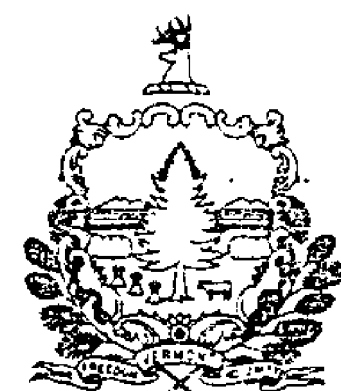


STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
TOWNS OF RANDOLPH & BRAINTREE
COUNTY OF ORANGE
VT ROUTE 12

BEGINNING IN RANDOLPH ON VT ROUTE 12 AT STA 4+940.00 (MM 3.070)
AND EXTENDING NORTHERLY ALONG ROUTE 12, A DISTANCE OF 8.44 km (5.244 MILES)
TO STA 2+505.00 (MM 1.556) AT THE BRAINTREE BROOKFIELD TOWN LINE.

LENGTH OF ROADWAY = 8 440 METERS (5.244 MILES)

LENGTH OF PROJECT = 8 440 METERS (5.244 MILES)

WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES RESURFACING
OF THE EXISTING HIGHWAY, WITH A LEVELING COURSE, WEARING COURSE,
NEW PAVEMENT MARKINGS, GUARDRAIL, SIGNS AND INCIDENTAL ITEMS.

TRAFFIC DATA

VT ROUTE 12 (RANDOLPH U.C. LIMITS TO T-42)

1996 ADT = 1500

1996 DHV = 210

2006 ADT = 1820

2006 DHV = 250

1996 - 2006 CUM. ESALS = 299,000

VT ROUTE 12 (T-42 TO BROOKFIELD T/L)

1996 ADT = 1360

1996 DHV = 190

2006 ADT = 1650

2006 DHV = 230

1996 - 2006 CUM. ESALS = 208,000

CONTRACT PLANS

THESE PLANS DO NOT REFLECT
CHANGES MADE ON THE PROJECT.

Metric

RIGHT-OF-WAY LIMITS, IF APPLICABLE, ARE PROVIDED
SOLELY FOR THE CONVENIENCE OF THE STATE AND ITS
CONTRACTOR DURING THE COURSE OF THIS PAVING
PROJECT. ANY REFERENCES TO OFFSETS ON THESE
PLANS ARE APPROXIMATE AND SHOULD NOT BE RELIED
UPON FOR ANY PURPOSES.

THESE PLANS ARE SUBJECT TO SUCH ENGINEERING
CHANGES AS MAY BE REQUIRED BY THE FEDERAL HIGHWAY
ADMINISTRATION OR THE CHIEF ENGINEER.

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE
WITH THESE PLANS AND THE STANDARD SPECIFICATIONS
FOR CONSTRUCTION DATED 1995, AS APPROVED BY THE
FEDERAL HIGHWAY ADMINISTRATION ON AUGUST 21, 1995.
FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT
REVISIONS AND SUCH REVISED SPECIFICATIONS AND
SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE
PLANS.

APPROVED: *Scott A. McAlister* 10/1/96
DIRECTOR OF CONSTRUCTION AND MAINTENANCE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED: _____ DATE _____
DIVISION ADMINISTRATOR

PROJECT RANDOLPH-BRAINTREE
STP 9602(1)S

SHEET 1 OF 14 SHEETS

INDEX OF SHEETS

1	TITLE SHEET
2-4	TYPICAL SECTIONS
5-9	QUANTITY SHEETS
10	ITEM DETAIL SHEET
11	LAYOUT SHEETS
12	TRAFFIC SIGN SUMMARY SHEET
13	CONSTRUCTION APPROACH SIGNING
14	BRIDGE DETAIL SHEET #1
	BRIDGE DETAIL SHEET #2
	SQUARE STEEL SIGN POST DETAIL SHEET

STANDARDS

D-8	REINFORCED CONCRETE DROP INLET WITH GRATE	06-01-94
D-1	CAST IRON GRATE, TYPE A	06-01-94
D-15	CAST IRON GRATE WITH FRAME, TYPE D & E	06-01-94
-100	CONSTRUCTION APPROACH SIGNS	08-08-95
-101	CONSTRUCTION SIGN DETAILS	08-08-95
-102	CONSTRUCTION SIGN DETAILS	08-08-95
-102A	CONSTRUCTION SIGN DETAILS	08-08-95
-106	TRAFFIC CONTROL - MISCELLANEOUS DETAILS	08-08-95
-107	DELINEATION, BARRICADES AND DETOURS FOR CONSTRUCTION AREAS	08-08-95
E-107A	BREAKAWAY BARRICADE DETAILS	08-08-95
-108	CONSTRUCTION ZONE LONGITUDINAL DROP OFFS	08-08-95
-110	MAJOR MAINTENANCE OPERATION-LANE CLOSURE	08-08-95
-121	STANDARD SIGN PLACEMENT, CONVENTIONAL ROADS	08-08-95
-141	REGULATORY SIGN DETAILS	09-20-95
-143	REGULATORY SIGN DETAILS	09-20-95
-160	FLANGED CHANNEL STEEL SIGN POST	08-18-95
-193	PAVEMENT MARKING DETAILS	08-18-95
-1	STEEL BEAM GUARDRAIL	06-01-94
-1d	STEEL BEAM GUARDRAIL	06-01-94
-170	MODIFIED ECCENTRIC LOADER TERMINAL WITH WOOD POSTS	01-18-95
-170	MODIFIED ECCENTRIC LOADER TERMINAL WITH WOOD POSTS	06-30-95

CONVENTIONAL SIGNS

COUNTY LINE	---
TOWN LINE	---
LIMITS OF ACCESS	---
POINT OF ACCESS	X
FENCE LINE	-x-x-
STONE WALL	---
TRAVELED WAY	---
GUARDRAIL	---
RAILROAD	---
SURVEY LINE	---
CULVERT	---
POWER POLE	○
TELEPHONE POLE	○
TREES	●
CONTROL OF ACCESS	---
PROPERTY LINE	---
R.O.W. TAKING LINE	---
SLOPE RIGHTS	---
TOP OF CUT	---
TOE OF SLOPE	---

UNLESS OTHERWISE INDICATED, THE DRAWINGS AND
DETAILS OF THESE PLANS ARE NOT TO SCALE.

DATUM

VERTICAL N/A

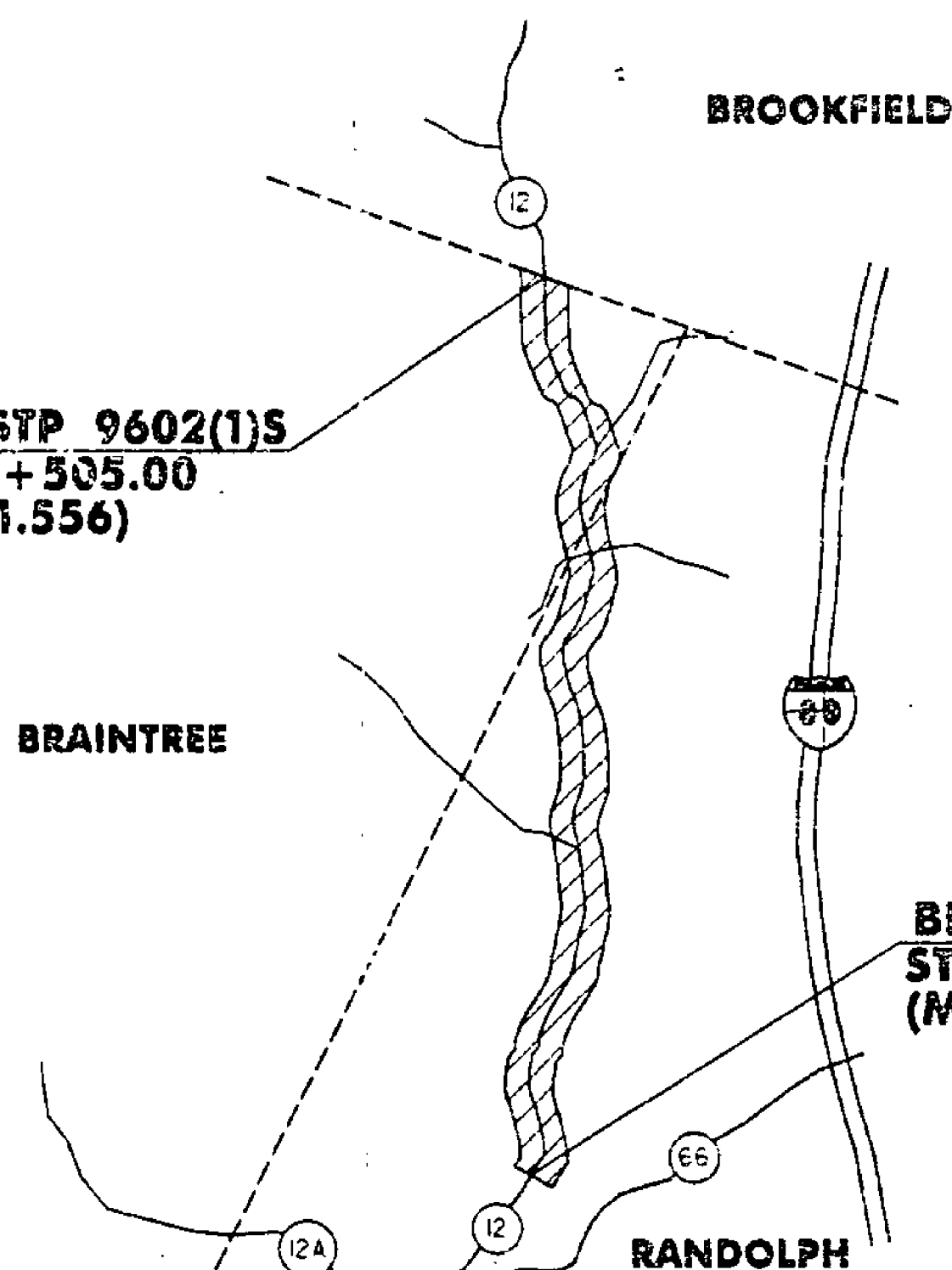
HORIZONTAL N/A

HORIZONTAL CONTROL (STATIONS)
WAS SET BY HOLDING THE ROUTE LOG
STATIONING AT PROJECT CONTROL POINTS.

PREPARED BY:

CLD

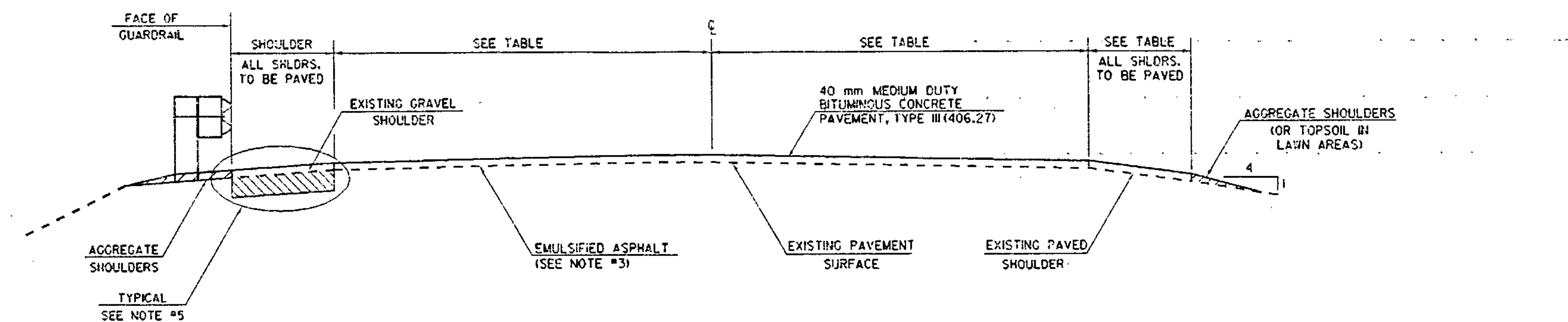
COSTELLO LONNIGNEY & DE NAPOLLE INC.
CONSULTING ENGINEERS
340 COMMERCIAL STREET
BRAINTREE, NH 03301
(603) 862-8229 FAX: (603) 862-8802



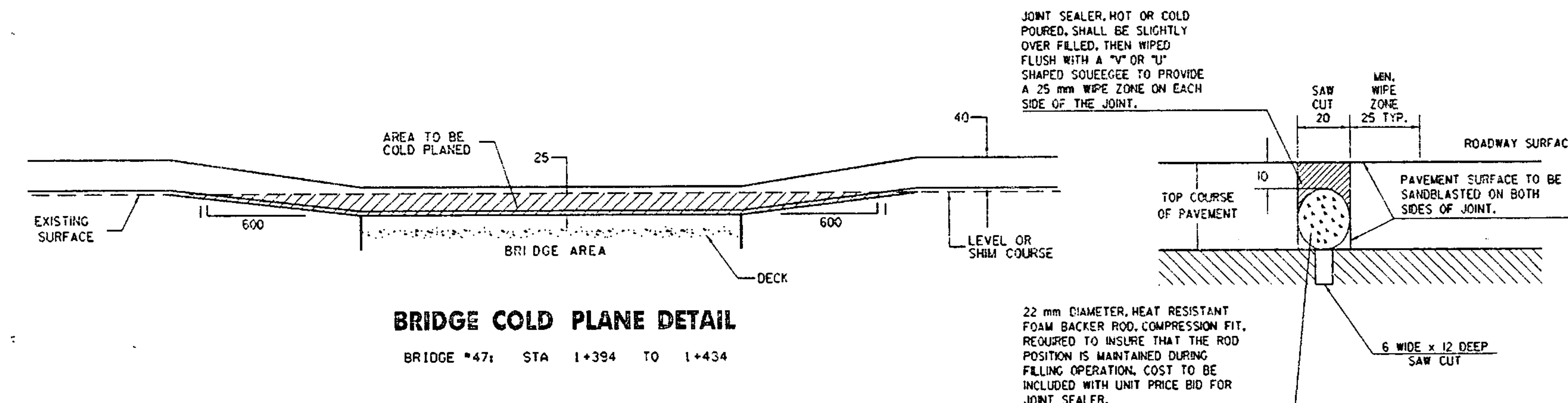
END STP 9602(1)S
STA 2+505.00
(MM 1.556)

BEGIN STP 9602(1)S
STA 4+940.00
(MM 3.070)

0 1 2
SCALE IN KM

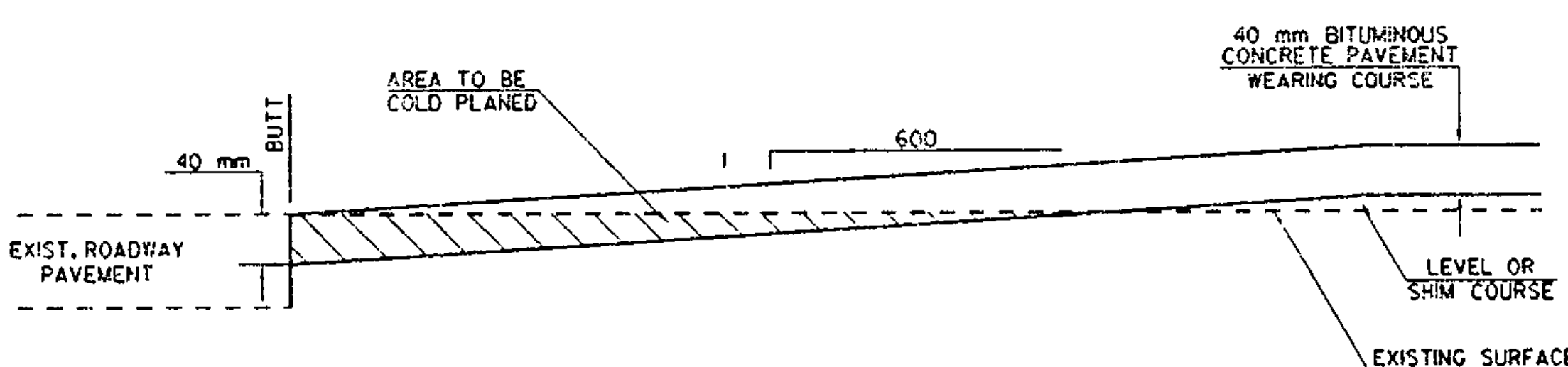


OVERLAY TYPICAL SECTION



BRIDGE COLD PLANE DETAIL

BRIDGE #47: STA 1+394 TO 1+434



APPROACH AREA COLD PLANING DETAIL

FULL ROADWAY WIDTH

RANDOLPH VT 12 STA 4+940 - BEGIN PROJECT
BRAINTREE VT 12 STA 2+505 - END PROJECT

PROJECT PAVING LIMITS

TOWN	BEGIN STATION	END STATION	LANE TYPICAL	WEARING DEPTH	BINDER DEPTH	LEVELING ±/km	NOTES
VT ROUTE 12							
RANDOLPH	4+940	5+072	1.8-3.3-3.3-1.8	40 mm		428	**
	5+072	10+875	0.6-3.3-3.3-0.6	40 mm		328	**
BRAINTREE	0+000	1+383	0.6-3.3-3.3-0.6	40 mm		328	**
	1+383	1+414	1.7-3.3-3.3-1.7	40 mm		420	**
	1+409	1+419	1.7-3.3-3.3-1.7	25 mm		420	BRIDGE #47: COLD PLANE 25 mm, LEVEL AND PAVE WITH 25 mm
	1+419	2+505	0.6-3.3-3.3-0.6	40 mm		328	**
							** LEVEL AND PAVE WITH 40 mm

1. THE PAVEMENT WEARING COURSE SHALL BE MEDIUM DUTY BITUMINOUS CONCRETE PAVEMENT TYPE II.
2. THE LEVELING COURSE SHALL BE TYPE III OR TYPE IV AS DIRECTED BY THE ENGINEER.
3. EMULSIFIED ASPHALT SHALL BE APPLIED ON ALL EXISTING PAVEMENT SURFACES, ON COLD PLANED SURFACES AND BETWEEN ALL COURSES OF PAVEMENT AT THE RATE OF 0.07 L/m² OR AS DIRECTED BY THE RESIDENT ENGINEER.
4. BITUMINOUS CONCRETE PAVEMENT TOLERANCE = 5 mm +/- (TOTAL THICKNESS EXCLUDING LEVELING COURSE).
5. EXISTING SHOULDER MATERIAL DEEMED UNSUITABLE BY THE RESIDENT ENGINEER SHALL BE EXCAVATED TO A DEPTH OF 75 mm +/- OR AS DIRECTED BY THE ENGINEER. EXCAVATED MATERIAL SHALL BE SPREAD ON THE ADJACENT SLOPES OR REMOVED FROM THE PROJECT, AS DIRECTED BY THE ENGINEER. EXCAVATION WILL BE PAID FOR AS ALL PURPOSE EXCAVATOR OR GRADER RENTAL. MATERIAL REMOVED SHALL BE REPLACED WITH SUBBASE OF CRUSHED GRAVEL (FINE GRADED).
6. COLD PLANING SHALL BE COMPLETED ACCORDING TO TYPICAL OR AS DENOTED OTHERWISE ON THE PLANS.
7. ALL DRIVES AND TOWN HIGHWAYS SHALL RECEIVE A 1m PAVED APRON AS DIRECTED BY THE ENGINEER. ANY EXCAVATION WILL BE PAID FOR UNDER ITEM 210.10. ANY NEW SUBBASE WILL BE PAID FOR UNDER ITEM 301.28. THE NEW BITUMINOUS SURFACE WILL BE PAID FOR UNDER ITEM 406.27.
8. ONE METER OF BACKING IS REQUIRED BEHIND THE FACE OF GUARDRAIL WITH 1.8 m POSTS. IF THIS CAN NOT BE OBTAINED THEN 2.5 m POSTS SHALL BE USED.
9. MARKER POSTS SHALL BE PLACED AS INDICATED OR AS DIRECTED BY THE ENGINEER.
10. ITEM 604.40, 604.42, 604.45 AND 604.48 ARE ESTIMATED QUANTITIES AND SHALL BE PERFORMED AS DIRECTED BY THE RESIDENT ENGINEER.

RURAL AREA - SEED MIXTURE

% MASS	kg/ha	NAME	PUR %	GERM %
37.14	26	CREEPING RED FESCUE	98	85
37.14	26	TALL FESCUE	95	90
5.71	4	RED TOP	95	90
14.30	10	BIRDSFOOT TREFOIL	98	85
5.71	4	ANNUAL RYE GRASS	95	85
100.00	70			

URBAN AREA - SEED MIXTURE

% MASS	kg/ha	NAME	PUR %	GERM %
42.22	38	CREEPING RED FESCUE	98	85
10.00	9	PERENNIAL RYE GRASS	95	90
42.22	38	KENTUCKY BLUE GRASS	85	85
5.56	5	ANNUAL RYE GRASS	95	85
100.00	90			

SEED MIXTURE:
SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY MASS AND SHALL BE FREE OF ALL NOXIOUS WEED SEED.

SEED:
TO BE APPLIED PER SEEDING FORMULAS OR AS DIRECTED BY THE ENGINEER.

FERTILIZER:
FORMULA 10-20-10 TO BE USED WITH SEED, APPLIED AT THE RATE OF 560 kg/ha. (HYDRO SEEDERS MAY USE 19-19-19 FORMULA)

AGRICULTURAL LIMESTONE:
TO BE APPLIED AT THE RATE OF 4500 kg/ha OR AS DIRECTED BY THE ENGINEER.

HAY MULCH:
TO BE PLACED ON EARTH SLOPES AT THE RATE OF 4500 kg/ha OR AS DIRECTED BY THE ENGINEER.

TOPSOIL:
TO BE USED WITH SEED AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.

PROJECT
TYPICAL
SHEET

PROJECT:	RANDOLPH-BRAINTREE	PROJECT NO.:	STP 9602(1)S
DESIGN FILE NAME:	/pave/95e019/p0019.dgn	PLOT DATE:	8/26
IFRM FILE NAME:	p0019.txd	SURVEY DATE:	11/95
SURVEYED BY:	CLD	DRAWN BY:	SJS
SQUAD LEADER:	JAW	SHEET:	2 OF 14



SUMMARY OF ESTIMATED QUANTITIES											DETAILED SUMMARY OF QUANTITIES				DETAILED SUMMARY OF QUANTITIES			
				BRIDGE	ROADWAY	QUANTITIES GRAND TOTAL	UNIT	ITEMS	ITEM NUMBER	RND	QUANTITIES	UNIT	ITEMS	QUANTITIES	UNIT	ITEMS		
					1	1	m3	TRENCH EXCAVATION OF EARTH (NOT A BID ITEM)	204.20	EST								
					785	785	m2	COLD PLANING - BIT. PAVEMENT	210.10	7								
					800	800	+	SUBBASE OF CRUSHED GRAVEL (FINE GRADED)	301.28	EST								
					1150	1150	+	AGGREGATE SHOULDERS	402.12	38								
					4700	4700	kg	EMULSIFIED ASPHALT	404.65	19								
					9800	9800	+	MEDIUM DUTY BITUMINOUS CONCRETE PAVEMENT	406.27	26								
					1	1	LS	PRICE ADJUSTMENT ASPHALT CEMENT (NOT A BID ITEM)	406.50									
				1		1	m3	CONCRETE, CLASS A	501.22	EST								
				100		100	kg	REINFORCING STEEL	507.15	EST								
								*** BEGIN OPTION ITEMS ***										
				10		10	m	JOINT SEALER, HOT POURED	524.11	-								
				10		10	m	JOINT SEALER, COLD POURED	524.13	-								
								*** END OPTION ITEMS ***										
				27		27	m	REMOVAL OF EXISTING RAILING	525.10	1								
				12		12	m	BRIDGE RAIL - HD. STEEL BEAM/FASCIA MOUNTED	525.41	0.6								
					15	15	m	300 mm CSP L7 mm (67 mm x 13 mm)	601.0005	-								
					6	6	EA	REHABILITATION OF DROP INLETS, CATCH BASINS OR MANHOLES, CLASS I	604.412	EST								
					6	6	EA	REHABILITATION OF DROP INLETS, CATCH BASINS OR MANHOLES, CLASS II	604.415	EST								
					5	5	EA	REHABILITATION OF DROP INLETS, CATCH BASINS OR MANHOLES, CLASS III	604.418	EST								
					140	140	HR	POWER GRADER RENTAL	608.15	EST								
					140	140	HR	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	608.25	EST								
					85	85	HR	POWER BROOM RENTAL	608.30	EST								
					140	140	HR	TRUCK RENTAL	608.37	EST								
					140	140	HR	LOADER RENTAL, TYPE I	608.40	EST								
					65	65	EA	YIELDING MARKER POSTS	619.17	EST								
				38	703	741	m	STEEL BEAM GUARDRAIL	621.20	7.6								
					228	228	m	STEEL BEAM GUARDRAIL (#/2.5 m STEEL POST) (MODIFIED)	621.20(MOD)	3.8								
				19		19	m	HEAVY DUTY STEEL BEAM GUARDRAIL	621.21	1.5								
				2	15	17	EA	MODIFIED ECCENTRIC LOADER TERMINAL	621.54	-								
				2	1	3	EA	ANCHOR FOR STEEL BEAM RAIL	621.60	-								
				52	923	975	m	REMOVAL AND DISP. OF GUARDRAIL	621.80	9								

PROJECT :		PROJECT NO.:	
RANDOLPH-BRAINTREE		STP 9602(IIS)	
DESIGN FILE NAME:		/pave/55c018/pc018.dgn	
PDM FILE NAME:		pc018qsl.i	
SURVEYED BY:		CLD	
SQUAD LEADER:		JAW	
		PLOT DATE: 8/96	
		SURVEY DATE: 8/95	
		DRAWN BY: NEL	
		SHEET: 3 OF 14	

PROJECT :	RANDOLPH-BRAINTREE	PROJECT NO. :	STP 9602(II)S
DESIGN FILE NAME:	7pave/95c018/pc018.dgn	PLOT DATE:	8/95
PARM FILE NAME:	pc018qsl1	SURVEY DATE:	8/95
SURVEYED BY:	CLD	DRAWN BY:	NEL
SQUAD LEADER:	JAW	SHEET:	3 OF 14

QUANTITY SHEET

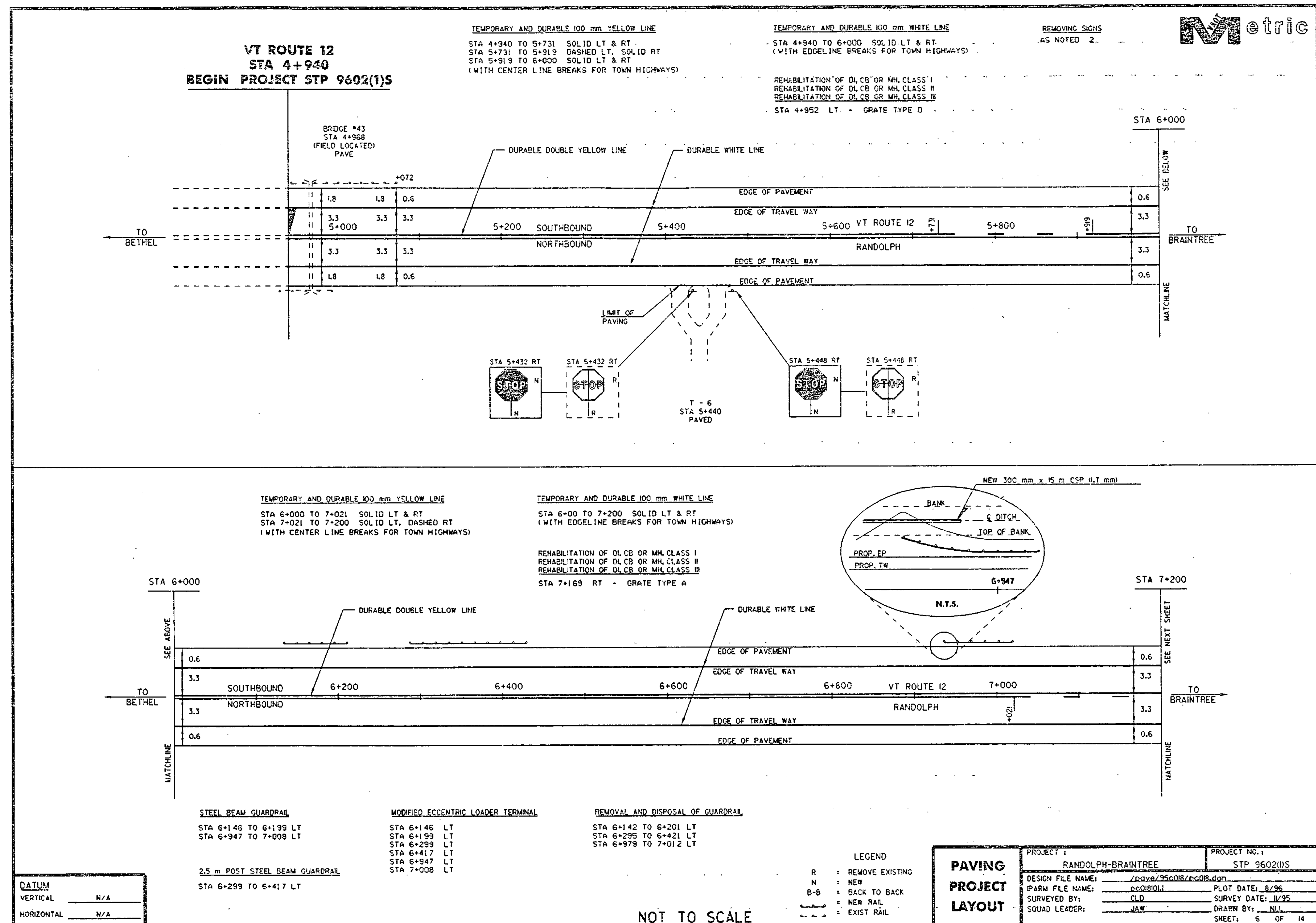
DETAILED SUMMARY OF QUANTITIES

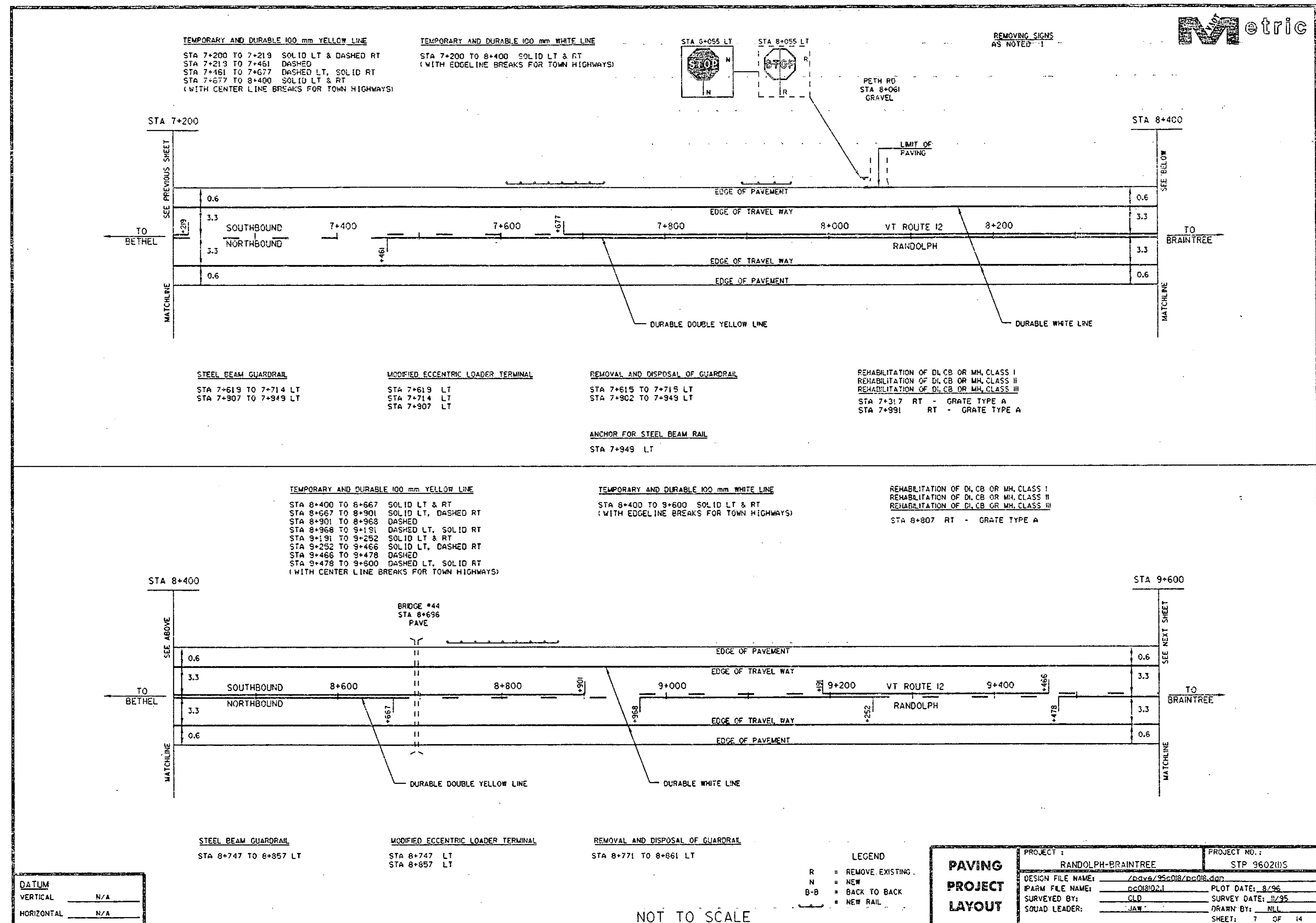
DETAILED SUMMARY OF QUANTITIES

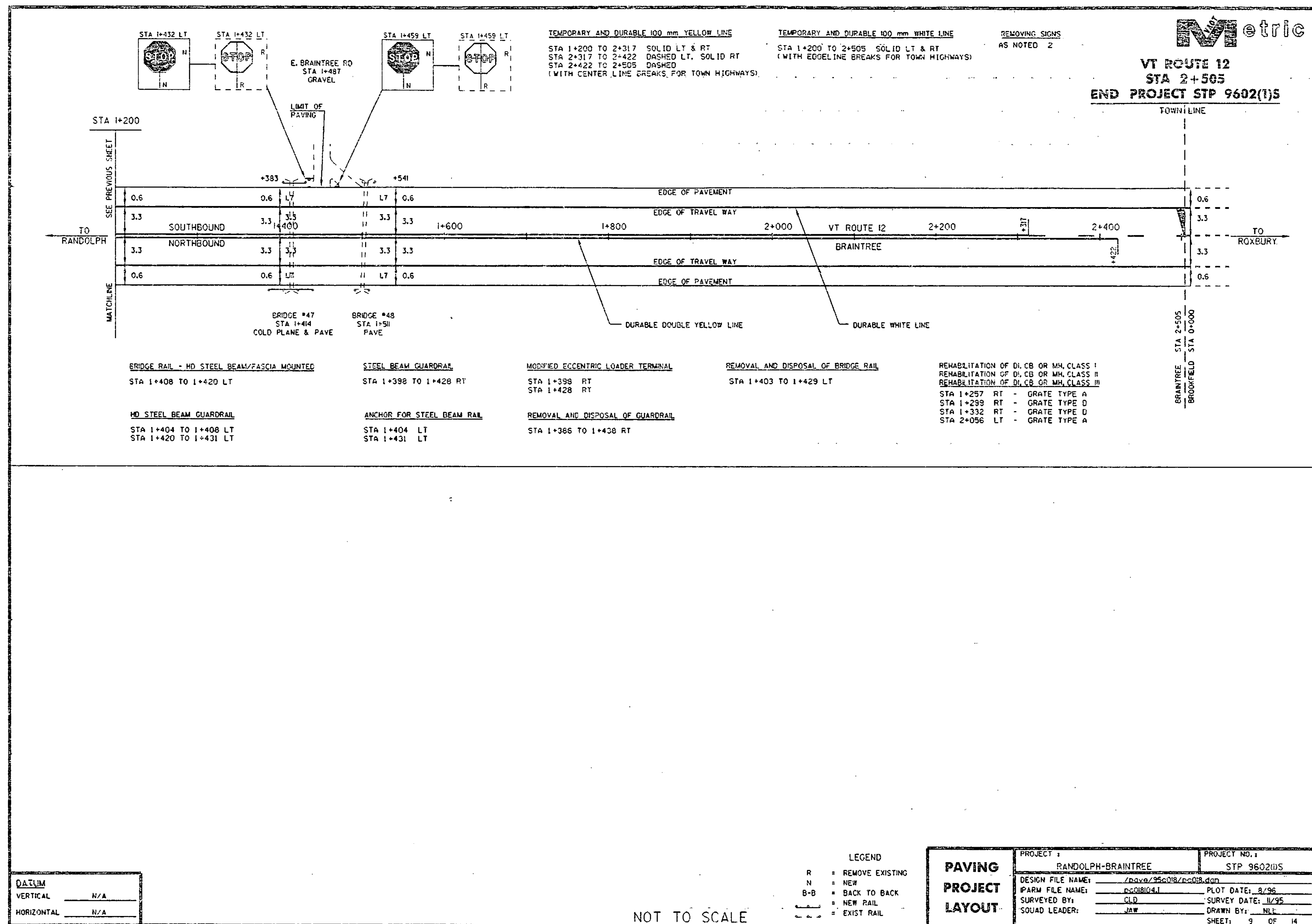
CHF. II/18/96

: Sheet Number: 4

LOCATION			CURBED SIDEWALKS					DROP INLETS				GUARDRAIL												PIPE			REMARKS	Metric
STATION	STATION	POS.	203.15	203.16	301.28	616.21	618.10	604.40	604.412	604.415	604.418	616.35	621.20	621.201/4001	621.21	621.54	621.53	621.60	621.75	621.80	621.81	676.10	601.0005	CSP				
			COMM. EXCAV.	SOLID ROCK EXCAV.	SUBBASE OF CR. GRAVEL	VERT. GRANITE CURB	PORT. CEM. CONCRETE SIDEWALK 125 mm	CHANGE ELEV. D.I.	REHAB. D.I. CLASS I	REHAB. D.I. CLASS II	REHAB. D.I. CLASS III	TIMBER CURB	STEEL BEAM G.R.	2.5 m POST BEAM G.R.	H.D. BEAM G.R.	M.E.L.T.	TERM. CONN.	ANCHOR FOR G.R.	REMOVE & RESET G.R.	REMOVE & DISP. G.R.	REMOVE & DISP. G.P.	STEEL POST DELIN.	D	L	TH/CL			
VT. RTE. 12, RANDOLPH			m3	m3	+	m	m2	EA	EA	EA	EA	m	m	m	m	EA	EA	EA	m	m	EA	EA	mm	m		FOR LOCATIONS & GRATE TYPES, SEE LAYOUT SHEETS. GRATE INCLUDED UNDER EACH ITEM		
4+940	10+875	LT&RT							4	4	3																MELT @ STA 6+146, MELT @ STA 6+199	
6+146	6+199	LT											53.2			2					50						MELT @ STA 6+299, MELT @ STA 6+417	
6+299	6+417	LT												117.8		2					126						MELT @ STA 6+947, MELT @ STA 7+008	
6+947	7+008	LT											60.8			2					33			300	15	1:7	MELT @ STA 7+619, MELT @ STA 7+714	
7+619	7+714	LT											95			2					100						MELT @ STA 7+907, ANCHOR @ STA 7+949, INSTALL 1-5 m RADIUS PANEL, SEE STANDARD DETAILS ON SHEET G-1d	
7+907	7+949	LT											41.8			1		1			47						MELT @ STA 8+747, MELT @ STA 8+857	
8+747	8+857	LT											110.2			2					90						MELT @ STA 9+751, MELT @ STA 10+093	
9+751	10+093	LT											342			2					352						MELT @ STA 10+143, MELT @ STA 10+249	
10+143	10+249	LT												106.4		2					107							
VT. RTE. 12, BRAINTREE									2	2	2																FOR LOCATIONS & GRATE TYPES, SEE LAYOUT SHEETS. GRATE INCLUDED UNDER EACH ITEM	
0+000	2+505	LT&RT																										
SHEET TOTALS									6	6	5		703	224.2	-	15		1			914				15			
BRIDGE SHEET #12 TOTALS									-	-	-		30.4	-	17.5	2		2			52				-			
SUBTOTALS									6	6	5		733.4	224.2	17.5	17		3			966				15			
ROUNDING									0	0	0		7.6	3.8	1.5	0		0			9				0			
PROJECT TOTALS									6	6	5		741	228	19	17		3			975				15			







STATE OF VERMONT

AGENCY OF TRANSPORTATION

TRAFFIC SIGN SUMMARY SHEET

KILOMETER MARKER, STATION, OR SIGN NUMBER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXIST. POST REMARKS	NO. OF POSTS	FLANGED CHANNEL			SQUARE STEEL			NEW SIGN POSTS			TUBULAR STEEL			W-SHAPE STEEL			REMARKS	SIGN DETAIL								
		EA	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN			SALV TIS	kg/m			(mm)			TUBULAR ALUMINUM			(mm)			FTG. SIZE			MASS	POST SIZE	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER					
											1.7	3.0	4.5	3.4	3.9	5.0	ANCHOR ROD	BOLT	TUBULAR ALUMINUM Ø (mm)	75	100	100 MOD	FOUND- ATION	75						89	100	125	600	750
RANDOLPH																																		
		1	750	750	0.56				1			X		X		X													E-143					
		1	750	750	0.56				1			X		X		X													E-143					
		1	750	750	0.56				1			X		X		X													E-143					
STA 10+725 RT		1	600	750	0.45				1			X		X		X													E-141					
STA 10+730 LT		1	750	750	0.56				1			X		X		X													E-143					
STA 10+734 RT		1	750	750	0.56				1			X		X		X													E-143					
		1	750	750	0.56				1			X		X		X													E-143					
		1	600	750	0.45				1			X		X		X													E-141					
BRAINTREE																																		
STA 0+875 RT		1	750	750	0.56				1			X		X		X													E-143					
STA 0+913 RT		1	750	750	0.56				1			X		X		X													E-143					
		1	750	750	0.56				1			X		X		X													E-143					
		1	750	750	0.56				1			X		X		X													E-143					
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE."		TOTALS	M ²	M ²	EA.	M ²				kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	EA.	kg	EA.	EA.	kg			
			6.50							216					216																			

PROJECT:

RANDOLPH-BRAINTREE

DESIGN FILE NAME:

/pave/95c08/pc08.dgn

PARM FILE NAME:

/pc08ts.l

SURVEYED BY:

CLD

SQUAD LEADER:

JAW

PROJECT NO.:

STP 9602(US)

PLOT DATE:

8/96

SURVEY DATE:

11/96

DRAWN BY:

NLL

SHEET:

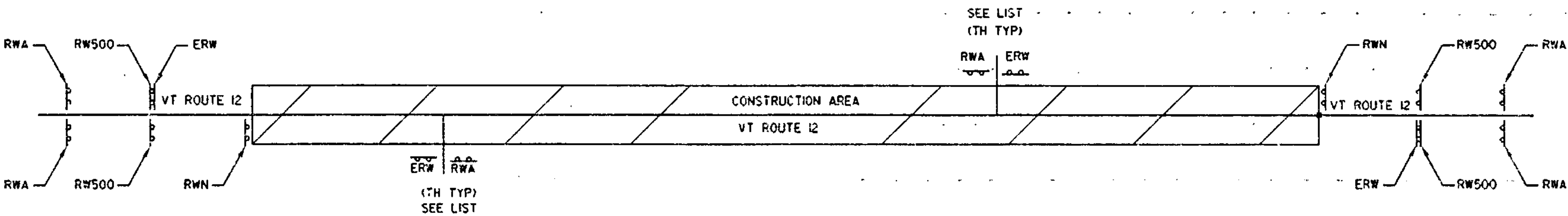
10 OF 14

: Sheet Number:



CONSTRUCTION APPROACH SIGNING

SEE STANDARD E-100 FOR SIGN PLACEMENT



LIST OF TOWN HIGHWAYS FOR CONSTRUCTION SIGNS

TOWN / HIGHWAY NAME	ROAD WORK AHEAD	END ROAD WORK	OTHER
TH-6	1	1	
PETH RD	1	1	
HOWARD HILL RD	1	1	
TH-23	1	1	
WEST RD	1	1	
E. BRAINTREE RD	1	1	
TOTAL	6	6	

LEGEND

- RWA = ROAD WORK AHEAD
- RW500 = ROAD WORK 500
- RWN = ROAD WORK NEXT 5/4 MILES
- ERW = END ROAD WORK

NOTE:
WHEN DIRECTED BY THE RESIDENT ENGINEER, "DEAD END" SIDE ROADS WILL NOT REQUIRE CONSTRUCTION SIGNING.

NOT TO SCALE

DATUM _____
VERTICAL _____
HORIZONTAL _____

CONSTRUCTION APPROACH SIGNING

PROJECT :		CHF 11/18/96	
RANDOLPH-BRAINTREE		PROJECT NO. 1	
		STP 9602(1)S	
DESIGN FILE NAME:	/pav/95c018/p018.dgn	PLOT DATE:	8/96
IPARM FILE NAME:	pc018ca.l	SURVEY DATE:	11/95
SURVEYED BY:	CLD	DRAWN BY:	ML
SQUAD LEADER:	JBW	SHEET:	11 OF 14

[illegible]

Metric

- | | |
|-------------------------------|---------------|
| ITEM 501.22 CONCRETE CLASS A | 1m3 (EST.) |
| ITEM 507.15 REINFORCING STEEL | 100 kg (EST.) |

WHEN A RAIL PANEL SPlice OCCURS AT POST NO.1,
USE SCHEDULE I FOR APPROACH RAILING. WHEN A RAIL
PANEL SPlice OCCURS AT BRIDGE END POST, USE
SCHEDULE II FOR APPROACH RAILING.

SCHEDULE I		
POST NO.	SPACING	PAYMENT FACTOR
1	950	1.4 x 3800
2	950	
3	950	
4	950	
5	1270	
6	1270	1.2 x 3800
7	1270	
8	1900 (TYP.)	
9	1900 (TYP.)	1.0 (TYP.)

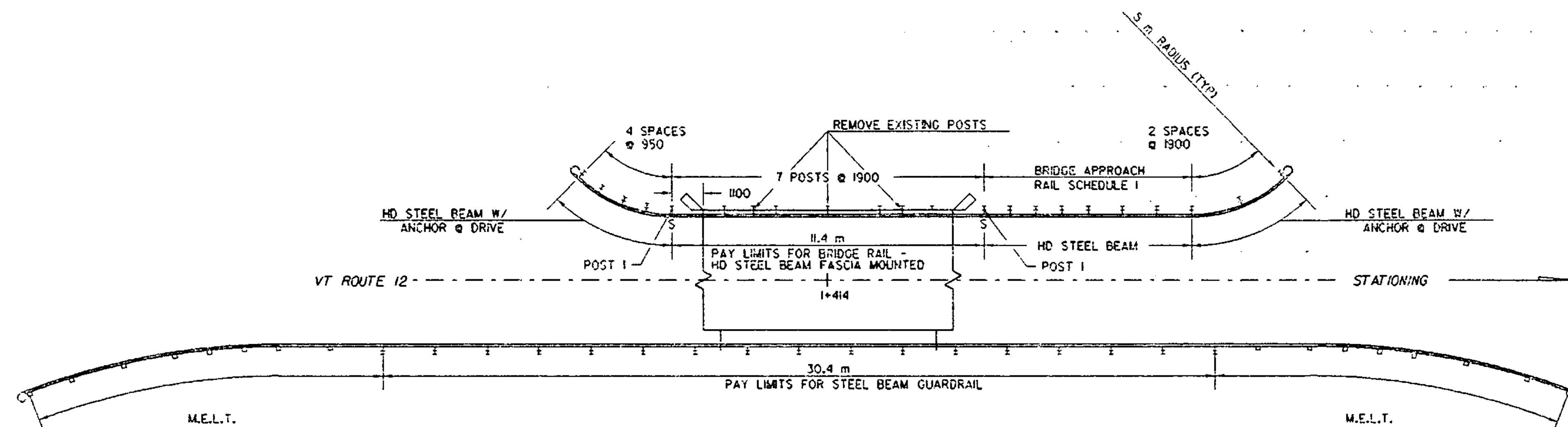
SCHEDULE II		
POST NO.	SPACING	PAYMENT FACTOR
1	950	1.4 x 5700
2	950	
3	950	
4	950	
5	950	
6	950	
7	1270	1.2 x 3800
8	1270	
9	1270	
10	1900 (TYP.)	
11	1900 (TYP.)	1.0 (TYP.)

The diagram illustrates the cross-section of a bridge approach rail system. Key components and dimensions include:

- BRIDGE APPROACH RAIL SCHED. 10R**: The top rail section, with a note stating "SCHED. II AS REQUIRED TO MATCH BRIDGE POST SPACING".
- PAY LIMIT HEAVY DUTY STEEL BEAM BRIDGE RAIL**: The lower rail section.
- EXISTING END POST**: The starting point of the rail section on the left.
- VARIES**: Dimension indicating the variable length between the existing end post and the first transition post.
- TRANSITION POST**: The first post after the existing end post.
- POST 1**: The second post, located 7600 SCHEDULE I or 9500 SCHEDULE II from the existing end post.
- POST 2**: The third post, located 950 units from POST 1.
- GROUND LINE**: The base line of the diagram.
- CURB**: The lower structure on the left side.
- 1900 (TYP.)**: Typical spacing between the end of the rail section and the next post.
- POST 8 (SCHED. I)** and **POST 10 (SCHED. II)**: Further posts shown on the right side of the diagram.
- 740**: Vertical dimension from the ground line to the top of the rail.
- 685**: Vertical dimension from the ground line to the top of the lower structure.

DATUM
VERTICAL _____
HORIZONTAL _____

PROJECT :		PROJECT NO. :	
RANDOLPH-BRAINTREE		STP 960200S	
DESIGN FILE NAME:	/pave/95c018/p0018.dgn		
IPARM FILE NAME:	p0018.tbl	PLOT DATE:	8/95
SURVEYED BY:	CLD	SURVEY DATE:	11/95
SQUAD LEADER:	JAW	DRAWN BY:	SJS
		SHEET:	12 OF 14



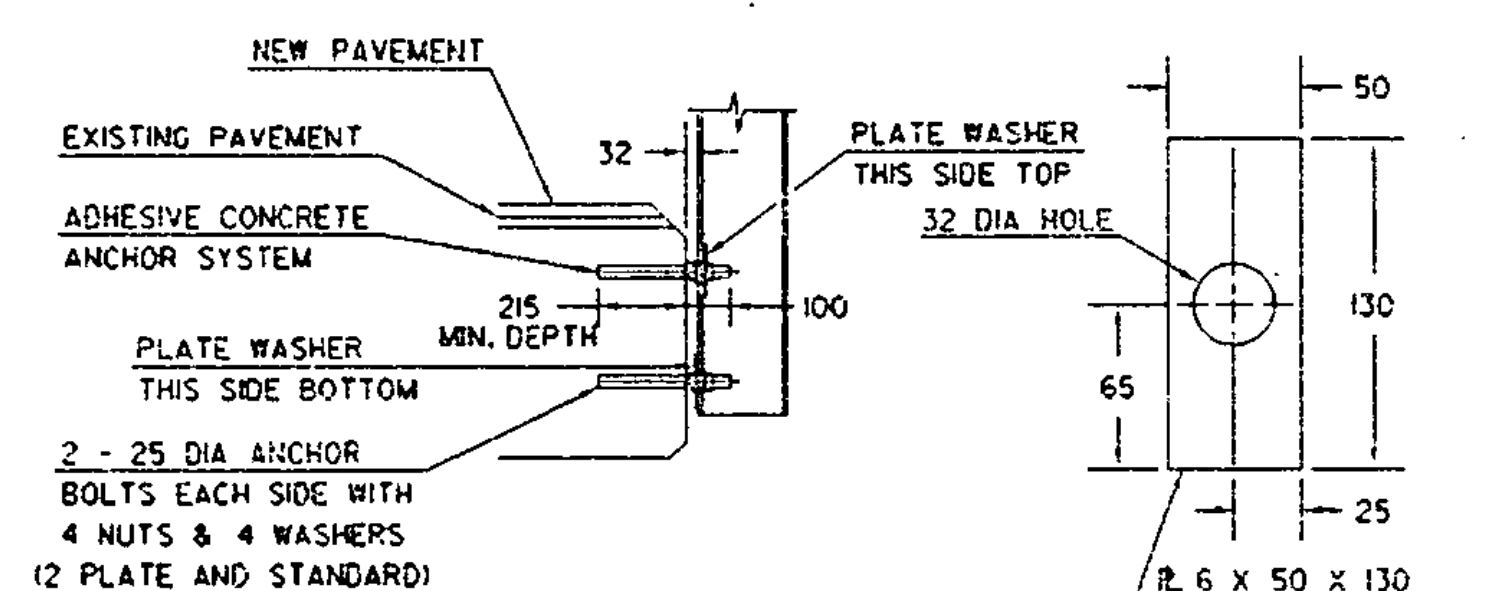
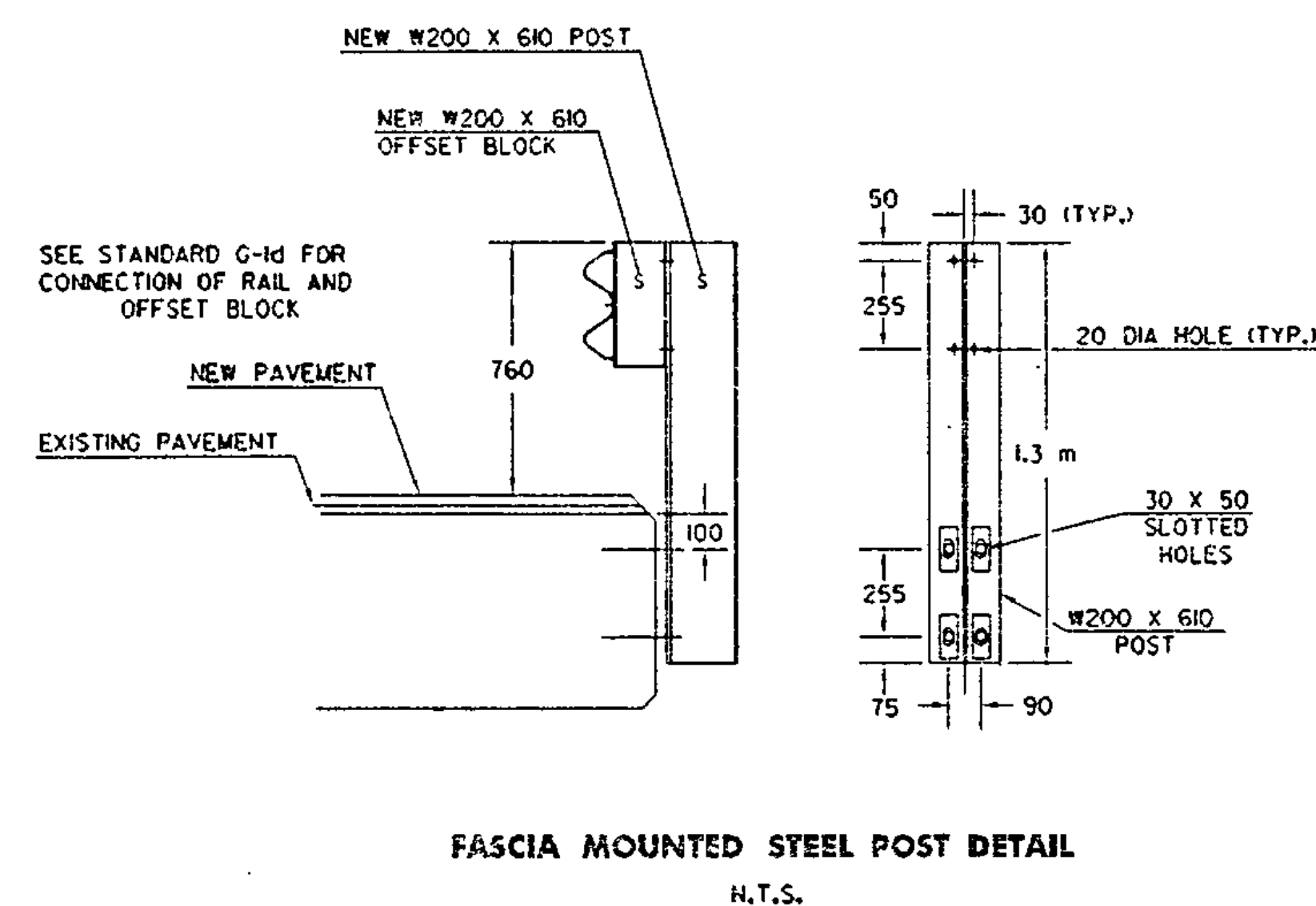
BRIDGE #47 @ STA 1+414

SCALE 1:100

NOTES

- ANCHOR BOLTS SHALL BE ASTM A307, 25 mm DIAMETER BY 355 mm IN LENGTH WITH A MINIMUM THREAD LENGTH OF 100 mm.
- ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A53 (AASHTO M 232) AND SHALL CONFORM TO VT SPECIFICATION 714 UNLESS OTHERWISE NOTED.
- INSTALLATION OF NEW ANCHOR BOLTS AND POSTS SHALL BE SUBSIDIARY TO THE BRIDGE RAIL ITEM.
- POSTS, BRACKETS AND PLATE WASHERS SHALL BE ASTM A36 STEEL.
- A MINIMUM PULOUT STRENGTH OF 13 600 kg SHALL BE ATTAINED ON ALL NEW BOLTS THAT ARE GROUTED IN PLACE. A SAMPLE GROUTED BOLT WILL BE TESTED BEFORE MATERIALS ARE APPROVED FOR USE, AND THEN RANDOM BOLTS WILL BE FIELD TESTED BY THE STATE OF VERMONT TO ENSURE THIS STRENGTH IS BEING ATTAINED. 48-HOURS ADVANCE NOTICE IS REQUIRED TO ALERT THE VDOT AS TO WHEN THE CONTRACTOR WILL BE READY FOR THIS TESTING.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT ALL LANES SHALL BE OPENED TO TRAFFIC DURING NON-WORKING HOURS. THEREFORE, NO GAPS BETWEEN EXISTING RAILING AND NEW RAILING WILL BE PERMITTED. DETAILS FOR TEMPORARY RAIL, IF REQUIRED TO BRIDGE THESE GAPS, SHALL BE SUBMITTED FOR APPROVAL. THE CONTRACTOR WILL BE ALLOWED TO WORK ON THE RAIL ON ONLY ONE SIDE OF THE BRIDGE AT A TIME. TWO WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES. ANY TEMPORARY RAIL REQUIRED SHALL BE PAID SUBSIDIARY TO ITEM 62121 - "HEAVY DUTY STEEL BEAM GUARDRAIL."
- THESE CONTRACT DOCUMENTS HAVE BEEN PREPARED BASED ON LIMITED FIELD INVESTIGATION AND RECORD DRAWINGS AVAILABLE AT THE TIME. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATIONS TO THE CONSTRUCTION DETAILS AND WORK QUANTITIES. THE CONTRACTOR SHALL PERFORM THE WORK IN ACCORDANCE WITH FIELD CONDITIONS. ALL DIMENSIONS AND JOINT LOCATIONS SHALL BE FIELD CHECKED BY THE CONTRACTOR PRIOR TO SUBMISSION OF FABRICATION DRAWINGS FOR APPROVAL.

