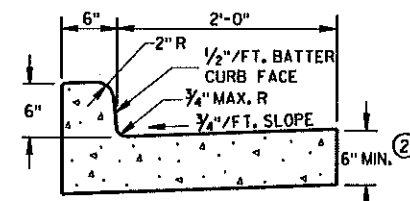
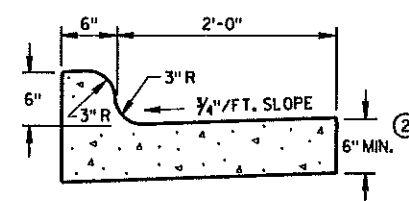


Standard Detail Drawing List

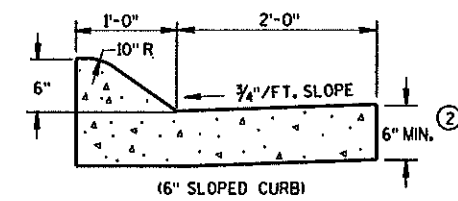
08D1-17	CONCRETE CURB, CONCRETE CURB AND GUTTER AND TIES
09G2-2A	BRIDGE TEMPORARY TRAFFIC SIGNAL INSTALLATION
09G2-2B	BRIDGE TEMPORARY TRAFFIC SIGNAL INSTALLATION
13B2-5	CONCRETE PAVEMENT APPROACH SLAB
14B15-6A	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B15-6B	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B15-6C	STEEL PLATE BEAM GUARD, CLASS "A", INSTALLATION & ELEMENTS
14B18-6A	STEEL PLATE BEAM GUARD, CLASS "A" (AT BRIDGES, OBSTACLES AND SIDEROADS/DRIVEWAYS)
14B20-7A	STEEL THRIE BEAM STRUCTURE APPROACH
14B24-6A	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
14B24-6B	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
14B24-6C	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
15C8-12A	PAVEMENT MARKING (MAINLINE)
15C8-12B	PAVEMENT MARKING (INTERSECTIONS)
15C8-12C	PAVEMENT MARKING (CLIMBING LANE & PASSING LANE)
15C12-3	TRAFFIC CONTROL FOR LANE CLOSURE (SUITABLE FOR MOVING OPERATIONS)



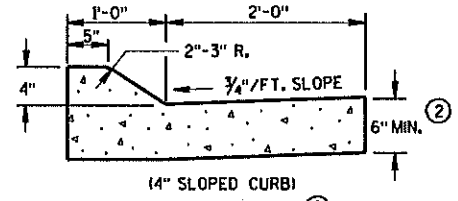
TYPES A &amp; D ①



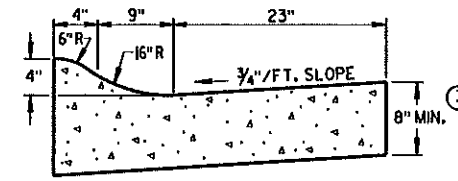
TYPES K &amp; L ①



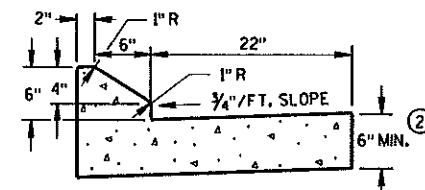
(6" SLOPED CURB)



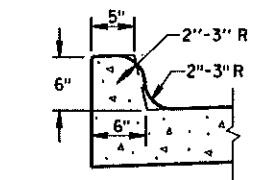
TYPES A &amp; D ①



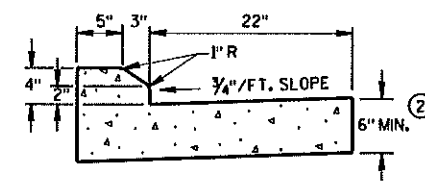
4" SLOPED CURB TYPES R &amp; T ① ④



6" SLOPED CURB TYPES G &amp; J ①

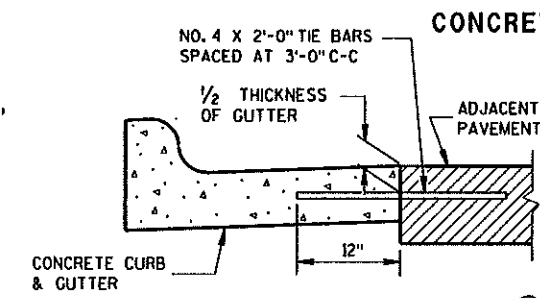


OPTIONAL CURB SHAPE FOR TYPES K &amp; L ①



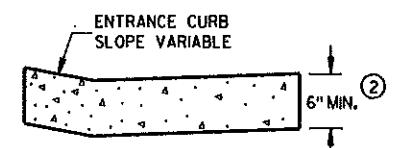
4" SLOPED CURB TYPES G &amp; J ①

CONCRETE CURB &amp; GUTTER 30"

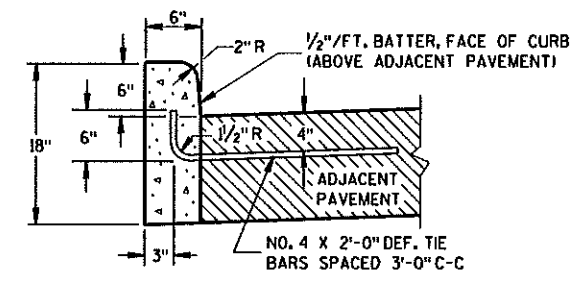


CONCRETE CURB &amp; GUTTER 36"

TYPICAL TIE BAR LOCATION ①

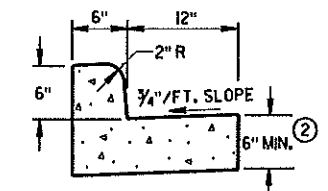


DRIVEWAY ENTRANCE CURB (WHEN DIRECTED BY THE ENGINEER)

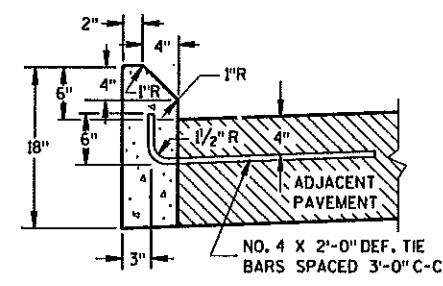


TYPES A &amp; D

CONCRETE CURB



TYPES A &amp; D CONCRETE CURB &amp; GUTTER 18"



TYPES G &amp; J

## GENERAL NOTES

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

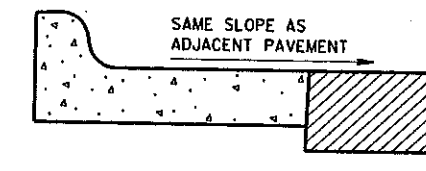
PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

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.

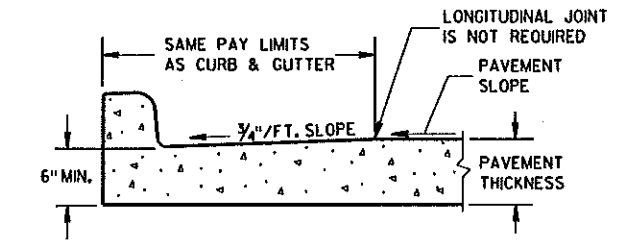
WHERE THE TRANSVERSE JOINTS IN THE PAVEMENT ARE REQUIRED TO BE SEALED, THE JOINTS IN THE INTEGRAL CURB AND GUTTER SHALL BE SEALED TO THE FACE OF CURB WITH THE SAME TYPE OF SEALANT. THE COST OF FURNISHING AND INSTALLING THIS SEALANT SHALL BE INCIDENTAL TO THE ITEM CONCRETE CURB AND GUTTER.

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

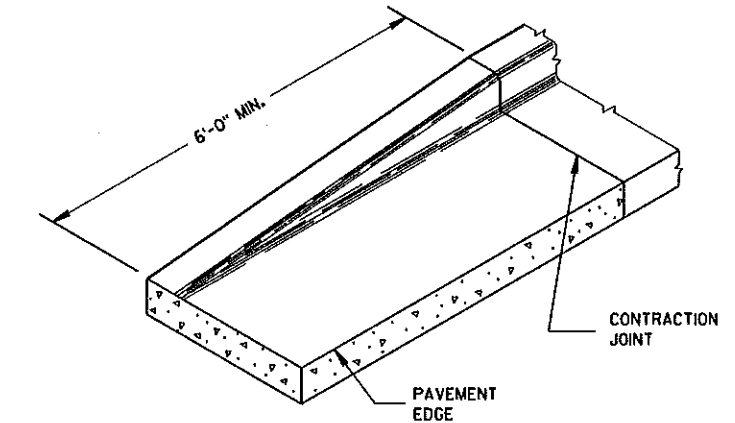
- ① TIE BARS ARE REQUIRED FOR CURB AND GUTTER TYPES A, G, K AND R.
- ② THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ③ THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 8" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ④ THE FACE OF CURB IS 6" FROM THE BACK OF CURB.
- ⑤ WHEN REVERSE SLOPE GUTTER IS REQUIRED, THE LOCATION(S) WILL BE SHOWN ELSEWHERE IN THE PLAN.



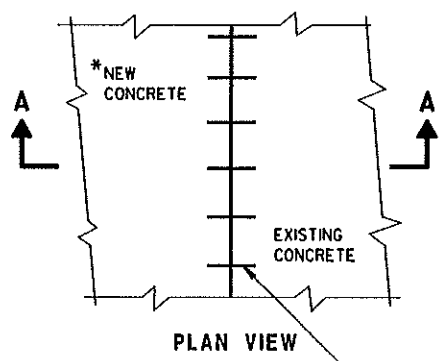
REVERSE SLOPE GUTTER ⑤ (TYPICAL FOR ALL CURB &amp; GUTTER TYPES)



PARTIAL SECTION OF PAVEMENT WITH INTEGRAL CURB &amp; GUTTER



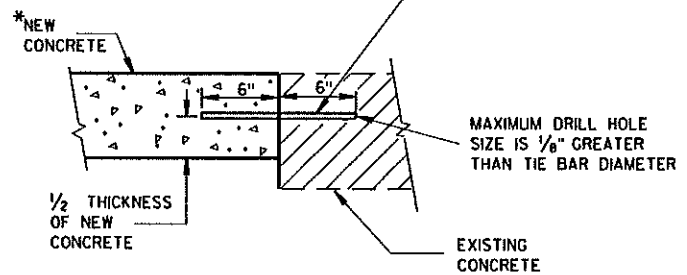
END SECTION CURB &amp; GUTTER



PLAN VIEW

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

NO. 6 TIE BARS SPACED 2'-6" C-C, INSTALLED PERPENDICULAR TO THE LONGITUDINAL JOINT.



SECTION A-A

TIE BARS DRILLED INTO EXISTING PAVEMENT

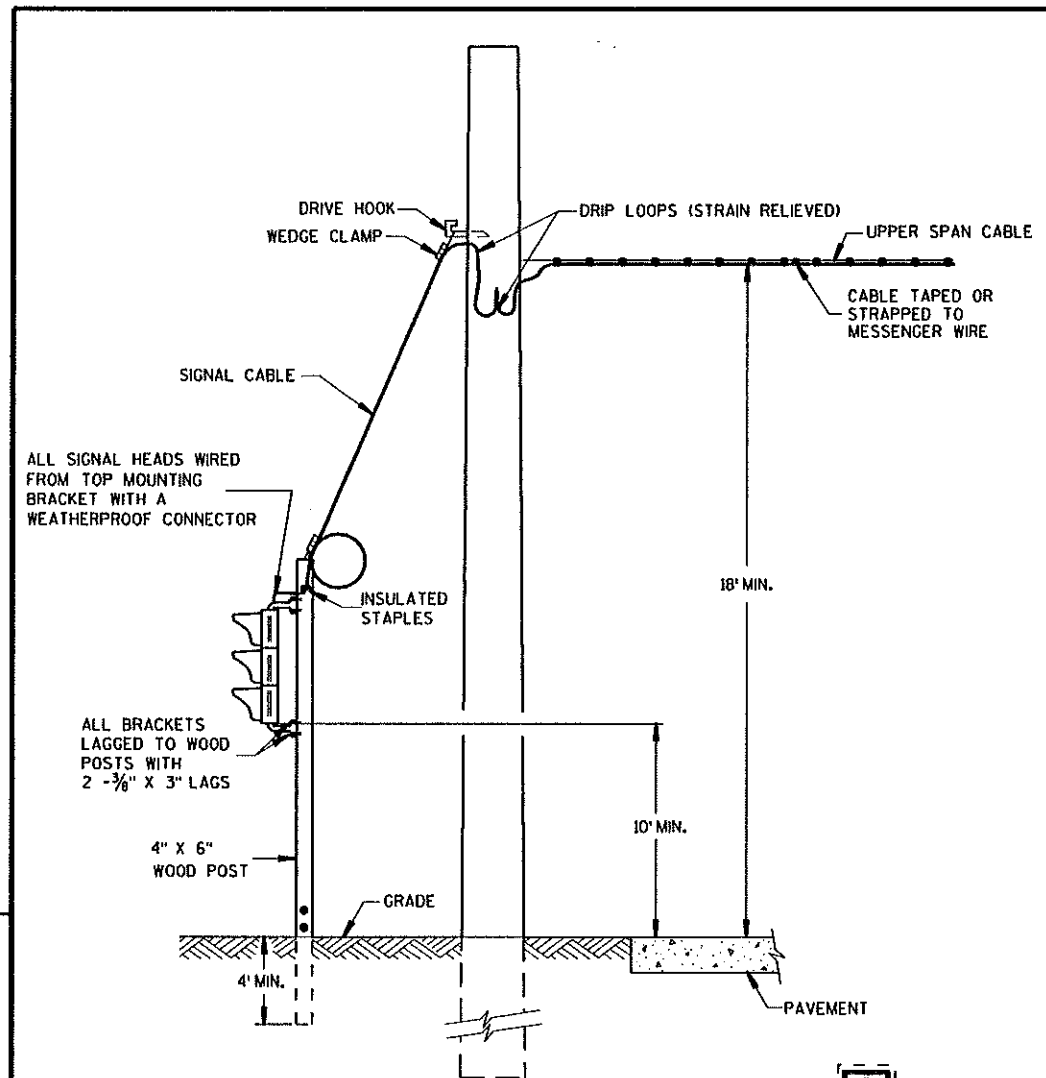
CONCRETE CURB, CONCRETE CURB & GUTTER AND TIES

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

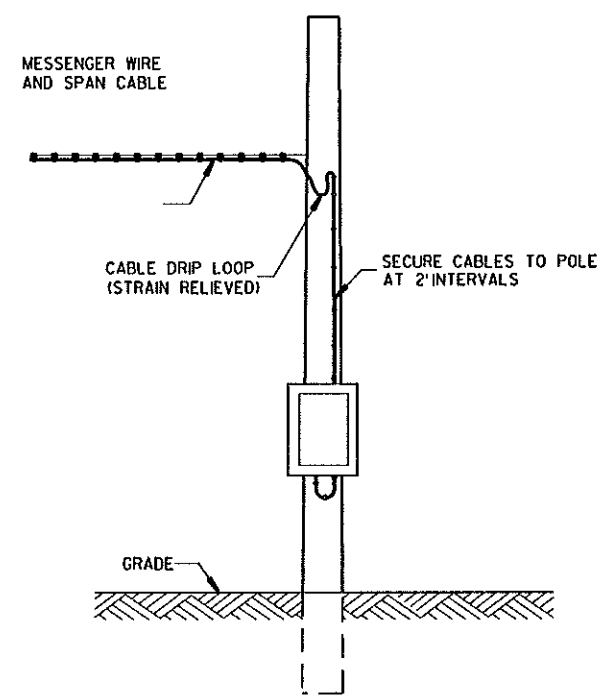
APPROVED  
9/4/08  
DATE  
/S/ Jerry H. Zogg  
ROADWAY STANDARDS DEVELOPMENT  
ENGINEER  
FHWA

