

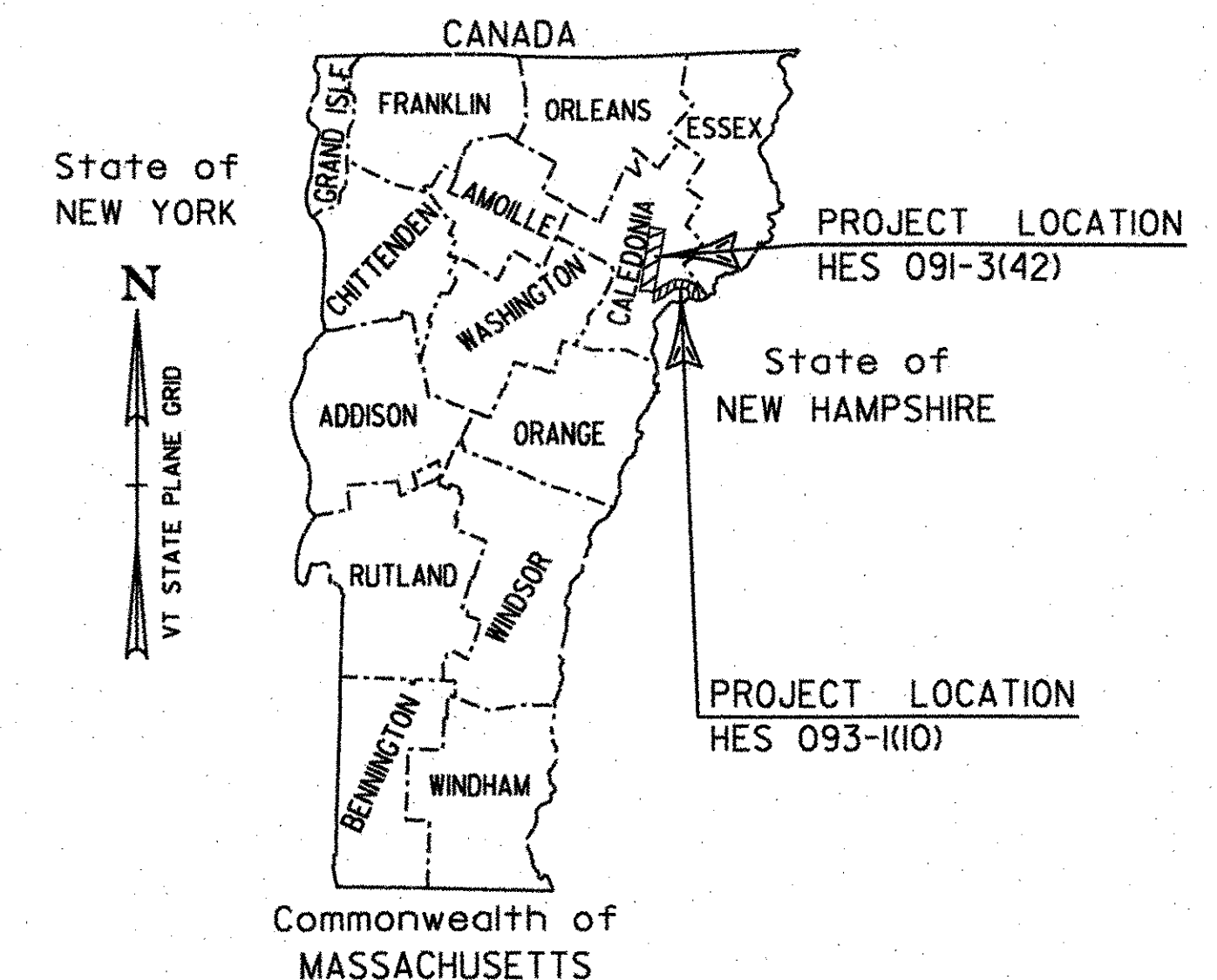
INDEX OF SHEETS
SEE SHEET 2

RECORD PLANS	
CONTRACTOR:	F. R. LAFAYETTE, INC. - ESSEX JUNCTION, VT
RESIDENT ENGINEER:	JIM FOREST
CONSTRUCTION BEGAN:	MAY 9, 2007
CONSTRUCTION COMPLETE:	DECEMBER 5, 2008
RECORD PLANS BY:	J. FOREST & C. PIERCE
I HEREBY CERTIFY THAT ALL THE CONSTRUCTION REQUIRED BY THIS SET OF DRAWINGS HAS BEEN ACCOMPLISHED AS INDICATED HEREIN.	
BY <u>James A. Forest</u>	RESIDENT ENGINEER
DATE <u>04-27-09</u>	
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.	

STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
TOWNS OF ST. JOHNSBURY-LYNDON
TOWN OF WATERFORD
COUNTY OF CALEDONIA



INTERSTATE ROUTE 91 (HES 091-3(42)) - SIGNS

BEGINNING AT MM 128.91 IN THE TOWN OF ST. JOHNSBURY AND EXTENDING NORTHERLY APPROXIMATELY 17.85 KM (11.09 MI) TO MM 140.00 IN THE TOWN OF LYNDON

LENGTH OF ROADWAY 17 848 METERS = 11.09 MILES = 17.85 KILOMETERS
LENGTH OF PROJECT 17 848 METERS = 11.09 MILES = 17.85 KILOMETERS

WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES REMOVAL OF EXISTING SIGNS AND PLACEMENT OF NEW SIGNS AND ASSOCIATED ELEMENTS ALONG THE PROJECT LENGTH, RAMPS, AND INTERCHANGES.

INTERSTATE ROUTE 93 (HES 093-1(10)) - SIGNS

BEGINNING AT A POINT AT THE NEW HAMPSHIRE / VERMONT STATE LINE IN THE TOWN OF WATERFORD AND EXTENDING NORTHERLY APPROXIMATELY 17.86 KM (11.10 MI) TO MM 11.10

LENGTH OF ROADWAY 17 864 METERS = 11.10 MILES = 17.86 KILOMETERS
LENGTH OF PROJECT 17 864 METERS = 11.10 MILES = 17.86 KILOMETERS

WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES REMOVAL OF EXISTING SIGNS AND PLACEMENT OF NEW SIGNS AND ASSOCIATED ELEMENTS ALONG THE PROJECT LENGTH, RAMPS, AND INTERCHANGES.

TRAFFIC DATA

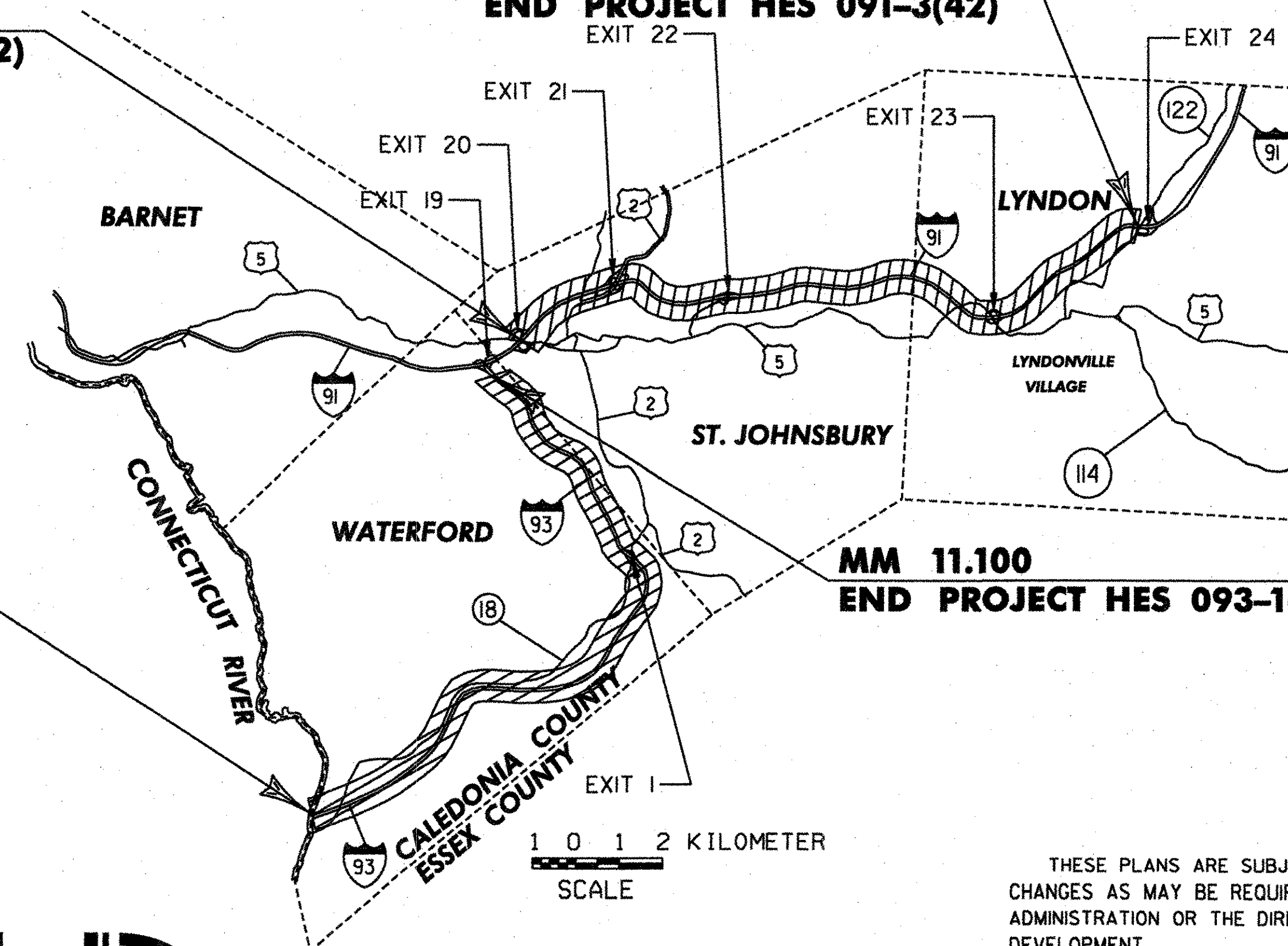
NORTHBOUND	SOUTHBOUND
INTERSTATE 91	
2000 ADT 9800	2000 ADT 9800
INTERSTATE 93	
2000 ADT = 4900	2000 ADT = 4900

