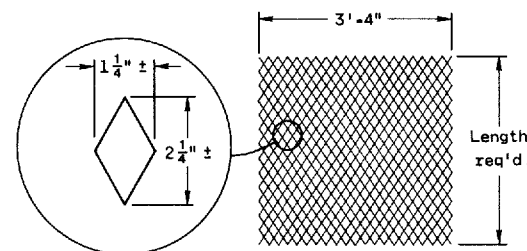


SECTION B-B

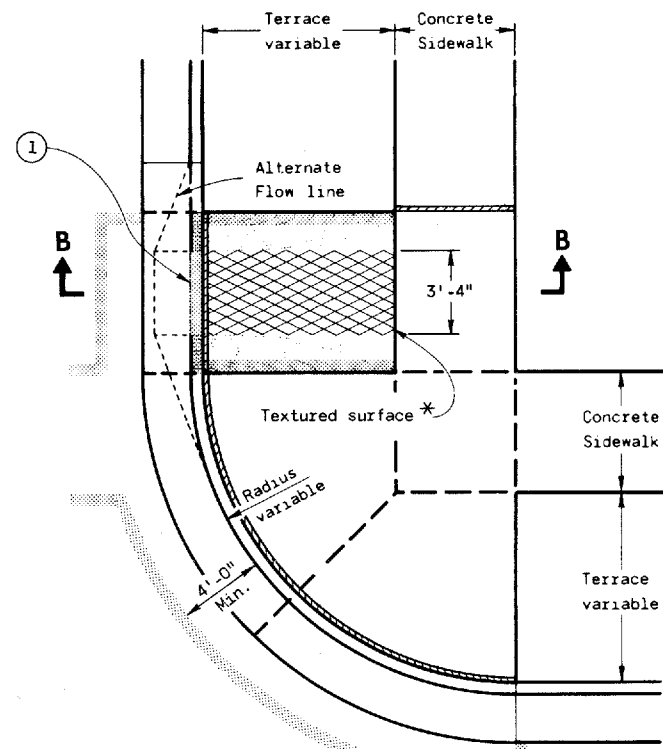
$\frac{1}{2}$ " EXPANSION JOINTS - SIDEWALK
--- CONTRACTION JOINTS
Location of joints may be varied from those shown to better fit site conditions and/or local government preference.



PLAN VIEW
TYPE 2 RAMP
(ON LINE WITH SIDEWALK)



DETAIL OF DIAMOND PATTERN *



PLAN VIEW
TYPE 3 RAMP
(OUTSIDE OF CROSSWALK AREA)

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.

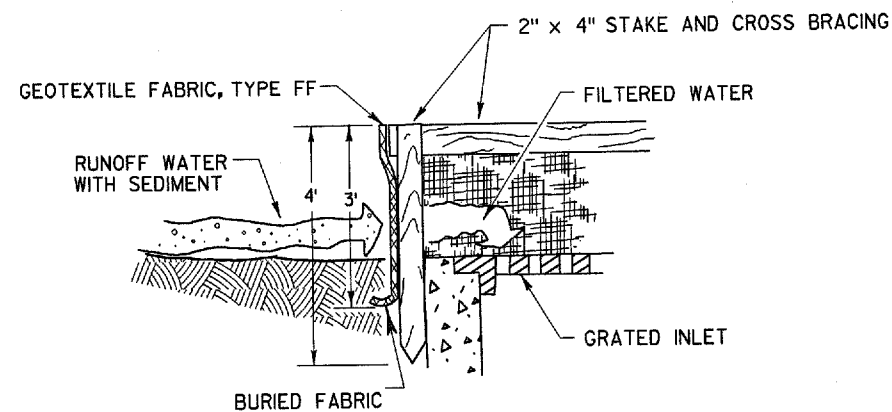
Surface texturing shall consist of linear impressions approximately $\frac{1}{4}$ inch to $\frac{3}{8}$ inch in depth and width, oriented to provide a uniform pattern of diamond shapes measuring approximately $1\frac{1}{4}$ inches in width by $2\frac{1}{4}$ inches in length, with the length being parallel 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.

① The ramp shall 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 unless otherwise specified in the contract.

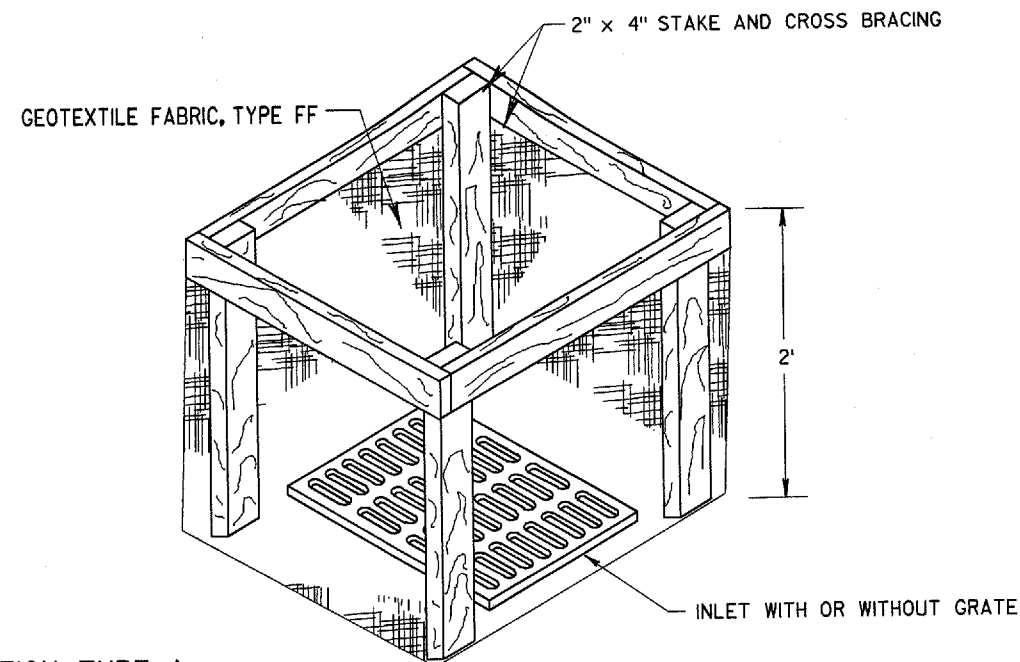
If a municipality requires the brick alternate, special details and provisions are shown elsewhere in the plans.

CURB RAMPS	
State of Wisconsin Department of Transportation	
APPROVED 10-23-84 DATE	<i>D. J. Strand</i> CHIEF DESIGN ENGINEER
FHWA	

NOTE: ATTACH GEOTEXTILE FABRIC, TYPE FF TO THE TOP OF STAKES AND CROSS BRACINGS.



INLET PROTECTION, TYPE A

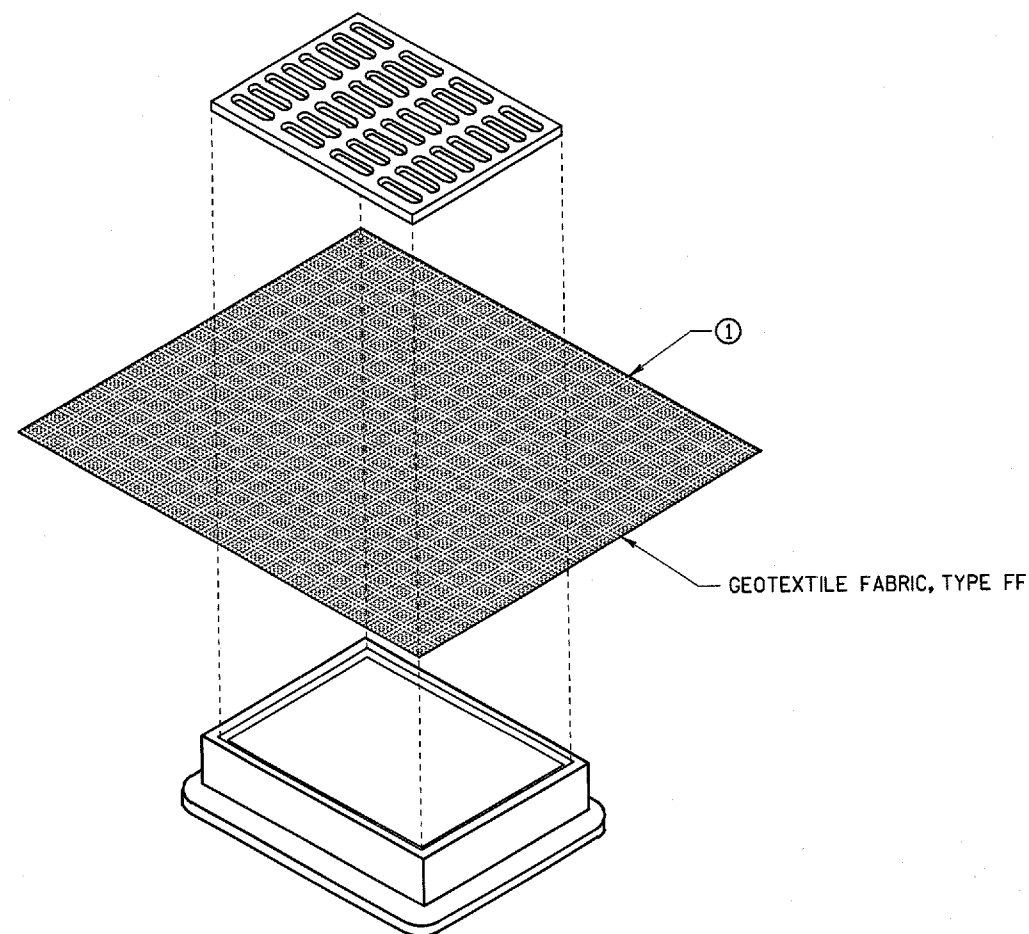


GENERAL NOTES:

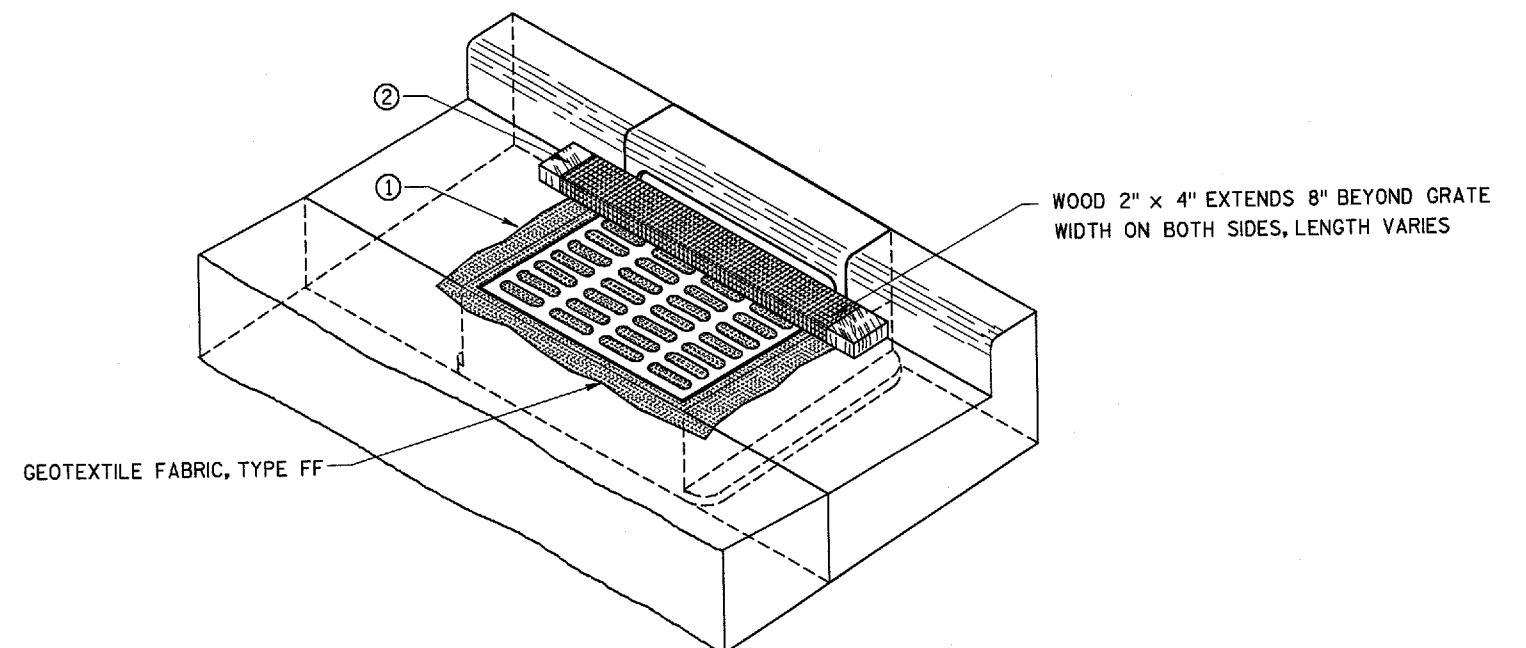
FABRIC SHALL BE REPLACED AT THE ENGINEERS DISCRETION.
THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX.
MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENT'S EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.

WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

- ① FABRIC SIZE SHALL BE 8" (MIN) GREATER ON ALL SIDES OF THE INLET COVER TO PROVIDE A HAND HOLD WHEN MAINTENANCE OR REMOVAL IS REQUIRED.
- ② FOR INLET PROTECTION, TYPE C, WITH A CURB BOX, AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES.



INLET PROTECTION, TYPE B (WITHOUT CURB BOX)
(CAN BE INSTALLED ON ANY INLET TYPE)



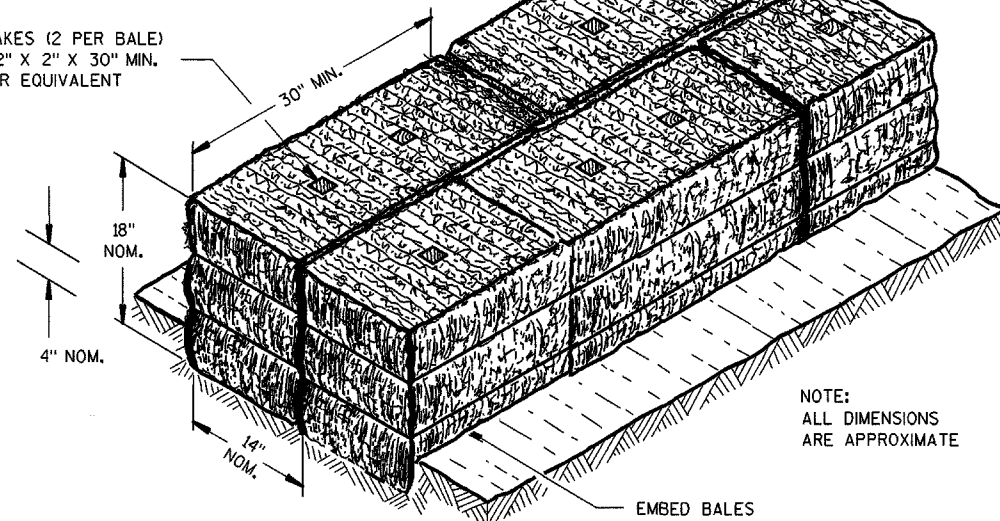
INLET PROTECTION, TYPE C (WITH CURB BOX)

INLET PROTECTION
TYPE A, B AND C

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
03/06/00
DATE
FHW
[Signature]
CHIEF ROADWAY DEVELOPMENT ENGINEER

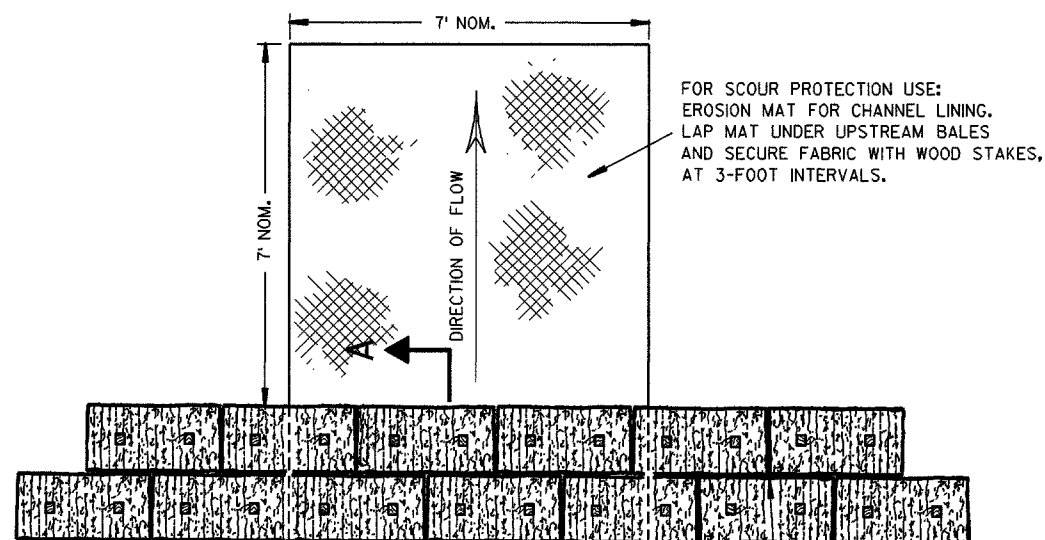
WOOD STAKES (2 PER BALE)
NOMINAL 2" X 2" X 30" MIN.
LENGTH OR EQUIVALENT



NOTE:
ALL DIMENSIONS
ARE APPROXIMATE

EMBED BALES

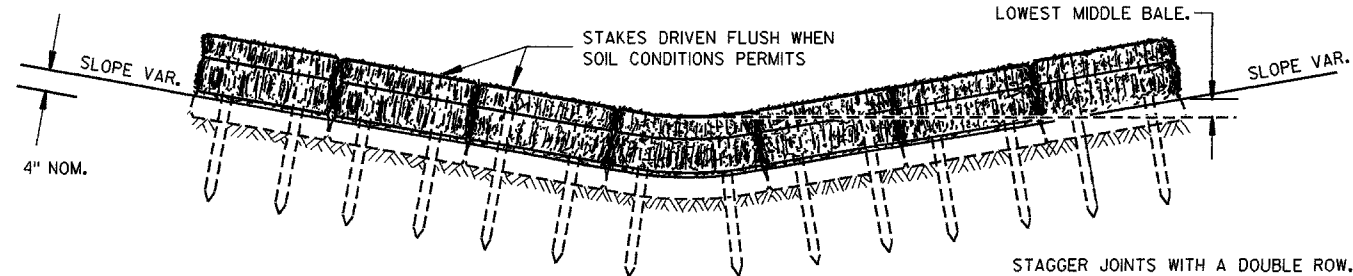
SECTION A-A



PLAN VIEW

STAGGER JOINTS BETWEEN ADJACENT
ROWS OF BALES.

BOTTOM ELEVATION OF END BALE SHALL
BE EQUAL TO OR GREATER THAN TOP OF
LOWEST MIDDLE BALE.



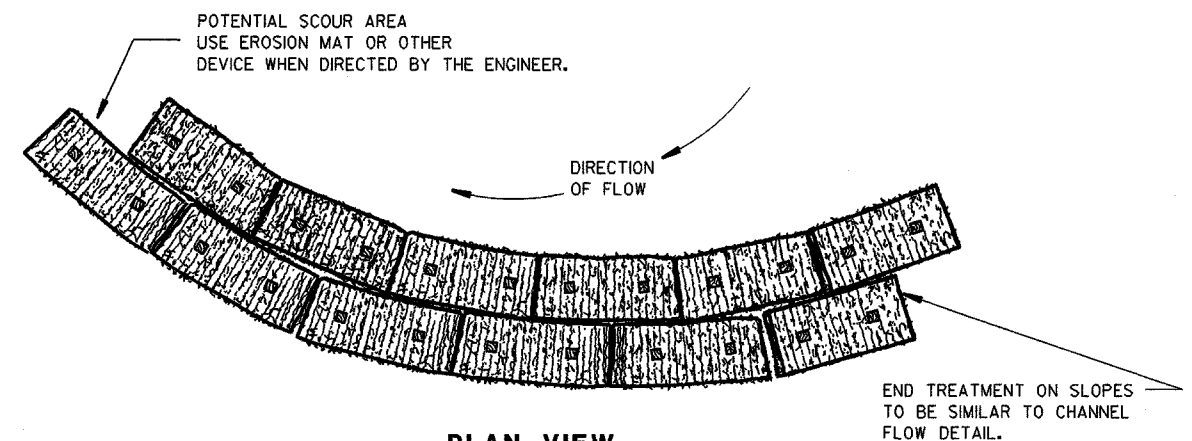
FRONT ELEVATION

TEMPORARY DITCH CHECK USING EROSION BALES ①

GENERAL NOTES

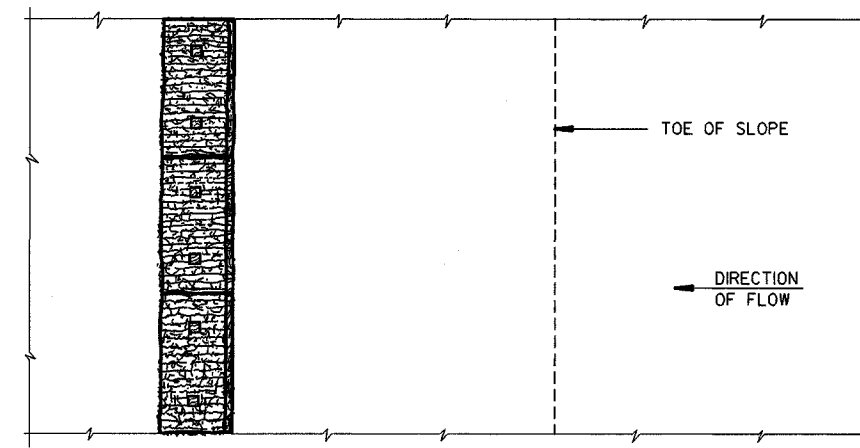
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

- ① TEMPORARY DITCH CHECKS EITHER EROSION BALES OR MANUFACTURED SHALL BE PAID FOR UNDER THE BID ITEM OF TEMPORARY DITCH CHECK. THE DEPARTMENT WILL NOT PAY FOR TEMPORARY DITCH CHECKS CONSTRUCTED OF A SINGLE ROW OF EROSION BALES.

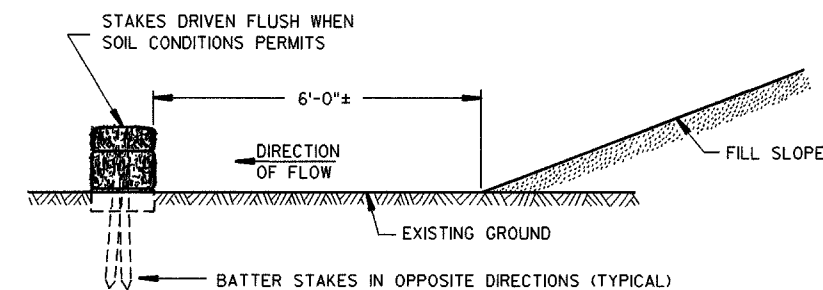


PLAN VIEW

WHEN ALTERING THE DIRECTION OF FLOW



PLAN VIEW



FRONT ELEVATION

WHEN EXISTING GROUND SLOPES AWAY FROM FILL SLOPE

EROSION BALES FOR SHEET FLOW

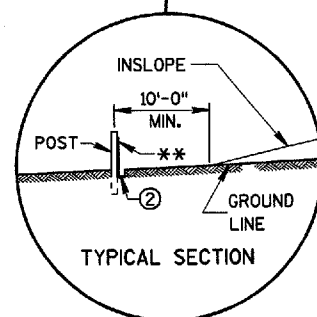
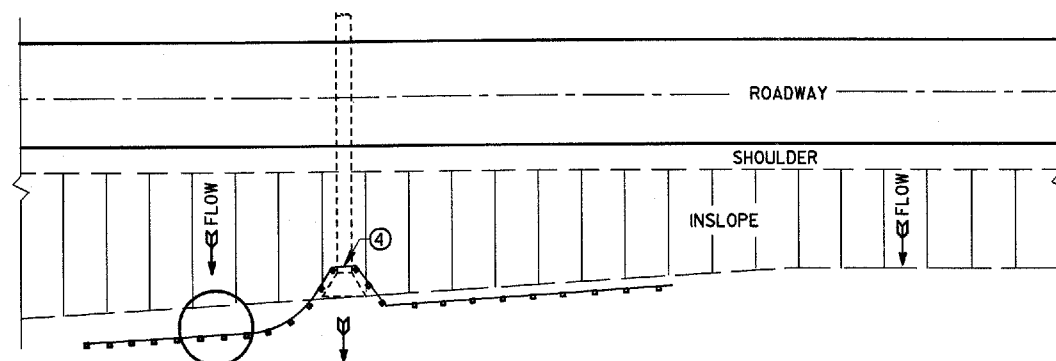
TYPICAL INSTALLATIONS OF
EROSION BALES / TEMPORARY
DITCH CHECKS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

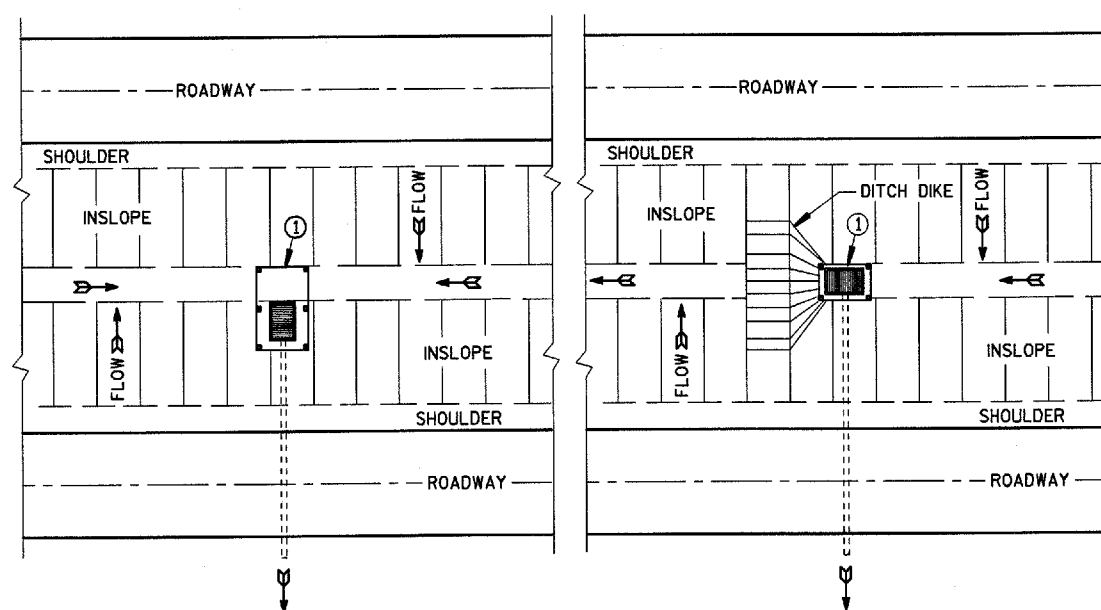
APPROVED
6/4/02
DATE

CHIEF ROADWAY DEVELOPMENT ENGINEER

FHWA



PLAN VIEW
TYPICAL APPLICATION OF SILT FENCE



SITUATION 1

SITUATION 2

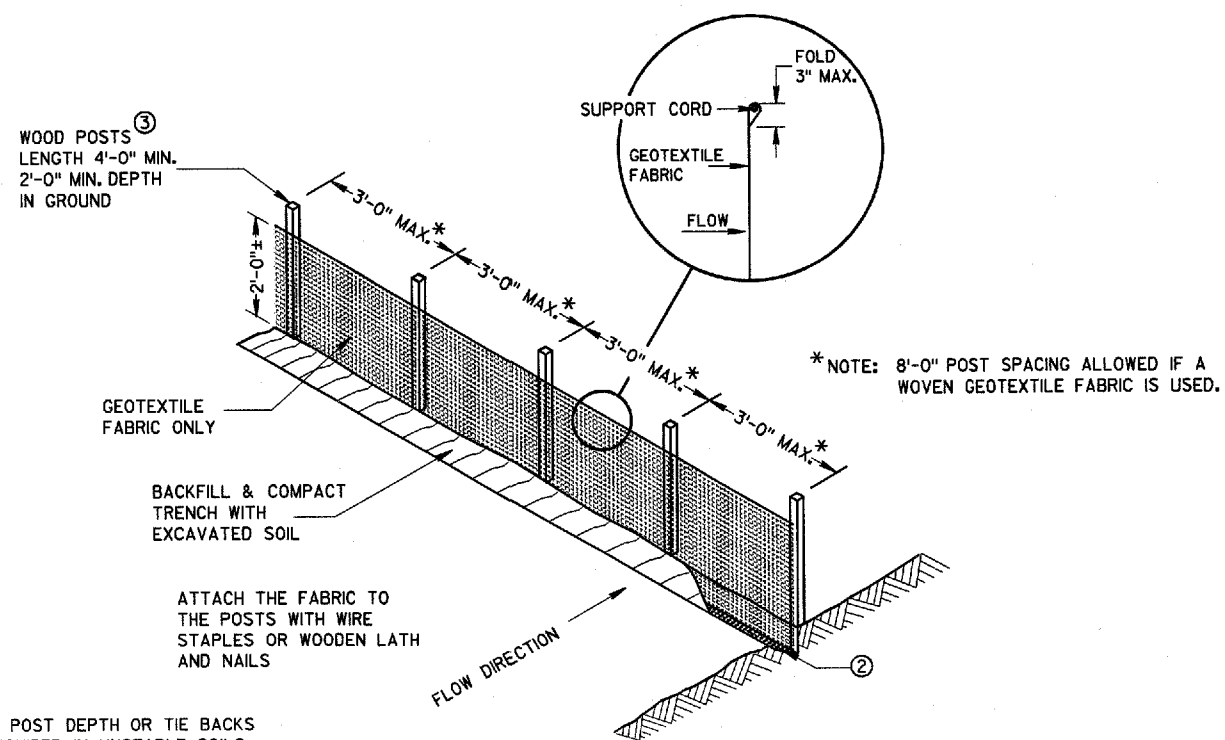
PLAN VIEW

SILT FENCE AT MEDIAN SURFACE DRAINS

GENERAL NOTES

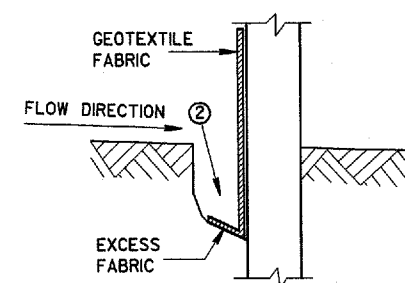
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

- ① HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.
- ② TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.
- ③ WOOD POSTS SHALL BE A MINIMUM SIZE OF 1 1/8" X 1 1/8" OF OAK OR HICKORY.
- ④ SILT FENCE TO EXTEND ACROSS THE TOP OF THE PIPE.

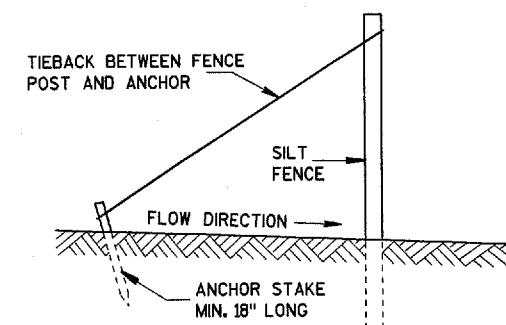


NOTE: ADDITIONAL POST DEPTH OR TIE BACKS MAY BE REQUIRED IN UNSTABLE SOILS

SILT FENCE



TRENCH DETAIL

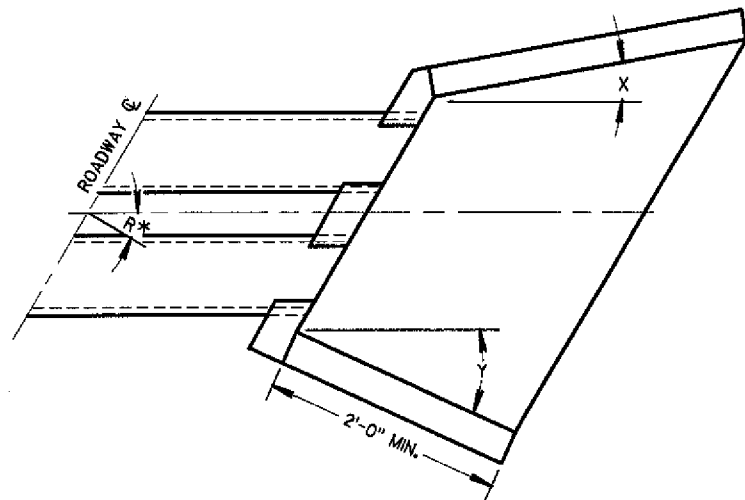


SILT FENCE TIE BACK
(WHEN REQUIRED BY THE ENGINEER)

SILT FENCE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
03/06/00
DATE
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA



WINGWALL ANGLE DETAILS

INLET			OUTLET		
R*	X	Y	R*	X	Y
0 - 7°	30°	30°	0 - 15°	15°	15°
8 - 22°	25°	"	16 - 45°	10°	"
23 - 37°	20°	"	46 - 75°	5°	"
38 - 52°	15°	"	OVER 75°	0°	"
53 - 67°	10°	"			
68 - 82°	5°	"			
OVER 82°	0°	"			

*R = NUMBER OF DEGREES RIGHT OR LEFT HAND FORWARD

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.

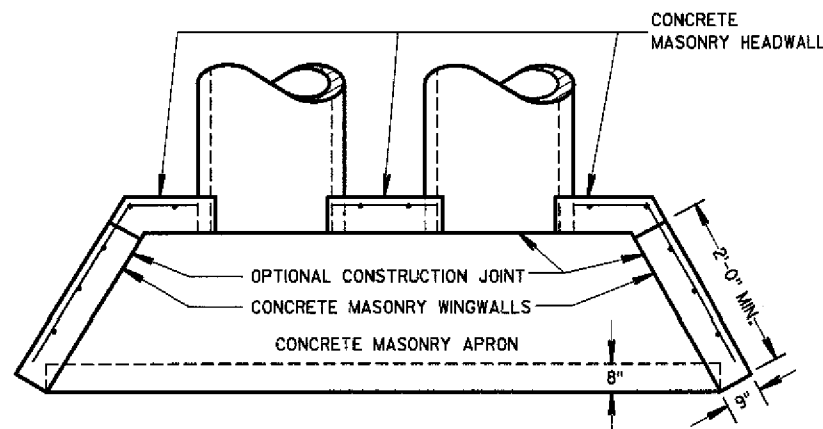
FILL SLOPES FLATTER THAN 2 1/2:1 SHALL BE WARPED TO MEET THE TOP OF THE WINGWALLS.

ALL STEEL REINFORCEMENT AND WELDED STEEL WIRE FABRIC SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE NOTED.

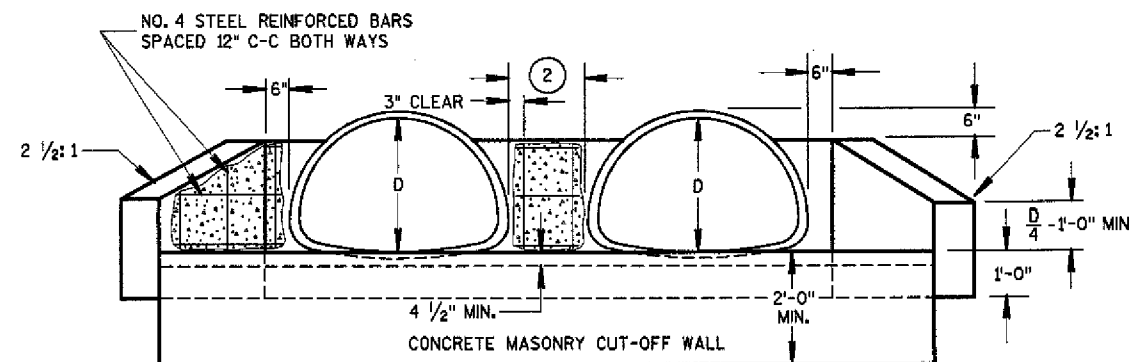
① MINIMUM REINFORCEMENT SHALL BE 6" X 6" - W4.0 X W4.0 OR NO. 3 BARS SPACED 12" C-C IN BOTH DIRECTIONS.

② THE SPACE BETWEEN PIPES SHALL BE AS FOLLOWS:

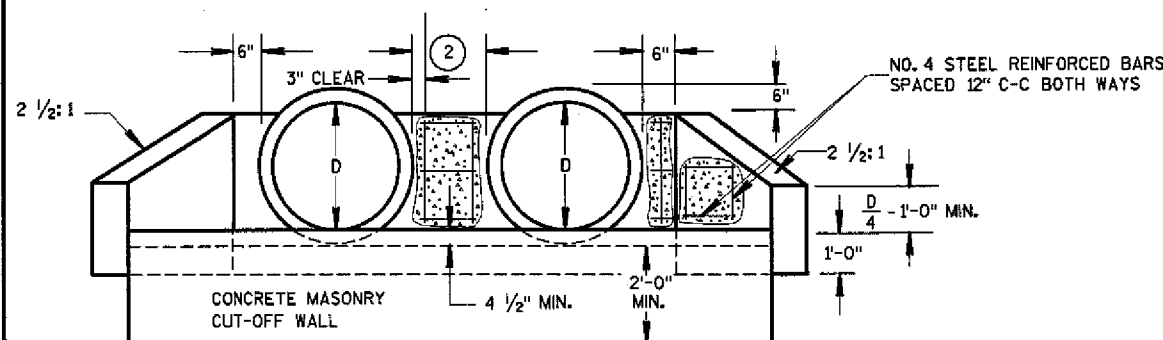
DIAMETER OR SPAN	SPACE
UP TO AND INCLUDING 48"	2'-0"
OVER 48" TO 72"	1/2 DIA. OR SPAN
OVER 72"	3'-0"



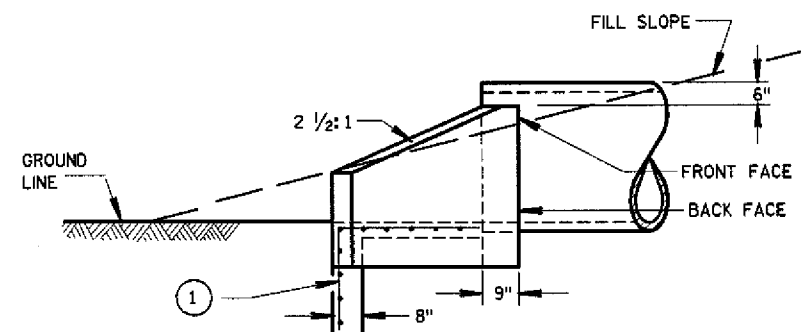
PLAN VIEW
CULVERT PIPE AND PIPE ARCH



END ELEVATION
PIPE ARCH



END ELEVATION
CULVERT PIPE



SIDE ELEVATION
CULVERT PIPE AND PIPE ARCH

CONCRETE MASONRY ENDWALLS FOR
CULVERT PIPE AND PIPE ARCH

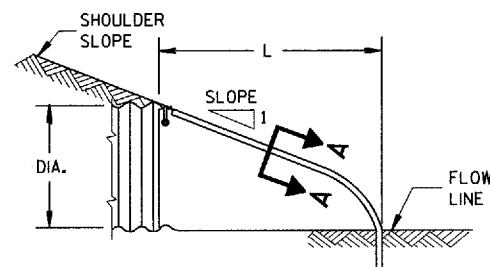
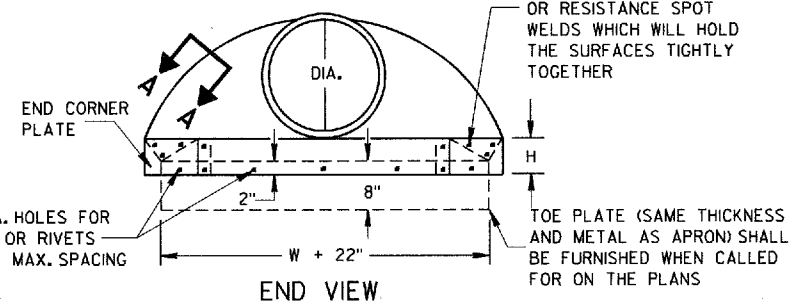
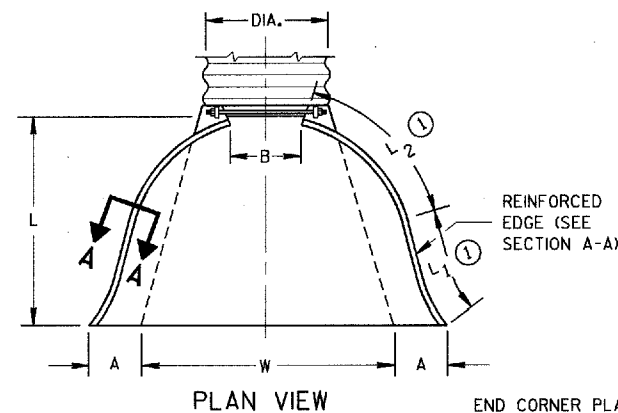
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
9/14/98
DATE
Ray Z. Krumm
CHIEF ROADWAY DEVELOPMENT ENGINEER

FHWA

METAL APRON ENDWALLS											
PIPE DIA. (IN.)	MIN. THICK. (Inches)		DIMENSIONS (Inches)						APPROX. SLOPE	BODY	
	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 ①	L2 ①			
12	.064	.060	6	6	6	21	12	17 1/2	2 1/2 to 1	1 Pc.	
15	.064	.060	7	8	6	26	14	21 3/4	2 1/2 to 1	1 Pc.	
18	.064	.060	8	10	6	31	15	28 1/4	2 1/2 to 1	1 Pc.	
21	.064	.060	9	12	6	36	18	29 5/8	2 1/2 to 1	1 Pc.	
24	.064	.075	10	13	6	41	18	37 1/4	2 1/2 to 1	1 Pc.	
30	.079	.075	12	16	8	51	18	52 1/4	2 1/2 to 1	1 Pc.	
36	.079	.105	14	19	9	60	24	59 3/4	2 1/2 to 1	2 Pc.	
42	.109	.105	16	22	11	69	24	75 5/8	2 1/2 to 1	2 Pc.	
48	.109	.105	18	27	12	78	24	81	2 1/4 to 1	3 Pc.	
54	.109	.105	18	30	12	84	30	85 1/2	2 1/4 to 1	3 Pc.	
60	.109x	.105x	18	33	12	87	—	—	2 to 1	3 Pc.	
66	.109x	.105x	18	36	12	87	—	—	2 to 1	3 Pc.	
72	.109x	.105x	18	39	12	87	—	—	2 to 1	3 Pc.	
78	.109x	.105x	18	42	12	87	—	—	1 1/2 to 1	3 Pc.	
84	.109x	.105x	18	45	12	87	—	—	1 1/2 to 1	3 Pc.	
90	.109x	.105x	18	37	12	87	—	—	1 1/2 to 1	3 Pc.	
96	.109x	.105x	18	35	12	87	—	—	1 1/2 to 1	3 Pc.	

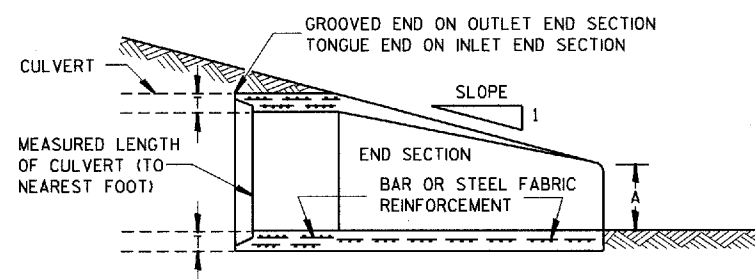
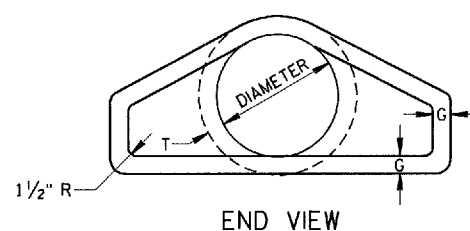
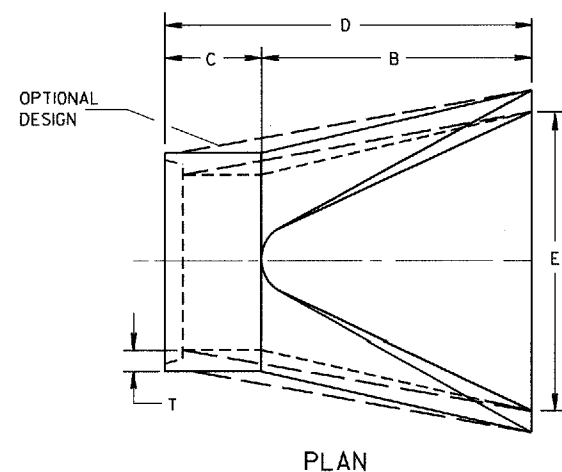
* EXCEPT CENTER PANEL
SEE GENERAL NOTES



SIDE ELEVATION
METAL ENDWALLS

REINFORCED CONCRETE APRON ENDWALLS											
PIPE DIA. (IN.)	DIMENSIONS (Inches)							APPROX. SLOPE			
	T	A	B	C	D	E	G				
12	2	4	24	48 1/8	72 1/8	24	2	3 to 1			
15	2 1/4	6	27	46	73	30	2 1/4	3 to 1			
18	2 1/2	9	27	46	73	36	2 1/2	3 to 1			
21	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	3 to 1			
24	3	9 1/2	43 1/2	30	73 1/2	48	3	3 to 1			
27	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	3 to 1			
30	3 1/2	12	54	19 3/4	73 1/2	60	3 1/2	3 to 1			
36	4	15	63	34 3/4	97 3/4	72	4	3 to 1			
42	4 1/2	21	63	35	98	78	4 1/2	3 to 1			
48	5	24	72	26	98	84	5	3 to 1			
54	5 1/2	27	65	33 1/4-35	98 1/4-100	90	5 1/2	2 1/2 to 1			
60	6	30-35	60	39	99	96	5	2 to 1			
66	6 1/2	34-36	72-78	21-27	99	102	5 1/2	2 to 1			
72	7	36-38	78	21	99	108	6	2 to 1			
78	7 1/2	38-40	78	21	99	114	6 1/2	2 to 1			
84	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2 to 1			
90	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	1 1/2 to 1			

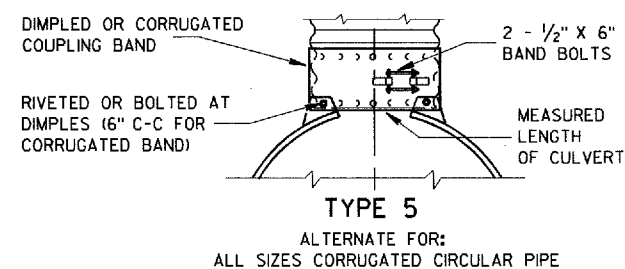
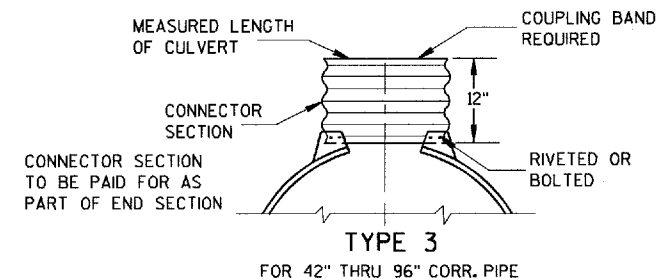
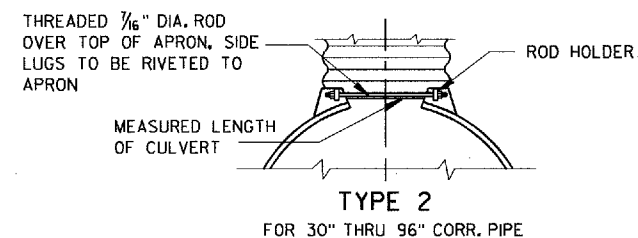
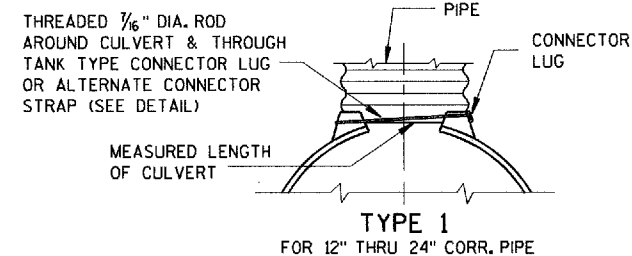
* MINIMUM
** MAXIMUM



LONGITUDINAL SECTION
CONCRETE ENDWALLS

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



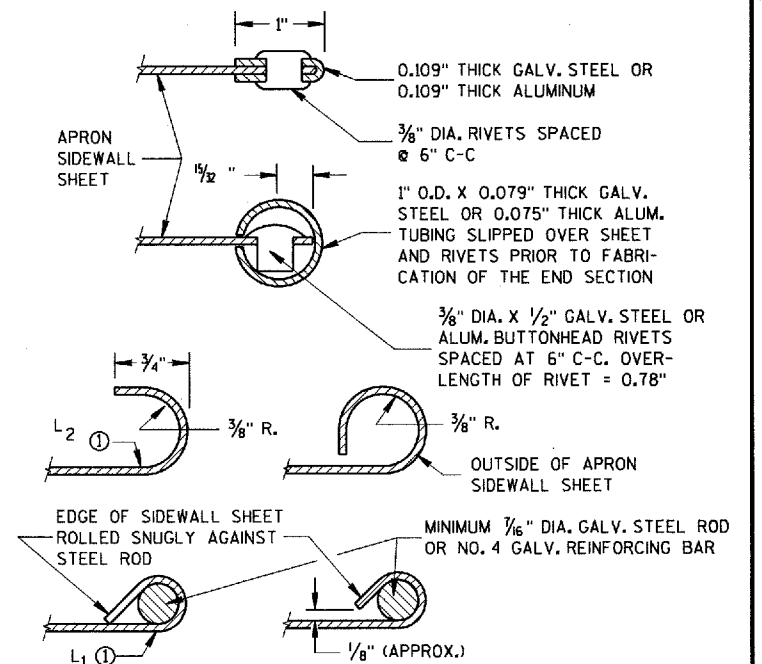
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

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.

CONNECTION DETAILS



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.

CONCRETE CULVERT ENDWALLS MAY NOT BE USED WITH GALVANIZED STEEL OR ALUMINUM CULVERT PIPE OR VISE VERSA. GALVANIZED STEEL OR ALUMINUM ENDWALLS SHALL NORMALLY BE INSTALLED ON CULVERT PIPE OF THE SAME METAL.

ALL THREE PIECE STEEL APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.109" SIDES AND 0.138" CENTER PANELS. ALL THREE PIECE ALUMINUM APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.105" SIDES AND 0.134" CENTER PANELS. THE WIDTH OF CENTER PANELS SHALL BE GREATER THAN 20 PERCENT OF THE PIPE PERIMETER.

LAP SEAMS SHALL BE TIGHTLY JOINED BY GALVANIZED RIVETS OR BOLTS FOR STEEL UNITS AND ALUMINUM RIVETS AND BOLTS FOR ALUMINUM UNITS. FOR THE 60" THROUGH 96" DIAMETER APRON ENDWALL SIZES, THE REINFORCED EDGES AND CENTER PANEL SEAMS SHALL BE FURTHER REINFORCED WITH GALVANIZED STEEL OR ALUMINUM STIFFENER ANGLES. THE ANGLES SHALL BE ATTACHED BY GALVANIZED NUTS AND BOLTS FOR STEEL UNITS AND ALUMINUM NUTS AND BOLTS FOR ALUMINUM UNITS.

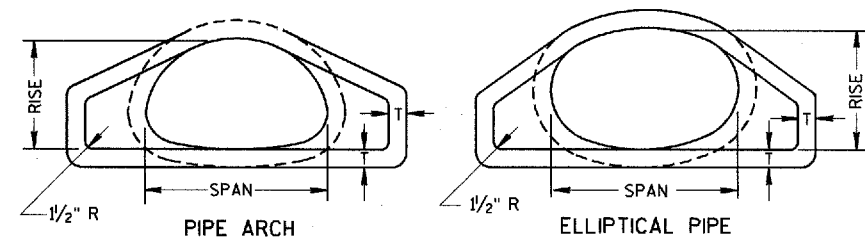
WHERE TWO OR MORE PIPES WITH APRON ENDWALLS ARE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY A DISTANCE SUFFICIENT TO PROVIDE A MINIMUM CLEARANCE OF 6 INCHES BETWEEN APRON ENDWALLS.

① FOR PIPE SIZES UP TO 60" DIAMETER, A 180° ROLLED EDGE MAY BE USED INSTEAD OF STEEL ROD REINFORCEMENT. SEE SECTION A-A.