6

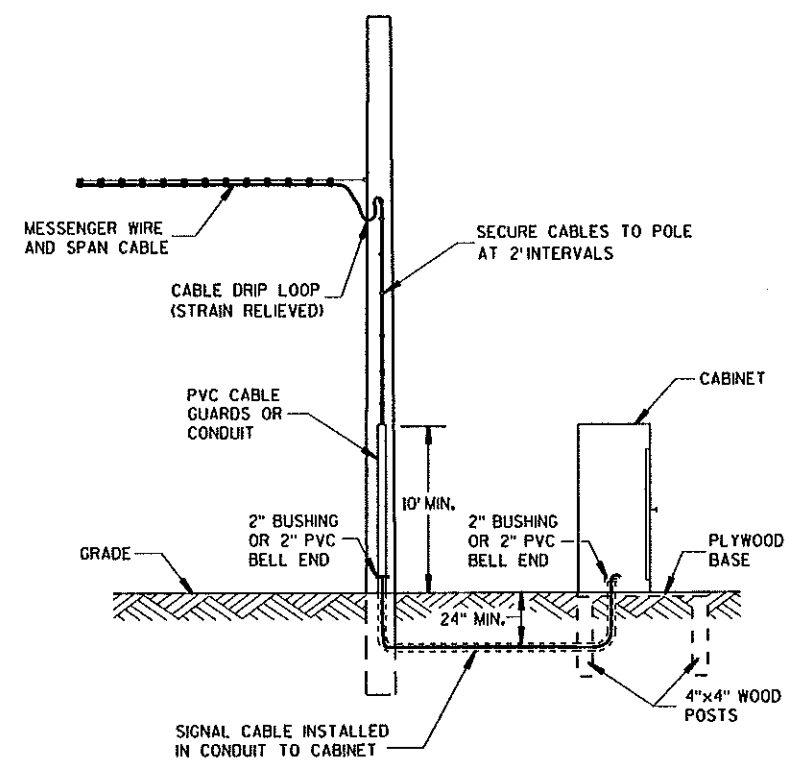
6



TYPICAL DROP TO TRAFFIC SIGNAL FACE



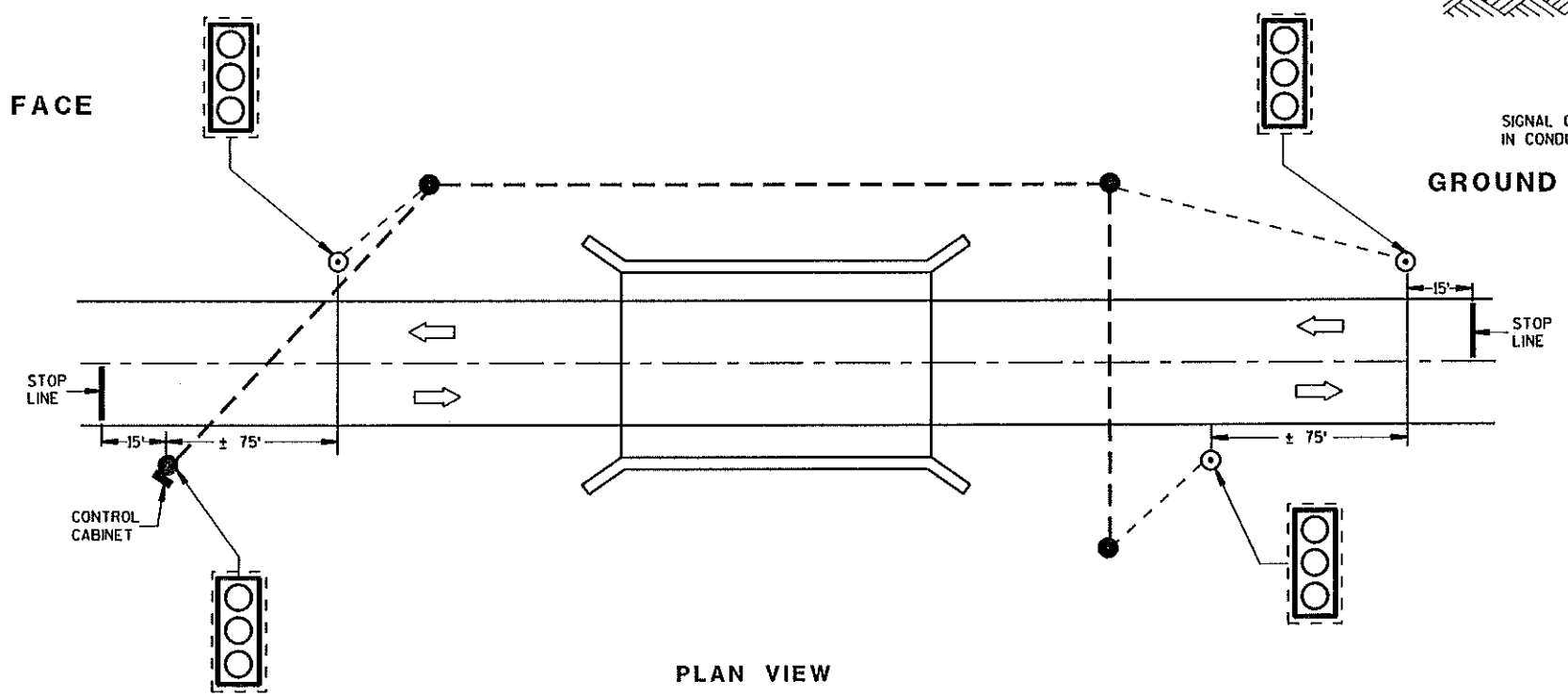
POLE MOUNT CABINET INSTALLATION



GROUND MOUNT CABINET INSTALLATION

OFFSET DISTANCES FOR TEMPORARY NON-BREAKAWAY POLES	
SPEED LIMIT	OFFSET DISTANCE**
GREATER THAN 45 MPH	18 FT
45 MPH OR LESS	12 FT
45 MPH OR LESS W/ CURBS	2 FT
**NOTE: OFFSET MEASURED FROM OUTER EDGE OF OUTSIDE THRU LANE.	

MINIMUM POLE LENGTHS	CLASS	MINIMUM BURIAL DEPTHS
25 FEET	V	5 FEET
30 FEET	V	6 FEET
35 FEET	IV	7 FEET
40 FEET	IV	8 FEET
45 FEET	IV	9 FEET



PLAN VIEW  
TYPICAL BRIDGE TEMPORARY TRAFFIC SIGNAL LOCATION

**LEGEND**

- WOOD POLE (NONBREAKAWAY)
- WOOD POST (BREAKAWAY)
- SIGNAL CABLE
- SIGNAL CABLE W/MESSENGER
- LED TRAFFIC SIGNAL FACE WITH BACKPLATE
- 3-12"
- DIRECTION OF TRAFFIC

**BRIDGE TEMPORARY TRAFFIC SIGNAL INSTALLATION**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
7-14-08 /S/ Balu Ananthanarayanan  
DATE CHIEF ELECTRICAL ENGINEER FOR HIGHWAYS  
FHWA

GENERAL NOTES

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

POLE MOUNTED TRAFFIC SIGNAL CONTROL CABINET MAYBE MOUNTED ON THE SERVICE POLE IF THE ELECTRICAL UTILITY ALLOWS THE INSTALLATION.

WHEN UTILITY POLES ARE USED TO SPAN THE TEMPORARY OVERHEAD CABLE, WRITTEN PERMISSION MUST BE OBTAINED FROM THE OWNER OF THE POLES AND GIVEN TO THE PROJECT MANAGER. ALL PERTINENT UTILITY AND CODE CLEARANCES SHALL BE MAINTAINED.

WOOD POLES (NONBREAKAWAY) SHALL BE NO CLOSER TO EDGE OF PAVEMENT THAN OFFSET DISTANCE CHART ALLOWS OR 4 FEET BEHIND PROTECTIVE BARRIER (BEAMGUARD, ETC.).

WOOD POSTS (BREAKAWAY) SHALL BE NO CLOSER THAN 2 FEET OUTSIDE OF SHOULDER.

VERTICAL CLEARANCE ETC. PER NEC.

TRAFFIC SIGNAL FACES SHALL BE TYPICALLY PLACED 12 FEET FROM EDGE OF PAVEMENT.

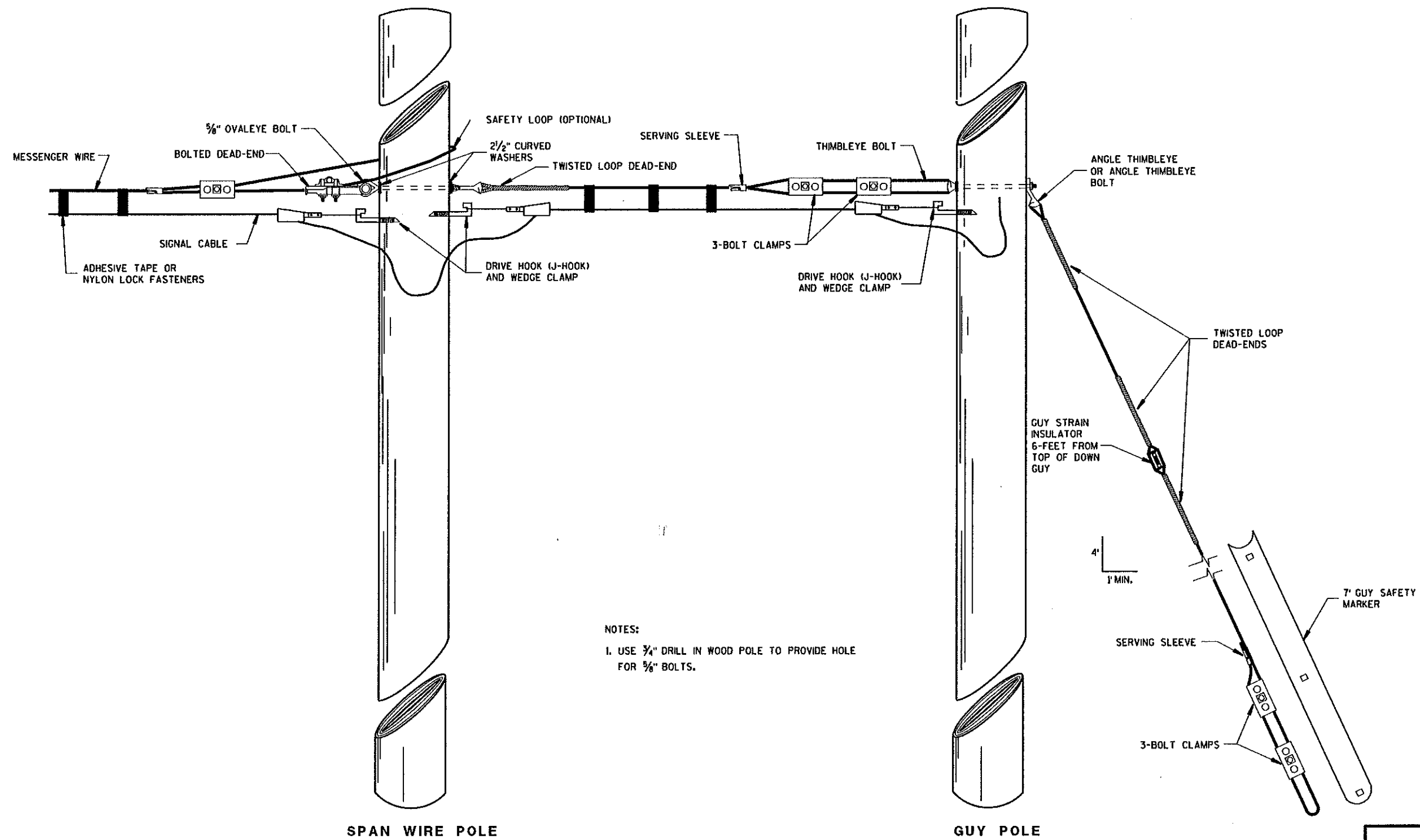
EACH TRAFFIC SIGNAL FACE SHALL HAVE A BACKPLATE.

S.D.D. 9 G 2-20

S.D.D. 9 G 2-20

6

S.D.D. 9 G 2-2b



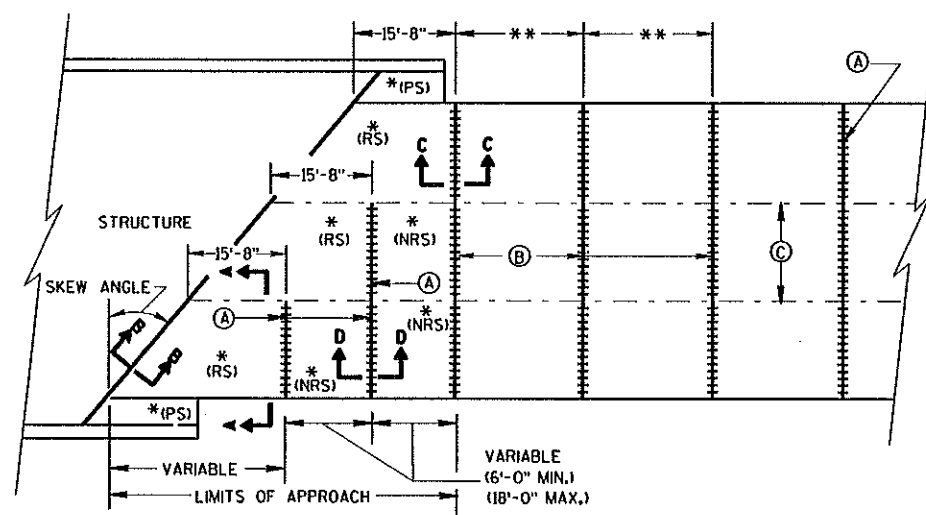
NOTES:  
1. USE  $\frac{3}{4}$ " DRILL IN WOOD POLE TO PROVIDE HOLE FOR  $\frac{5}{8}$ " BOLTS.

TYPICAL DEAD-ENDINGS OR GUYING

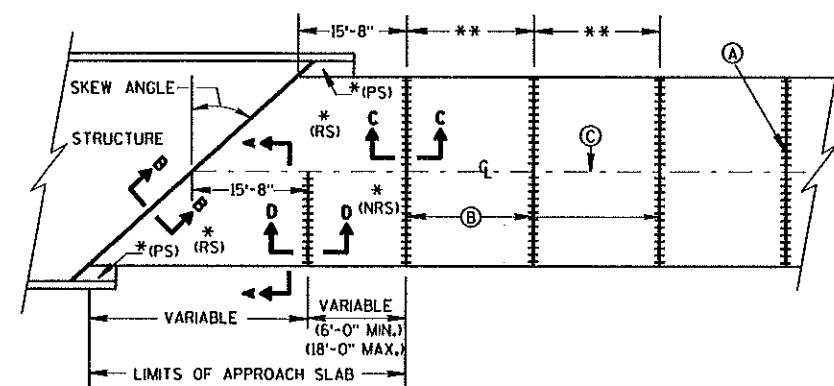
BRIDGE TEMPORARY TRAFFIC SIGNAL INSTALLATION	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 7-14-08 DATE	/S/ Balu Ananthanarayanan CHIEF ELECTRICAL ENGINEER FOR HIGHWAYS
FHWA	

6

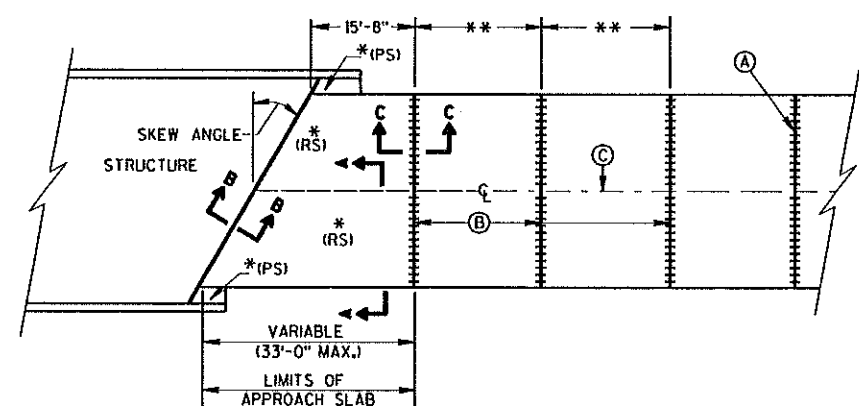
S.D.D. 9 G 2-2b



**SKewed APPROACH**  
(PAVEMENT MORE THAN 2 LANES)

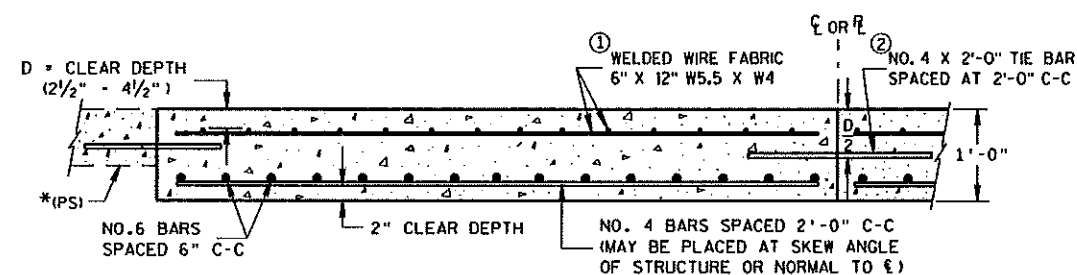


**SKEWS > 30°**  
(PAVEMENT WIDTH ≤ 30')

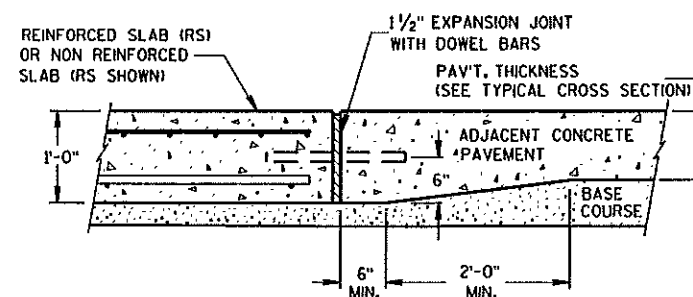


**SKews ≤ 30°**  
(PAVEMENT WIDTH ≤ 30')  
**APPROACH SLAB AND ADJACENT PAVEMENT**

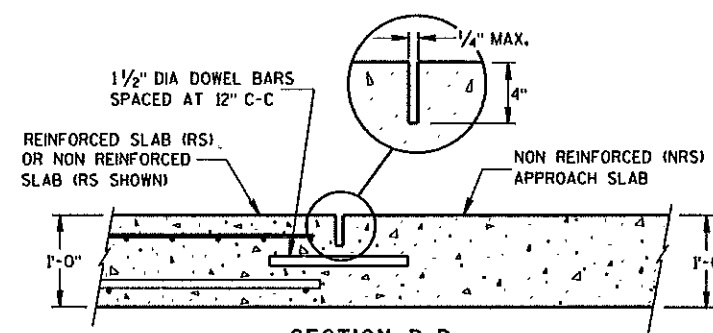
- \* (RS) = REINFORCED CONCRETE SLAB  
 \* (PS) = PAVED CONCRETE SHOULDER, CONCRETE PAVEMENT, OR CONCRETE SURFACE DRAIN  
 (SEE DETAILS ELSEWHERE IN THE PLAN)  
 \* (NRS) = NON-REINFORCED CONCRETE SLAB  
 \*\* STANDARD TRANSVERSE JOINT SPACING  
 (SEE SDD 13C4, SDD 13C11, & SDD 13C13)  
 (A) STANDARD CONTRACTION JOINT NORMAL TO  $R_L$  OR  $R_C$   
 (B)  $1\frac{1}{2}$ " EXPANSION JOINT WITH DOWEL BARS NORMAL TO  $R_L$  OR  $R_C$   
 (C) STANDARD LONGITUDINAL JOINT AND TIE BARS.