MM 128.910
BEGIN PROJECT HES 091-3(42)

MM 140.000
END PROJECT HES 091-3(42)

VT-NH STATE LINE (MM 0.000)
BEGIN PROJECT HES 093-1(10)

MM 11.100
END PROJECT HES 093-1(10)



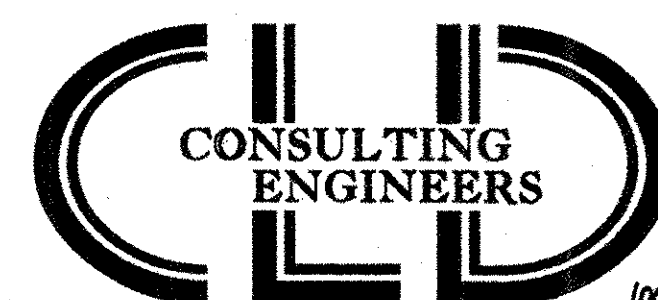
CONVENTIONAL SYMBOLS

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	

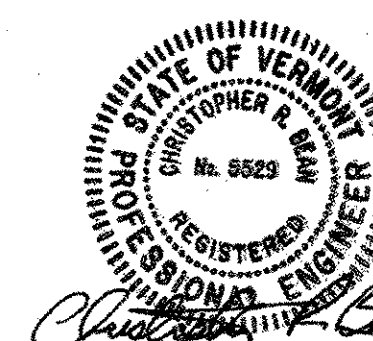
SURVEYED BY : N/A
SURVEYED DATE : N/A

DATUM

VERTICAL N/A
HORIZONTAL N/A



540 Commercial Street • Manchester, NH 03101
(603) 668-8223 • Fax: (603) 668-8802
email: cld@cldeingr.com • www.cldeingr.com
Maine • New Hampshire • Vermont



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 2001, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JANUARY 4, 2001 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

Metric

UNLESS NOTED OTHERWISE
STATIONS ARE IN MILES
ELEVATIONS ARE IN METERS
DIMENSIONS ARE IN MILLIMETERS

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATOR	
APPROVED <u>Mark D. Kutt</u>	DATE <u>2-21-07</u>
DIRECTOR OF PROGRAM DEVELOPMENT	
APPROVED <u>Richard J. Schmitt</u>	DATE <u>1-9-07</u>
PROJECT MANAGER : ROGER THOMPSON	
PROJECT NAME : ST. JOHNSBURY-LYNDON/WATERFORD	
PROJECT NUMBER :	HES 091-3 (42) HES 093-1 (10)
SHEET 1 OF 130 SHEETS	

INDEX OF STANDARD PLANS

STD	DATE	DESCRIPTION
D-4	06/01/94	FLUSHING BASINS, END SECTION, ELBOWS - TYPICAL WATERFALL FOR CULVERTS UP TO AND INCLUDING 48" DIA - EXTENSION SERVICE BOX AND CURB STOP - CORRUGATED PIPE ELBOW
E-100	01/02/04	CONSTRUCTION APPROACH SIGNS
E-100A	01/02/04	SIDE ROAD CONSTRUCTION - APPROACH SIGNS
E-101	05/30/03	CONSTRUCTION SIGN DETAILS
E-102	06/30/03	CONSTRUCTION SIGN DETAILS
E-102A	05/01/04	CONSTRUCTION SIGN DETAILS
E-103	03/01/04	MAINLINE TRAFFIC CONTROL DIVIDED HIGHWAY - ONE LANE CLOSED
E-106	03/01/04	TRAFFIC CONTROL - MISCELLANEOUS DETAILS
E-107	06/30/03	DELINEATION, BARRICADES AND DETOURS FOR - U-TURNS ON DIVIDED HIGHWAY
E-107A	08/08/95	BREAKAWAY BARRICADE DETAILS
E-110	08/08/95	MAJOR MAINTENANCE OPERATION LANE CLOSURE
E-120	08/08/95	STANDARD SIGN PLACEMENT - EXPRESSWAY & FREEWAY
E-121	08/08/95	STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD
E-123	03/16/04	GUIDE SIGN PLACEMENT - MISCELLANEOUS DETAILS
E-126	02/01/00	TYPICAL FREEWAY INTERCHANGE SIGNING
E-127	08/08/95	ROUTE MARKINGS AT RURAL INTERSECTIONS
E-130	08/08/95	TYPE "B" GUIDE SIGN, ATTACHMENT DETAILS
E-131	08/08/95	GUIDE SIGN DETAILS
E-132	08/18/95	GENERAL MOTORIST SERVICE SIGN DETAILS
E-133	08/08/95	SERVICE SIGN DETAILS
E-135	08/18/95	INTERSTATE ROUTE MARKER SIGN DETAIL
E-136A	08/08/95	U.S. ROUTE MARKER SIGN DETAILS
E-136B	08/08/95	STATE ROUTE MARKER SIGN DETAILS
E-139	05/01/04	MILEMARKER DETAILS - INTERSTATE
E-141	09/20/95	REGULATORY SIGN DETAILS
E-142	09/20/95	REGULATORY SIGN DETAILS
E-143	06/15/04	REGULATORY SIGN DETAILS
E-144	03/29/99	REGULATORY SIGN DETAILS
E-145B	12/23/94	REGULATORY SIGN DETAILS - LANE USE CONTROL SIGNS
E-146	09/20/95	REGULATORY SIGN DETAILS
E-150	05/01/04	WARNING SIGN DETAILS
E-151	05/01/04	WARNING SIGN DETAILS
E-152	05/01/04	WARNING SIGN DETAILS
E-153	05/01/04	WARNING SIGN DETAILS
E-154	05/01/04	WARNING SIGN DETAILS
E-155	05/01/04	WARNING SIGN DETAILS
E-160	05/20/99	FLANGED CHANNEL STEEL SIGN POST
E-161	08/18/95	W-SHAPED STEEL SIGN POST
E-162	05/20/99	TUBULAR ALUMINUM SIGN POST
E-163	05/20/99	TUBULAR STEEL SIGN POST
E-164	05/20/99	SQUARE STEEL SIGN POST
E-191	02/01/99	PAVEMENT MARKING DETAILS
E-192	10/12/00	PAVEMENT MARKING DETAILS
E-193	08/18/95	PAVEMENT MARKING DETAILS
E-197	04/01/05	DELINEATOR PLACEMENT TYPICAL
E-199	04/01/05	DELINEATOR AND MILEPOST MOUNTING ON BRIDGE RAIL
G-1	01/03/00	STEEL BEAM GUARDRAIL (50MPH & OVER) - HEAVY DUTY STEEL BEAM GUARDRAIL TWISTED END TERMINAL - ANCHOR FOR STEEL BEAM RAIL
G-1D	01/03/00	STEEL BEAM GUARDRAIL (40MPH & LESS) - HEAVY DUTY STEEL BEAM GUARDRAIL STEEL BEAM MEDIAN BARRIER - ANCHOR FOR STEEL BEAM RAIL
G-19	11/15/02	GENERIC GRADING PLANS FOR GUARDRAIL END TERMINALS

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2	INDEX OF SHEETS
3	GENERAL NOTES & MISCELLANEOUS DETAILS
4	DELINEATOR AND MILEPOST DETAILS
5-6	QUANTITY SHEETS
HES 091-3(42)	
7	TITLE SHEET
8-9	INTENTIONALLY LEFT BLANK
10	ITEM DETAIL SUMMARY SHEET
11-17	EXISTING SIGN LAYOUT SHEETS
18-24	NEW SIGN LAYOUT SHEETS
25-28	DELINEATOR LAYOUT SHEETS
29-62	TRAFFIC SIGN SUMMARY SHEETS
63-70	SIGN DETAIL SHEETS
71-76	SIGN CROSS SECTION SHEETS
77	CANTILEVER / OVERHEAD SIGN SUPPORT NOTES
78	OVERHEAD TRAFFIC SIGN BRIDGE / FOOTING DETAIL SHEET
79	BORING LOG SHEET
HES 093-1(10)	
80	TITLE SHEET
81-82	INTENTIONALLY LEFT BLANK
83	ITEM DETAIL SUMMARY SHEET
84-88	EXISTING SIGN LAYOUT SHEETS
89-93	NEW SIGN LAYOUT SHEETS
94-95	DELINEATOR LAYOUT SHEETS
96-114	TRAFFIC SIGN SUMMARY SHEETS
115-121	SIGN DETAIL SHEETS
122-124	SIGN CROSS SECTION SHEETS
125	CANTILEVER / OVERHEAD SIGN SUPPORT NOTES
126-128	OVERHEAD TRAFFIC SIGN BRIDGE / FOOTING DETAIL SHEETS
129-130	BORING LOG SHEETS