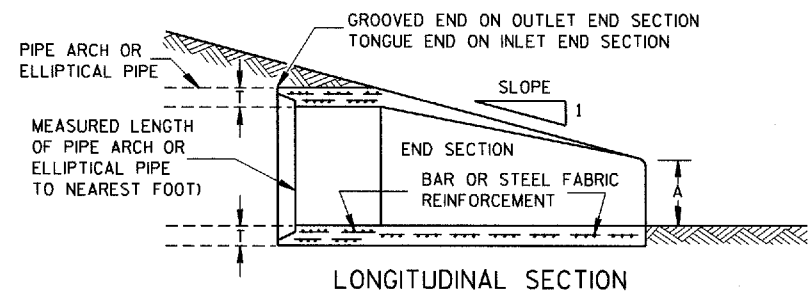
APRON ENDWALLS FOR CULVERT PIPE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
11/30/94
DATE
FHW
CHIEF ROADWAY DEVELOPMENT ENGINEER

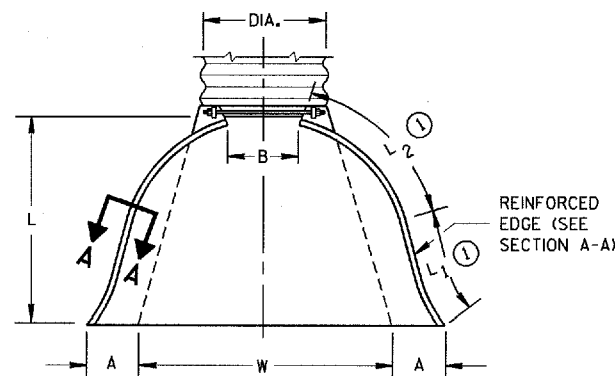


END VIEW

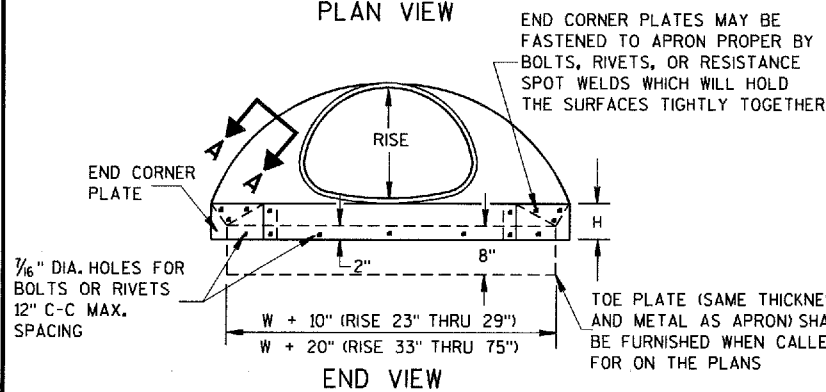


LONGITUDINAL SECTION

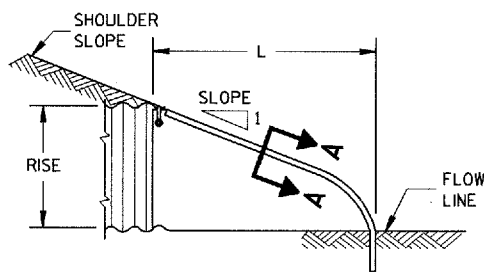
CONCRETE ENDWALLS



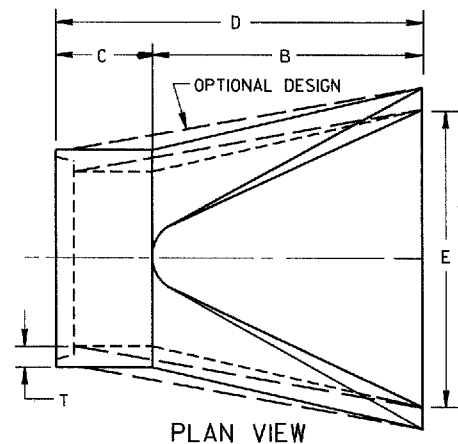
PLAN VIEW



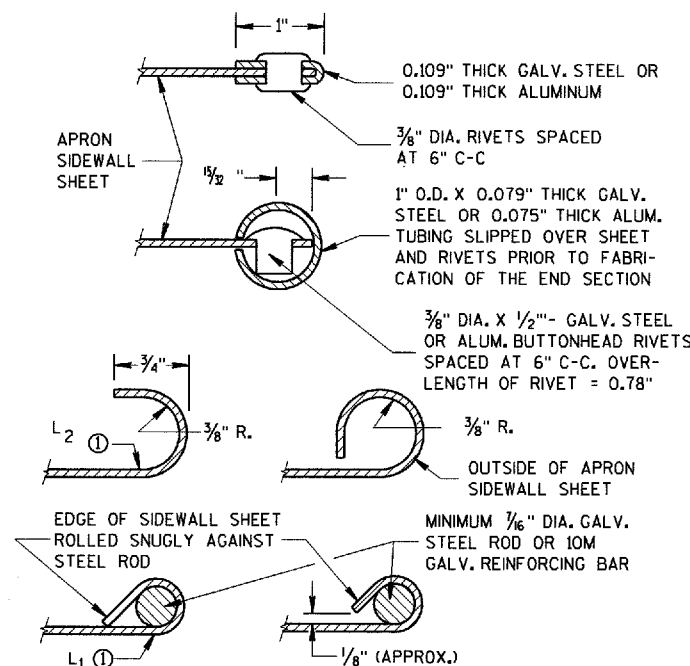
END VIEW



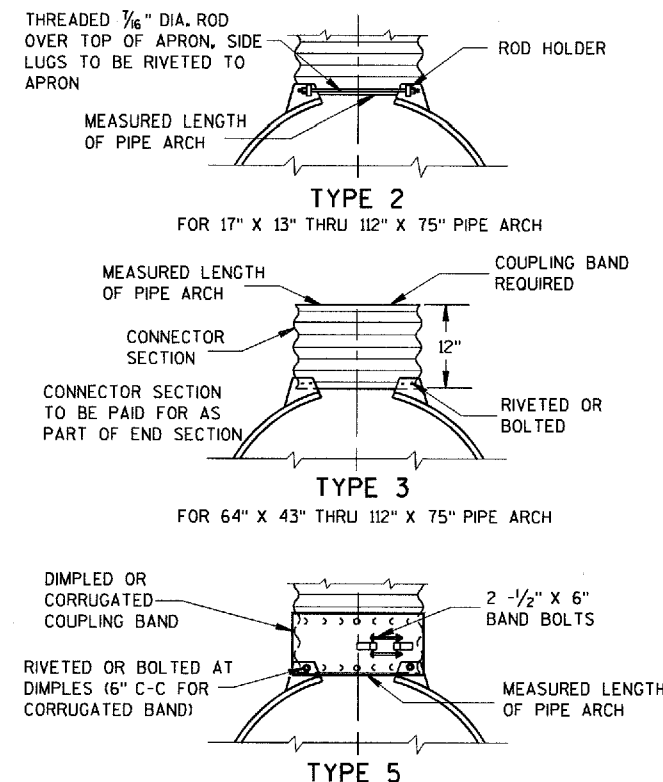
SIDE ELEVATION
METAL ENDWALLS



PLAN VIEW



SECTION A-A



NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL,
AND CORRUGATED BAND FITS INSIDE ENDWALL.

CONNECTION DETAILS

2- 2/3" x 1/2" CORRUGATIONS													
EQUIV. DIA. (Inches)	(Inches)		MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE	BODY
	SPAN	RISE	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1/2")	L1 ①	L2 ①	W (±2")		
15	17	13	.064	.060	7	9	6	19	14	16	30	2 1/2 to 1	1 Pc.
18	21	15	.064	.060	7	10	6	23	14	19 3/8	36	2 1/2 to 1	1 Pc.
21	24	18	.064	.060	8	12	6	28	18	21 3/4	42	2 1/2 to 1	1 Pc.
24	28	20	.064	.060	9	14	6	32	18	27 1/2	48	2 1/2 to 1	1 Pc.
30	35	24	.079	.075	10	16	6	39	18	37 3/8	60	2 1/2 to 1	1 Pc.
36	42	29	.079	.075	12	18	8	46	24	45 3/8	75	2 1/2 to 1	1 Pc.
42	49	33	.109	.105	13	21	9	53	24	54 3/4	85	2 1/2 to 1	2 Pc.
48	57	38	.109	.105	18	26	12	63	24	68	90	2 1/2 to 1	3 Pc.
54	64	43	.109	.105	18	30	12	70	24	72 3/4	102	2 1/2 to 1	3 Pc.
60	71	47	.109*	.105*	18	33	12	77	30	82 1/4	114	2 1/2 to 1	3 Pc.
66	77	52	.109*	.105*	18	36	12	77	—	—	126	2 to 1	3 Pc.
72	83	57	.109*	.105*	18	39	12	77	—	—	138	2 to 1	3 Pc.

3" X 1" CORRUGATIONS													
EQUIV. DIA. (Inches)	(Inches)		MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE	BODY
	SPAN	RISE	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1/2")	L1 ①	L2 ①	W (±2")		
48	53	41	.109	.105	18	26	12	63	24	72 3/4	90	2 1/2 to 1	2 Pc.
54	60	46	.109	.105	18	30	12	70	30	82 1/4	102	2 to 1	2 Pc.
60	66	51	.109*	.105*	18	33	12	77	—	—	114	1 1/2 to 1	3 Pc.
66	73	55	.109*	.105*	18	36	12	77	—	—	126	1 1/2 to 1	3 Pc.
72	81	59	.109*	.105*	18	39	12	77	—	—	138	2 to 1	3 Pc.
78	87	63	.109*	.105*	22	38	12	77	—	—	148	1 1/2 to 1	3 Pc.
84	95	67	.109*	.105*	22	34	12	77	—	—	162	1 1/2 to 1	3 Pc.
90	103	71	.109*	.105*	22	38	12	77	—	—	174	1 1/2 to 1	3 Pc.
96	112	75	.109*	.105*	24	40	12	77	—	—	174	1 1/2 to 1	3 Pc.

NOTE: ALL SPLICES TO BE LAP RIVETED OR BOLTED.

* EXCEPT CENTER PANEL
SEE GENERAL NOTES

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.

CONCRETE APRON ENDWALLS MAY NOT BE USED WITH GALVANIZED STEEL OR ALUMINUM CULVERT PIPE OR VISE VERSA. GALVANIZED STEEL OR ALUMINUM APRON ENDWALLS SHALL NORMALLY BE INSTALLED ON CULVERT PIPE OF THE SAME METAL.

ALL THREE PIECE STEEL APRON ENDWALLS FOR 66" X 51" PIPE ARCH AND LARGER SHALL HAVE 0.109" SIDES AND 0.138" CENTER PANELS. ALL THREE PIECE ALUMINUM APRON ENDWALLS FOR 66" X 51" PIPE ARCH AND LARGER SHALL HAVE 0.105" SIDES AND 0.134" CENTER PANELS. THE WIDTH OF CENTER PANELS SHALL BE GREATER THAN 20 PERCENT OF THE PIPE ARCH PERIMETER.

LAP SEAMS SHALL BE TIGHTLY JOINED BY GALVANIZED RIVETS OR BOLTS FOR STEEL UNITS AND ALUMINUM RIVETS AND BOLTS FOR ALUMINUM UNITS. FOR THE 77" X 52" THROUGH 112" X 75" APRON ENDWALL SIZES, THE REINFORCED EDGES AND CENTER PANEL SEAMS SHALL BE FURTHER REINFORCED WITH GALVANIZED STEEL OR ALUMINUM STIFFENER ANGLES. THE ANGLES SHALL BE ATTACHED BY GALVANIZED NUTS AND BOLTS FOR STEEL UNITS AND ALUMINUM NUTS AND BOLTS FOR ALUMINUM UNITS.

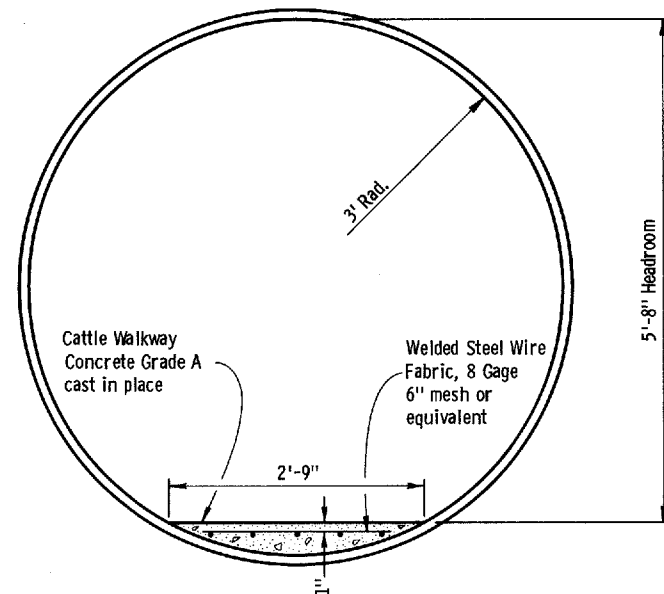
WHERE TWO OR MORE PIPES WITH APRON ENDWALLS ARE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY A DISTANCE SUFFICIENT TO PROVIDE A MINIMUM CLEARANCE OF 6 INCHES BETWEEN APRON ENDWALLS.

① FOR PIPE ARCH SIZES UP TO 73" X 55" A 180° ROLLED EDGE MAY BE USED INSTEAD OF STEEL ROD REINFORCEMENT. SEE SECTION A-A.

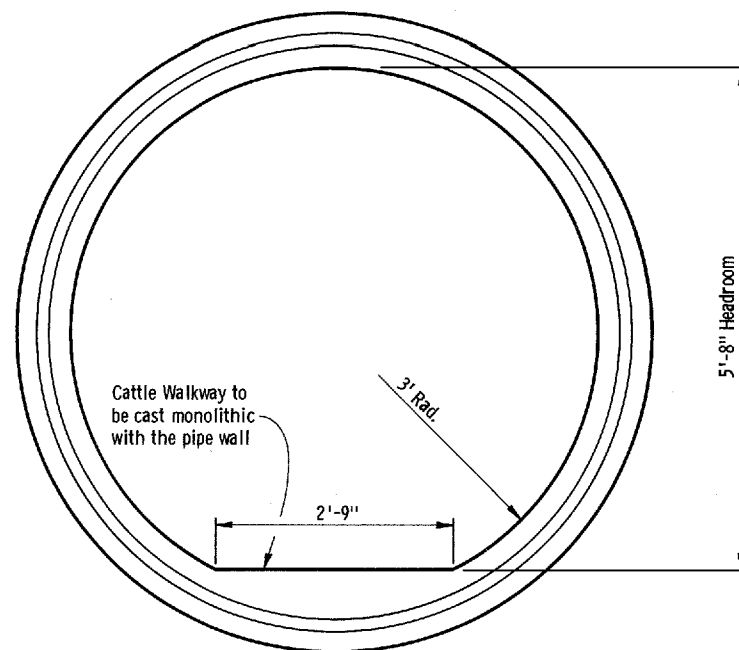
APRON ENDWALLS FOR PIPE ARCH AND ELLIPTICAL PIPE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

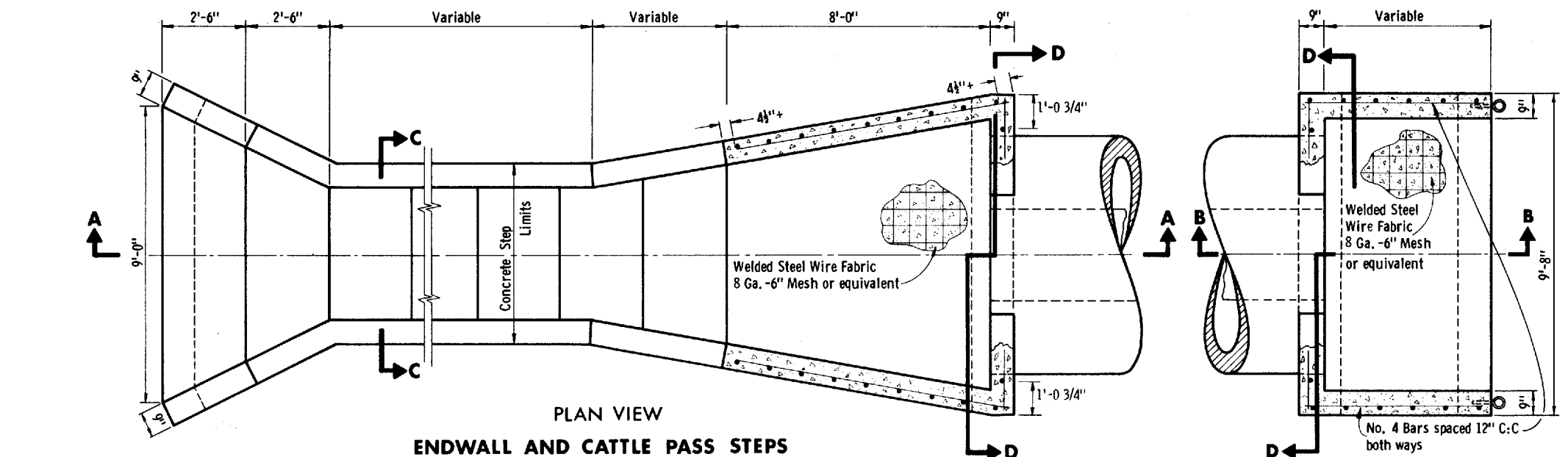
APPROVED
11/30/94
DATE
Roy L. Thompson
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA



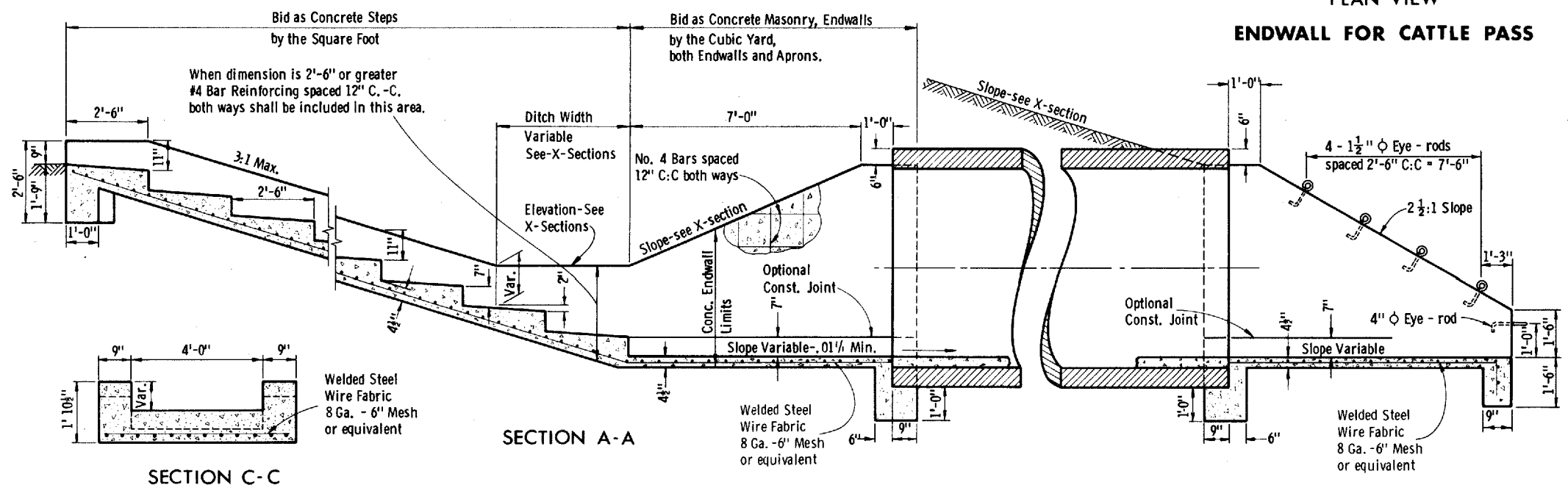
CROSS SECTION
CORRUGATED METAL PIPE CATTLE PASS



END VIEW
REINFORCED CONCRETE PIPE CATTLE PASS



PLAN VIEW
ENDWALL AND CATTLE PASS STEPS



PLAN VIEW
ENDWALL FOR CATTLE PASS

SECTION B - B

GENERAL NOTES

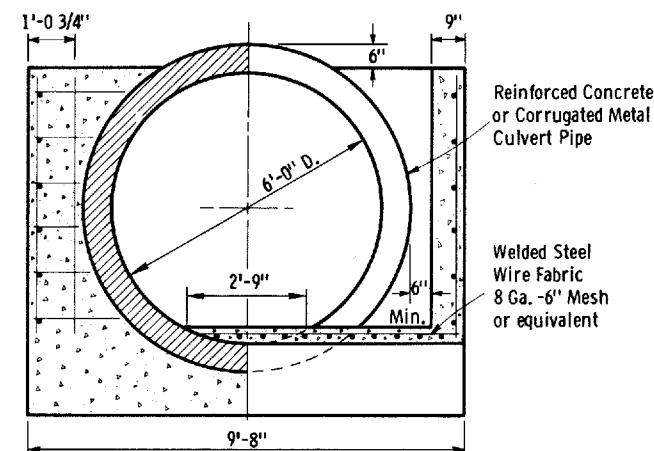
Details of construction, materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the Standard Specifications and the applicable Special Provisions.

All steel reinforcement in Endwalls and Cattle Pass Steps shall be embedded 2 inches clear unless otherwise noted.

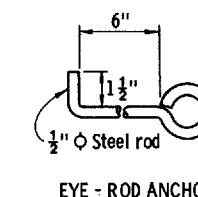
All steel reinforcement or fabric used as shown above shall be incidental to the bid item of which it is an integral part.

Eye-rods for fence connections shall be provided by the contractor as an incidental to the bid item of CONCRETE MASONRY, ENDWALLS and shall be galvanized.

Concrete used for the Cattle Walkway within the pipe shall be incidental to the bid item of PIPE CATTLE PASS.



SECTION D - D



EYE - ROD ANCHOR

DETAILS FOR PIPE CATTLE PASS, CONCRETE ENDWALLS AND STEPS

State of Wisconsin
Department of Transportation
Division of Highways

RECOMMENDED FOR APPROVAL

6-6-75

DATE

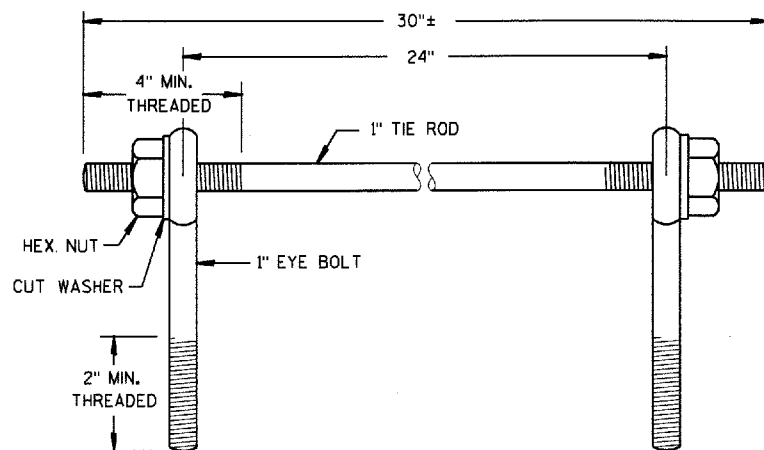
APPROVED

6-6-75

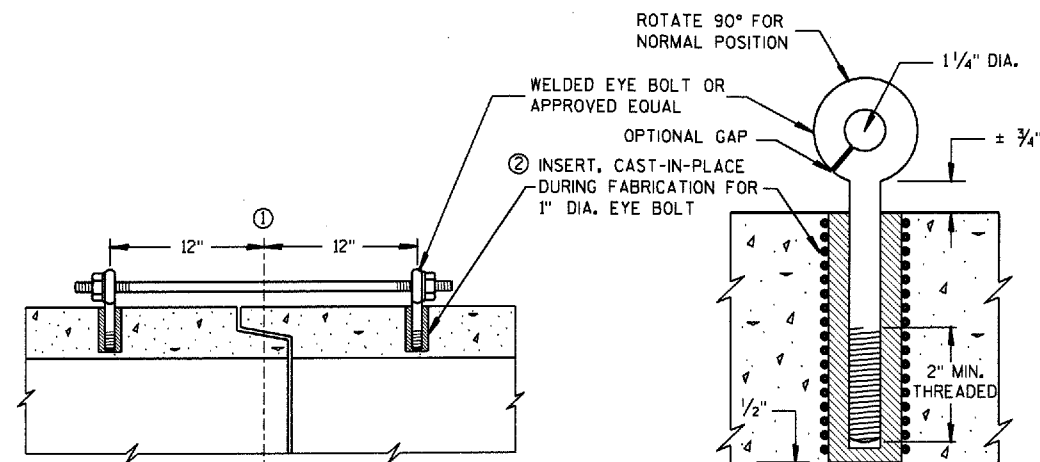
DATE

J. C. Hennrich
CHIEF OF FACILITIES DEVELOPMENT

W. J. Sieder
STATE HIGHWAY ENGINEER



EYE BOLTS AND TIE ROD



(CAST-IN-PLACE THREADED INSERT)
LONGITUDINAL SECTIONS

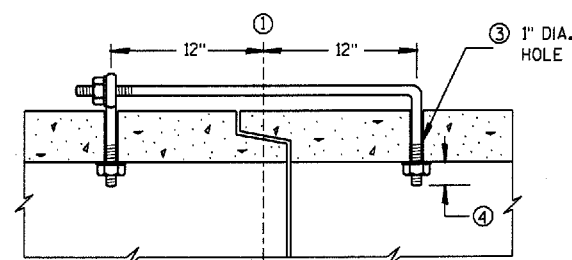
GENERAL NOTES

CONCRETE CULVERT PIPE SHALL BE TIED TOGETHER IN THE MANNER ILLUSTRATED BY THIS DETAIL AT LOCATIONS DESIGNATED ON THE PLAN. THE CONTRACTOR MAY USE EITHER ALTERNATE 1, 2 OR 3 FOR DRAINAGE STRUCTURES. ONLY ALTERNATE 1 AND 3 MAY BE USED FOR CATTLE PASSES. UNLESS OTHERWISE STATED IN THE CONTRACT THE MATERIALS, FABRICATION AND WORK NECESSARY TO TIE CULVERT PIPE AS INDICATED ON THE PLANS AND BY THIS DETAIL WILL BE CONSIDERED INCIDENTAL TO CULVERT PIPE, REINFORCED CONCRETE CULVERT PIPE, OR REINFORCED CONCRETE PIPE CATTLE PASS.

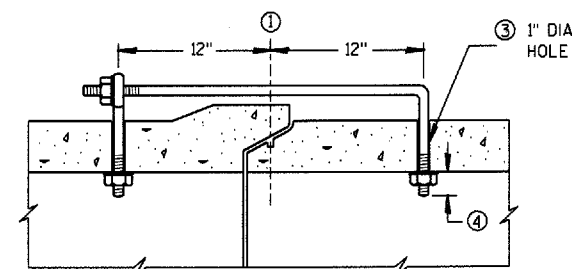
DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR JOINT TIES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

- ① ϕ OF TONGUE AND GROOVE OR BELL AND SPIGOT JOINTS.
- ② THE INSIDE OF THE THREADED INSERTS SHALL BE CLEAN TO ALLOW THE INSERTION OF THREADED EYE BOLTS.
- ③ HOLES SHALL BE CAST-IN-PLACE OR DRILLED 12" FROM ϕ OF TONGUE AND GROOVE.
- ④ BOLT PROJECTION INSIDE OF PIPE SHALL NOT EXCEED 2".
- ⑤ ROD DIAMETER + 1 INCH.
- ⑥ LENGTH ADEQUATE TO EXTEND TO WITHIN $\frac{1}{2}$ INCH OF THE INNER SURFACE OF THE PIPE.

EYE BOLT AND TIE ROD ASSEMBLY (ALTERNATE NO. 1)



(TONGUE & GROOVE PIPE)



(MODIFIED BELL PIPE)
LONGITUDINAL SECTION

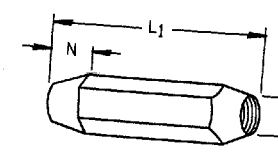
EYE BOLT DIMENSION TABLE

PIPE SIZE	L = LENGTH	
	TONGUE & GROOVE PIPE	MODIFIED BELL PIPE
18" TO 24"	4 $\frac{1}{2}$ "	6 $\frac{1}{4}$ "
30"	5"	7"
36"	5 $\frac{1}{2}$ "	7"
42"	6"	
48"	6 $\frac{1}{2}$ "	
60"	7 $\frac{1}{2}$ "	
66"	8"	

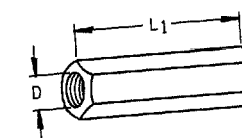
ADJUSTABLE TIE ROD TABLE

PIPE DIAMETER	TIE ROD DIAMETER	D	L ₁	N
12-60	$\frac{5}{8}$	$\frac{5}{8}$	5	$\frac{1}{2}$
66-84	$\frac{3}{4}$	$\frac{3}{4}$	5	$\frac{1}{2}$
90-108	1	1	7	$1\frac{1}{8}$

DIMENSIONS SHOWN ARE IN INCHES



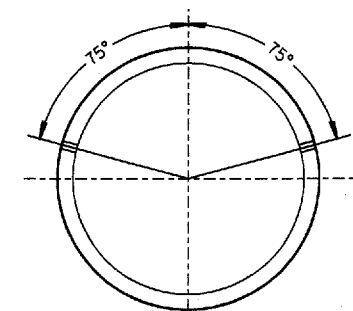
TAPERED



PLAIN

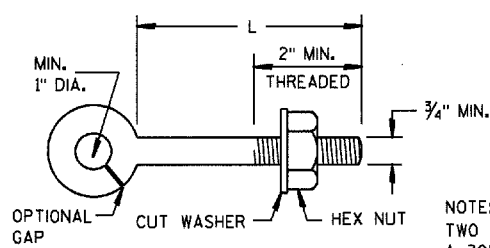
RIGHT AND LEFT THREADS

SLEEVE NUTS



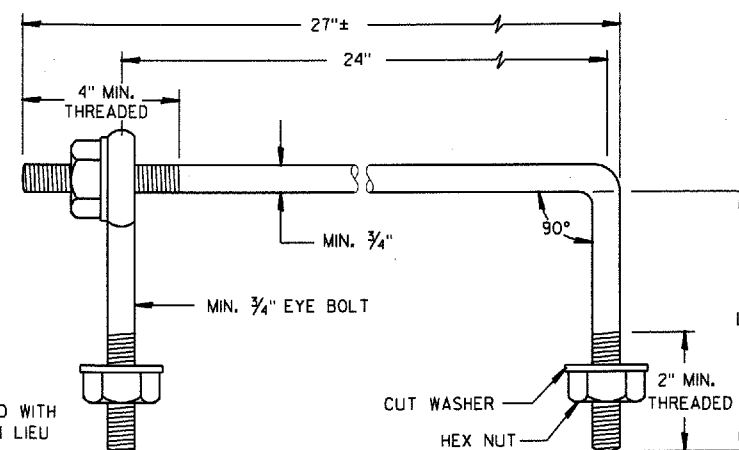
PLACEMENT OF (2) CAST-IN-PLACE INSERTS OR HOLES DURING FABRICATION FOR PIPE SECTIONS REQUIRING TIE RODS

TRANSVERSE SECTION



EYE BOLT

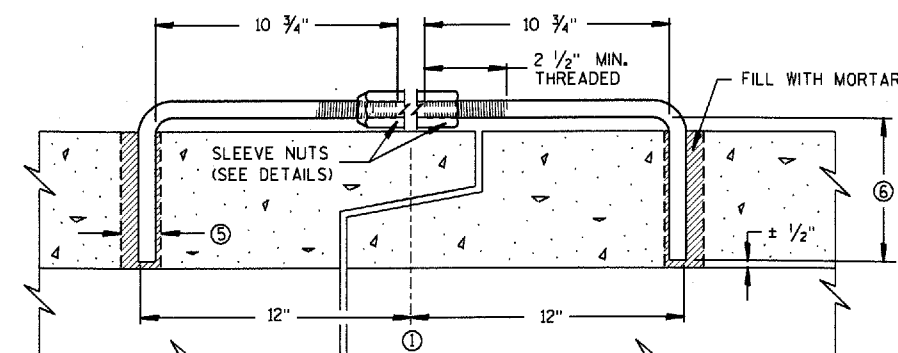
NOTE:
TWO EYE BOLTS MAY BE USED WITH A 30" LONG THREADED ROD IN LIEU OF THE 90° BENT TIE ROD.



EYE BOLT AND TIE ROD

(JOINT TIES FOR 18" TO 66" DIA. CONCRETE PIPE)

EYE BOLT AND TIE ROD ASSEMBLY (ALTERNATE NO. 2)



LONGITUDINAL SECTION

(JOINT TIES FOR 12" TO 108" DIA. CONCRETE PIPE)

ADJUSTABLE TIE ROD (ALTERNATE NO. 3)

JOINT TIES FOR CONCRETE PIPE

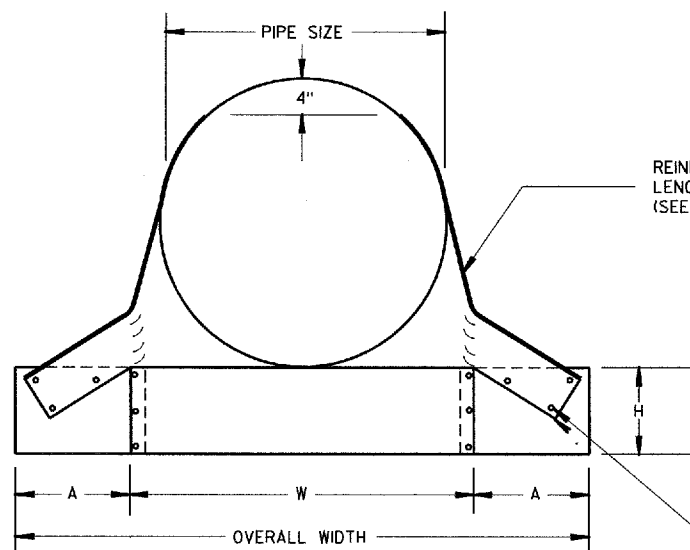
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

9/18/92
DATE

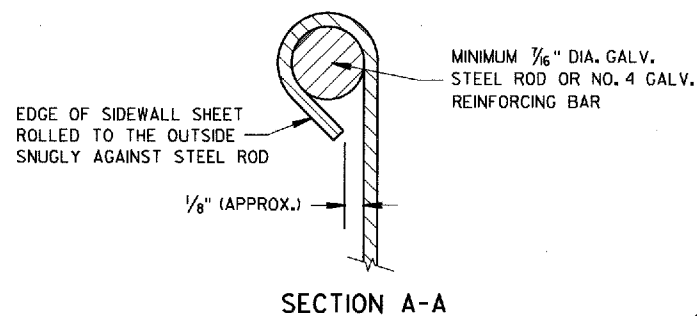
FHWA

STATE DESIGN ENGINEER FOR HWYS

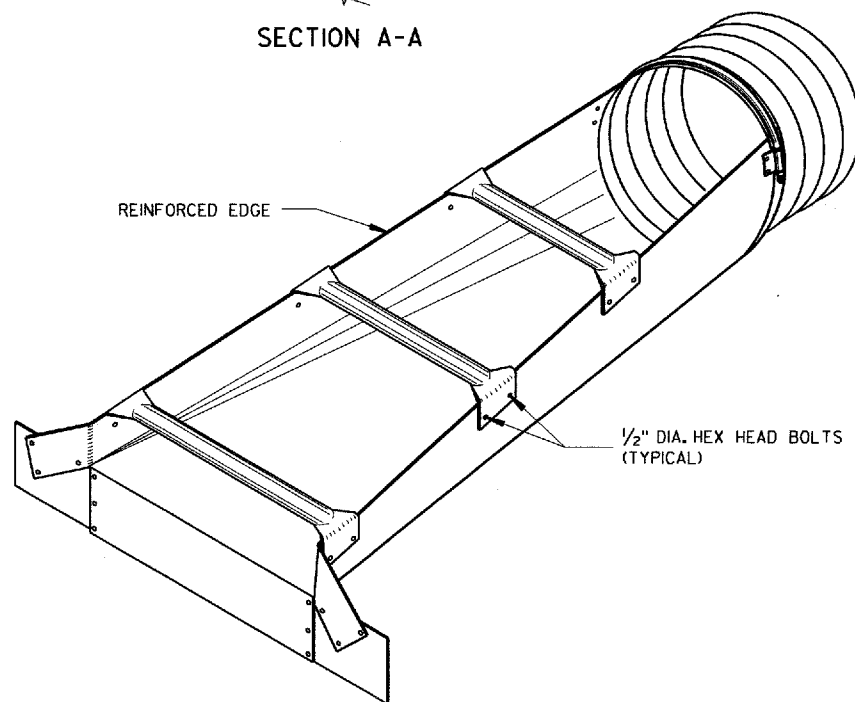


FRONT VIEW

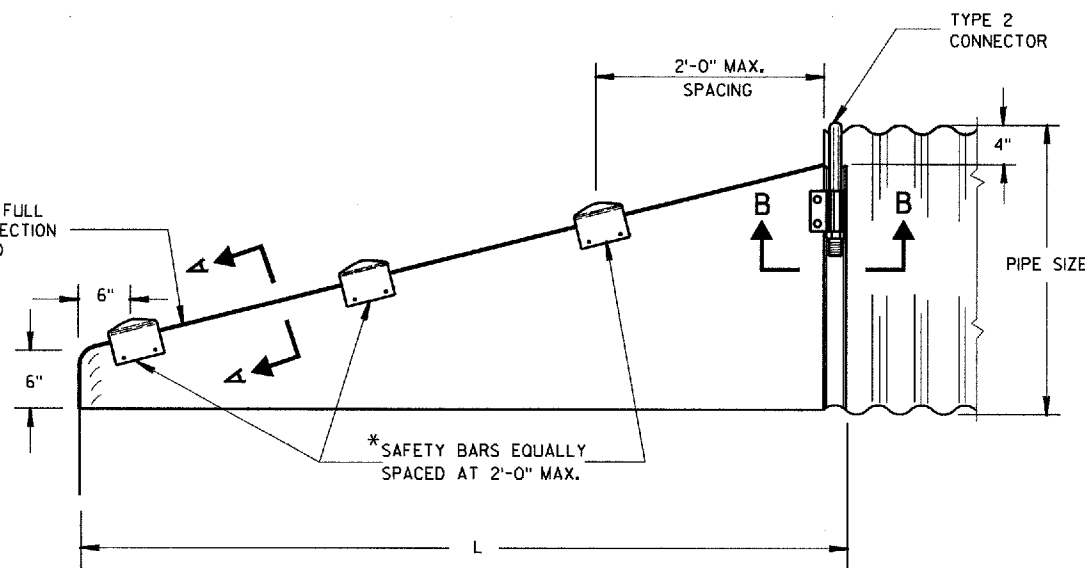
BOLTS, RIVETS, OR RESISTANCE SPOT WELDS WHICH WILL HOLD THE SURFACES TIGHTLY TOGETHER



SECTION A-A



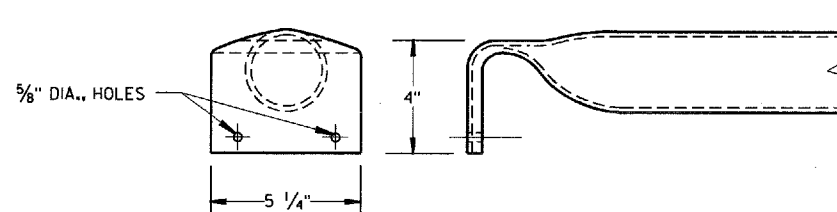
ISOMETRIC VIEW



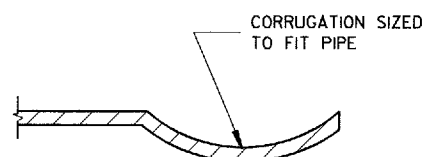
SIDE VIEW

*NOTE: THREE SAFETY BARS ARE SHOWN. ACTUAL NUMBER OF BARS REQUIRED AT A 2'-0" C-C MAX. SPACING WILL VARY DEPENDING ON THE LENGTH OF THE END SECTION.

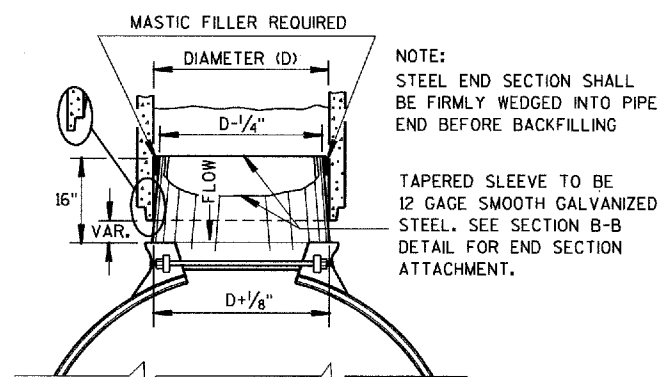
3" GALVANIZED PIPE, FLATTEN ENDS, THEN BEND OUTSIDE 4" TO MATCH END SECTION SIDES.



DETAIL OF SAFETY BAR



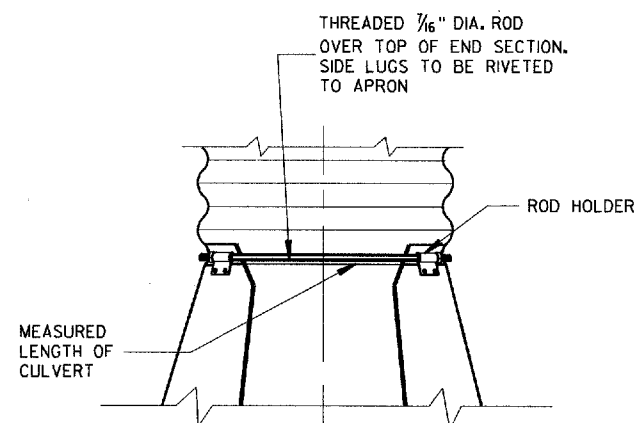
SECTION B-B



STEEL ADAPTER SLEEVE FOR CONCRETE PIPE

NOTE: STEEL END SECTION SHALL BE FIRMLY WEDGED INTO PIPE END BEFORE BACKFILLING

TAPERED SLEEVE TO BE 12 GAGE SMOOTH GALVANIZED STEEL. SEE SECTION B-B DETAIL FOR END SECTION ATTACHMENT.



TYPE 2 CONNECTION DETAIL

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.

SLOPED END SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS, SECTION 521 FOR STEEL APRON ENDWALLS.

SAFETY BARS SHALL BE FABRICATED FROM GALVANIZED STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A-53, GRADE B, SCHEDULE 40 OR APPROVED EQUAL.

STEEL APRON ENDWALLS FOR CULVERT PIPE

PIPE DIA. (IN.)	MIN. THICK. (Inches)	DIMENSIONS (Inches)				L DIMENSIONS	
		A	H	W	OVERALL WIDTH	SLOPE	LENGTH INCHES
15	.064	8	6	21	37	6:1	30
18	.064	8	6	24	40	6:1	48
21	.064	8	6	27	43	6:1	66
24	.064	8	6	30	46	6:1	84
30	.109	12	9	36	60	6:1	120
36	.109	12	9	42	66	6:1	156
42	.109	16	12	48	80	5.63 TO 1	180
48	.109	16	12	54	86	4.74 TO 1	180
54	.109	16	12	60	92	—	—

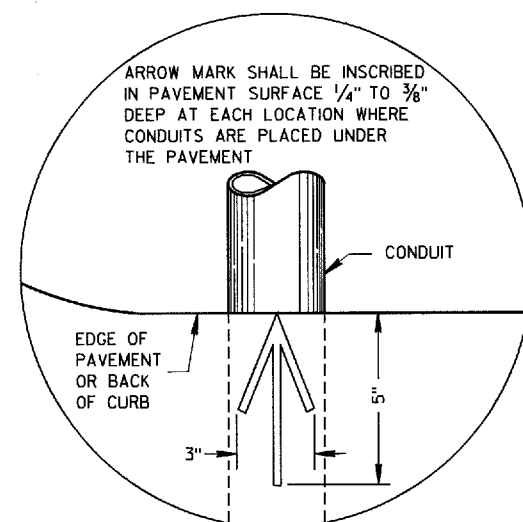
STEEL APRON ENDWALLS FOR PIPE ARCH

EQUIV. DIA. (Inches)	(Inches)		MIN. THICK. (Inches)	DIMENSIONS (Inches)				L DIMENSIONS	
	SPAN	RISE		A	H	W	OVERALL WIDTH	SLOPE	LENGTH INCHES
15	17	13	.064	8	6	23	39	6:1	18
18	21	15	.064	8	6	27	43	6:1	30
21	24	18	.064	8	6	30	46	6:1	48
24	28	20	.064	8	6	34	50	6:1	60
30	35	24	.079	12	9	41	65	6:1	84
36	42	29	.109	12	9	48	72	6:1	114
42	49	33	.109	16	12	55	87	6:1	138
48	57	38	.109	16	12	63	95	6:1	168
54	64	43	.109	16	12	70	102	5.45 TO 1	180

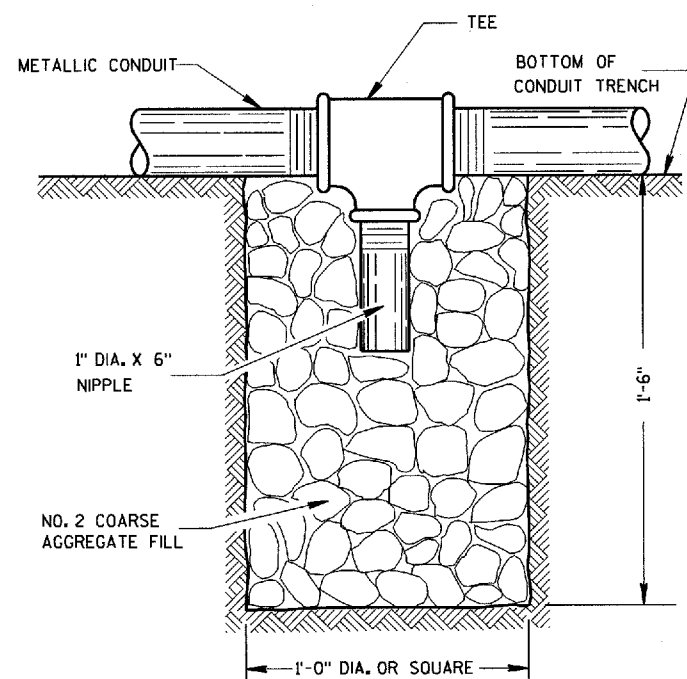
STEEL APRON ENDWALLS FOR CULVERT PIPE AND PIPE ARCH SIDE DRAINS SLOPED SECTION

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
4/17/95
DATE
Raymond J. Thoma
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

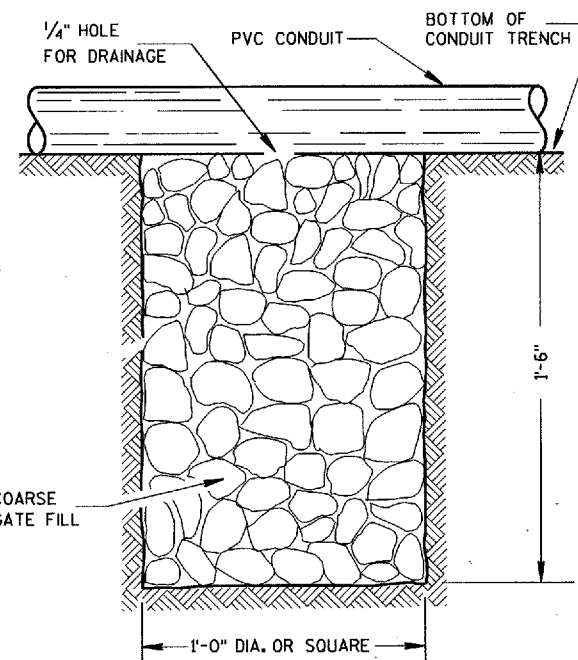


PLAN VIEW
ARROW MARK



NOTE: INSTALL AT LOCATIONS WHERE METALLIC CONDUITS CANNOT BE PITCHED TO DRAIN INTO A PULL BOX.

DRAIN SUMP FOR METALLIC CONDUIT



NOTE: INSTALL AT LOCATIONS WHERE PVC CONDUITS CANNOT BE PITCHED TO DRAIN INTO A PULL BOX.

DRAIN SUMP FOR PVC CONDUIT

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

METALLIC (STANDARD SPECIFICATION 652.2.2) OR NONMETALLIC (STANDARD SPECIFICATION 652.2.3) CONDUIT SHALL BE FURNISHED AND PLACED AS SHOWN.

DEPTH OF CONDUIT INSTALLED BELOW THE TRAVELED WAY SHALL BE 24 INCHES MINIMUM AND 36 INCHES MAXIMUM.

DEPTH OF CONDUIT INSTALLED THAT IS NOT BELOW THE TRAVELED WAY SHALL BE 18 INCHES MINIMUM AND 36 INCHES MAXIMUM.

ANY EXCEPTION TO THE MAXIMUM DEPTH SHALL BE ONLY WITH THE WRITTEN APPROVAL OF THE ENGINEER.

THE TRENCH SHALL NOT BE BACKFILLED PRIOR TO INSPECTION OF THE CONDUIT.

ALL METALLIC CONDUIT RACEWAY ENDS SHALL BE REAMED AND THREADED.

ALL METALLIC CONDUIT IN WHICH WIRE OR CABLE IS TO BE INSTALLED SHALL BE BUSHED WITH APPROVED THREADED BUSHINGS BEFORE INSTALLATION OF THE WIRE OR CABLE.

ALL METALLIC CONDUITS IN WHICH WIRE OR CABLE IS NOT TO BE INSTALLED SHALL BE CAPPED WITH THREADED PROTECTIVE CAPS, AS APPROVED BY THE ENGINEER.

ALL NONMETALLIC CONDUIT SHALL BE CAPPED OR PLUGGED IMMEDIATELY AFTER INSTALLATION AND SHALL REMAIN CAPPED OR PLUGGED UNTIL WIRE/CABLES ARE INSTALLED.

NONMETALLIC CONDUITS IN WHICH WIRE OR CABLE IS NOT BEING INSTALLED SHALL REMAIN CAPPED OR PLUGGED.

BENDING OF PVC ELECTRICAL CONDUIT SHALL BE ACCOMPLISHED BY USING A BLANKET OR EMERSION TYPE TANK DESIGNED FOR THE PURPOSE OF BENDING PVC ELECTRICAL CONDUIT.

ALL CUT ENDS SHALL BE TRIMMED INSIDE AND OUTSIDE TO REMOVE ALL ROUGH EDGES ON NONMETALLIC CONDUIT. (SEE NEC 347.5)

WHEN REQUIRED TO CONNECT NONMETALLIC CONDUIT TO METALLIC CONDUIT, ONLY U.L. LISTED ADAPTER FITTINGS SHALL BE USED.

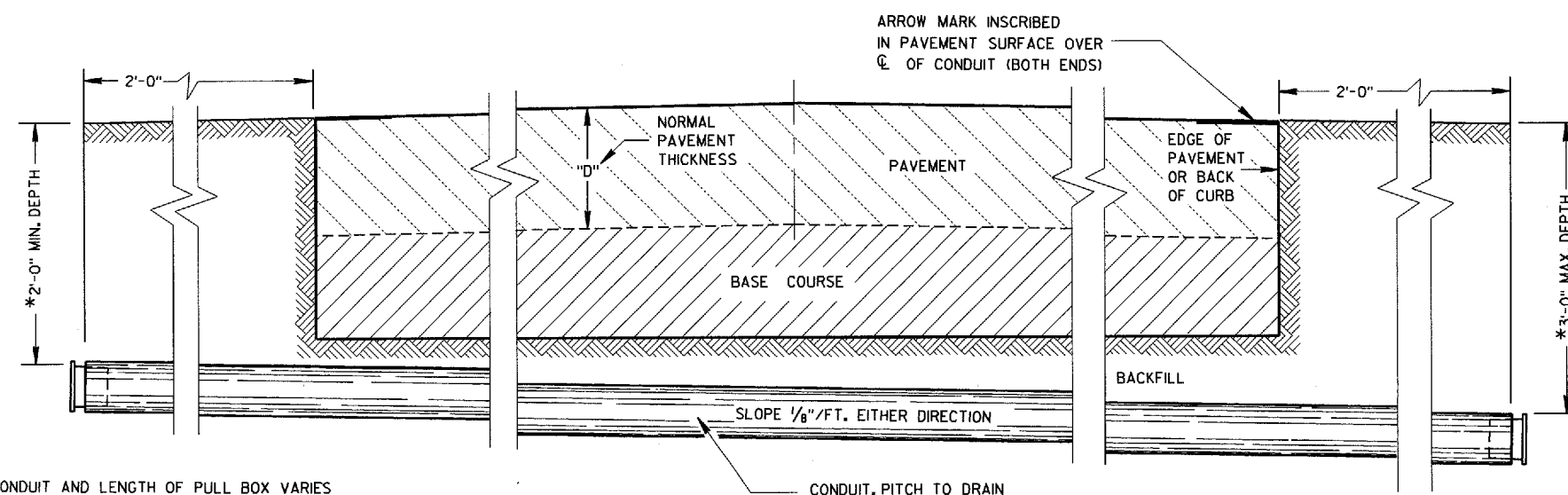
PRIOR TO CONDUIT ACCEPTANCE, CONDUIT CAPS OR PLUGS SHALL BE REMOVED, AND THE CAPS, PLUGS AND CONDUIT ENDS SHALL BE THOROUGHLY CLEANED AND THEN THE CAPS OR PLUGS REINSTALLED TO ENSURE THAT THE CAPS OR PLUGS CAN BE EASILY REMOVED IN THE FUTURE.

ALL CONDUIT BEING FURNISHED AND INSTALLED SHALL HAVE THE U.L. LABEL FIRMLY ATTACHED.

CONDUIT RUNS SHALL BE THE SAME SIZE OF CONDUIT FROM ONE END TO THE OTHER (FROM PULL BOX TO PULL BOX-OR-JUNCTION BOX TO JUNCTION BOX-OR-BASE TO BASE, ETC.).

POLY ROPE OR A PULL WIRE SHALL BE INSTALLED AS STATED IN THE STANDARD SPECIFICATION, ITEM 652.3.1.1.

ALL CONDUIT RUNS SHALL BE STRAIGHT (WITHOUT BENDS) FROM PULL BOX TO PULL BOX, PULL BOX TO BASE AND BASE TO BASE AS SHOWN ON THE PLANS UNLESS OTHERWISE APPROVED BY THE PROJECT ENGINEER.