NOTE: ALL DIMENSIONS IN MILLIMETERS EXCEPT AS INDICATED.



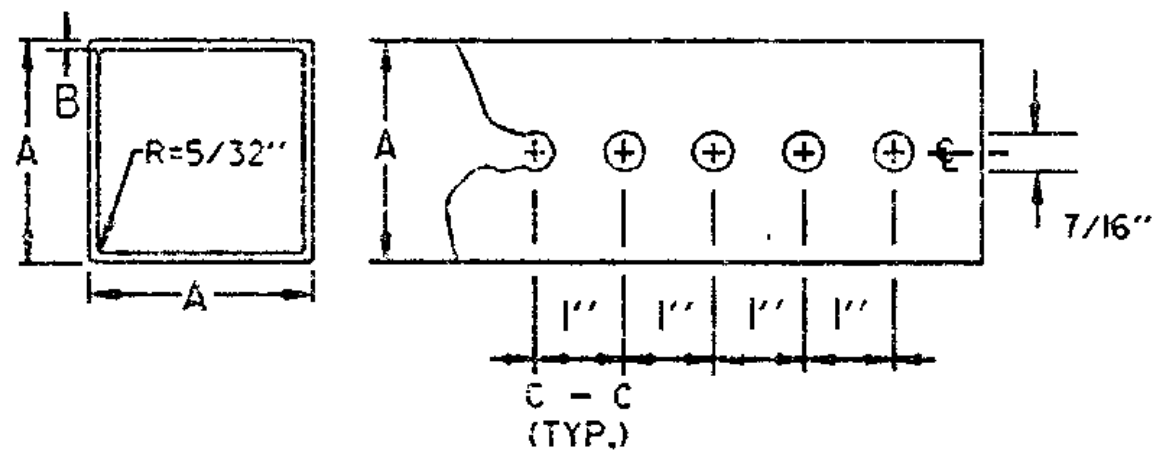
DATUM
VERTICAL _____
HORIZONTAL _____

**BRIDGE DETAIL
SHEET #2**

PROJECT :	RANDOLPH-BRAINTREE	PROJECT NO.:	STP 960201S
DESIGN FILE NAME:	/pave/95c018/pc018.dgn	PLOT DATE:	8/96
PARM FILE NAME:	pc018dte.i	SURVEY DATE:	11/95
SURVEYED BY:	CLD	DRAWN BY:	SJS
SQUAD LEADER:	JAH	SHEET:	13 OF 14

GUARDRAIL DEFLECTION CHART (PER AASHTO - ROADSIDE DESIGN GUIDE - 1988)		
TYPE	GR POST SPACING	DEFLECTION
THREE CABLE W/STEEL POSTS	16' - 0"	12'
W/WOODEN POSTS	12' - 6"	12'
W-BEAM		
W/WEAK POST	12' - 6"	7'
W/STRONG POST	6' - 3"	3'
BOX BEAM	6' - 0"	5'
THREE BEAM W/WEAK POST	12' - 6"	4'
W/STRONG POST	6' - 3"	2'
LONG-SPAN NESTED W-BEAM	12' - 6"	3.4'
GUARDRAIL W/STEEL POSTS	18' - 9"	3.2'

THIS CHART LISTS THE THEORETICAL DEFLECTION DISTANCE UPON IMPACT OF VARIOUS GUARDRAIL WITH DIFFERENT TYPES AND SPACING OF POSTS.



NOTE :

THE POSTS SHALL BE CAREFULLY FORMED OF STEEL WITH A MINIMUM YIELD OF 55,000 PSI INTO A SIZE AND SHAPE WITH CORNERS INDUCTION WELDED IN SUCH A MANNER THAT NEITHER FLASH NOR WELD SHALL INTERFERE WITH THE TELESCOPING PROPERTIES, NOR DAMAGE THE GALVANIZING.

* THE WALL THICKNESS TOLERANCES SHALL BE $\pm .005$ AND $\pm .010$ FOR THE 12 GAUGE.

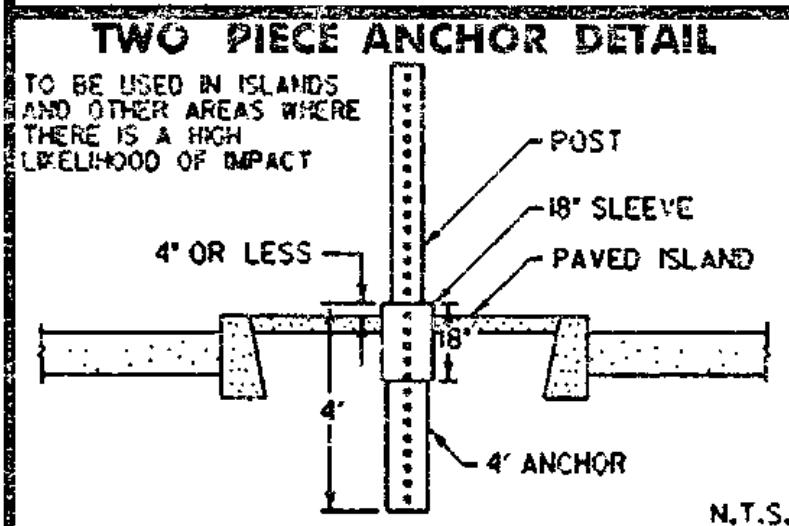
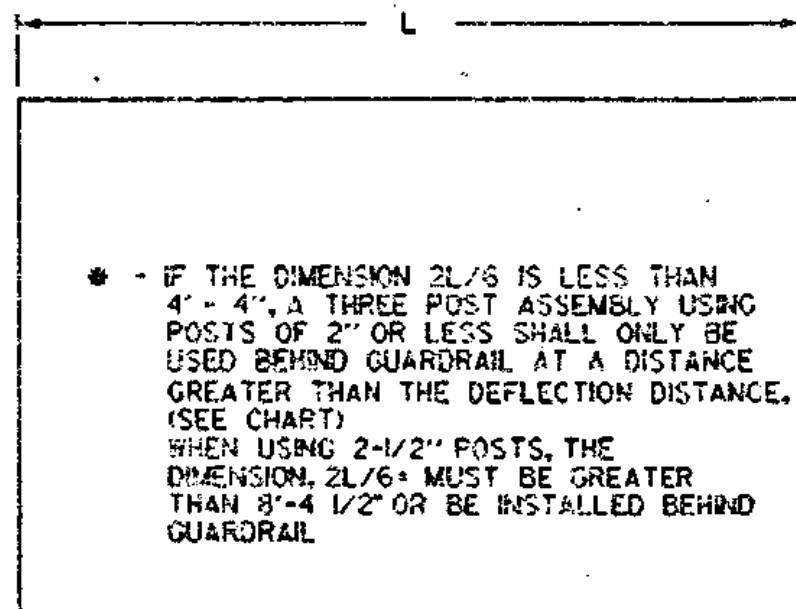
DIMENSION DETAILS AND POST SELECTION CHART

POST SELECTION CHART							
SIGN AREA (FT ²) X H (FT) $\leq$ SV (SELECTION VALUE)							
POST SIZE	DIMENSIONS		SECTION MODULUS IN ³	ONE POST SV	TWO POST SV	THREE POST SV	NUMBER PERMITTED IN 8' PATH
LBS/FT.	A	B	GAUGE				
2.30	1-3/4"	.105	12	0.265	73	146	219
2.65	2"	.105	12	0.372	102	204	306
3.35	2-1/2"	.105	12	0.642	177	354	531

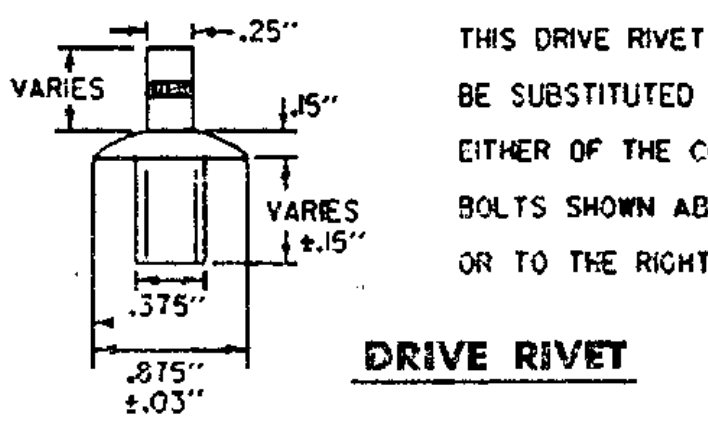
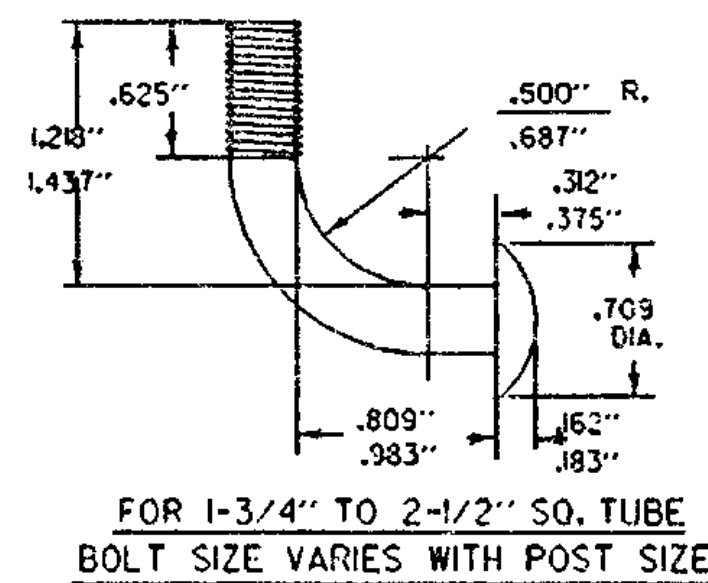
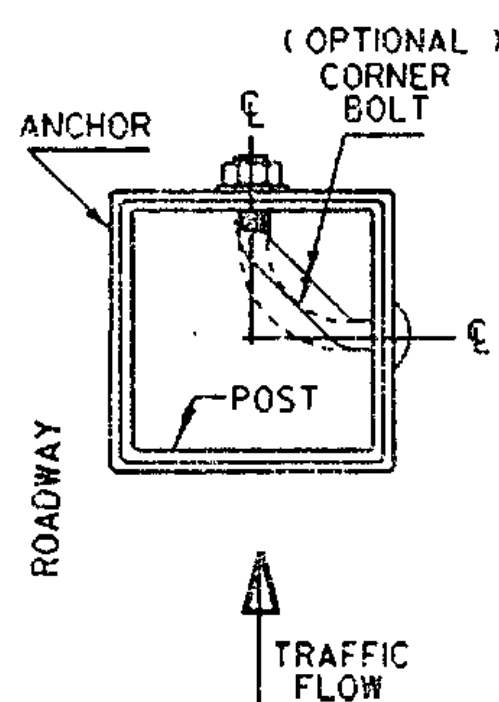
DESIGN CRITERIA:

WIND SPEED = 60 MPH (10 -YEAR MEAN RECURRENCE INTERVAL)
WIND PRESSURE = 14 PSF
STEEL MINIMUM YIELD = 55,000 PSI
ALLOWABLE STRESS = (1.4) 0.60 FY

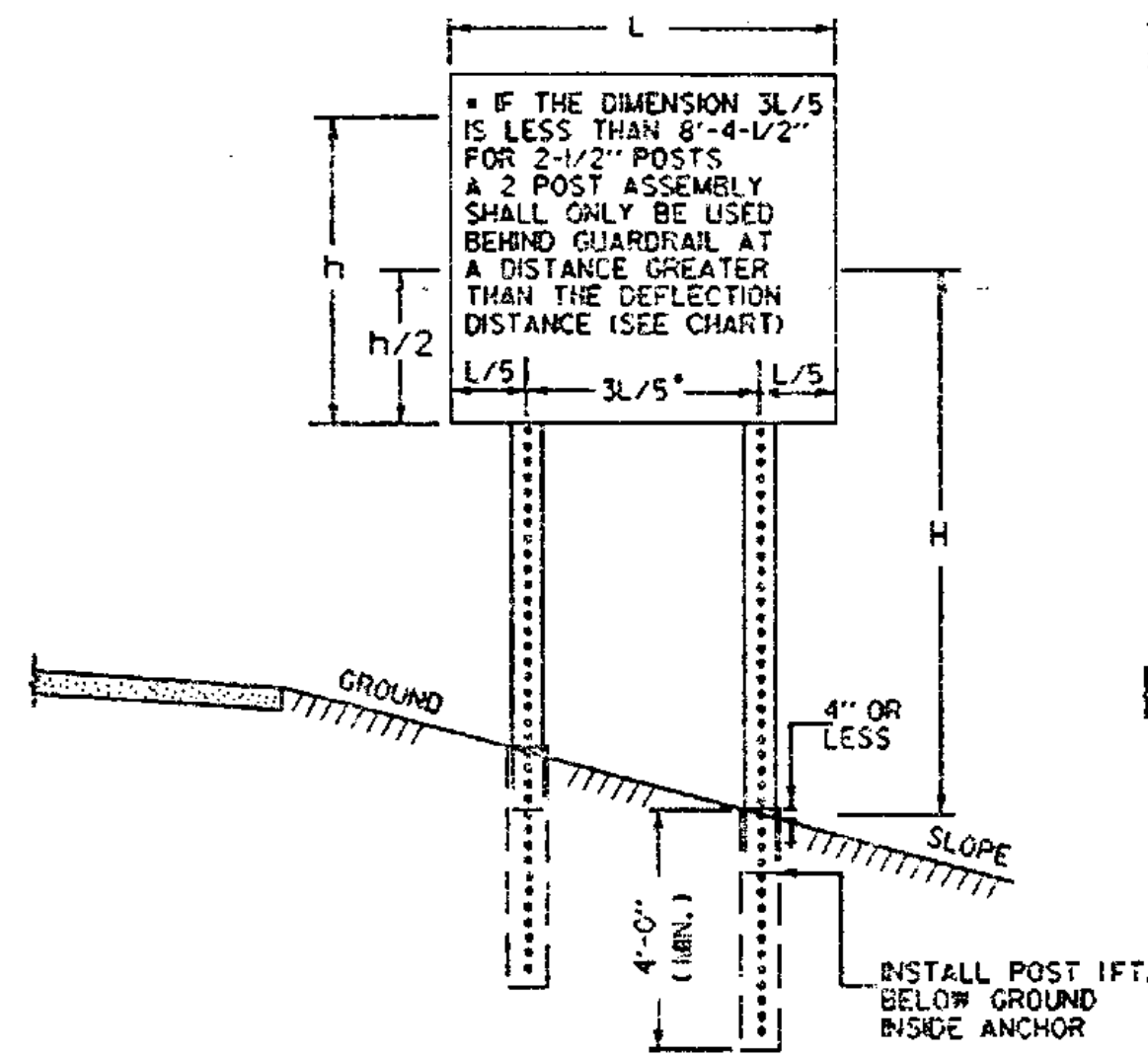
DATUM	
VERTICAL	N/A
HORIZONTAL	N/A



TOP VIEW OF ANCHOR, POST AND BOLT



MULTI-POST INSTALLATIONS



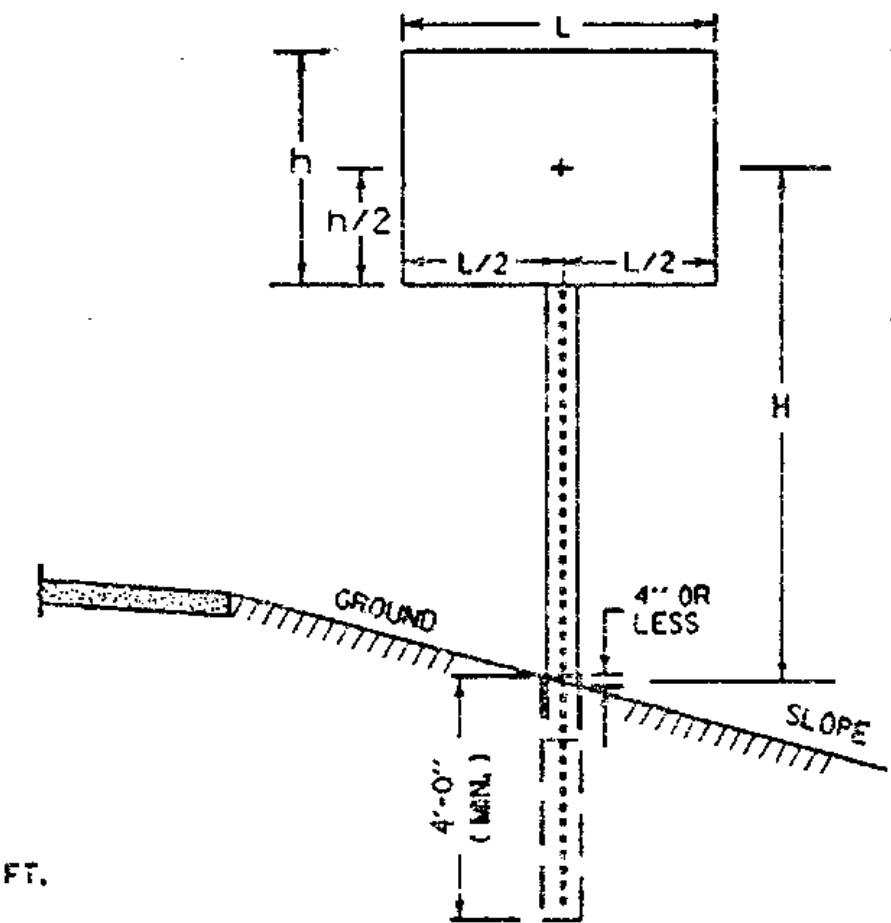
POST SPACING DETAILS

GENERAL NOTES

CONSTRUCTION METHODS - POSTS MAY BE DRIVEN OR SET BY A DUG HOLE AND BACKFILLED. IF DRIVEN, A GRIVING CAP SHALL BE USED. THE DUG HOLE INSTALLATION SHALL BE USED IN AREAS OF POOR SOIL CONDITIONS OR AS DIRECTED BY THE RESIDENT ENGINEER. BACKFILL SHALL BE COMPACTED AS DIRECTED BY THE RESIDENT ENGINEER.

SIGN CLEARANCES - HORIZONTAL AND VERTICAL SIGN CLEARANCES SHALL BE SHOWN ON THE PLANS OR THE APPROPRIATE STD. SHEETS.

SINGLE POST INSTALLATIONS SHALL BE LIMITED TO A SIGN AREA OF 20 SQ. FT. OR LESS



NOTE

WHEN USING SQUARE STEEL POSTS ON STEEP SLOPES (1 ON 2 OR STEEPER) ADD ONE FOOT EMBEDMENT FOR GREATER STABILITY.

CONNECTION DETAIL

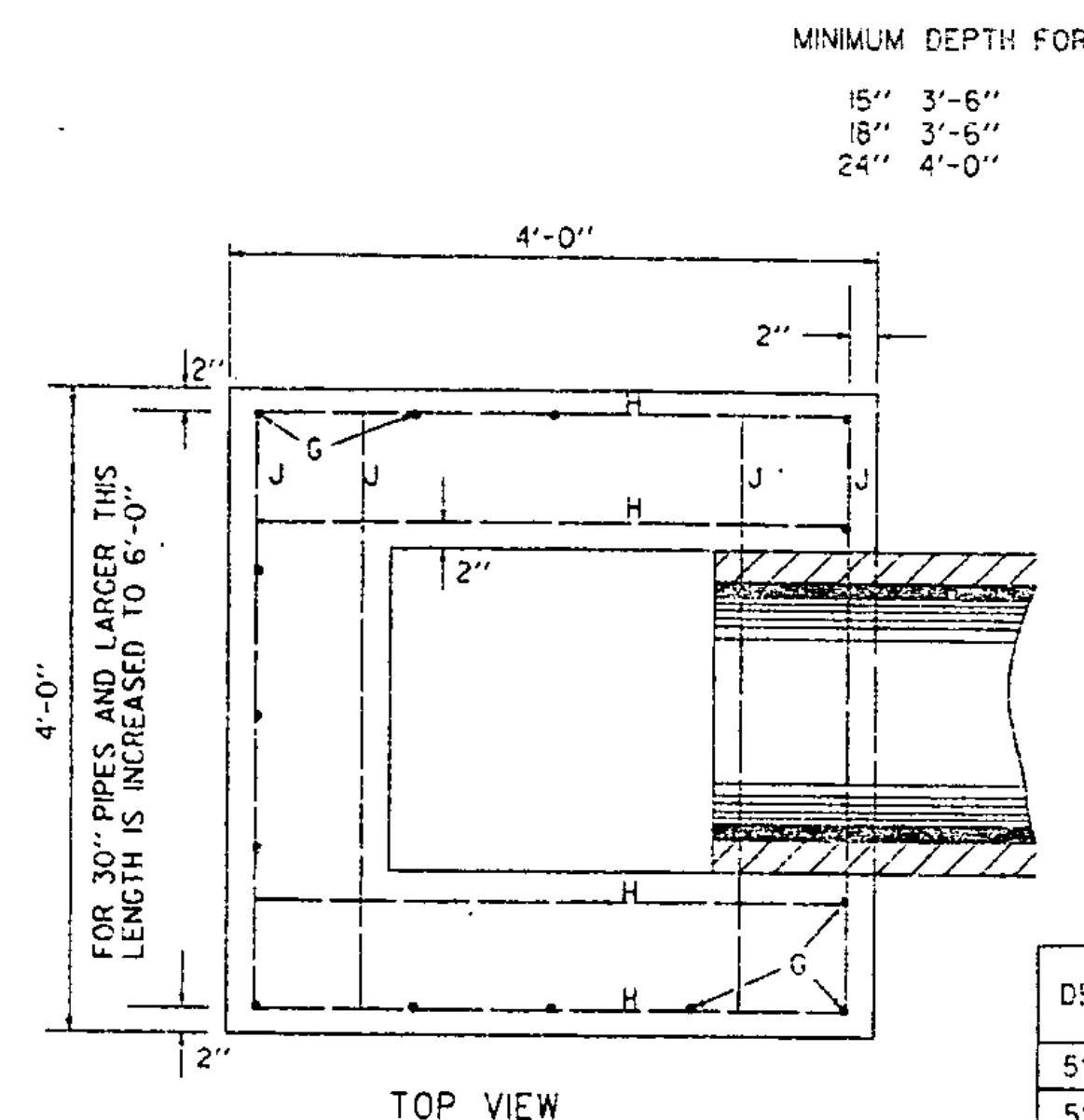


(SEE DETAIL LEFT FOR BOLT PLACEMENT)

COMPOSITE SQUARE STEEL SIGN POST DETAIL SHEET

SURVEYED BY	N/A	DATE	N/A
DRAWN BY	PAVE	DATE	6/96
SQUAD LEADER	N/A		
DESIGN FILE NO.	/pave/95c018/pc018.dgn		
PARM FILE	pc018st.i	DATE	1-OCT-1996
PROJ. NAME	RANDOLPH-BRAINTREE		
PROJ. NO.	STP 9602(1)		
SHEET	14 OF 14 SHEETS		

REINFORCED CONCRETE DROP INLET WITH GRATE (BOTTOM SECTION)
SEE SHEETS D-9, D-10, D-11, AND D-16 FOR TOP SECTION

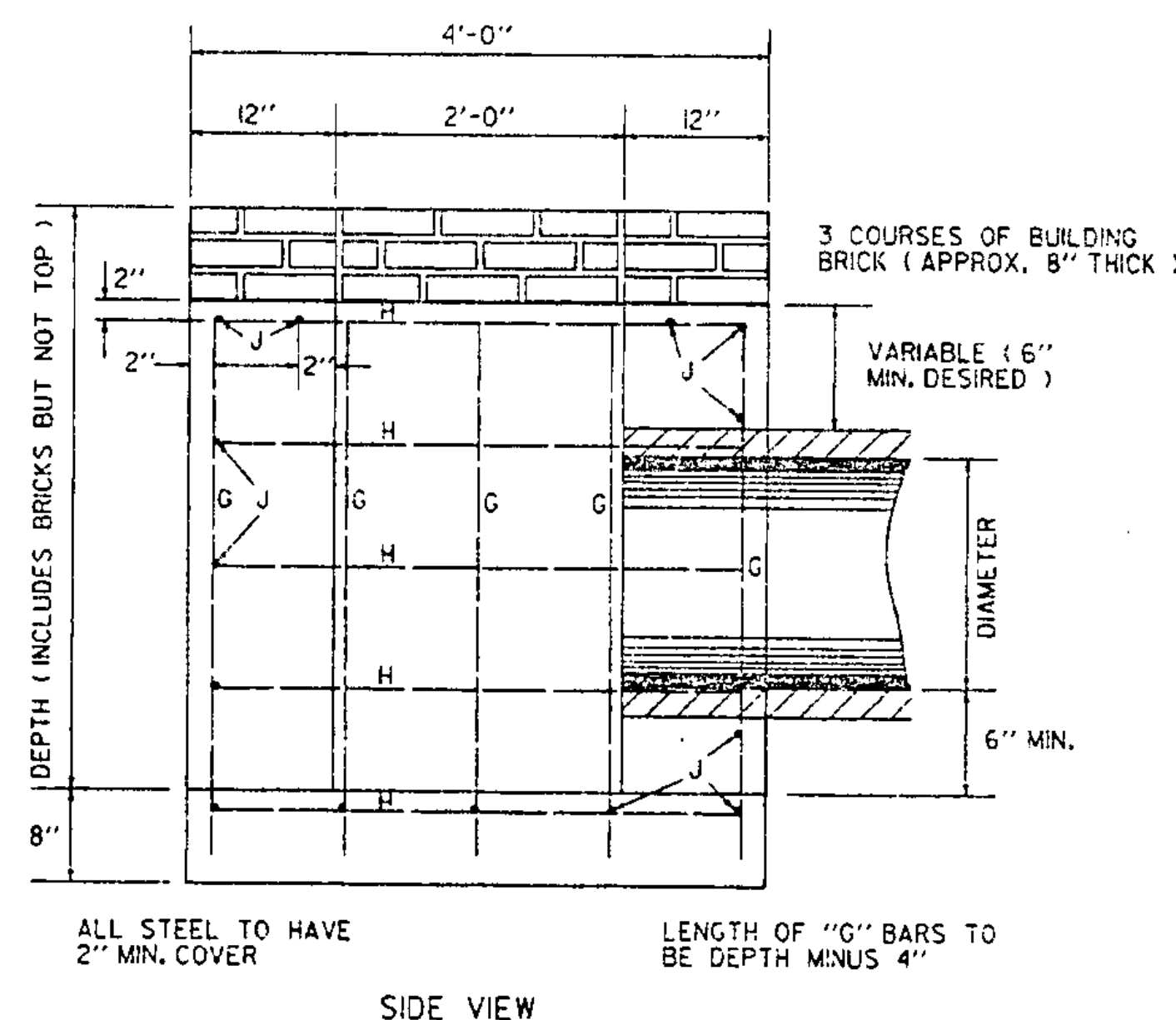


STEEL SCHEDULE FOR DROP INLET (BOTTOM SECTION ONLY)											
DEPTH	12" TO 24" DIAMETER 4' x 4' D.I.						30" DIAMETER 4' x 6' D.I.				
	NO.	J	LENGTH	NO.	H	LENGTH	NO.	J	LENGTH	NO.	G
3'-0"	12		3'-8"	13		3'-8"	15		2'-8"		
3'-6"	12		3'-8"	13		3'-8"	15		3'-2"		
4'-0"	14		3'-8"	15		3'-8"	15		3'-8"		
4'-6"	14		3'-8"	15		3'-8"	15		4'-2"		
5'-0"	16		3'-8"	17		3'-8"	15		4'-8"		
5'-6"	16		3'-8"	17		3'-8"	15		5'-2"		
6'-0"	16		3'-8"	19		3'-8"	15		5'-8"		

DEPTH	36" DIAMETER 4' x 6' D.I.					
	NO.	J	LENGTH	NO.	H	LENGTH
5'-0"	14		5'-8"	19		3'-8"
5'-6"	14		5'-8"	19		3'-8"
6'-0"	16		5'-8"	21		3'-8"

BRICKS ARE INCLUDED IN CONCRETE QUANTITIES IN CHART

DEPTH	12"-24" DIA.		30" DIA.		36" DIA.	
	CONC BY C.Y.	STEEL	CONC BY C.Y.	STEEL	CONC BY C.Y.	STEEL
3'-0"	1.73	138				
3'-6"	1.95	145				
4'-0"	2.17	168				
4'-6"	2.40	176	3.08	210		
5'-0"	2.62	199	3.37	238	3.29	238
5'-6"	2.84	207	3.67	247	3.59	247
6'-0"	3.06	230	3.97	276	3.89	276



TO FIND VOLUME OF CONCRETE FOR THE ENTIRE STRUCTURE, ADD THE VOLUME FOR THE TOP USED, TO THE VOLUME IN THIS TABLE. FOR VOLUME IN TOP, SEE SHEETS D-9, D-10.

ALL REINFORCING STEEL TO BE NO. 5 Ø DEFORMED BARS, EVENLY SPACED, WITH A MAXIMUM SPACING OF 12" CENTER TO CENTER.

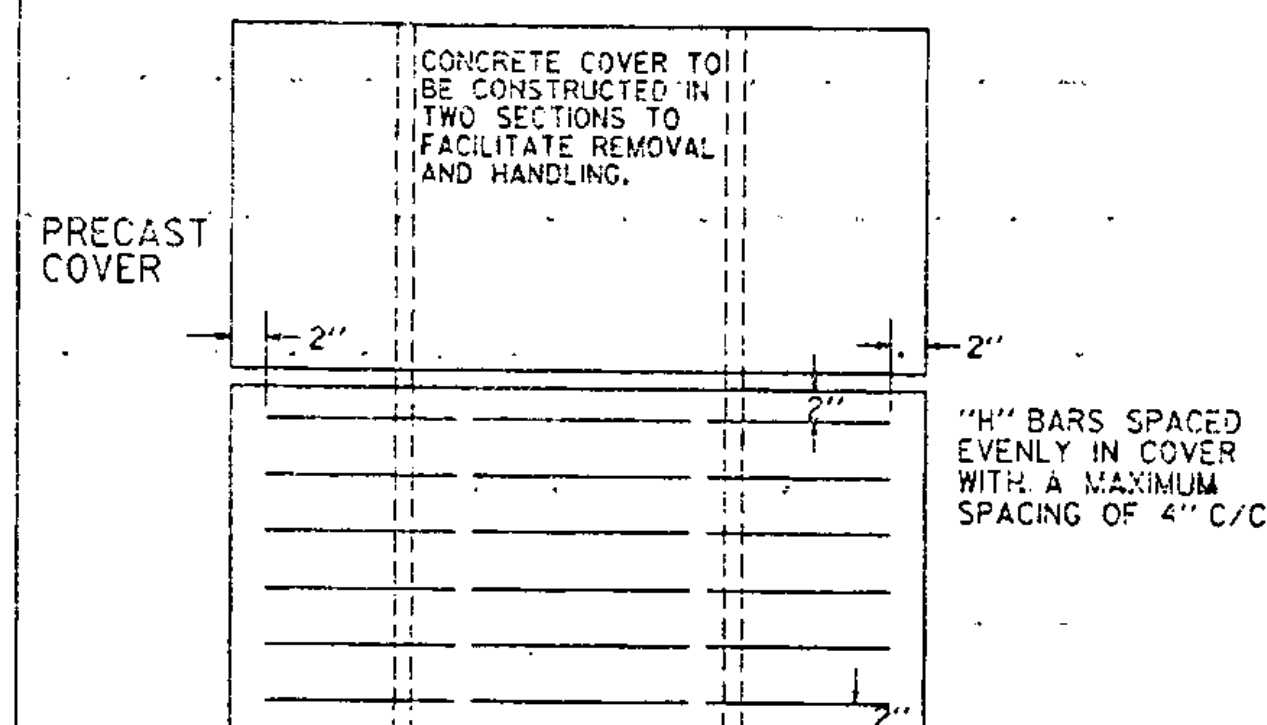
DROP INLET TO BE CONSTRUCTED IN ACCORDANCE WITH STRUCTURAL CONCRETE, SECTION 501.

FURNISHING AND LAYING OF BRICKS FOR ADJUSTING ELEVATION OF GRATE, SHALL BE INCLUDED IN UNIT BID PRICE FOR CONCRETE, CLASS B, PAY ITEM 501.25, AND THEIR VOLUME TO BE INCLUDED IN THE FINAL QUANTITIES.

MORTAR, TYPE II, TO BE USED FOR JOINT FILLER AND LAYING OF BRICK.

FOR PIPES OF 30" OR MORE IN DIAMETER, ALLOWANCE SHALL BE MADE FOR THE OPENING IN COMPUTING CONCRETE VOLUMES. THIS DEDUCTION WILL BE BASED ON THE RATED DIAMETER OF THE PIPE USED, WITH THE SAME DEDUCTION FOR CONCRETE AND METAL PIPE.

REINFORCED CONCRETE DROP INLET WITH PRECAST COVER
DROP INLET AND COVER TO BE CONSTRUCTED IN ACCORDANCE WITH STRUCTURAL CONCRETE, SECTION 501

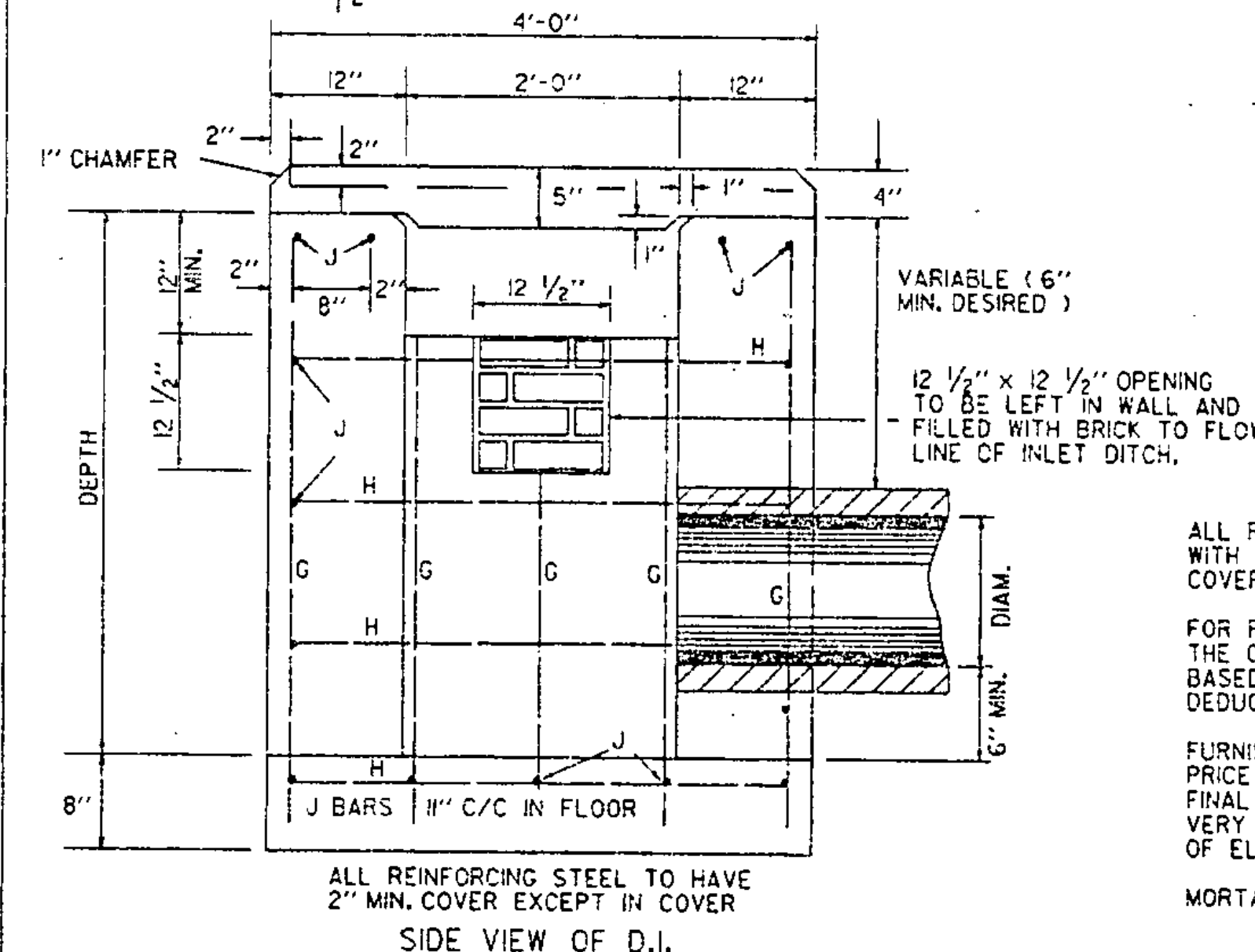


DEPTH	12" TO 24" DIAMETER						30" DIAMETER					
	NO.	J	LENGTH	NO.	H	LENGTH	NO.	J	LENGTH	NO.	H	LENGTH
2'-0"	15		2'-4"	31		3'-8"						
2'-6"	15		2'-10"	33		3'-8"						
3'-0"	15		3'-4"	36		3'-8"						
3'-6"	15		3'-10"	36		3'-8"						
4'-0"	15		4'-4"	39		3'-8"						
4'-6"	15		4'-10"	39		3'-8"						
5'-0"	15		5'-4"	42		3'-8"						
5'-6"	15		5'-10"	42		3'-8"						
6'-0"	15		6'-4"	45		3'-8"						

DEPTH	36" DIAMETER					
	NO.	J	LENGTH	NO.	H	LENGTH
4'-0"	16		4'-4"	14		4'-8"
4'-6"	16		4'-10"	14		4'-8"
5'-0"	16		5'-4"	16		4'-8"
5'-6"	16		5'-10"	16		4'-8"
6'-0"	16		6'-4"	18		4'-8"

NOTE: SPACING OF BARS WILL VARY SLIGHTLY WITH SIZE OF PIPE USED. CUT "G" BARS IN THROAT AREA TO ELEVATION AT BOTTOM OF BRICKS

TOP VIEW OF D.I.



CONCRETE AND STEEL QUANTITIES FOR DROP INLETS OF VARIOUS DEPTHS											
DEPTH	12" 15" 18"		24"		30"		36"				
	CONC BY C.Y.	STEEL LBS.	CONC BY C.Y.	STEEL LBS.	CONC BY C.Y.	STEEL LBS.	CONC BY C.Y.	STEEL LBS.	CONC BY C.Y.	STEEL LBS.	CONC BY C.Y.
2'-0"	1.4	155									
2'-6"	1.6	171	1.6	171							
3'-0"	1.8	190	1.8	190							
3'-6"	2.0	198	2.0	198	2.1	204					
4'-0"	2.3	217	2.3	217	2.3	221	2.5	248			
4'-6"	2.5	225	2.5	225	2.6	237	2.7	256			
5'-0"	2.7	244	2.7	244	2.8	254	3.0	282			
5'-6"	2.9	252	2.9	252	3.0	270	3.2	290			
6'-0"	3.2	271	3.2	271	3.3	287	3.5	316			

ALL REINFORCING BARS SHALL BE NO. 5 Ø DEFORMED BARS, EVENLY SPACED, WITH A MAXIMUM SPACING OF 12" CENTER TO CENTER, EXCEPT IN THE COVER, WHERE THE MAXIMUM SPACING IS 4" CENTER TO CENTER.

FOR PIPES OF 30" OR MORE IN DIAMETER, ALLOWANCE SHALL BE MADE FOR THE OPENING IN COMPUTING CONCRETE VOLUMES. THIS DEDUCTION WILL BE BASED ON THE RATED DIAMETER OF THE PIPE USED, WITH THE SAME DEDUCTION FOR CONCRETE AND METAL PIPE.

FURNISHING AND LAYING OF BRICKS, SHALL BE INCLUDED IN THE UNIT BID PRICE FOR CONCRETE, CLASS B, AND THEIR VOLUME TO BE INCLUDED IN THE FINAL QUANTITIES. ONLY SUFFICIENT MORTAR TO BE USED TO PROVIDE A VERY LIGHT BOND TO ALLOW WITH EASE, FUTURE REMOVAL, FOR CORRECTION OF ELEVATION OF FLOW LINE.

MORTAR, TYPE II, TO BE USED FOR JOINT FILLER AND LAYING OF BRICK.

REVISIONS AND CORRECTIONS
DEC. 6, 1971 - ORIGINAL APPROVAL
JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.

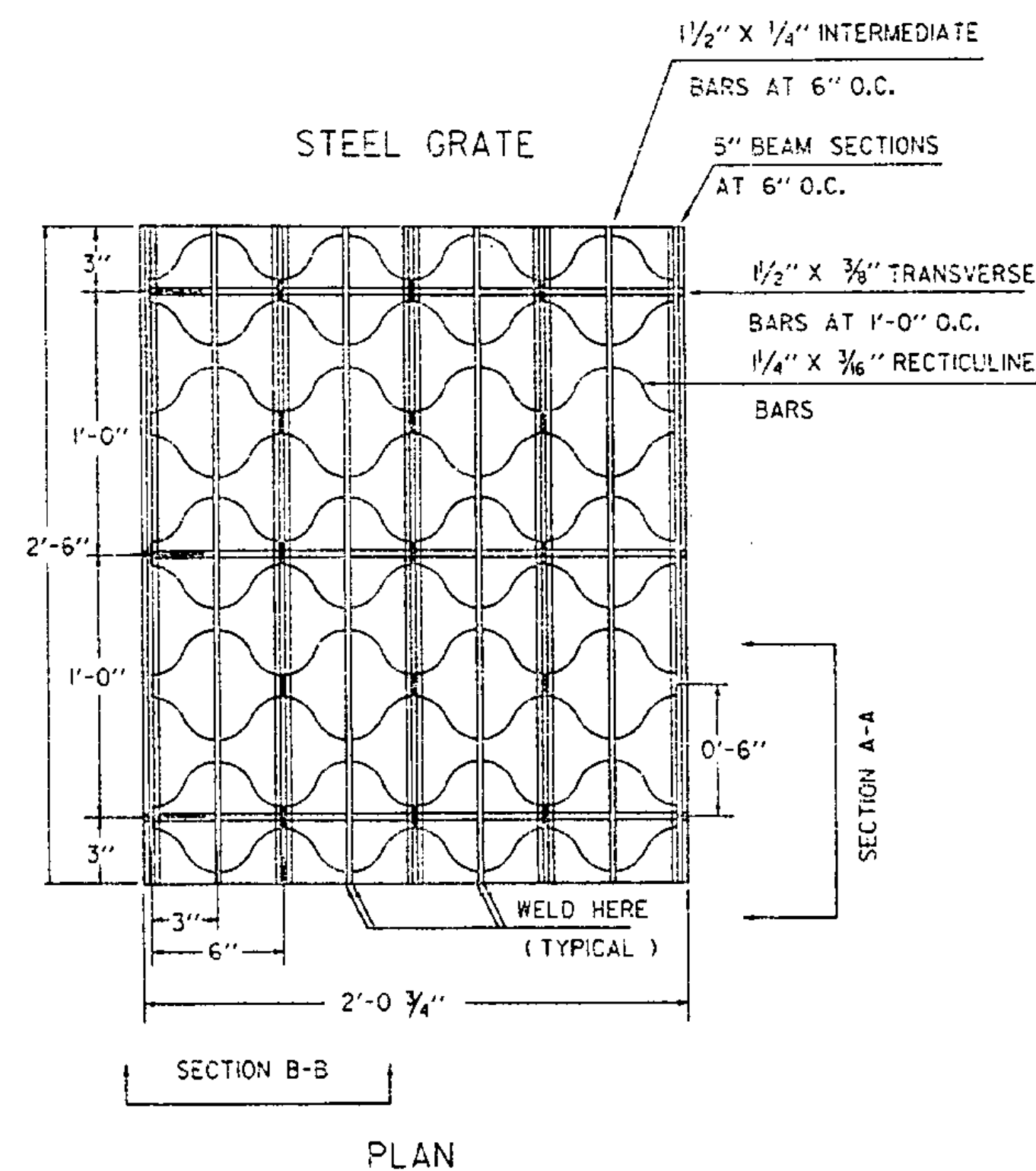
APPROVED
APPROVED FOR THIS PROJECT AND/OR DESIGN IMPLEMENTATION
FINAL APPROVAL PENDING.

Stephen A. McAllister, P.E.
DIRECTOR OF ENGINEERING
John M. Murphy, P.E.
DESIGN ENGINEER

REINFORCED CONCRETE DROP INLET WITH PRECAST COVER
REINFORCED CONCRETE DROP INLET WITH GRATE (BOTTOM SECTION)
(SEE SHEETS D-9, D-10, AND D-11 FOR TOP SECTION)



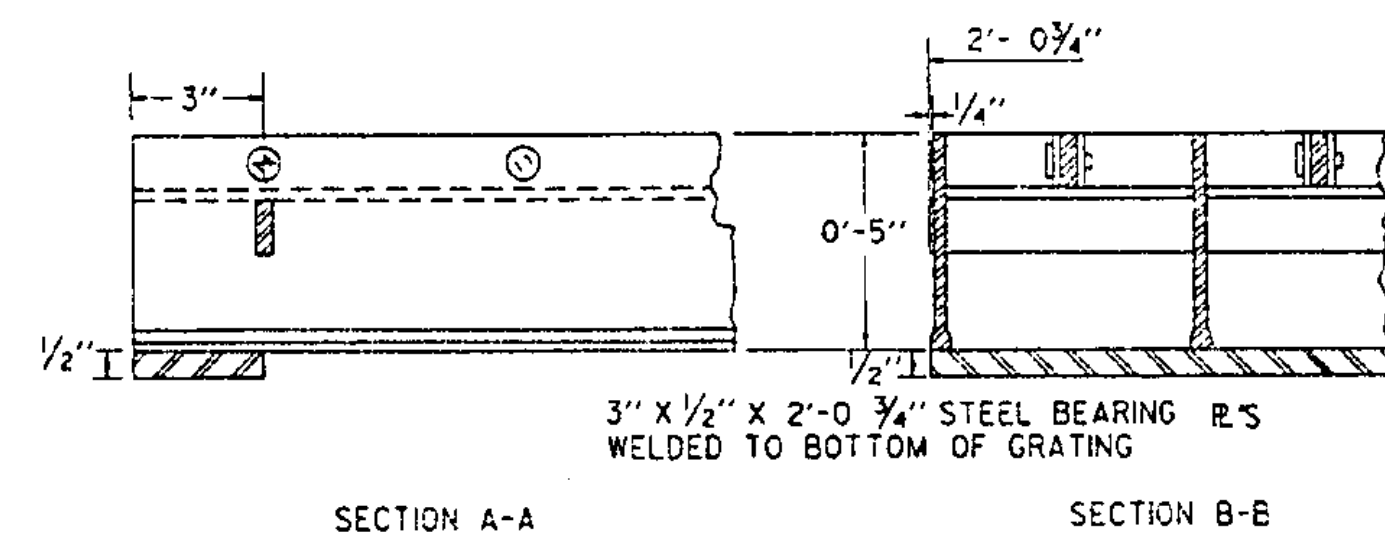
STANDARD
D-8



GRATE SIZE SINGLE 24 3/4" X 30"
DOUBLE 24 3/4" X 54"

WEIGHT 95 LBS OR MORE
GRATES SHALL BE CAPABLE OF SUPPORTING H-20 (32,000 LB. AXLE LOAD) INCLUDING 30% IMPACT.

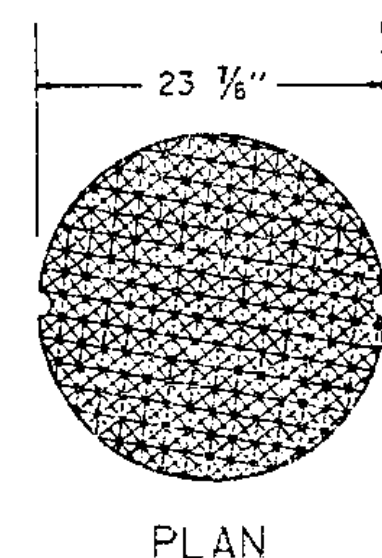
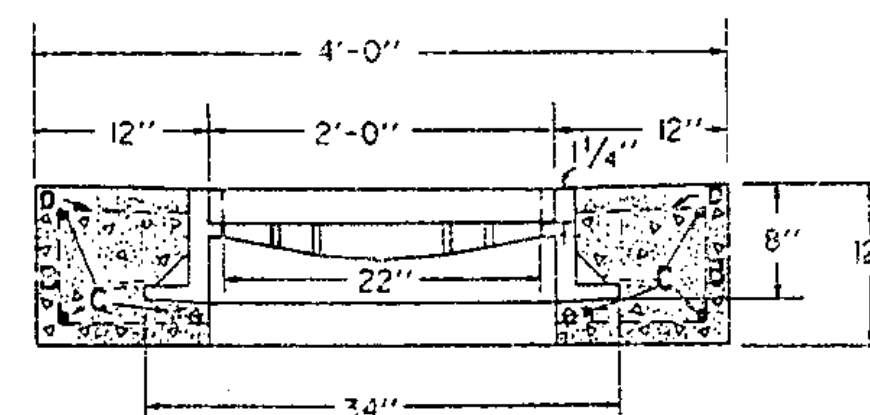
UNIT STRESSES (LBS PER SQ. IN.)	18,000	20,000
MAIN BAR PARALLEL TO TRAFFIC H-20	49"	53"
MAIN BAR PERPENDICULAR TO TRAFFIC H-20	39"	42"



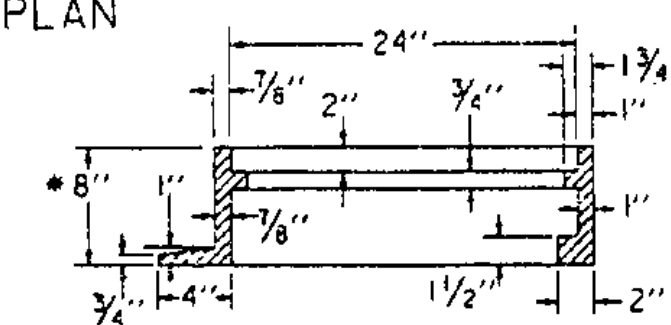
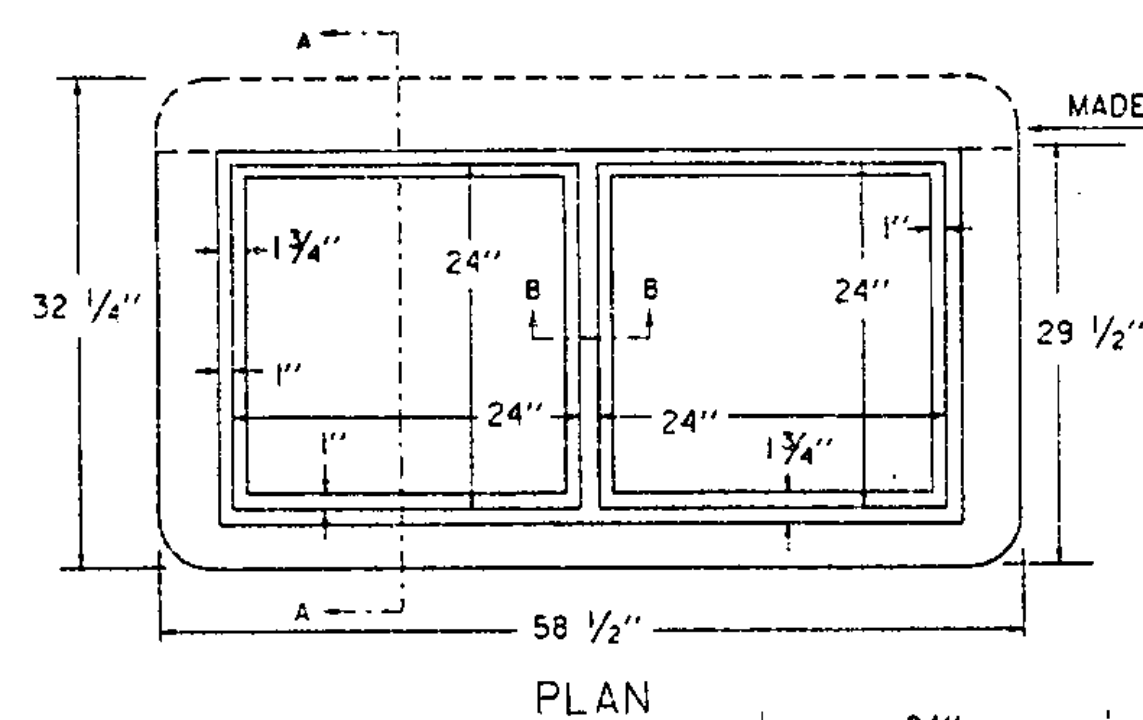
CAST IRON COVER WITH FRAME

BAR	NO.	LENGTH
B	4	8" 3'-8" 8"
C	6	3'-8" STRAIGHT
D	4	3'-8" STRAIGHT

ALL REINFORCING STEEL TO BE NO. 5 DEFORMED BARS

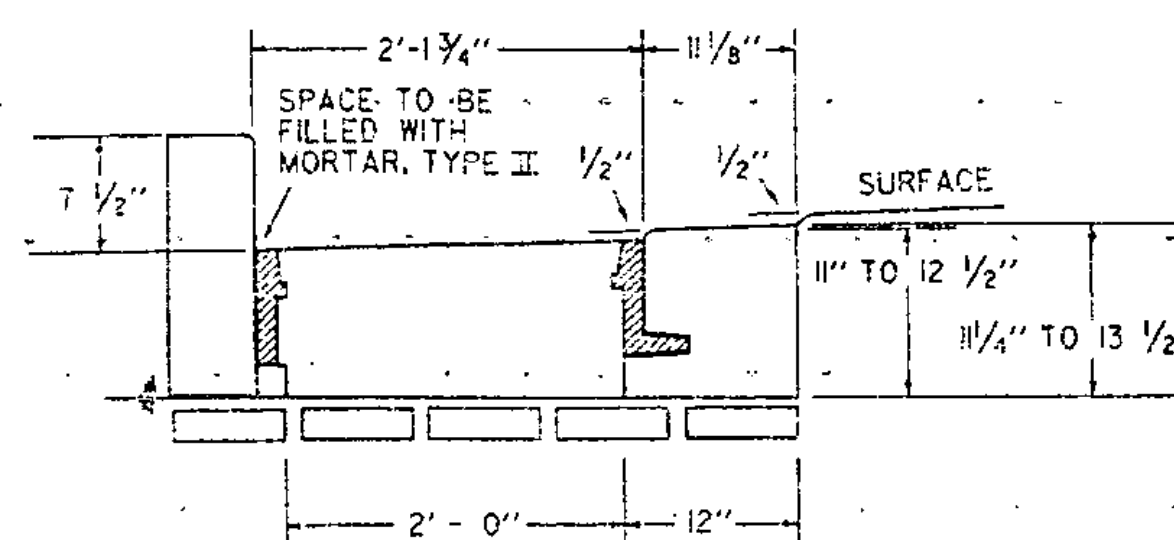


GENERAL NOTES:
WEIGHT OF FRAME AND COVER = 425 LBS.



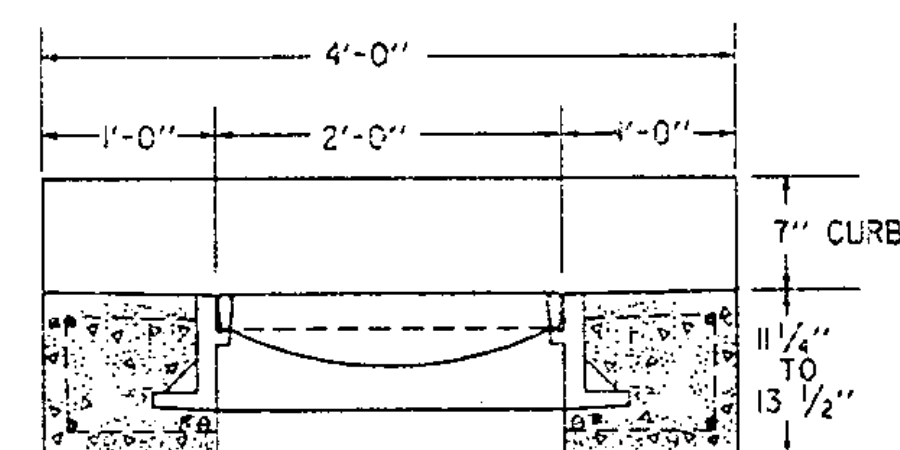
RECTANGULAR CAST IRON FRAME FOR TWO 24" SQUARE CAST IRON GRATES

CAST IRON GRATE WITH FRAME



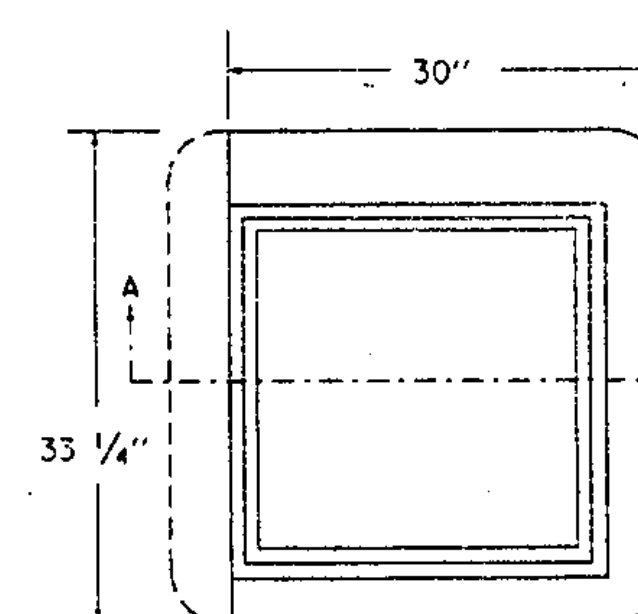
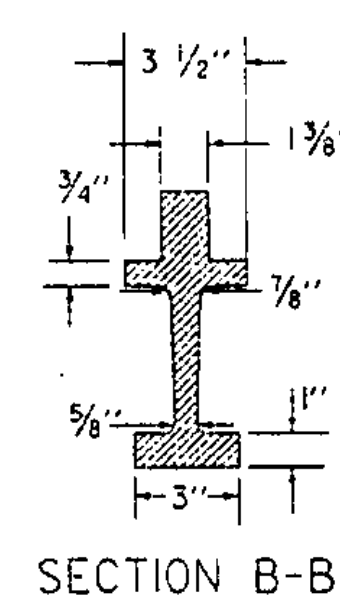
ELEVATION OF REINFORCED CONCRETE DROP INLET WITH VERTICAL GRANITE CURB AND 3 FLANGE CAST IRON FRAME FOR CAST IRON GRATE

SEE STANDARD D-9 FOR CONCRETE VOLUME, REINFORCING STEEL SCHEDULE, AND CURB JOINT DETAIL.