PROJECT NAME:	ST. JOHNSBURY - LYNDON / WATERFORD		
PROJECT NUMBER:	HES 091-3(42) / HES 093-1(10)		
FILE NAME:	indexStJWaterford.xls	PLOT DATE:	1 / 4 / 2007
PROJECT LEADER:	CRB	DRAWN BY:	JCS
DESIGNED BY:	DAM	CHECKED BY:	DAM
CLD REF. NO.:	97-0211	SHEET	2 OF 130

GENERAL NOTES

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION (VTRANS) STANDARD SPECIFICATIONS FOR CONSTRUCTION, DATED 2001, AND ITS LATEST REVISIONS AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), DATED 2003, AND ITS LATEST REVISIONS.
2. ALL SIGNS WITHIN THE PROJECT LIMITS ARE TO BE REPLACED UNLESS OTHERWISE NOTED OR AS DIRECTED BY THE ENGINEER. ALL NEW SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH THESE PLANS, MUTCD, APPLICABLE VTRANS E-SERIES STANDARDS OR AS DIRECTED BY THE ENGINEER.
3. TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH APPLICABLE VTRANS E-SERIES STANDARDS AND PART 6 OF THE MUTCD OR AS DIRECTED BY THE ENGINEER.
4. TEXT LAYOUT DIMENSIONS AND DESIGN OF SYMBOLS FOR STANDARD SIGNS NOT DETAILED ON THESE PLANS OR IN THE E-SERIES STANDARDS CAN BE FOUND IN THE LATEST PUBLICATION OF THE MUTCD STANDARD HIGHWAY SIGNS.
5. THE CONTRACTOR SHALL REVIEW AND UNDERSTAND ALL APPLICABLE PERMITS PRIOR TO CONSTRUCTION AND ENSURE THAT ALL CONSTRUCTION CONDITIONS ARE MET.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO PRIVATE OR PUBLIC PROPERTY CAUSED BY THE CONTRACTOR, AT THE SOLE COST OF THE CONTRACTOR.
7. THINNING AND TRIMMING MAY BE REQUIRED AT VARIOUS SIGN LOCATIONS THROUGHOUT THE PROJECT. THIS WORK SHALL INCLUDE REMOVAL OF ANY TREES, SHRUBS OR OVERGROWTH NECESSARY FOR PLACEMENT OF SIGNS AS DIRECTED BY THE ENGINEER. THIS WORK SHALL BE PAID UNDER ITEM 201.31, "THINNING AND TRIMMING (FOR SIGNS)".
8. THE CONTRACTOR SHALL ERECT NEW POSTS AND MOUNT NEW SIGNS BEHIND EXISTING SIGNS PRIOR TO REMOVING THE OLD SIGN AND POSTS, WHERE APPLICABLE, OR AS DIRECTED BY THE ENGINEER.
9. THE ABBREVIATIONS "OUT" AND "MED" REFER TO LOCATIONS OUTSIDE OF THE NORTHBOUND OR SOUTHBOUND INTERSTATE BARREL OR IN THE MEDIAN, RESPECTIVELY. ANY REFERENCE TO "LEFT" AND/OR "RIGHT" REFERS TO THE DIRECTION OF STATIONING AND NOT THE DIRECTION OF TRAFFIC.
10. DELINEATORS: NEW MAINLINE DELINEATORS WITH OR WITHOUT MILEPOST PLAQUES ARE NOT SHOWN ON THE PLANS. REFER TO STANDARD E-197 AND DETAILS ON NEXT SHEET FOR GENERAL PLACEMENT AND SPACING CRITERIA. AN ESTIMATED QUANTITY OF DELINEATORS W/STEEL POSTS AND REMOVAL OF EXISTING DELINEATORS HAS BEEN INCLUDED. DELINEATORS TO BE REMOVED SHALL NOT BE CUT BUT SHALL BE COMPLETELY REMOVED FROM THE GROUND.
11. EXISTING MILEMARKERS ON STATE HIGHWAYS OR FOR RAMPS ARE TO BE SALVAGED AND INSTALLED ON POSTS FOR NEW SIGNS OR RETAINED IF ON SEPARATE POSTS OR AS DIRECTED BY THE ENGINEER. THE MILEMARKER LOCATIONS ARE NOT DEPICTED ON THE PLANS. PAYMENT FOR ATTACHING TO NEW POSTS IS INCIDENTAL TO OTHER CONTRACT PAY ITEMS.
12. ALL STATIONING ALONG RAMPS AND STATE/TOWN HIGHWAYS IN MILES ARE APPROXIMATE ONLY. REFER TO STANDARD SHEETS FOR APPROPRIATE SIGN PLACEMENT GUIDELINES.

SEEDING FORMULA
RURAL AREAS

% MASS.	kg/ha	NAME	PUR %	GERM %
37.5	26.0	CREEPING RED FESCUE	98	85
37.5	26.0	TALL FESCUE	95	90
5.0	4.0	RED TOP	95	90
15.0	10.0	BIRDSFOOT TREFOIL	98	85
5.0	4.0	ANNUAL RYE GRASS	95	85
100.0	70.0			

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

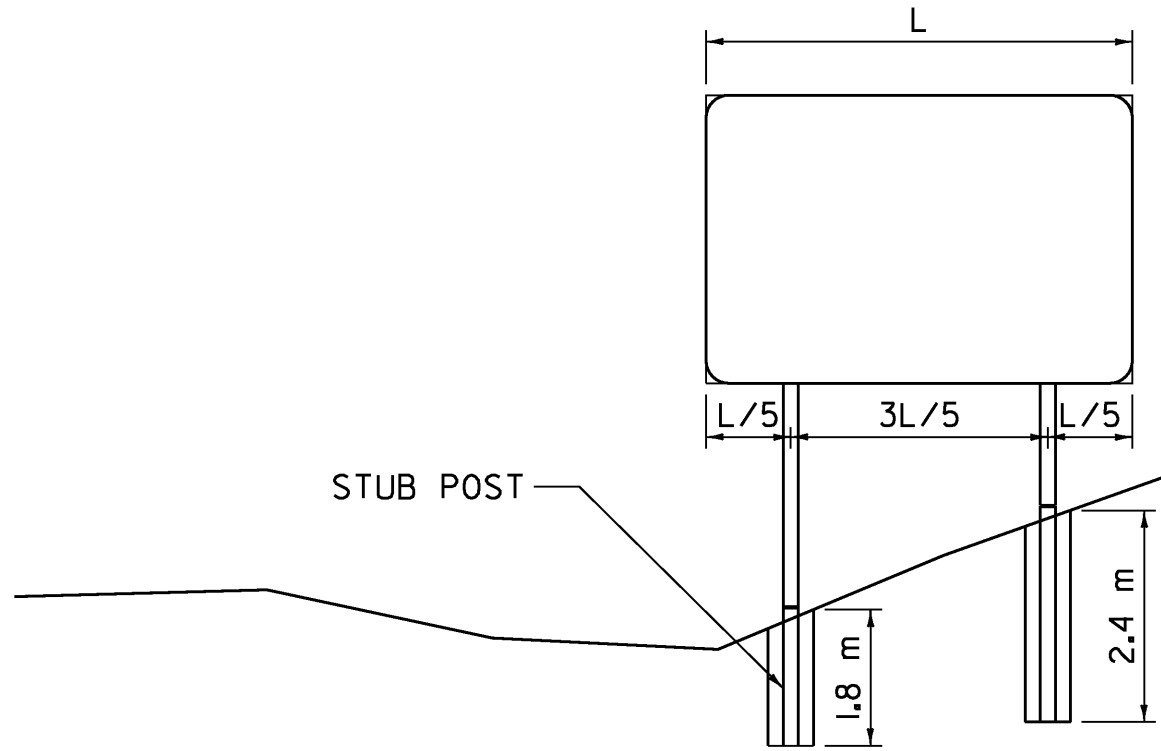
SEED: TO BE APPLIED PER SEEDING FORMULAS OR AS DIRECTED BY THE ENGINEER.

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

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

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

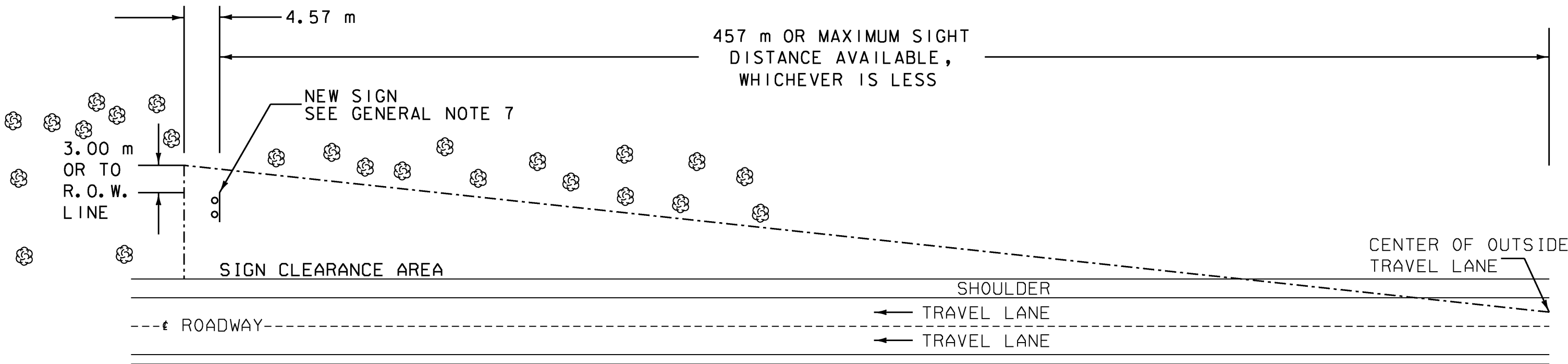
TOPSOIL: TO BE USED WITH SEED AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.



