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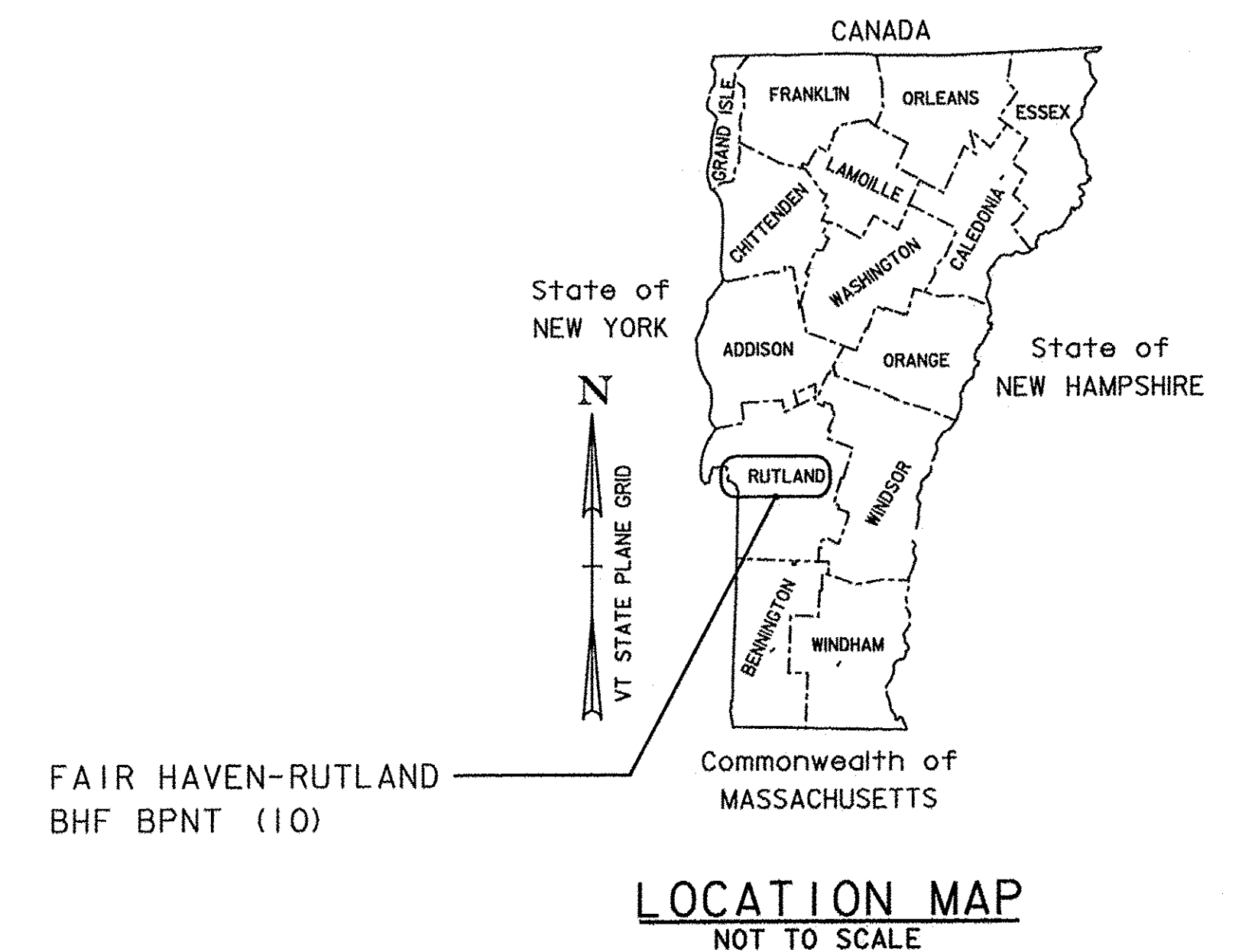
STANDARD SHEETS

- E-100 01-02-2004
- E-100A 01-02-2004
- E-101 05-30-2003
- E-102 06-30-2003
- E-102A 05-01-2004
- E-103 03-01-2004
- E-106 03-01-2004
- E-107 06-30-2003
- E-107A 06-08-2009

STATE OF VERMONT AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT BRIDGE PROJECT FAIR HAVEN - RUTLAND COUNTY OF RUTLAND ELEVEN BRIDGES ON OR OVER US ROUTE 4



RECORD PLANS

CONTRACTOR: ATLAS PAINTING & SHEETING CORP. - AMHURST, NY

RESIDENT ENGINEER: TIM POCKETTE

CONSTRUCTION BEGAN: MAY 8, 2013

CONSTRUCTION COMPLETE: NOVEMBER 14, 2014

RECORD PLANS BY: TIM POCKETTE

I HEREBY CERTIFY THAT ALL THE CONSTRUCTION REQUIRED BY THIS SET OF DRAWINGS HAS BEEN ACCOMPLISHED AS INDICATED HEREIN.

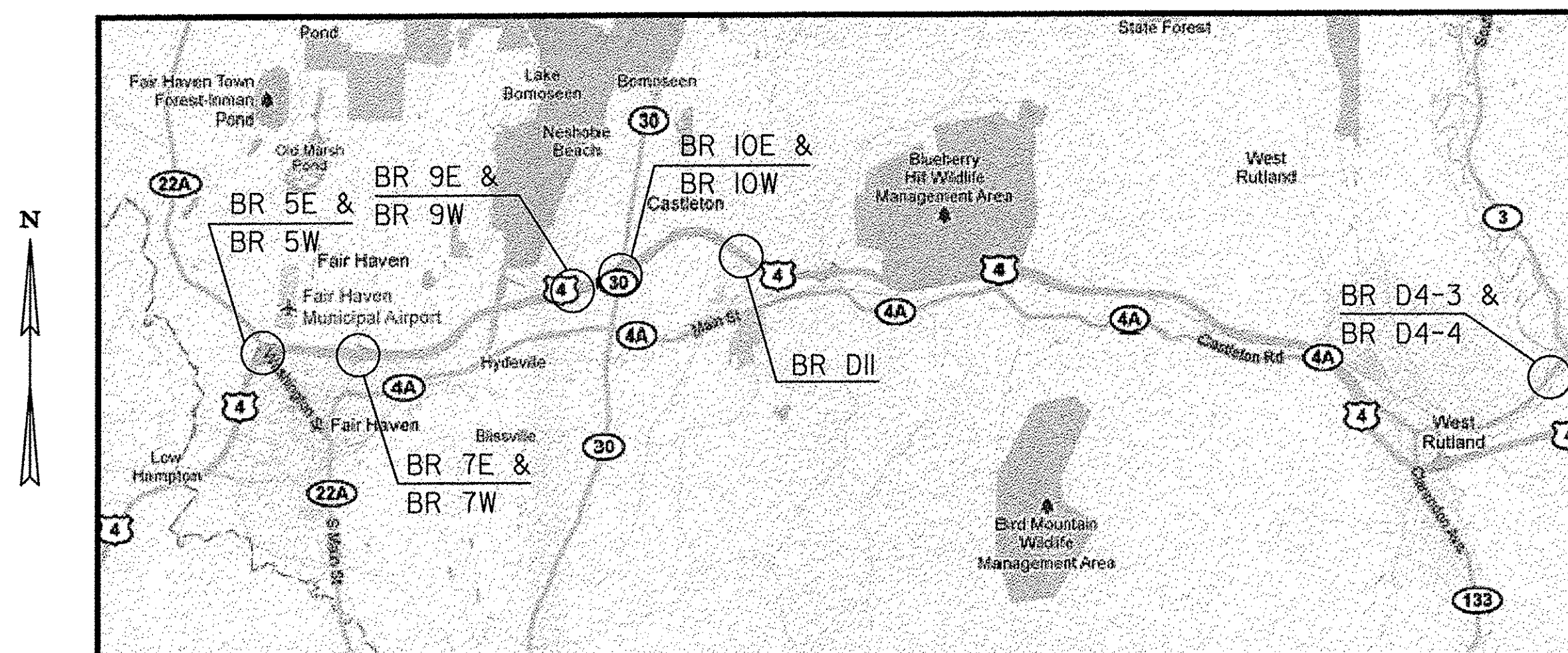
BY [Signature] RESIDENT ENGINEER

DATE 02-19-2015

NOTE: Any further information concerning final quantities, amounts or other details relative to this project may be found at Central Files in the electronic archives.

PROJECT LOCATION: RUTLAND BR D4-3 (BUSINESS ROUTE 4 OVER CLARENDON RIVER) (MM 3.19)
 RUTLAND BR D4-4 (BUSINESS ROUTE 4 OVER OTTER CREEK) (MM 6.28)
 FAIR HAVEN BR 5E & 5W (US ROUTE 4 OVER VT ROUTE 22A) (MM 16.76)
 FAIR HAVEN BR 7E & 7W (DUTTON AVE OVER US ROUTE 4) (MM 25.73)
 CASTLETON BR 9E & 9W (DRAKE ROAD OVER US ROUTE 4) (MM 49.94)
 CASTLETON BR 10E & 10W (US ROUTE 4 OVER VT ROUTE 30) (MM 54.49)
 CASTLETON BR D11 (OLD NORTH ROAD OVER US ROUTE 4) (MM 68.96)

PROJECT DESCRIPTION: THIS PROJECT INVOLVES CLEANING, LEAD PAINT REMOVAL AND REPAINTING THE EXISTING STEEL SUPERSTRUCTURE MEMBERS AND MINOR ASSOCIATED WORK.



PROJECT LIMITS PLAN
NOT TO SCALE

CONVENTIONAL SYMBOLS

COUNTY LINE	
TOWN LINE	
LIMITS OF ACCESS	
POINT OF ACCESS	
FENCE LINE	
STONE WALL	
TRAVELED WAY	
GUARD RAIL	
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	

SURVEYED BY : N/A
 SURVEYED DATE : N/A

DATUM
 VERTICAL N/A
 HORIZONTAL N/A

THESE PLANS ARE SUBJECT TO SUCH ENGINEERING CHANGES AS MAY BE REQUIRED BY THE FEDERAL HIGHWAY ADMINISTRATION OR THE DIRECTOR OF PROGRAM DEVELOPMENT.

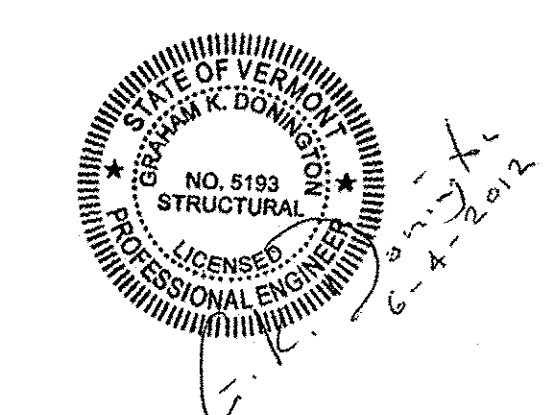
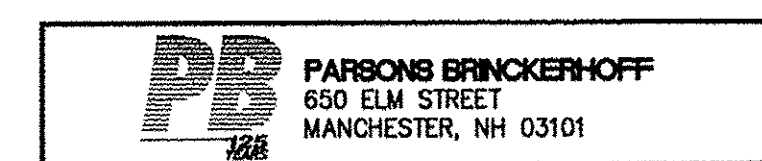
CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2011, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JULY 20, 2011 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

DIRECTOR OF PROGRAM DEVELOPMENT
 APPROVED [Signature] DATE 6-20-12

PROJECT MANAGER : MARK SARGENT

PROJECT NAME : FAIR HAVEN - RUTLAND
 PROJECT NUMBER : BHF BPNT (10)

SHEET 1 OF 28 SHEETS



PROJECT NOTES:

- ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION 2011 STANDARD SPECIFICATIONS FOR CONSTRUCTION AND ITS LATEST REVISIONS AND THE CONTRACT SPECIAL PROVISIONS.
- ALL WORK AND ANY ASSOCIATED ACTIVITY ON THIS PROJECT SHALL BE PERFORMED WITHIN THE EXISTING RIGHT-OF-WAY LIMITS. THE RIGHT-OF-WAY FOR ALL HIGHWAYS OTHER THAN US ROUTE 4 SHALL BE ASSUMED TO BE A MINIMUM OF 3 RODS UNLESS SHOWN OTHERWISE ON REFERENCE PLANS.
- VTRANS WILL REVIEW CONSTRUCTION STAGING AREAS FOR ADEQUACY AND EXISTING CONDITIONS. THESE STAGING AREAS SHALL BE RESTORED TO ORIGINAL CONDITION. EROSION CONTROL MEASURES SHALL BE INCORPORATED FOR ALL DISTURBED AREAS AND PAID FOR UNDER ITEMS 649.51 AND 653.20.
- ALL COSTS ASSOCIATED WITH EXTENDING OR FILLING THE DRAIN TUBES SHALL BE INCIDENTAL TO ITEM 900.645, SPECIAL PROVISION (QC/QA CLEAN AND PAINT EXISTING STEEL STRUCTURES, BARE STEEL).
- THE LENGTHS OF BEAMS OR GIRDERS TO BE GREASE COATED (AT THE ENDS) SHALL BE EQUAL TO THE END DEPTH OF THE MEMBER INCLUDING ALL EXPOSED SURFACE AREAS OF MEMBER AND ATTACHMENTS, SUCH AS CROSS MEMBERS, WITHIN THIS DISTANCE.
- STAGING AND CONTAINMENT STRUCTURES SHALL NOT BE ANCHORED INTO PIERS. ANCHORING INTO THE ABUTMENTS IS ALLOWED AS APPROVED BY THE ENGINEER. CONTRACTOR SHALL PROVIDE A DETAILED PLAN FOR CLEANING AND PAINTING BEARING DEVICES IF ANCHOR CABLES ARE PLACED AROUND BEARING PLATES. PAYMENT WILL BE CONSIDERED INCIDENTAL TO CONTRACT ITEM 900.645 SPECIAL PROVISION (CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES.)
- UTILITIES AND GALVANIZED METAL DOWNSPOUTS THAT ARE PRESENT ON THE STRUCTURES SHALL NOT BE BLASTED OR PAINTED. THESE UTILITIES MUST BE PROTECTED.
- CONTRACTOR SHALL VERIFY THE CAPACITY, THROUGH LOAD CALCULATIONS, OF THE EXISTING BRIDGE IF THE VACUUM RECYCLER UNIT TRUCK IS PLACED ON THE BRIDGE.
- THE CONTRACTOR SHALL NOT IMPEDE THE TOWN CONTROLLED PORTION OF THE RIGHT OF WAY WITH EQUIPMENT OR ANY STAGING MATERIALS FOR STRUCTURES CARRYING TOWN HIGHWAYS OVER THE INTERSTATE.
- WORK OUTSIDE THE SEASONAL LIMITATIONS WILL NOT BE ALLOWED UNLESS BY SPECIAL PERMISSION GRANTED BY THE PROJECT MANAGER. WORK OUTSIDE THE SEASONAL LIMITATION WILL ONLY BE ALLOWED FOR A SHORT PERIOD OF TIME IF GIVEN, TO FINALIZE TOUCHUPS OR OTHER REPAIRS. NO LONG TERM OUT OF SEASON WORK WILL BE ALLOWED OR CONSIDERED.

TRAFFIC CONTROL:

- THE CONTRACTOR SHALL SUBMIT SITE SPECIFIC TRAFFIC CONTROL PLANS DEPICTING EACH PHASE OF THE PLANNED WORK FOR ANY WORK ON US ROUTE 4 AND OTHER ROADWAYS. THE DESIGN SHALL ENSURE STATE-REGULATED WIDE LOADS CAN BE ACCOMMODATED DURING THE LANE CLOSURES. PLANS SHALL BE SUBMITTED IN ACCORDANCE WITH SECTION 641 AND SUBSECTION 105.03 AND SHALL BE STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN AN APPROPRIATE DISCIPLINE IN THE STATE OF VERMONT.
- THE CONTRACTOR SHALL OBTAIN THE MOST CURRENT TRAFFIC VOLUMES FOR US ROUTE 4 AND CROSS ROADS FOR USE IN THE SPECIFIC TRAFFIC CONTROL PLANS.

TOWN	ROUTE 4 BRIDGE No	US ROUTE 4 2011 AADT		CROSSROAD	CROSSROAD 2011 AADT SUM OF BOTH DIRECTIONS	BUSINESS ROUTE 4 2011 AADT
		EASTBOUND	WESTBOUND			
RUTLAND	BR D4-3	N/A	N/A	N/A	N/A	11100
RUTLAND	BR D4-4	N/A	N/A	N/A	N/A	11100
FAIR HAVEN	5E & 5W	2400	2300	VT ROUTE 22A	5700	N/A
FAIR HAVEN	7E & 7W	3400	3400	DUTTON AVE	1800	N/A
CASTLETON	9E & 9W	4300	4300	DRAKE ROAD	N/A	N/A
CASTLETON	10E & 10W	3500	3700	VT ROUTE 30	5100	N/A
CASTLETON	D II	5900	5900	OLD NORTH ROAD	660	N/A

- THE TRAFFIC CONTROL PLANS SHALL SHOW ALL RAMPS AND US ROUTE 4 ACCELERATION LANES AND DECELERATION LANES.
- UNIFORMED TRAFFIC OFFICERS ARE REQUIRED FOR THE TRAFFIC CONTROL ON US ROUTE 4.
- THE TRAFFIC CONTROL DEVICES SHOWN ON THESE PLANS ARE FOR ILLUSTRATIVE PURPOSES AND DO NOT RELIEVE THE CONTRACTOR FROM ADHERING TO ALL VTRANS TRAFFIC CONTROL STANDARDS, REQUIREMENTS AND SPECIFICATIONS. ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE 2009 MUTCD AND ITS LATEST REVISIONS. WHERE CONFLICTS EXIST BETWEEN AOT STANDARDS AND MUTCD, THE MUTCD SHALL GOVERN.
- UNLESS COVERED UNDER INDIVIDUAL PAY ITEMS, ALL COSTS FOR TEMPORARY TRAFFIC CONTROL DEVICES WILL BE CONSIDERED TO BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR TRAFFIC CONTROL, ITEM 641.10.

BRIDGE NOTES:

RUTLAND, BRIDGE D4-3 - BUSINESS ROUTE 4 OVER CLARENDON RIVER

- REMOVE GREASE COATING ON ENDS OF STEEL BEAMS, END CROSS MEMBERS AND BEARINGS
- CLEAN AND PAINT EXISTING STEEL
- REPAIR AND CLEAN BRIDGE SCUPPERS (REFER TO SHEET 4)
- REPLACE DRAIN ON ~~WEST END~~ ONLY (REFER TO SHEET 3) **EAST END**
- UTILITIES LOCATED ON NORTH SIDE OF BRIDGE (REFER TO PROJECT NOTE 7 ON THIS SHEET)

RUTLAND, BRIDGE D4-4 - BUSINESS ROUTE 4 OVER OTTER CREEK

- REMOVE GREASE COATING ON ENDS OF STEEL BEAMS, END CROSS MEMBERS AND BEARINGS
- CLEAN AND PAINT EXISTING STEEL
- REPAIR AND CLEAN BRIDGE SCUPPERS (REFER TO SHEET 4)
- REMOVE DIAPER DRAIN AT CENTER PIER (DO NOT REPLACE)
- UTILITIES LOCATED ON NORTH SIDE OF BRIDGE AND WATERLINE ON SOUTH SIDE OF BRIDGE (REFER TO PROJECT NOTE 7 ON THIS SHEET)

FAIR HAVEN, BRIDGES 5E & 5W - US ROUTE 4 OVER VT ROUTE 22A

- ALL STEEL BEAMS, CROSS MEMBERS, AND BEARINGS ARE COVERED IN GREASE FOR THE TOTAL LENGTH OF THE BRIDGE. REMOVE GREASE FROM ALL SURFACES.
- CLEAN AND PAINT EXISTING STEEL
- REPLACE DRAIN ON EAST END OF BRIDGE (5E & 5W) (REFER TO SHEET 5)
- EXTEND BRIDGE DRAIN WEEPERS AND ATTACH TO GIRDER FLANGES ON NORTH SIDE OF BRIDGE (REFER TO SHEET 3)

FAIR HAVEN, BRIDGES 7E & 7W - DUTTON AVE OVER US ROUTE 4

- REMOVE GREASE COATING ON ENDS OF STEEL BEAMS, END CROSS MEMBERS AND BEARINGS
- CLEAN AND PAINT EXISTING STEEL
- EXTEND BRIDGE DRAIN WEEPERS AND ATTACH TO GIRDER FLANGES (REFER TO SHEET 3)
- REPLACE DIAPER DRAIN ON NORTH ABUTMENT (7E & 7W) (REFER TO SHEET 5)
- GALVANIZED METAL DOWNSPOUTS LOCATED ON BRIDGE (REFER TO PROJECT NOTE 7 ON THIS SHEET)

CASTLETON, BRIDGES 9E & 9W - DRAKE ROAD OVER US ROUTE 4

- REMOVE GREASE COATING ON ENDS OF STEEL BEAMS, END CROSS MEMBERS AND BEARINGS
- CLEAN AND PAINT EXISTING STEEL
- EXTEND BRIDGE DRAIN WEEPERS AND ATTACH TO GIRDER FLANGES (REFER TO SHEET 3)

CASTLETON, BRIDGES 10E & 10W - US ROUTE 4 OVER VT ROUTE 30

- REMOVE GREASE COATING ON ENDS OF STEEL BEAMS, END CROSS MEMBERS AND BEARINGS
- CLEAN AND PAINT EXISTING STEEL
- CLEAN METAL BRIDGE DRAINS
- EXTEND BRIDGE DRAIN WEEPERS ("10 E" NORTH SIDE ALREADY EXTENDED) AND ATTACH ALL WEEPERS TO GIRDER FLANGES (REFER TO SHEET 3)

CASTLETON, BRIDGE D11 - OLD NORTH ROAD OVER US ROUTE 4

- REMOVE GREASE COATING ON ENDS OF STEEL BEAMS, END CROSS MEMBERS AND BEARINGS
- CLEAN AND PAINT EXISTING STEEL
- CLEAN EXISTING METAL DRAINS (DO NOT COAT INSIDE OF DRAINS)
- EXTEND BRIDGE DRAIN WEEPERS AND ATTACH TO GIRDER FLANGES (REFER TO SHEET 3)

TRAFFIC CONTROL CONTINUED:

- THE PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) AND PRINT MEDIA SHALL BE IMPLEMENTED 2 WEEKS IN ADVANCE OF LANE CLOSURES AS DIRECTED BY THE ENGINEER.
- RIGHT-OF-WAY FENCE MAY HAVE TO BE REMOVED AND RESET IN ACCORDANCE WITH SECTION 620 FOR EGRESS AND INGRESS. THIS WORK SHALL BE PAID UNDER ITEM 620.50.

PROJECT NOTES

PROJECT NAME: FAIR HAVEN - RUTLAND

PROJECT NUMBER: BHF BPNT (10)

FILE NAME: I0b182/str/z10b182det.dgn

PROJECT LEADER: G.K.DONINGTON

DESIGNED BY: A.STOCKIN

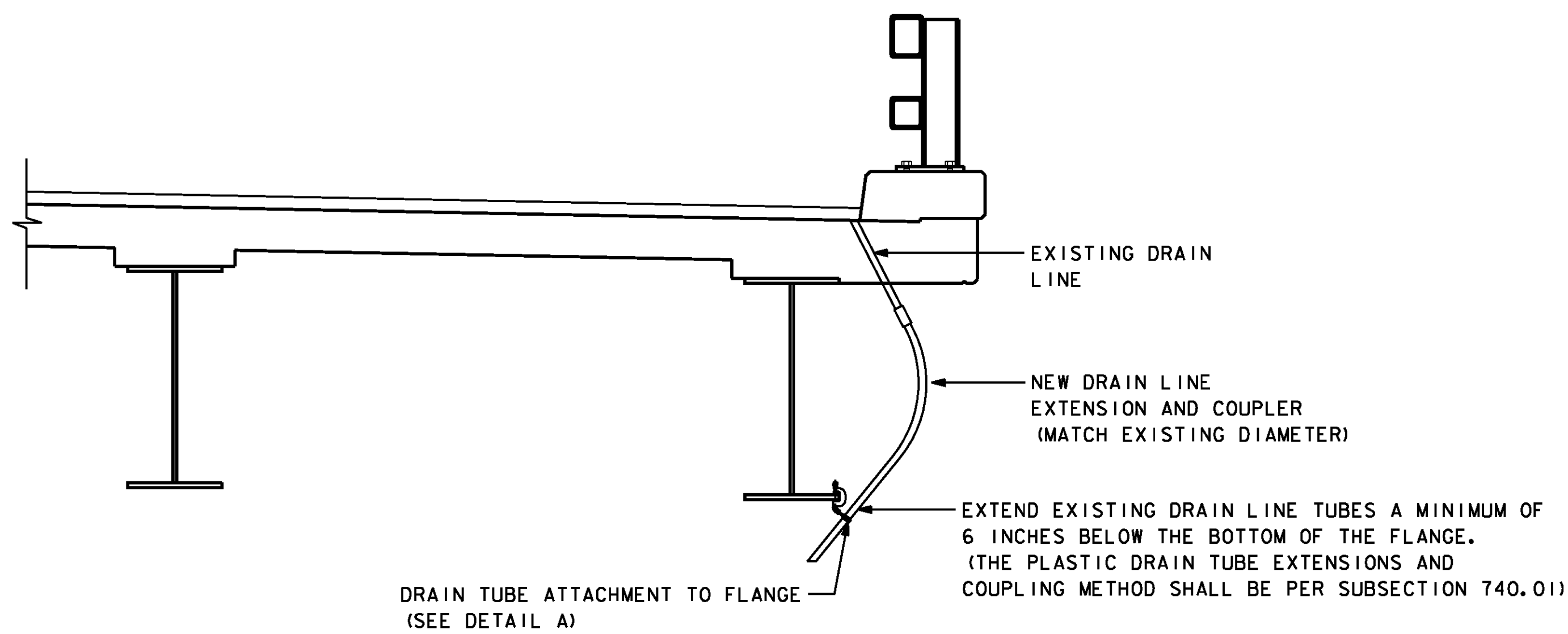
PLOT DATE: 6/19/2012

DRAWN BY: W.GERHOLD

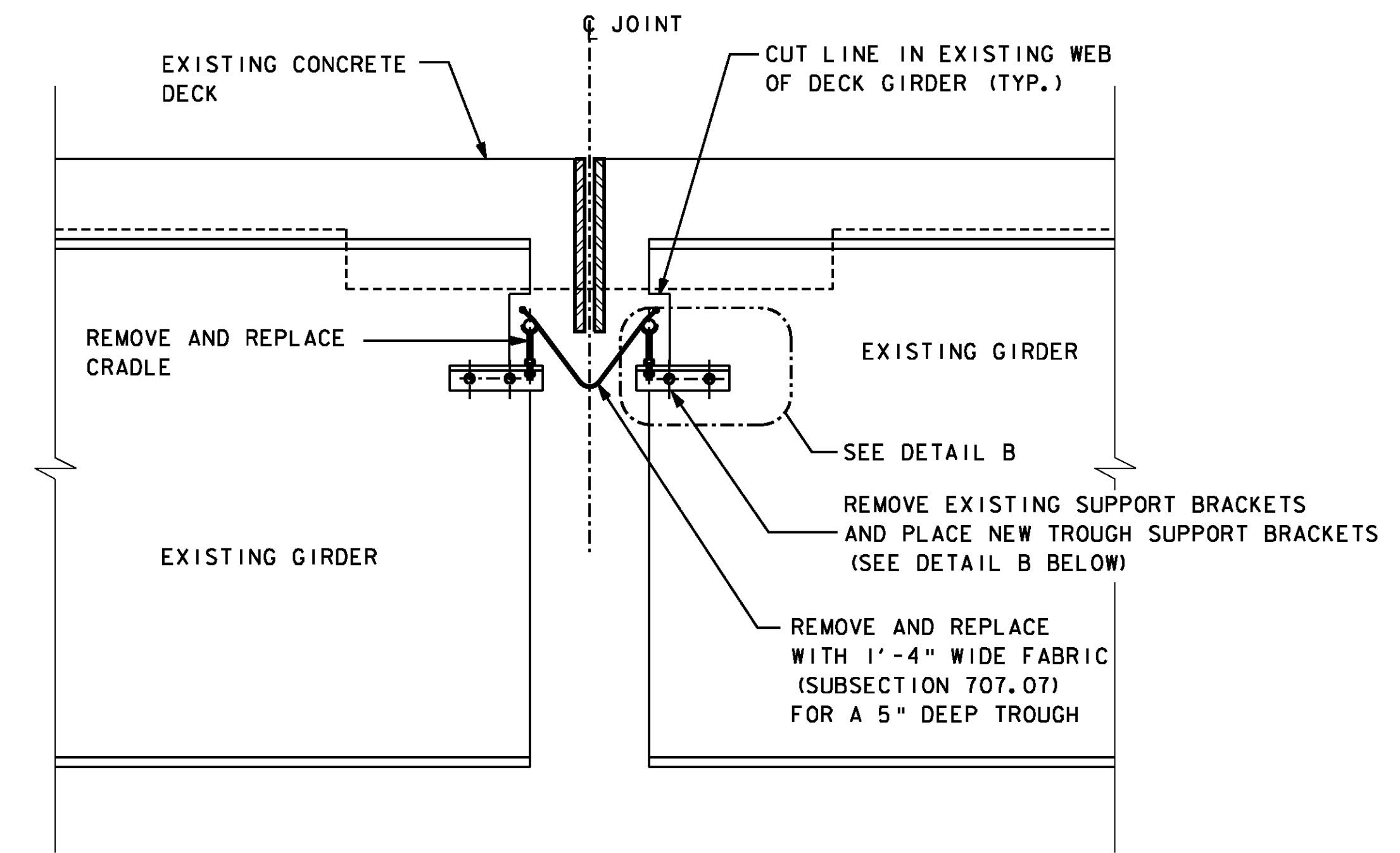
CHECKED BY: D.SARGENT

SHEET 2 OF 28

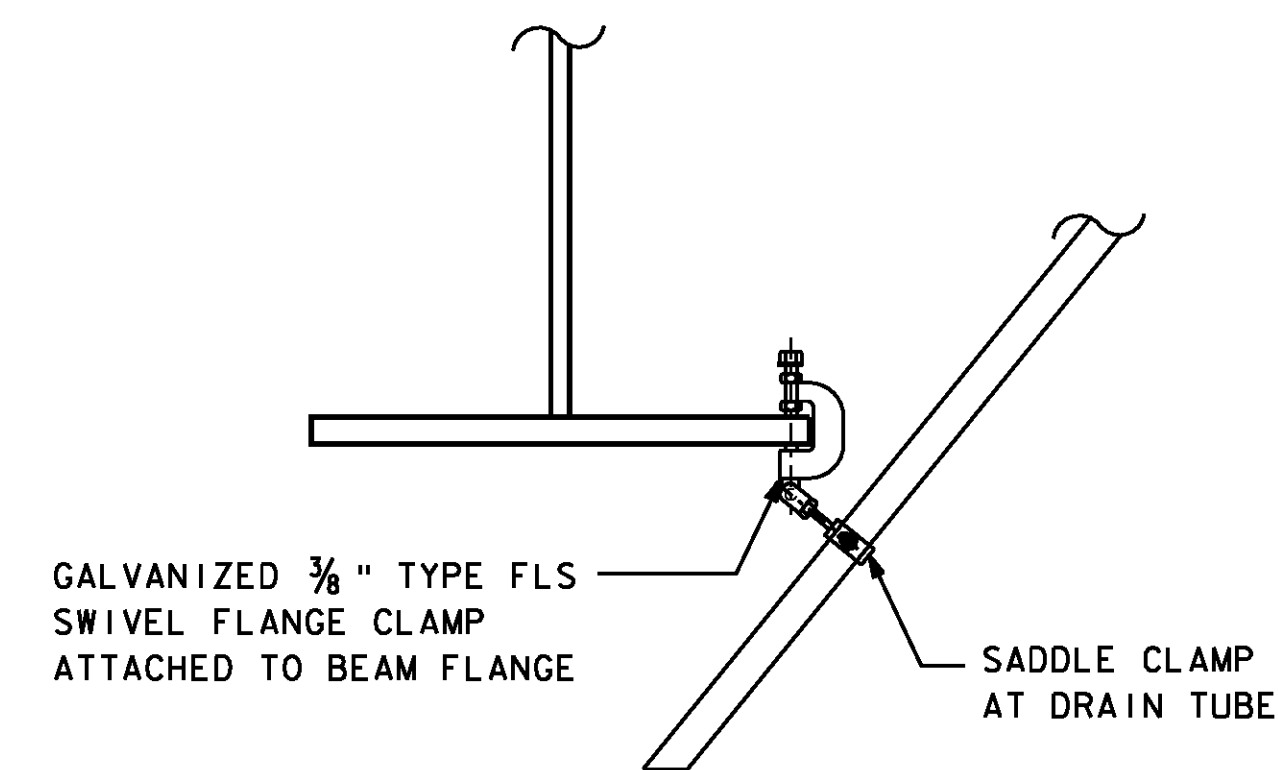




DRAIN TUBE EXTENSION DETAIL
NOT TO SCALE



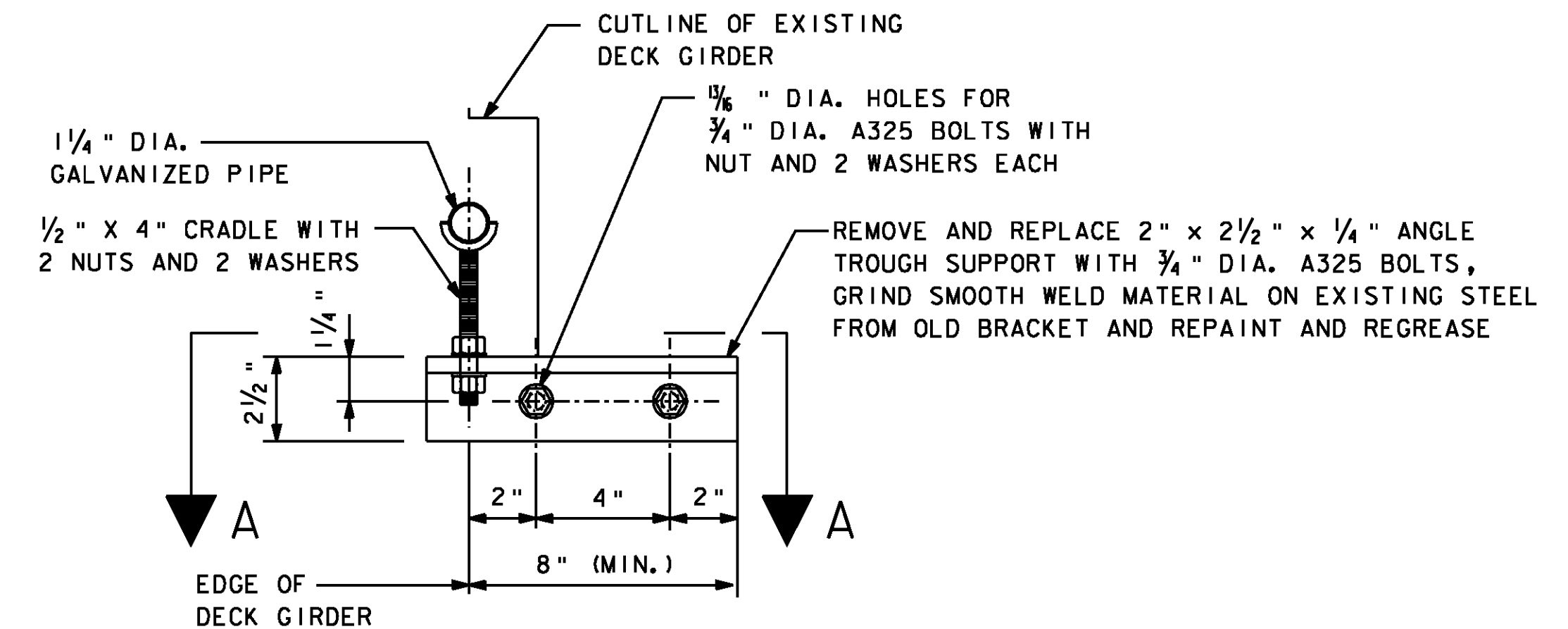
TYPICAL SECTION AT EXISTING DIAPER DRAIN
SCALE: 1" = 1'-0"



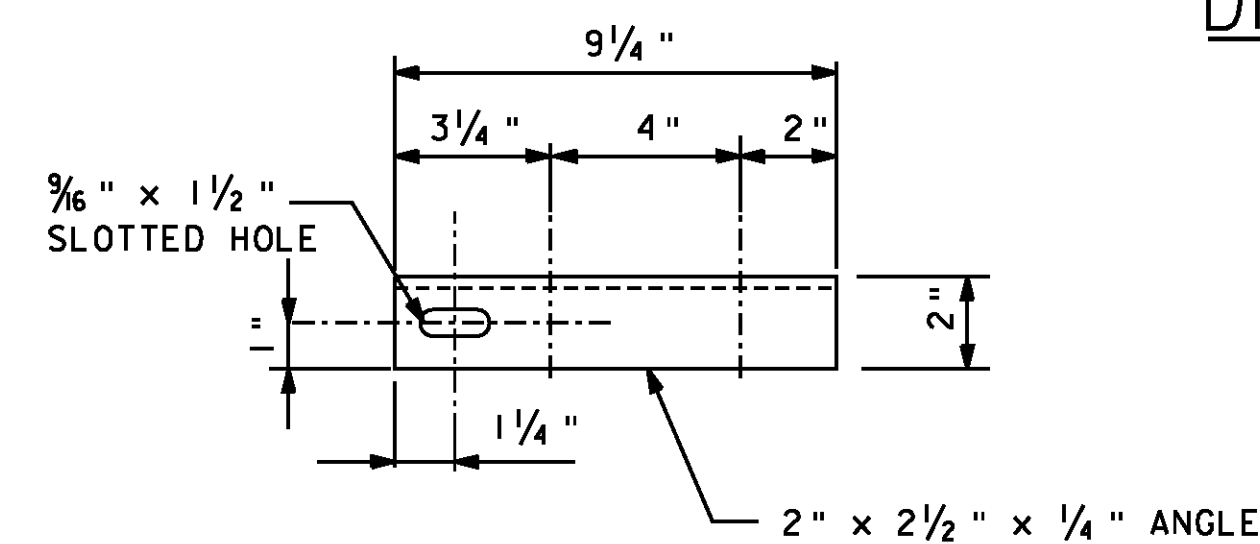
DETAIL A
NOT TO SCALE

NOTES:

- IF EXISTING DRAIN TUBE IS TOO SHORT TO PROVIDE ADEQUATE CONNECTION, THE CONTRACTOR SHALL COMPLETELY FILL THE TUBE WITH POLYURETHANE SEALANT CONFORMING TO SUBSECTION 707.05. TUBES TO BE FILLED WITH POLYURETHANE SEALANT SHALL BE APPROVED BY THE ENGINEER PRIOR TO BEING FILLED.



DETAIL B
3" = 1'-0"
DIAPER DRAIN REPAIR DETAILS



TROUGH SUPPORT BRACKET DETAIL A
PLAN VIEW
3" = 1'-0"

DIAPER DRAIN REPAIR NOTES:

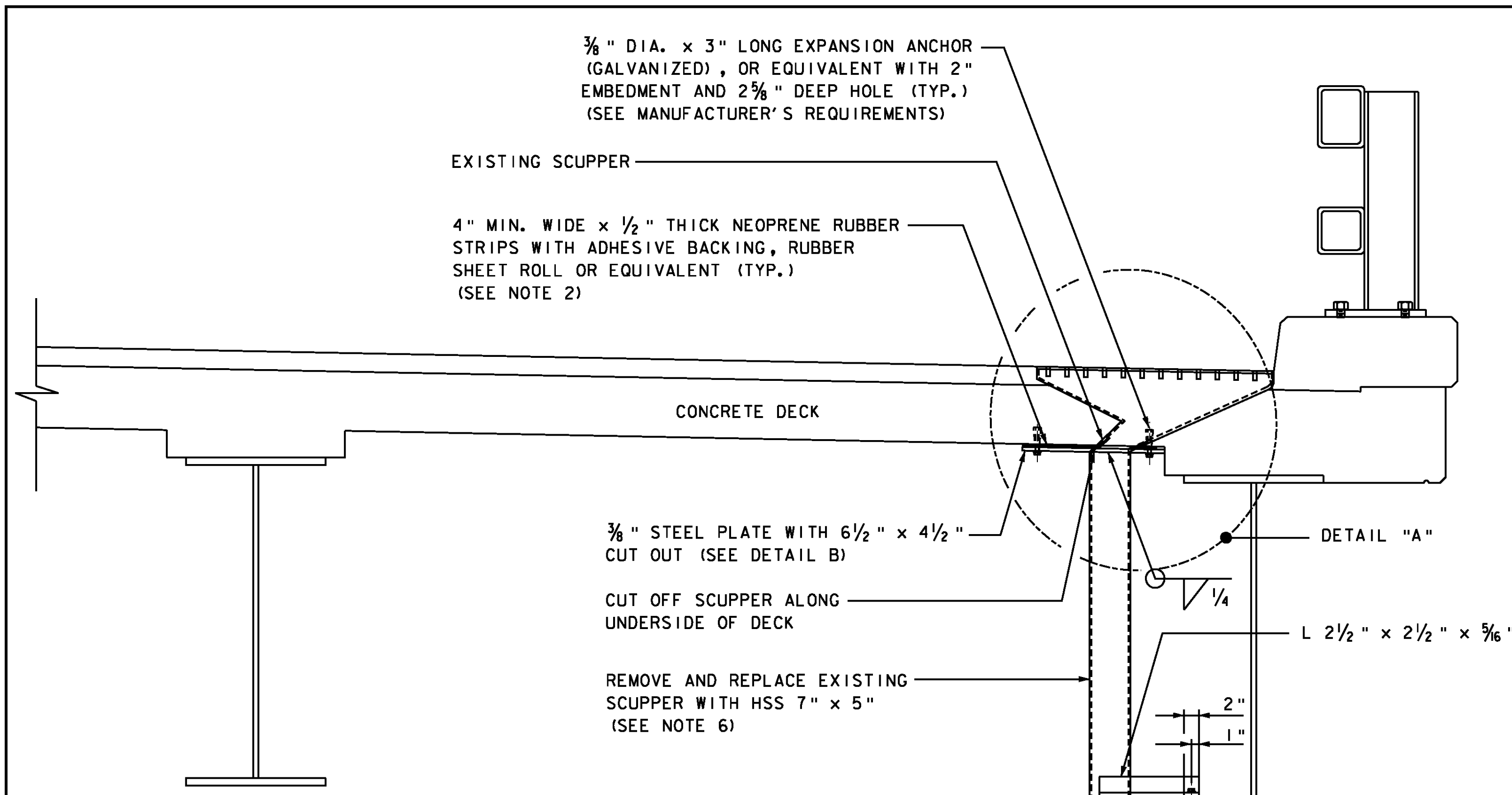
- TROUGH SUPPORT BRACKETS SHALL NOT BE WELDED TO GIRDER WEB.
- STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM-A500 OR ASTM-A501 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-123 AFTER FABRICATION. ALL PLATES, BARS AND ANGLES SHALL CONFORM TO ASTM A-36 AND SHALL ALSO BE GALVANIZED IN ACCORDANCE WITH ASTM-123 AFTER FABRICATION. CRADLE ASSEMBLIES SHALL CONSIST OF THREADED RODS (ASTM A568, CLASS 4.6), NUTS (ASTM A563), AND WASHERS (ASTM F486), FINISH TO BE HOT-DIP ZINC COATING (ASTM A153).
- THE 1/4" (NOMINAL DIAMETER) GALVANIZED STEEL PIPE, PREFORMED FABRIC MATERIAL, CRADLES AND RELATED HARDWARE, TAP SCREWS, CUTTING OF THE EXISTING STRUCTURAL STEEL AS REQUIRED, REMOVAL AND DISPOSAL OF THE EXISTING DRAIN TROUGH SYSTEM AND FLUSHING OF ALL PIER CAPS SHALL BE PAID UNDER ITEM 506.75, STRUCTURAL STEEL.
- THESE DETAILS ARE ILLUSTRATED AS AN EXAMPLE. CONTRACTOR TO SUBMIT FABRICATION DRAWINGS FOR APPROVAL.

**PROJECT STANDARD
DETAILS SHEET (1)**

PROJECT NAME: FAIR HAVEN - RUTLAND
PROJECT NUMBER: BHF BPNT (10)

FILE NAME: i0b182/str/z10b182det.dgn PLOT DATE: 24-JAN-2012
PROJECT LEADER: G.K.DONINGTON DRAWN BY: W.GERHOLD
DESIGNED BY: A.STOCKIN CHECKED BY: D.SARGENT
det_2.dgn SHEET 3 OF 28

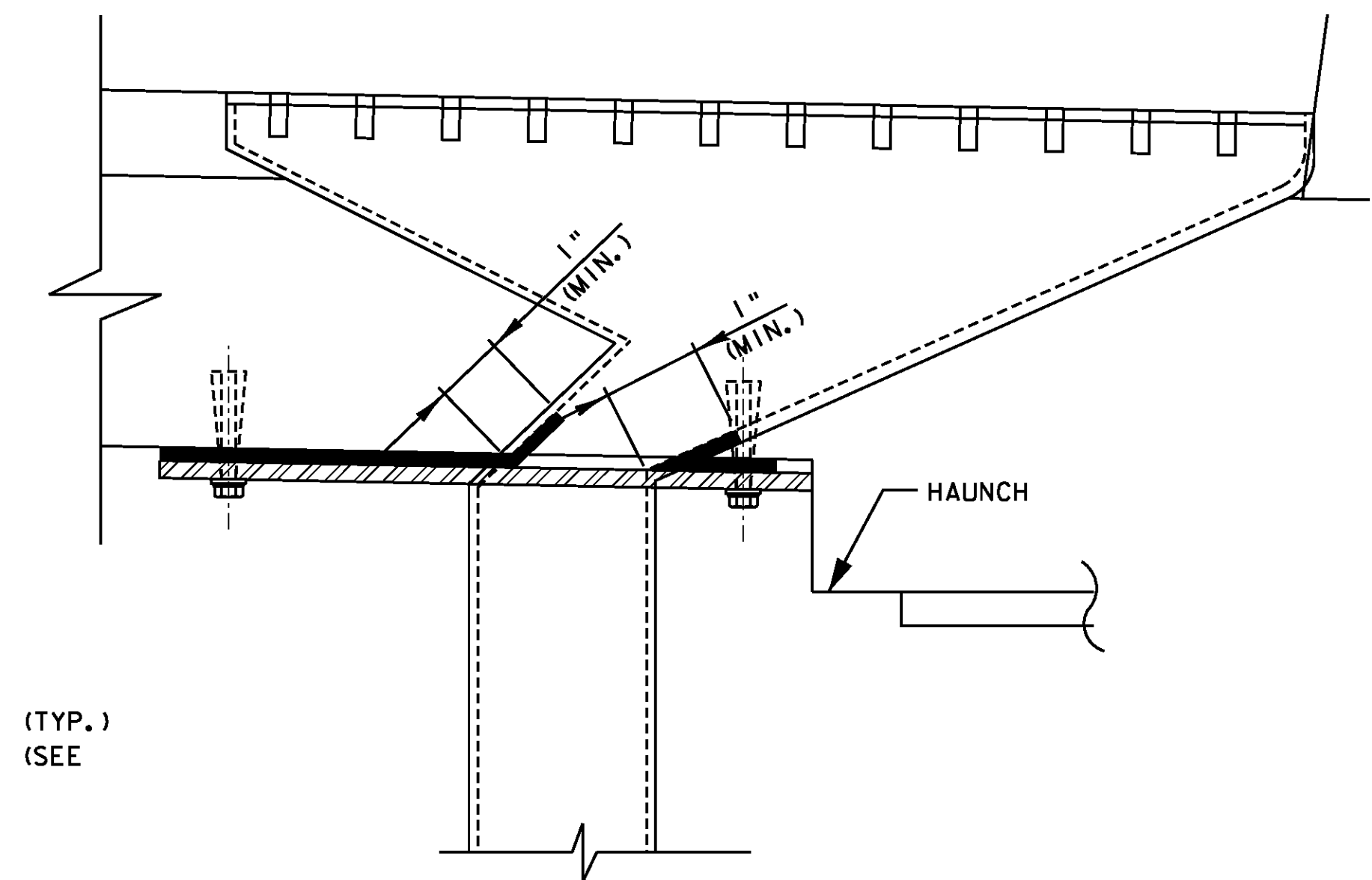




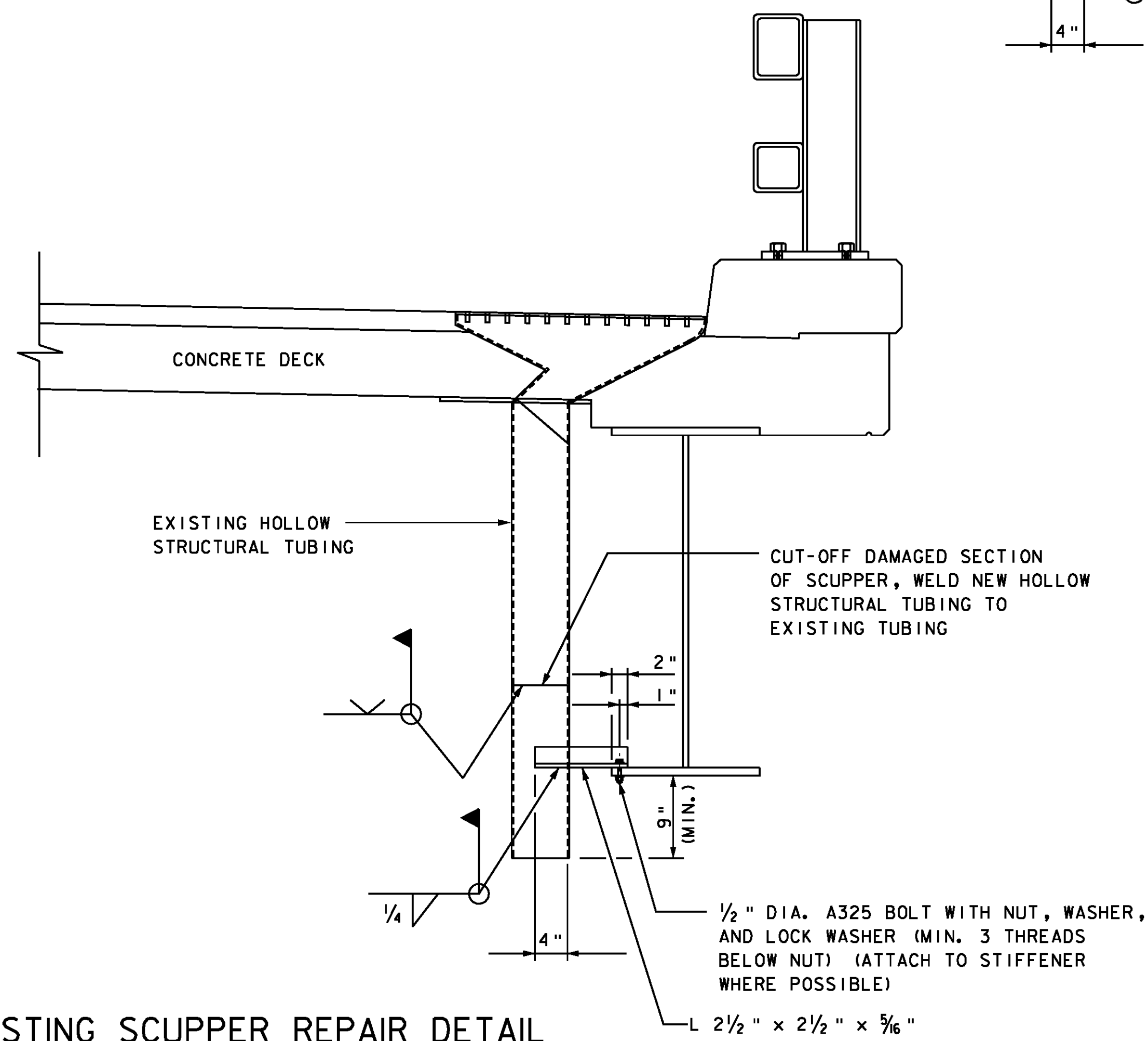
SCUPPER REPLACEMENT DETAIL
SCALE: 1" = 1'-0"

NOTES:

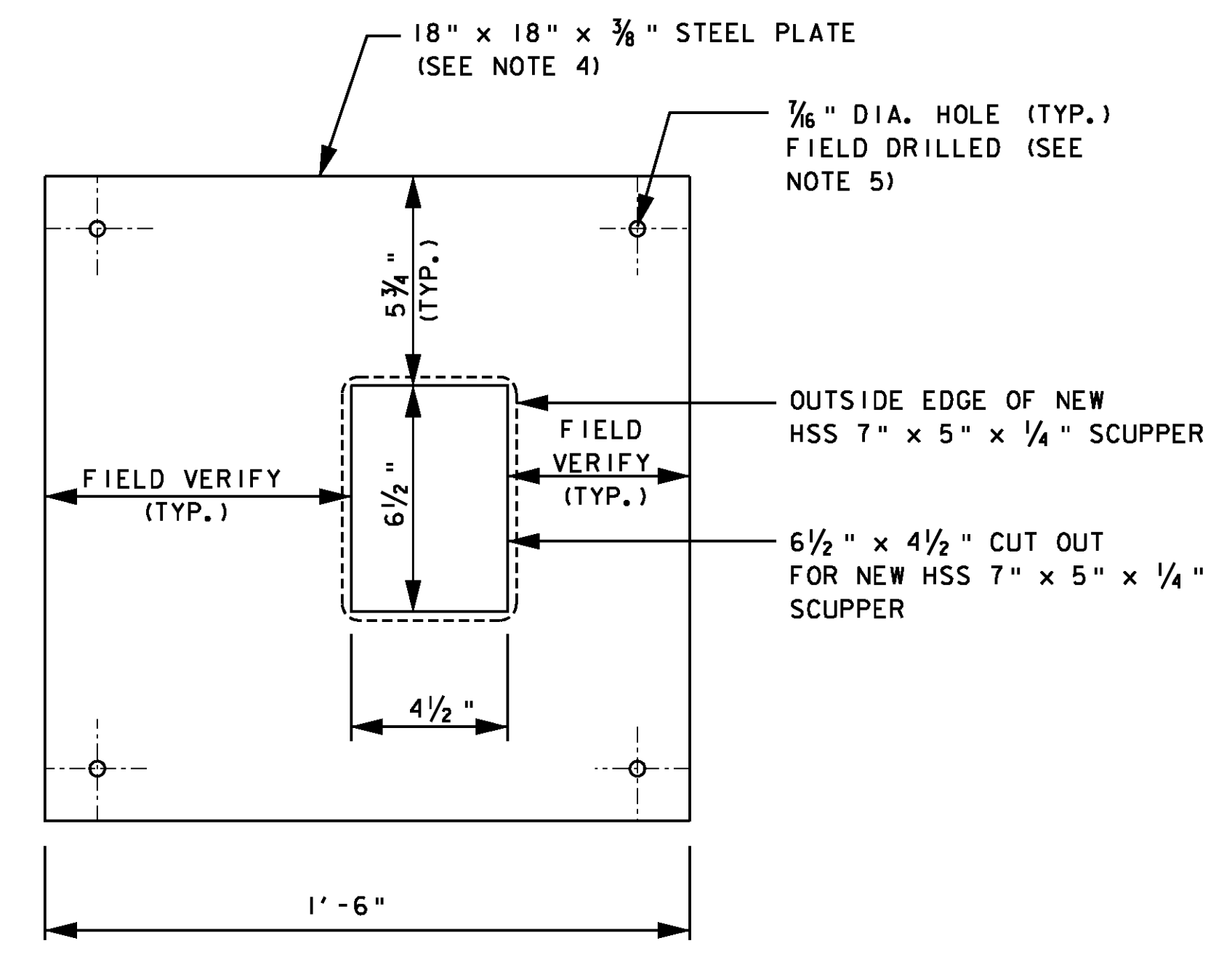
1. ALL THE DETERIORATED SCUPPERS WITH SIGNIFICANT LOSS OF SECTION SHALL BE CUT OFF ABOVE THE DETERIORATION AREA. IF THE DETERIORATION EXTENDS TO THE UNDERSIDE OF THE DECK, THE SCUPPER SHALL BE CUT OFF AND REPLACED. THE ENGINEER SHALL APPROVE THE EXTENT OF THE REPAIR FOR EACH DETERIORATED SCUPPER IDENTIFIED BY THE CONTRACTOR PRIOR TO BEING REPAIRED OR REPLACED.
2. ADHESIVE SIDE OF NEOPRENE SHALL BE PLACED ON THE UNDERSIDE OF CONCRETE DECK AND INTERIOR OF EXISTING SCUPPER AROUND PERIMETER OF DRAIN. NEOPRENE SHALL COVER ENTIRE SURFACE OF THE STEEL PLATE AND EXTEND A MINIMUM OF 1" UP INTO THE INTERIOR OF THE EXISTING SCUPPER DRAIN.
3. ALL EXISTING DIMENSIONS AND SCUPPER SIZES SHALL BE FIELD VERIFIED.
4. PLATE SHALL BE CUT IN THE FIELD TO ACCOMMODATE HAUNCH.
5. BOLT HOLES SHALL BE FIELD DRILLED AND SHALL HAVE A MINIMUM EDGE DISTANCE OF 1 1/2" EXCEPT WHERE NOTED OTHERWISE.
6. ALL NEW STEEL SHALL BE ZINC PRIMED AND PAINTED WITH NEP COAT SYSTEM.
7. ALL WELDING SHALL CONFORM WITH THE PROVISIONS OF SUBSECTION 506.10.
8. HOLLOW STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A-500 GRADE C.
9. STEEL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270, GRADE 50 (ASTM A709, GRADE 50).
10. HIGH STRENGTH BOLTS, NUTS AND CIRCULAR WASHERS SHALL CONFORM TO SUBSECTION 714.05 OF THE 2011 STANDARD SPECIFICATIONS.
11. ALL WORK TO BE PAID UNDER ITEM 506.75, STRUCTURAL STEEL.
12. THESE DETAILS ARE ILLUSTRATED AS AN EXAMPLE. CONTRACTOR TO SUBMIT FABRICATION DRAWINGS FOR APPROVAL.



DETAIL A
SCALE: 3" = 1'-0"



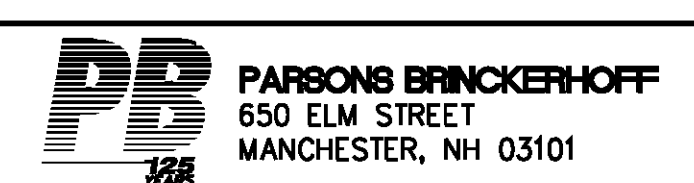
EXISTING SCUPPER REPAIR DETAIL
SCALE: 1" = 1'-0"

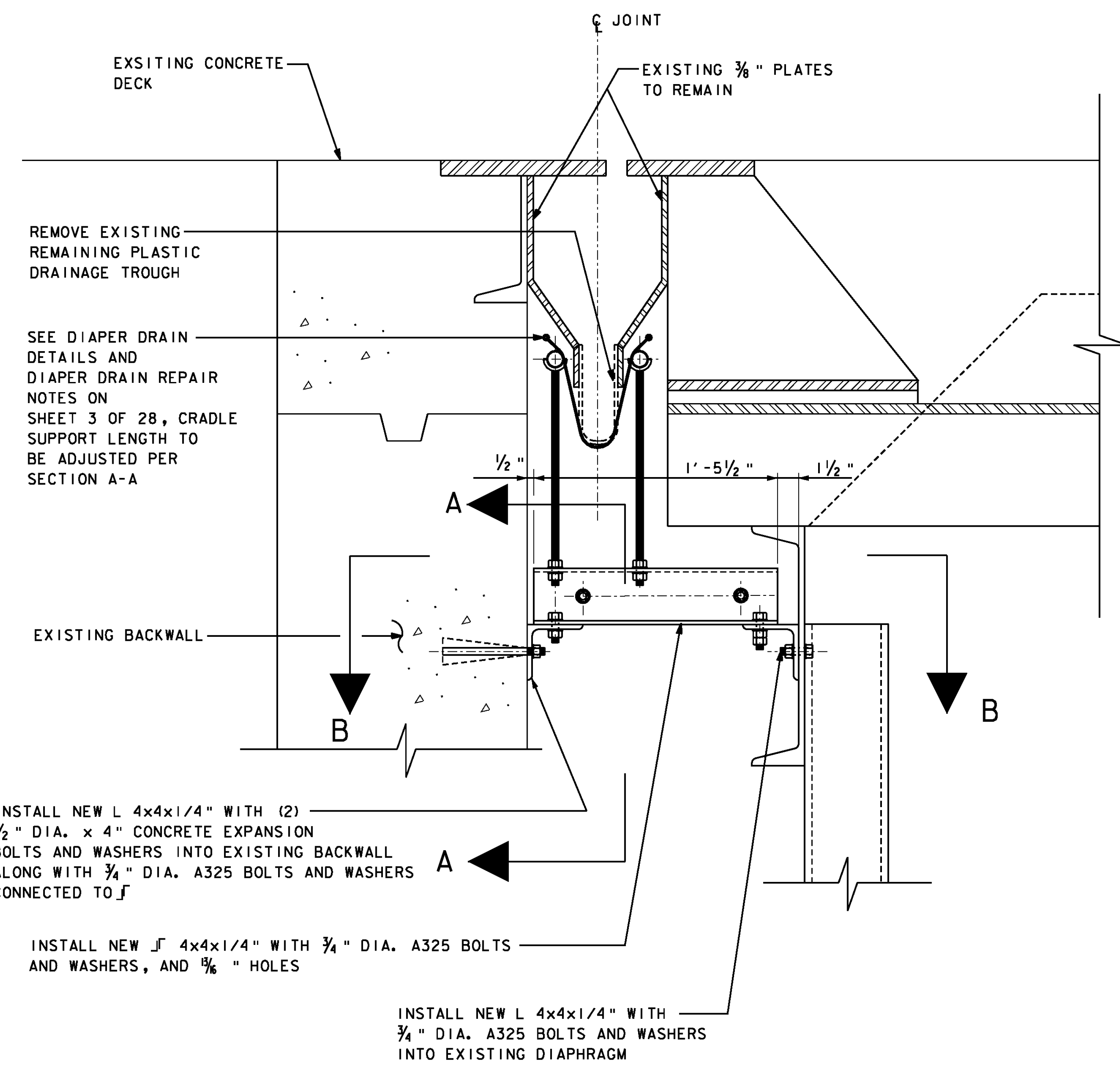


DETAIL B
SCALE: 3" = 1'-0"

**PROJECT STANDARD
DETAILS SHEET (2)**

PROJECT NAME: FAIR HAVEN - RUTLAND	
PROJECT NUMBER: BHF BPNT (10)	
FILE NAME: i0b182/str/z10b182.dgn	PLOT DATE: 24-JAN-2012
PROJECT LEADER: G.K.DONINGTON	DRAWN BY: W.GERHOLD
DESIGNED BY: A.STOCKIN	CHECKED BY: D.SARGENT
det_3.dgn	SHEET 4 OF 28





REMOVE EXISTING REMAINING PLASTIC DRAINAGE TROUGH

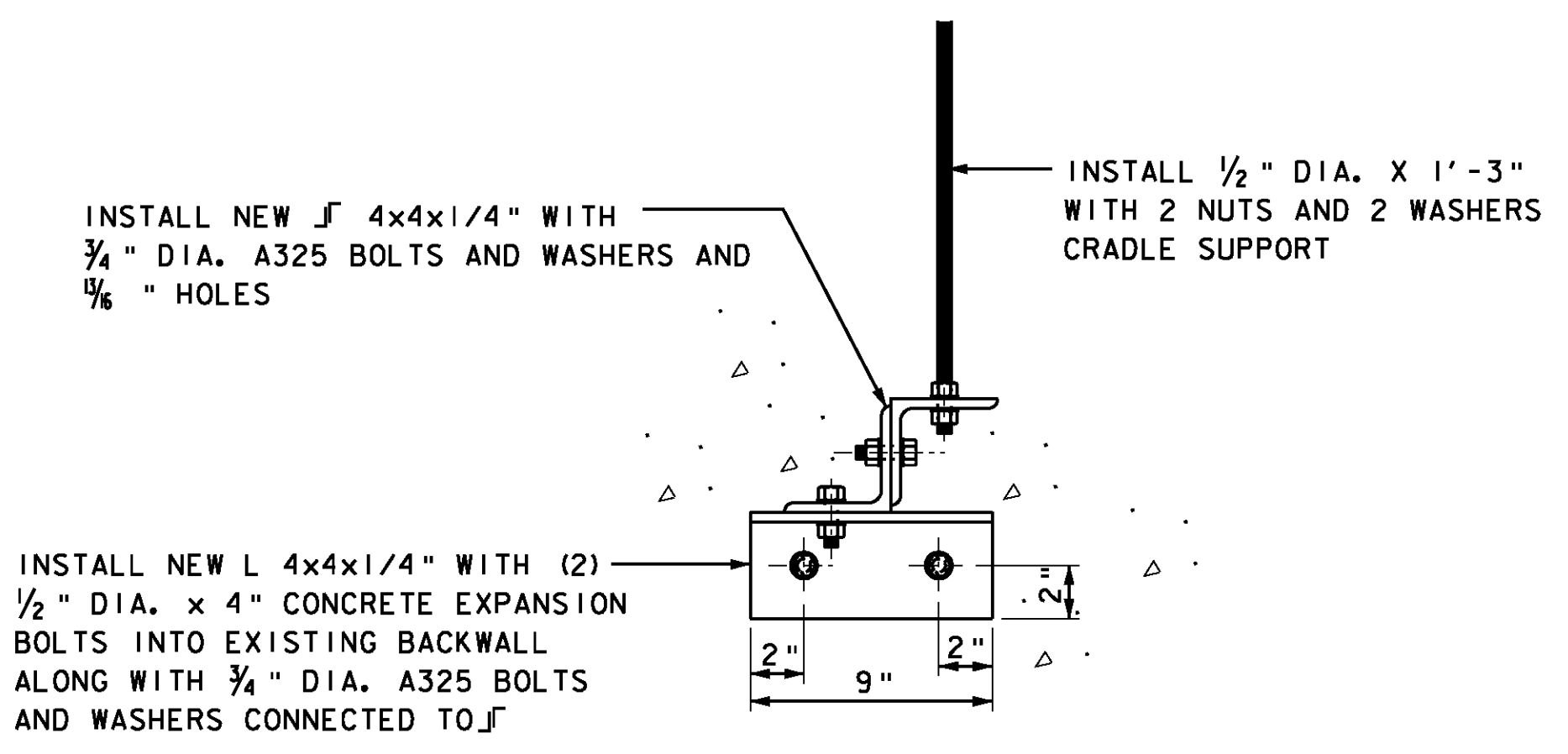
SEE DIAPER DRAIN DETAILS AND DIAPER DRAIN REPAIR NOTES ON SHEET 3 OF 28, CRADLE SUPPORT LENGTH TO BE ADJUSTED PER SECTION A-A

INSTALL NEW L 4x4x1/4" WITH (2) 1/2" DIA. x 4" CONCRETE EXPANSION BOLTS AND WASHERS INTO EXISTING BACKWALL ALONG WITH 3/4" DIA. A325 BOLTS AND WASHERS CONNECTED TO J

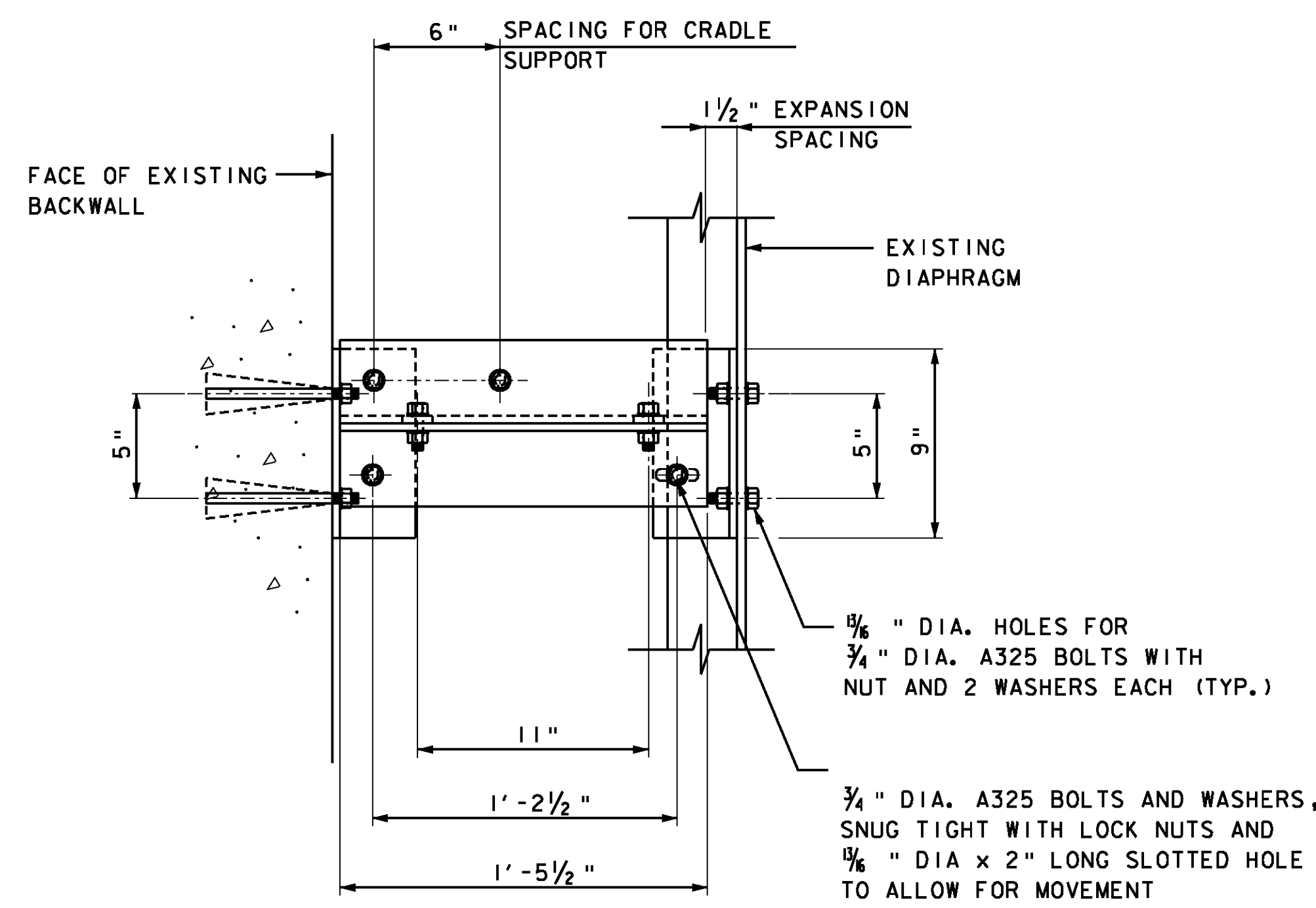
INSTALL NEW J 4x4x1/4" WITH 3/4" DIA. A325 BOLTS AND WASHERS, AND 1/8" HOLES

INSTALL NEW L 4x4x1/4" WITH 3/4" DIA. A325 BOLTS AND WASHERS INTO EXISTING DIAPHRAGM

DRAINAGE TROUGH REPLACEMENT DETAIL
(FOR BRIDGES 5E, 5W, 7E, AND 7W)
SCALE: 2" = 1'-0"



SECTION A-A
SCALE: 2" = 1'-0"



SECTION B-B
SCALE: 2" = 1'-0"

NOTES:

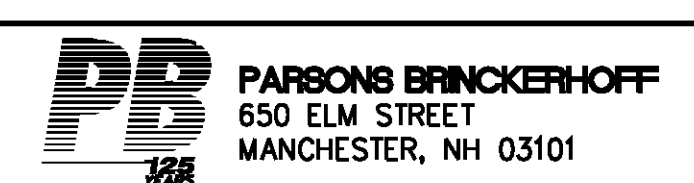
1. ALL EXISTING DIMENSIONS SHALL BE FIELD VERIFIED.
2. BOLT HOLES SHALL HAVE A MINIMUM EDGE DISTANCE OF 1 1/2".