*DEPTH OF CONDUIT AND LENGTH OF PULL BOX VARIES WITH HEIGHT OF CURB USED. ALSO SEE PULL BOX S.D.D. 9B4

SIDE ELEVATION
DETAIL FOR CONDUIT UNDER PAVED HIGHWAYS

CONDUIT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
10/21/96
DATE
FHWA

Bala Stued
STATE ELECTRICAL ENGINEER FOR
HIGHWAYS

TABLE OF NOMINAL DIMENSIONS AND WEIGHTS

DIMENSION IN INCHES		TYPE OF PIPE								
		CORRUGATED STEEL								
PIPE DIAMETER (INSIDE)	A	12	12	12	18	18	18	24	24	24
PIPE LENGTH **	B	24	30	36	24	30	36	36	42	48
WALL THICKNESS	C	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
COVER	D	10 1/4	10 1/4	10 1/4	16 1/4	16 1/4	16 1/4	22 1/4	22 1/4	22 1/4
FRAME	E	14 1/2	14 1/2	14 1/2	20 1/2	20 1/2	20 1/2	26 1/2	26 1/2	26 1/2
FRAME	F	8 1/2	8 1/2	8 1/2	14 1/2	14 1/2	14 1/2	20 1/2	20 1/2	20 1/2
FRAME	G	11 1/2	11 1/2	11 1/2	17 1/2	17 1/2	17 1/2	23 1/2	23 1/2	23 1/2
WEIGHT IN POUNDS *										
FRAME AND COVER		60	60	60	110	110	110	155	155	155

* THE ACTUAL WEIGHT OF THE MANHOLE FRAME AND COVER MAY VARY WITHIN 5 PERCENT PLUS OR MINUS OF THE WEIGHTS SHOWN.

** NORMALLY USED LENGTHS. THE PROJECT ENGINEER SHALL DETERMINE IF PIPE LENGTHS, OTHER THAN THOSE SPECIFIED, SHALL BE USED, TO A MAXIMUM OF 48" (CONTINUOUS LENGTH, NON-SPLICED). THE ADDITIONAL LENGTH SHALL BE INCIDENTAL TO THE PULL BOX BID PRICE.

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

ALL FRAMES AND COVERS SHALL BE HEAVY DUTY TYPE, SUITABLE FOR VEHICULAR TRAFFIC LOADS.

PULL BOXES LOCATED IN THE ROADWAYS SHALL HAVE LOCKING COVERS.

ENTRANCE HOLES INTO PULL BOXES SHALL BE CUT WITH A CIRCULAR HOLE SAW OR HYDRAULIC CONDUIT PUNCH. HOLE SIZE SHALL BE THE OUTSIDE DIAMETER OF THE CONDUIT THAT IS TO FIT IN THE OPENING PLUS NO MORE THAN 1/4".

THE CONTRACTOR SHALL NOT INSTALL WIRE IN ANY PULL BOX UNTIL ITS INSTALLATION HAS BEEN INSPECTED AND ACCEPTED BY THE ENGINEER.

GROUNDING LUGS (MECHANICAL CONNECTORS) SHALL BE U.L. LISTED AND APPROVED FOR USE WITH COPPER WIRE. THE MECHANICAL CONNECTION (INSIDE AND OUTSIDE) TO THE PULL BOX, SHALL BE TOTALLY AND PERMANENTLY SEALED WITH A SILICONE OR RUBBERIZED CAULKING COMPOUND AS APPROVED BY THE ENGINEER.

GROUNDING LUGS ARE NOT REQUIRED IN PULL BOXES WHEN VOLTAGES OF LESS THAN 50 VOLTS AC ARE THE ONLY VOLTAGES ENCOUNTERED IN THE BOXES.

DRAIN DUCT SHALL BE MEASURED AND PAID FOR SEPARATELY.

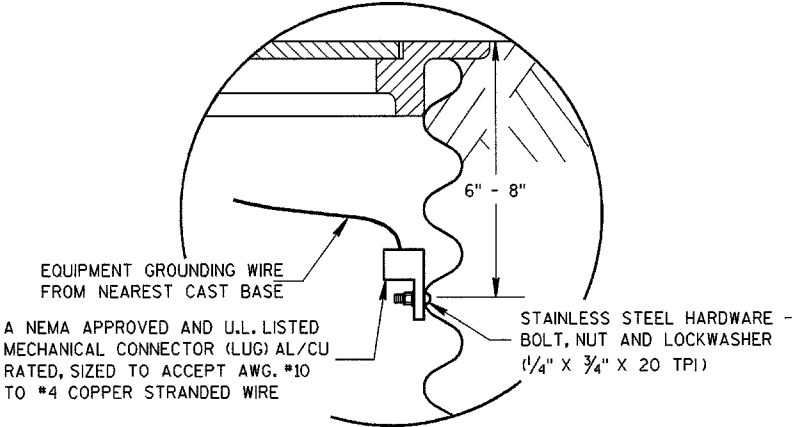
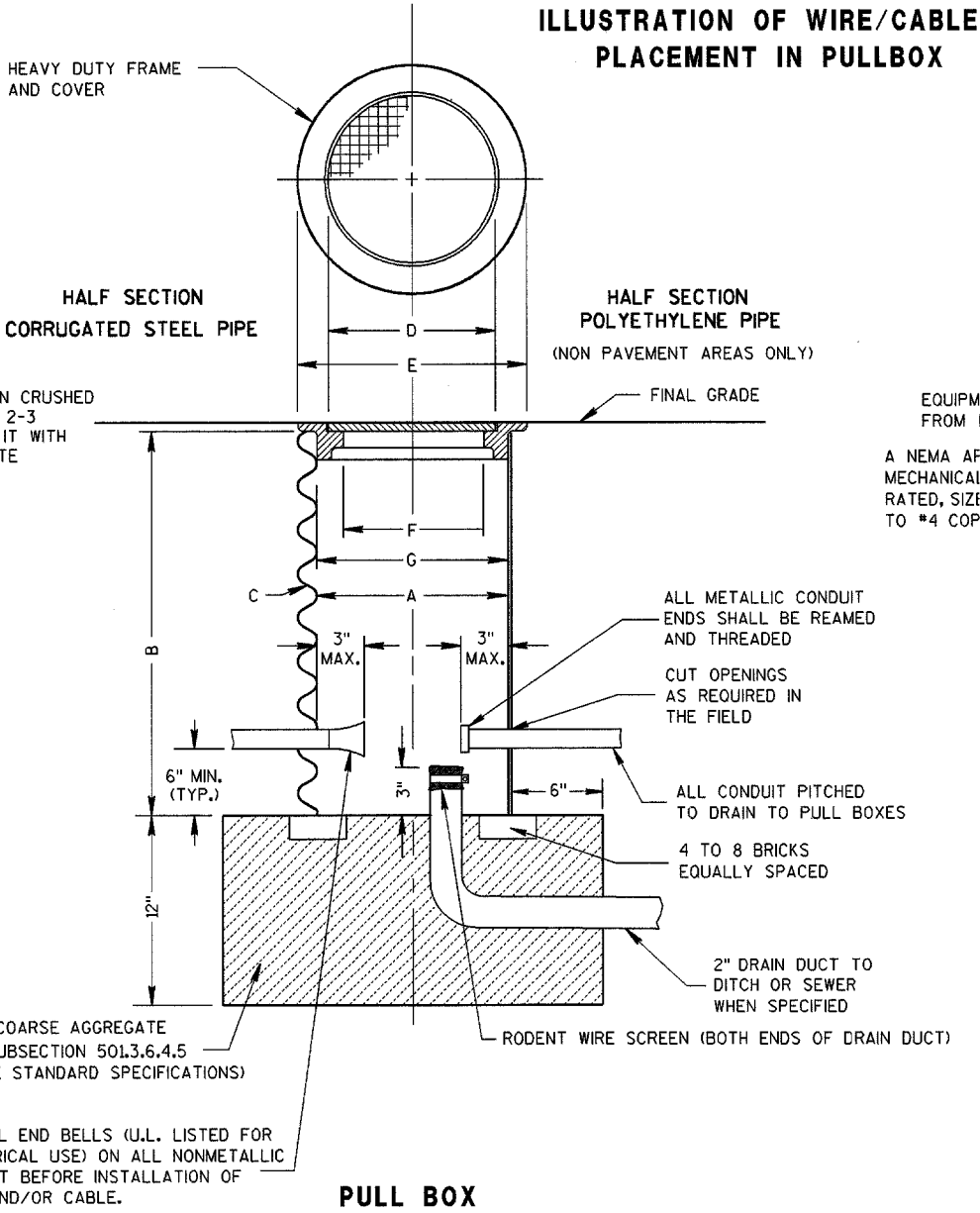
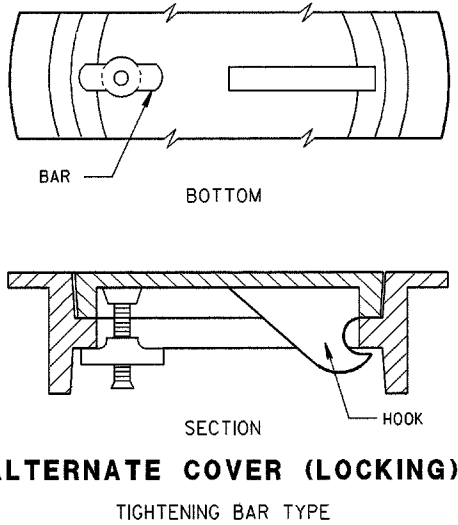
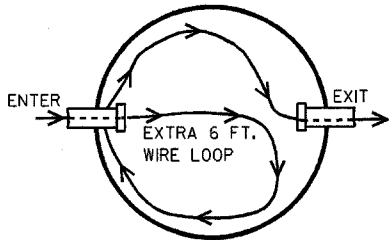
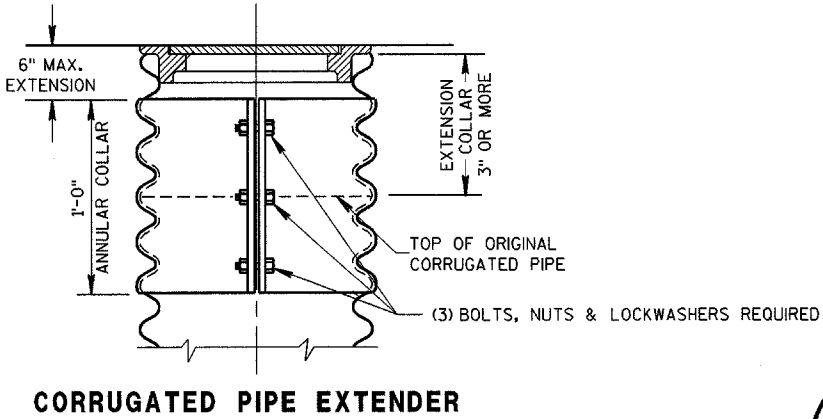
RODENT WIRE SCREEN SHALL BE 1/8" STAINLESS STEEL MESH AND BE INSTALLED WITH A STAINLESS STEEL HOSE CLAMP OF SUFFICIENT SIZE.

ALL METALLIC CONDUIT IN WHICH WIRE AND/OR CABLE IS TO BE INSTALLED, SHALL BE BUSHED BEFORE INSTALLATION OF THE WIRE AND/OR CABLE.

S.D.D. 9B2, "CONDUIT", APPLIES TO THIS DRAWING.

WHEN PULL BOXES ARE INSTALLED FOR FUTURE USE, DO NOT INSTALL THE EQUIPMENT GROUNDING LUG. THE EQUIPMENT GROUNDING LUG, THE EQUIPMENT GROUNDING ELECTRODE AND THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE REQUIRED AND INSTALLED UNDER A FUTURE WIRING CONTRACT.

IF PULL BOX EQUIPMENT GROUNDING IS REQUIRED USING AN EQUIPMENT GROUNDING ELECTRODE IN EACH PULL BOX, THE EQUIPMENT GROUNDING ELECTRODE SHALL BE 5/8" X 8'-0", COPPERCLAD AND BE EXOTHERMICALLY WELDED TO A #4 AWG, COPPER, STRANDED WIRE (BARE OR GREEN INSULATED). THE #4 AWG WIRE SHALL BE 4 FEET IN LENGTH, NEATLY COILED, TAPED AND AVAILABLE FOR USE WHEN REQUIRED.



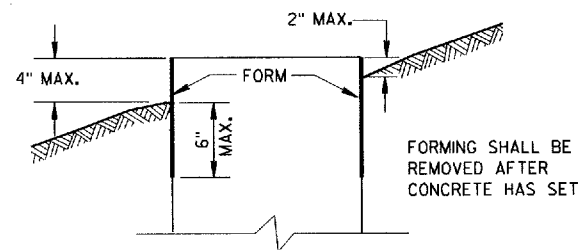
EQUIPMENT GROUNDING LUG AND LOCATION IN STEEL PULL BOXES

PULL BOX	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 2/11/02 DATE FHWA	 STATE ELECTRICAL ENGINEER FOR HIGHWAYS

S.D.D. 9 B 4-5

S.D.D. 9 B 4-5

FORM DEPTH SHALL BE NO MORE THAN 6" BELOW GRADE ON THE LOWER SIDE OF BASE



FORMING DETAIL

QUANTITY REQUIREMENTS	CONCRETE BASE TYPE		
	1	2	5
APPROX. CUBIC YARDS OF CONCRETE	0.40	0.57	0.40
LBS. OF HOOP BAR STEEL	NONE	23	16
LBS. OF VERTICAL BAR STEEL	NONE	60	18

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

BASES SHALL BE EXCAVATED BY USE OF A CIRCULAR AUGER.

TOP SURFACES OF CONCRETE BASES SHALL BE TROWEL FINISHED AND LEVEL.

CONDUIT SIZES AND LOCATIONS SHALL BE AS SHOWN ON THE PLANS.

THE FINAL OR TERMINATING CONCRETE BASE IN A CONDUIT RUN SHALL HAVE A 6" EXIT STUB INSTALLED FOR FUTURE CABLING USE. THE EXIT STUB SHALL BE SIZED AS USED THROUGHOUT THE CONDUIT RUN AS SHOWN AT THE ENTRANCE OF THE BASE.

MINIMUM BENDING RADIUS OF CONDUIT IS EQUAL TO 6 X THE DIAMETER.

CONDUIT HEIGHT ABOVE CONCRETE BASES SHALL BE 1 INCH. ALL METALLIC CONDUIT ENDS SHALL BE REAMED AND THREADED.

ALL CONDUIT ENDS AT THE TOP OF CONCRETE BASES SHALL BE CAPPED IF METALLIC OR PLUGGED IF NONMETALLIC IMMEDIATELY AFTER PLACEMENT AND BEFORE CONCRETE IS POURED. CONDUITS IN WHICH WIRE OR CABLE IS NOT INSTALLED SHALL REMAIN CAPPED OR PLUGGED.

GENERAL NOTES (CONTINUED)

BELL ENDS SHALL BE INSTALLED ON ALL PVC CONDUIT EXPOSED AT THE TOP OF CONCRETE BASES BEFORE INSTALLATION OF CABLE OR WIRE.

ENDS OF CONDUIT INSTALLED BELOW GRADE FOR FUTURE USE SHALL BE CAPPED IF METALLIC OR PLUGGED IF NONMETALLIC.

WHEN REQUIRED TO CONNECT NONMETALLIC CONDUIT TO METALLIC CONDUIT, ONLY ADAPTER FITTINGS, U.L. LISTED FOR ELECTRICAL USE, SHALL BE USED.

IF A BASE REQUIRES A DEEP FORM BECAUSE OF LOOSE DIRT OR FILL, THE FORM SHALL BE REMOVED BEFORE BACKFILLING AROUND THE BASE. BACKFILL SHALL BE TAMPED TIGHT AGAINST THE BARE CONCRETE BASE IN LAYERS OF 1 FOOT OR LESS.

A NO. 4 AWG, STRANDED COPPER EQUIPMENT GROUNDING CONDUCTOR SHALL BE EXOTHERMICALLY WELDED TO THE EQUIPMENT GROUNDING ELECTRODE (GROUND ROD) FOR TYPE 2 AND TYPE 5 BASES.

THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE FURNISHED AND INSTALLED TO ENTER THE BASE OF THE TYPE 2 AND TYPE 5 BASES THROUGH A 1 INCH CONDUIT INSTALLED FOR GROUNDING PURPOSES, LEAVING A 4 FOOT COIL OF WIRE ABOVE THE CONCRETE BASE. THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE NEATLY COILED AND THE COILS TIED TOGETHER.

ANCHOR RODS SHALL BE THREADED 12" IN LENGTH ON EACH END OF THE ROD. ANCHOR RODS SHALL BE MANUFACTURED IN ACCORDANCE WITH SECTION 654.2.1 AND 641.2.2 OF THE STANDARD SPECIFICATIONS, ASTM A-449, OR ASTM A-687 (GRADE 105).

WASHERS AND LOCK WASHERS ARE REQUIRED ON ALL ANCHOR RODS.

WHEN ANCHOR RODS USING THE ALTERNATE "L" BEND ARE FURNISHED, THE 4" "L" BEND SHALL BE IN ADDITION TO THE SPECIFIED ANCHOR ROD BAR LENGTH. THE "L" BEND END SHALL NOT BE THREADED.

WELDING OF THE ANCHOR RODS TO THE CAGE IS UNACCEPTABLE. TIE WIRES SHALL BE USED.

BAR STEEL REINFORCEMENT SHALL BE COATED WITH POWERED EPOXY RESIN IN ACCORDANCE WITH SECTION 505 OF THE STANDARD SPECIFICATIONS (LATEST EDITION).

1 THE MINIMUM DEPTH OF CONDUIT EXITING THE CONCRETE BASE AND INSTALLED BELOW THE TRAVELED WAY SHALL BE 24 INCHES. THE MINIMUM DEPTH OF CONDUIT EXITING THE CONCRETE BASE THAT IS NOT INSTALLED BELOW THE TRAVELED WAY SHALL BE 18 INCHES. THE MAXIMUM DEPTH OF ALL CONDUIT SHALL BE 36 INCHES EXCEPT WITH WRITTEN APPROVAL BY THE ENGINEER.

2 (4) 1" DIA. X 3'-6" ANCHOR RODS.

3 (4) 1" DIA. X 5'-0" ANCHOR RODS.

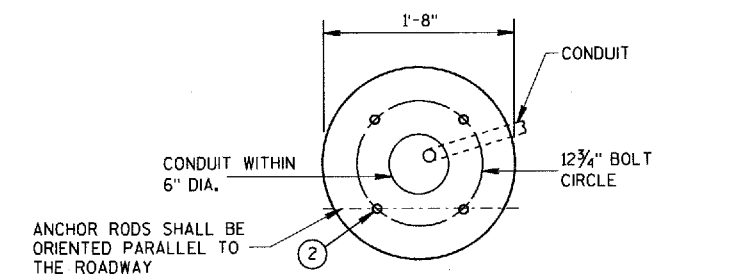
4 (6) NO. 6 X 6'-8" BAR STEEL REINFORCEMENT.

5 (7) NO. 4 X 5'-1" BAR STEEL REINFORCEMENT @ 1'-0" C-C.

6 (4) 1" DIA. X 3'-6" ANCHOR RODS.

7 (6) NO. 4 X 4'-8" BAR STEEL REINFORCEMENT

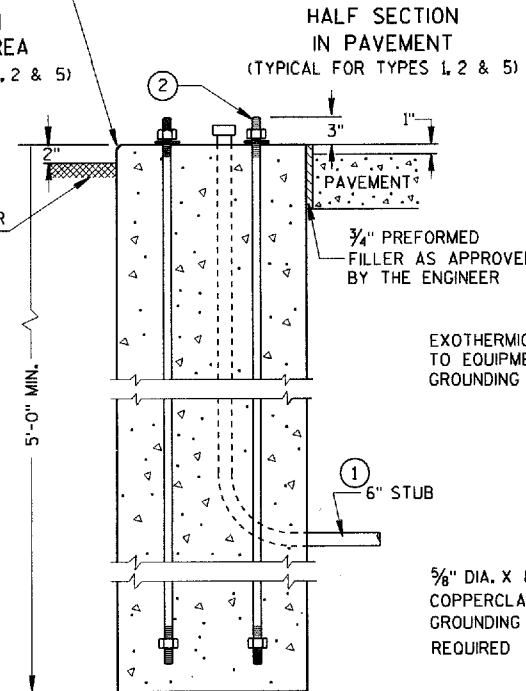
8 (5) NO. 4 X 5'-1" BAR STEEL REINFORCEMENT @ 1'-0" C-C.



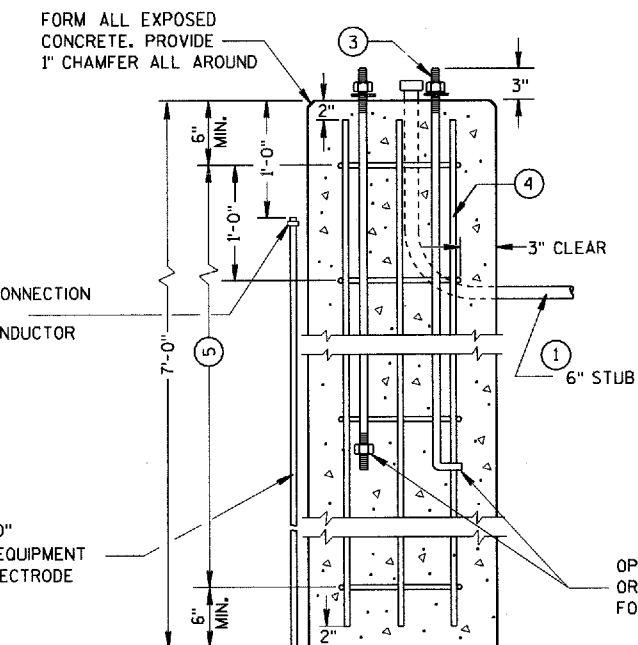
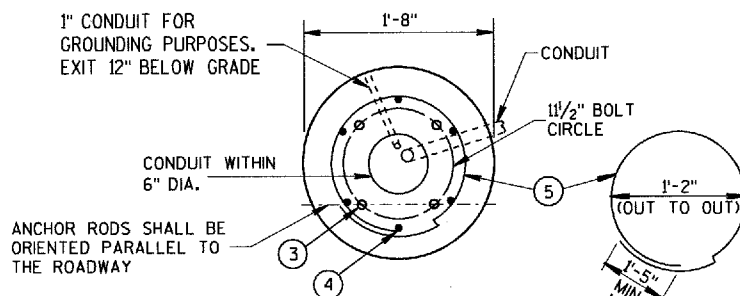
FORM ALL EXPOSED CONCRETE. PROVIDE 1" CHAMFER ALL AROUND

HALF SECTION IN UNPAVED AREA (TYPICAL FOR TYPES 1, 2 & 5)

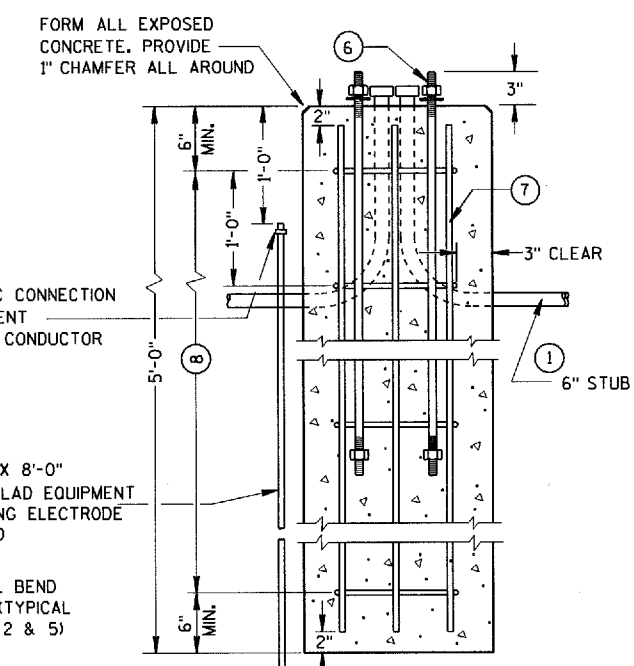
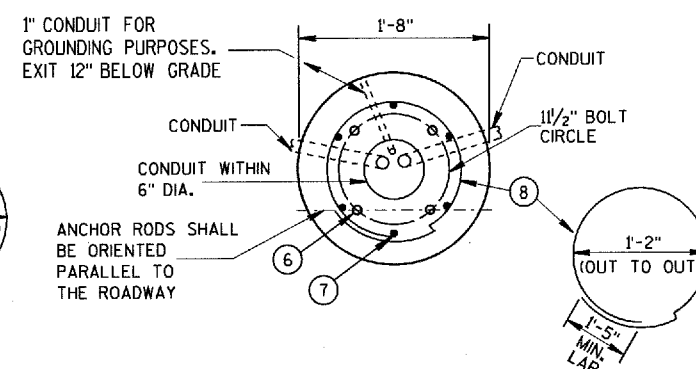
TOPSOIL AND SEED OR CRUSHED AGGREGATE



TYPE 1



TYPE 2



TYPE 5

CONCRETE BASES

CONCRETE BASES,
TYPES 1, 2 & 5

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
DATE 10/2/96
STATE ELECTRICAL ENGINEER FOR
FHWA HIGHWAYS

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

FOUR (4) BOLTS SHALL BE FURNISHED WITH EACH TRANSFORMER BASE. BOLTS SHALL BE 1" DIAMETER, 4" IN LENGTH, WITH WASHERS, LOCK WASHERS AND NUTS. BOLTS, NUTS AND WASHERS SHALL BE MANUFACTURED IN ACCORDANCE WITH SECTION 641.2.2 OF THE STANDARD SPECIFICATIONS, ASTM A-325, (92,000 YIELD) HEAVY HEX NUT AND BE GALVANIZED IN ACCORDANCE WITH ASTM A-153, CLASS C.

LEVELING SHIMS, IF NEEDED, SHALL BE DESIGNED FOR THE PURPOSE AND USED UNDER CAST BASES WHEN PLUMBING POLES OR STANDARDS DURING INSTALLATION. THE USE OF WASHERS IN LIEU OF PROPER LEVELING SHIMS IS NOT ACCEPTABLE.

SHIM LENGTH SHALL BE LONG ENOUGH TO COMPLETELY COVER THE AREA UNDER THE LENGTH AND WIDTH OF THE BASE MOUNTING FLANGE.

DOUBLE NUTTING IS NOT ACCEPTABLE FOR LEVELING OR MOUNTING PURPOSES.

A NEMA APPROVED AND U.L. LISTED MECHANICAL CONNECTOR (LUG) AL/CU RATED AND SIZED TO ACCEPT #10 AWG STRANDED WIRE, SHALL BE FURNISHED AND INSTALLED IN THE PEDESTAL AND TRANSFORMER BASES.

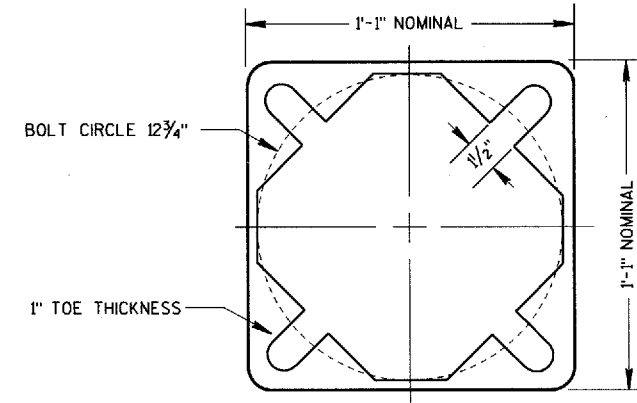
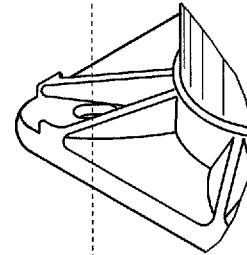
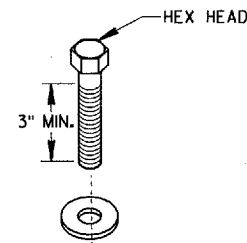
THE MECHANICAL CONNECTOR SHALL BE INSTALLED USING A 1/4" - 20 (TPI) STAINLESS STEEL HEX HEAD BOLT OF SUFFICIENT LENGTH TO FIRMLY ATTACH THE LUG TO THE BASE.

SHOULD THE MANNER OF ATTACHMENT OF THE LUG REQUIRE WASHERS, HEX NUTS, LOCK WASHER - THEY SHALL BE STAINLESS STEEL AS IS THE BOLT. THE MANNER OF ATTACHMENT SHALL NOT BLOCK ACCESSIBILITY TO WIRE PLACEMENT IN THE CONNECTOR.

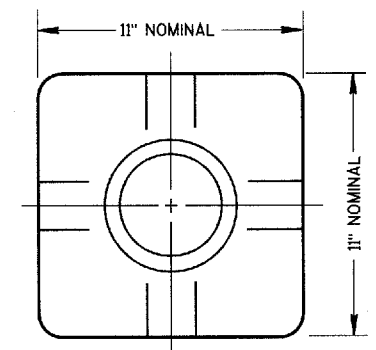
PEDESTAL BASE COLLAR THREADING SHALL BE TAPERED AND IN ACCORDANCE WITH NATIONAL PIPE THREADING DIMENSIONS.

BASE COLLAR THREADING SHALL EXTEND INTO THE BASE COLLAR WITH SUFFICIENT DEPTH TO ACCEPT THE INSTALLATION OF TRAFFIC SIGNAL STANDARDS TO A DEPTH OF 1/2", THEN TIGHTENING TO A POINT OF BEING IMMOVABLE.

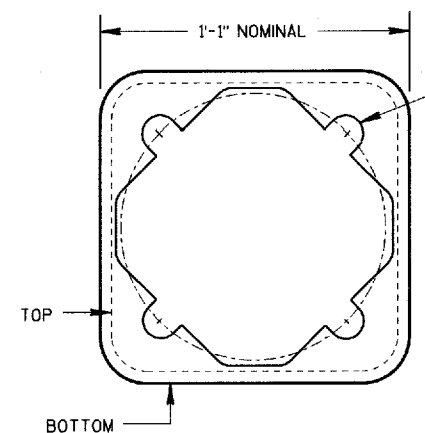
THE ACCESS DOOR SHALL BE OF THE SAME MATERIAL AS THE BASE.



BOTTOM VIEW
(PEDESTAL BASE)

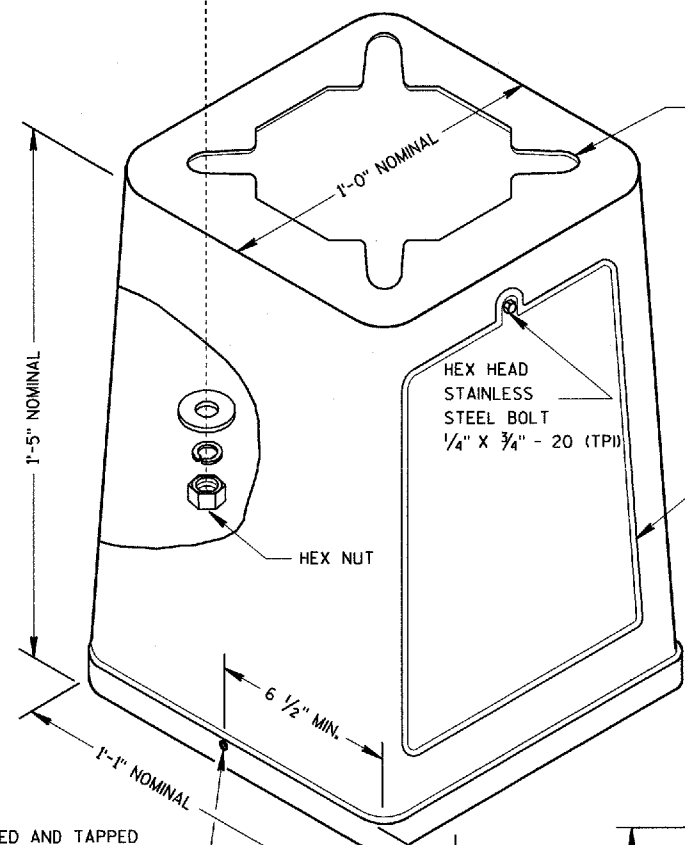


TOP VIEW
(PEDESTAL BASE)



BOTTOM VIEW
(TRANSFORMER BASE)

SLOTTED FOR 1" DIA. BOLTS
10" THROUGH 12" BOLT CIRCLE



ISOMETRIC VIEW

SLOTTED FOR 1" DIA. BOLTS
ON 10" THROUGH 12" BOLT CIRCLE

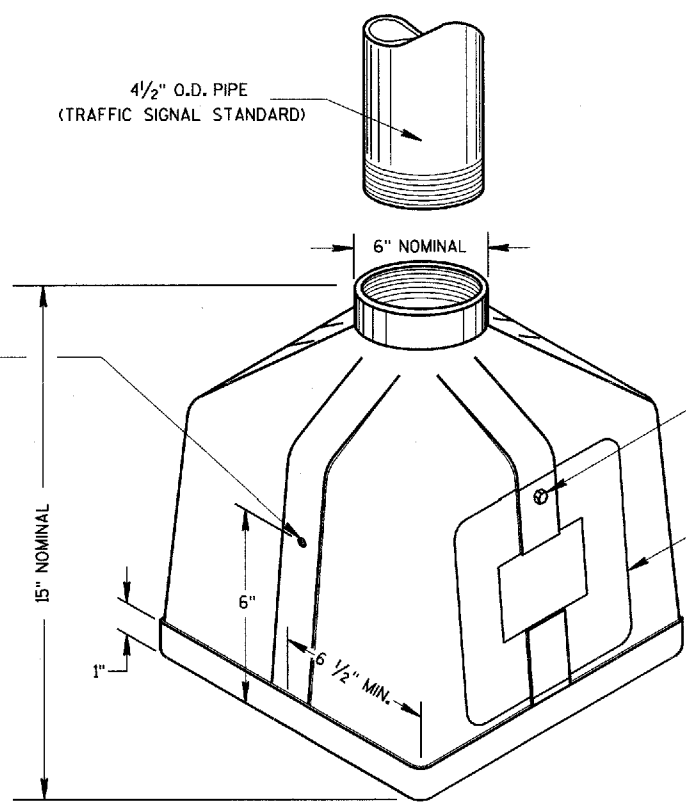
HOLE DRILLED AND TAPPED
FOR A 1/4" - 20 (TPI) BOLT
FOR GROUNDING PURPOSES
(SEE DETAIL)

ACCESS OPENING NOMINAL
13 1/2" X 8 3/4" X 9 1/2"

HEX HEAD
STAINLESS
STEEL BOLT
1/4" X 3/4" - 20 (TPI)

HEX NUT

HOLE DRILLED AND TAPPED
FOR A 1/4" - 20 (TPI) BOLT
FOR GROUNDING PURPOSES
(SEE DETAIL)



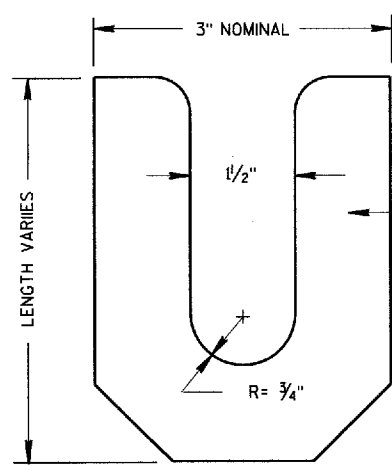
ISOMETRIC VIEW
PEDESTAL BASE

4 1/2" O.D. PIPE
(TRAFFIC SIGNAL STANDARD)

6" NOMINAL

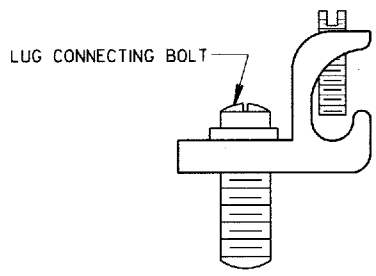
HEX HEAD STAINLESS
STEEL BOLT
1/4" X 3/4" - 20 (TPI)

ACCESS OPENING
NOMINAL 8" X 8"



LEVELING SHIM

1/16" OR 1/8" THICK
AS NEEDED



TYPICAL MECHANICAL
CONNECTOR LUG

TO BE FURNISHED WITH EACH BASE

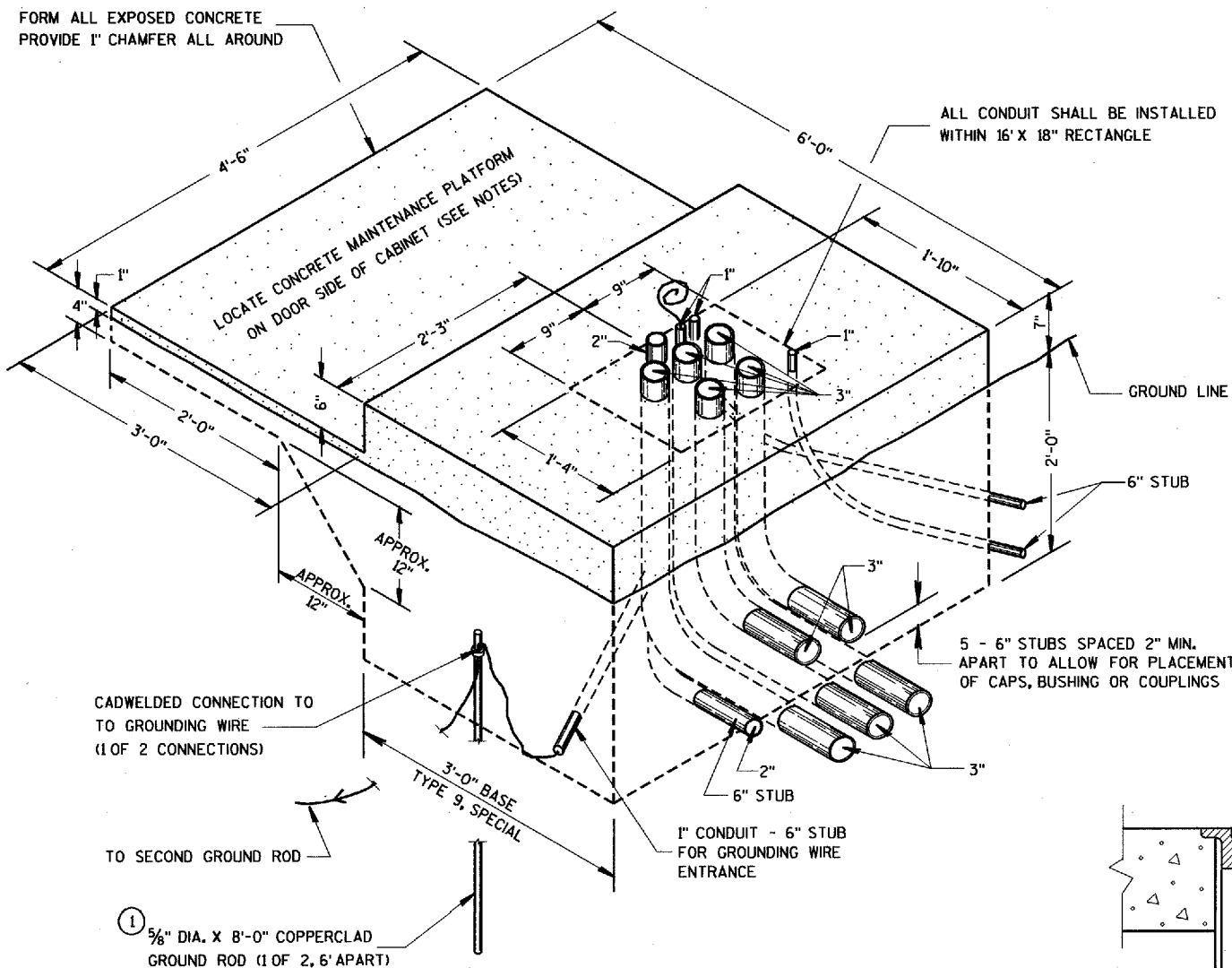
TRANSFORMER BASE

INTENDED FOR USE WITH TYPE 2, 3, 4, 5 & 6 POLES

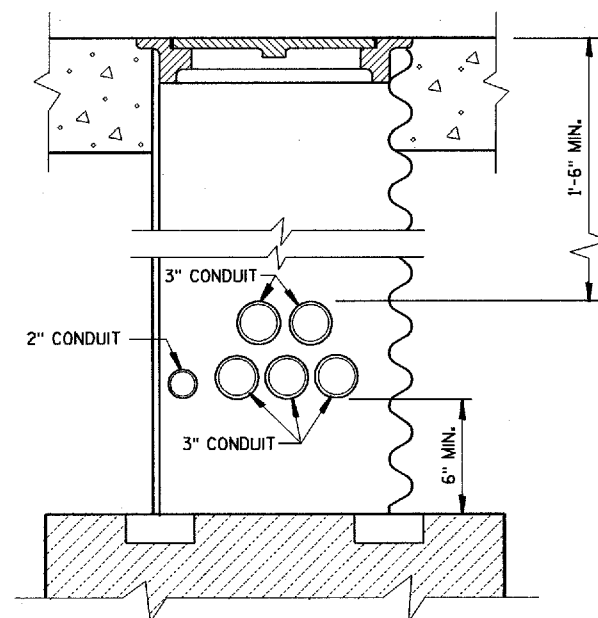
TRANSFORMER/PEDESTAL BASES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
DATE 10/21/96
STATE ELECTRICAL ENGINEER FOR
HIGHWAYS



TYPE 9, SPECIAL (5-3")
(ISOMETRIC VIEW)
(C.Y. CONCRETE = APPROX. 1.56)



CONDUIT LOCATIONS IN 24" X 36" PULL BOX
(LEADING TO CONTROLLER CABINET BASE TYPE 9, SPECIAL)
FOR OTHER PULL BOX INFORMATION, SEE SDD FOR "PULL BOXES"

CONCRETE CONTROL CABINET BASE, TYPE 9, SPECIAL (5-3" & 1-2" CONDUITS)

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

INSTALL FOUR 1/2 INCH MINIMUM DIAMETER X 4 INCH MINIMUM LENGTH APPROVED CONCRETE MASONRY ANCHORS TO ANCHOR THE CABINET TO TYPE 6, 7, 8, AND 9 BASES. THE ANCHOR BOLTS SHALL BE LOCATED AS DIRECTED BY THE ENGINEER TO PROPERLY ANCHOR THE CONTROL CABINET TO THE BASE.

WHEN REQUIRED TO CONNECT NONMETALLIC CONDUIT TO METALLIC CONDUIT, ONLY ADAPTER FITTINGS, U.L. LISTED FOR ELECTRICAL USE, SHALL BE USED.

CONDUIT HEIGHT ABOVE THE CONCRETE BASE SHALL BE 1 INCH.

DEPTH OF CONDUIT INSTALLED BELOW THE TRAVELED WAY SHALL BE 24 INCHES MINIMUM AND 36 INCHES MAXIMUM.

DEPTH OF CONDUIT INSTALLED THAT IS NOT BELOW THE TRAVELED WAY SHALL BE 18 INCHES MINIMUM AND 36 INCHES MAXIMUM.

ANY EXCEPTION TO THE MAXIMUM DEPTH SHALL BE ONLY WITH THE WRITTEN APPROVAL OF THE ENGINEER.

CONTROL CABINET BASE TOP SURFACE SHALL BE TROWEL FINISHED AND LEVEL.

MAINTENANCE PLATFORM SHALL BE FLOAT OR BROOM FINISHED AND BE LEVEL.

MAINTENANCE PLATFORMS ARE NOT REQUIRED WHEN THE SURROUNDING AREA IS PAVED.

MINIMUM BENDING RADIUS OF CONDUIT = 6 X THE DIAMETER.

ALL METALLIC CONDUIT ENDS SHALL BE REAMED AND THREADED.

CAP ALL BELOW GRADE METALLIC CONDUIT ENDS IN WHICH WIRE OR CABLE IS NOT BEING INSTALLED.

PLUG ALL BELOW GRADE NONMETALLIC CONDUIT ENDS IN WHICH WIRE OR CABLE IS NOT BEING INSTALLED.

ALL CONDUIT ENDS AT THE TOP OF CONCRETE BASES SHALL BE CAPPED IF METALLIC OR PLUGGED IF NONMETALLIC IMMEDIATELY AFTER PLACEMENT AND BEFORE CONCRETE IS POURED. CONDUITS IN WHICH WIRE OR CABLE IS NOT BEING INSTALLED SHALL REMAIN CAPPED OR PLUGGED.

CONDUIT EXITING THE CONCRETE BASE (ONE TWO INCH, FIVE THREE INCH) SHALL TERMINATE IN PULL BOX(S) AS SHOWN ON THE PLANS.

CONCRETE FORM DEPTH BELOW FINISHED GRADE SHALL BE 6" MAXIMUM. CONCRETE FORMS SHALL BE REMOVED AFTER CONCRETE HAS SET.

BELL ENDS SHALL BE INSTALLED ON ALL PVC CONDUIT EXPOSED AT THE TOP OF THE CONCRETE BASE BEFORE INSTALLATION OF CABLE OR WIRE.

① A NO. 6 STRANDED, BARE COPPER GROUNDING WIRE SHALL BE CADWELDED TO THE GROUND ROD. THE OTHER END OF THE GROUNDING WIRE SHALL BE FED TO THE TOP OF THE CONTROL CABINET BASE, BY WAY OF THE 1" CONDUIT INSTALLED FOR GROUNDING WIRE ENTRANCE USE. FOUR (4) FEET OF NO. 6 GROUNDING WIRE SHALL BE LEFT AT THE TOP OF THE CONTROL CABINET BASE FOR FUTURE USE. IT SHALL BE NEATLY COILED AND TIED.

CONCRETE CONTROL CABINET
BASE, TYPE 9, SPECIAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

4/21/93
DATE

John A. Smith
STATE ELECTRICAL ENGR FOR HWYS

4/21/93
DATE

John A. Smith
STATE TRAFFIC ENGINEER FOR HWYS

FHWA

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

BASES SHALL BE EXCAVATED BY USE OF A CIRCULAR AUGER.

TOP SURFACES OF CONCRETE BASES SHALL BE TROWEL FINISHED AND LEVEL.

CONDUIT SIZES AND LOCATIONS SHALL BE AS SHOWN ON THE PLANS.

THE FINAL OR TERMINATING CONCRETE BASE IN A CONDUIT RUN SHALL HAVE A 6" EXIT STUB INSTALLED FOR FUTURE CABLING USE. THE EXIT STUB SHALL BE SIZED AS USED THROUGHOUT THE CONDUIT RUN AS SHOWN AT THE ENTRANCE OF THE BASE.

MINIMUM BENDING RADIUS OF CONDUIT IS EQUAL TO 6 X THE DIAMETER.

CONDUIT HEIGHT ABOVE CONCRETE BASES SHALL BE 1 INCH. ALL METALLIC CONDUIT ENDS SHALL BE REAMED AND THREADED.

ALL CONDUIT ENDS AT THE TOP OF CONCRETE BASES SHALL BE CAPPED IF METALLIC OR PLUGGED IF NONMETALLIC IMMEDIATELY AFTER PLACEMENT AND BEFORE CONCRETE IS POURED. CONDUITS IN WHICH WIRE OR CABLE IS NOT INSTALLED SHALL REMAIN CAPPED OR PLUGGED.

BELL ENDS SHALL BE INSTALLED ON ALL PVC CONDUIT EXPOSED AT THE TOP OF CONCRETE BASES BEFORE INSTALLATION OF CABLE OR WIRE.

ENDS OF CONDUIT INSTALLED BELOW GRADE FOR FUTURE USE SHALL BE CAPPED IF METALLIC OR PLUGGED IF NONMETALLIC.

WHEN REQUIRED TO CONNECT NONMETALLIC CONDUIT TO METALLIC CONDUIT, ONLY ADAPTER FITTINGS, U.L. LISTED FOR ELECTRICAL USE, SHALL BE USED.

IF A BASE REQUIRES A DEEP FORM BECAUSE OF LOOSE DIRT OR FILL, THE FORM SHALL BE REMOVED BEFORE BACKFILLING AROUND THE BASE. BACKFILL SHALL BE TAMPED TIGHT AGAINST THE BARE CONCRETE BASE IN LAYERS OF 1 FOOT OR LESS.

A NO. 4 AWG, STRANDED COPPER EQUIPMENT GROUNDING CONDUCTOR SHALL BE EXOTHERMICALLY WELDED TO THE EQUIPMENT GROUNDING ELECTRODE (GROUND ROD).

THE EQUIPMENT GROUNDING CONDUCTOR SHALL ENTER THE BASE THROUGH A 1 INCH CONDUIT INSTALLED FOR GROUNDING PURPOSES, LEAVING A 4 FOOT COIL OF WIRE ABOVE THE CONCRETE BASE. THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE NEATLY COILED AND THE COILS TIED TOGETHER.

ANCHOR RODS SHALL BE 1" X 60".

ANCHOR RODS SHALL BE THREADED 12" IN LENGTH ON EACH END OF THE ROD. ANCHOR RODS SHALL BE MANUFACTURED IN ACCORDANCE WITH SECTION 654.2.1 AND 641.2.2 OF THE STANDARD SPECIFICATIONS, ASTM A-449, OR ASTM A-687 (GRADE 105).

WHEN ANCHOR RODS USING THE ALTERNATE "L" BEND ARE FURNISHED, THE THE 4" "L" BEND SHALL BE IN ADDITION TO THE SPECIFIED ANCHOR ROD BAR LENGTH. THE "L" BEND END SHALL NOT BE THREADED.

WELDING OF THE ANCHOR RODS TO THE CAGE IS UNACCEPTABLE. TIE WIRES SHALL BE USED.

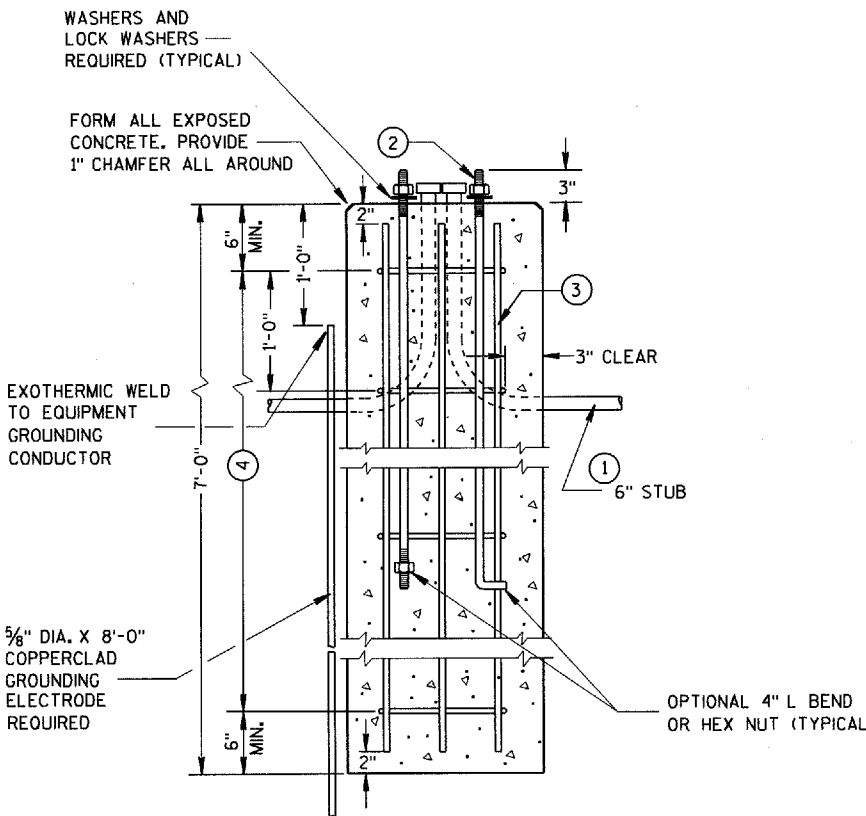
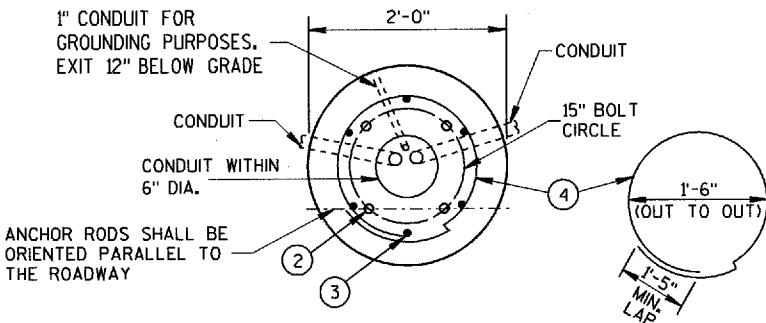
BAR STEEL REINFORCEMENT SHALL BE COATED WITH POWERED EPOXY RESIN IN ACCORDANCE WITH SECTION 505 OF THE STANDARD SPECIFICATIONS (LATEST EDITION).

1 THE MINIMUM DEPTH OF CONDUIT EXITING THE CONCRETE BASE AND INSTALLED BELOW THE TRAVELED WAY SHALL BE 24 INCHES. THE MINIMUM DEPTH OF CONDUIT EXITING THE CONCRETE BASE THAT IS NOT INSTALLED BELOW THE TRAVELED WAY SHALL BE 18 INCHES. THE MAXIMUM DEPTH OF ALL CONDUIT SHALL BE 36 INCHES EXCEPT WITH WRITTEN APPROVAL BY THE ENGINEER.

2 (4) 1" DIA. X 5'-0" ANCHOR RODS

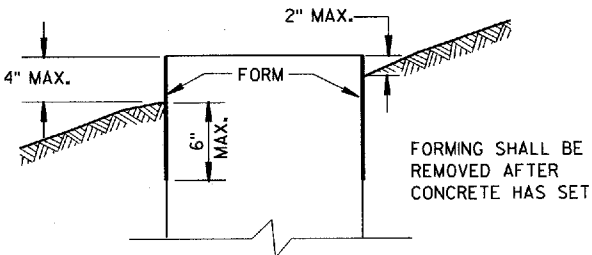
3 (6) NO. 6 X 6'-8" BAR STEEL REINFORCEMENT.