ELEVATION

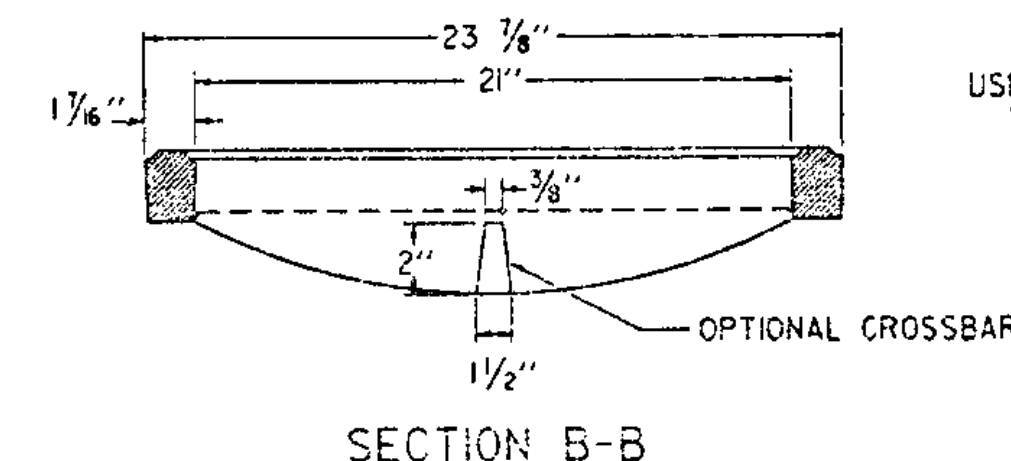
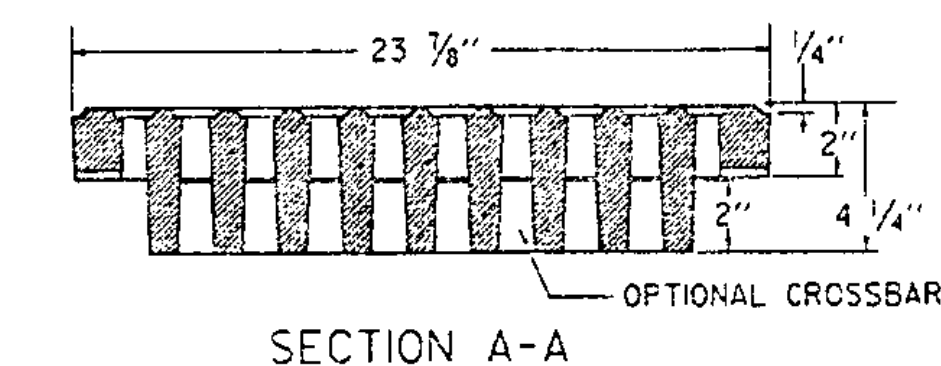
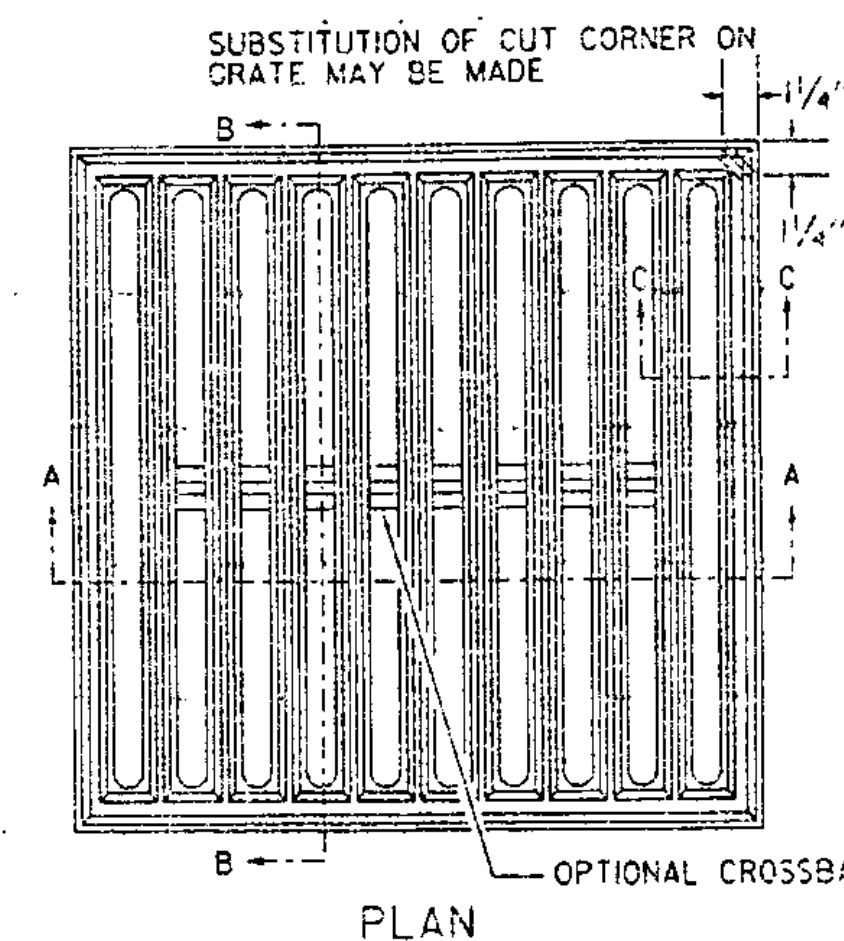
WEIGHT OF 3 FLANGED FRAME AND GRATE	
GRATE	220 LBS
FRAME	260 LBS
TOTAL	480 LBS



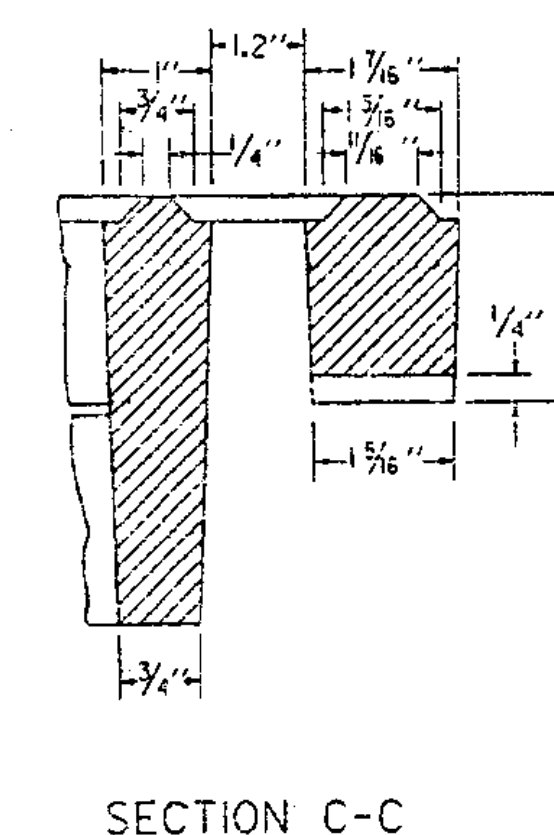
SQUARE CAST IRON FRAME FOR CAST IRON GRATE TYPE A

* NOTE: FRAME DEPTH TO BE "6" WHEN USED IN CONJUNCTION WITH DROP INLET DETAILED ON STANDARD D-6.

CAST IRON GRATE, TYPE A



USE OF THE TYPE A GRATE IS PROHIBITED WHERE BICYCLE TRAFFIC IS EXPECTED



THIS FRAME TO BE PLACED IN DROP INLET TOP BEFORE CONCRETE IS POURED.
4 FLANGES UNLESS OTHERWISE INDICATED. FRAMES TO BE FURNISHED WITH 3 FLANGES WHEN USED IN CONJUNCTION WITH CURB OR AS DIRECTED BY THE ENGINEER.

REVISIONS AND CORRECTIONS

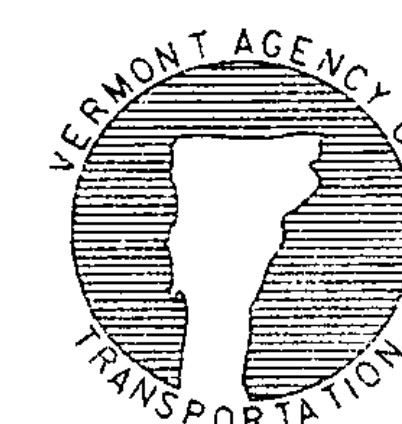
DEC. 6, 1971 - ORIGINAL APPROVAL
APR. 25, 1972 - CAST IRON COVER CHANGED FROM SQUARE TO CIRCULAR
SEPT. 4, 1980 - OPTIONAL CROSSBAR ADDED TO A GRATE; NOTE ADDED TO A GRATE FRAME DETAIL
AUG. 25, 1981 - NOTE ADDED RESTRICTING USE OF TYPE A GRATE
JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.

APPROVED

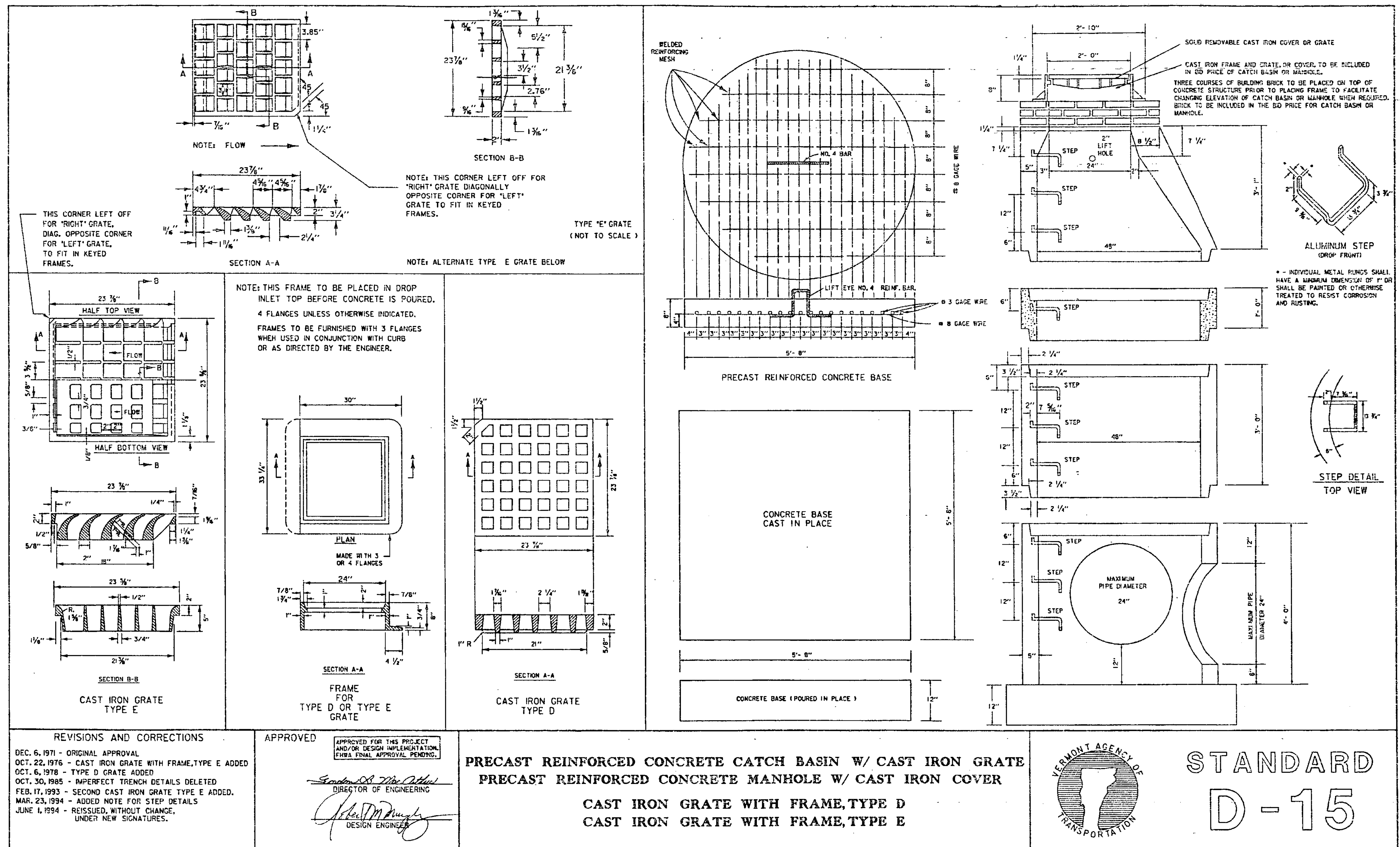
APPROVED FOR THIS PROJECT AND/OR DESIGN IMPLEMENTATION
FHWA FINAL APPROVAL PENDING

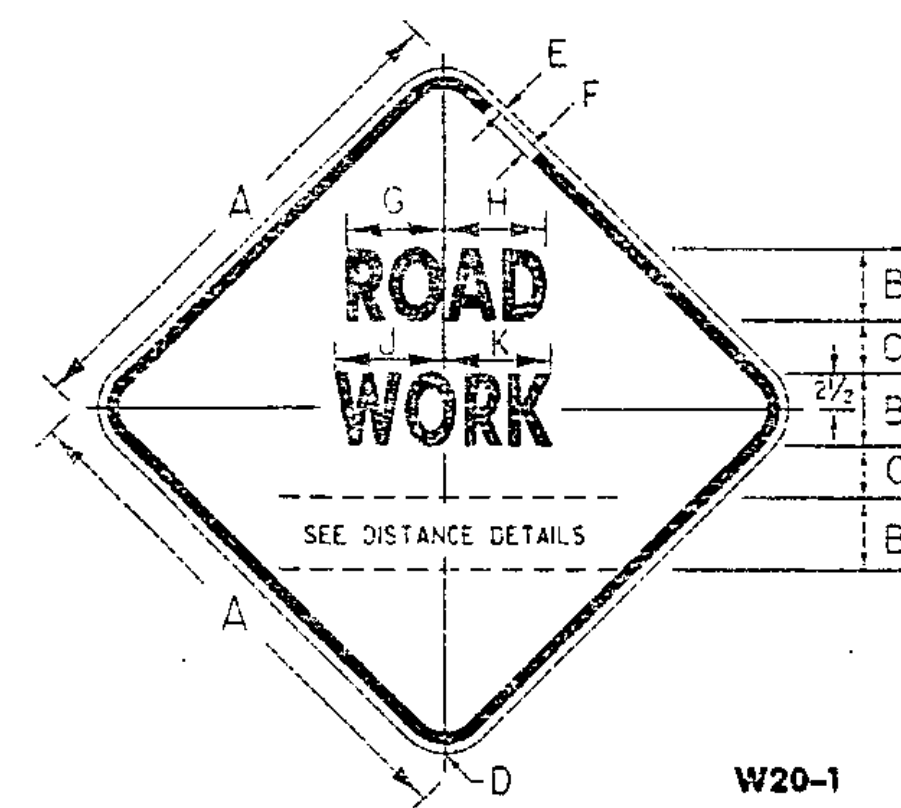
Robert M. Murphy, PE
DIRECTOR OF ENGINEERING
Robert M. Murphy, PE
DESIGN ENGINEER

STEEL GRATE CAST IRON GRATE TYPE A CAST IRON COVER

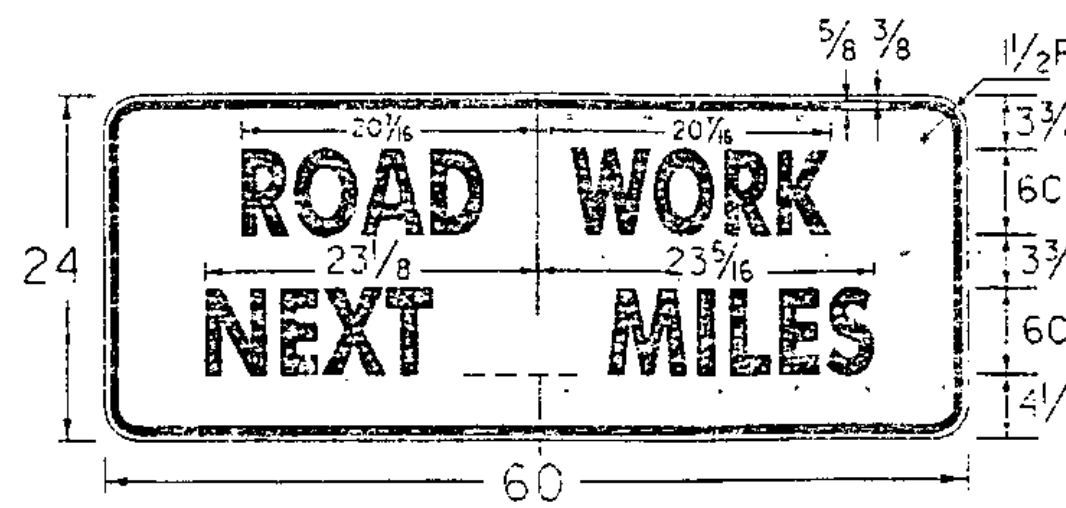
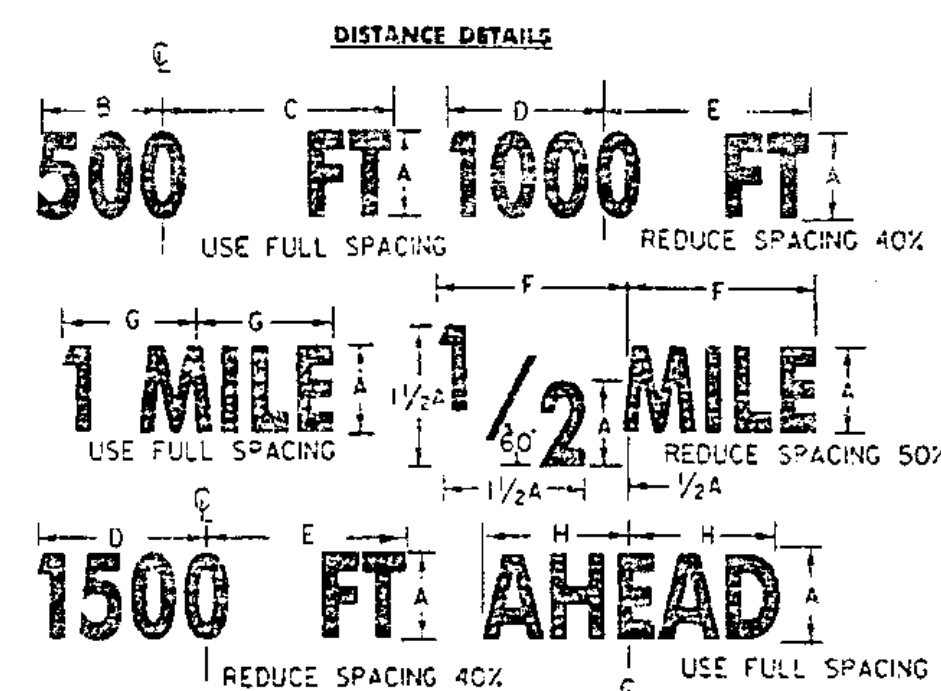


STANDARD
D-11

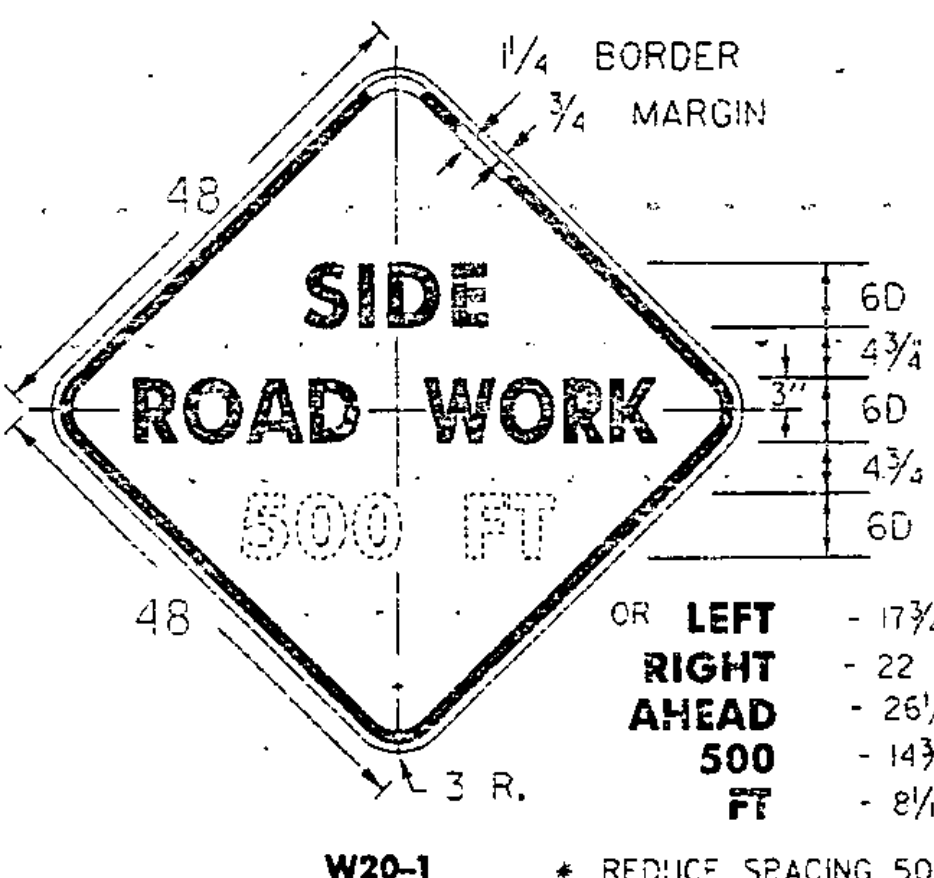




W20-1



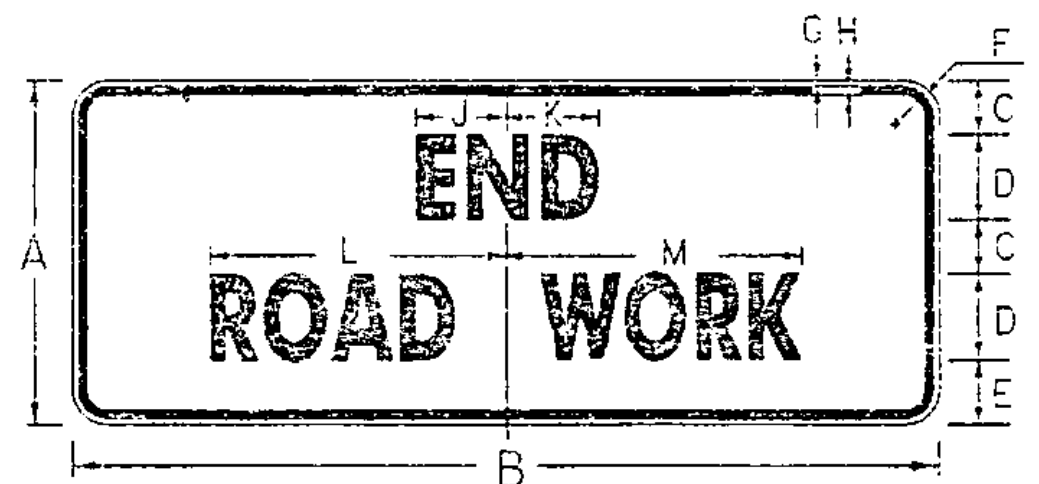
THIS SIGN TO BE USED WHEN PROJECT LENGTH EXCEEDS 2 MILES OR AS REQUESTED BY THE RESIDENT ENGINEER. SHOW MILEAGE TO NEAREST 1/4 MILE USING FRACTIONS, NOT DECIMALS. HAND LETTERING OF MILEAGE WILL NOT BE ALLOWED. (ALL DIMENSIONS SHOWN IN INCHES)



W20-1 * REDUCE SPACING 50%

DIMENSIONS (INCHES)										
STD.	A	B	C	D	E	F	G	H	J	K
STD.	48	7C	4 3/4	3" R.	3/4	1 1/4	9 1/2	9 1/2	10 1/2	10 3/8
URBAN	36	5C	3 3/8	2 1/4 R.	3/8	7/8	6 1/8	7 1/8	7 1/2	7 3/8

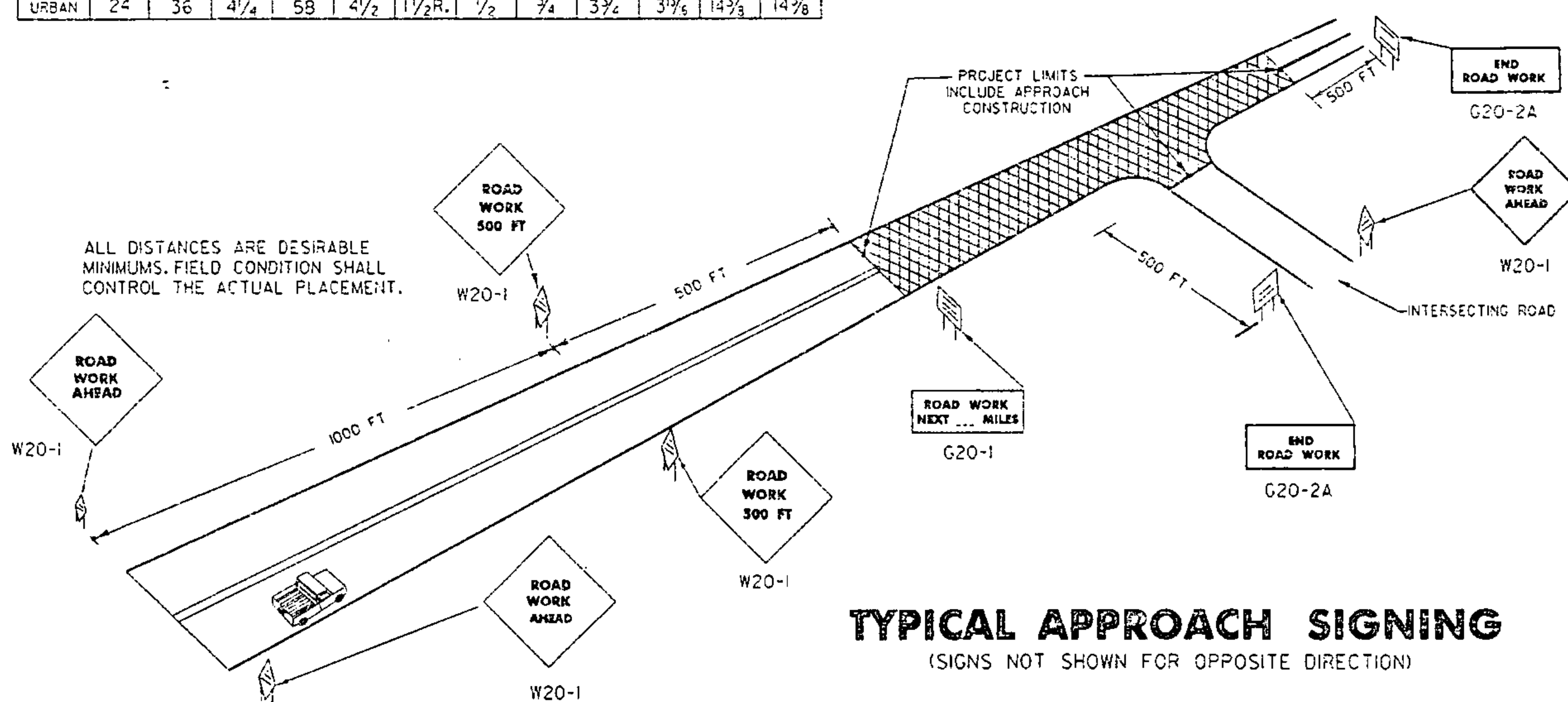
DIMENSIONS (INCHES)							
A	B	C	D	E	F	G	H
5D	10 3/4	10 3/4	11 1/4	11 1/4	11 1/4	9 1/2	10 3/8
6C	10 3/4	10 3/4	11 1/4	12	12 1/2	9 1/4	10 1/2
7C	12	12 3/8	13 1/8	14	14 3/8	10 3/8	12 1/4
8D	16 1/4	17 1/4	17	18	18	14 3/8	17 3/8



G20-2A

DIMENSIONS (INCHES)												
STD.	A	B	C	D	E	F	G	H	J	K	L	M
STD.	24	60	3 3/4	6C	4 1/2	1 1/2 R.	3/8	3/8	6 1/4	6 3/8	20 1/8	20 1/8
URBAN	24	36	4 1/4	5B	4 1/2	1 1/2 R.	1/2	3/4	3 3/4	3 3/8	14 3/8	14 3/8

(ALL DIMENSIONS SHOWN IN INCHES UNLESS OTHERWISE NOTED)



TYPICAL APPROACH SIGNING
(SIGNS NOT SHOWN FOR OPPOSITE DIRECTION)

NOTES

THE SIGNS SHOWN ON THIS SHEET ARE INTENDED FOR USE IN PROVIDING ADVANCE WARNING AND INFORMATION ON CONSTRUCTION PROJECTS OVER WHICH TRAFFIC WILL BE MAINTAINED. WHEN ADDITIONAL APPROACH SIGNS OR OTHER TYPES OF ADVANCE SIGNING OR CONTROL ARE NECESSARY, THE PLANS AND/OR THE SPECIFICATIONS FOR THAT PROJECT WILL GIVE THE DETAILS OF THE SIGNS AND DEVICES REQUIRED. FOR ON-PROJECT CONSTRUCTION SIGNS, REFER TO APPROPRIATE STANDARD SHEETS.

APPLICATION OF STANDARDS

SINCE IT IS NOT POSSIBLE TO PRESCRIBE DETAILED STANDARDS OF APPLICATION FOR ALL OF THE SITUATIONS THAT MAY CONCEIVABLY ARISE ON A CONSTRUCTION PROJECT, REFERENCE SHALL BE MADE TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" FOR THE PRINCIPLES, PROCEDURES, AND STANDARDS THAT WILL BE REQUIRED IN CONNECTION WITH ADVANCED WARNING AND ON-PROJECT CONSTRUCTION SIGNS AND BARRICADES. THE SIGNS SHOWN IN E-101 AND E-102 REPRESENT A SAMPLE OF THOSE MORE COMMONLY USED.

LOCATION

THE SIGNS SHALL BE LOCATED AS DETAILED ON THIS SHEET OR AS OTHERWISE SHOWN ON THE PLANS. THEY SHALL APPEAR AT EACH END OF THE HIGHWAY UNDER CONSTRUCTION AND ON ALL INTERSECTING PUBLIC HIGHWAYS. THE EXACT PLACEMENT OF ANY SIGN WILL DEPEND UPON THE ALIGNMENT INTENDED TO INDICATE THE SEQUENCE TO BE FOLLOWED, AND THE APPROPRIATE SPACING TO BE OBSERVED. THE ENGINEER SHALL DETERMINE THE EXACT LOCATIONS.

DESIGN

THE DESIGN OF THE SIGNS SHALL CONFORM WITH THE DETAILS SHOWN ON THIS SHEET AND WITH THE STANDARDS PRESCRIBED IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

MATERIALS

THE SIGN BASE MATERIAL USED FOR THE SIGNS ON THIS SHEET MAY BE ANY OF THE FOLLOWING, WITH MINIMUM THICKNESS AS NOTED:
FLAT SHEET ALUMINUM 0.125 INCHES
HIGH DENSITY OVERLAPED PLYWOOD 1/2, 5/8, OR 3/4 INCHES
GALVANIZED SHEET STEEL 12 GAGE

REFLECTORIZATION

ALL REFLECTORIZED MATERIAL SHALL CONSIST OF TYPE 11B OR TYPE 111 SHEETING.

COLORS

THE COLORS SHALL CONFORM WITH THE STANDARD COLORS ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AND APPROVED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION. COLORS SHOWN ON THIS SHEET CONSIST OF BLACK TEXT AND BORDER ON A REFLECTORIZED ORANGE BACKGROUND.

INSTALLATION

THE SIGNS SHALL BE ERECTED BEFORE THE START OF ANY WORK AND SHALL BE COVERED UNTIL WORK COMMENCES. DURING PERIODS OF INACTIVITY, OR UPON COMPLETION OF THE WORK, SIGNS MAY BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMANLIKE MANNER ON POSTS SET SECURELY IN THE GROUND. THE BOTTOM OF A SIGN SHALL BE AT LEAST 7 FEET ABOVE THE EDGE OF PAVEMENT, AND THE NEAREST EDGE OF A SIGN SHALL BE AT LEAST 6 FEET OUTSIDE THE SHOULDER POINT, 4 FEET OUTSIDE GUARD RAIL, OR 2 FEET OUTSIDE CURBING, OR SIDEWALK. THE INSTALLATION OF SIGNS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER. IN URBAN AREAS, THE BOTTOM OF THE SIGN SHALL BE AT LEAST 7 FEET ABOVE THE SIDEWALK.

MAINTENANCE

SIGNS SHALL BE MAINTAINED IN A CLEAN AND LEGIBLE CONDITION SATISFACTORY TO THE ENGINEER. THEY SHALL BE COMPLETELY VISIBLE TO APPROACHING TRAFFIC AT ALL TIMES. THEY SHALL BE KEPT PLUMB AND LEVEL, AND ALWAYS PRESENT A NEAT APPEARANCE. DAMAGED, DEFACED, OR DIRTY SIGNS SHALL BE REPAIRED, CLEANED OR REPLACED AS ORDERED BY THE ENGINEER.

NOTES CONT.

GENERAL

THE COST OF FURNISHING, INSTALLING, MAINTAINING AND REMOVING ALL CONSTRUCTION APPROACH SIGNS WILL BE CONSIDERED SUBSIDIARY WORK PERTAINING TO THE PROJECT AS A WHOLE AND SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR VARIOUS ITEMS INVOLVED IN THE CONTRACT. DURING ALL PHASES OF CONSTRUCTION THE REQUIREMENTS SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL BE MET. WHEN THE PROJECT IS CLOSED DOWN FOR TEMPORARY PERIODS THE SIGNS SHALL BE COVERED IN A WORKMANLIKE MANNER.

SIGN COVERS

SIGN COVERS SHALL CONSIST OF A PANEL PAINTED FLAT BLACK, THE SAME SIZE AS THE SIGN IT COVERS. THE PANEL SHALL BE OF WOOD, PLYWOOD, HARDBOARD OR ANY MATERIAL SATISFACTORY TO THE ENGINEER. NO MATERIAL WILL BE APPROVED THAT WILL DETERIORATE BY EXPOSURE TO THE WEATHER DURING THE PROJECT. MOUNTING OF THE PANEL SHALL BE DONE IN SUCH A WAY AS NOT TO DAMAGE THE SIGN FACE MATERIAL.

CONTRACTORS SHALL COORDINATE THEIR SIGNING ACTIVITIES WITH OTHER CONTRACTORS WITHIN THE PROJECT LIMITS, AS DIRECTED BY THE REGIONAL CONSTRUCTION ENGINEER.

SIGN POSTS

WHERE CONSTRUCTION SIGN INSTALLATIONS ARE NOT PROTECTED BY GUARD RAIL OR OTHER APPROVED TRAFFIC BARRIERS, THE POSTS ON WHICH THE SIGNS ARE MOUNTED SHALL BE YIELDING METAL POSTS AS DESIGNATED IN THE E SERIES OF STANDARD DRAWINGS OR YIELDING WOODEN POSTS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:

WOODEN POSTS ARE ACCEPTABLE FOR USE WITH CONSTRUCTION SIGNS. THESE POSTS SHALL HAVE A UNIFORM CROSS-SECTION AND SHALL BE MADE FROM GRADE 2, AIR-DRIED SOUTHERN YELLOW PINE OR ANOTHER EQUIVALENT SOFTWOOD. AN ACCEPTABLE EQUIVALENT SOFTWOOD SHALL HAVE AN EXTREME FIBER IN BENDING "F" DESIGN VALUE NOT TO EXCEED 1400 psi AND HORIZONTAL SHEAR "H" DESIGN VALUE NOT TO EXCEED 90 psi SPECIFICATION "DESIGN VALUES FOR WOOD CONSTRUCTION" AND RELATED SUPPLEMENT, DATED 1986.

AS ESTABLISHED BY THE NATIONAL FOREST PRODUCTS ASSOCIATION IN THEIR NATIONAL DESIGN THE FOLLOWING ARE CONSIDERED TO BE ACCEPTABLE WOODEN POSTS:

- 4" X 4" (ACTUAL DIMENSIONS ARE 3.5" X 3.5")
A) ACCEPTABLE FOR SINGLE OR DUAL POSTS INSTALLATION WITH NO MODIFICATIONS.
B) ACCEPTABLE FOR THREE POSTS (OR MORE) INSTALLATION ONLY WHEN THERE ARE NO MORE THAN TWO POSTS IN A 7 FOOT PATH.
- 4" X 6" (ACTUAL DIMENSIONS ARE 3.5" X 5.5")
A) ACCEPTABLE FOR SINGLE POST INSTALLATIONS ONLY WHEN MODIFIED BY DRILLING TWO 1 1/2" DIAMETER HOLES, ONE AT 4" AND THE OTHER 18" ABOVE THE GROUND LINE AND PERPENDICULAR TO THE ROADWAY CENTERLINE.
B) ACCEPTABLE FOR MULTIPLE POSTS (TWO OR MORE) INSTALLATIONS ONLY WHEN MODIFIED AS ABOVE AND THE MINIMUM SPACING BETWEEN POSTS IS 7 FEET.
- 6" X 6" (ACTUAL DIMENSIONS ARE 5.5" X 5.5")
A) ACCEPTABLE FOR SINGLE POST INSTALLATIONS ONLY WHEN MODIFIED BY DRILLING TWO 2" DIAMETER HOLES, ONE AT 4" AND THE OTHER AT 18" ABOVE THE GROUND LINE AND PERPENDICULAR TO ROADWAY CENTERLINE.
B) ACCEPTABLE FOR MULTIPLE POST INSTALLATION ONLY WHEN MODIFIED AS ABOVE AND THE MINIMUM SPACING BETWEEN POSTS IS 7 FEET.
- 6" X 8" (ACTUAL DIMENSIONS ARE 5.5" X 7.5")
A) ACCEPTABLE FOR SINGLE POST INSTALLATIONS ONLY WHEN MODIFIED BY DRILLING TWO 3" DIAMETER HOLES, ONE AT 4" AND THE OTHER AT 18" ABOVE THE GROUND LINE AND PERPENDICULAR TO THE ROADWAY CENTERLINE.
B) ACCEPTABLE FOR MULTIPLE POST INSTALLATIONS ONLY WHEN MODIFIED AS ABOVE AND THE MINIMUM SPACING BETWEEN POSTS IS 7 FEET.

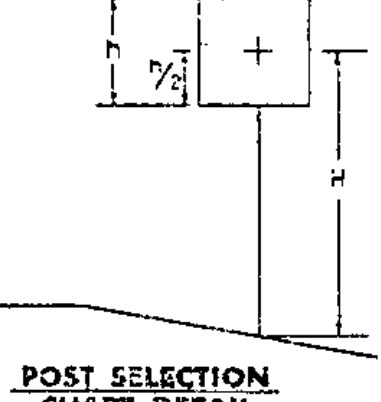
ADDITIONAL DESIGN CRITERIA

THE LONGER DIMENSION OF THE POST(S), SUCH AS THE 6" DIMENSION OF THE 4" X 6" POST, SHALL BE PLACED PARALLEL TO THE ROADWAY CENTERLINE. ALL WOODEN POSTS SHALL HAVE AN EMBEDMENT DEPTH OF 4 FEET.

NO CROSS-BRACING OR BACK-BRACING TO KEEP THE POSTS PLUMB WILL BE ALLOWED. CONCRETE FOUNDATIONS COLLARS OR SOIL BEARING PLATES ARE NOT PERMITTED. CONSTRUCTION SIGNS SHALL BE PLACED ON TWO OR MORE POSTS WHEN ANY OF THE FOLLOWING CONDITIONS GOVERN:

- THE SIGN WIDTH (HORIZONTAL DIMENSIONS FOR DIAMOND SHAPED SIGNS) EXCEEDS 3 1/2 FEET.
- THE EXPOSED SIGN AREA OF ANY SINGLE SIGN OR ASSEMBLY EXCEEDS 12 1/2 SQ. FEET.
- THE SV OF A SINGLE POST IS EXCEEDED. (SEE THE POST SELECTION CHART BELOW).

WOOD POST SELECTION CHART		
SIGN AREA (FT ²) X HEIGHT (FT) < SV (SELECTION VALUE)		
POST SIZE	SV	DESIGN CRITERIA:
4" X 4"	64	WIND SPEED = 60 MPH (10-YEAR MEAN OCCURRENCE INTERVAL)
4" X 6"	147	WIND PRESSURE = 13 psf
6" X 6"	216	ALLOWABLE BENDING STRESS
6" X 8"	389	



OTHER STDs. REQUIRED:

REVISIONS AND CORRECTIONS

MAY 26, 1989 - DATE OF ORIGINAL ISSUE
OCT 21, 1992 - REVISED WOOD POST REQUIREMENTS, ADDED SIGN DETAILS, & REVISED TITLE BLOCK
AUG 08, 1995 - MINOR NOTE REVISIONS

APPROVED

Stephen D. MacArthur
DIRECTOR OF ENGINEERING
David A. Ross
TRAFFIC AND SAFETY ENGINEER

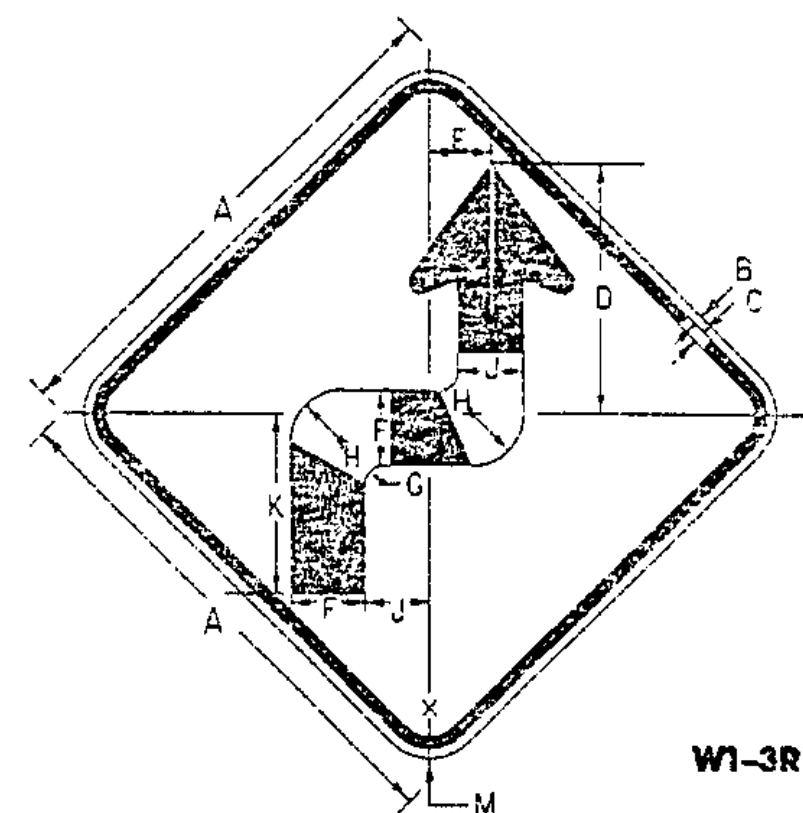
CONSTRUCTION APPROACH SIGNS



STANDARD
E-100

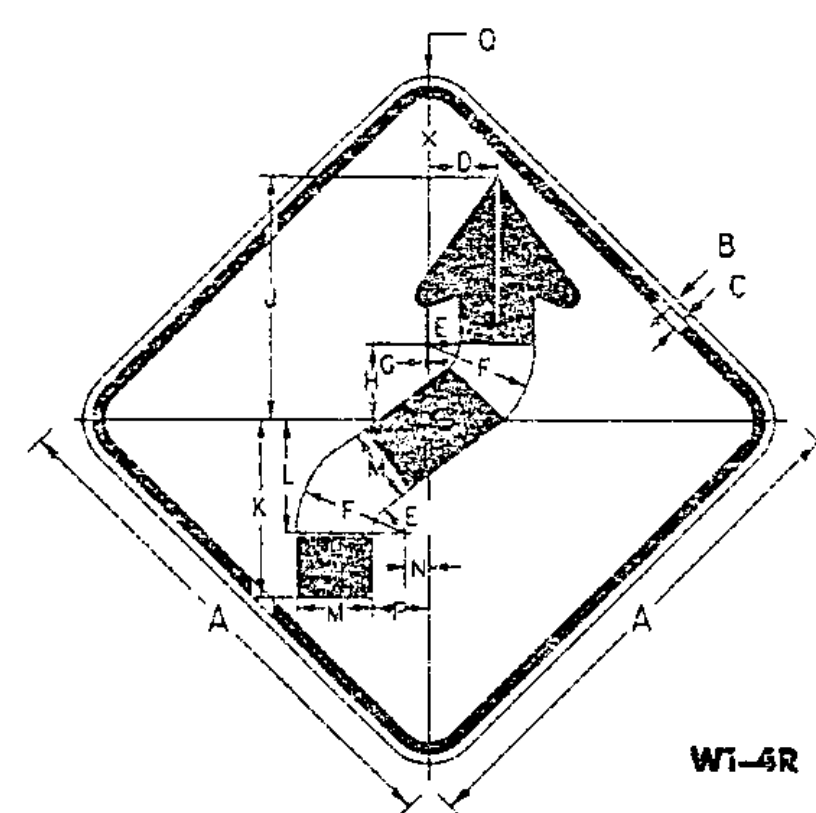
APPROVED FOR THIS PROJECT AND/OR DESIGN IMPLEMENTATION, FHWA FINAL APPROVAL PENDING.

\\traf\std\std100.dgn : std100.i



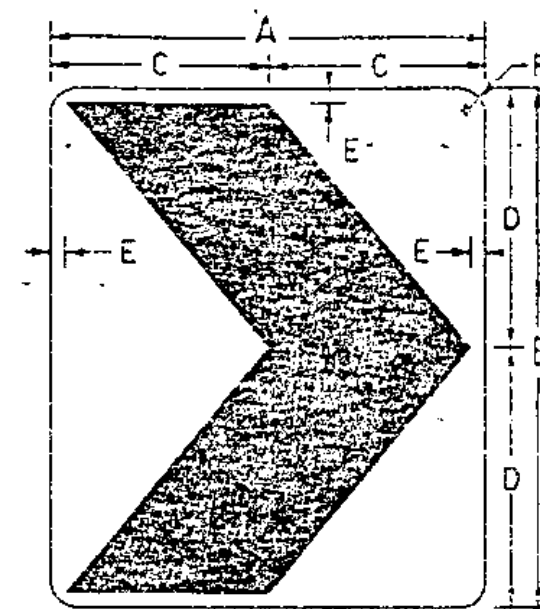
W1-3R

SIGN	DIMENSIONS (INCHES)												
	A	B	C	D	E	F	G	H	J	K	L	M	
STD. & MIN.	36	5/8	7/8	17/16	47/32	5 1/4	1 1/4	3 5/8	4 1/2	12 5/16	1 7/8	2 1/4	
SPECIAL	48	3/4	1 1/4	2 3/16	5 5/8	7	1 5/8	4 7/8	6	16 5/8	2 3/8	3	



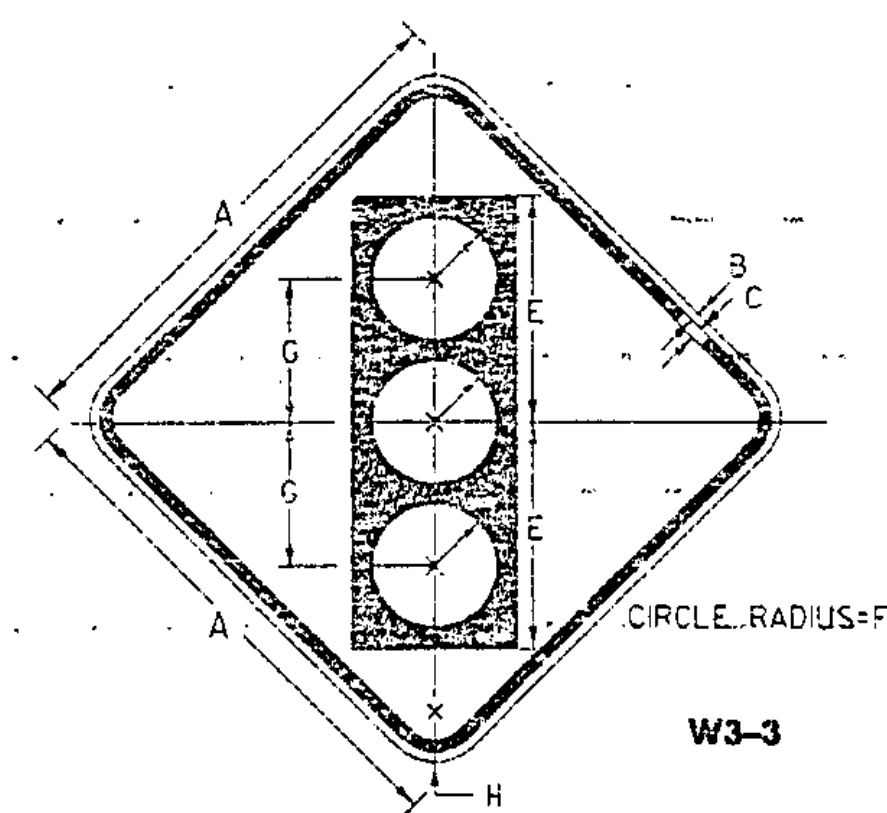
W1-4R

SIGN	DIMENSIONS (INCHES)															
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	O	
STD. & MIN.	36	5/8	7/8	4 1/32	2 1/4	7 1/2	5/32	5 1/4	16 3/8	12 3/8	7 7/8	5 1/4	1 1/8	3 3/8	2 1/4	
SPECIAL	48	3/4	1 1/4	6 5/8	3	10	3/16	7	22 1/2	16 1/2	10 1/2	7	2 1/4	5 1/4	3	



W1-8

SIGN	DIMENSIONS (INCHES)					
	A	B	C	D	E	F
STD.	18	24	9	12	3/4	1 1/2
SPECIAL	24	30	12	15	1 1/8	1 3/4
EXPWY.	30	36	15	18	1	1 7/8
FRWY.	36	48	18	24	1 1/8	2 1/4

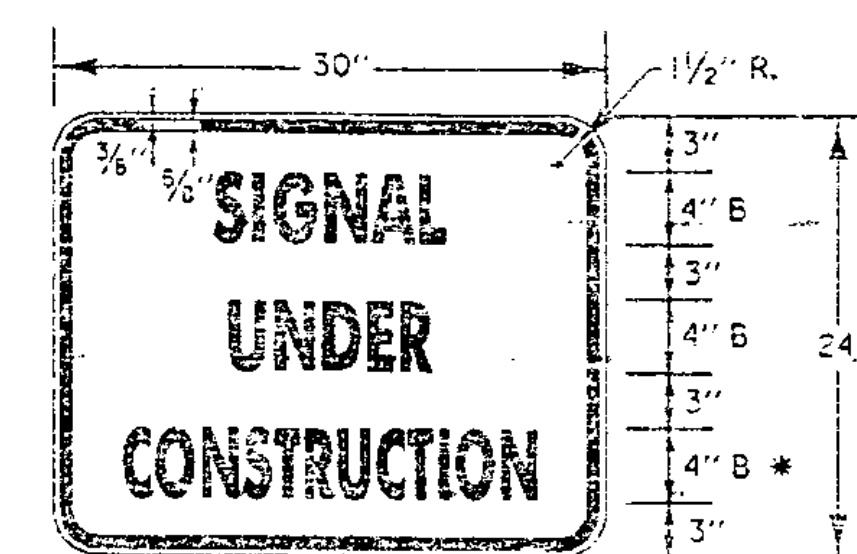


W3-3

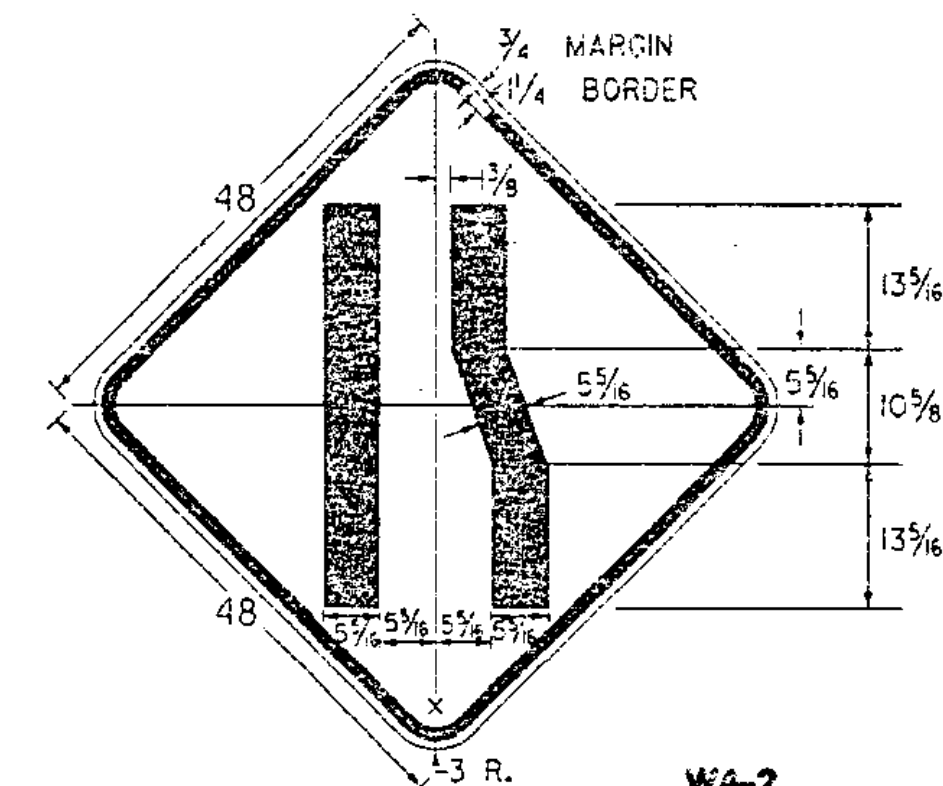
SIGN	DIMENSIONS (INCHES)							
	A	B	C	D	E	F	G	H
STD. & MIN.	36	5/8	7/8	5 1/4	15 1/2	4 1/4	10	2 1/4
SPECIAL	48	3/4	1 1/4	7 1/2	20	5	12 1/2	3

COLORS

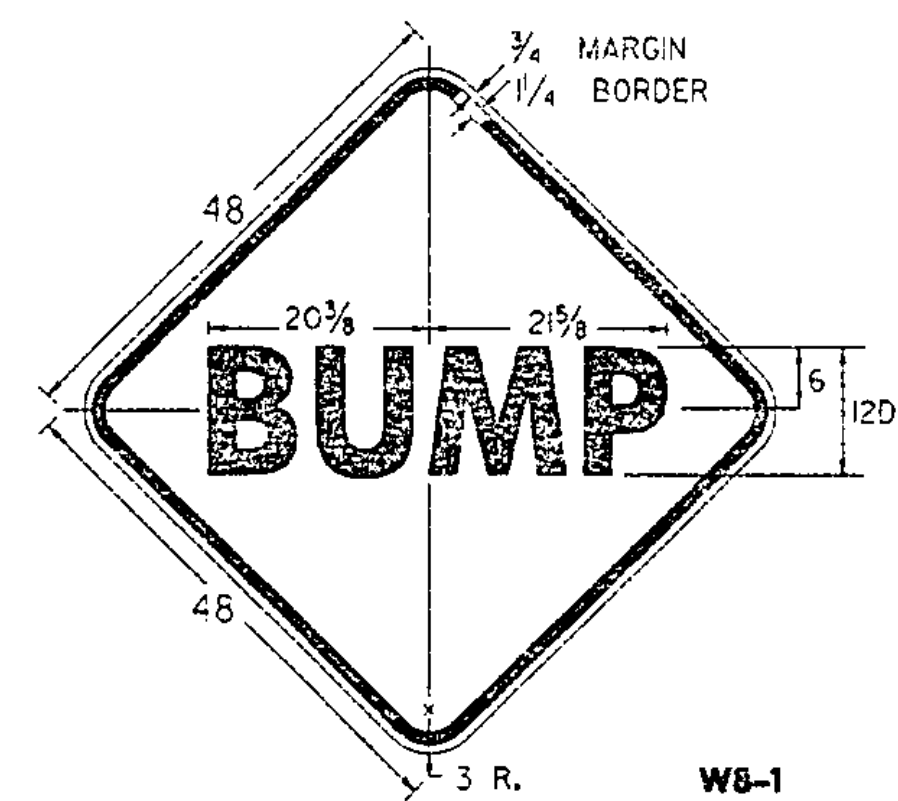
SYMBOL & LEGEND - BLACK (NON-REFL)
BACKGROUND - ORANGE (REFL)
TOP CIRCLE - RED (REFL)
MIDDLE CIRCLE - YELLOW (REFL)
BOTTOM CIRCLE - GREEN (REFL)