**SECTION A-A**  
**REINFORCEMENT POSITIONING DETAIL**



**SECTION C-C**  
**TRANSITION DETAIL**  
**APPROACH SLAB TO ADJACENT PAVEMENT**



**SECTION D-D**  
**CONTRACTION JOINT**

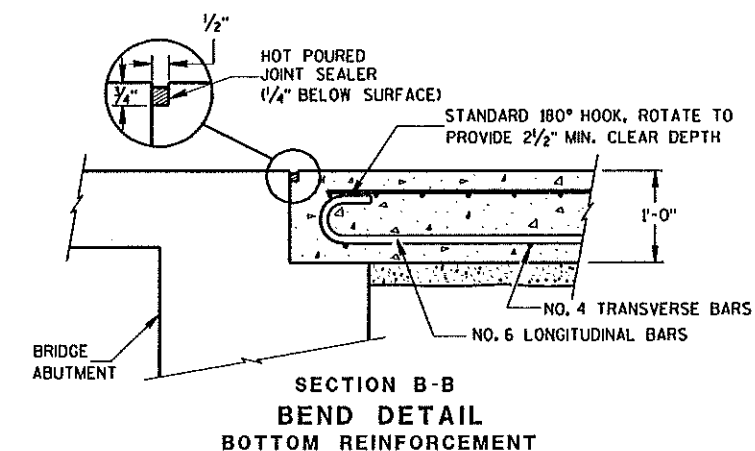
## GENERAL NOTES

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

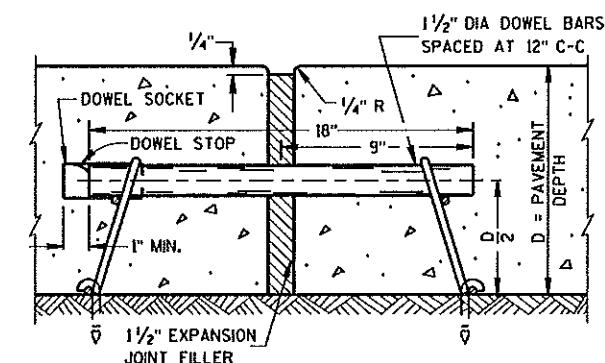
DOWEL BARS ARE NOT REQUIRED WHEN THE APPROACH SLAB ABUTS AN ASPHALT PAVEMENT OVER BASE COURSE.

SPLICING OF NO. 6 BARS IN THE APPROACH SLAB IS PERMITTED FOR SKEWED STRUCTURES ONLY. SPLICES SHALL BE STAGGERED, WITH A MAXIMUM OF ONE SPLICE PER BAR. THE LENGTH OF LAP SHALL BE 20 INCHES.

- NO. 4 BARS SPACED AT 2'-0" C-C IN BOTH THE LONGITUDINAL AND TRANSVERSE DIRECTIONS MAY BE USED FOR TOP REINFORCEMENT AS AN ALTERNATIVE TO THE WELDED WIRE FABRIC.
- TIE BARS BETWEEN REINFORCED SLABS MAY BE OMITTED WHERE SLAB REINFORCEMENT EXTEND ACROSS THE CENTERLINE OR REFERENCE LINE.



**SECTION B-B**  
**BEND DETAIL**  
**BOTTOM REINFORCEMENT**



**EXPANSION JOINT**

## CONCRETE PAVEMENT APPROACH SLAB

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

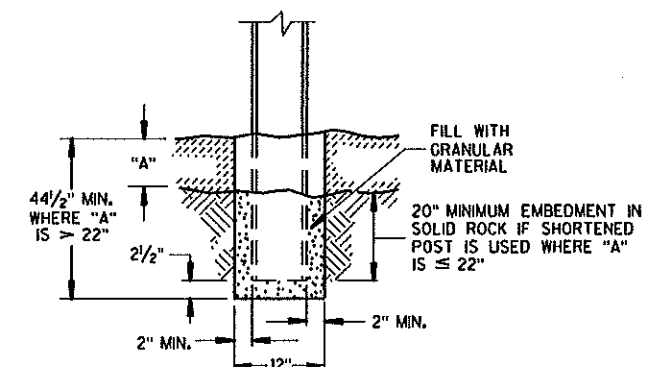
APPROVED  
3/21/07 /S/ Steven W. Krebs  
DATE CHIEF MATERIALS MANAGEMENT ENGINEER  
FHWA

## GENERAL NOTES

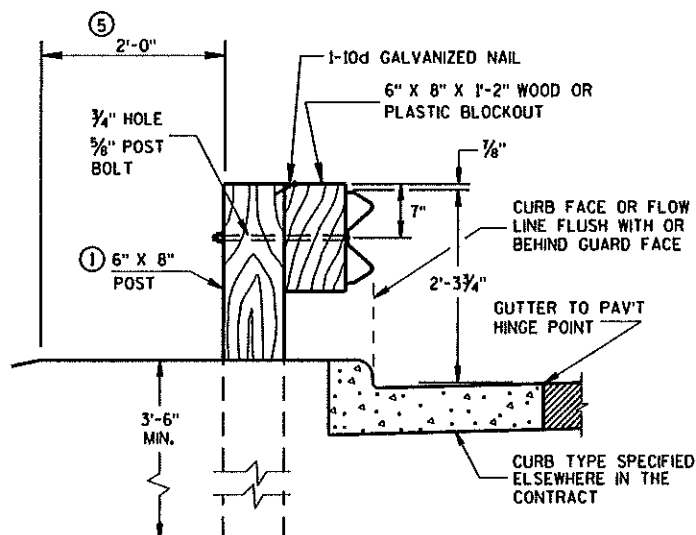
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, AND THE APPLICABLE SPECIAL PROVISIONS.

- W6 X 9 OR W6 X 8.5 STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POSTS WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS. APPROVED PLASTIC BLOCKOUT DESIGNS MAY VARY FROM THIS TYPICAL DETAIL WHEN USED IN CONJUNCTION WITH STEEL POSTS. DO NOT MIX STEEL POSTS AND WOOD POSTS IN A SINGLE INSTALLATION.
- USE STRUCTURAL STEEL POSTS CONFORMING TO ASTM A 36. GALVANIZED POSTS ACCORDING TO AASHTO M 111. EITHER SET THE POSTS IN DRILLED HOLES OR DRIVE TO GRADE. REMOVE MUSHROOMING CAUSED BY DRIVING AND REPAIR DAMAGED SPALTER COATING ON GALVANIZED POSTS.
- INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
- USE EITHER WOOD OR APPROVED PLASTIC BLOCKOUTS ON WOOD POSTS.
- IF THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING, W BEAM (LHW).
- IF ROCK IS ENCOUNTERED DURING EXCAVATION, THE ENGINEER MAY APPROVE USING A 12 INCH DIAMETER POST HOLE EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE APPROXIMATELY 2 1/2 INCHES DEEP. CUT THE POSTS TO LENGTH AND PLACE IN THE HOLE. BACKFILL WITH MATERIAL EXCAVATED FROM THE HOLE AND COMPACT ADEQUATELY.

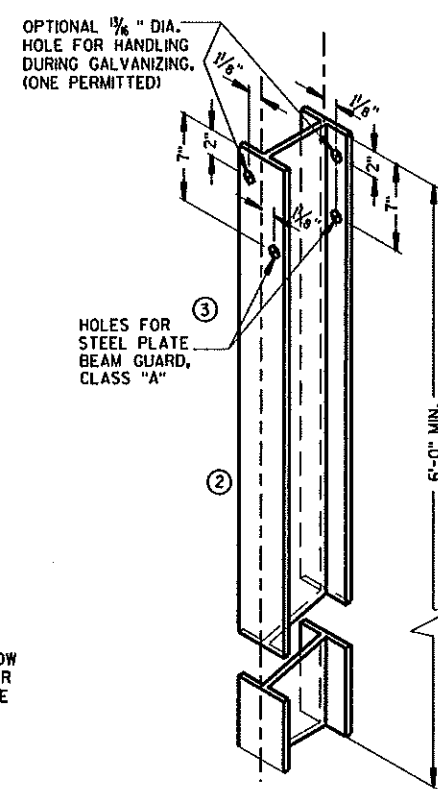
INSTALL BEAM GUARD SECTIONS AND ALL NECESSARY HARDWARE ACCORDING TO THE APPLICABLE PLAN AND CURRENT STANDARD AND SUPPLEMENTAL SPECIFICATIONS. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURER'S TOLERANCES EXCEPT WHERE ALLOWABLE TOLERANCES ARE SHOWN.



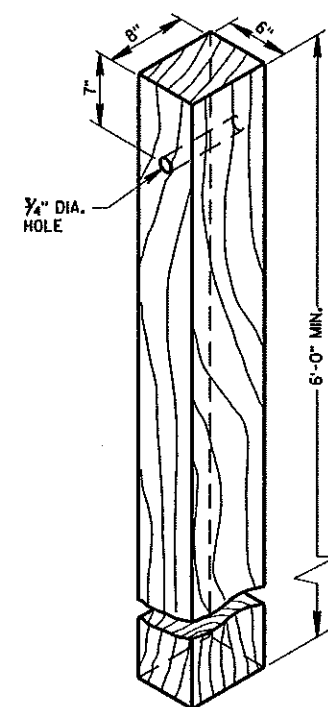
END VIEW  
SETTING STEEL OR WOOD POST IN ROCK ⑥



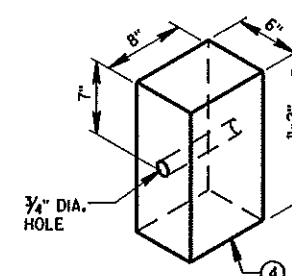
END VIEW  
LOCATED ALONG A CURBED ROADWAY



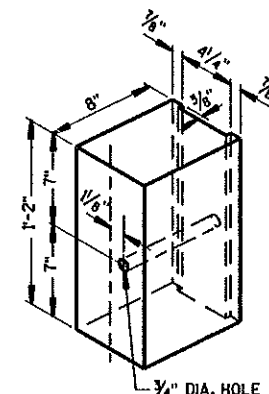
STEEL POST &  
HOLE PUNCHING DETAIL  
(W6 X 9) ①  
ALL HOLES 1/4" DIAMETER EXCEPT AS NOTED



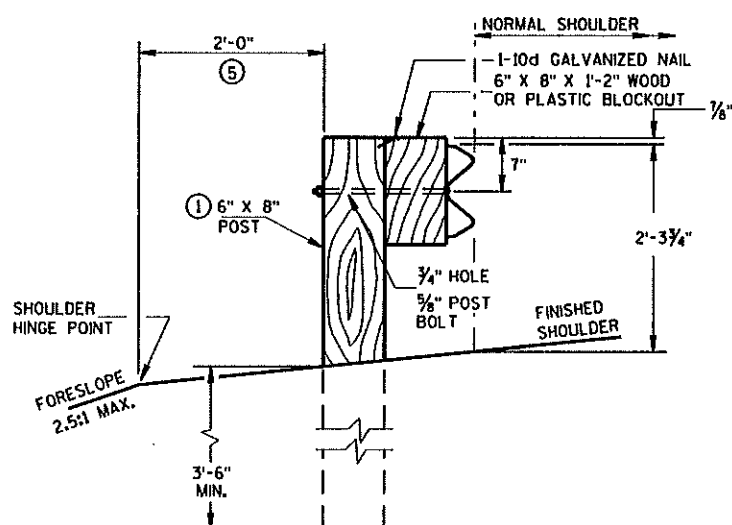
WOOD POST  
(6"X8") NOMINAL



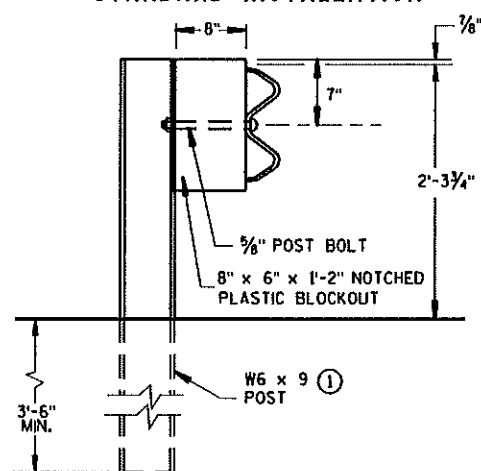
WOOD OR PLASTIC  
BLOCKOUT FOR  
WOOD POSTS



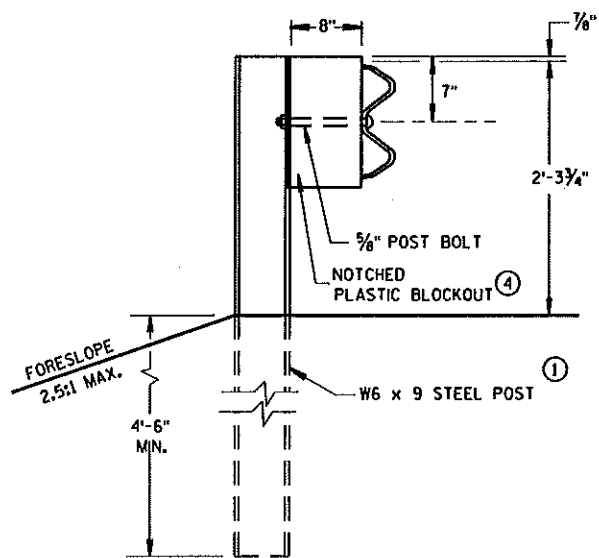
TYPICAL NOTCHED ①  
PLASTIC BLOCKOUT  
FOR STEEL POSTS



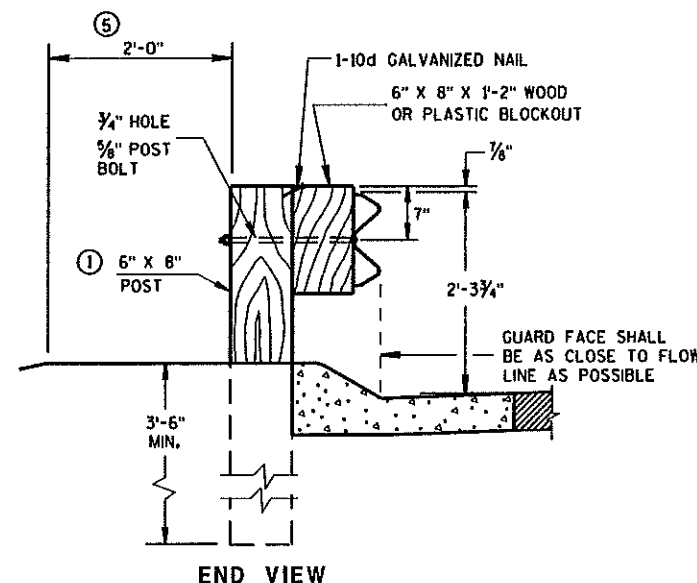
END VIEW  
LOCATED ALONG A ROADWAY SHOULDER  
STANDARD INSTALLATION



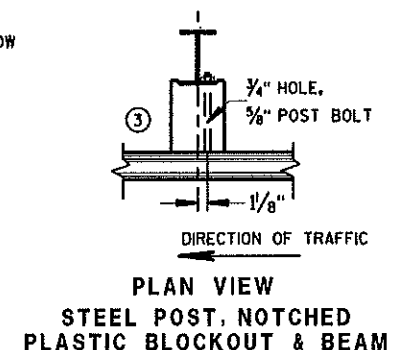
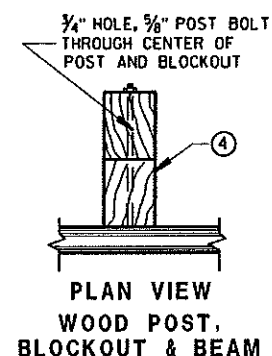
END VIEW  
STEEL POST & NOTCHED  
PLASTIC BLOCKOUT ALTERNATIVE  
STANDARD INSTALLATION