4 (7) NO. 4 X 6'-2" BAR STEEL REINFORCEMENT @ 1'-0" C-C.



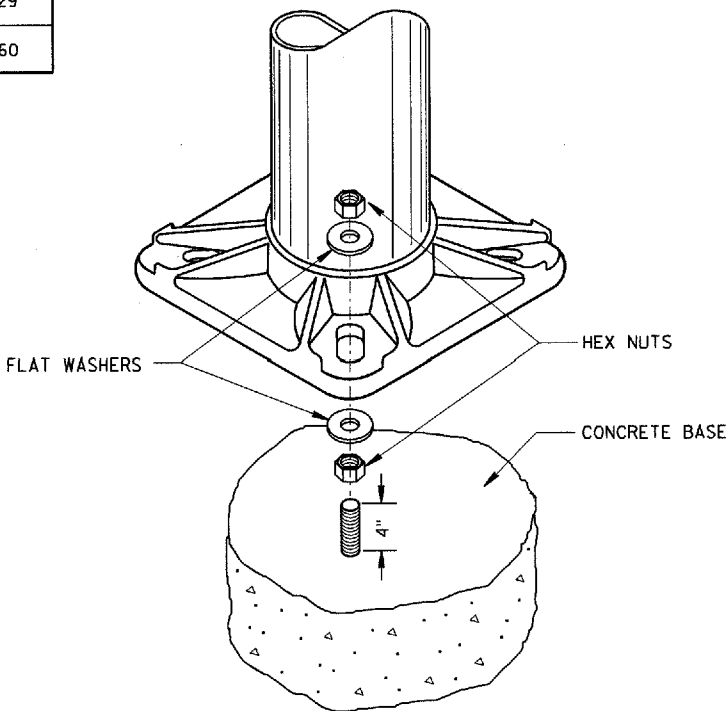
CONCRETE BASE, TYPE 7
(FOR 40' LIGHT POLES)

FORM DEPTH SHALL BE NO MORE THAN 6" BELOW GRADE ON THE LOWER SIDE OF BASE



FORMING DETAIL

QUANTITY REQUIREMENTS	
APPROX. CUBIC YARDS OF CONCRETE	0.8
LBS. OF HOOP BAR STEEL	29
LBS. OF VERTICAL BAR STEEL	60



NON-BREAKAWAY INSTALLATION
(LEVELING NUT)

CONCRETE BASE, TYPE 7

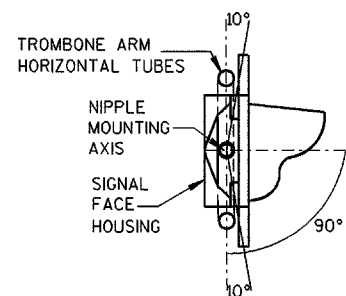
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

10/21/96
DATE

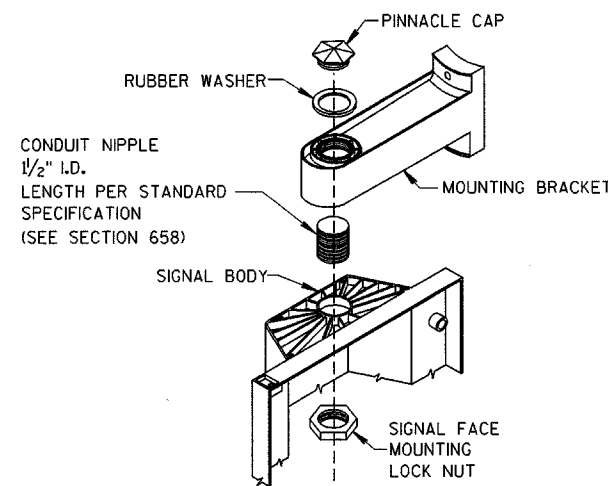
FHWA

STATE ELECTRICAL ENGINEER FOR
HIGHWAYS

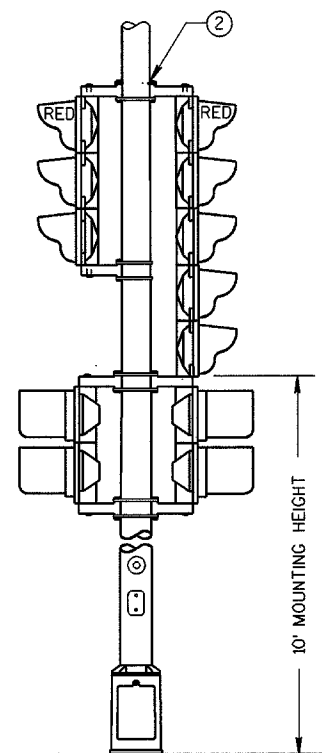
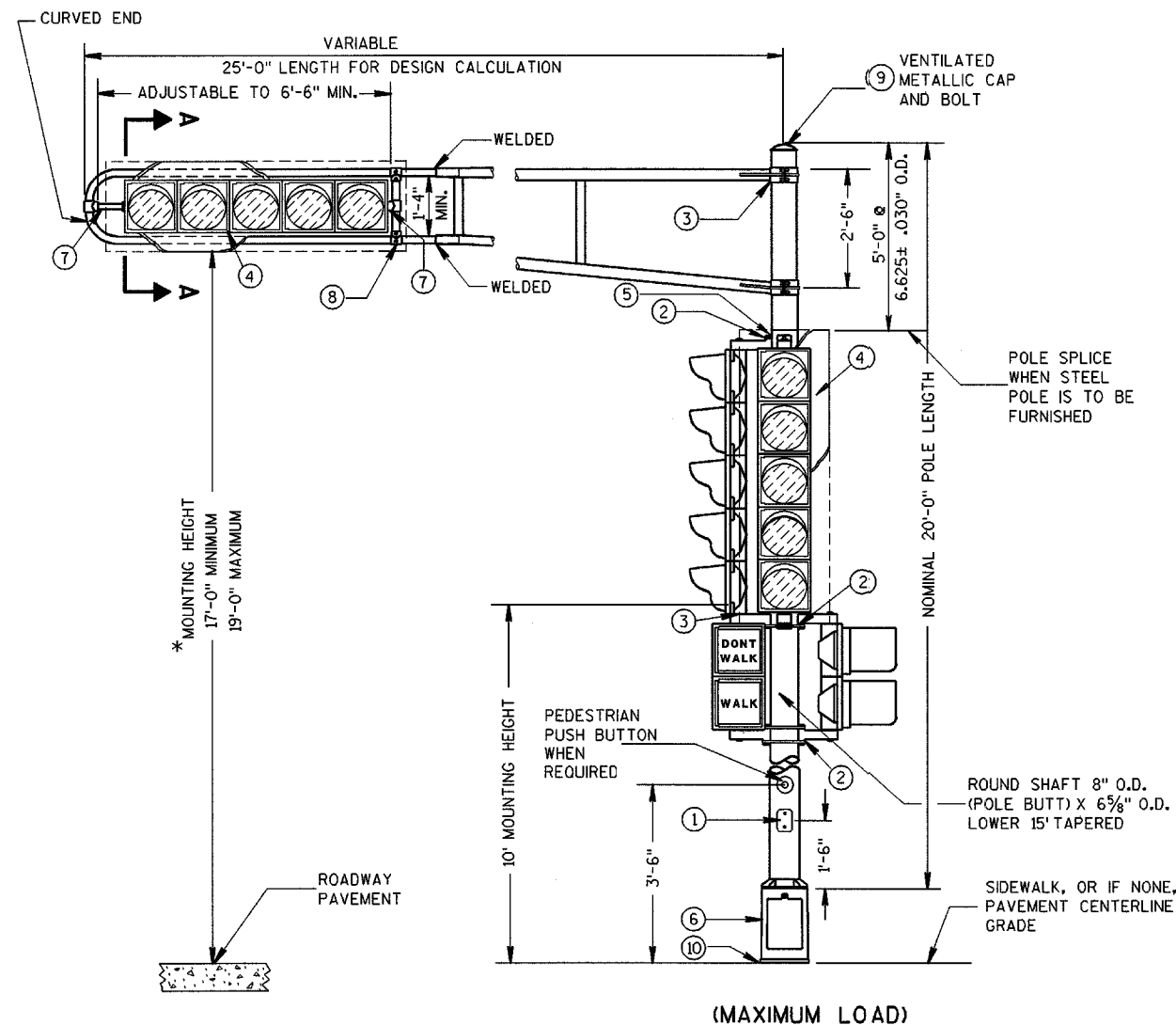


SECTION A-A

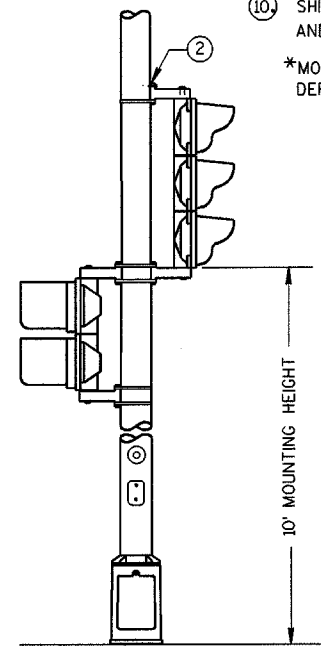
(10 DEGREES TILT REQUIREMENT OF FACE(S) IN THE TROMBONE MOUNTING)



**SIGNAL FACE MOUNTING DETAIL
(BAND)**



**TYPICAL MOUNTING OF BACK TO BACK
3 AND 5 SECTION SIGNAL FACES**



**TYPICAL MOUNTING OF 3 SECTION
SIGNAL FACE**

TYPE 2 POLE MOUNTING CONFIGURATION

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

POLES SHALL BE EITHER ALUMINUM OR GALVANIZED STEEL AS CALLED FOR IN THE CONTRACT.

SECTION 657, POLES, OF THE STANDARD SPECIFICATIONS SHALL APPLY TO THIS DRAWING.

A PULL WIRE/ROPE IN ACCORDANCE WITH STANDARD SPECIFICATION 652 SHALL BE INSTALLED IN EACH TROMBONE ARM RACEWAY DURING THE MANUFACTURING PROCESS.

TYPE 2 ALUMINUM POLES SHALL BE CONSTRUCTED OF 6063-T6 ALUMINUM ALLOY. SLEEVING INSIDE THE POLE IS NOT ACCEPTABLE.

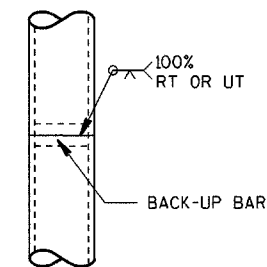
WHEN TRANSFORMER BASES ARE USED, WIRE CONNECTIONS SHALL BE MADE IN THE TRANSFORMER BASE.

- ① 4" X 6" REINFORCED HANDHOLE & COVER ASSEMBLY WITH 2 (TWO) 1/4" X 3/4" - 20 TPI HEX HEAD STAINLESS STEEL BOLTS.
- ② SIGNAL FACE MOUNTING BRACKETS. MOUNT WITH CAP SCREWS AND BANDING. (SEE STANDARD SPECIFICATIONS - SEC. 658)
- ③ GROMMETS, 1" CHASE NIPPLES OR 1" CLOSE CONDUIT NIPPLES WITH BUSHINGS SHALL BE PROVIDED FOR 1 1/8" HOLE IN POLE SHAFT FOR WIRING.
- ④ SECURELY MOUNT DULL BLACK POLYCARBONATE BACKPLATES, PROJECTING 5" BEYOND ALL SIDES OF THE SIGNAL FACE HOUSING, WITH SELF-TAPPING STAINLESS STEEL SCREWS.
- ⑤ POLE MOUNTED SIGNAL FACES SHALL REQUIRE 1 OR MORE MOUNTING SPACERS UNDER THE TOP MOUNTING BRACKET(S) AS REQUIRED, TO PLUMB THE SIGNAL FACES.
- ⑥ CAST ALUMINUM TRANSFORMER BASE, WHEN REQUIRED.
- ⑦ MOUNTING BRACKET NIPPLES FOR THE SIGNAL FACE(S) SHALL BE 2 INCHES IN LENGTH AND 1/2 INCHES IN DIAMETER. (SEE STANDARD SPECIFICATION - SECTION 658).
- ⑧ VERTICAL STRUT (ADJUSTABLE). ONE (1) SET SCREW (1/4" X 3/4" LONG-20 TPI, STAINLESS STEEL, HEX HEAD) INTO EACH ARM MEMBER IF STRUT IS THE SLIDING TYPE.
- ⑨ FURNISH AND INSTALL VENTILATED, CAST, METALLIC (ALUMINUM ALLOY) CAPS. FASTEN CAPS WITH ONE (1) 1/4" X 3/4" - 20 TPI STAINLESS STEEL, HEX HEAD BOLT.
- ⑩ SHIMMING, IF NEEDED, SHALL BE LOCATED BETWEEN THE CONCRETE FOUNDATION AND THE TRANSFORMER BASE.

*MOUNTING HEIGHT LIMITATION DIMENSIONS OF THE TROMBONE MAST ARM WILL BE DEPENDENT UPON THE USE/NON-USE OF A TRANSFORMER BASE.

FOR MANUFACTURERS USE ONLY

WELD TO BE 100% R.T. OR U.T. TESTED AS PER THE REQUIREMENTS OF AWS D 15-88. RECORDS OF COMPLIANCE OF SUCH TESTING SHALL BE FURNISHED TO THE OFFICE OF DESIGN/BRIDGE FOR VERIFICATION AND APPROVAL.

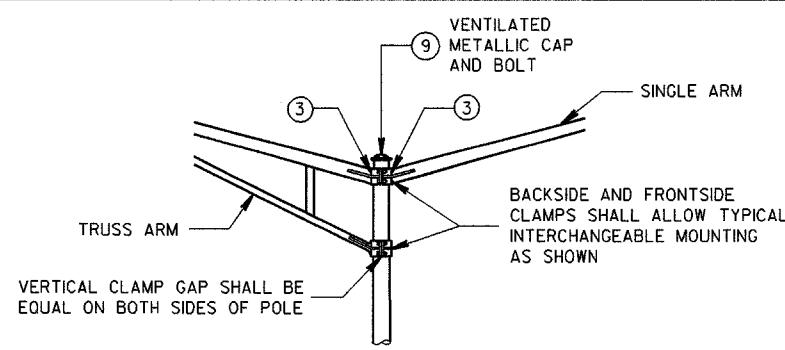
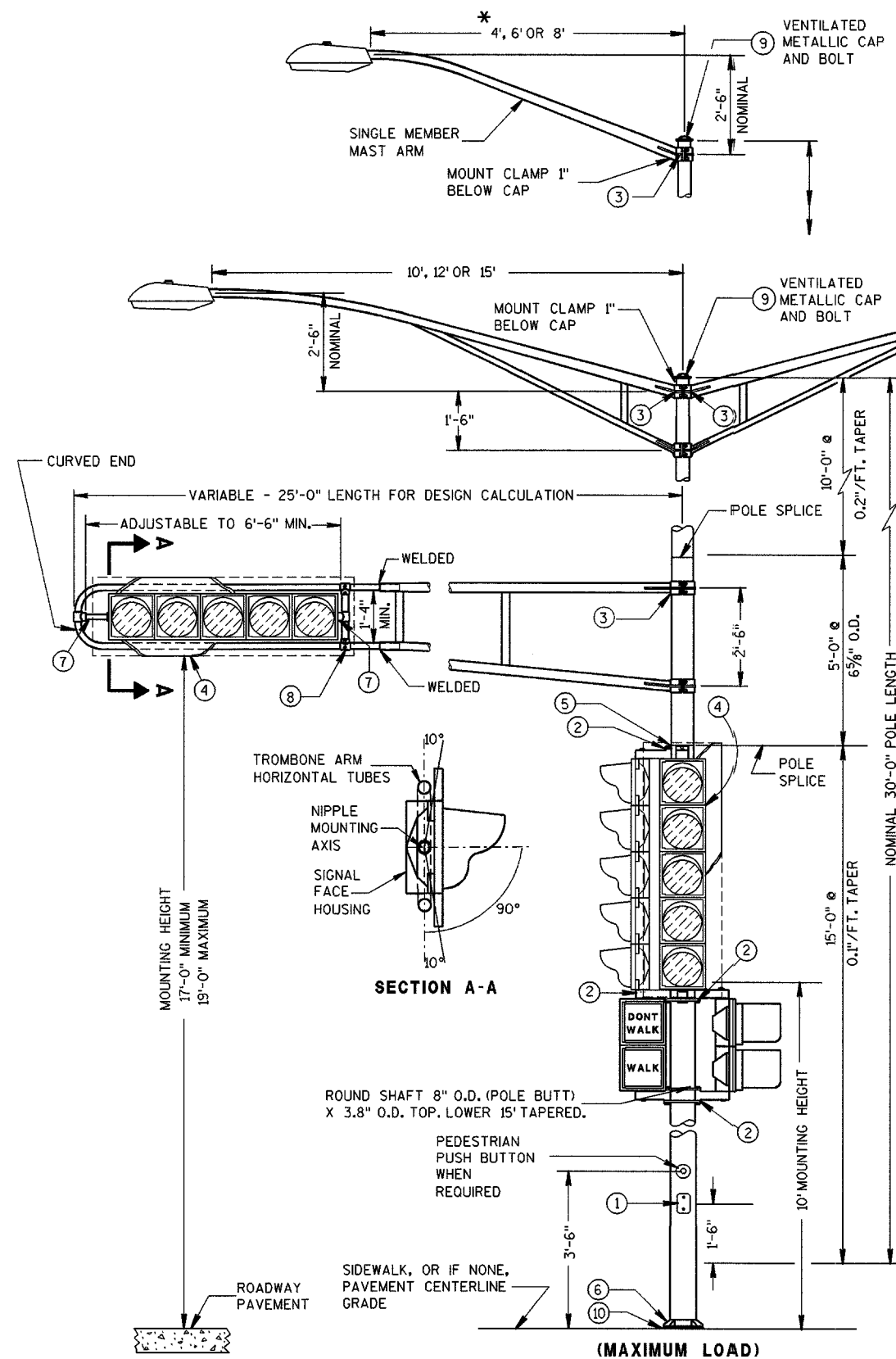


POLE SPLICE DETAIL

**POLE MOUNTINGS FOR
TRAFFIC SIGNALS
TYPE 2**

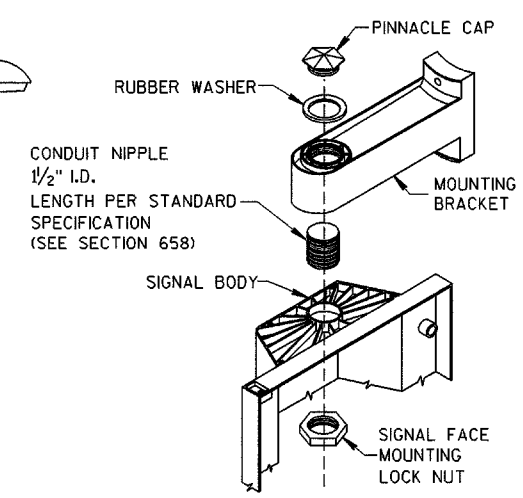
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

*RISE FOR 4' ARM SHALL BE 2'-0".

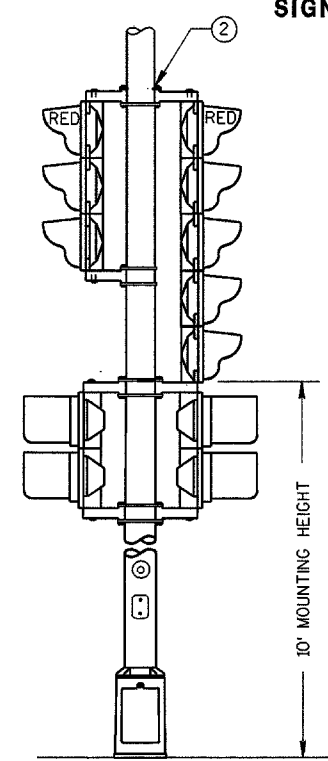


LUMINAIRE
WT. - 50 LBS.
EFFECTIVE PROJECTED
AREA FOR WIND
LOADING = 1.5 SQ. FT.

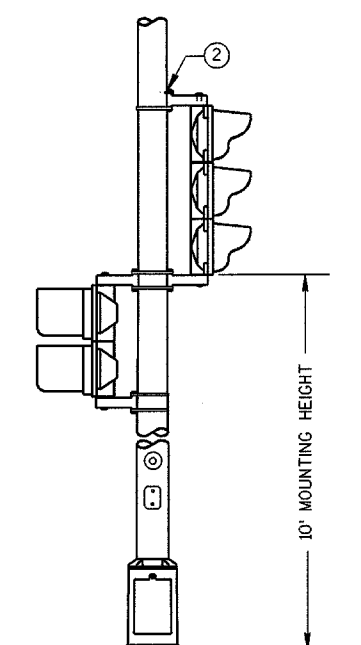
INTERCHANGEABLE MOUNTING DETAIL



SIGNAL FACE MOUNTING DETAIL (BANDED)



TYPICAL MOUNTING OF BACK TO BACK
3 AND 5 SECTION SIGNAL FACES



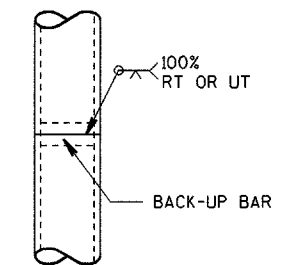
TYPICAL MOUNTING OF 3 SECTION
SIGNAL FACE

TYPE 3 POLE MOUNTING CONFIGURATION

GENERAL NOTES

- DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.
- ALL TYPE 3 POLE MOUNTINGS SHALL BE DESIGNED TO INCLUDE TWIN 15' ARMS WITH LUMINAIRES.
- POLES SHALL BE GALVANIZED STEEL.
- SECTION 657, POLES, OF THE STANDARD SPECIFICATIONS SHALL APPLY TO THIS DRAWING.
- A PULL WIRE/ROPE IN ACCORDANCE WITH STANDARD SPECIFICATION 652, SHALL BE INSTALLED IN EACH TROMBONE ARM RACEWAY DURING THE MANUFACTURING PROCESS.
- THE SLIPFITTER END OF THE LUMINAIRE MAST ARM SHALL BE A NOMINAL 2 3/8 INCHES IN OUTSIDE DIAMETER. THE STRAIGHT PORTION OF THE SLIPFITTER END OF THE LUMINAIRE MAST ARM SHALL BE A NOMINAL 12 INCHES IN LENGTH.
- WHEN TRANSFORMER BASES ARE USED, WIRE CONNECTIONS SHALL BE MADE IN THE TRANSFORMER BASE.
- 4" X 6" REINFORCED HANDHOLE & COVER ASSEMBLY WITH 2 (TWO) 1/4" X 3/4" - 20 TPI HEX HEAD STAINLESS STEEL BOLTS.
 - SIGNAL FACE MOUNTING BRACKETS, MOUNT WITH CAP SCREWS AND BANDING. (SEE STANDARD SPECIFICATIONS - SEC. 658)
 - GROMMETS, 1" CHASE NIPPLES OR 1" CLOSE CONDUIT NIPPLES WITH BUSHINGS SHALL BE PROVIDED FOR 1 1/8" HOLE IN POLE SHAFT FOR WIRING.
 - SECURELY MOUNT DULL BLACK POLYCARBONATE BACKPLATES, PROJECTING 5" BEYOND ALL SIDES OF THE SIGNAL FACE HOUSING, WITH SELF-TAPPING STAINLESS STEEL SCREWS.
 - POLE MOUNTED SIGNAL FACES SHALL REQUIRE 1 OR MORE MOUNTING SPACERS UNDER THE TOP MOUNTING BRACKET(S) AS REQUIRED, TO PLUMB THE SIGNAL FACE.
 - TYPE 3 POLE CONFIGURATIONS SHALL BE MOUNTED DIRECTLY TO THEIR CONCRETE BASES.
 - MOUNTING BRACKET NIPPLES FOR THE SIGNAL FACE(S) SHALL BE 2 INCHES IN LENGTH AND 1/2 INCHES IN DIAMETER. (SEE STANDARD SPECIFICATION - SECTION 658)
 - VERTICAL STRUT (ADJUSTABLE). ONE (1) SET SCREW (1/4" X 3/4" - 20 TPI, STAINLESS STEEL, HEX HEAD) INTO EACH ARM MEMBER IF STRUT IS THE SLIDING TYPE.
 - FURNISH AND INSTALL VENTILATED, CAST, METALLIC (ALUMINUM ALLOY) CAPS. FASTEN CAPS WITH ONE (1) 1/4" X 3/4" - 20 TPI STAINLESS STEEL, HEX HEAD BOLT.
 - SHIMMING, IF NEEDED, SHALL BE LOCATED BETWEEN THE CONCRETE FOUNDATION AND POLE.

WELD TO BE 100% R.T. OR U.T. TESTED AS PER THE REQUIREMENTS OF AWS D 1.5-88. RECORDS OF COMPLIANCE OF SUCH TESTING SHALL BE FURNISHED TO THE OFFICE OF DESIGN/BIDGE FOR VERIFICATION AND APPROVAL.

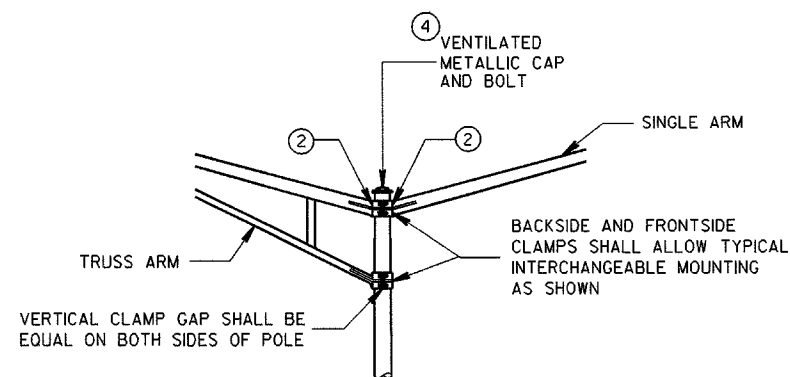
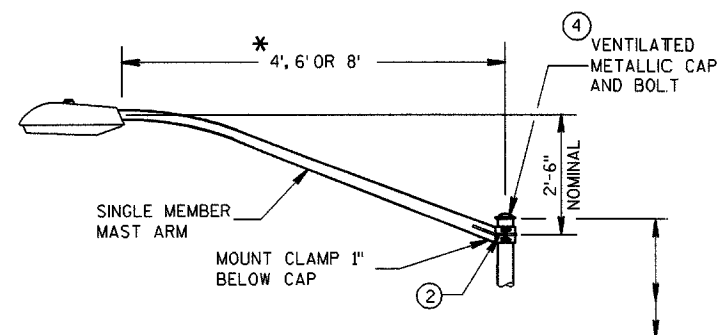


POLE SPLICE DETAIL

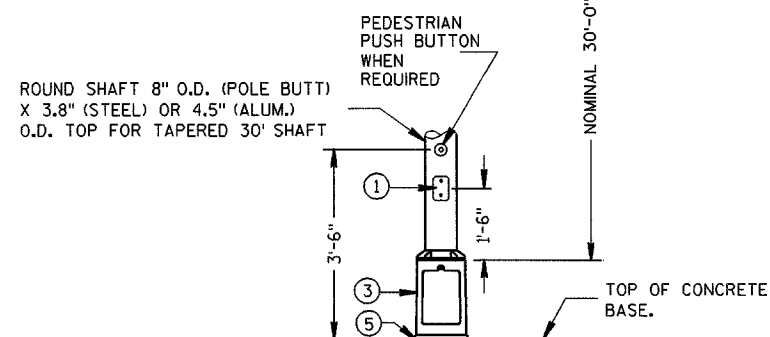
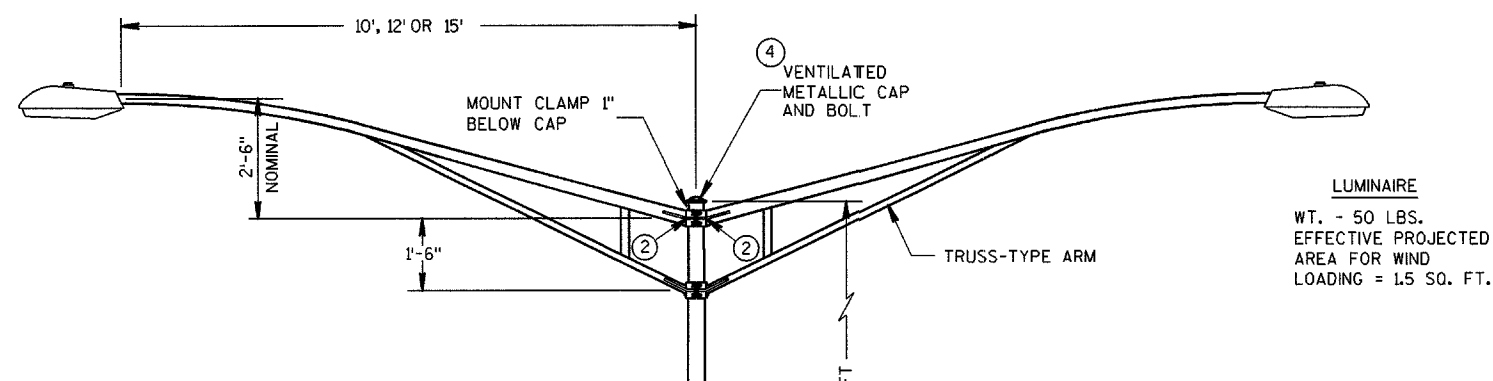
POLE MOUNTINGS FOR
TRAFFIC SIGNALS AND
LIGHTING UNITS, TYPE 3
(HEAVY DUTY)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

*RISE FOR 4' ARM SHALL BE 2'-0".



INTERCHANGEABLE MOUNTING DETAIL



TYPE 5 POLE MOUNTING CONFIGURATION
(MAXIMUM LOAD)
LIGHTING ONLY

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.
ALL TYPE 5 POLE MOUNTINGS SHALL BE DESIGNED TO INCLUDE TWIN 15' ARMS WITH LUMINAIRES.

POLES SHALL BE GALVANIZED STEEL OR ALUMINUM, AS CALLED FOR IN THE CONTRACT.

TYPE 5 ALUMINUM POLES SHALL BE CONSTRUCTED OF 6063-T6 ALUMINUM ALLOY. SLEEVING INSIDE THE POLE IS NOT ACCEPTABLE.

THE SLIPFITTER END OF THE LUMINAIRE MAST ARM SHALL BE A NOMINAL 2 3/8 INCHES IN OUTSIDE DIAMETER. THE STRAIGHT PORTION OF THE SLIPFITTER END OF THE LUMINAIRE ARM SHALL BE A NOMINAL 12 INCHES IN LENGTH.

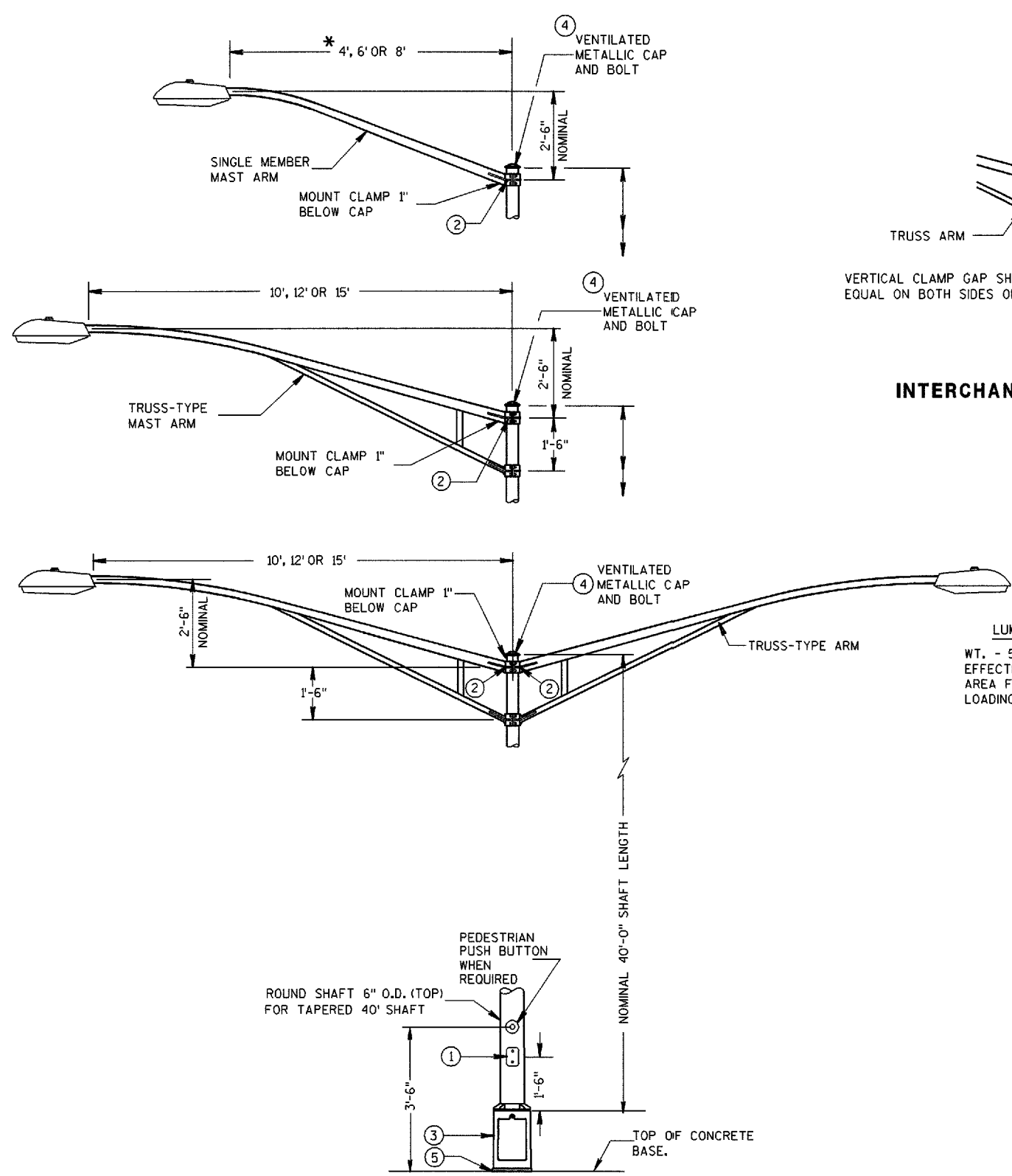
WHEN TRANSFORMER BASES ARE USED, WIRE CONECTIONS SHALL BE MADE IN THE TRANSFORMER BASE.

- ① 4" x 6" REINFORCED HANDHOLE & COVER ASSEMBLY WITH 2 (TWO) 1/4" x 3/4" - 20 TPI HEX HEAD STAINLESS STEEL BOLTS.
- ② GROMMETS, 1" CHASE NIPPLES OR 1" CLOSE CONDUIT NIPPLES WITH BUSHINGS SHALL BE PROVIDED FOR 1 3/8" HOLE IN POLE SHAFT FOR WIRING.
- ③ CAST ALUMINUM TRANSFORMER BASE, WHEN REQUIRED.
- ④ FURNISH AND INSTALL VENTILATED, CAST, METALLIC (ALUMINUM ALLOY) CAPS. FASTEN CAPS WITH ONE (1) 1/4" x 3/4" - 20 TPI STAINLESS STEEL, HEX HEAD BOLT.
- ⑤ SHIMMING, IF NEEDED, SHALL BE LOCATED BETWEEN THE CONCRETE FOUNDATION AND THE TRANSFORMER BASE.

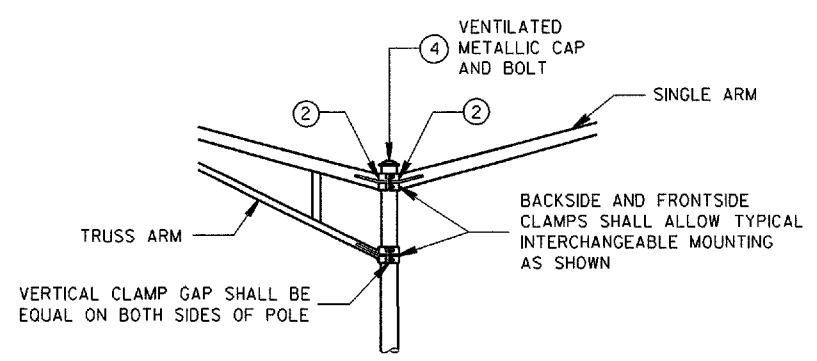
POLE MOUNTINGS FOR
LIGHTING UNITS, TYPE 5
(30 FEET)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

*RISE FOR 4' ARM SHALL BE 2'-0".



INTERCHANGEABLE MOUNTING DETAIL

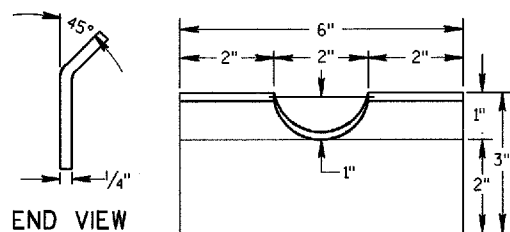


GENERAL NOTES

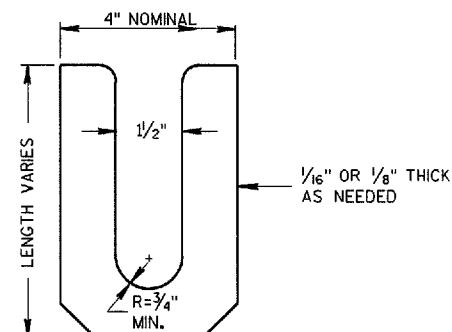
- DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.
- ALL LUMINAIRE POLE MOUNTINGS SHALL BE DESIGNED FOR TWIN 15' ARMS WITH LUMINAIRES.
- POLES SHALL BE GALVANIZED STEEL.
- THE SHOE BASE SHALL BE SLOTTED TO ACCEPT A 15" BOLT CIRCLE (14" X 16" SLOT) USING 1" ANCHOR RODS.
- THE SLIPFITTER END OF THE LUMINAIRE MAST ARM SHALL BE A NOMINAL 2 3/8" INCHES IN OUTSIDE DIAMETER. THE STRAIGHT PORTION OF THE SLIPFITTER END OF THE LUMINAIRE ARM SHALL BE A NOMINAL 12 INCHES IN LENGTH.
- WHEN TRANSFORMER BASES ARE USED, WIRE CONNECTIONS SHALL BE MADE IN THE TRANSFORMER BASE.
- ① 4" x 6" REINFORCED HANDHOLE & COVER ASSEMBLY WITH 2 (TWO) 1/4" x 3/4" - 20 TPI HEX HEAD STAINLESS STEEL BOLTS.
 - ② GROMMETS, 1" CHASE NIPPLES OR 1" CLOSE CONDUIT NIPPLES WITH BUSHINGS SHALL BE PROVIDED FOR A 1 3/8" HOLE IN THE POLE SHAFT FOR WIRING.
 - ③ CAST ALUMINUM FHWA APPROVED TRANSFORMER BASE WHEN REQUIRED, SHALL HAVE AN ULTIMATE STATIC LOAD STRENGTH OF AT LEAST 40,000 FT. - LBS.
 - ④ FURNISH AND INSTALL VENTILATED, CAST, METALLIC (ALUMINUM ALLOY) CAPS. FASTEN CAPS WITH ONE (1) 1/4" x 3/4" - 20 TPI STAINLESS STEEL, HEX HEAD BOLT.
 - ⑤ SHIMMING, IF NEEDED, SHALL BE LOCATED BETWEEN THE CONCRETE FOUNDATION AND THE TRANSFORMER BASE.

TYPE 7 POLE MOUNTING CONFIGURATION
(MAXIMUM LOAD)
LIGHTING ONLY

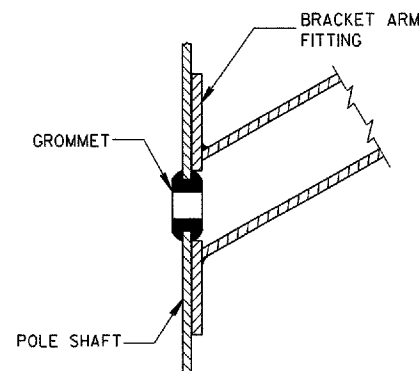
POLE MOUNTINGS FOR LIGHTING UNIT, TYPE 7, 40 FEET
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION



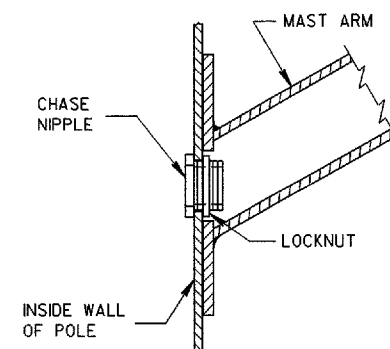
**FRONT VIEW
RECTANGULAR CLAMP SHIM**
(4 TO A SET)



LEVELING SHIM
SHALL BE ALUMINUM



**TYPICAL APPLICATION OF
GROMMET IN POLE SHAFT**



**TYPICAL APPLICATION OF
CHASE NIPPLE IN POLE SHAFT**

GENERAL NOTES

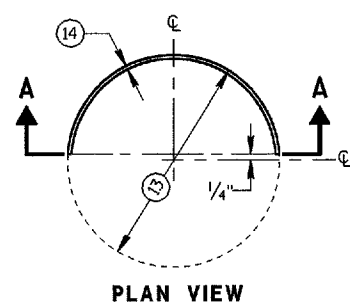
CLAMP BOLT-NUT TIGHTENING TORQUE SHALL BE INDICATED BY INDENT STAMPING (1/2 INCH NUMERALS AND LETTERS) OR WEATHERPROOF PRINTING ON THE INSIDE OF THE CLAMP THAT IS WELDED TO THE ARM MEMBER.

- (10) 4.5" I.D. FOR LUMINAIRE MAST ARM CLAMP.
6.625" I.D. FOR TROMBONE MAST ARM CLAMP.
- (11) INDIVIDUAL BASE PLATE ANCHOR ROD COVERS. (4 REQUIRED)
- (12) BASE PLATE SLOTTED TO ACCEPT 11" THROUGH 12" BOLT CIRCLE USING 1" DIAMETER ANCHOR RODS.
- (13) OUTSIDE SHIM DIAMETER - (4.5" O.D. FOR LUMINAIRE MAST ARM)
(6.625" O.D. FOR TROMBONE MAST ARM)
- (14) VARIABLE SHIM THICKNESS - (0.10", 0.25", 0.35", 0.53" OR 0.70")
SHIM THICKNESS FOR TROMBONE MAST ARMS MAY BE TYPICALLY 0.25", 0.35", 0.53" OR 0.70".
SHIM THICKNESS FOR LUMINAIRE MAST ARMS MAY BE TYPICALLY 0.10", 0.25" OR 0.35".
SHIM MATERIAL SHALL BE ALUMINUM ALLOY.
SHIM THICKNESS SHALL BE IMPRESSED INTO EACH SHIM. NUMERALS SHALL BE 1/4" HIGH AND LEGIBLE.

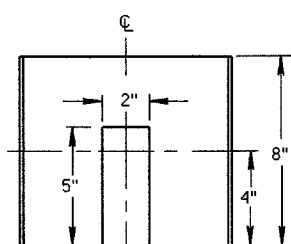
THE CONTRACTOR SHALL SUBMIT TWO COPIES OF ALL SHIM SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL.

- (15) LEVELING SHIMS, DESIGNED FOR THE PURPOSE, SHALL BE USED WHEN PLUMBING POLES. THE USE OF WASHERS IN LIEU OF PROPER LEVELING SHIMS IS NOT ACCEPTABLE. LEVELING SHIMS SHALL BE USED ONLY BETWEEN THE TOP OF THE CONCRETE BASE AND A METALLIC BASE PLATE.

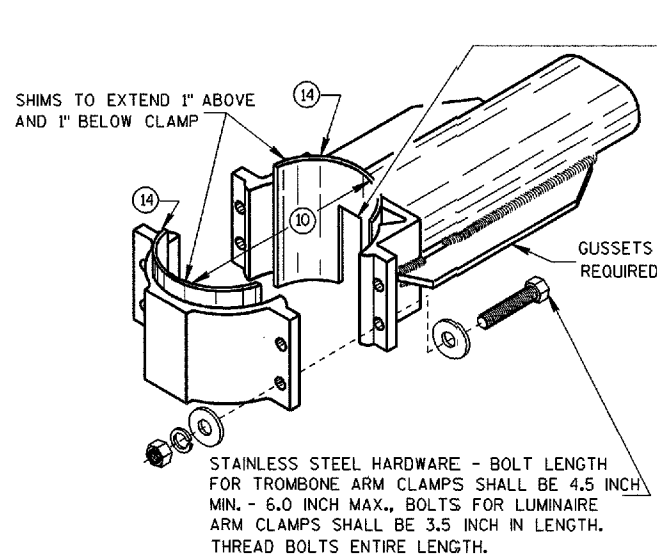
SHIMS SHALL BE LONG ENOUGH AND WIDE ENOUGH TO COMPLETELY COVER THE AREA UNDER THE LENGTH AND WIDTH OF THE BASE MOUNTING FLANGE.



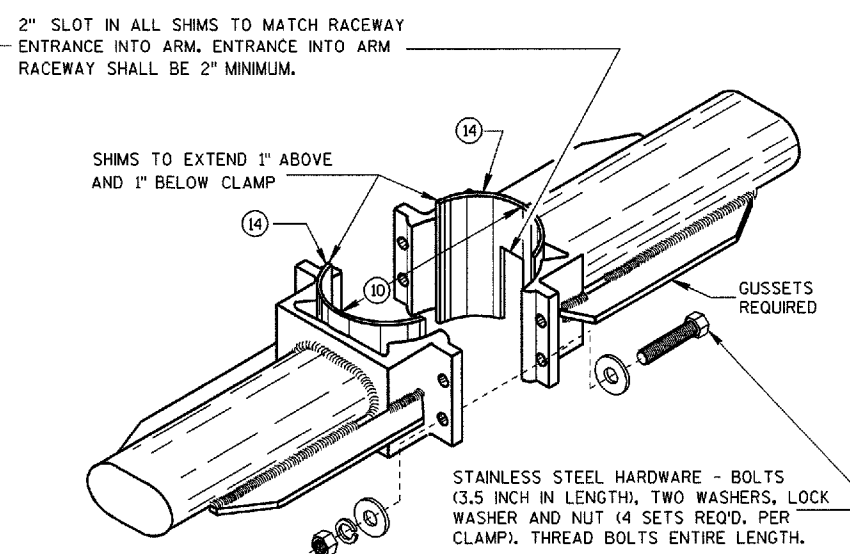
PLAN VIEW



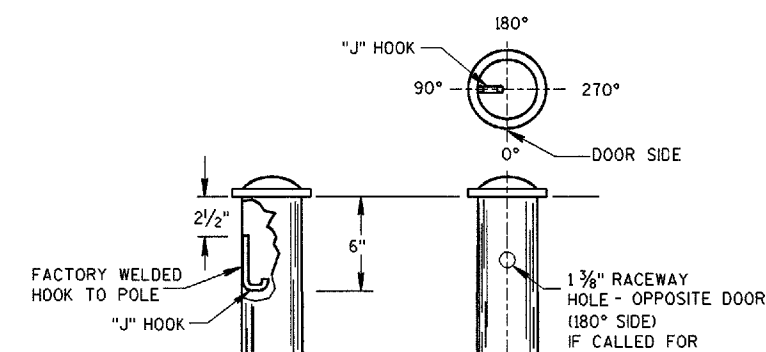
**SECTION A-A
CIRCULAR CLAMP SHIM**
(2 TO A SET)



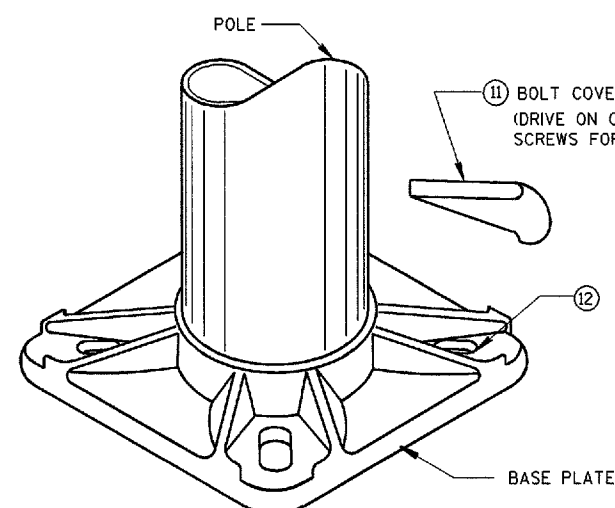
**TYPICAL TROMBONE MAST ARM AND SINGLE
LUMINAIRE MAST ARM MOUNTING CLAMP**



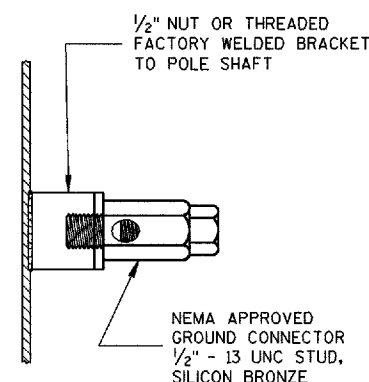
**TYPICAL LUMINAIRE MAST ARM
(DOUBLE) MOUNTING BRACKETS**



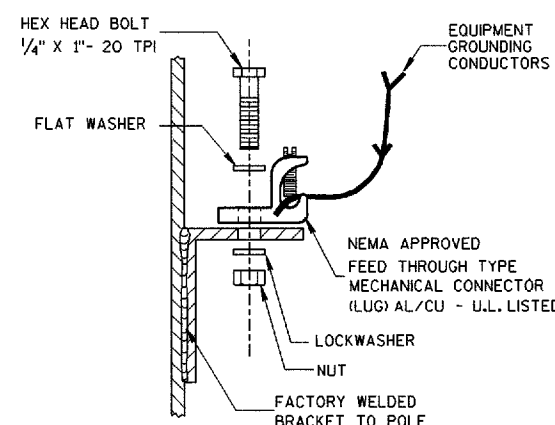
TYPICAL "J" HOOK LOCATION



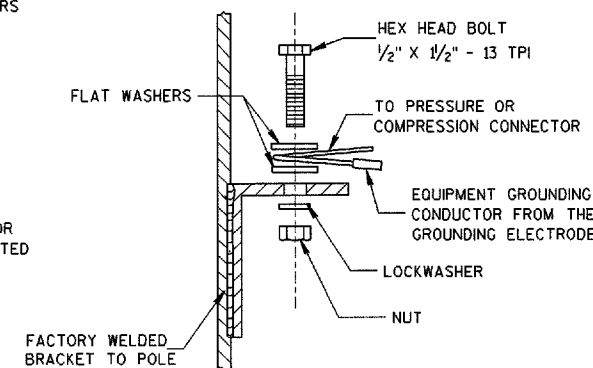
BASE PLATE



**NEMA APPROVED
GROUND CONNECTOR
1/2" - 13 UNC STUD,
SILICON BRONZE**



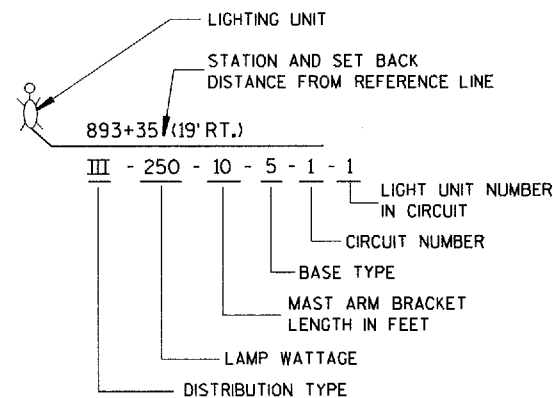
TYPICAL GROUNDING CONNECTIONS
NUT, BOLT AND WASHERS SHALL
BE STAINLESS STEEL



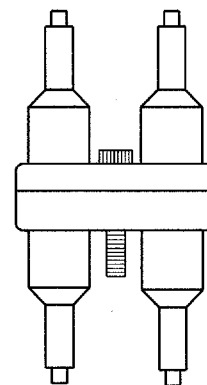
HARDWARE DETAILS FOR POLE MOUNTINGS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

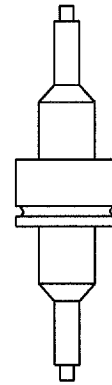
APPROVED
3/15/11
DATE
STATE ELECTRICAL ENGINEER FOR
HIGHWAYS



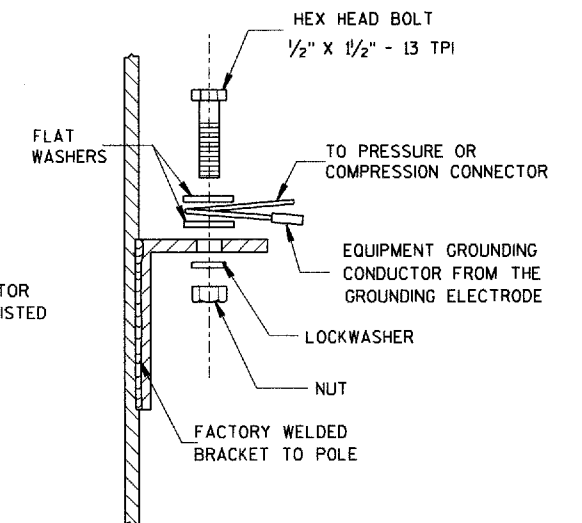
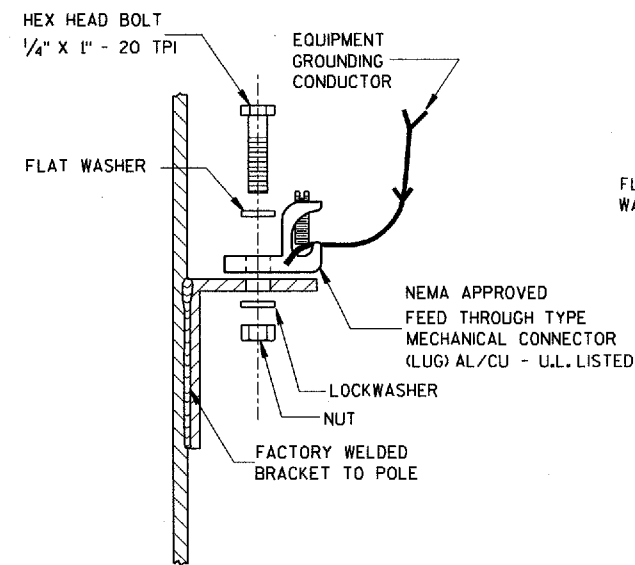
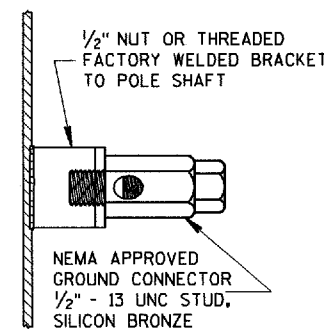
LIGHTING UNIT CODE
(TYPICAL)