DIAPER DRAIN NOTES

1. TROUGH SUPPORT BRACKETS SHALL NOT BE WELDED TO GIRDER WEB.
2. STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM-A500 OR ASTM-A501 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-123 AFTER FABRICATION. ALL PLATES, BARS AND ANGLES SHALL CONFORM TO ASTM A-36 AND SHALL ALSO BE GALVANIZED IN ACCORDANCE WITH ASTM-123 AFTER FABRICATION. CRADLE ASSEMBLIES SHALL CONSIST OF THREADED RODS (ASTM A568, CLASS 4.6), NUTS (ASTM A563), AND WASHERS (ASTM F486), FINISH TO BE HOT-DIP ZINC COATING (ASTM A153).
3. THE 1 1/4" (NOMINAL DIAMETER) GALVANIZED STEEL PIPE, PREFORMED FABRIC MATERIAL, CRADLES AND RELATED HARDWARE, TAP SCREWS, CUTTING OF THE EXISTING STRUCTURAL STEEL AS REQUIRED, REMOVAL AND DISPOSAL OF THE EXISTING DRAIN TROUGH SYSTEM AND FLUSHING OF ALL PIER CAPS SHALL BE PAID UNDER ITEM 506.75, STRUCTURAL STEEL.
4. THESE DETAILS ARE ILLUSTRATED AS AN EXAMPLE. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL.

**PROJECT STANDARD
DETAILS SHEET (3)**

PROJECT NAME: FAIR HAVEN - RUTLAND	PLOT DATE: 24-JAN-2012
PROJECT NUMBER: BHF BPNT (10)	DRAWN BY: W.GERHOLD
FILE NAME: i0b182/str/z10b182det.dgn	CHECKED BY: D.SARGENT
PROJECT LEADER: G.K.DONINGTON	SHEET 5 OF 28
DESIGNED BY: A.STOCKIN	
det_4.dgn	



QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES											TOTALS		DESCRIPTIONS			DETAILED SUMMARY OF QUANTITIES		
ROADWAY	EROSION CONTROL	BRIDGE NO. D4.4	BRIDGE NO. D4.3	BRIDGE NO. D11	BRIDGE NO. 10E	BRIDGE NO. 9E	BRIDGE NO. 7E	BRIDGE NO. 5E	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
		1	1							1		LS	STRUCTURAL STEEL (BUSINESS RTE 4 - BRIDGE NO. D4-3)	506.75				
										1		LS	STRUCTURAL STEEL (BUSINESS RTE 4 - BRIDGE NO. D4-4)	506.75				
							1			1		LS	STRUCTURAL STEEL (DUTTON AVE OVER US RTE 4 - BRIDGE NO. 7E)	506.75				
								1		1		LS	STRUCTURAL STEEL (US RTE 4 - BRIDGE NO. 5E)	506.75				
				120	120	120	120	120		600		HR	TRUCK-MOUNTED ATTENUATOR	608.45				
		100	100	100	100	100	100	100		700		LF	REMOVING AND RESETTING FENCE	620.50				
		650	650	1170	700	1170	1170	450		5960		LF	TEMPORARY TRAFFIC BARRIER	621.90				
		300	300	300	300	300	300	300		2100		HR	UNIFORMED TRAFFIC OFFICERS	630.10				
		300	300	300	300	300	300	300		2100		HR	FLAGGERS	630.15				
									1	1		LS	FIELD OFFICE, ENGINEERS	631.10				
									1	1		LS	TESTING EQUIPMENT, PROTECTIVE COATINGS	631.18				
									3000	3000		DL	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.26				
									540	540		HR	EMPLOYEE TRAINESHIP	634.10				
1										1		LS	MOBLIZATION/DEMOBLIZATION	635.11				
			1							1		LS	TRAFFIC CONTROL (BUSINESS RTE 4 - BROGE NO. D4-3)	641.10				
		1								1		LS	TRAFFIC CONTROL (BUSINESS RTE 4 - BRIDGE NO. D4-4)	641.10				
						1				1		LS	TRAFFIC CONTROL (DRAKE ROAD OVER US RTE 4 - BRIDGE NO. 9E)	641.10				
							1			1		LS	TRAFFIC CONTROL (DUTTON AVE OVER US RTE 4 - BRIDGE NO. 7E)	641.10				
				1						1		LS	TRAFFIC CONTROL (OLD NORTH ROAD OVER US RTE 4 - BRIDGE NO. D11)	641.10				
					1					1		LS	TRAFFIC CONTROL (US RTE 4 - BRIDGE NO. 10E)	641.10				
								1		1		LS	TRAFFIC CONTROL (US RTE 4 - BRIDGE NO. 5E)	641.10				
		1300	1300	30	30	30				90		DAY	PORTABLE CHANGEABLE MESSAGE SIGN RENTAL	641.17				
					1400					4900		LF	4 INCH WHITE LINE	646.20				
				6180	3090	3090				12360		LF	6 INCH WHITE LINE	646.214				
		1300	1300		2800			1800		7200		LF	TEMPORARY 4 INCH WHITE LINE, TYPE II TAPE	646.601				
				6180	3090	3090				12360		LF	TEMPORARY 6 INCH WHITE LINE, TYPE II TAPE	646.621				
				100	100	100				300		SF	PAVEMENT MARKING MASK	646.86				
	1100									1100		SY	GEOTEXTLE FOR SILT FENCE	649.51				
	2200									2200		SY	TEMPORARY EROSION MATTING	653.20				
			1							1		LS	SPECIAL PROVISION (CONTAMNMENT AND DISPOSAL OF LEAD PAINT CLEANING RESDUJES) (US4-BR. NO. D4-3)	900.645				
		1								1		LS	SPECIAL PROVISION (CONTAMNMENT AND DISPOSAL OF LEAD PAINT CLEANING RESDUJES) (US4-BR. NO. D4-4)	900.645				
					1					1		LS	SPECIAL PROVISION (CONTAMNMENT AND DISPOSAL OF LEAD PAINT CLEANING RESDUJES) (US4-BR. NO. 10E)	900.645				
								1		1		LS	SPECIAL PROVISION (CONTAMNMENT AND DISPOSAL OF LEAD PAINT CLEANING RESDUJES) (US4-BR. NO. 5E)	900.645				
								1		1		LS	SPECIAL PROVISION (CONTAMNMENT AND DISPOSAL OF LEAD PAINT CLEANING RESDUJES) (US4-BR. NO. 7E)	900.645				
						1				1		LS	SPECIAL PROVISION (CONTAMNMENT AND DISPOSAL OF LEAD PAINT CLEANING RESDUJES) (US4-BR. NO. 9E)	900.645				
				1						1		LS	SPECIAL PROVISION (CONTAMNMENT AND DISPOSAL OF LEAD PAINT CLEANING RESDUJES) (US4-BR. NO. D11)	900.645				

QUANTITY SHEET (1)

PROJECT NAME: FAIR HAVEN - RUTLAND
PROJECT NUMBER: BHF BPNT (10)

FILE NAME: I0b182/s1r/zx0b182qs.dgn
PROJECT LEADER: G.K.DONNINGTON
DESIGNED BY: C.CARNEY
MANCHESTER, NH 03101

PLOT DATE: 4-MAY-2002
DRAWN BY: W.GERHOLD
CHECKED BY: R.BENJAMIN
SHEET 6 OF 28



QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
ROADWAY	EROSION CONTROL	BRIDGE NO. D4.4	BRIDGE NO. D4.3	BRIDGE NO. D11	BRIDGE NO. 10E	BRIDGE NO. 9E	BRIDGE NO. 7E	BRIDGE NO. 5E	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
			1							1		LS	SPECIAL PROVISION (CO/ICA CLEAN AND PAINT EXISTING STEEL STRUCTURES, BARE STEEL) (US4-BR.NO. D4-3)	900.645				
		1								1		LS	SPECIAL PROVISION (CO/ICA CLEAN AND PAINT EXISTING STEEL STRUCTURES, BARE STEEL) (US4-BR.NO. D4-4)	900.645				
					1					1		LS	SPECIAL PROVISION (CO/ICA CLEAN AND PAINT EXISTING STEEL STRUCTURES, BARE STEEL) (US4-BR. NO. 10E)	900.645				
								1		1		LS	SPECIAL PROVISION (CO/ICA CLEAN AND PAINT EXISTING STEEL STRUCTURES, BARE STEEL) (US4-BR. NO. 5E)	900.645				
							1			1		LS	SPECIAL PROVISION (CO/ICA CLEAN AND PAINT EXISTING STEEL STRUCTURES, BARE STEEL) (US4-BR. NO. 7E)	900.645				
						1				1		LS	SPECIAL PROVISION (CO/ICA CLEAN AND PAINT EXISTING STEEL STRUCTURES, BARE STEEL) (US4-BR. NO. 9E)	900.645				
				1						1		LS	SPECIAL PROVISION (CO/ICA CLEAN AND PAINT EXISTING STEEL STRUCTURES, BARE STEEL) (US4-BR. NO. D11)	900.645				
			1							1		LS	SPECIAL PROVISION (REMOVAL OF EXISTNG GREASE COATNG) (US4-BR. NO. D4-3)	900.645				
		1								1		LS	SPECIAL PROVISION (REMOVAL OF EXISTNG GREASE COATNG) (US4-BR. NO. D4-4)	900.645				
					1					1		LS	SPECIAL PROVISION (REMOVAL OF EXISTNG GREASE COATNG) (US4-BR. NO. 10E)	900.645				
								1		1		LS	SPECIAL PROVISION (REMOVAL OF EXISTNG GREASE COATNG) (US4-BR. NO. 5E)	900.645				
							1			1		LS	SPECIAL PROVISION (REMOVAL OF EXISTNG GREASE COATNG) (US4-BR. NO. 7E)	900.645				
						1				1		LS	SPECIAL PROVISION (REMOVAL OF EXISTNG GREASE COATNG) (US4-BR. NO. 9E)	900.645				
				1						1		LS	SPECIAL PROVISION (REMOVAL OF EXISTNG GREASE COATNG) (US4-BR. NO. D11)	900.645				

QUANTITY SHEET (2)

PROJECT NAME: FAIR HAVEN - RUTLAND
PROJECT NUMBER: BHF BPNT (10)

FILE NAME: I0b182/s1r7z0b182qs.dgn
PROJECT LEADER: G.K.DONNINGTON
DESIGNED BY: C.CARNEY
qs.2.dgn

PLOT DATE: 4-MAY-2012
DRAWN BY: W.GERHOLD
CHECKED BY: R.BENJAMIN
SHEET 7 OF 28



QUANTITY SHEET 3

SUMMARY OF ESTIMATED QUANTITIES					TOTALS		DESCRIPTORS				DETAILED SUMMARY OF QUANTITIES		
BRIDGE NO. 10W	BRIDGE NO. 9W	BRIDGE NO. 7W	BRIDGE NO. 5W	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS	
		1		1		LS	STRUCTURAL STEEL (DUTTON AVE OVER US RTE 4 - BRIDGE NO. 7W)	506.75					
			1	1		LS	STRUCTURAL STEEL (US RTE 4 - BRIDGE NO. 5W)	506.75					
120	120	120	120	480		HR	TRUCK-MOUNTED ATTENUATOR	608.45					
100	100	100	100	400		LF	REMOVING AND RESETTING FENCE	620.50					
700	1170	1170	450	3490		LF	TEMPORARY TRAFFIC BARRIER	621.90					
300	300	300	300	1200		HR	UNIFORMED TRAFFIC OFFICERS	630.10					
300	300	300	300	1200		HR	FLAGGERS	630.15					
	1			1		LS	TRAFFIC CONTROL (DRAKE ROAD OVER US RTE 4 - BRIDGE NO. 9W)	641.10					
		1		1		LS	TRAFFIC CONTROL (DUTTON AVE OVER US RTE 4 - BRIDGE NO. 7W)	641.10					
1				1		LS	TRAFFIC CONTROL (US RTE 4 - BRIDGE NO. 10W)	641.10					
			1	1		LS	TRAFFIC CONTROL (US RTE 4 - BRIDGE NO. 5W)	641.10					
	30	30		60		DAY	PORTABLE CHANGEABLE MESSAGE SIGN RENTAL	641.17					
1400			900	2300		LF	4 INCH WHITE LINE	646.20					
	4790	3090		7880		LF	6 INCH WHITE LINE	646.214					
2800			1900	4600		LF	TEMPORARY 4 INCH WHITE LINE, TYPE I TAPE	646.601					
	4790	3090		7880		LF	TEMPORARY 6 INCH WHITE LINE, TYPE I TAPE	646.621					
	1000			1000		LF	TEMPORARY 12 INCH WHITE LINE, TYPE I TAPE	646.661					
	100	100		200		SF	PAVEMENT MARKING MASK	646.86					
1				1		LS	SPECIAL PROVISION (CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES) (US4-BR. NO. 10W)	900.645					
			1	1		LS	SPECIAL PROVISION (CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES) (US4-BR. NO. 5W)	900.645					
		1		1		LS	SPECIAL PROVISION (CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES) (US4-BR. NO. 7W)	900.645					
	1			1		LS	SPECIAL PROVISION (CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES) (US4-BR. NO. 9W)	900.645					
1				1		LS	SPECIAL PROVISION (QC/QA CLEAN AND PAINT EXISTING STEEL STRUCTURES, BARE STEEL) (US4-BR. NO. 10W)	900.645					
			1	1		LS	SPECIAL PROVISION (QC/QA CLEAN AND PAINT EXISTING STEEL STRUCTURES, BARE STEEL) (US4-BR. NO. 5W)	900.645					
		1		1		LS	SPECIAL PROVISION (QC/QA CLEAN AND PAINT EXISTING STEEL STRUCTURES, BARE STEEL) (US4-BR. NO. 7W)	900.645					
	1			1		LS	SPECIAL PROVISION (QC/QA CLEAN AND PAINT EXISTING STEEL STRUCTURES, BARE STEEL) (US4-BR. NO. 9W)	900.645					
1				1		LS	SPECIAL PROVISION (REMOVAL OF EXISTING GREASE COATING) (US4-BR. NO. 10W)	900.645					
			1	1		LS	SPECIAL PROVISION (REMOVAL OF EXISTING GREASE COATING) (US4-BR. NO. 5W)	900.645					
		1		1		LS	SPECIAL PROVISION (REMOVAL OF EXISTING GREASE COATING) (US4-BR. NO. 7W)	900.645					
	1			1		LS	SPECIAL PROVISION (REMOVAL OF EXISTING GREASE COATING) (US4-BR. NO. 9W)	900.645					

QUANTITY SHEET (3)

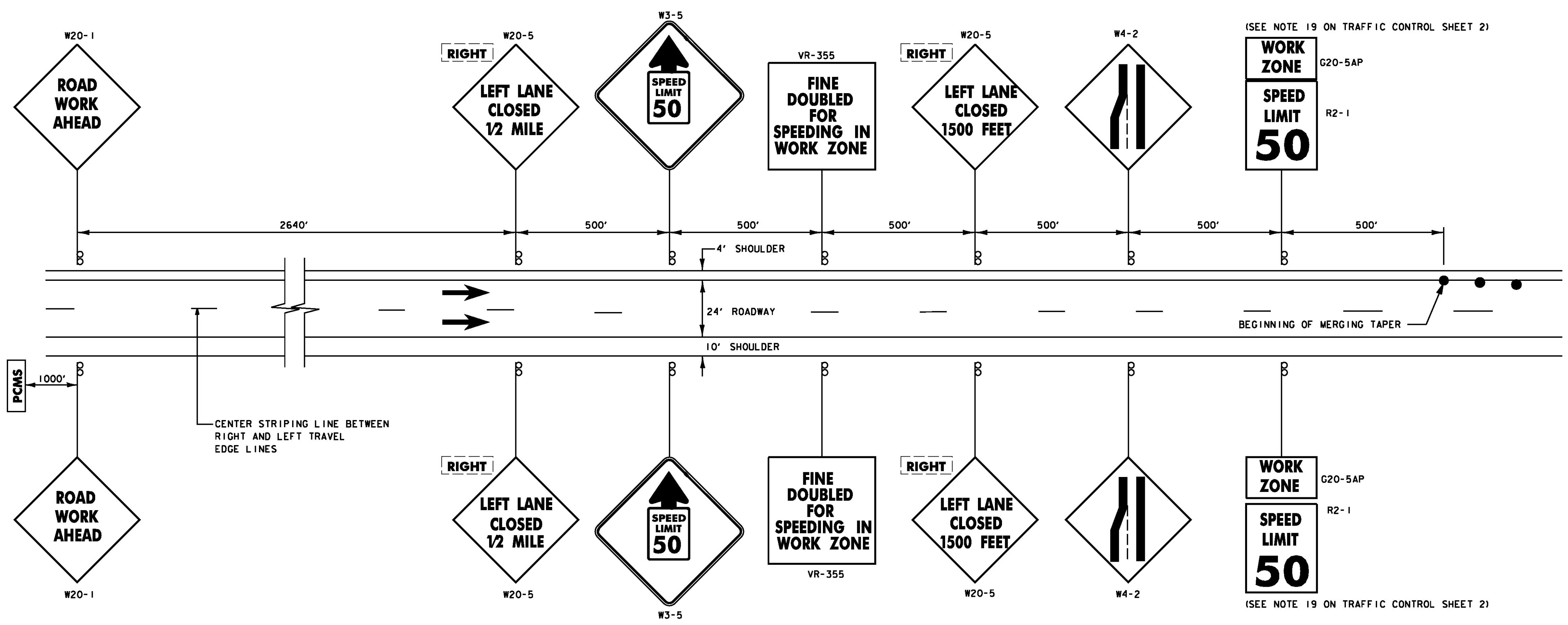
PROJECT NAME: FAIR HAVEN - RUTLAND
PROJECT NUMBER: BHF BPNT (10)

FILE NAME: I0b182/s1r/z0b182qs.dgn
PROJECT LEADER: G.K.DONNINGTON
DESIGNED BY: C.CARNEY
qs_3.dgn

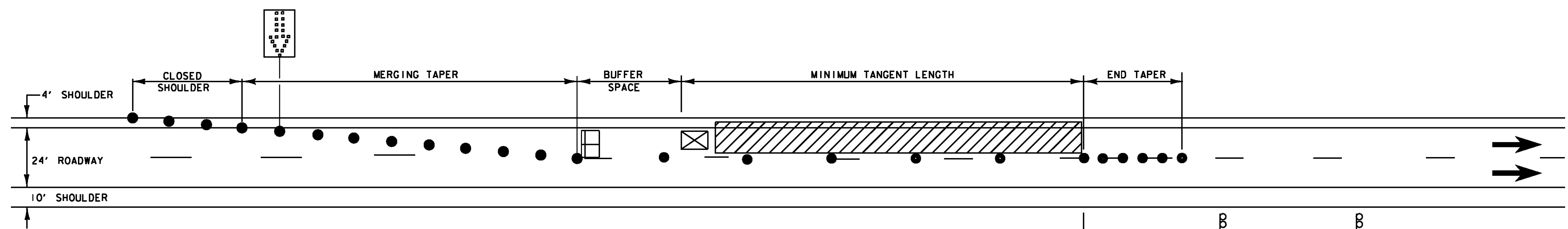
PLOT DATE: 4-MAY-2002
DRAWN BY: W.GERHOLD
CHECKED BY: R.BENJAMIN
SHEET 8 OF 28



PARSONS BRINCKERHOFF
150 ELM STREET
MANCHESTER, NH 03101



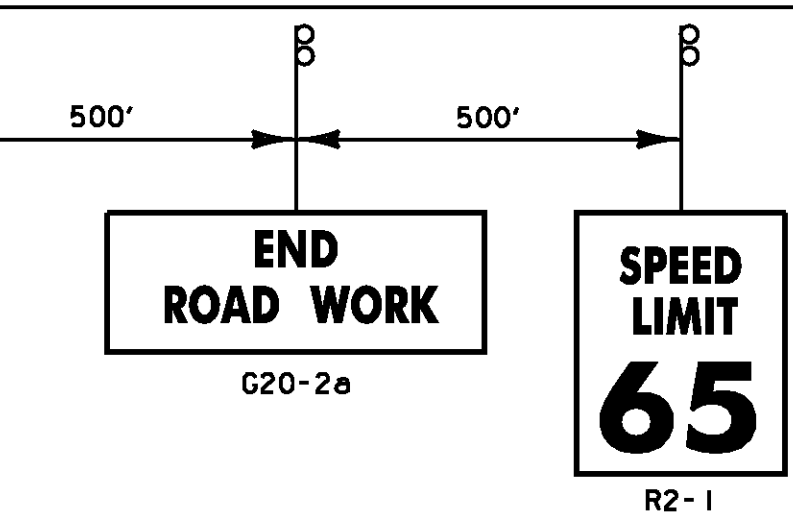
CONSTRUCTION APPROACH SIGNING ON US ROUTE 4, LEFT LANE CLOSED
NOT TO SCALE



TRAFFIC CONTROL ON US ROUTE 4, LEFT LANE CLOSED
NOT TO SCALE

- LEGEND**
- FLOW OF TRAFFIC
 - WORK AREA
 - REFLECTORIZED PLASTIC DRUM
 - TYPE III BARRICADE
 - TRUCK/TRAILER MOUNTED ATTENUATOR (OPTIONAL)
 - FLASHING ARROW PANEL
 - PORTABLE CHANGEABLE MESSAGE SIGN

POSTED SPEED LIMIT	TAPER LENGTHS (FT)		TANGENT W=12 FT (L/2)	MINIMUM BUFFER SPACE LENGTH (FT)	MAXIMUM CHANNELIZING DEVICE SPACING (FT)	
	SHOULDER W=10 FT	MERGING 12 FT LANE			TAPER	TANGENT
40	90	320	160	305	40	80
45	150	540	270	360	45	90
50	170	600	300	425	50	100
55	185	660	330	495	55	110
60	200	720	360	570	60	120
65	215	780	390	645	65	130



TAPER RATES ARE DETERMINED USING THE FOLLOWING EQUATIONS:
 $L = WS$ FOR POSTED SPEEDS OF 45 MPH OR GREATER
 $L = WS^2/60$ FOR POSTED SPEEDS OF 40 MPH OR LESS
 L = MINIMUM LENGTH OF TAPER
 W = WIDTH OF OFFSET IN FEET
 S = POSTED SPEED IN MPH

TRAFFIC CONTROL NOTES - US ROUTE 4:

1. THE TRAFFIC CONTROL PLAN SHOWN IS A SCHEMATIC ONLY AND SHOULD BE USED AS A REFERENCE. THE CONTRACTOR SHALL SUBMIT A SITE SPECIFIC TRAFFIC CONTROL PLAN FOR BRIDGES 7E & W, 9E & W AND D11 TO VTRANS FOR APPROVAL. PAYMENT FOR PREPARING AND SUBMITTING THE TRAFFIC CONTROL PLAN, AND MAKING NECESSARY REVISIONS TO THE PLAN, WILL BE INCLUDED IN THE UNIT PRICE BID FOR CONTRACT ITEM 641.10 - TRAFFIC CONTROL. THE CONTRACTOR SHALL ALLOW TWO WEEKS FOR APPROVAL OF THE TRAFFIC CONTROL PLAN. NO WORK SHALL COMMENCE UNTIL THE CONTRACTOR HAS AN APPROVED TRAFFIC CONTROL PLAN.
2. THE EXISTING SPEED LIMIT FOR US ROUTE 4 IS 65 MPH. THE SPEED LIMIT WILL BE REDUCED TO 50 MPH IN THE WORK ZONE FOR THIS PROJECT. ANY EXISTING SPEED LIMIT SIGNS WITHIN THE SPEED REDUCTION AREA SHALL BE COMPLETELY COVERED.
3. CONSTRUCTION SIGNS SHALL BE INSTALLED SO AS NOT TO OBSTRUCT EXISTING SIGNS.
4. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND THE "STANDARD HIGHWAY SIGNS" BOOK (SHS) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION (FHWA).
5. ORANGE CONSTRUCTION SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING THE REQUIREMENTS OF SECTION 750 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION FOR TYPE VII, VIII OR IX, UNLESS OTHERWISE NOTED.
6. ROLL UP SIGNS SHALL HAVE A RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING THE REQUIREMENTS OF SECTION 750 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION FOR TYPE VI.
7. SIGNS SHALL BE ERECTED BEFORE THE START OF ANY WORK AND SHALL BE COVERED UNTIL WORK COMMENCES AND DURING PERIODS OF INACTIVITY. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMAN LIKE MANNER. SIGNS SHALL BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER.
8. FIXED SIGNS SHALL BE SET SECURELY IN THE GROUND. THE BOTTOM OF A SIGN SHALL BE AT LEAST SEVEN FEET ABOVE THE EDGE OF PAVEMENT. THE NEAREST EDGE OF A SIGN SHALL BE AT LEAST SIX FEET OUTSIDE THE SHOULDER POINT OR FOUR FEET OUTSIDE THE GUARDRAIL.
9. PORTABLE SIGNS SHALL BE PLACED ON THE EDGE OF ROADWAY AND A ONE FOOT MINIMUM HEIGHT ABOVE TRAVELED WAY. WHEN PLACED BEHIND THE GUARD RAIL, THE BOTTOM OF THE SIGN FACE SHALL BE ABOVE THE TOP OF THE GUARDRAIL. ALL VEGETATION THAT INTERFERES WITH VISIBILITY OF THE SIGNS SHALL BE REMOVED. PAYMENT FOR REMOVAL IS INCIDENTAL TO THE APPROPRIATE CONTRACT ITEMS.
10. WHERE SIGN INSTALLATIONS ARE NOT PROTECTED BY GUARDRAIL OR OTHER APPROVED TRAFFIC BARRIERS, ALL SIGN STANDS AND POST INSTALLATIONS SHALL BE "NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM" (NCHRP) REPORT 350 COMPLIANT. NO SIGN POSTS SHALL EXTEND OVER THE TOP OF THE SIGN INSTALLED ON SAID POST(S). WHEN ANCHORS ARE INSTALLED STUB SHALL NOT BE GREATER THAN FOUR INCHES ABOVE EXISTING GROUND.
11. THE CONTRACTOR SHALL HAVE SIGNS FOR CLOSURE OF LEFT AND RIGHT LANES INSTALLED BEFORE WORK COMMENCES.
12. THE NUMBER OF CHANNELIZING DEVICES, TYPE III BARRICADES AND OTHER TRAFFIC CONTROL DEVICES SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL NUMBER REQUIRED ARE TO BE DETERMINED BASED ON INDIVIDUAL DETOUR CONDITIONS (TAPERS, SPEED LIMITS, LENGTH OF DETOUR, CURVE ETC.). WARNING LIGHTS SHALL NOT BE USED ON CHANNELIZING DEVICES.
13. PLACE LAST CHANNELIZING DEVICE 100 FEET BEYOND THE ANTICIPATED WORK ZONE TERMINAL POINT EACH DAY AND START THE END TAPER. THE END TAPER SHALL BE CONSTRUCTED OF 5 ADDITIONAL RETROREFLECTIVE DRUMS SPACED AT 10 FEET ON CENTER.
14. THE ARROW BOARD SHALL BE PLACED ON THE SHOULDER OF THE ROADWAY, OR, IF PRACTICAL, FURTHER FROM THE TRAVELED LANE AT THE END OF THE SHOULDER TAPER.
15. THE PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE USED FOR US ROUTE 4 LANE CLOSURES AND AT THE DISCRETION OF THE ENGINEER FOR LANE CLOSURES ON OTHER ROADWAYS.
16. TRAVEL LANE SHALL BE A MINIMUM OF 12 FEET WIDE ON US ROUTE 4.
17. AT NO TIME WILL THE CONTRACTOR BE ALLOWED TO HAVE WORKERS' VEHICLES, CONSTRUCTION EQUIPMENT OR STOCKPILED MATERIALS WITHIN THE CLEAR ZONE OF US ROUTE 4 WITHOUT POSITIVE PROTECTION. POSITIVE PROTECTION SHALL BE AS DIRECTED BY THE ENGINEER. THE CLEAR ZONE IS DEFINED AS FOLLOWS:
US ROUTE 4 - 34 FEET FROM THE TRAVELED WAY

NOTES CONTINUED ON TRAFFIC CONTROL SHEET 2.

TRAFFIC CONTROL SHEET (1)

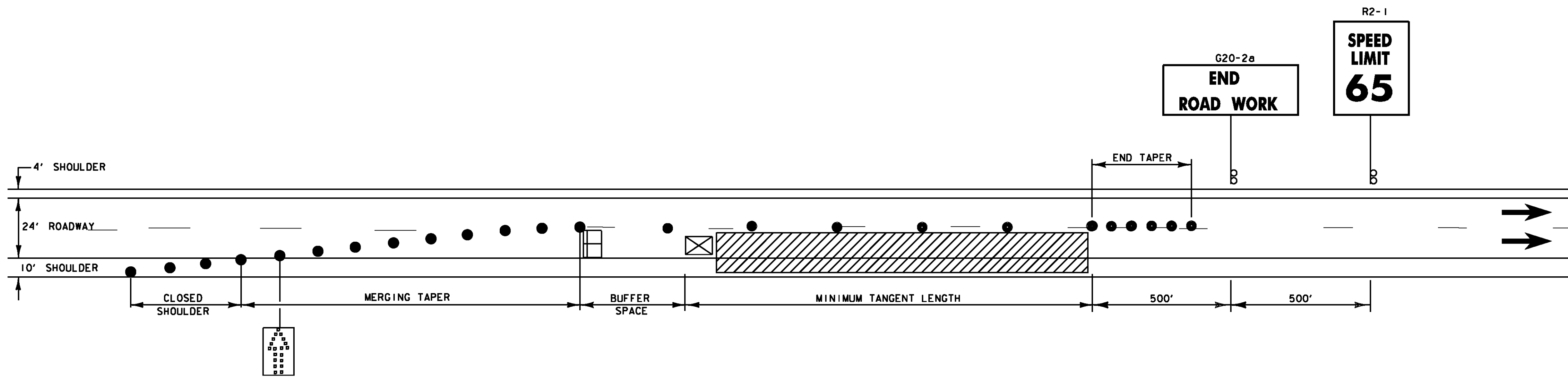
PROJECT NAME: FAIR HAVEN - RUTLAND	PLOT DATE: 24-JAN-2012
PROJECT NUMBER: BHF BPNT (10)	DRAWN BY: W.GERHOLD
FILE NAME: I0b182/str/z10b182tc.dgn	CHECKED BY: R.BENJAMIN
PROJECT LEADER: G.K.DONNINGTON	SHEET 9 OF 28
DESIGNED BY: C.CARNEY	
tc_l.dgn	



TRAFFIC CONTROL NOTES - US ROUTE 4:

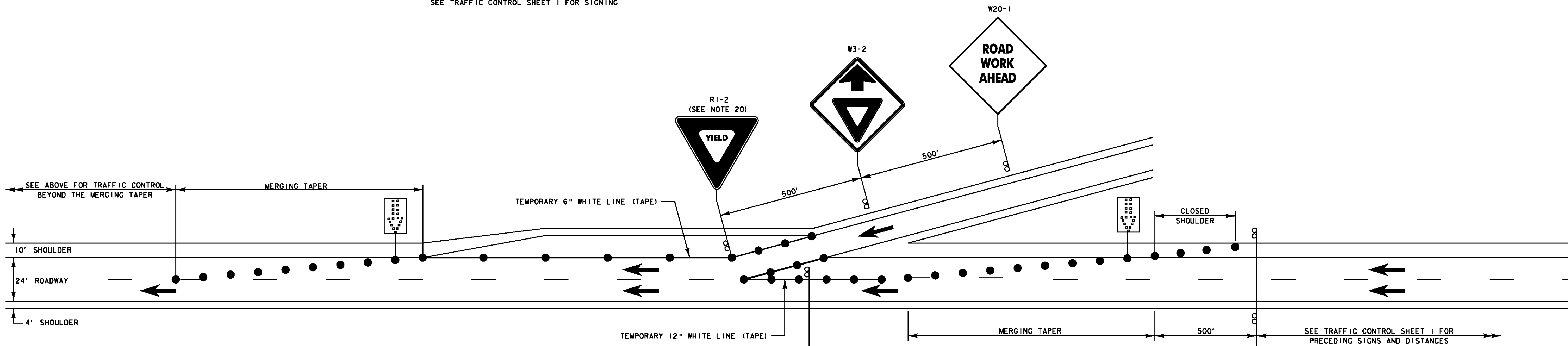
NOTES CONTINUED FROM TRAFFIC CONTROL SHEET 1:

- 18. BRIDGE 7W, RIGHT LANE CLOSED: COMPLETE MAINLINE RIGHT SHOULDER CLOSURE BEFORE EXIT RAMP TAPER TO SCOTCH HILL ROAD. BEGIN MAINLINE RIGHT LANE MERGING TAPER AT THE PHYSICAL NOSE.
- 19. BRIDGE 7W, RIGHT LANE CLOSED: PLACE SIGNS G20-5AP AND R2-1 AT END OF RIGHT SHOULDER CLOSURE ON BOTH SIDES OF THE ROADWAY. PLACE PRECEDING SIGNS AS SHOWN ON TRAFFIC CONTROL SHEET 1.
- 20. MOUNT ON TYPE III BARRICADE - MODIFIED. SEE STANDARD E-107A.



TRAFFIC CONTROL ON US ROUTE 4, RIGHT LANE CLOSED

NOT TO SCALE
SEE TRAFFIC CONTROL SHEET 1 FOR SIGNING



**TRAFFIC CONTROL ON US ROUTE 4, RIGHT LANE CLOSED
BRIDGE 9W**

NOT TO SCALE

LEGEND

- - FLOW OF TRAFFIC
- ▨ - WORK AREA
- - REFLECTORIZED PLASTIC DRUM
- - TYPE III BARRICADE
- ⊠ - TRUCK/TRAILER MOUNTED ATTENUATOR (OPTIONAL)
- ⊠ - FLASHING ARROW PANEL
- PCMS - PORTABLE CHANGEABLE MESSAGE SIGN

POSTED SPEED LIMIT	TAPER LENGTHS (F T)		TANGENT W=12 FT (L/2)	MINIMUM BUFFER SPACE LENGTH (F T)	MAXIMUM CHANNELIZING DEVICE SPACING (F T)	
	SHOULDER W=10 FT	MERGING 12 FT LANE			TAPER	TANGENT
40	90	320	160	305	40	80
45	150	540	270	360	45	90
50	170	600	300	425	50	100
55	185	660	330	495	55	110
60	200	720	360	570	60	120
65	215	780	390	645	65	130

TAPER RATES ARE DETERMINED USING THE FOLLOWING EQUATIONS:
 $L = WS$ FOR POSTED SPEEDS OF 45 MPH OR GREATER
 $L = WS^2/60$ FOR POSTED SPEEDS OF 40 MPH OR LESS

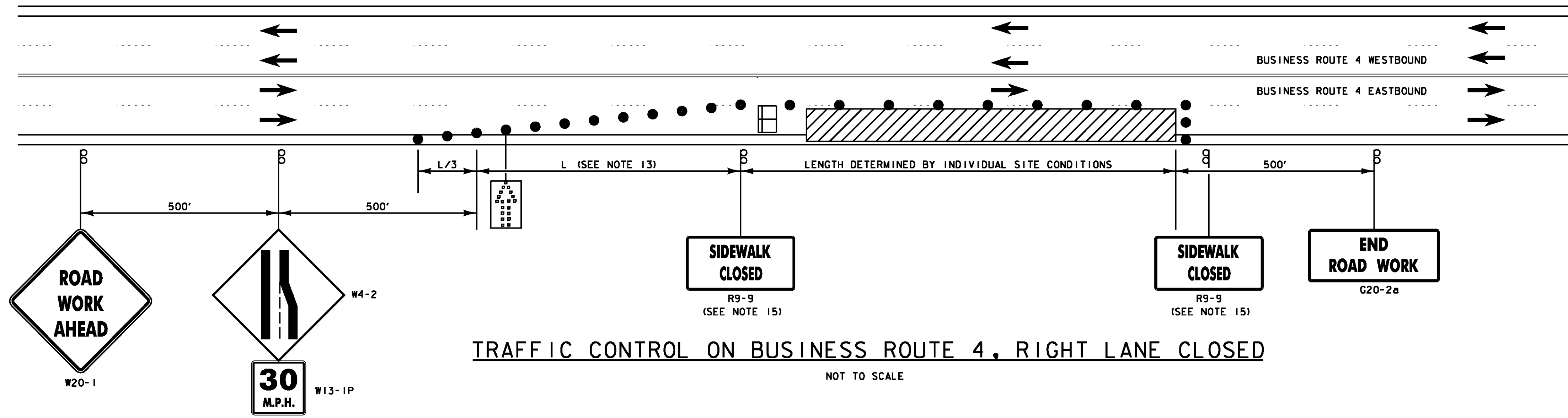
L = MINIMUM LENGTH OF TAPER
 W = WIDTH OF OFFSET IN FEET
 S = POSTED SPEED IN MPH



TRAFFIC CONTROL SHEET (2)

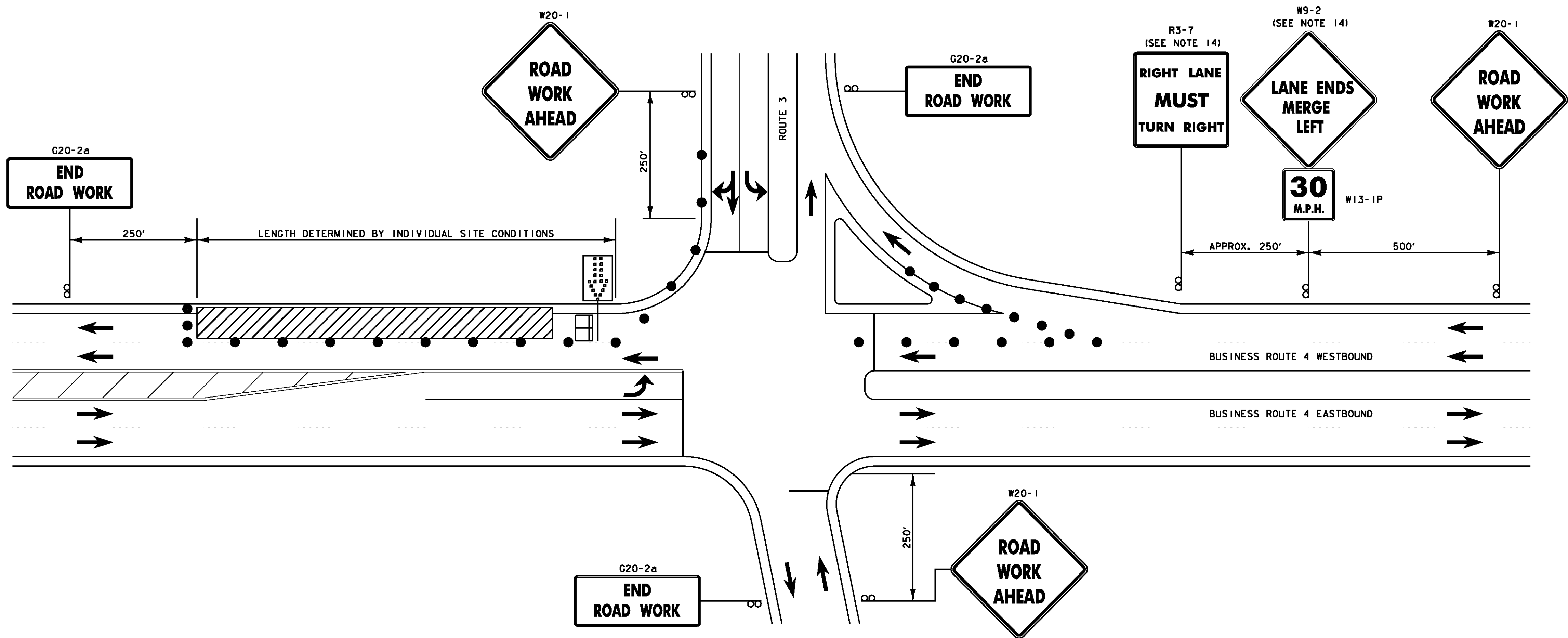
PROJECT NAME: FAIR HAVEN - RUTLAND
 PROJECT NUMBER: BHF BPNT (10)

FILE NAME: I0b182/str/z10b182tc.dgn PLOT DATE: 24-JAN-2012
 PROJECT LEADER: G.K.DONINGTON DRAWN BY: W.GERHOLD
 DESIGNED BY: C.CARNEY CHECKED BY: R.BENJAMIN
 tc_2.dgn SHEET 10 OF 28



TRAFFIC CONTROL ON BUSINESS ROUTE 4, RIGHT LANE CLOSED

NOT TO SCALE



TRAFFIC CONTROL ON BUSINESS ROUTE 4, RIGHT LANE CLOSED
BRIDGE D4-4, WESTBOUND TRAVEL DIRECTION

NOT TO SCALE

- LEGEND**
- ➔ - FLOW OF TRAFFIC
 - ▨ - WORK AREA
 - - REFLECTORIZED PLASTIC DRUM
 - - TYPE III BARRICADE
 - ⚡ - FLASHING ARROW PANEL

POSTED SPEED LIMIT	TAPER LENGTHS (FT)		MAXIMUM CHANNELIZING DEVICE SPACING (FT)	
	SHOULDER W=10 FT (L/3)	MERGING W=12 FT (L)	TAPER	TANGENT
30	50	180	30	60
35	70	245	35	70
40	90	320	40	80

TAPER RATES ARE DETERMINED USING THE FOLLOWING EQUATIONS:
 $L = WS$ FOR POSTED SPEEDS OF 45 MPH OR GREATER
 $L = WS^2/60$ FOR POSTED SPEEDS OF 40 MPH OR LESS
 L = MINIMUM LENGTH OF TAPER
 W = WIDTH OF OFFSET IN FEET
 S = POSTED SPEED IN MPH

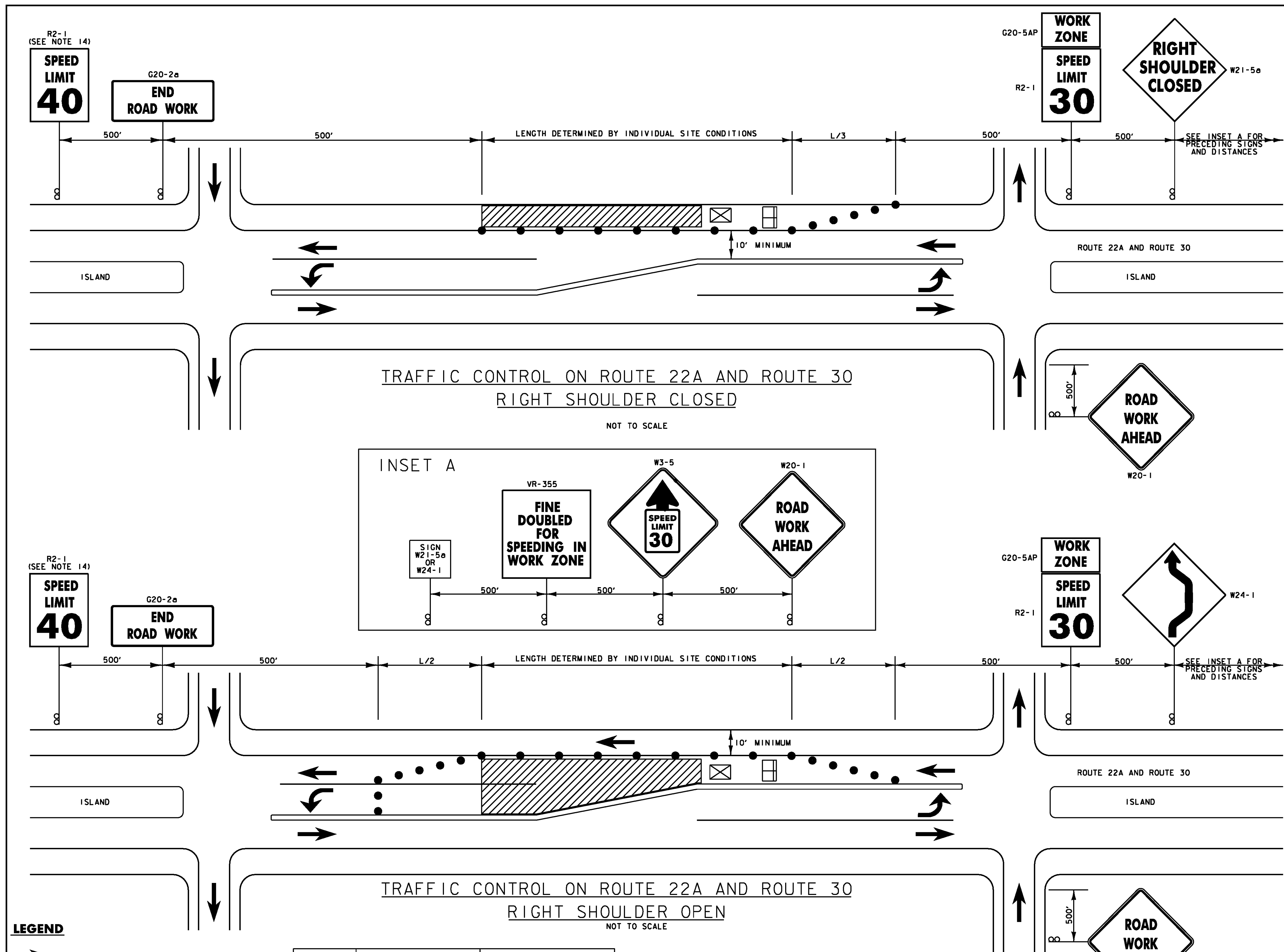
TRAFFIC CONTROL NOTES - BUSINESS ROUTE 4:

1. THE TRAFFIC CONTROL PLAN SHOWN IS A SCHEMATIC ONLY AND SHOULD BE USED AS A REFERENCE. THE CONTRACTOR SHALL SUBMIT A SITE SPECIFIC TRAFFIC CONTROL PLAN FOR BRIDGES D4-3 AND D4-4 TO VTRANS FOR APPROVAL. PAYMENT FOR PREPARING AND SUBMITTING THE TRAFFIC CONTROL PLAN, AND MAKING NECESSARY REVISIONS TO THE PLAN, WILL BE INCLUDED IN THE UNIT PRICE BID FOR CONTRACT ITEM 641.10 - TRAFFIC CONTROL. THE CONTRACTOR SHALL ALLOW TWO WEEKS FOR APPROVAL OF THE TRAFFIC CONTROL PLAN. NO WORK SHALL COMMENCE UNTIL THE CONTRACTOR HAS AN APPROVED TRAFFIC CONTROL PLAN.
2. THE EXISTING SPEED LIMIT FOR BUSINESS ROUTE 4 IN THIS AREA VARIES BETWEEN 35 MPH AND 40 MPH. AN ADVISORY SPEED LIMIT OF 30 MPH WILL BE POSTED IN THE WORK ZONE FOR THIS PROJECT.
3. CONSTRUCTION SIGNS SHALL BE INSTALLED SO AS NOT TO OBSTRUCT EXISTING SIGNS.
4. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND THE "STANDARD HIGHWAY SIGNS" BOOK (SHS) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION (FHWA).
5. ORANGE CONSTRUCTION SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING THE REQUIREMENTS OF SECTION 750 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION FOR TYPE VII, VIII OR IX, UNLESS OTHERWISE NOTED.
6. ROLL UP SIGNS SHALL HAVE A RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING THE REQUIREMENTS OF SECTION 750 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION FOR TYPE VI.
7. SIGNS SHALL BE ERECTED BEFORE THE START OF ANY WORK AND SHALL BE COVERED UNTIL WORK COMMENCES AND DURING PERIODS OF INACTIVITY. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMAN LIKE MANNER. SIGNS SHALL BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER.
8. FIXED SIGNS SHALL BE SET SECURELY IN THE GROUND. THE BOTTOM OF A SIGN SHALL BE AT LEAST SEVEN FEET ABOVE THE EDGE OF PAVEMENT. THE NEAREST EDGE OF A SIGN SHALL BE AT LEAST SIX FEET OUTSIDE THE SHOULDER POINT OR FOUR FEET OUTSIDE THE GUARDRAIL.
9. PORTABLE SIGNS SHALL BE PLACED ON THE EDGE OF ROADWAY AND A ONE FOOT MINIMUM HEIGHT ABOVE TRAVELED WAY. WHEN PLACED BEHIND THE GUARDRAIL, THE BOTTOM OF THE SIGN FACE SHALL BE ABOVE THE TOP OF THE GUARDRAIL. ALL VEGETATION THAT INTERFERES WITH VISIBILITY OF THE SIGNS SHALL BE REMOVED. PAYMENT FOR REMOVAL IS INCIDENTAL TO THE APPROPRIATE CONTRACT ITEMS.
10. WHERE SIGN INSTALLATIONS ARE NOT PROTECTED BY GUARDRAIL OR OTHER APPROVED TRAFFIC BARRIERS, ALL SIGN STANDS AND POST INSTALLATIONS SHALL BE "NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM" (NCHRP) REPORT 350 COMPLIANT. NO SIGN POSTS SHALL EXTEND OVER THE TOP OF THE SIGN INSTALLED ON SAID POST(S). WHEN ANCHORS ARE INSTALLED STUB SHALL NOT BE GREATER THAN FOUR INCHES ABOVE EXISTING GROUND.
11. THE NUMBER OF CHANNELIZING DEVICES, TYPE III BARRICADES AND OTHER TRAFFIC CONTROL DEVICES SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL NUMBER REQUIRED ARE TO BE DETERMINED BASED ON INDIVIDUAL DETOUR CONDITIONS (TAPERS, SPEED LIMITS, LENGTH OF DETOUR, CURVE ETC.). WARNING LIGHTS SHALL NOT BE USED ON CHANNELIZING DEVICES.
12. AT NO TIME WILL THE CONTRACTOR BE ALLOWED TO HAVE WORKERS' VEHICLES, CONSTRUCTION EQUIPMENT OR STOCKPILED MATERIALS WITHIN THE CLEAR ZONE OF BUSINESS ROUTE 4 WITHOUT POSITIVE PROTECTION. POSITIVE PROTECTION SHALL BE AS DIRECTED BY THE ENGINEER. THE CLEAR ZONE IS DEFINED AS FOLLOWS:
BUSINESS ROUTE 4 - 16 FEET FROM THE TRAVELED WAY
13. BRIDGE D4-4, EASTBOUND RIGHT LANE CLOSED: THE INTERSECTION WITH SIMONS AVE CLOSEST TO BRIDGE D4-4 FALLS WITHIN THE MERGING TAPER OF THE RIGHT LANE. PROVIDE A GAP IN THE REFLECTORIZED PLASTIC DRUMS AT THIS INTERSECTION, SO VEHICLES CAN ENTER AND EXIT SIMONS AVE.
14. BRIDGE D4-4, WESTBOUND RIGHT THRU LANE CLOSED: PLACE SIGN W9-2 AT FAR SIDE OF THE BUSINESS ROUTE 4 AND EAST PROCTOR ROAD INTERSECTION. PLACE SIGN R3-7 AT BEGINNING OF SLIP LANE TAPER TO ROUTE 3.
15. SIGN R9-9 SHOULD BE INSTALLED AT THE BEGINNING OF THE CLOSED SIDEWALK AND AT INTERSECTIONS PRECEDING THE CLOSED SIDEWALK.

TRAFFIC CONTROL SHEET (3)

PROJECT NAME: FAIR HAVEN - RUTLAND	PLOT DATE: 24-JAN-2012
PROJECT NUMBER: BHF BPNT (10)	DRAWN BY: W.GERHOLD
FILE NAME: I0b182/str/z10b182tc.dgn	CHECKED BY: R.BENJAMIN
PROJECT LEADER: G.K.DONNINGTON	SHEET II OF 28
DESIGNED BY: C.CARNEY	
tc_3.dgn	





TRAFFIC CONTROL NOTES - ROUTE 22A AND ROUTE 30:

1. THE TRAFFIC CONTROL PLAN SHOWN IS A SCHEMATIC ONLY AND SHOULD BE USED AS A REFERENCE. THE CONTRACTOR SHALL SUBMIT A SITE SPECIFIC TRAFFIC CONTROL PLAN FOR BRIDGES 5E & W AND 10E & W TO VTRANS FOR APPROVAL. PAYMENT FOR PREPARING AND SUBMITTING THE TRAFFIC CONTROL PLAN, AND MAKING NECESSARY REVISIONS TO THE PLAN, WILL BE INCLUDED IN THE UNIT PRICE BID FOR CONTRACT ITEM 641.10 - TRAFFIC CONTROL. THE CONTRACTOR SHALL ALLOW TWO WEEKS FOR APPROVAL OF THE TRAFFIC CONTROL PLAN. NO WORK SHALL COMMENCE UNTIL THE CONTRACTOR HAS AN APPROVED TRAFFIC CONTROL PLAN.
2. THE EXISTING SPEED LIMITS FOR ROUTE 22A AND ROUTE 30 VARY BETWEEN 40 MPH AND 50 MPH IN THE PROJECT AREAS. THE SPEED LIMITS WILL BE REDUCED TO 30 MPH IN THE WORK ZONES FOR THIS PROJECT. ANY EXISTING SPEED LIMIT SIGNS WITHIN THE SPEED REDUCTION AREA SHALL BE COMPLETELY COVERED.
3. CONSTRUCTION SIGNS SHALL BE INSTALLED SO AS NOT TO OBSTRUCT EXISTING SIGNS.
4. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND THE "STANDARD HIGHWAY SIGNS" BOOK (SHS) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION (FHWA).
5. ORANGE CONSTRUCTION SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING THE REQUIREMENTS OF SECTION 750 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION FOR TYPE VII, VIII OR IX, UNLESS OTHERWISE NOTED.
6. ROLL UP SIGNS SHALL HAVE A RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING THE REQUIREMENTS OF SECTION 750 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION FOR TYPE VI.
7. SIGNS SHALL BE ERECTED BEFORE THE START OF ANY WORK AND SHALL BE COVERED UNTIL WORK COMMENCES AND DURING PERIODS OF INACTIVITY. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMAN LIKE MANNER. SIGNS SHALL BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER.
8. FIXED SIGNS SHALL BE SET SECURELY IN THE GROUND. THE BOTTOM OF A SIGN SHALL BE AT LEAST SEVEN FEET ABOVE THE EDGE OF PAVEMENT. THE NEAREST EDGE OF A SIGN SHALL BE AT LEAST SIX FEET OUTSIDE THE SHOULDER POINT OR FOUR FEET OUTSIDE THE GUARDRAIL.
9. PORTABLE SIGNS SHALL BE PLACED ON THE EDGE OF ROADWAY AND A ONE FOOT MINIMUM HEIGHT ABOVE TRAVELED WAY. WHEN PLACED BEHIND THE GUARD RAIL, THE BOTTOM OF THE SIGN FACE SHALL BE ABOVE THE TOP OF THE GUARDRAIL. ALL VEGETATION THAT INTERFERES WITH VISIBILITY OF THE SIGNS SHALL BE REMOVED. PAYMENT FOR REMOVAL IS INCIDENTAL TO THE APPROPRIATE CONTRACT ITEMS.
10. WHERE SIGN INSTALLATIONS ARE NOT PROTECTED BY GUARDRAIL OR OTHER APPROVED TRAFFIC BARRIERS, ALL SIGN STANDS AND POST INSTALLATIONS SHALL BE "NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM" (NCHRP) REPORT 350 COMPLIANT. NO SIGN POSTS SHALL EXTEND OVER THE TOP OF THE SIGN INSTALLED ON SAID POST (S). WHEN ANCHORS ARE INSTALLED STUB SHALL NOT BE GREATER THAN FOUR INCHES ABOVE EXISTING GROUND.
11. THE NUMBER OF CHANNELIZING DEVICES, TYPE III BARRICADES AND OTHER TRAFFIC CONTROL DEVICES SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL NUMBER REQUIRED ARE TO BE DETERMINED BASED ON INDIVIDUAL DETOUR CONDITIONS (TAPERS, SPEED LIMITS, LENGTH OF DETOUR, CURVE ETC.). WARNING LIGHTS SHALL NOT BE USED ON CHANNELIZING DEVICES.
12. AT NO TIME WILL THE CONTRACTOR BE ALLOWED TO HAVE WORKERS' VEHICLES, CONSTRUCTION EQUIPMENT OR STOCKPILED MATERIALS WITHIN THE CLEAR ZONE OF ROUTE 22A OR ROUTE 30 WITHOUT POSITIVE PROTECTION. POSITIVE PROTECTION SHALL BE AS DIRECTED BY THE ENGINEER.
THE CLEAR ZONES ARE DEFINED AS FOLLOWS:
ROUTE 22A - 16 FEET FROM THE TRAVELED WAY
ROUTE 30 - 22 FEET FROM THE TRAVELED WAY
13. THE SHOULDER AND TRAVEL LANE CLOSURE SCHEMES SHOWN IN THE TRAFFIC CONTROL PLANS FOR ROUTE 22A AND ROUTE 30 ARE TO BE USED FOR THE NORTHBOUND AND SOUTHBOUND CLOSURES.
14. SPEED LIMIT IS 40 MPH FOR ROUTE 22A NORTHBOUND/SOUTHBOUND AND ROUTE 30 SOUTHBOUND. SPEED LIMIT IS 50 MPH FOR ROUTE 30 NORTHBOUND.