END VIEW  
LONGER POST AT HALF  
POST SPACING W BEAM  
(LHW)

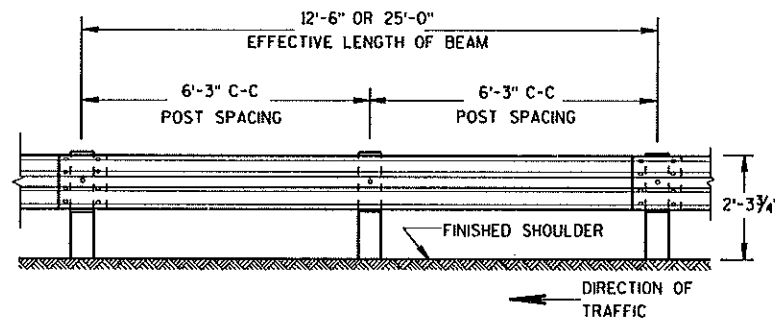


END VIEW  
LOCATED ALONG A  
MOUNTABLE CURBED ROADWAY



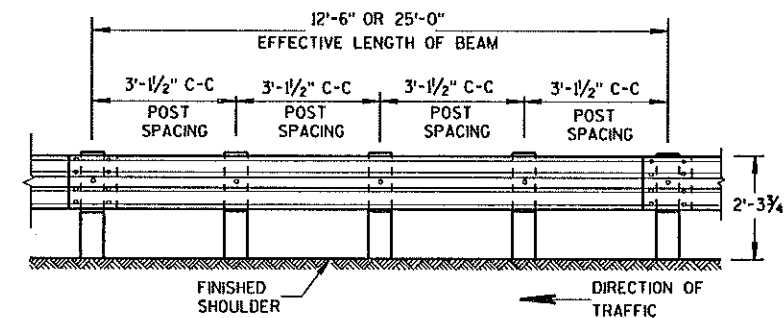
STEEL PLATE BEAM GUARD,  
CLASS "A"  
INSTALLATION & ELEMENTS

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



FRONT VIEW

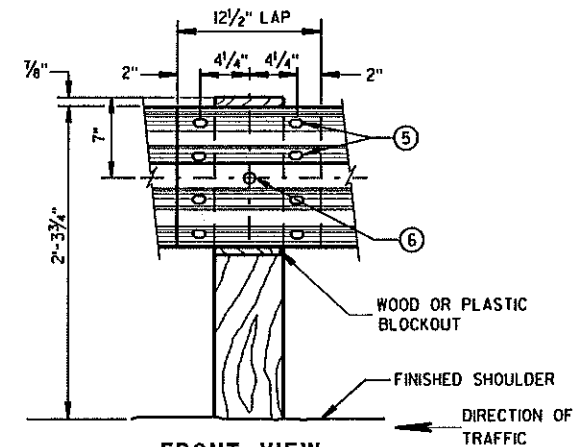
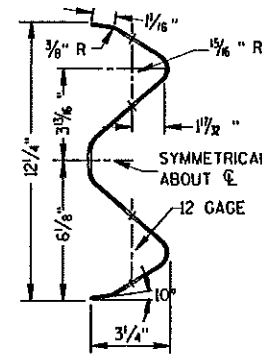
### POST SPACING STANDARD INSTALLATION



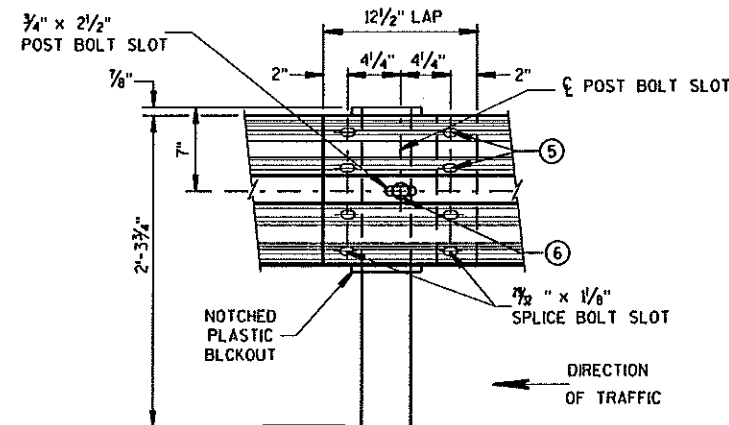
FRONT VIEW

### POST SPACING FOR LONGER POST AT HALF POST SPACING W BEAM (LHW)

### SECTION THRU W BEAM



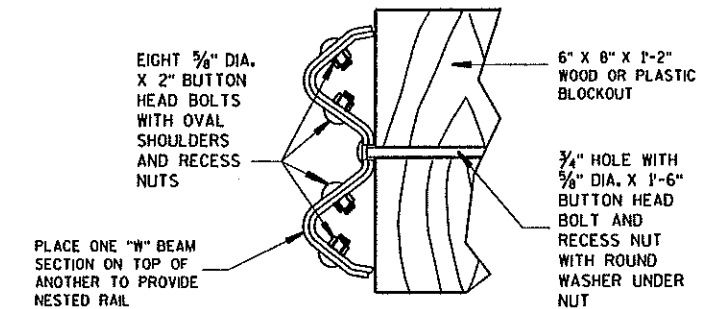
FRONT VIEW  
BEAM SPLICE AT WOOD POST  
AND POST MOUNTING DETAIL



FRONT VIEW  
BEAM SPLICE AT STEEL POST  
TYPICAL SPLICING DETAILS  
OF STEEL PLATE BEAM GUARD

### GENERAL NOTES

- ① PROVIDE TYPE "H" SILVER REFLECTIVE SHEETING ON ALL REFLECTORS EXCEPT THOSE LOCATED ALONG THE LEFT EDGE OF ONE-WAY ROADWAYS, WHICH SHALL BE PROVIDED WITH TYPE "H" YELLOW REFLECTIVE SHEETING.
- ② DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.
- ③ REVERSE EVERY OTHER REFLECTOR FOR 2-WAY VISIBILITY. THE CONTRACTOR MAY FURNISH TWO-SIDED REFLECTORS IN LIEU OF ONE-SIDED REFLECTORS.
- ④ PROVIDE AN ANGLE OF BEND OF  $90^\circ \pm 1^\circ$  FOR TWO-SIDED REFLECTORS.
- ⑤ 8 - 5/8"  $\phi$  X 2" BUTTON HEAD BOLTS WITH OVAL SHOULDERS & RECESS NUTS.
- ⑥ 5/8"  $\phi$  X 1'-6" BUTTON HEAD BOLT AND AND RECESS NUT WITH ROUND WASHER UNDER NUT.

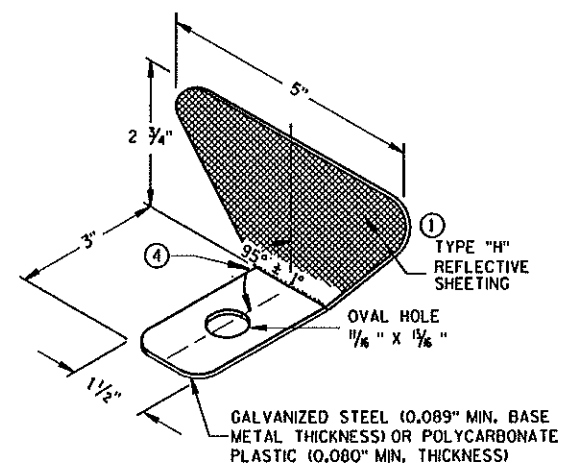
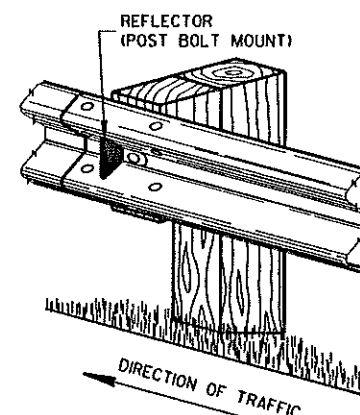


NESTED W BEAM (NW)

USE ALL OTHER STANDARD BEAM GUARD DETAILS FOR CONSTRUCTING NESTED W BEAM (NW)

REFLECTOR SPACING<sup>②</sup>

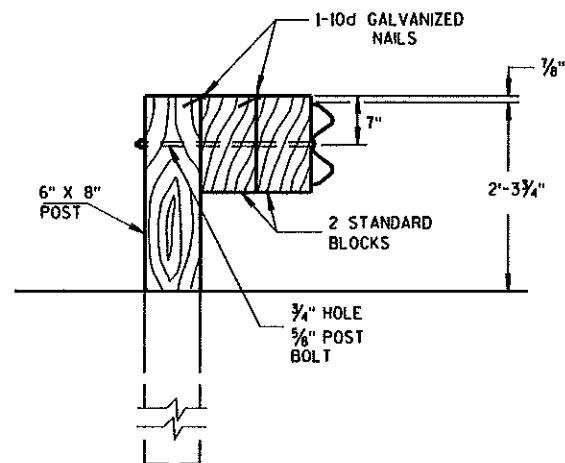
	BEAM GUARD LENGTH	REFLECTOR SPACING	NO. SURFACES REFLECTORIZED	MIN. NO. REFLECTORS
ONE WAY TRAFFIC	< 200'	50' C-C	1	3
	> 200'	100' C-C	1	
TWO WAY TRAFFIC	< 200'	25' C-C	1 ③	6
	> 200'	50' C-C	1	
TWO WAY TRAFFIC	< 200'	50' C-C	2 ④	3
	> 200'	100' C-C	2	



### ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION<sup>①</sup>

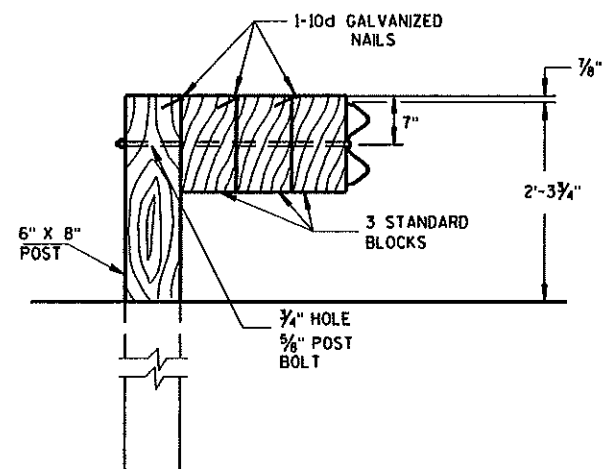
STEEL PLATE BEAM GUARD,  
CLASS "A",  
INSTALLATION & ELEMENTS

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



#### DETAIL FOR DOUBLE BLOCKS

THE NUMBER OF DOUBLE BLOCK POSTS WITHIN A BARRIER RUN IS UNLIMITED

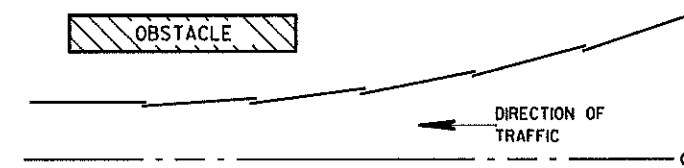


#### DETAIL FOR TRIPLE BLOCKS

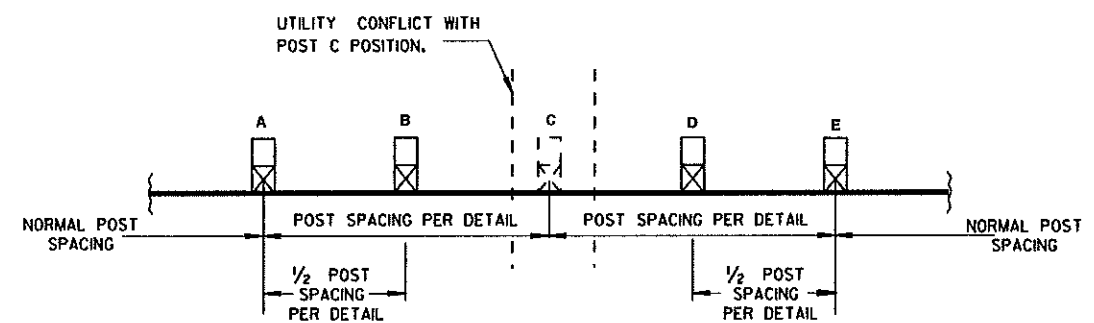
TRIPLE BLOCK DETAIL IS LIMITED TO ONE LOCATION WITHIN A BEAM GUARD RUN.

NOTES: USE DOUBLE OR TRIPLE BLOCKS WHEN UNDERGROUND OBSTACLES PREVENT THE POST FROM BEING INSTALLED.

DO NOT USE EXTRA BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.



#### PLAN VIEW BEAM LAPPING DETAIL

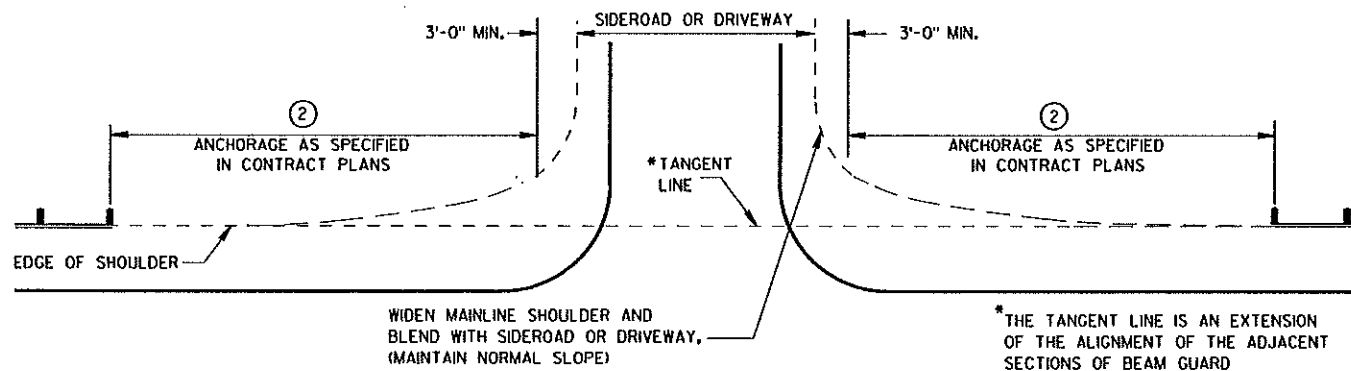


#### POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION

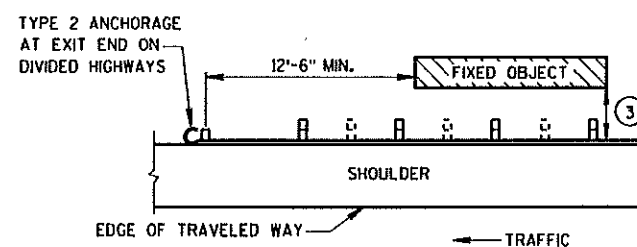
STEEL PLATE BEAM GUARD,  
CLASS "A",  
INSTALLATION & ELEMENTS

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

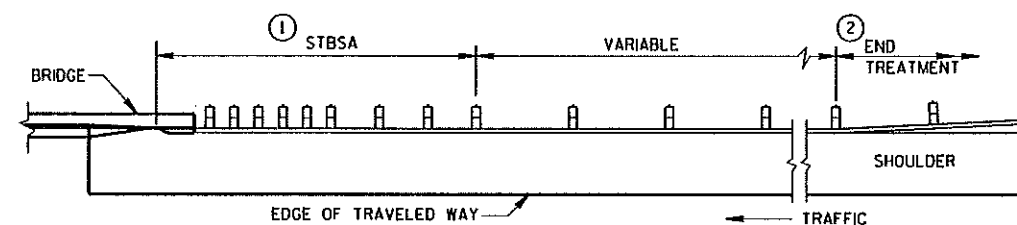




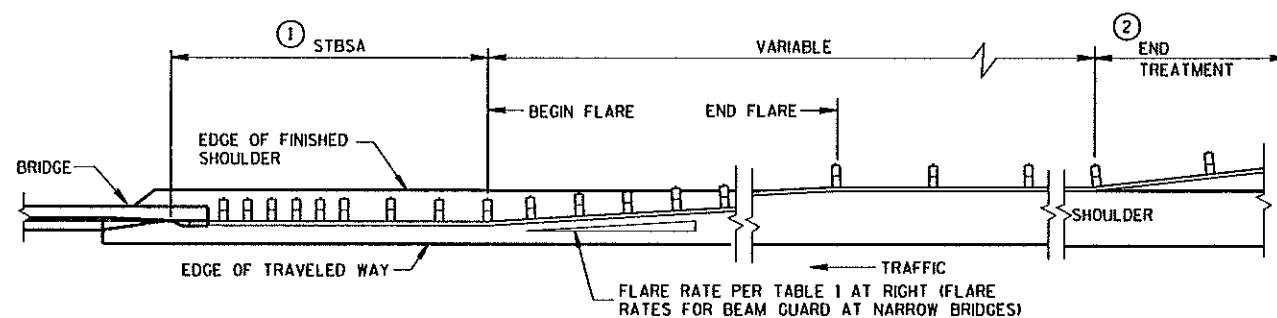
### BEAM GUARD AT SIDEROADS OR DRIVEWAYS