DETAIL "A"
DOUBLE POLE



DETAIL "B"
SINGLE POLE



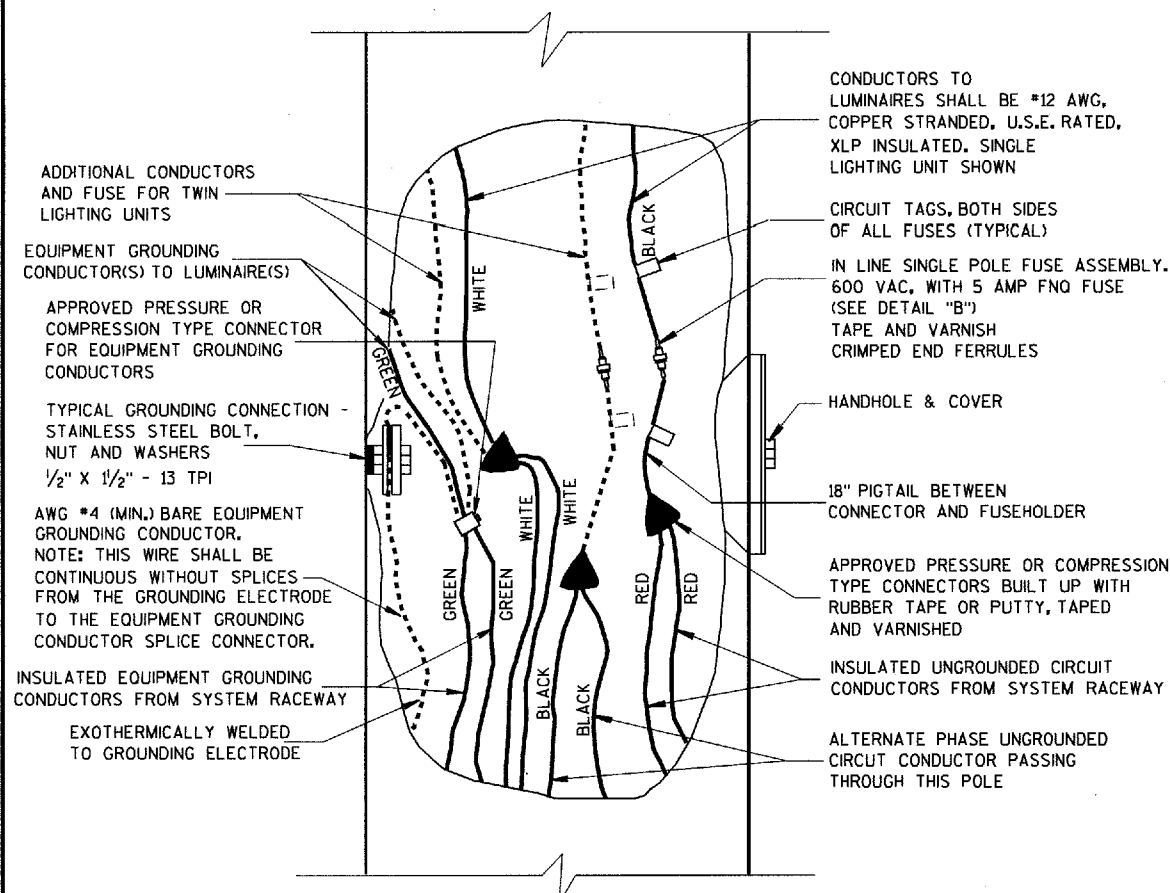
TYPICAL GROUNDING CONNECTIONS

NUT, BOLT, WASHERS AND LOCKWASHERS SHALL BE STAINLESS STEEL

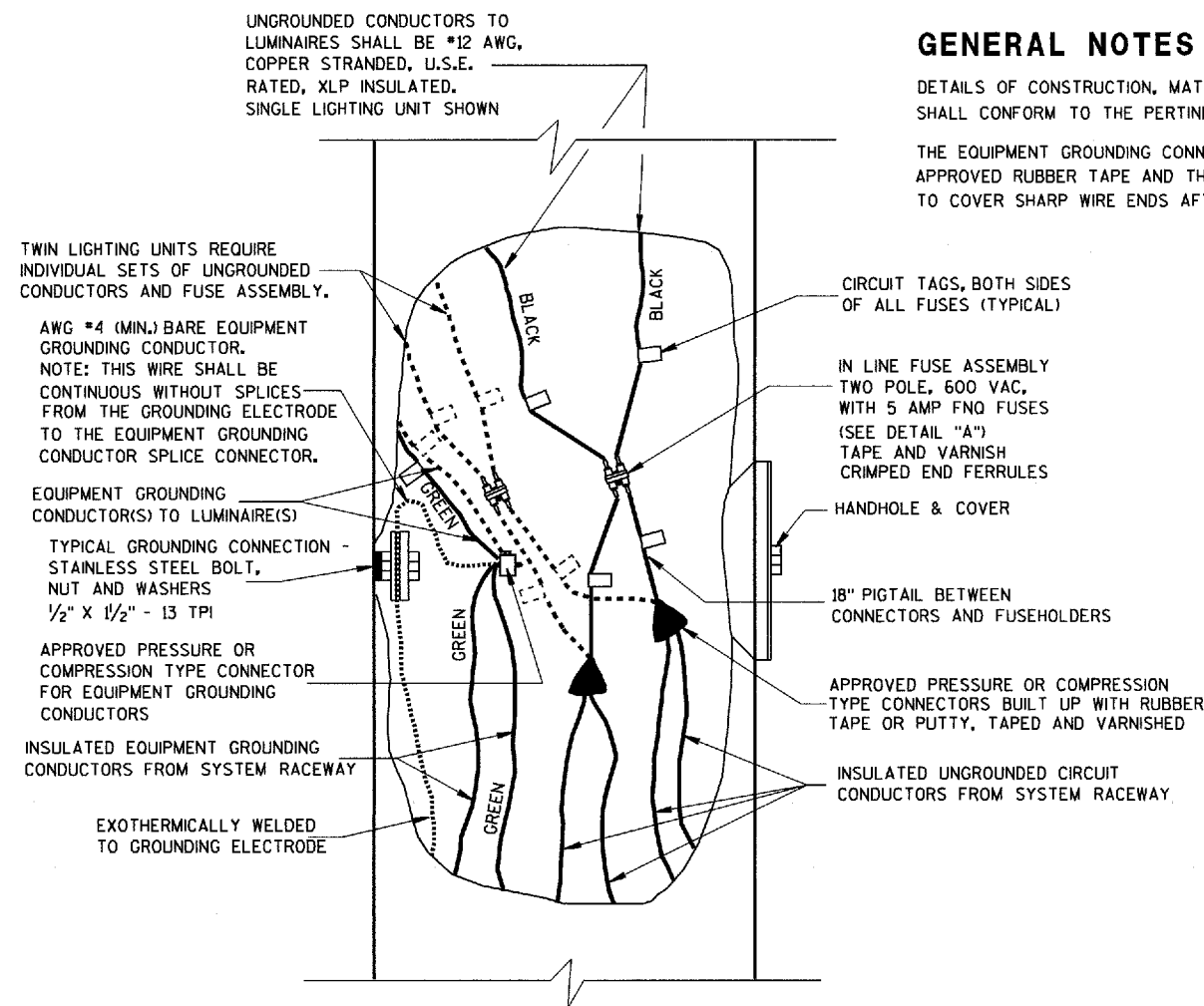
GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

THE EQUIPMENT GROUNDING CONNECTOR SHALL BE TAPED WITH 3 WRAPS (MINIMUM) OF APPROVED RUBBER TAPE AND THEN 3 WRAPS (MINIMUM) OF APPROVED VINYL TAPE TO COVER SHARP WIRE ENDS AFTER THE CONNECTION IS COMPLETED.



3 WIRE - 120, 240 OR 480 VAC (UNGROUND CONDUCTOR)
WITH GROUNDED CONDUCTOR AND
WITH EQUIPMENT GROUNDING CONDUCTOR



2 WIRE - 240 OR 480 VAC (UNGROUND CONDUCTORS)
WITH EQUIPMENT GROUNDING CONDUCTOR

**NON-FREWAY LIGHTING UNIT
POLE WIRING**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

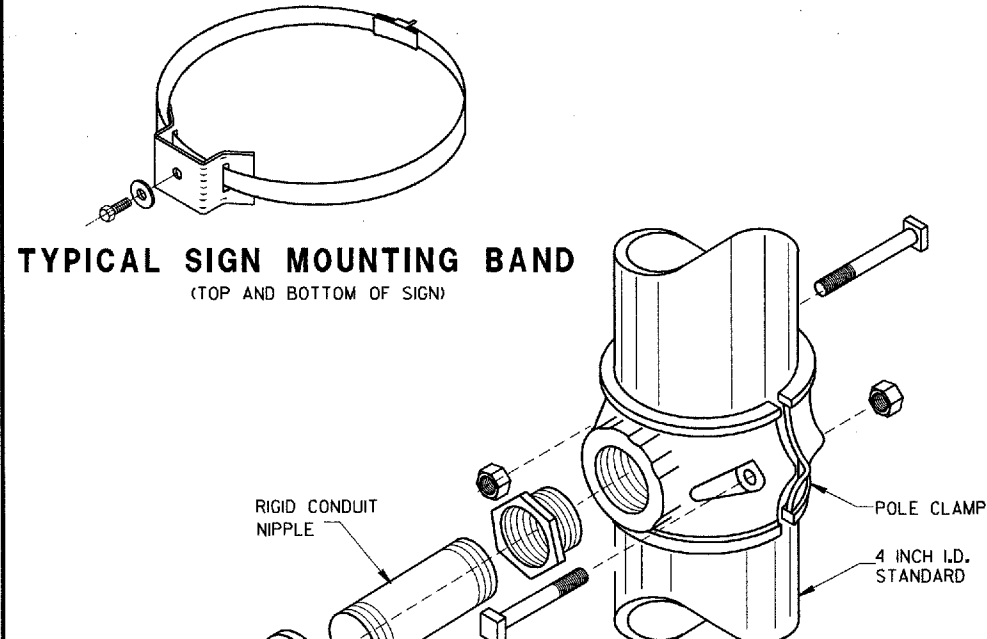
APPROVED

10/21/96
DATE

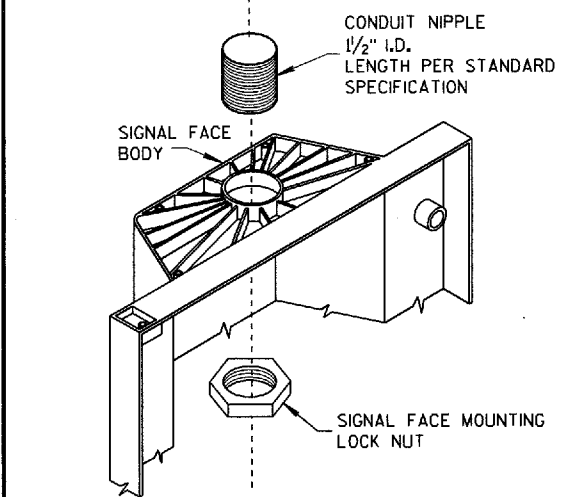
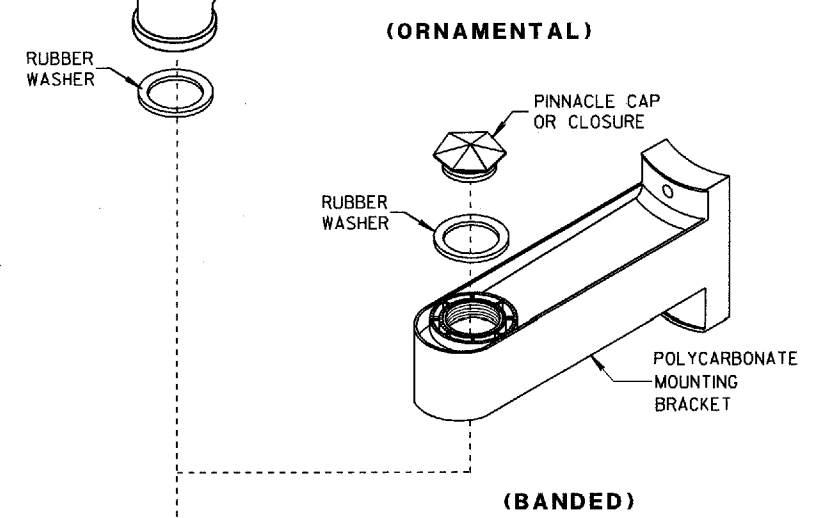
FHWA

State Engineer
STATE ELECTRICAL ENGINEER FOR
HIGHWAYS

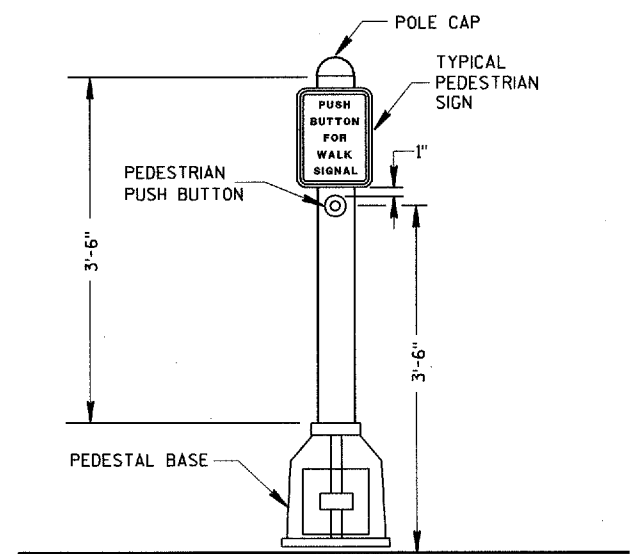
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S.D.D. 9 E 7-1



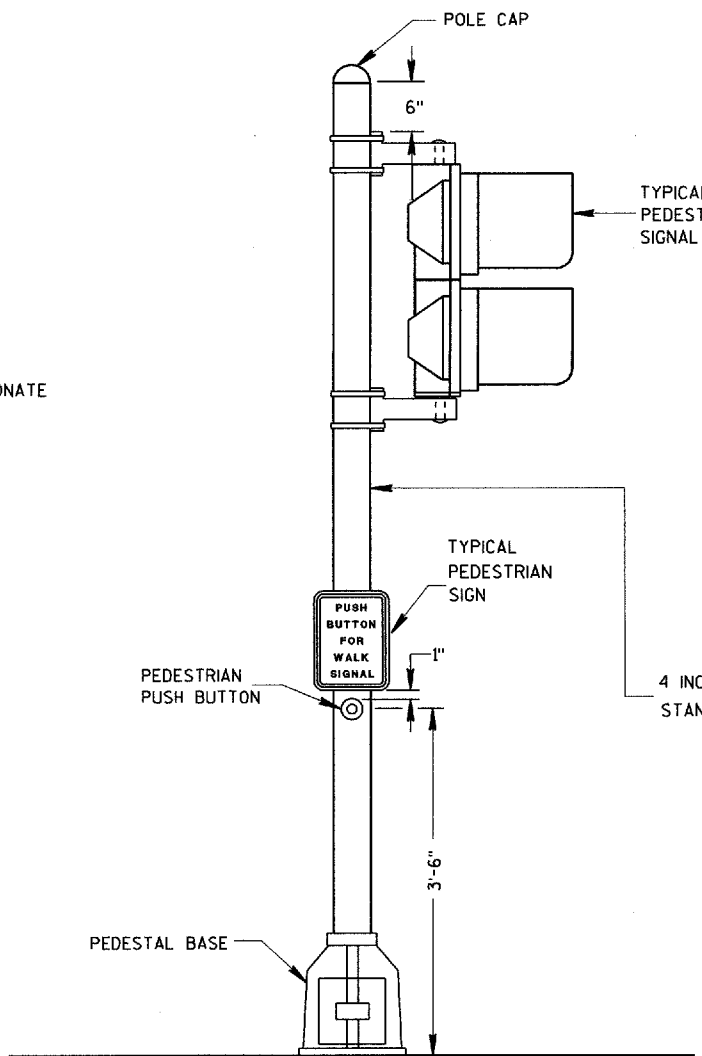
TYPICAL SIGN MOUNTING BAND
(TOP AND BOTTOM OF SIGN)



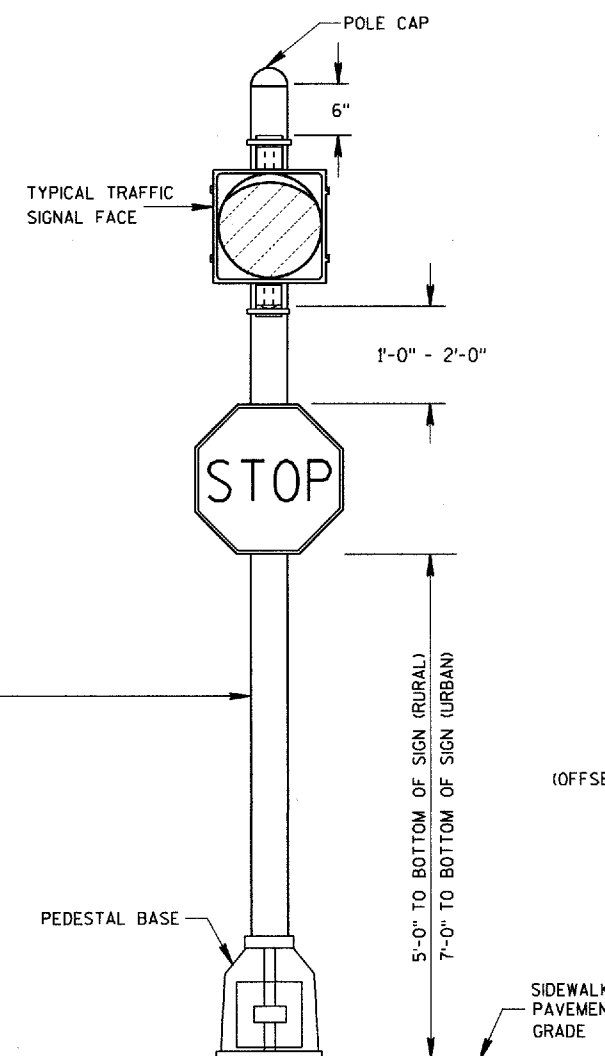
SIGNAL FACE MOUNTING DETAILS



**PEDESTRIAN PUSH BUTTON
TYPICAL MOUNTING**



PEDESTRIAN FACE STANDARD-10 FT.
(WALK-DON'T WALK)



STANDARD FLASHER.
10 FOOT, 13 FOOT OR 15 FOOT AS REQUIRED

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

SEE THE SIGNAL PLAN FOR REQUIRED SIGNAL FACE SIZES.

LOCATIONS SHALL BE AS SHOWN ON THE PLANS.

ALL PEDESTAL BASES SHALL BE MOUNTED ON CONCRETE BASE - TYPE 1.

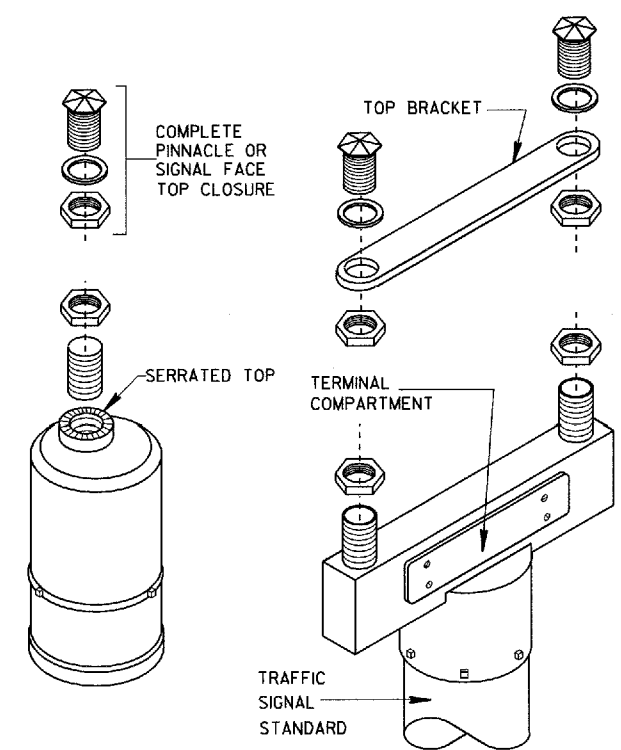
FOR APPROVED MOUNTING HARDWARE, SEE THE CONTRACT SPECIFICATIONS.

POLYCARBONATE SIGNAL FACE MOUNTING BRACKETS SHALL BE USED UNLESS ORNAMENTAL POLE CLAMPS ARE SPECIFIED.

LENGTH OF TRAFFIC STANDARDS SHALL BE AS SHOWN ON THE PLANS.

MOUNTINGS AND BRACKETS SHALL BE AS SHOWN ON THE PLANS OR DESCRIBED IN THE SPECIAL PROVISIONS (BY THE DISTRICT TRAFFIC ENGINEER).

PEDESTRIAN SIGNS SHALL BE AS DESIGNATED IN THE PLANS.

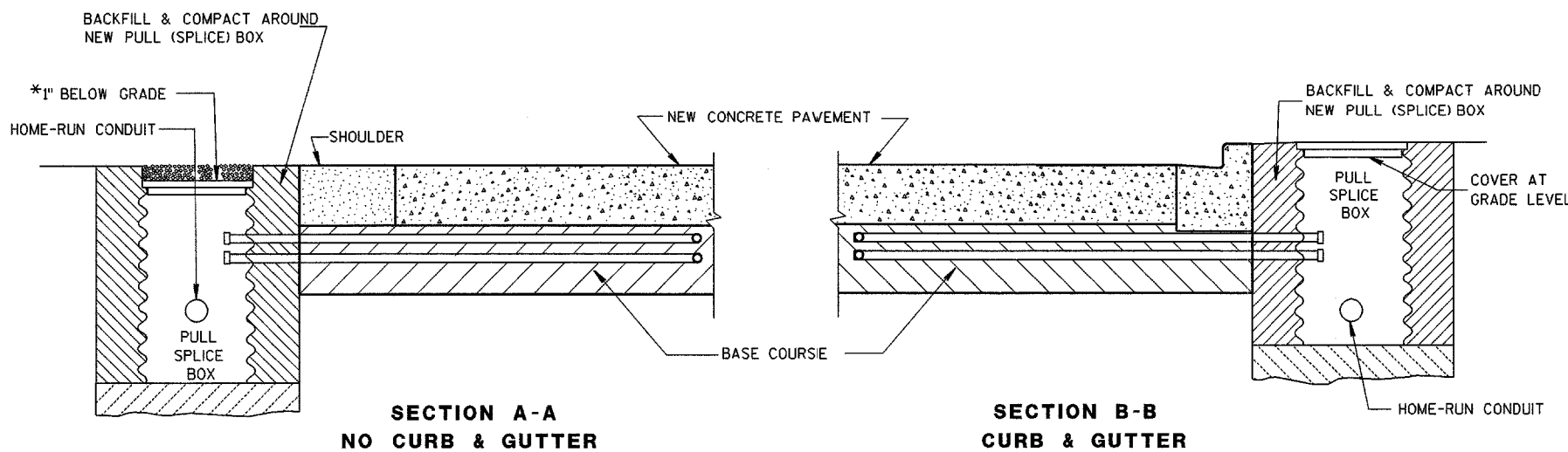


SINGLE
(OFFSET-SERRATED MOUNTING)

DOUBLE
(SERRATED MOUNTING)

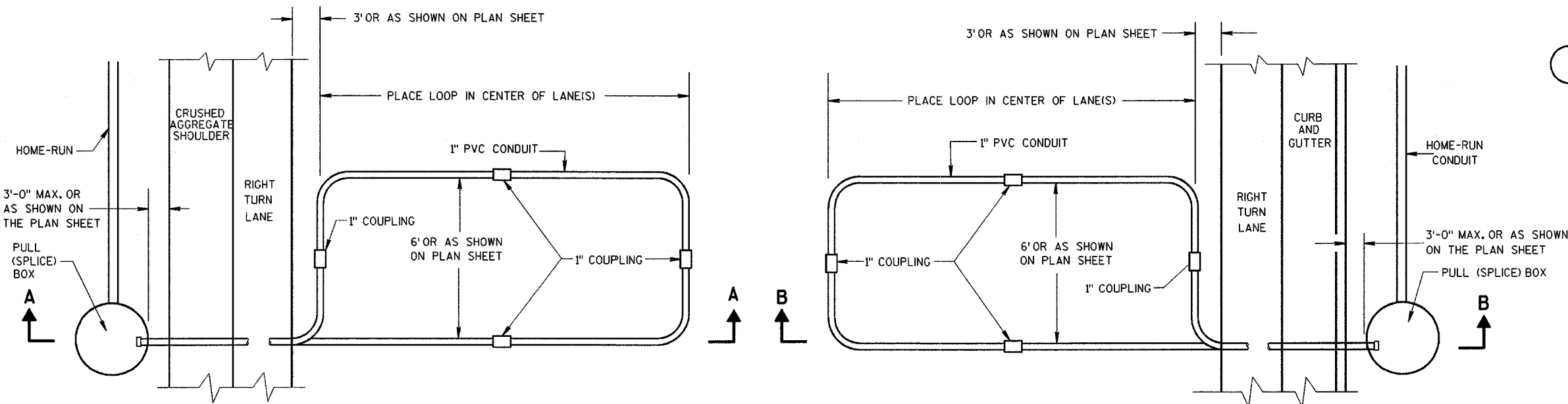
SLIPFITTERS

TRAFFIC SIGNAL STANDARD PEDESTRIAN AND FLASHER TYPICAL MOUNTING DETAILS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED <i>[Signature]</i> DATE	STATE ELECTRICAL ENGINEER FOR HIGHWAYS
FHWA	

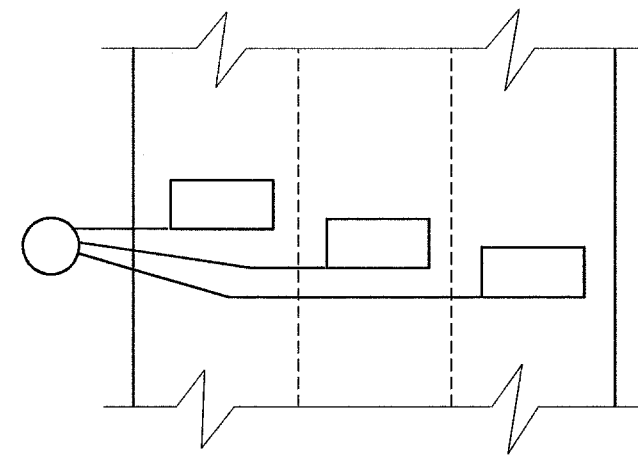


*RECESS PULL (SPICE) BOX SO THAT THE COVER IS 3" BELOW GRADE IN SHOULDER AREAS OF CRUSHED AGGREGATE. BACKFILL OVER COVER WITH THE CRUSHED AGGREGATE TO BRING THE AREA TO GRADE LEVEL.

LOOP DETECTOR INSTALLATION DETAIL



TYPICAL PLAN OF LOOP DETECTOR WITH 24" PULL (SPICE) BOX



MULTI-LANE INSTLLATION

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

LOOP SIZE, CONFIGURATION LOCATION, NUMBER OF TURNS OF WIRE AND ASSOCIATED SIGNAL PHASE SHALL BE AS SHOWN ON THE PLANS.

PITCH LEAD OUT CONDUIT TO DRAIN TO ROADSIDE PULL (SPICE) BOX.

SPLICES SHALL BE INSTALLED BY USING CAST IN PLACE SPLICE KITS SUCH AS 3M TYPE 82A1 OR APPROVED EQUAL. NON-INSULATED BUTT SPLICES TO FIT #12 AWG STRANDED WIRE SHALL BE USED. SPLICES SHALL BE SOLDERED AND INSULATED FROM EACH OTHER AS PER INSTRUCTIONS INCLUDED IN THE SPLICE KIT.

THE GROUND RESISTANCE READING OF THE LOOP SHALL READ "INFINITY" TO GROUND ON AN OHMMETER USING A MULTIPLIER SCALE OF 1 MEGOHM AND AN INPUT RESISTANCE OF 11 MEGOHMS MINIMUM BEFORE SPLICING THE LOOP TO THE LEAD-IN CABLE.

AFTER SPLICING THE LOOP WIRE TO THE LOOP LEAD-IN CABLE, THE CONTRACTOR SHALL MEASURE INDUCTANCE, GROUND RESISTANCE AND WIRE RESISTANCE AT THE CABINET END OF THE LEAD-IN CABLE AND FURNISH A COPY OF THE READINGS TO THE PROJECT ENGINEER FOR EVALUATION.

LOOP DETECTOR LEADS SHALL BE IDENTIFIED WITH THEIR ASSOCIATED LOOP BY USE OF WATERPROOF TAGS AT BOTH ENDS OF THE CABLE. A LISTING OF THE CABLE IDENTIFICATION PER INDIVIDUAL LOOP LEAD-IN SHALL BE PLACED IN THE CABINET.

THE #12 AWG LOOP WIRE IN THE PULL (SPICE) BOX SHALL BE HAND TWISTED AT LEAST 3 TWISTS PER FOOT BEFORE BEING SPLICED TO THE LOOP LEAD-IN CABLE.

SPLICES OF LOOP WIRE TO LEAD-IN CABLE SHALL BE MADE ONLY IN PULL (SPICE) BOXES AT THE SIDE OF THE ROAD.

THE #12 AWG LOOP WIRE SHALL BE INSTALLED FROM THE ROADSIDE PULL (SPICE) BOX, THROUGH THE LOOP CONDUIT, BACK TO THE ROADSIDE PULL (SPICE) BOX, AND BE INSTALLED IN ONE, NON-SPLICED CONTINUOUS LENGTH.

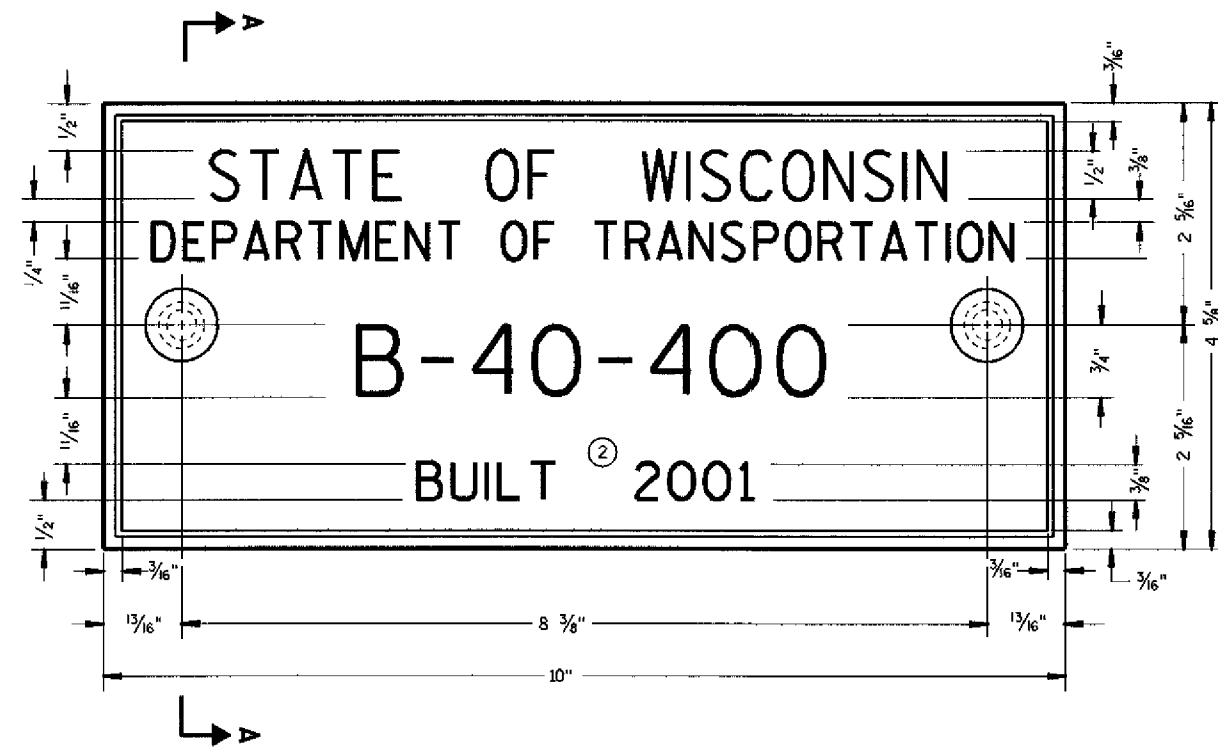
PROTECTION OF THE CONDUITS IN THE BASE COURSE SHALL BE REQUIRED AFTER INSTALLATION AND BEFORE NEW PAVEMENT IS INSTALLED.

SHOULD INSTALLATION REPAIR BE REQUIRED, IT SHALL BE DONE UNDER THE DIRECTION OF THE PROJECT ENGINEER.

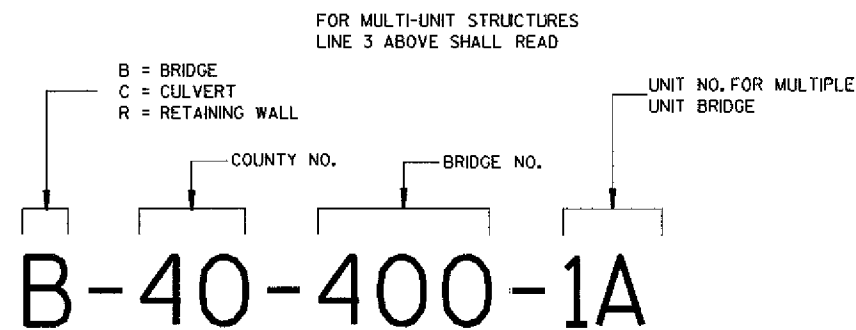
LOOP DETECTOR INSTALLED IN BASE COURSE WITH PULL (SPICE) BOX OFF ROADWAY (OPTION 2)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED DATE FHWA	<i>[Signature]</i> STATE ELECTRICAL ENGINEER FOR HIGHWAYS

S.D.D. 9 F 15-1b

S.D.D. 9 F 15-1b



TYPICAL NAME PLATE
(BRIDGES, CULVERTS, AND RETAINING WALLS)



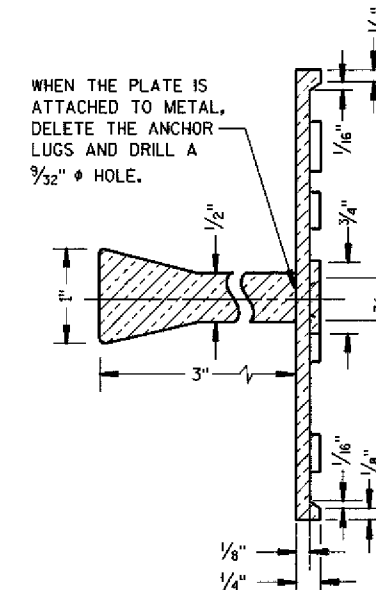
NUMBERING DESIGNATION
MULTI-UNIT STRUCTURES

GENERAL NOTES

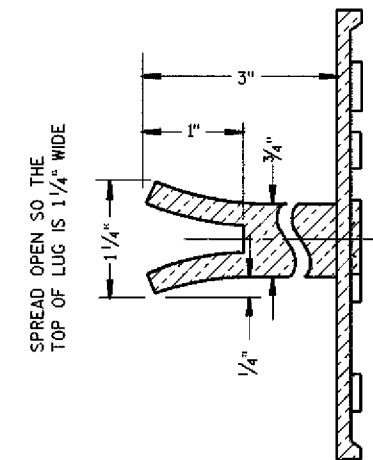
NAME PLATES TO BE INSTALLED ON BRIDGES, CULVERTS, AND RETAINING WALLS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 506.2.4 OF THE STANDARD SPECIFICATIONS.

THE BRIDGE NUMBER AND YEAR BUILT SHOWN ON THIS DRAWING ARE EXAMPLES ONLY. SEE CONSTRUCTION PLANS FOR INDIVIDUAL NUMBERING AND YEAR BUILT.

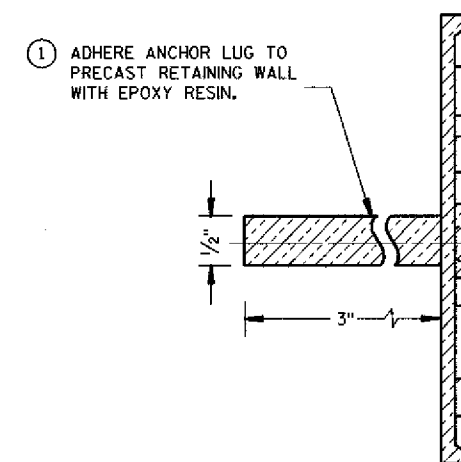
- 1 EPOXY RESIN SHALL BE FROM AN APPROVED MANUFACTURER AND USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- 2 REHABILITATION OF AN EXISTING STRUCTURE SHOULD USE THE DATE OF ORIGINAL STRUCTURE CONSTRUCTION.



SECTION A-A



ALTERNATE LUG



ALTERNATE LUG
(FOR ATTACHMENT TO PRECAST STRUCTURES)

NAME PLATE
(STRUCTURES)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

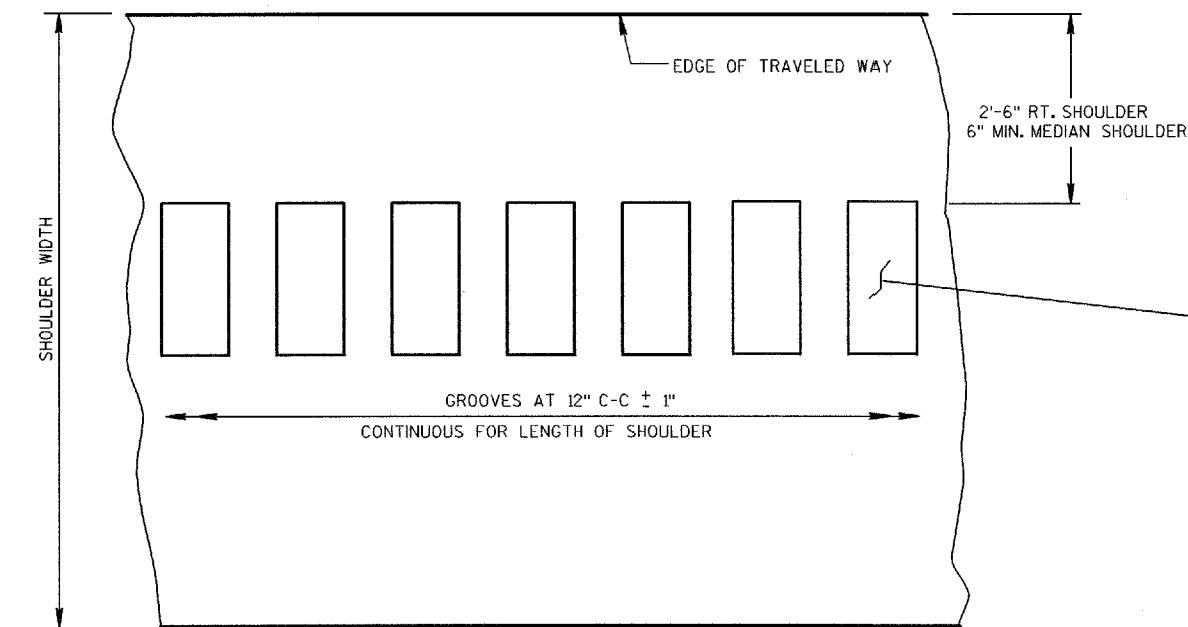
APPROVED

11/29/00

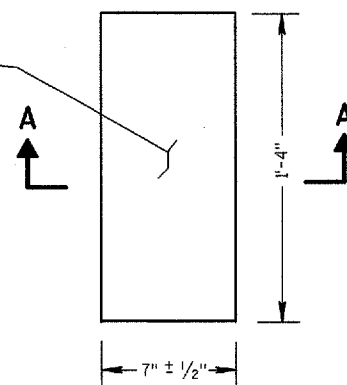
DATE

CHIEF STRUCTURAL DEVELOPMENT ENGINEER

FHWA



**PLAN VIEW
SHOULDER WITH GROOVES**



**PLAN VIEW
(SINGLE GROOVE)**

PLACEMENT DETAIL FOR MILLED RUMBLE STRIP

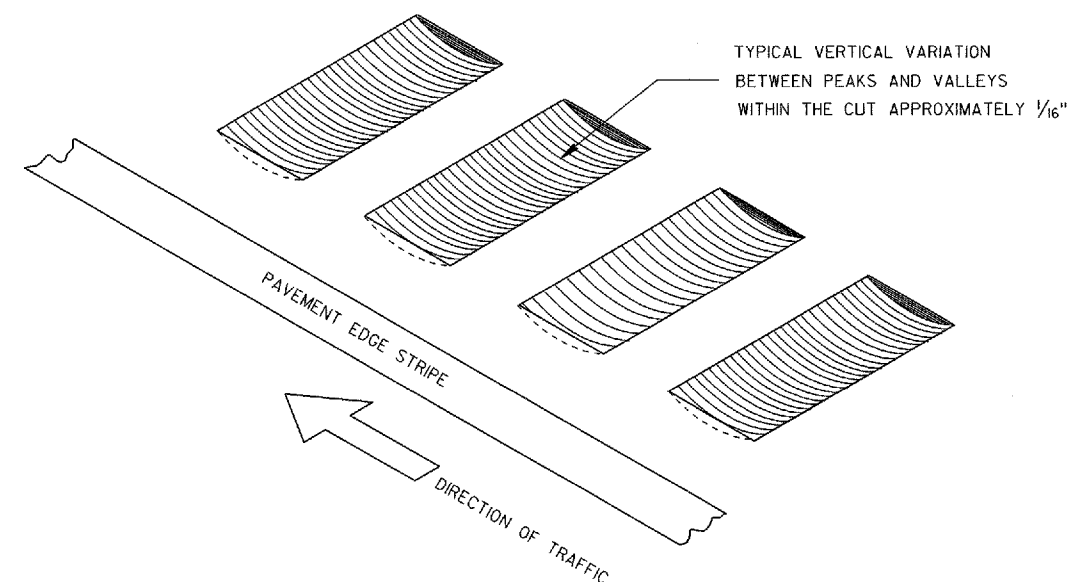
GENERAL NOTES

DETAILS OF CONSTRUCTION SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

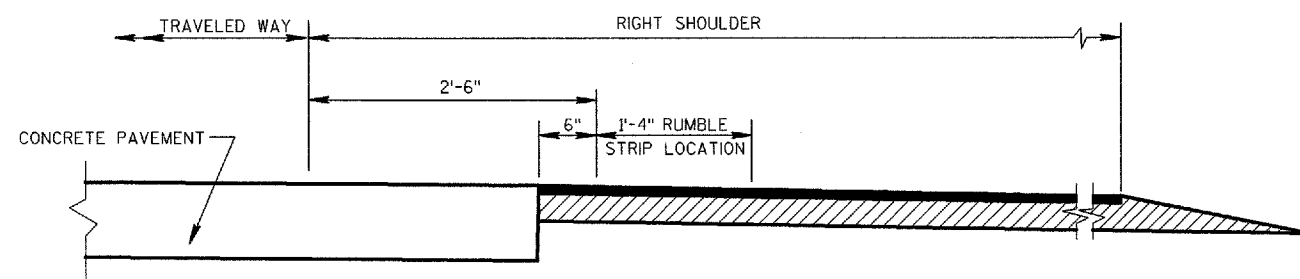
RUMBLE STRIPS ON EXPRESSWAYS

DO NOT INSTALL RUMBLE STRIPS ACROSS SIDE ROAD INTERSECTIONS, COMMERCIAL DRIVEWAYS OR ADJACENT TO RIGHT TURN LANES, LEFT TURN LANES OR TURN LANE TAPERS. THE ATTACHED STANDARD DETAIL DRAWING SHOWS THE LOCATION OF THE RUMBLE STRIPS AT INTERCHANGE AREAS.

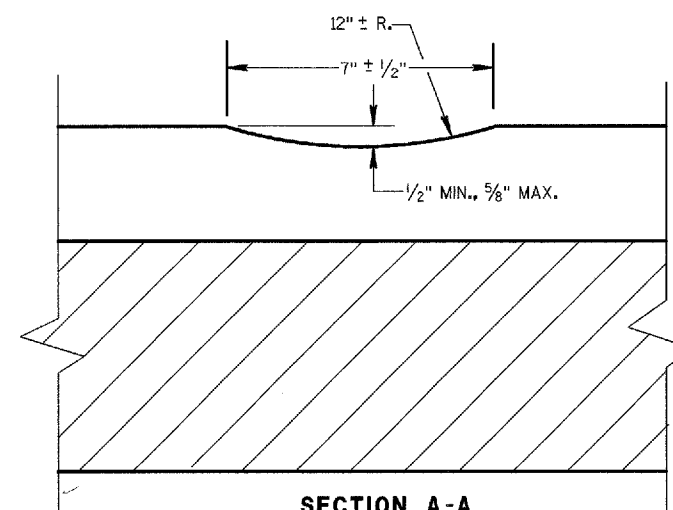
① 2'-6" FOR MEDIAN SHOULDERS THAT HAVE A PAVED WIDTH OF 5'-0" OR MORE.



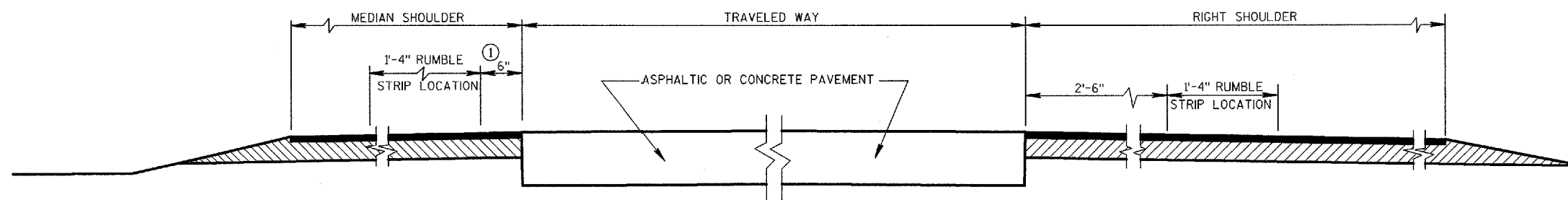
ISOMETRIC



**SECTION VIEW
(CONCRETE PAVEMENT EXTENDS INTO RIGHT SHOULDER)**



SECTION A-A



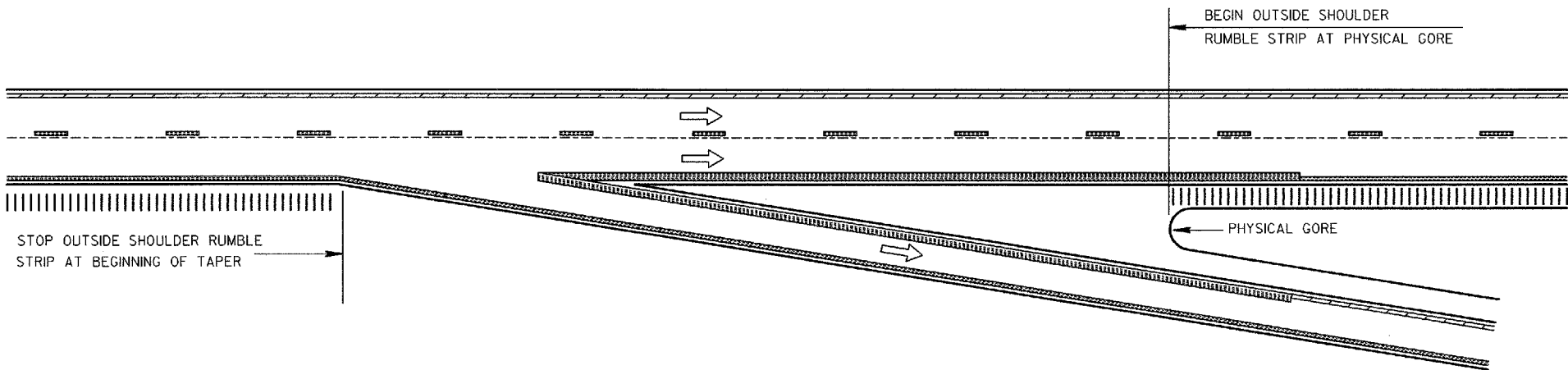
**SECTION VIEW
TYPICAL LOCATIONS OF ASPHALTIC SHOULDER RUMBLE STRIPS
IN RURAL DIVIDED HIGHWAYS
(ONE ROADWAY IS SHOWN)**

**ASPHALTIC SHOULDER
RUMBLE STRIP, MILLING**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

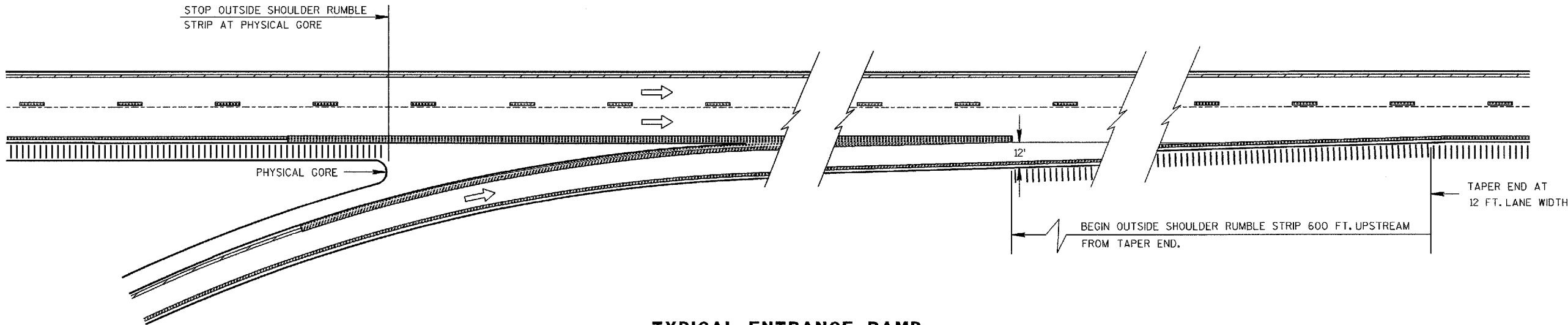
NOTES:

NO RUMBLE STRIP ON EXIT, DIRECTIONAL, OR ENTRANCE RAMP, EXCEPT NEAR THE ENTRANCE TAPER END AS SHOWN.
PAVEMENT MARKING DETAILS AND SPECIFICATIONS ARE PROVIDED ELSEWHERE IN THE CONTRACT.