- LEGEND**
- - FLOW OF TRAFFIC
 - ▨ - WORK AREA
 - - REFLECTORIZED PLASTIC DRUM
 - - TYPE III BARRICADE
 - ⊠ - TRUCK/TRAILER MOUNTED ATTENUATOR (OPTIONAL)

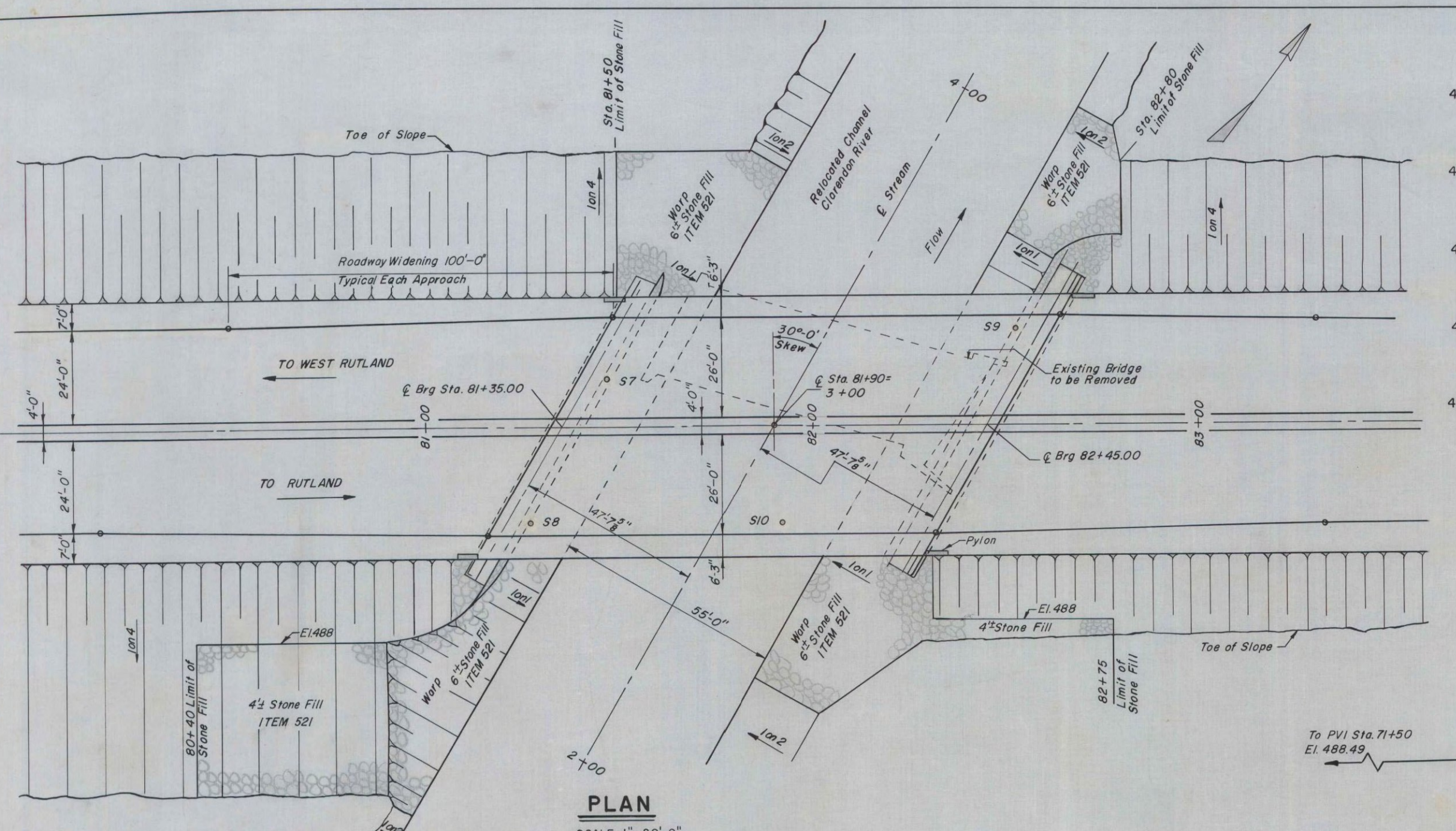
POSTED SPEED LIMIT	TAPER LENGTHS (FT)		MAXIMUM CHANNELIZING DEVICE SPACING (FT)	
	SHOULDER W=10 FT (L/3)	SHIFTING W=10 FT (L/2)	TAPER	TANGENT
30	50	75	30	60
35	70	105	35	70
40	90	135	40	80
45	150	225	45	90
50	170	250	50	100

TAPER RATES ARE DETERMINED USING THE FOLLOWING EQUATIONS:
 $L = WS$ FOR POSTED SPEEDS OF 45 MPH OR GREATER
 $L = WS^2/60$ FOR POSTED SPEEDS OF 40 MPH OR LESS
 L = MINIMUM LENGTH OF TAPER
 W = WIDTH OF OFFSET IN FEET
 S = POSTED SPEED IN MPH

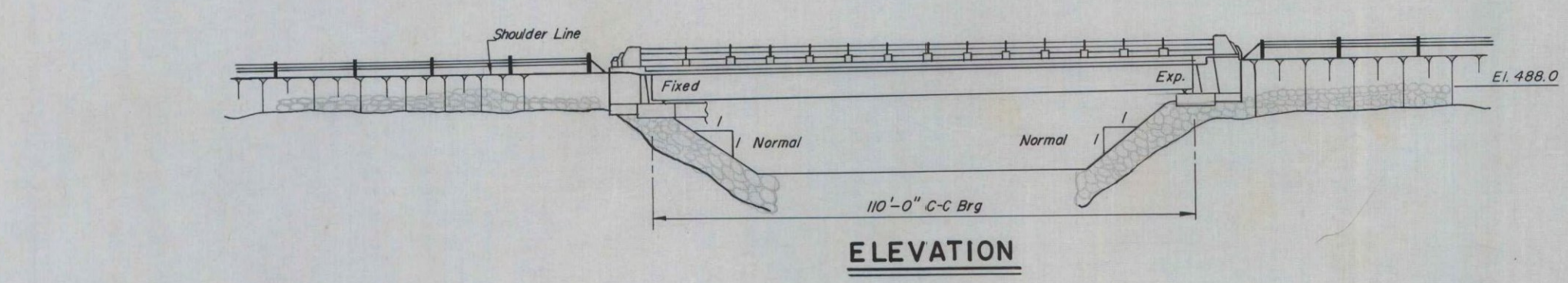
TRAFFIC CONTROL SHEET (4)

PROJECT NAME: FAIR HAVEN - RUTLAND	FILE NAME: I0b182/str/z10b182tc.dgn	PLOT DATE: 24-JAN-2012
PROJECT NUMBER: BHF BPNT (10)	PROJECT LEADER: G.K.DONINGTON	DRAWN BY: W.GERHOLD
	DESIGNED BY: A.STOCKIN	CHECKED BY: R.BENJAMIN
	tc_4.dgn	SHEET 12 OF 28

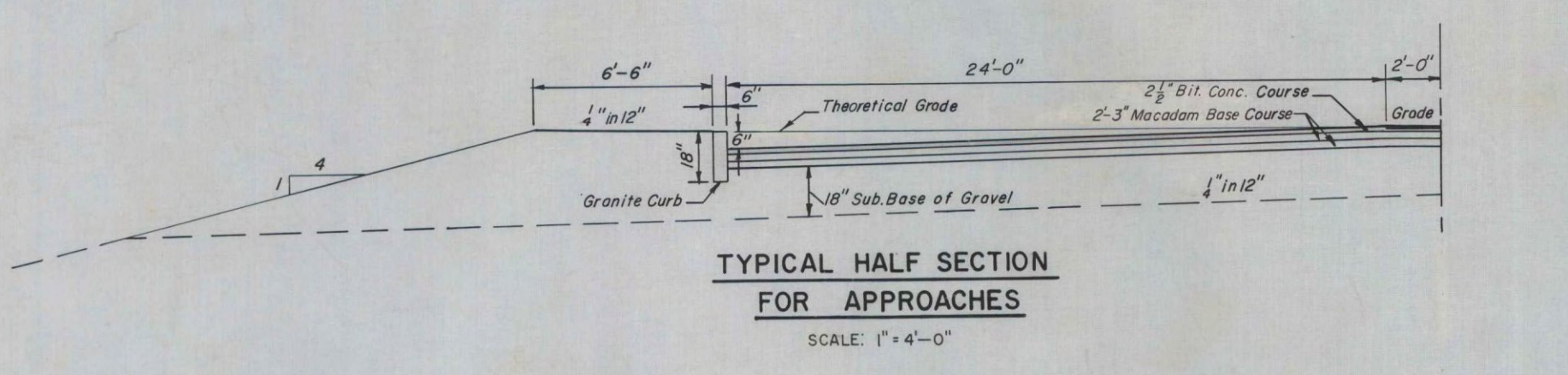




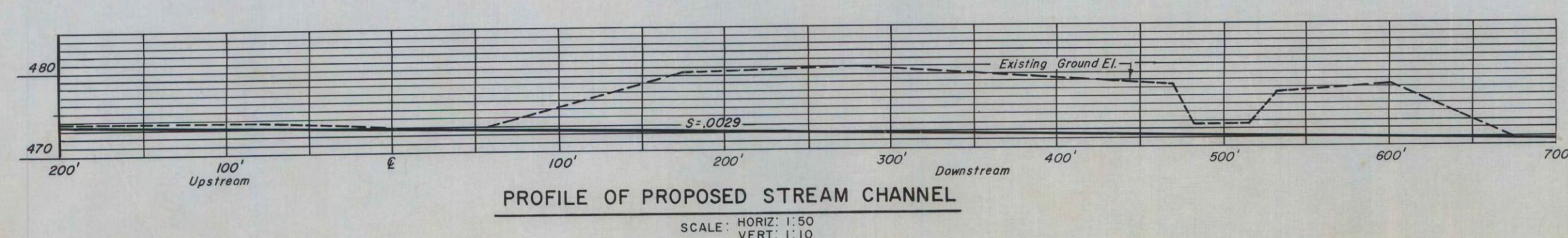
PLAN
SCALE: 1" = 20'-0"



ELEVATION



TYPICAL HALF SECTION FOR APPROACHES
SCALE: 1" = 4'-0"

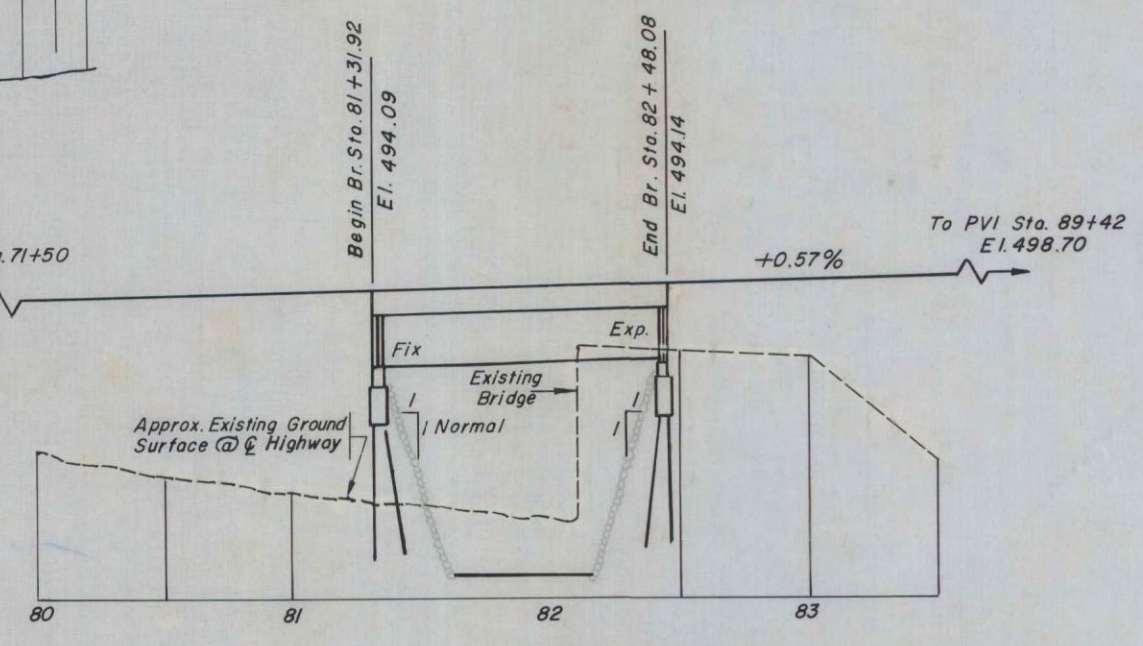


PROFILE OF PROPOSED STREAM CHANNEL
SCALE: HORIZ: 1" = 100'-0"
VERT: 1" = 10'

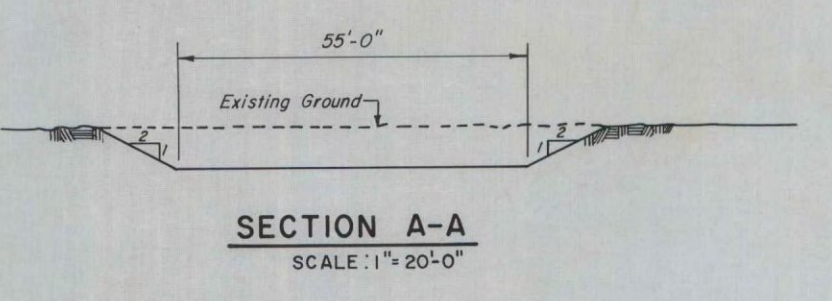
S7		S8		S9		S10	
Soil	24	Soil	24	Soil	24	Soil	24
Sand & Gravel	38	Sand & Gravel	44	Sand & Gravel	44	Sand & Gravel	44
Gravel	24	Sand & Silt	24	Gravel	24	Gravel	24
Heavy Gravel	24	Gravel	24	Gravel	24	Gravel	24
State Ledge El. 442.0		State Ledge El. 442.0		State Ledge El. 442.0		State Ledge El. 442.0	

FOUNDATION INFORMATION

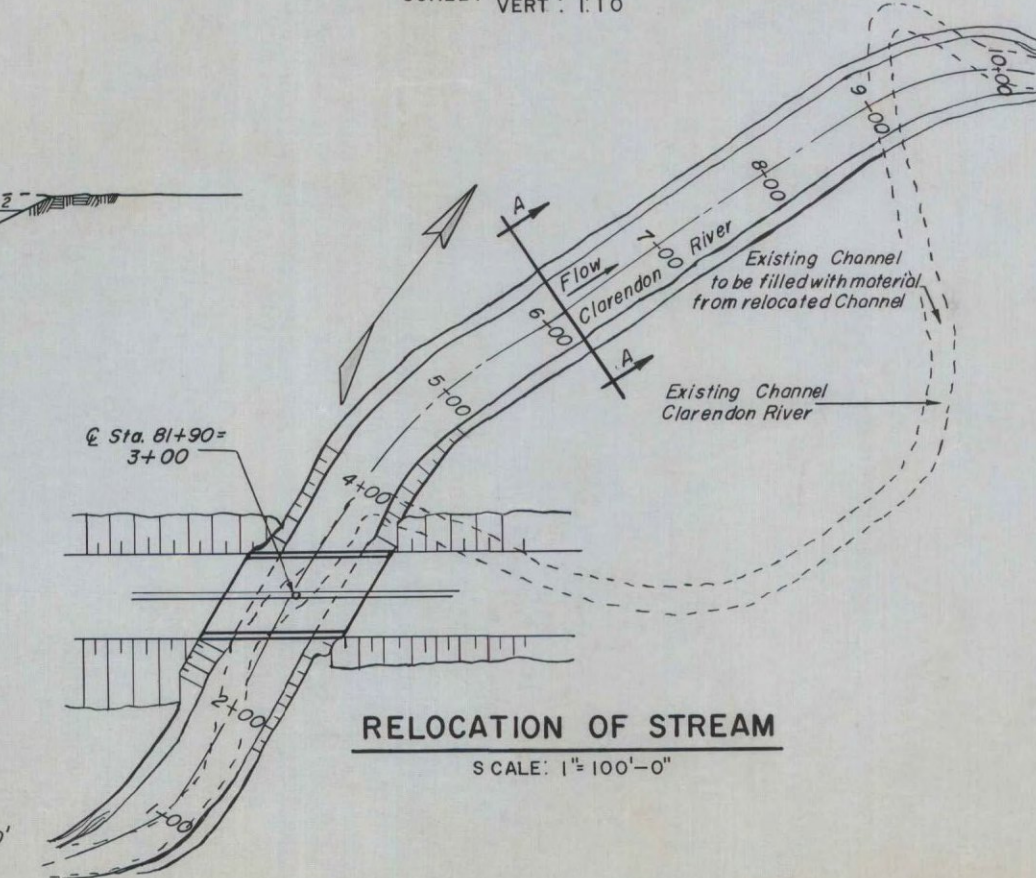
Obtained for design purposes only, and the state assumes no responsibility whatsoever for the sufficiency or accuracy of the information shown. Boulders may be encountered at either of the abutment locations.
Dia. of Casing - 24"
Thickness of Shell - 1/2"
Hammer Weight - 350#
Hammer Drop - 24"
Figures indicate No. of Blows Req. to Drive Casing - 1



ROADWAY PROFILE ALONG C
SCALE: HORIZ: 1" = 50'
VERT: 1" = 10'



SECTION A-A
SCALE: 1" = 20'-0"



RELOCATION OF STREAM
SCALE: 1" = 100'-0"

ITEM NO	DESCRIPTION	UNIT	QUANTITY
107	Structure Excavation	C.Y.	100
401B	Concrete Class B, mod.	C.Y.	515
402	Reinforcing Steel	LB.	65,000
403	Spiral Reinforcement	L.S.	1
404A	Structural Steel	LB.	340,000
441	Temporary Bridge	L.S.	1
442	Removal of Present Superstructure	L.S.	1
501	Furnishing Equipment for Driving Piles	L.S.	1
502-B	Treated Timber Piling	L.F.	4,200
521	Stone Fill (Heavy Type)	C.Y.	2,050
572	Bridge Piling	L.F.	234
361-B	Autumnous Concrete Riverbank	sq	55

NOTES

- See Bridge Sheet 7 for General Notes.
- Foundations of existing bridge to be removed. Cost to be included in the unit price bid for structure excavation, Item 107, and channel, Item 106 C.
- Existing superstructure is to remain the property of the state. Removal and storage of superstructure to be paid for under Item 442. See Specifications.

REFERENCE DRAWINGS

- West Abutment Bridge Sheet 2
- East Abutment " " 3
- Framing Plan and Girder Details " " 4
- Deck and Railing Plan - Misc. Details " " 5
- Typical Bridge Details " " 6
- Superstructure Sections and General Notes " " 7

FAIRHAVEN-RUTLAND
BHF BPNT (10)
PROJECT BRIDGE #D4-3
SHEET 13 OF 28
FOR INFORMATION ONLY

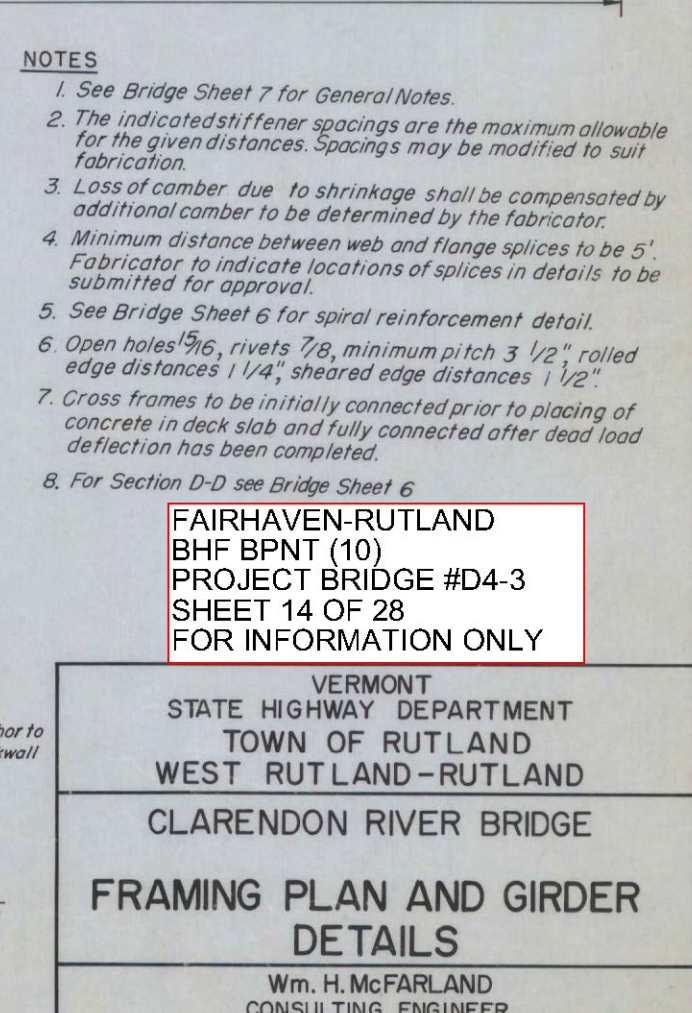
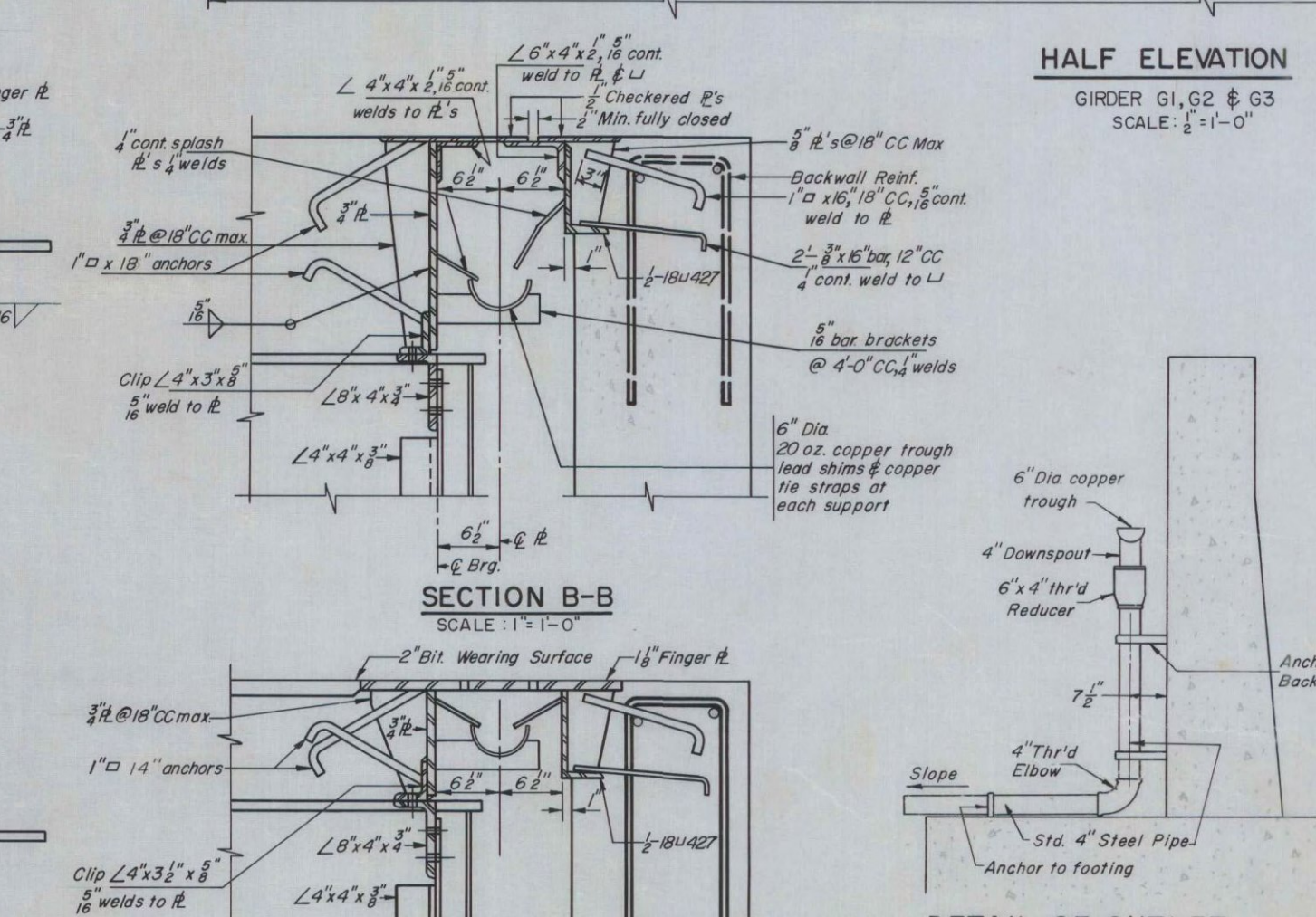
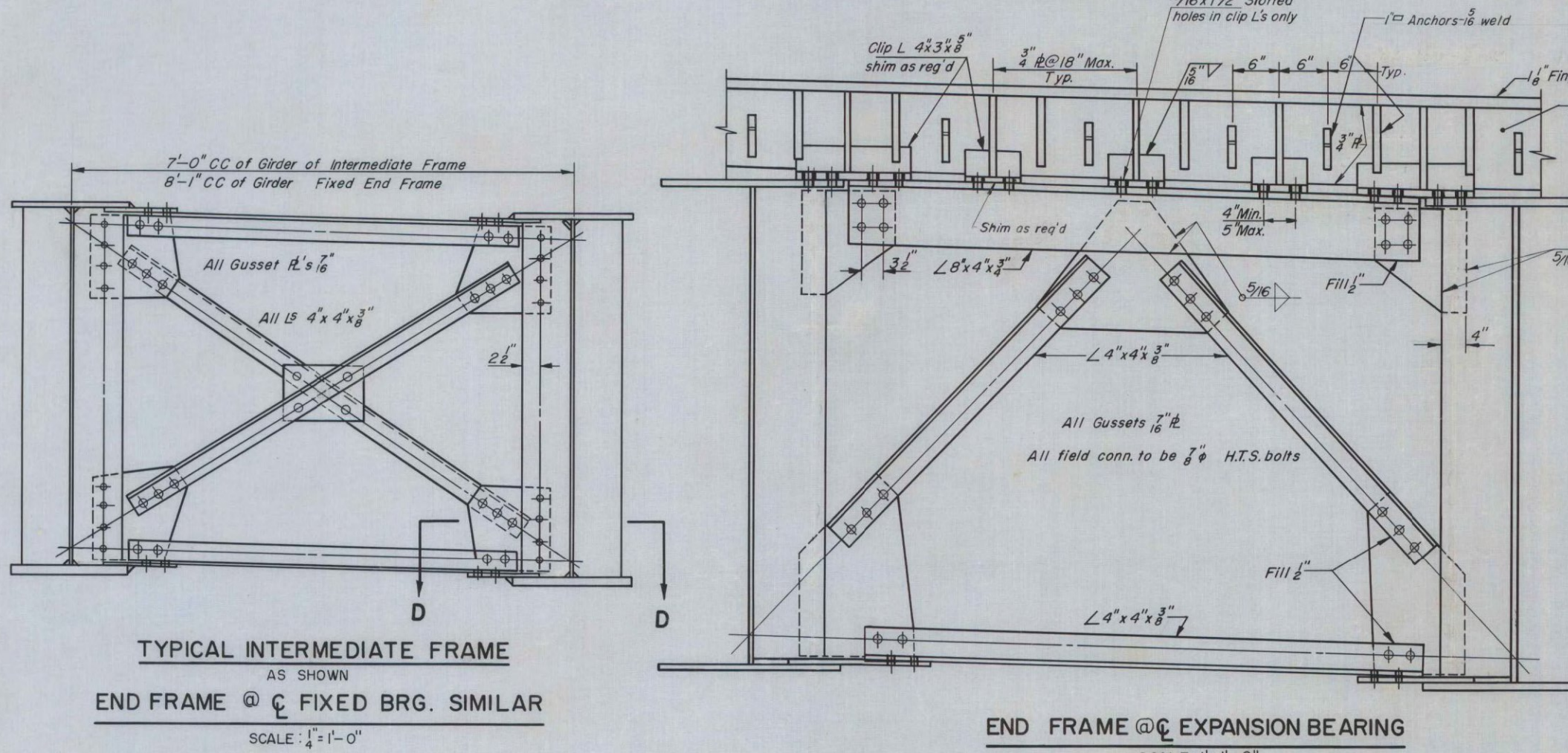
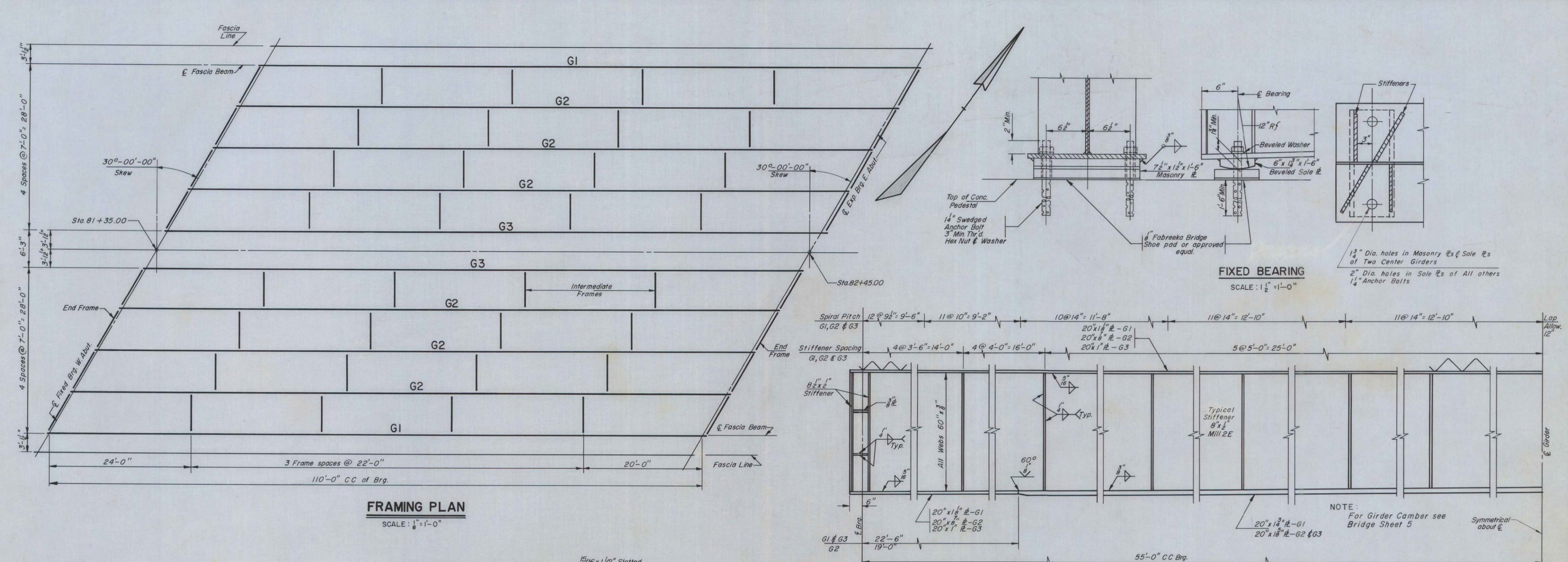
VERMONT
STATE HIGHWAY DEPARTMENT
TOWN OF RUTLAND
WEST RUTLAND - RUTLAND
CLARENDON RIVER BRIDGE

GENERAL PLAN ELEVATIONS & PROFILES

Wm. H. McFARLAND
CONSULTING ENGINEER
BINGHAMTON, N.Y.

DESIGNED: L.H.S. CHECKED: L.H.S. DATE: 2-28-57
DRAWN: S.G.S. IN CHARGE: F.S.P. SCALE: AS NOTED

PROJECT NO. SHEET 13 OF 28
BRIDGE SHEET 1 OF 12



NOTES

- See Bridge Sheet 7 for General Notes.
- The indicated stiffener spacings are the maximum allowable for the given distances. Spacings may be modified to suit fabrication.
- Loss of camber due to shrinkage shall be compensated by additional camber to be determined by the fabricator.
- Minimum distance between web and flange splices to be 5'. Fabricator to indicate locations of splices in details to be submitted for approval.
- See Bridge Sheet 6 for spiral reinforcement detail.
- Open holes 3/8", rivets 7/8", minimum pitch 3 1/2", rolled edge distances 1 1/4", sheared edge distances 1 1/2".
- Gross frames to be initially connected prior to placing of concrete in deck slab and fully connected after dead load deflection has been completed.
- For Section D-D see Bridge Sheet 6.

FAIRHAVEN RUTLAND
BHF BPNT (10)
PROJECT BRIDGE #D4-3
SHEET 14 OF 28
FOR INFORMATION ONLY

VERMONT
STATE HIGHWAY DEPARTMENT
TOWN OF RUTLAND
WEST RUTLAND - RUTLAND
CLARENDON RIVER BRIDGE

FRAMING PLAN AND GIRDER DETAILS

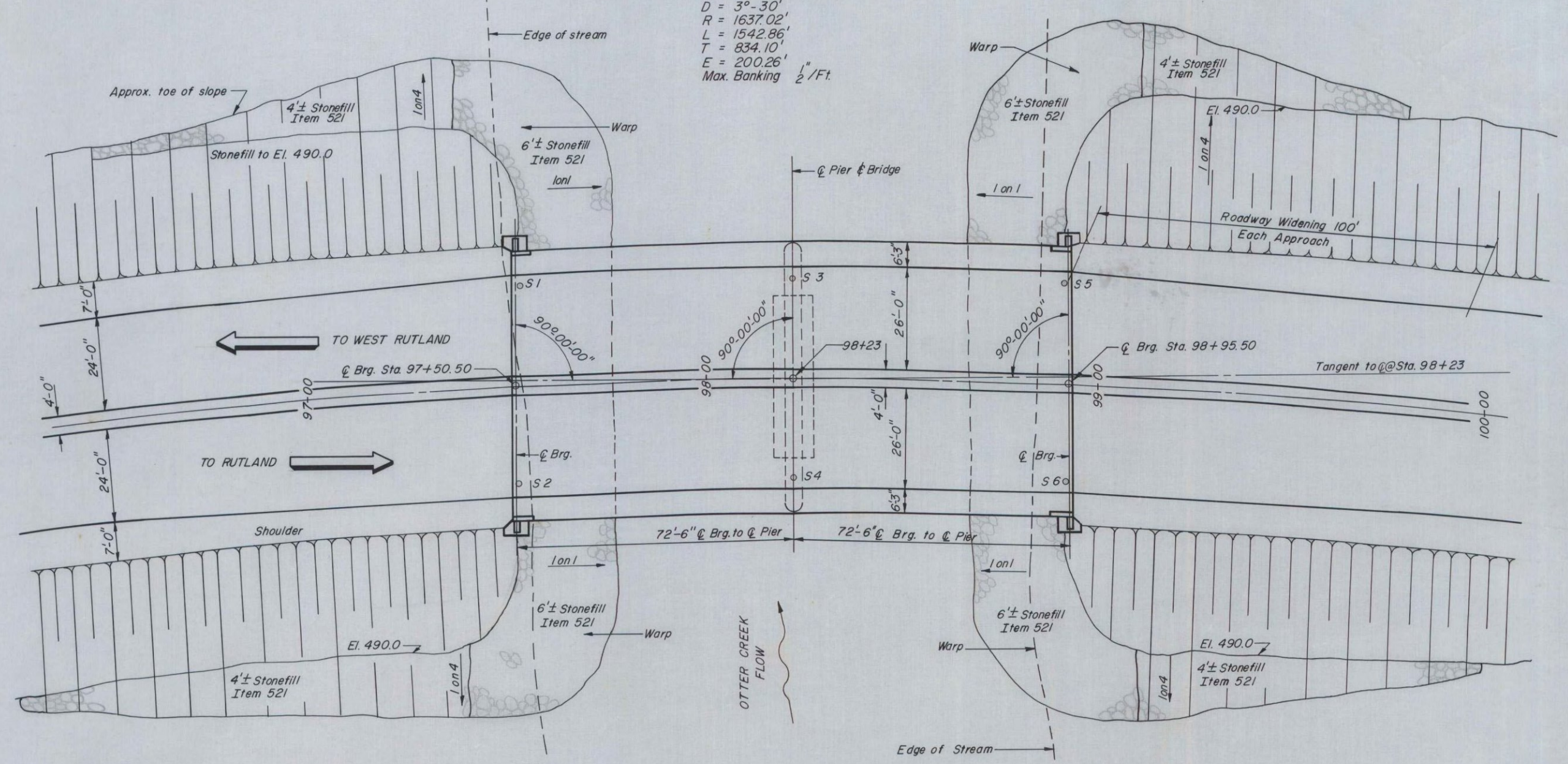
Wm. H. McFARLAND
CONSULTING ENGINEER
BINGHAMTON, N.Y.

DESIGNED L.L.S. CHECKED J.E.S. DATE 2-28-57
DRAWN S.G.S. IN CHARGE E.S.P. SCALE AS NOTED

PROJECT NO. SHEET 14 OF 28
STATE 65-2 BRIDGE SHEET 4 OF 12

HIGHWAY CURVE DATA

$\Delta = 54^{\circ}00'00''$
 $D = 3^{\circ}30'$
 $R = 1637.02'$
 $L = 1542.86'$
 $T = 894.10'$
 $E = 200.26'$
 Max Banking $\frac{1}{2}$ F/I



PLAN

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
107	Structure Excavation	CY	26.0
40B	Concrete Class B, mod.	CY	7.40
402	Reinforcing Steel	lb	93,000
403	Spiral Reinforcement	L.S.	
404A	Structural Steel	lb	320,000
501	Fun. Equipment for Driving Piles	L.S.	
502-B	Treated Timber Piling	L.F.	2,400
521	Stone Fill (Heavy Type)	CY	4,020
572	Bridge Railing	L.F.	27.6
442	Removal of Present Superstructure	L.S.	
102-A	Channel Excavation of Earth	cy	28.5
361-B	Bituminous Concrete Pavement	sq. yd.	108
504	Steel Piling (12" H. 55.6")	lf	108

Boring	S 1	S 2	S 3	S 4	S 5	S 6
480.0						
470.0	Flg. Sand & Gravel	Flg. Sand & Gravel	Flg. Sand & Gravel	Flg. Sand & Gravel	Flg. Sand & Gravel	Flg. Sand & Gravel
460.0	Very hard gravel	Very hard gravel	Very hard gravel	Very hard gravel	Very hard gravel	Very hard gravel
455.0	Heavy gravel	Heavy gravel	Heavy gravel	Heavy gravel	Heavy gravel	Heavy gravel

FOUNDATION INFORMATION

Obtained for design purposes only, and the state assumes no responsibility whatsoever for the sufficiency or accuracy of the information shown. Boulders may be encountered at any pier or abutment location.

Di. of Casing - 2 1/2"
 Thickness of Shell - 8"
 Hammer Weight - 350 lb.
 Hammer Drop - 24"
 * Blasted
 Figures indicate no. of blows req'd to drive casing 1'

- NOTES:**
- See bridge sheet 7 for general notes.
 - See bridge sheet 6 for railing, pylons, spirals and steel pile splice details.
 - Existing superstructure is to remain the property of the state. Removal and storage of superstructure to be paid for under item 442. See specifications.

- REFERENCE DRAWINGS**
- Typical Bridge Details - Bridge Sheet 6
 - Superstructure Sections and General Notes - 7
 - Pier Details, Deck and Railing Plan - 9
 - Abutment Plans, Elevations and Sections - 10
 - Framing Plan and Beam Details - 11

**FAIRHAVEN-RUTLAND
 BHF BPT (10)
 PROJECT BRIDGE #D4-4
 SHEET 15 OF 28
 FOR INFORMATION ONLY**

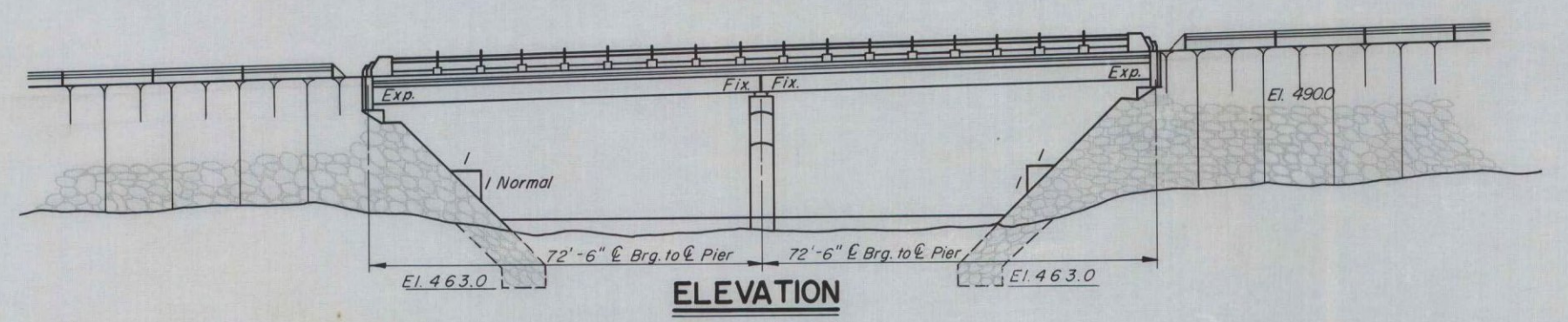
VERMONT
 STATE HIGHWAY DEPARTMENT
 TOWN OF RUTLAND
 WEST RUTLAND - RUTLAND
 OTTER CREEK BRIDGE

**GENERAL PLAN
 ELEVATIONS & PROFILES**

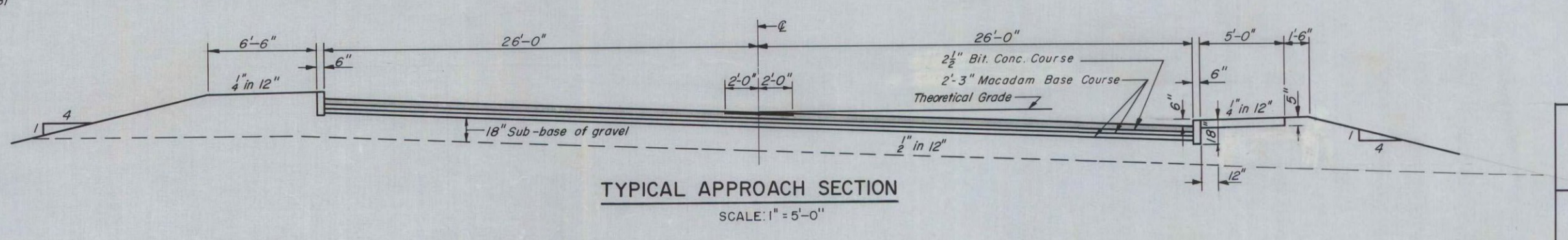
Wm. H. McFARLAND
 CONSULTING ENGINEER
 BINGHAMTON, N.Y.

DESIGNED L.H.S. CHECKED L.H.S. DATE 2-28-57
 DRAWN S.G.S. IN CHARGE F.S.P. SCALE AS NOTED.

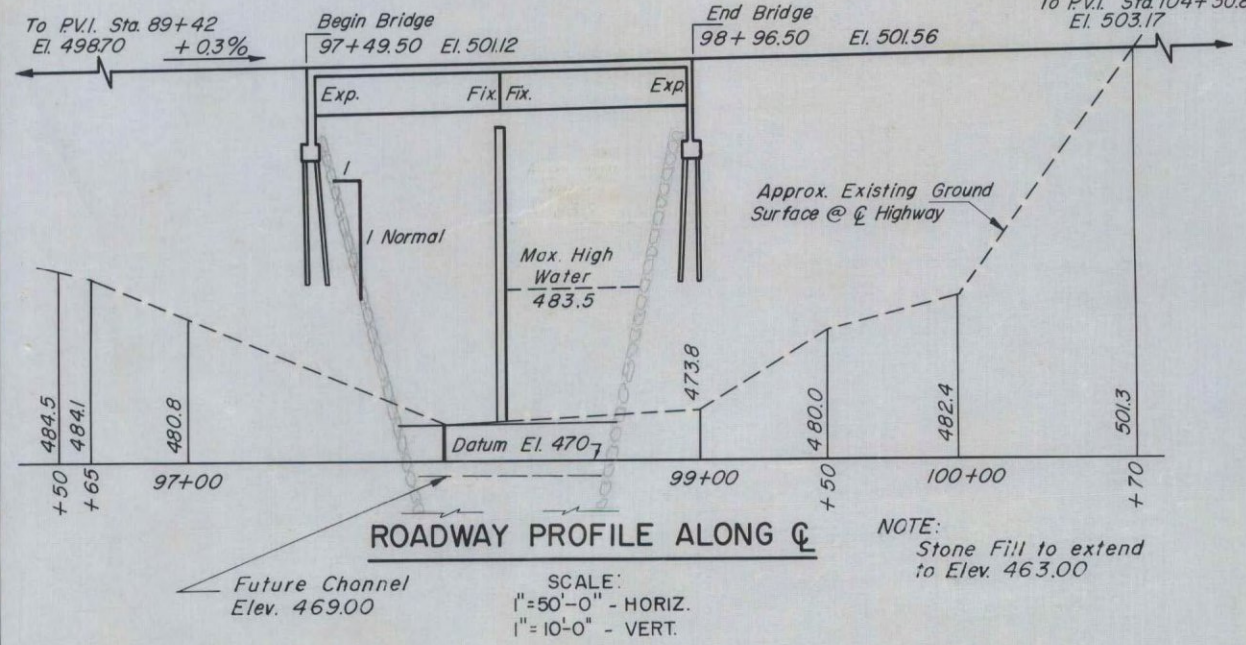
PROJECT NO. SHEET 26 OF 141
 STATE 65-2 BRIDGE SHEET 8 OF 12



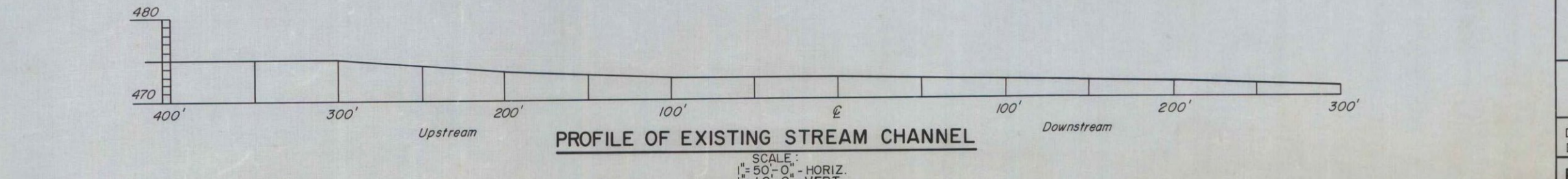
ELEVATION



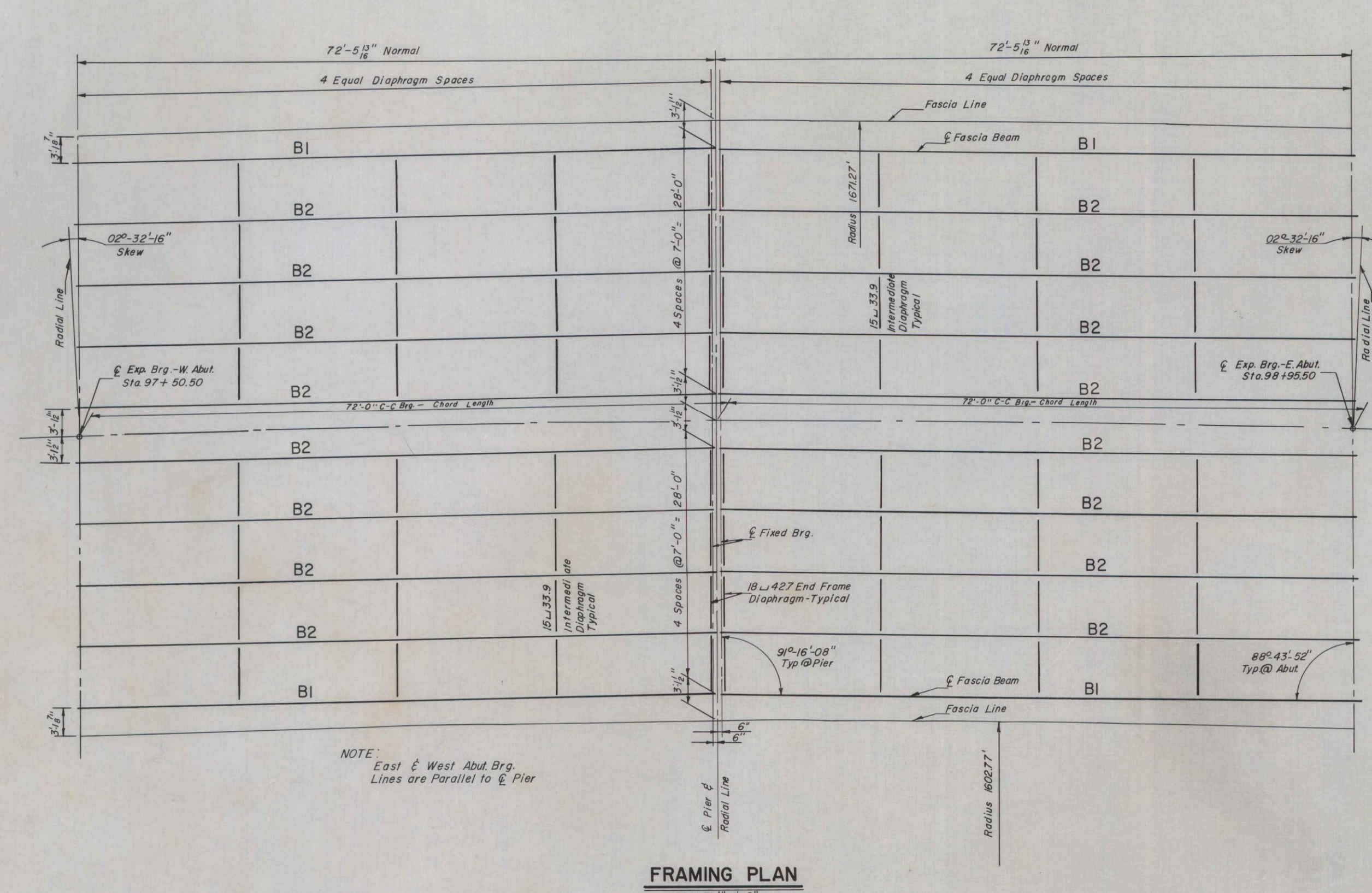
TYPICAL APPROACH SECTION



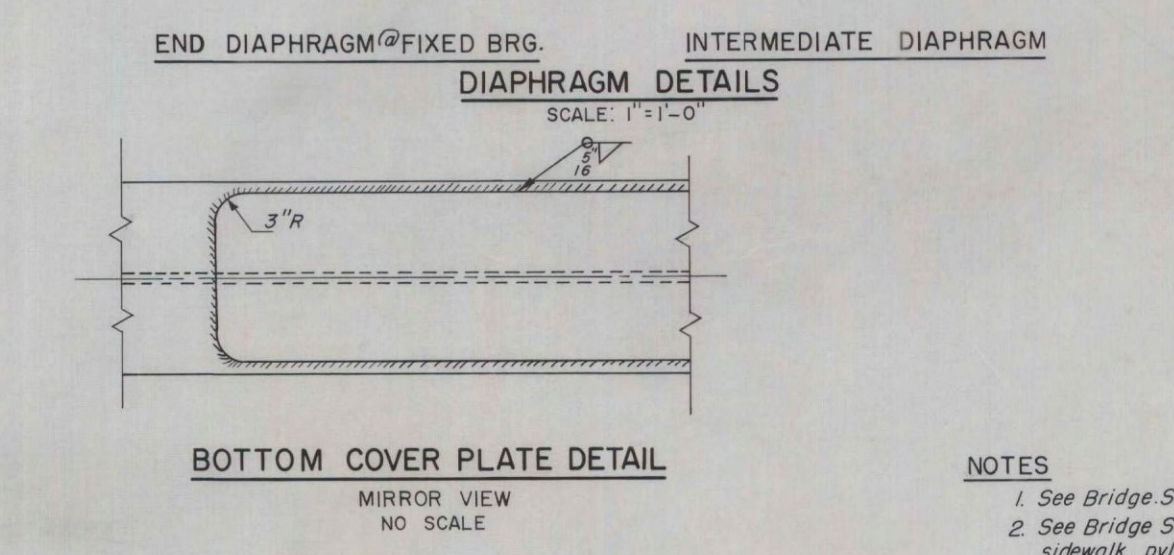
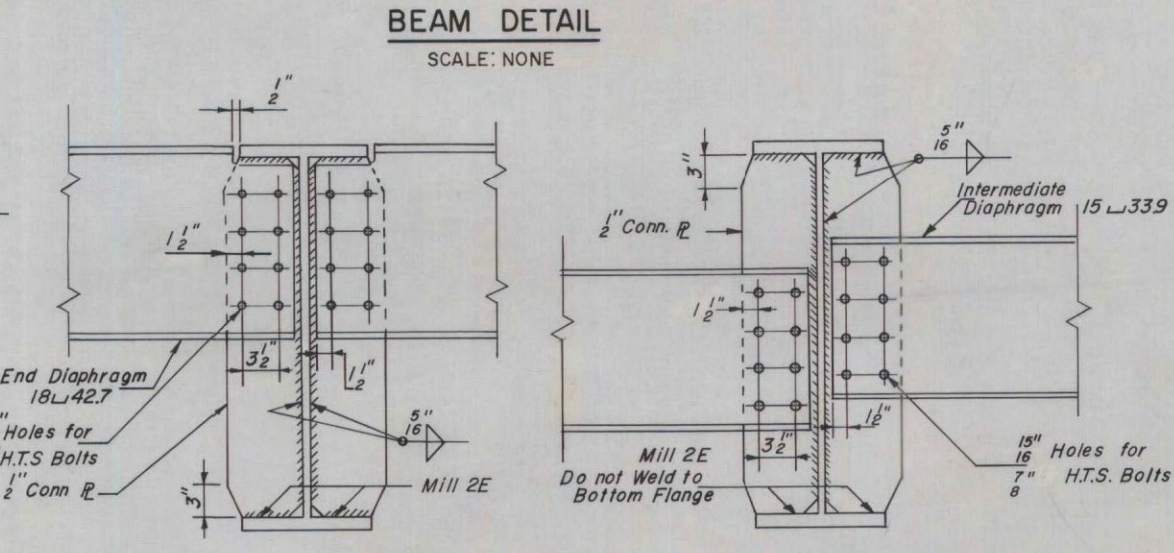
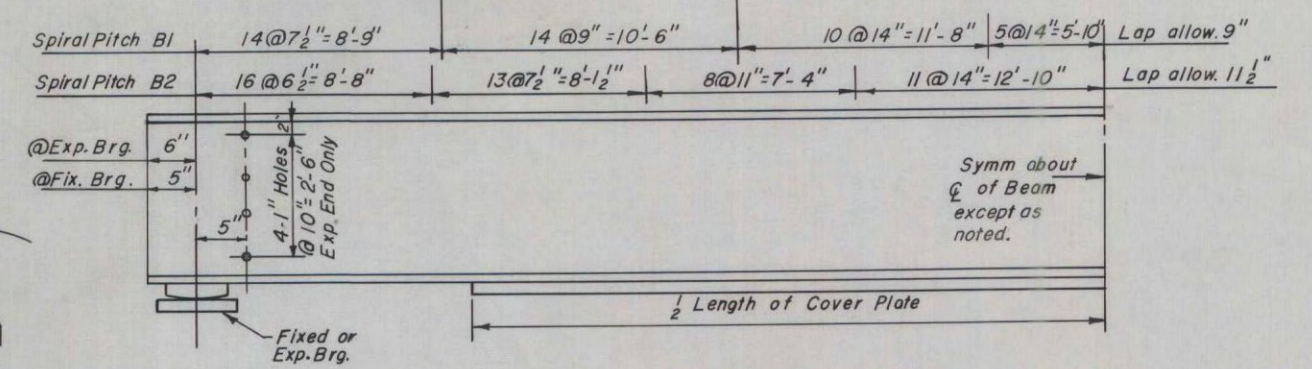
ROADWAY PROFILE ALONG C



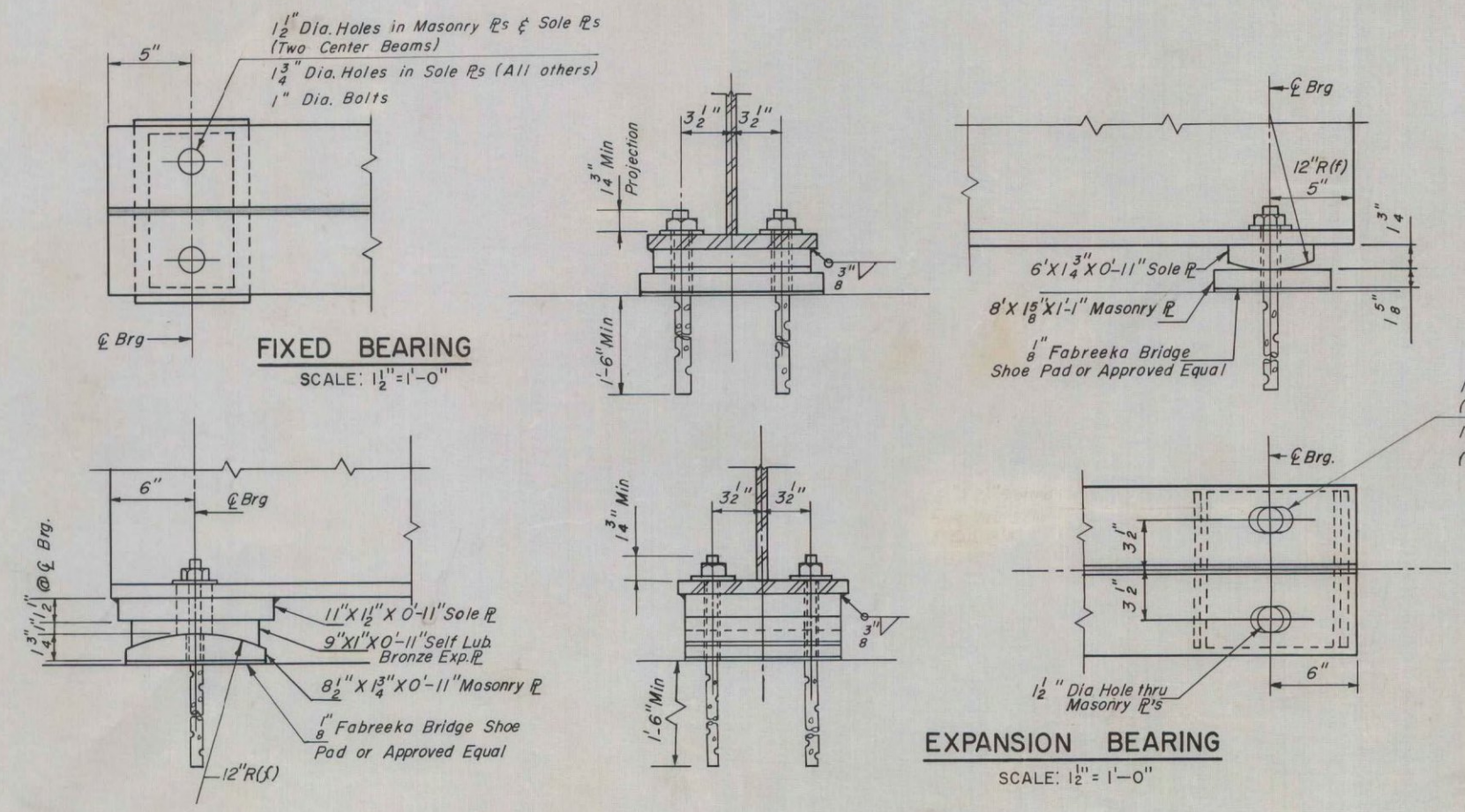
PROFILE OF EXISTING STREAM CHANNEL



BEAM SCHEDULE						
Beam Mark	Beam Size	Length C-C Brg	Cover Plate		D.L. Defl.	Camber to be Provided
			Length	Size		
B1	36 W 170	72'-0"	11' x 11"	42'-0"	1.96	2"
B2	36 W 170	72'-0"	11' x 1 1/2"	43'-10"	1.54	2"



- NOTES
- See Bridge Sheet 7 for General Notes.
 - See Bridge Sheet 6 for spiral reinforcement, sidewalk, tyrod and railing details.
 - Diaphragms to be initially connected prior to placing of concrete in deck slab and fully connected after dead load deflection has been completed.



FAIRHAVEN-RUTLAND
BHF BPNT (10)
PROJECT BRIDGE #D4-4
SHEET 16 OF 28
FOR INFORMATION ONLY

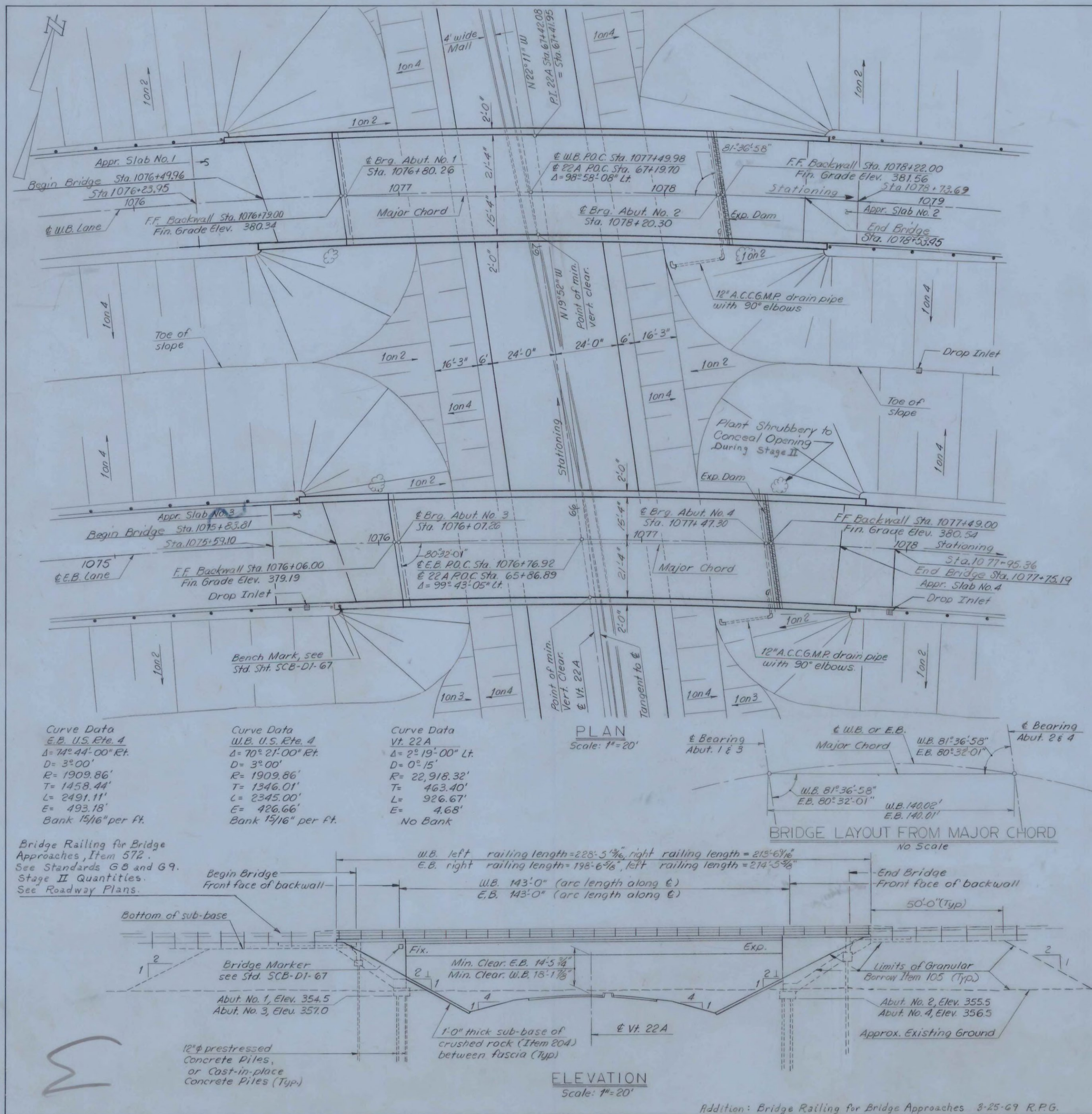
VERMONT
STATE HIGHWAY DEPARTMENT
TOWN OF RUTLAND
WEST RUTLAND-RUTLAND
OTTER CREEK BRIDGE

**FRAMING PLAN AND
BEAM DETAILS**

Wm. H. McFARLAND
CONSULTING ENGINEER
BINGHAMTON, N.Y.

DESIGNED L.H.S. CHECKED L.H.S. DATE 2-28-57
DRAWN S.B.S. IN CHARGE T.S.P. SCALE AS NOTED

PROJECT NO. 65301 SHEET 16 OF 28
STATE 65-2 BRIDGE SHEET 11 OF 12



GENERAL NOTES

- SPECIFICATIONS:**
 All materials and construction shall conform to the State of Vermont, Department of Highways, Standard Specifications for Highway and Bridge Construction, dated April, 1964, and the A.A.S.H.O. Standard Specifications dated 1965, as modified by current Interim Specifications.
- LIVE LOAD:**
 Structure designed for HS-20-44 Loading modified for National System of Interstate Highways applied in accordance with the provisions of the A.A.S.H.O. Standard Specifications, Article 1.2.B.
- CONCRETE:**
 All exposed edges of concrete shall be chamfered 1" x 1" unless otherwise noted. All construction joints to be made as shown on SCB-D6-67, details B and C, unless otherwise noted.
- REINFORCEMENT:**
 All reinforcement to have a clear cover of 2", unless otherwise noted.
- DIMENSIONS:**
 All dimensions given are measured horizontally or vertically unless otherwise noted. Dimensions given are for 98°F, unless otherwise noted. Elevation datum, sea level, based on nearest U.S. Government Vertical Control.
- STRUCTURAL STEEL:**
 Item 404-A shall include all structural steel, copper, wrought iron, and any other materials indicated or required in the completed structure which are not otherwise classified. All structural steel shall be structural carbon steel conforming to the requirements of the specifications for steel bridges and buildings, ASTM Designation A-36-62T, except as otherwise noted. The contractor shall submit complete details of the structural steel to the State of Vermont, Department of Highways, and receive their written approval prior to the start of fabrication. The steel details shall include provisions for cambering of beams for dead load deflection as well as erection diagrams and falsework details. The final coat of field paint shall be green.
- WATER REPELLENT:**
 The top surfaces of safety walks, fascia and back to the fascia beam under the slab, and on exposed areas of abutments not otherwise treated shall be covered with water repellent, (Item 440).
- FIELD BOLTING:**
 Field bolted connections shall be made with 3/8" # A365 High Strength bolts. A490 bolts are not allowed.
- ABUTMENTS:**
 The top surfaces of all abutments shall be sloped 1/4" per foot from the front edge of abutment curtain walls, except for bearing pads projecting 1" or more above the general area, which surfaces shall be level. Elevation of bridge seats given are for centerline of bearings. The entire exposed top surface of abutments shall be coated with Asphaltic-Asbestos Coating, 1/2" thick, as per Item 407 of the specifications. The application of this item shall be after all painting and incidental items are completed. Fill inside the abutments shall be graded to 3' above the bottom of the exterior concrete girders of the abutment section and shall meet the requirements of Item 405.
- PILES:**
 Cast-in-Place Piling or Prestressed Concrete Piling Type will be chosen by alternate bids. Vertical Design Load=40 tons/pile; Horizontal Design Load=1 ton /pile. All piling shall be driven to the lengths indicated on the plans unless otherwise directed in writing by the Engineer.
- GENERAL:**
 Cross slopes of the approach slabs to conform to the cross slope of the bridge. All expansion material shall be pre-molded cork containing no bitumen or asphalt.
- BITUMINOUS CONCRETE PAVEMENT:**
 Bituminous concrete pavement, Item 361 Modified, Type II, shall be applied in two courses.

FAIRHAVEN-RUTLAND
 BHF BPNT (10)
 PROJECT BRIDGE #5E & 5W
 SHEET 17 OF 28
 FOR INFORMATION ONLY

INDEX OF DRAWINGS

- BR 501 PLAN AND ELEVATION
- BR 502 QUANTITY SHEET
- BR 503 PRELIMINARY INFORMATION SHEET
- BE 504 BOEING LOG
- BE 505 BOEING LOG
- BR 506 BOEING LOG
- BR 507 SUPERSTRUCTURE DETAILS
- BR 508 SUPERSTRUCTURE DETAILS
- BR 509 SUPERSTRUCTURE DETAILS
- BR 510 JOINT DETAILS
- BR 511 ABUTMENT NO. 1 DETAILS
- BR 512 ABUTMENT NO. 2 DETAILS
- BR 513 ABUTMENT NO. 3 DETAILS
- BR 514 ABUTMENT NO. 4 DETAILS
- BR 515 FOOTING DETAILS & TYPICAL SECTIONS
- BR 516 FOOTING DETAILS & TYPICAL SECTIONS
- BR 517 APPROACH SLAB NO. 1
- BR 518 APPROACH SLAB NO. 2
- BR 519 APPROACH SLAB NO. 3
- BR 520 APPROACH SLAB NO. 4
- BR 521 REINFORCING STEEL DETAILS
- BR 522 REINFORCING STEEL DETAILS
- BR 523 REINFORCING STEEL DETAILS
- BR 524 REINFORCING STEEL DETAILS
- BR 525 REINFORCING STEEL DETAILS

STANDARD DRAWINGS

- SCB-D6-67 PILE SPLICE DETAILS, CONSTRUCTION JOINT DETAILS
- SCB-D4-67 DECK REINFORCING LAYOUT AT ABUTMENT
- SCB-D2-67 BEAM HAUNCH
- SCB-D1-67 BEAM MARK & BRIDGE MARKER DETAILS AND GENERAL NOTES
- SB-R2-65 STEEL RAILING DETAILS
- SB-R1-64 (SHEETS 1 AND 2) ALUMINUM RAILING DETAILS
- PRESTRESSED CONCRETE PILES - JOINT COMMITTEE, AASHTO COMMITTEE ON BRIDGES & STRUCTURES AND PRESTRESSED CONCRETE INSTITUTE
- SB-P1-66 CAST-IN-PLACE CONCRETE PILING.

DESIGN STRESSES

- Concrete — F_c = 3,000 p.s.i.
- F_c = 1,200 p.s.i.
- Structural Steel — F_s = 20,000 p.s.i.
- Reinforcing Steel — F_s = 36,000 p.s.i. (Tension)
- F_s = 20,000 p.s.i. (Compression)
- F_s = 16,000 p.s.i. (Compression)

VERMONT
 STATE HIGHWAY DEPARTMENT
 TOWN OF FAIRHAVEN
 U.S. ROUTE 4

U.S. RTE. 4 RELOCATION
 OVER VT. 22 A RELOC.

PLAN AND ELEVATION

MCFARLAND-JOHNSON
 CONSULTING ENGINEERS
 BINGHAMTON, NEW YORK

DESIGNED BRK CHECKED REC DATE 3-22-68
 DRAWN EMG IN CHARGE HGC SCALE As shown

PROJECT NO F020-1(4)8 SH 80 FS32

CONTRACT NO. BR 501 180 255

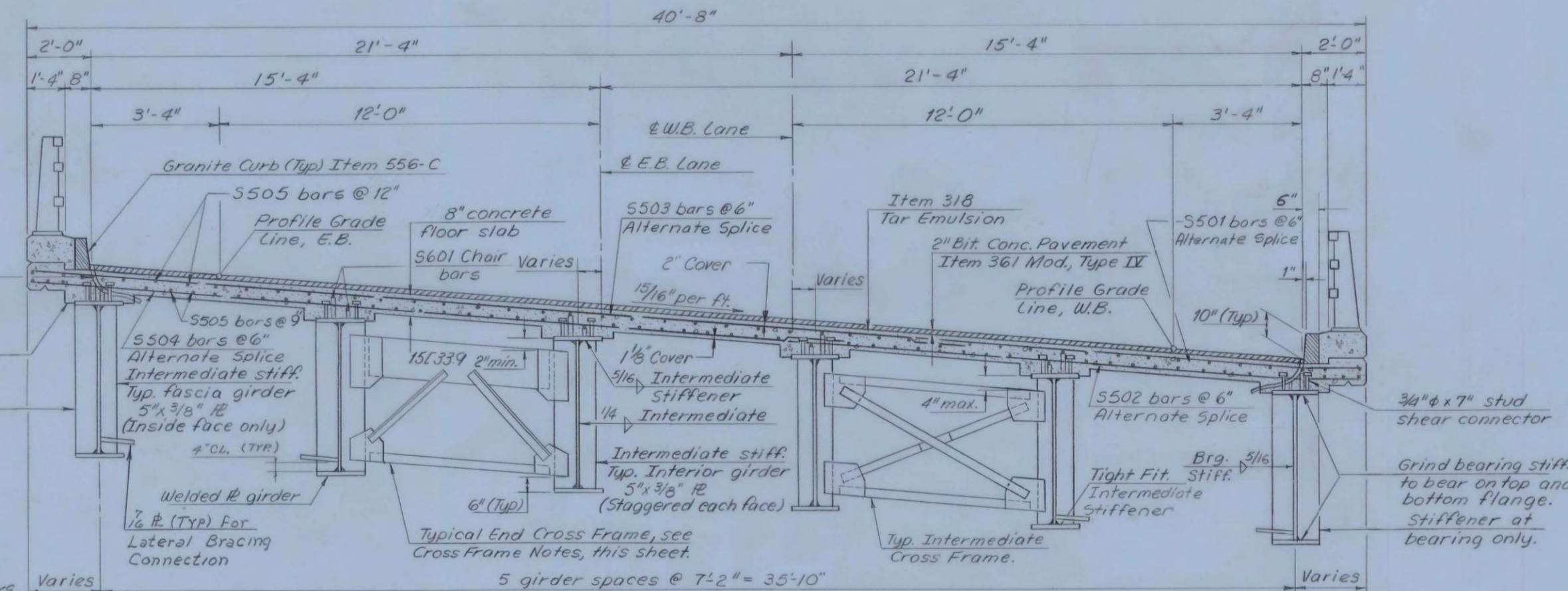
NOTE: The concrete floor slab surface shall be finished with a self-propelled concrete finishing machine.

1" plastic tube @ 10'-0" intervals.