W-SHAPE FOOTING DETAIL

NOTES

1. THE LONGER CONCRETE FOOTINGS SHALL BE USED AT POST LOCATIONS ON STEEP SIDE SLOPES AS IDENTIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
2. FORMS/TUBES FOR THE LONGER CONCRETE FOOTINGS SHALL BE SMOOTH. CORRUGATED PIPE SHALL NOT BE USED.
3. REFER TO VTRANS STANDARD E-161 FOR ADDITIONAL NOTES AND DETAILS REGARDING CONCRETE FOOTINGS.
4. PAYMENT FOR THE LONGER CONCRETE FOOTINGS SHALL BE PAID FOR UNDER ITEM 675.41, "FOUNDATION FOR W-SHAPE STEEL POSTS, 600mm (MOD. - 2.4 m FOUNDATION)". OR UNDER ITEM 675.42, "FOUNDATION FOR W-SHAPE STEEL POSTS, 750mm (MOD. - 2.4 m FOUNDATION)".



THE CONTRACTOR SHALL REMOVE ALL WOODY STEMMED GROWTH INCLUDING BRUSH, SAPLINGS, TREE LIMBS GROWING WITHIN OR PROJECTING INTO THE CLEARANCE AREA AND DOWN TO GROUND LEVEL OR AT LEAST 3.05 m BELOW THE BOTTOM OF THE SIGN, WHICH EVER IS LESS. PAYMENT WILL BE FOR ITEM 201.31 THINNING AND TRIMMING (FOR SIGNS) AND PAID FOR PER EACH SIGN ASSEMBLY LOCATION.

THINNING AND TRIMMING DETAIL (INTERSTATE)

GENERAL NOTES
&
MISCELLANEOUS
DETAILS

PROJECT NAME: ST. JOHNSBURY-LYNDON / WATERFORD

PROJECT NUMBER: HES 091-3(42) / HES 093-1(10)

FILE NAME: 9721ls-gennotes.dgn

PLOT DATE: 1/4/2007

PROJECT LEADER: CRB

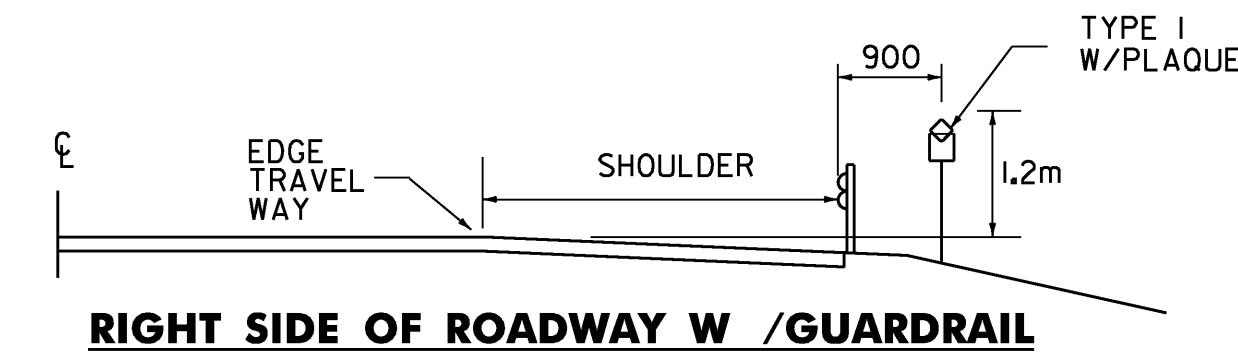
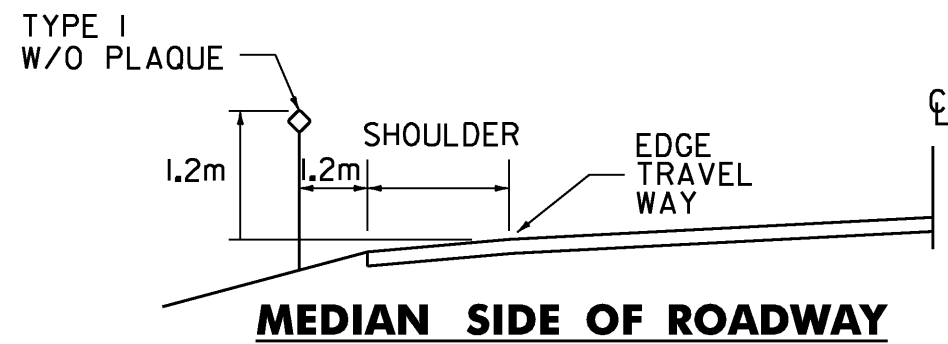
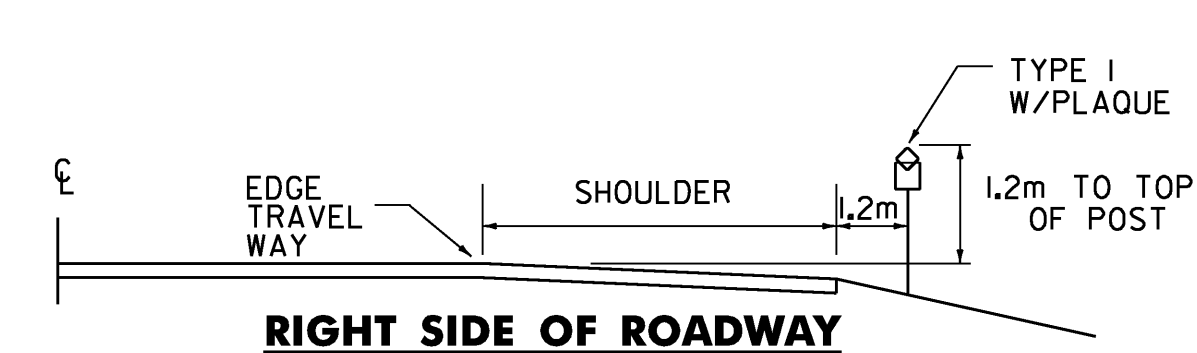
DRAWN BY: JCS

DESIGNED BY: DAM

CHECKED BY: DAM

CLD REF. NO.: 97-0211

SHEET 3 OF 130



TYPICAL PLACEMENT OF TYPE I DELINEATORS AND MILEPOSTS ON DIVIDED HIGHWAY

TYPE I DELINEATORS WITH WHITE REFLECTOR UNITS AND APPROPRIATE MILEPOST PLAQUES SHALL BE ERECTED CONTINUOUSLY ALONG THE RIGHT SIDE OF DIRECTION OF TRAVEL THE DIVIDED HIGHWAYS BETWEEN MILEMARKERS.

THE TYPE I DELINEATORS WITH OR WITHOUT MILEPOST PLAQUES SHALL BE OMITTED ALONG DECELERATION AND ACCELERATION LANES, BUT THE SUCCEEDING SPACING SHALL BE AS IF THE DELINEATORS HAD BEEN ERECTED CONTINUOUSLY AND SHALL BE SO INDICATED.

THE LOCATION OF TYPE I DELINEATORS AND MILEPOSTS ARE TO BE COMPUTED AND MARKED IN THE FIELD BY THE ENGINEER IN ACCORDANCE WITH THE LATEST REVISION OF THE AGENCY'S "POLICY ON LOCATION MARKING FOR VERMONT DIVIDED HIGHWAYS."

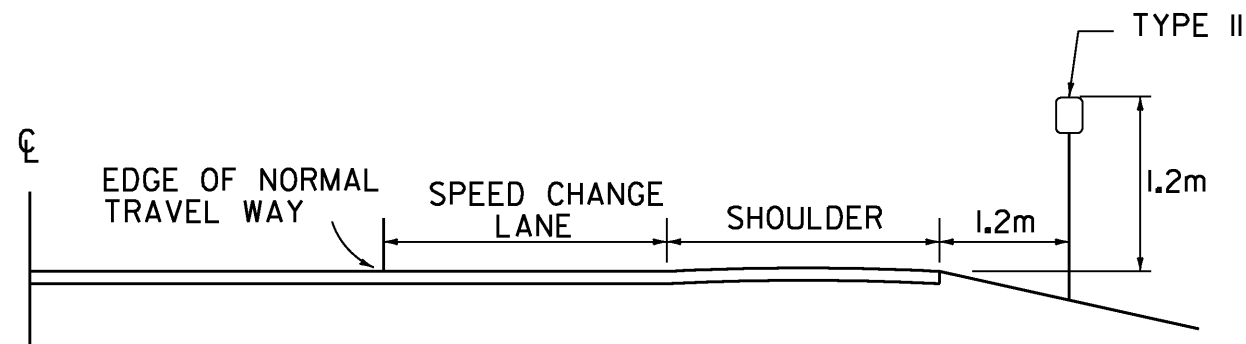
TYPE I YELLOW DELINEATORS WITHOUT MILEPOST PLAQUES SHALL BE ERECTED CONTINUOUSLY ALONG THE LEFT OR MEDIAN SIDE OF DIVIDED HIGHWAYS, CONTINUED AT APPROXIMATELY THE SAME SPACING THROUGH INTERCHANGES AND REST AREAS WHERE THERE MAY NOT BE ANY TYPE I DELINEATORS ON THE RIGHT SIDE. PLACEMENT OF TYPE I DELINEATORS SHALL BE FOLLOWED ON THE LEFT AS ON THE RIGHT. THE SAME LATERAL TYPE I DELINEATORS WITHOUT MILEPOST PLAQUE SHALL BE INSTALLED ON INTERSTATE RAMPS AS SHOWN ON THE PLANS.