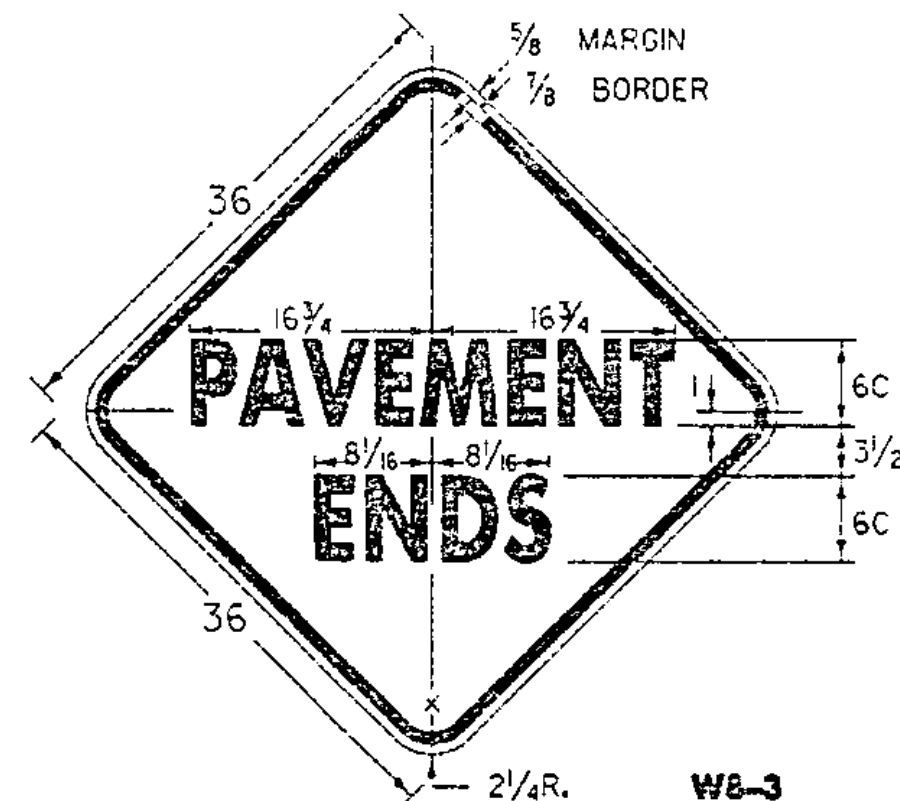
* REDUCE SPACING 50%



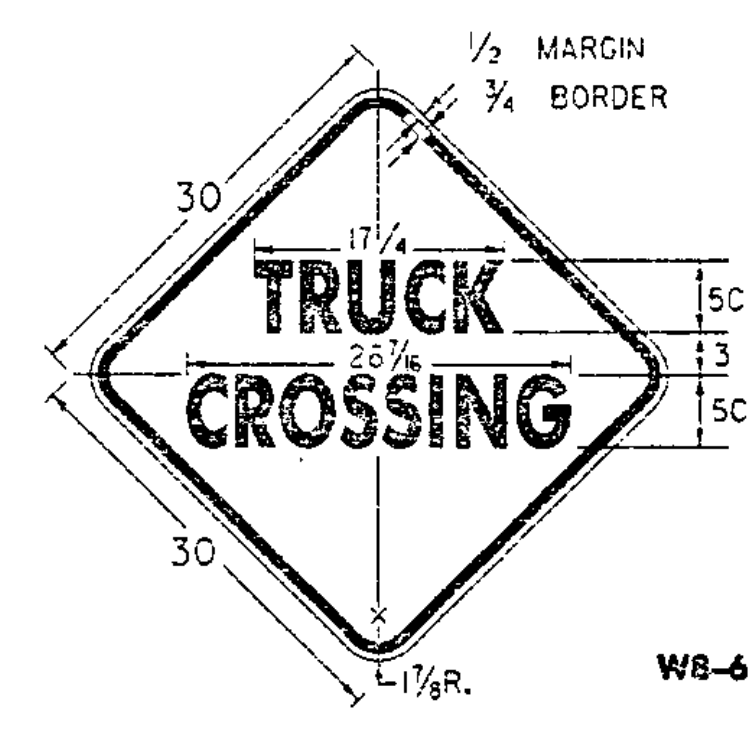
W4-2



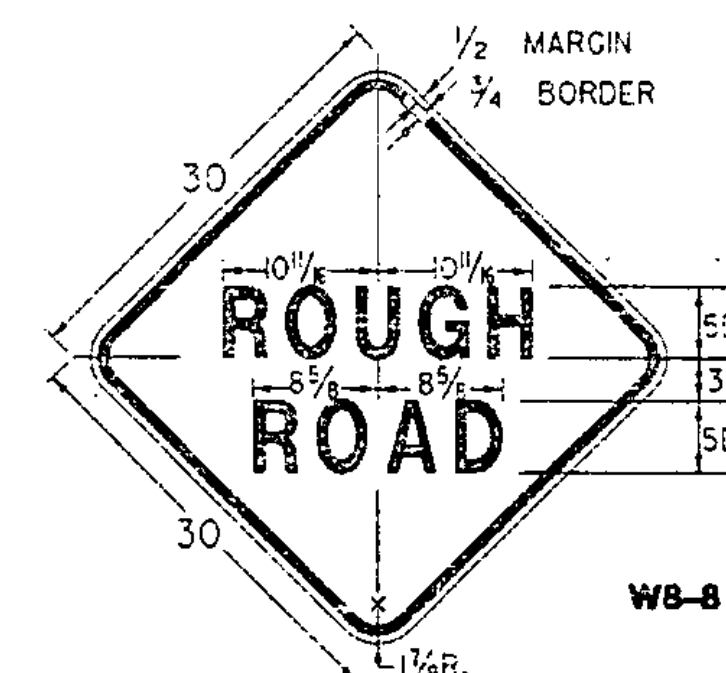
W8-1



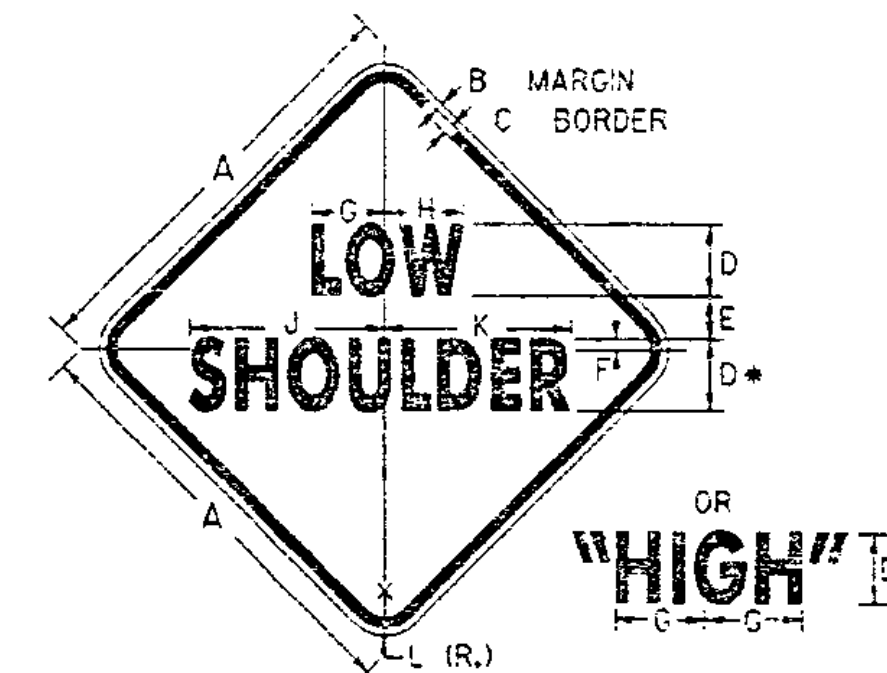
W8-3



W8-6



W8-8



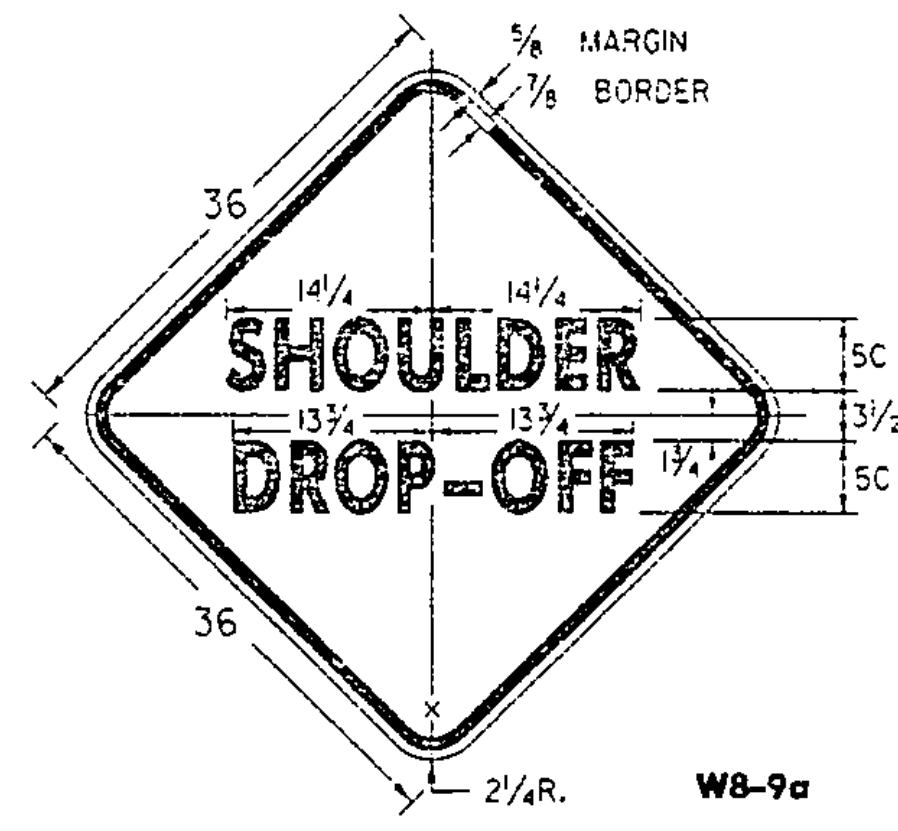
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* REDUCE SPACING 25%

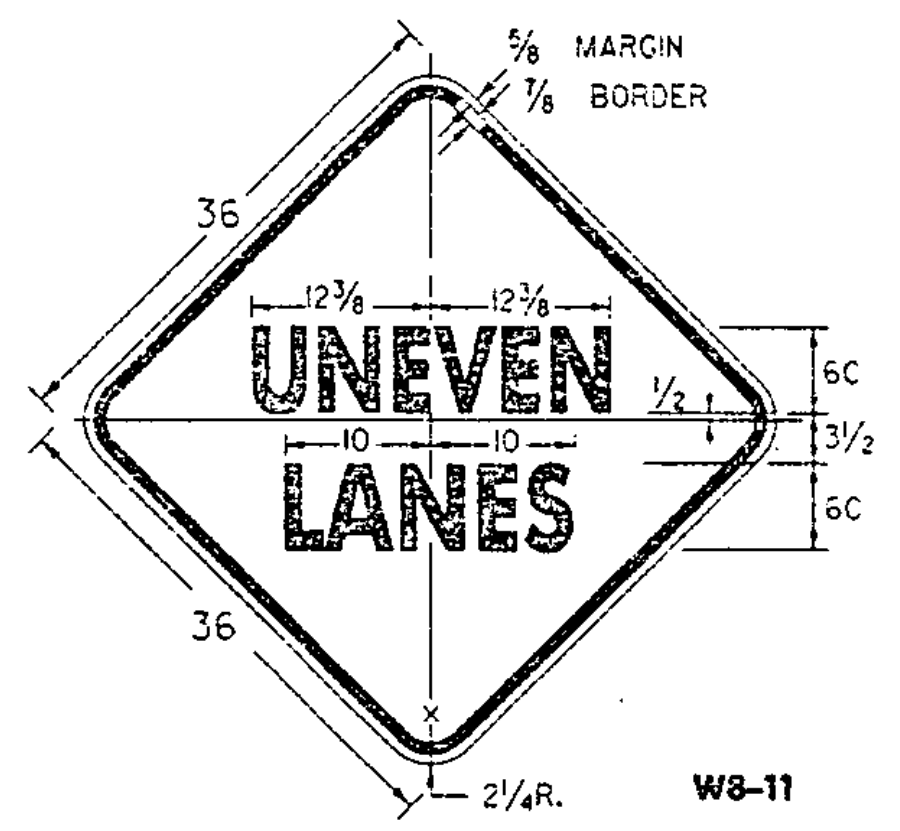
SIGN	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J	K	L
STD.	30	1 1/2	1 1/4	5C	3 1/2	5 1/8	8 1/4	9	13 1/8	13 1/8	1 3/8
FRWY.	48	1 1/2	1 1/4	8C	5 1/2	8 1/4	9	12 1/8	12 1/8	2 3/8	3

NOTES

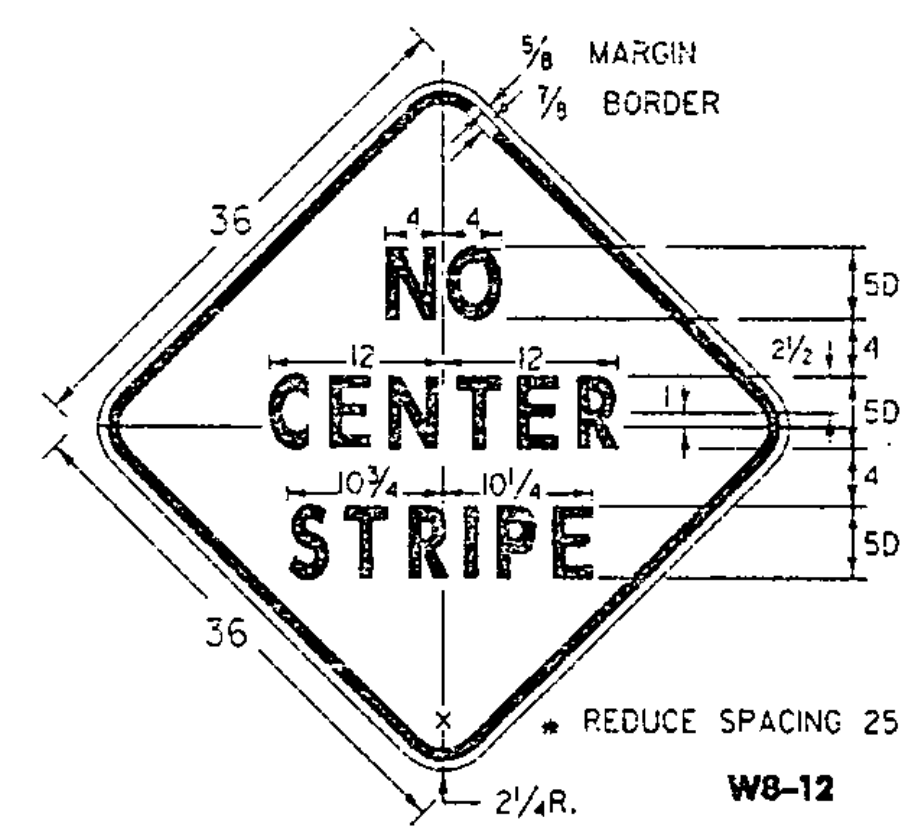
SEE STANDARD SHEET E-100 FOR NOTES AND TEXT DETAILS
COLORS FOR SIGNS SHOWN ON THIS SHEET SHALL BE BLACK TEXT, BORDER AND SYMBOLS ON A REFLECTORIZED TYPE IIB OR TYPE III ORANGE BACKGROUND, UNLESS OTHERWISE NOTED.
SIGNS USED ONLY FOR DAYTIME MAINTENANCE OPERATIONS DO NOT NEED TO BE REFLECTORIZED, HOWEVER, THESE SIGNS SHALL BE LABELED "DAYTIME USE ONLY" ON THE BACK OF THE SIGN PANEL WITH 3" SERIES C LETTERS.



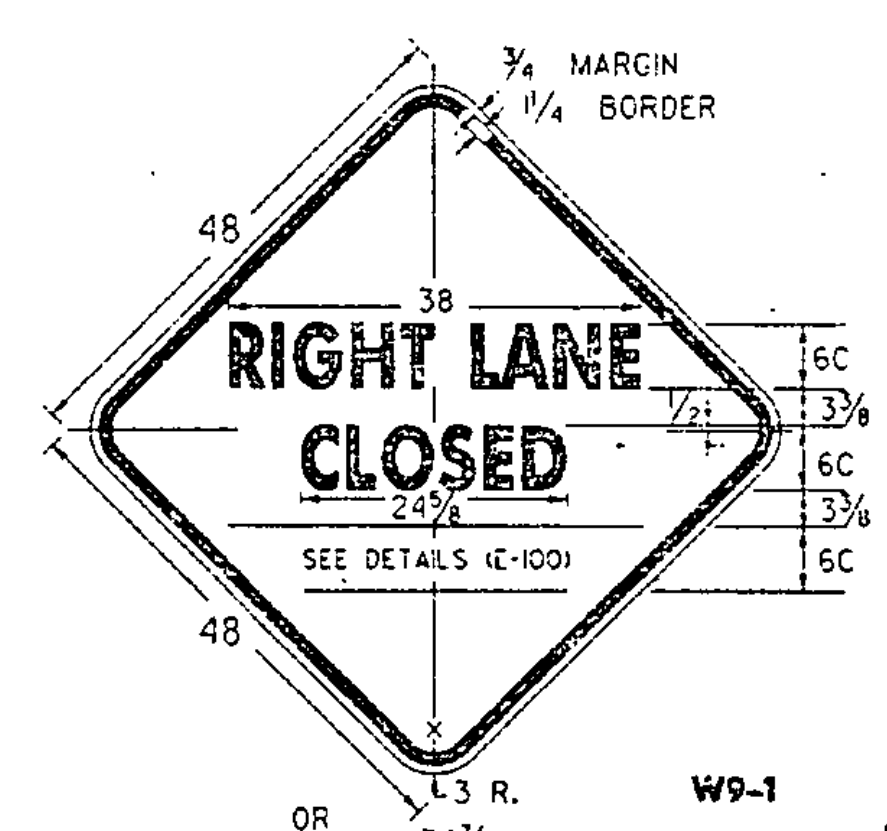
W8-9a



W8-11



W8-12



W9-1

(ALL DIMENSIONS SHOWN IN INCHES)

LEFT LANE

REVISIONS AND CORRECTIONS

OCT. 30, 1987 - DATE OF ORIGINAL ISSUE
OCT. 21, 1992 - ADDED ADDITIONAL SIGN DIMENSIONS, REVISED CHEVRON BACKGROUND TO ORANGE, & REVISED TITLE BLOCK
AUG. 08, 1995 - ADDED AND DELETED VARIOUS SIGN DETAILS

APPROVED

Stephen A. McArthur
DIRECTOR OF ENGINEERING

David O. Roach
TRAFFIC AND SAFETY ENGINEER

CONSTRUCTION SIGN DETAILS

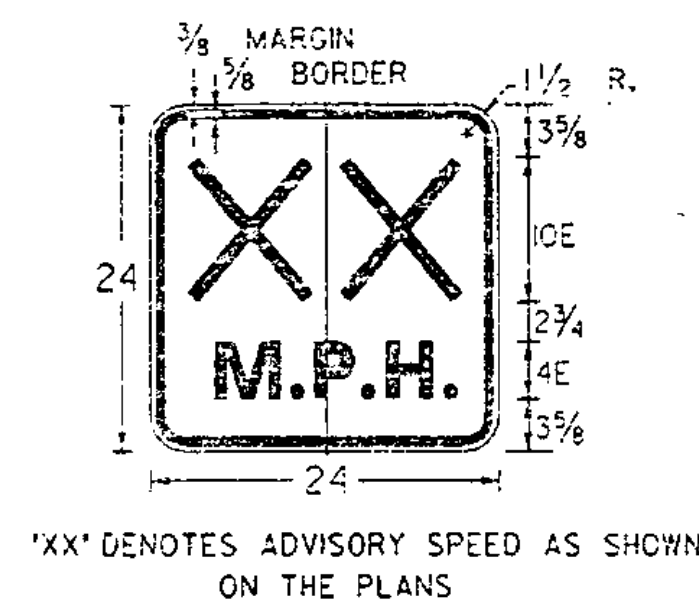
OTHER STDs. E-100 REQUIRED:



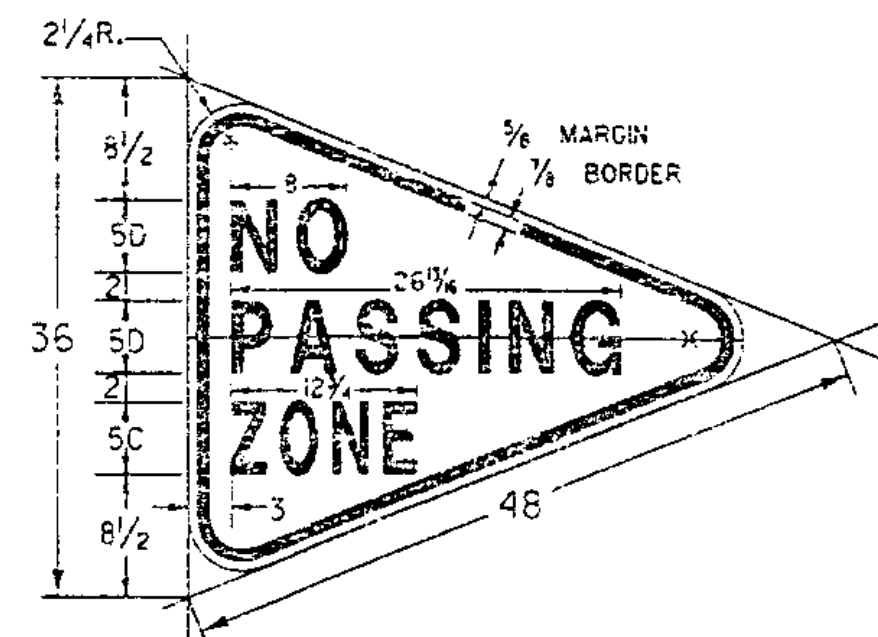
STANDARD E-101

APPROVED FOR THIS PROJECT AND/OR DESIGN IMPLEMENTATION, FHWA FINAL APPROVAL PENDING.

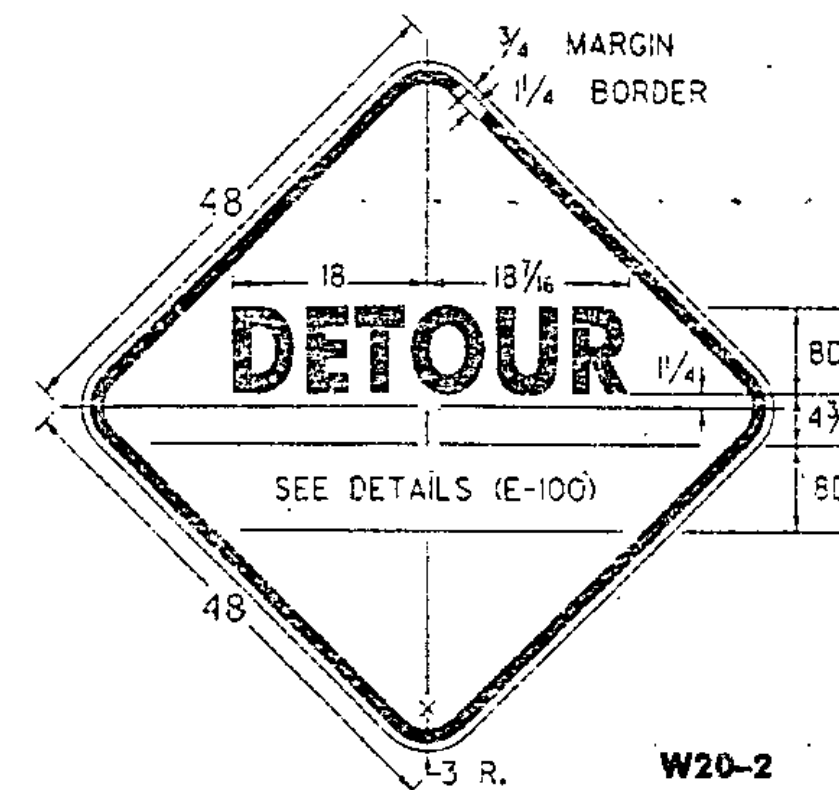
/trnf/std/stcd01.dgn : stcd01.1



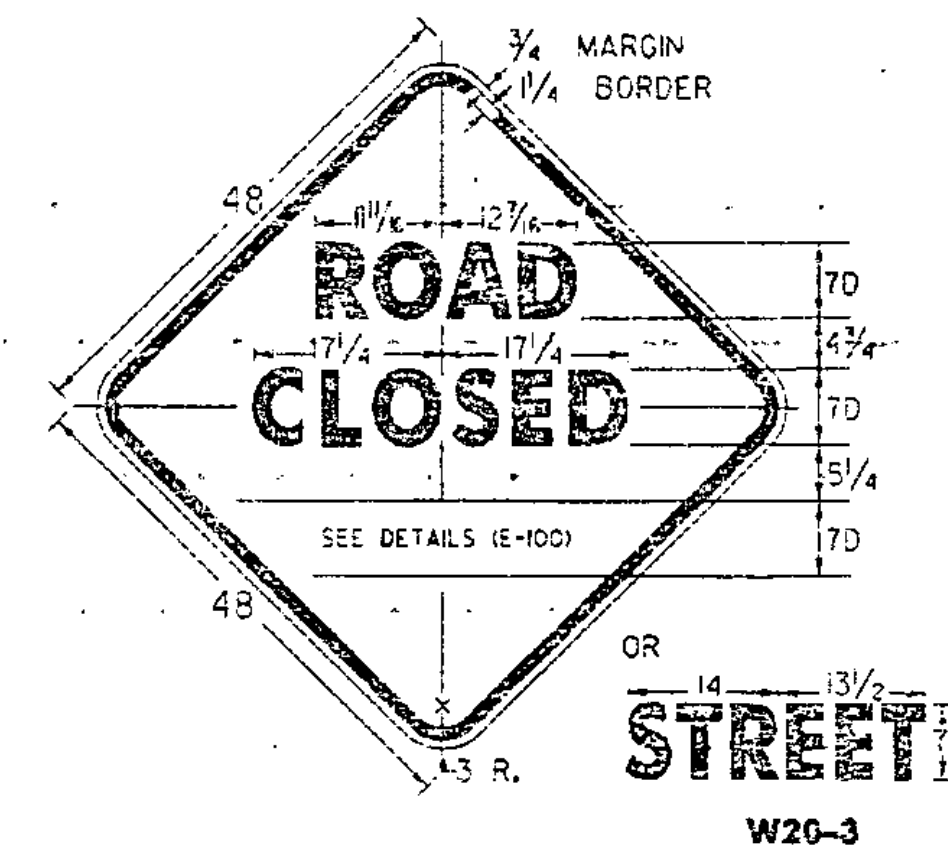
W13-1



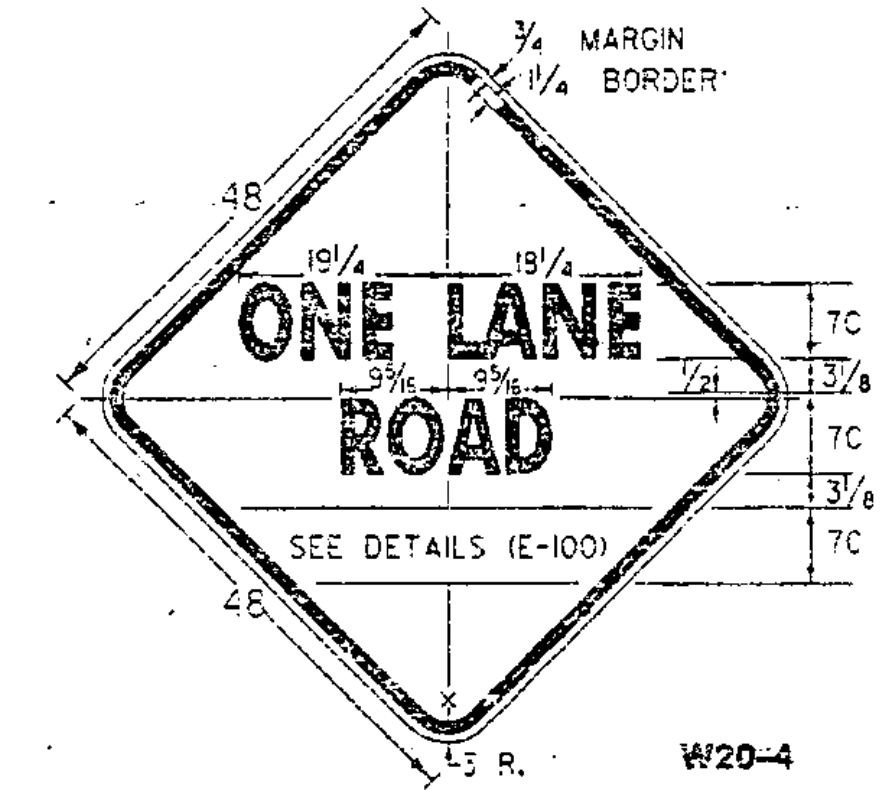
W14-3



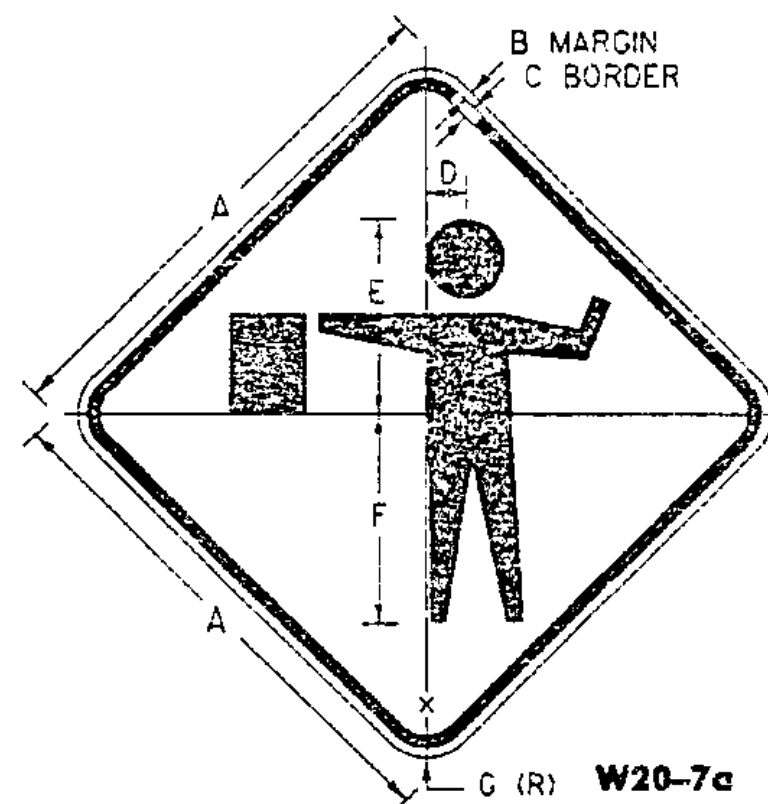
W20-2



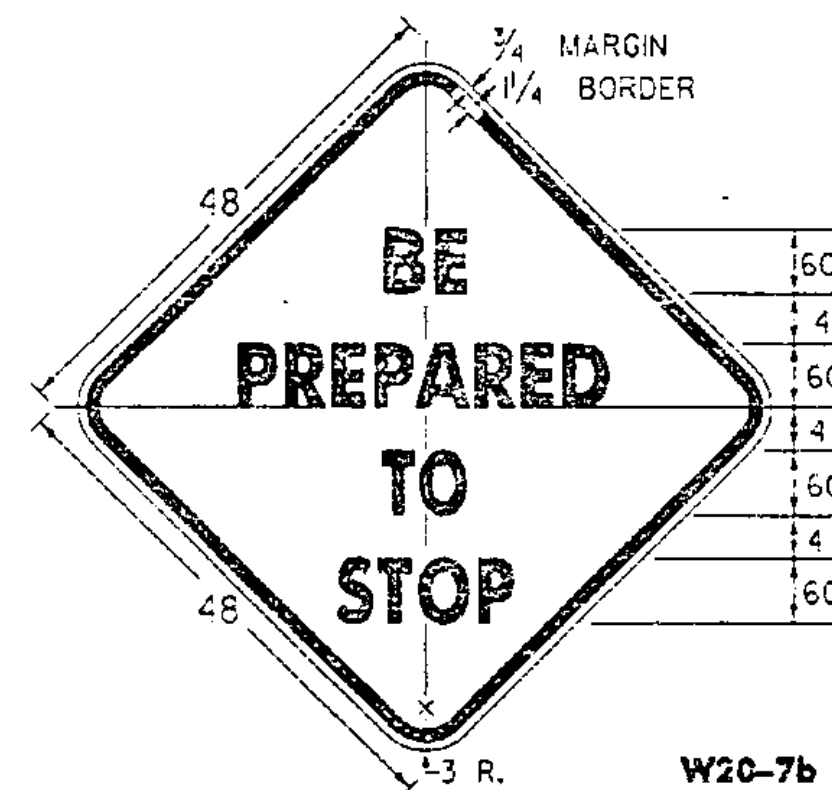
W20-3



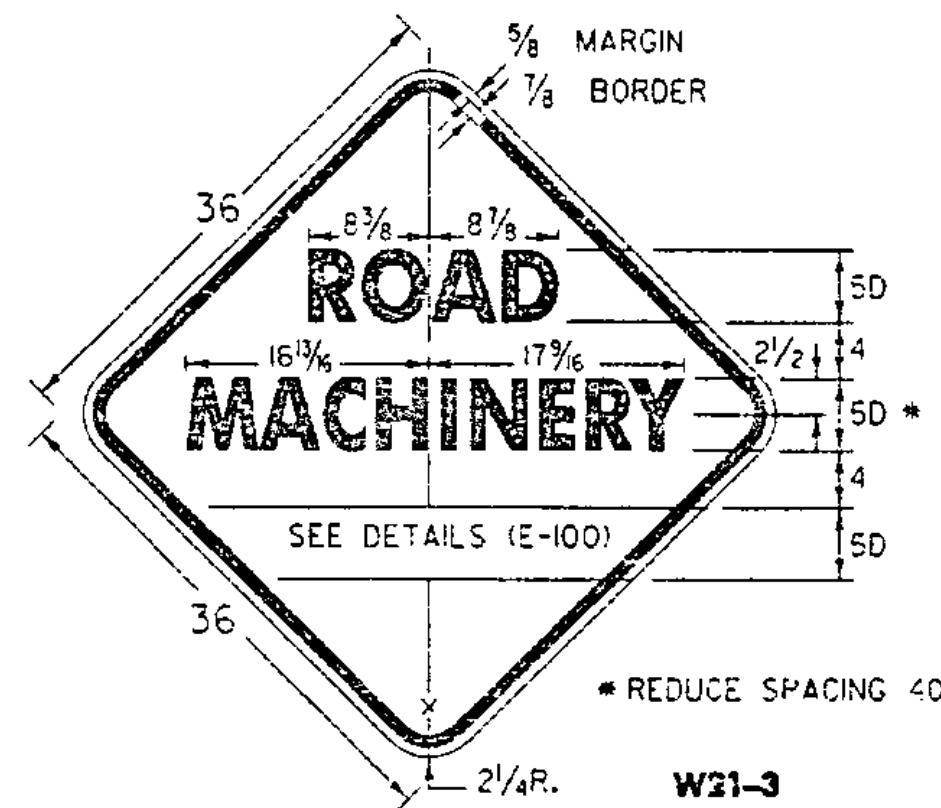
W20-4



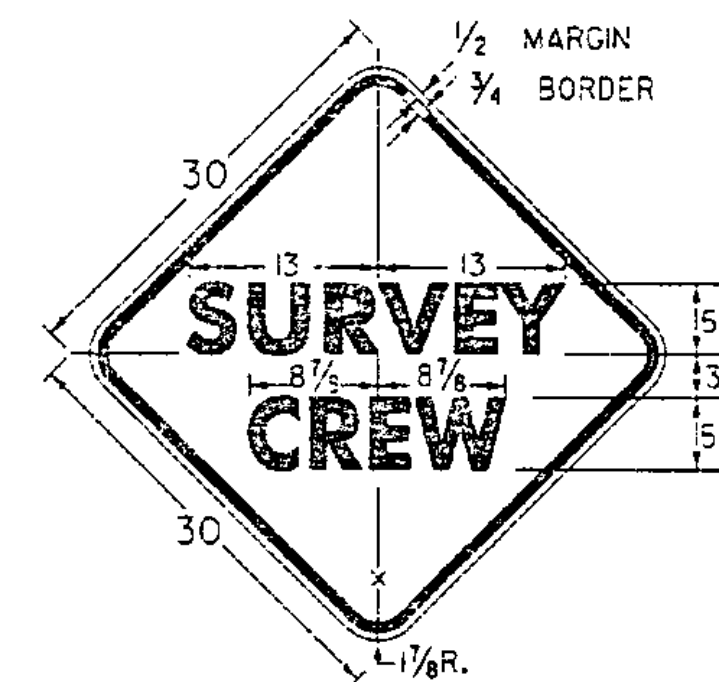
W20-7a



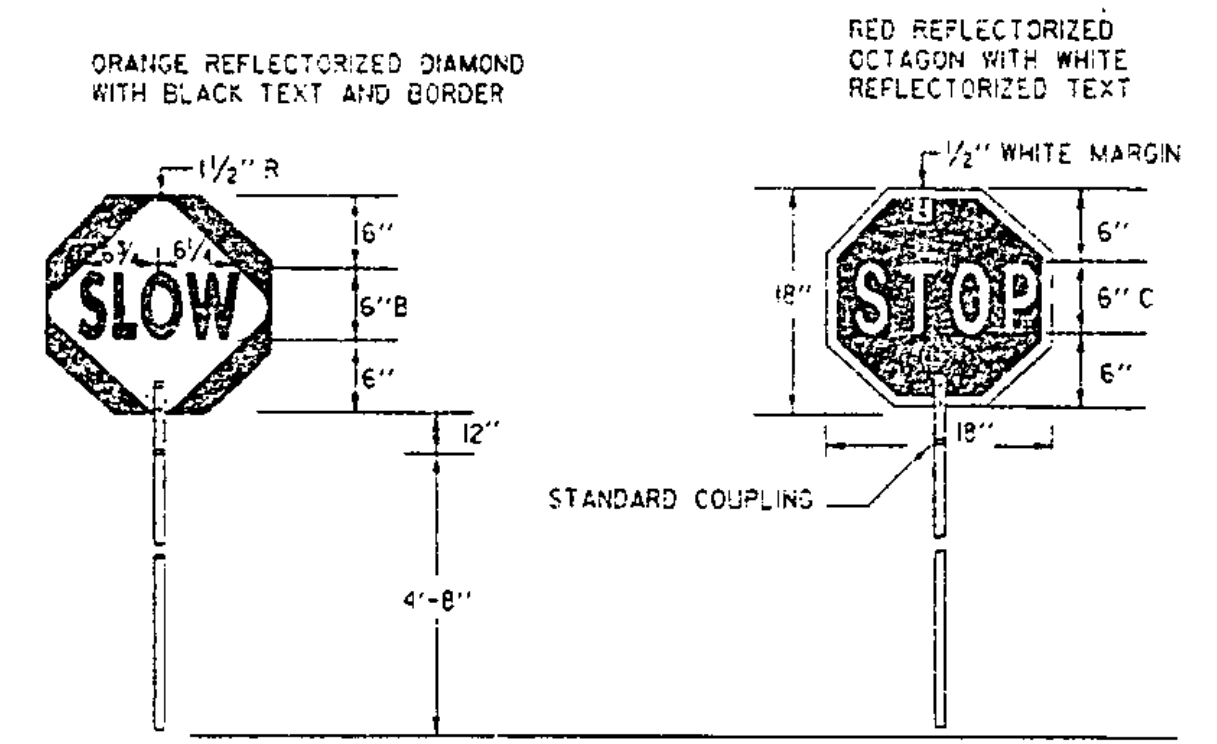
W20-7b



W21-3



W21-6



SIGN DETAIL

STAFF DETAIL

MATERIALS
THE SIGN MATERIALS SHALL BE 0.063" ALUMINUM WITH COLORS AS INDICATED ON DETAILS.
THE STAFF SHALL BE 3/4" TO 1" DIAMETER RIGID ALUMINUM CONDUIT/TUBING WITH A WALL THICKNESS OF 0.125" OR 1" TO 1 1/2" DIAMETER RIGID PVC CONDUIT/TUBING WITH 0.125" WALL THICKNESS.

MOUNTING
THE STAFF SHALL BE MOUNTED WITH EITHER TWO 1/4" DIAMETER ALUMINUM BOLTS OR TWO 1/2" DIAMETER ALUMINUM RIVETS.

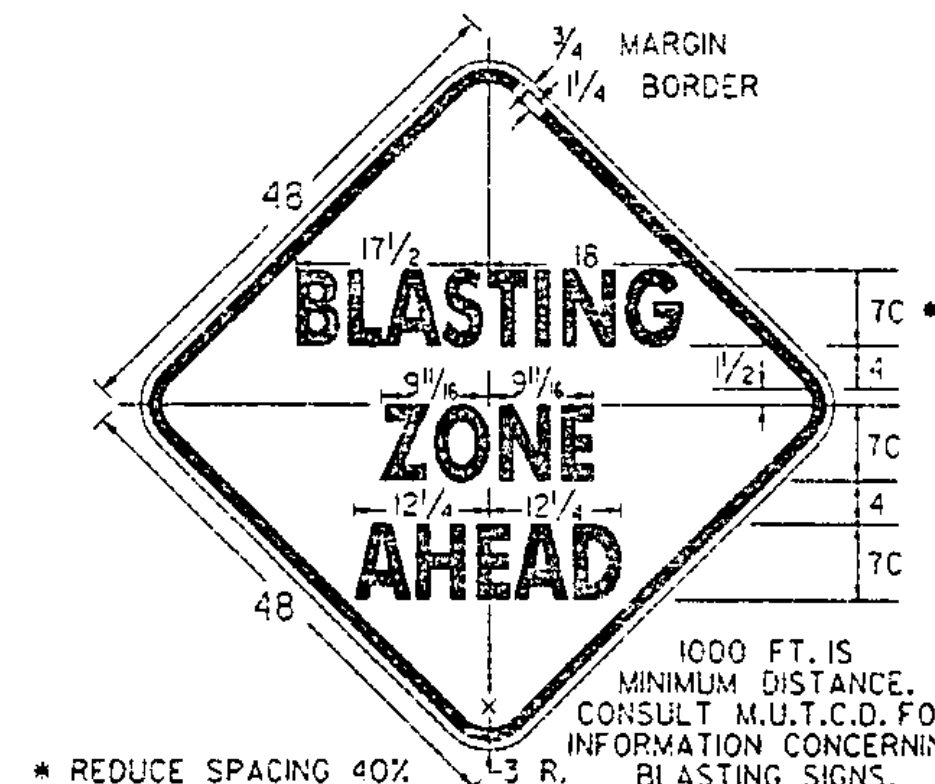
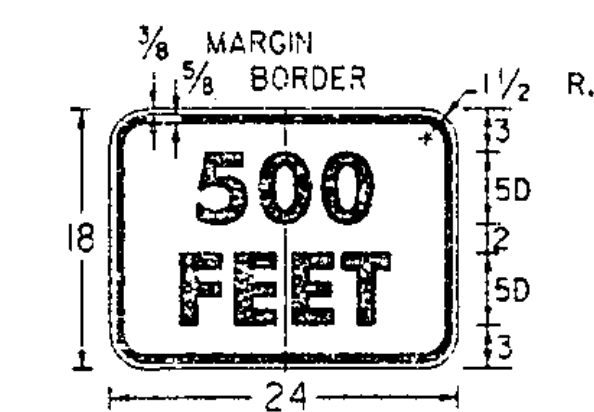
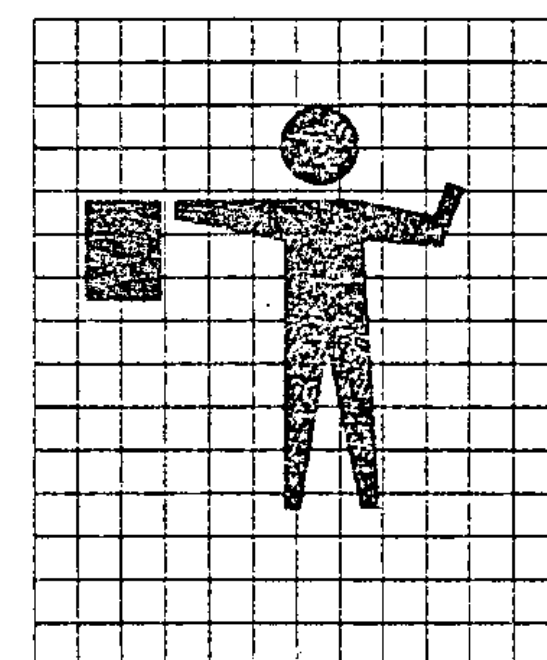
SIGN PADDLE FOR FLAGPERSON

NOTES

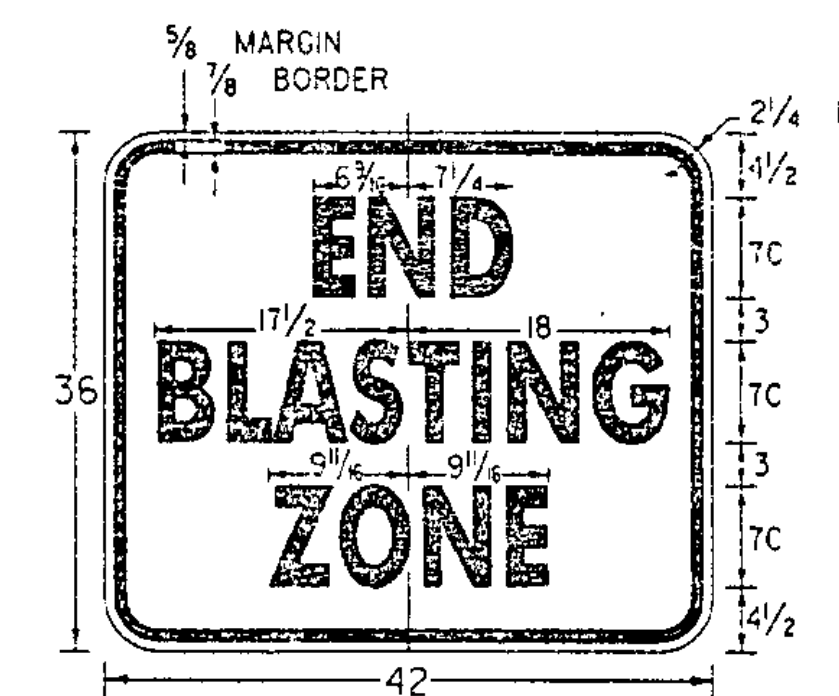
SEE STANDARD SHEET E-100 FOR NOTES AND TEXT DETAILS.
COLORS FOR SIGNS SHOWN ON THIS SHEET SHALL BE BLACK TEXT, BORDER AND SYMBOLS SHALL BE ON A REFLECTORIZED ORANGE BACKGROUND OF TYPE IIB OR TYPE III REFLECTIVE SHEETING, UNLESS OTHERWISE NOTED. THE EXCEPTION IS THE PADDLE SIGN.

SIGN DETAILS INDICATE THE APPROPRIATE COLOR.

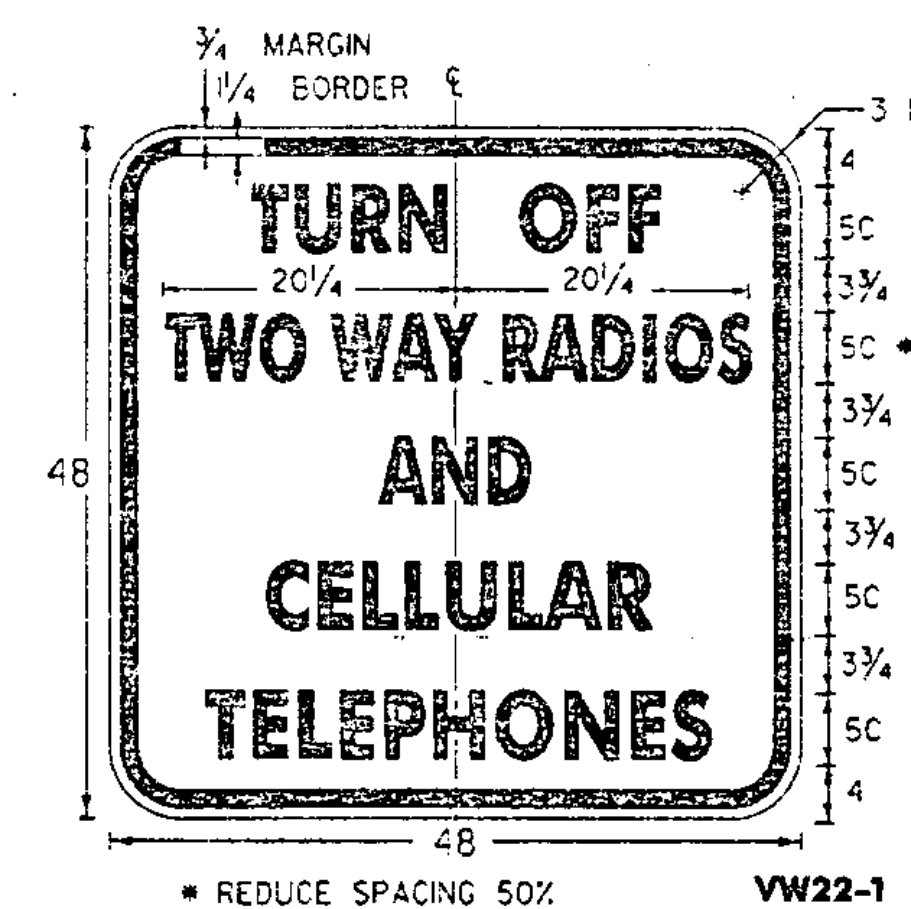
SIGNS USED ONLY FOR DAYTIME MAINTENANCE OPERATIONS DO NOT NEED TO BE REFLECTORIZED, HOWEVER, THESE SIGNS SHALL BE LABELED "DAYTIME USE ONLY" ON THE BACK OF THE SIGN PANEL WITH 3" SERIES C LETTERS.



W22-1



W22-3



W22-1

DIMENSIONS (INCHES)							
SIGN	A	B	C	D	E	F	G
STD.	36	1 3/4	1 3/4	2 3/4	13 1/2	14 3/4	2 1/4
FWY.	48	3/4	1 1/4	3 3/4	18	19 1/2	3

(ALL DIMENSIONS SHOWN IN INCHES)

REVISIONS AND CORRECTIONS

OCT. 30, 1987 - DATE OF ORIGINAL ISSUE
JAN. 23, 1989 - DELETE MOTORCYCLE SYMBOL SIGN AND SPEED SIGN, ADDED TWO SIGNS
OCT. 21, 1992 - ADDED A SIGN, REVISED A SIGN DIMENSION & TYPE ERROR & REVISED TITLE BLOCK
AUG. 08, 1995 - ADDED FLAGGER GRID

APPROVED

Stephen D. MacArthur
DIRECTOR OF ENGINEERING

David A. Ross
TRAFFIC AND SAFETY ENGINEER

CONSTRUCTION SIGN DETAILS

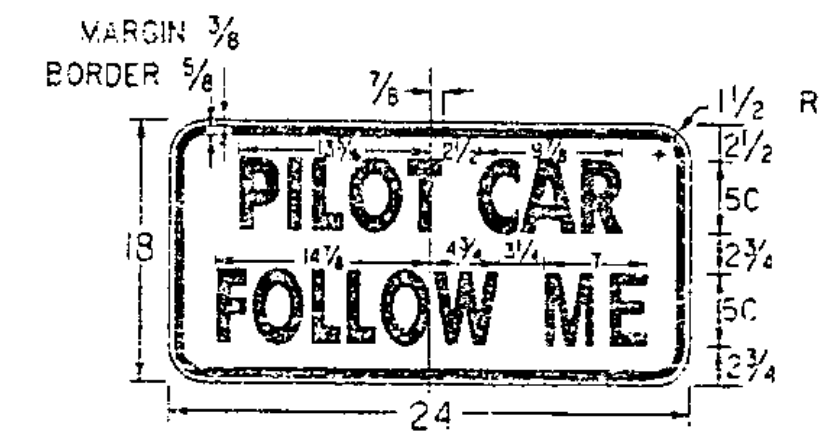
OTHER STDS. E-100
REQUIRED:



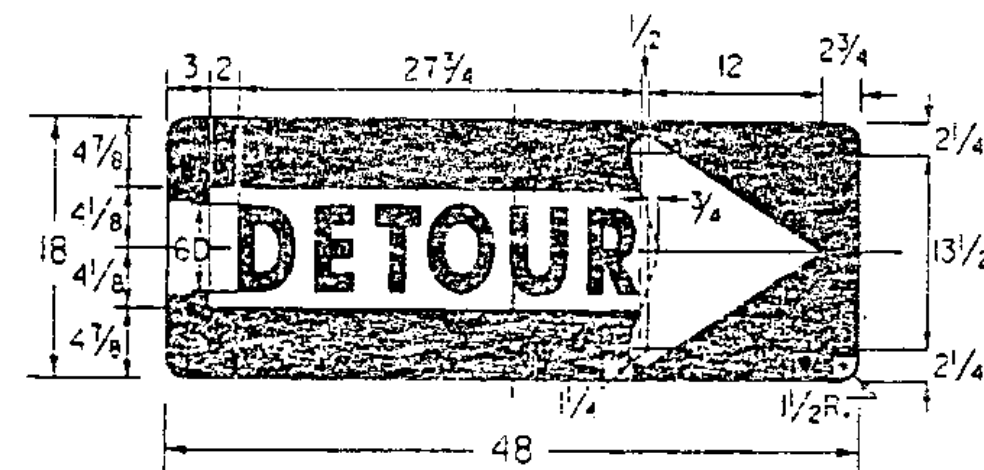
STANDARD
E-102

APPROVED FOR THIS PROJECT
AND/OR DESIGN IMPLEMENTATION.
FHWA FINAL APPROVAL PENDING.