### BEAM GUARD AT OBSTACLES EXIT END - ONE WAY TRAFFIC



### BEAM GUARD AT FULL WIDTH BRIDGES



### BEAM GUARD AT NARROW BRIDGES (FLARED TO SHOULDER EDGE, THEN PARALLEL TO ROADWAY)

### GENERAL NOTES

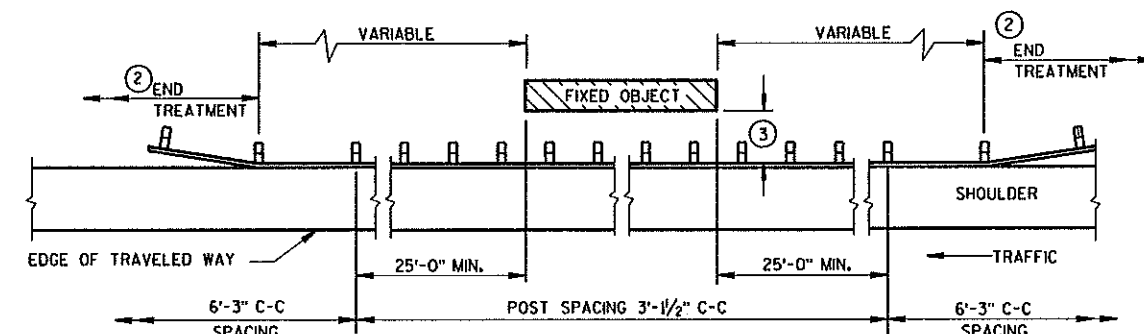
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE PERTINENT STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

W6 X 9 OR W6 X 8.5 STEEL POSTS WITH NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POSTS WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS.

THE LOCATIONS AND LENGTHS OF BEAM GUARD ARE SHOWN ELSEWHERE IN THE PLAN.

- ① STEEL THRIE BEAM STRUCTURAL APPROACH (STBSA) - SEE CURRENT SDD 14B20.
- ② USE AN APPROVED END TREATMENT FOR THE TRAFFIC APPROACH SIDE OF BRIDGE/OBSTACLES. USE TYPE 2 ANCHORAGE ONLY AT THE DOWNSTREAM ENDS OF BEAM GUARD LOCATED ALONG ROADWAYS WITH ONE WAY TRAFFIC.

MINIMUM LATERAL DISTANCE FROM FACE OF BEAM GUARD TO FIXED OBJECT	POST SPACING
3'-6"	3' - 1/2"
4'-6"	6' - 3"



### BEAM GUARD AT OBSTACLES - TWO WAY TRAFFIC

(RAIL TO OBSTACLE CLEARANCE 3'-6" TO 4'-6")

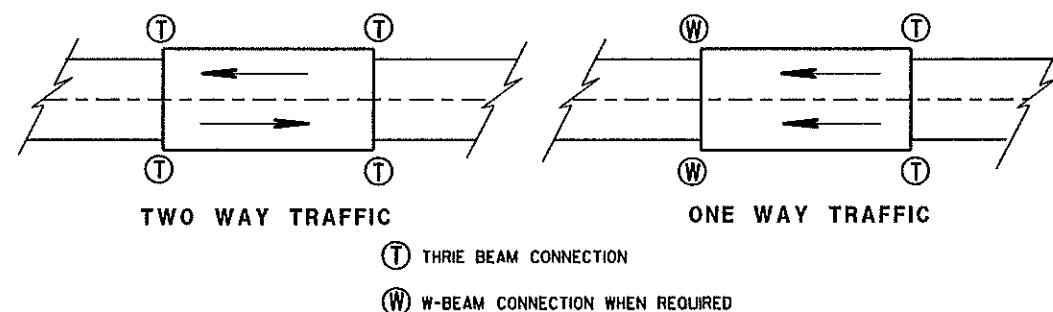
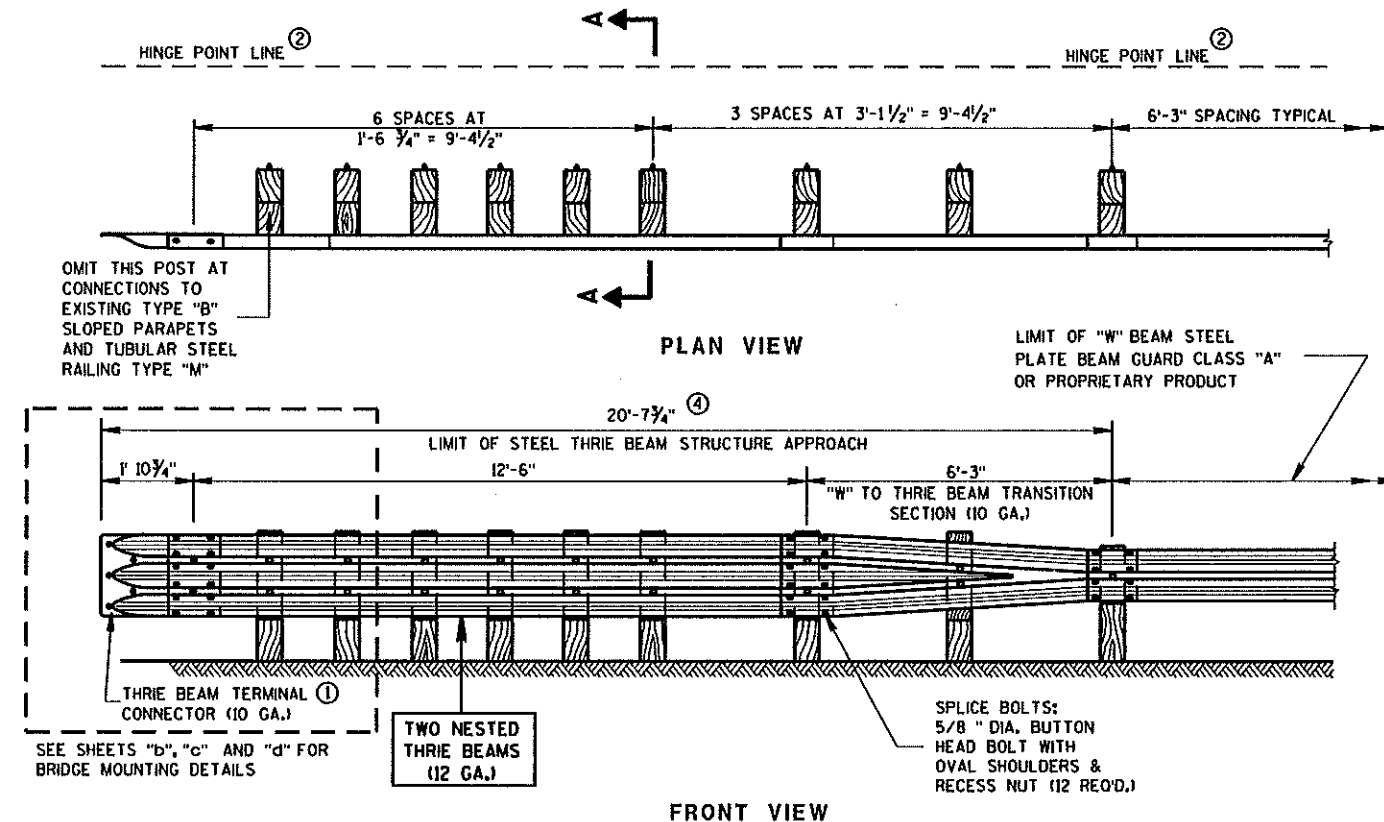
TABLE 1  
FLARE RATES FOR BEAM  
GUARD AT NARROW BRIDGES

POSTED SPEED (MPH)	FLARE RATE
25	13:1
30	15:1
35	16:1
40	18:1
45	21:1
50	24:1
55	26:1
65	30:1

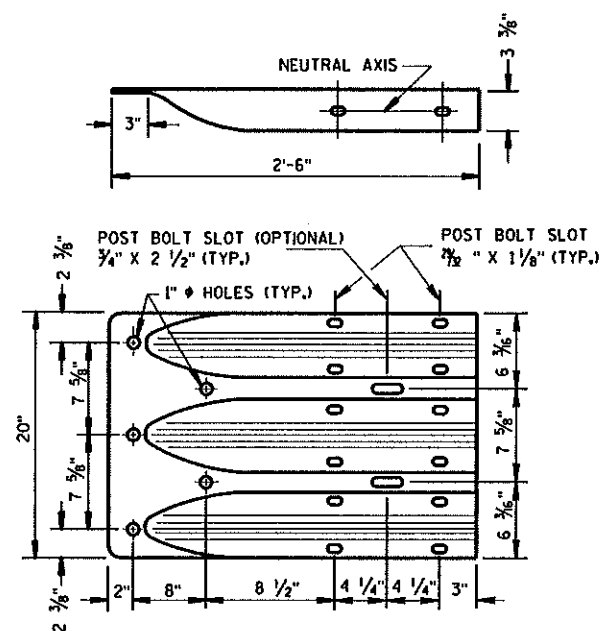
STEEL PLATE BEAM GUARD,  
CLASS "A"  
(AT BRIDGES, OBSTACLES  
AND SIDEROADS/DRIVEWAYS)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

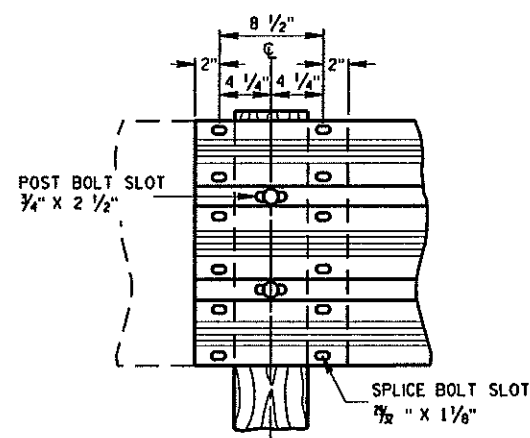
APPROVED  
8-21-07 /S/ Jerry H. Zogg  
DATE ROADWAY STANDARDS DEVELOPMENT  
ENGINEER  
FHWA



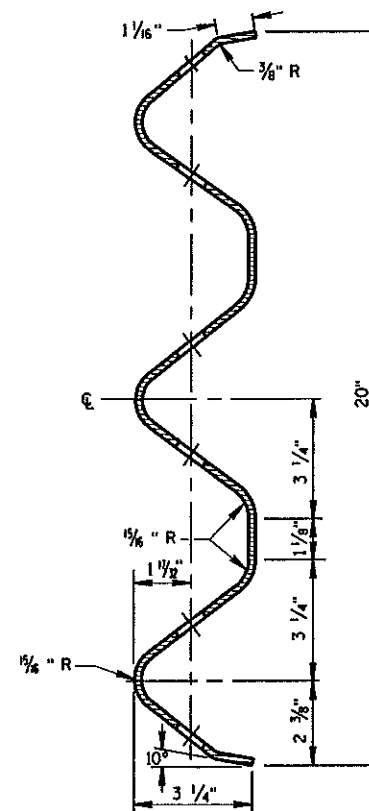
TYPICAL LOCATIONS OF THRIE BEAM AND W-BEAM CONNECTIONS TO BRIDGE



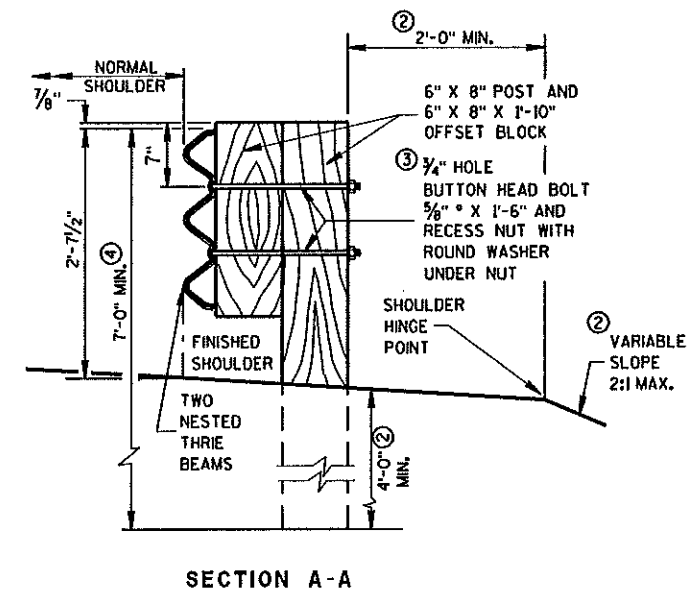
THRIE BEAM TERMINAL CONNECTOR



THRIE BEAM SPLICE



SECTION THRU THRIE BEAM RAIL ELEMENT



## GENERAL NOTES

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

FURNISH AND CONSTRUCT THRIE BEAM STRUCTURAL APPROACH ACCORDING TO THE REQUIREMENTS OF SECTION 614 OF THE STANDARD SPECIFICATIONS. THRIE BEAM SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO DESIGNATION M180, CLASS "A", TYPE 2.

BOLT THE THRIE BEAM TO ALL POSTS AND BLOCKOUTS. DRILL OR PUNCH BOLT HOLES IN THE BEAM IF THE POST SPACING IS LESS THAN 6'-3".

DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THRIE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.

IF ROCK IS ENCOUNTERED DURING EXCAVATION, THE ENGINEER MAY APPROVE USING A 12 INCH DIAMETER POST HOLE EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE APPROXIMATELY 2 1/2 INCHES DEEP. CUT THE POSTS TO LENGTH AND PLACE IN THE HOLE. BACKFILL WITH MATERIAL EXCAVATED FROM THE HOLE AND COMPACT ADEQUATELY, (SEE SDD 14 B 15-4d).

- ① BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.
- ② MINIMUM EMBEDMENT SHALL BE 4'-0". WHERE EXISTING CONDITIONS DO NOT PERMIT THE APPROPRIATE EARTHWORK SHOWN ON THE PLAN TYPICAL SECTIONS OR DETAILS, THE ENGINEER MAY ALLOW THE REDUCTION OR ELIMINATION OF THE 2 FOOT DISTANCE TO THE HINGE POINT. OTHERWISE BUILD AS THE PLAN SHOWS OR AS THE ENGINEER DIRECTS. IF THE 2 FOOT DISTANCE TO THE HINGE POINT IS REDUCED OR ELIMINATED, INCREASE THE POST EMBEDMENT DEPTH TO 4'-6" OR MORE.
- ③ BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F-1554, GRADE 55. NUTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-563 DH.
- ④ ALL WOOD POSTS MUST BE 6" X 8" AND AT LEAST 7'-0" LONG.