TYPE I DELINEATORS USED AT U-TURNS SHALL BE PLACED WHERE THE RADIUS MEETS THE TANGENT OF THE MAINLINE.

TYPE III DELINEATORS

TYPE III DELINEATORS WILL BE TYPE I DELINEATORS WITH AN ADDITIONAL RED REFLECTIVE UNIT MOUNTED ON THE REVERSRE SIDE. THEY SHALL BE ERECTED ON THE RIGHT AND LEFT SIDE OF THE RAMPS AS SHOWN ON THE PLANS.

TYPE III DELINEATORS SHALL BEGIN 15.2 m FROM THE WRONG WAY SIGNS AND EXTEND EVERY 15.2 m TO A POINT NOT LESS THAN 7.6 m FROM THE DIVIDED HIGHWAY. SEE STANDARD E-197.

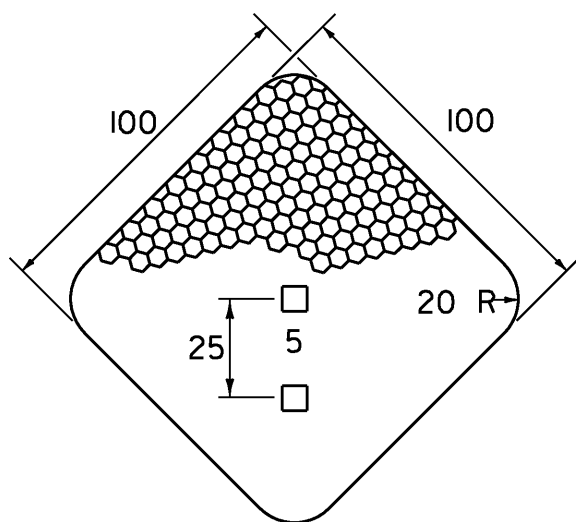


TYPICAL PLACEMENT OF TYPE II DELINEATORS ON SPEED CHANGE LANES

TYPE II DELINEATORS SHALL BE ERECTED CONTINUOUSLY ALONG THE RIGHT SIDE OF THE DECELERATION AND ACCELERATION LANES AT 30 m INTERVALS INCLUDING GUARDRAIL SECTIONS. THE DELINEATORS SHALL START AT THE BEGINNING OF THE TAPER AND END AT THE NOSE OF THE EXIT OR ENTRANCE GORE. THEY SHALL HAVE WHITE REFLECTOR UNITS.

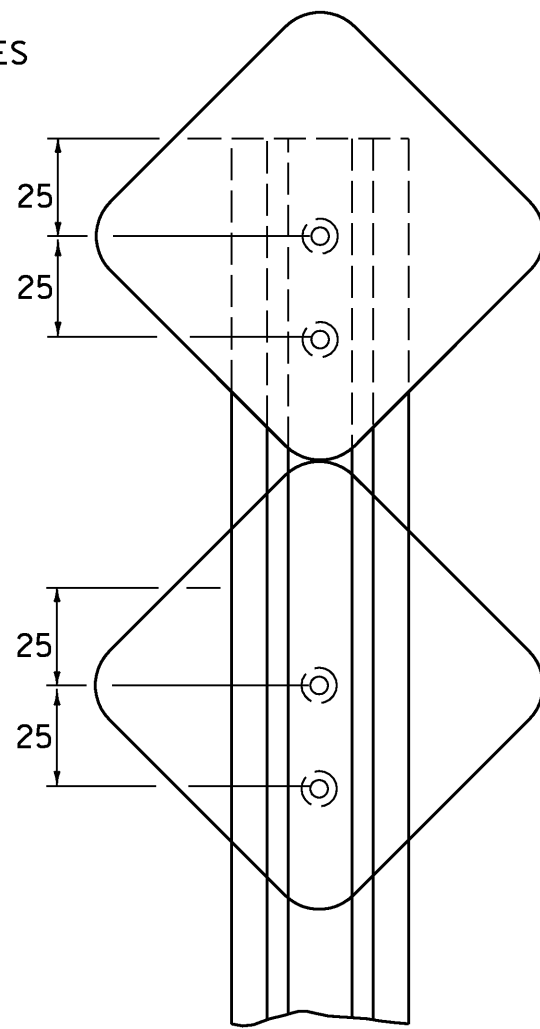
NOTES

- FOR MOUNTING DELINEATORS AND MILEPOSTS ON BRIDGES, SEE STANDARD E-199
- MILEPOST PLAQUES WITH OR A WITHOUT REFLECTOR UNIT SHALL BE MOUNTED ON THE POST WITH TWO OR THREE 5 mm DIA. BY 37.5 mm LONG ALUMINUM BOLTS WITH 12.5 mm DIA. ALUMINUM VANDAL RESISTANT NUTS, OR 5 mm DIA. BY 37.5 mm LONG VANDAL RESISTANT FASTENERS.
- DELINEATOR POSTS SHALL BE 3 kg/m FLANGE CHANNEL A MINIMUM OF 2.4 METERS LONG.
- DELINEATOR POSTS SHALL HAVE A MINIMUM EMBEDMENT OF 750 mm IN THE GROUND.
- WHEN USING DELINEATORS AND MILEPOSTS ON STEEP SLOPES (1 ON 2 OR STEEPER) OR ERODED SOILS ADD 300 mm FOR GREATER STABILITY.

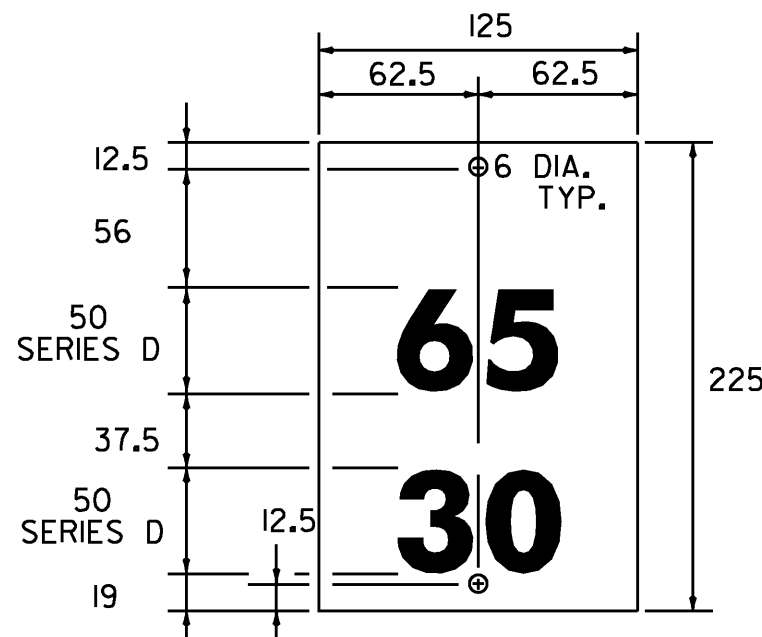
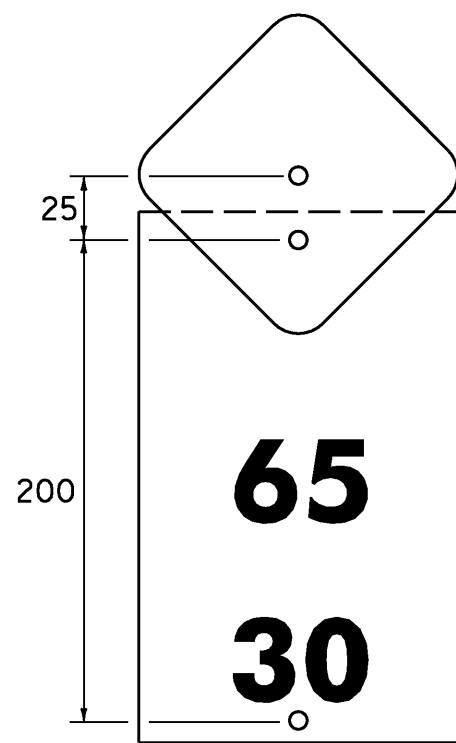