TYPICAL EXIT RAMP

NOTE:
ARROW SYMBOL (→)
SHOWS DIRECTION OF TRAVEL

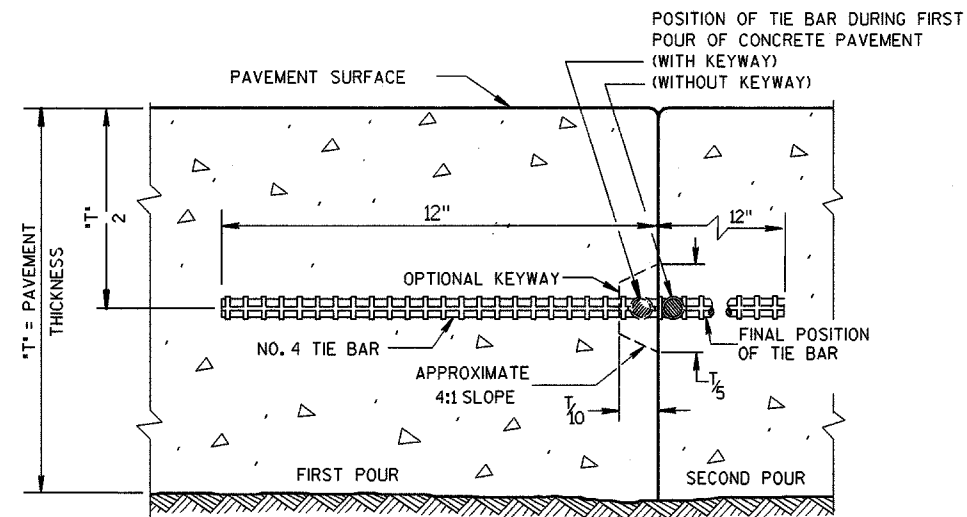


**TYPICAL ENTRANCE RAMP
RAMP AND GORE RUMBLE STRIP LOCATIONS**

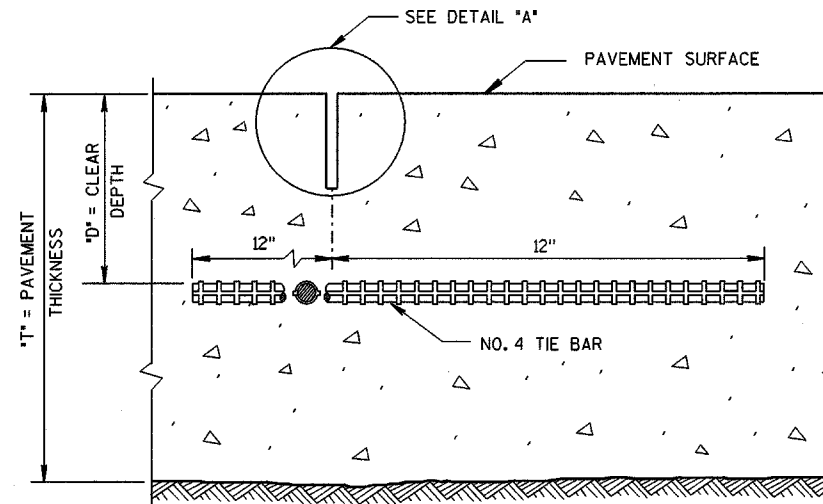
ASPHALTIC SHOULDER
RUMBLE STRIP, MILLING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

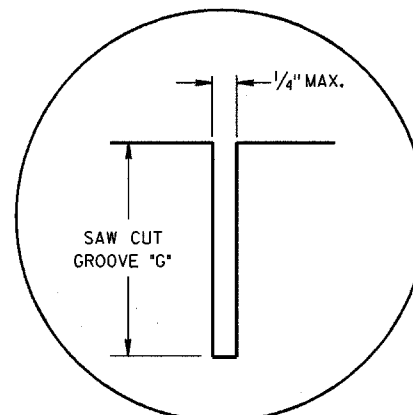
APPROVED *[Signature]*
DATE 10/01/99
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA



CONSTRUCTION JOINT



SAWED JOINT



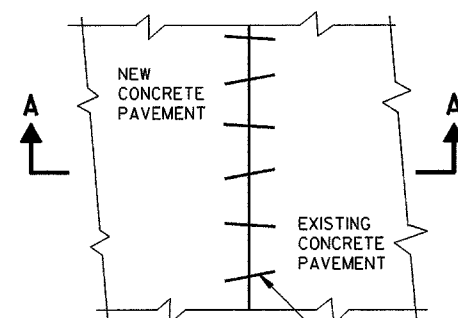
DETAIL "A"

GENERAL NOTES

DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

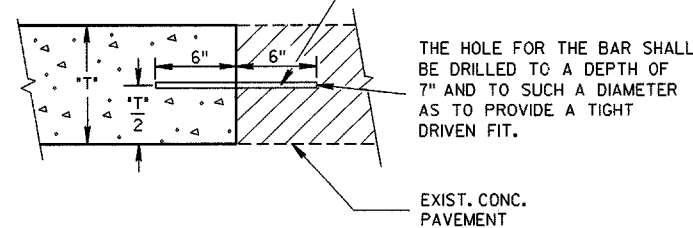
LONGITUDINAL JOINTS SHALL NOT BE SEALED OR FILLED.

TIE BAR SPACINGS ARE VALID ONLY FOR PAVEMENT WIDTHS IN THE TABLE. FOR WIDER PAVEMENTS, TIED CONCRETE SHOULDERS OR RAMPS, THE TIE BAR SPACING SHALL BE AS SHOWN ON THE PLANS.



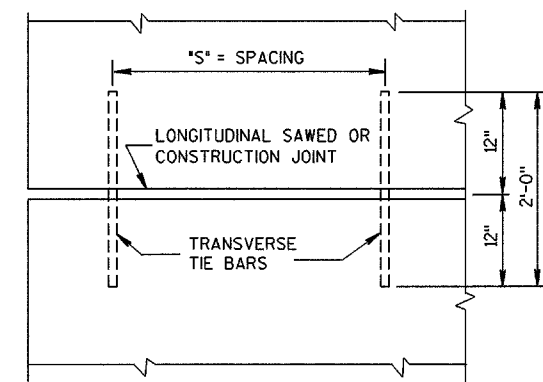
PLAN VIEW

NO. 6 TIE BARS SPACED 3'-0" C-C, INSTALLED ON 6:1 SKEW HORIZONTALLY. DIRECTION OF SKEW ALTERNATING AFTER EVERY ONE OR TWO BARS.



SECTION A-A PAVEMENT TIES

PAVEMENT THICKNESS "T"	CLEAR DEPTH "D"	SAW CUT GROOVE "G"	MAXIMUM TIE BAR SPACING "S"	
			PAVEMENT WIDTH	
			24' OR 26'	30'
6, 6 1/2"	3" ± 1/2"	2"	48"	42"
7, 7 1/2"	3 1/4" ± 1"	2 1/4"	45"	36"
8, 8 1/2"	3 3/4" ± 1"	2 1/2"	39"	30"
9, 9 1/2"	4 1/4" ± 1"	3"	33"	27"
10, 10 1/2"	4 3/4" ± 1"	3 1/4"	30"	24"
11, 11 1/2"	5 1/4" ± 1"	3 3/4"	27"	21"
12"	5 3/4" ± 1"	4"	24"	21"

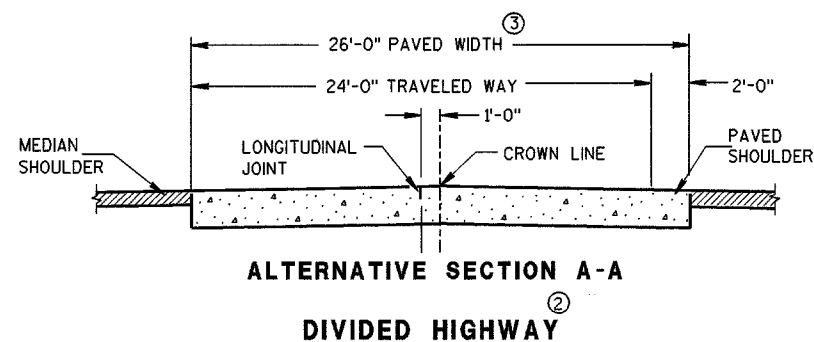
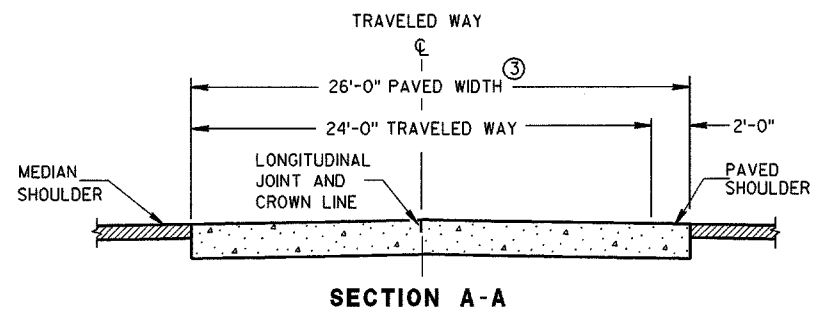
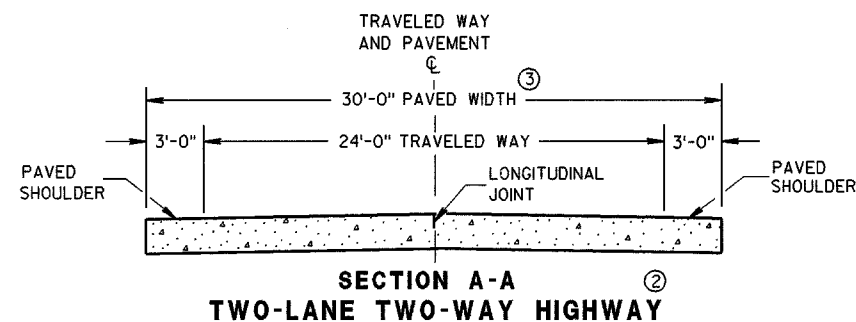


PLAN VIEW SHOWING LOCATION OF TIE BARS

CONCRETE PAVEMENT LONGITUDINAL JOINTS AND PAVEMENT TIES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
DATE 6/6/02
PAVEMENT ENGINEER
FHWA



GENERAL NOTES

DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

CONTRACTION JOINTS

CONTRACTION JOINTS SHALL BE NORMAL TO THE CENTERLINE. THE LOCATION OF CONTRACTION JOINTS THROUGH INTERSECTIONS SHALL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

CONTRACTION JOINTS SHALL NOT BE SEALED OR FILLED.

DOWEL BARS SHALL BE PARALLEL TO THE PAVEMENT CENTERLINE AND SURFACE.

CONSTRUCTION JOINTS

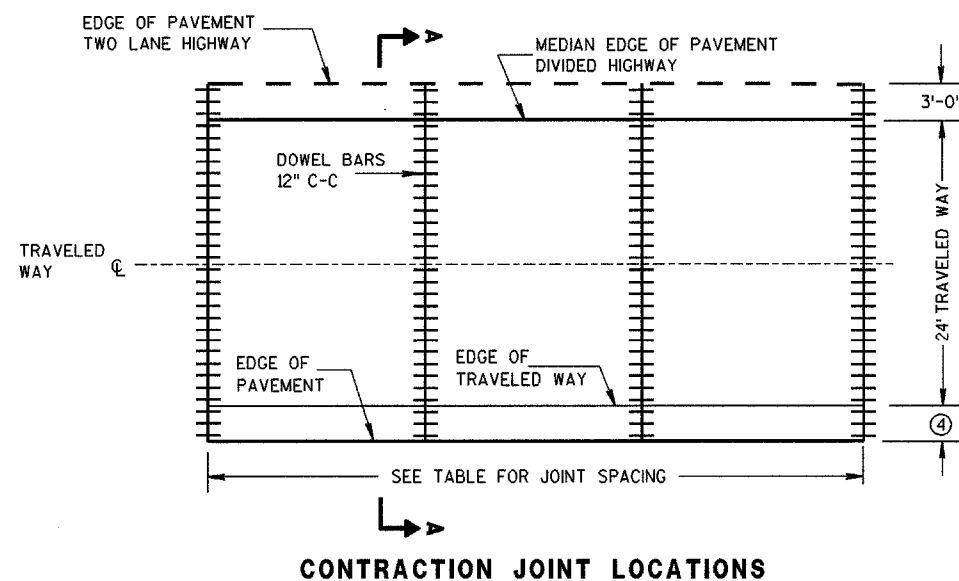
CONSTRUCTION JOINTS SHALL BE A MINIMUM OF 4 FEET FROM THE NEAREST CONTRACTION JOINT AND ALIGNED EITHER PARALLEL TO THE CONTRACTION JOINTS OR AT 90° TO THE CENTERLINE.

TIE BARS MAY BE INSERTED THROUGH THE HEADER BOARD AFTER THE CONCRETE HAS BEEN PLACED.

- ① ALTERNATIVE DESIGNS OF THE DOWEL ASSEMBLY MAY BE USED WHEN APPROVED BY THE ENGINEER. MECHANICAL DOWEL BAR IMPLANTERS MAY BE USED INSTEAD OF DOWEL ASSEMBLIES.
- ② REFER TO TYPICAL CROSS SECTIONS FOR ADDITIONAL DETAILS.
- ③ THE ENTIRE PAVED WIDTH INCLUDING THE PORTION(S) LABELED PAVED SHOULDER WILL BE MEASURED AS CONCRETE PAVEMENT.
- ④ 2'-0" DIVIDED HIGHWAYS
3'-0" TWO-LANE TWO-WAY HIGHWAYS
SEE SECTION A-A
- ⑤ DOWEL BARS SHALL BE ANCHORED INTO DRILL HOLES WITH AN APPROVED EPOXY GROUT.
- ⑥ THE FREE END OF DOWEL BARS SHALL RECEIVE A THIN UNIFORM COATING OF BOND BREAKING GREASE.
- ⑦ DOWEL BARS INSTALLED BY DRILLING SHALL BE SPACED 1'-3" ON CENTER. THE GROUPING OF DOWEL BARS SHALL BE CENTERED INSIDE THE SLAB BASED ON ALL THE FOLLOWING SITUATIONS:

BETWEEN THE EDGES OF PAVEMENTS WITHOUT LONGITUDINAL JOINTS OR BETWEEN THE EDGE OF PAVEMENT AND NEAREST LONGITUDINAL JOINT OR BETWEEN TWO ADJACENT LONGITUDINAL JOINTS.

THE CLEAR DISTANCE FROM THE EDGE OF PAVEMENT OR LONGITUDINAL JOINT TO THE NEAR EDGE OF DOWEL BAR NEAREST THAT EDGE OR JOINT SHALL BE A MINIMUM OF 6 INCHES AND A MAXIMUM OF 14 INCHES.

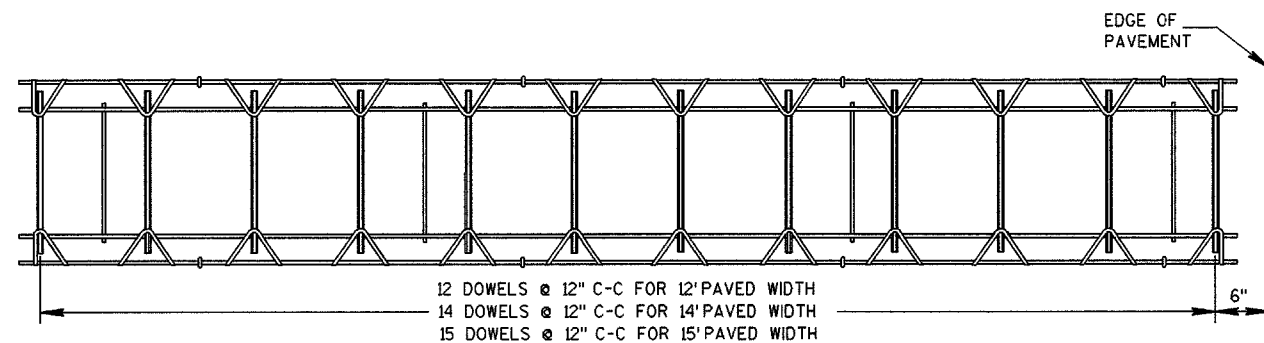


DOWEL BAR SIZE & JOINT SPACING TABLE

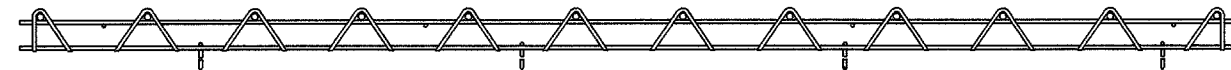
PAVEMENT DEPTH	DOWEL BAR DIAMETER	CONTRACTION JOINT SPACING
9 1/2" OR LESS	1 1/4"	15'
MORE THAN 9 1/2"	1 1/2"	18'

RURAL DOWELED
CONCRETE PAVEMENT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

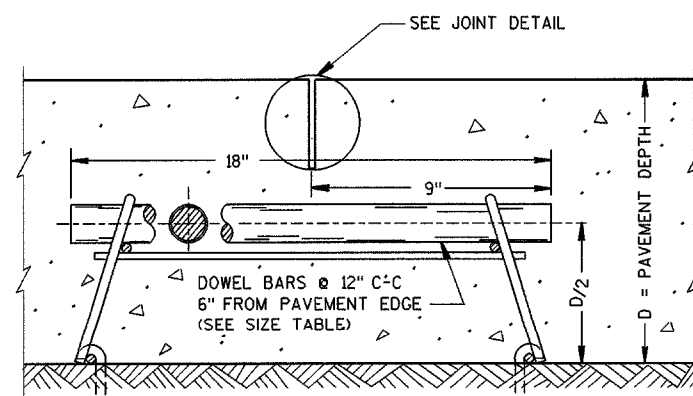


PLAN VIEW

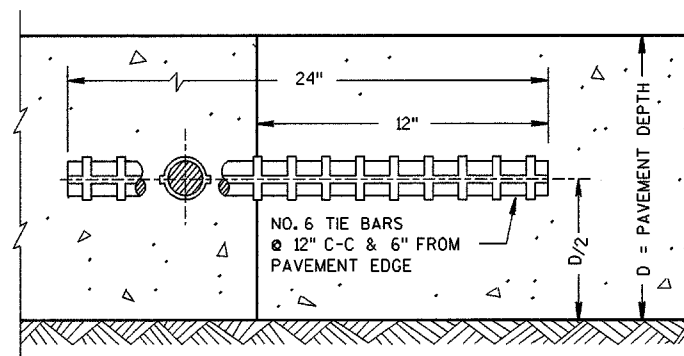


SIDE VIEW
(NORMAL TO CENTERLINE)

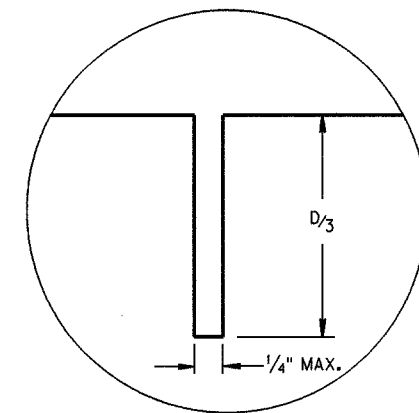
CONTRACTION JOINT DOWEL ASSEMBLY ①



DOWELED CONTRACTION JOINT

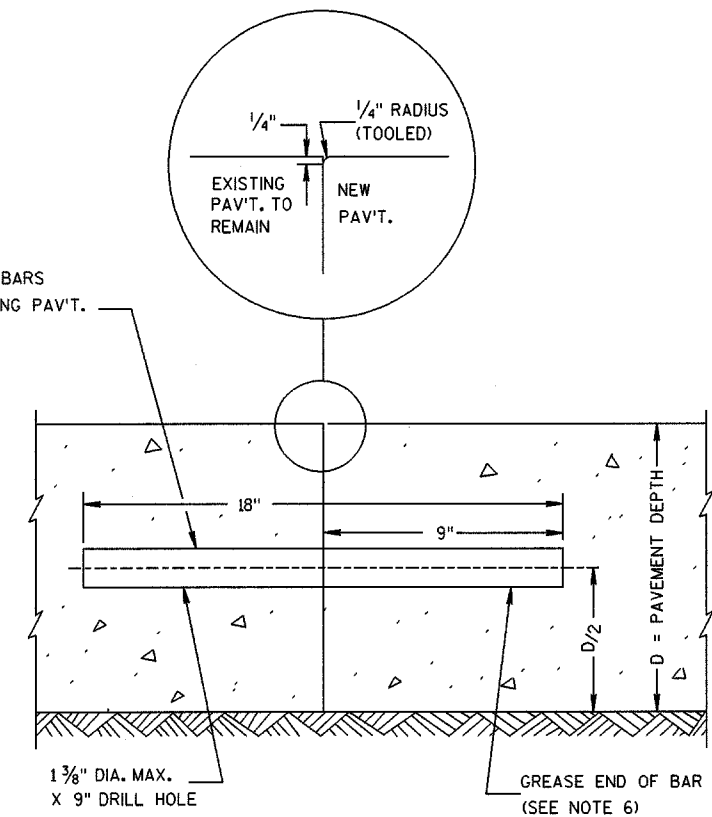


CONSTRUCTION JOINT



JOINT DETAIL

1 1/4" DIA. X 18" DOWEL BARS
ANCHORED INTO EXISTING PAV'T.
(SEE NOTE 5)



TRANSVERSE CONTRACTION JOINTS ABUTTING
EXISTING PAVEMENT
① DOWEL BAR DETAIL

RURAL DOWELED
CONCRETE PAVEMENT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

6/6/02
DATE

FHWA

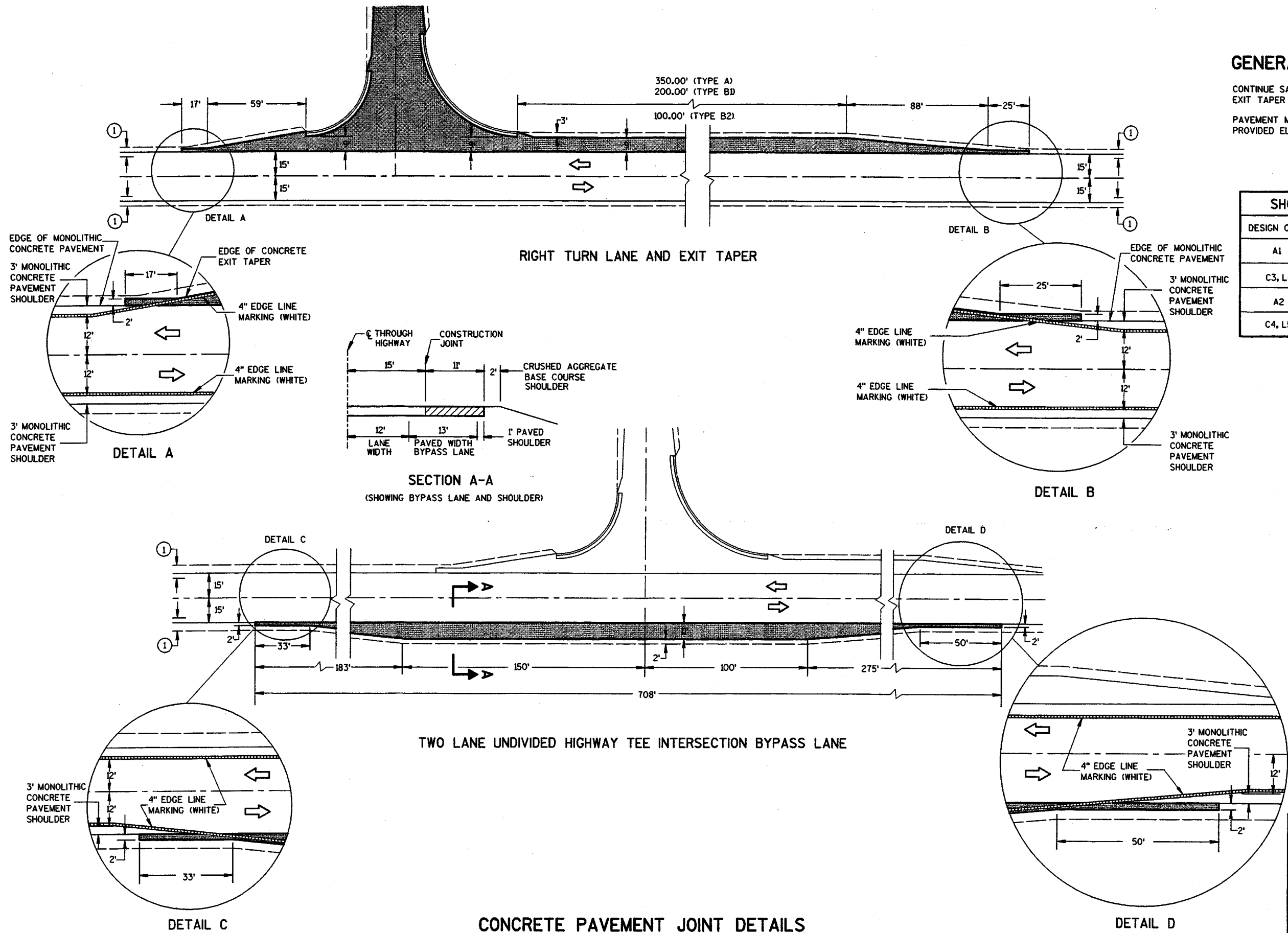
Bill Docket
PAVEMENT ENGINEER

GENERAL NOTES

CONTINUE SAW CUT CONTRACTION JOINT ACROSS TURN LANE, EXIT TAPER AND PASSING LANE.

PAVEMENT MARKING DETAILS AND SPECIFICATIONS ARE PROVIDED ELSEWHERE IN THE CONTRACT.

SHOULDER WIDTH TABLE ①		
DESIGN CLASS	PAVED	TOTAL
A1	3 ft.	6 ft.
C3, L4	3 ft.	6 ft.
A2	3 ft.	10 ft.
C4, L5	3 ft.	8 ft.



CONCRETE JOINT DETAIL FOR
TEE INTERSECTION BYPASS
LANE AND RIGHT TURN LANE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

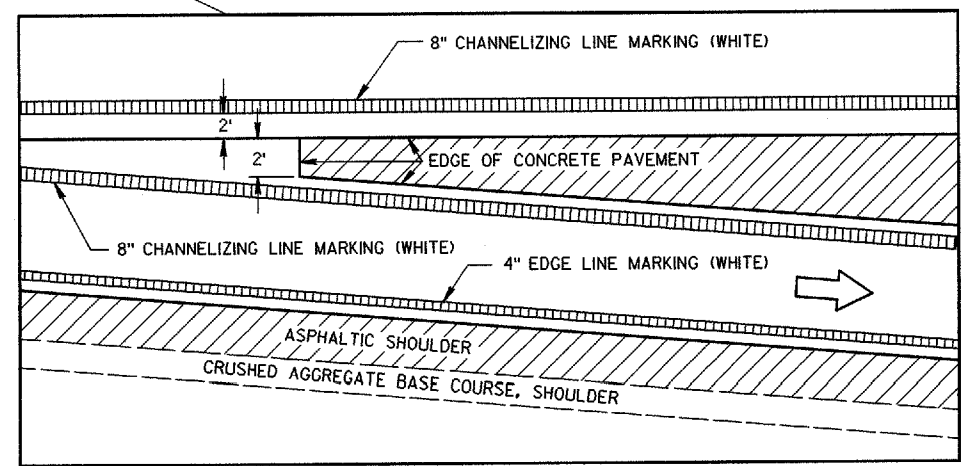
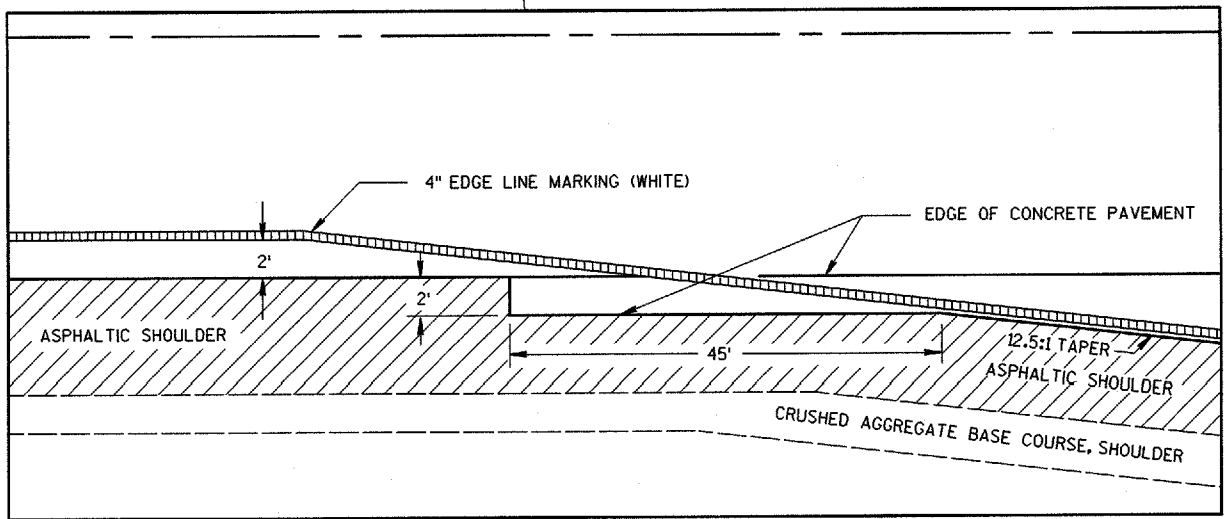
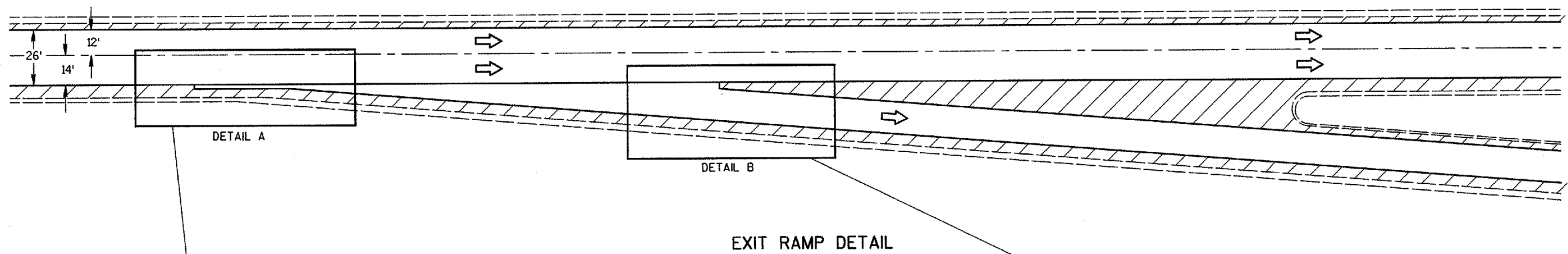
APPROVED
05/27/98
DATE

Roy L. Harrison
CHIEF ROADWAY DEVELOPMENT ENGINEER

FHWA

LEVELS ON - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63

S.D.D. 13 C 17-1d



CONCRETE JOINT PAVING DETAILS

GENERAL NOTES

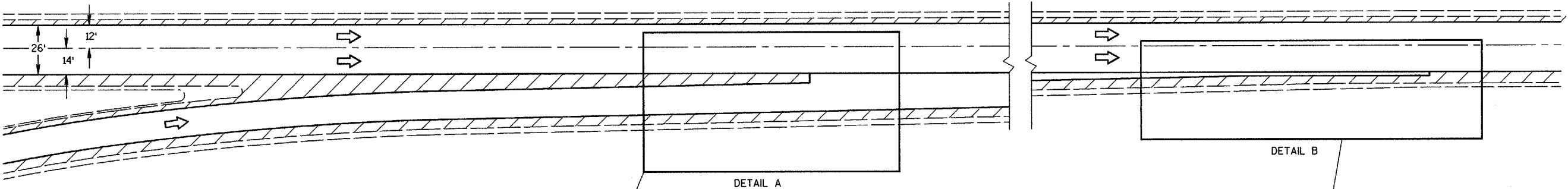
PAVEMENT MARKING DETAILS AND SPECIFICATIONS ARE PROVIDED ELSEWHERE IN THE CONTRACT.

SEE SDD 13 A 4-4c OR SDD 13 A 5-1b FOR RAMP AND GORE RUMBLE STRIP LOCATION.

CONCRETE JOINT DETAIL FOR EXIT RAMP TERMINI
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

LEVELS ON - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63

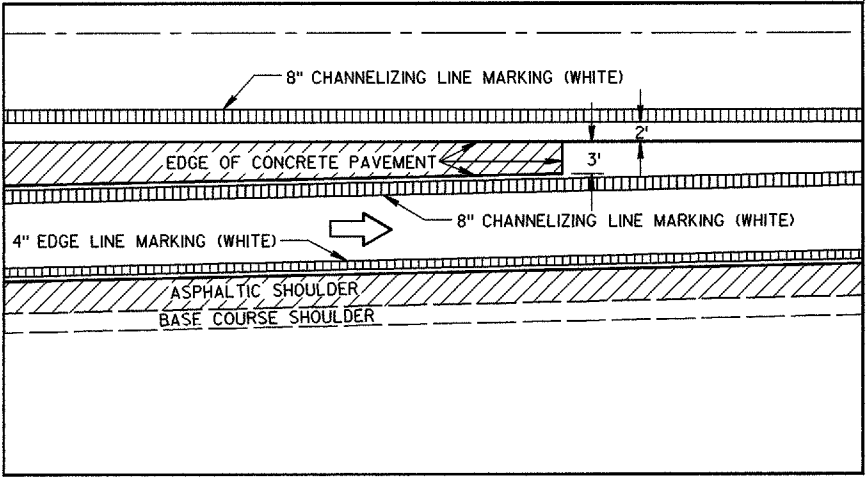
S.D.D. 13 C 17-1b



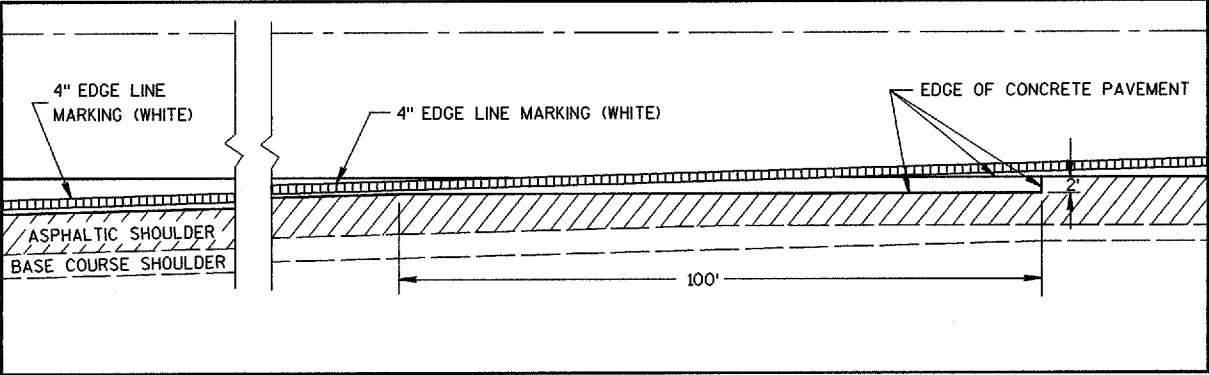
DETAIL A

DETAIL B

ENTRANCE RAMP DETAIL



DETAIL A



DETAIL B

CONCRETE JOINT PAVING DETAILS

GENERAL NOTES

PAVEMENT MARKING DETAILS AND SPECIFICATIONS ARE PROVIDED ELSEWHERE IN THE CONTRACT.

SEE SDD 13 A 4-4c OR SDD 13 A 5-1b FOR RAMP AND GORE RUMBLE STRIP LOCATION.

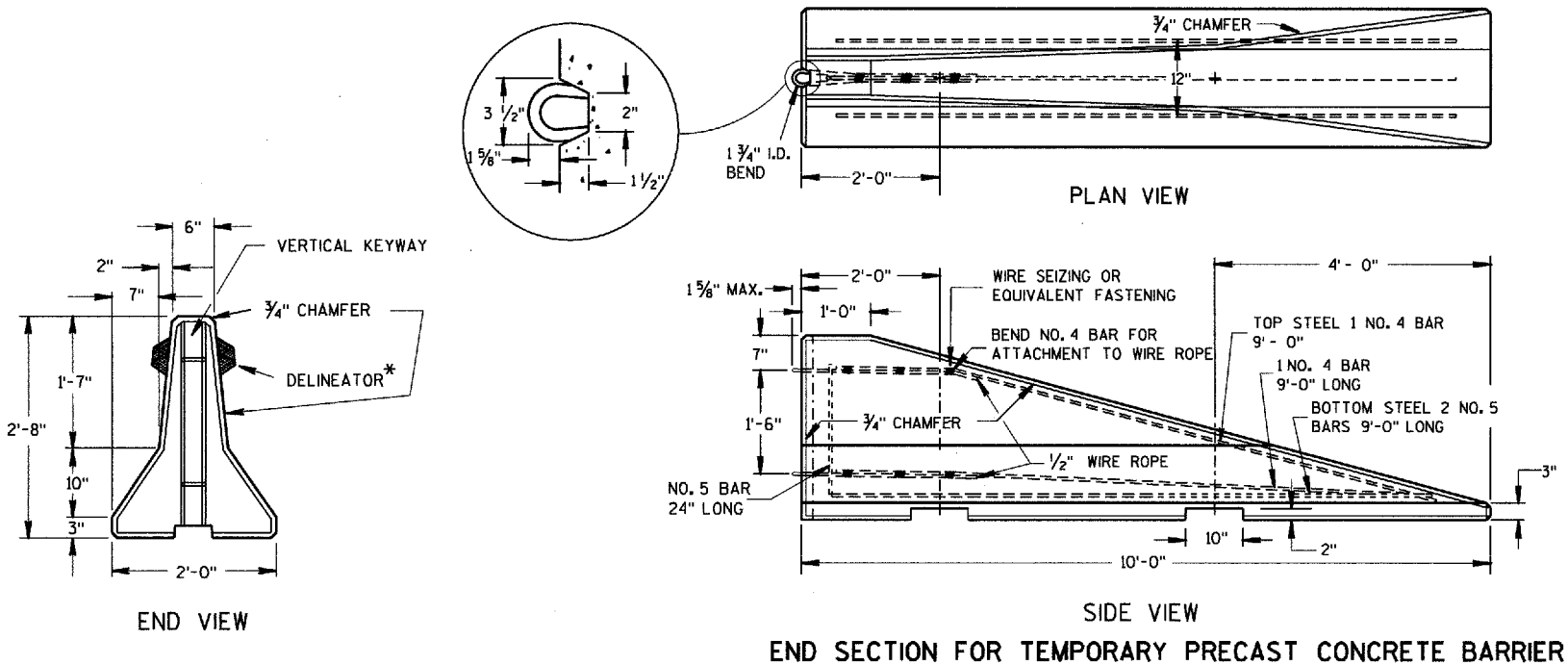
CONCRETE JOINT DETAIL FOR
ENTRANCE RAMP TERMINI

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
05/27/98
DATE

Ray A. Thompson
CHIEF ROADWAY DEVELOPMENT ENGINEER

FHWA



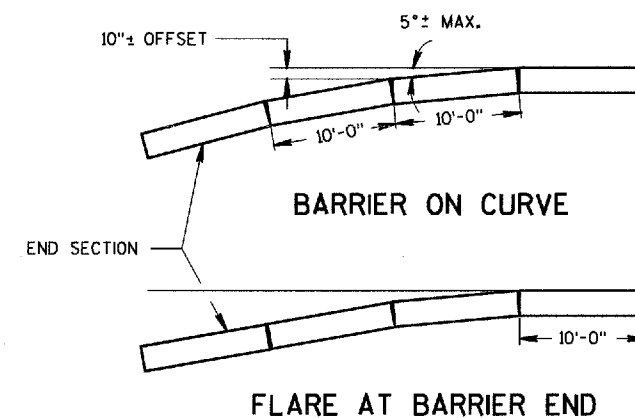
GENERAL NOTES

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.

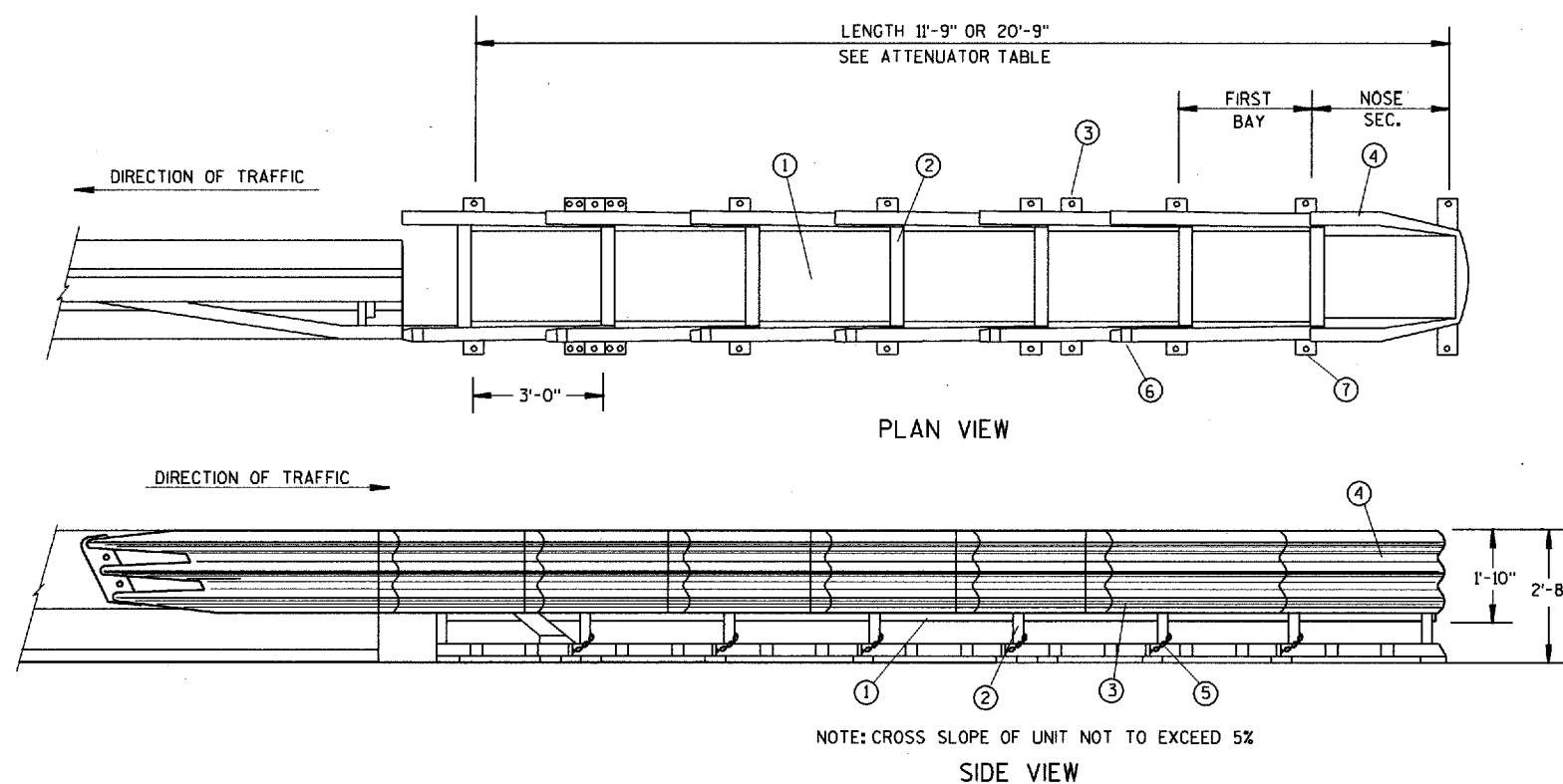
THE PORTABLE CRASH CUSHION SHALL BE THE G-R-E-A-T CZ IMPACT ATTENUATOR MANUFACTURED BY ENERGY ABSORPTION SYSTEMS, INC. ONE EAST WACKER DRIVE, CHICAGO, IL., 60601.

THE CRASH CUSHION SHALL BE MANUFACTURED, ASSEMBLED AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS DETAILED ELSEWHERE IN THE PLANS OR AS SHOWN ON THE APPROVED SHOP DRAWINGS. THE CRASH CUSHION PLATFORM SHALL BE ANCHORED TO EITHER 6 INCH MINIMUM CONCRETE PAVEMENT OR 3 INCH MINIMUM ASPHALTIC SURFACES THAT HAVE A PREPARED COMPACTED SUBBASE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

*WHEN BARRIERS ARE USED TO SEPARATE OPPOSING TRAFFIC, DELINEATORS ARE REQUIRED ON BOTH SIDES.



OPERATING SPEED, MPH	FLARE RATE
40 OR LESS	10 : 1
50 OR MORE	15 : 1



- ① HEX-FOAM CARTRIDGE
- ② DIAPHRAGM
- ③ THREE BEAM FENDER PANEL
- ④ NOSE COVER
- ⑤ STABILIZING CHAIN
- ⑥ DEFLECTOR PANEL
- ⑦ ANCHORAGE DEVICE (WHERE ONE-WAY TRAFFIC EXISTS)

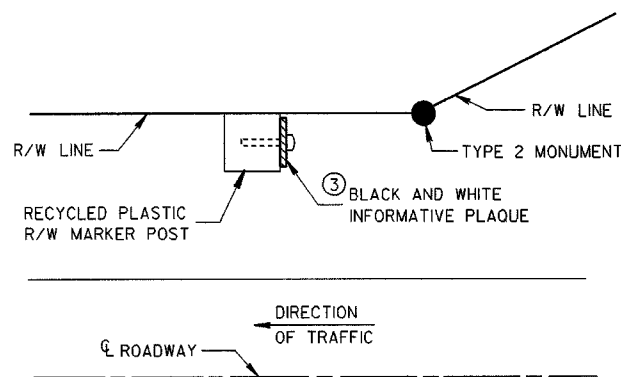
ATTENUATOR TABLE

ATTENUATOR LENGTH	NO. OF BAYS	DESIGN SPEED MPH
11' - 9"	3	40 OR LESS
20' - 9"	6	40 TO 55

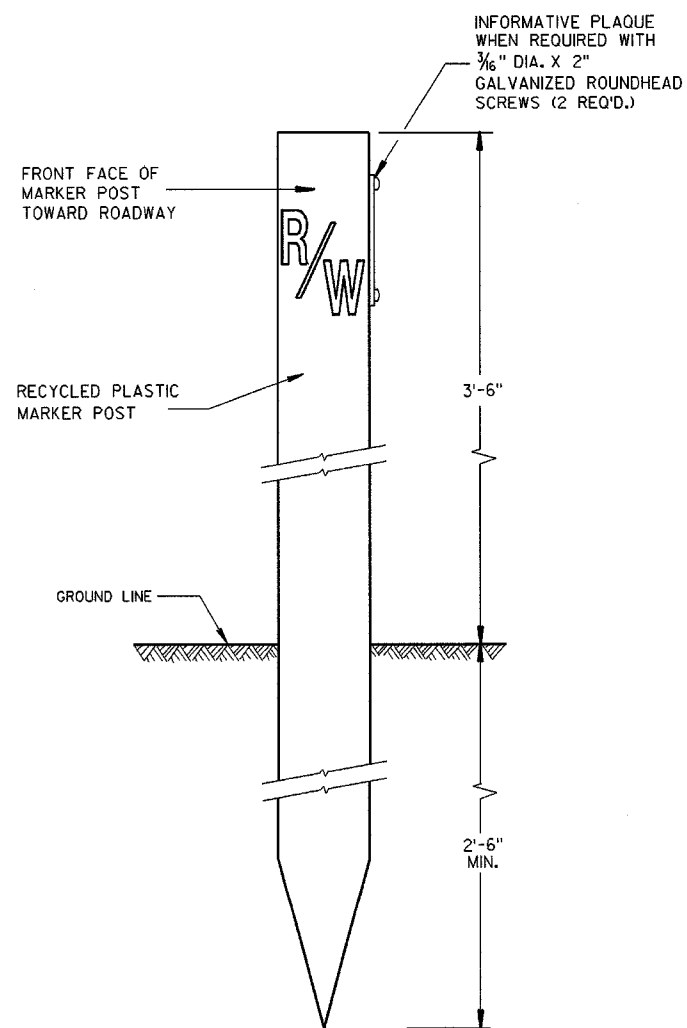
TEMPORARY PRECAST CONCRETE
BARRIER END SECTION AND
PORTABLE CRASH CUSHION

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

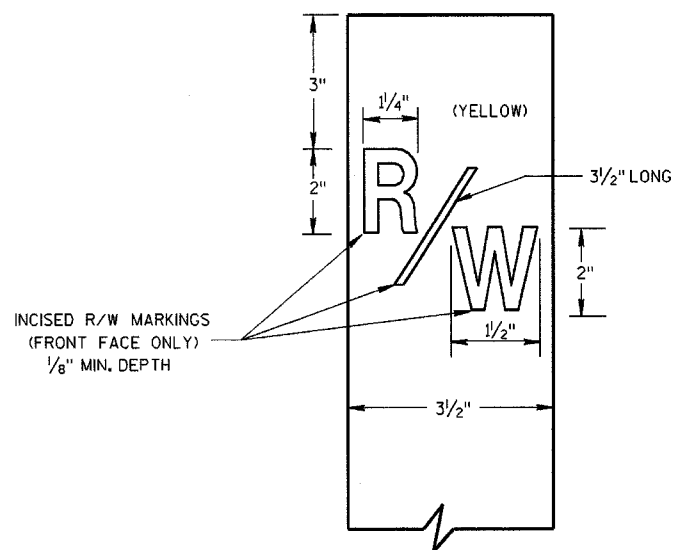
APPROVED
10/24/95 *Roy L. Thompson*
DATE CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA



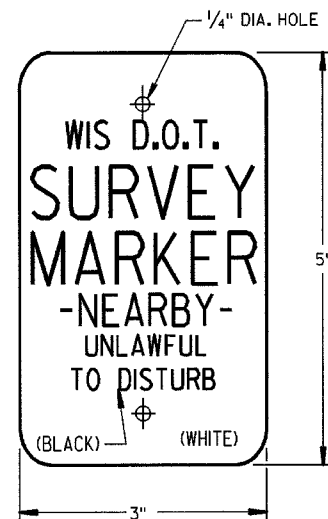
PLAN VIEW
TYPICAL LOCATION ③



FRONT VIEW
TYPICAL INSTALLATION ① ②

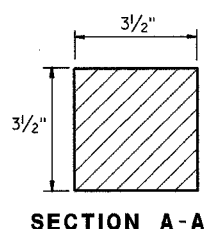


RECYCLED PLASTIC
RIGHT-OF-WAY MARKER POST
FRONT FACE

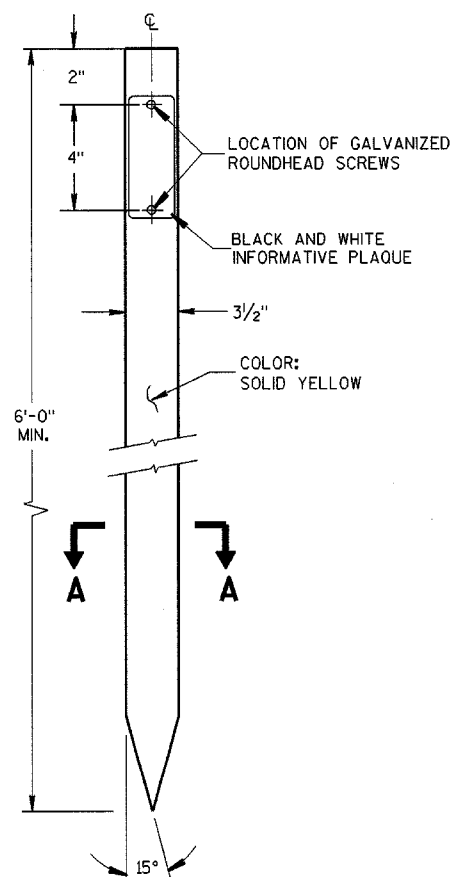


INFORMATIVE PLAQUE ④

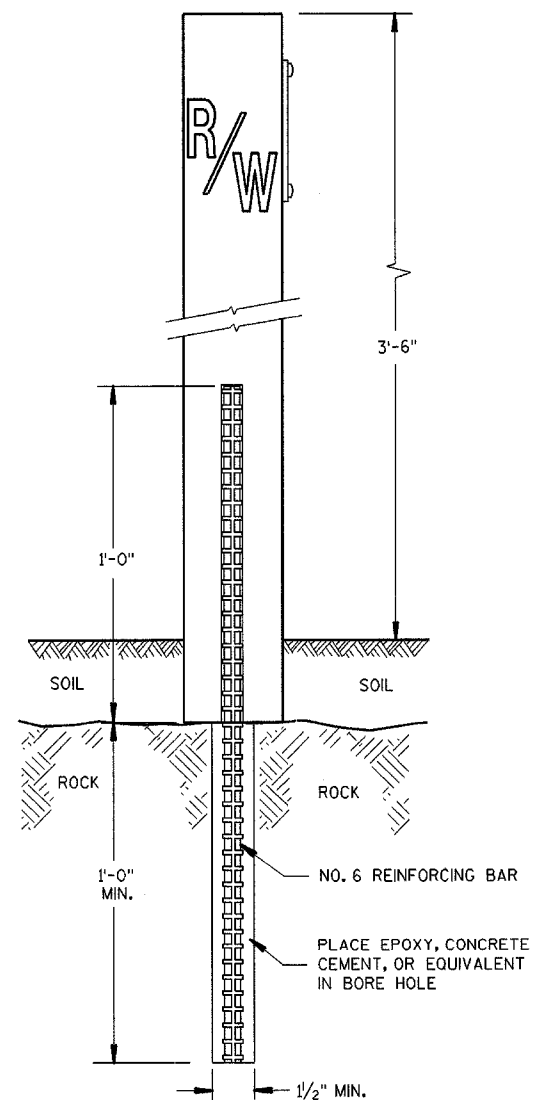
MARKING & SIGNING DETAILS



SECTION A-A



SIDE VIEW
STANDARD RECYCLED
PLASTIC MARKER POST



FRONT VIEW
ROCK INSTALLATION ⑤

GENERAL NOTES

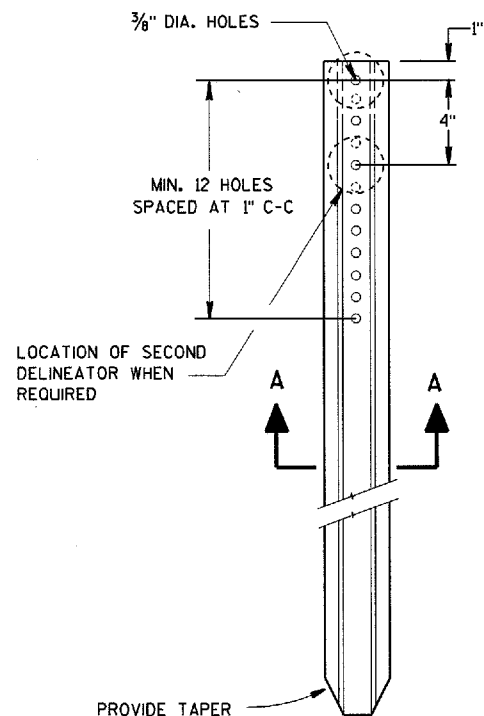
DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

- ① POSTS SHOULD BE DRIVEN 2'-6" INTO THE GROUND.
- ② IN HEAVY SOILS, IT IS RECOMMENDED A PILOT HOLE BE DRILLED INTO THE GROUND BEFORE DRIVING THE POST.
- ③ A MARKER POST FOR RIGHT-OF-WAY SHALL BE PLACED ADJACENT TO EACH TYPE 2 MONUMENT TO SERVE AS A GUARD POST, AND AT OTHER LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
- ④ INFORMATIVE PLAQUES WILL BE FURNISHED BY THE DEPARTMENT OF TRANSPORTATION AND BE PLACED ON THE SIDE OF THE POST FACING THE TYPE 2 MONUMENT.
- ⑤ IN AREAS OF SOLID ROCK, DRILL A 1 1/2" MIN. BORE HOLE INTO THE ROCK TO A DEPTH OF 12". CUT THE POST SO THAT A LENGTH OF 3'-6" PROTRUDES ABOVE THE GROUND. DRILL A 5/8" PILOT HOLE 1 FOOT INTO THE BOTTOM OF THE POST, DRIVE A 2 FOOT PIECE OF NO. 6 REINFORCING BAR INTO THE POST, BLOW OUT THE BORE HOLE IN THE ROCK USING COMPRESSED AIR, FILL THE BORE HOLE WITH EPOXY, CONCRETE CEMENT OR EQUIVALENT. PLACE THE POST WITH THE EXTENDED REINFORCING BAR INTO THE BORE HOLE WITH ADHESIVE. DEPENDING ON THE STABILITY OF THE ROCK, DEPTH OF THE BORE HOLE AND REINFORCING BAR MAY BE INCREASED AT THE DIRECTION OF THE ENGINEER.