## STEEL THRIE BEAM STRUCTURE APPROACH

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED

6/18/09

DATE

FHWA

/S/ Jerry H. Zogg

ROADWAY STANDARDS DEVELOPMENT

ENGINEER

# BILL OF MATERIALS

NOTE NO.	QTY.	DESCRIPTION
①	4	WOOD BREAKAWAY TERMINAL POST: 5 1/2" X 7 1/2" X 3'-9"
②	4	STEEL TUBE: TS 8" X 6" X 0.188", 4'-6" LONG OR 6'-0" LONG **
③	3	SOIL PLATE: 2'-0" X 1'-6" X 1/4" **
④	4	WOOD BREAKAWAY CRT POST: 6" X 8" X 6'-0"
⑤	6	WOOD OFFSET BLOCKS: 6" X 8" X 1'-2"
⑥	1	PIPE SLEEVE: 2" X 5 1/2" STANDARD PIPE
⑦	1	BEARING PLATE
⑧	1	BCT CABLE ASSEMBLY
⑨	1	CABLE ANCHOR BOX
⑩	1	STRUT & YOKE
⑪	1	STEEL PLATE BEAM, END PANEL 12 GA. 13'-6 1/2" LONG FOR SKT-350, ET-2000 AND ET-2000 PLUS
⑫	3	STEEL PLATE BEAM: 12 GA. 13'-6 1/2"
⑬	1	ET-2000/ET-2000 PLUS GUARDRAIL EXTRUDER OR SKT-350 IMPACT HEAD: AS FURNISHED BY MANUFACTURER
⑭	1	REFLECTIVE SHEETING TYPE H: 18" X 18"
⑮	1	E.A.T. MARKER POST

## GENERAL NOTES

FOLLOW MANUFACTURE'S BOLTING RECOMMENDATIONS, IF NONE ARE AVAILABLE, INSTALL 5/8"  $\phi$  X 1'-6" BUTTON HEAD BOLTS AT ALL POSTS EXCEPT FOR POST 1.

\*\* SDD SHOWS 4 - 54 INCH STEEL TUBES WITH SOIL PLATE INSTALLED ON POST 1 THROUGH POST 3. POST 4 DOES NOT REQUIRE A SOIL PLATE. AN ALTERNATIVE INSTALLATION WOULD CONSIST OF 4 - 72 INCH STEEL TUBES ON POST 1 THROUGH POST 4, WITHOUT SOIL PLATES.

(A) THE SLOPE IN THE AREA BOUNDED BY THE EXTENDED VEHICLE RUNOUT PATH (EVRP), THE HINGE POINT LINE (HPL), AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.

(B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED.

(C) THE 13 SLOT FIRST RAIL PANEL MAY BE USED IN LIEU OF THE 3 SLOT RAIL PANEL ON SKT-350 ONLY.

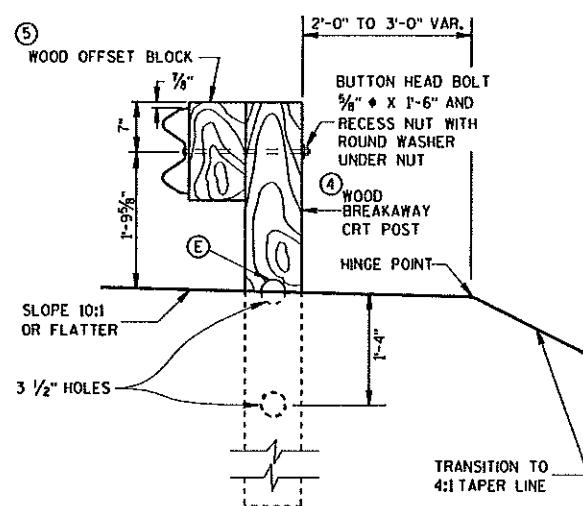
(D) THE TOP OF THE STEEL TUBE ON POSTS 1 THROUGH 4 SHALL NOT BE MORE THAN 3" ABOVE THE FINISH GROUND ELEVATION.

(E) THE CENTER OF THE UPPER 3/2" DIAMETER HOLE ON POST 5 THROUGH 8 SHALL BE 1/4" ABOVE THE FINISHED GROUND LINE.

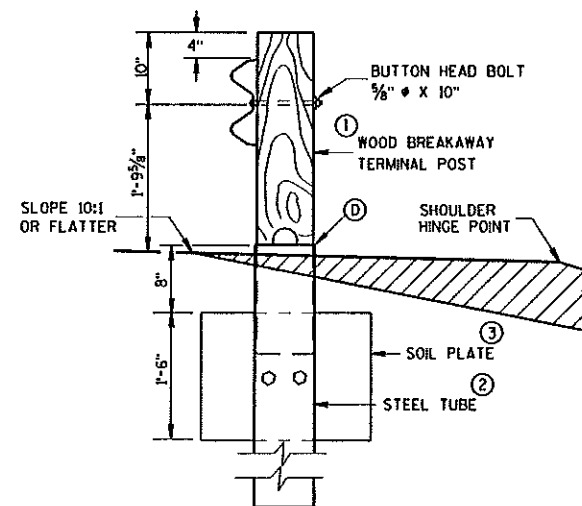
(F) SHEETING IS ATTACHED TO 0.040 ALUMINUM SHEET AND ATTACHED TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF-TAPPING SCREWS, ONE SCREW PER CORNER OF E.A.T. STEEL POSTS SHALL NOT BE ALLOWED FOR USE WITH ENERGY ABSORBING TERMINALS.

DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

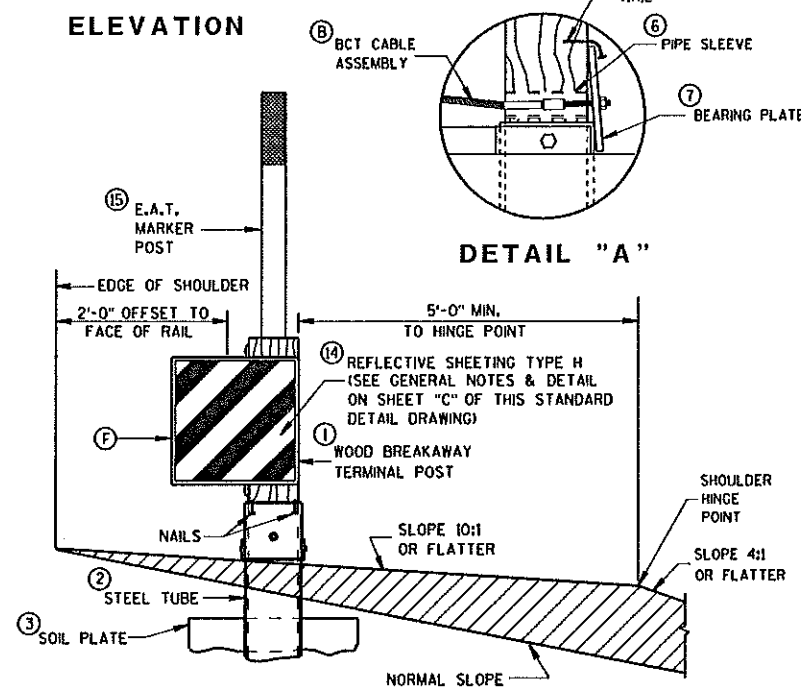
\* DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.



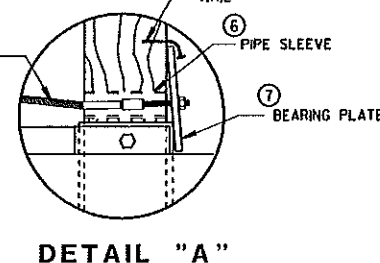
SECTION C-C  
TYPICAL AT POST NOS. 6, 8



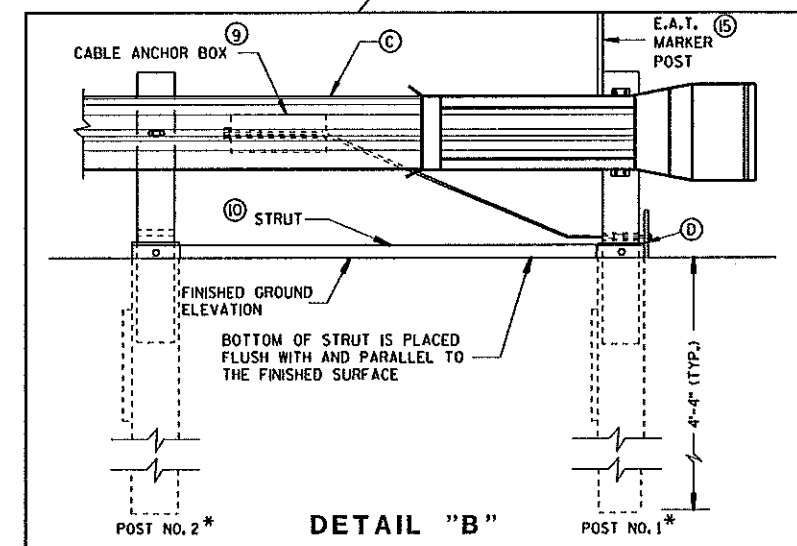
SECTION B-B  
TYPICAL AT POST NO. 2\*



SECTION A-A  
TYPICAL AT POST NO. 1\*



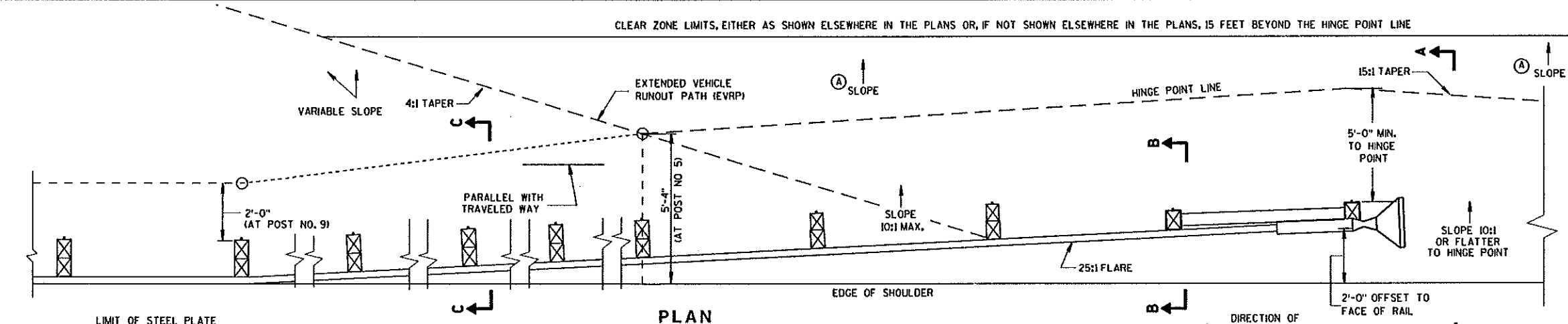
DETAIL "A"



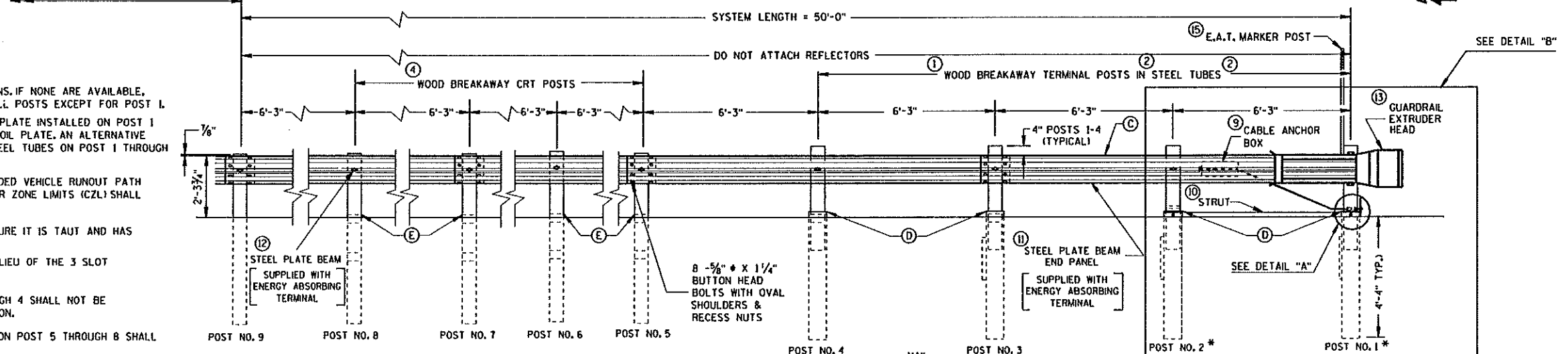
DETAIL "B"

STEEL PLATE BEAM GUARD  
ENERGY ABSORBING TERMINAL

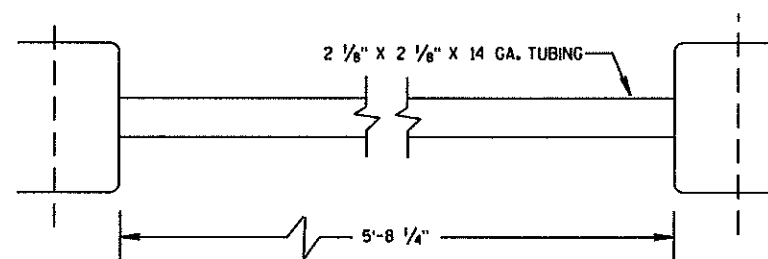
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



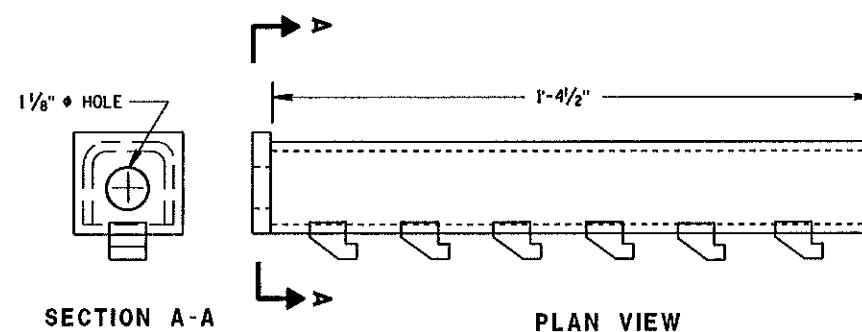
PLAN



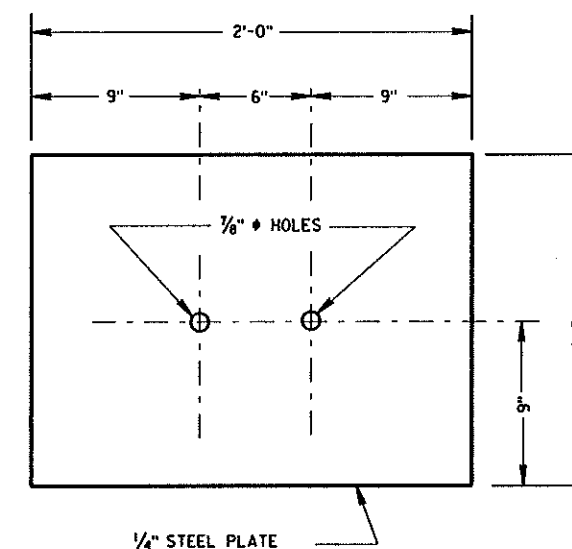
ELEVATION



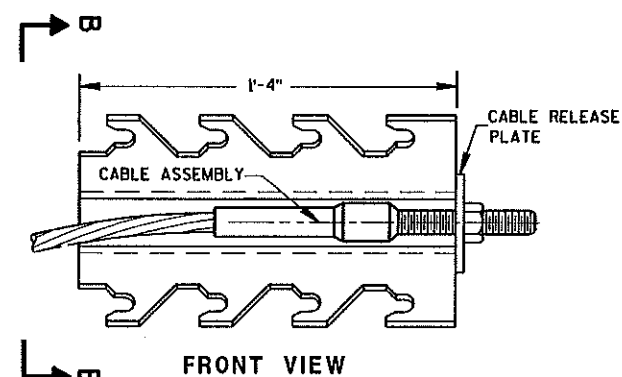
⑩ STRUT DETAIL (SKT-350)



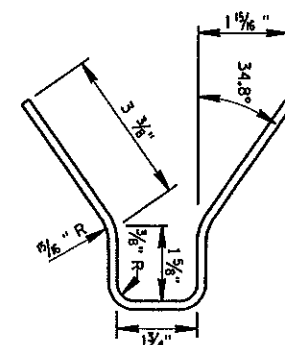
⑨ CABLE ANCHOR BOX (ET-2000/ET-2000 PLUS)



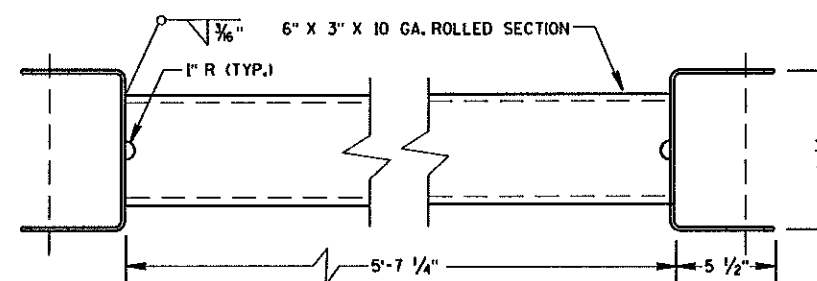
③ SOIL PLATE  
(SKT-350, ET-2000/ET-2000 PLUS)