DELINEATOR REFLECTIVE SHEETING UNIT

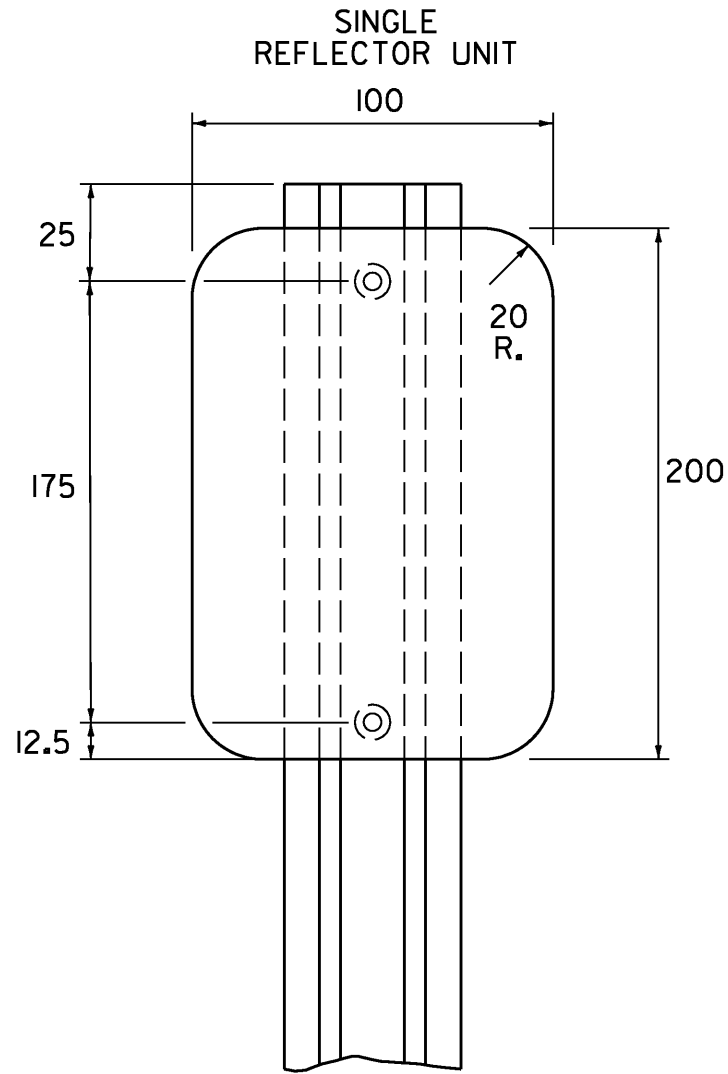
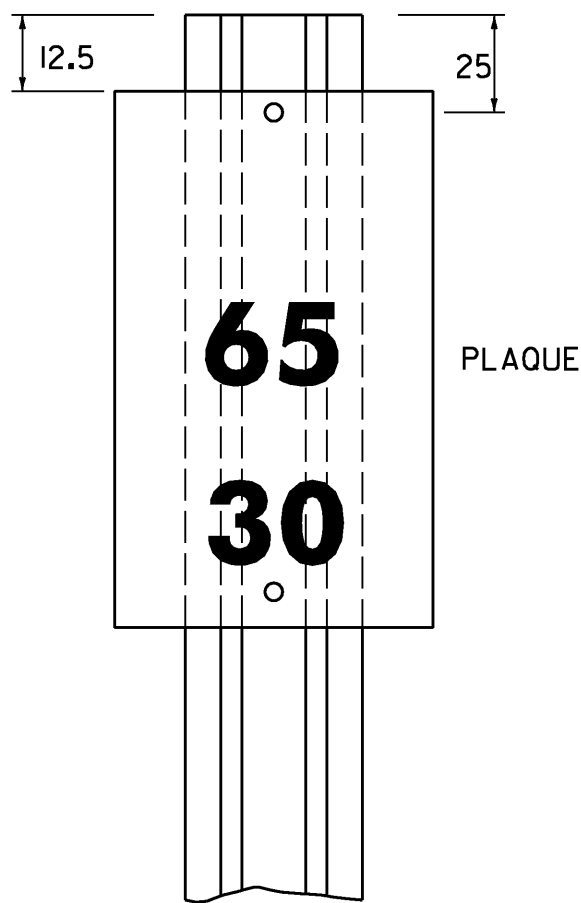
MATERIAL FOR RETROREFLECTIVE SHEETING FOR DELINEATORS SHALL BE A 1.60-mm ALUMINUM BACKING WITH A WHITE, ASTM TYPE III, OR RED/YELLOW SHALL BE TYPE VII, TYPE VIII OR TYPE IX.



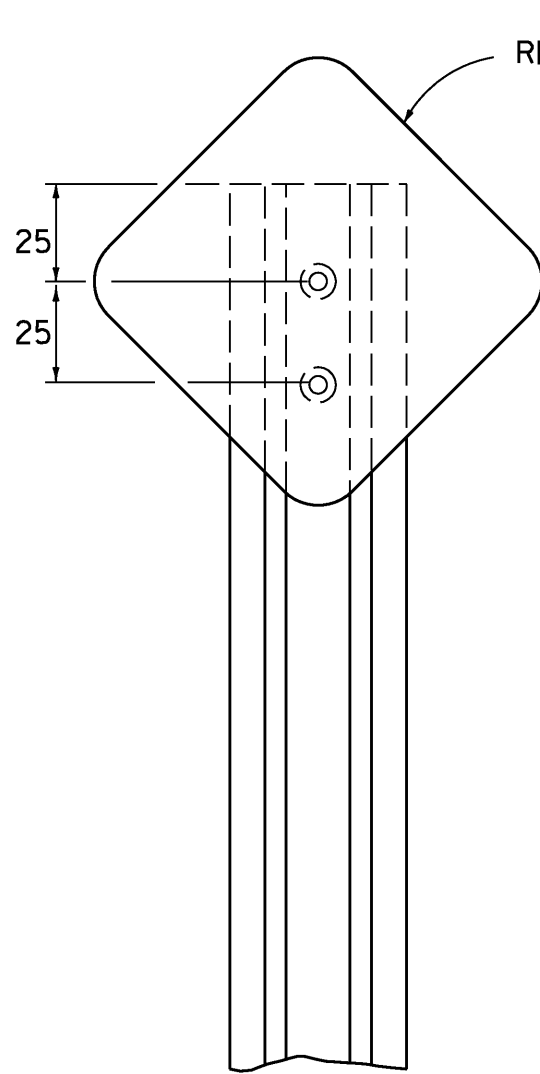
TYPE I AT U-TURNS



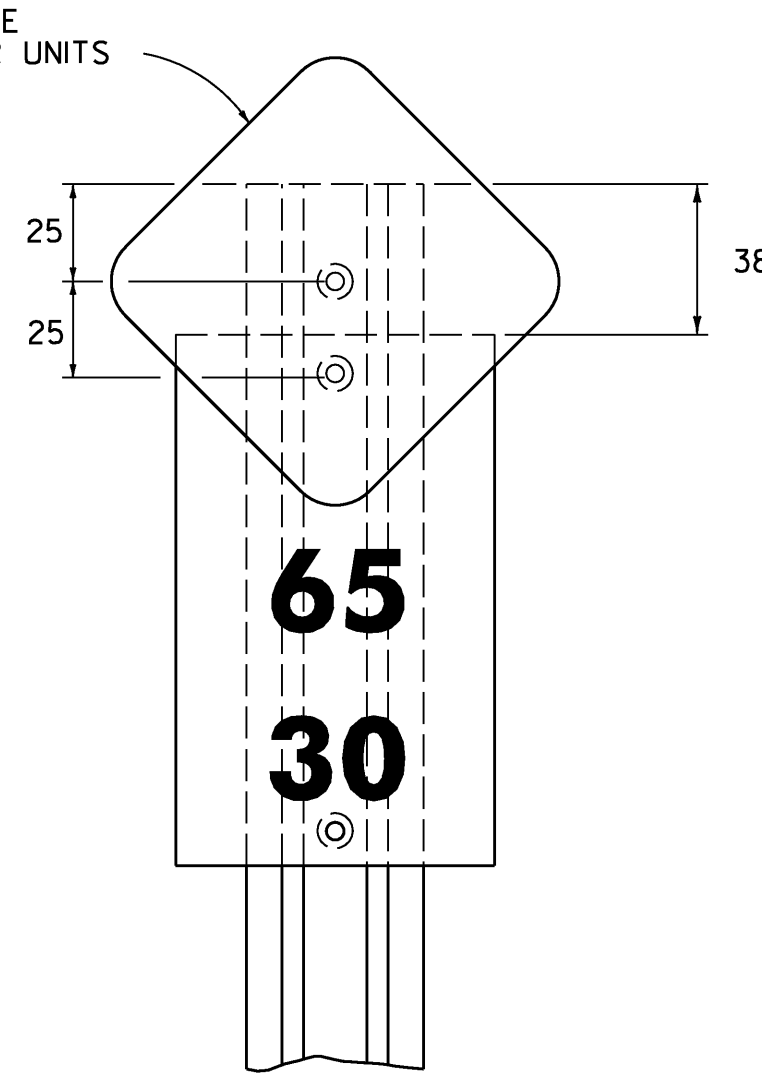
MILEPOST PLAQUE



TYPE II



TYPE I WITHOUT PLAQUE



TYPE I WITH PLAQUE

DELINEATORS WITH REFLECTIVE SHEETING

DELINEATOR AND MILEPOST DETAILS

PROJECT NAME: ST. JOHNSBURY-LYNDON / WATERFORD

PROJECT NUMBER: HES 091-3(42) / HES 093-1(10)