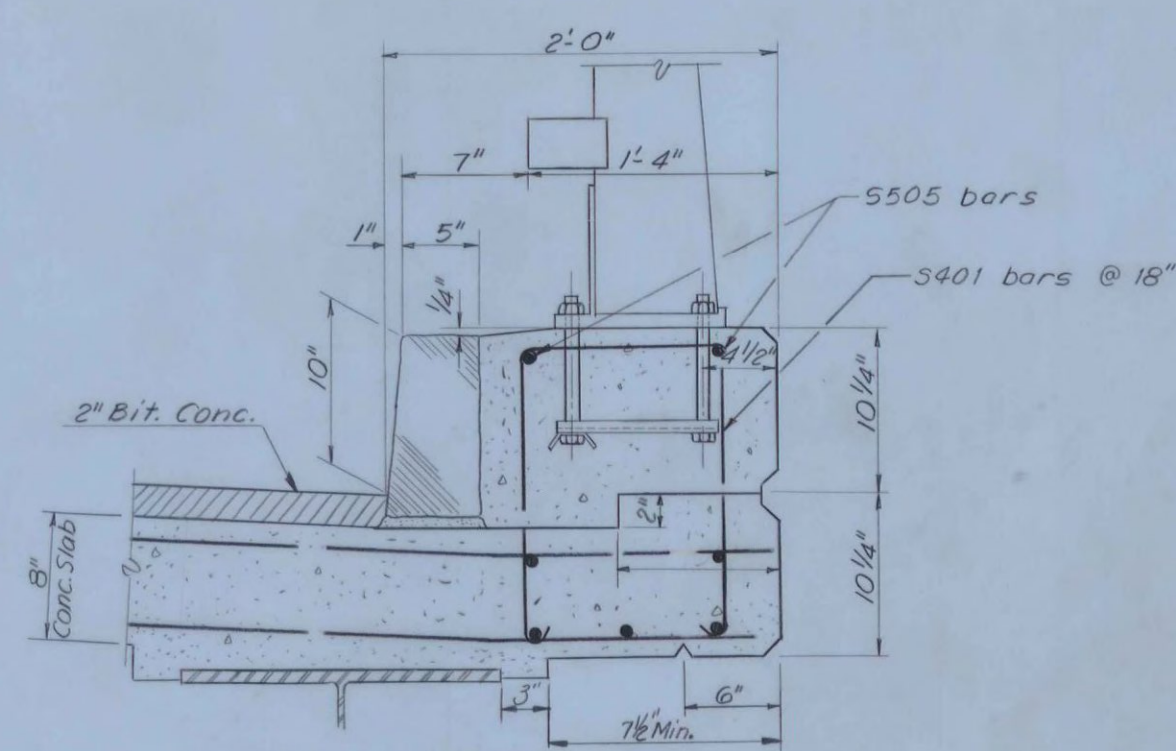
For Haunch Details see Std. SCB-D2-67

Stiffener at bearing only 7" x 3/4" I2

S501, S502, S503, S504 bars shall be cut in the field to fit the skewed end. The cut-off bars shall be used at the opposite end.

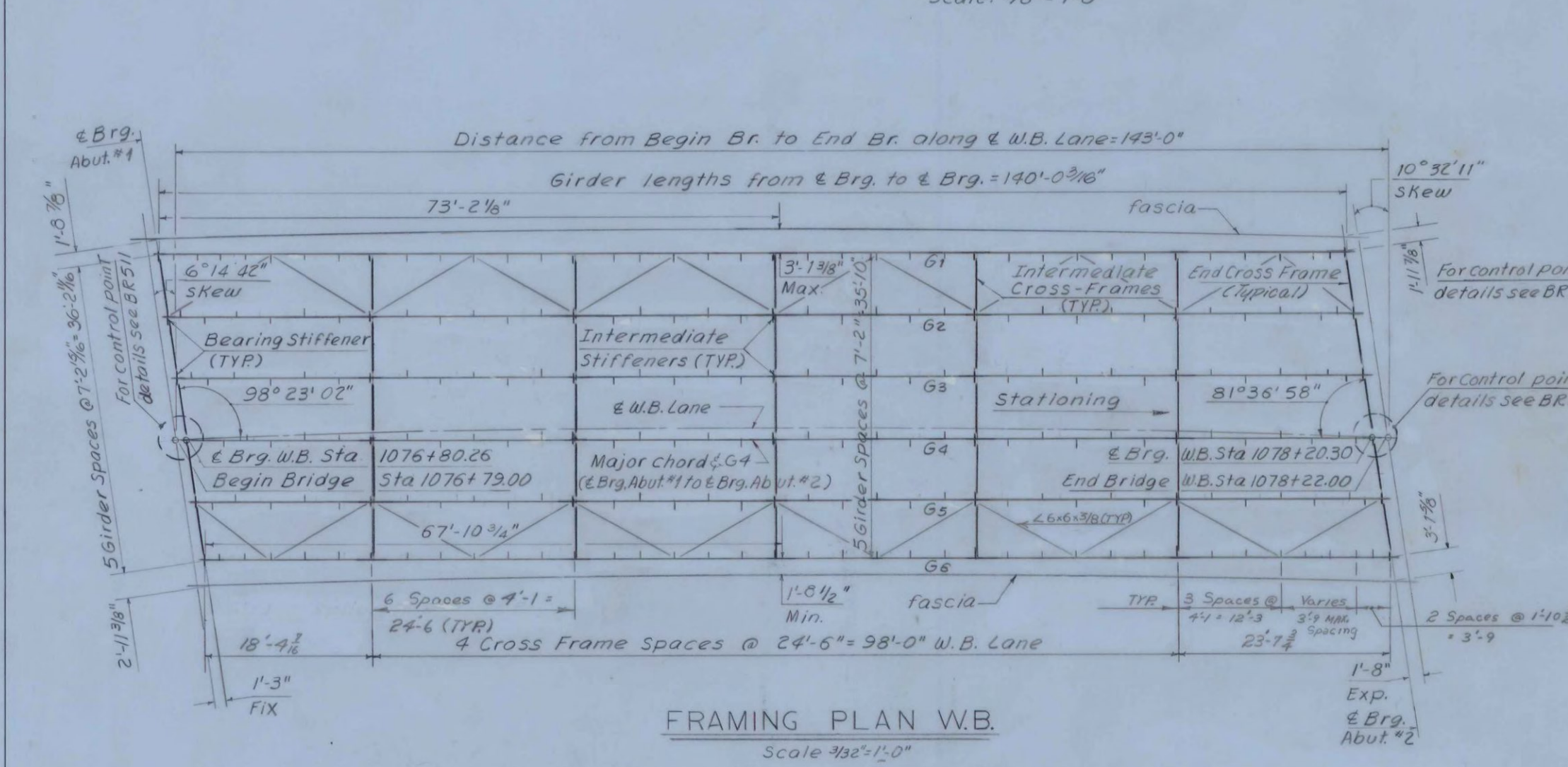


TYPICAL SECTION
Scale: 3/8" = 1'-0"

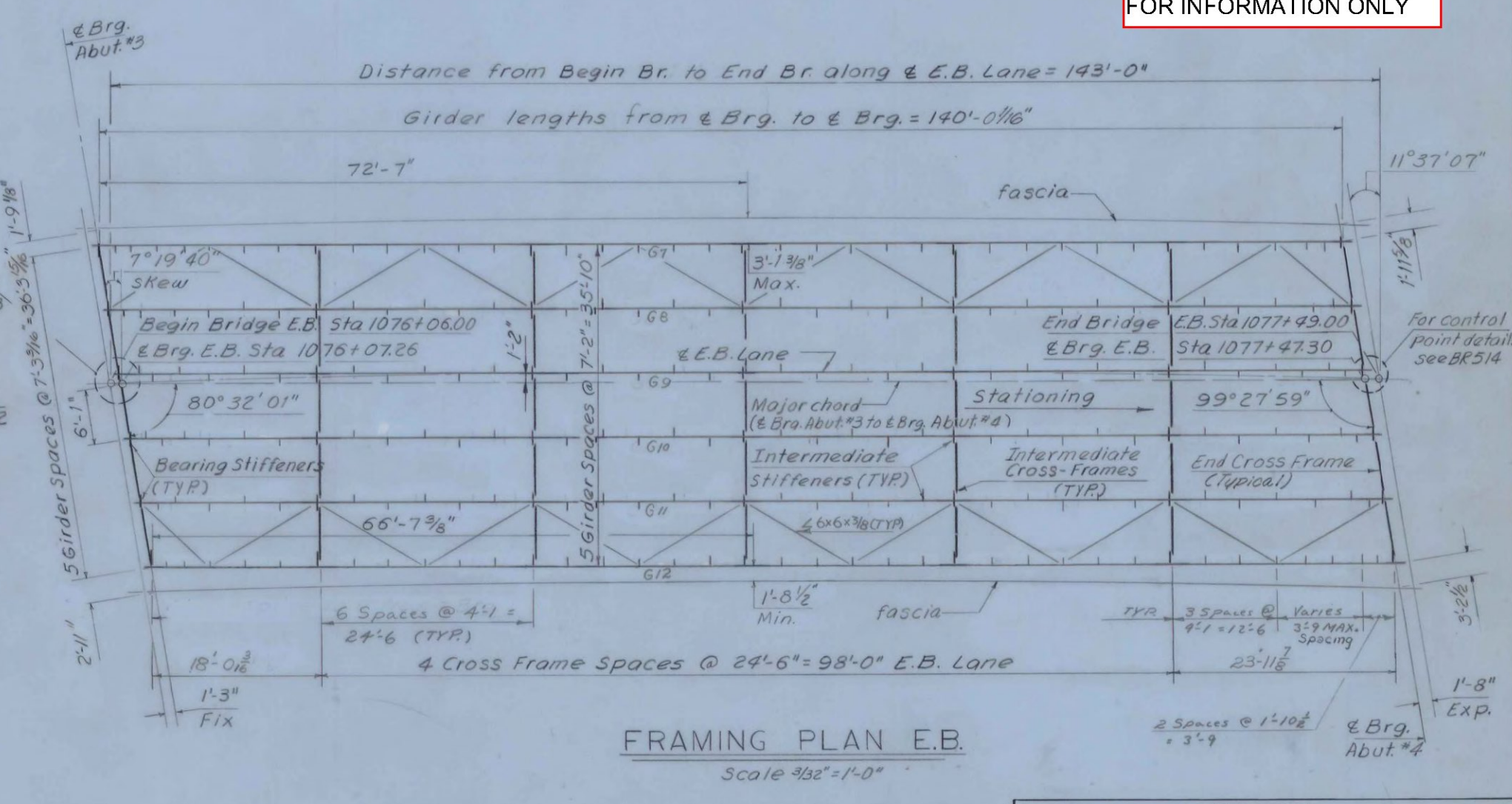


TYPICAL CURB SECTION
Scale: 1/2" = 1'-0"

FAIRHAVEN-RUTLAND
BHF BPNT (10)
PROJECT BRIDGE #5E & SW
SHEET 18 OF 28
FOR INFORMATION ONLY



FRAMING PLAN W.B.
Scale: 3/32" = 1'-0"



FRAMING PLAN E.B.
Scale: 3/32" = 1'-0"

REVISIONS (5-15-69) R.S.H.
1) CHANGE STIFFENER SPACING
2) ADD LATERAL BRACING
3) ELIMINATE GIRDER SPLICE

REVISIONS (6-23-69) R.O.H.
1) CHANGE LATERAL BRACING FROM 2.5 x 5/16 TO 2.6 x 3/8.

NOTES

1. For General Notes, see BR 501
2. For Joint Details, see BR 510
3. For Beam Haunch Details, see SCB-D2-67
4. All studs are to be 3/8" x 7" welded studs. If 7/8" studs are used, increase the spacing shown for 3/8" studs by 50%, see detail BR 505.
5. Cross Frame Notes: All gusset & connection plates shall be 7/8" plates. Cross Frame angles shall be 4.4 x 3.4.
6. All shop connections. For Cross Frames and Lateral Bracing shall be 3/8" fillet welds. All field connections shall be 3/4" high strength bolts meeting the requirements of ASTM, A 325.
7. All Girders are parallel to the major chord.
8. Cross Frames shall be bolted to stiffeners.

VERMONT
STATE HIGHWAY DEPARTMENT
TOWN OF FAIR HAVEN
U.S. ROUTE 4
U.S. RTE. 4 RELOCATION
OVER VT. 22 A RELOC.

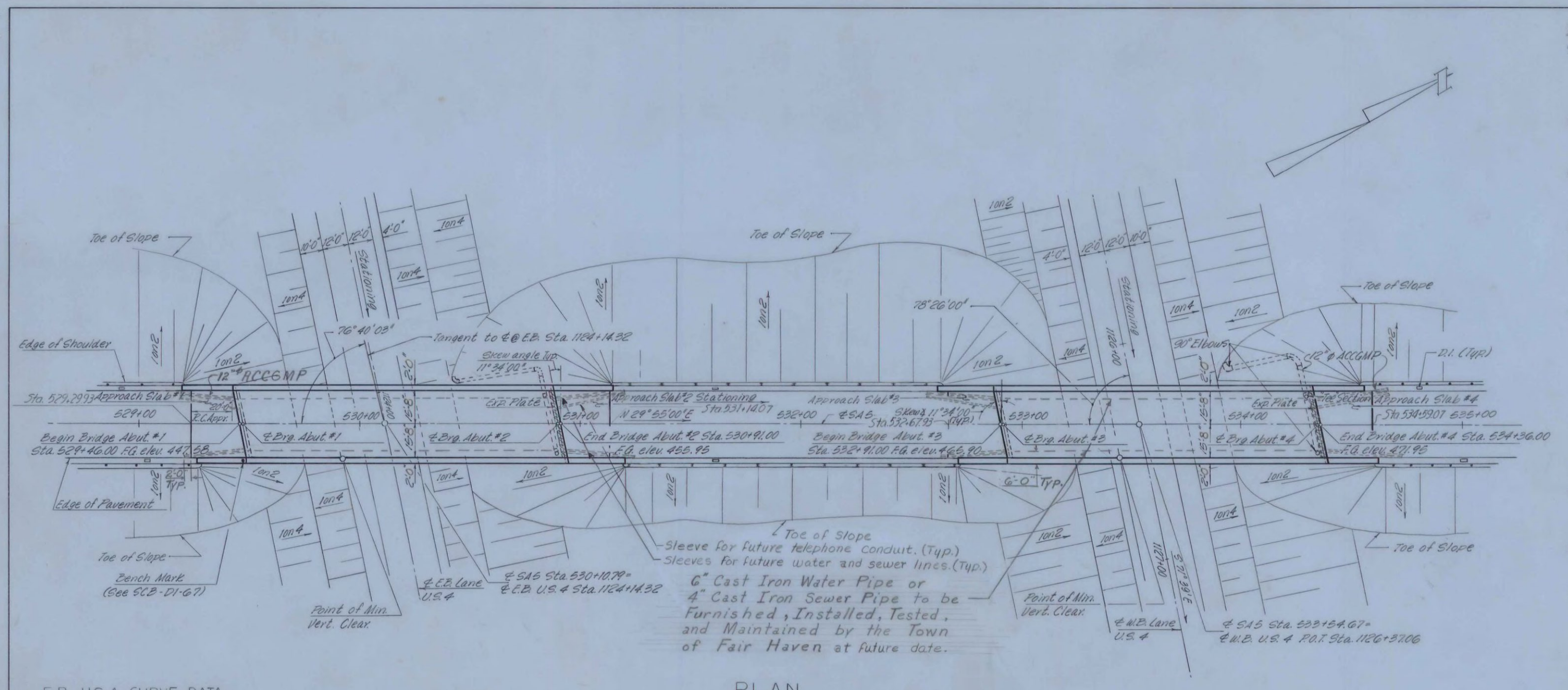
SUPERSTRUCTURE DETAILS

McFARLAND-JOHNSON
CONSULTING ENGINEERS
BINGHAMTON, NEW YORK

DESIGNED *MLB* CHECKED *EEC* DATE *5-23-69*
DRAWN *EMG* IN CHARGE *HGC* SCALE *As shown*

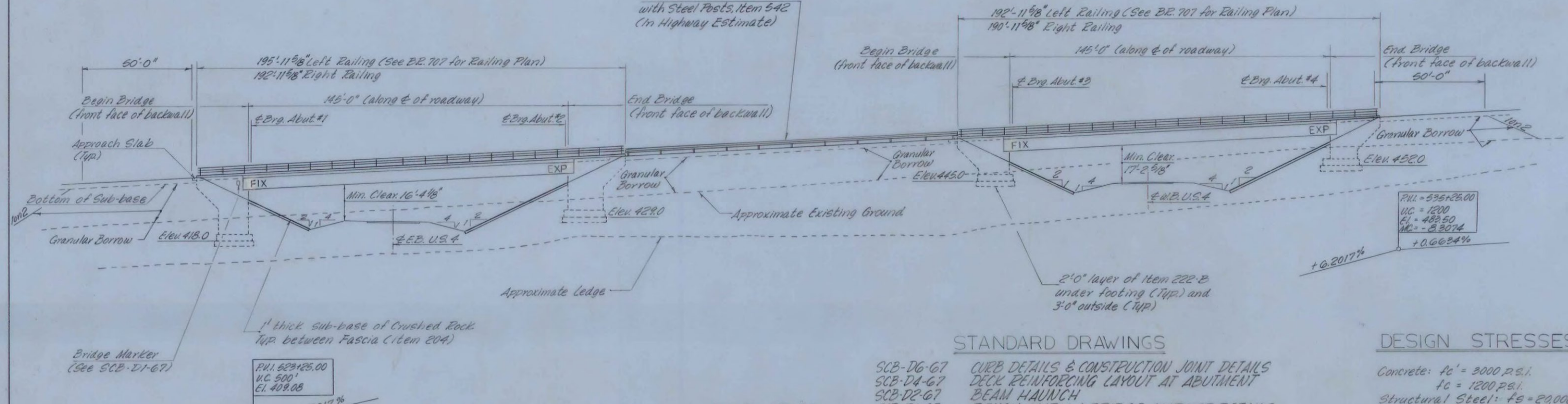
PROJECT NO. F020 - 1 (8) 1/86 U.C. 100

CONTRACT NO. BR 507 183 235



F.B. U.S. 4 CURVE DATA
CURVE NO. 4
 Δ = 8° 36' 20" LL
 D = 0° 30'
 E = 1459.16'
 F = 860.50'
 L = 1717.78'
 C = 32.26'
 Bank 14' per foot

PLAN
 Scale: 1"=50'



ELEVATION
 Scale: 1"=50'

STANDARD DRAWINGS
 SCD-D6-G7 CURB DETAILS & CONSTRUCTION JOINT DETAILS
 SCD-D4-G7 REEF REINFORCING LAYOUT AT ABUTMENT
 SCD-D2-G7 BEAM HAUNCH
 SCD-D1-G7 BRANCH MARK & BRIDGE MARKER DETAILS & GENERAL NOTES
 SB-PZ-G5 STEEL RAILING DETAILS
 SB-B1-G4 SHEETS 1&2 ALUMINUM RAILING DETAILS

DESIGN STRESSES
 Concrete: f_c = 3000 p.s.i.
 f_t = 1000 p.s.i.
 Structural Steel: f_y = 50,000 p.s.i. 1/2" plate
 Other steels as per AASHTO specs.
 Reinforcing Steel (Intermediate): f_y = 20,000 p.s.i. (tension)
 f_c = 15,000 p.s.i. (compression)

Revision 1: Included Sleeves for Water and Sewer Pipe. 7-26-68 RPG

GENERAL NOTES

- SPECIFICATIONS:**
 All materials and construction shall conform to the State of Vermont, Department of Highways, Standard Specifications for Highway and Bridge Construction, dated April 1964, and the AASHTO, Standard Specifications dated 1965 as modified by current Interim Specifications.
- LIVE LOAD:**
 Structure designed for HS 20-44 loading modified for National System of Interstate Highways applied in accordance with the provisions of the AASHTO standard Specifications Article 1.2.B.
- CONCRETE:**
 All exposed edges of concrete shall be chamfered 1"x1" unless otherwise noted. All construction joints to be made as shown on SCD-D6-G7, Details B and C unless otherwise noted.
- REINFORCEMENT:**
 All reinforcement to have a clear cover of 2" unless otherwise noted.
- DIMENSIONS:**
 All dimensions given are measured horizontally or vertically unless otherwise noted. Dimensions given are for S&T's unless otherwise noted. Elevation datum sea level based on nearest U.S. Government vertical control.
- STRUCTURAL STEEL:**
 Item 404-A shall include all structural steel, copper, wrought iron, and any other materials indicated or required in the completed structure which are not otherwise classified.
 All structural steel shall be structural carbon steel conforming to the requirements of the specifications for steel bridges and buildings A.S.T.M. designation A-50-A-52, except as otherwise noted.
 The contractor shall submit complete details of the structural steel to the State of Vermont, Department of Highways, and receive their written approval prior to the start of fabrication. The steel details shall include provisions for sanding of beams for dead load deflection as well as erection diagrams and falsework details.
 The final coat of field paint shall be green.
- WATER REPELLENT:**
 The top surface of safety walks, fascia, and back to the fascia beam under the slab, exposed areas of abutments not otherwise treated shall be covered with water repellent (Item 440).
- FIELD BOLTING:**
 Field bolted connections shall be made with 7/8" Ø A325 High Strength Bolts. 1/4" bolts are not allowed.
- ABUTMENTS:**
 The top surfaces of all abutments (123-A) shall be sloped 1/4" per foot from the back edge of the abutment to the front edge of the abutment except for bearing pads which shall be level. Elevation of bridge seats given are for centerline of bearings. The entire exposed top surface of abutments (123-A) shall be coated with Asphaltic-Asbestos coating 1/2" thick as per Item 407 of the specifications. The application of this item shall be after all painting and incidental items are completed.
- GENERAL:**
 Cross slopes of approach slabs to conform to the cross slope of the bridge.
 All expansion material shall be premoistened concrete containing no bitumen or asphalt.
- BITUMINOUS CONCRETE PAVEMENT:**
 Bituminous Concrete Pavement Item 201 Modified, Type II shall be applied in two courses.

INDEX OF DRAWINGS

BR 701	PLAN & ELEVATION	BR 703	FOOTING DETAILS, ABUTMENT No.1 & TYPICAL SECTIONS
BR 702	BRIDGE QUANTITIES	BR 704	FOOTING DETAILS, ABUTMENT No.2 & TYPICAL SECTIONS
BR 703	PRELIMINARY INFORMATION SHEET	BR 705	FOOTING DETAILS, ABUTMENT No.3 & TYPICAL SECTIONS
BR 704	BRIDGE LOG	BR 706	APPROACH SLAB No.1
BR 705	BRIDGE LOG	BR 707	APPROACH SLAB No.2
BR 706	SUPPLEMENTAL DETAILS	BR 708	APPROACH SLAB No.3
BR 707	SUPPLEMENTAL DETAILS	BR 709	APPROACH SLAB No.4
BR 708	ABUTMENT No.1 WINDOW No.1	BR 710	REINFORCING DETAILS
BR 709	ABUTMENT No.2 WINDOW No.2	BR 711	REINFORCING DETAILS
BR 710	ABUTMENT No.3 WINDOW No.3	BR 712	REINFORCING DETAILS
BR 711	ABUTMENT No.4 WINDOW No.4	BR 713	SCB-306TT

FAIRHAVEN-UTLAND
BHF BPNT (10)
PROJECT BRIDGE #7E & TW
SHEET 19 OF 28
FOR INFORMATION ONLY

Revisions: Revised to 2'0" brush curbs. Removed cheekwalls. 6-11-68 RPG/RFS

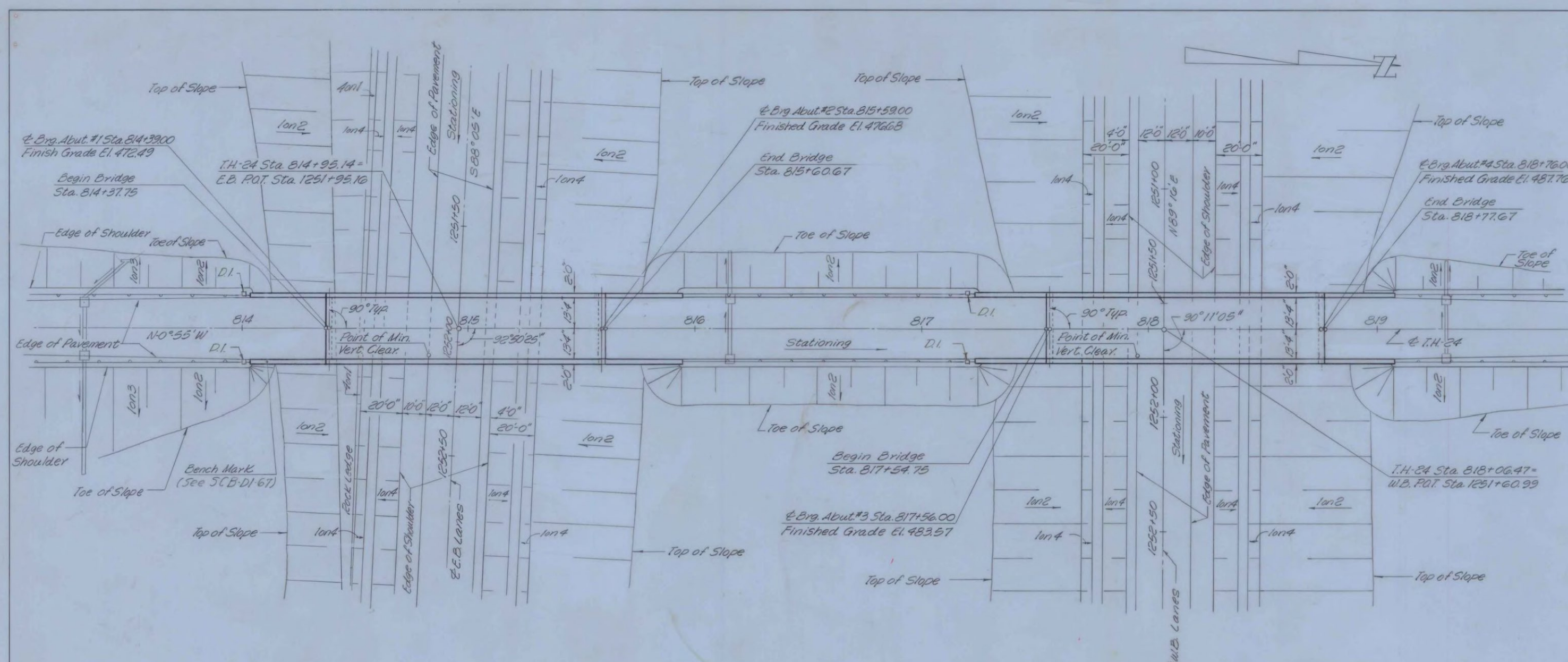
VERMONT
 STATE HIGHWAY DEPARTMENT
 TOWN OF FAIR HAVEN
 U.S. ROUTE 4

SA 5 RELOCATED OVER
 U.S. ROUTE 4 RELOCATED
 PLAN AND ELEVATION

MCFARLAND-JOHNSON
 CONSULTING ENGINEERS
 BINGHAMTON, NEW YORK

DESIGNED BY: [] CHECKED BY: [] DATE: 11.1.1967
 DRAWN BY: [] IN CHARGE: HGC SCALE: AS NOTED
 PROJECT NO. F0201(4) SH 240 OF 532

CONTRACT NO. 1 BR 701



PLAN
Scale: 1" = 30'

GENERAL NOTES

SPECIFICATIONS:
 All materials and construction shall conform to the State of Vermont, Department of Highways, Standard Specifications for Highway and Bridge Construction, dated April, 1964, and the AASHTO Standard Specifications dated 1965 as modified by current interim specifications.

LIVE LOAD:
 Structure designed for HS 20-44 loading modified for National System of Interstate Highways applied in accordance with the provisions of the AASHTO Standard Specifications Article 12.B.

CONCRETE:
 All exposed edges of concrete shall be chamfered 1"x1" unless otherwise noted. All construction joints to be made as shown on SCB-D6-G7, Details B and C unless otherwise noted.

REINFORCEMENT:
 All reinforcement to have a clear cover of 2" unless otherwise noted.

DIMENSIONS:
 All dimensions given are measured horizontally or vertically unless otherwise noted. Dimensions given are for 65°F unless otherwise noted. Elevation datum Sea level based on nearest U.S. Government vertical control.

STRUCTURAL STEEL:
 Item 404-A shall include all structural steel, copper, wrought iron, and any other materials indicated or required in the completed structure which are not otherwise classified. All structural steel shall be structural carbon steel conforming to the requirements of the specifications for steel bridges and buildings A.S.T.M. designation A-36-62, except as otherwise noted. The contractor shall submit complete details of the structural steel to the State of Vermont, Department of Highways, and receive their written approval prior to the start of fabrication. The steel details shall include provisions for cambering of beams for dead load deflection as well as erection diagrams and falsework details. The final color of field paint shall be green.

WATER REPELLENT:
 The top surface of safety walks, fascia and back to the fascia beam under the slab, exposed areas of abutments not otherwise treated shall be covered with Water Repellent (Item 404).

FIELD BOLTING:
 Field bolted connections shall be made with 7/8" φ A325 High Strength Bolts. A490 bolts are not allowed.

ABUTMENTS:
 The top surfaces of all abutments (1234) shall be sloped 1/4" per foot from the back edge of the abutment to the front edge of the abutment except for bearing pads which shall be level. Elevation of bridge seats given are for centerline of bearings. The entire exposed top surface of abutments (1234) shall be coated with asphaltic diisocyanate coating 1/2" thick as per item 404 of the specifications. The application of this item shall be after all painting and incidental items are completed.

GENERAL:
 All expansion material shall be premixed concrete containing no bitumen or asphalt. Payment for waterstop sealing strips and all labor necessary to install same, shall be included in the unit price bid for concrete class B, item 401.B.

BITUMINOUS CONCRETE PAVEMENT:
 Bituminous Concrete Pavement item 361 Modified Type II shall be applied in two courses.

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- BR 901 PLAN AND ELEVATION
- BR 902 BRIDGE QUANTITIES
- BR 903 PRELIMINARY INFORMATION SHEET
- BR 904 BORING LOG
- BR 905 BORING LOG
- BR 906 SUPERSTRUCTURE DETAILS
- BR 907 SUPERSTRUCTURE DETAILS
- BR 908 JOINT DETAILS
- BR 909 ABUTMENT NO. 1, WINGWALL NO. 1
- BR 910 ABUTMENT NO. 2, WINGWALL NO. 2
- BR 911 ABUTMENT NO. 3, WINGWALL NO. 3
- BR 912 ABUTMENT NO. 4, WINGWALL NO. 4
- BR 913 ABUTMENT NO. 1 THROUGH 4 TYPICAL SECTIONS
- BR 914 REINFORCING DETAILS
- BR 915 REINFORCING DETAILS
- BR 916 REINFORCING DETAILS
- BR 917 REINFORCING DETAILS



FAIRHAVEN-RUTLAND
 SHF BPN1 (10)
 PROJECT BRIDGE #9E & 9W
 SHEET 21 OF 28
 FOR INFORMATION ONLY

VERMONT
 STATE HIGHWAY DEPARTMENT
 TOWN OF CASTLETON
 U.S. ROUTE 4
 TH-24 OVER U.S. RTE. 4
 RELOCATION
 PLAN AND ELEVATION

McFARLAND-JOHNSON
 CONSULTING ENGINEERS
 BINGHAMTON, NEW YORK
 DESIGNED WDS CHECKED JEL DATE 3-16-68
 DRAWN LRS IN CHARGE HGC SCALE AS NOTED
 PROJECT NO. APO20450 SH 21 OF 28

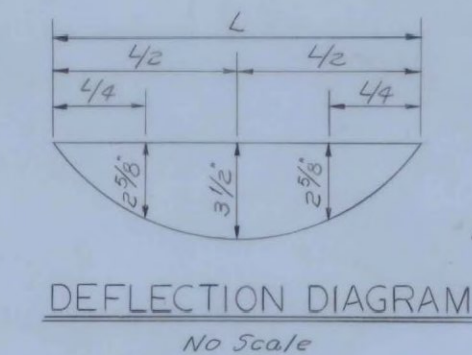
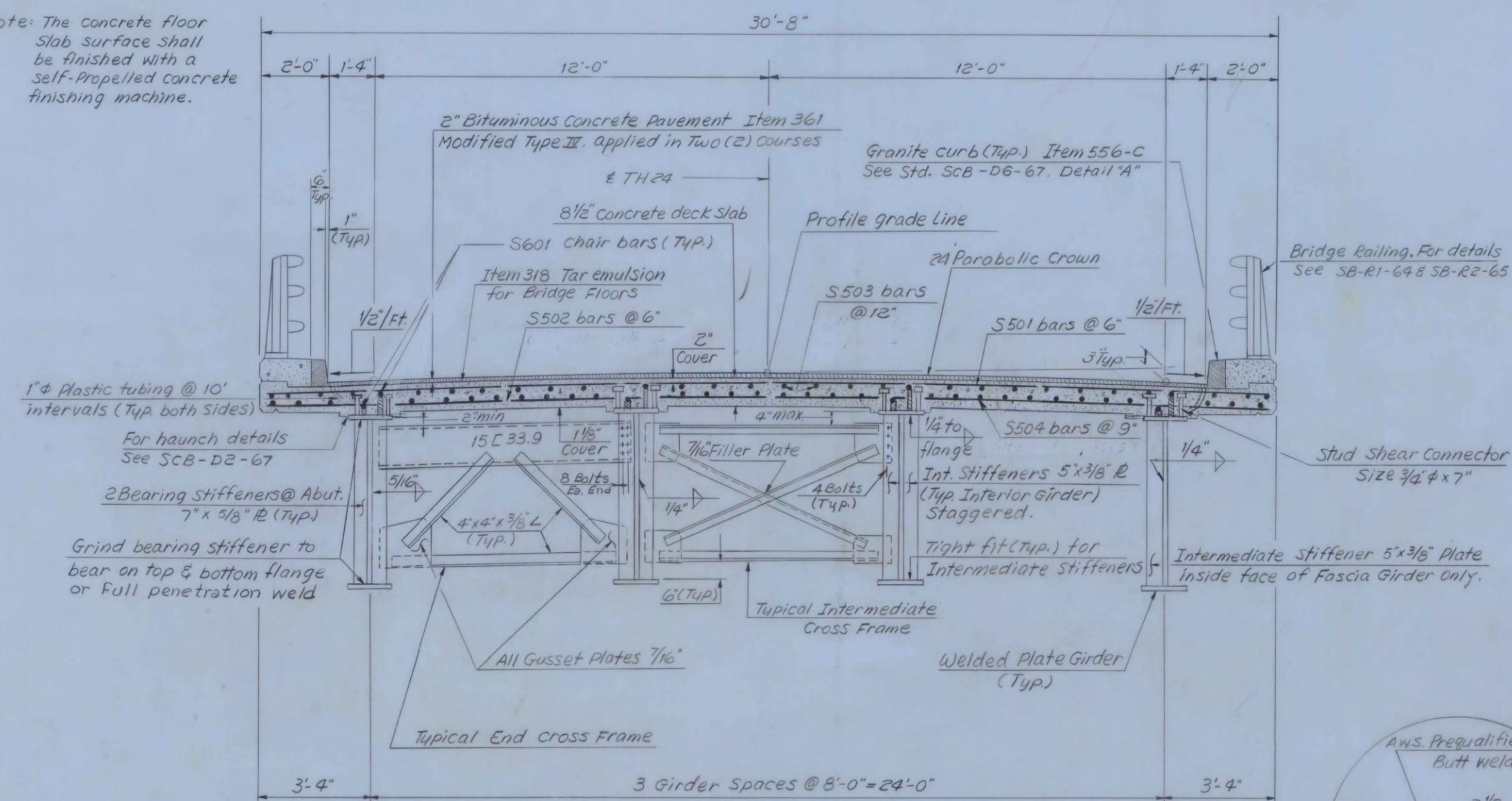
STANDARD DRAWINGS

- SCB-D6-67 CURB DETAILS & CONSTRUCTION JOINT DETAILS-DET. A,B & D, MAY 23-69 R
- SCB-D4-67 CORK REINFORCING LAYOUT AT ABUTMENT- DEC. 17-68
- SCB-D2-67 BEAM HAUNCH- DET. C JAN 24-68
- SCB-D1-67 BENCH MARK & BRIDGE MARKER DETAILS & GENERAL NOTES JAN 24-68
- SB-E2-65 STEEL RAILING DETAILS- NOV 8-66
- SB-E1-64 (SHEETS 1 & 2) ALUMINUM RAILING DETAILS- SH 1 DEC 16-68 SH 2 NOV 8-66
- SCB-D3-67 PLASTIC TUBES AT EXPANSION PLATE- DET. A, JAN 24-68

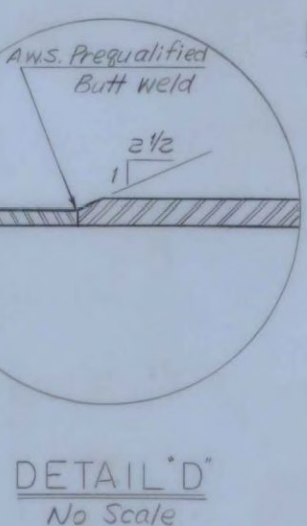
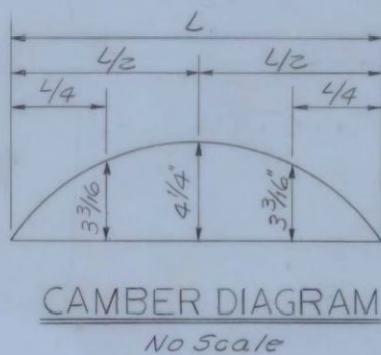
DESIGN STRESSES

Concrete: f_c = 3,000 p.s.i., f_t = 1,000 p.s.i.
 Structural Steel: f_s = 20,000 p.s.i.
 (A 36 - other steels as per AASHTO Specifications)
 Reinforcing Steel (Intermediate Grade): f_s = 20,000 p.s.i. (Tension)
 f_s = 16,000 p.s.i. (Compression)

Note: The concrete floor slab surface shall be finished with a self-applied concrete finishing machine.

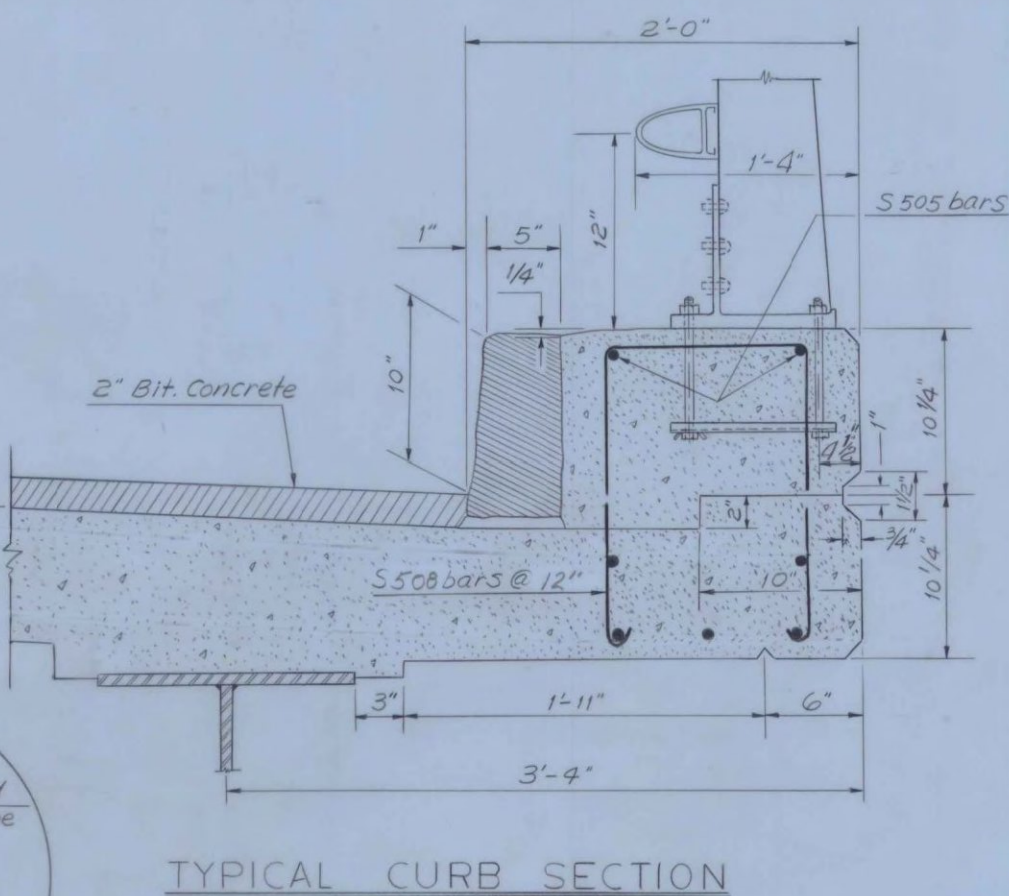


TYPICAL SECTION
Scale: 3/8" = 1'-0"



DETAIL 'B'
No Scale

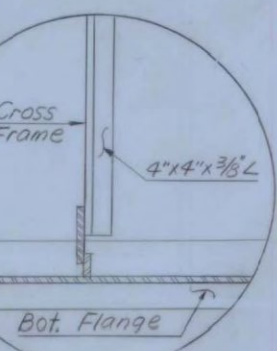
DETAIL 'C'
No Scale



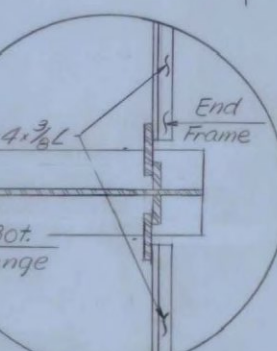
TYPICAL CURB SECTION
Scale: 1/2" = 1'-0"



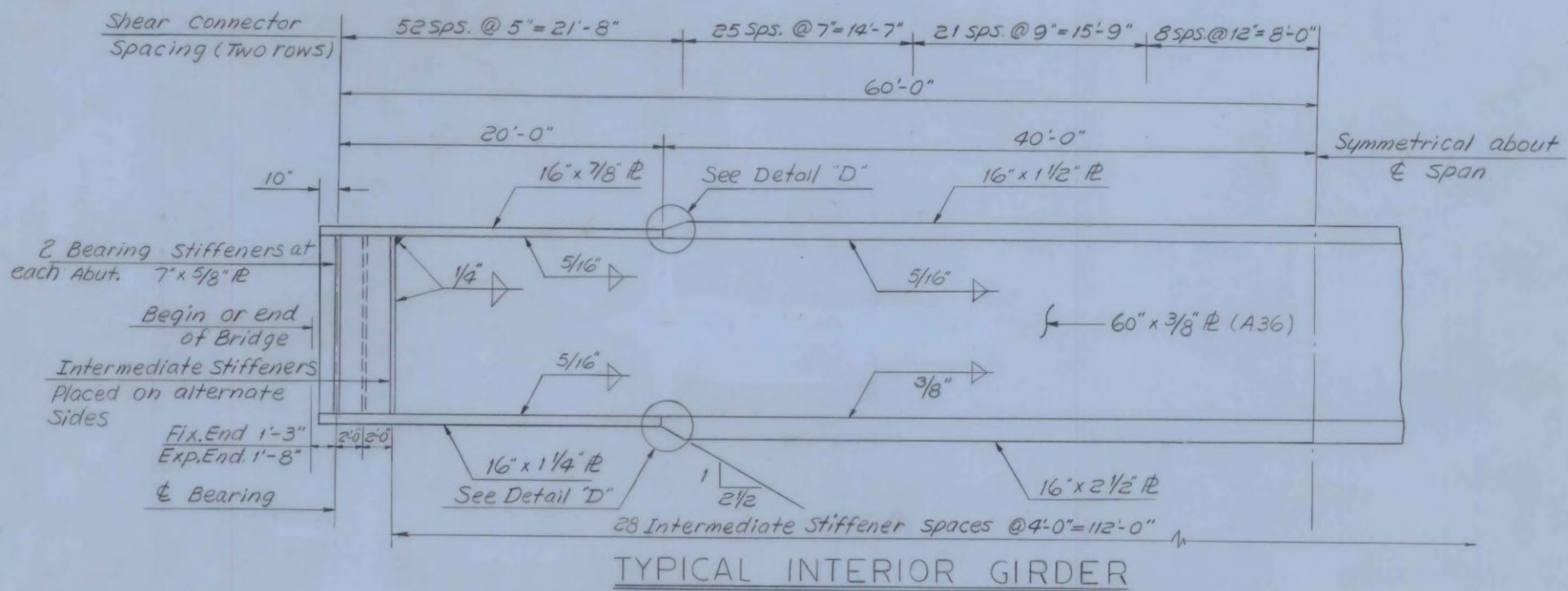
DETAIL 'A'
No Scale



DETAIL 'B'
No Scale



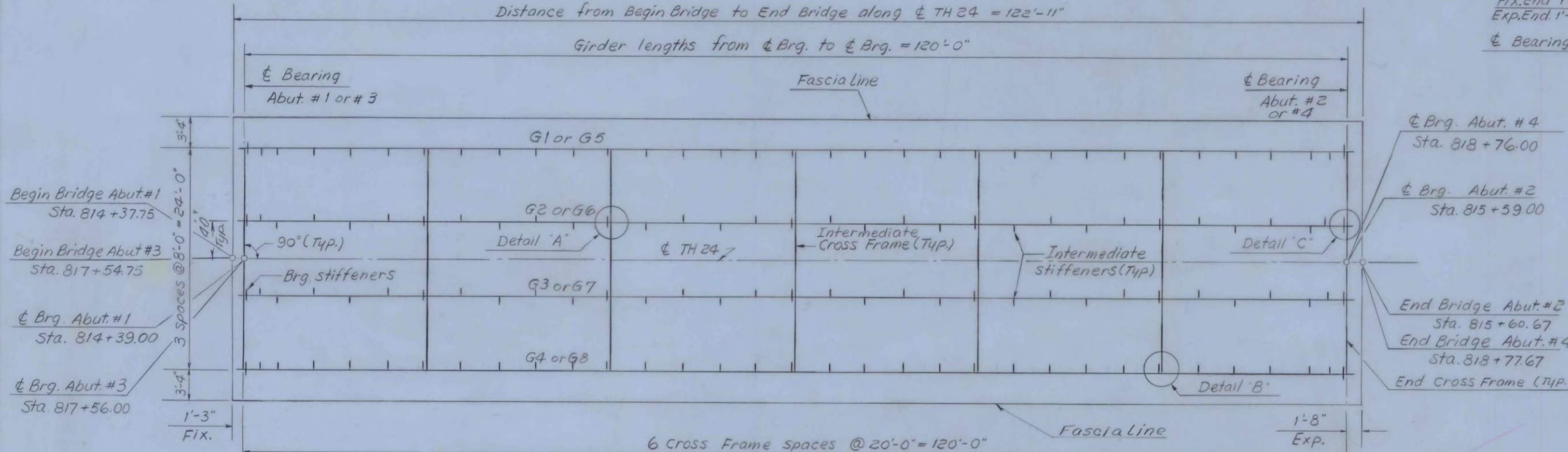
DETAIL 'C'
No Scale



TYPICAL INTERIOR GIRDER
No Scale

- NOTES**
1. For General Notes see BE 901
 2. For Joint Details see BE 905
 3. For Beam Haunch Details see SCB-D2-67
 4. All studs are to be 3/8" x 7" welded studs. If 3/8" studs are used, increase spacing shown for 3/4" studs by 50%.
 5. CROSS FRAME NOTES: All gusset and connection plates shall be 7/16" plates. Gusset and connection plates shall be welded to stiffeners with a 5/16" fillet weld. All angles shall be 4-1/2" x 3/8" angles.
 6. All shop connections for cross frames shall be 3/8" fillet welds. All field connections shall be 7/8" high strength bolts.
 7. For Stud Shear Connector Detail see BE 907.

NOTE: Fascia girders are identical to interior girders except for the intermediate stiffeners, which shall be placed on the inside face only of the fascia girders.



FRAMING PLAN
Scale: 1/8" = 1'-0"

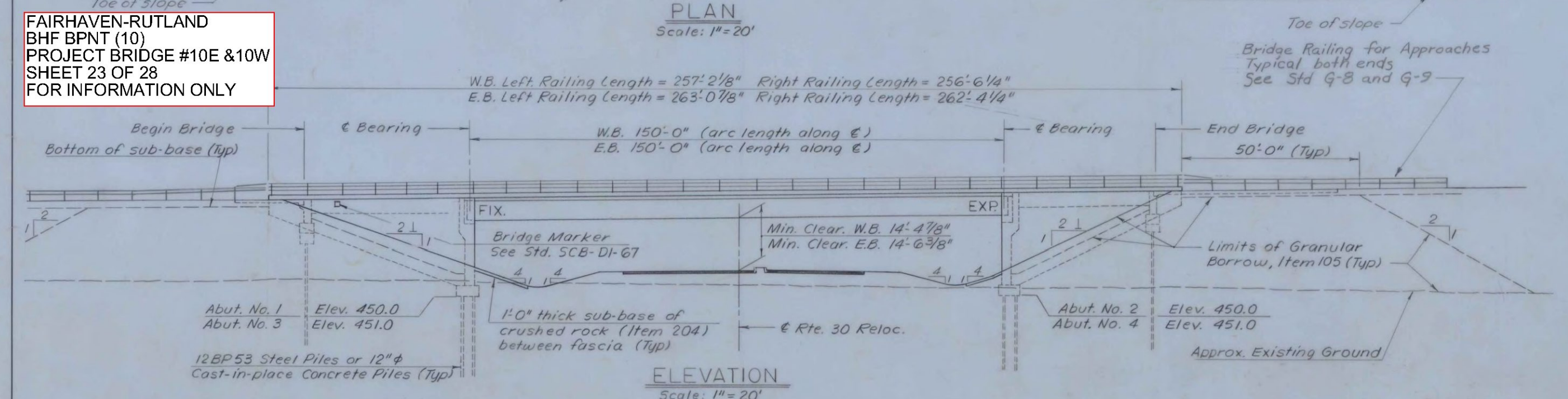
REVISIONS	
DELETED OPTIONAL GIRDER SPLICE	R.S.H. 5-21-69
CURB REINFORCING REVISED	R.S.H. 7-31-69

VERMONT
STATE HIGHWAY DEPARTMENT
TOWN OF CASTLETON
U.S. ROUTE 4
TH-24 OVER U.S. RTE 4
RELOCATION
SUPERSTRUCTURE DETAILS

McFARLAND-JOHNSON
CONSULTING ENGINEERS
BINGHAMTON, NEW YORK

DESIGNED WDS CHECKED DEL DATE 3-18-68
DRAWN LWC IN CHARGE HGC SCALE AS NOTED
PROJECT NO. APO20-160 SH. 400F-421

CONTRACT NO. BR. 906



GENERAL NOTES

- SPECIFICATIONS:**
 All materials and construction shall conform to the State of Vermont, Department of Highways, Standard Specifications for Highway and Bridge Construction dated April, 1964, and the A.A.S.H.O. Standard Specifications dated 1965, as modified by current Interim Specifications.
- LIVE LOAD:**
 Structure designed for HS-20-44 loading modified for National System of Interstate Highways applied in accordance with the provisions of the A.A.S.H.O. Standard Specifications, Article 1.2.8.
- CONCRETE:**
 All exposed edges of concrete shall be chamfered 1" x 1" unless otherwise noted. All construction joints to be made as shown on SCB-D6-67, details B and C, unless otherwise noted.
- REINFORCEMENT:**
 All reinforcement to have a clear cover of 2", unless otherwise noted.
- DIMENSIONS:**
 All dimensions given are measured horizontally or vertically unless otherwise noted. Dimensions given are for 68" F, unless otherwise noted. Elevation datum, sea level, based on nearest U.S. Government vertical control.
- STRUCTURAL STEEL:**
 Item 404-A shall include all structural steel, copper, wrought iron, and any other materials indicated or required in the completed structure which are not otherwise classified. All structural steel shall be structural carbon steel conforming to the requirements of the specifications for steel bridges and buildings ASTM Designation A-36-62T, except as otherwise noted. The contractor shall submit complete details of the structural steel to the State of Vermont, Department of Highways, and receive their written approval prior to the start of fabrication. The steel details shall include provisions for cambering of beams for dead load deflection as well as erection diagrams and falsework details. The final coat of field paint shall be green.
- WATER REPELLENT:**
 The top surfaces of safety walks, fascia and back to the fascia beam under the slab, and on exposed areas of abutments not otherwise treated, and the area inside the abutments shall be covered with water-repellent (Item 410).
- FIELD BOLTING:**
 Field bolted connections shall be made with $7/8" \phi$ A325 High Strength bolts. A490 bolts are not allowed.
- ABUTMENTS:**
 The top surfaces of all abutments shall be sloped $1/4"$ per foot from the front edge of abutment curtainwalls, except for bearing pads projecting 1" or more above the general area, which surfaces shall be level. Elevations of bridge seats given are for centerline of bearings. The entire exposed top surface of abutments shall be coated with Asphaltic-Asbestos Coating, $1/2"$ thick, as per Item 407 of the specifications. The application of this item shall be after all painting and incidental items are completed. Fill inside the abutments shall be graded to 3" above the bottom of the exterior concrete girders of the abutment section and shall meet the requirements of Item 105.
- PILES:**
 Cast-in-place piling or steel piling will be chosen by alternate bids. Vertical Design Loads 40 tons/pile (12" ϕ cast-in-place); 58 tons/pile (12" BP 53 steel). Horizontal Design Load 3 tons per pile. Steel piling shall be driven to edge. Cast-in-place piling shall be driven to the lengths indicated on the plans unless otherwise directed by the Engineer. Care shall be taken not to damage the tip of the cast-in-place piles.
- GENERAL:**
 Cross slopes of the approach slabs to conform to the cross slope of the bridge. All expansion material shall be premealed cork containing no bitumen or asphalt.
- BITUMINOUS CONCRETE PAVEMENT:**
 Bituminous concrete pavement, Item 361 Modified, Type II, shall be applied in two courses.

INDEX OF DRAWINGS

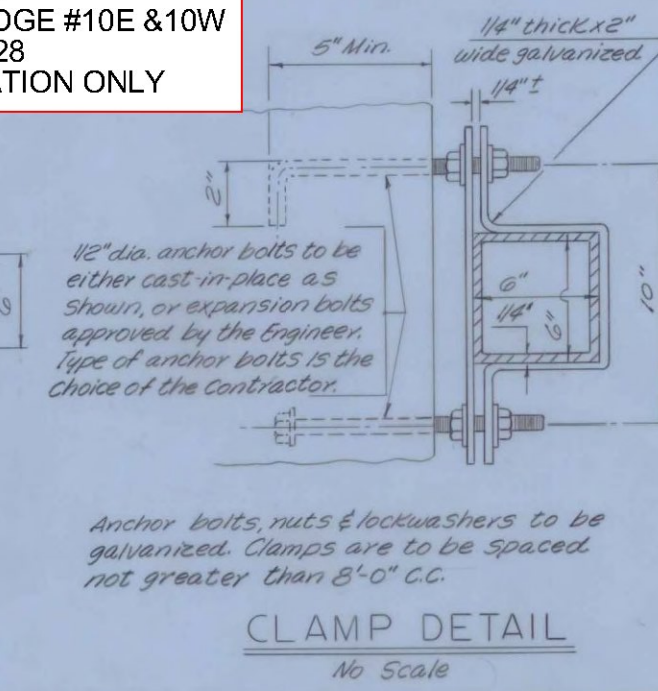
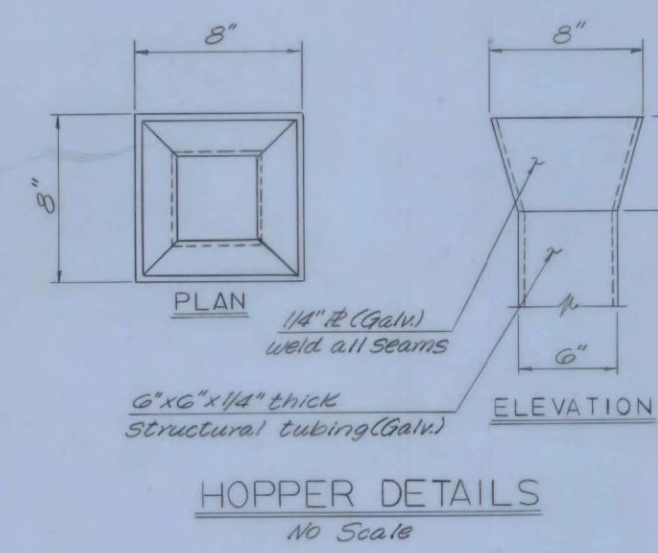
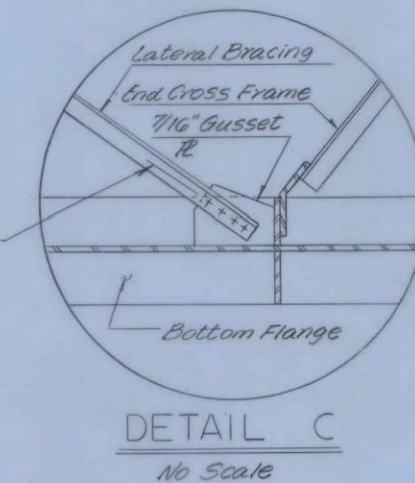
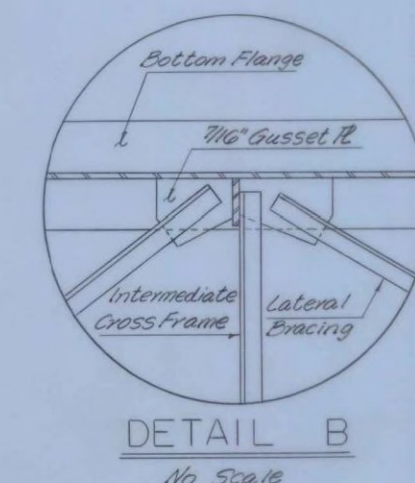
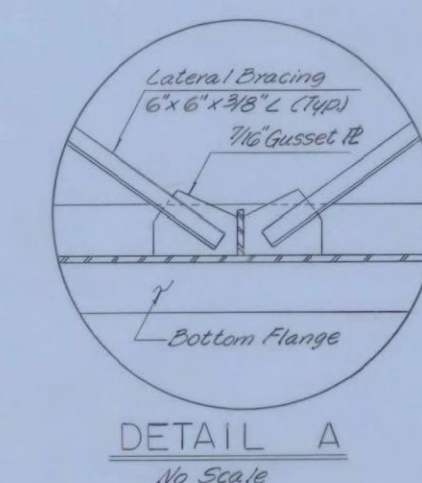
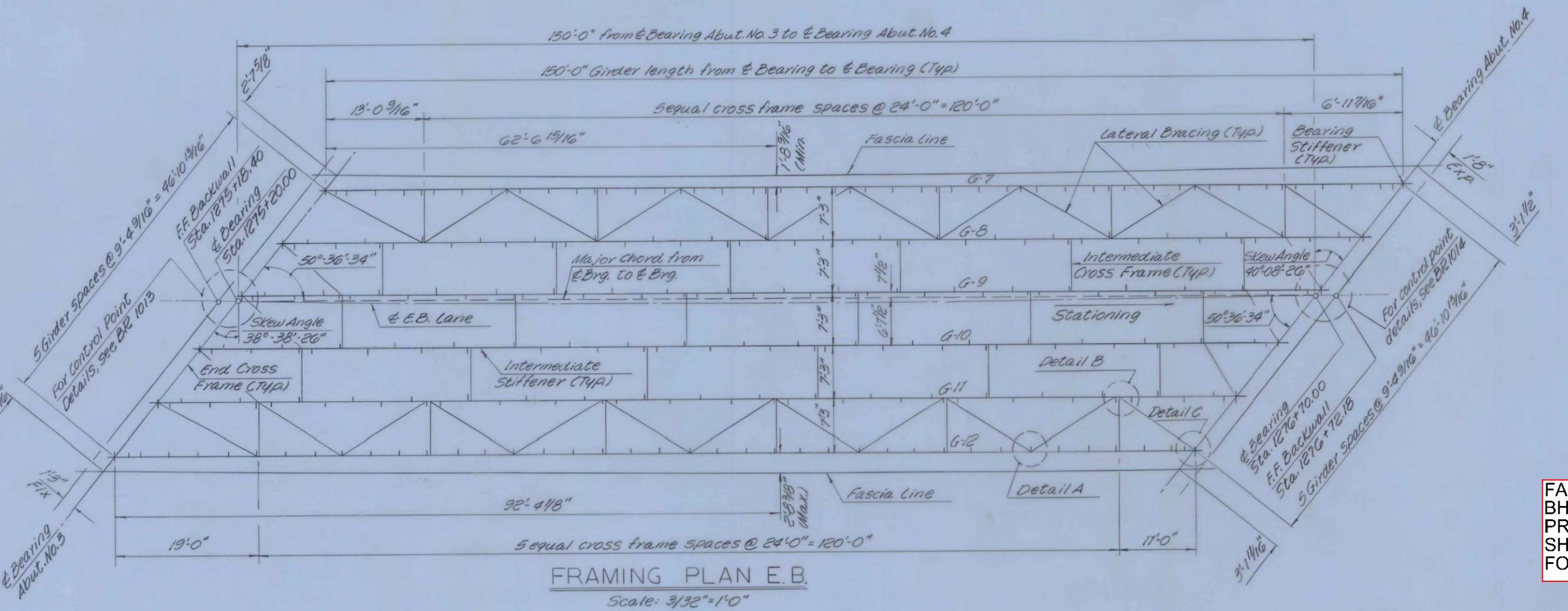
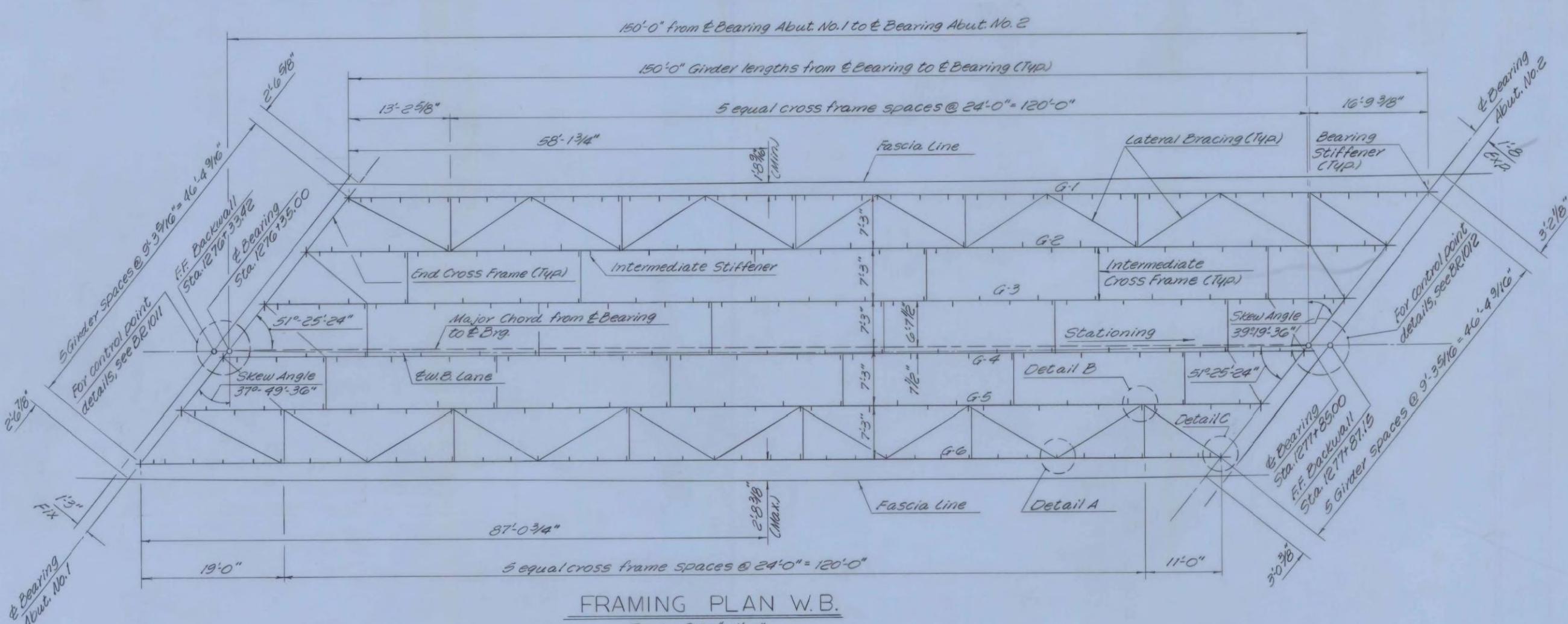
- BR1001 PLAN AND ELEVATION
- BR1002 QUANTITY SHEET
- BR1003 PRELIMINARY INFORMATION SHEET
- BR1004 BORING LOG
- BR1005 BORING LOG
- BR1006 BORING LOG
- BR1007 SUPERSTRUCTURE DETAILS
- BR1008 SUPERSTRUCTURE DETAILS
- BR1009 SUPERSTRUCTURE DETAILS
- BR1010 JOINT DETAILS
- BR1011 ABUTMENT NO. 1 DETAILS
- BR1012 ABUTMENT NO. 2 DETAILS
- BR1013 ABUTMENT NO. 3 DETAILS
- BR1014 ABUTMENT NO. 4 DETAILS
- BR1015 EXTERIOR GIRDERS ABUTMENTS 1 & 2
- BR1016 EXTERIOR GIRDERS ABUTMENTS 3 & 4
- BR1017 FOOTING DETAILS & TYPICAL SECTIONS
- BR1018 FOOTING DETAILS & TYPICAL SECTIONS
- BR1019 APPROACH SLAB NO. 1
- BR1020 APPROACH SLAB NO. 2
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- BR1023 REINFORCING DETAILS
- BR1024 REINFORCING DETAILS
- BR1025 REINFORCING DETAILS
- BR1026 REINFORCING DETAILS

STANDARD DRAWINGS

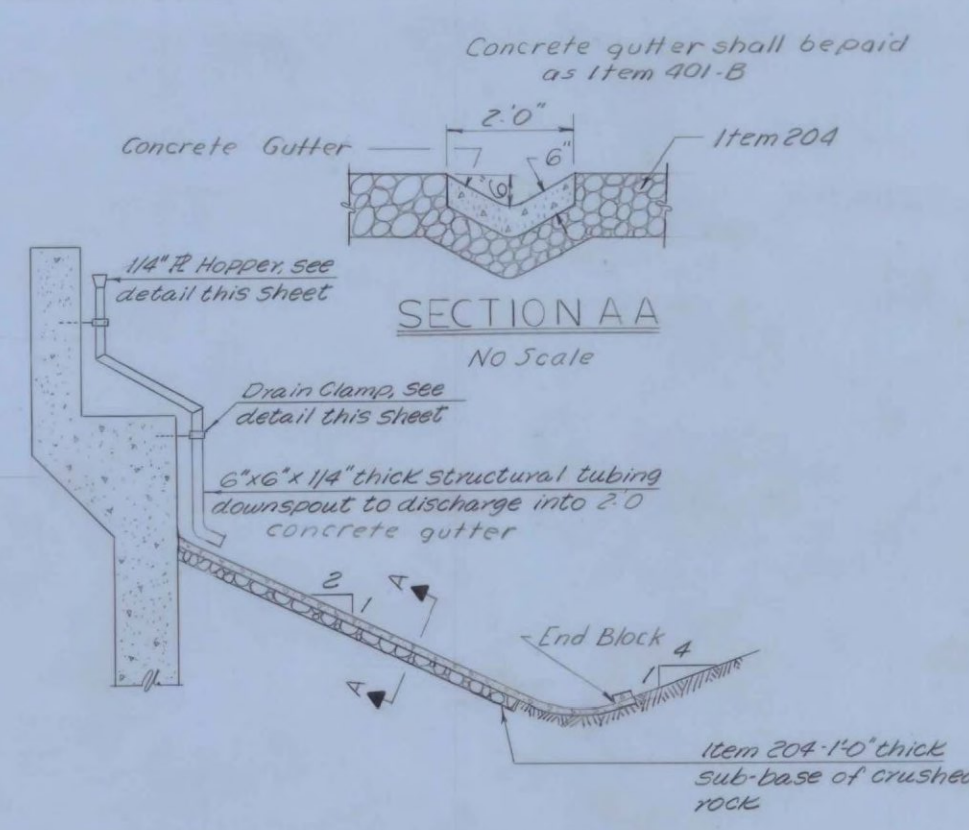
- SCB-D6-67 PILE SPICE DETAILS & CONSTRUCTION JOINT DETAILS MAY 23-63R
- SCB-D4-67 DECK REINFORCING LAYOUT AT ABUTMENTS DEC. 17-68
- SCB-D2-67 BEAM HAUNCH JAN. 23-68
- SCB-D1-67 BENCH MARK & BRIDGE MARKER DETAILS AND GENERAL NOTES JAN. 24-68
- SB-E2-65 STEEL RAILING DETAILS NOV. 24-65R
- SB-F1-64 (SHEETS 1 AND 2) ALUMINUM RAILING DETAILS SH. 1 OF 2 DEC. 16-68
- SH-2 OF 2 NOV. 8-66R
- 3B-F1-66 CAST-IN-PLACE CONCRETE PILING NOV. 8-66
- G-8 BRIDGE RAILING (BRIDGE APPROACHES) FEB. 13-65
- G-9 BRIDGE RAILING (BRIDGE APPROACHES) AUG. 21-65

VERMONT
 STATE HIGHWAY DEPARTMENT
 TOWN OF CASTLETON
 U.S. ROUTE 4
 U.S. RTE. 4 RELOCATION
 OVER RTE. 30 RELOC.
 PLAN AND ELEVATION

DESIGNED BY: [] CHECKED BY: [] DATE: 9-16-68
 DRAWN BY: [] IN CHARGE: HGC SCALE: AS SHOWN
 PROJECT NO. APO20K01SH 152 OF 221
 CONTRACT NO. F (2) BR 1001



REVISION
DELETED OPTIONAL GIRDER
SPLICE
INCREASED LATERAL BRACING
TO 6x6x3/8 & RSH 5-21-69



Downspouts to be placed inside of north fascia girders. Downspout is included in the price of the expansion joint. C to be paid for under Item 404-A.