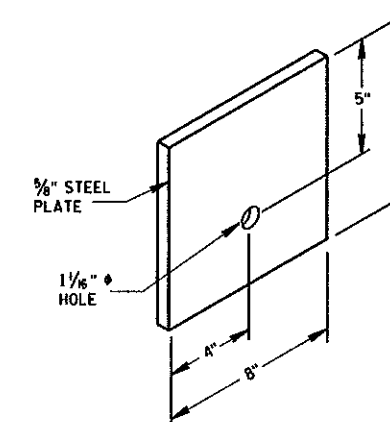
⑨ CABLE ANCHOR BOX (SKT-350)  
(SKT-350)



SECTION B-B



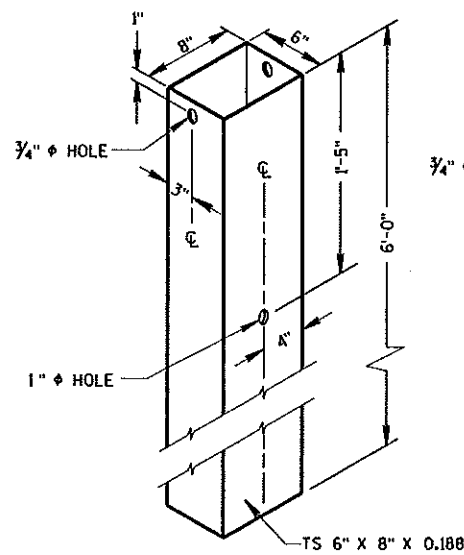
⑩ STRUT DETAIL (ET-2000/ET-2000 PLUS)  
(ET-2000/ET-2000 PLUS)



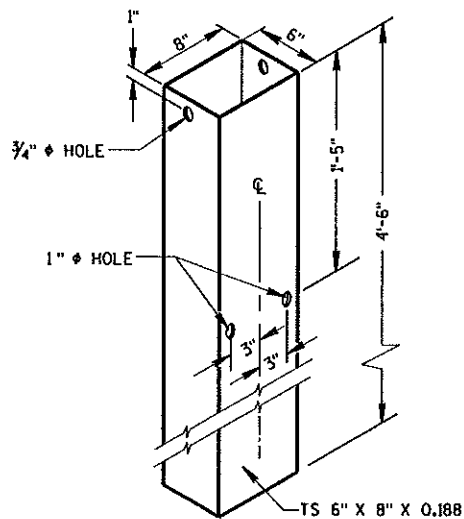
⑦ STEEL BEARING PLATE  
(SKT-350, ET-2000/ET-2000 PLUS)

STEEL PLATE BEAM GUARD  
ENERGY ABSORBING TERMINAL

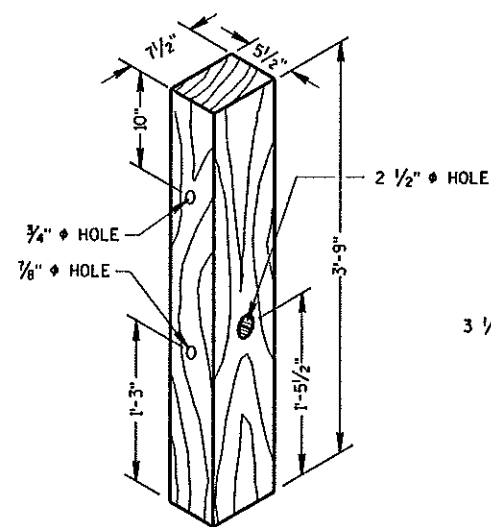
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



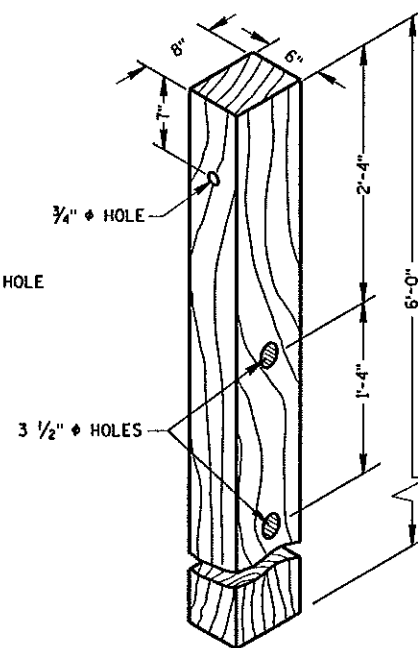
② 72" STEEL TUBE  
(POSTS NO. 1-4)



② 54" STEEL TUBE  
(POSTS NO. 1-4)

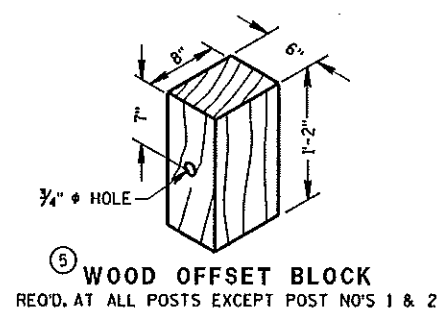


① TERMINAL POST  
(POSTS NO. 1-4)

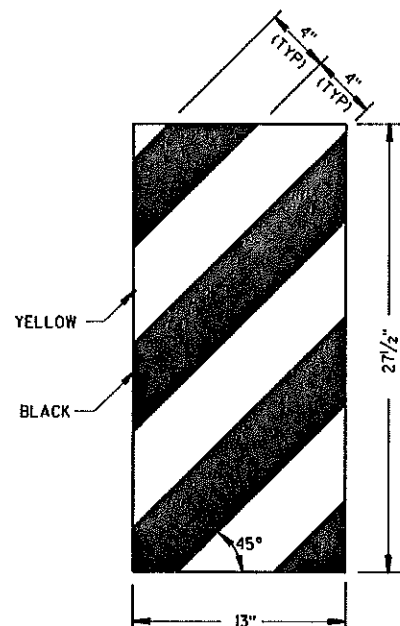


④ CRT POST  
(POSTS NO'S 5-8)

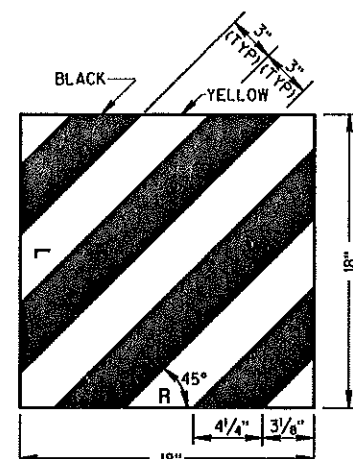
### WOOD BREAKAWAY POSTS



⑤ WOOD OFFSET BLOCK  
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2



ET-2000 PLUS ONLY

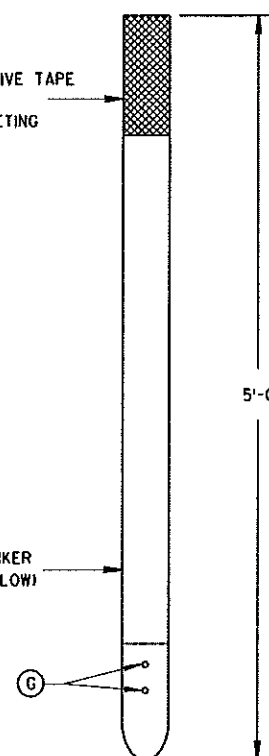


ET-2000 AND SKT-350

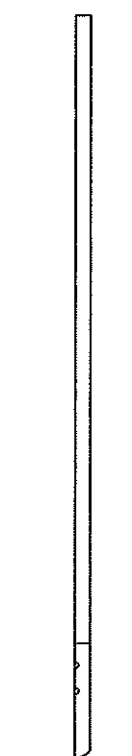
⑬ REFLECTIVE SHEETING DETAILS

YELLOW REFLECTIVE TAPE  
3" X 9" TYPE H  
REFLECTIVE SHEETING

E.A.T. MARKER  
POST (YELLOW)



FRONT VIEW



SIDE VIEW

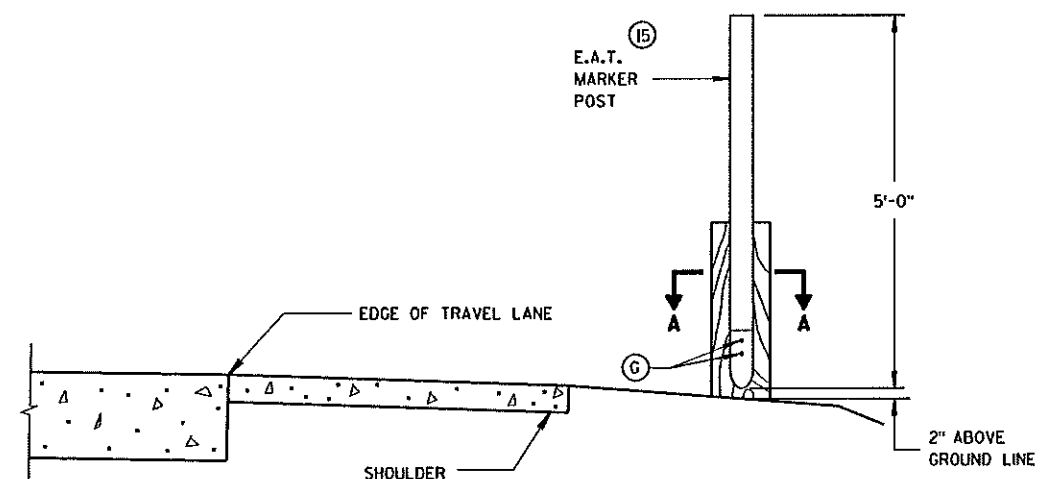
⑮ E.A.T. MARKER POST

### GENERAL NOTES

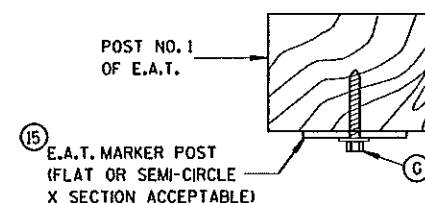
STEEL PLATE BEAM GUARD, ENERGY ABSORBING TERMINAL SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, WHICH SHALL INCLUDE HARDWARE, STEEL PLATE BEAM GUARD, POSTS, REFLECTIVE SHEETING AND INSTALLATION AS SHOWN.

WHEN ROCK IS ENCOUNTERED DURING EXCAVATION, A 12 INCH DIA. POST HOLE EXTENDING 20 INCHES DEEP INTO THE ROCK MAY BE USED IF APPROVED BY THE ENGINEER. GRANULAR MATERIAL SHALL BE PLACED IN THE BOTTOM OF THE HOLE APPROXIMATELY 2 1/2" INCHES DEEP TO PROVIDE DRAINAGE. THE SOIL TUBES SHALL BE FIELD CUT TO LENGTH, PLACED IN THE HOLE AND BACKFILLED WITH ADEQUATELY COMPACTED MATERIAL EXCAVATED FROM THE HOLE.

⑥ 1/2" DIA. X 3" LAG BOLT WITH WASHER.



TYPICAL INSTALLATION OF E.A.T.  
MARKER POST BACKSIDE OF POST NO. 1  
(E.A.T. AND RAIL REMOVED FOR CLARITY)