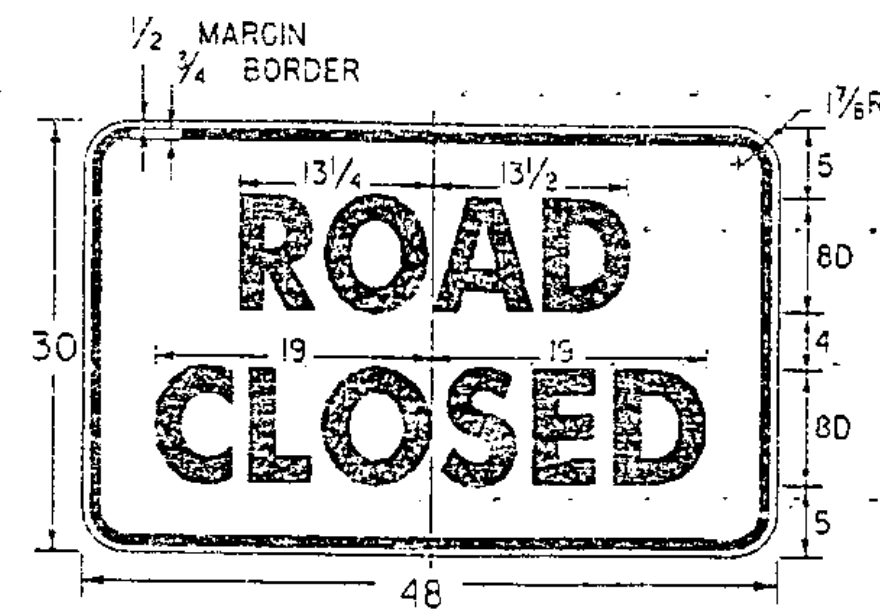
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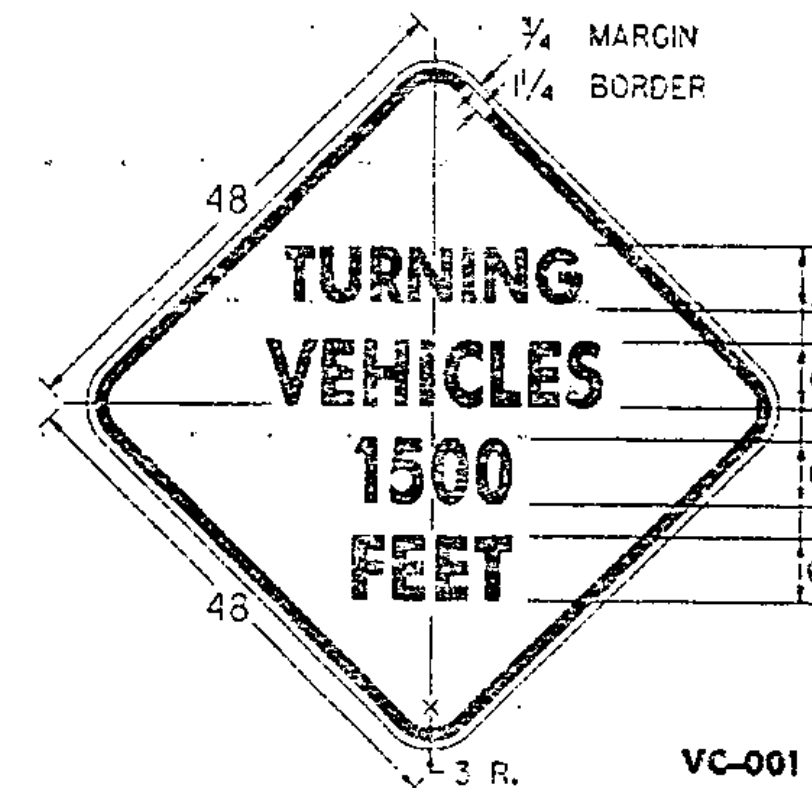
G20-4



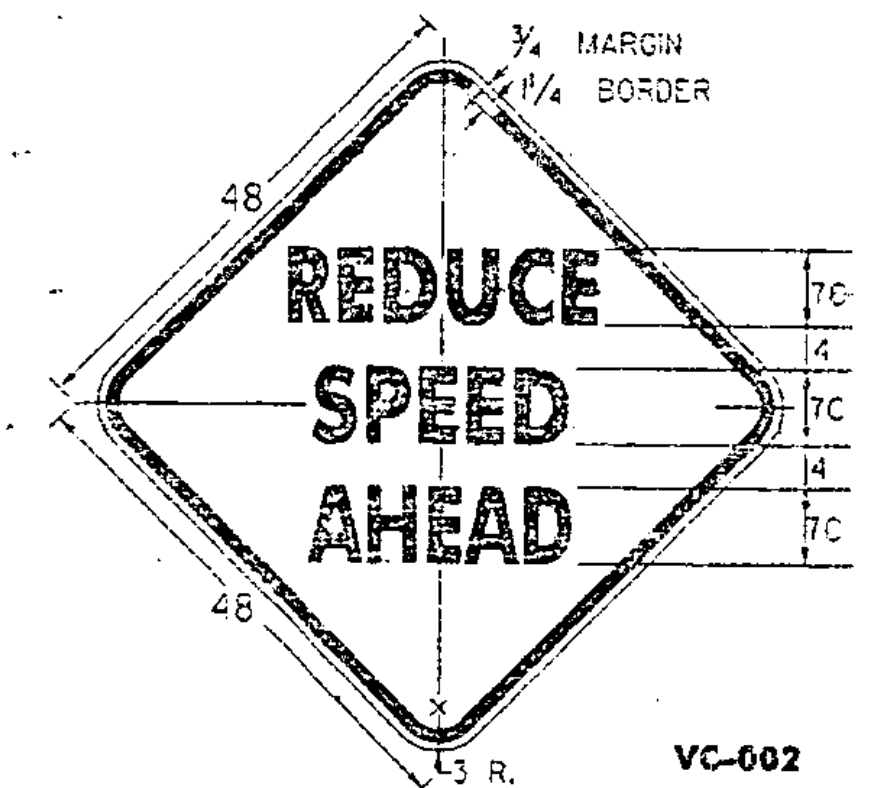
M4-10(R)



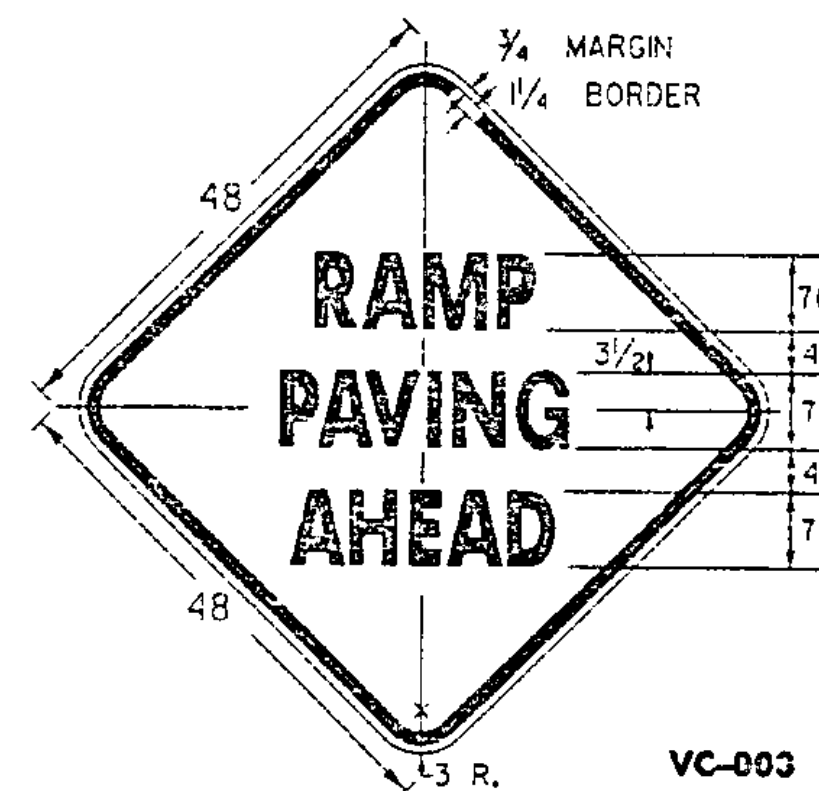
R11-2
COLORS:
BLACK TEXT AND BORDER
WHITE REFLECTORIZED BACKGROUND



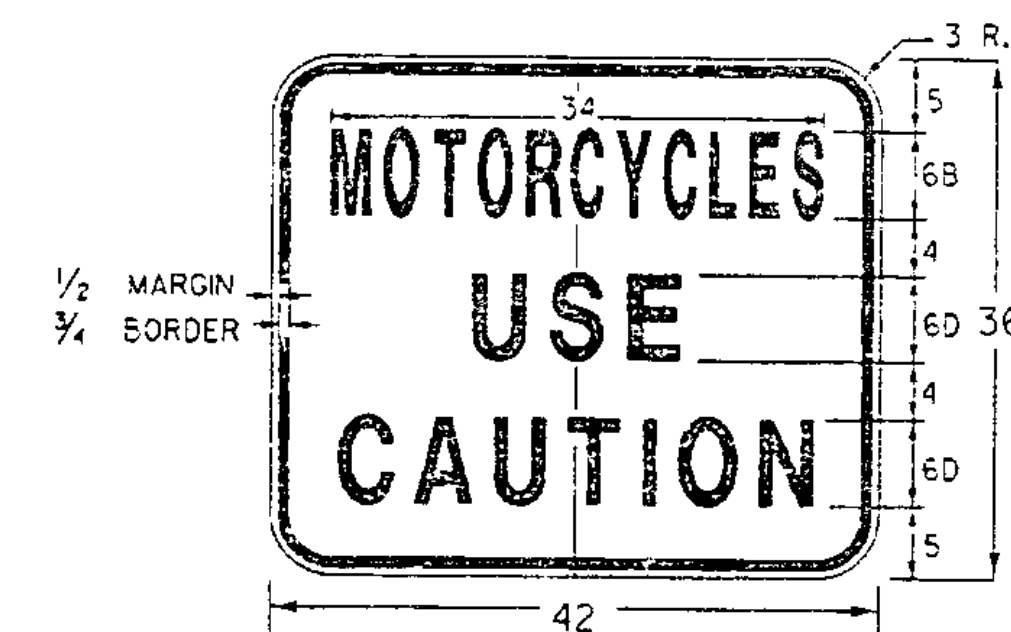
VC-001



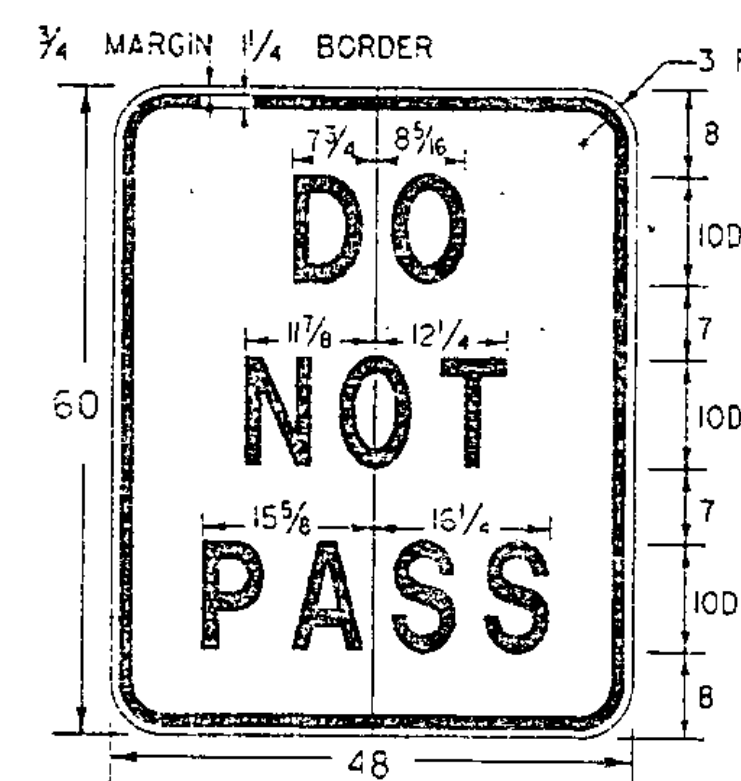
VC-002



VC-003

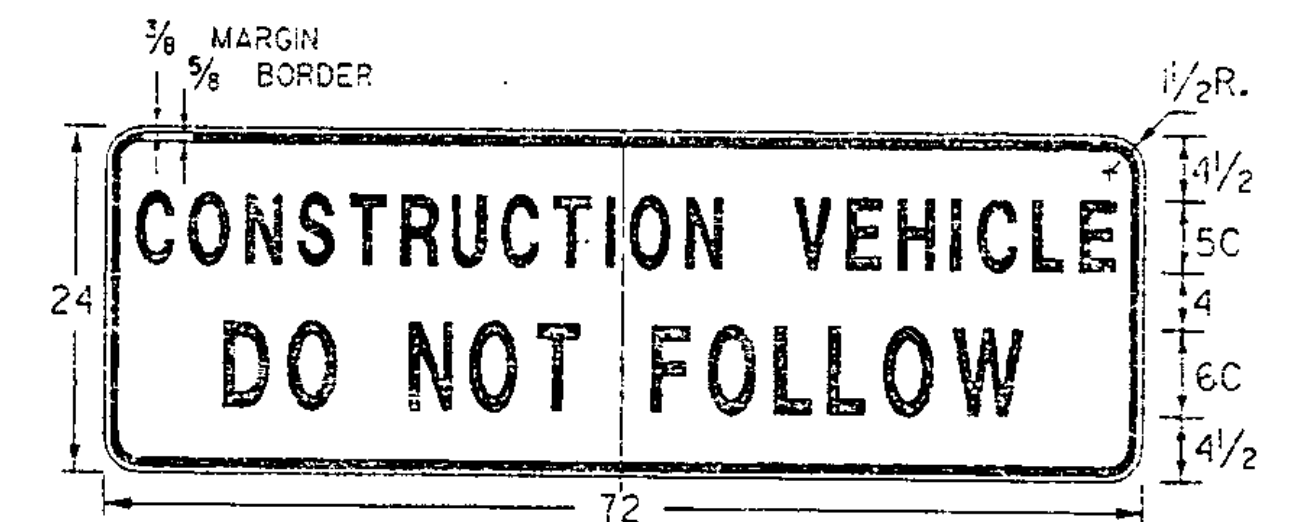


VC-004



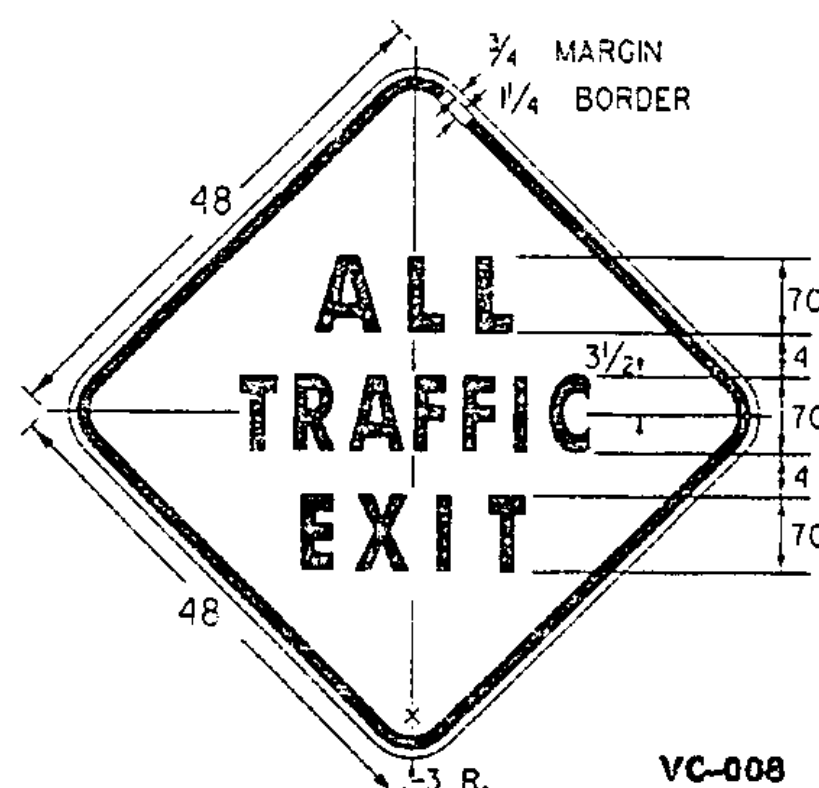
VC-005

* REDUCE SPACING BY 40%

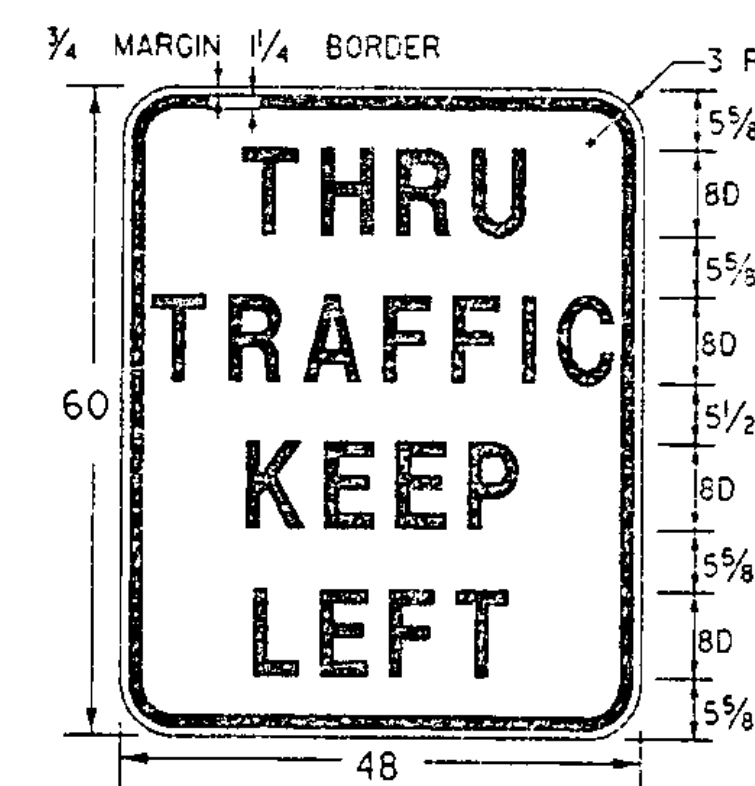


VC-007

IT IS SUGGESTED THAT THIS SIGN BE DESIGNED TO FOLD, (DOWN OR ACROSS), OR BE COVERED, OR BE REMOVED WHEN NOT IN USE. THE SIGN SHOULD ALSO BE MOUNTED AS TO NOT INTERFERE WITH THE VISIBILITY OF DIRECTIONAL OR TAIL LIGHTS AS REQUIRED BY LAW.

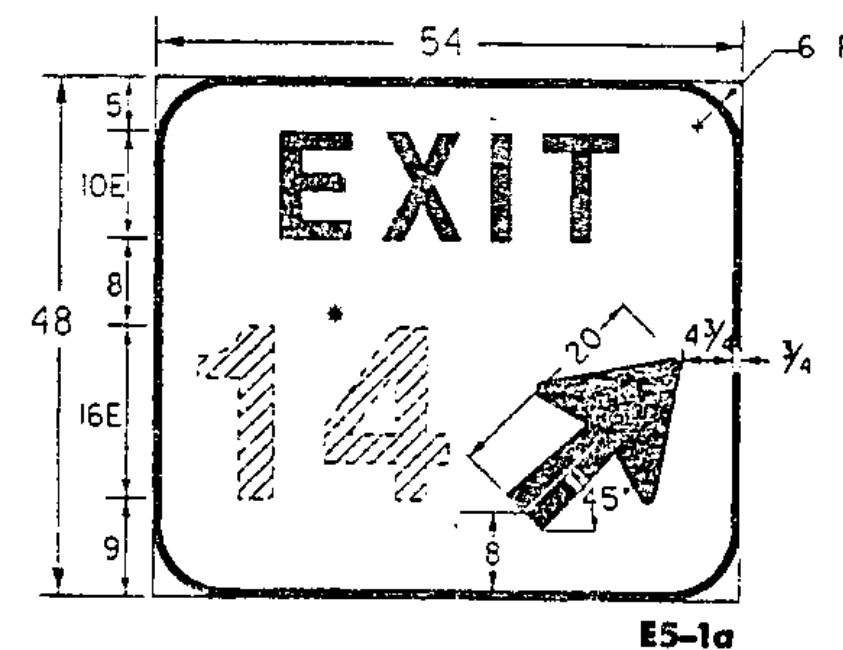


VC-008



VR-118

COLORS: BLACK BORDER & TEXT
WHITE (REFL.) BACKGROUND



ES-1a

* EXIT NUMBER AS PER PLANS
OPTICALLY SPACED
COLORS:
BACKGROUND - GREEN (REFL.)
BORDER, ARROW AND LEGEND - WHITE (REFL.)

NOTES

SEE STANDARD SHEET E-100 FOR NOTES AND TEXT DETAILS

COLORS FOR SIGNS SHOWN ON THIS SHEET SHALL BE BLACK TEXT, BORDER AND SYMBOLS SHALL BE ON A REFLECTORIZED ORANGE BACKGROUND OF TYPE II-B OR TYPE III REFLECTIVE SHEETING, UNLESS OTHERWISE NOTED.

SIGN DETAILS INDICATE THE APPROPRIATE COLOR.

SIGNS USED ONLY FOR DAYTIME MAINTENANCE OPERATIONS DO NOT NEED TO BE REFLECTORIZED, HOWEVER, THESE SIGNS SHALL BE LABELED "DAYTIME USE ONLY" ON THE BACK OF THE SIGN PANEL WITH 3" SERIES C LETTERS.

(ALL DIMENSIONS SHOWN IN INCHES)

REVISIONS AND CORRECTIONS

AUG 08, 1995 - DATE OF ORIGINAL ISSUE

APPROVED FOR THIS PROJECT
AND/OR DESIGN IMPLEMENTATION,
FHWA FINAL APPROVAL PENDING.

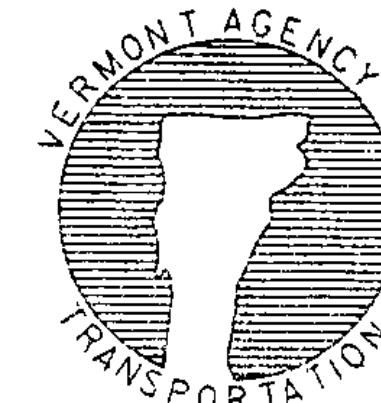
APPROVED

Stephen D. McAllen
DIRECTOR OF ENGINEERING

David A. Ross
TRAFFIC AND SAFETY ENGINEER

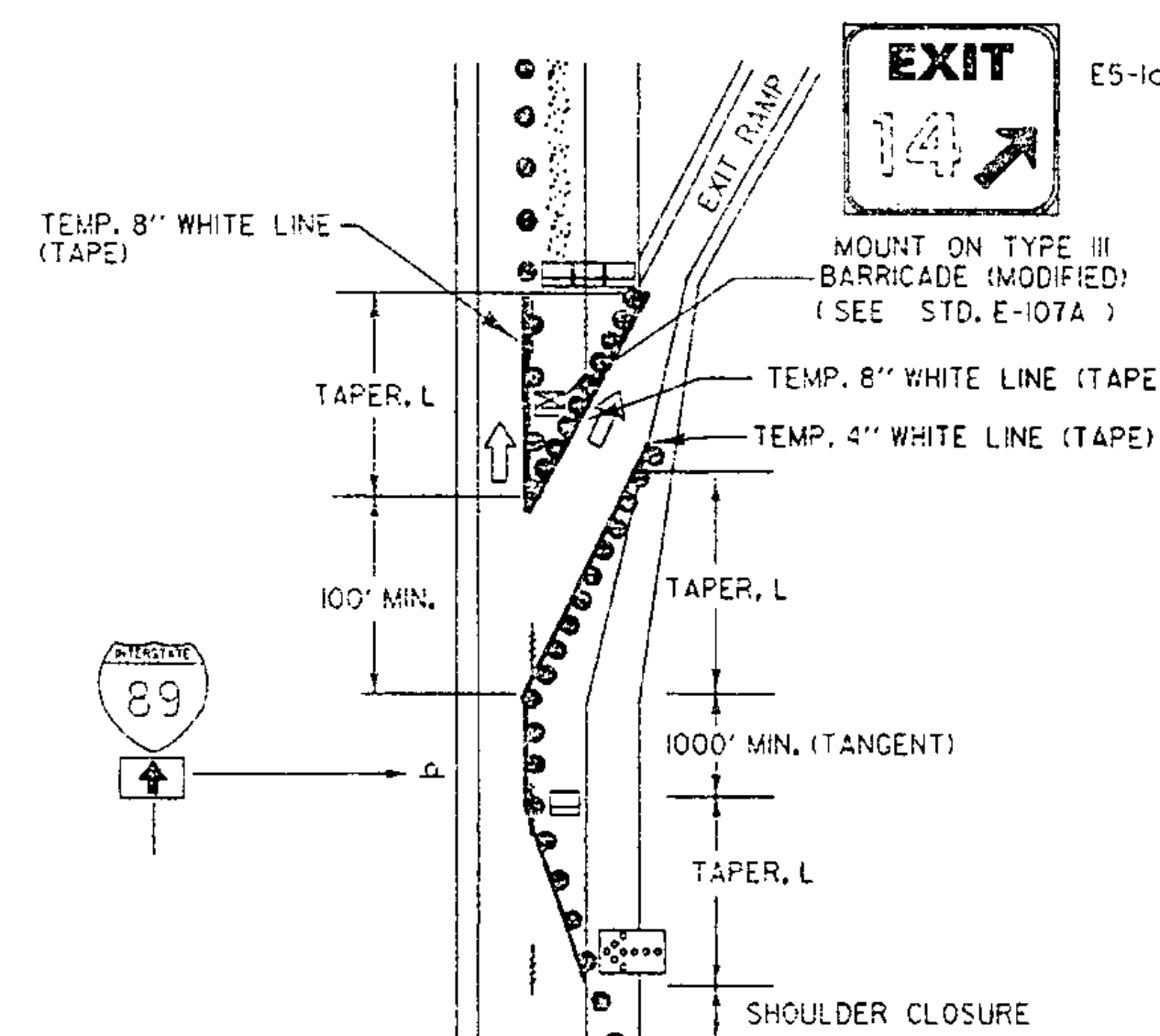
CONSTRUCTION SIGN DETAILS

OTHER STDs. E-100
REQUIRED:



STANDARD
E-102A

/trac/std/stdel02.cgn : stdel02A.i



NOT TO SCALE

MAINLINE LANE CLOSURE
AT AN EXIT RAMP

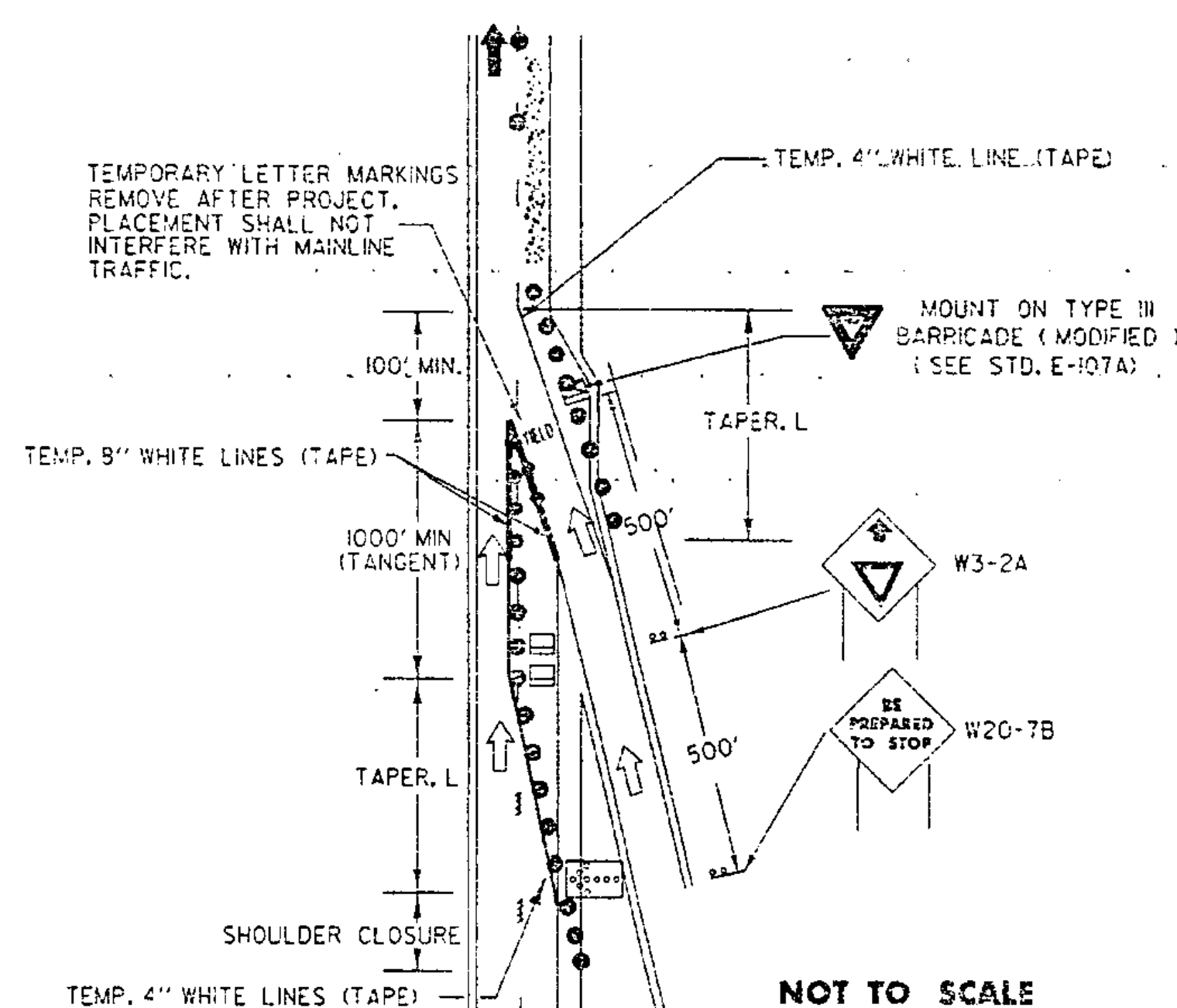
THIS DETAIL SHALL BE USED WHEN THE WORK ZONE BEGINS AT THE GORE OR THE MAINLINE LANE CLOSURE DRUM PLACEMENT INTERFERES WITH THE EXIT RAMP.

NOTES:

- 1) ALL SIGNS SHALL BE MOUNTED ON FIXED POSTS (YIELDING TYPE) UNLESS OTHERWISE NOTED.
- 2) CHANNELIZING DEVICES SHALL BE PLACED AS FOLLOWS:
TAPERS - DEVICES SHALL BE SPACED A MAXIMUM OF "S" (THE SPEED LIMIT IN FEET) APART.
TANGENT - DEVICES SHALL BE SPACED 2 X "S" (THE SPEED LIMIT IN FEET) APART.
- 3) ALL DISTANCES ARE DESIRABLE MINIMUMS FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT.
- 4) TAPER RATES ARE BASED ON THE POSTED MAINLINE AND EXIT SPEEDS.
- 5) TEMPORARY PAVEMENT MARKINGS ARE REQUIRED WHEN THE LAYOUT IS TO BE IN EFFECT FOR THREE DAYS OR MORE.
- 6) LANE CLOSURES AND TAPER LENGTHS, L, AS DETAILED ON STANDARD E-103.
- 7) EXIT SIGN SHALL BE MOUNTED A MINIMUM OF 3' ABOVE THE GROUND AND HIGH ENOUGH TO BE SEEN ABOVE CHANNELIZING DEVICES.

LEGEND

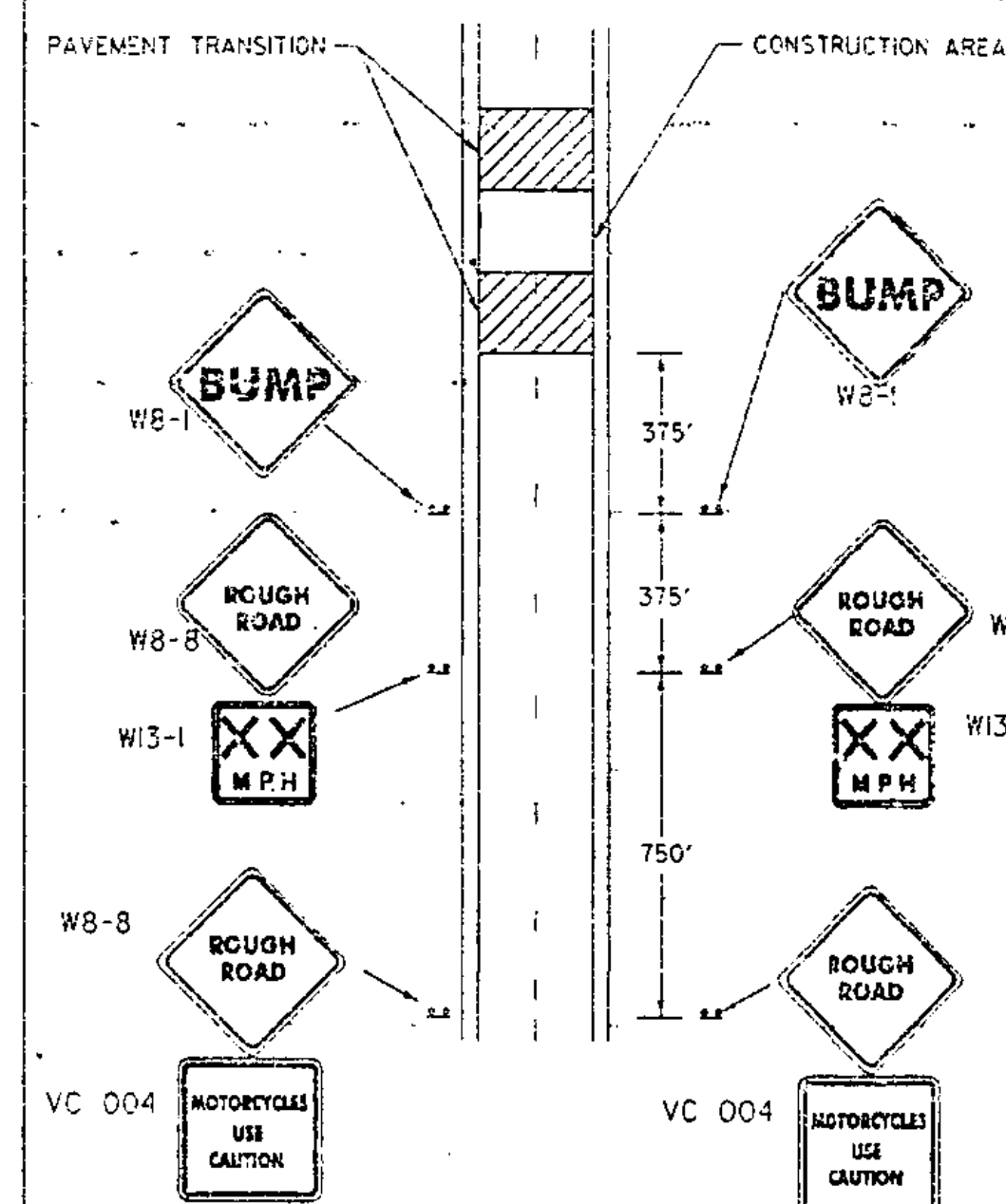
- REFL. 28" CONES
- REFL. PLASTIC DRUMS
- PAVEMENT MARKING REMOVAL
- ↑ INDICATES TRAFFIC FLOW
- WORK AREA
- FLASHING ARROW PANEL
- TYPE III BARRICADES
- TYPE III BARRICADES (MOD.)



NOT TO SCALE

MAINLINE LANE CLOSURE
AT AN ENTRANCE RAMP

THIS DETAIL SHALL BE USED WHEN THE WORK ZONE BEGINS AT AT THE END OF THE ACCELERATION LANE OR THE MAINLINE LANE CLOSURE DRUM PLACEMENT INTERFERES WITH THE ON-RAMP TRAFFIC.
IF THE LENGTH OF THE ACCELERATION LANE IS NOT ADEQUATE, THE YIELD SIGN SHALL BE REPLACED WITH A STOP SIGN. IF A STOP SIGN IS USED, IT SHOULD BE ACCOMPANIED BY A STOP BAR.

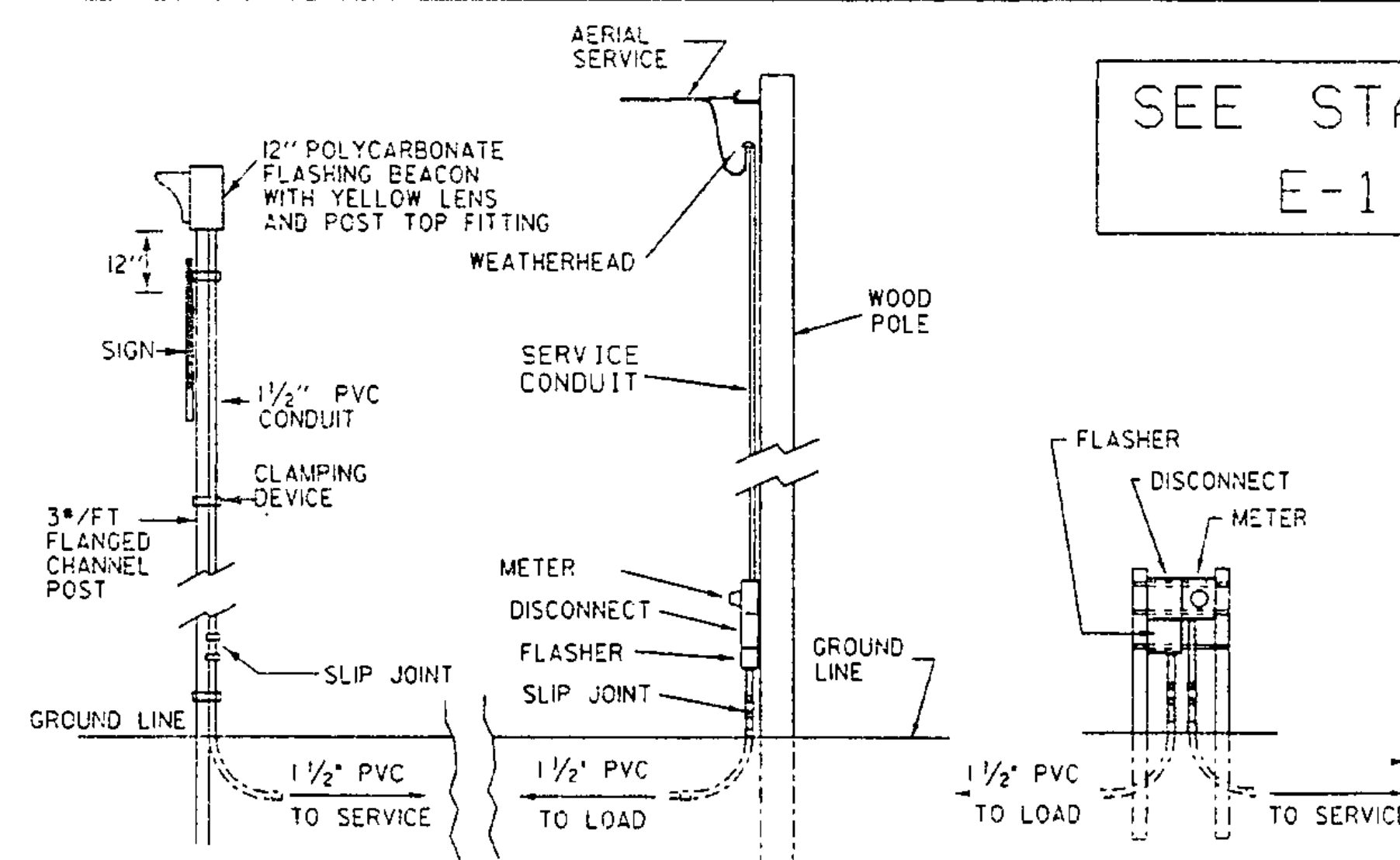


NOTES:

- 1) ADVISORY SPEED AS DETERMINED BY THE RESIDENT ENGINEER (40 M.P.H. MINIMUM RECOMMENDED)
- 2) SIGNS MOUNTED ON FIXED POSTS (YIELDING TYPE)
- 3) ALL DISTANCES ARE DESIRABLE MINIMUMS. FIELD CONDITION SHALL CONTROL THE ACTUAL PLACEMENT.
- 4) THE BUMP SIGN MAY BE ELIMINATED WHEN THERE IS NO BUMP. WHEN THE CONTRACTOR IS WORKING IN THE CONSTRUCTION AREA THE APPROPRIATE ADVANCED WARNING SIGN PACKAGE SHALL BE USED. SEE STD. E-103.

NOT TO SCALE

ADVANCED WARNING SIGN PACKAGE FOR
COLD PLANED (SCARIFIED) SURFACES.

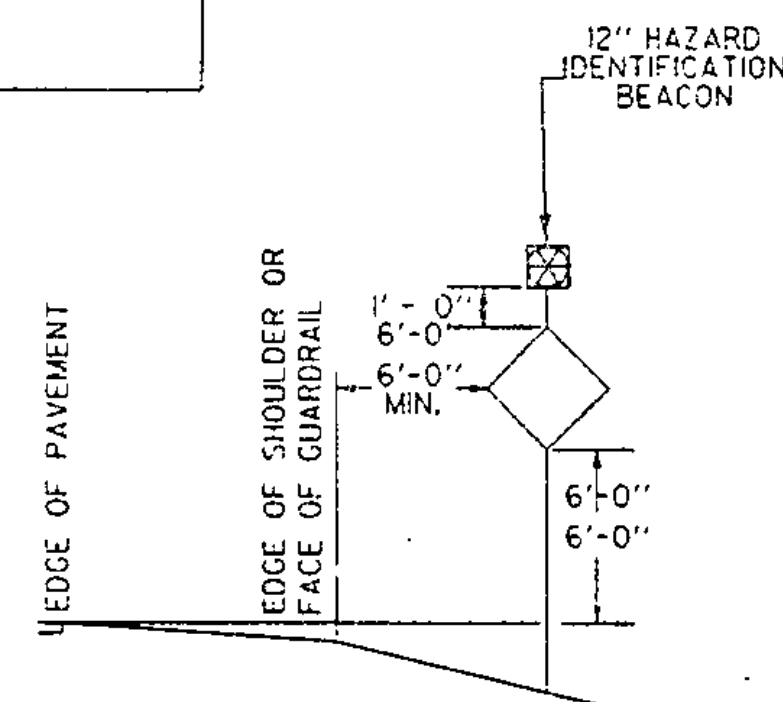


FLASHING BEACON
DETAIL

AERIAL SERVICE
WITHOUT LUMINAIRE

UNDERGROUND SERVICE DETAIL

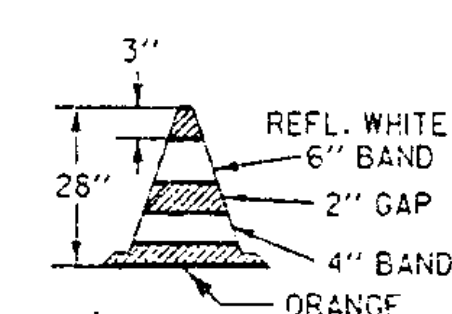
SEE STANDARD
E-175



SIGN PLACEMENT DETAIL

NOTES:

- 1) AT THE CONTRACTOR'S OPTION:
A. THE POWER SUPPLY MAY BE AERIAL OR UNDERGROUND (SEE DETAIL).
B. POWER FOR A FLASHING BEACON MAY BE COMBINED WITH POWER FOR A TRAFFIC SIGNAL OR THEY MAY HAVE SEPARATE POWER SOURCES.
C. THE FLASHER MAY BE INSTALLED ON A STANCHION NEAR THE SIGN, ON A UTILITY POLE (WITH UTILITY COMPANY APPROVAL) OR AT THE SAME LOCATION AS A TRAFFIC SIGNAL CONTROLLER.
- 2) THE FLASHER UNIT SHALL BE ONE CIRCUIT AND INCLUDE A RADIO INTERFERENCE FILTER.
- 3) BATTERY OPERATED FLASHERS WILL NOT BE ALLOWED.
- 4) BOTTOM OF THE BEACON SHALL BE A MIN. OF 8'-0" AND A MAX. OF 12'-0" ABOVE THE EDGE OF THE PAVEMENT.
- 5) FOR URBAN AREA PLACEMENT SEE STD. E-121.

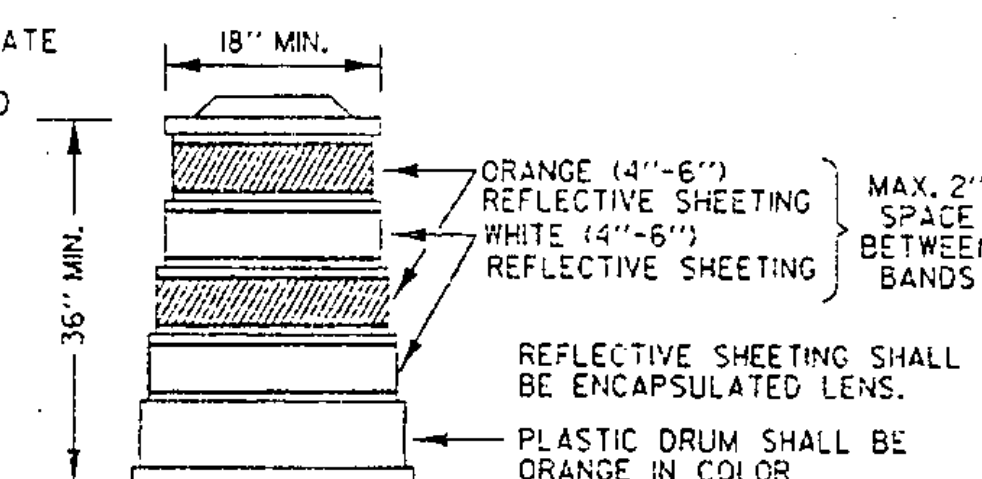


NOTES:

- 1) 28" CONES SHALL BE USED ON ROADWAYS WITH SPEED LIMITS OF 35 MPH OR MORE AND ON ALL ROADWAYS DURING HOURS OF DARKNESS.
- 2) CONES MAY BE WEIGHTED TO PREVENT OVERTURNING, HOWEVER THE WEIGHTS SHALL NOT PRESENT A HAZARD IF THE CONE IS STRUCK.
- 3) REFLECTIVE SHEETING SHALL BE ENCAPSULATED LENS.

28" REFLECTORIZED CONE

SAND BAGS OR AN APPROPRIATE BALLASTING DEVICE, WHICH DOES NOT PRESENT A HAZARD TO THE IMPACTING VEHICLE OR BECOME A PROJECTILE UPON IMPACT, SHALL BE USED TO WEIGHT DRUMS.



REFLECTORIZED PLASTIC
DRUM

OTHER STDS. REQUIRED:	E-101 E-102	E-102A E-103	E-107A E-136	E-150 E-175

REVISIONS AND CORRECTIONS

APR 12, 1988 - DATE OF ORIGINAL ISSUE
JAN 23, 1989 - REVISED EXIT SIGN - CLARIFIED EXIT TAPER
SEPT 20, 1993 - REVISED RAMP CLOSURES, FLASHING BEACON DETAILS AND MOVED TYPE III BARRICADE (MOD) TO STD. E-107A
AUG 08, 1995 - REVISED BEACON SIZE

APPROVED

Andrew D. MacArthur
DIRECTOR OF ENGINEERING
David A. Ross
TRAFFIC AND SAFETY ENGINEER

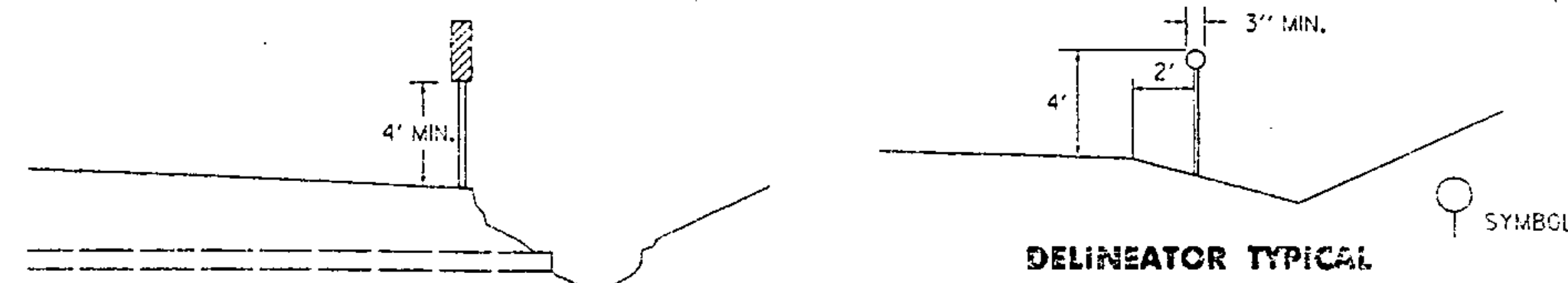
TRAFFIC CONTROL MISCELLANEOUS DETAILS



STANDARD
E-106

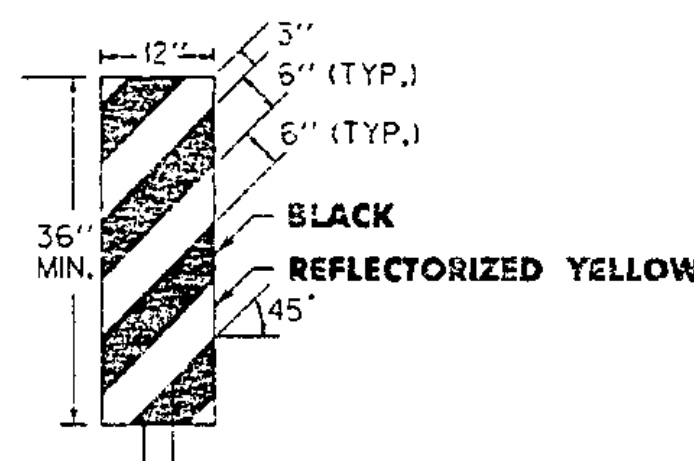
APPROVED FOR THIS PROJECT
AND/OR DESIGN IMPLEMENTATION,
FHWA FINAL APPROVAL PENDING.

/trcf/std/stdel06.dgn : stdel06.i



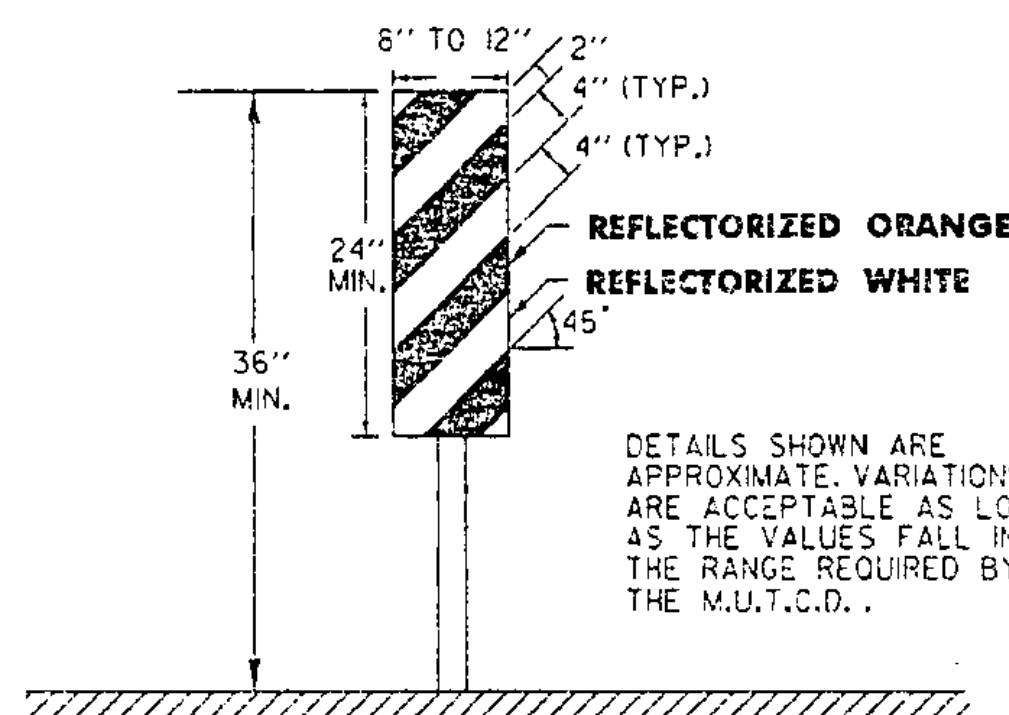
DELINEATOR TYPICAL

DELINEATORS SHALL BE REFLECTORIZED WHITE IN COLOR. THEY SHALL HAVE A MINIMUM OF 7 SQUARE INCHES. THEY MAY BE ROUND, SQUARE, OR OBLONG.



OBJECT MARKER TYPICAL

OBJECT MARKERS ARE USED TO MARK OBSTRUCTIONS WITHIN OR ADJACENT TO THE ROADWAY. IN SOME CASES THERE MAY NOT BE A PHYSICAL OBJECT INVOLVED, BUT OTHER ROADSIDE CONDITIONS SUCH AS NARROW SHOULDER DROP-OFFS, GORES, D.I. EXCAVATIONS, AND ABRUPT CHANGES IN THE ROADWAY ALIGNMENT MAY MAKE IT UNDESIRABLE FOR A DRIVER TO LEAVE THE ROADWAY. THE INSIDE EDGE OF THE OBJECT MARKER SHALL BE IN LINE WITH THE INNER EDGE OF THE OBSTRUCTION, WHENEVER POSSIBLE. OBJECT MARKERS SHALL HAVE ALTERNATING BLACK AND REFLECTORIZED YELLOW STRIPES, (SLOPING DOWNWARD IN THE DIRECTION TRAFFIC IS TO PASS).

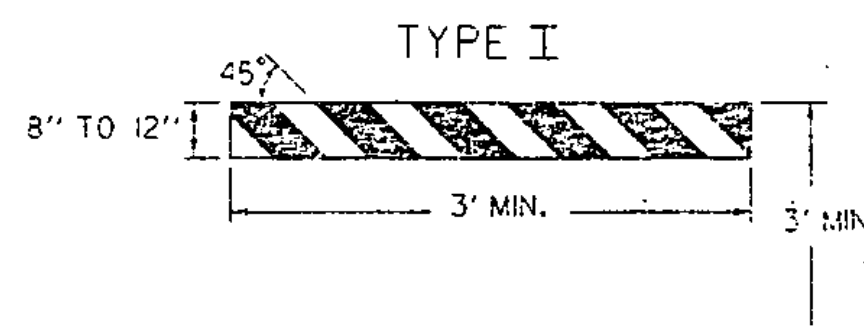


VERTICAL PANEL

VERTICAL PANELS SHALL HAVE ALTERNATING ORANGE AND WHITE REFLECTORIZED STRIPES (SLOPING DOWNWARD IN THE DIRECTION TRAFFIC IS TO PASS). THESE DEVICES MAY BE USED FOR TRAFFIC SEPARATION, CHANNELIZING OR BARRICADING WHERE SPACE IS AT A MINIMUM.

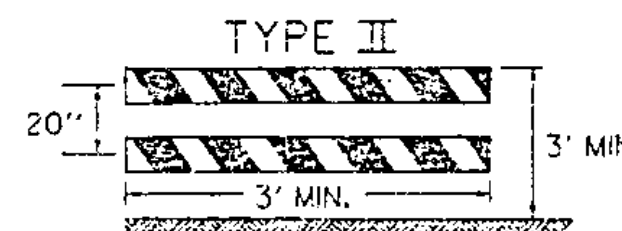
DELINEATOR, VERTICAL PANEL AND OBJECT MARKER DETAILS FOR CONSTRUCTION AREAS WHERE TRAFFIC IS MAINTAINED

ALL SIGN PLACEMENT DISTANCES ARE DESIRABLE SPECIFICATIONS. FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT. PROJECT CONSTRUCTION APPROACH SIGNING PLACEMENT SHALL TAKE INTO CONSIDERATION SPACING REQUIREMENTS FOR THE DETOUR SIGN LAYOUT REQUIREMENTS.

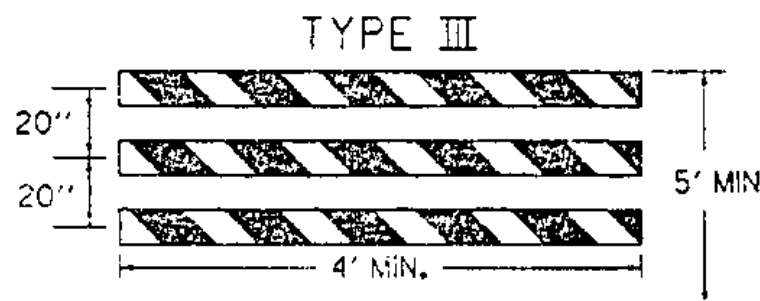


TYPE I

STRIPING IS SHOWN WITH TRAFFIC PASSING TO THE RIGHT.



TYPE II



TYPE III

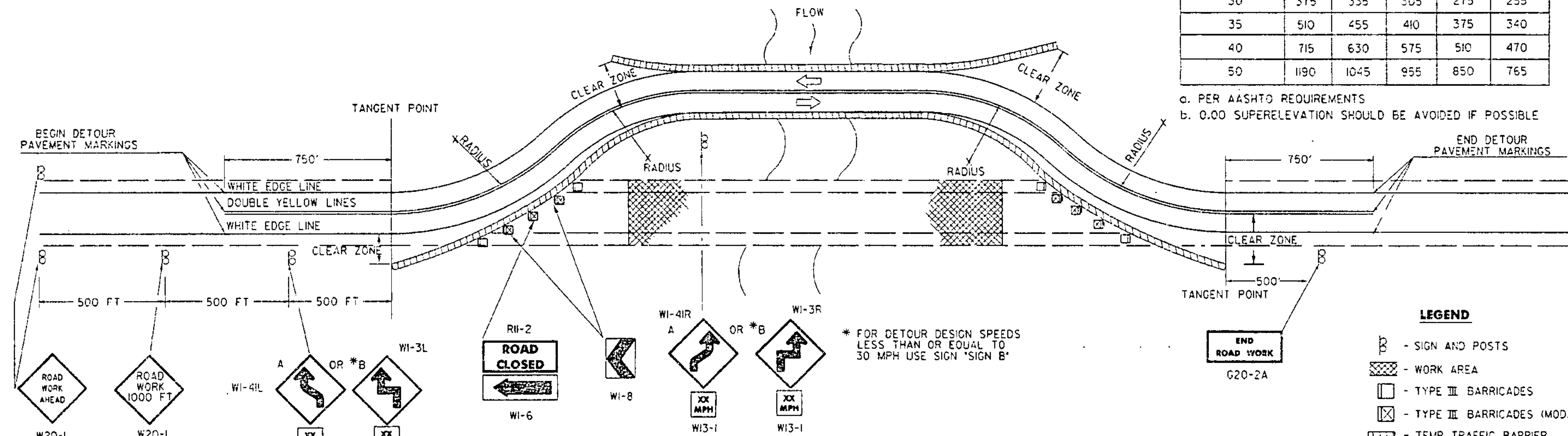
A TYPE III (MODIFIED) BARRICADE SHALL CONSIST OF TYPE II RAILS MOUNTED ON A BREAKAWAY BARRICADE AS SHOWN ON STANDARD SHEET E-107A.

BARRICADE CHARACTERISTICS			
	I	II	III
WIDTH OF RAIL	8" MIN. 12" MAX.	8" MIN. 12" MAX.	8" MIN. 12" MAX.
LENGTH OF RAIL	3' MIN.	3' MIN.	4' MIN.
WIDTH OF STRIPES	6"	6"	6"
HEIGHT	3' MIN.	3' MIN.	5' MIN.
TYPE OF FRAME	SEE E-107A	SEE E-107A	SEE E-107A
FLEXIBILITY	PORTABLE	PORTABLE	PORTABLE
ANGLE OF STRIPE	45°	45°	45°
COLOR OF STRIPES	ORANGE AND ORANGE AND WHITE	ORANGE AND ORANGE AND WHITE	ORANGE AND ORANGE AND WHITE

BARRICADE CHARACTERISTICS

DETOUR DESIGN SPEED (M.P.H.)	MINIMUM RADIUS (FT.) ^a				
	SUPERELEVATION (FT./FT.)				
20	160	140	130	120	110
25	245	220	200	185	170
30	375	335	305	275	255
35	510	455	410	375	340
40	715	630	575	510	470
50	1190	1045	955	850	765

a. PER AASHTO REQUIREMENTS
b. 0.00 SUPERELEVATION SHOULD BE AVOIDED IF POSSIBLE



TRAFFIC CONTROL PLAN TWO LANE HIGHWAY PAVED DETOUR WITH TEMPORARY TRAFFIC BARRIER

- LEGEND**
- SIGN AND POSTS
 - WORK AREA
 - TYPE III BARRICADES
 - TYPE III BARRICADES (MOD.)
 - TEMP. TRAFFIC BARRIER
 - INDICATES TRAFFIC DIRECTION

BARRICADES

APPLICATION NOTES

TYPE I BARRICADES SHALL BE USED ON CONVENTIONAL ROADS OR URBAN STREETS AND ARTERIALS TO MARK A SPECIFIC HAZARD.
TYPE II BARRICADES SHALL BE USED ON EXPRESSWAYS AND FREEWAYS, SERVING THE SAME FUNCTIONS AS TYPE I BARRICADES.
TYPE III BARRICADES (SEE STD. E-107A) SHALL ONLY BE USED WHEN A ROAD SECTION OR LANE IS CLOSED TO TRAFFIC AND ARE TO BE ERECTED AT THE POINT OF CLOSURE.

MATERIALS

THE BARRICADES SHOWN ON THIS SHEET SHOULD BE OF LIGHTWEIGHT MATERIAL. IF WOOD IS USED THE FOLLOWING CONDITIONS SHALL APPLY:

- WOODEN BARRICADES (TYPE I AND II):
a) SHALL NOT BE USED TO CHANNELIZE OR DELINEATE WORK AREAS WITHIN THE CLEAR ZONE OF ANY HIGHWAY WHERE OPERATING SPEEDS IN EXCESS OF 20 M.P.H. ARE EXPECTED UNLESS INSTALLED FOR PEDESTRIAN CONTROL BEHIND APPROVED POSITIVE BARRIERS.
b) MAY BE USED WHERE OPERATING SPEEDS OF 20 M.P.H. OR LESS ARE EXPECTED.
- TYPE III WOODEN BARRICADES SHALL NOT BE USED.

COLORS

THE BARRICADE PANELS SHOWN ON THIS SHEET SHALL HAVE AN ALTERNATING REFLECTORIZED WHITE AND ORANGE STRIPES. THE ORANGE SHALL CONFORM WITH THE STANDARD COLORS ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AND APPROVED BY THE U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION. THE BARRICADE COMPONENTS SHALL BE WHITE UNLESS UNPAINTED METAL OR ALUMINUM IS USED.

REFLECTORIZATION

THE REFLECTIVE SHEETING ON BARRICADE PANELS SHALL BE TYPE III.

LOCATION

THE BARRICADES SHOWN ON THIS SHEET WILL BE LOCATED BY THE RESIDENT ENGINEER IN THE FIELD OR AS SHOWN ON THE PLANS. THE LOCATION OF THE BARRICADES SHALL FOLLOW THE PROCEDURES SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", OR AS OTHERWISE NOTED.

MAINTENANCE

BARRICADES SHALL BE MAINTAINED IN CLEAN CONDITION, SATISFACTORY TO THE RESIDENT ENGINEER. THEY SHALL BE COMPLETELY VISIBLE TO THE APPROACHING TRAFFIC AT ALL TIMES. DAMAGED, DEFACED, OR DIRTY BARRICADES SHALL BE REPAIRED, CLEANED, OR REPLACED AS ORDERED BY THE RESIDENT ENGINEER.

DETOUR NOTES

- SIGNS AND DELINEATION SHOWN FOR ONE DIRECTION OF TRAFFIC ONLY.
- THE CONTRACTOR IS RESPONSIBLE FOR PAVEMENT MARKING AND SHALL REMOVE ANY CONFLICTING OR CONFUSING EXISTING MARKINGS.
- ADDITIONAL SIGNING MAY BE REQUIRED AT THE DISCRETION OF THE RESIDENT ENGINEER.
- UNPAVED DETOURS REQUIRE PAVEMENT MARKINGS FOR TRANSITIONS FROM EXISTING PAVEMENT.
- THE NUMBER OF CHANNELIZING DEVICES, BARRICADES AND OTHER TRAFFIC CONTROL DEVICES SHOWN ON THIS SHEET ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL NUMBER REQUIRED SHALL BE DETERMINED BASED ON INDIVIDUAL DETOUR CONDITIONS (TAPERS, SPEED LIMITS, LENGTH OF DETOUR CURVE, ETC.).
- AASHTO CLEAR ZONE REQUIREMENTS SHOULD BE MET. IF NOT THEN AN APPROVED ENERGY ABSORPTION ATTENUATOR SUITABLE FOR THE TEMPORARY TRAFFIC BARRIER USED AND FOR THE DESIGN SPEED SHALL BE INSTALLED PER THE CURRENT AASHTO ROADSIDE DESIGN GUIDE.
- THE DETOUR DESIGN SPEED SHOULD BE NO LESS THAN 10 M.P.H. BELOW THE POSTED SPEED LIMIT, UNLESS PHYSICAL RESTRICTIONS PREVENT THIS.
- SEE STANDARD SHEETS E-100, E-101 AND E-102 FOR SIGN DETAIL AND MATERIAL REQUIREMENTS.
- IF THE USE OF TEMPORARY TRAFFIC BARRIER IS NOT REQUIRED, THEN REFLECTORIZED PLASTIC DRUMS SHALL BE USED.