DOWNSPROUT DETAIL AT EXPANSION JOINT
No Scale

- NOTES:
1. For General Notes, see BE-1001.
 2. For Cross Frame Notes, see BE-1007.
 3. All girders are parallel to the Major Chord.

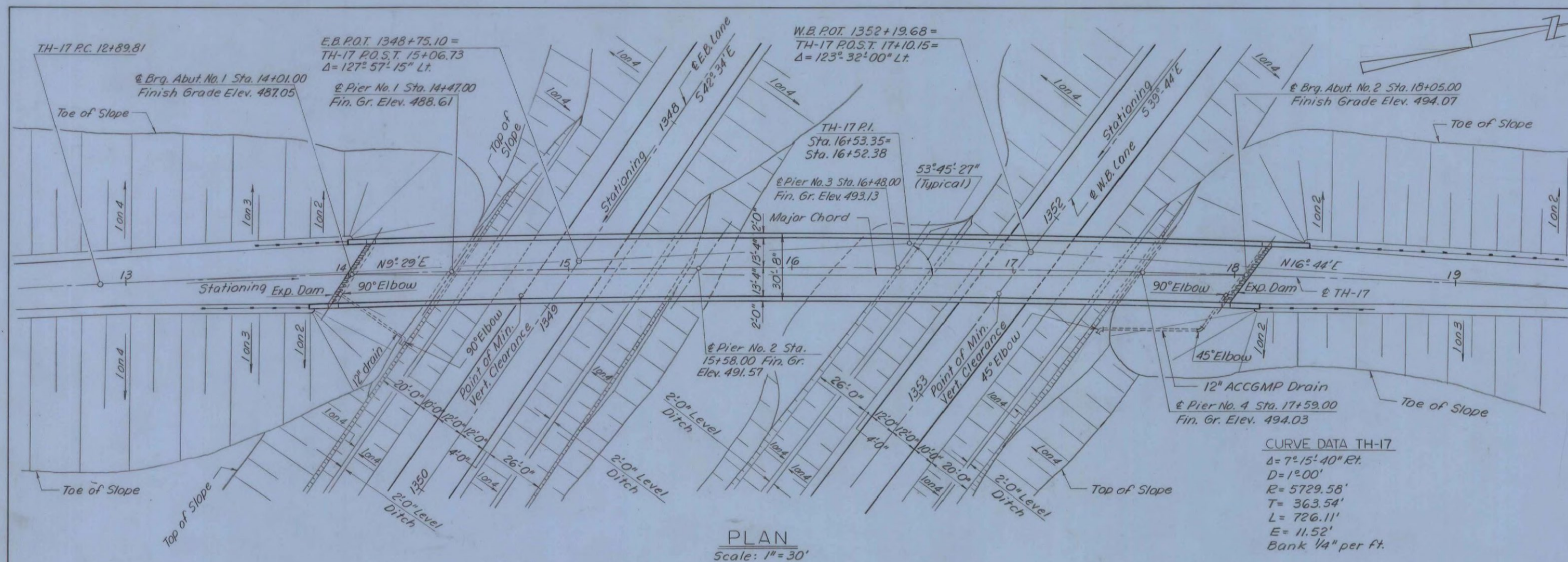
FAIRHAVEN-RUTLAND
BHF BPNT (10)
PROJECT BRIDGE #10E & 10W
SHEET 24 OF 28
FOR INFORMATION ONLY

VERMONT
STATE HIGHWAY DEPARTMENT
TOWN OF CASTLETON
U.S. ROUTE 4
US RTE. 4 RELOCATION
OVER RTE. 30 RELOC.
SUPERSTRUCTURE DETAILS

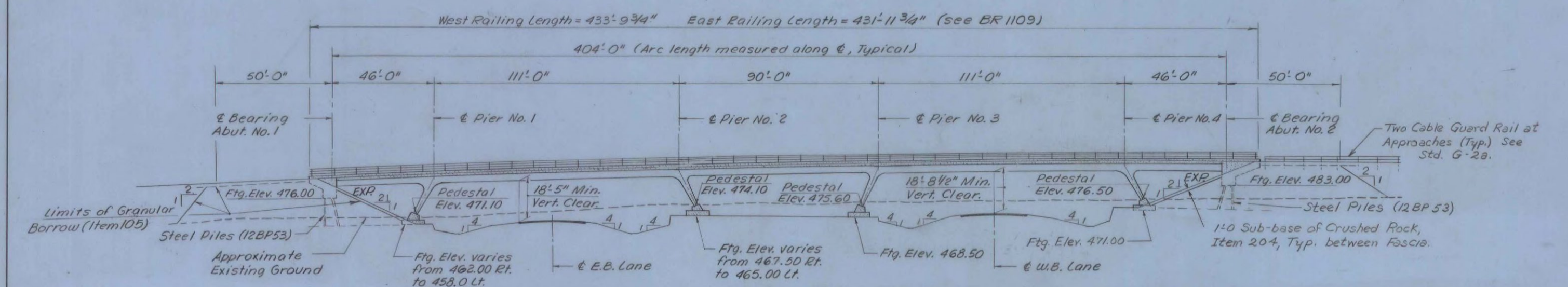
McFARLAND-JOHNSON
CONSULTING ENGINEERS
BINGHAMTON, NEW YORK

DESIGNED W.D.S. CHECKED REC. DATE 9-16-68
DRAWN L.R.S. IN CHARGE H.G.C. SCALE AS SHOWN
PROJECT NO. APO20(150) SH 159 OF 24

CONTRACT NO. BR 1008



PLAN
Scale: 1" = 30'



ELEVATION
Scale: 1" = 30'

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BR 103	PRELIMINARY INFORMATION SHEET
BR 104	BORING LOG
BR 105	SUPERSTRUCTURE DETAILS
BR 106	SUPERSTRUCTURE DETAILS
BR 107	SUPERSTRUCTURE DETAILS
BR 108	SUPERSTRUCTURE DETAILS
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BR 113	ABUTMENT FOOTING DETAILS & TYPICAL SECTIONS
BR 114	PIER NO. 1 & PIER NO. 2
BR 115	PIER NO. 3 & PIER NO. 4
BR 116	REINFORCING STEEL DETAILS
BR 117	REINFORCING STEEL DETAILS

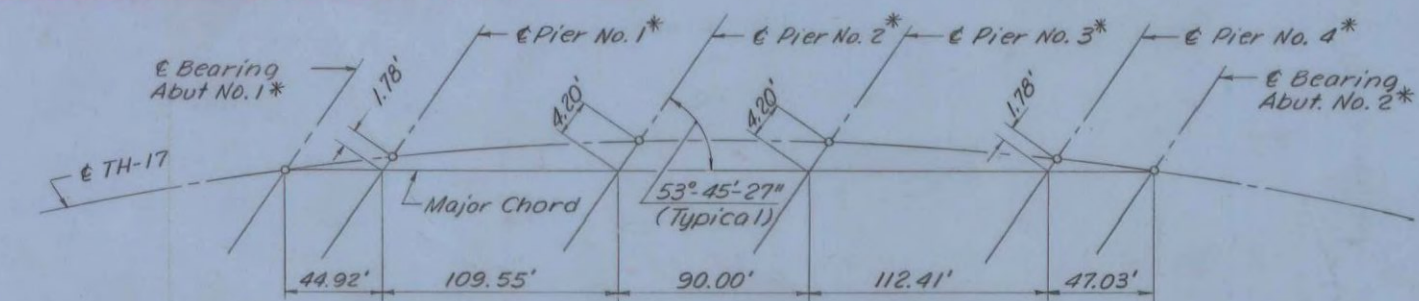
CONTRACTOR E.T. O'NEIL & SON
RESIDENT ENGINEER N.W. BITTNER
INSPECTOR R.L. WEICHERT

CONTRACT DATED AUG. 19, 1970
STARTED AUG. 25, 1970
COMPLETED AUG. 31, 1971
ACCEPTED SEPT. 15, 1971

MATERIALS
CONCRETE (AA & B): CARRARA
REINFORCING STEEL: BETHLEHEM STEEL
STRUCTURAL STEEL: VT. STRUCT. STEEL
BRIDGE RAILING: S.T. GRISWOLD

STANDARD DRAWINGS

SCB-DI-67	BENCH MARK DETAILS & GENERAL NOTES	APRIL 20, 1970 R.
SCB-DE-67	CURB DETAILS, PILE SPICE DETAILS, & CONSTRUCTION JOINT DETAILS	APRIL 20, 1970 R.
SB-E2-65	STEEL RAILING DETAILS	Nov. 8, 1964 R.
SB-E1-64	(SHEETS 1 & 2) ALUMINUM RAILING DETAILS	APRIL 28, 1970 R.
SCB-DD-67	BEAM HAUNCH	Jan. 24, 1968
SCB-DD-67	DIAPHRAGM DETAILS	Jan. 24, 1968



SUPERSTRUCTURE LAYOUT FROM MAJOR CHORD
 No Scale
 * WORKING POINTS ARE LOCATED AT TOP OF STEEL FRAME AS SHOWN ON BR. 1106. FOR SUBSTRUCTURE LAYOUT SEE BR. 1113

DESIGN STRESSES
 CONCRETE: $f_c = 3,000$ p.s.i.
 $f_c = 1,200$ p.s.i.
 STRUCTURAL STEEL: $f_s = 20,000$ p.s.i. (A36, other steels as per AASHTO Specifications)
 REINFORCING STEEL: $f_s = 20,000$ p.s.i. (Tensile)
 $f_s = 16,000$ p.s.i. (Compression) (intermediate grade)

GENERAL NOTES

- SPECIFICATIONS:**
 All materials and construction shall conform to the State of Vermont, Department of Highways, Standard Specifications for Highway and Bridge Construction, dated April, 1964 and the AASHTO Standard Specifications dated 1963, as modified by current Interim Specifications.
- LIVE LOAD:**
 Structure designed for HS-20-44 loading modified for National System of Interstate Highways applied in accordance with the provisions of the AASHTO Standard Specifications Article 1.2.8.
- CONCRETE:**
 All exposed edges of concrete shall be chamfered 1"x1" unless otherwise noted. All construction joints to be made as shown on SCB-DE-67 details B and C unless otherwise noted.
- REINFORCEMENT:**
 All reinforcement to have a clear cover of 2", unless otherwise noted.
- DIMENSIONS:**
 All dimensions given are measured horizontally or vertically unless otherwise noted. Dimensions given are for 68% unless otherwise noted. Elevation datum sea level based on nearest U.S. Government vertical control.
- STRUCTURAL STEEL:**
 Item 404-A shall include all structural steel, copper, wrought iron, and any other materials indicated or required in the completed structure which are not otherwise classified. Structural steel shall be structural carbon steel conforming to the requirements of the specifications for steel bridges and buildings ASTM Designations as noted on the project plans. The contractor shall submit complete details of the structural steel to the State of Vermont, Department of Highways, and receive their written approval prior to start of fabrication. The steel details shall include provisions for cambering of beams for dead load deflection as well as erection diagrams and falsework details. The final coat of field paint shall be green.
- WATER REPELLENT:**
 The top surfaces of safety walks, fascia, bottom of deck slab back to the exterior frame and the exposed areas of the Piers and abutments not otherwise treated shall be covered with Water Repellent (Item 440).
- FIELD BOLTING:**
 Field bolted connections shall be made with 3/8" x A325 High Strength bolts. A490 bolts are not allowed.
- ABUTMENTS AND PIERS:**
 The top surfaces of all abutments shall be sloped 1/4" ft. from the front edge of abutment and curtainwalls except for bearing pads, which shall be level. Elevation of bridge seats given are for centerline of bearings. The entire exposed top surface of abutments shall be coated with Asphaltic-Asbestos coating 1/8" thick as per Item 407 of the specifications. The application of this item shall be after all painting and incidental items are completed.
- STEEL PILES:**
 Steel bearing piles shall be driven to ledge rock unless otherwise approved by the engineer. When piles are driven in fill the material shall be such as to have no stones large enough to interfere with the driving of the piles. All pile points shall be reinforced with steel plates as specified in Article 503.03, Subarticle C, Part 1 of the Special Provisions for Item 503-C, Steel Piling.
- GENERAL:**
 All expansion material shall be premeled cork containing no bitumen or asphalt. Polyureth sealants and all labor necessary to install same shall be included in the unit price bid for Concrete Class B, Item 401-B.
- BITUMINOUS CONCRETE PAVEMENT**
 Bituminous Concrete Pavement, Item 361 (Modified) Type II mix shall be applied in two courses.

FAIRHAVEN-RUTLAND
 BHP BPNT (10)
 PROJECT BRIDGE #D11
 SHEET 25 OF 28
 FOR INFORMATION ONLY

NOTE: ANY REQUEST FOR CLARIFICATION CONCERNING FINAL QUANTITIES, AMOUNTS OR OTHER DETAILS RELATIVE TO THIS PROJECT MAY BE FOUND IN EITHER THE FIELD BOOK OR THE ESTIMATE FILE.

VERMONT
 STATE HIGHWAY DEPARTMENT
 TOWN OF CASTLETON
 U.S. ROUTE 4

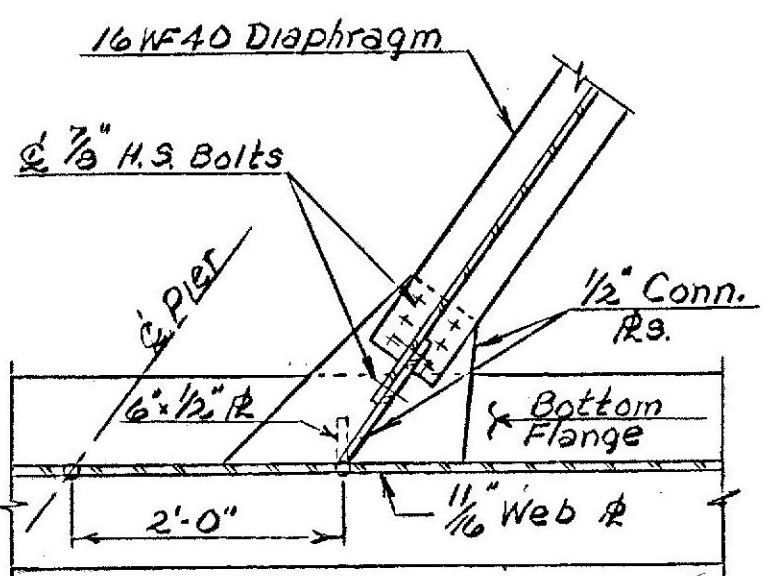
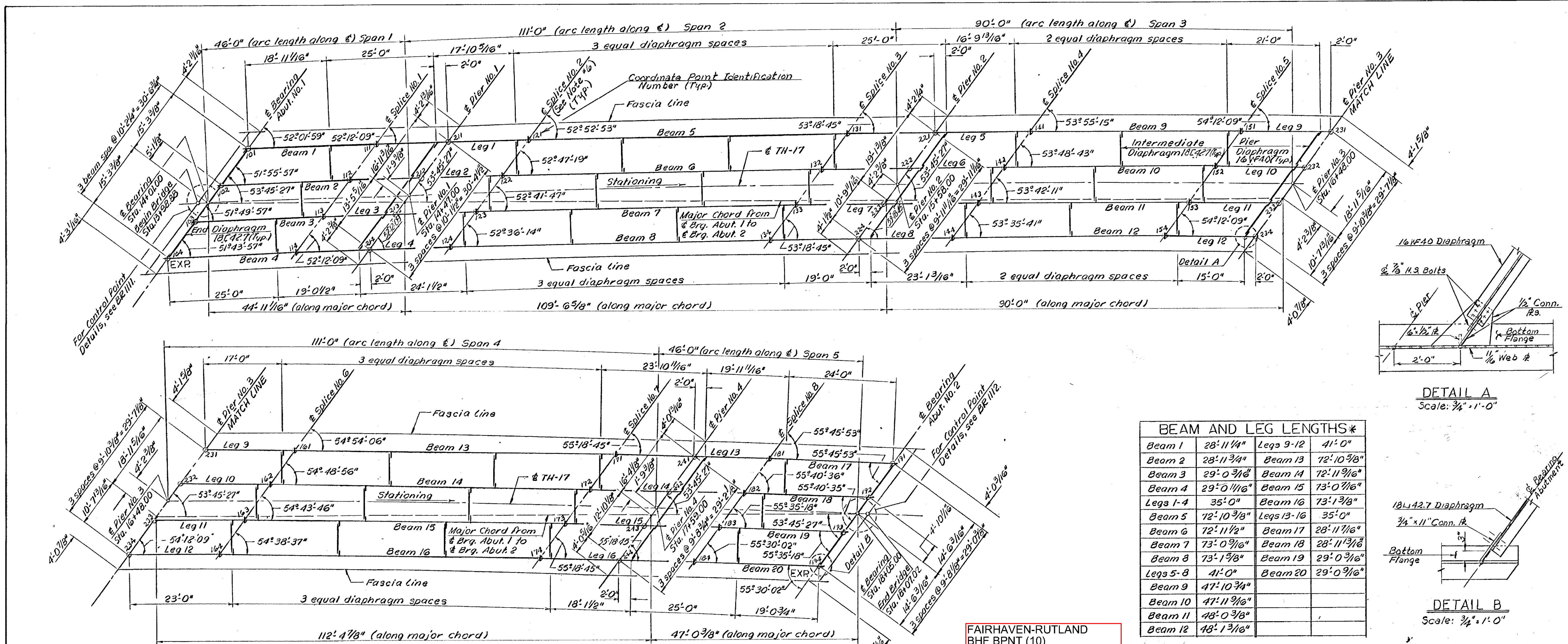
TH-17 RELOC. OVER U.S. RTE 4 RELOC.
 PLAN AND ELEVATION

MEFARLAND-JOHNSON
 CONSULTING ENGINEERS
 BINGHAMTON, NEW YORK

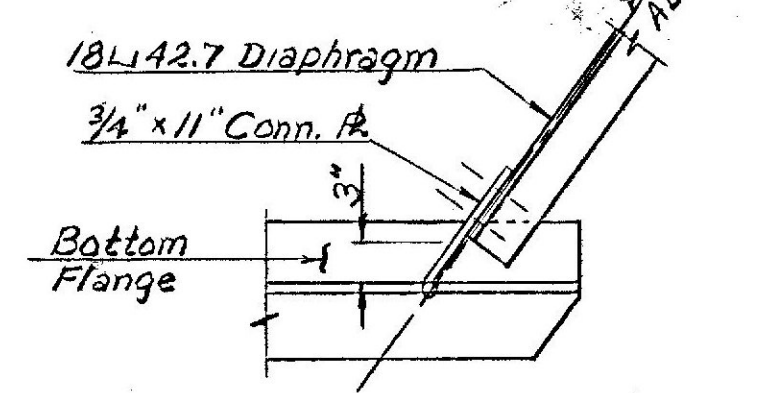
DESIGNED BRK / CHECKED BFC / DATE 7-12-68
 DRAWN RMG / IN CHARGE HGC / SCALE AS SHOWN

PROJECT NO. F020-1(7) SH 43 OF 204

CONTRACT NO. BR 1101



DETAIL A
Scale: 3/4" = 1'-0"



DETAIL B
Scale: 3/4" = 1'-0"

BEAM AND LEG LENGTHS*			
Beam 1	28'-11 1/4"	Legs 9-12	41'-0"
Beam 2	28'-11 3/4"	Beam 13	72'-10 5/8"
Beam 3	29'-0 3/16"	Beam 14	72'-11 9/16"
Beam 4	29'-0 1/16"	Beam 15	73'-0 7/16"
Legs 1-4	35'-0"	Beam 16	73'-1 3/8"
Beam 5	72'-10 3/8"	Legs 13-16	35'-0"
Beam 6	72'-11 1/2"	Beam 17	28'-11 7/16"
Beam 7	73'-0 9/16"	Beam 18	28'-11 13/16"
Beam 8	73'-1 9/8"	Beam 19	29'-0 3/16"
Legs 5-8	41'-0"	Beam 20	29'-0 9/16"
Beam 9	47'-10 3/4"		
Beam 10	47'-11 1/2"		
Beam 11	48'-0 3/8"		
Beam 12	48'-1 3/16"		

* @ Top of Steel Frame

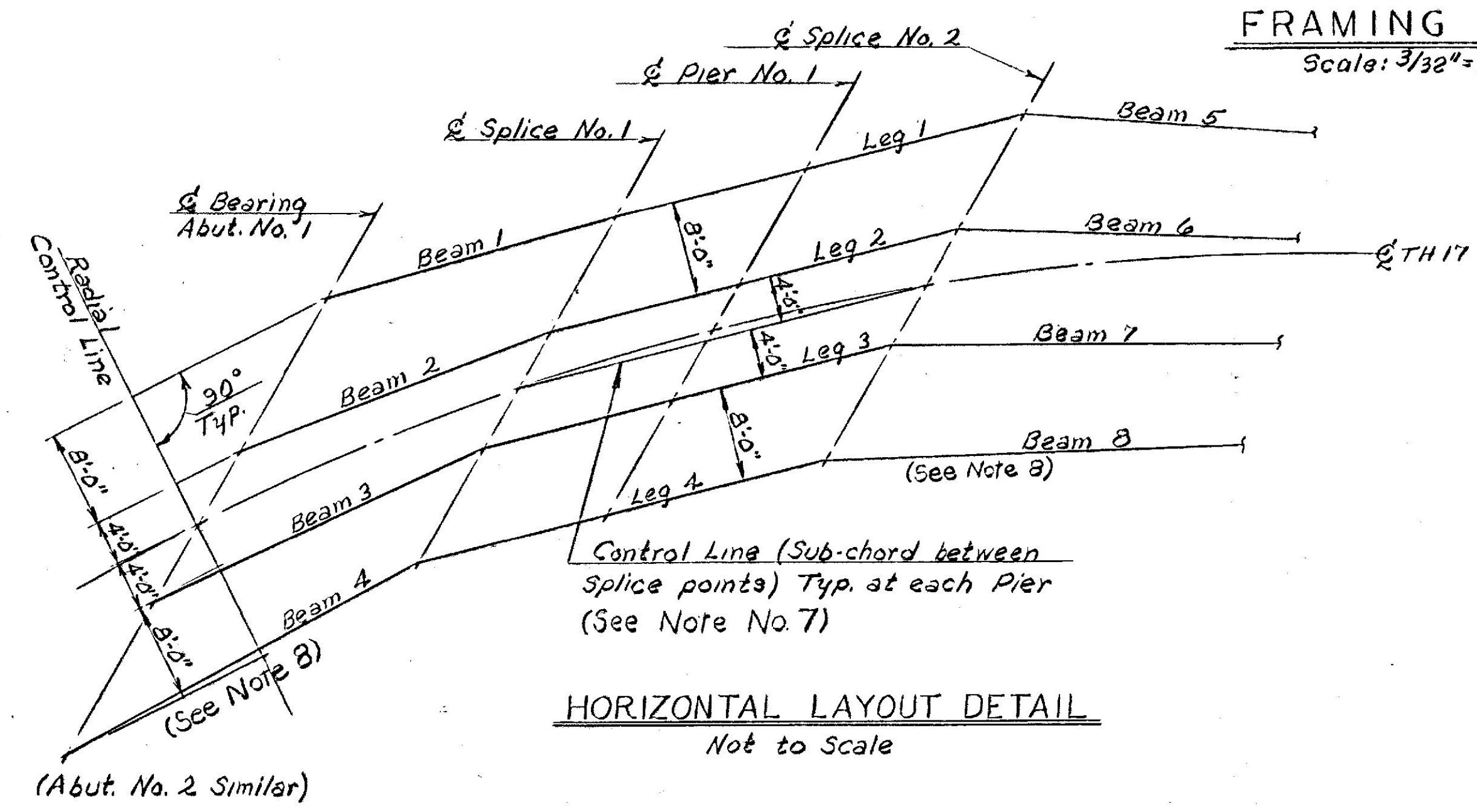
FAIRHAVEN-RUTLAND
BHF BPNT (10)
PROJECT BRIDGE #D11
SHEET 26 OF 28
FOR INFORMATION ONLY

FRAMING PLAN
Scale: 3/32" = 1'-0"

BEAM & LEG COORDINATES*					
Point	North	South	Point	North	South
101	3762.123	3949.430	151	3983.326	3935.676
102	3754.750	3956.133	152	3975.898	4002.165
103	3747.077	3962.837	153	3968.470	4008.654
104	3739.404	3969.540	154	3961.042	4015.144
111	3790.842	3954.898	231	4003.756	4000.415
112	3783.218	3961.593	232	3996.328	4006.904
113	3775.593	3968.287	233	3988.901	4013.394
114	3767.969	3974.981	234	3981.473	4019.884
211	3807.506	3958.155	161	4023.265	4004.941
212	3799.882	3964.849	162	4015.837	4011.430
213	3792.257	3971.543	163	4008.410	4017.919
214	3784.633	3978.237	164	4000.982	4024.409
121	3825.192	3961.612	171	4094.057	4022.276
122	3817.567	3968.306	172	4086.630	4028.766
123	3809.943	3974.999	173	4079.202	4035.256
124	3802.319	3981.693	174	4071.774	4041.746
131	3896.534	3976.137	241	4111.491	4026.677
132	3889.021	3983.001	242	4104.064	4033.167
133	3881.508	3989.865	243	4096.637	4039.657
134	3873.995	3996.729	244	4089.210	4046.147
221	3916.057	3980.648	181	4127.992	4030.844
222	3908.544	3987.512	182	4120.565	4037.334
223	3901.031	3994.376	183	4113.138	4043.824
224	3893.518	4001.240	184	4105.711	4050.314
141	3936.613	3983.081	191	4156.008	4036.133
142	3929.100	3989.945	192	4148.581	4042.623
143	3921.587	3996.809	193	4141.154	4049.113
144	3914.074	4003.673	194	4133.727	4055.603

NOTES

- For General Notes, see BR 1101.
- For Diaphragm Details, see Std. SCB-D7-67.
- For Pier Diaphragm Details, see BR 1108.
- All shop connections for Diaphragms shall be 5/16" fillet welds. All field connections shall be 1/8" φ high-strength bolts.
- ε Pier is defined as the intersection of ε Frame Leg and top of steel frame.
- Frames are bent at each splice point.
- Legs between splice points are of equal length and are parallel to each other.
- Beams are of unequal lengths and are not parallel to each other.
- Lengths of end beams are measured from ε bearing at abutments to ε splice.
- Lengths of legs and intermediate beams are measured from ε splice to ε splice.
- ε bearing lines at abutments, ε Pier lines and ε splice lines are parallel to each other. ε bearing lines at piers are not parallel to each other.



HORIZONTAL LAYOUT DETAIL
Not to Scale

EXAMPLE SHEETS

Added Horizontal Layout Detail and Beam & Leg Coordinates Table, Revised Detail A.
W. Tripp 10-29-69

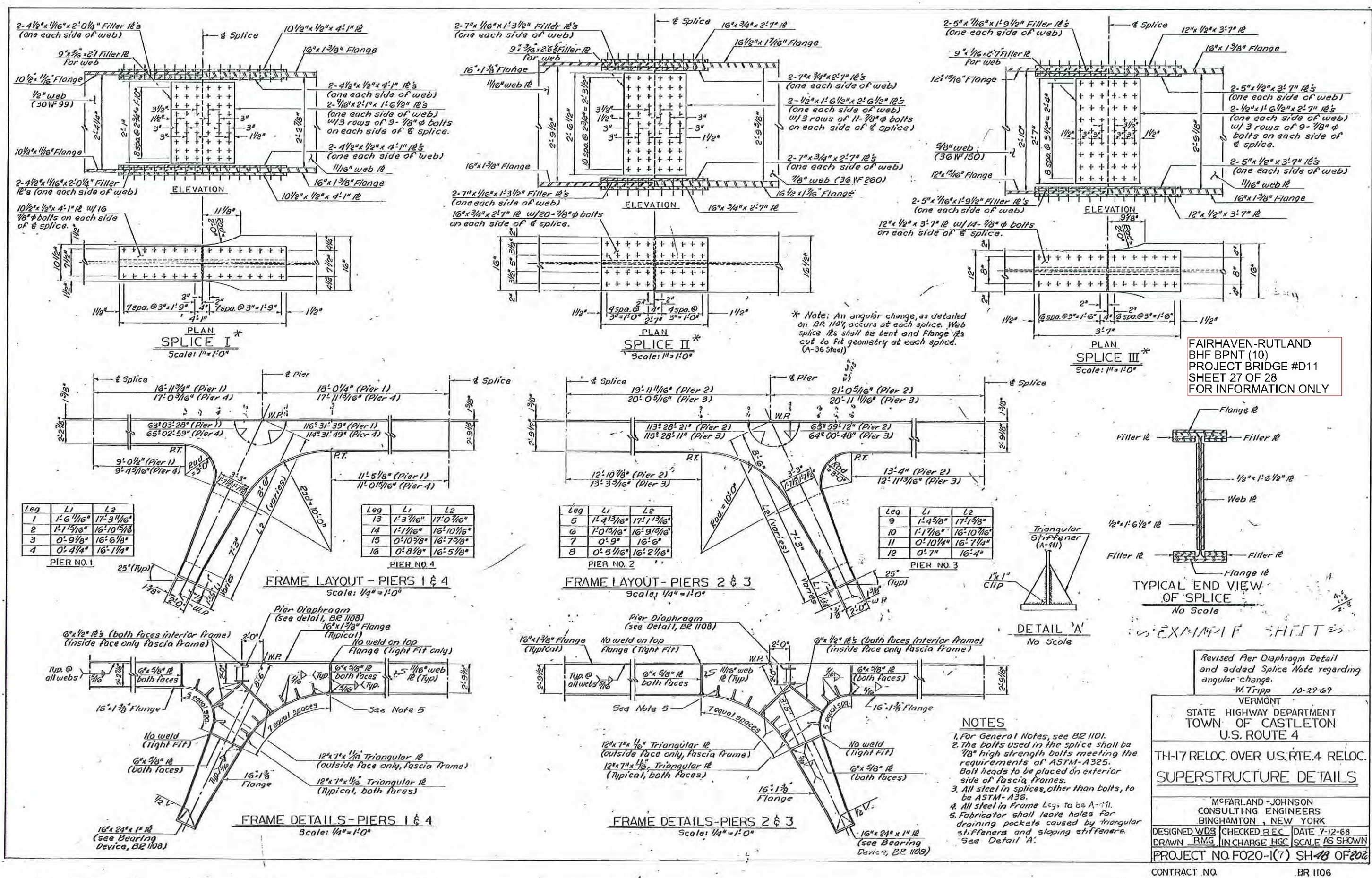
VERMONT
STATE HIGHWAY DEPARTMENT
TOWN OF CASTLETON
U.S. ROUTE 4

TH-17 RELOC. OVER U.S. RTE. 4 RELOC.
SUPERSTRUCTURE DETAILS

MCFARLAND-JOHNSON
CONSULTING ENGINEERS
BINGHAMTON, NEW YORK

DESIGNED WDS CHECKED REC DATE 7-12-68
DRAWN RMG IN CHARGE HGC SCALE AS SHOWN
PROJECT NO. FO20-1(7) SH 49 OF 206

CONTRACT NO. BR. 1107



NOTES CONT.

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.

GENERAL

THE COST OF FURNISHING, INSTALLING, MAINTAINING AND REMOVING ALL CONSTRUCTION APPROACH SIGNS WILL BE CONSIDERED INCIDENTAL 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.

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 "Fb" DESIGN VALUE NOT TO EXCEED 1400 PSI AND HORIZONTAL SHEAR "Fv" DESIGN VALUE NOT TO EXCEED 90 PSI SPECIFICATION; "DESIGN VALUES FOR WOOD CONSTRUCTION" AND RELATED SUPPLEMENT, LATEST EDITION.

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

- 1. 4" X 4" (ACTUAL DIMENSIONS ARE S4S 3.5" X 3.5")
- A) ACCEPTABLE FOR SINGLE OR DUAL POSTS INSTALLATION WITH NO MODIFICATIONS.

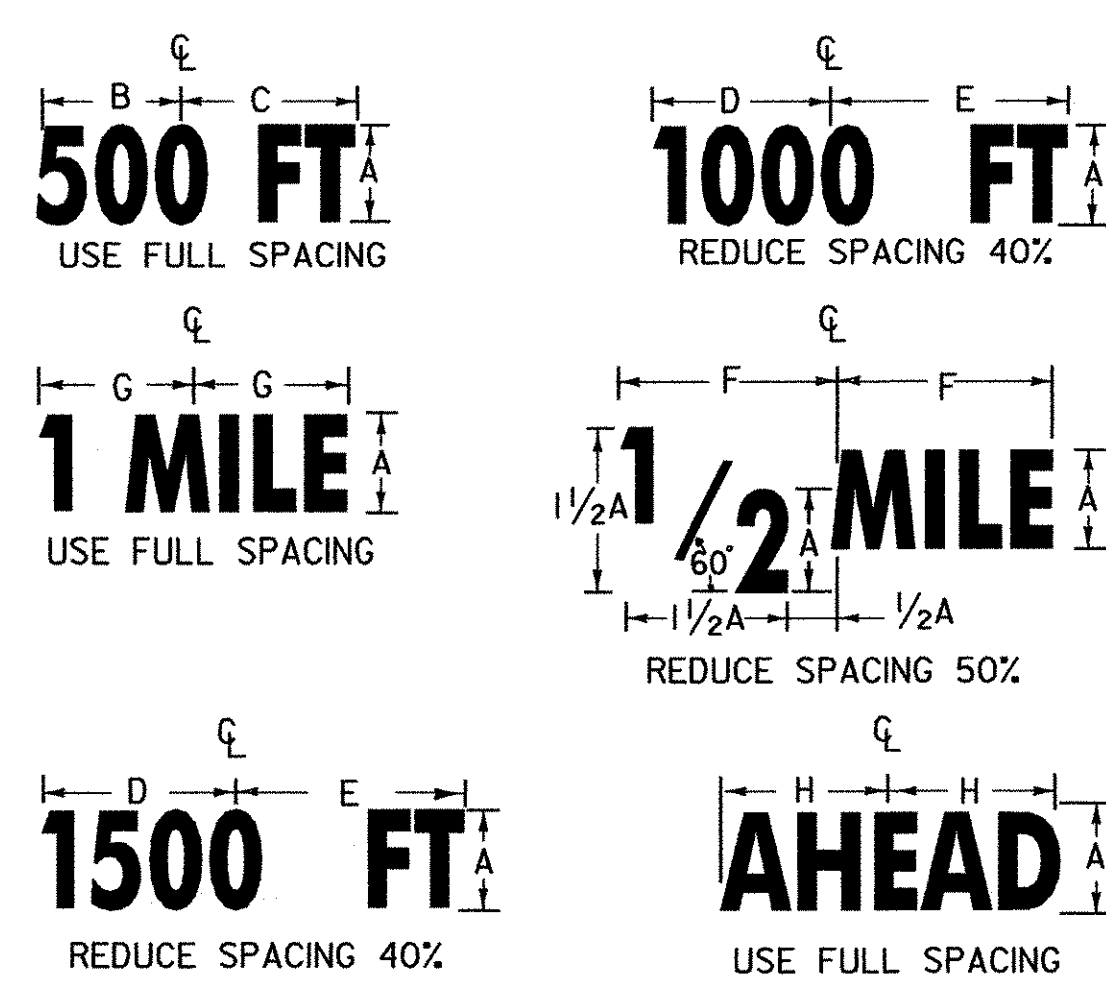
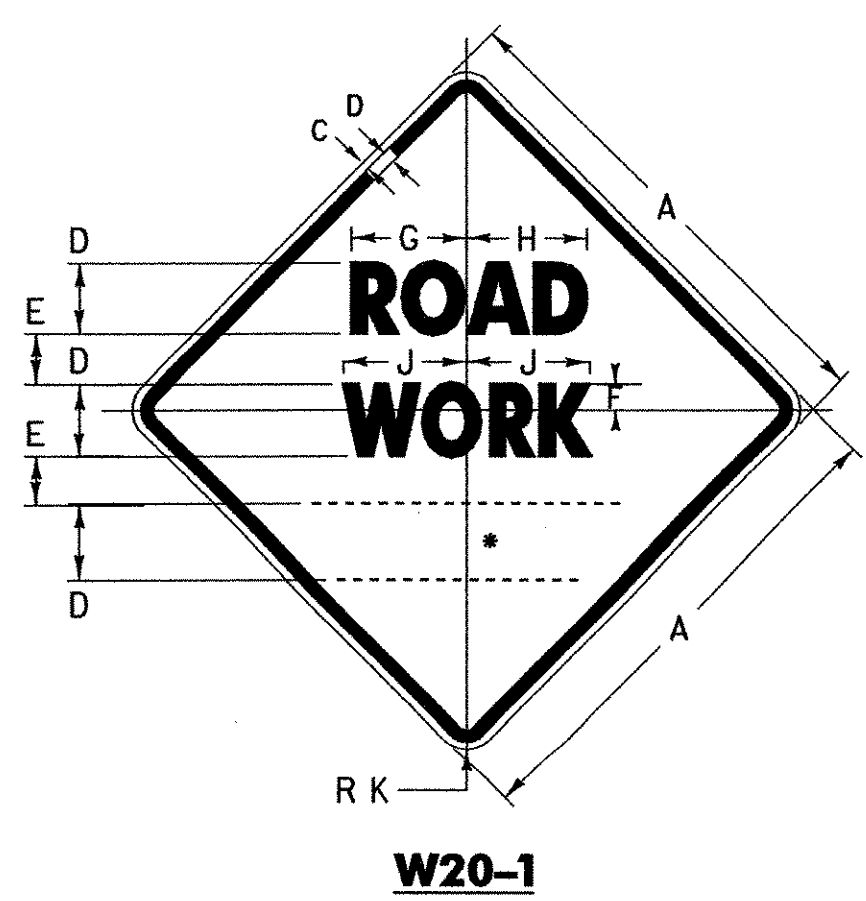
ALL WOODEN POSTS SHALL HAVE AN EMBEDMENT DEPTH OF 4 FEET. NO CROSS-BRACING OR BACK-BRACING TO KEEP THE POSTS PLUMB WILL BE ALLOWED. CONCRETE FOUNDATIONS, COLLARS, OR SOIL BEARING PLATES ARE NOT PERMITTED. CONSTRUCTION SIGNS SHALL BE PLACED ON TWO OR MORE POSTS WHEN ANY OF THE FOLLOWING CONDITIONS GOVERN:

- A) THE SIGN WIDTH (HORIZONTAL DIMENSIONS FOR DIAMOND SHAPED SIGNS) EXCEEDS 3 1/2 FEET.
- B) THE EXPOSED SIGN AREA OF ANY SINGLE SIGN OR ASSEMBLY EXCEEDS 7 SQ. FEET.
- C) THE SV OF A SINGLE POST IS 64.

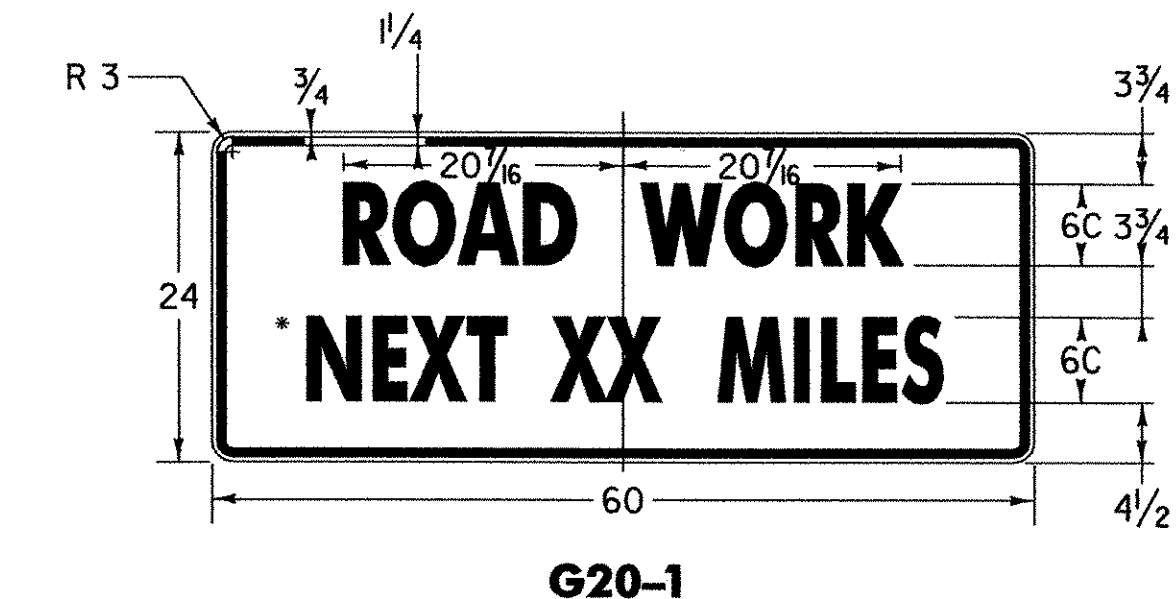
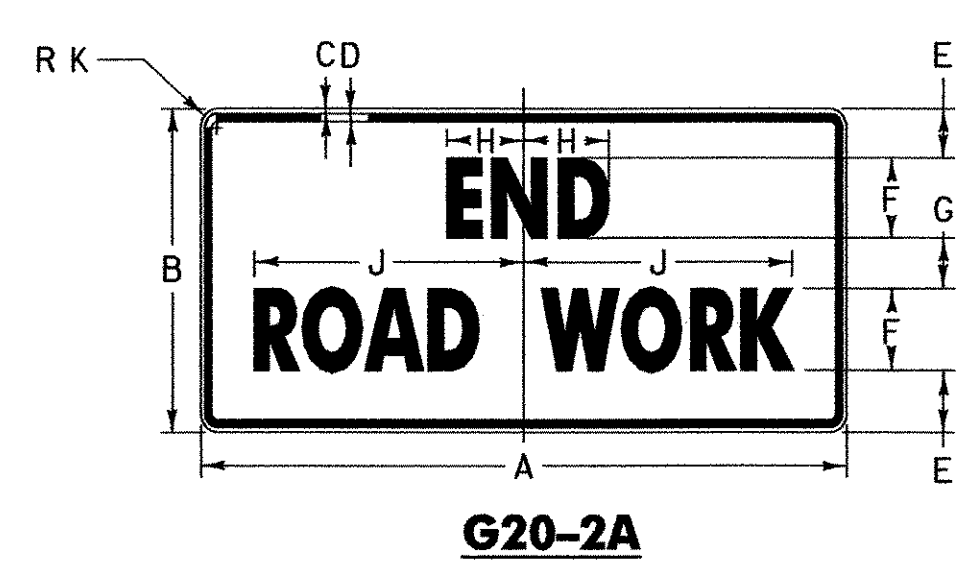
OTHER STDS. E-100A, E-101, E-102 REQUIRED:



STANDARD E-100



DISTANCE DETAILS



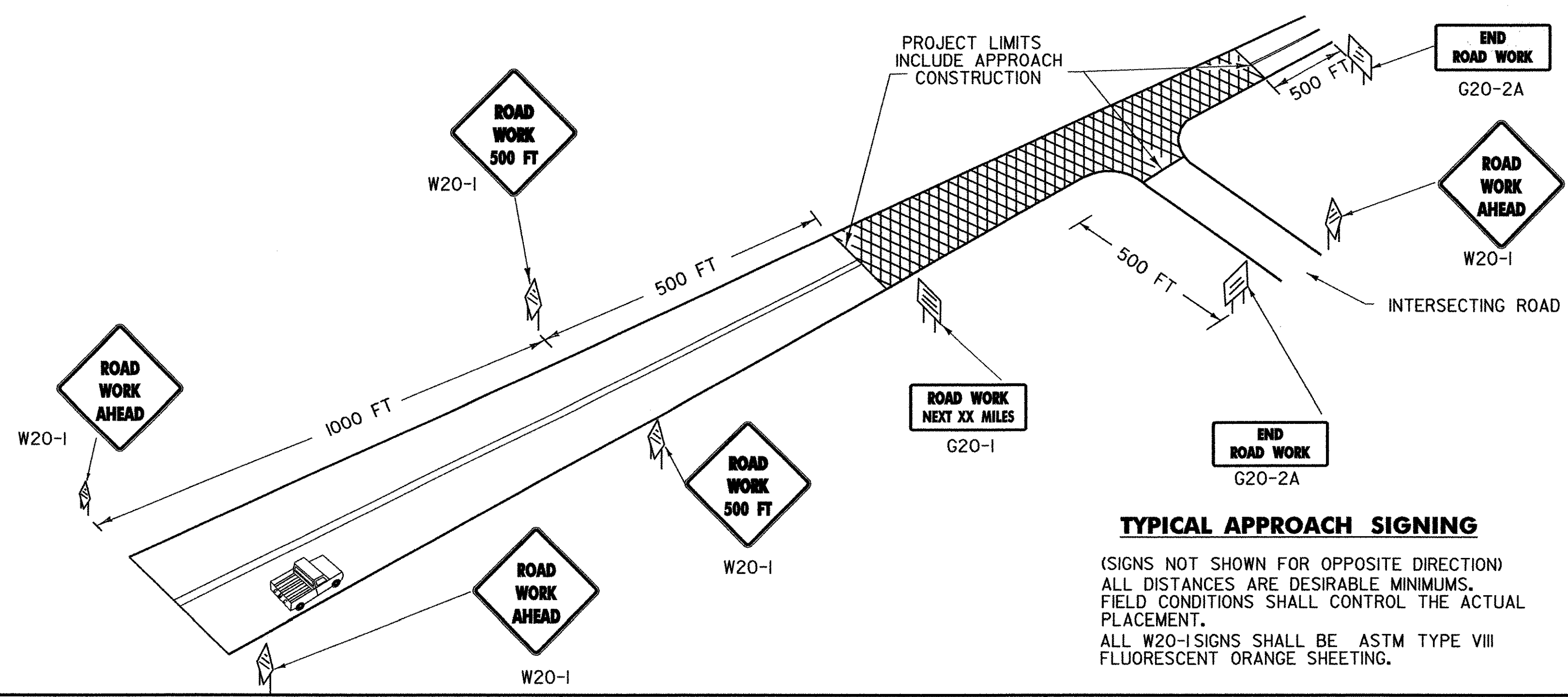
SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	K
MIN.	36	18	5/8	7/8	3 3/4	4C	2 1/2	4	12 5/8	2 1/4
STD.	48	24	3/4	1 1/4	4 1/8	6C	3 3/4	5 7/8	22	3

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.

SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	K
MIN.	36	5/8	7/8	5D	3 1/2	3 3/4	8 3/8	8 7/8	9	2 1/4
STD.	48	3/4	1 1/4	7D	4 3/4	4 1/2	11 1/8	12 1/8	12 5/8	3

DIMENSIONS (INCHES)							
A	B	C	D	E	F	G	H
5D	10 3/8	10 3/8	11 5/8	11 1/4	11 1/4	9 1/2	10 7/8
7D	14 1/4	15 1/8	14 3/8	15 3/4	15 3/4	13 1/8	15 1/2

(ALL DIMENSIONS SHOWN IN INCHES)



TYPICAL APPROACH SIGNING

(SIGNS NOT SHOWN FOR OPPOSITE DIRECTION)
ALL DISTANCES ARE DESIRABLE MINIMUMS. FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT.
ALL W20-1 SIGNS SHALL BE ASTM TYPE VIII FLUORESCENT ORANGE SHEETING.

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 ENGINEER SHALL DETERMINE THE EXACT LOCATIONS.

DESIGN

LETTERS, DIGITS, ARROWS, SPACING AND TEXT DIMENSIONS SHALL CONFORM WITH THE "STANDARD HIGHWAY SIGNS BOOK" AND DESIGNS PRESCRIBED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) ADOPTED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION (FHWA).

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 OVERLAYED PLYWOOD 5/8 INCHES

REFLECTORIZATION

ALL LEAD SIGNS (W20-1) ON THIS SHEET SHALL BE ASTM TYPE VIII FLUORESCENT ORANGE SHEETING. ALL OTHER SIGNS ON THIS SHEET SHALL BE ASTM TYPE III RETROREFLECTORIZED SHEETING.

COLORS

THE COLORS SHALL CONFORM WITH THE STANDARD COLORS ADOPTED BY AASHTO AND APPROVED BY THE FHWA. COLORS SHOWN ON THIS SHEET CONSIST OF BLACK TEXT AND BORDER ON A RETROREFLECTORIZED ASTM TYPE III OR TYPE VIII 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. 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. SIGNS MAY BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER.

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
- JAN. 06, 1997 - MINOR NOTE AND DIMENSION REVISIONS
- JAN. 2, 2004 - CHANGED REFLECTIVE SHEETING TO ASTM TYPE III OR TYPE VIII

APPROVED
[Signature]
DIRECTOR OF PROGRAM DEVELOPMENT
[Signature]
TRAFFIC OPERATIONS ENGINEER
[Signature]
FEDERAL HIGHWAY ADMINISTRATION

CONSTRUCTION APPROACH SIGNS

NOTES CONT.

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 OVERLAYED PLYWOOD 5/8 INCHES

REFLECTORIZATION

ALL LEAD SIGNS (W20-1, VC-839) ON THIS SHEET SHALL BE ASTM TYPE VIII FLUORESCENT ORANGE SHEETING. ALL OTHER SIGNS ON THIS SHEET SHALL BE ASTM TYPE III RETROREFLECTORIZED SHEETING.

COLORS

THE COLORS SHALL CONFORM WITH THE STANDARD COLORS ADOPTED BY AASHTO AND APPROVED BY THE FHWA. COLORS SHOWN ON THIS SHEET CONSIST OF BLACK TEXT AND BORDER ON A RETROREFLECTORIZED ASTM TYPE III OR TYPE VIII 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. 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. SIGNS MAY BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER.

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.

GENERAL

THE COST OF FURNISHING, INSTALLING, MAINTAINING AND REMOVING ALL CONSTRUCTION APPROACH SIGNS WILL BE CONSIDERED INCIDENTAL 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.

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 "Fb" DESIGN VALUE NOT TO EXCEED 1400 PSI AND HORIZONTAL SHEAR "Fv" DESIGN VALUE NOT TO EXCEED 90 PSI SPECIFICATION; "DESIGN VALUES FOR WOOD CONSTRUCTION" AND RELATED SUPPLEMENT, LATEST EDITION.

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

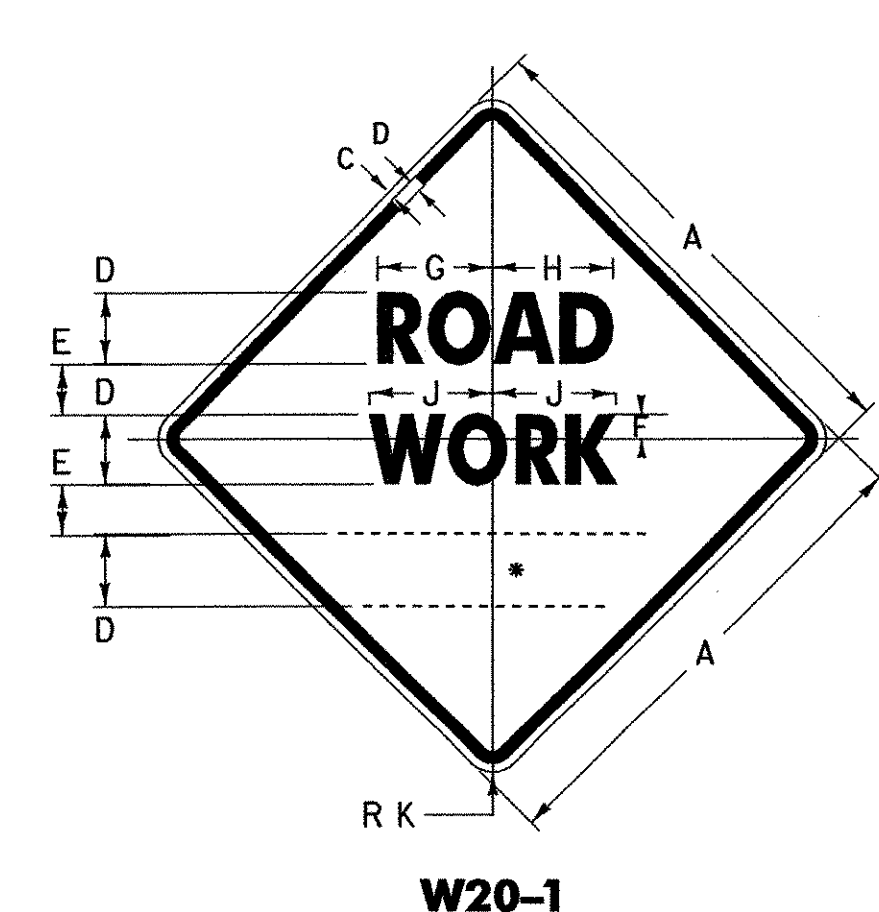
- 1. 4" X 4" (ACTUAL DIMENSIONS ARE S4S 3.5" X 3.5")

A) ACCEPTABLE FOR SINGLE OR DUAL POSTS INSTALLATION WITH NO MODIFICATIONS.

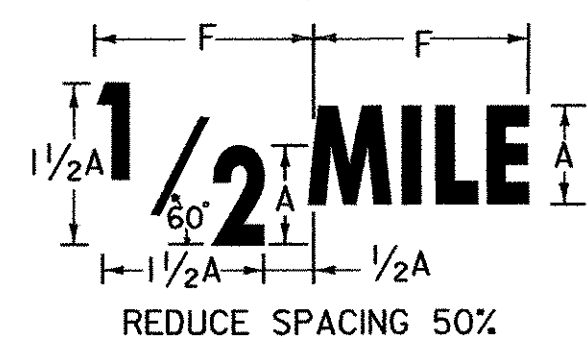
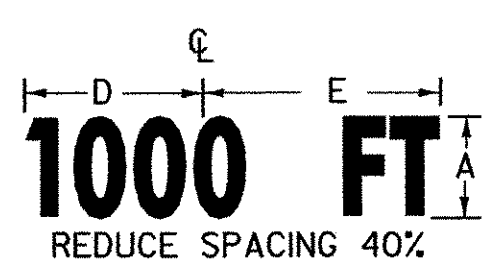
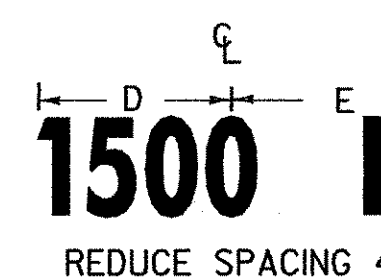
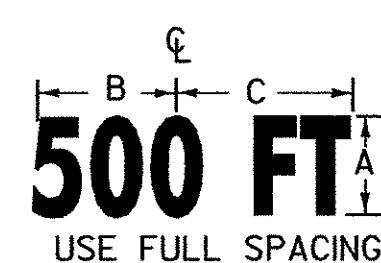
ALL WOODEN POSTS SHALL HAVE AN EMBEDMENT DEPTH OF 4 FEET. NO CROSS-BRACING OR BACK-BRACING TO KEEP THE POSTS PLUMB WILL BE ALLOWED. CONCRETE FOUNDATIONS, COLLARS OR SOIL BEARING PLATES ARE NOT PERMITTED. CONSTRUCTION SIGNS SHALL BE PLACED ON TWO OR MORE POSTS WHEN ANY OF THE FOLLOWING CONDITIONS GOVERN:

- A) THE SIGN WIDTH (HORIZONTAL DIMENSIONS FOR DIAMOND SHAPED SIGNS) EXCEEDS 3 1/2 FEET.
- B) THE EXPOSED SIGN AREA OF ANY SINGLE SIGN OR ASSEMBLY EXCEEDS 7 SQ. FEET.
- C) THE Sv OF A SINGLE POST IS 64

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



W20-1
• SEE DISTANCE DETAILS

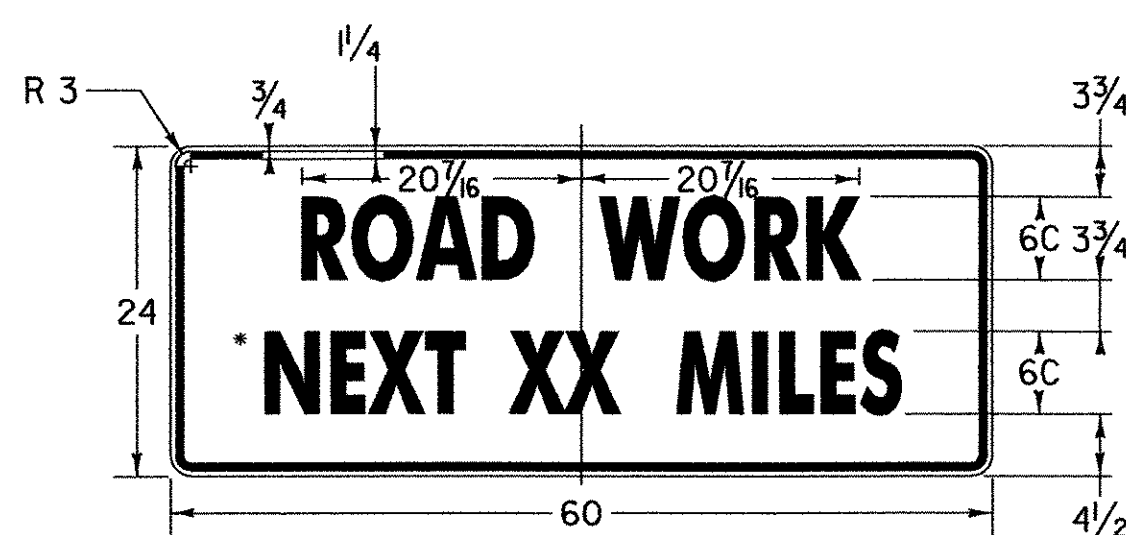


DISTANCE DETAILS

SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	K
MIN.	36	5/8	7/8	5D	3 1/2	3 1/4	8 3/8	8 7/8	9	2 1/4
STD.	48	3/4	1 1/4	7D	4 3/4	4 1/2	11 1/8	12 7/16	12 5/8	3

DIMENSIONS (INCHES)							
A	B	C	D	E	F	G	H
5D	10 3/16	10 3/16	11 5/8	11 1/4	11 1/4	9 1/2	10 7/8
7D	14 1/4	15 1/8	14 7/8	15 3/4	15 3/4	13 1/16	15 1/2

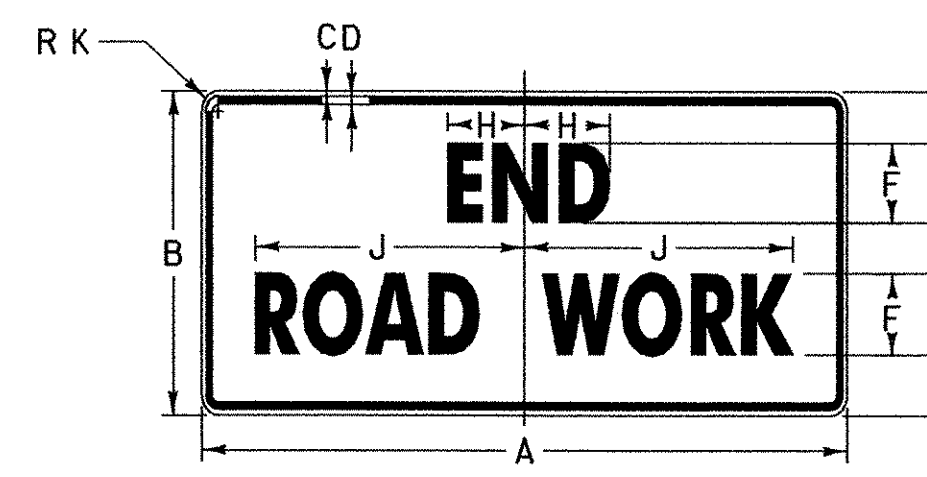
(ALL DIMENSIONS SHOWN IN INCHES)



G20-1

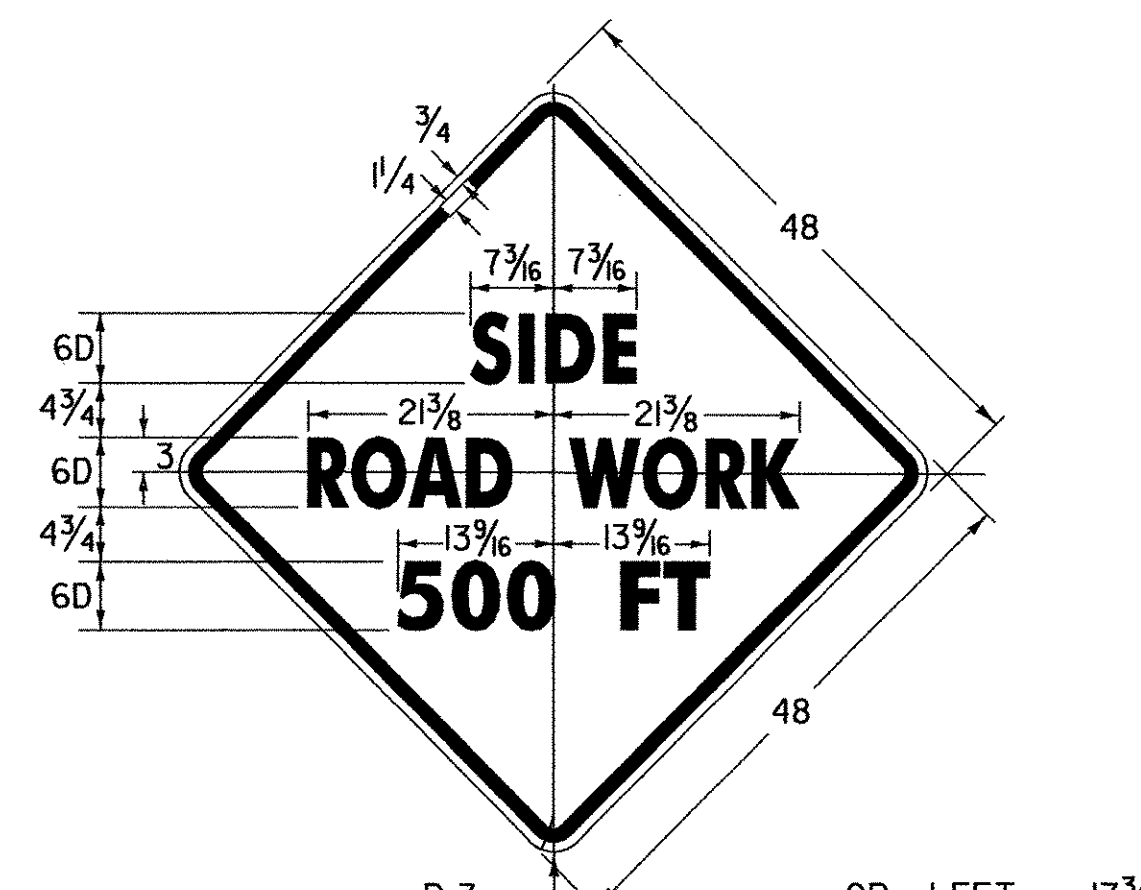
* OPTICALLY CENTER

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.



G20-2A

SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	K
MIN.	36	18	5/8	7/8	3 3/4	4C	2 1/2	4	12 5/8	2 1/4
STD.	48	24	3/4	1 1/4	4 1/8	6C	3 3/4	5 7/8	22	3



VC-839

OR LEFT - 17 3/4
 RIGHT - 22
 500 - 14 3/4
 FT - 8 1/16

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

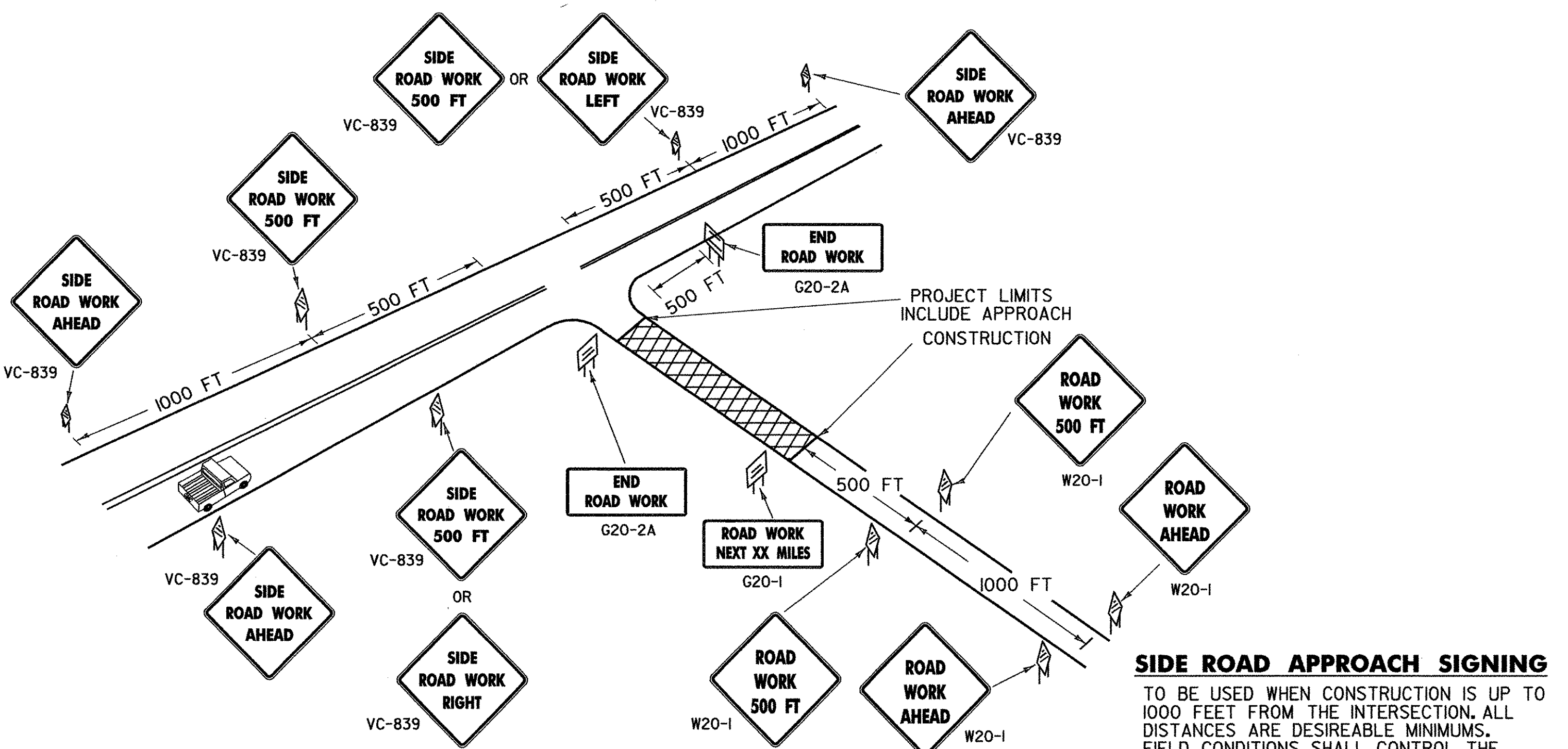
SINCE IT IS NOT POSSIBLE TO PRESCRIBE DETAILED STANDARDS OF APPLICATION FOR ALL OF THE SITUATIONS THAT MAY CONCEIVABLY ARISE ON A CONSTRUCTION PROJECT, REFERENCE SHALL BE MADE TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" FOR THE PRINCIPLES, PROCEDURES, AND STANDARDS THAT WILL BE REQUIRED IN CONNECTION 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 ENGINEER SHALL DETERMINE THE EXACT LOCATIONS.