FILE NAME: 9721ls-gennotes.dgn

PROJECT LEADER: CRB

DESIGNED BY: DAM

CLD REF. NO.: 97-0211

PLOT DATE: 1/4/2007

DRAWN BY: JCS

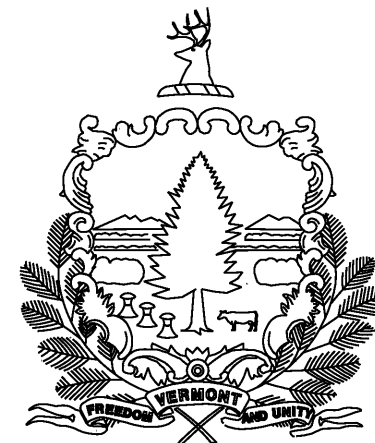
CHECKED BY: DAM

SHEET 4 OF 130

SUMMARY OF ESTIMATED QUANTITIES													TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
ST. JOHNSBURY - LYNDON HES 091-3(42)							WATERFORD HES 093-1(10)				ITEMS				ITEM NUMBER	ROUND						
				ROADWAY	EROSION CONTROL	FULL C.E ITEMS		ROADWAY	EROSION CONTROL	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT				QUANTITIES	UNIT	ITEMS			
				10				6			16		EACH	THINNING AND TRIMMING (FOR SIGNS)	201.31	-						
				44				66			110		CM	EARTH BORROW	203.30	-						
														BEGIN OPTION AA								
				15				15			30		M	300 mm CAAP 1.52 mm (68 mm X 12 mm)	601.0205	-						
				15				15			30		M	300 mm PCCSP 1.63 mm (68 mm X 12 mm)	601.0405	-						
				15				15			30		M	300 mm RCP CLASS III	601.0805	-						
				15				15			30		M	300 mm CPEP	601.0905	-						
														END OPTION AA								
				6				8			14		EA	YIELDING MARKER POSTS	619.17	-						
				658				760			1418		M	STEEL BEAM GUARD RAIL (GALVANIZED)	621.20	0.6						
				4				6			10		EACH	MANUFACTURED TERMINAL SECTION (TANGENT)	621.505	-						
				4				5			9		EACH	ANCHOR FOR STEEL BEAM RAIL	621.60	-						
				180				162			342		M	REMOVL AND DISP OF GUARD RAIL	621.80	0.6						
				1050				525			1575		HR	UNIFORMED TRAFFIC OFFICERS	630.10	15						
				225				125			350		HR	FLAGGERS	630.15	38						
						0.5				0.5	1		LS	FIELD OFFICE-ENGINEERS	631.10	-						
						0.5				0.5	1		LS	TESTING EQUIPMENT - CONCRETE	631.16	-						
						0.5				0.5	1		LU	FIELD OFFICE - TELEPHONE (N.A.B.I.)	631.25	-						
				0.5				0.5			1		LS	MOBILIZATION / DEMOBILIZATION	635.11	-						
				0.5				0.5			1		LS	TRAFFIC CONTROL	641.10	-						
				2				2			4		EACH	PORTABLE CHANGEABLE MESSAGE SIGN	641.15	EST						
				2				2			4		EACH	PORTABLE ARROW BOARD	641.16	EST						
								310			310		M	DURABLE 200 mm WHITE LINE (THERMOPLASTIC)	646.42	9						
					7				4		11		KG	SEED	651.15	0.8						
					56				26		82		KG	FERTILIZER	651.18	0.6						
					0.5				0.2		0.7		T	AGRICULTURAL LIMESTONE	651.20	0.1						
					0.5				0.2		0.7		T	HAY MULCH	651.25	0.1						
				50				23			73		CM	TOPSOIL	651.35	0.3						
				336				157			493		SM	TRAFFIC SIGNS, TYPE A	675.20	0.97						
				632				344			976		SM	TRAFFIC SIGNS, TYPE B	675.21	1.1						
														BEGIN OPTION BB								
				1251				582			1833		M	FLANGED CHANNEL SIGN POST	675.301	-						
				1251				582			1833		M	SQUARE TUBE SIGN POSTS AND ANCHOR	675.341	-						
														END OPTION BB								
				13267				4269			17536		KG	W-SHAPE STEEL SIGN POSTS	675.31	-						
				485				198			683		KG	TUBULAR ALUMINUM SIGN POSTS	675.32	1.3						
				8146				5189			13335		KG	TUBULAR STEEL SIGN POSTS	675.33	1.1						
				34				23			57		EACH	FOUNDATION FOR W-SHAPE STEEL POSTS, 600 MM DIAMETER	675.41	-						
				32				5			37		EACH	FOUNDATION FOR W-SHAPE STEEL POSTS, 600 MM DIAMETER) (MOD. - 2.4M FOUNDATION)	675.41	-						
				5							5		EACH	FOUNDATION FOR W-SHAPE STEEL POSTS, 750 MM DIAMETER	675.42	-						
PROJECT NAME: ST. JOHNSBURY - LYNDON / WATERFORD PROJECT NUMBER HES 091-3(42) / HES 093-1(10)																	FILE NAME: qssStJWaterford.xls PROJECT LEADER CRB DESIGNED BY: PTS QUANTITY SHEET #1			PLOT DATE: 1/8/2007 DRAWN BY: JCS CHECKED BY: DAM SHEET 5 OF 130		

[illegible]

STATE OF VERMONT
AGENCY OF TRANSPORTATION



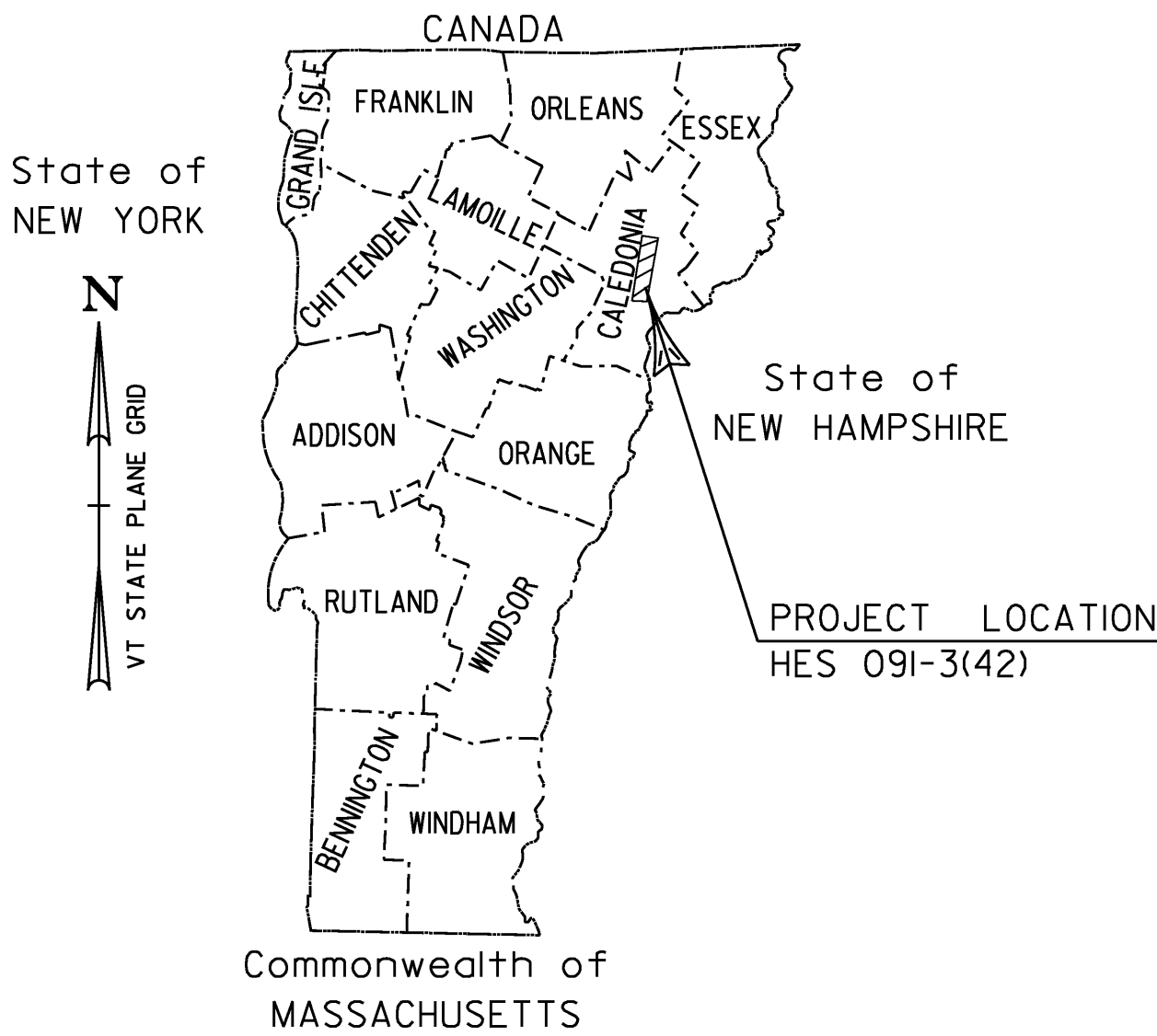
PROPOSED IMPROVEMENT
TOWNS OF ST. JOHNSBURY & LYNDON
COUNTY OF CALEDONIA

INTERSTATE ROUTE 91 (HES 091-3(42)) - SIGNS

BEGINNING AT MM 128.91 IN THE TOWN OF ST. JOHNSBURY AND EXTENDING NORTHERLY
APPROXIMATELY 17.85 KM (11.09 MI) TO MM 140.00 IN THE TOWN OF LYNDON

LENGTH OF ROADWAY 17 848 METERS = 11.09 MILES = 17.85 KILOMETERS
LENGTH OF PROJECT 17 848 METERS = 11.09 MILES = 17.85 KILOMETERS

WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES REMOVAL OF EXISTING
SIGNS AND PLACEMENT OF NEW SIGNS AND ASSOCIATED ELEMENTS ALONG THE
PROJECT LENGTH, RAMPS, AND INTERCHANGES.