OTHER STDS. REQUIRED:	E-100 E-101	E-102 E-102a	E-107a
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REVISIONS AND CORRECTIONS

SEPT. 10, 1987 - DATE OF ORIGINAL ISSUE
APRIL 29, 1988 - FHWA REVIEW COMMENTS
SEPT. 20, 1993 - NEW RADIUS CHART, BARRICADE ALIGNMENT AND USE OF TEMPORARY TRAFFIC BARRIER
AUG. 08, 1995 - REVISED SIGNING PER MUTCD

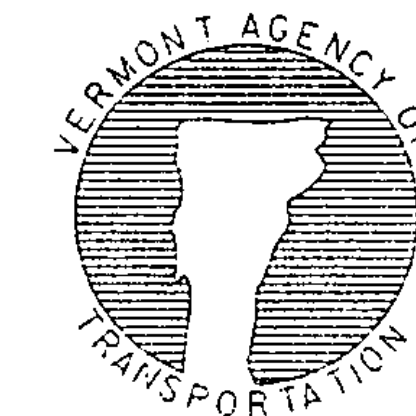
APPROVED FOR THIS PROJECT AND/OR DESIGN IMPLEMENTATION, FHWA FINAL APPROVAL PENDING.

APPROVED

Stephen J. MacArthur
DIRECTOR OF ENGINEERING

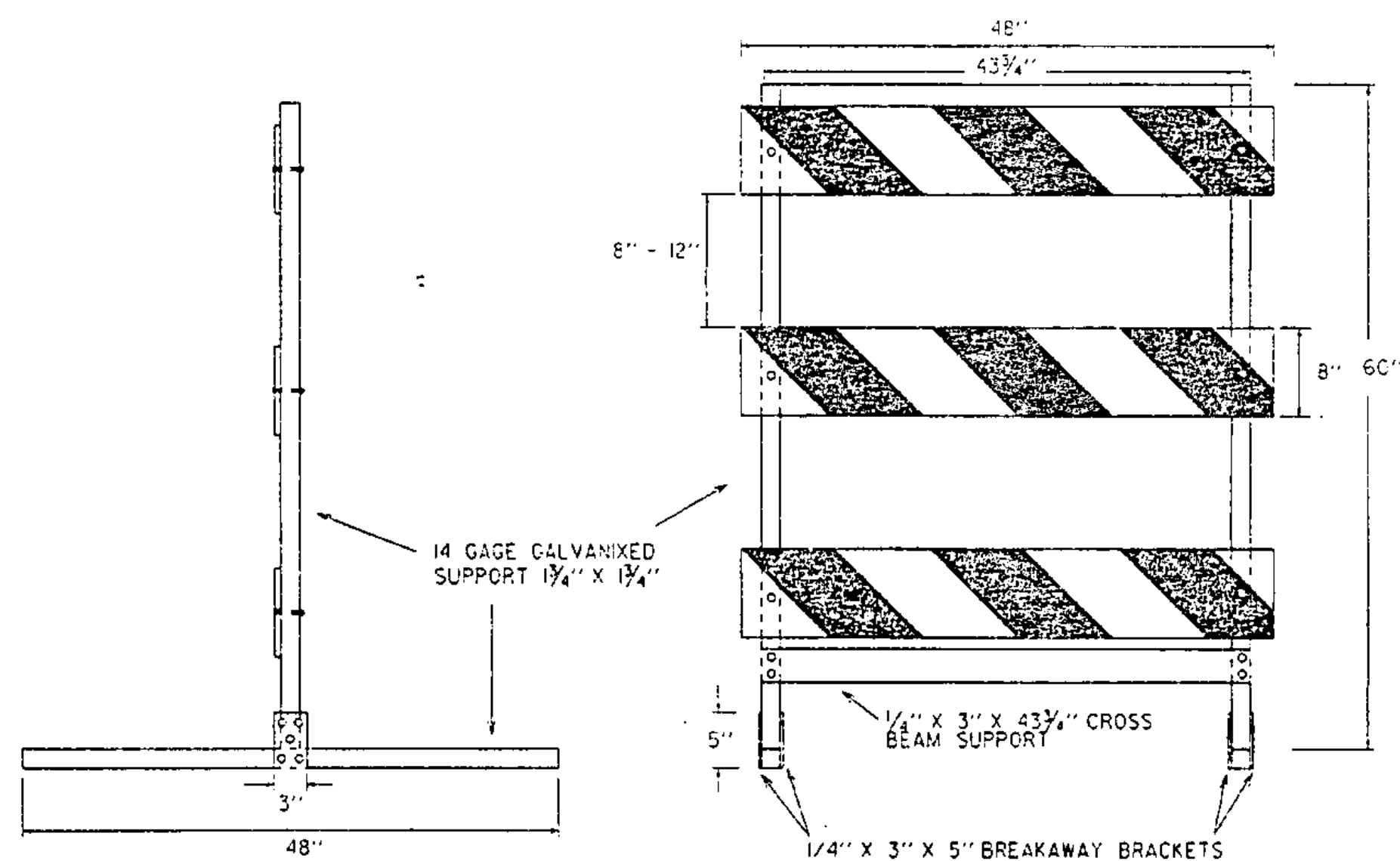
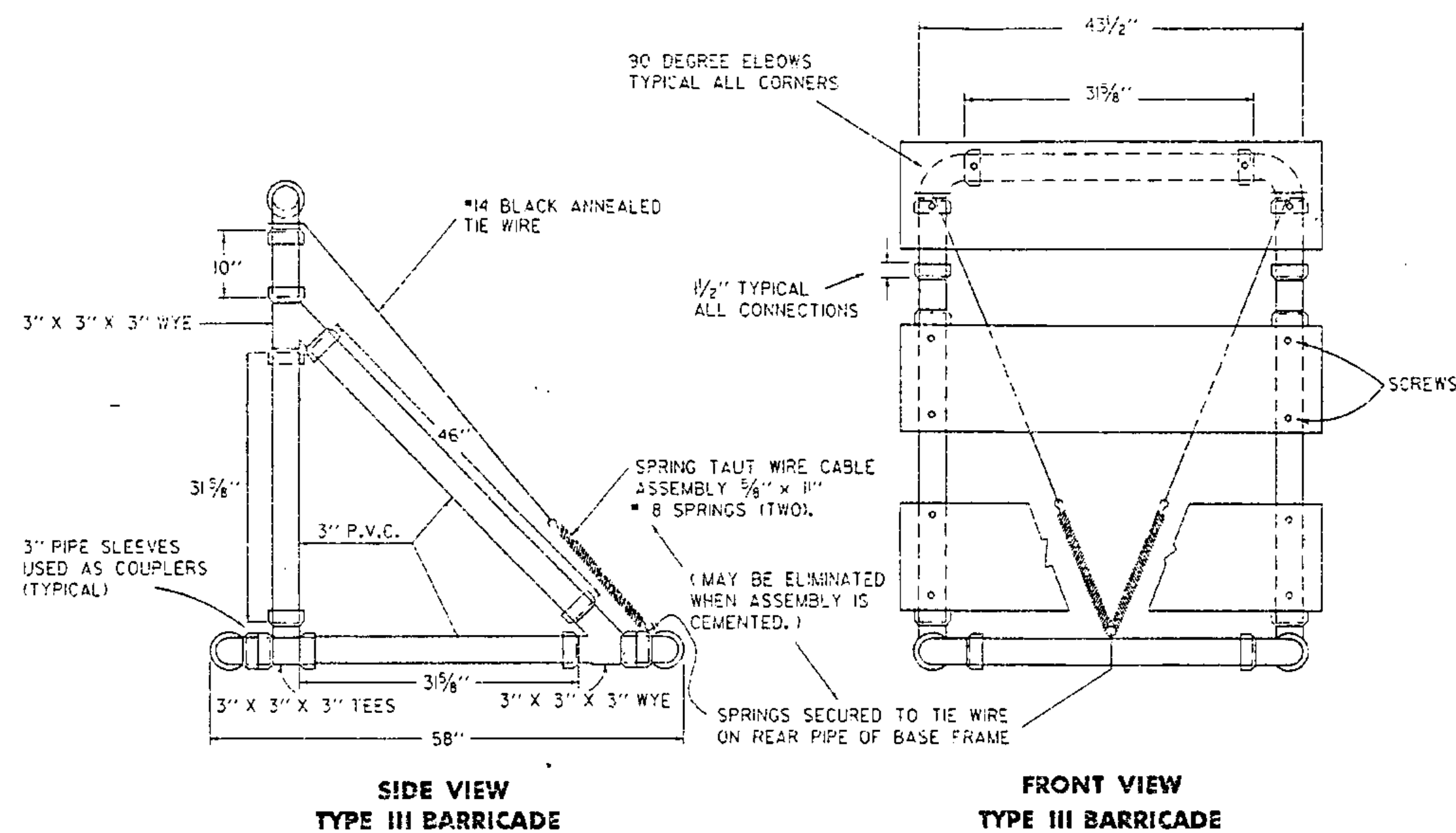
Donna A. Ross
TRAFFIC AND SAFETY ENGINEER

DELINEATION, BARRICADES AND DETOURS FOR CONSTRUCTION AREAS



STANDARD E-107

\\trcf\std\stdel07.dgn : stdel07.i



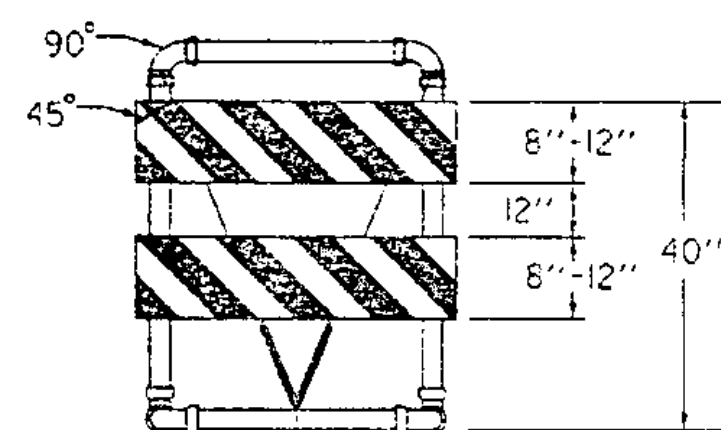
SIDE AND FRONT VIEW OF TYPE III METAL BARRICADE

MATERIALS FOR TYPE I AND II BARRICADES

- 20' - 1" PVC
- 4 - 1" PVC 90° ELBOWS
- 30' - 1/2" ID THINWALL PVC CONDUIT
- 36' - 1/4" STEEL ROD
- 4 - 1" WASHERS
- 24' - LIGHT DUTY CHAIN
- 1/2" - 1/4" PAN HEAD METAL SCREWS (AS REQUIRED)
- 2 - 3/4" COTTER PINS
- 2 OR 4 - 8" OR 12" X 36" X 0.025" BARRICADE RAILS (AS REQUIRED)

MATERIALS FOR TYPE III BARRICADES

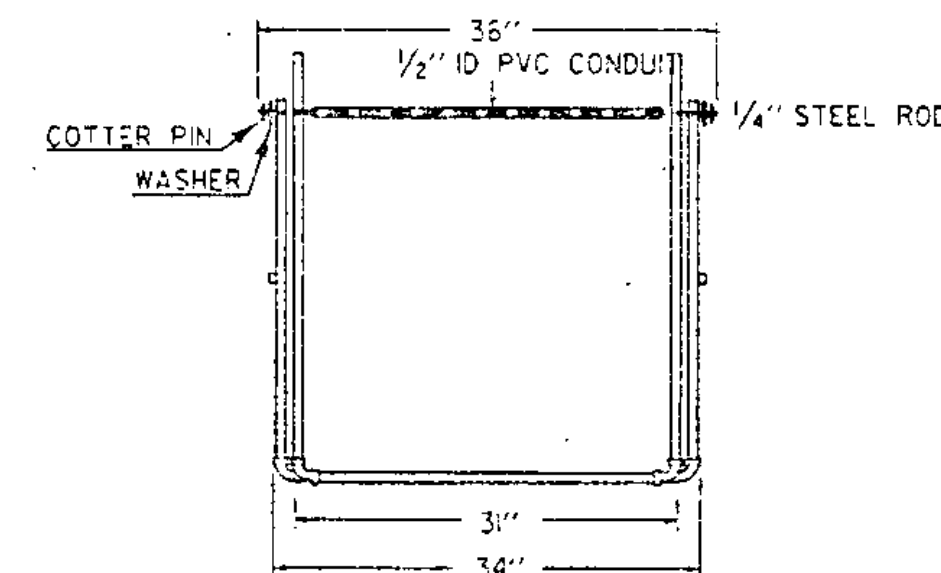
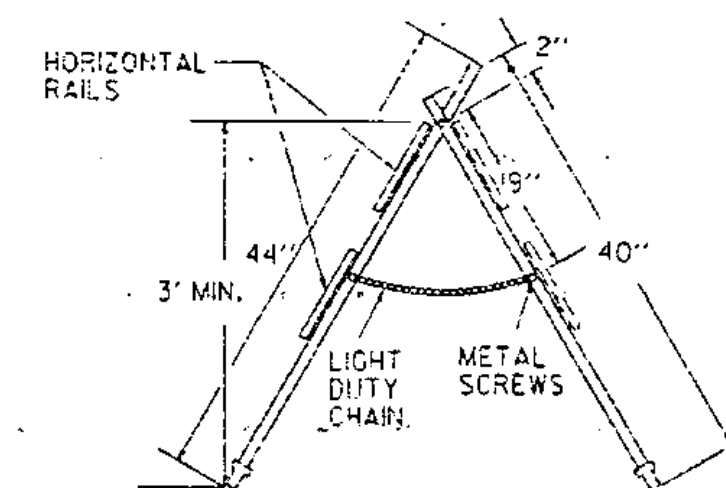
- 30 LF - 3" I.D. PVC PIPE
- 6 - 3" 90° ELBOWS
- 4 - 3" TEES
- 4 - 3" WYES
- 3 - 8" OR 12" X 48" X 0.025" BARRICADE RAILS
- 2 - 5/8" X 11" #8 SPRING (IF ASSEMBLY IS NOT CEMENTED)
- 12 - 1" #14 PAN HEAD METAL SCREWS
- 15 LF - 1/4" BLACK ANNEALED TIE WIRE (IF ASSEMBLY IS NOT CEMENTED)



TYPE III (MODIFIED) BARRICADE
(STRIPING IS SHOWN WITH TRAFFIC PASSING TO THE RIGHT).

MATERIALS FOR METAL TYPE III BARRICADES

- PANELS (3): 8' X 48' GALVANIZED STEEL...COVERED 1 OR 2 SIDES WITH WHITE/ORANGE, DIAGONALLY STRIPED REFLECTIVE SHEETING
- VERTICAL SUPPORTS (2): 14 GAGE GALVANIZED TUBING 1 3/4" X 1 3/4" X 60'
- HORIZONTAL SUPPORTS (2): 14 GAGE GALVANIZED TUBING 1 3/4" X 1 3/4" X 48'
- CROSS BEAM SUPPORT (1): COLD GALVANIZED STEEL 1/4" X 3" X 43 3/4"
- BREAKAWAY BRACKETS (4): COLD GALVANIZED STEEL 1/4" X 3" X 5"
- FASTENERS: 6 - SHEAR BOLTS WITH LOCK NUTS 1/4" D X 2 3/4" 4 - FULCRUM BOLTS WITH LOCK NUTS 3/8" D X 2 3/4" 4 - FASTENER BOLTS WITH LOCK NUTS 3/8" D X 2 3/4" 6 - PANEL BOLTS WITH LOCK NUTS AND WASHERS 1/4" D X 2" ALL FASTENERS GALVANIZED STEEL. ALL BOLTS HEX HEAD.



TYPE I AND TYPE II BARRICADE

MATERIALS

THE PIPE, WYES, TEES AND ELBOWS USED TO CONSTRUCT BARRICADES SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION D 2241 FOR P.V.C. 1120 OR 1220 SDR-21, PRESSURE RATING 200 PSI. THE WYES, TEES AND ELBOWS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION D 2456, TYPE II, GRADE 4. ALL JOINTS SHALL BE SLIP-FIT AND MAY BE LIGHTLY CEMENTED. THE BARRICADE RAILS SHALL BE FABRICATED FROM 0.025" ANODIZED ALUMINUM AND SHALL HAVE REFLECTORIZED ALTERNATING ORANGE AND WHITE STRIPES (SLOPING DOWNWARD AT AN

MAINTENANCE

BARRICADES SHALL BE MAINTAINED IN CLEAN AND LEGIBLE CONDITIONS SATISFACTORY TO THE ENGINEER. THEY SHALL BE COMPLETELY VISIBLE TO APPROACHING TRAFFIC AT ALL TIMES. DAMAGED, DEFACED, OR DIRTY BARRICADES SHALL BE REPAIRED, CLEANED, OR REPLACED AS ORDERED BY THE ENGINEER. THE P.V.C. PIPE AND FITTINGS SHALL BE WHITE IN COLOR. AT LEAST TWO (2) HOLES SHALL BE DRILLED (1/2" DIA.) IN EACH SECTION OF PIPE AND FITTINGS IF THE ASSEMBLY IS NOT CEMENTED.

WHICH WILL NOT CONSTITUTE A HAZARD IF THE BARRICADE IS HIT, THESE SHALL BE PLACED ONLY ON THE FRONT AND REAR PIPES OF THE BASE FRAME BE A HAZARD TO VEHICLES PASSING ON EITHER SIDE. GLUED JOINTS MAY PROVIDE ADDITIONAL STABILITY TO THE INSTALLATION.

TYPE I BARRICADES SHALL UTILIZE ONE HORIZONTAL RAIL IN EACH DIRECTION.

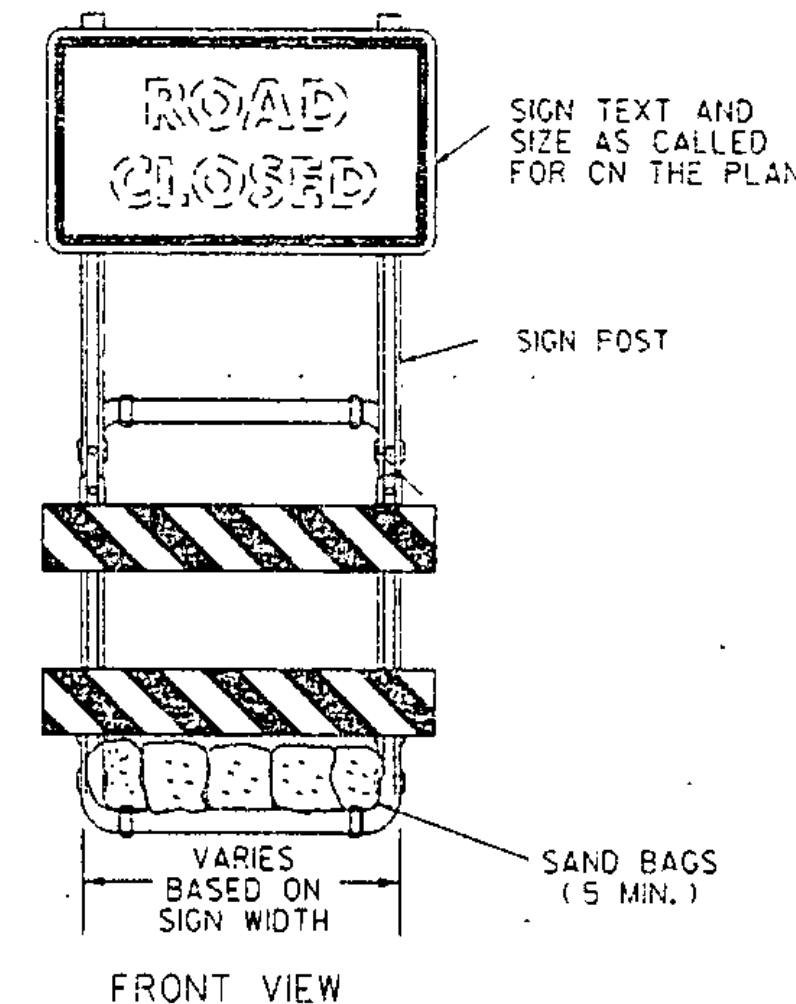
TYPE II BARRICADES SHALL BE A TYPE I BARRICADE WITH AN ADDITIONAL HORIZONTAL RAIL MOUNTED BELOW THE OTHER IN EACH DIRECTION.

TYPE II BARRICADES (MODIFIED) SHALL CONSIST OF THE BREAKAWAY 3" PVC DESIGN SHOWN ON THIS SHEET WITH THE TWO RAIL LAYOUT DETAILED ABOVE LEFT.

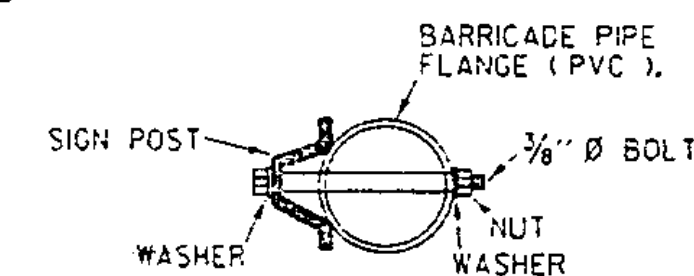
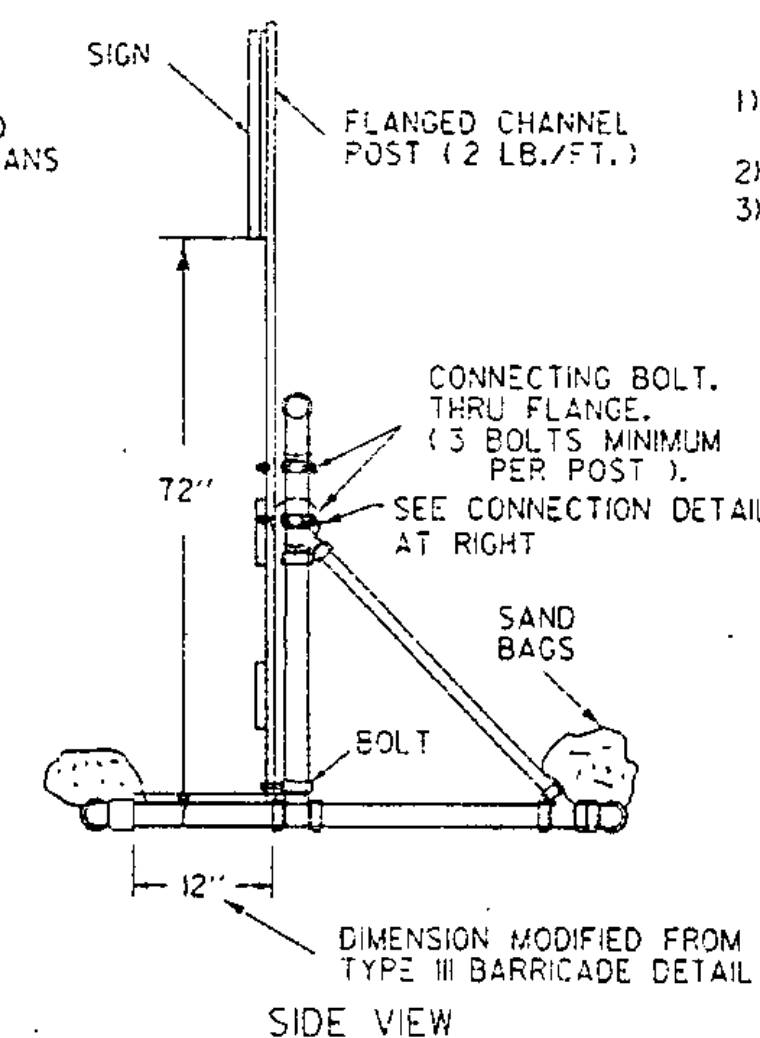
SEE STD E-107 FOR ADDITIONAL INFORMATION.

NOTES:

- 1) REFER TO STANDARD TYPE III BARRICADE (ABOVE LEFT)
- 2) ALL BARRICADE JOINTS SHALL BE GLUED.
- 3) FIVE SAND BAGS ARE REQUIRED BOTH FRONT AND BACK, 50 LB. MINIMUM EACH.



SIGN MOUNTING ON
TYPE III BARRICADE (MODIFIED)



CONNECTION DETAIL

OTHER STDS. E-107
REQUIRED:

REVISIONS AND CORRECTIONS

- SEPT. 10, 1987 - ADDED METAL TYPE III BARRICADE
- SEPT. 20, 1993 - REVISED NOTES AND TYPE III (MOD.) BARRICADE DETAIL
- AUG. 08, 1995 - ADDED METAL TYPE III BARRICADE

APPROVED FOR THIS PROJECT
AND/OR DESIGN IMPLEMENTATION.
FHWA FINAL APPROVAL PENDING.

APPROVED

Stephen D. MacArthur
DIRECTOR OF ENGINEERING

David A. Ross
TRAFFIC AND SAFETY ENGINEER

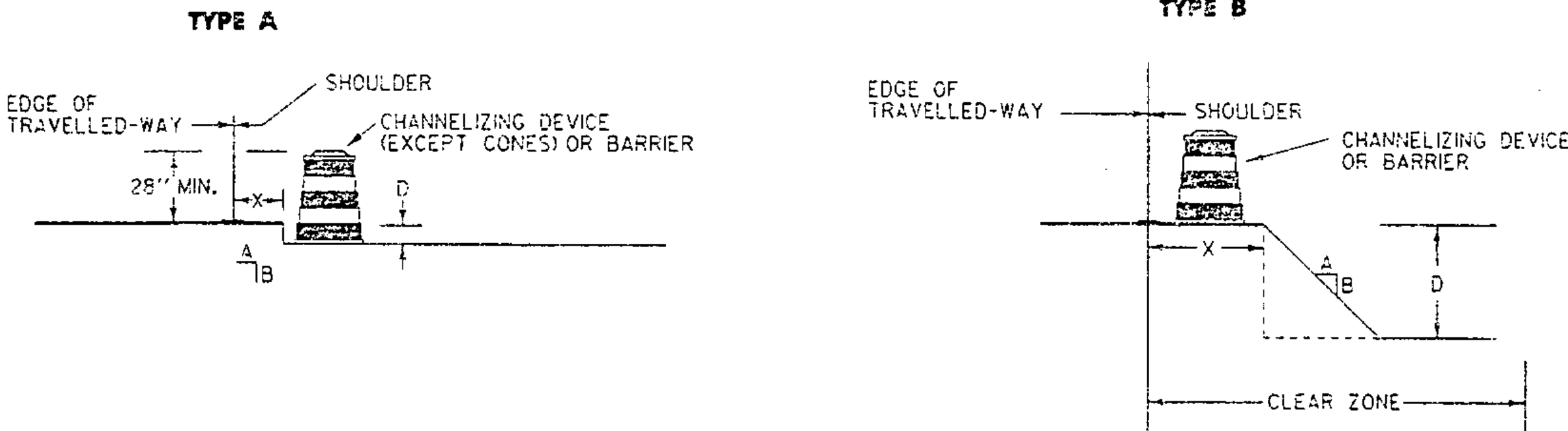
BREAKAWAY BARRICADE DETAILS



STANDARD
E-107 A

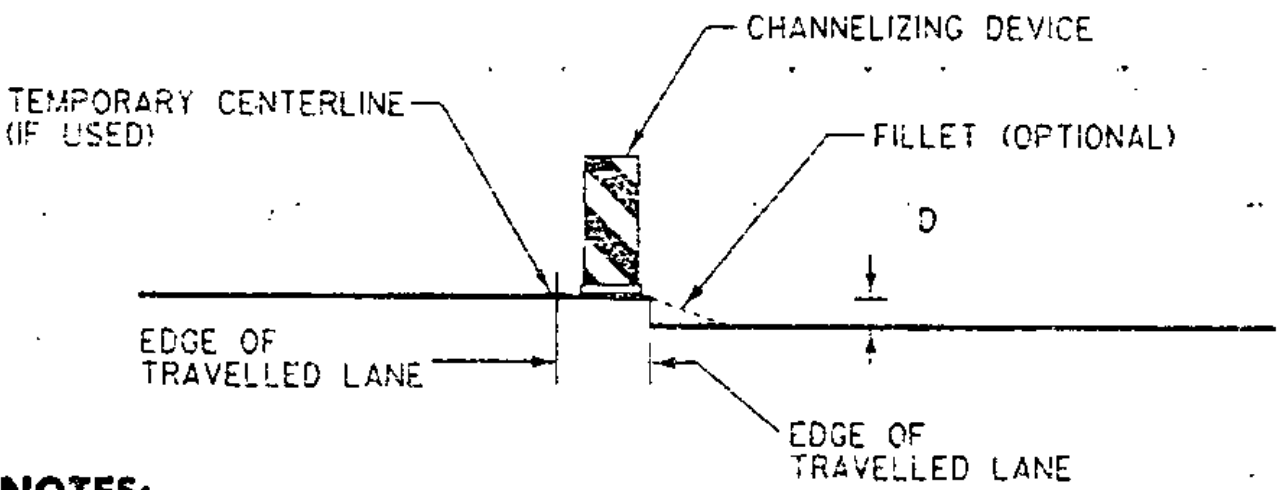
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CONDITION 1
DROP-OFF ADJACENT TO TRAVELLED-WAY



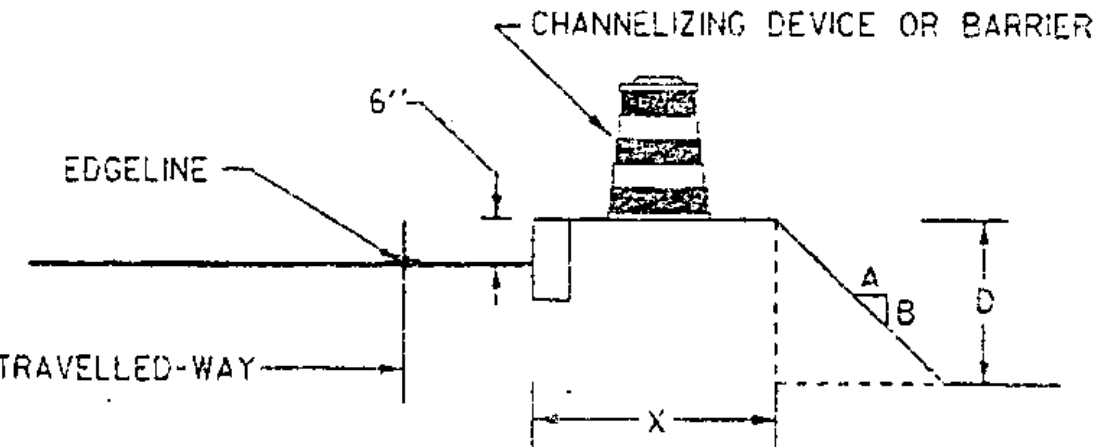
- NOTES:
1. CHANNELIZING DEVICES OR BARRIER SHOULD BE PLACED TO MAXIMIZE THE WIDTH OF THE TRAVELED-WAY.
 2. FOR SPECIFIC REQUIREMENTS USE CHART "A".
 3. IF THE DROP-OFF REQUIRES CHANNELIZING DEVICES TO REMAIN INPLACE OVERNIGHT THEN "LOW SHOULDER" OR "SHOULDER DROP OFF" SIGNS SHOULD BE INSTALLED.

CONDITION 2
DROP-OFF BETWEEN ADJACENT TRAVELLED LANES



- NOTES:
1. WHENEVER A LONGITUDINAL DROP-OFF BETWEEN ADJACENT TRAVELLED-LANES IS TO BE LEFT OVERNIGHT THEN "UNEVEN LANES" SIGNS AND CHANNELIZING DEVICES SHOULD BE INSTALLED.
 2. IF REQUIRED, THE CHANNELIZING DEVICES USED SHOULD BE THOSE WHICH MAXIMIZE THE TRAVELLED LANE (IE. CONES, VERTICAL PANELS OR TUBULAR MARKERS).
 3. A BITUMINOUS CONCRETE FILLET WITH A 3:1 SLOPE MAY BE USED IN LIEU OF CHANNELIZING DEVICES, HOWEVER THE "UNEVEN LANES" SIGNS SHOULD BE INSTALLED REGARDLESS.

CONDITION 3
DROP-OFF BEYOND SHOULDER OR CURB



- NOTES:
1. CHANNELIZING DEVICES OR BARRIER SHOULD BE PLACED TO MAXIMIZE THE WIDTH OF THE TRAVELLED WAY.
 2. FOR SPECIFIC REQUIREMENTS USE CHART "A" OR "B" AS APPLICABLE.

CHART A
ALL SPEEDS
NO CURB

X (FEET)	DROP (D) (INCHES)	A/B SLOPE	DEVICE REQUIRED
0 TO 4'	LESS THAN 2"	ANY	NONE
	2" TO 5"	3:1 OR FLATTER	NONE
	GREATER THAN 5"	STEEPER THAN 3:1	CHANNELIZING DEVICE
4' TO 10'	LESS THAN 5"	ANY	NONE
	5" TO 12"	3:1 OR FLATTER	NONE
	GREATER THAN 12"	STEEPER THAN 3:1	BARRIER
10' TO CZ	LESS THAN OR EQUAL TO 12"	ANY	NONE
	GREATER THAN 12"	3:1 OR FLATTER	NONE
		STEEPER THAN 3:1	BARRIER

1. CLEAR ZONE (CZ) IS TO BE DETERMINED PER THE CURRENT AASHTO ROADSIDE DESIGN GUIDE.
2. CHANNELIZING DEVICES MAY BE USED INSTEAD OF BARRIER FOR SHORT TERM (ONE-DAY) OPERATIONS.
3. ON BORDERLINE CONDITIONS THE ENGINEER SHALL DETERMINE WHICH TREATMENT IS ADEQUATE FOR THE EXISTING CONDITIONS.

GENERAL NOTES

1. THESE CONDITIONS AND TREATMENTS ARE ONLY PART OF THE TRAFFIC CONTROL SYSTEM AND SHALL BE USED IN ADDITION TO THE PROPER WORK ZONE SIGNING.
2. THE FOLLOWING ARE ACCEPTABLE CHANNELIZING DEVICES:
SEE STANDARD SHEETS E-106, E-107 AND E-107A FOR FURTHER DETAILS
A. VERTICAL PANEL
B. TYPE 1 OR TYPE 11 BARRICADE
C. PLASTIC DRUM
* D. CONE - WHERE APPLICABLE
* CONES SHALL NOT BE USED WHEN THE CHANNELIZING DEVICE IS REQUIRED TO BE PLACED BELOW THE GRADE OF THE TRAVELLED-WAY. (SEE CONDITION 1, TYPE A)
3. WHERE BARRIER IS CALLED FOR, EITHER CONCRETE BARRIER (JERSEY SHAPE), STEEL BEAM GUARDRAIL OR OTHER FHWA APPROVED BARRIER MAY BE USED.
-BARRIER ENDS FACING ONCOMING TRAFFIC SHALL BE TAPERED BEYOND THE CLEAR ZONE OR PROTECTED WITH AN APPROVED END TREATMENT DESIGNED FOR THE 85TH PERCENTILE SPEED OR THE POSTED SPEED LIMIT OF THE ROADWAY.
4. CHANNELIZING DEVICE SPACING SHALL BE AS FOLLOWS:
TAPERS - CHANNELIZING DEVICES SHALL BE SPACED A MAXIMUM OF 'S' (THE SPEED LIMIT IN FEET, 65 MPH = 65 FT) CENTER TO CENTER.
TANGENT - CHANNELIZING DEVICES SHALL BE SPACED 'S' (THE SPEED LIMIT IN FEET, 65 MPH = 65 FT) TO A MAXIMUM OF '2S' CENTER TO CENTER.
5. "LOW SHOULDER" OR "UNEVEN LANES" SIGNS, WHEN USED, SHALL BEGIN PRIOR TO THE DROP-OFF CONDITION AND SHOULD BE REPEATED EVERY 1500 FEET.

CHART B
40 MPH OR LESS
WITH CURB

X (FEET)	DROP (D) (INCHES)	DEVICE REQUIRED
0-10'	LESS THAN OR EQUAL TO 12"	NONE
0-10'	GREATER THAN 12"	CHANNELIZING DEVICE
GREATER THAN 10	ANY	NONE

- NOTES:
1. USE THIS CHART ONLY FOR CONDITION 3.
 2. USE THIS CHART FOR VERTICAL CURBS OF 6" OR GREATER FOR LOWER CURBS OR MOUNTABLE USE CHART A.
 3. FOR CURBED SECTIONS WITH POSTED SPEEDS ABOVE 40 MPH USE CHART A.

REVISIONS AND CORRECTIONS

SEPT. 20, 1993 - DATE OF ORIGINAL ISSUE
AUG. 18, 1995 - ADDED SHOULDER WARNING NOTE

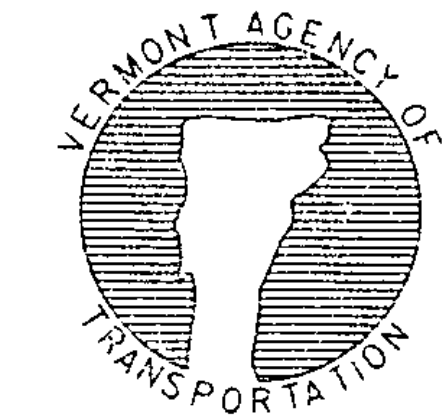
APPROVED FOR THIS PROJECT
AND/OR DESIGN IMPLEMENTATION.
FHWA FINAL APPROVAL PENDING.

APPROVED

Stephen J. McArthur
DIRECTOR OF ENGINEERING

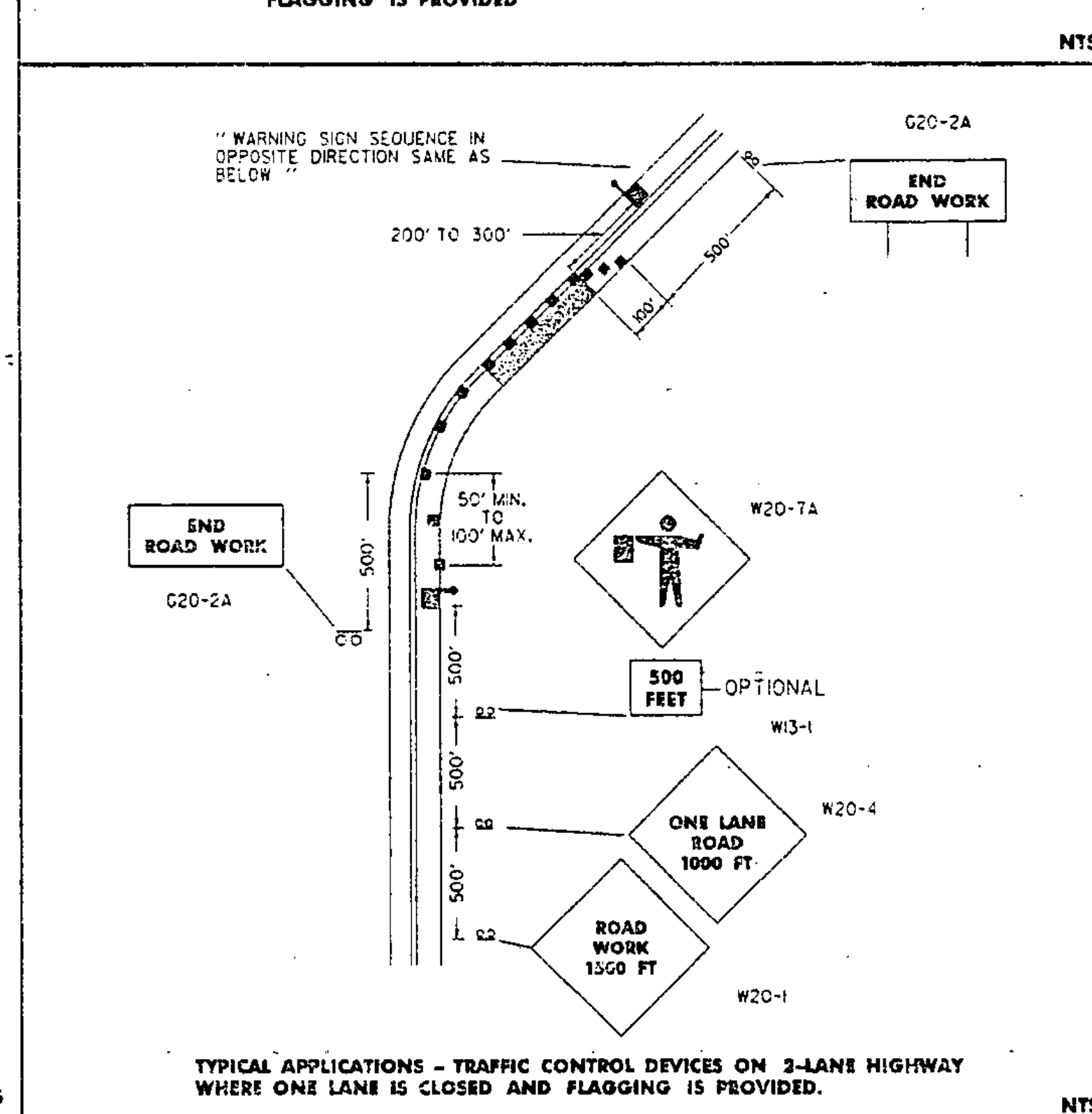
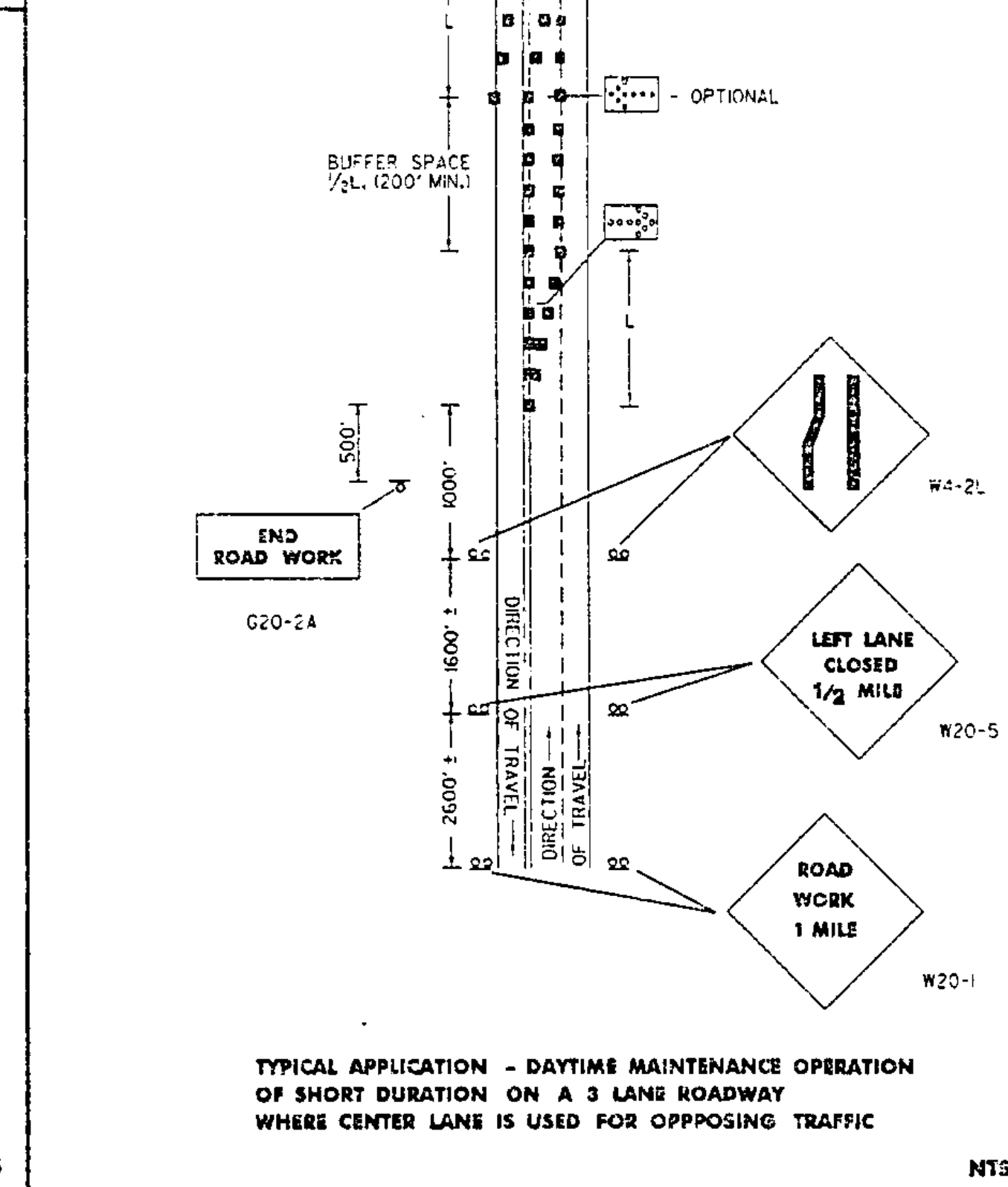
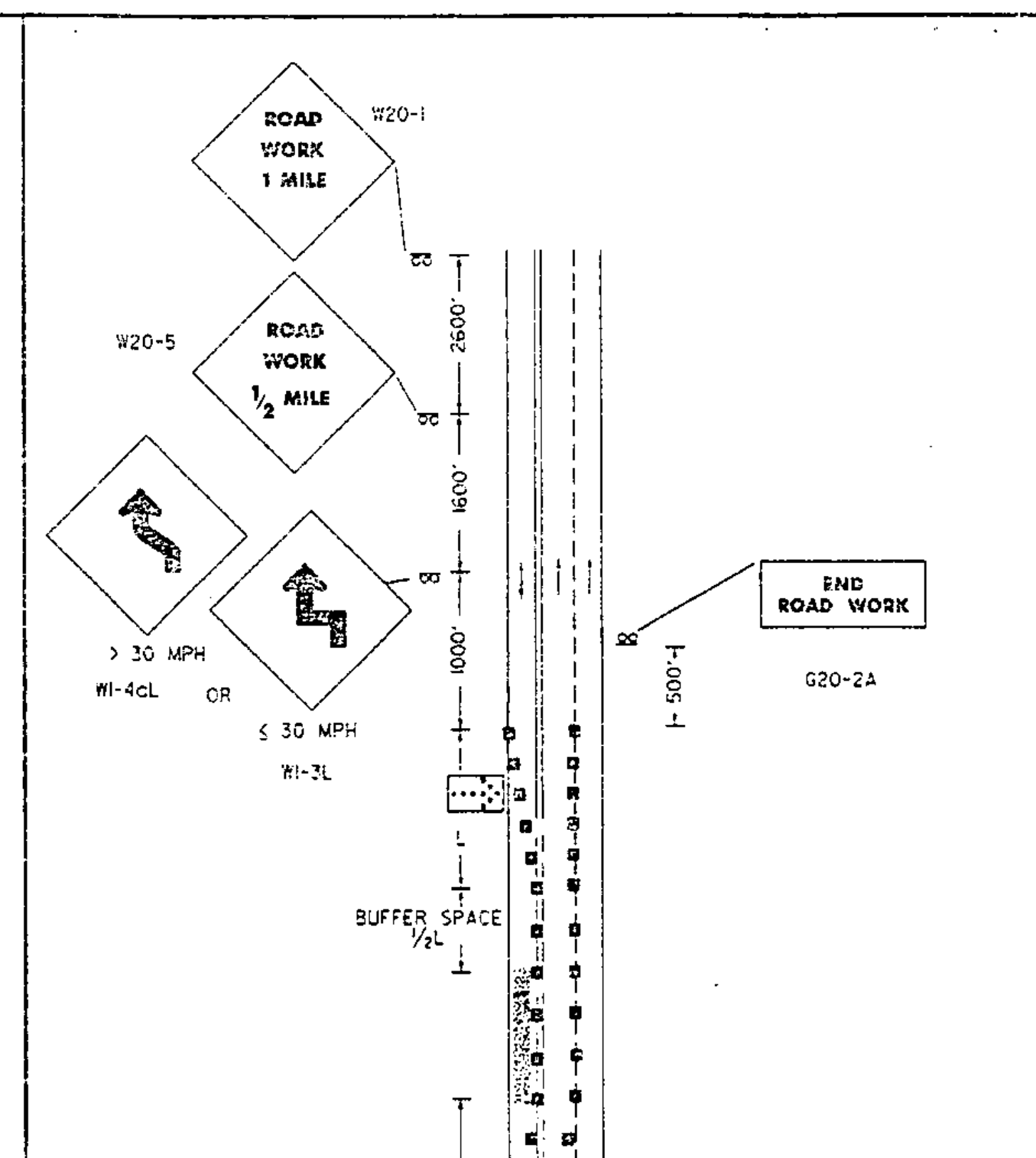
David A. Ross
TRAFFIC AND SAFETY ENGINEER

CONSTRUCTION ZONE
LONGITUDINAL DROP OFFS



STANDARD
E-108

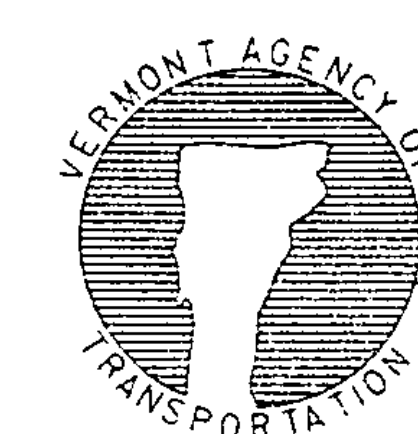
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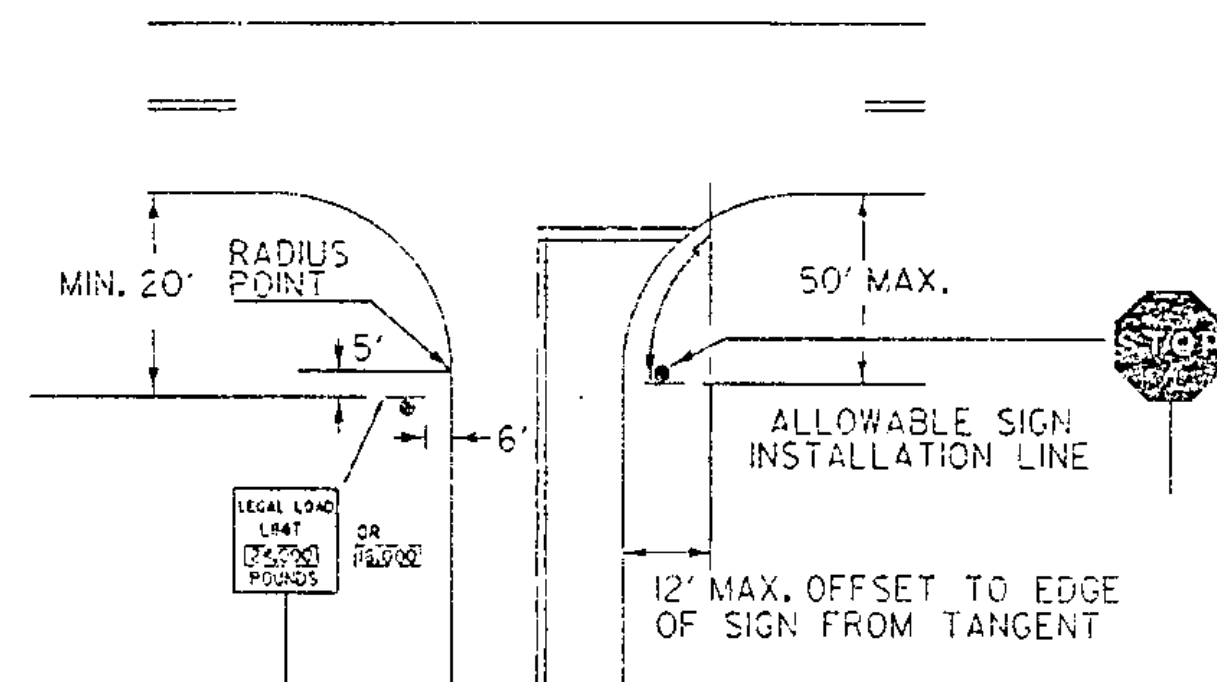
- | LEGEND: | | | |
|---|--|---|---------------------|
|  | FLAGPERSON |  | WORK AREA |
|  | CHANNELIZING
DEVICES (CONES OR DRUMS) |  | SIGN & POSTS |
|  | FLASHING ARROW PANEL |  | TYPE III BARRICADES |

OTHER STDS.	E-100	E-102
REQUIRED:	E-101	E-106

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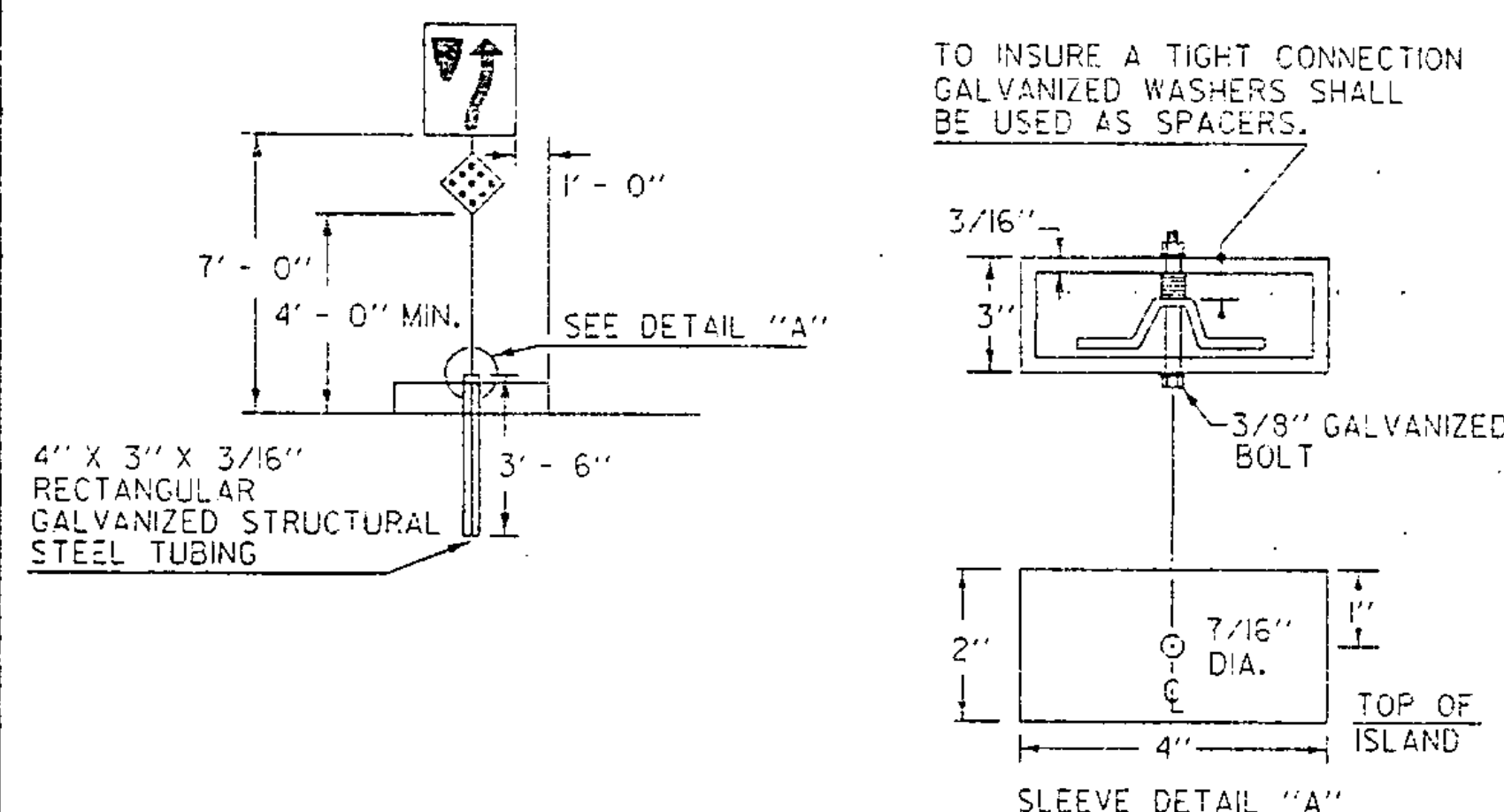


STANDARD E-110



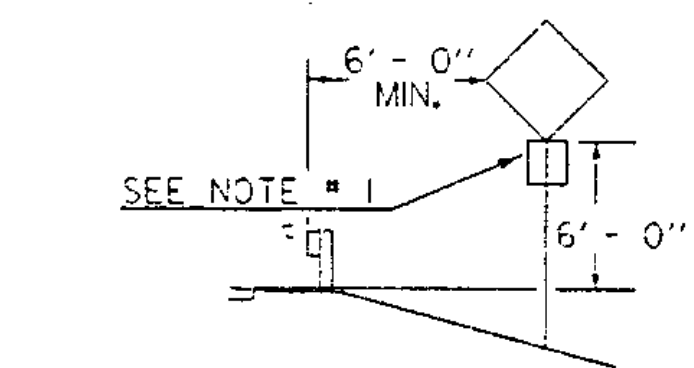
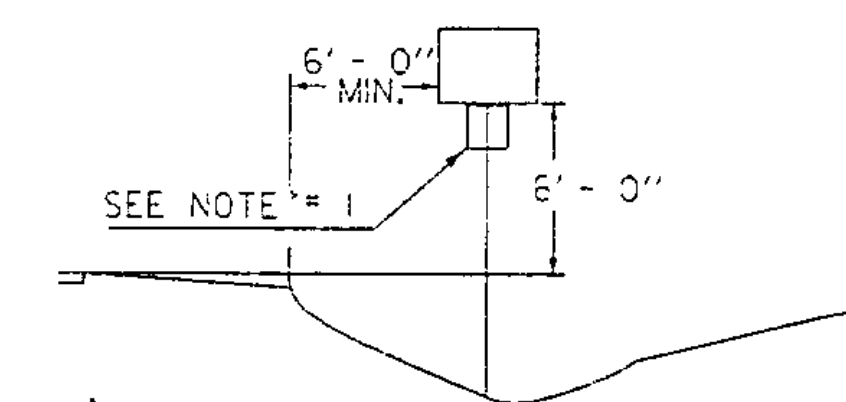
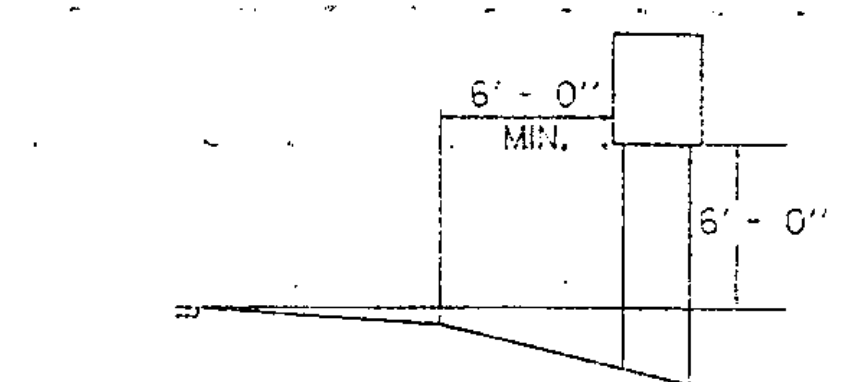
LEGAL LOAD LIMIT AND STOP SIGNS AT INTERSECTIONS WITH TOWN HIGHWAYS

STOP SIGN SHALL BE PLACED ON DRIVERS RIGHT, MAINTAINING MAXIMUM VISIBILITY. CLEARANCE SHALL BE A MINIMUM OF 6' AND A MAXIMUM OF 50' FROM EDGE LINE OF INTERSECTING ROADWAY AND DOES NOT HAVE TO BE ADJACENT TO THE STOP BAR.