DESIGN

LETTERS, DIGITS, ARROWS SPACING AND TEXT DIMENSIONS SHALL CONFORM WITH THE "STANDARD HIGHWAY SIGNS BOOK" AND DESIGNS PRESCRIBED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) ADOPTED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION (FHWA).



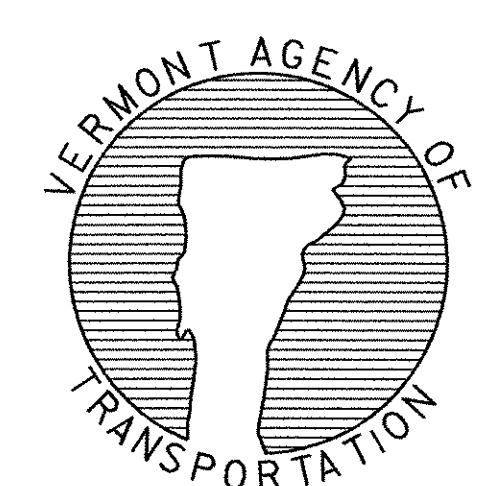
SIDE ROAD APPROACH SIGNING

TO BE USED WHEN CONSTRUCTION IS UP TO 1000 FEET FROM THE INTERSECTION. ALL DISTANCES ARE DESIRABLE MINIMUMS. FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT.
 ALL W20-1 AND VC-839 SIGNS SHALL BE ASTM TYPE VIII FLUORESCENT ORANGE SHEETING.

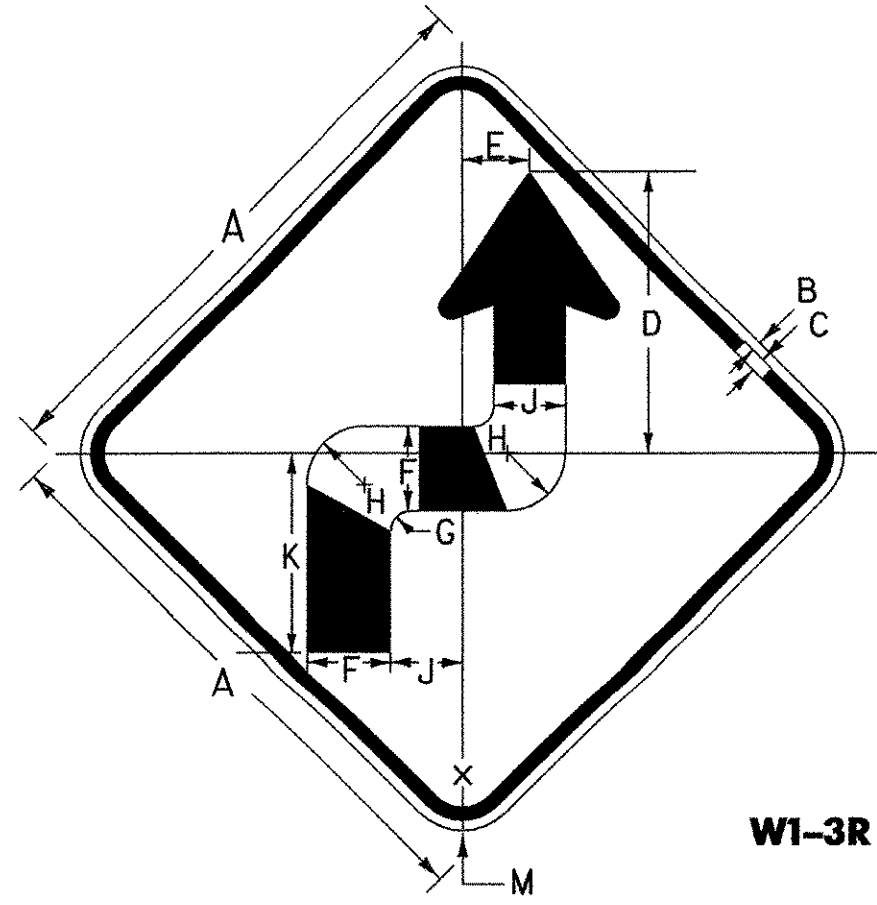
REVISIONS AND CORRECTIONS
 JAN. 06, 1997 - DATE OF ORIGINAL ISSUE
 JAN. 2, 2004 - CHANGED REFLECTIVE SHEETING TO ASTM TYPE III OR TYPE VIII

APPROVED
 DIRECTOR OF PROGRAM DEVELOPMENT
 TRAFFIC OPERATIONS ENGINEER
 FEDERAL HIGHWAY ADMINISTRATION

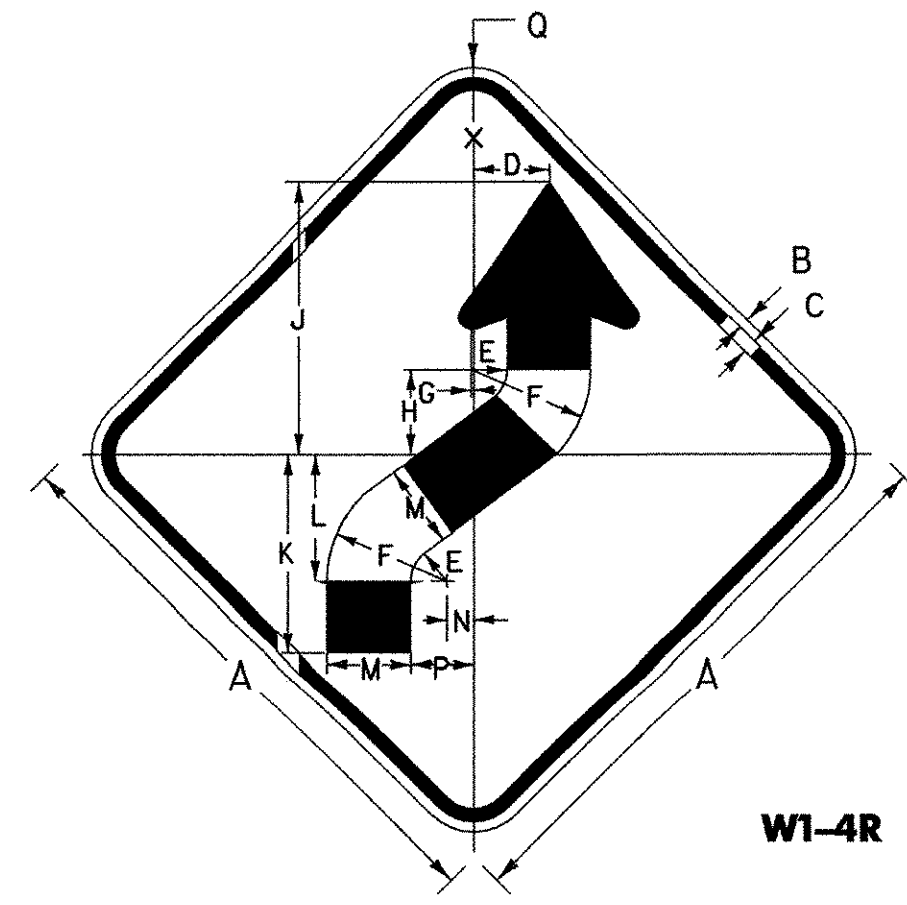
SIDE ROAD CONSTRUCTION APPROACH SIGNS



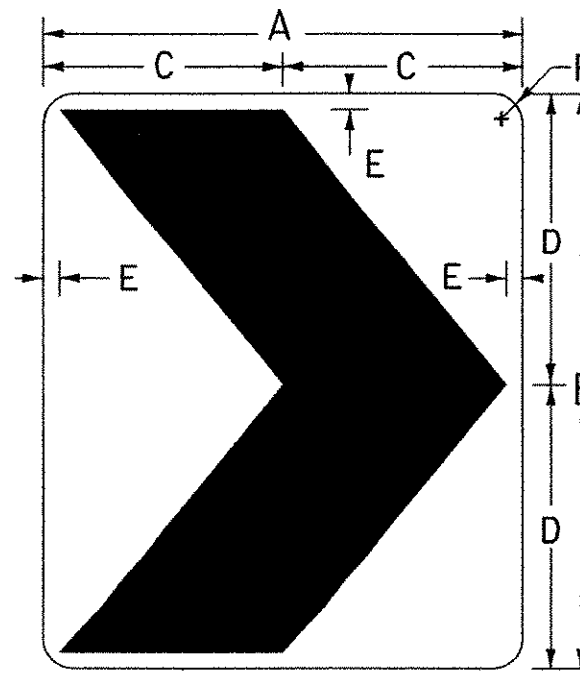
STANDARD E-100A



W1-3R

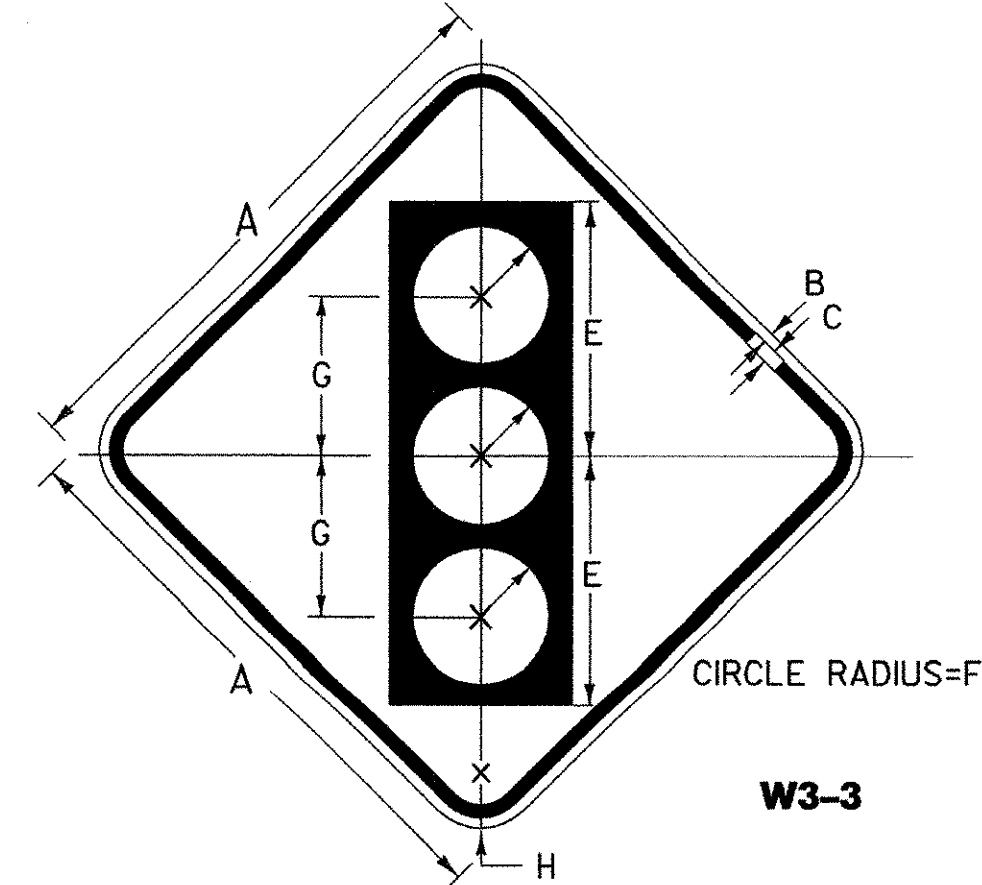


W1-4R



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	7/8	1 1/2
EXPWY.	30	36	15	18	1	1 1/8
FRWY.	36	48	18	24	1 1/8	2 1/4



W3-3

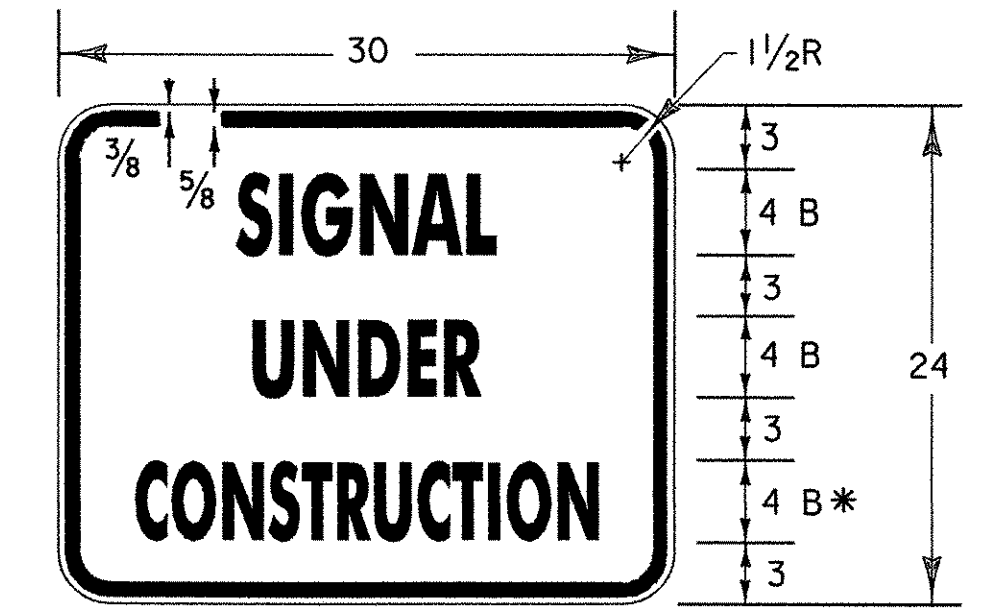
SIGN	DIMENSIONS (INCHES)							
	A	B	C	D	E	F	G	H
STD. & MIN.	36	5/8	7/8	5 3/4	15 3/4	4 1/4	10	2 1/4
SPECIAL	48	3/4	1 1/4	7 1/2	20	5	12 1/2	3

SIGN	DIMENSIONS (INCHES)											
	A	B	C	D	E	F	G	H	J	K	L	M
STD. & MIN.	36	5/8	7/8	17 1/16	4 1/32	5 1/4	1 1/4	3 5/8	4 1/2	12 5/32	1 3/32	2 1/4
SPECIAL	48	3/4	1 1/4	23 3/16	5 5/8	7	1 5/8	4 7/8	6	16 5/8	2 3/8	3

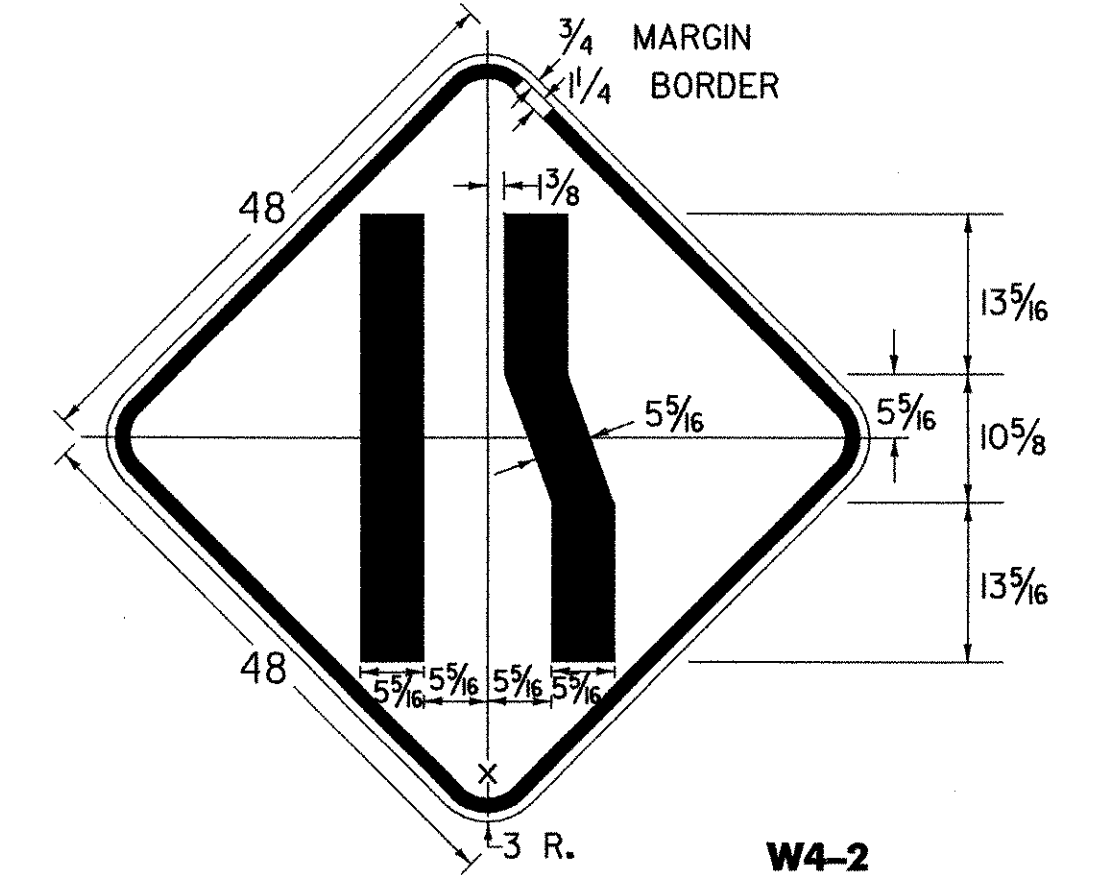
SIGN	DIMENSIONS (INCHES)														
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
STD. & MIN.	36	5/8	7/8	4 2/32	2 1/4	7 1/2	5/32	5 1/4	16 7/8	12 3/8	7 7/8	5 1/4	1 1/16	3 5/16	2 1/4
SPECIAL	48	3/4	1 1/4	6 5/16	3	10	3/16	7	22 1/2	16 1/2	10 1/2	7	2 1/4	5 1/4	3

COLORS

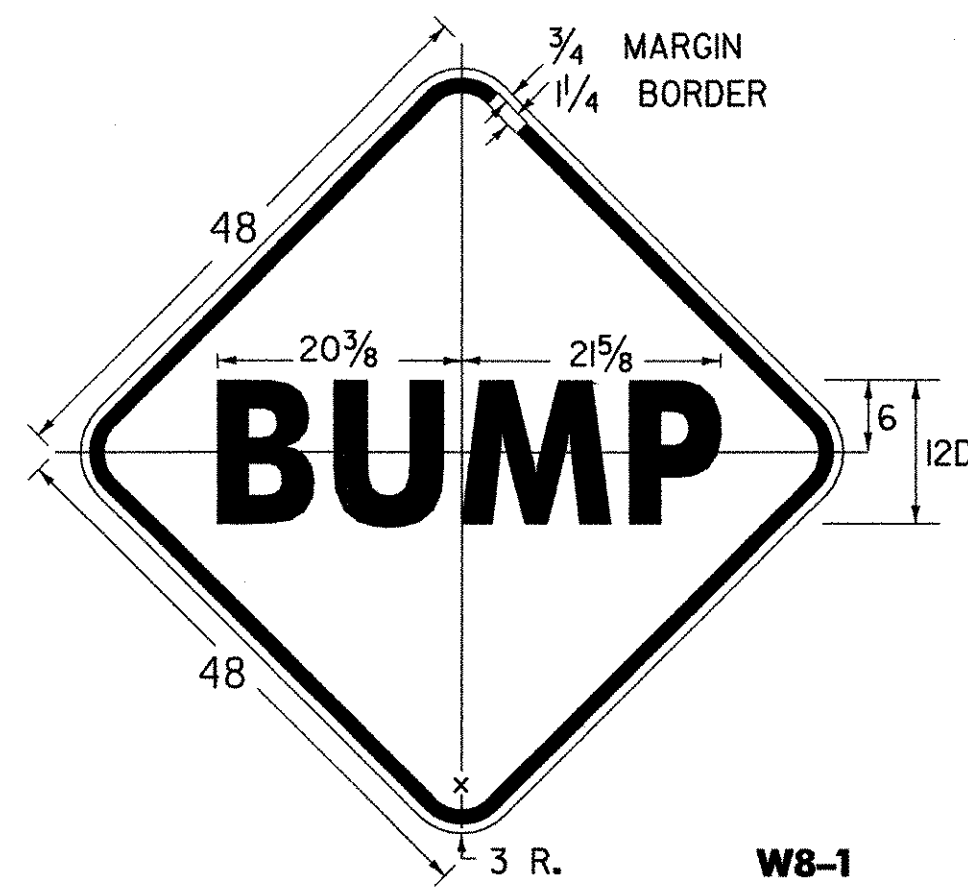
TOP CIRCLE RED (REFL)
MIDDLE CIRCLE YELLOW (REFL)
BOTTOM CIRCLE GREEN (REFL)
SYMBOL & LEGEND - BLACK (NON-REFL)
BACKGROUND - ORANGE (REFL)



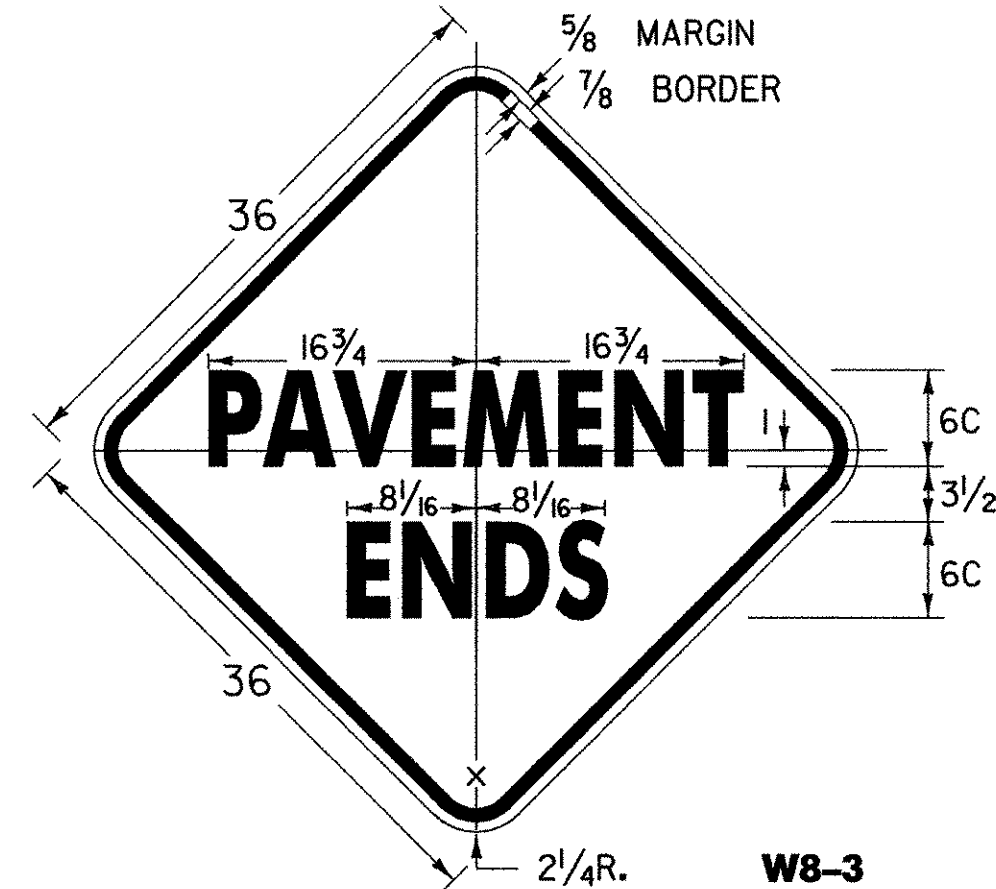
* REDUCE SPACING 50%



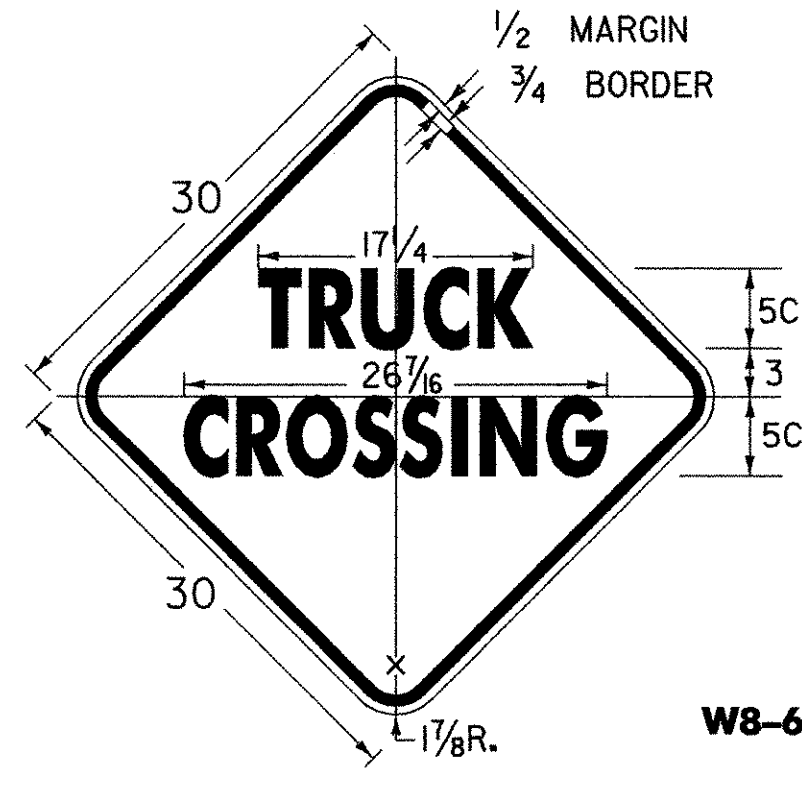
W4-2



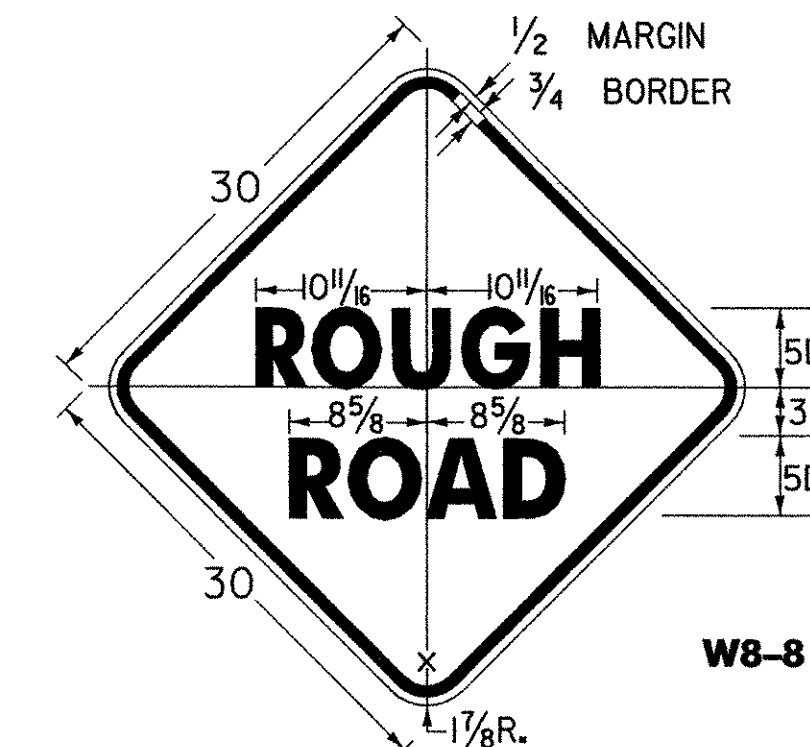
W8-1



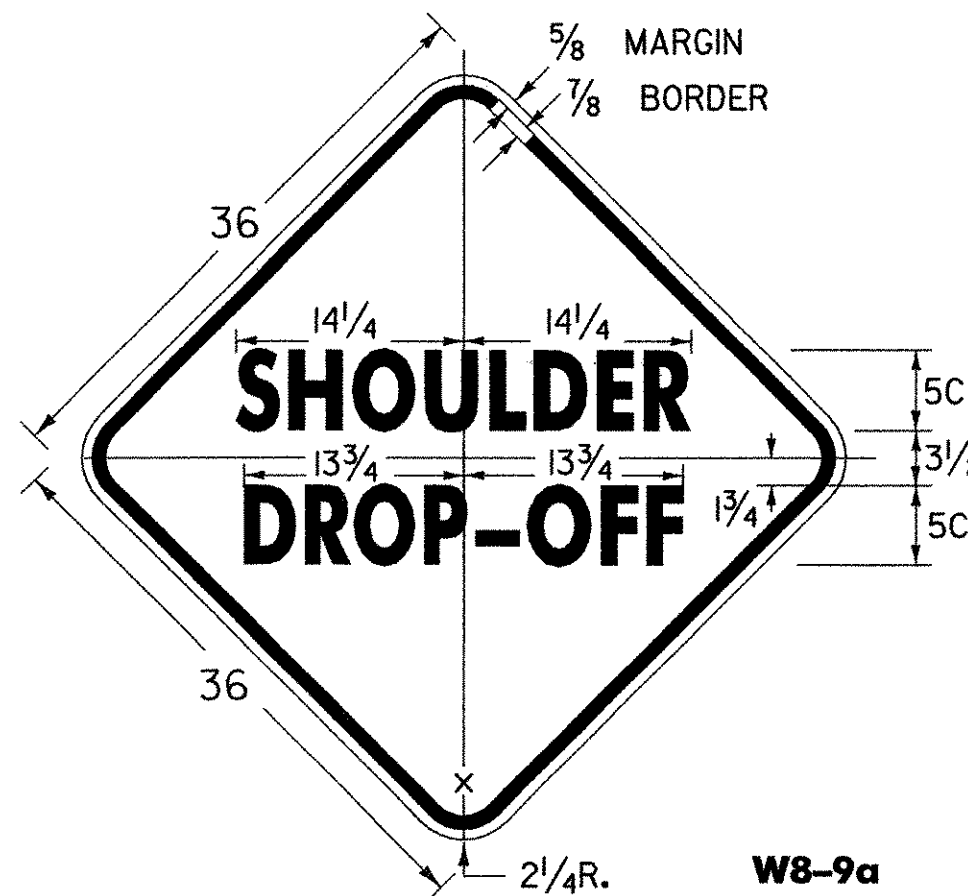
W8-3



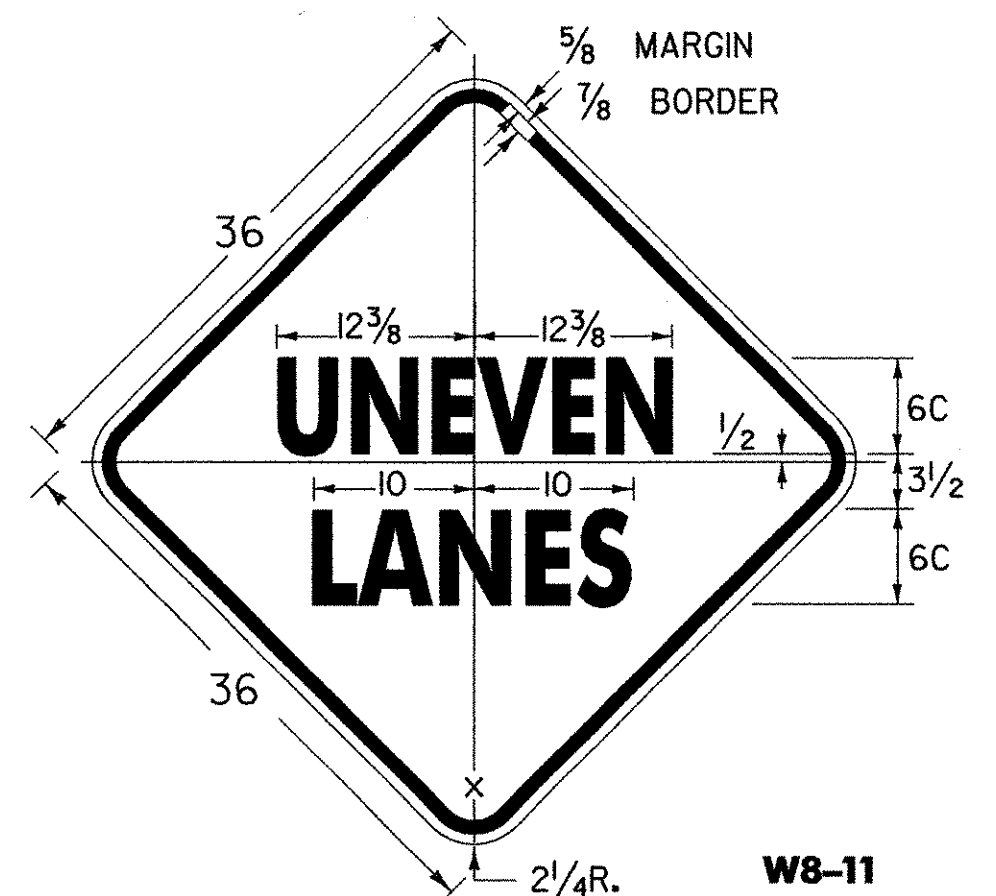
W8-6



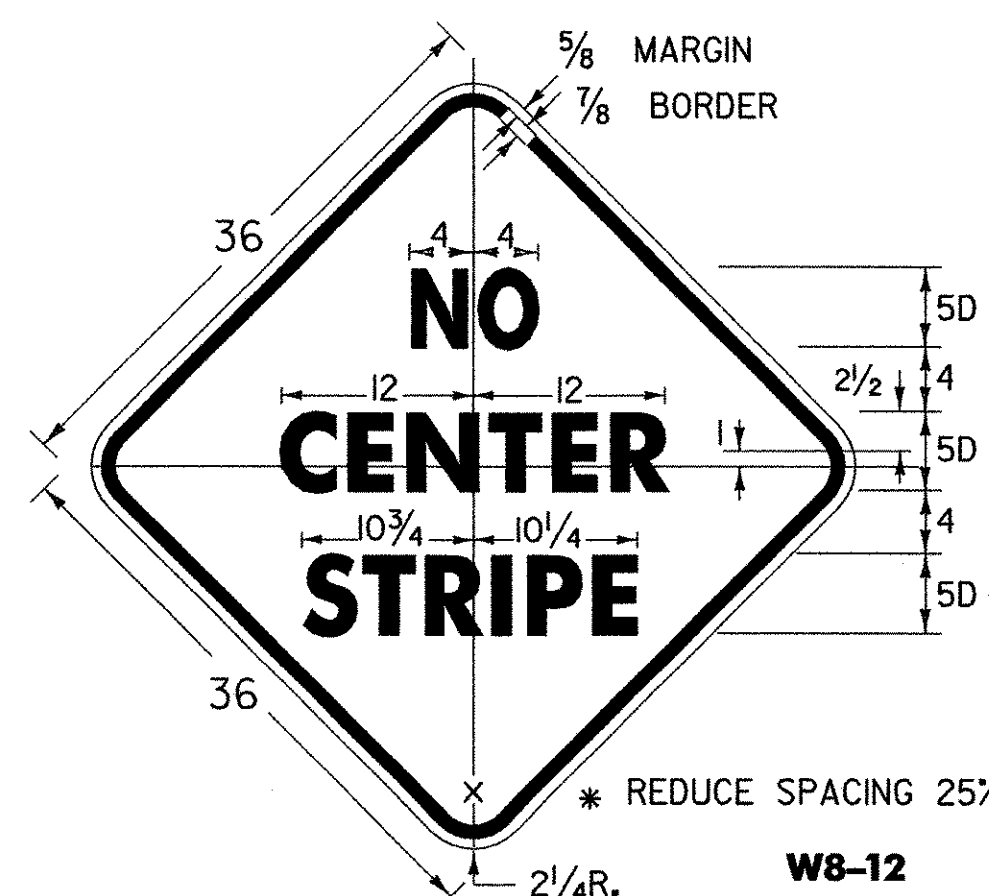
W8-8



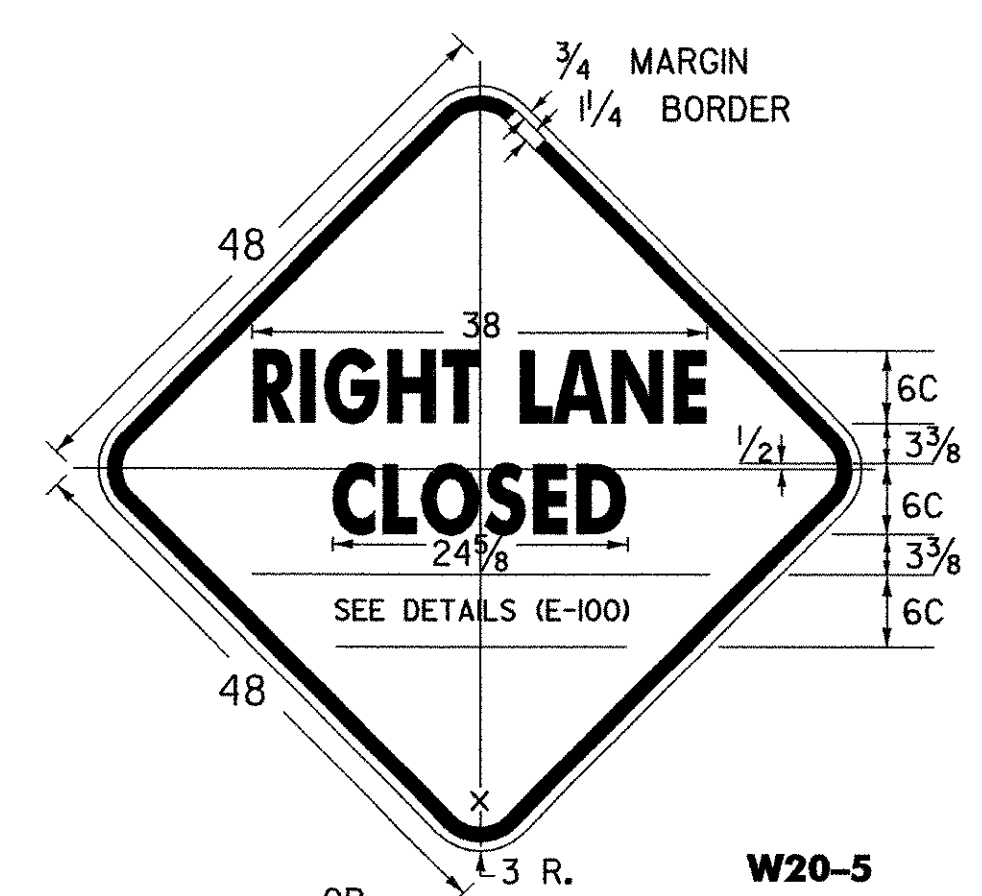
W8-9a



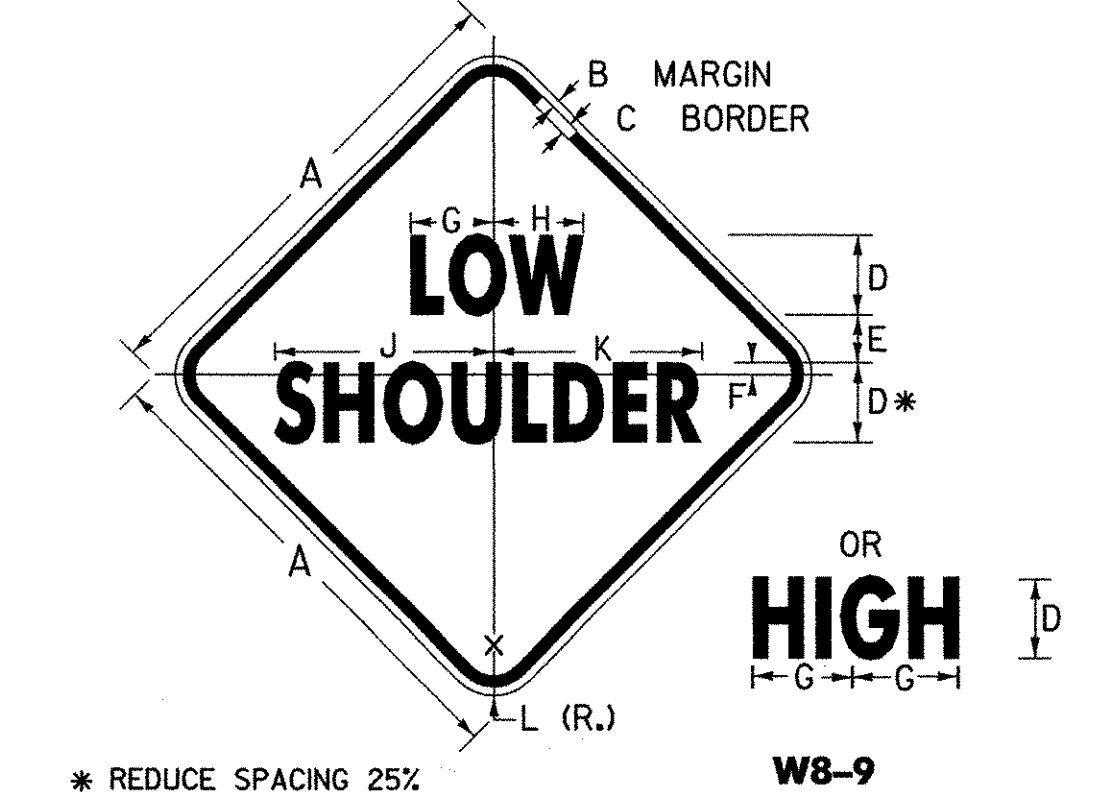
W8-11



W8-12



W20-5



W8-9

SIGN	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J	K	L
STD.	30	1/2	3/4	5C	3	3/4	5 5/8	5 5/8	13 1/8	13 1/8	1 1/8
FWY.	48	3/4	1 1/4	8C	5	1 1/4	8 1/4	9	21 1/8	20 7/8	3

* REDUCE SPACING 25%

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 ASTM TYPE III OR TYPE VI RETROREFLECTORIZED ORANGE BACKGROUND, UNLESS OTHERWISE NOTED.

(ALL DIMENSIONS SHOWN IN INCHES)

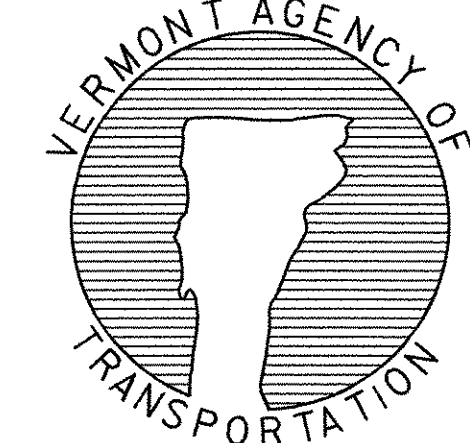
LEFT LANE

OTHER STDS. E-100 REQUIRED:

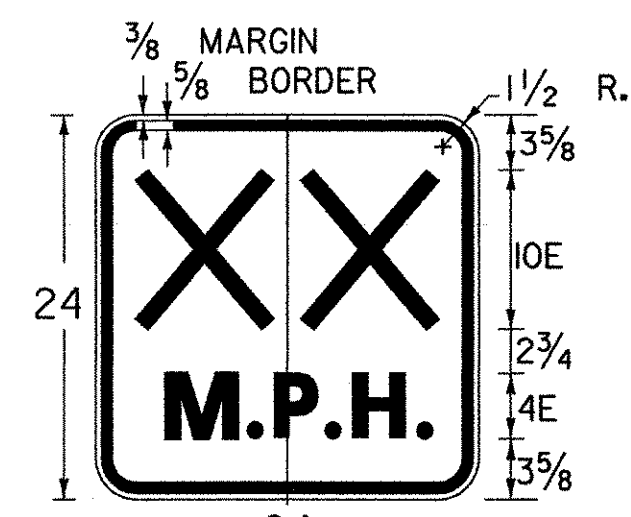
REVISIONS AND CORRECTIONS
OCT. 30, 1987 - DATE OF ORIGINAL ISSUE
OCT. 21, 1992 - ADDED ADDITIONAL SIGN DIMENSIONS, REVISED CHEVRON BACKGROUND TO ORANGE, & REVISED TITLE BLOCK
AUG. 08, 1995 - ADDED AND DELETED VARIOUS SIGN DETAILS
MAR., 10 1997 - REVISED SIGN DETAILS
MAY 30, 2003 - CHANGED REFLECTIVE SHEETING TO ASTM TYPE III OR TYPE VI

APPROVED
[Signature]
DIRECTOR OF PROGRAM DEVELOPMENT
[Signature]
TRAFFIC OPERATIONS ENGINEER
[Signature]
FEDERAL HIGHWAY ADMINISTRATION

CONSTRUCTION SIGN DETAILS

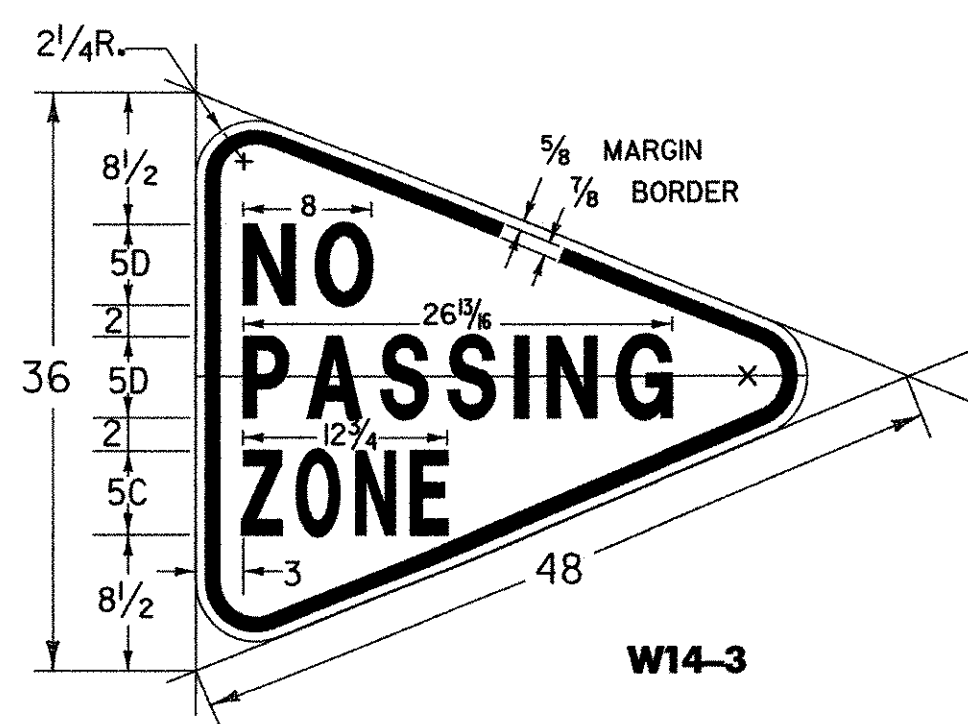


STANDARD E-101

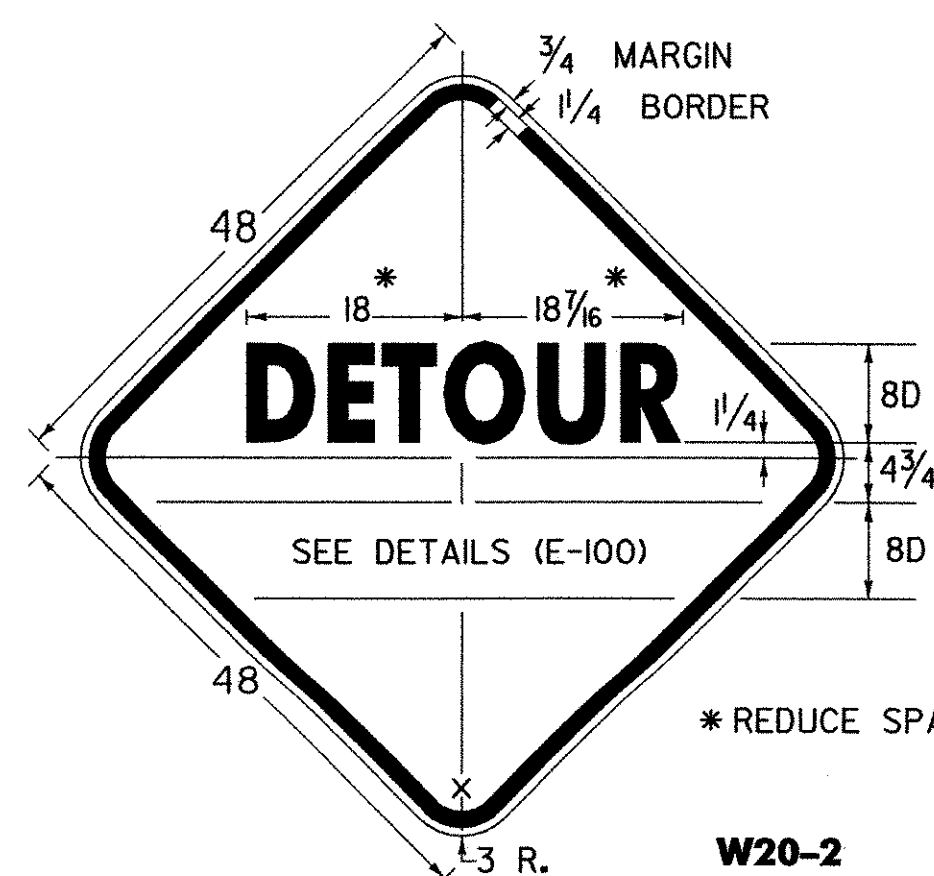


XX DENOTES ADVISORY SPEED AS SHOWN ON THE PLANS

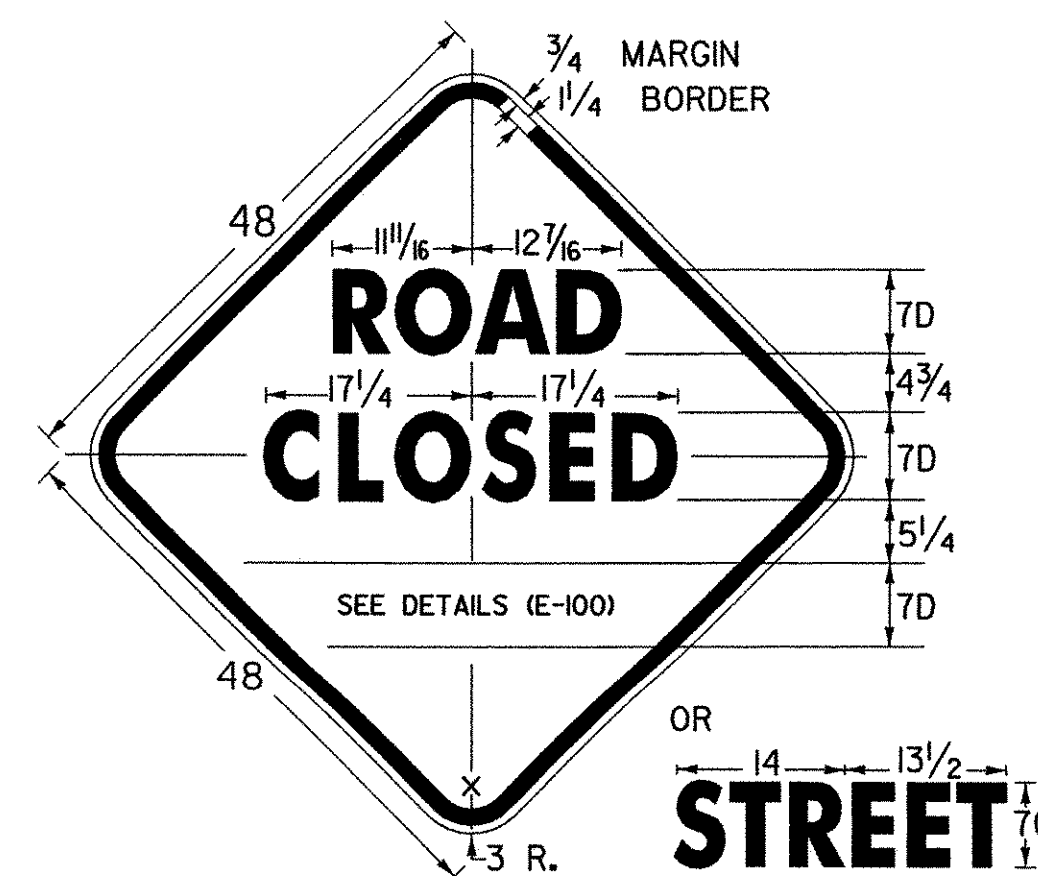
W13-1



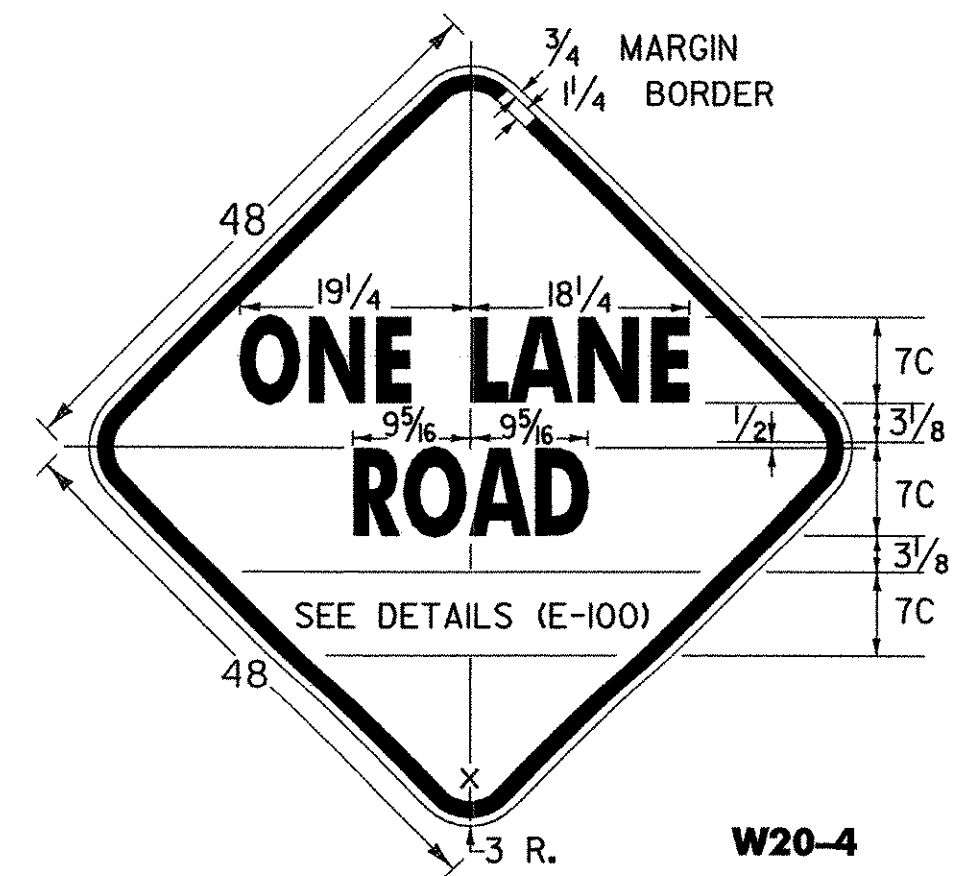
W14-3



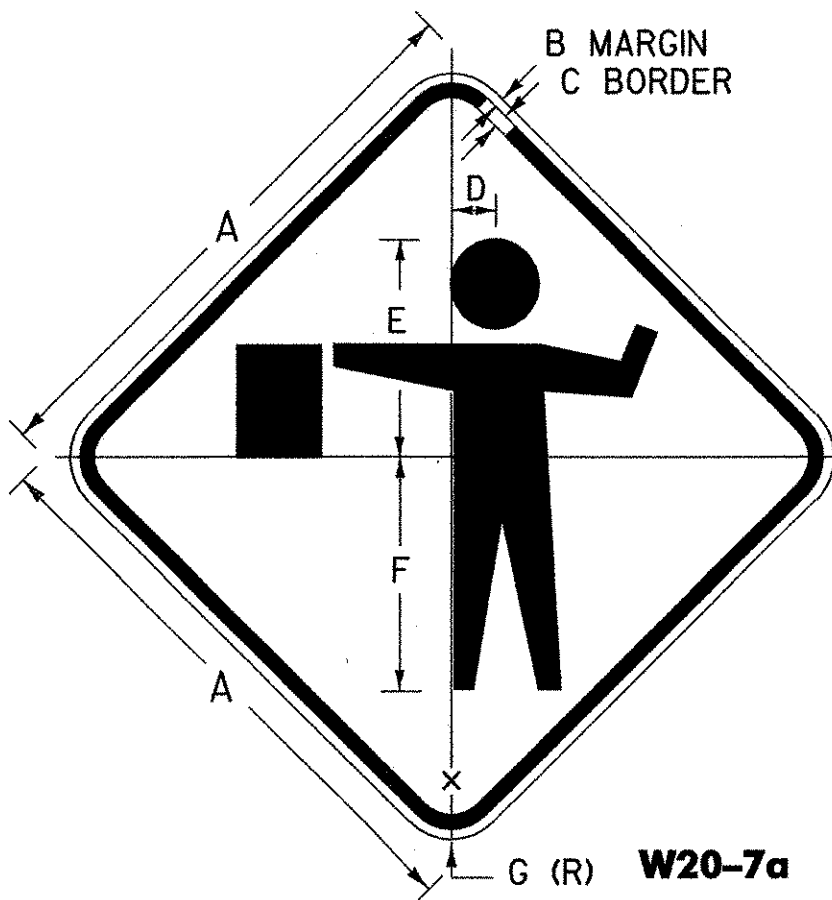
W20-2



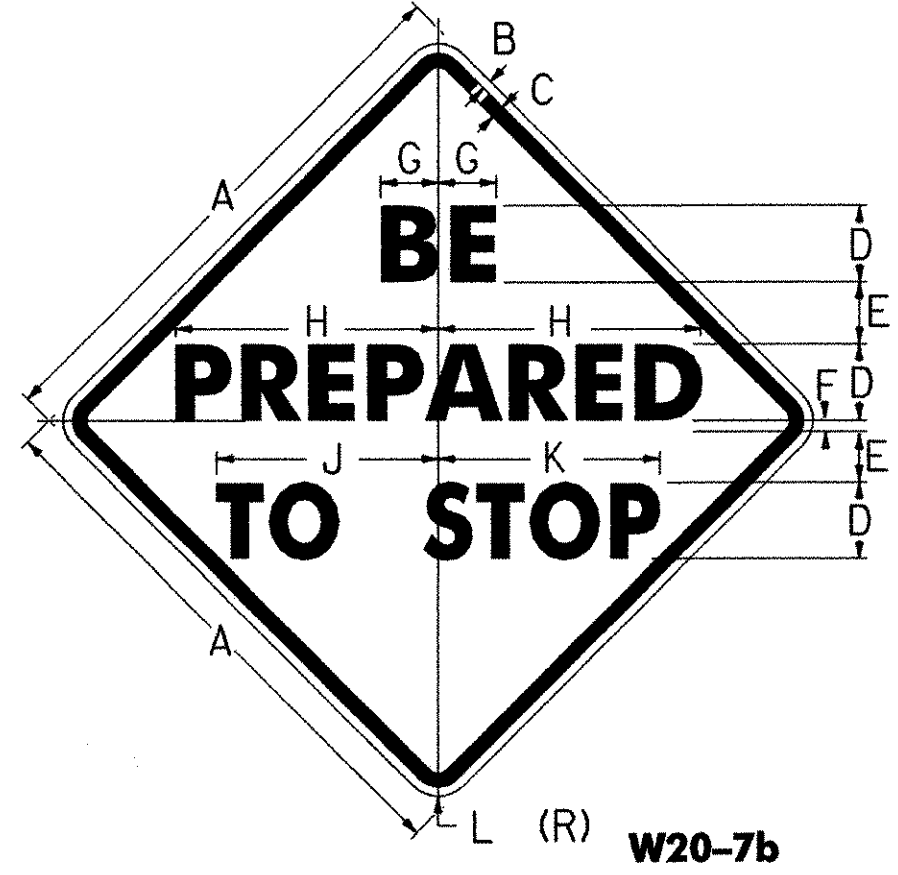
W20-3



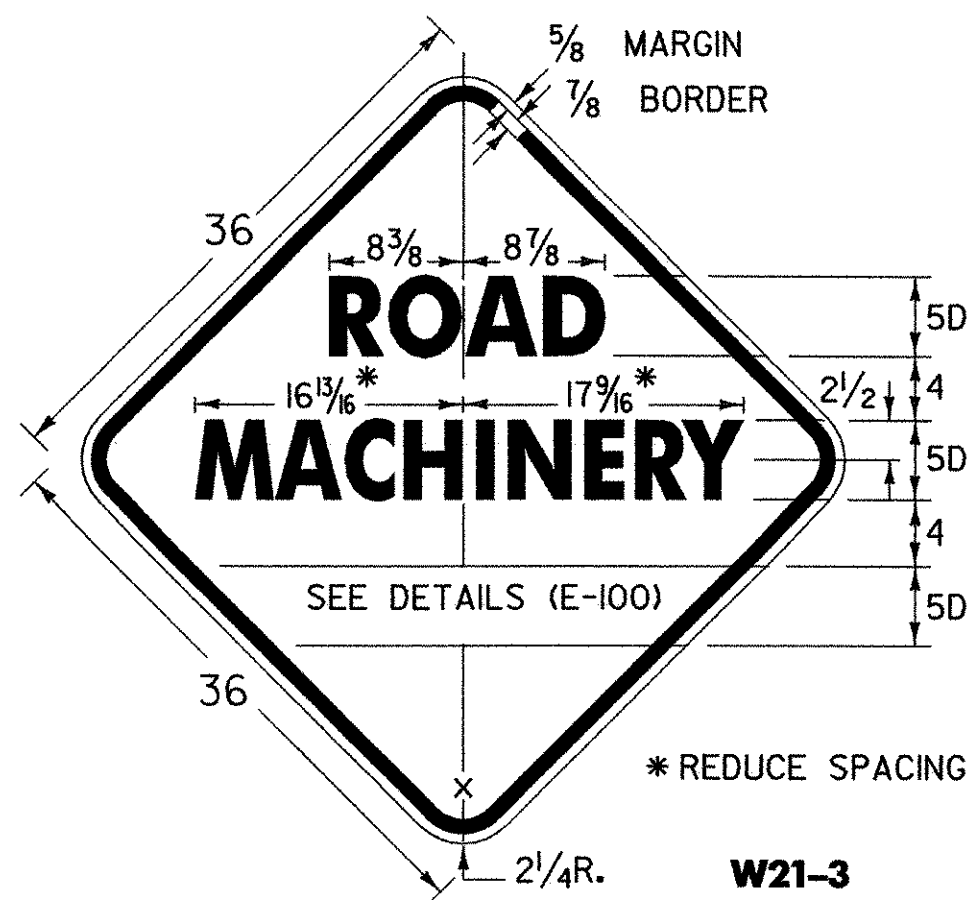
W20-4



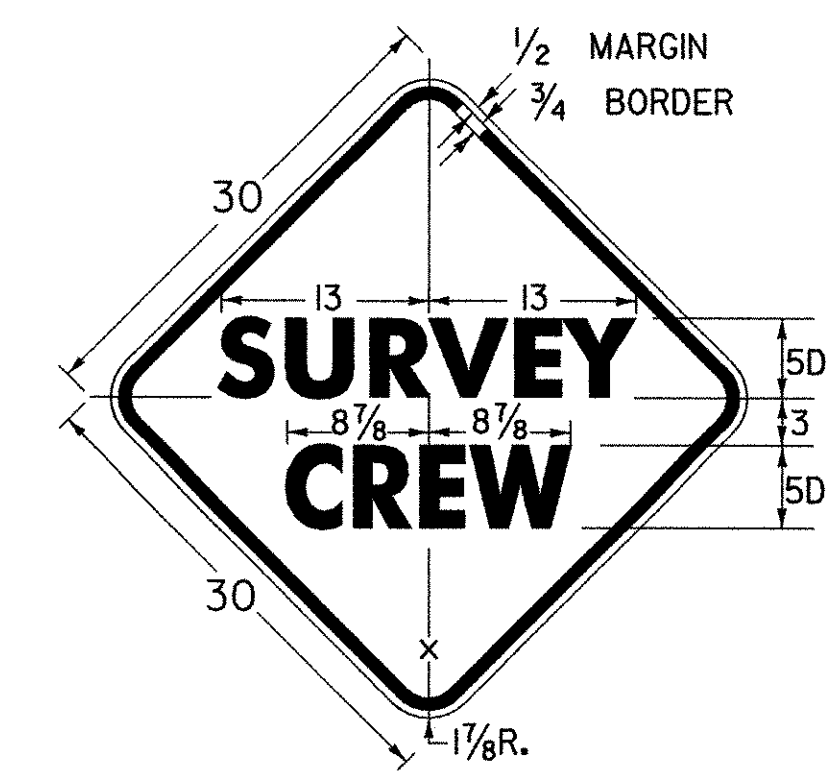
W20-7a



W20-7b

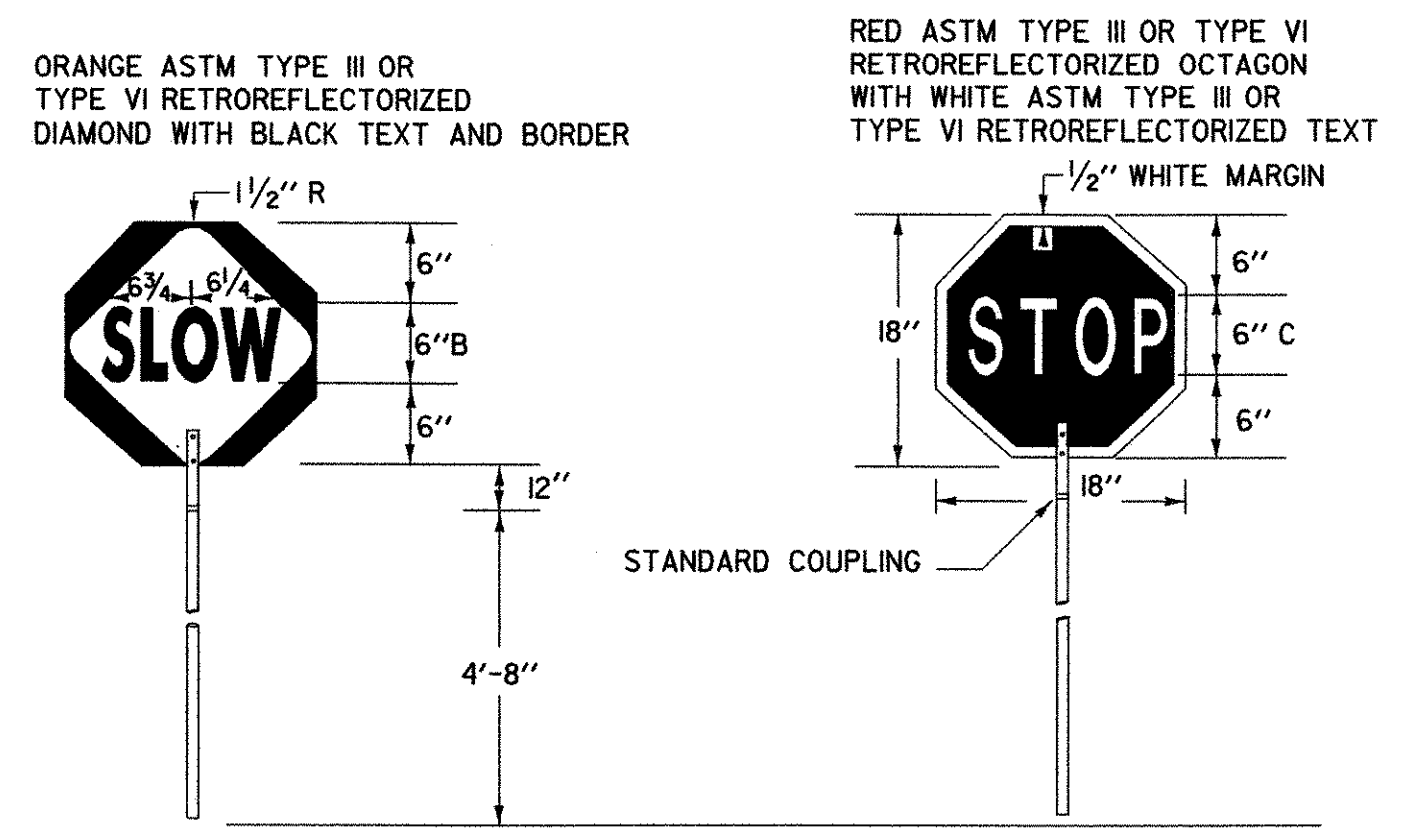


W21-3

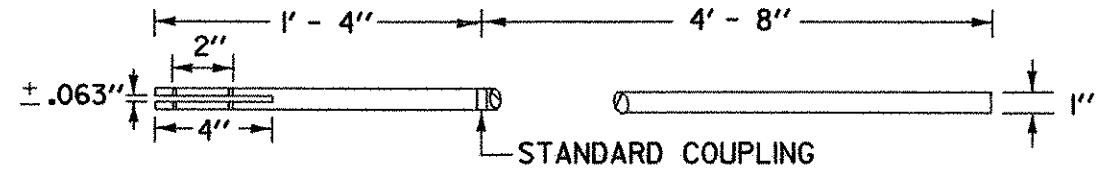


W21-6

SIGN PADDLE FOR FLAGPERSON



SIGN DETAIL



STAFF DETAIL

MATERIALS
THE SIGN MATERIALS SHALL BE 0.063" ALUMINUM WITH COLORS AS INDICATED ON DETAILS.
THE STAFF SHALL BE 1/4" 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 1/4" DIAMETER ALUMINUM RIVETS.