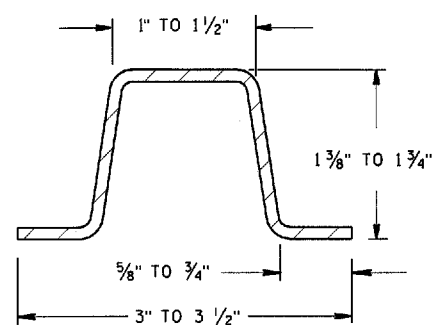
MARKER POST
FOR RIGHT-OF-WAY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
DATE
CHIEF SURVEYING AND MAPPING ENGINEER
FWHA

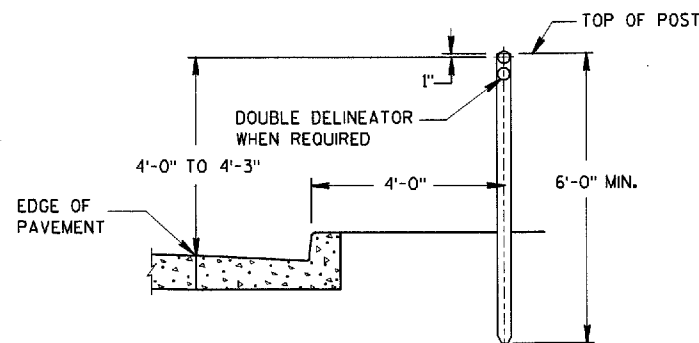
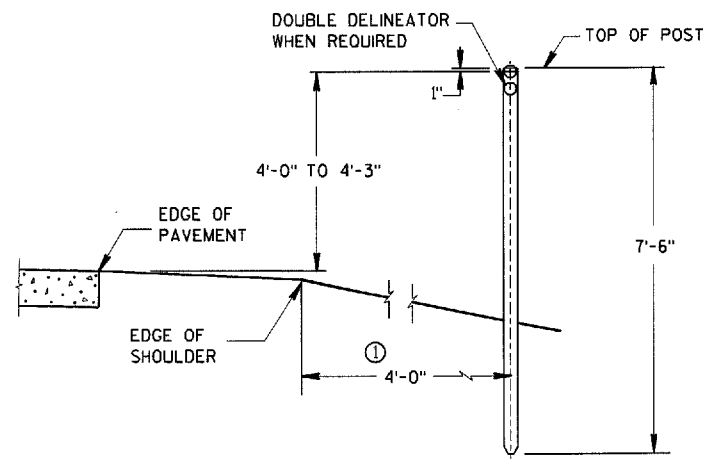


DELINEATOR POST

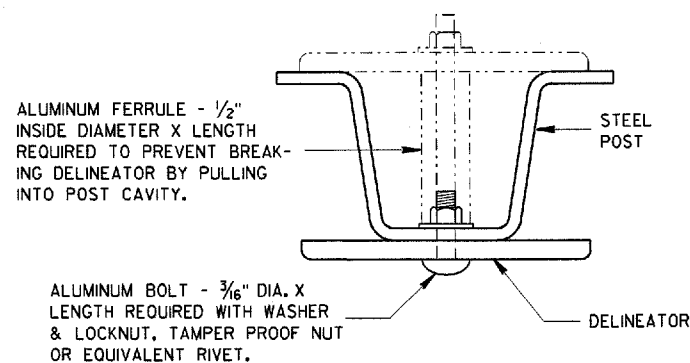


SECTION A-A

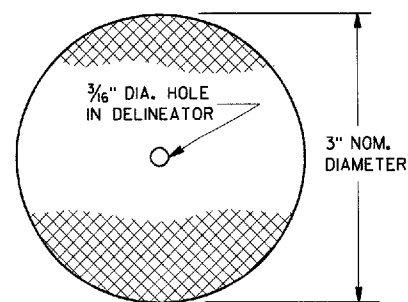
WEIGHT 1.12 LBS PER FT. \pm 0.1 LB.



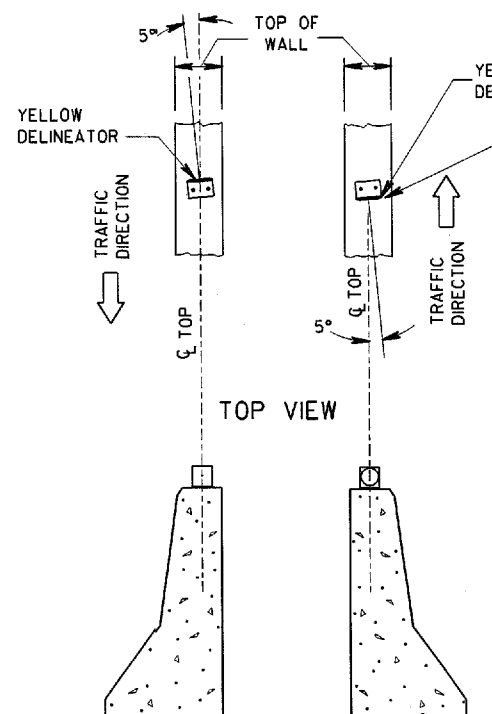
TYPICAL INSTALLATIONS OF DELINEATOR POSTS



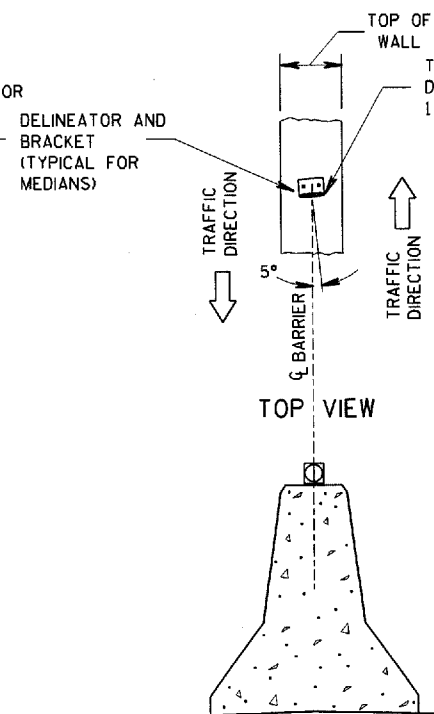
MOUNTING DETAIL FOR DELINEATOR



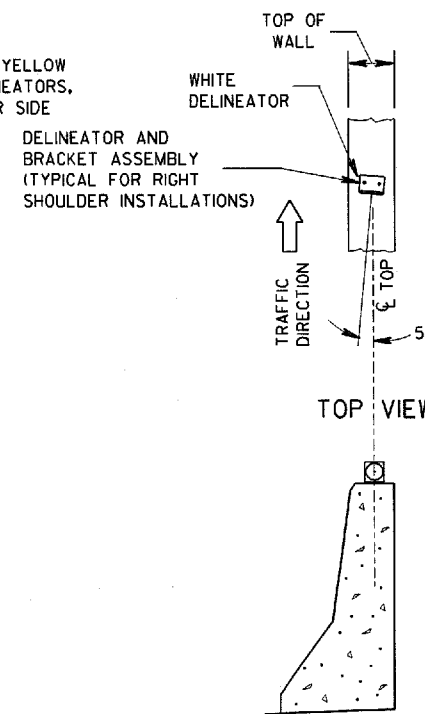
DELINEATOR



DOUBLE BARRIERS IN MEDIAN



MEDIAN BARRIER



BARRIER LOCATED TO RT. OF TRAFFIC FLOW

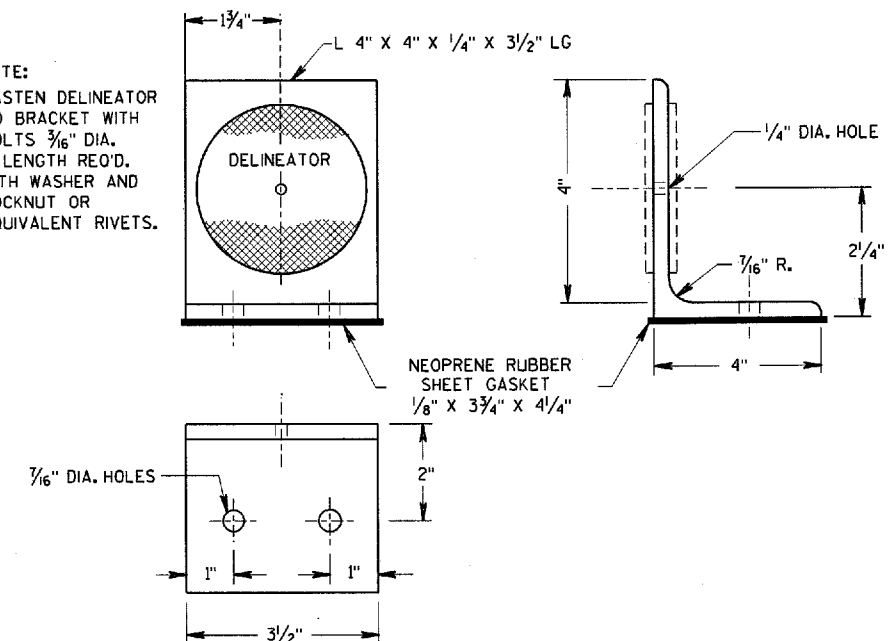
LOCATION AND AIMING DETAILS FOR DELINEATORS MOUNTED ON CONCRETE BARRIERS

GENERAL NOTES

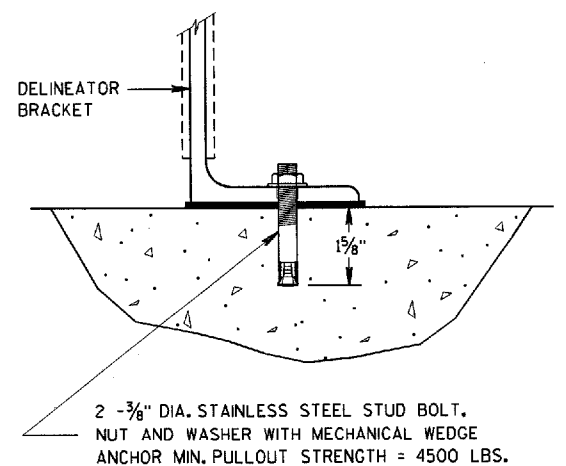
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

- ① DELINEATORS SHALL BE PLACED AT A CONSTANT DISTANCE FROM THE EDGE OF THE SHOULDER FOR THE LENGTH OF THE INSTALLATION.

NOTE:
FASTEN DELINEATOR TO BRACKET WITH BOLTS $\frac{3}{16}$ " DIA. X LENGTH REQ'D. WITH WASHER AND LOCKNUT OR EQUIVALENT RIVETS.



DELINEATOR BRACKET



DELINEATOR BRACKET MOUNTING DETAIL

DELINEATOR POST, DELINEATOR
BRACKET AND DELINEATOR

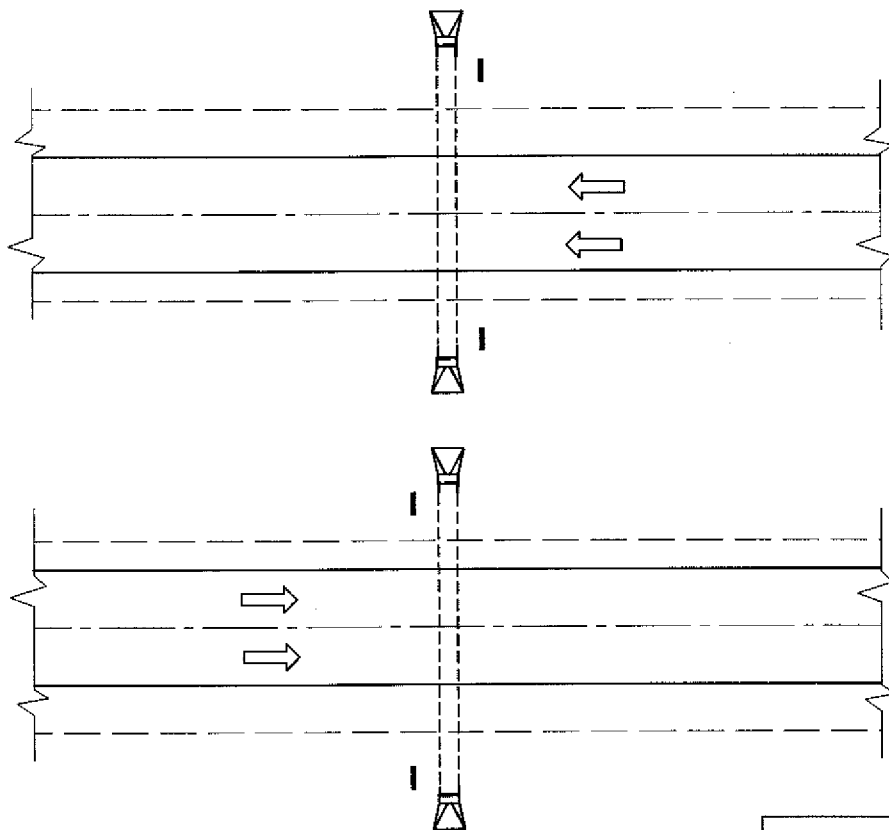
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

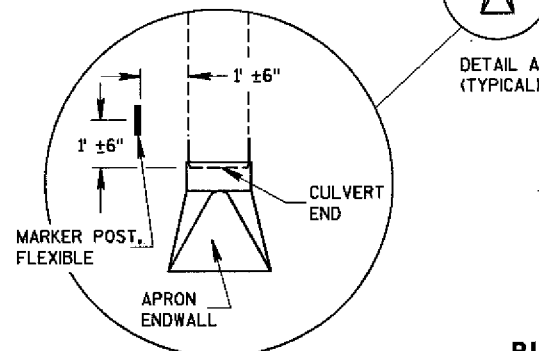
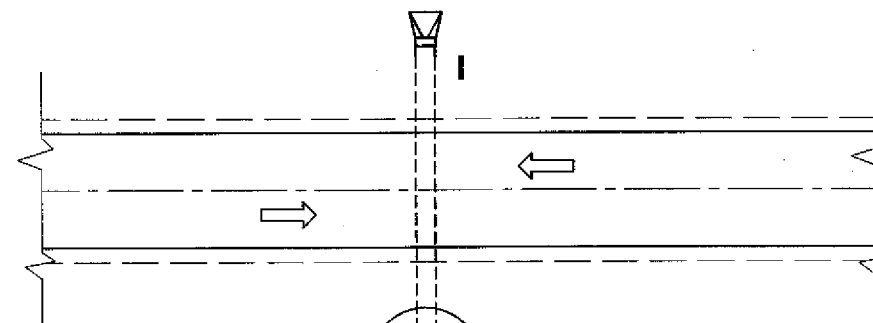
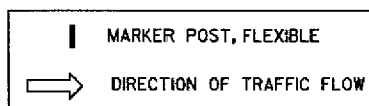
5-19-00
DATE

Christa J. Spang
CHIEF SIGNS AND MARKING ENGINEER

FHWA



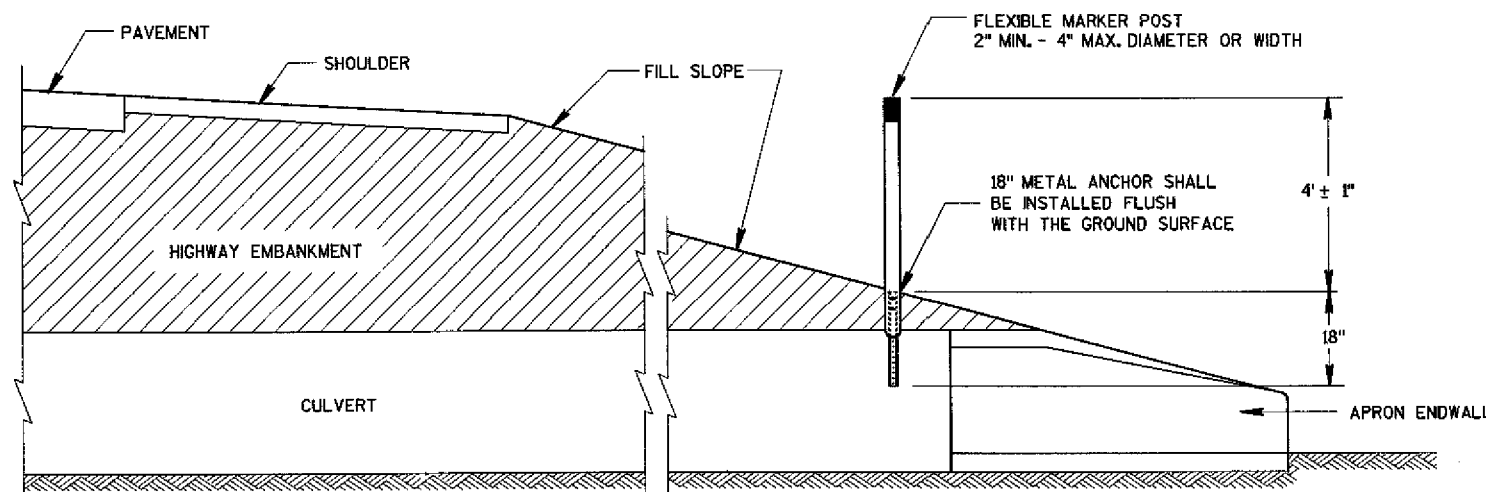
PLAN VIEW
DIVIDED HIGHWAY



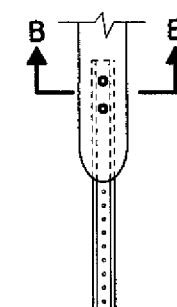
DETAIL A
(TYPICAL)

PLAN VIEW
UNDIVIDED HIGHWAY

FLEXIBLE MARKER POST LOCATION



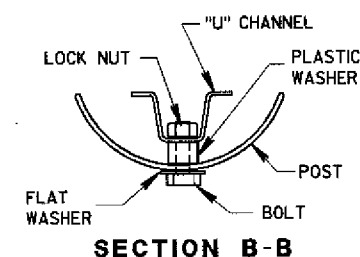
CROSS SECTION
FLEXIBLE MARKER POST



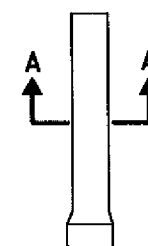
FRONT VIEW
CURVED MARKER



SIDE VIEW
CURVED MARKER



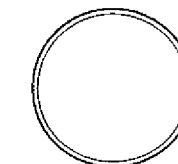
SECTION B-B



FRONT VIEW
ROUND MARKER



SIDE VIEW
ROUND MARKER

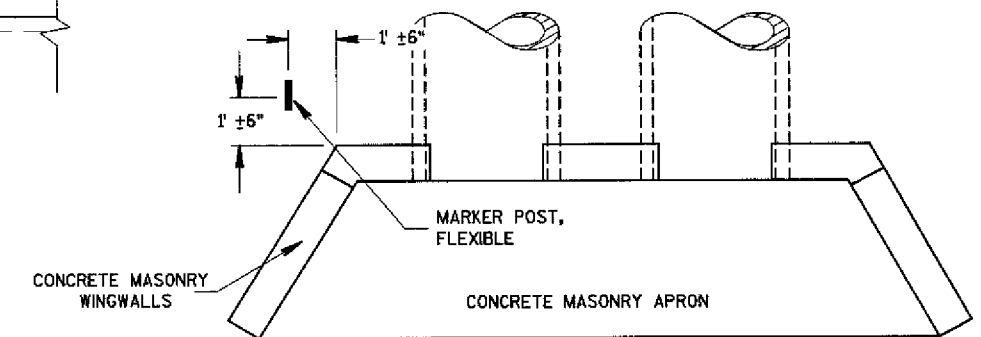


SECTION A-A

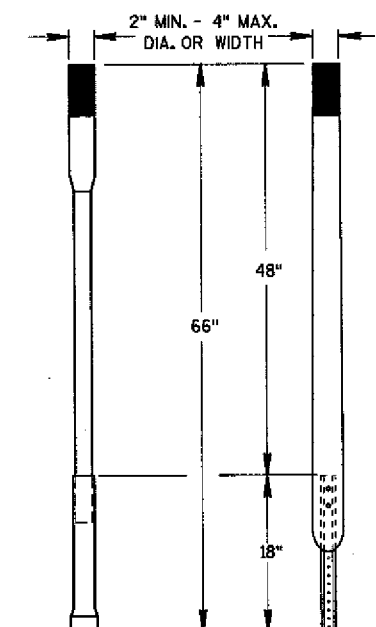
FLEXIBLE MARKER POST ANCHORS

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.



PLAN VIEW
CONCRETE MASONRY ENDWALLS FOR
CULVERT PIPE AND PIPE ARCH



ALTERNATE 1 ALTERNATE 2
FLEXIBLE MARKER POST

MARKER POST, FLEXIBLE,
FOR CULVERT END

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

10/01/98

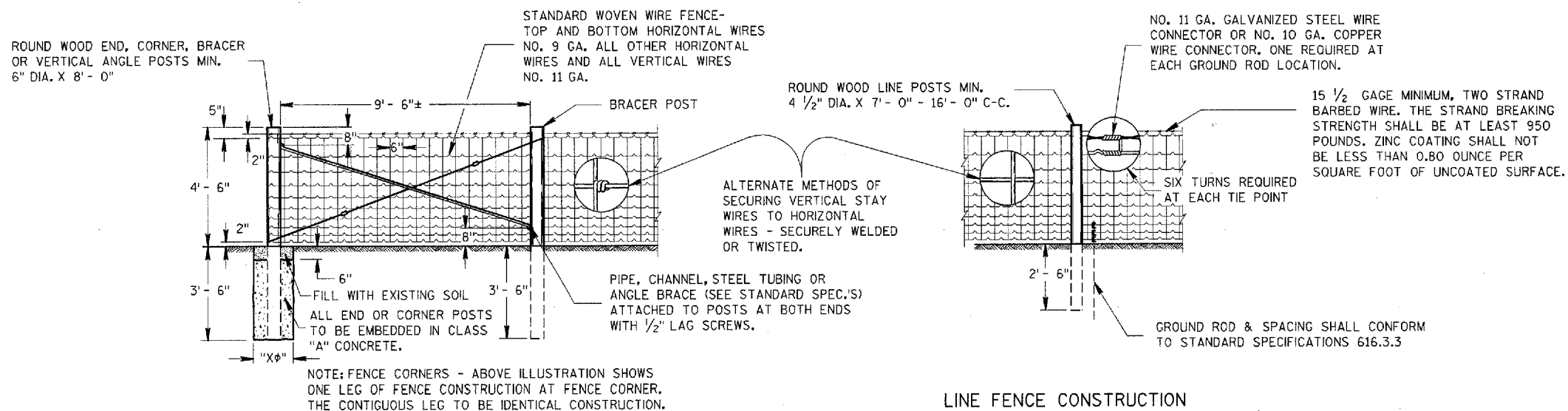
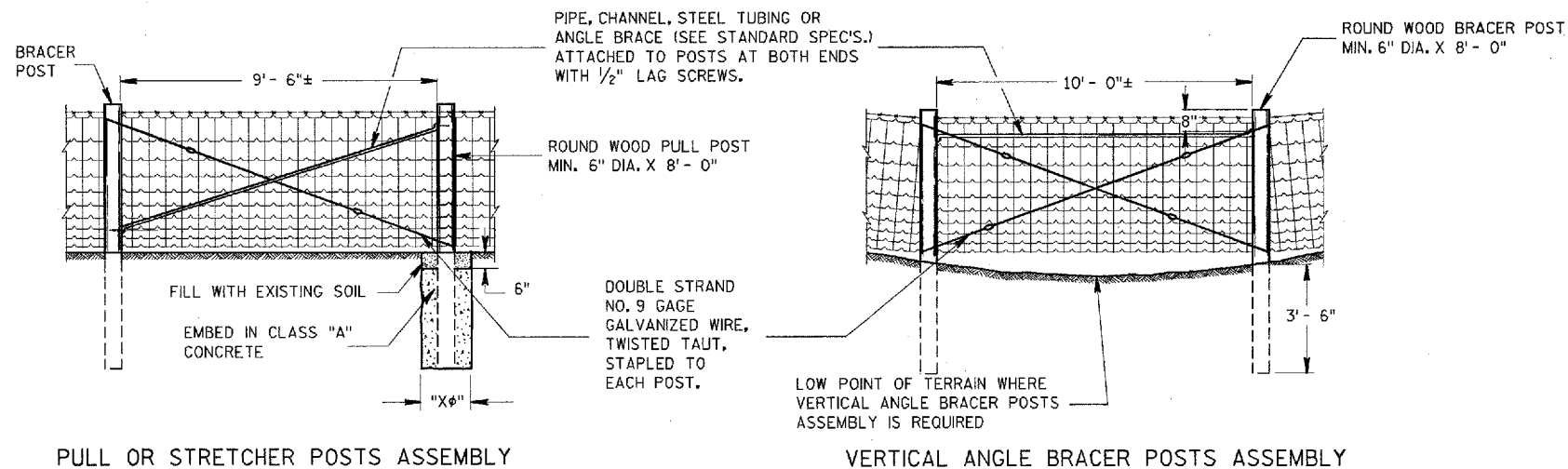
DATE

FHWA

Tom J. Hines
CHIEF ROADWAY DEVELOPMENT ENGINEER

NOTE: PULL OR STRETCHER POST ASSEMBLIES SHALL BE PLACED MIDWAY BETWEEN END POSTS AND CORNER POSTS WHERE A RUN OF FENCE EXCEEDS 660' BUT IS LESS THAN 1,320'. FOR RUNS OF FENCE IN EXCESS OF 1,320' MAXIMUM SPACING OF PULL OR STRETCHER POST ASSEMBLIES SHALL BE 660'± C-C.

ILLUSTRATION SHOWS POSITION OF STANDARD STEEL BRACE, DOUBLE STRAND GALVANIZED WIRE, AND THE POST TO BE EMBEDDED IN CONCRETE WHEN WIRE FENCE IS INSTALLED FROM LEFT TO RIGHT. THE BRACES SHALL BE POSITIONED ON THE OPPOSITE DIAGONALS AND THE OPPOSITE POST SHALL BE EMBEDDED IN CONCRETE WHEN WIRE FENCE IS INSTALLED FROM RIGHT TO LEFT.



GENERAL NOTES

DETAILS OF CONSTRUCTION NOT SHOWN HEREON SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

"Xφ" = DIAMETER OF THE POST PLUS 12".

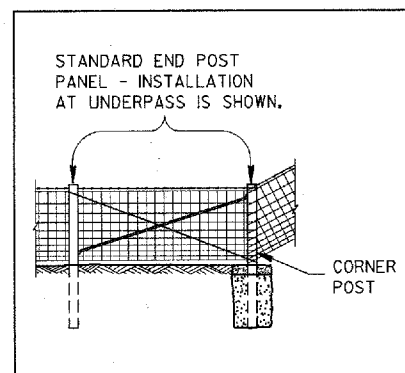
FENCE STAPLES SHOULD NEVER BE DRIVEN VERTICALLY INTO WOOD POSTS (WITH BOTH LEGS PARALLEL WITH THE WOOD GRAIN). DOING SO CAN SEPARATE THE GRAIN AND SIGNIFICANTLY REDUCE THE HOLDING POWER. ROTATING THE STAPLES SLIGHTLY OFF VERTICAL STRADDLES THE GRAIN AND PROVIDES MORE RESISTANCE TO PULL-OUT.

DO NOT STAPLE WIRE TIGHT TO THE LINE POSTS. ALLOW MOVEMENT OF WIRE FOR EXPANSION AND CONTRACTION. STAPLE ARRANGEMENT SHALL BE THE SAME FOR ALL OTHER POSTS EXCEPT THAT THEY SHALL BE DRIVEN TIGHT TO POSTS. ALL STAPLES SHALL BE 2" X 9 GAGE AND SHALL BE MANUFACTURED FROM GALVANIZED WIRE OR HOT DIP GALVANIZED AFTER FORMING. STAPLES SHALL HAVE SLASH-CUT POINTS.

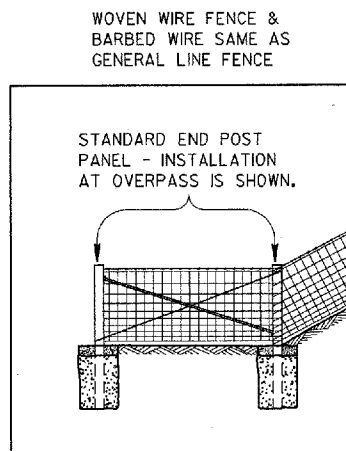
FENCE SHALL BE LOCATED 3'-0" INSIDE THE RIGHT OF WAY LINE UNLESS OTHERWISE INDICATED ON THE PLANS.

END OR CORNER POSTS ASSEMBLY

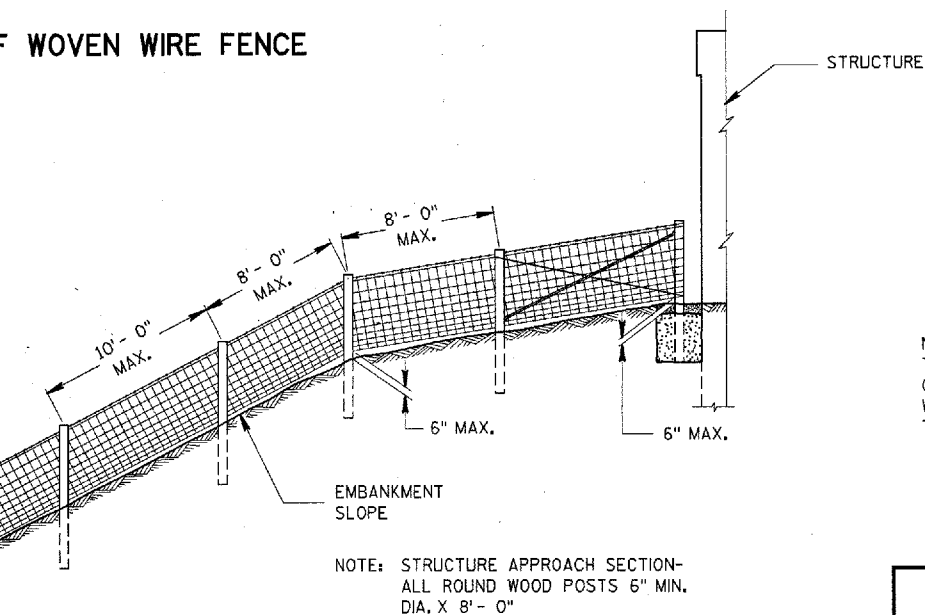
GENERAL ROADSIDE VIEW OF WOVEN WIRE FENCE



ALTERNATE FENCE DESIGN AT STRUCTURE



FENCE DESIGN AT STRUCTURE APPROACH



NOTE: THIS STANDARD DETAIL DRAWING CONSISTS OF TWO PLATES AND BOTH ARE REQUIRED WHEN THIS STANDARD IS CALLED FOR IN THE PLANS.

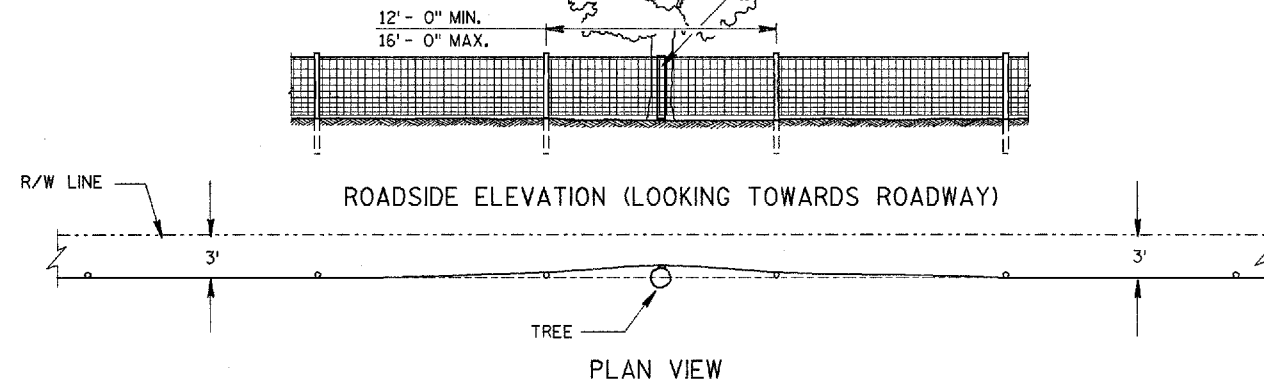
WOVEN WIRE FENCE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

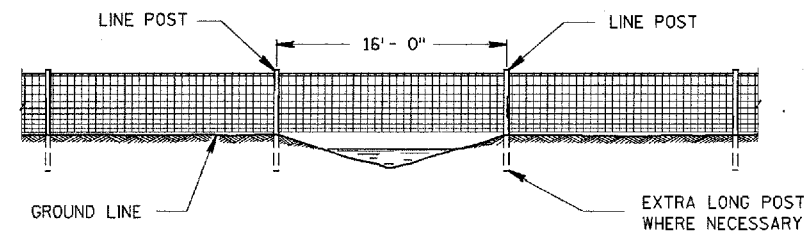
S.D.D.15 B I-7a

NOTE: TREE IN NORMAL FENCE LINE SPECIFICALLY ORDERED BY ENGINEER TO REMAIN IN PLACE.

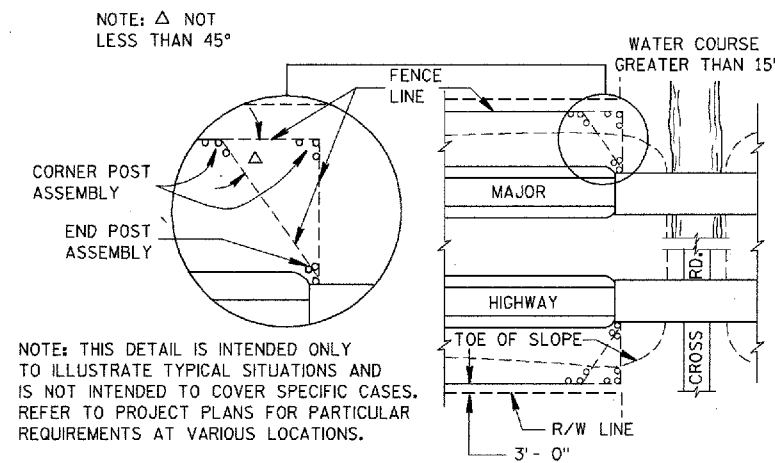
2" X 6" DOUGLAS FIR OR SO. YELLOW PINE PLACED BETWEEN TREE AND WOVEN WIRE FENCE. WOVEN WIRE FENCE AND BARBED WIRE TO BE STAPLED TO 2" X 6" LIKE AS TO LINE POST. 2" X 6" NOT FASTENED TO TREE.



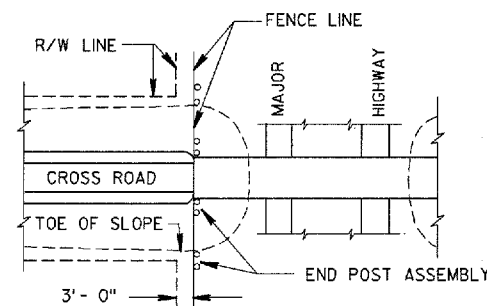
FENCE DESIGN AT TREES REMAINING IN NORMAL FENCE LINE



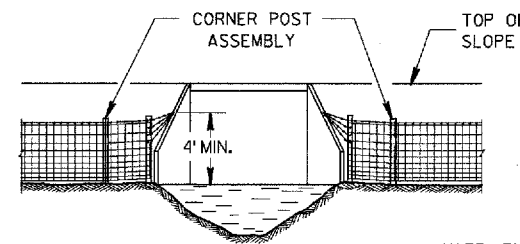
FENCE CONSTRUCTION OVER STREAM COURSES OF 15 FT. OR LESS IN WIDTH



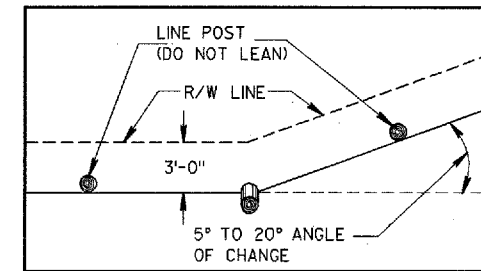
PLAN VIEW
MAJOR HIGHWAY OVERPASS OR STREAM COURSE CROSSING OF GREATER THAN 15 FT. IN WIDTH



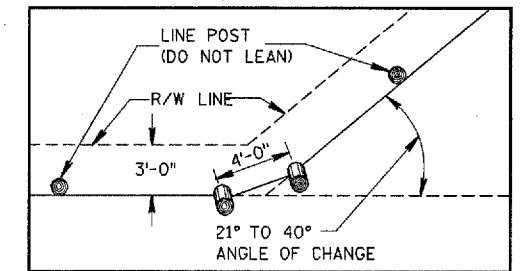
PLAN VIEW
MAJOR HIGHWAY UNDERPASS



FENCE INSTALLATION TO WINGWALLS



PLAN VIEW
SINGLE POST CORNER

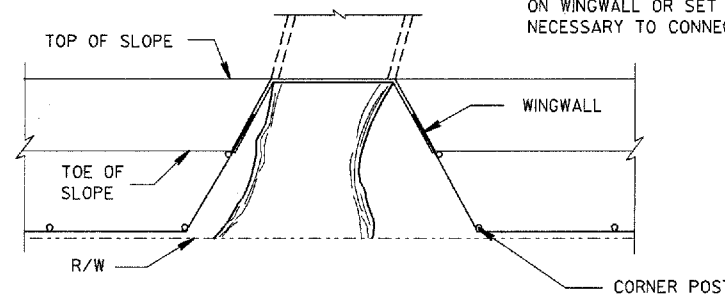


PLAN VIEW
DOUBLE POST CORNER

RIGHT OF WAY LINE CHANGE 40° AND LESS

NOTE: SINGLE AND DOUBLE POSTS SHALL BE A MIN. 6" DIA. X 8'-0" WITH A LEAN OF 4" TOWARD THE OUTSIDE OF THE CURVE. WHEN THE RIGHT OF WAY LINE CHANGE IS MORE THAN 40° USE THE CORNER OR STRETCHER POSTS ASSEMBLY.

NOTE: PLACE A MINIMUM OF 4 STRANDS OF BARBED WIRE, 6" MAXIMUM CENTERS IN FAN SHAPE CONNECTED TO AN EYE BOLT ON WINGWALL OR SET A LONE POST WHEN NECESSARY TO CONNECT BARBED WIRE.

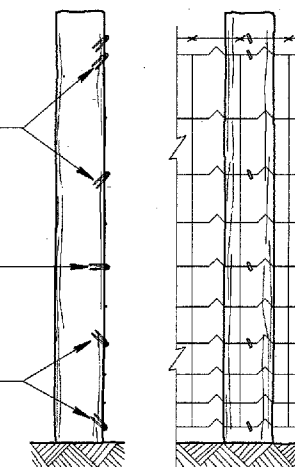


NOTE: WHEN POSTS ARE DRIVEN THE SMALL END SHALL BE DOWN.

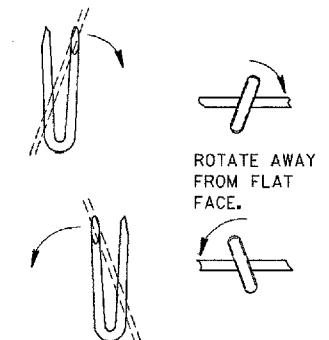
STAPLES SLOPED DOWNWARD FOR SUSTAINED GRADES AND OVER KNOLLS.

STAPLES LEVEL FOR LEVEL GROUND.

SLOPE UPWARDS WHEN FENCE TENDS TO LIFT.



END ELEVATION
FARM SIDE ELEVATION
FENCE MOUNTING DETAIL



LINE POST

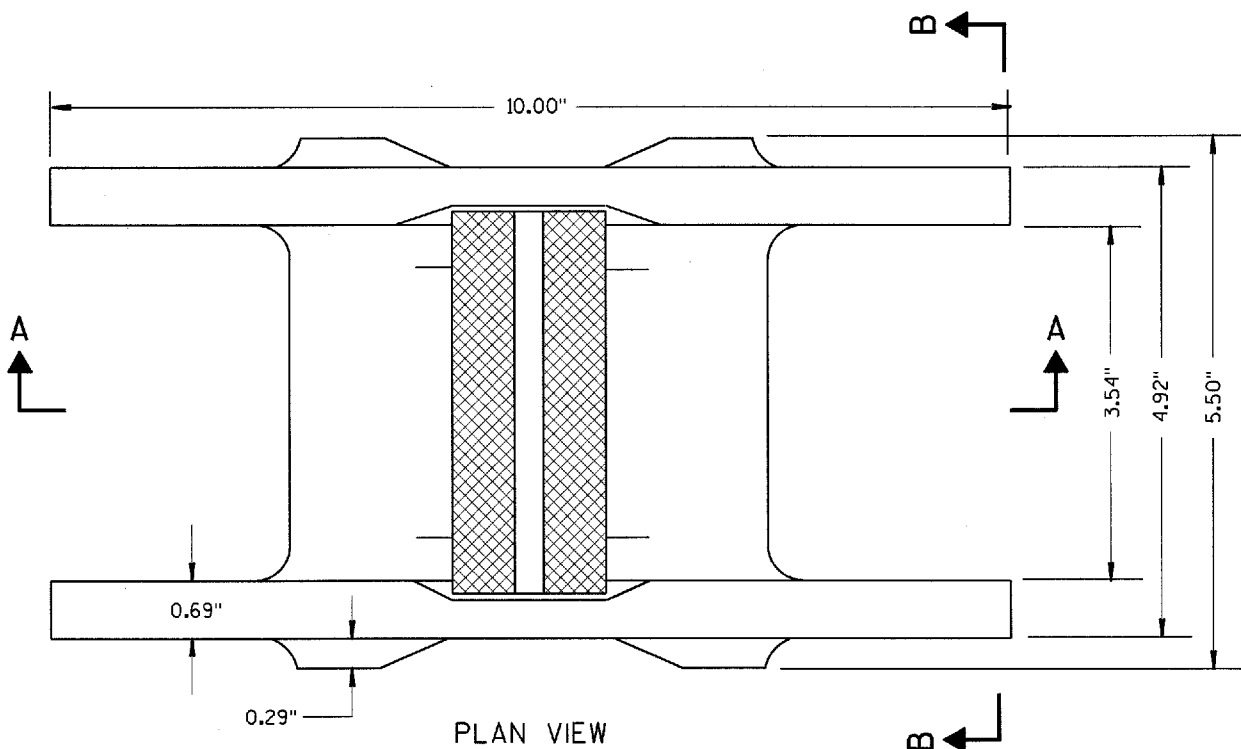
NOTE: THIS STANDARD DETAIL DRAWING CONSISTS OF TWO PLATES AND BOTH ARE REQUIRED WHEN THIS STANDARD IS CALLED FOR IN THE PLANS.

WOVEN WIRE FENCE

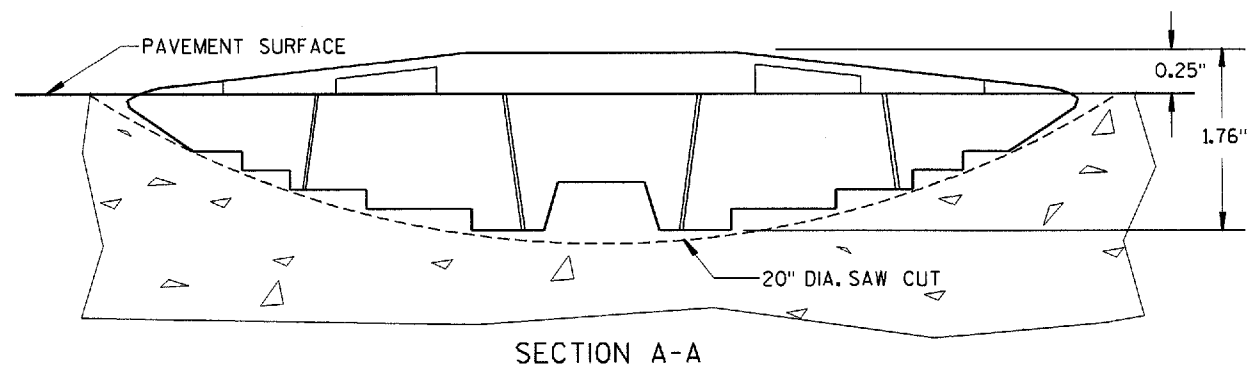
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
12-26-85
DATE
FHWA

STATE DESIGN ENGINEER FOR HWYS

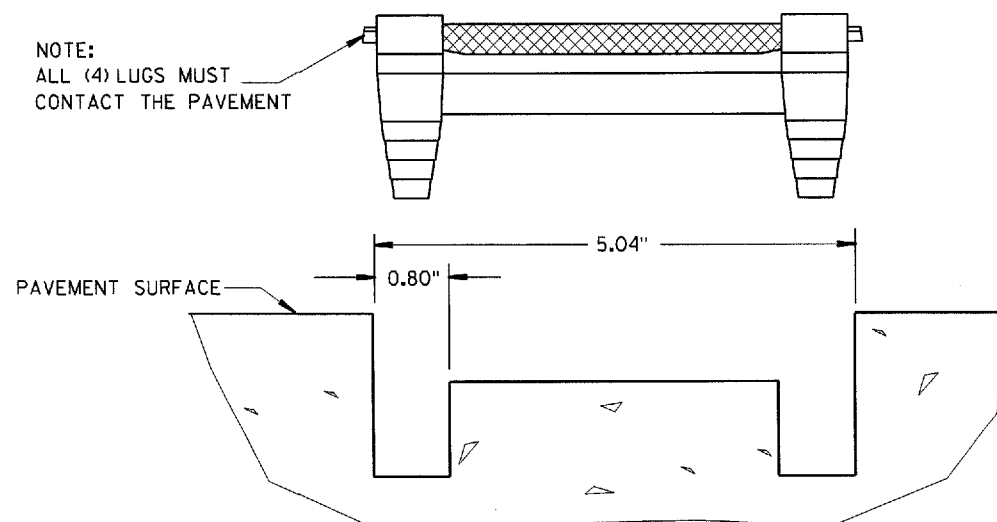


PLAN VIEW
RAISED MARKER
INSTALLED IN PAVEMENT



SECTION A-A

NOTE:
ALL (4) LUGS MUST
CONTACT THE PAVEMENT



SECTION B-B

GENERAL NOTES

THE PAVEMENT SHALL BE SAW CUT TO THE DIMENSIONS SHOWN ON THIS DRAWING.

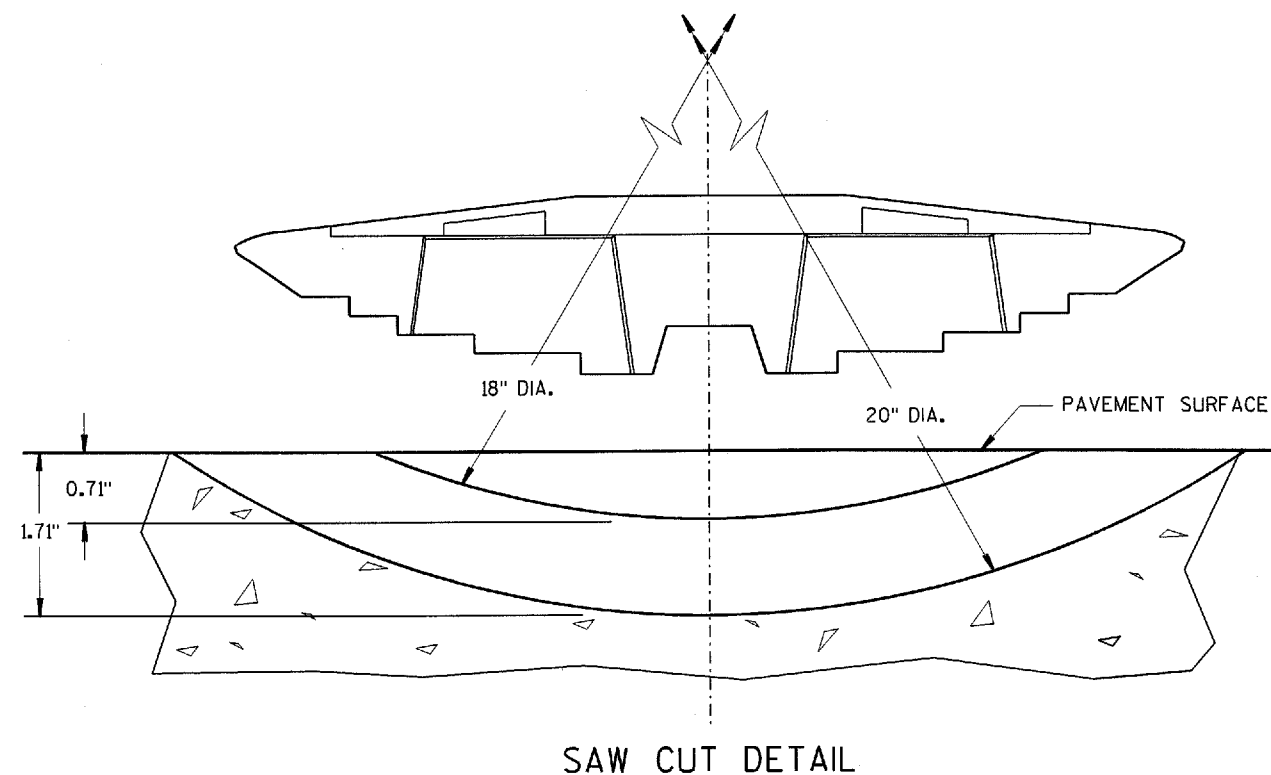
THE CONCRETE SAW SHALL BE FITTED WITH A GANG OF 18 INCH DIAMETER CONCRETE BLADES, BORDERED BY 20 INCH DIAMETER BLADES AT EACH END.

FOR PROPER FIT OF THE MARKER THE CASTING SHOULD HAVE APPROXIMATELY $\frac{1}{8}$ INCH CLEARANCE (SIDE TO SIDE MOVEMENT) WHEN INSERTED AT EACH END, ALL FOUR LEVELING LUGS MUST CONTACT THE PAVEMENT, AND THE LEADING EDGES OF THE CASTING MUST LIE BELOW THE PAVEMENT SURFACE.

THE SAW CUT AREA MUST BE DRY AND FREE OF DUST, DIRT OR ANY MATERIAL WHICH WILL ADVERSELY AFFECT THE BOND OF THE ADHESIVE.

THE CASTING, WHERE IT WILL BE IN CONTACT WITH THE EPOXY, SHALL BE FREE OF SCALE, RUST, DIRT, OIL, GREASE, OR OTHER CONTAMINANT THAT MAY REDUCE THE BOND.

INSTALL THE MARKER WITH AN APPROVED TWO COMPONENT EPOXY ADHESIVE, BY FIRST FILLING THE SAW CUT TO WITHIN APPROXIMATELY $\frac{3}{8}$ INCH OF PAVEMENT SURFACE AND THEN PLACING THE MARKER BY HAND INTO THE EPOXY FILLED SAW CUT. AFTER PLACEMENT OF MARKER, EPOXY SHOULD BE FLUSH WITH THE PAVEMENT SURFACE. EPOXY SHOULD NOT BE ALLOWED TO BUILD UP IN FRONT OF THE MARKER LENS, COVER THE MARKER LENS OR ADJACENT PAVEMENT MARKING. ANY DEBRIS OR RESIDUE CAUSED BY THE PAVEMENT SAWING, CUTTING AND MARKER INSTALLATION SHALL BE REMOVED FROM THE PAVEMENT MARKINGS.