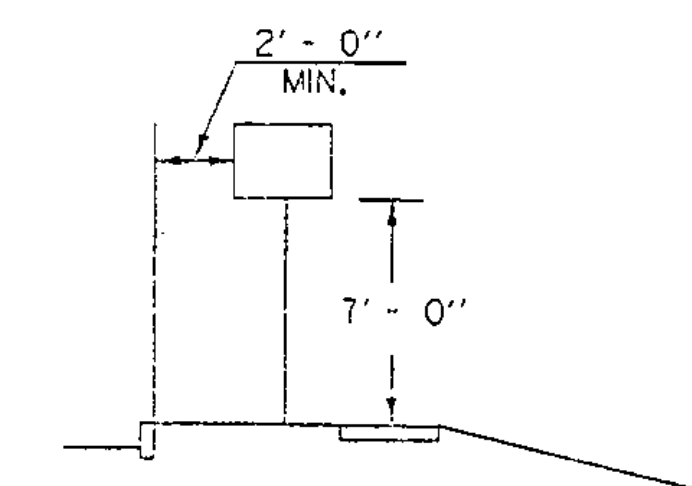
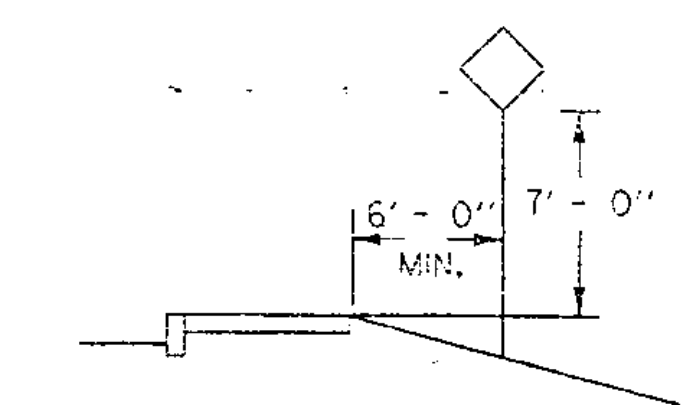


SIGNS ON MEDIAN ISLANDS IN THE LINE OF TRAFFIC

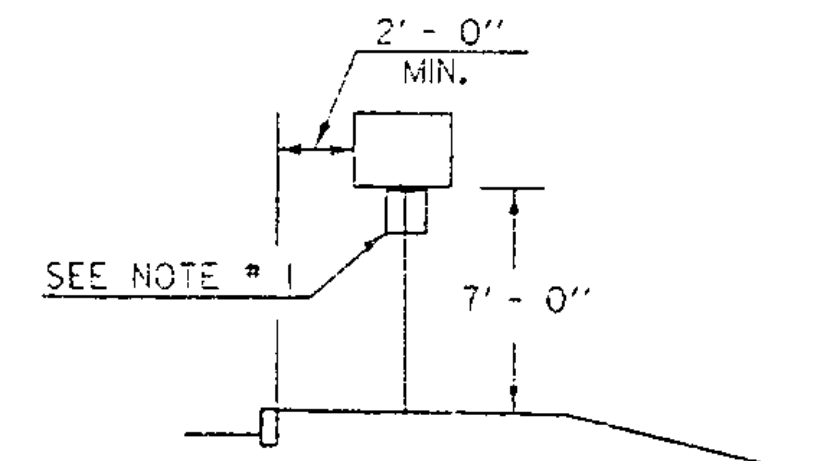
INCREASE VERTICAL CLEARANCE TO 7' IN AREAS OF FREQUENT ROADSIDE PARKING OR PEDESTRIAN ACTIVITY



RURAL



IF SUFFICIENT CLEARANCE IS NOT AVAILABLE BETWEEN CURB AND SIDEWALK MOUNT SIGN BEHIND SIDEWALK AS SHOWN AT TOP. CHECK FOR ADEQUATE R.O.W..



URBAN

NOTES:

1. IN BOTH RURAL AND URBAN LOCATIONS, IF A SECONDARY SIGN IS MOUNTED BELOW ANOTHER SIGN, THE MINIMUM CLEARANCE MAY BE REDUCED BY ONE FOOT.
2. IN RURAL AREAS WITH NO OR MINIMAL SHOULDER, THE LATERAL CLEARANCE TO THE EDGE OF A SIGN SHOULD BE A MINIMUM OF 12' FROM THE EDGE OF THE TRAVELED WAY.
3. ALSO SEE OTHER STANDARD SHEETS FOR MOUNTING CLEARANCE AND SPACING OF DESTINATION AND ROUTE MARKER ASSEMBLIES AND TOWN LINE SIGNS.

POST REFERENCE:

REFER TO THE DETAILS ON THE APPROPRIATE STANDARD DRAWING FOR INFORMATION CONCERNING THE PROPER MOUNTING OF SIGNS ON APPROPRIATE POSTS.

OTHER STDS. E-160 E-161 E-162 E-163 E-164
REQUIRED:

REVISIONS AND CORRECTIONS

JAN. 23, 1995 - DATE OF ORIGINAL ISSUE
AUG. 08, 1995 - VARIOUS MINOR NOTE REVISIONS

APPROVED FOR THIS PROJECT
AND/OR DESIGN IMPLEMENTATION.
FHWA FINAL APPROVAL PENDING.

APPROVED

Stephen D. McArthur
DIRECTOR OF ENGINEERING

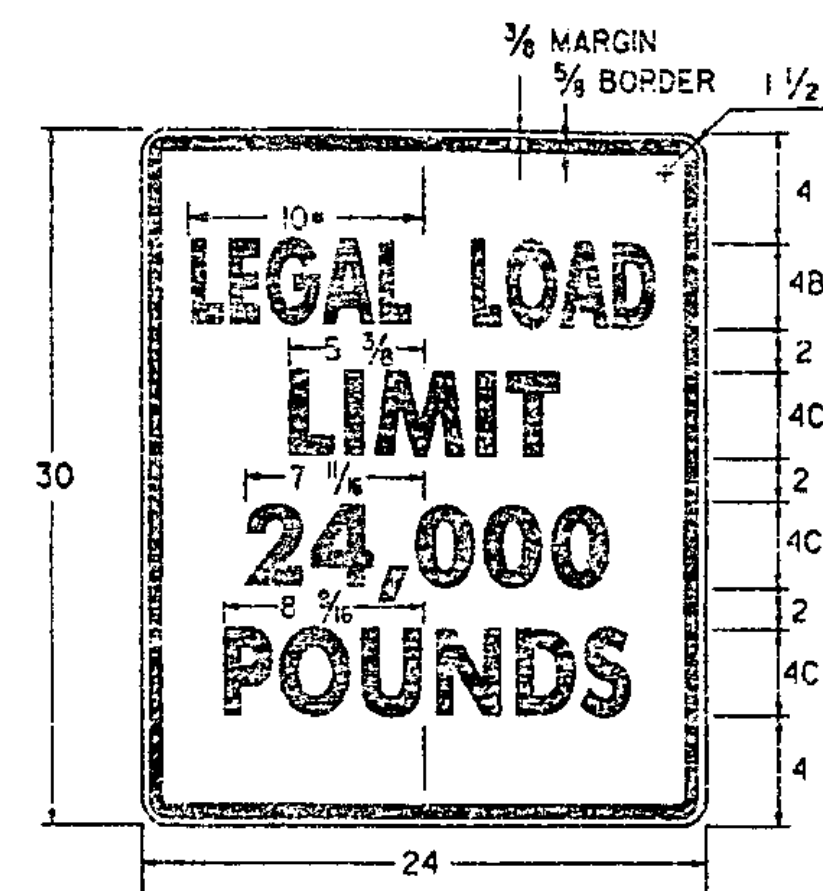
David A. Ross
TRAFFIC AND SAFETY ENGINEER

**STANDARD SIGN PLACEMENT
CONVENTIONAL ROAD**

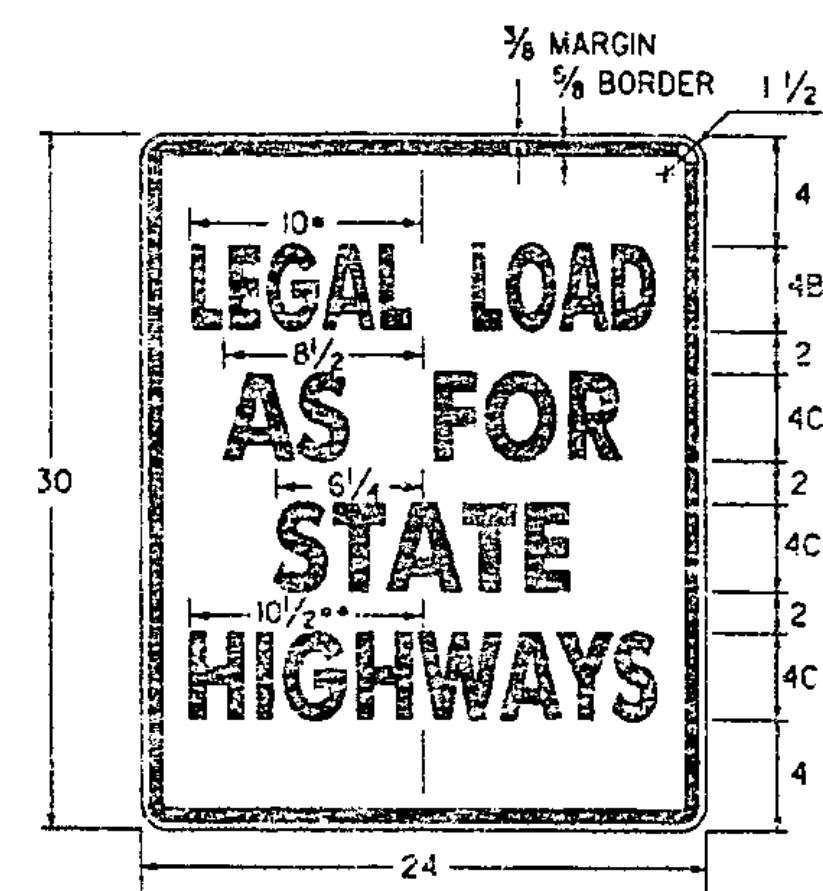


**STANDARD
E-121**

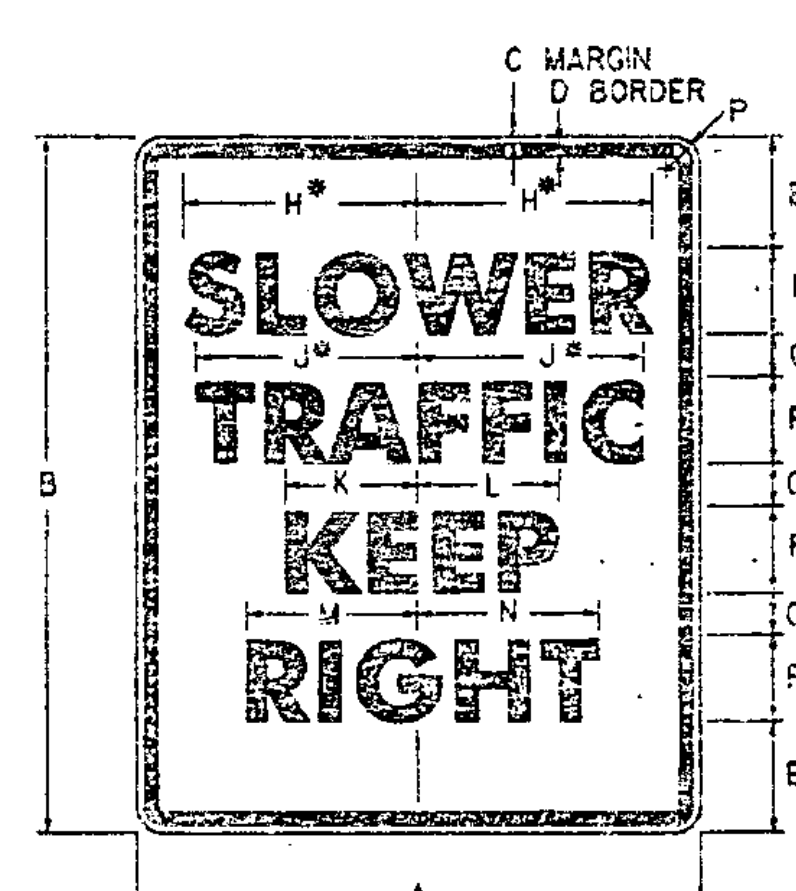
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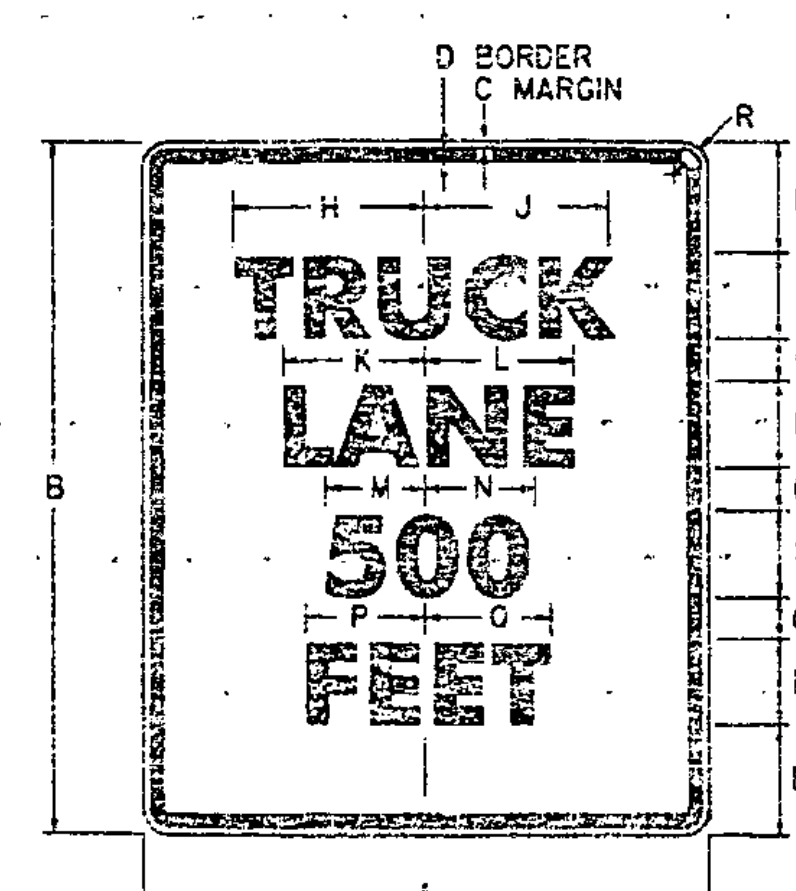
* REDUCE SPACING 50 %
LINE 3 ALTERNATE - 16,000
VR-017



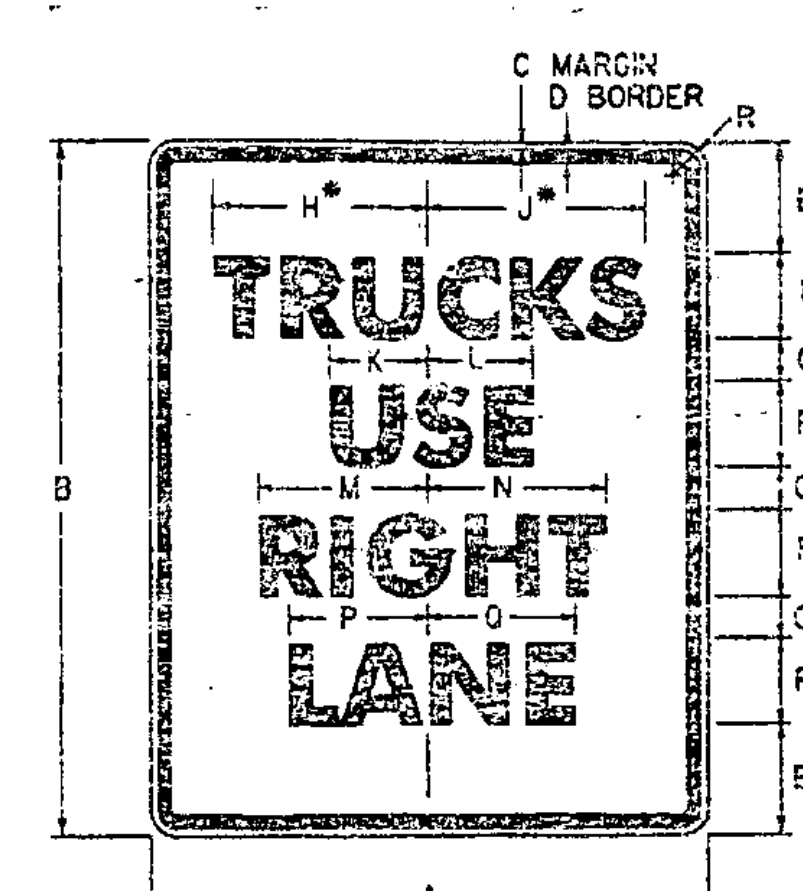
* REDUCE SPACING 50 %
** REDUCE SPACING 38 %
VR-079



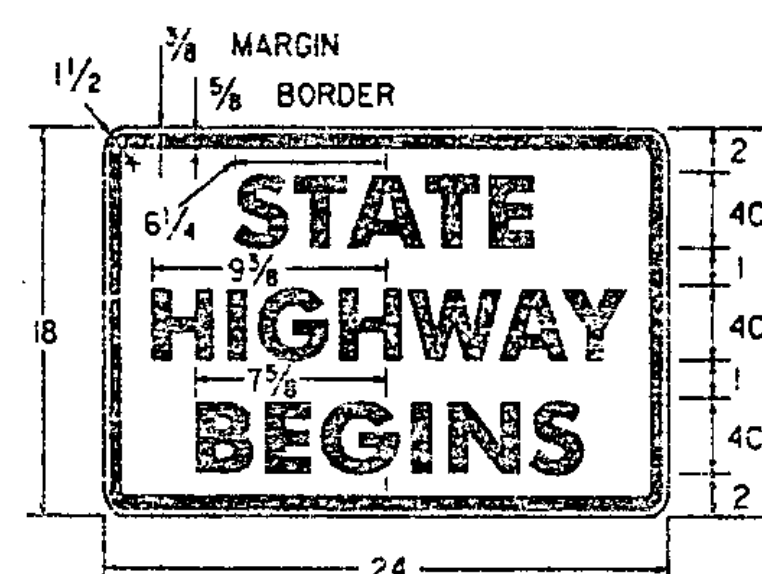
* REDUCE SPACING 25 %
VR-043



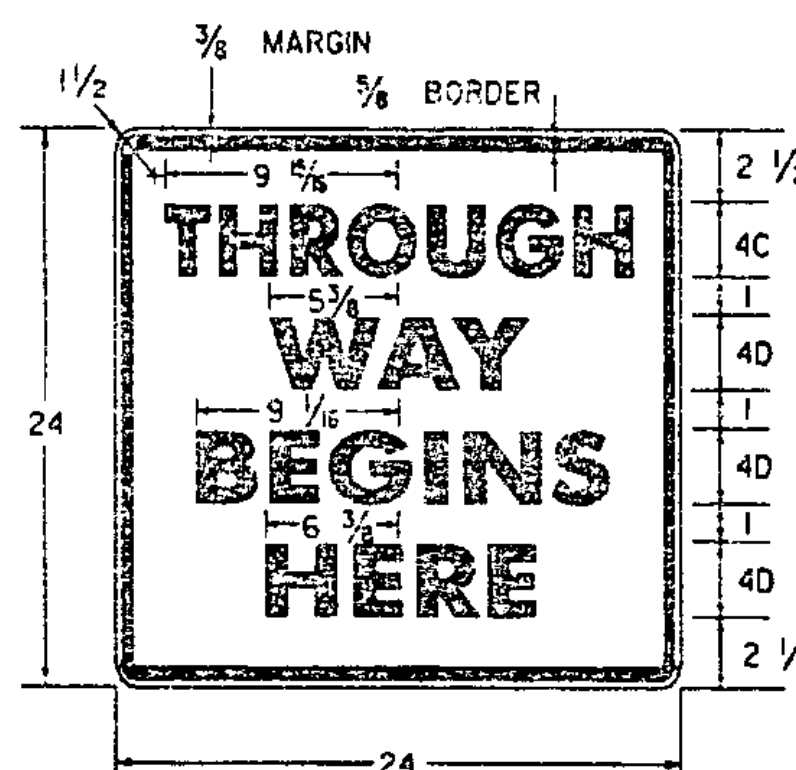
VR-046



* REDUCE SPACING 32 %
VR-045



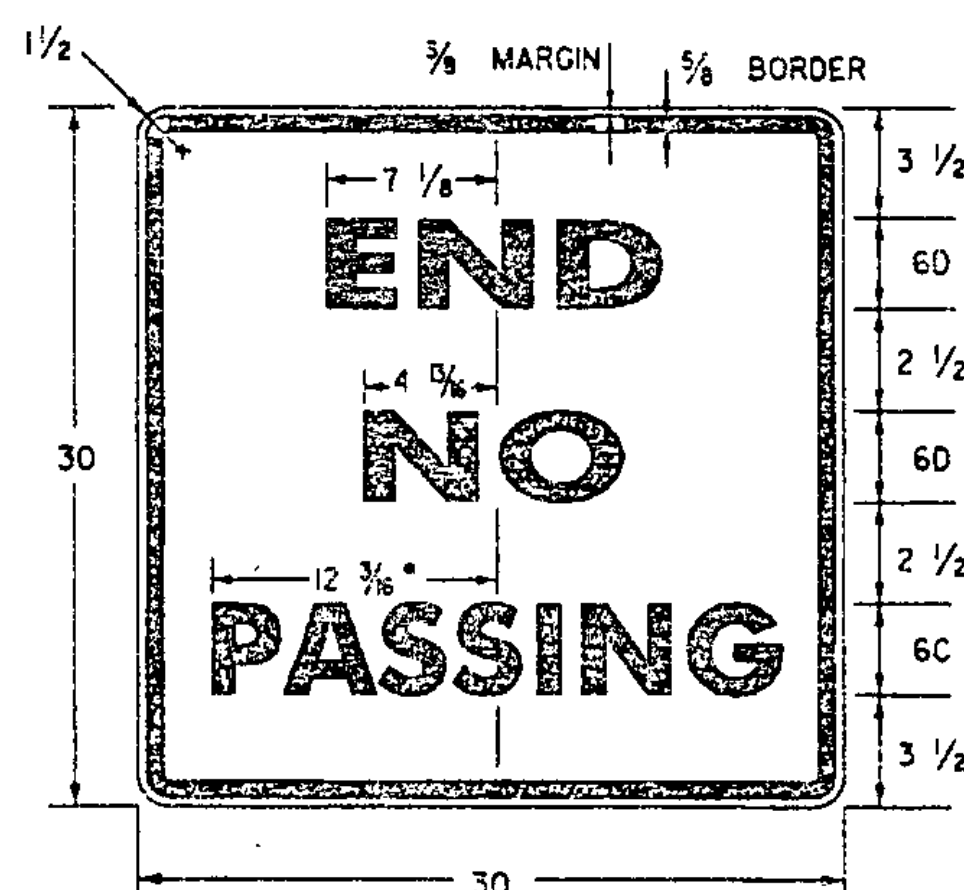
VR-039



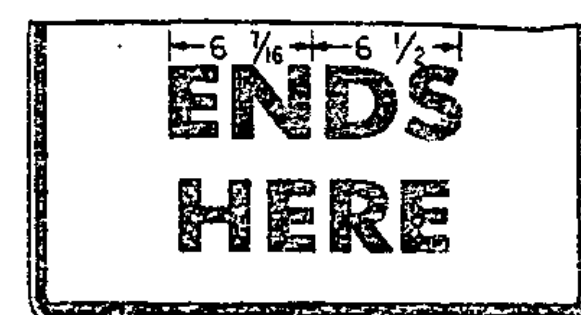
VR-041



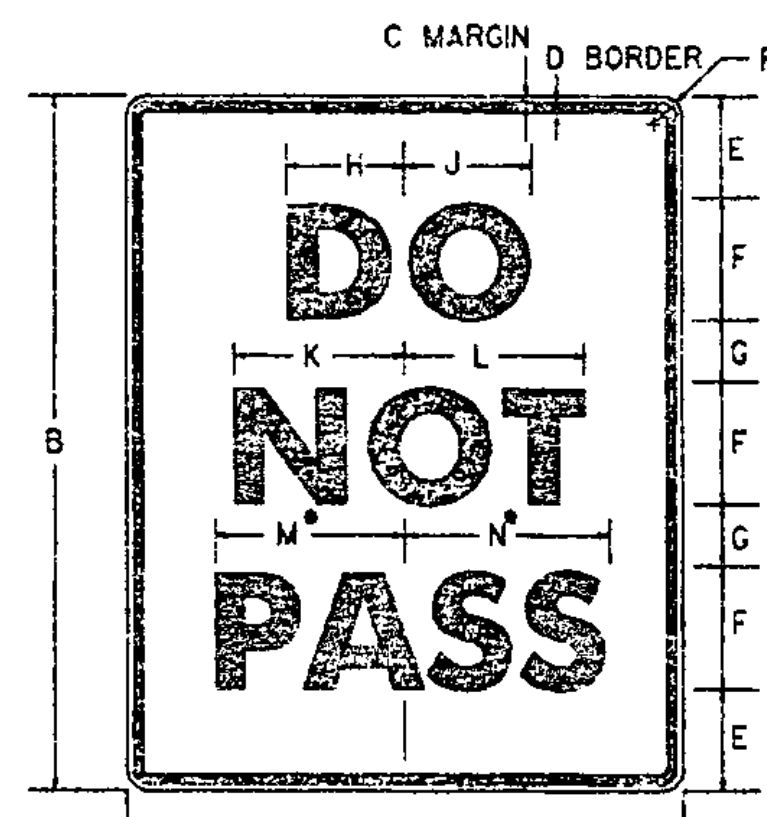
VR-038



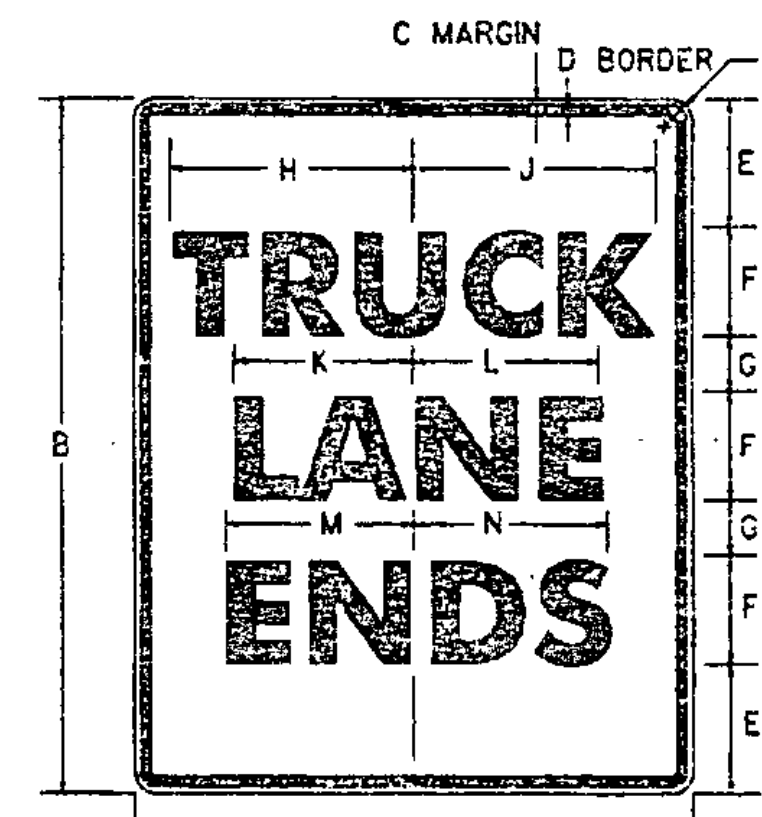
* REDUCE SPACING 50 %
VR-417



VR-040



* REDUCE SPACING 40 %
VR-41



VR-186

SIGN	A	B	C	D	E	F	G	H	J	K	L	M	N	P
STD.	24	30	36	42	48	54	60	66	72	78	84	90	96	102
EXPWY.	36	48	60	72	84	96	108	120	132	144	156	168	180	192
FWY.	48	60	72	84	96	108	120	132	144	156	168	180	192	204

SIGN	A	B	C	D	E	F	G	H	J	K	L	M	N	P
STD.	24	30	36	42	48	54	60	66	72	78	84	90	96	102
EXPWY.	36	48	60	72	84	96	108	120	132	144	156	168	180	192
FWY.	48	60	72	84	96	108	120	132	144	156	168	180	192	204

GENERAL:

1. ALL DIMENSIONS IN INCHES.

COLORS:

THE REGULATORY SIGNS SHOWN ON THIS SHEET SHALL HAVE BLACK TEXT ON REFLECTORIZED WHITE BACKGROUND, UNLESS OTHERWISE NOTED. THE COLORS SHALL CONFORM WITH THE COLORS ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AND APPROVED BY THE DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.

MATERIALS:

THE SIGN BASE MATERIALS USED FOR REGULATORY SIGNS SHOWN ON THIS SHEET MAY BE ANY OF THE FOLLOWING OF THE MINIMUM THICKNESS NOTED.

24" X 18"	0.080"	0.100"
24" X 24"	1/2"	5/8"
24" X 30"	16 GAGE	14 GAGE
30" X 30"		

FLAT SHEET ALUMINUM
HIGH DENSITY OVERLAP PLYWOOD
GALVANIZED FLAT SHEET STEEL

THE REFLECTIVE MATERIAL FOR GROUND MOUNTED SIGNS SHALL BE AASHTO TYPE II OR III WHITE REFLECTIVE SHEETING APPLIED TO THE ENTIRE BACKGROUND OF THE SIGN. THE TEXT OF THE SIGNS MAY BE LETTERING FILM, SILK SCREENED OR HAND PAINTED. HAND PAINTING MUST BE COMPARABLE IN QUALITY TO THE RESULTS OBTAINED BY SILK SCREENING.

SPECIFICATIONS:

REGULATORY SIGNS SHALL MEET THE VERMONT STANDARD SPECIFICATIONS FOR TRAFFIC SIGNS.

TEXT DESIGN:

LETTERS, DIGITS, ARROWS, SPACING AND TEXT DIMENSIONS SHALL CONFORM WITH THE "STANDARD ALPHABET FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" AND DESIGNS PRESCRIBED IN THE STANDARD HIGHWAY SIGNS AS SPECIFIED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

REVISIONS AND CORRECTIONS

OCT. 30, 1987 - DATE OF ORIGINAL ISSUE
SEPT. 20, 1995 - ADDED AND DELETED SIGN DETAIL,
ADDED SIGN ID NUMBERS, MINOR NOTE
REVISIONS.

APPROVED FOR THIS PROJECT
AND/OR DESIGN IMPLEMENTATION.
FHWA FINAL APPROVAL PENDING.

APPROVED

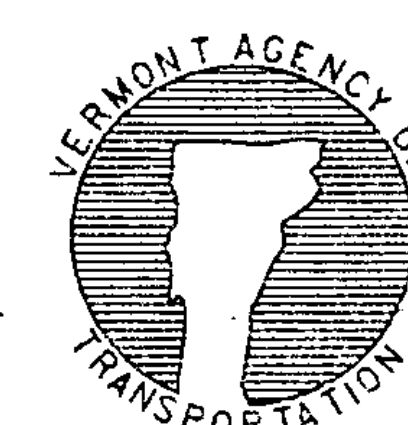
Stephen D. McAllen
DIRECTOR OF ENGINEERING

David O. Burr
TRAFFIC AND SAFETY ENGINEER

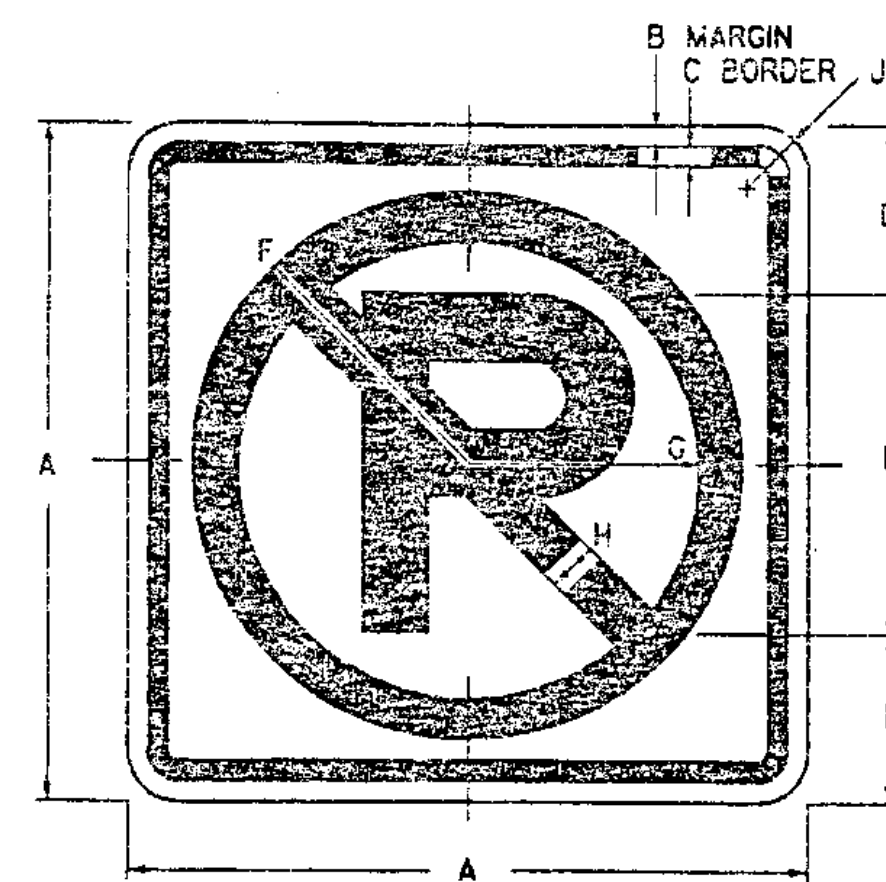
REGULATORY SIGN DETAILS

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OTHER STDS.: NONE
REQUIRED



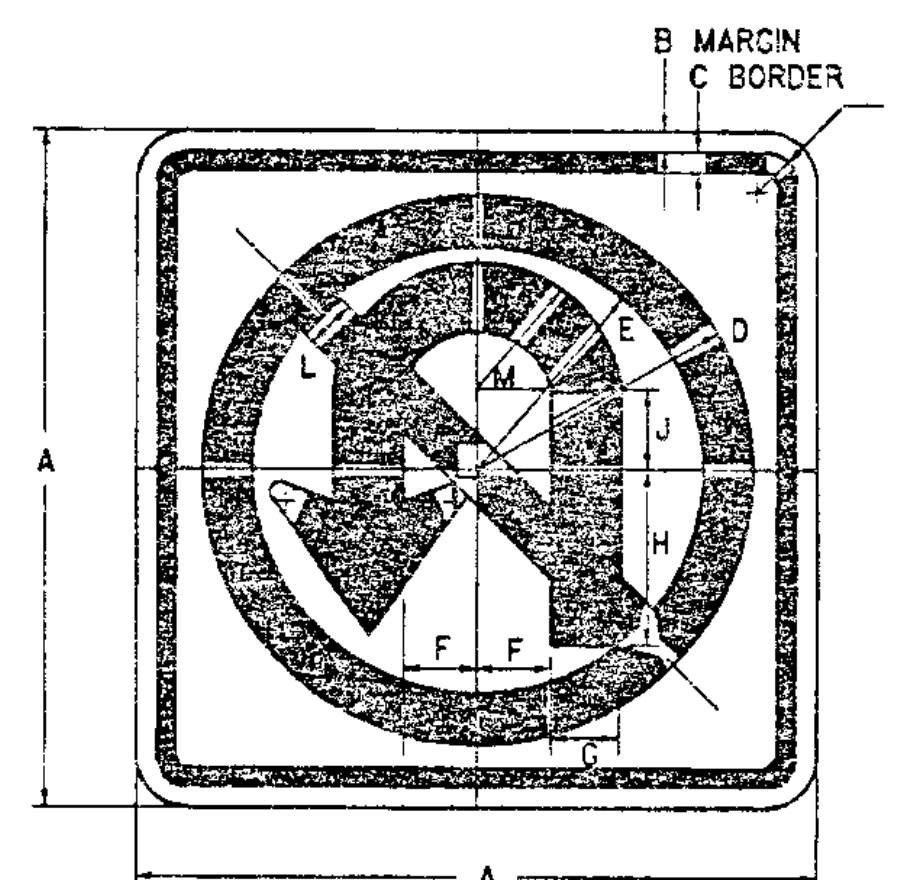
STANDARD E-141



COLORS
CIRCLE AND DIAGONAL - RED (REFL - RURAL)
SYMBOL AND BORDER - BLACK (NON - REFL)
BACKGROUND - WHITE (REFL - RURAL)

R3-3A

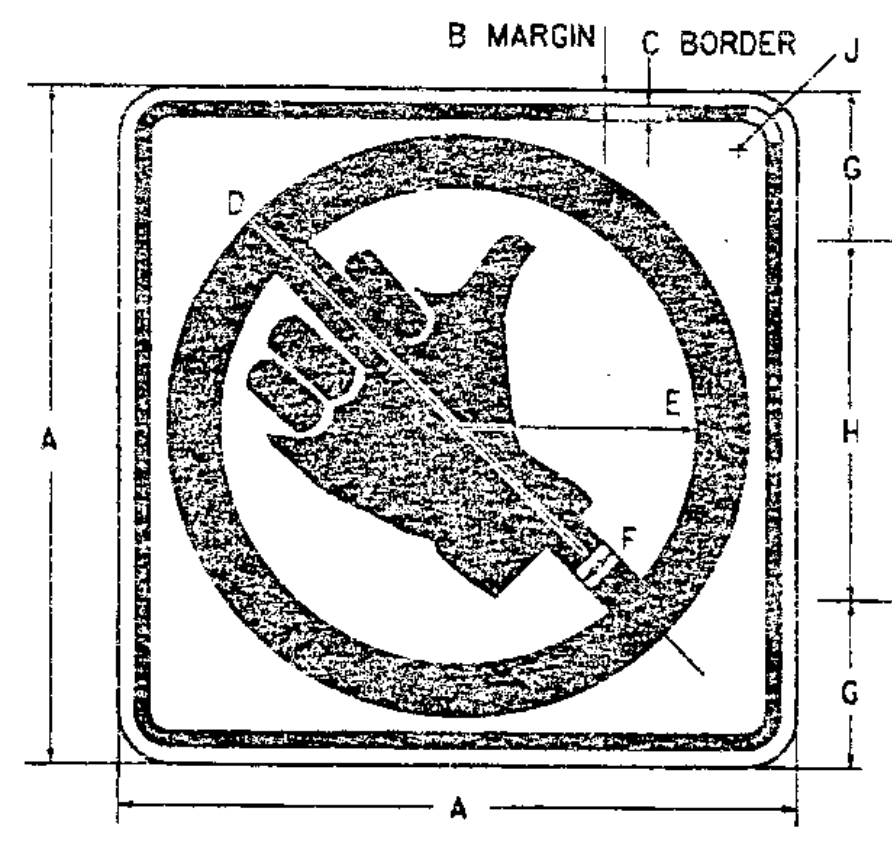
SIGN	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J		
URBAN MIN. AND STD.	12	3/8	3/8	3	6E(M)	4 7/8	3 7/8	1	1 1/2		
RURAL MIN. AND STD.	24	3/8	3/8	6	12E(M)	10 1/2	8 1/2	2	1 1/2		
EXPWY.	36	3/8	3/8	9	18E(M)	15 3/4	12 3/4	3	2 1/4		
FWY.	48	3/4	1 1/4	12	24E(M)	21	17	4	3		



COLORS
CIRCLE AND DIAGONAL - RED (REFL)
ARROW AND BORDER - BLACK (NON - REFL)
BACKGROUND - WHITE (REFL)

R3-4

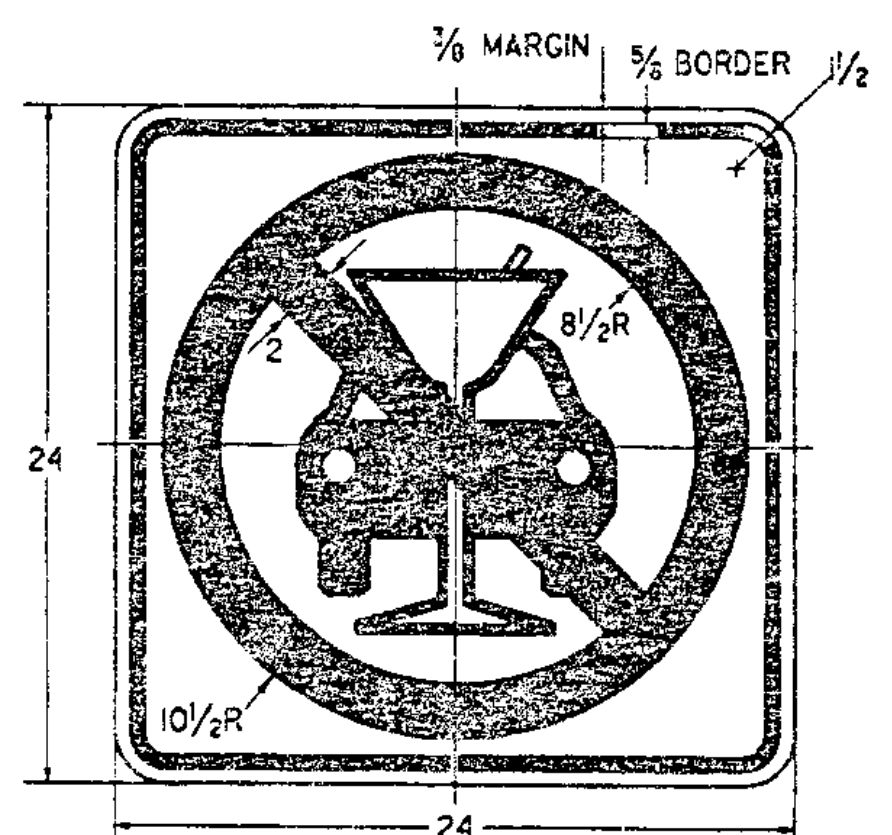
SIGN	DIMENSIONS (INCHES)												
	A	B	C	D	E	F	G	H	J	K	L	M	
MIN. AND STD.	24	3/8	3/8	10 1/2	8 1/2	2 1/2	2 1/2	6	2 1/4	1 1/2	2	5	
SPECIAL	30	1/2	3/4	13 1/8	10 3/8	3 1/8	3 1/8	7 1/2	2 3/4	1 3/4	2 1/2	6 1/4	
EXPWY.	36	3/8	3/8	15 3/4	12 3/4	3 3/4	3 3/4	9	3 3/4	2 1/4	3	7 1/2	
SPECIAL	48	3/4	1 1/4	21	17	5	5	12	4 1/2	3	4	10	



COLORS
CIRCLE AND DIAGONAL - RED (REFL)
SYMBOL AND BORDER - BLACK (NON - REFL)
BACKGROUND - WHITE (REFL)

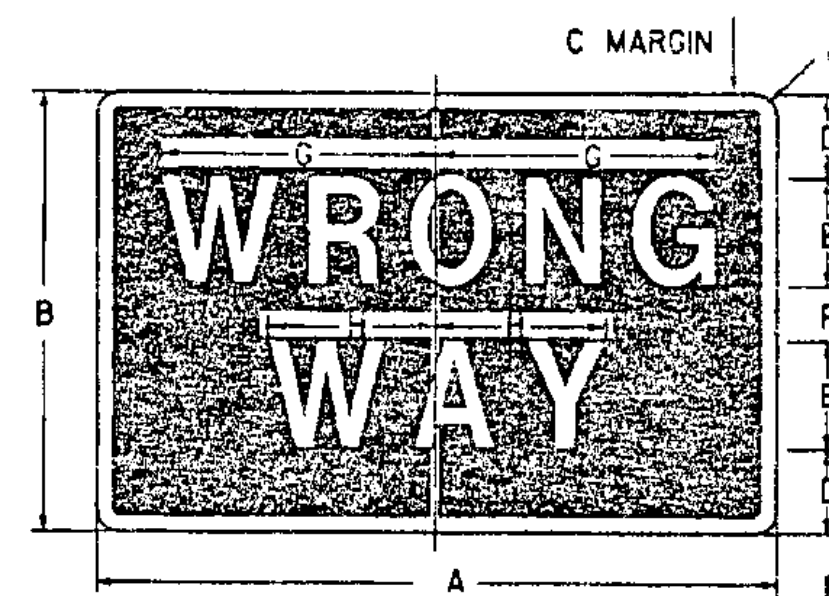
R3-4A

SIGN	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J		
MIN.	18	3/8	3/8	7 1/8	5 3/8	1 1/2	3 3/4	1 1/2	1 1/2		
STD.	24	3/8	3/8	10 1/2	8 1/2	2	5	14	1 1/2		



COLORS
CIRCLE AND DIAGONAL - RED (REFL)
SYMBOL AND BORDER - BLACK (NON - REFL)
BACKGROUND - WHITE (REFL)

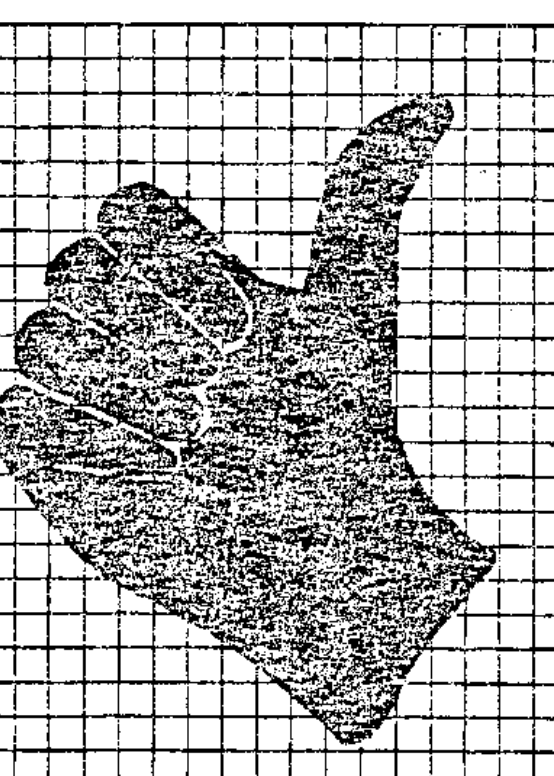
VR-634



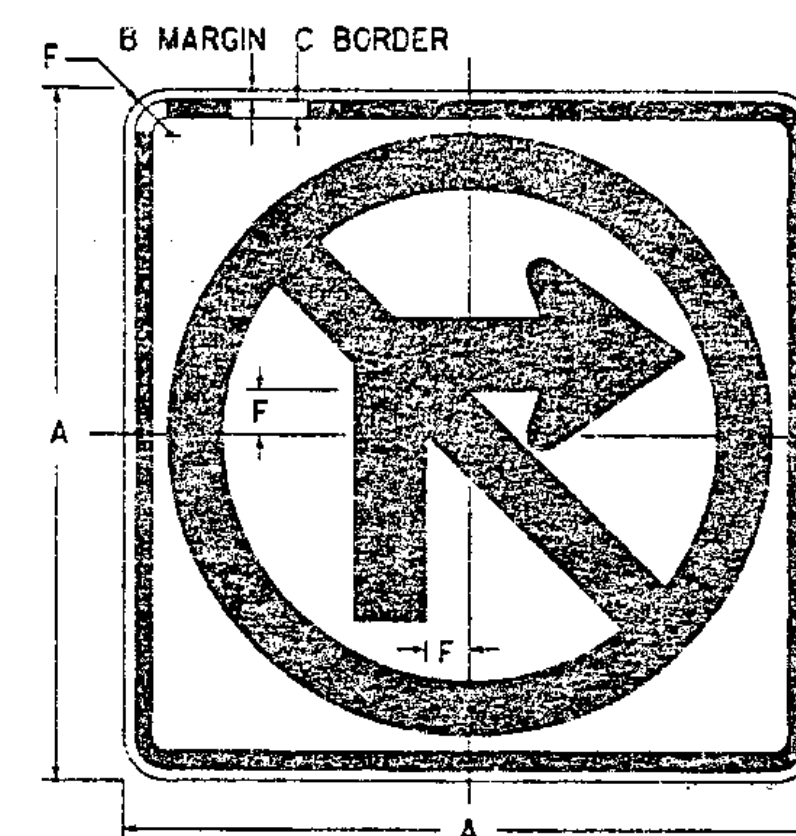
"WRONG WAY"

COLORS
LEGEND - WHITE (REFL)
BACKGROUND - RED (REFL)
ENCAPSULATED LENS

SIGN	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J		
MIN.	30	18	3/8	3	5D	2	11 1/8	6 1/8	1 1/2		
STD.	36	24	3/4	4 1/2	6D	3	13 3/8	8 1/8	1 1/2		
SPECIAL	42	30	3/8	5	8D	4	17 3/4	10 3/4	1 1/2		



R3-2



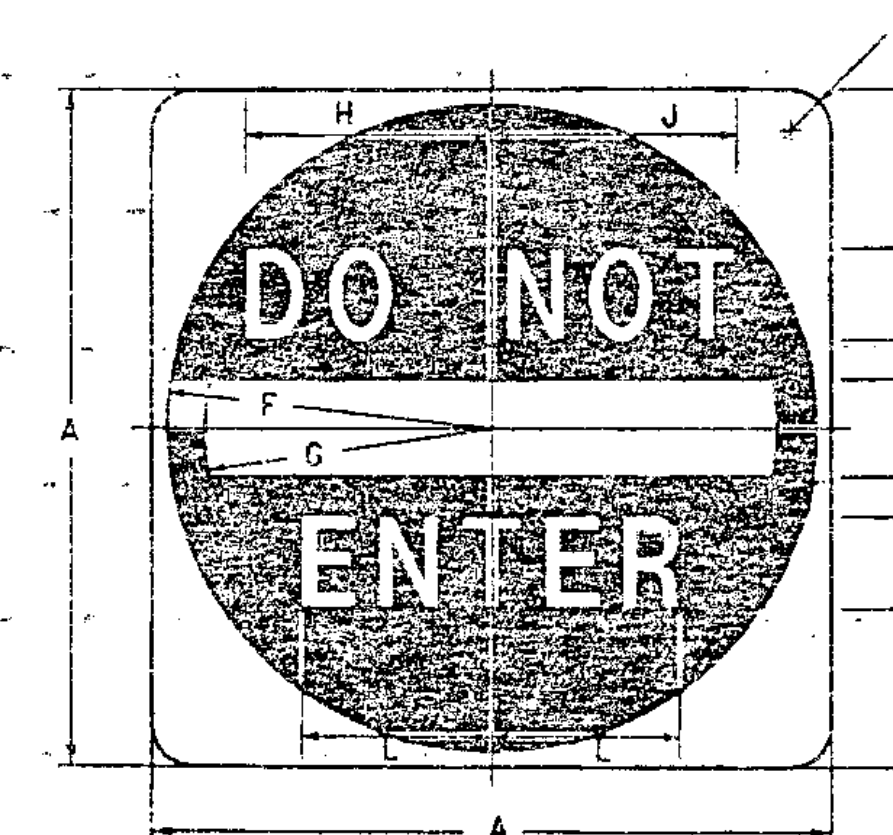
R3-1

NOTE:
USE SAME ARROW DETAIL FOR R3-1 AND R3-2

COLORS

CIRCLE AND DIAGONAL - RED (REFL)
ARROW AND BORDER - BLACK (NON - REFL)
BACKGROUND - WHITE (REFL)

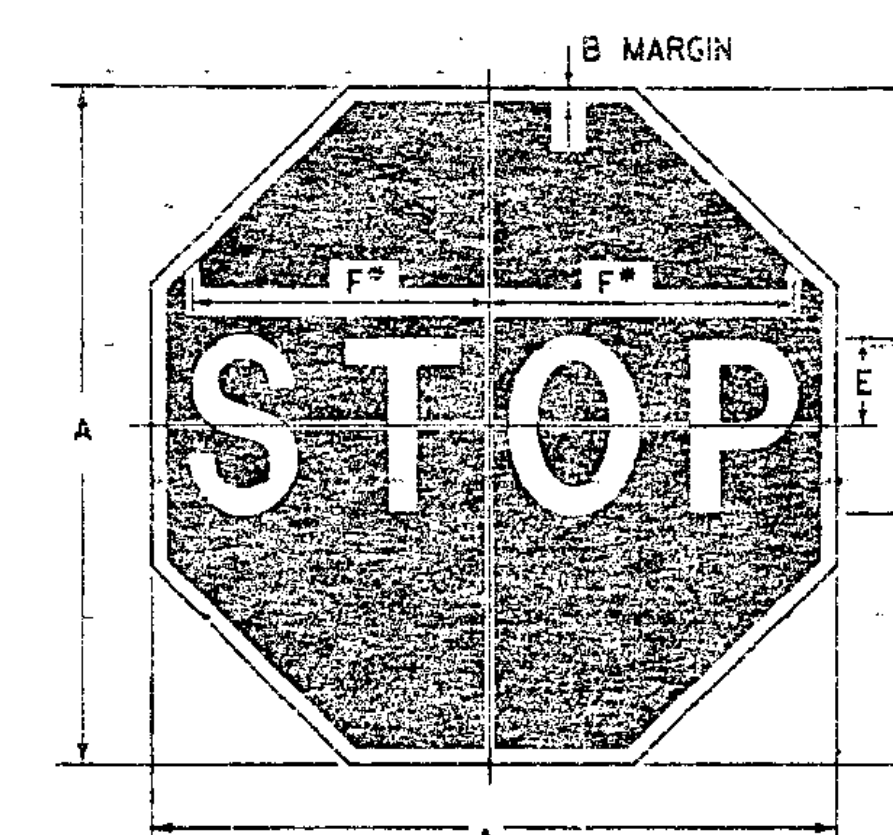
SIGN	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J	K	L
MIN. AND STD.	24	3/8	3/8	10 1/2	8 1/2	1 1/2	2 1/2	10 1/2	1 1/2	2	1 1/2
SPECIAL	30	1/2	3/4	13 1/8	10 3/8	1 3/8	3 1/8	13 1/8	1 3/8	2 1/2	3/4
EXPWY.	36	3/8	3/8	15 3/4	12 3/4	2 3/4	3 3/4	15 3/4	2 3/4	3	3/4
SPECIAL	48	3/4	1 1/4	21	17	3	5	21	23	4	1



R5-1

COLORS
SYMBOL - RED (REFL)
LEGEND AND BACKGROUND - WHITE (REFL)
ENCAPSULATED LENS

SIGN	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J	K	L
MIN. AND STD.	30	6 1/2	4D	2	5	14 1/2	12 1/2	9 3/4	10	17 1/8	7 7/8
EXPWY.	36	7 1/2	5D	2 1/2	5	17 1/2	15	12	12 3/8	2 1/4	8 3/4
SPECIAL	48	11	6D	3	8	23 1/2	20	14 1/2	15	3	11 3/4



* REDUCE SPACING 40 %
COLORS
LEGEND - WHITE (REFL)
BACKGROUND - RED (REFL)
ENCAPSULATED LENS

R1-1

SIGN	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J	K	L
BIKE	18	3/8	3/8	6	6C	3	7 3/4				
MIN.	24	3/8	3/8	8	8C	4	10				
STD.	30	3/4	1	10	10C	5	12 1/2				
EXPWY.	36	3/8	3/8	12	12C	6	15				
SPECIAL	48	1 1/4	1 1/4	16	16C	8	20				

GENERAL:

- ALL DIMENSIONS IN INCHES.
- SEE STANDARD E-144 FOR ARROWHEAD DETAILS.

COLORS:

THE REGULATORY SIGNS SHOWN ON THIS SHEET SHALL HAVE BLACK TEXT ON REFLECTORIZED THE COLORS SHALL CONFORM WITH THE COLORS ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AND APPROVED BY THE DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.

MATERIALS:

THE SIGN BASE MATERIALS USED FOR REGULATORY SIGNS SHOWN ON THIS SHEET MAY BE ANY OF THE FOLLOWING OF THE MINIMUM THICKNESS NOTED.

	12" X 12"	24" X 24"	36" X 24"
FLAT SHEET ALUMINUM	0.060"	0.080"	0.100"
HIGH DENSITY OVERLAP PLYWOOD	1/2"	3/8"	5/8"
GALVANIZED FLAT SHEET STEEL	18 GAGE	16 GAGE	14 GAGE

THE REFLECTIVE MATERIAL SHALL BE AASHTO TYPE II OR III WHITE REFLECTIVE SHEETING APPLIED TO THE ENTIRE BACKGROUND OF THE SIGN. THE BLACK PORTIONS OF THE SIGNS MAY BE LETTERING FILM, SILK SCREENED OR HAND PAINTED. HAND PAINTING MUST BE COMPARABLE IN QUALITY TO THE RESULTS OBTAINED BY SILK SCREENING. ENCAPSULATED LENS REFLECTIVE SHEETING SHALL BE USED FOR THE SIGN BACKGROUND WHERE NOTED.

SPECIFICATIONS:

REGULATORY SIGNS SHALL MEET THE VERMONT STANDARD SPECIFICATIONS FOR TRAFFIC SIGNS.

TEXT DESIGN:

LETTERS, DIGITS, ARROWS, SPACING AND TEXT DIMENSIONS SHALL CONFORM WITH THE STANDARD ALPHABET FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS, AND DESIGNS PRESCRIBED IN THE STANDARD HIGHWAY SIGNS AS SPECIFIED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

REVISIONS AND CORRECTIONS

OCT. 30, 1987 - DATE OF ORIGINAL ISSUE
SEPT. 20, 1995 - ADDED AND DELETED SIGN DETAILS,
ADDED SIGN ID NUMBERS, MINOR NOTE
REVISIONS.

APPROVED FOR THIS PROJECT
AND/OR DESIGN IMPLEMENTATION,
FHWA FINAL APPROVAL PENDING.