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 ASTM TYPE III OR TYPE VI RETROREFLECTORIZED ORANGE BACKGROUND, UNLESS OTHERWISE NOTED
SIGN DETAILS INDICATE THE APPROPRIATE COLOR.

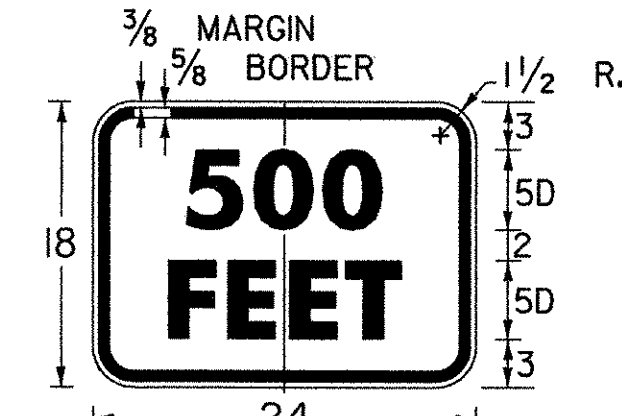
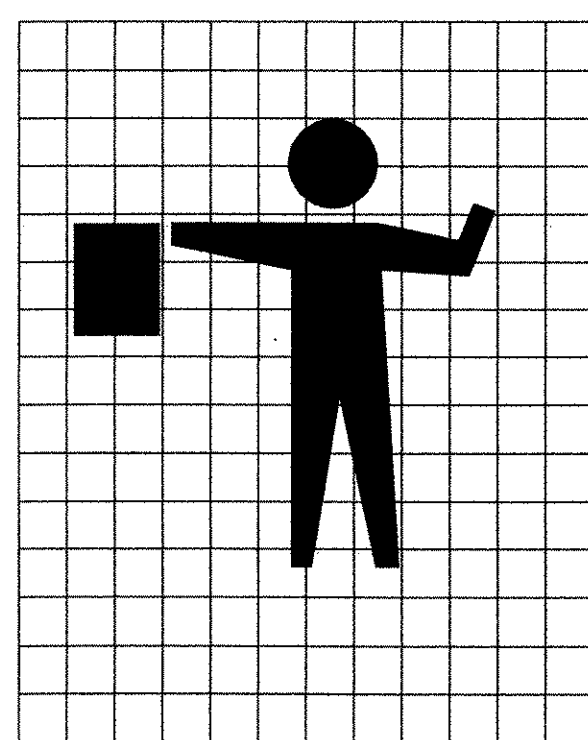
SIGN	DIMENSIONS (INCHES)						
	A	B	C	D	E	F	G
STD.	36	5/8	7/8	2 3/4	13 1/2	14 5/8	2 1/4
FWY.	48	3/4	1 1/4	3 3/4	18	19 1/2	3

COLORS:
BLACK BORDER AND TEXT (NON RETRORFL.)
ORANGE BACKGROUND (RETRORFL.)

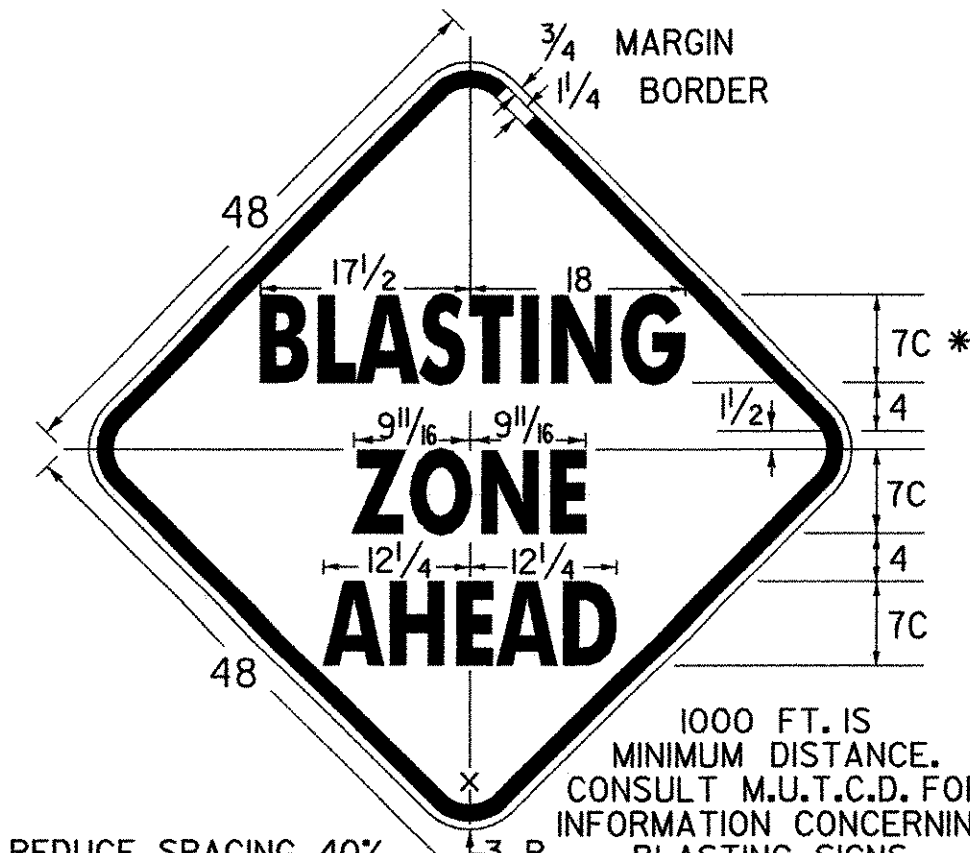
W3-4

COLORS:
BLACK BORDER AND TEXT (NON RETRORFL.)
YELLOW BACKGROUND (RETRORFL.)

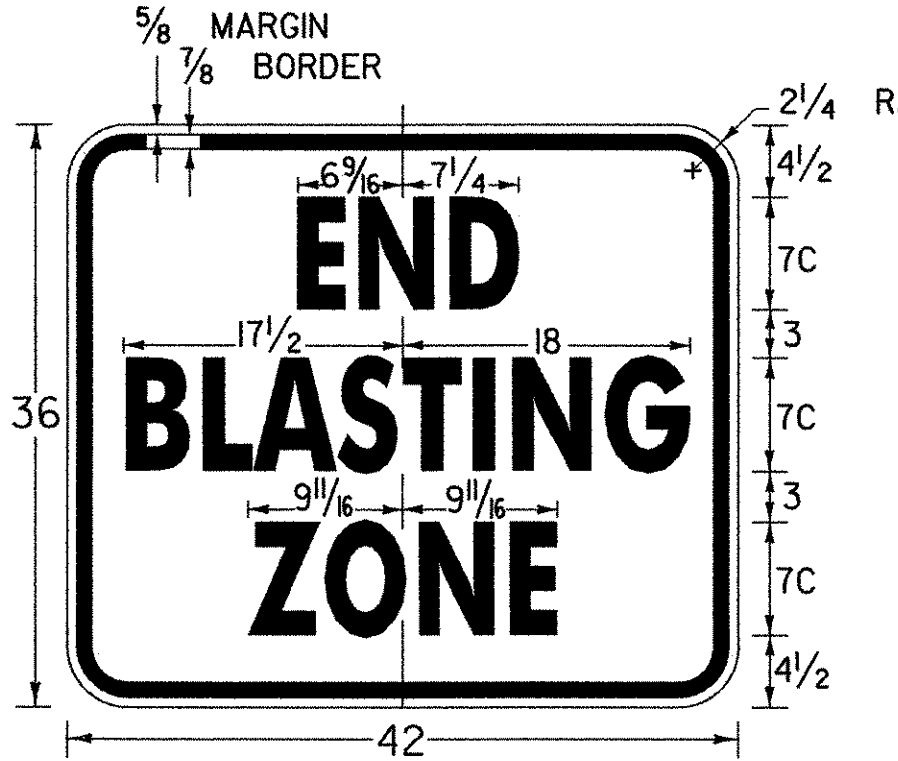
SIGN	DIMENSIONS (INCHES)											
	A	B	C	D	E	F	G	H	J	K	L	
MIN.	36	5/8	7/8	6C	3 3/8	7/8	3 3/4	16 3/8	13	13 3/8	2 1/4	
STD.	48	3/4	1 1/4	8C	4 7/8	1 1/4	5	21 7/8	17 3/8	18 1/2	3	
EXPWY.	60	3/4	1 1/4	9C	5 3/8	1 3/8	5 5/8	24 9/8	19 3/8	20 1/4	3	



W16-2a



W22-1



W22-3

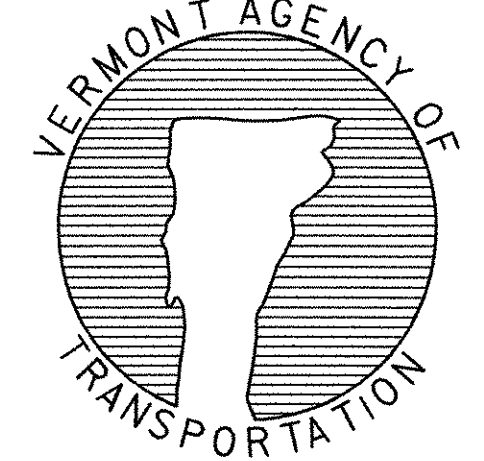


VW22-1

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
JUNE 30, 2003 - CHANGED REFLECTIVE SHEETING TO ASTM TYPE III OR TYPE VI CHANGED TEXT ON W20-7b SIGN

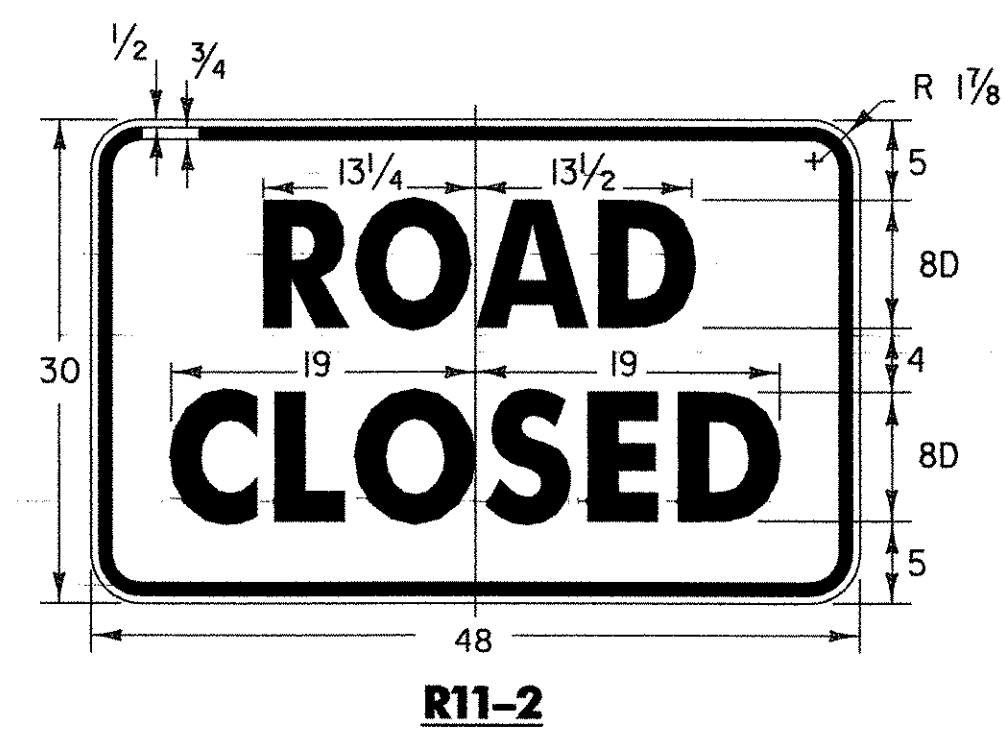
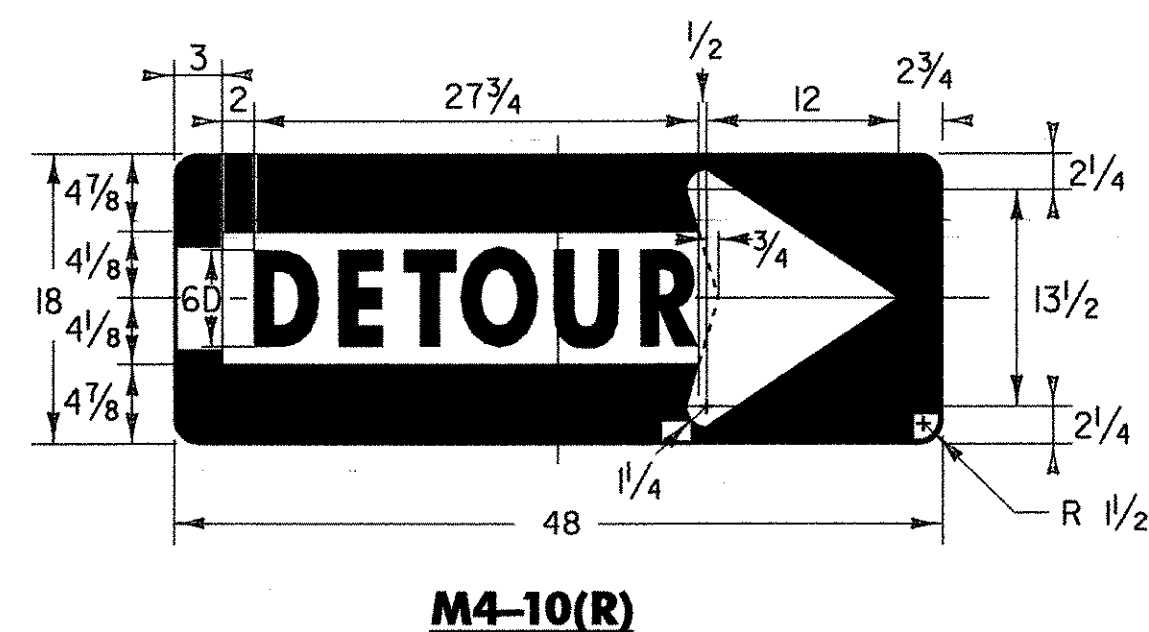
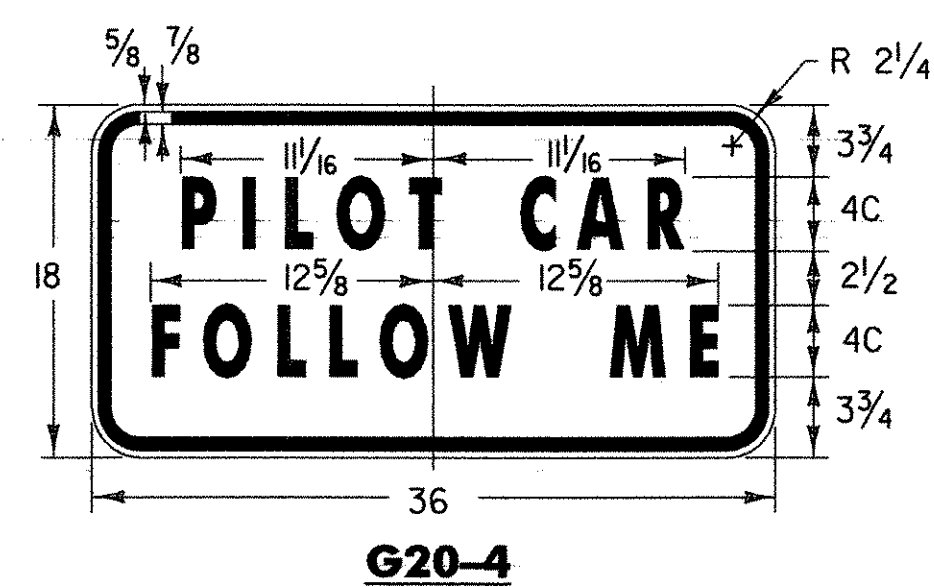
APPROVED
[Signature]
DIRECTOR OF PROGRAM DEVELOPMENT
[Signature]
TRAFFIC OPERATIONS ENGINEER
[Signature]
FEDERAL HIGHWAY ADMINISTRATION

CONSTRUCTION SIGN
DETAILS

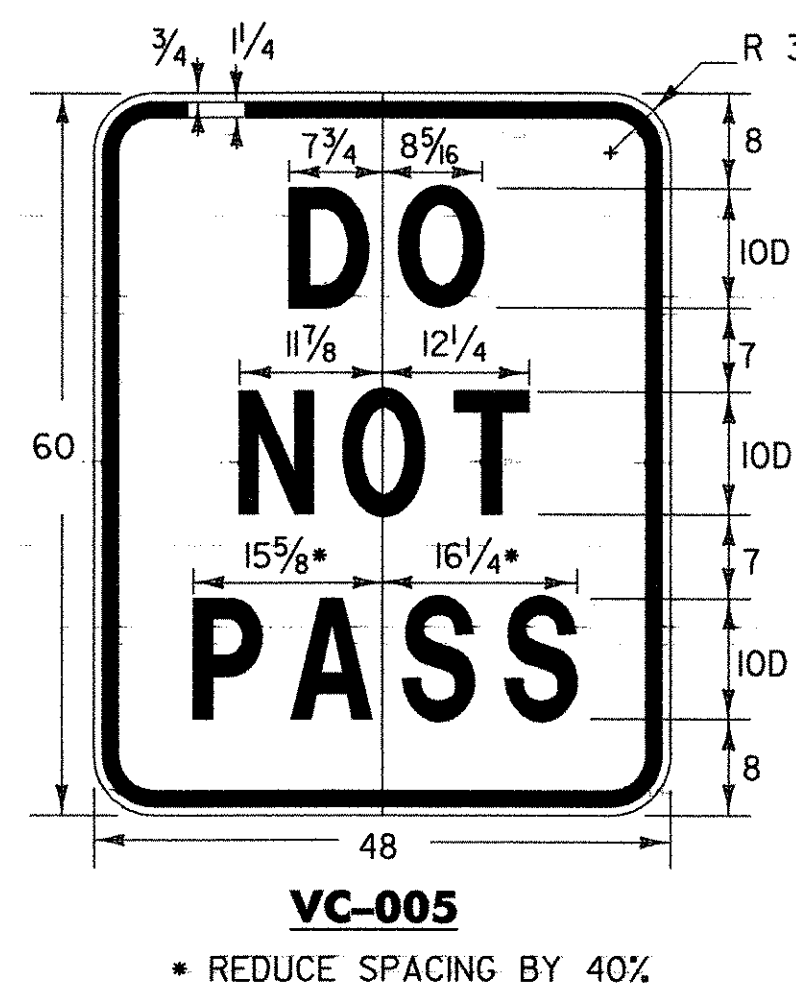
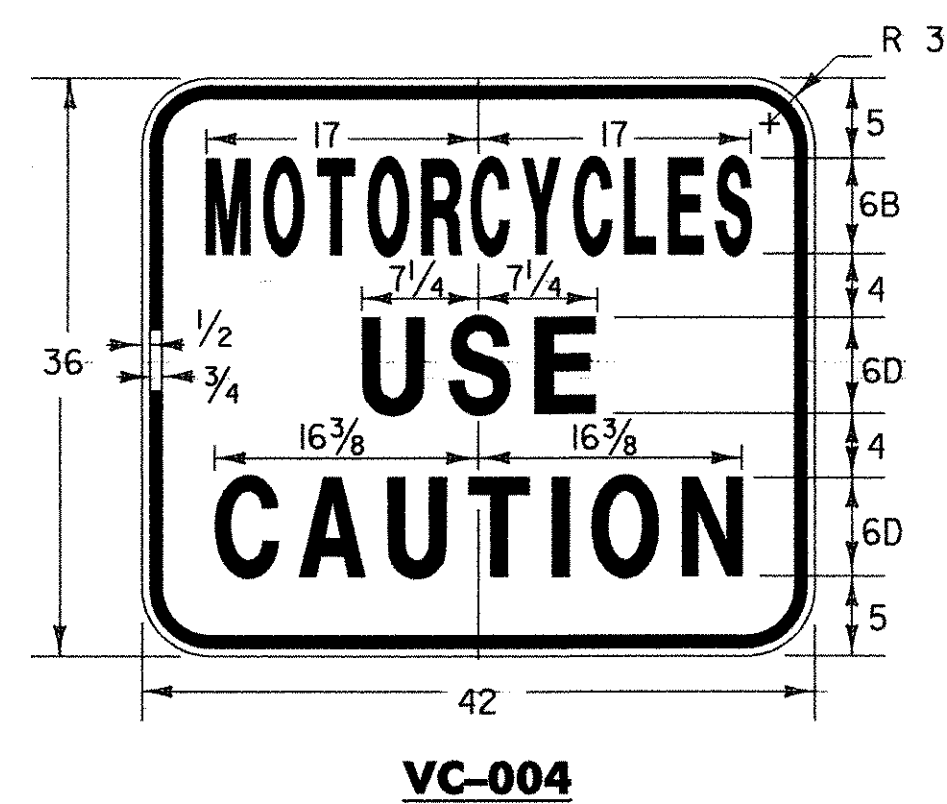
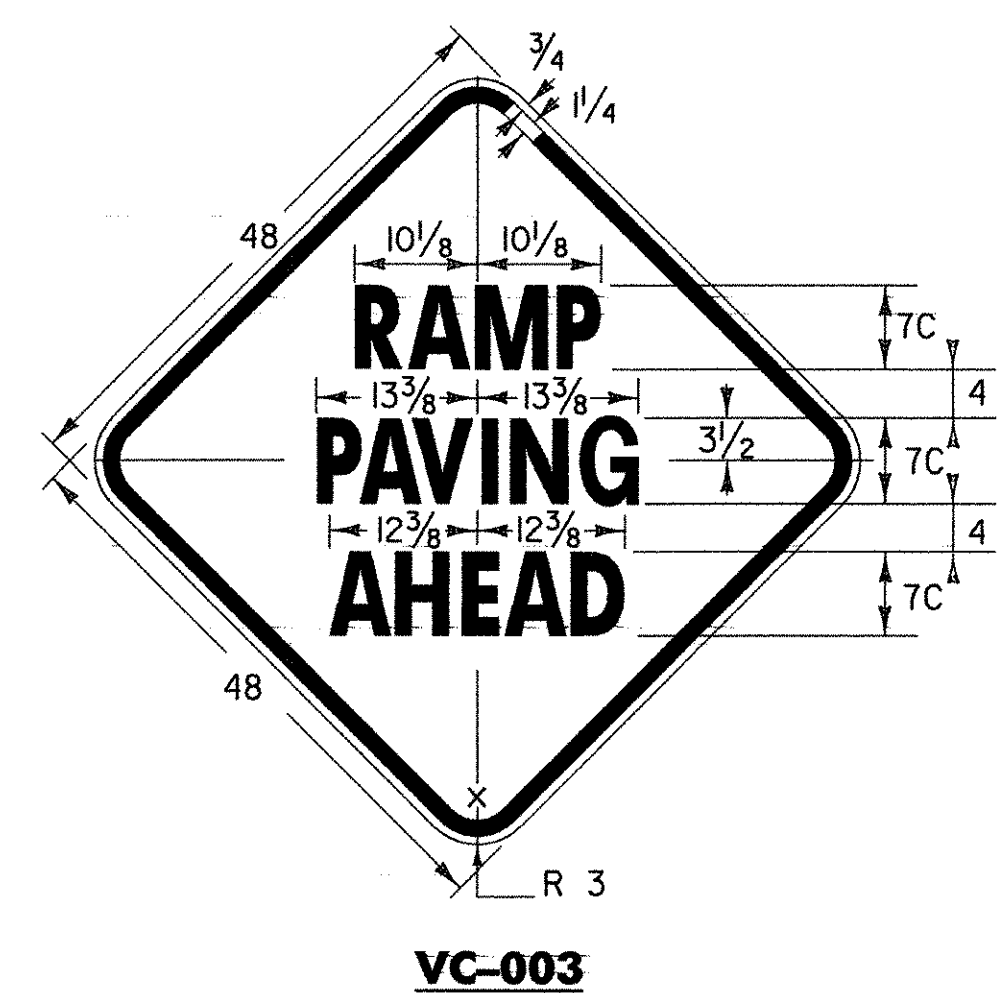
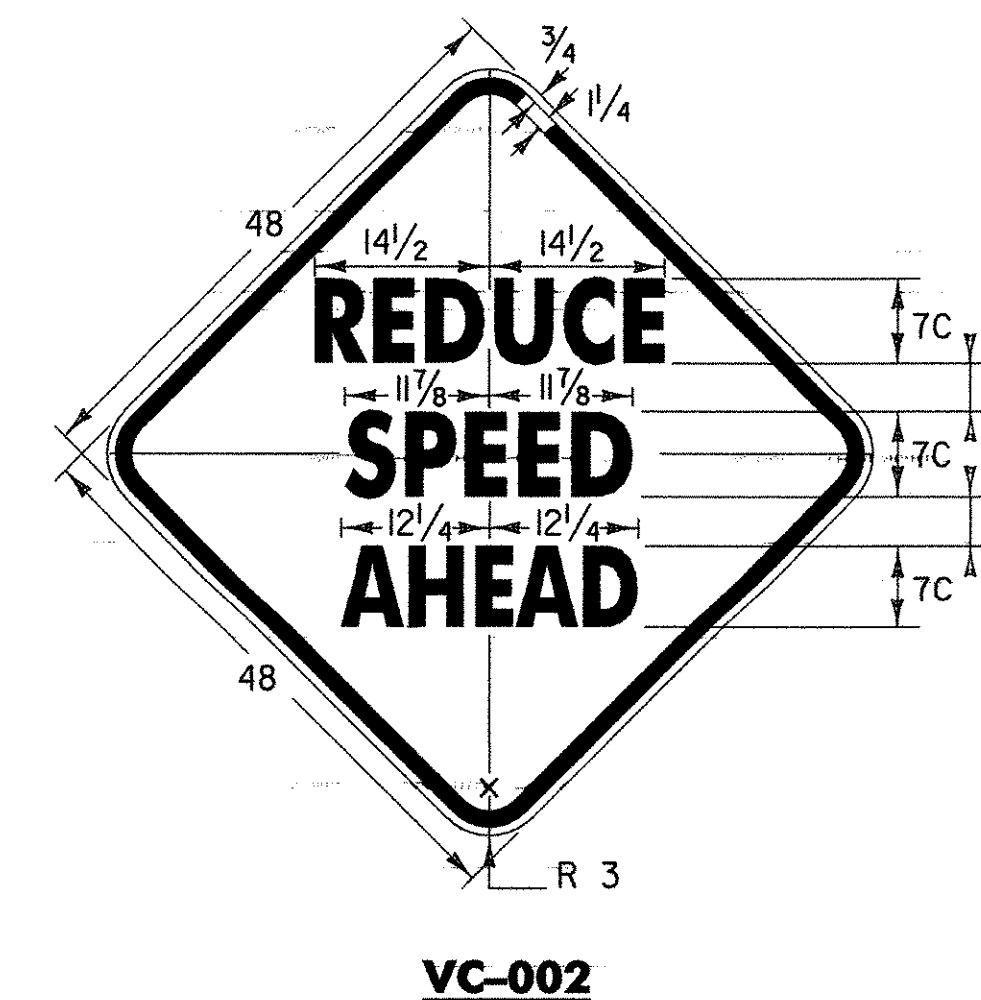
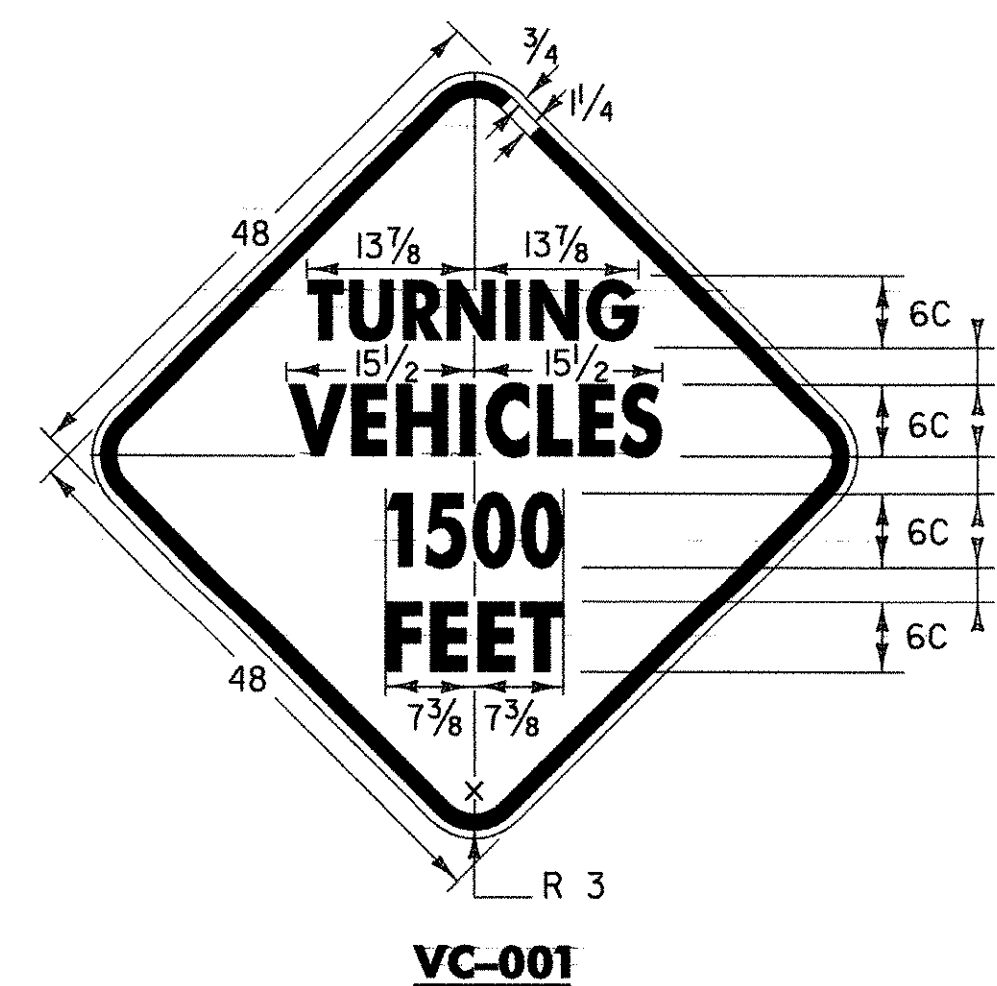


STANDARD
E-102

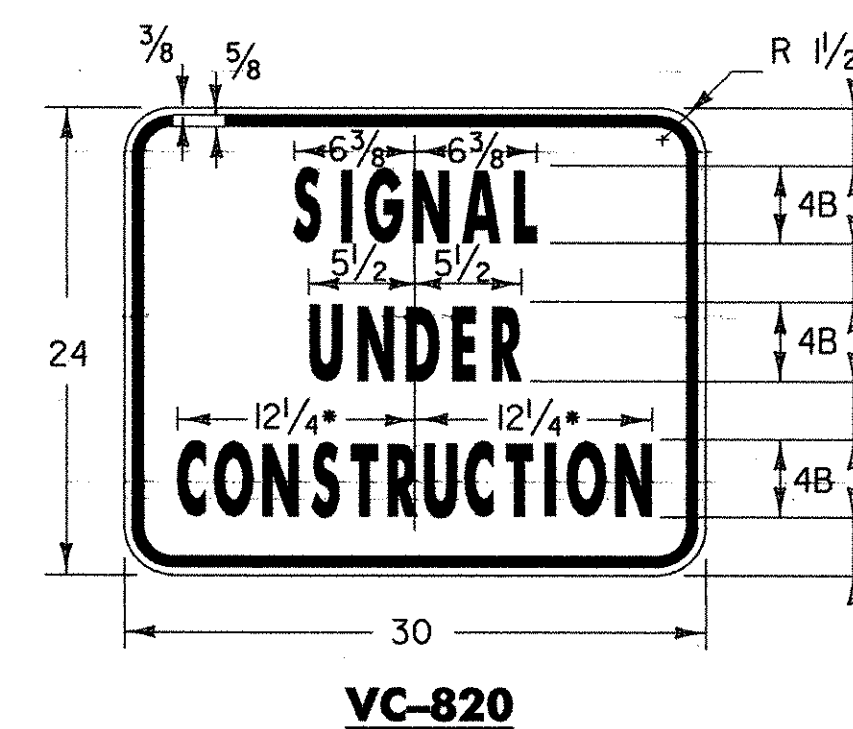
OTHER STDS. E-100 REQUIRED: NOTE: ALL DIMENSIONS SHOWN IN INCHES EXCEPT WHERE NOTED



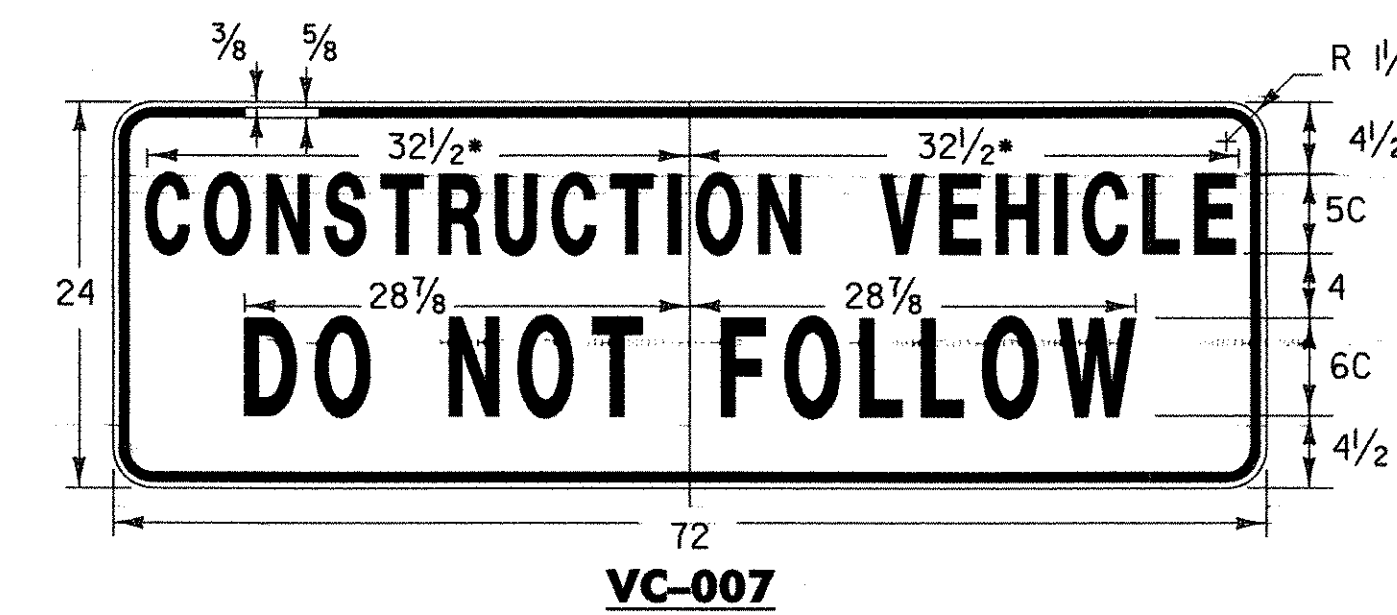
COLORS:
BLACK TEXT AND BORDER
WHITE RETROREFLECTORIZED BACKGROUND



* REDUCE SPACING BY 40%

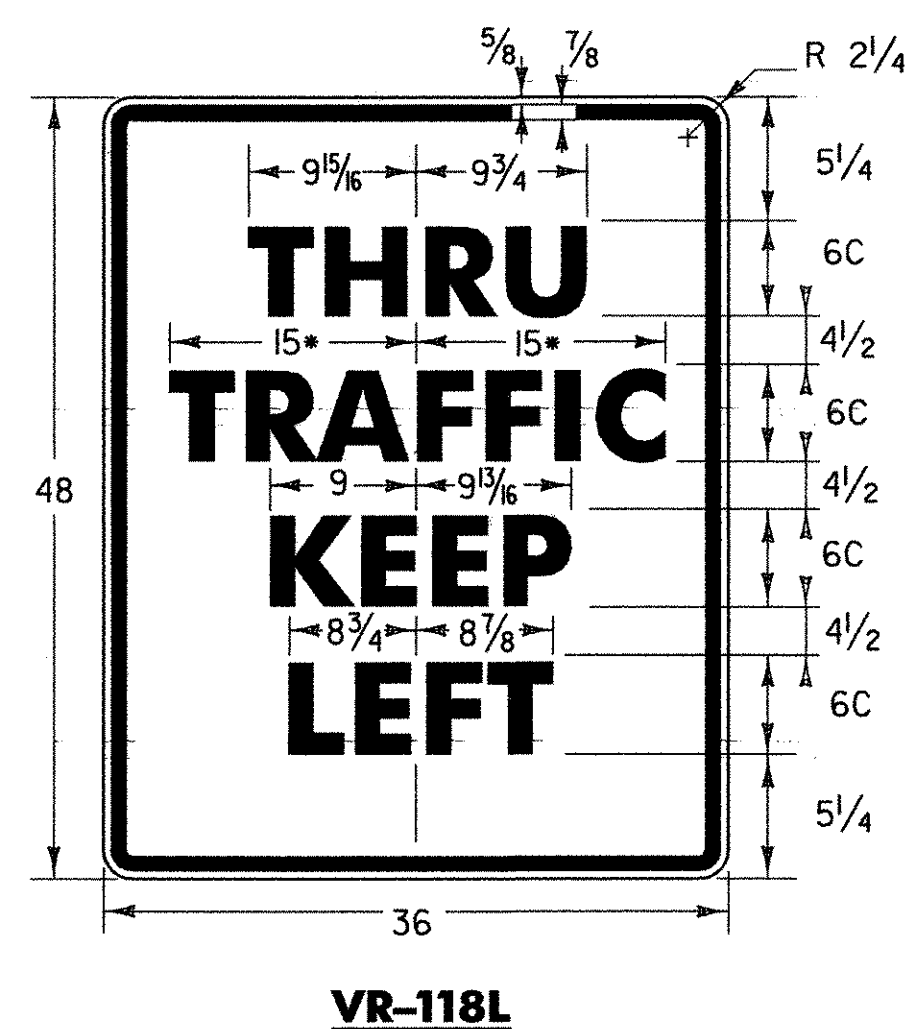
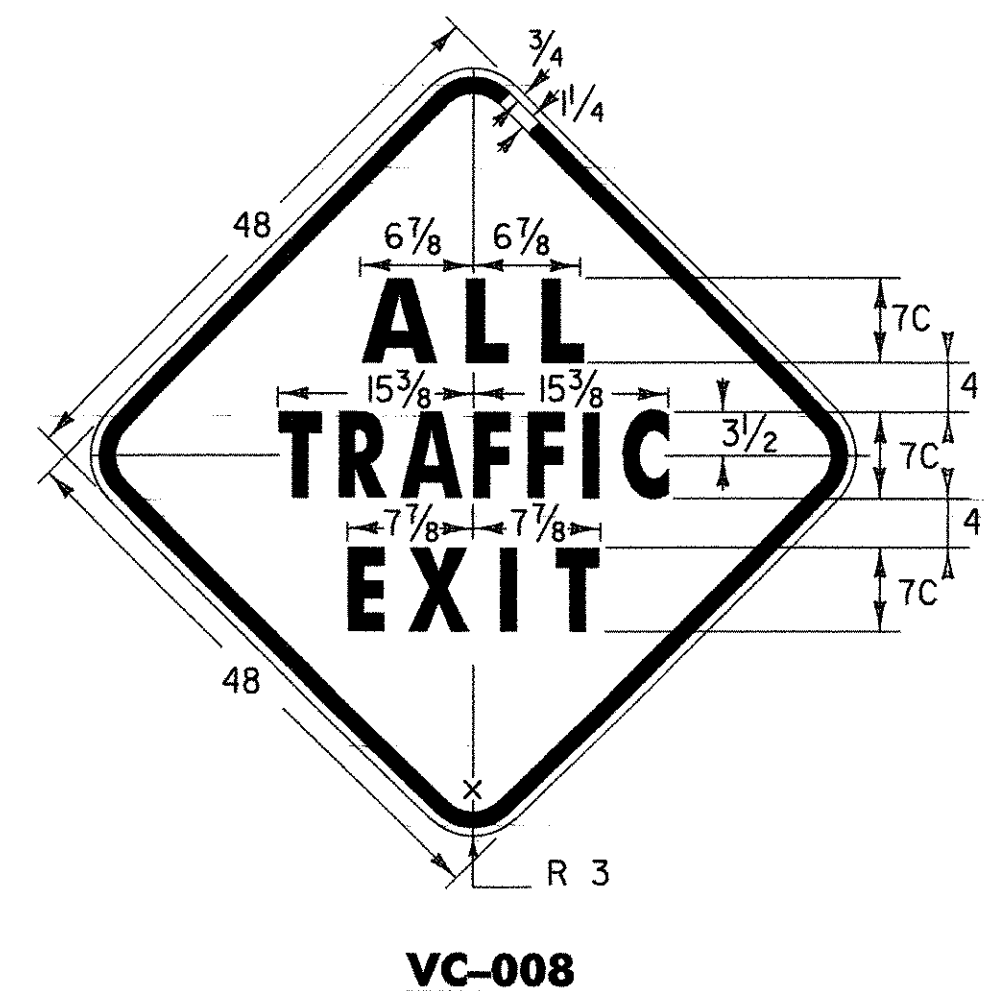


* REDUCE SPACING 25%



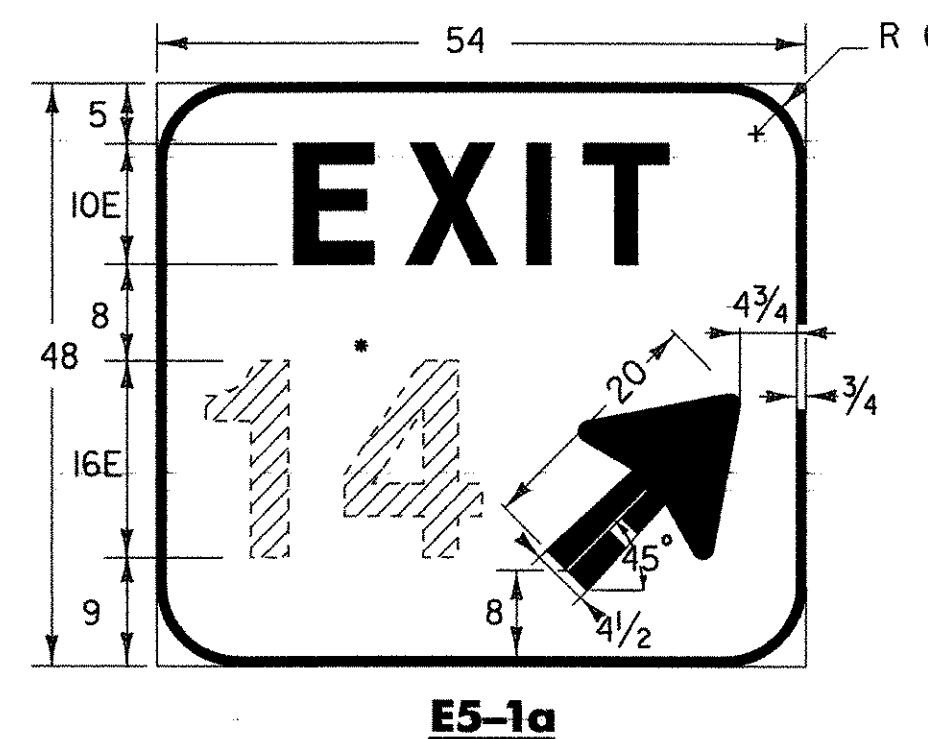
* REDUCE SPACING 20%

IT IS SUGGESTED THAT THIS SIGN BE DESIGNED TO FOLD, (DOWN OR ACROSS), 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.



* REDUCE SPACING 25 %

COLORS:
BLACK TEXT AND BORDER
WHITE (RETROREFLECTORIZED) BACKGROUND



* EXIT NUMBER AS PER PLANS OPTICALLY SPACED

COLORS:
WHITE RETROREFLECTORIZED BORDER, ARROW AND LEGEND
GREEN RETROREFLECTORIZED BACKGROUND

(ALL DIMENSIONS SHOWN IN INCHES EXCEPT WHERE NOTED)

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 ASTM TYPE III OR TYPE VIII RETROREFLECTIVE ORANGE BACKGROUND, UNLESS OTHERWISE NOTED.
SIGN DETAILS INDICATE THE PROPER COLOR.

OTHER STDS. E-100, E-151 REQUIRED:

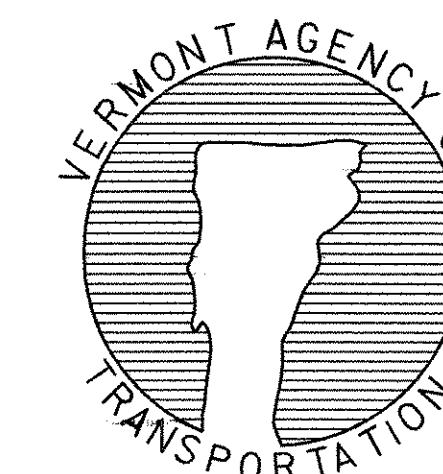
REVISIONS AND CORRECTIONS

AUG 08, 1995 - DATE OF ORIGINAL ISSUE
MAY 01, 2004 - CHANGED REFLECTIVE SHEETING TO TYPE III

APPROVED

[Signature]
DIRECTOR OF PROGRAM DEVELOPMENT
[Signature]
TRAFFIC OPERATIONS ENGINEER
[Signature]
FEDERAL HIGHWAY ADMINISTRATION

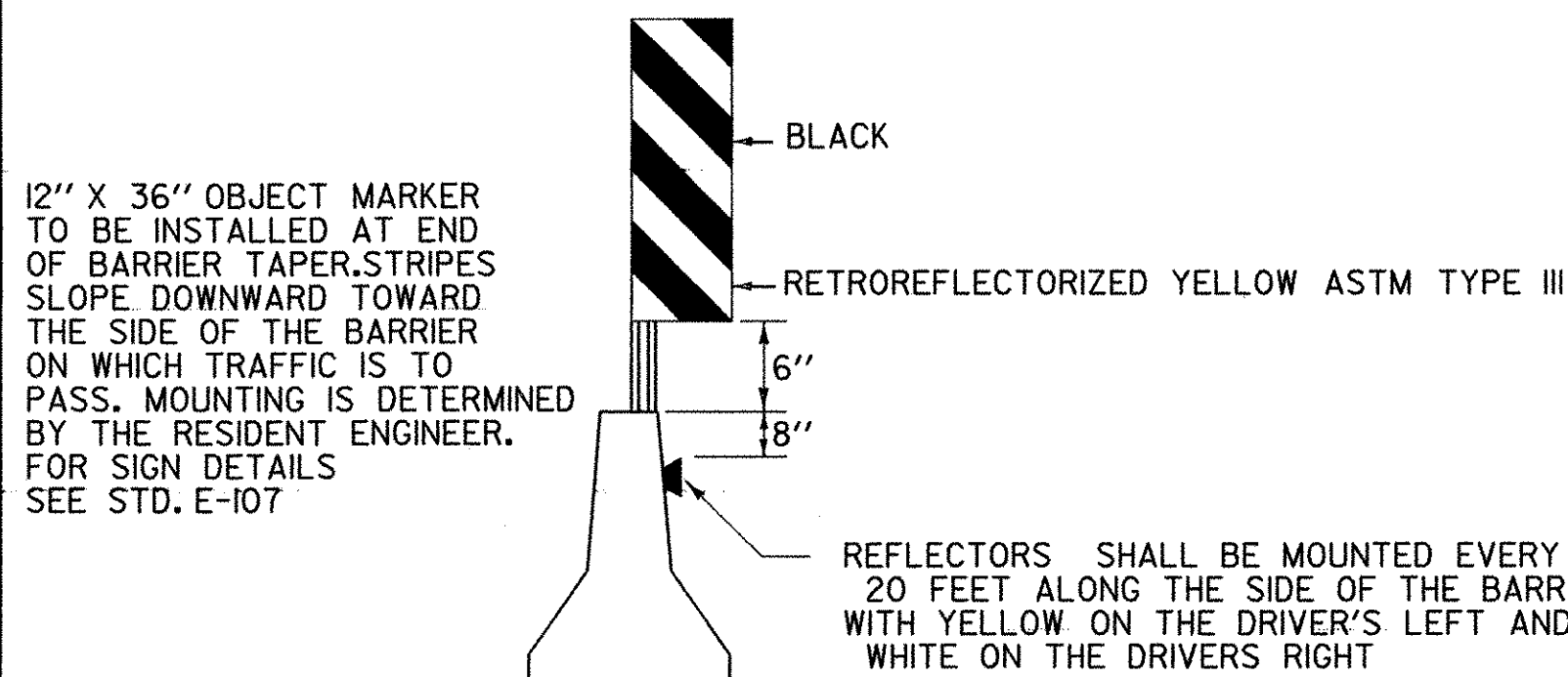
**CONSTRUCTION SIGN
DETAILS**



**STANDARD
E-102A**

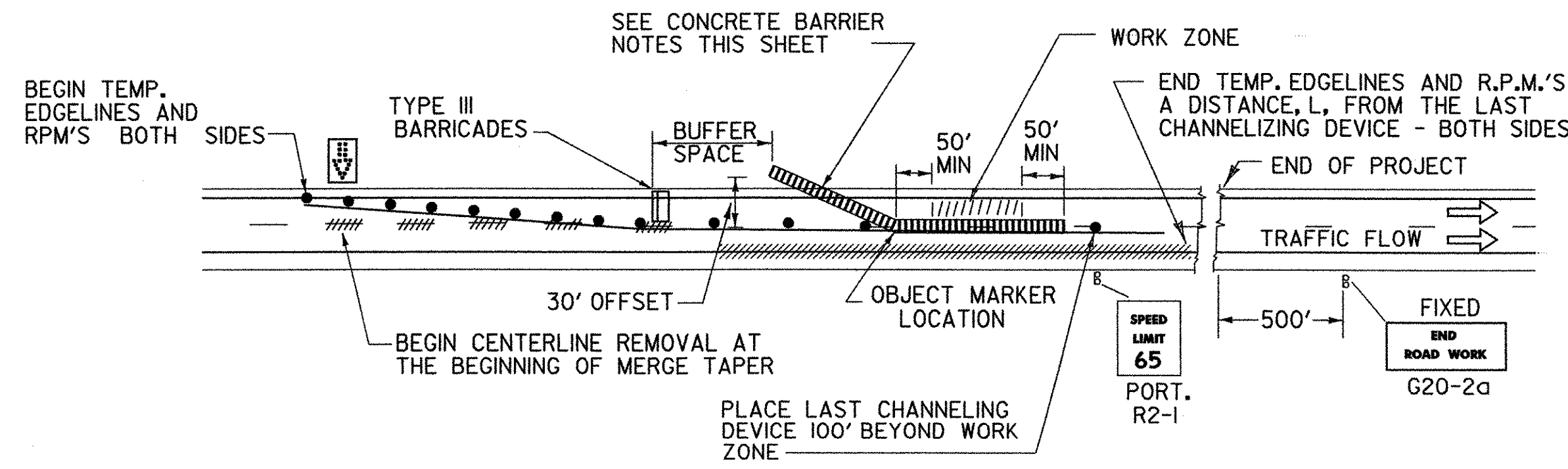
TRAVEL LANE REQUIREMENTS

1. BARRIER SHALL BE PLACED AS CLOSE AS POSSIBLE TO THE CENTERLINE TO ALLOW THE TRAFFIC TO USE THE NORMAL LANE WIDTH.
2. EDGELINES SHALL BE REMOVED AND NEW TEMPORARY TAPE EDGELINES SHALL BE APPLIED. THE DRIVERS LEFT EDGELINE SHALL BE A MINIMUM OF ONE FOOT (TWO FEET IS DESIRABLE) FROM BARRIER. TRAVEL LANE SHALL BE 12 FEET WIDE.
3. THE TEMPORARY TAPE PAVEMENT MARKINGS SHALL BE OF A TYPE WHICH CAN BE COMPLETELY REMOVED AFTER THE PROJECT IS COMPLETED WITHOUT, SCARRING OR MARKING THE PAVEMENT SURFACE.
4. PAYMENT FOR THE TAPE MARKINGS SHALL BE UNDER THE APPROPRIATE ITEM NUMBERS. PAVEMENT MARKING REMOVALS SHALL BE PAID UNDER THE APPROPRIATE ITEM NUMBER. TEMPORARY TAPE REMOVAL IS NOT PAID UNDER THE REMOVAL ITEM, IT IS PAID INCIDENTAL TO THE TAPE ITEM.
5. THE RAISED PAVEMENT MARKERS (RPM'S) SHALL BE OF A TYPE WHICH CAN BE EASILY REMOVED AND, SHALL BE PLACED TO THE OUTSIDE OF THE TEMPORARY TAPE PAVEMENT MARKINGS. THE RPM'S SHALL BE SPACED AT 20 FEET. THE RPM'S ARE INCIDENTAL TO ITEM 646.08 TEMPORARY PAVEMENT MARKINGS.
6. THE COST OF THE RAISED PAVEMENT MARKERS SHALL BE CONSIDERED A PART OF THE TEMPORARY PAVEMENT MARKING ITEM AND SEPARATE RPM'S SHALL NOT BE REQUIRED.



12" X 36" OBJECT MARKER TO BE INSTALLED AT END OF BARRIER TAPER. STRIPES SLOPE DOWNWARD TOWARD THE SIDE OF THE BARRIER ON WHICH TRAFFIC IS TO PASS. MOUNTING IS DETERMINED BY THE RESIDENT ENGINEER. FOR SIGN DETAILS SEE STD. E-107

REFLECTORS SHALL BE MOUNTED EVERY 20 FEET ALONG THE SIDE OF THE BARRIER, WITH YELLOW ON THE DRIVER'S LEFT AND WHITE ON THE DRIVER'S RIGHT



ONE LANE CLOSED WITH POSITIVE BARRIER PROTECTION

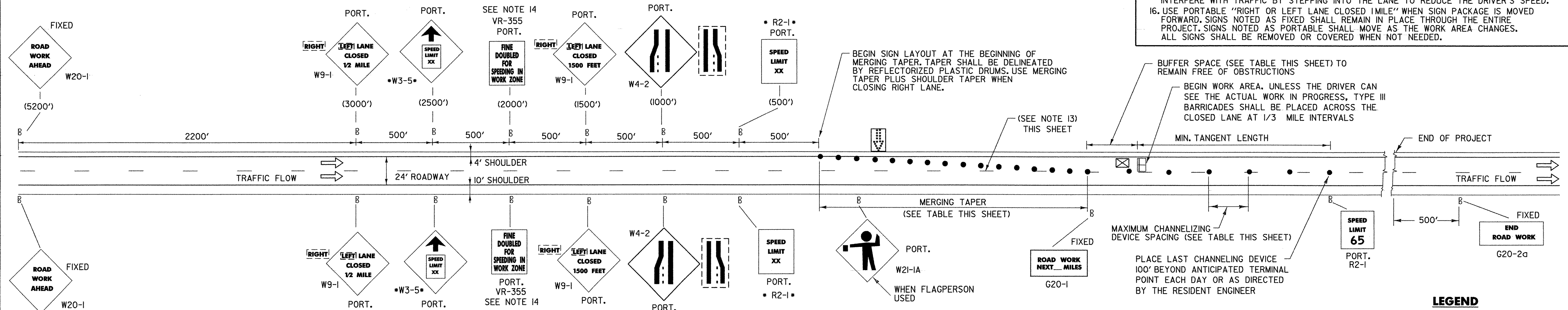
ADVANCE SIGNS AND LAYOUT REQUIREMENTS ARE THE SAME AS SHOWN BELOW USING FIXED SIGN MOUNTING THROUGHOUT

CONCRETE MEDIAN BARRIER NOTES

1. PROVIDE A MINIMUM TAPER RATE AS SHOWN IN THE TABLE BELOW, WITH A MINIMUM OF 50 FEET OF TANGENT SECTION ON EACH END OF THE WORK ZONE.
2. THE END OF THE BARRIER FACING APPROACHING TRAFFIC SHALL MEET THE FOLLOWING REQUIREMENTS:
 - A. WHEN NO GUARDRAIL IS PRESENT, USE 30 FOOT OFFSET FROM EDGE OF TRAVELLED WAY.
 - B. IF GUARDRAIL IS PRESENT, THEN CONCRETE BARRIER CAN BE TAPERED TO A DISTANCE BEYOND THE DEFLECTION DISTANCE OF THE GUARDRAIL. IF A 30 FOOT OFFSET IS NOT ATTAINABLE OR TO A DISTANCE BEYOND THE DEFLECTION DISTANCE OF THE GUARDRAIL, THEN A CRASH ATTENUATOR SHALL BE PROVIDED.
3. IF THE BARRIER IS PLACED SUCH THAT THE TEMPORARY TAPE CAN BE PLACED OVER THE EXISTING DASHED LINE, THEN THE EDGELINES DO NOT NEED TO BE TAPERED BEFORE THE BARRIER AND THE DASHED MARKINGS DO NOT NEED TO BE REMOVED IN THE TANGENT SECTION. IF THE BARRIER LINE IS PLACED SUCH THAT COVERING THE DASHED EDGELINE WITH TEMPORARY TAPE IS NOT POSSIBLE, THE EDGELINES SHALL BE TAPERED A LENGTH 'L', BOTH IN ADVANCE AND BEYOND THE BARRIER PLACED ON THE TANGENT.

NOTES

1. WHEN CONSTRUCTION EQUIPMENT IS WORKING AT OR NEAR THE EXIT OR ENTRANCE RAMP, FLAGPERSONS OR UNIFORMED TRAFFIC CONTROL OFFICERS (UTO'S) SHOULD BE USED TO ASSIST IN CONTROLLING TRAFFIC. SEE STD. E-106 FOR TRAFFIC CONTROL DETAILS.
2. ALL SIGNS SHALL BE PLACED BEFORE ANY WORK BEGINS OR EQUIPMENT IS PUT ON THE ROADWAY. SIGNS SHALL BE COVERED OR REMOVED WHEN NOT APPLICABLE, SEE STANDARD SHEET E-100 FOR REQUIREMENTS.
3. CONTRACTOR SHALL HAVE CHANNELIZING DEVICES AND SIGNS FOR LEFT SIDE CLOSURE AND RIGHT SIDE CLOSURE ON PROJECT BEFORE STARTING PROJECT.
4. EXISTING SPEED LIMIT SIGNS SHALL BE COVERED WHEN REDUCED SPEED SIGNS ARE POSTED.
5. CHANNELIZING DEVICES OTHER THAN REFLECTORIZED PLASTIC DRUMS WILL BE ALLOWED ALONG TANGENT SECTIONS AS LONG AS THEY CONFORM TO THE M.U.T.C.D. AND ARE APPROVED BY THE RESIDENT ENGINEER. THE TYPE OF DEVICE SHALL BE CONSISTENT THROUGHOUT THE TANGENT SECTION.
6. THE "SPEED LIMIT XX" AND OTHER RELATED SIGNS SHALL BE REMOVED OR COVERED WHEN WORK IS NOT IN PROGRESS AND ROADWAY IS NOT RESTRICTED.
7. "REDUCED SPEED AHEAD" SIGNS MAY BE USED IN LIEU OF "SPEED ZONE AHEAD".
8. FOR RELATIVELY SHORT TERM PROJECTS WITH NO OFFICIAL SPEED ZONE ENACTMENT, THE SPEED LIMIT AND REDUCED SPEED LIMIT SIGNS CAN BE SUBSTITUTED WITH ADVISORY SPEED PLAQUES MOUNTED AS SUPPLEMENTAL SIGNS ON OTHER WARNING SIGNS.
9. ALL FIXED SIGNS SHALL BE MOUNTED ON YIELDING STEEL, ALUMINUM OR WOOD SUPPORTS AS SHOWN ON APPROPRIATE STANDARD SHEETS.
10. PORTABLE SIGNS SHALL BE KEPT LEVEL WHEN PLACED ON THE EDGE OF ROADWAY AND ALL VEGETATION THAT INTERFERES WITH VISIBILITY OF THE SIGNS SHALL BE REMOVED. PAYMENT INCIDENTAL TO OTHER CONTRACT ITEMS. WHEN PLACED BEHIND GUARDRAIL, THE BOTTOM OF THE SIGN FACES SHALL BE PLACED ABOVE THE TOP OF THE GUARDRAIL.
11. WARNING LIGHTS SHALL NOT BE USED ON CHANNELIZING DEVICES.
12. THE NUMBER OF CHANNELIZING DEVICES, TYPE III BARRICADES AND OTHER TRAFFIC CONTROL DEVICES SHOWN ON THIS SHEET ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL NUMBER REQUIRED ARE TO BE DETERMINED BASED ON INDIVIDUAL DETOUR CONDITIONS (TAPERS, SPEED LIMITS, LENGTH OF DETOUR, CURVE, ETC.)
13. FOR ANY LONG TERM CLOSURE (GREATER THAN 3 DAYS) EXISTING CENTERLINE SHALL BE REMOVED AND TEMPORARY EDGELINES PLACED AS SHOWN WITH POSITIVE BARRIER.
14. FINE DOUBLED FOR SPEEDING IN WORK ZONE WILL ONLY BE USED IF TEMPORARY SPEED LIMIT FORM HAS BEEN FILED.
15. IF CONSTRUCTION ACTIVITIES REDUCE LANE WIDTHS TO THE POINT WHERE 40 MPH CANNOT BE MAINTAINED, ADDITIONAL ADVISORY SPEED PLATE SIGNS SHALL BE INSTALLED UNDER THE LANE REDUCTION TRANSITION SIGN. FLAGPERSONS AND U.T.O.'S SHALL NOT BE ALLOWED TO INTERFERE WITH TRAFFIC BY STEPPING INTO THE LANE TO REDUCE THE DRIVER'S SPEED.
16. USE PORTABLE "RIGHT OR LEFT LANE CLOSED 1 MILE" WHEN SIGN PACKAGE IS MOVED FORWARD. SIGNS NOTED AS FIXED SHALL REMAIN IN PLACE THROUGH THE ENTIRE PROJECT. SIGNS NOTED AS PORTABLE SHALL MOVE AS THE WORK AREA CHANGES. ALL SIGNS SHALL BE REMOVED OR COVERED WHEN NOT NEEDED.