SAW CUT DETAIL

TWO WAY
RAISED PAVEMENT MARKERS
(CASTING & SAWCUT DETAILS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED


5-19-00
DATE

FHWA


Chris J. Spang
CHIEF SIGNS AND MARKING ENGINEER

TWO-LANE ROADWAY


SYMBOLS



WORK AREA



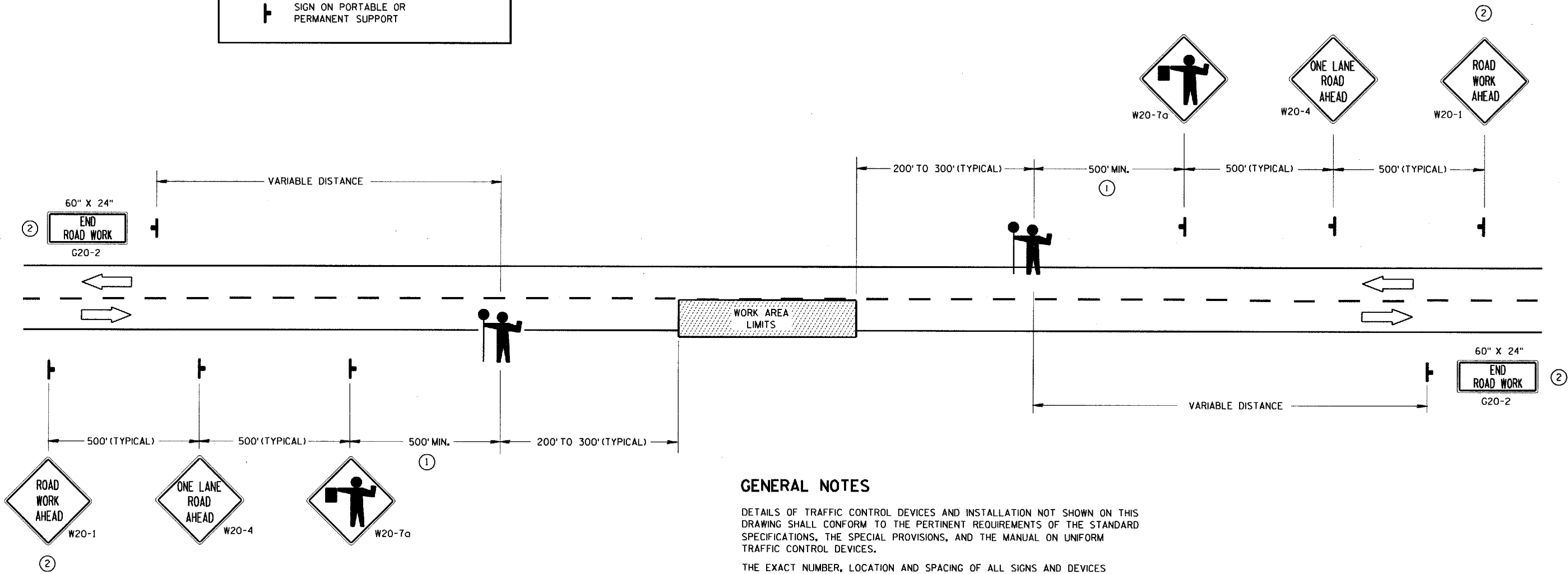
FLAGGER, EQUIPPED WITH STOP/SLOW PADDLE FASTENED ON SUPPORT STAFF



SIGN ON PORTABLE OR PERMANENT SUPPORT



USE OF THE "BE PREPARED TO STOP" SIGN IS OPTIONAL. WHEN USED, THIS SIGN SHALL BE LOCATED BETWEEN THE W20-7a AND W20-4 SIGNS. A 500' TYPICAL SPACING SHALL BE PROVIDED BETWEEN THE SIGNS.



GENERAL NOTES

DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS AND DEVICES (AND THE LOCATION OF ALL FLAGGERS) SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.

THE FIRST ADVANCE WARNING SIGN SHOULD TYPICALLY BE LOCATED IN ADVANCE OF THE ANTICIPATED TRAFFIC BACKUP OR QUEUE.

WHEN A SIDE ROAD OR RAMP INTERSECTS THE FACILITY ON WHICH THE WORK IS BEING PERFORMED, ADDITIONAL TRAFFIC CONTROLS SHALL BE PROVIDED AS SPECIFIED IN THE PLANS AND/OR THE SPECIAL PROVISIONS OR AS DIRECTED BY THE ENGINEER.

FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES. THEY SHALL BE EQUIPPED WITH STOP/SLOW PADDLES FASTENED ON SUPPORT STAFFS. WHEN THE FLAGGING OPERATION IS NOT IN EFFECT, THE "FLAGGER AHEAD", THE "ROAD WORK AHEAD" AND THE "ONE LANE ROAD AHEAD" SIGNS SHALL BE COVERED OR REMOVED AND THE HIGHWAY RESTORED TO NORMAL OPERATION.

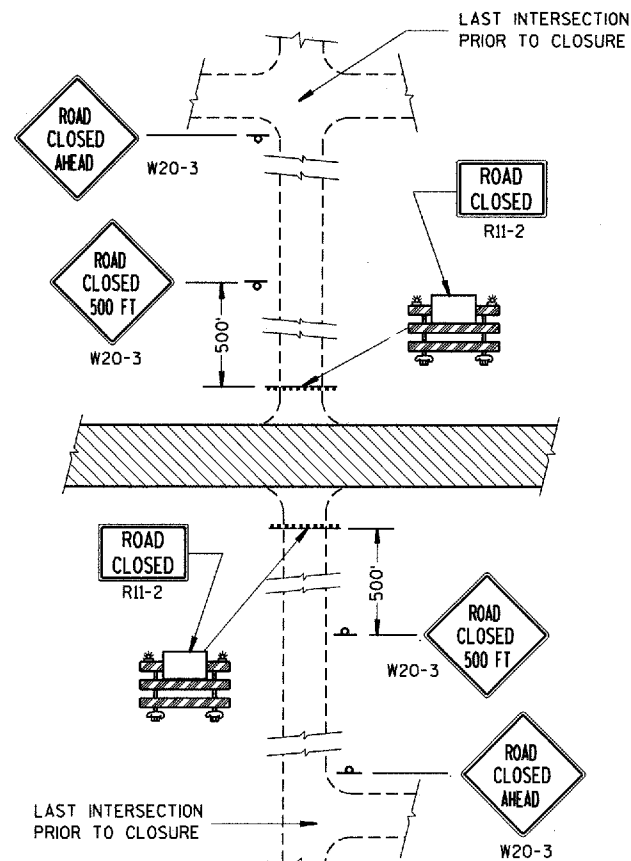
ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.

- ① FOR A MOVING WORK OPERATION, SIGNING FOR BOTH DIRECTIONS SHALL BE REESTABLISHED (AS SIMULTANEOUSLY AS PRACTICAL) AT APPROXIMATELY 3500 FOOT INTERVALS IN THE MOVING WORK OPERATION OR AS DIRECTED BY THE ENGINEER.
- ② SIGN NOT REQUIRED IF FLAGGING OPERATION OCCURS WITHIN A SIGNED ROAD WORK ZONE AREA.

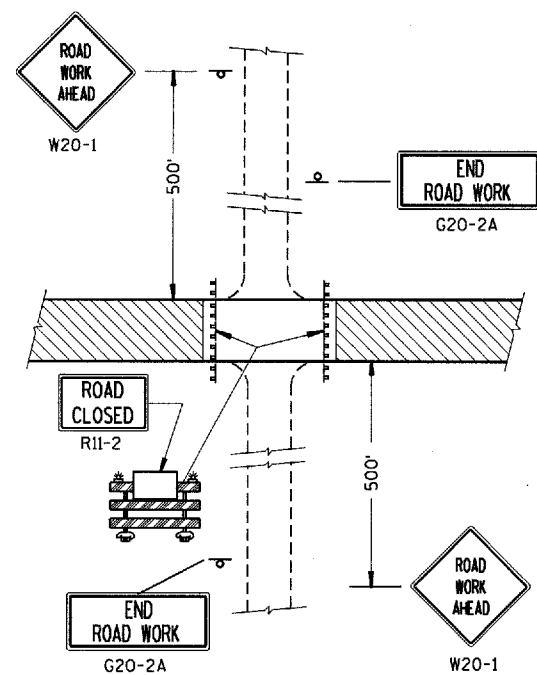
TRAFFIC CONTROL FOR LANE CLOSURE (SUITABLE FOR MOVING OPERATIONS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

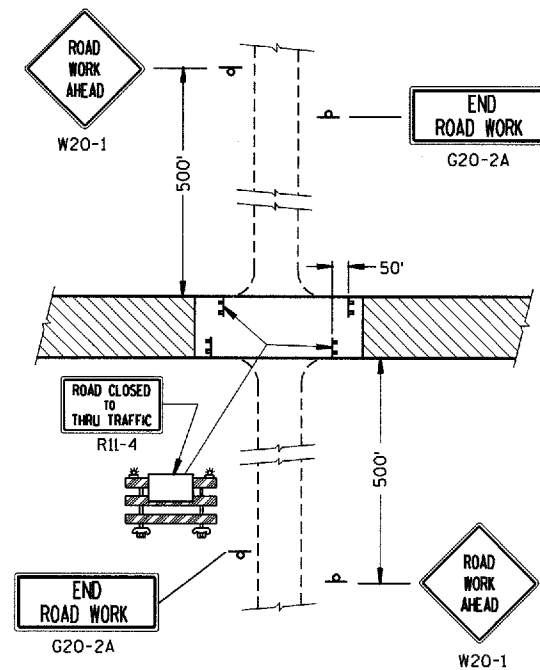
APPROVED
DATE 2/17/94
STATE TRAFFIC ENGINEER FOR HWYS
FHWA



DETAIL 1
(NO ACCESS TO PROJECT)

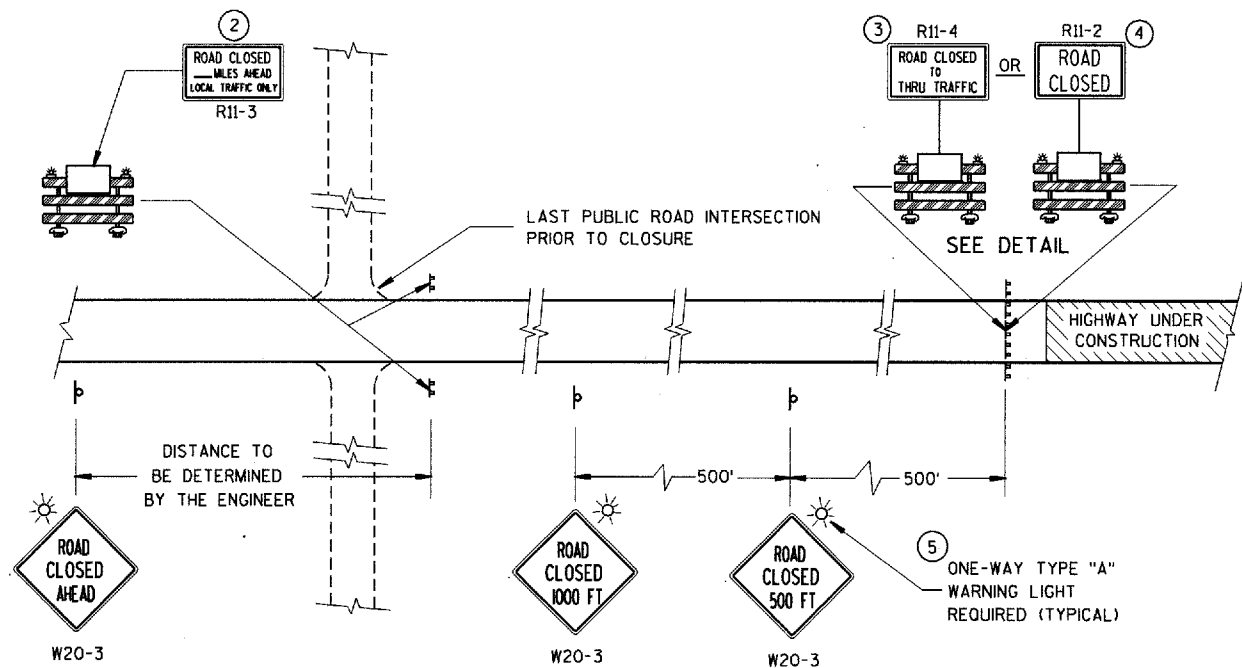


DETAIL 2
(PUBLIC CROSS-TRAFFIC MAINTAINED,
NO ACCESS TO PROJECT).

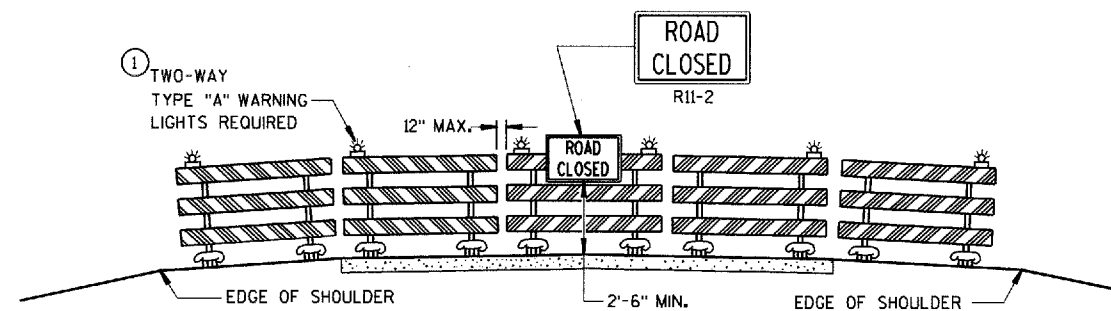


DETAIL 3
(PUBLIC CROSS-TRAFFIC MAINTAINED, CONTRACTOR,
LOCAL BUSINESS AND RESIDENT ACCESS).

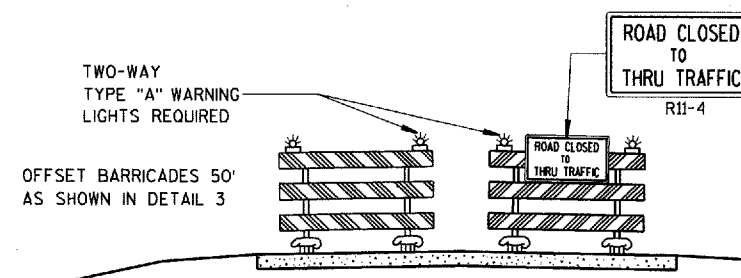
SIDEROAD CLOSURES



MAINLINE CLOSURE



ROAD CLOSURE BARRICADE DETAIL



LANE CLOSURE BARRICADE DETAIL

GENERAL NOTES

DETAILS OF TRAFFIC CONTROL DEVICES AND THEIR LOCATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE WISCONSIN MANUAL OF TRAFFIC CONTROL DEVICES, THE PLANS, SPECIFICATIONS AND CONTRACT.

SIGN AND BARRICADE LOCATIONS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER. ANY EXISTING TRAFFIC SIGNS THAT CONFLICT WITH THIS WORK SHALL BE COVERED AS DIRECTED BY THE ENGINEER. ALL "STOP" OR OTHER REGULATORY SIGNS ON THE SIDE ROADS SHALL NOT BE DISTURBED, EXCEPT WHEN NECESSARY TO COMPLETE THE WORK. THE SIGNS MUST THEN BE IMMEDIATELY REESTABLISHED.

ALL TYPE III BARRICADES SHALL HAVE RAILS REFLECTORIZED ON BOTH FACES. STRIPES SHALL BE PROPERLY SLOPED DOWN TOWARD THE TRAFFIC SIDE OR AS SHOWN IN THE ROAD CLOSURE BARRICADE DETAIL FOR FULL ROAD CLOSURES. TYPE "A" LOW INTENSITY FLASHING WARNING LIGHTS SHALL BE VISIBLE ON BOTH SIDES OF THE BARRICADE.

THE ROAD CLOSED SIGN (R11-2), ROAD CLOSED — MILES AHEAD SIGN (R11-3) AND THE ROAD CLOSED TO THRU TRAFFIC SIGN (R11-4) SHALL BE ATTACHED ONLY TO THE TOP RAIL OF THE TYPE III BARRICADE. THE SIGNS SHALL NOT COVER MIDDLE RAIL.

TYPE "H" REFLECTIVE SHEETING SHALL BE USED ON ALL BARRICADES, TYPE I, II AND III, AND ON ALL R11-2, R11-3 AND R11-4 SIGNS.

ALL SIGNS SHALL BE 48" X 48" UNLESS OTHERWISE NOTED BELOW:

R11-2, "ROAD CLOSED" SIGNS SHALL BE 48" X 30".

R11-3, AND R11-4 SIGNS SHALL BE 60" X 30".

G20-2A SIGNS SHALL BE 48" X 24".

- 1 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.
- 2 THESE SIGNS AND BARRICADES ARE NOT REQUIRED IF ROAD CLOSURE BEGINS AT INTERSECTION.
- 3 FOR ROAD CLOSURE WITH LOCAL ACCESS TO PROJECT. SEE LANE CLOSURE BARRICADE DETAIL.
- 4 FOR ROAD CLOSURE WITHOUT LOCAL ACCESS TO PROJECT. SEE ROAD CLOSURE BARRICADE DETAIL.
- 5 ONE-WAY LIGHTS SHALL BE PROVIDED ON ALL ADVANCE WARNING SIGNS. THE UNIT SHALL BE POSITIONED SUCH THAT THE LIGHT SOURCE IS OUTSIDE THE SIGN FACE AND AT THE TOP OF THE SIGN.

LEGEND

- POST MOUNTED WARNING SIGN
- TYPE III BARRICADES WITH TYPE "H" REFLECTIVE SHEETING
- TYPE "A" LOW INTENSITY FLASHING WARNING LIGHT (FOR NIGHT USE)
- WORK AREA

BARRICADES AND SIGNS FOR ROAD CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

8-10-95
DATE

FHWA

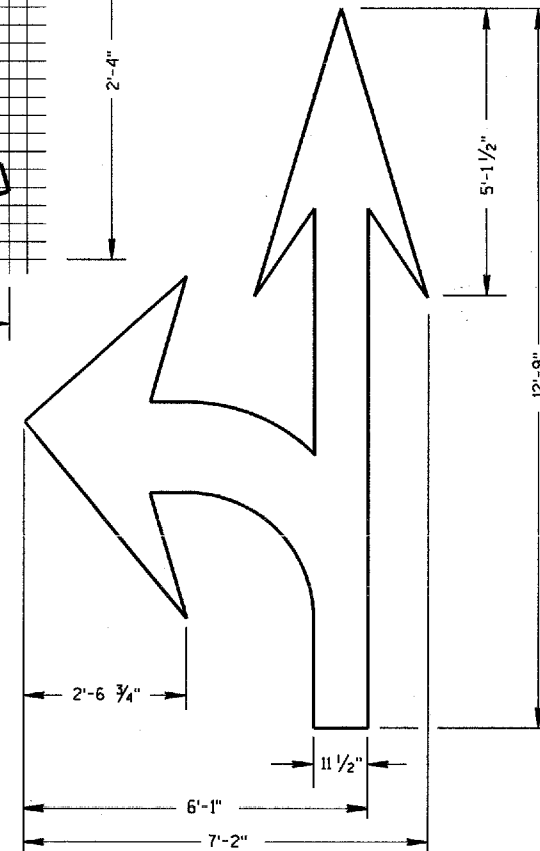
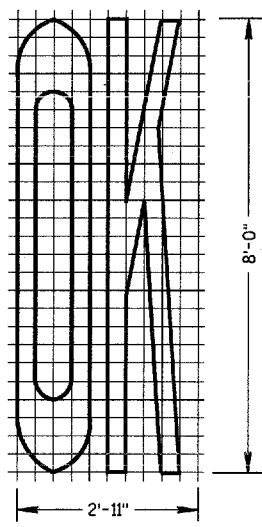
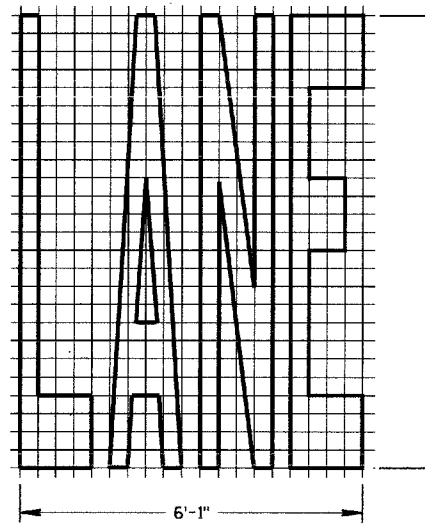
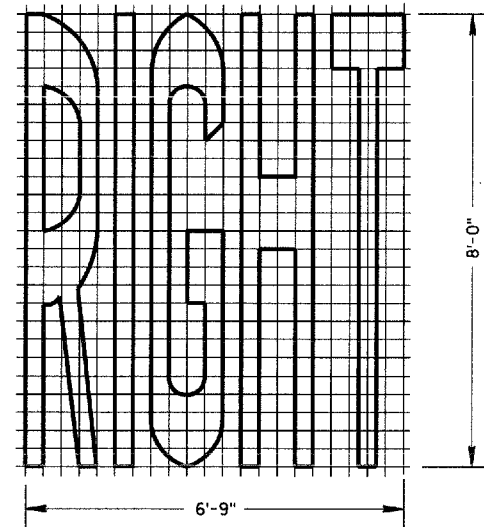
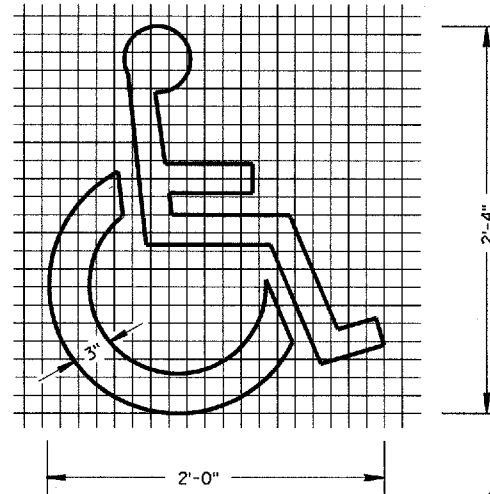
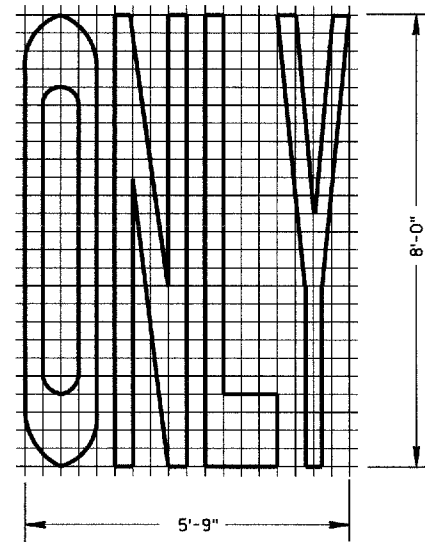
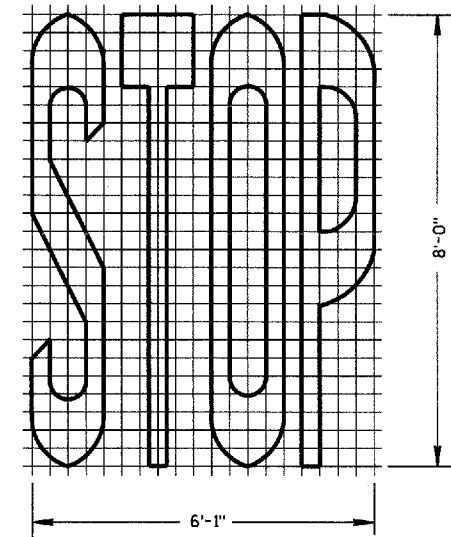
for *Charles J. Spang*
DIRECTOR, OFFICE OF TRAFFIC

GENERAL NOTES

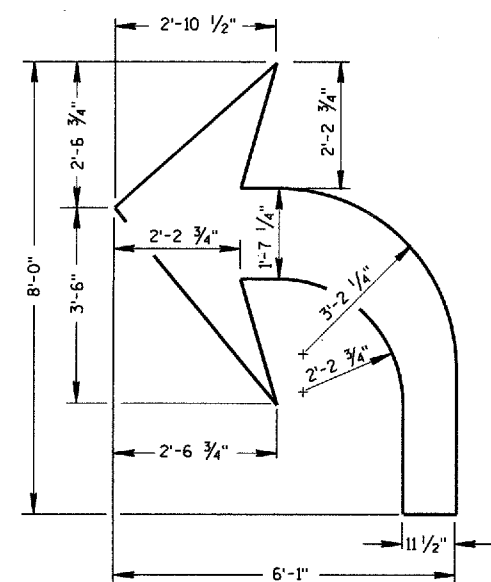
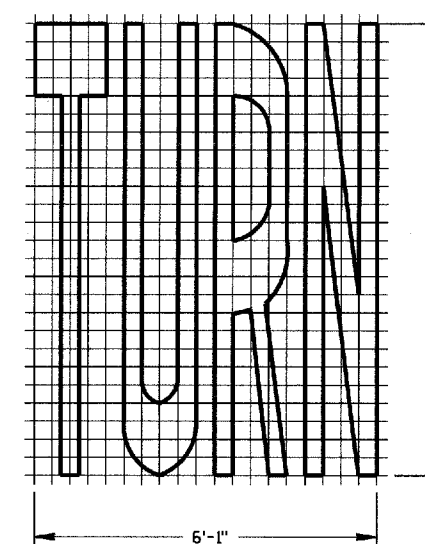
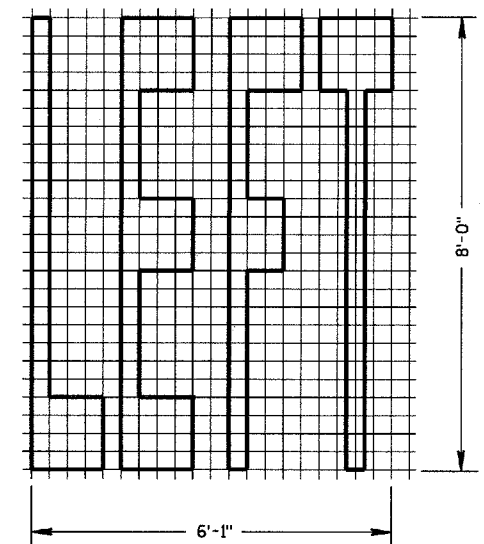
DETAILS OF INSTALLATION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

ALL LETTERS AND SYMBOLS SHALL BE IN CONFORMANCE WITH REQUIREMENTS INCLUDED IN "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKING" BY THE FEDERAL HIGHWAY ADMINISTRATION. ALL LETTERS, ARROWS AND SYMBOLS SHALL BE WHITE AND REFLECTORIZED.

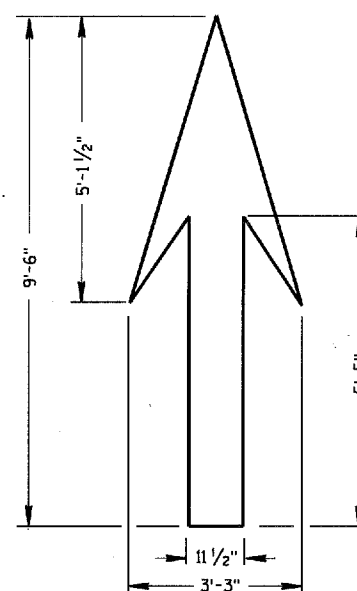
A DETAILED DRAWING OF THE HANDICAPPED PARKING SYMBOL IS ILLUSTRATED IN THE "STANDARD HIGHWAY SIGNS MANUAL" BY THE FEDERAL HIGHWAY ADMINISTRATION.



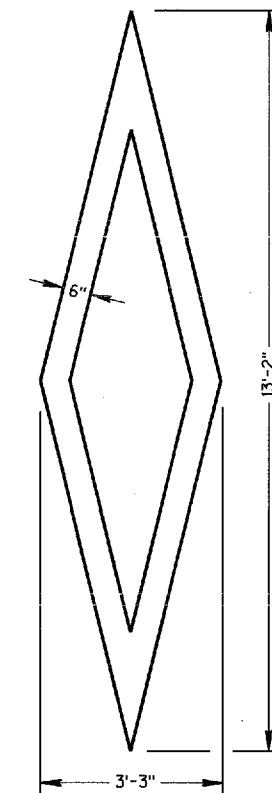
TYPE 3



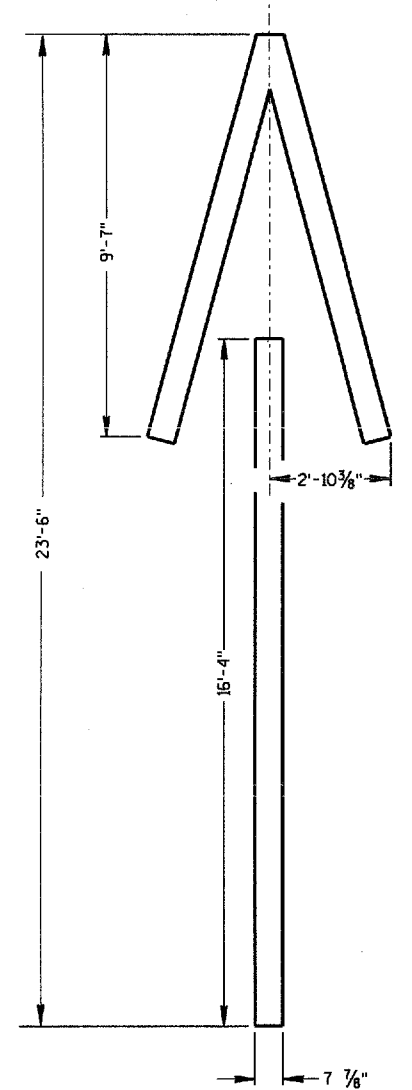
TYPE 2



TYPE 1



PREFERENTIAL
LANE SYMBOL



TYPE 4

PAVEMENT MARKING SYMBOLS

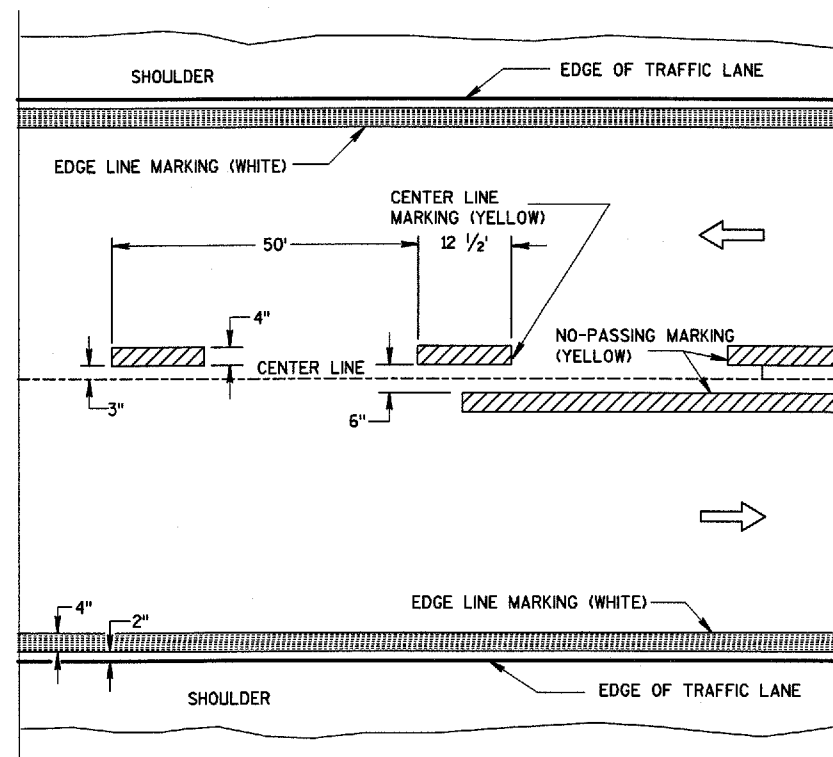
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

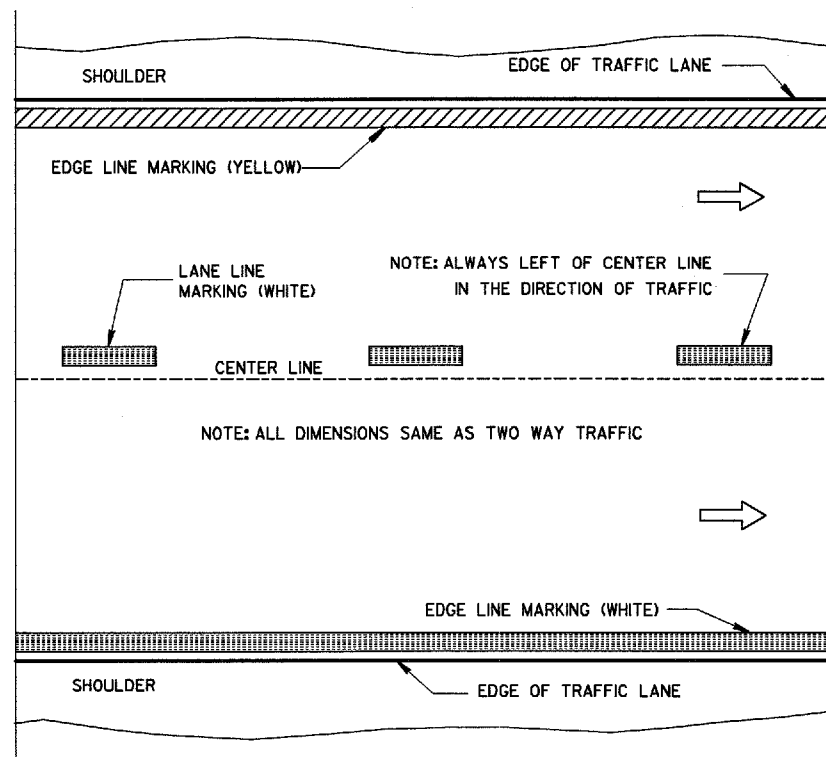
7-28-95
DATE

FHWA

Christa J. Spang
for DIRECTOR, OFFICE OF TRAFFIC



TWO WAY TRAFFIC



ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING

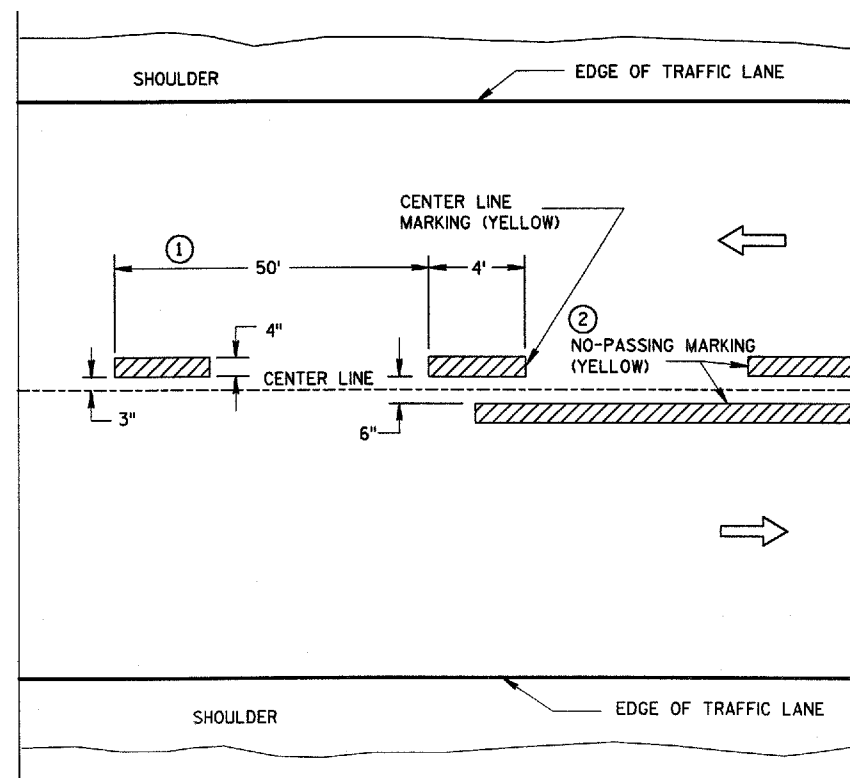
GENERAL NOTES

DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

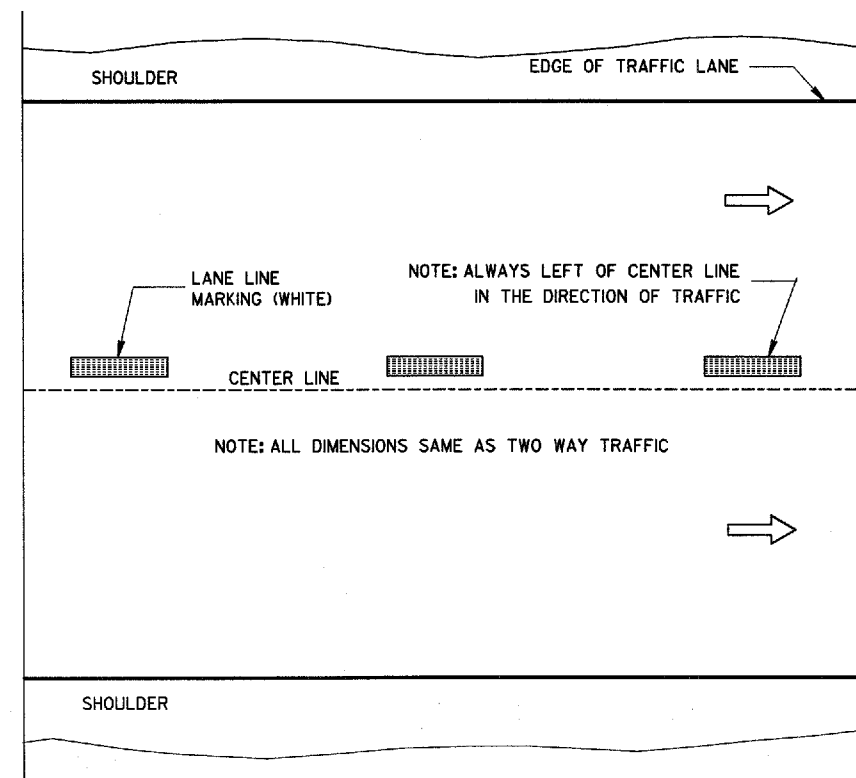
- ① HALF CYCLE LENGTHS (25'±) WITH 2' MINIMUM STRIPE LENGTHS SHALL BE PROVIDED ON ROADWAYS (INCLUDING TEMPORARY TRAVELED WAYS) WITH REVERSE CURVATURE, CURVATURE OF OVER 5 DEGREES OR WHEN DIRECTED BY THE ENGINEER TO MARK UNUSUAL ALIGNMENT OF THE TRAVELED WAY.
- ② NO PASSING ZONE TEMPORARY PAVEMENT MARKING IS REQUIRED TO BE PLACED, WHERE APPROPRIATE, ALONG WITH CENTERLINE TEMPORARY PAVEMENT MARKING WHEN A SAME DAY PERMANENT PAVEMENT MARKING ITEM IS INCLUDED IN THE CONTRACT.

NOTE

ARROW SYMBOL (→) SHOWS DIRECTION OF TRAVEL



TWO WAY TRAFFIC



ONE WAY TRAFFIC

TEMPORARY (INTERMEDIATE) PAVEMENT MARKING (SHOWS CYCLE FOR TEMPORARY CENTER LINE OR TEMPORARY LANE LINE MARKING)

PAVEMENT MARKING
(MAINLINE)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

2-17-00
DATE

FHWA

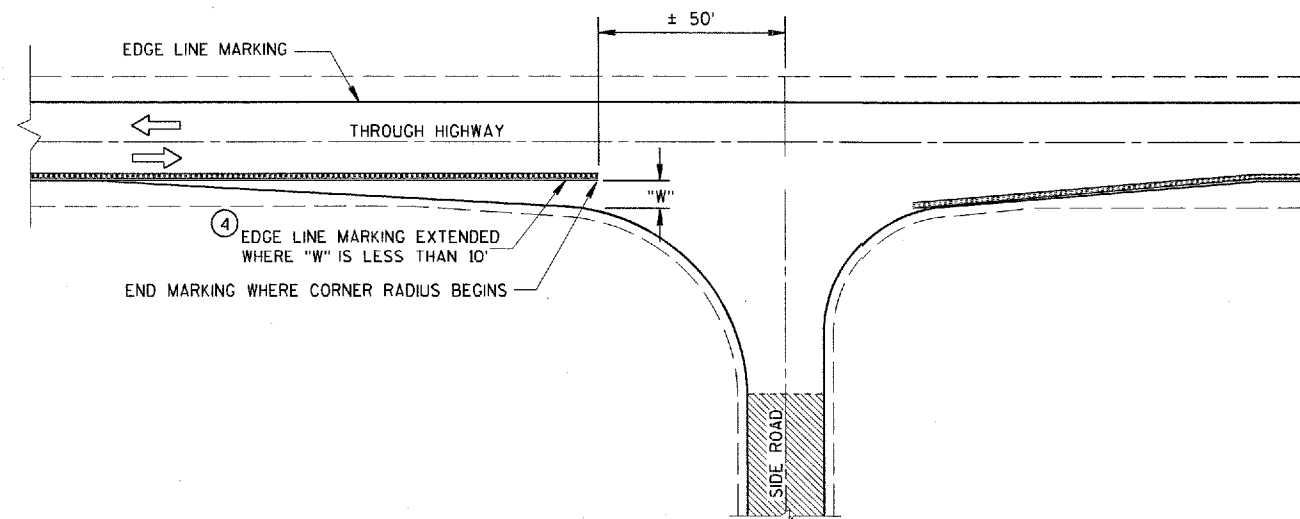
CHIEF SIGNS AND MARKING ENGINEER

NOTES

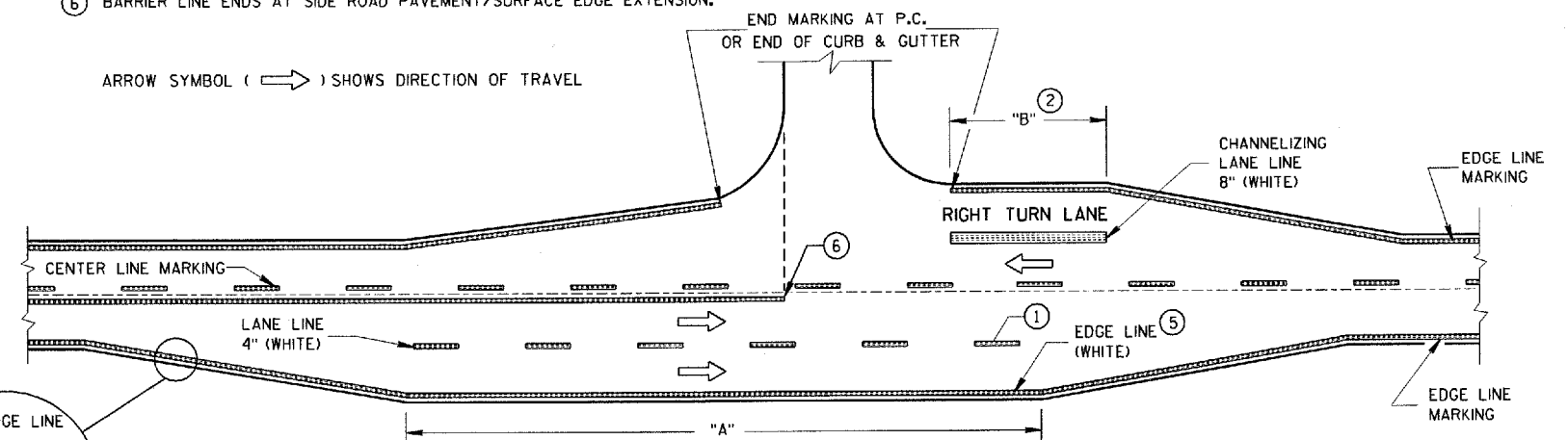
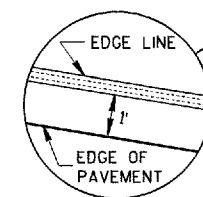
EDGE LINES SHALL BE OMITTED THROUGH INTERSECTIONS. EDGE LINES SHALL BE CONTINUED THROUGH DRIVEWAYS.

- ① WHEN DISTANCE "A" IS LESS THAN 250 FEET, OMIT LANE LINE.
- ② WHEN DISTANCE "B" IS LESS THAN 100 FEET, OMIT CHANNELIZING LANE LINE.
- ③ ALTERNATIVE MARKING SHALL BE PROVIDED WHEN SPECIFIED IN THE CONTRACT. TYPICAL SITUATIONS WHERE THIS MARKING MAY BE REQUIRED ARE WHERE THE INTERSECTION IS ON A SHARP HORIZONTAL CURVE OR CREST VERTICAL CURVE IN AN UNLIGHTED AREA SUCH THAT THE EDGE LINE MAY BE MISLEADING TO THE MOTORIST OR DISAPPEAR FROM SIGHT.
- ④ LOCATE THE EDGE LINE ALONG THE TAPER WHERE "W" IS 10' OR MORE.
- ⑤ THE EDGE LINE IN THE TAPER AREAS OF THE BYPASS LANE AND THE BYPASS LANE SHALL BE LOCATED 1-FOOT FROM EDGE OF PAVEMENT TO THE OUTSIDE EDGE OF EDGE LINE.
- ⑥ BARRIER LINE ENDS AT SIDE ROAD PAVEMENT/SURFACE EDGE EXTENSION.

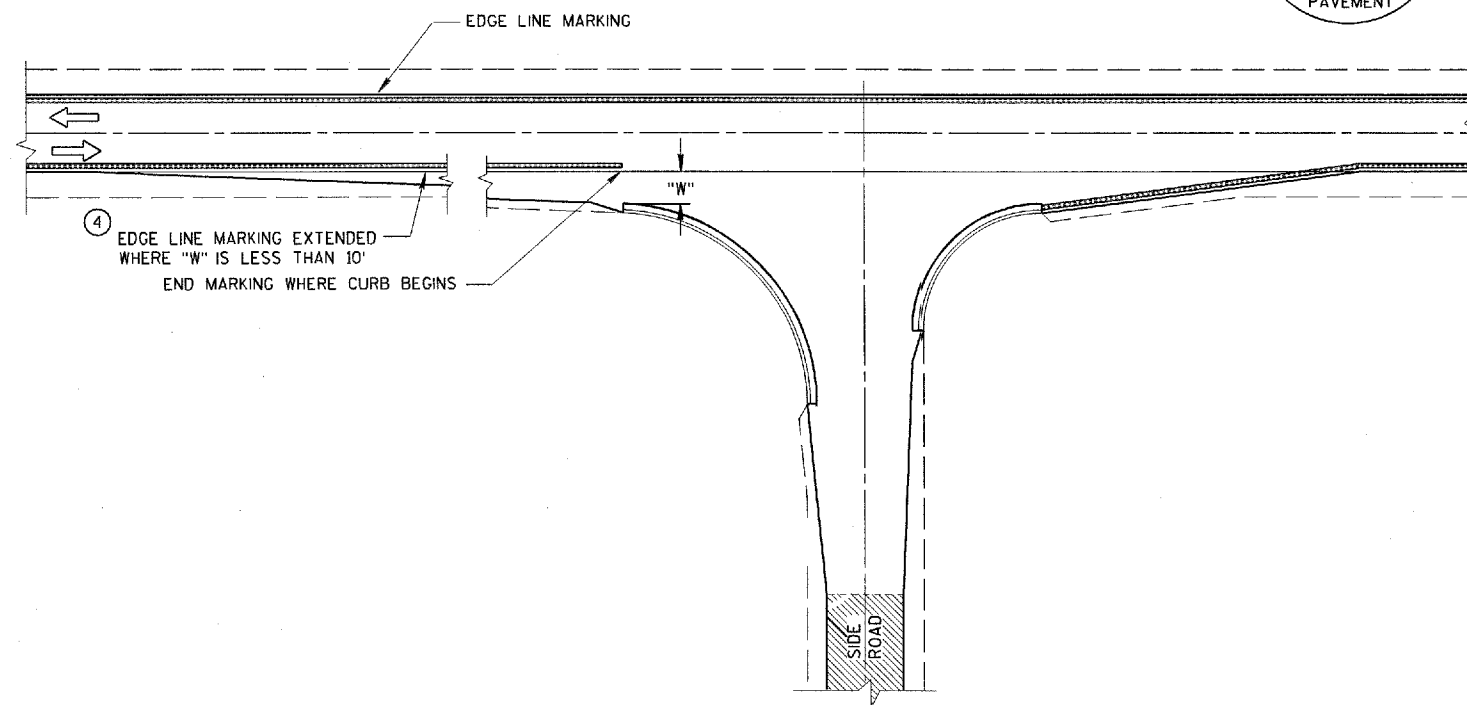
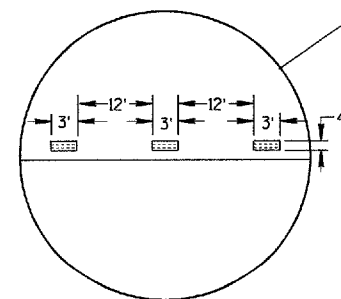
ARROW SYMBOL (→) SHOWS DIRECTION OF TRAVEL



MINOR INTERSECTION WITHOUT CURBS



MAJOR INTERSECTIONS
(INTERSECTION WITH FULL RIGHT TURN LANE OR BYPASS LANES)



MINOR INTERSECTION WITH CURBS
(TYPICAL MARKING)

MINOR INTERSECTION WITH CURBS
③ (FOR SPECIAL CONDITIONS AS SPECIFIED)

PAVEMENT MARKING
(INTERSECTIONS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS AND DEVICES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED. IF NECESSARY DUE TO SPACE CONSTRAINTS IN URBAN AREAS, 36" X 36" SIGNS MAY BE USED IF APPROVED BY DISTRICT TRAFFIC UNIT.

"WO" SIGNS ARE THE SAME AS "W" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

W20-1 AND G20-2A SIGNS ARE NOT REQUIRED IF THE WORK AREA IS WITHIN A LARGER WORK ZONE WHERE THESE SIGNS ARE ALREADY PRESENT. G20-2A SIGNS MAY ALSO BE OMITTED IF DURATION OF WORK IS LESS THAN 7 CONTINUOUS DAYS AND NIGHTS.

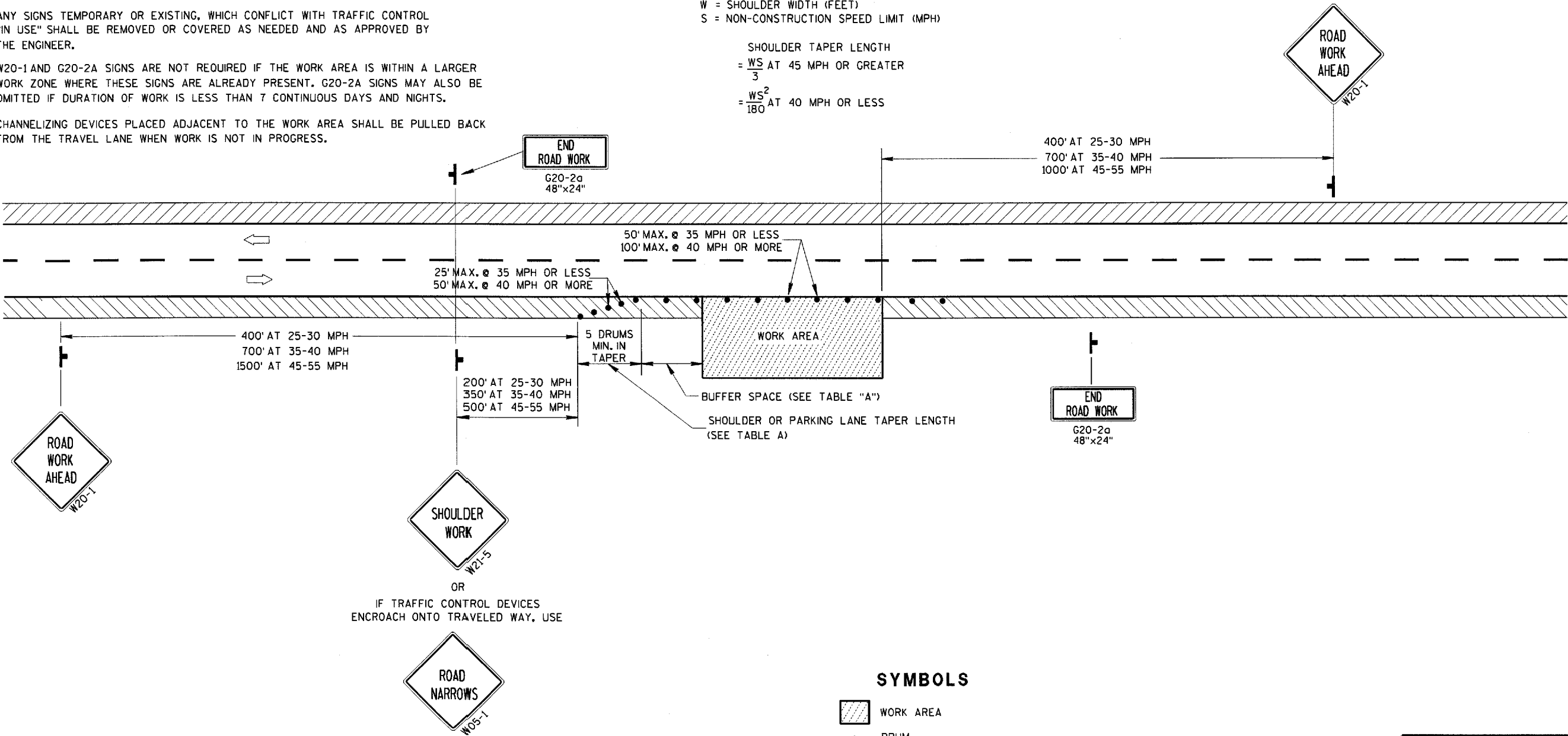
CHANNELIZING DEVICES PLACED ADJACENT TO THE WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

TABLE A

S	SHOULDER TAPER LENGTH (FEET)					BUFFER SPACE (FEET)
	W	4	6	8	10	
30	20	30	40	50		85
35	30	45	55	70		120
40	40	55	75	90		170
45	60	90	120	150		220
50	70	100	135	170		280
55	75	110	150	185		335

W = SHOULDER WIDTH (FEET)
S = NON-CONSTRUCTION SPEED LIMIT (MPH)

SHOULDER TAPER LENGTH
= $\frac{WS}{3}$ AT 45 MPH OR GREATER
= $\frac{WS^2}{180}$ AT 40 MPH OR LESS



SYMBOLS

- WORK AREA
- DRUM
- POST MOUNTED SIGN
- DIRECTION OF TRAFFIC FLOW

TRAFFIC CONTROL,
WORK ON SHOULDER OR
PARKING LANE,
UNDIVIDED ROADWAY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
5/23/00
DATE
CHIEF SIGNS AND MARKING ENGINEER
FHWA