APPROVED

Stephen R. The Allen
DIRECTOR OF ENGINEERING

David O. Pinn
TRAFFIC AND SAFETY ENGINEER

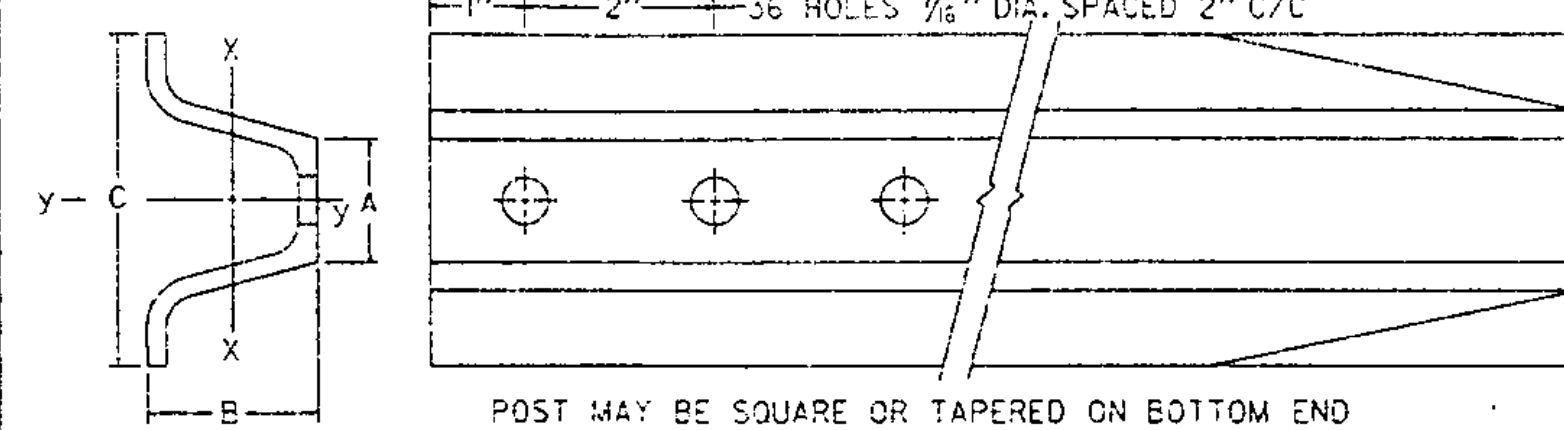
REGULATORY SIGN DETAILS

/traf/std/stdel43.dgn : stdel43.i

OTHER STDS.: E-144
REQUIRED

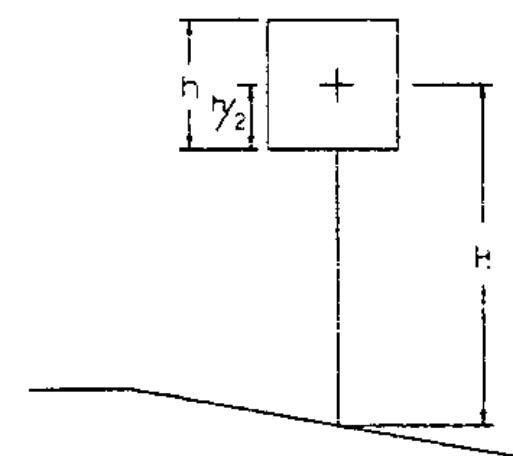


STANDARD E-143



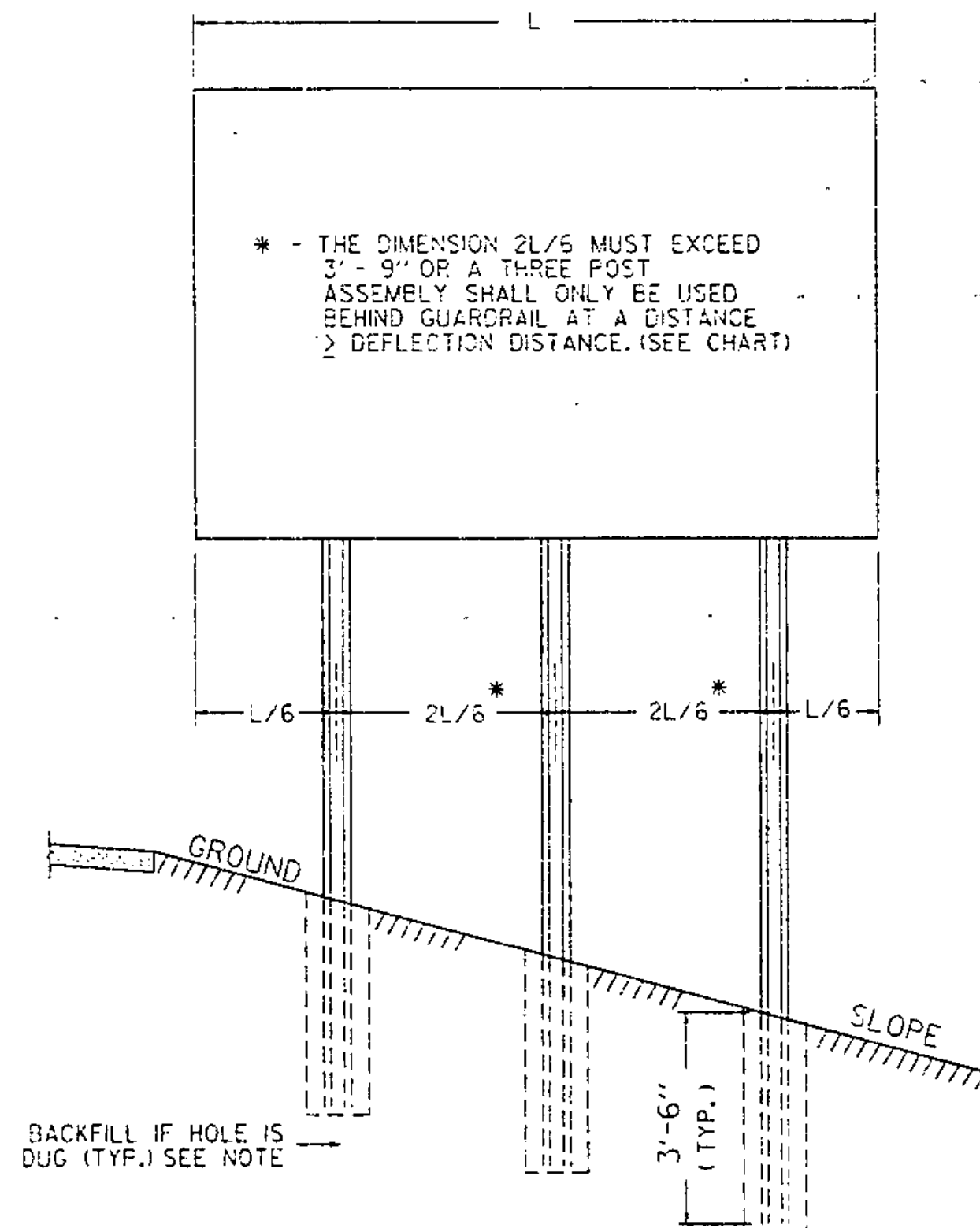
POST SIZE (LB/FT.)	DIMENSIONS			SECTION MODULUS, X-X
	A	B	C	
2	1 3/32"	1 3/4"	3 1/8"	0.225 IN. ³
3	1 5/16"	1 7/8"	3 1/2"	0.403 IN. ³

SIMILAR DIMENSIONS ARE ACCEPTABLE, HOWEVER
SECTION MODULUS VALUES SHALL NOT BE EXCEEDED.



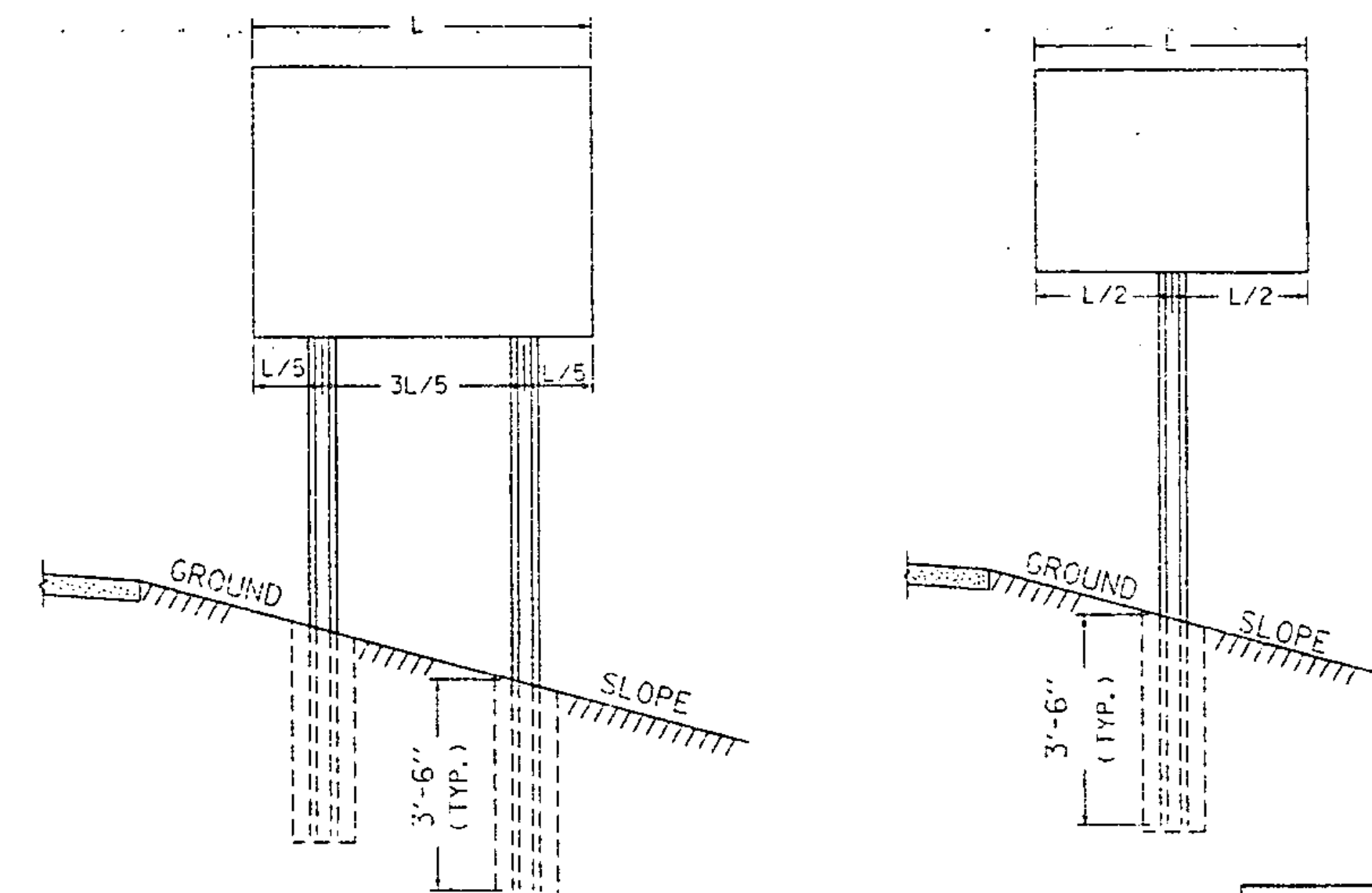
POST SELECTION CHART		
SIGN AREA (FT ²) x H (FT) (SV (SELECTION VALUE))		
POST SIZE	SV	DESIGN CRITERIA
2 LB/FT. (ONE POST INSTALLATION)	32	WIND SPEED = 60 MPH (10-YEAR MEAN RECURRENCE INTERVAL)
2 LB/FT. (TWO POST INSTALLATION)	62	WIND PRESSURE = 13 PSF
3 LB/FT.	107	STEEL MIN. YIELD F _y = 50,000 PSI ALLOWABLE STRESS = (1.4) 0.60 F _y

SINGULAR 2 LB./FT. POSTS SHALL ONLY TO BE USED IN URBAN AREAS.

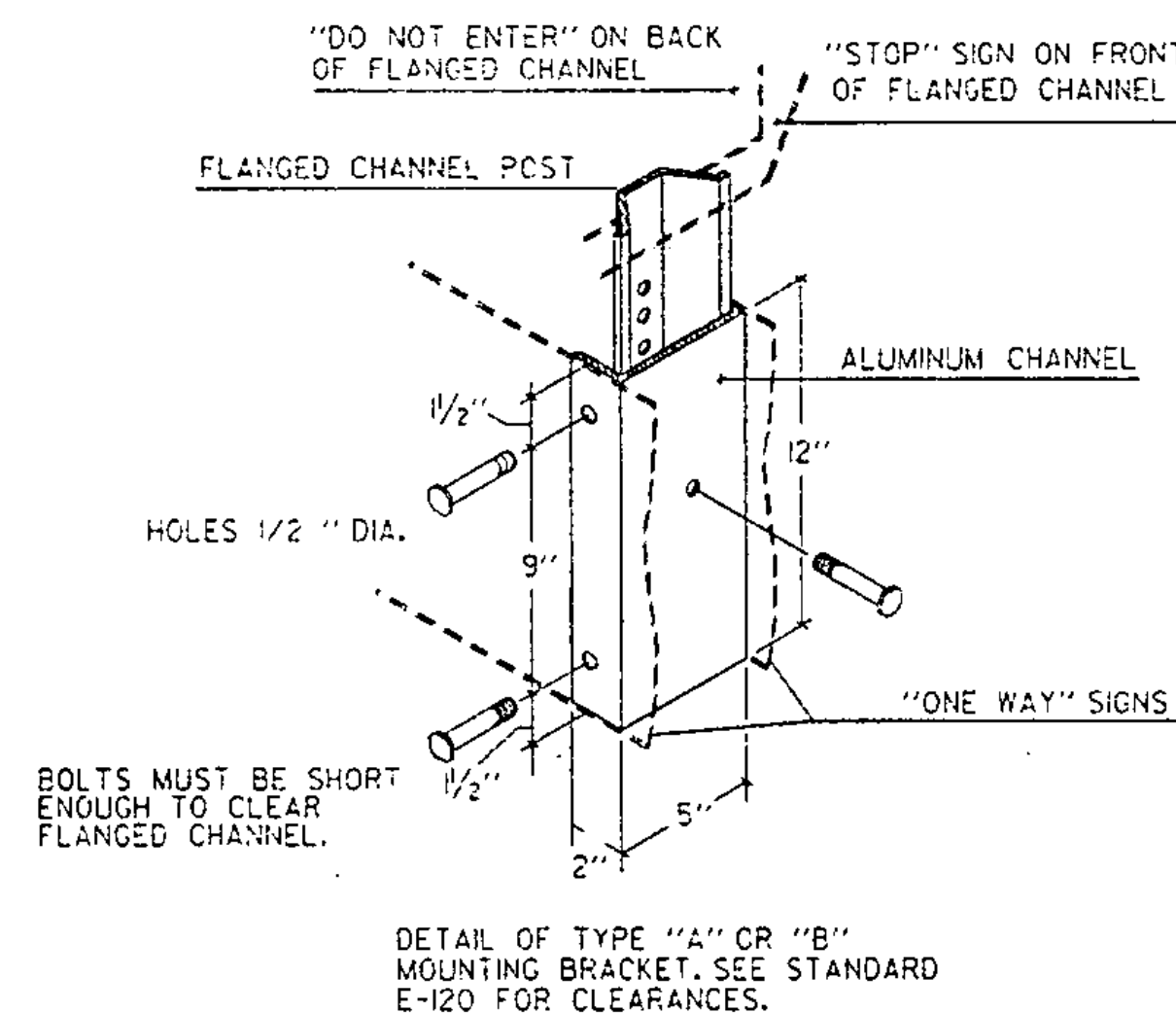


MULTI-POST INSTALLATIONS

WHEN SIGN POSTS ARE INSTALLED WITH A POST ...
SPACING OF LESS THAN 8 FEET, POST SIZES MUST
BE SELECTED TO INSURE THAT WHEN ACTING TOGETHER
THE POSTS DO NOT CREATE A HAZARD. REFER TO V.A.O.T.
SIGN POST DESIGN GUIDELINE FOR ADDITIONAL DETAILS.



POST SPACING DETAILS



GUARDRAIL DEFLECTION CHART (PER AASHTO - ROADSIDE DESIGN GUIDE - 1988)		
TYPE	GR POST SPACING	DEFLECTION
THREE CABLE W/STEEL POSTS	16' - 0"	12'
W/WOODEN POSTS	12' - 6"	12'
W-BEAM	12' - 6"	7'
W/WEAK POST	6' - 3"	3'
BOX BEAM	6' - 0"	5'
THREE BEAM W/WEAK POST	12' - 6"	4'
W/STRONG POST	6' - 3"	2'

THIS CHART LISTS THE THEORETICAL DEFLECTION DISTANCE
UPON IMPACT OF VARIOUS GUARDRAIL WITH DIFFERENT TYPES
AND SPACING OF POSTS.

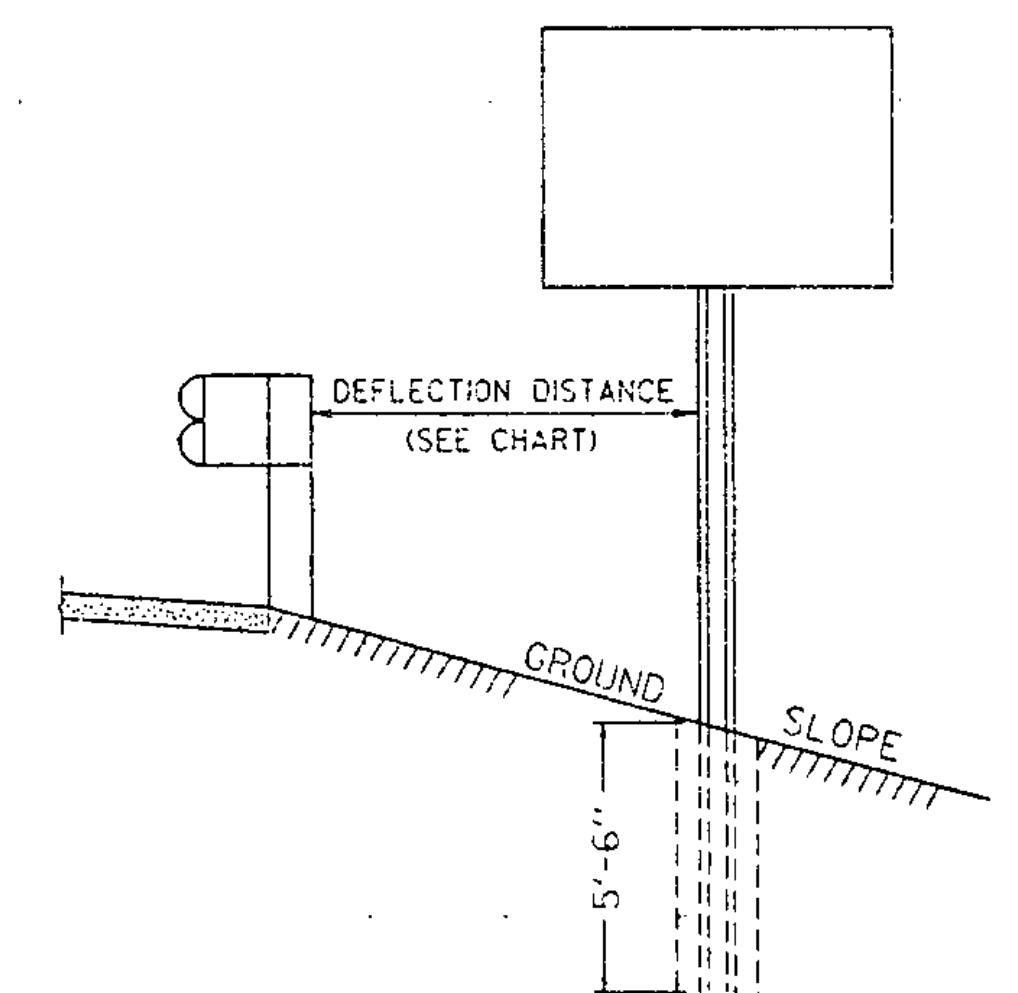
GENERAL NOTES

CONSTRUCTION METHODS - POSTS MAY BE
DRIVEN OR SET IN A DUG HOLE AND BACKFILLED.
IF DRIVEN, A DRIVING CAP SHALL BE USED.
THE DUG HOLE INSTALLATION SHALL BE USED IN
AREAS OF POOR SOIL CONDITIONS OR AS
DIRECTED BY THE RESIDENT ENGINEER. BACKFILL
SHALL BE COMPACTED AS DIRECTED BY THE
RESIDENT ENGINEER.

IN AREAS WHERE LEDGE ROCK IS ENCOUNTERED,
POSTS WILL BE SET IN A HOLE WITH 2' CLEARANCE
AND GROUTED WITH TYPE 4 MORTAR
24" BELOW THE SURFACE OF THE SOLID ROCK.
UNLESS THE POSTS PENETRATE THE GROUND A
MINIMUM OF 3'-6". THE PORTION OF THE POST
IN CONTACT WITH THE MORTAR SHALL BE COATED
WITH AN APPROVED COATING.

SIGN CLEARANCES - HORIZONTAL AND VERTICAL
SIGN CLEARANCES SHALL BE SHOWN ON THE PLANS
OR THE APPROPRIATE STD. SHEETS.

SINGLE POST INSTALLATIONS SHALL BE LIMITED
TO A SIGN AREA OF 12-1/2 SQ. FT. OR LESS.



WHEN USING FLANGED CHANNEL POSTS ON STEEP SLOPES
(1 ON 2 OR STEEPER FILL SLOPES BEHIND GUARDRAIL),
ADD 2' EMBEDMENT TO THE POST LENGTH TO GIVE THE
ASSEMBLY MORE STABILITY. HOWEVER IF SIGN POST IS
LOCATED INSIDE THE DEFLECTION DISTANCE, THE SIGN POST
SHALL BE SET AT A DEPTH OF 3' - 6".

OTHER STDS.
REQUIRED:

REVISIONS AND CORRECTIONS

SEP. 10, 1987 - DATE OF ORIGINAL ISSUE
MAR. 01, 1988 - FHWA REVIEW COMMENTS
OCT. 21, 1992 - ADDED DETAILS, REVISED NOTES &
REVISED TITLE BLOCK
AUG. 18, 1995 - DELETION OF 2.5 #/FT. POST AND TWO-
RAIL ALUMINUM. ADDED ADDITIONAL NOTE.

APPROVED FOR THIS PROJECT
AND/OR DESIGN IMPLEMENTATION.
FHWA FINAL APPROVAL PENDING.

APPROVED

Steven A. McArthur
DIRECTOR OF ENGINEERING

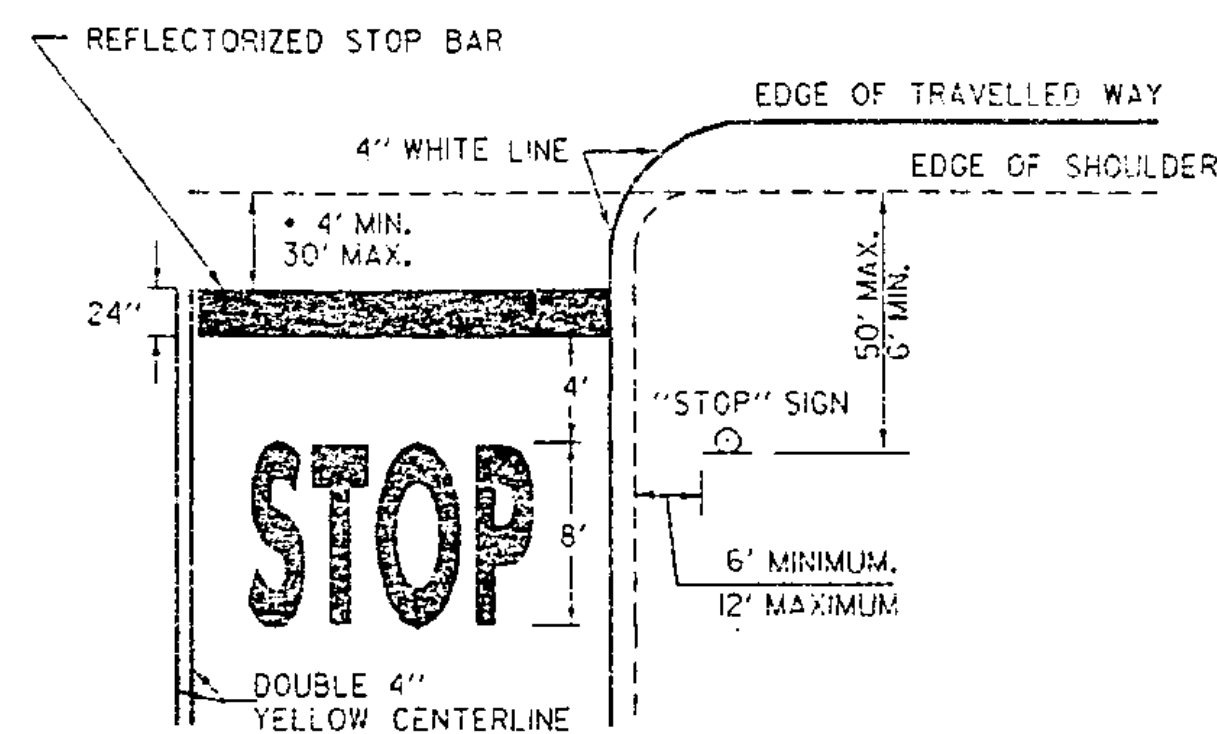
David C. Davis
TRAFFIC AND SAFETY ENGINEER

FLANGED CHANNEL STEEL SIGN POST

/traf/std/stdel60.dgn : stdel60.i

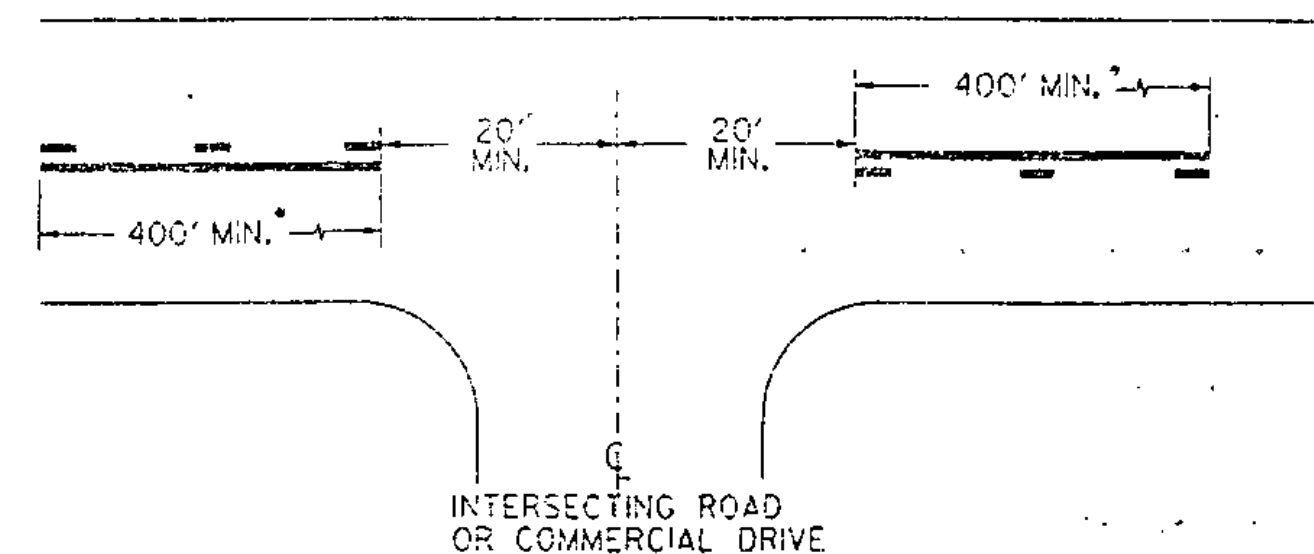


STANDARD
E-160



• THE "DESIRED STOPPING POINT" IS THE LOCATION BASED ON SITE CONDITIONS THAT BEST ALLOWS THE STOPPED VEHICLE TO VIEW THE APPROACHING TRAFFIC.

STOP BAR LAYOUT



• THE SOLID LINE SHALL BE PAIRED WITH EITHER A SOLID OR DASHED LINE DEPENDING ON SIGHT DISTANCE AVAILABILITY IN THE OPPOSING DIRECTION. ADJUSTMENTS TO THE 40 FOOT CENTERLINE OPENING MAY BE MADE TO ACCOMMODATE SKEWED INTERSECTIONS.

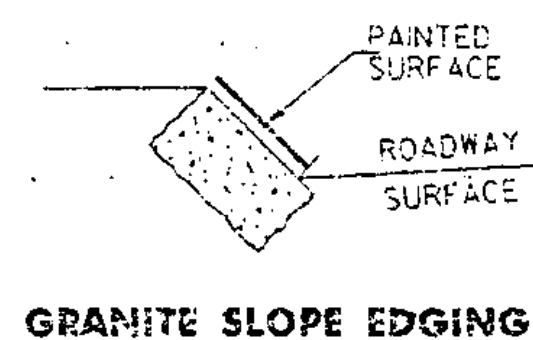
CENTERLINE BREAKS:

A. AT ALL STATE HIGHWAYS AND TOWN HIGHWAYS, INCLUDING CLASS 4 TH'S, THAT HAVE STOP AND LEGAL LOAD LIMIT SIGNS INSTALLED

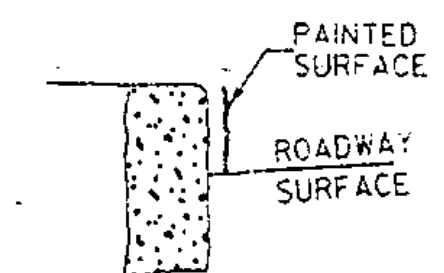
B. COMMERCIAL DRIVES:

1. WHERE A SEPARATE TURN LANE EXISTS ON THE MAIN LINE (LT. OR RT.)
2. SIGNIFICANT TRAFFIC VOLUMES EXISTS.
3. IF MOTORISTS NEED ASSISTANCE TO DEFINE ENTRANCE POINTS.

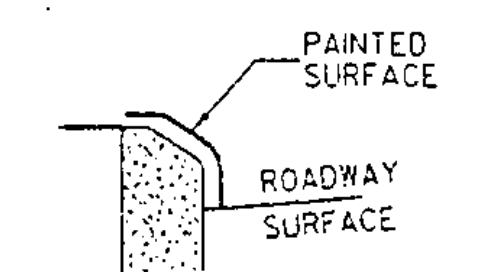
CENTERLINE LAYOUT



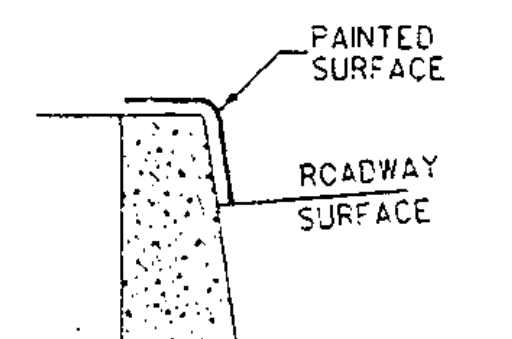
GRANITE SLOPE EDGING



VERTICAL GRANITE CURB

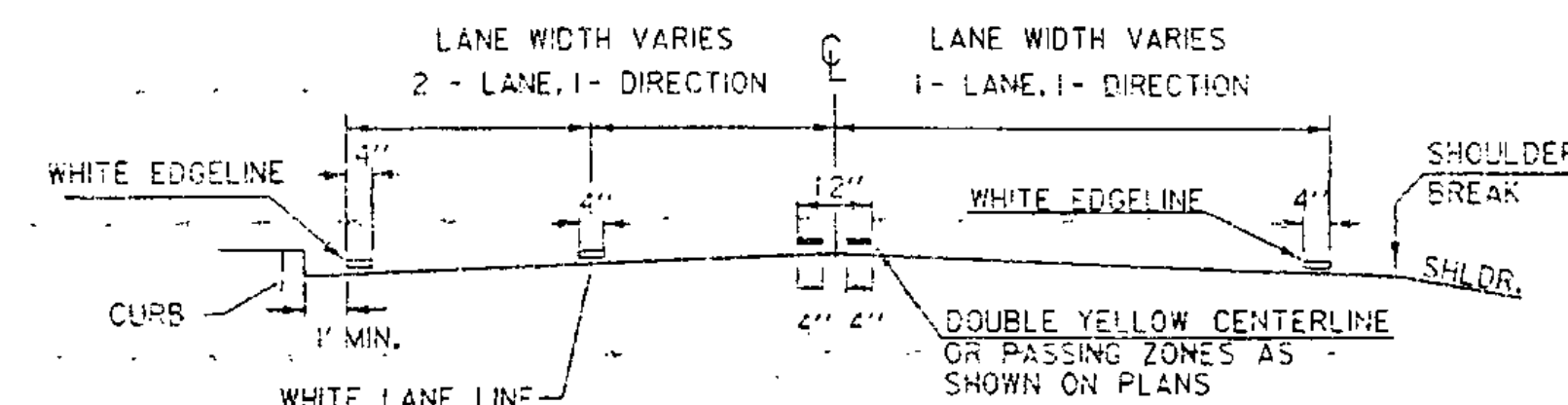


TYPE A (CONCRETE)

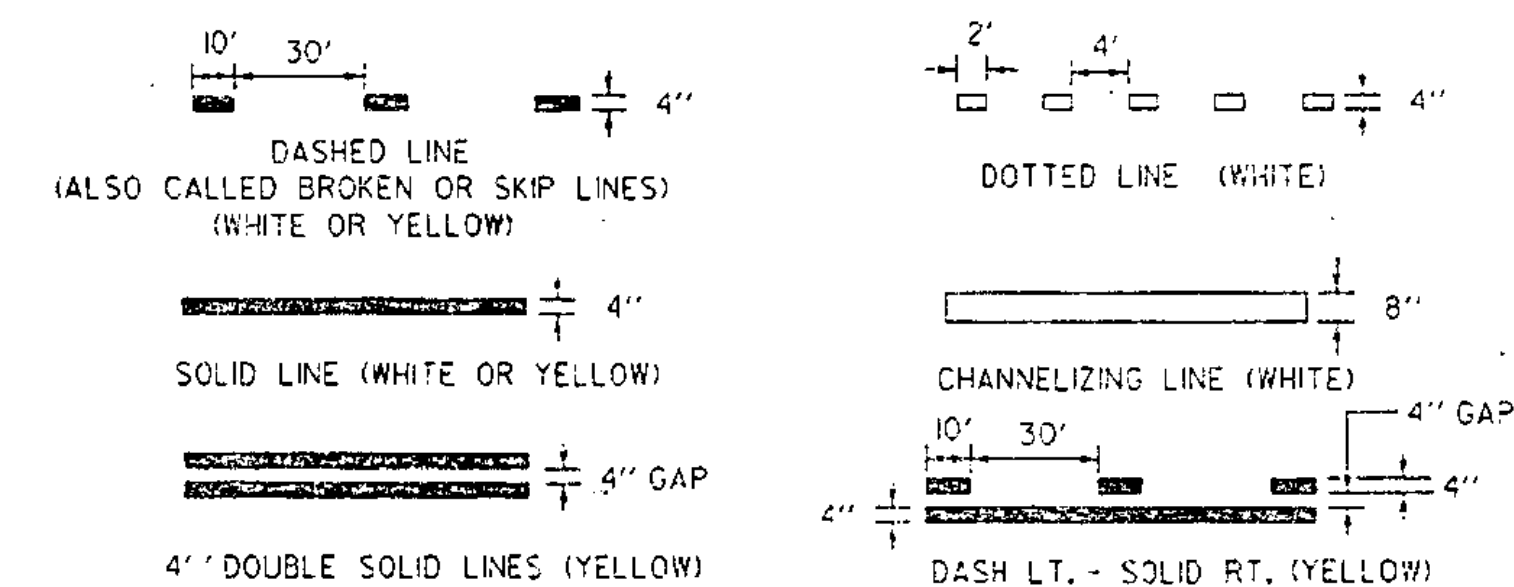


TYPE B (CONCRETE)

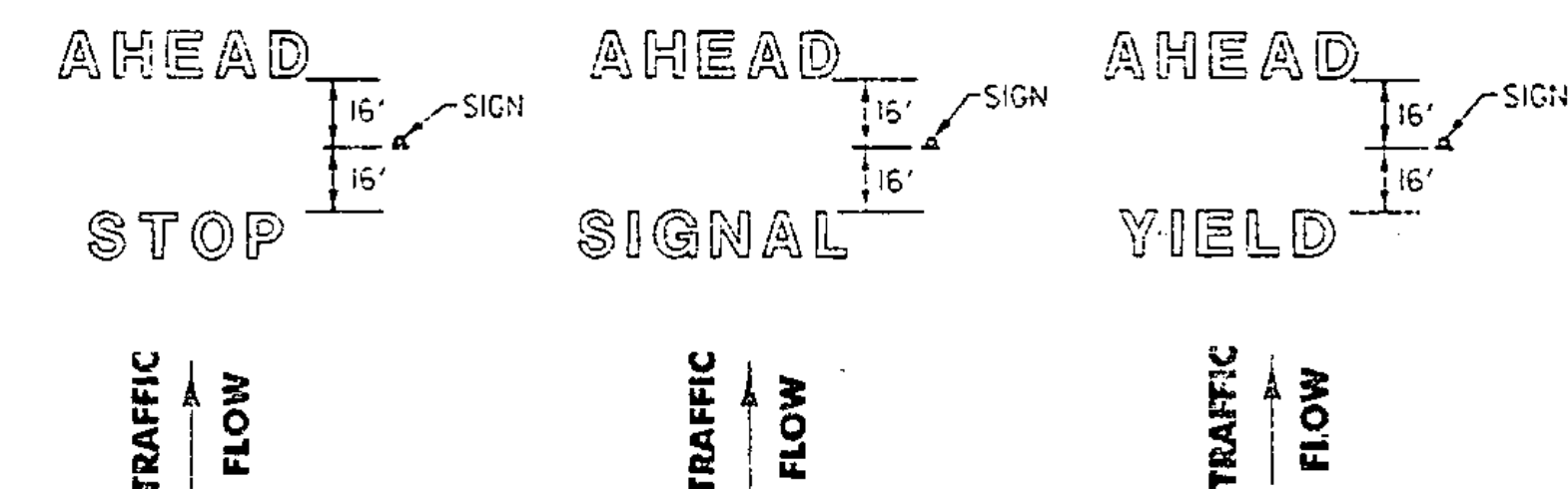
PAINTED CURB



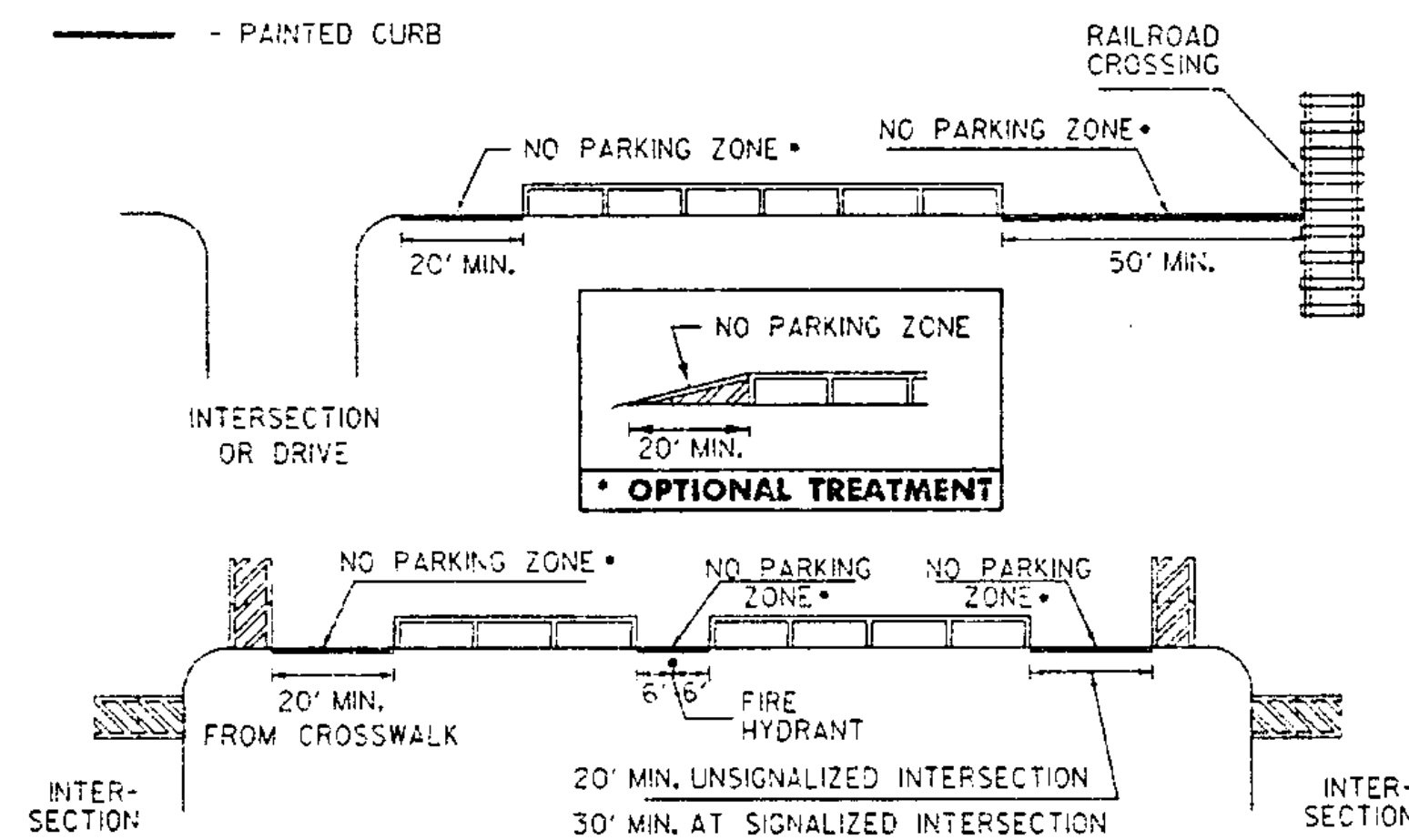
PAVEMENT MARKING PLACEMENT DETAIL



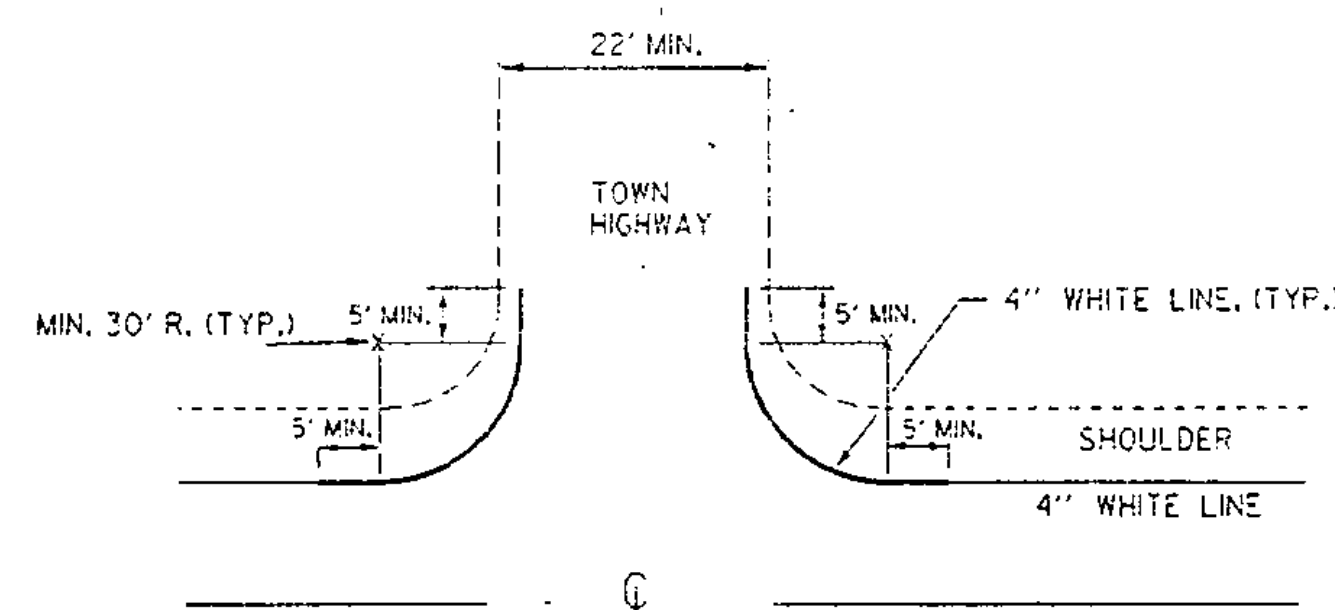
PAVEMENT MARKING LINE DETAILS



NOTE: SINGLE WORDS CENTERED ON SIGN 16: SCHOOL OR YIELD



NO PARKING LAYOUT DETAILS

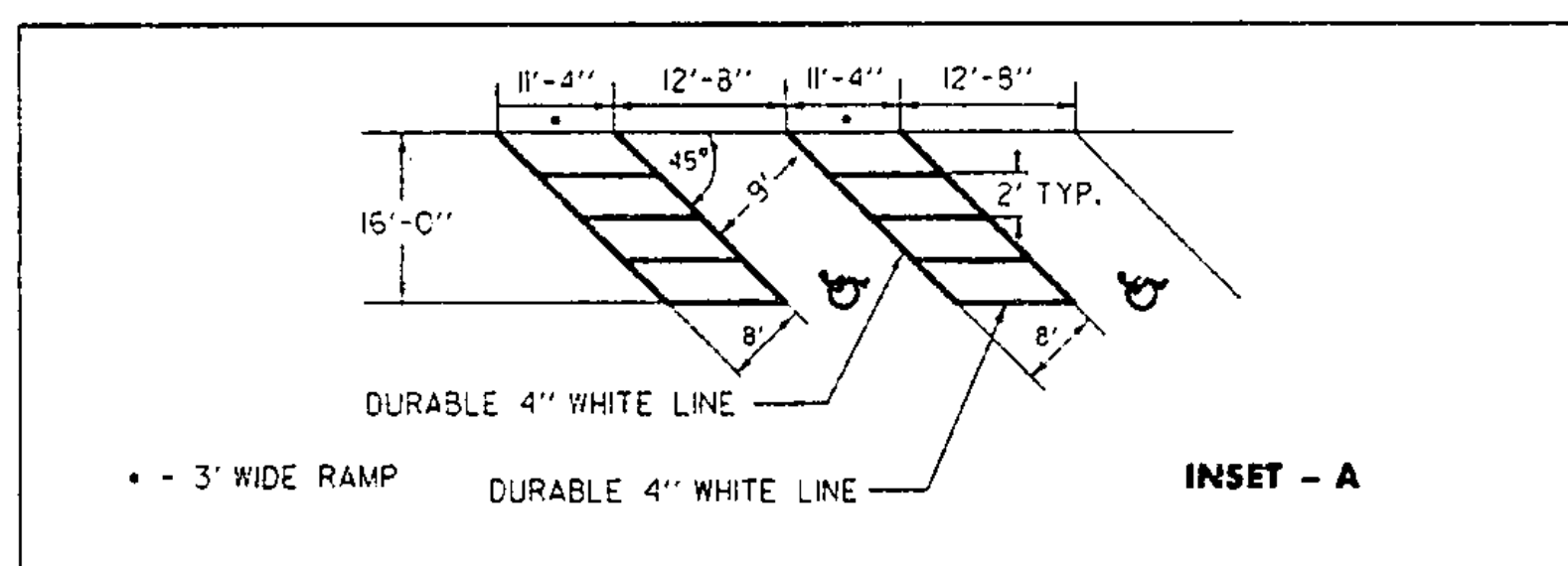


EDGE LINES SHALL BE APPLIED TO ALL STATE HIGHWAYS AND SHOULD BE MAINTAINED AT A CONSTANT DISTANCE FROM THE CENTERLINE UNLESS PAVEMENT WIDTH INCREASES TO ALLOW WIDER LANES.

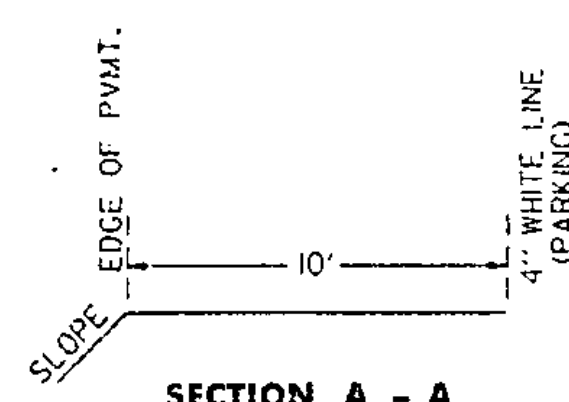
APPLY EDGE LINE AS DETAILED ON ALL PAVED CLASS 1 & CLASS 2 TOWN HIGHWAYS AND ANY CLASS 3 TOWN HIGHWAY 22 FEET OR MORE IN WIDTH.

IF MIN. 30 FOOT RADIUS CANNOT BE OBTAINED, OR THE TOWN HIGHWAY IS NOT PAVED, BREAK THE EDGE LINE USING AN 80 FOOT GAP AT INTERSECTION.

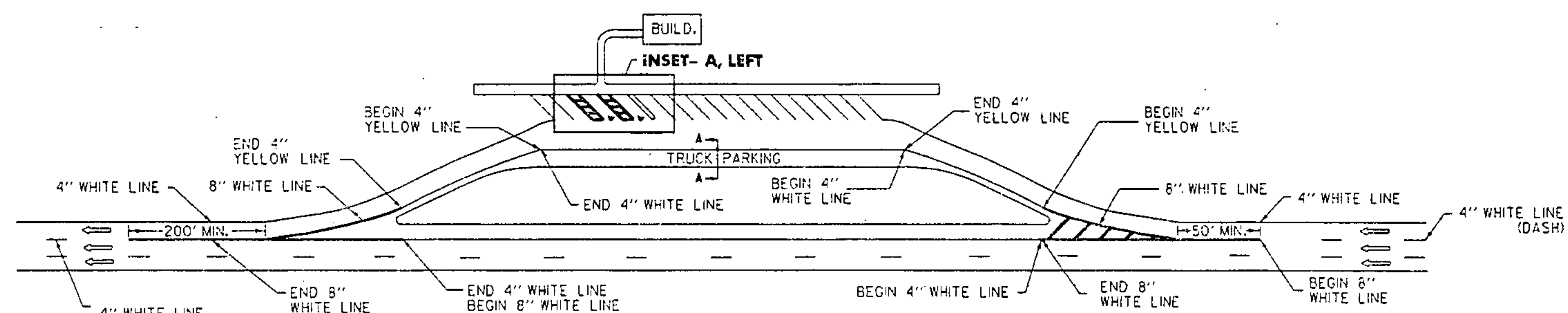
EDGE LINE LAYOUTS



NOTE:
SEE STANDARD SHEET E-191 FOR
HANDICAP SYMBOL POSITIONING AND DETAIL.



TRUCK PARKING DETAIL



REST AREA PARKING DETAILS

THIS SHEET IS
NOT TO SCALE

OTHER STDS. E - 191, E - 192
REQUIRED

REVISIONS AND CORRECTIONS
AUG. 18, 1995 - DATE OF ORIGINAL ISSUE

APPROVED

Stephen J. McArthur
DIRECTOR OF ENGINEERING

Dana R. Rasmussen
TRAFFIC AND SAFETY ENGINEER

APPROVED FOR THIS PROJECT
AND/OR DESIGN IMPLEMENTATION.
FHWA FINAL APPROVAL PENDING.

PAVEMENT MARKING DETAILS

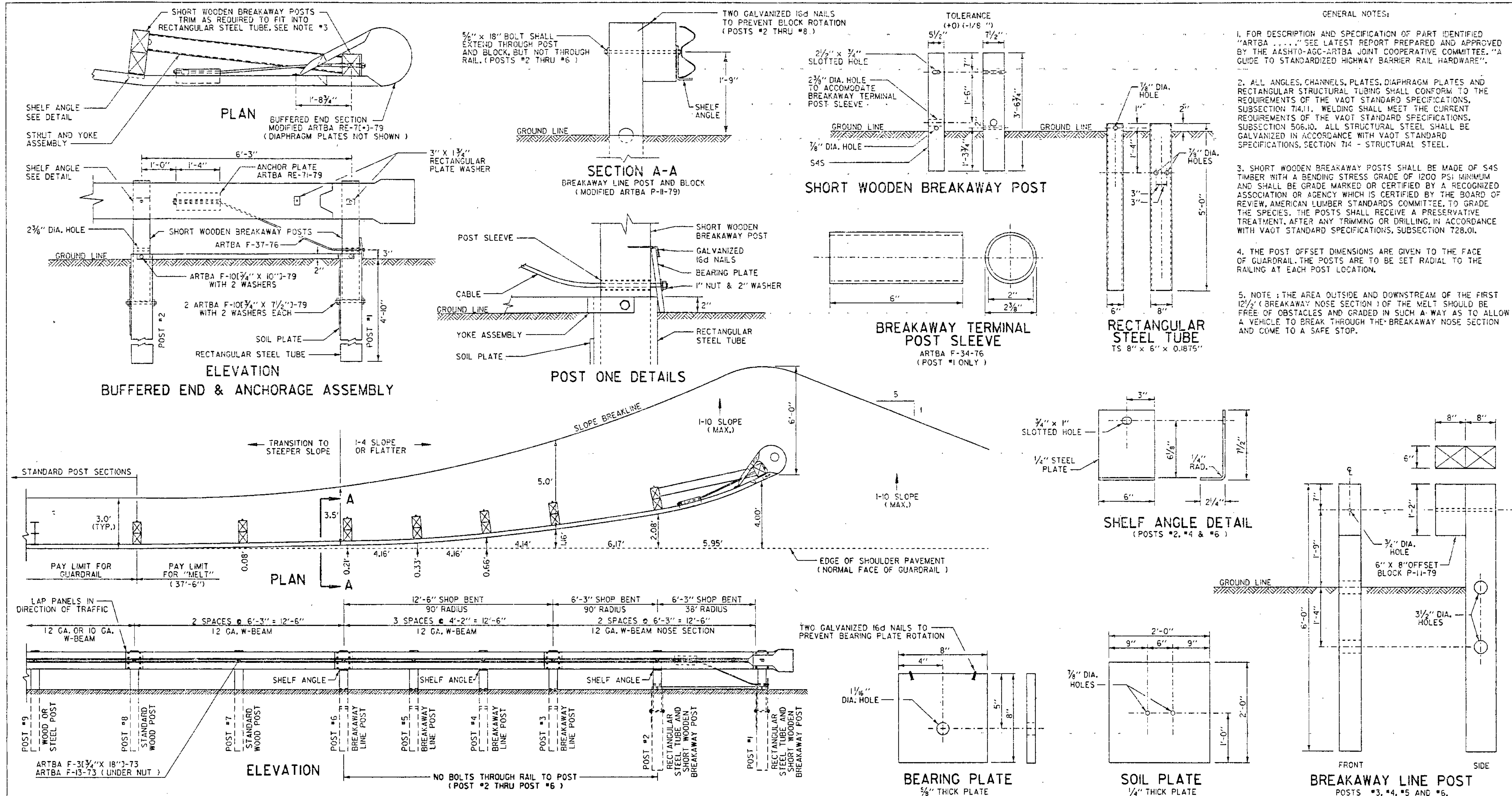
/traf/std/std193.dgn/std193.i



STANDARD
E-193

GENERAL NOTES:

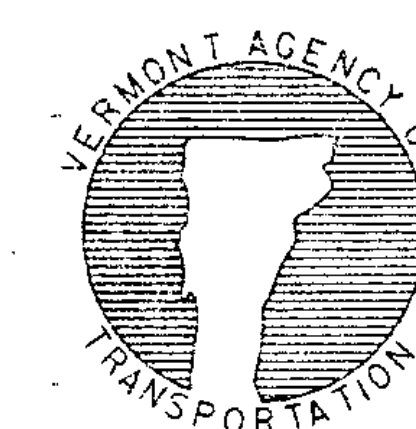
1. FOR DESCRIPTION AND SPECIFICATION OF PART IDENTIFIED "ARTBA" SEE LATEST REPORT PREPARED AND APPROVED BY THE AASHTO-AGC-ARTBA JOINT COOPERATIVE COMMITTEE, "A GUIDE TO STANDARDIZED HIGHWAY BARRIER RAIL HARDWARE".
2. ALL ANGLES, CHANNELS, PLATES, DIAPHRAGM PLATES AND RECTANGULAR STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF THE VAOT STANDARD SPECIFICATIONS, SUBSECTION 714.11. WELDING SHALL MEET THE CURRENT REQUIREMENTS OF THE VAOT STANDARD SPECIFICATIONS, SUBSECTION 506.10. ALL STRUCTURAL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH VAOT STANDARD SPECIFICATIONS, SECTION 714 - STRUCTURAL STEEL.
3. SHORT WOODEN BREAKAWAY POSTS SHALL BE MADE OF S4S TIMBER WITH A BENDING STRESS GRADE OF 1200 PSI MINIMUM AND SHALL BE GRADE MARKED OR CERTIFIED BY A RECOGNIZED ASSOCIATION OR AGENCY WHICH IS CERTIFIED BY THE BOARD OF REVIEW, AMERICAN LUMBER STANDARDS COMMITTEE, TO GRADE THE SPECIES. THE POSTS SHALL RECEIVE A PRESERVATIVE TREATMENT AFTER ANY TRIMMING OR DRILLING, IN ACCORDANCE WITH VAOT STANDARD SPECIFICATIONS, SUBSECTION 728.01.
4. THE POST OFFSET DIMENSIONS ARE GIVEN TO THE FACE OF GUARDRAIL. THE POSTS ARE TO BE SET RADIAL TO THE RAILING AT EACH POST LOCATION.
5. NOTE: THE AREA OUTSIDE AND DOWNSTREAM OF THE FIRST 12 1/2' (BREAKAWAY NOSE SECTION) OF THE MELT SHOULD BE FREE OF OBSTACLES AND GRADED IN SUCH A WAY AS TO ALLOW A VEHICLE TO BREAK THROUGH THE BREAKAWAY NOSE SECTION AND COME TO A SAFE STOP.



REVISIONS AND CORRECTIONS
JUNE 30, 1995 ORIGINAL APPROVAL
JANUARY 18, 1996 CHANGED DIAMETER
AND LENGTH OF BOLT (SECTION A-A)

APPROVED
APPROVED FOR THIS PROJECT
AND/OR DESIGN REPRESENTATION
FHWA FINAL APPROVAL PENDING.
DIRECTOR OF ENGINEERING
DESIGN ENGINEER

MODIFIED ECCENTRIC LOADER TERMINAL WITH WOOD POSTS (MELT)



STANDARD
G-17 a