CHANNELIZING DEVICES

TAPER RATES ARE DETERMINED USING THE FOLLOWING EQUATION:
 $L = WS$ FOR DESIGN SPEEDS OF 45 MPH OR GREATER
 $L = WS^2/60$ FOR DESIGN SPEEDS OF 40 MPH OR LESS
 WHERE: L = MINIMUM LENGTH OF TAPER
 W = WIDTH OF OFFSET (USUALLY LANE WIDTH) IN FEET
 S = DESIGN SPEED IN MPH

POSTED SPEED OR 85th PERCENTILE (mph)	DESIGN SPEED (mph)	TAPER LENGTHS (ft)			TANGENT SECTION LENGTHS (L/2) (ft)	MINIMUM BUFFER SPACE LENGTH (ft)	MAXIMUM CHANNELIZING DEVICE SPACING (ft)		BARRIER FLARE RATE (MIN)
		MERGING 12 FT LANE (L)	SHIFTING W=16 FT (L/2)	SHOULDER W=10 FT (L/3)			TAPER	ALONG LANE LINE & WORK ZONE	
≤ 40	40	320	215	90	160	35	70	1:9	
45	45	540	360	150	270	40	80	1:9	
50	50	600	400	170	300	50	100	1:11	
55	55	660	440	185	330	55	110	1:13	
60 & 65	60	720	480	200	360	60	120	1:13	
70	70	840	560	235	420	65	130	1:13	

LEGEND

- ◻ - FLASHING ARROW PANEL
- - REFLECTORIZED PLASTIC DRUM
- //// - PAVEMENT MARKING REMOVAL
- ▬ - CONCRETE MEDIAN BARRIER
- ▭ - TYPE III BARRICADE
- ⊠ - TRUCK/TRAILER MOUNTED ATTENUATOR (OPTIONAL)

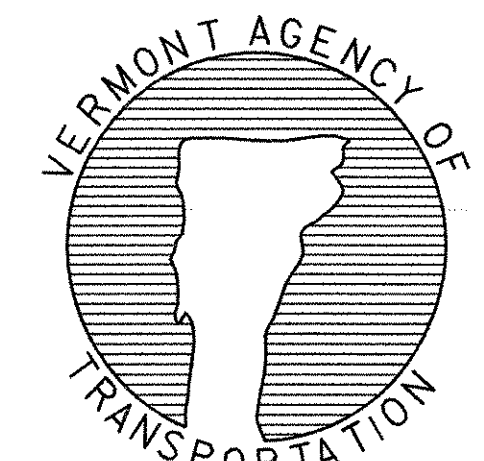
OTHER STDS. REQUIRED: E-100, E-101, E-102, E-102A, E-106, E-107, E-107A, E-108

REVISIONS AND CORRECTIONS

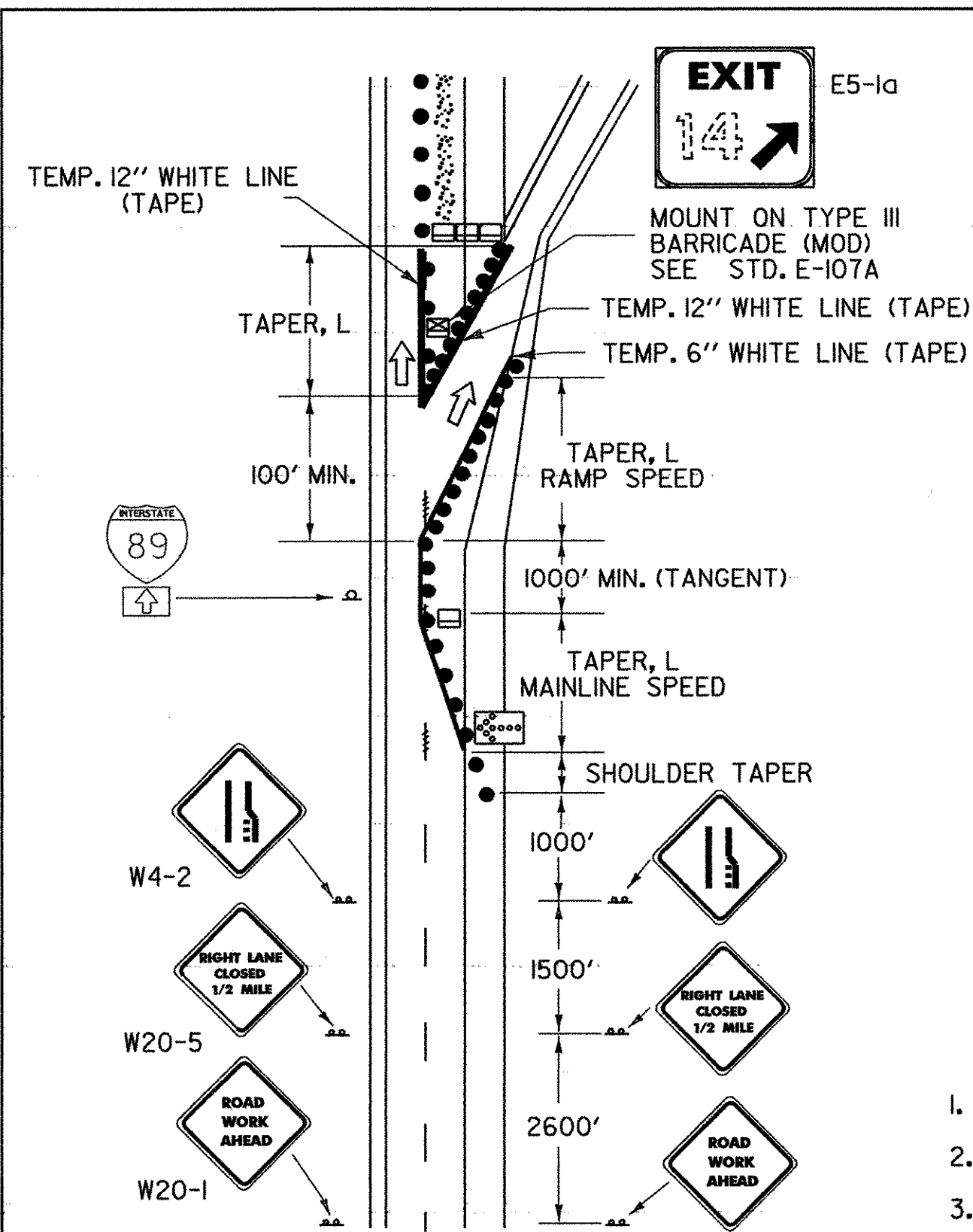
- OCT. 30, 1987 - DATE OF ORIGINAL ISSUE
- JAN. 23, 1989 - FHWA COMMENTS - CHANGE TO 65 M.P.H. TAPER RATES
- OCT. 21, 1992 - ADDED TAPER RATE TABLE & REVISED TITLE BLOCK
- AUG. 08, 1995 - DELETED AN INVALID NOTE
- SEPT. 23, 1998 - ADDED FINE SIGN VR-355
- MAR. 01, 2004 - CHANGED REFLECTIVE SHEETING AND REVISED TO MUTCD 2003

APPROVED
 DIRECTOR OF PROGRAM DEVELOPMENT
 TRAFFIC OPERATIONS ENGINEER
 FEDERAL HIGHWAY ADMINISTRATION

MAINLINE TRAFFIC CONTROL DIVIDED HIGHWAY ONE LANE CLOSED



STANDARD E-103



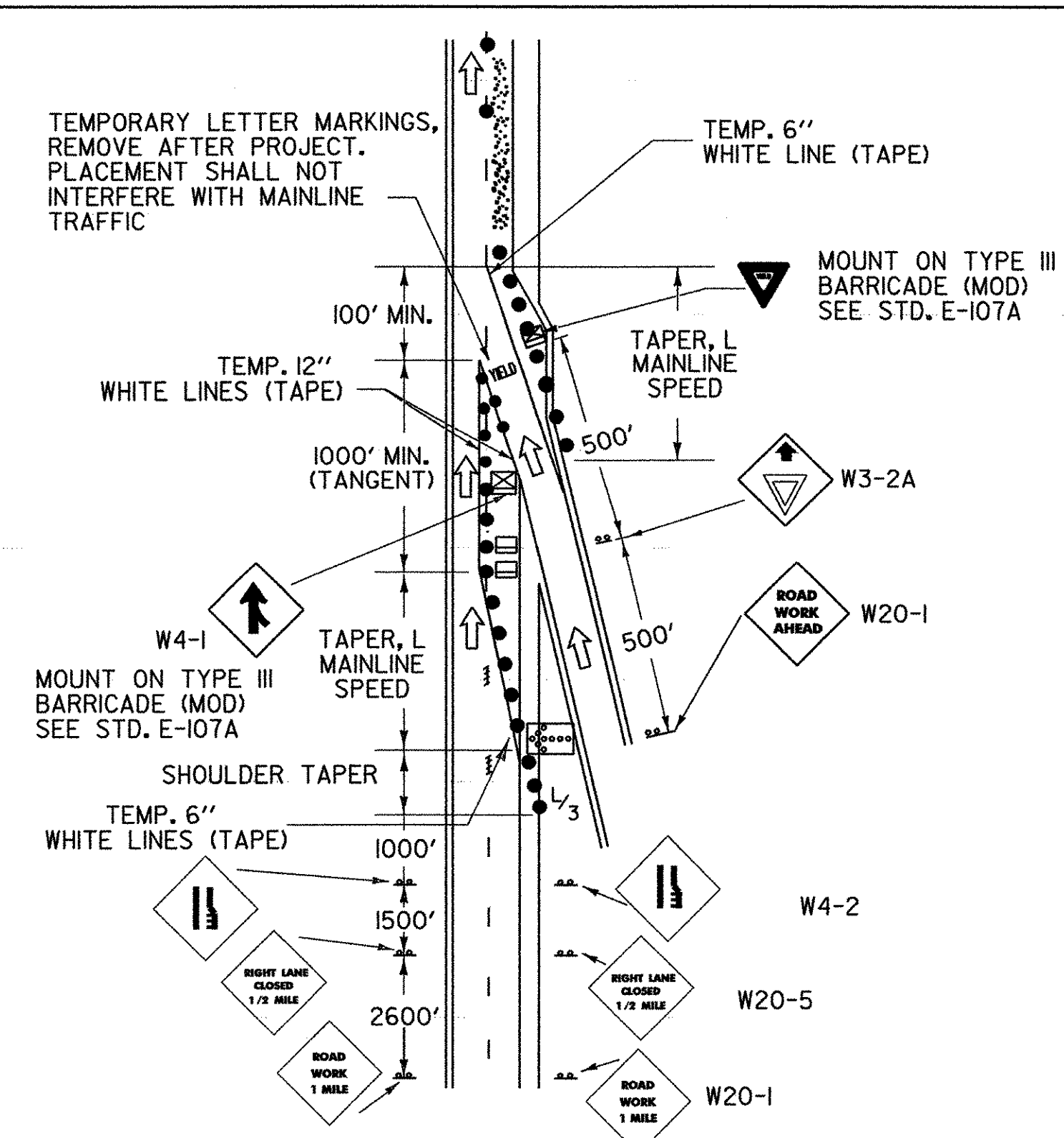
MAINLINE LANE CLOSURE AT AN EXIT RAMP

NOT TO SCALE
THIS DETAIL SHALL BE USED WHEN THE WORK ZONE BEGINS AT THE CORE OR THE MAINLINE LANE CLOSURE DRUM PLACEMENT INTERFERES WITH THE EXIT RAMP.

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

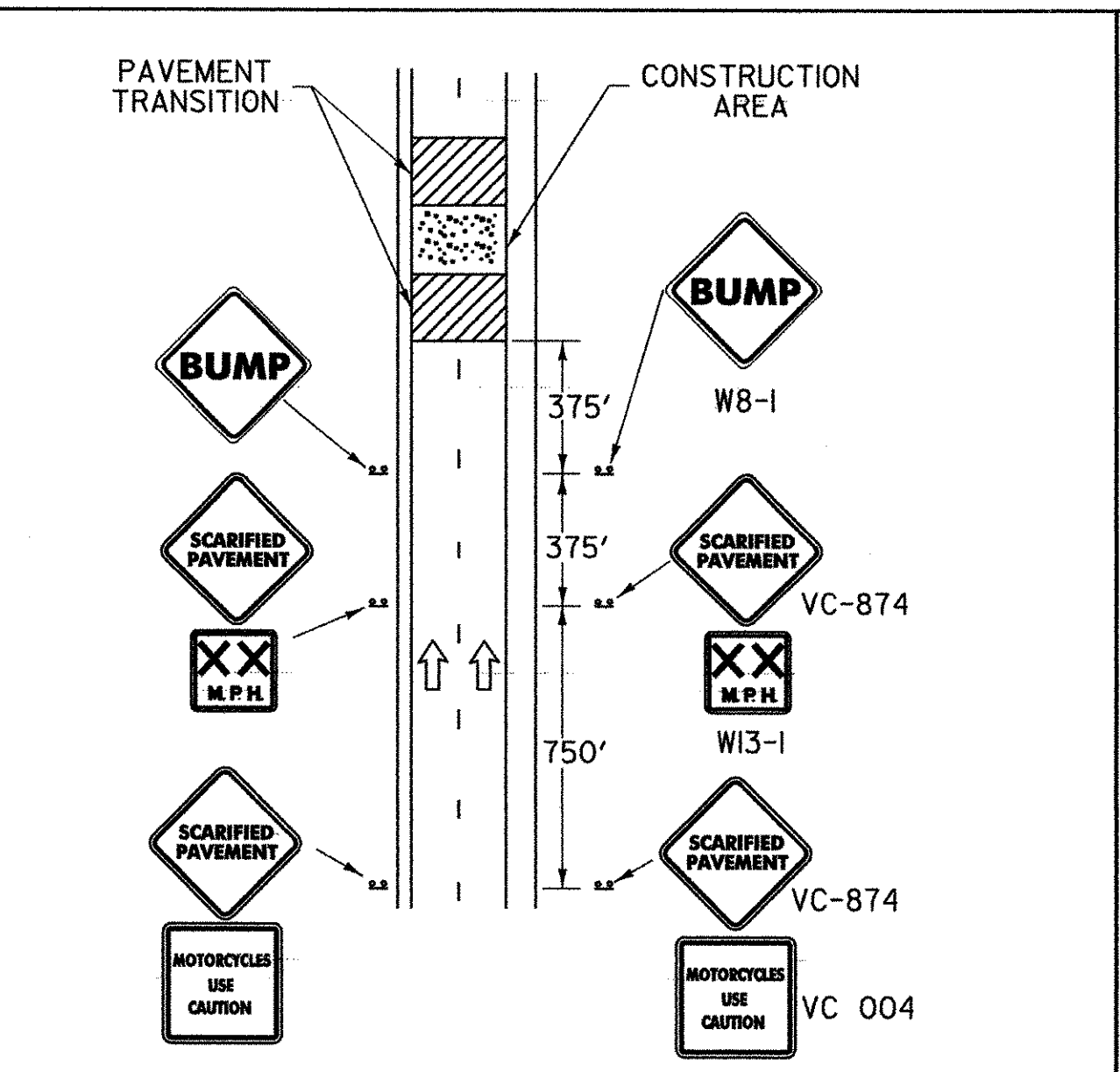
NOTES

1. ALL SIGNS SHALL BE MOUNTED ON FIXED POSTS (YIELDING TYPE) UNLESS OTHERWISE NOTED.
2. CHANNELIZING DEVICES SHALL BE PLACED IN ACCORDANCE WITH THE TABLE ON THIS SHEET
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 THIS SHEET.
7. EXIT SIGN SHALL BE MOUNTED A MINIMUM OF 7 FEET ABOVE THE GROUND AND HIGH ENOUGH TO BE SEEN ABOVE CHANNELIZING DEVICES.



MAINLINE LANE CLOSURE AT AN ENTRANCE RAMP

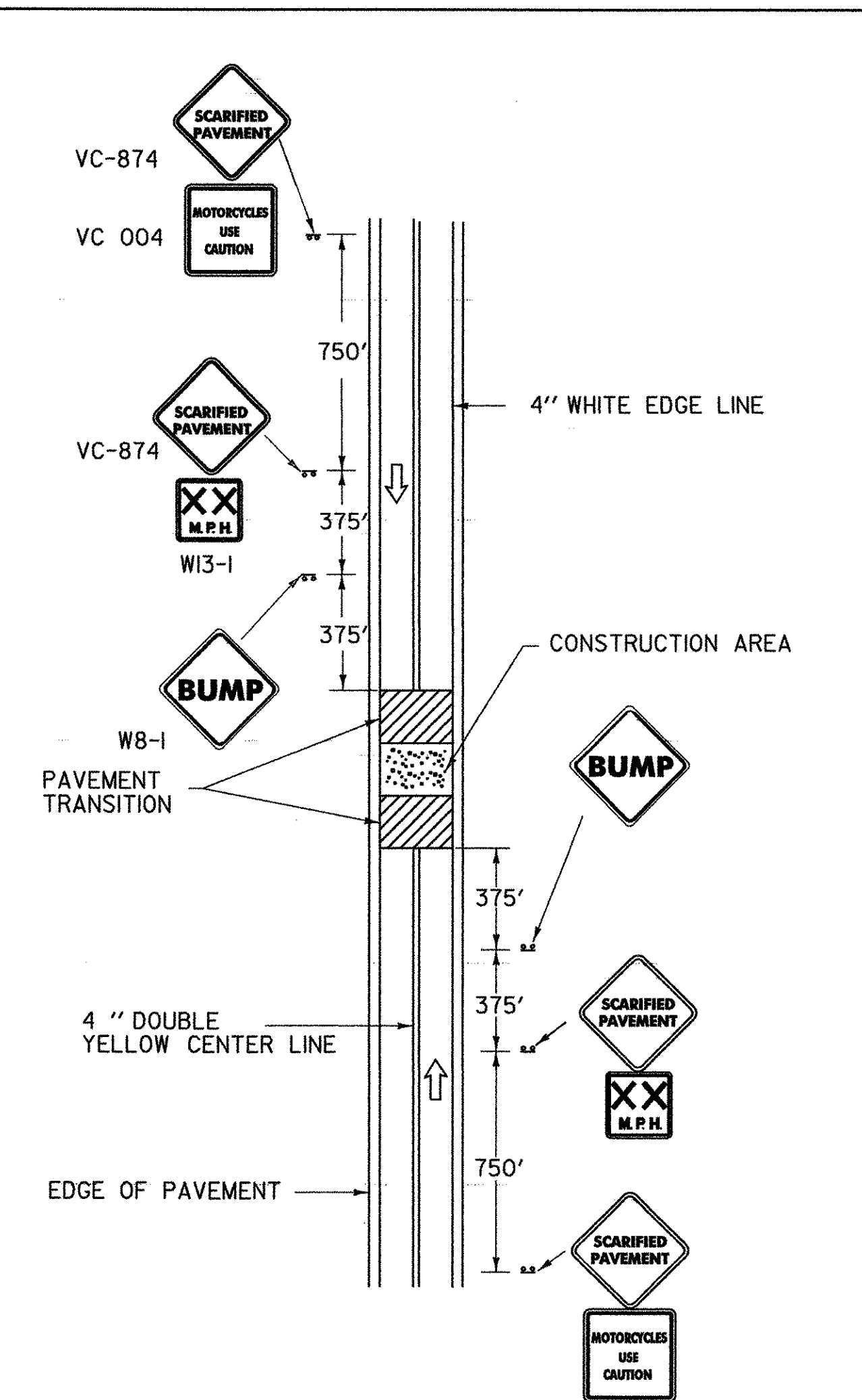
NOT TO SCALE
THIS DETAIL SHALL BE USED WHEN THE WORK ZONE BEGINS AT THE END OF THE ACCELERATION LANE OR THE MAINLINE LANE CLOSURE DRUM PLACEMENT INTERFERES WITH THE ON-RAMP TRAFFIC. IF THE LENGTH OF THE ACCELERATION LANE IS NOT ADEQUATE, THE YIELD SIGN SHALL BE REPLACED WITH A STOP SIGN. IF A STOP SIGN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



ADVANCED WARNING SIGN PACKAGE FOR COLD PLANED (SCARIFIED) SURFACES DIVIDED HIGHWAY

NOTES

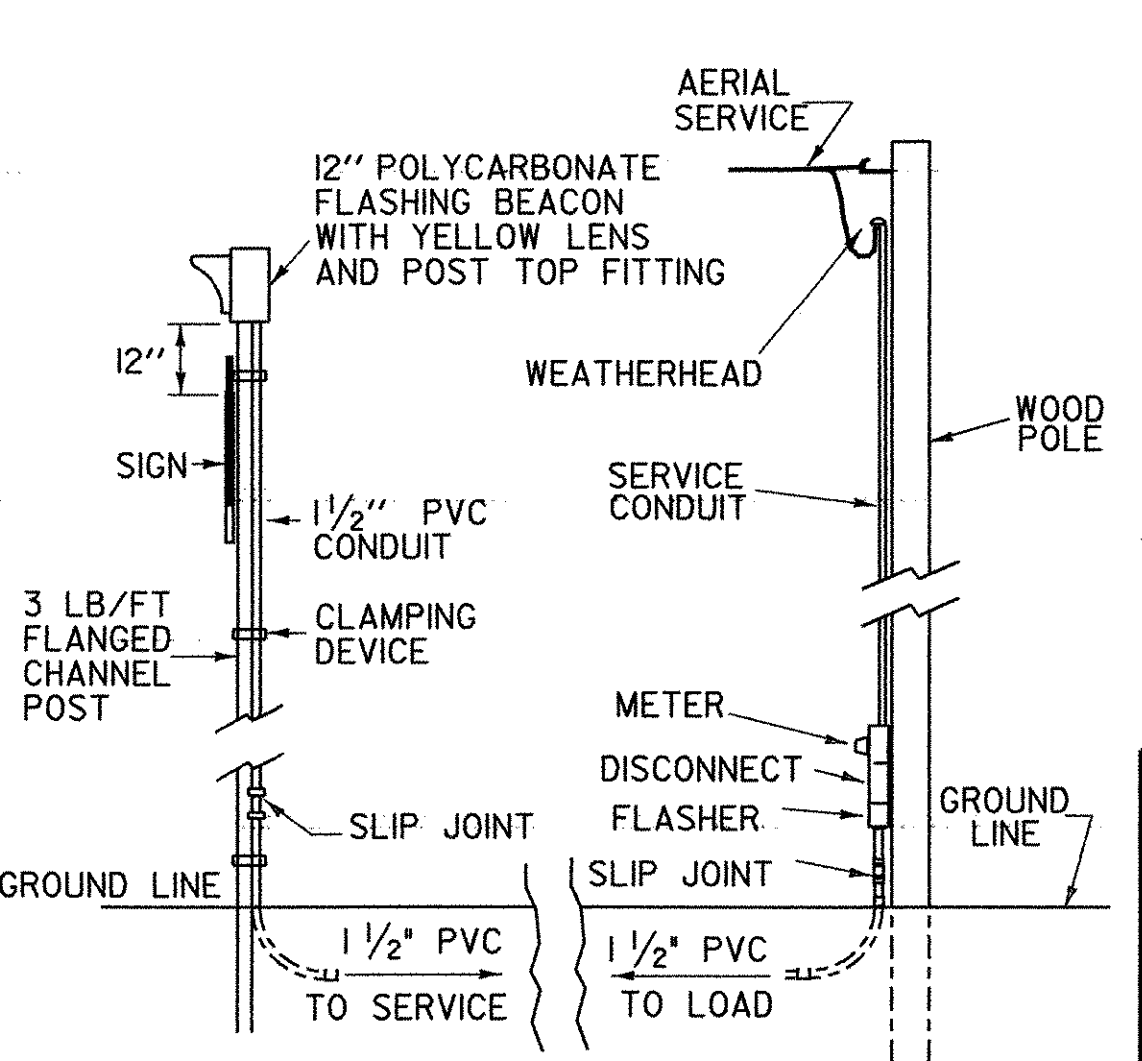
1. ADVISORY SPEED AS DETERMINED BY THE RESIDENT ENGINEER (40 MPH MINIMUM RECOMMENDED).
2. ALL SIGNS SHALL BE MOUNTED ON FIXED POSTS (YIELDING TYPE).
3. ALL DISTANCES ARE DESIRABLE MINIMUMS, FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT.
4. THE BUMP SIGN MAY BE ELIMINATED WHEN THERE IS NO BUMP. WHEN THE CONTRACTOR IS WORKING IN THE CONSTRUCTION AREA THE APPROPRIATE ADVANCED WARNING SIGN PACKAGE SHALL BE USED, SEE STD.E-103.
5. GATE POSTING OF SIGNS IS AN OPTION AS DETERMINED BY THE RESIDENT ENGINEER (WHEN PASSING, TURNING OR CLIMBING LANES LIMIT VISIBILITY).



ADVANCED WARNING SIGN PACKAGE FOR COLD PLANED (SCARIFIED) SURFACES 2 LANE ROADWAY

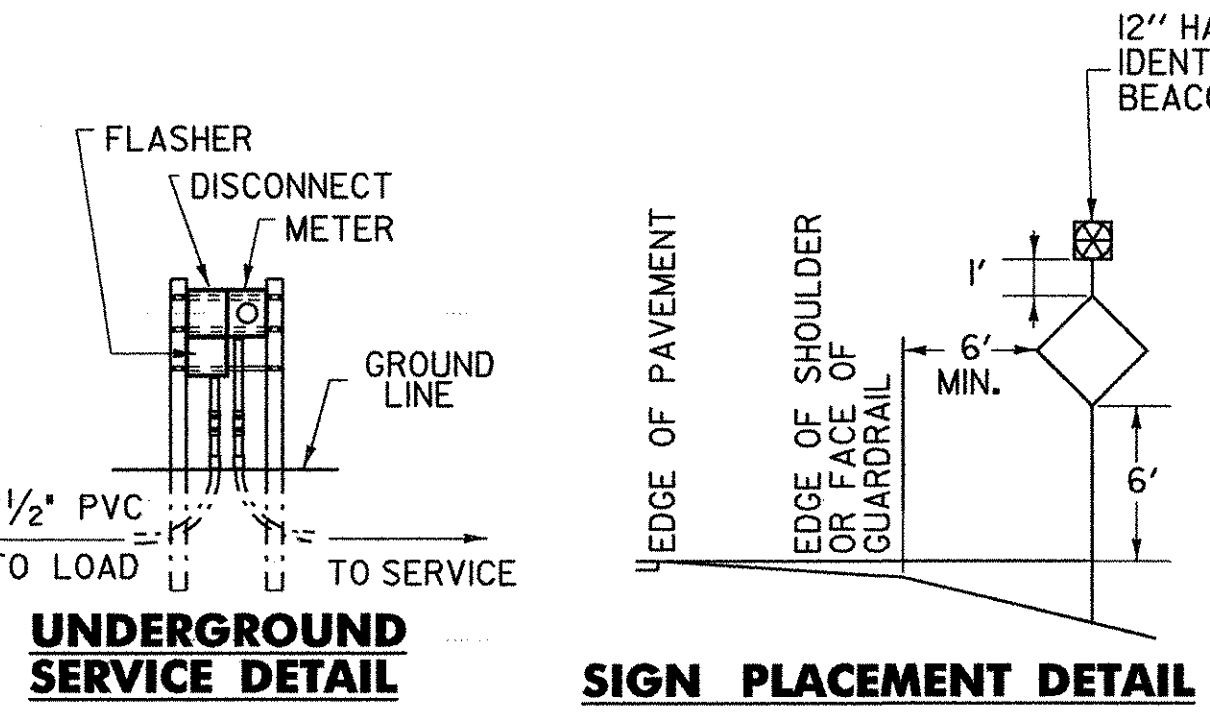
NOTES

1. ADVISORY SPEED AS DETERMINED BY THE RESIDENT ENGINEER (40 MPH MINIMUM RECOMMENDED).
2. ALL SIGNS SHALL BE MOUNTED ON FIXED POSTS (YIELDING TYPE).
3. ALL DISTANCES ARE DESIRABLE MINIMUMS, FIELD CONDITIONS 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.
5. GATE POSTING OF SIGNS IS AN OPTION AS DETERMINED BY THE RESIDENT ENGINEER (WHEN PASSING, TURNING OR CLIMBING LANES LIMIT VISIBILITY).



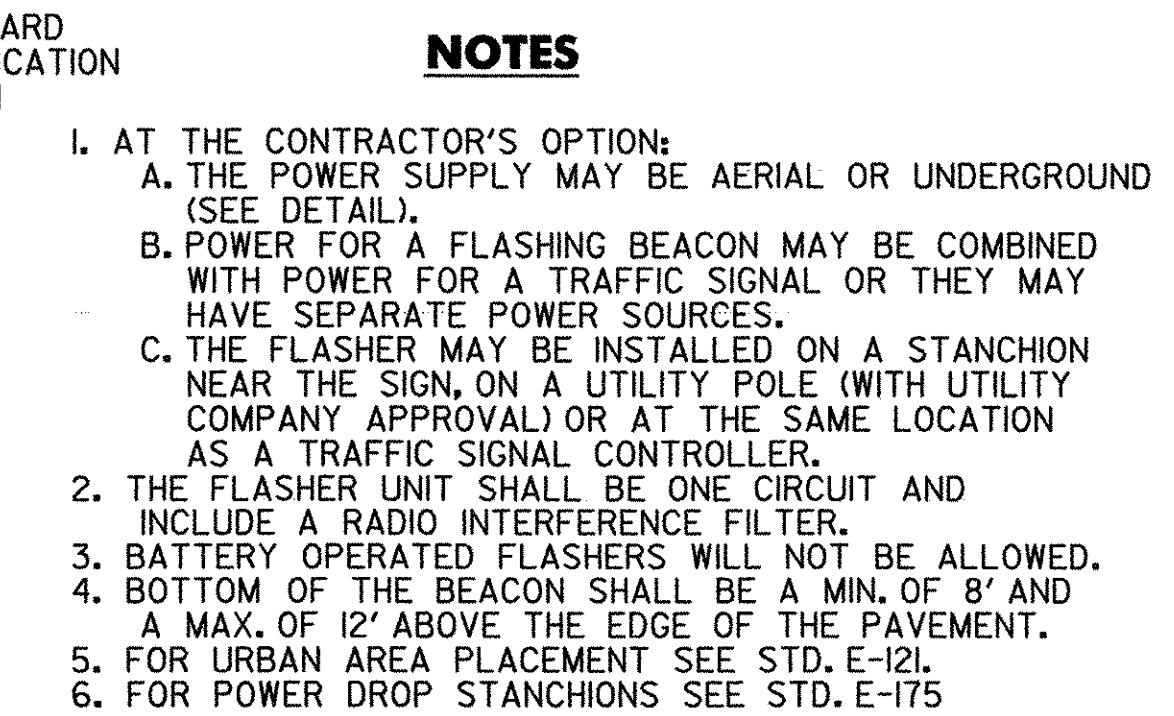
FLASHING BEACON DETAIL

AERIAL SERVICE WITHOUT LUMINAIRE



UNDERGROUND SERVICE DETAIL

SIGN PLACEMENT DETAIL



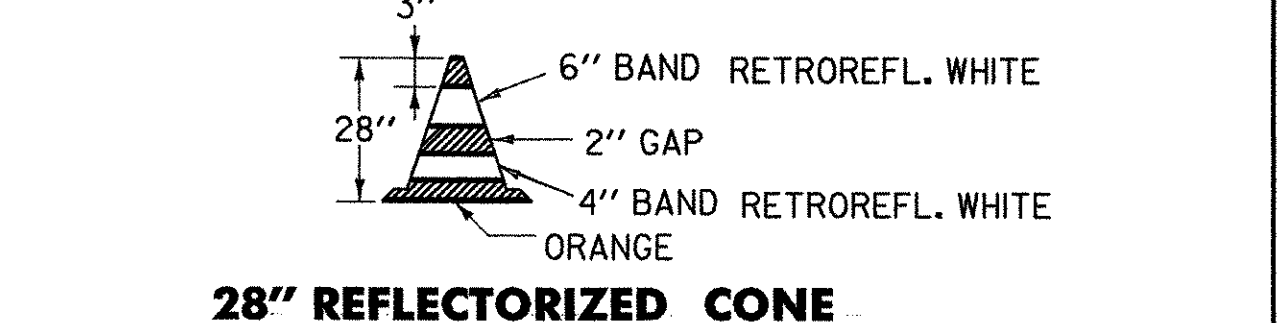
NOTES

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' AND A MAX. OF 12' ABOVE THE EDGE OF THE PAVEMENT.
5. FOR URBAN AREA PLACEMENT SEE STD. E-121.
6. FOR POWER DROP STANCHIONS SEE STD. E-175

CHANNELIZING DEVICES

TAPER RATES ARE DETERMINED USING THE FOLLOWING EQUATION:
 $L = WS$ FOR DESIGN SPEEDS OF 45 MPH OR GREATER
 $L = WS^2/60$ FOR DESIGN SPEEDS OF 40 MPH OR LESS
 WHERE: L = MINIMUM LENGTH OF TAPER IN FEET
 W = WIDTH OF OFFSET (USUALLY LANE WIDTH) IN FEET
 S = DESIGN SPEED IN MPH

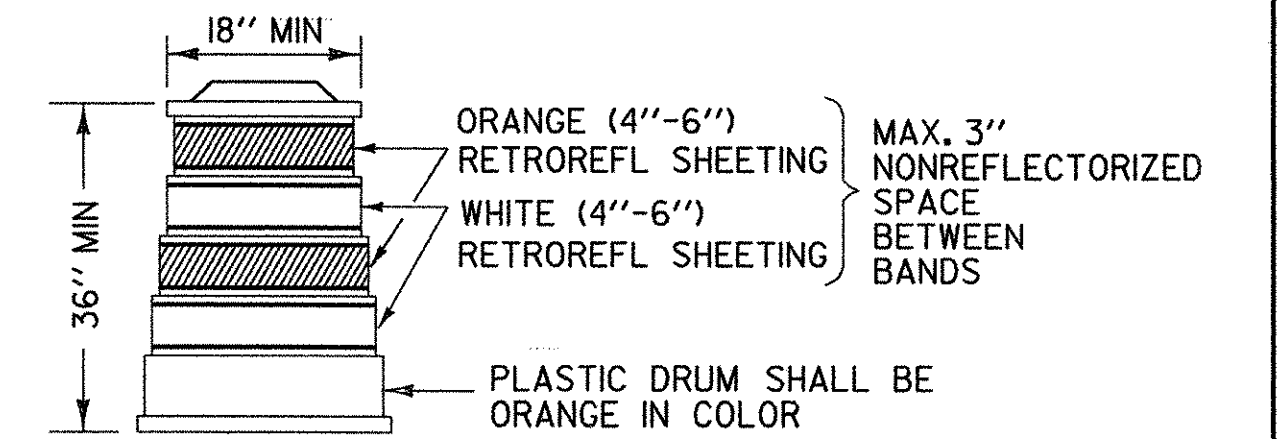
POSTED SPEED OR 85th PERCENTILE (mph)	DESIGN SPEED (mph)	TAPER LENGTHS (ft)			TANGENT SECTION LENGTHS (L/2) (ft)	MINIMUM BUFFER SPACE LENGTH (ft)	MAXIMUM CHANNELIZING DEVICE SPACING (ft)		BARRIER FLARE RATE (MIN)
		MERGING 12ft LANE (L)	SHIFTING W=16ft (L/2)	SHOULDER W=10ft (L/3)			TAPER	ALONG LANE LINE & WORK ZONE	
≤ 40	40	320	215	90	160	160	35	70	1:9
45	45	540	360	150	270	270	40	80	1:9
50	50	600	400	170	300	300	50	100	1:11
55	55	660	440	185	330	330	55	110	1:13
60 & 65	60	720	480	200	360	360	60	120	1:13
70	70	840	560	235	420	440	65	130	1:13



28\"/>

NOTES

1. 28\"/>
2. CONES MAY BE WEIGHTED TO PREVENT OVERTURNING, HOWEVER THE WEIGHTS SHALL NOT PRESENT A HAZARD IF THE CONE IS STRUCK.
3. RETROREFLECTIVE SHEETING SHALL BE ASTM TYPE III OR TYPE VI.



REFLECTORIZED PLASTIC DRUM

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. RETROREFLECTIVE SHEETING SHALL BE ASTM TYPE III OR TYPE VI.

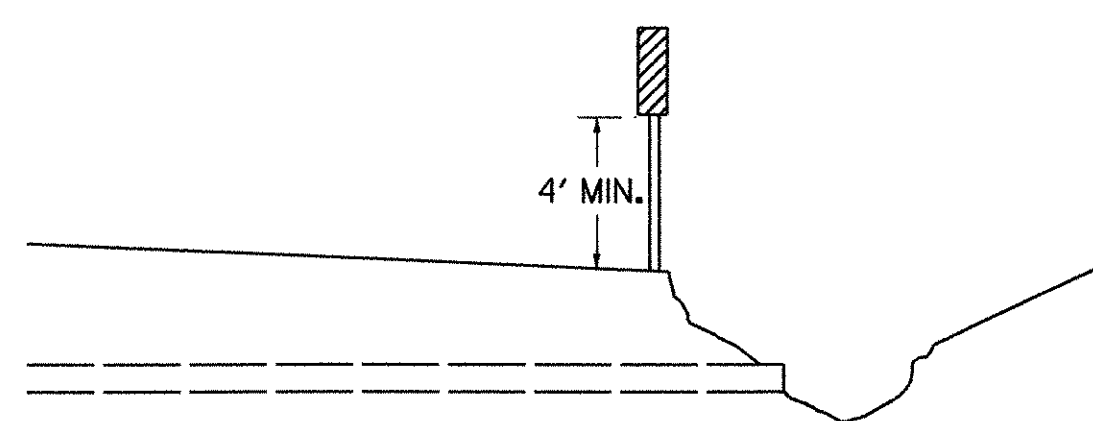
OTHER STDS. E-101, E-102, E-102A, E-103, E-107A, E-110, E-121, E-136, REQUIRED: E-150, E-175

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 STDE-107A
 AUG 08, 1995 - REVISED BEACON SIZE
 MAR. 01, 2004 - ADDED ADVANCED WARNING SIGN PACKAGE FOR COLD PLANED TWO WAY HIGHWAYS, CHANNELIZING DEVICES CHART

APPROVED
 DIRECTOR OF PROGRAM DEVELOPMENT
 TRAFFIC OPERATIONS ENGINEER
 FEDERAL HIGHWAY ADMINISTRATION

TRAFFIC CONTROL MISCELLANEOUS DETAILS

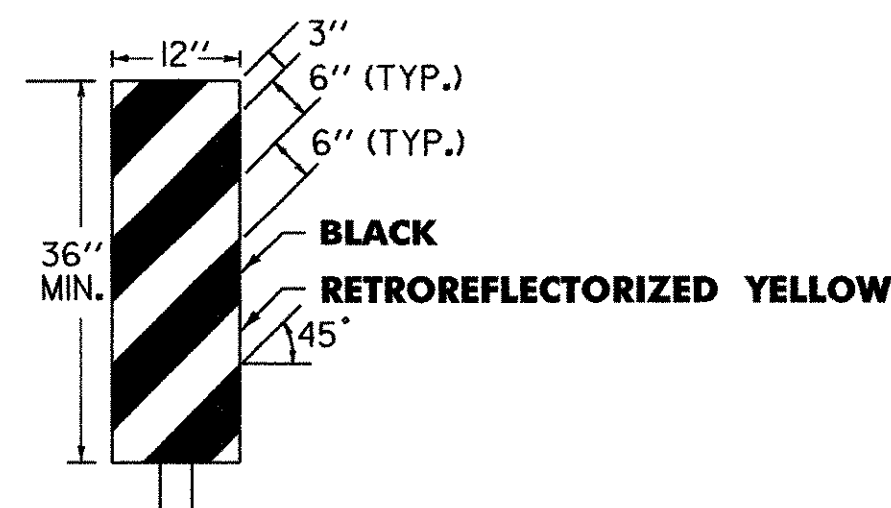
VERMONT AGENCY OF TRANSPORTATION
STANDARD E-106



DELINEATOR TYPICAL

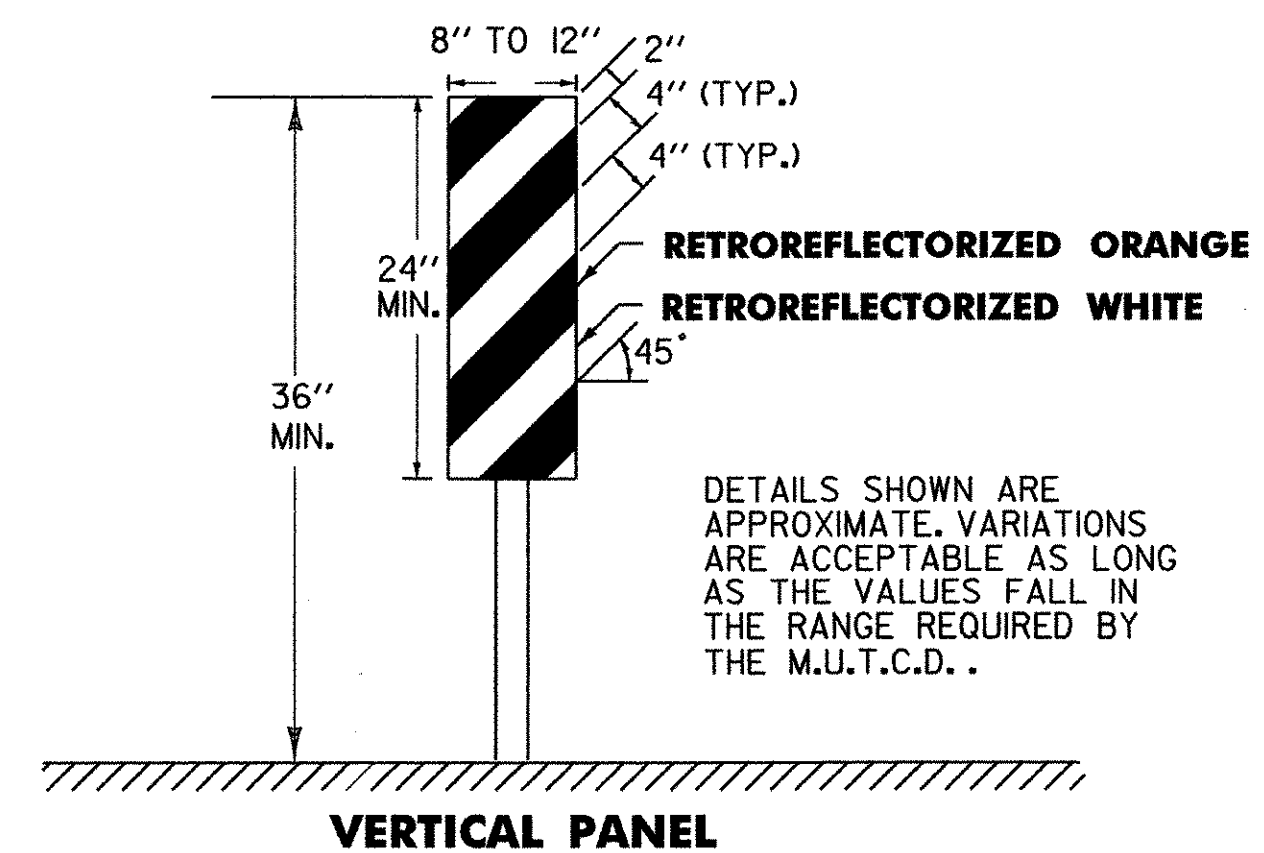
THE STANDARD COLOR FOR DELINEATORS USED ALONG BOTH SIDES OF TWO-WAY STREETS AND HIGHWAYS AND THE RIGHT SIDE OF ONE-WAY STREETS SHALL BE WHITE. DELINEATORS USED ALONG THE LEFT SIDE OF ONE-WAY ROADWAYS SHALL BE YELLOW. THEY SHALL HAVE A MINIMUM AREA OF 7 SQUARE INCHES. THEY MAY BE ROUND, SQUARE OR OBLONG, FOR ALTERNATES SEE STD. E-198

SYMBOL



OBJECT MARKER TYPICAL

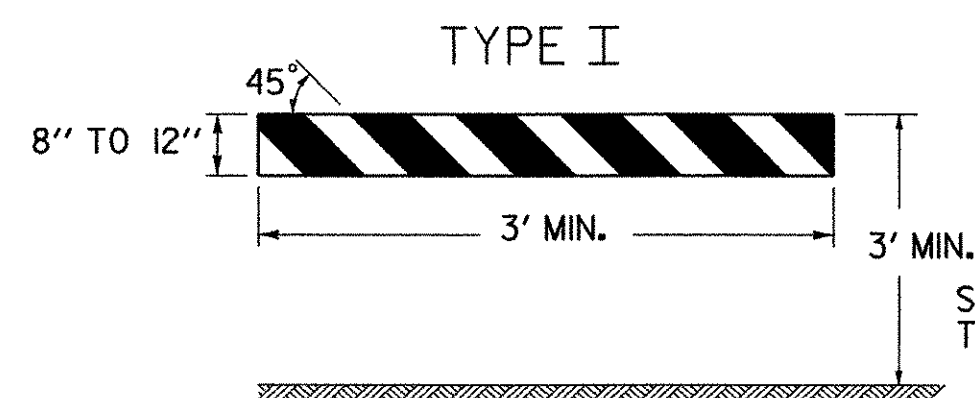
OBJECT MARKERS ARE USED TO MARK OBSTRUCTIONS WITHIN OR ADJACENT TO THE ROADWAY. IN SOME CASES THERE MAY NOT BE A PHYSICAL OBJECT INVOLVED, BUT OTHER ROADSIDE CONDITIONS SUCH AS NARROW SHOULDER DROP-OFFS, GORES, D.I. EXCAVATIONS, AND ABRUPT CHANGES IN THE ROADWAY ALIGNMENT MAY MAKE IT UNDESIRABLE FOR 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 RETROREFLECTORIZED YELLOW STRIPES. (SLOPING DOWNWARD IN THE DIRECTION TRAFFIC IS TO PASS).



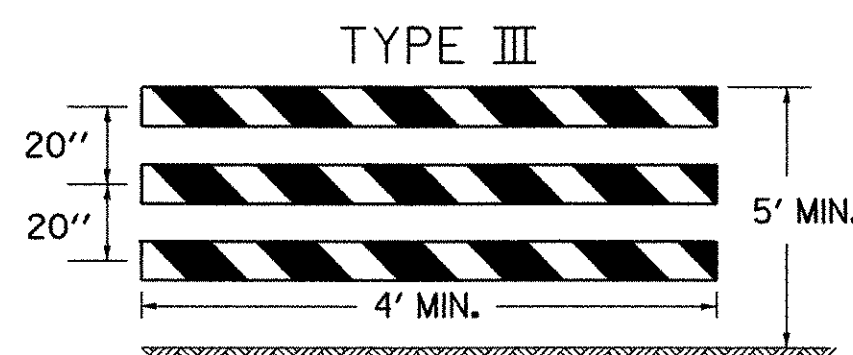
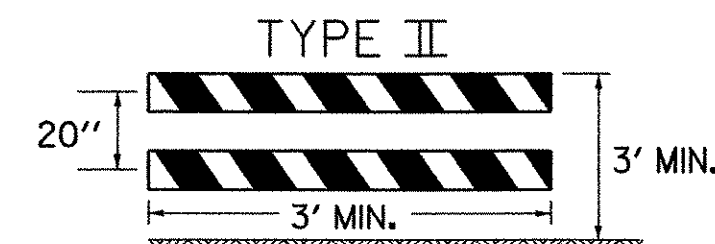
VERTICAL PANEL

VERTICAL PANELS SHALL HAVE ALTERNATING ORANGE AND WHITE RETROREFLECTORIZED 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



STRIPING IS SHOWN WITH TRAFFIC PASSING TO THE RIGHT.

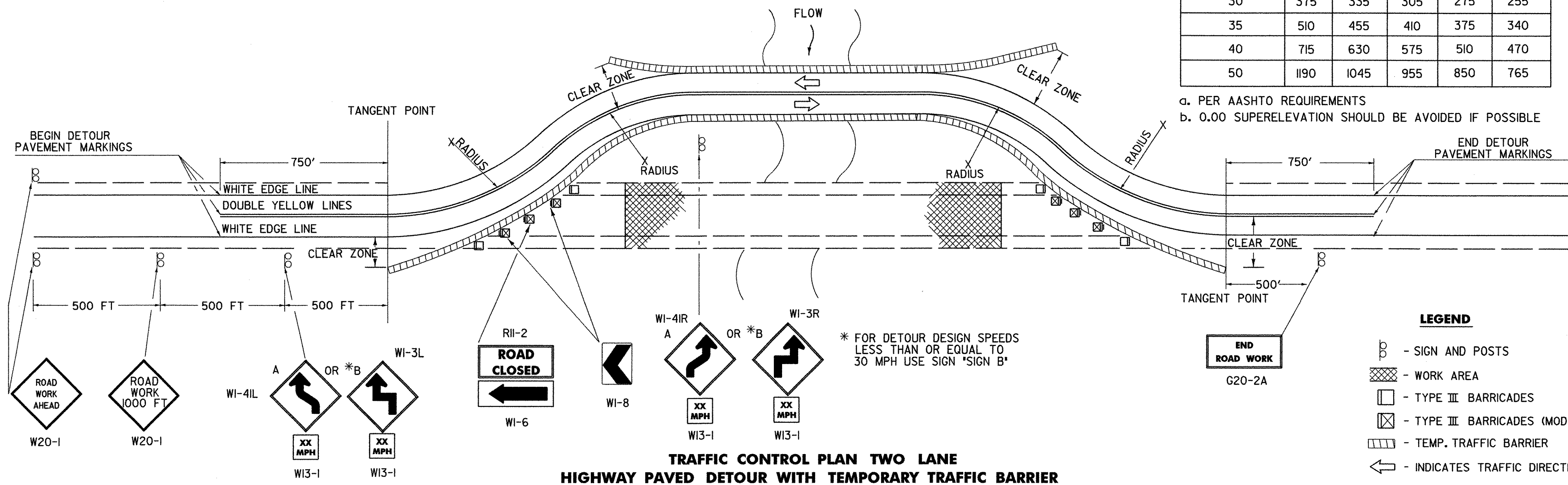


A TYPE III (MODIFIED) BARRICADE SHALL CONSIST OF TYPE II RAILS MOUNTED ON A BREAKAWAY BARRICADE AS SHOWN ON STANDARD SHEET E-107A.

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 WHITE	ORANGE AND WHITE	ORANGE AND WHITE

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.



DETOUR DESIGN SPEED (M.P.H.)	MINIMUM RADIUS (FT.) ^a				
	SUPERELEVATION (FT./FT.)				
	0.00 ^b	0.02	0.04	0.06	0.08
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

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)
 - 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.
 - 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 ALTERNATING RETRO-REFLECTORIZED WHITE AND ORANGE STRIPES. THE ORANGE SHALL CONFORM WITH THE STANDARD COLORS ADOPTED BY AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AND APPROVED BY THE US DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION. THE BARRICADE COMPONENTS SHALL BE WHITE UNLESS UNPAINTED METAL OR ALUMINUM IS USED.

REFLECTORIZATION

THE RETROREFLECTIVE SHEETING ON BARRICADE PANELS SHALL BE ASTM 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, DEFACTED, OR DIRTY BARRICADES SHALL BE REPAIRED, CLEANED, OR REPLACED AS ORDERED BY THE RESIDENT ENGINEER.

DETOUR NOTES

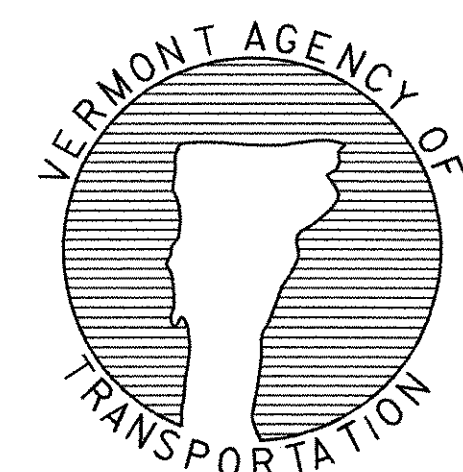
- SIGNS AND DELINEATION SHOWN FOR ONE DIRECTION OF TRAFFIC ONLY.
- THE CONTRACTOR IS RESPONSIBLE FOR PAVEMENT MARKING AND SHALL REMOVE ANY CONFLICTING OR CONFUSING EXISTING MARKINGS.
- ADDITIONAL SIGNING MAY BE REQUIRED AT THE DISCRETION OF THE RESIDENT ENGINEER.
- UNPAVED DETOURS REQUIRE PAVEMENT MARKINGS 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 E-198

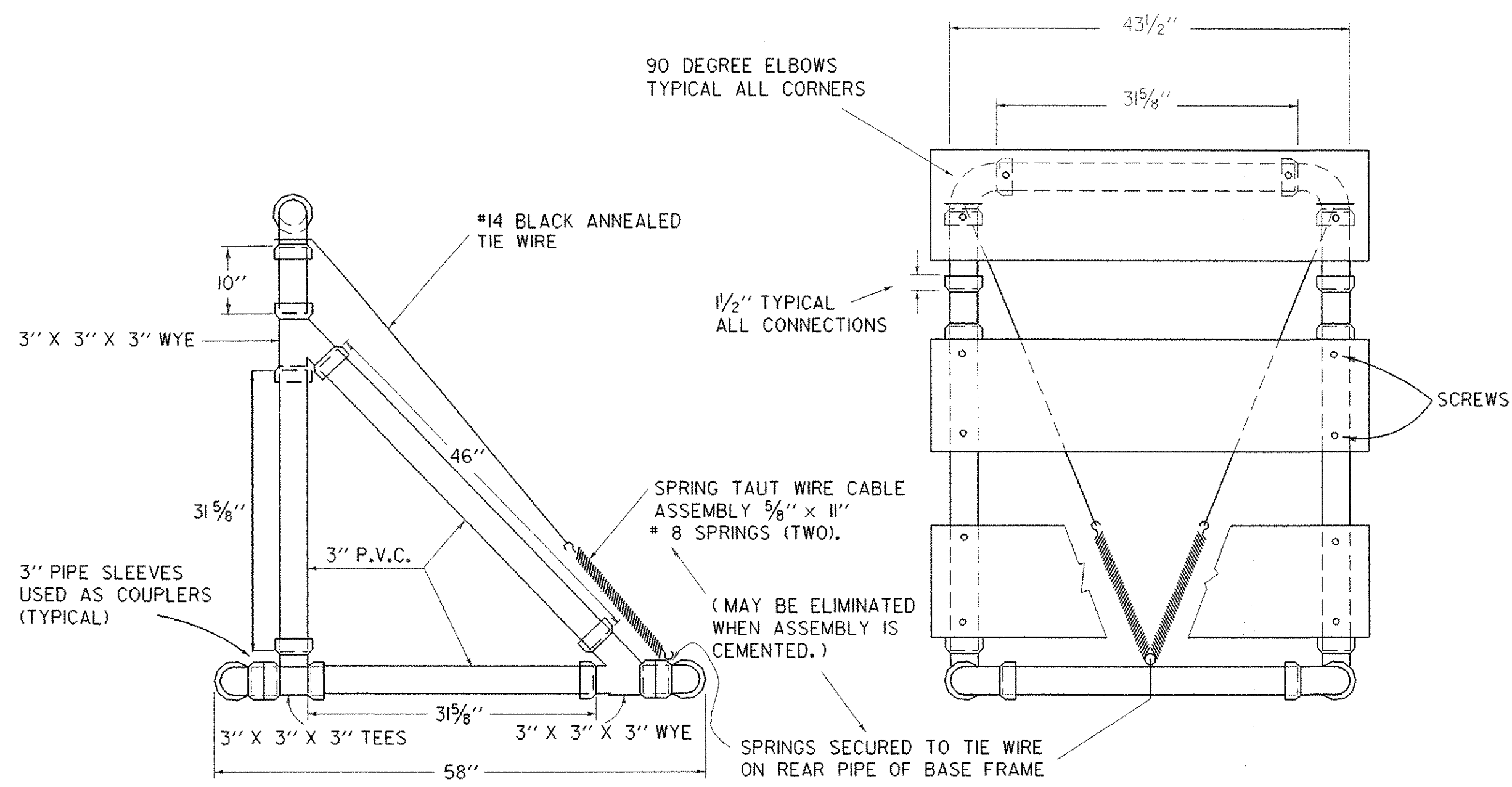
REVISIONS AND CORRECTIONS
 SEPT. 10, 1987 - DATE OF ORIGINAL ISSUE
 APRIL 29, 1988 - FHWA REVIEW COMMENTS
 SEPT. 20, 1993 - NEW RADIUS CHART, BARRICADE ALIGNMENT AND USE OF TEMPORARY TRAFFIC BARRIER
 AUG. 08, 1995 - REVISED SIGNING PER MUTCD
 JUNE 30, 2003 - CHANGED REFLECTIVE SHEETING TO TYPE III

APPROVED
 DIRECTOR OF PROGRAM DEVELOPMENT
 TRAFFIC OPERATIONS ENGINEER
 FEDERAL HIGHWAY ADMINISTRATION

DELINEATION, BARRICADES AND DETOURS FOR CONSTRUCTION AREAS



STANDARD E-107

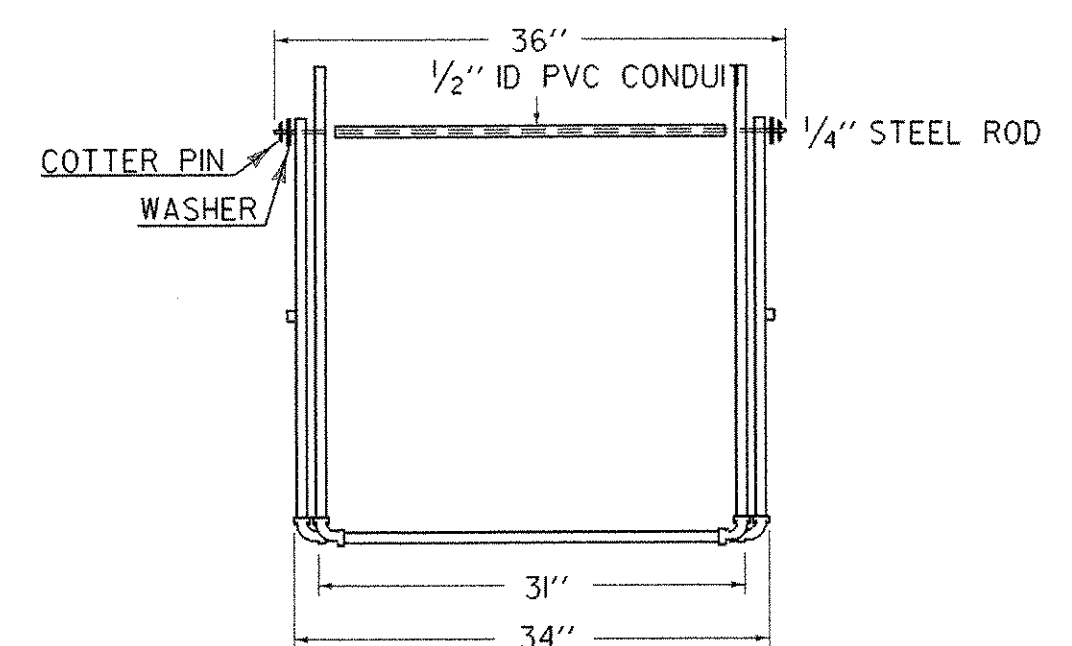
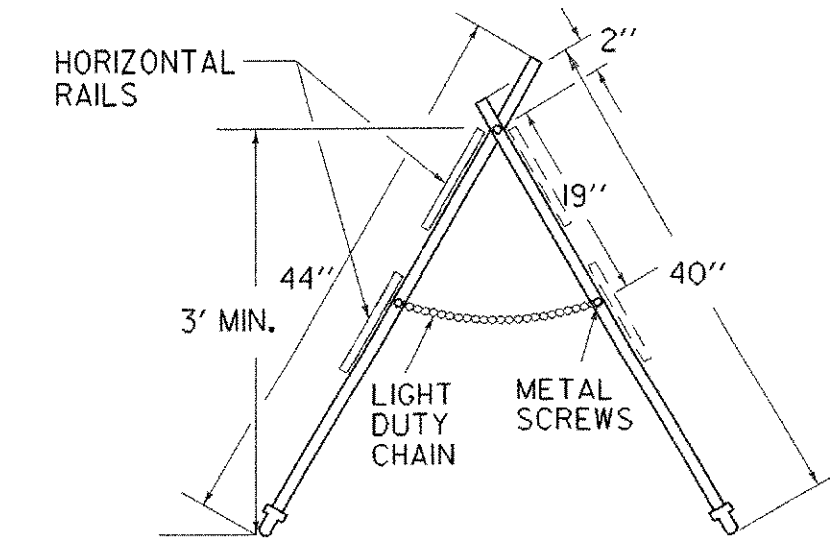


**SIDE VIEW
TYPE III BARRICADE**

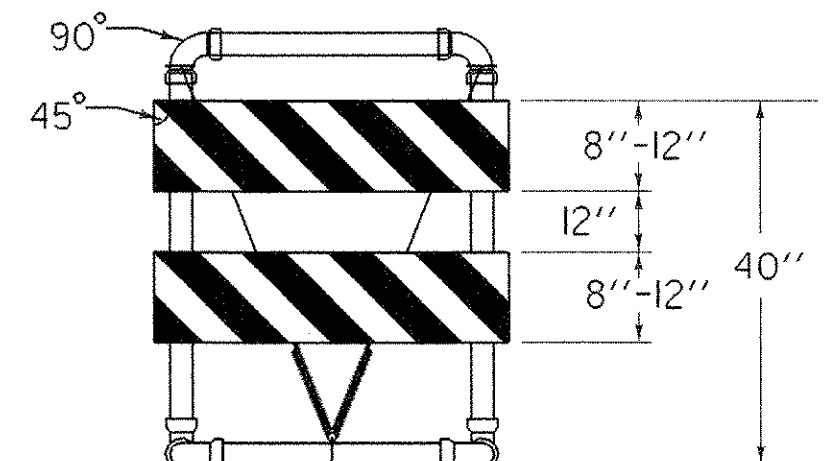
**FRONT VIEW
TYPE III BARRICADE**

- 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" - #14 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
 - 2 - 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 - #14 BLACK ANNEALED TIE WIRE (IF ASSEMBLY IS NOT CEMENTED)

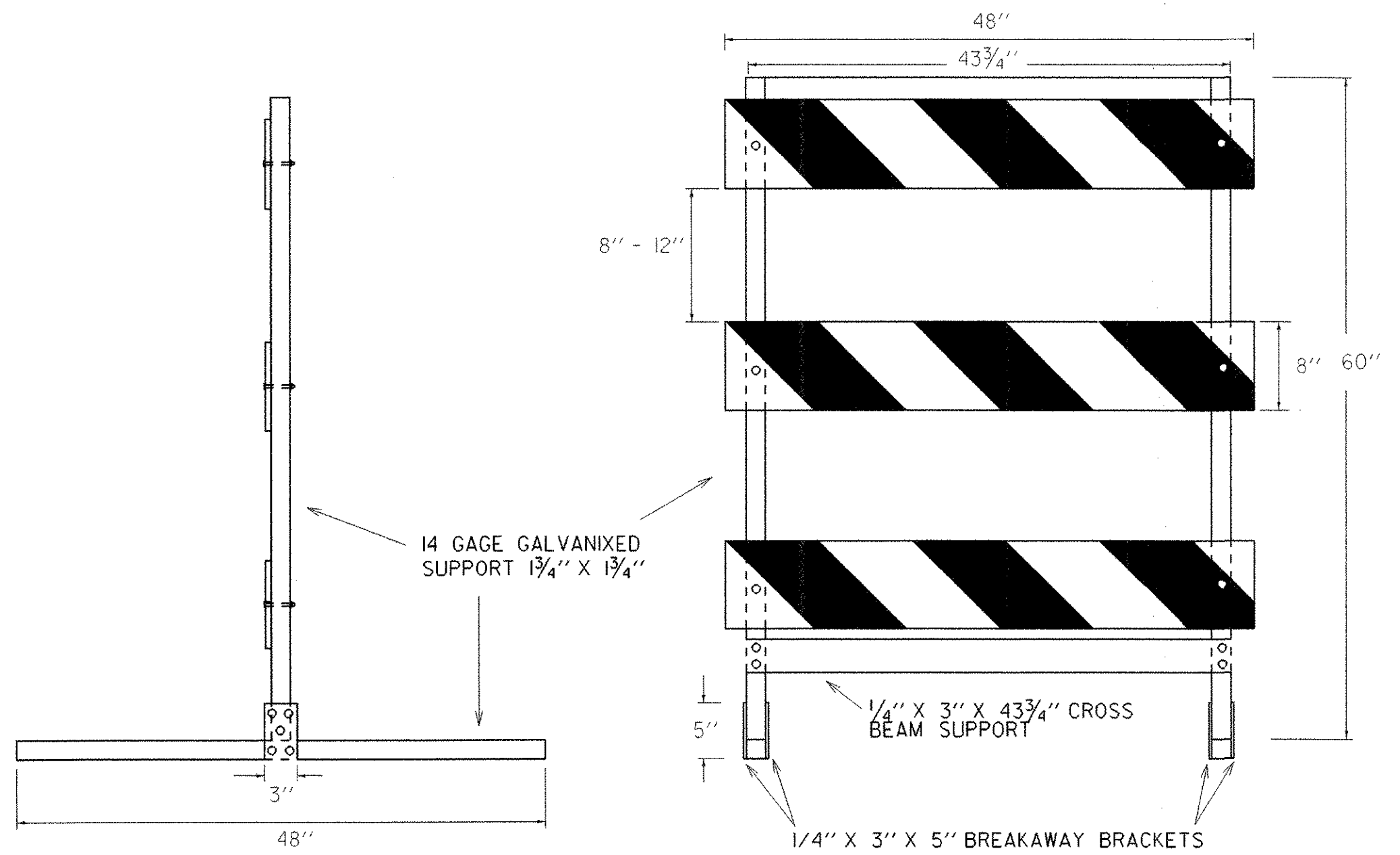


TYPE I AND TYPE II BARRICADE

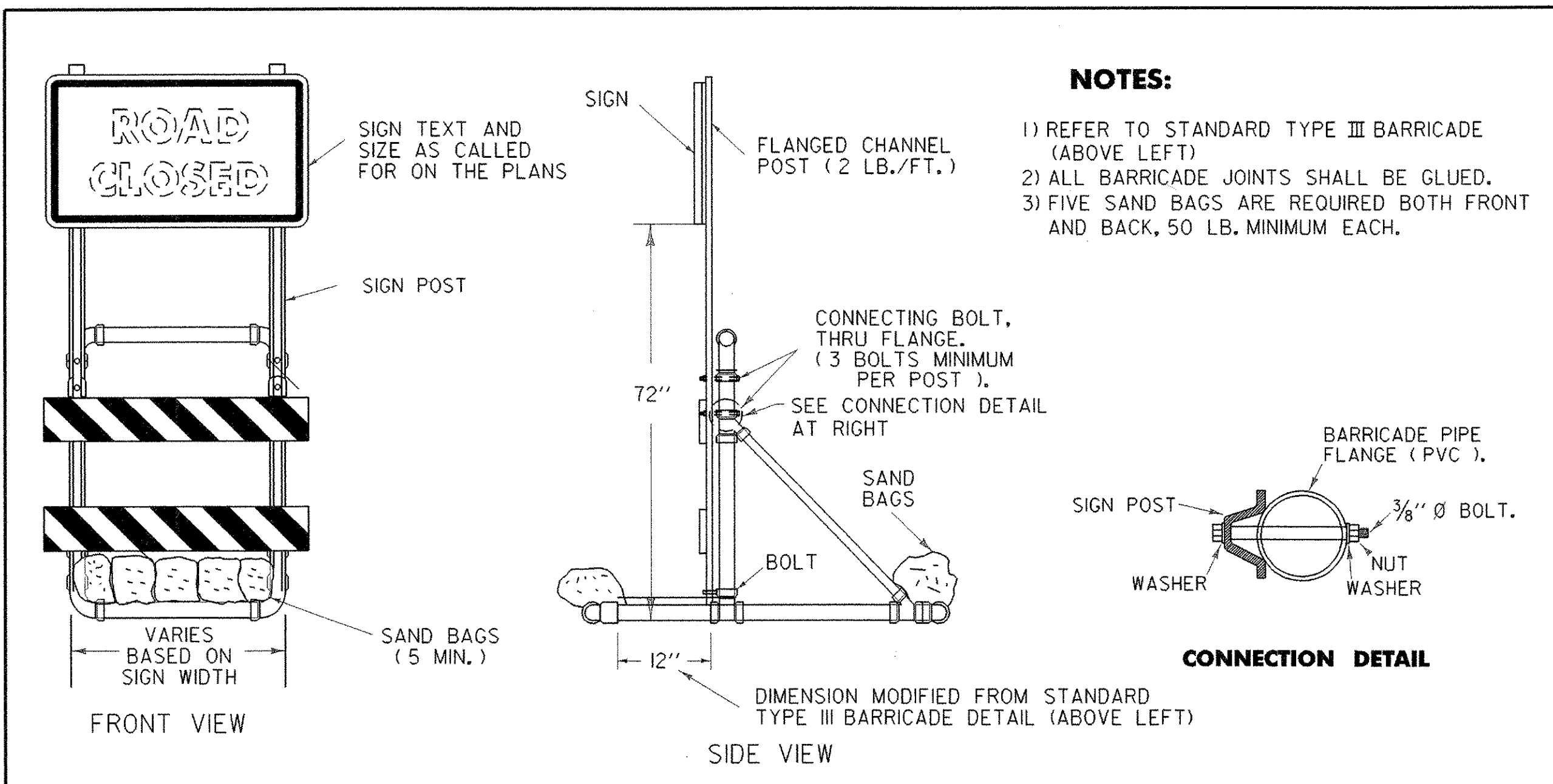


**TYPE III (MODIFIED) BARRICADE
(STRIPING IS SHOWN WITH TRAFFIC PASSING TO THE RIGHT).**

- 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.



SIDE AND FRONT VIEW OF TYPE III METAL BARRICADE



**SIGN MOUNTING ON
TYPE III BARRICADE (MODIFIED)**

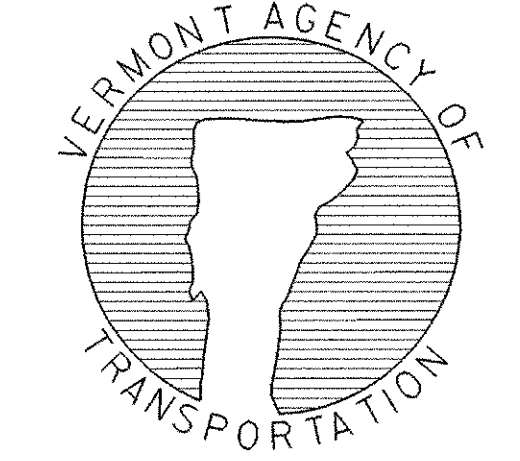
- NOTES:**
- 1) REFER TO STANDARD TYPE III BARRICADE (ABOVE LEFT)
 - 2) ALL BARRICADE JOINTS SHALL BE GLUED.
 - 3) FIVE SAND BAGS ARE REQUIRED BOTH FRONT AND BACK, 50 LB. MINIMUM EACH.

**OTHER STDS. E-107
REQUIRED:**

REVISIONS AND CORRECTIONS
SEPT. 10, 1987 - ORIGINAL APPROVAL DATE
SEPT. 20, 1993 - REVISED NOTES AND TYPE III (MOD.) BARRICADE DETAIL
AUG. 08, 1995 - ADDED METAL TYPE III BARRICADE
JUN. 08, 2009 - MINOR CORRECTIONS

APPROVED
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**BREAKAWAY BARRICADE
DETAILS**



**STANDARD
E-107 A**