SECTION A-A

STEEL PLATE BEAM GUARD  
ENERGY ABSORBING TERMINAL

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED

6-18-09

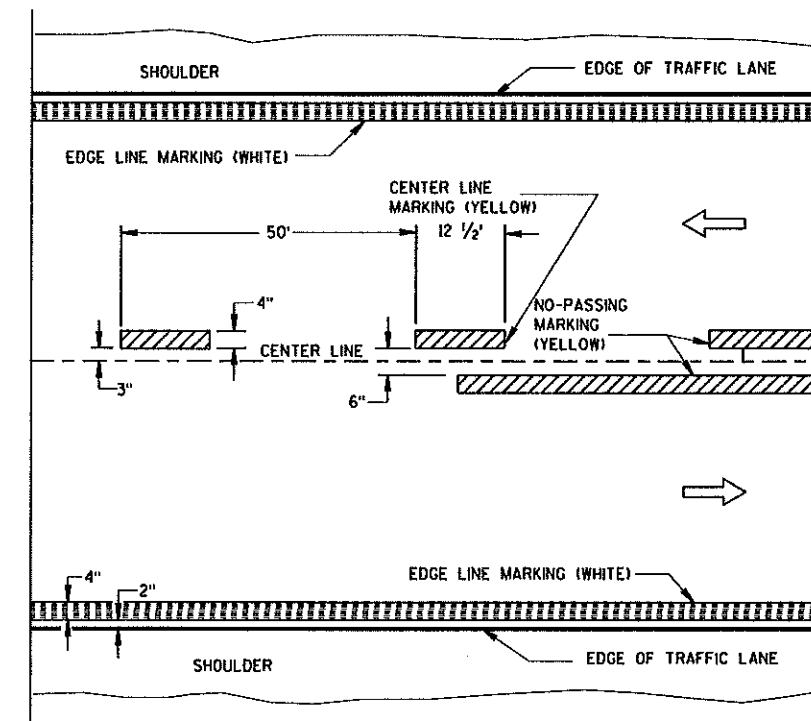
DATE

FHWA

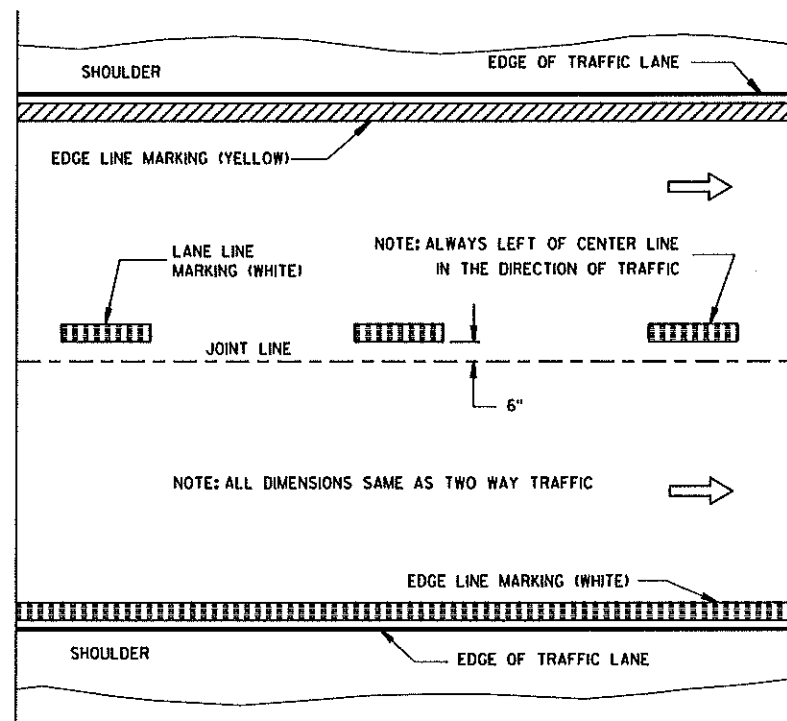
/S/ Jerry H. Zogg

ROADWAY STANDARDS DEVELOPMENT

ENGINEER

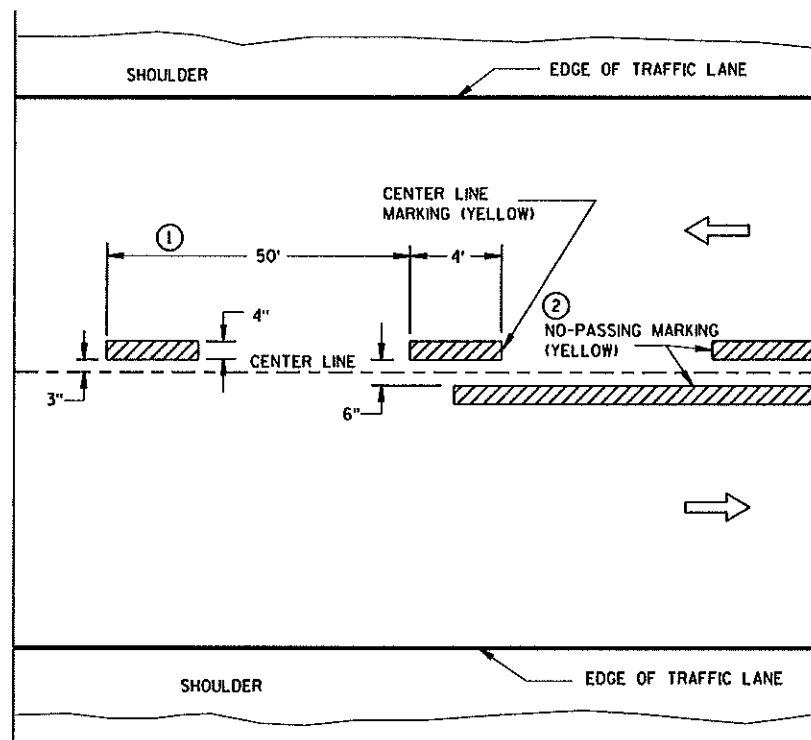


TWO WAY TRAFFIC

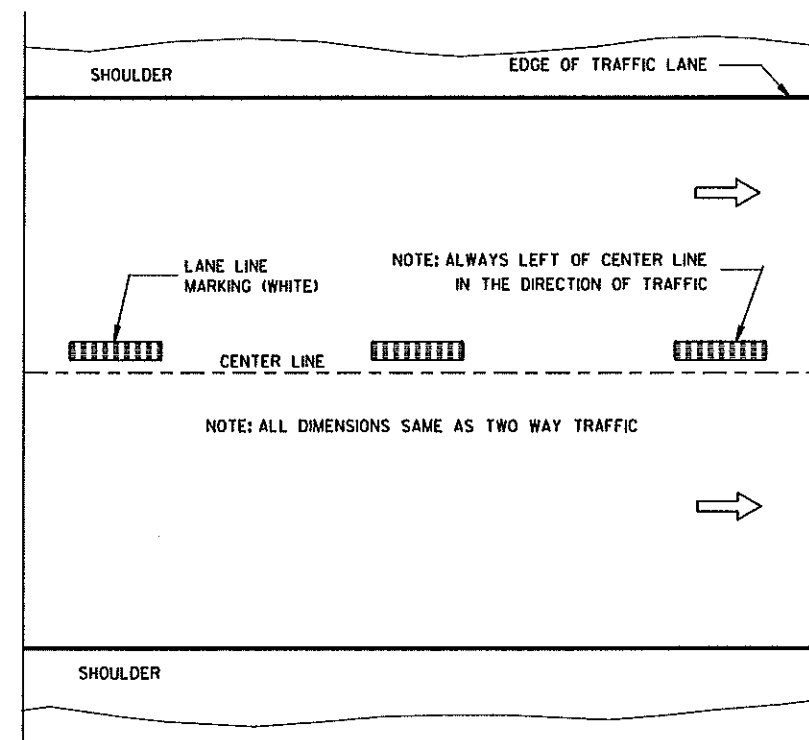


ONE WAY TRAFFIC

### PERMANENT PAVEMENT MARKING



TWO WAY TRAFFIC



ONE WAY TRAFFIC

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

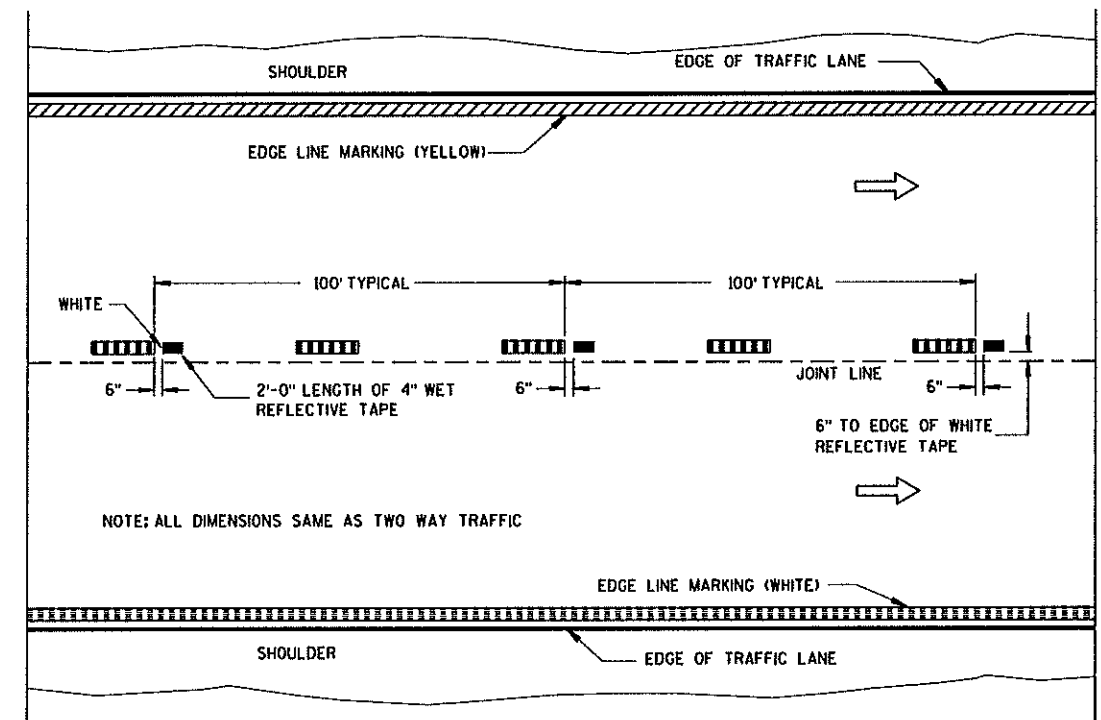
### GENERAL NOTES

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



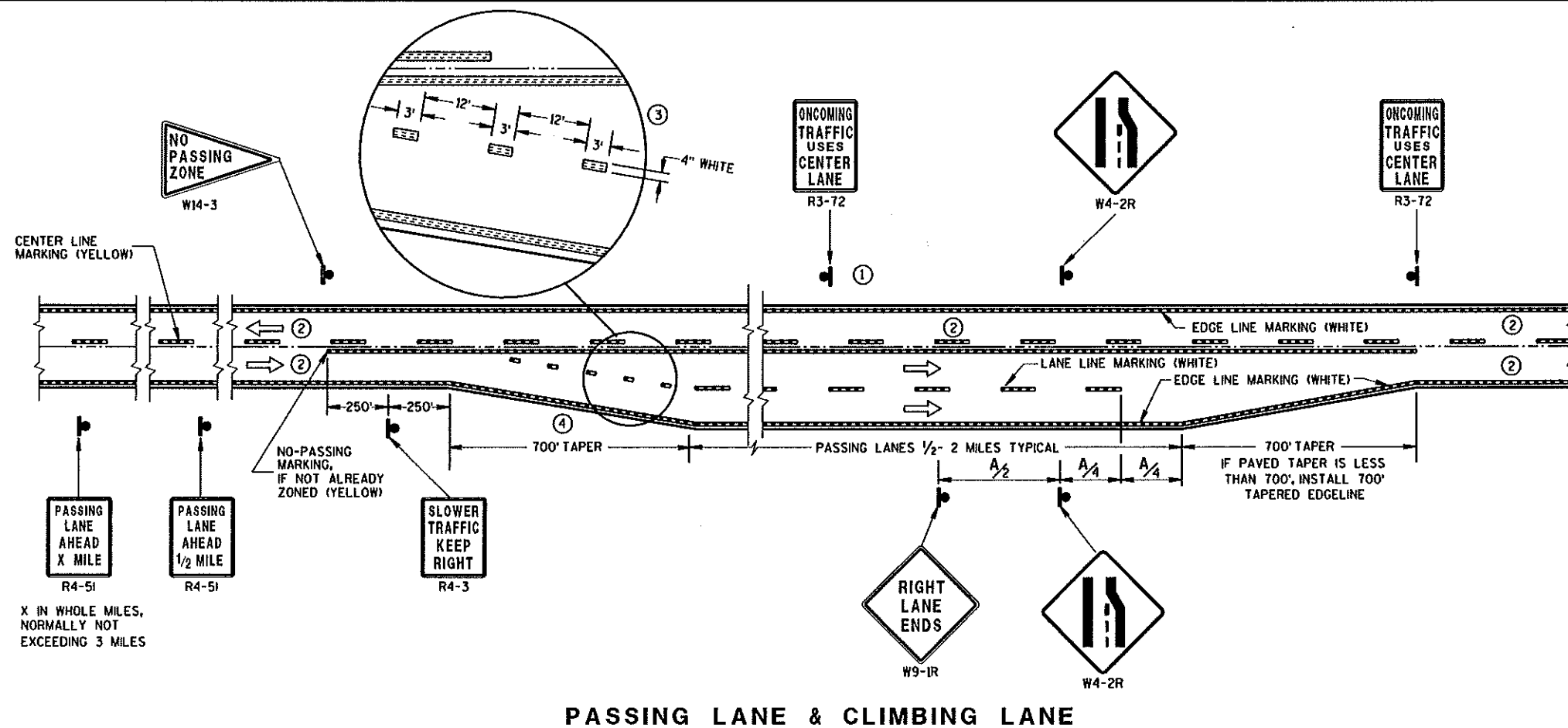
### WET REFLECTIVE TAPE SUPPLEMENT TO SPRAYED OR NON WET REFLECTIVE TAPE LANE LINE

PAVEMENT MARKING  
(MAINLINE)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
10-20-09 /S/ Thomas N. Notbohm  
DATE STATE TRAFFIC ENGINEER OF DESIGN  
FHWA





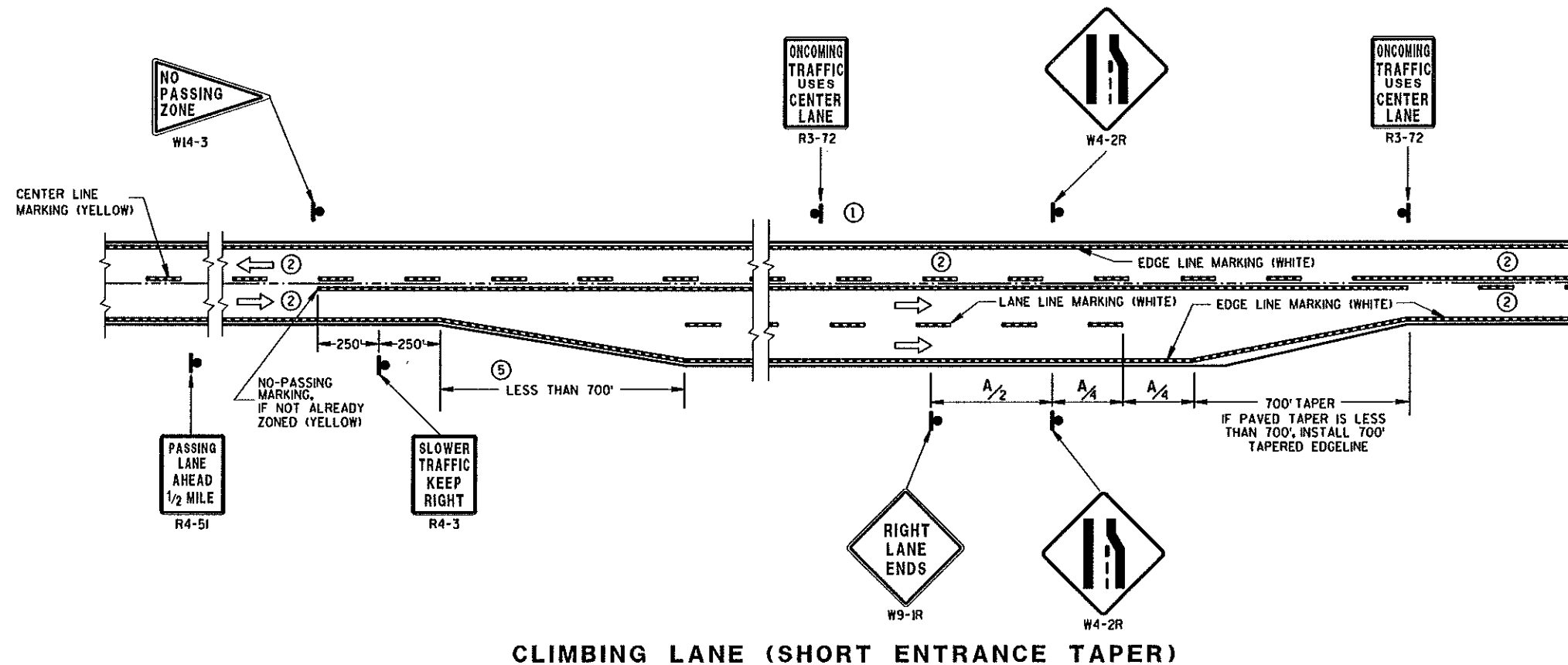
## GENERAL NOTES

- ① SIGN R3-72 SHALL BE REPEATED AT  $\frac{1}{2}$  MILE INCREMENTS WHERE THE ADDED LANE IS LONGER THAN  $\frac{1}{2}$  MILE. (NOT NECESSARY IF MARKED NO-PASSING)
- ② THERE MAY BE SOLID YELLOW ON THE CENTERLINE DUE TO SIGHT CONDITIONS.
- ③ THE TAPER LENGTH OF THE PAVEMENT MARKING SHALL BE 700 FEET.
- ④ WHEN THE SHOULDER WIDTH IN THE PASSING LANE OR CLIMBING LANE IS LESS THAN THE ADJACENT HIGHWAY, DO NOT GUIDE TRAFFIC TO THE RIGHT IN THE ENTRANCE TAPER AREA WITH SKIP-DASH PAVEMENT MARKING.
- ⑤ WHEN THE ENTRANCE TAPER IS LESS THAN 700 FEET OR THE SHOULDER WIDTH IN THE CLIMBING LANE IS LESS THAN THE ADJACENT HIGHWAY, DO NOT GUIDE TRAFFIC TO THE RIGHT IN THE ENTRANCE TAPER AREA WITH SKIP-DASH PAVEMENT MARKING.

ARROW SYMBOL (  $\Rightarrow$  ) SHOWS DIRECTION OF TRAVEL

DISTANCE TABLE

POSTED OR 85th PERCENTILE SPEED	DISTANCE "A"
45	750
50	850
55	950

PAVEMENT MARKING  
(CLIMBING LANE &  
PASSING LANE)STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



TWO-LANE ROADWAY

SYMBOLS



WORK AREA



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

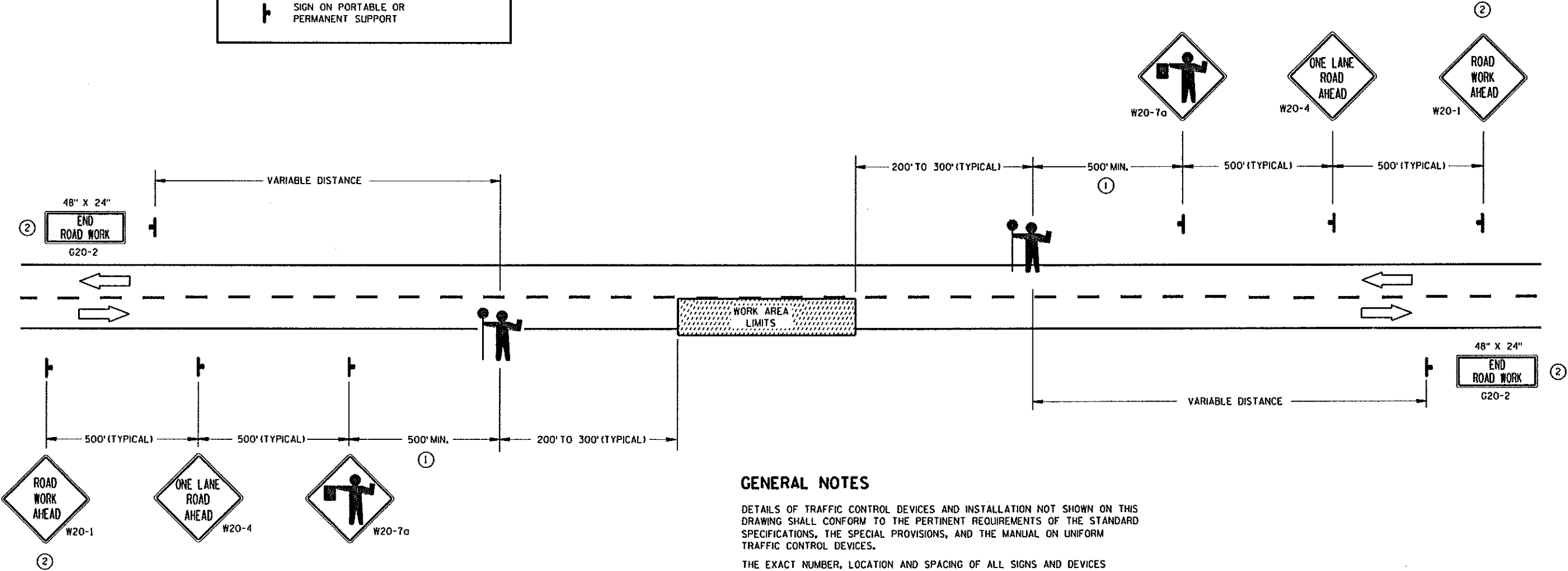


SIGN ON PORTABLE OR  
PERMANENT SUPPORT



W3-4

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 APPROVED 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 APPROVED 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 APPROVED 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  
9/5/06 /S/ Thomas N. Notbohm  
DATE STATE TRAFFIC ENGINEER OF DESIGN  
FHWA