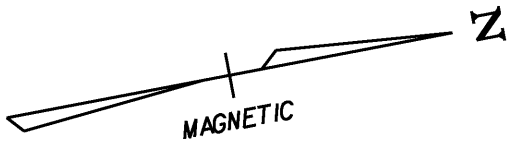
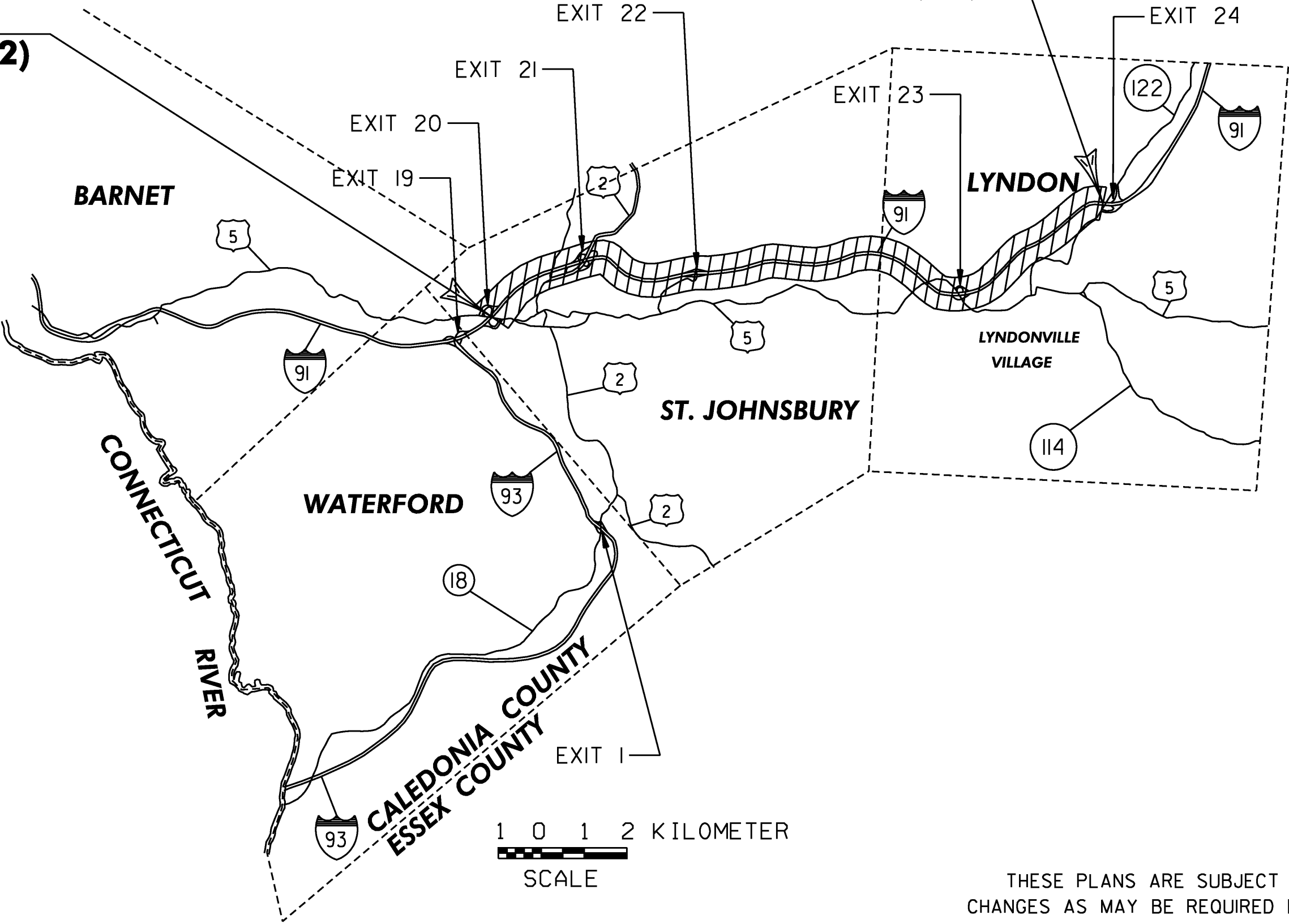


TRAFFIC DATA

NORTHBOUND	SOUTHBOUND
INTERSTATE 91	
2000 ADT 9800	2000 ADT 9800

MM 128.910
BEGIN PROJECT HES 091-3(42)

MM 140.000
END PROJECT HES 091-3(42)



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 2001, AS APPROVED BY THE
FEDERAL HIGHWAY ADMINISTRATION ON JANUARY 4, 2001
FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT
REVISIONS AND SUCH REVISED SPECIFICATIONS AND
SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE
PLANS.

Metric

UNLESS NOTED OTHERWISE

STATIONS ARE IN MILES
ELEVATIONS ARE IN METERS
DIMENSIONS ARE IN MILLIMETERS

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATOR
APPROVED _____ DATE _____
DIRECTOR OF PROGRAM DEVELOPMENT
APPROVED _____ DATE _____
PROJECT MANAGER : ROGER THOMPSON
PROJECT NAME : ST. JOHNSBURY - LYNDON
PROJECT NUMBER : HES 091-3 (42)
SHEET 7 OF 130 SHEETS

EXISTING GUARDRAIL (m)			CLEARANCE HEIGHT (m)				GUARDRAIL ITEMS (F-A)					TYPE		AVAILABLE OPTIONS						RT MARKS									
MM	MM	POS	STEEL BEAM	CADLE	STEEL BEAM (GALVANIZED) (m)	STEEL BEAM GR. MOD. (2.4 m POST)	REMOVE & RESET	ADJUST GUARDRAIL HEIGHT	REMOVE AND DISPOSE	REMOVE ALUM. APPROACH RAIL	REMOVE ALUM. APPROACH RAIL	MIS (TANGENT)	ANCHOR FOR STILL BEAM	REPLACE GUARDRAIL POST ASSEMBLY	REPLACE GUARDRAIL BEAM/UNIT	REMOVAL OF GUIDEPOST	D (mm)	L (m)	PCCSP (mm)	CARP (mm)	RCP CL	CPLP SL	COMMON EXCAVATION (m3)	LAR III BORROW (m3)	SUBBASE OF D.G.C.S. (m3)	AGGREGATE SHOULDER (ton)	TOPSOIL (m3)	RT MARKS	
					621.20	621.20	621.75	621.79	621.80	621.81	621.74	621.60	621.80	621.78	621.77	621.81								208.16	202.81	311.36	401.12		
SOUTHBOUND																													
0.07	129.25	OUT		180.0	263.5 262.2				176.0 180.0			1	1												11.0			BEGIN G.R. ON INT. #20 RAMP D	
129.12	129.19	MED			118.72 117.8							1	1												11.0				
129.25		OUT															300	5	1.63	1.52	III	X							
129.39	129.46	OUT			414.0							4	4												11.0				
129.46		OUT															300	5	1.63	1.52	III	X							
137.60	137.70	OUT			463.4							4	4												11.0				
137.70		OUT															300	5	1.63	1.52	III	X							
	129.95	OUT			12.04			3.81					1															GUARD RAIL EXTENDED TO PROTECT NEW SIGN	
SUBTOTAL:					394.26 667.4				179.81 180.0			2 4	3 4												44.0				
ROUNDING:					0 -0.6			0.0				0	0												0.0				
PROJECT TOTALS:					394.26 668.0				179.81 180.0			2 4	3 4				300	15.0	1.63	1.52	III	X			44.0			PROJECT NAME: ST. JOHNSBURY - LYNDON PROJECT NUMBER: HES 091-3(42)	
																											FILE NAME: gridsStJ.xls PROJECT LEADER: CRB DESIGNED BY: DAM CLD REF. NO.: 97-0211	PLOT DATE: 1/8/2007 DRAWN BY: JCS CHECKED BY: DAM SHEET 10 OF 130	

BEGIN PROJECT
HES 091-3(42)
(MM 128.91)

EXIT 20 129.516 SB

129.815 SB

129.908 SB



REMOVING SIGNS

NB - TYPE A: 29
TYPE B: 8
BRIDGE PLAQUE: 5 (NOT SHOWN)
SB - TYPE A: 40
TYPE B: 11
BRIDGE PLAQUE: 5 (NOT SHOWN)

INTERCHANGE 20

129.561 SB

MILE 1 3 0

130.26 SB

MM 130.90

MATCH LINE SEE BELOW

TH #68
TH #68

VT 28

MM 130.260

INTERCHANGE 21
SEE SHEET 14

MM 130.900

MILE 1 2 9

129.234 NB
NORTH
91

129.300 NB
GROOVED SHOULDER

129.37 NB
SPEED LIMIT 65
MINIMUM 40

129.65 NB

EXIT 21
2 TO 15
St. Johnsbury
Montpelier
1 MILE
NEXT EXIT 3 MILES

129.92 NB
EXIT 21
Danville
Hardwick
NEXT RIGHT

MILE 1 3 0

130.25 NB

130.93 SB

MM 130.90

MATCH LINE SEE ABOVE

MILE 1 3 1

130.960 SB

EXIT 21 131.043 SB
2 TO 15
St. Johnsbury
Montpelier
NEXT RIGHT
24 MILES

131.230 SB
EXIT 21
Danville
Hardwick
NEXT RIGHT

EXIT 21 131.542 SB
2 TO 15
St. Johnsbury
Montpelier
1 MILE
NEXT EXIT 3 MILES

131.71 SB

131.952 SB
SPEED LIMIT 65
MINIMUM 40

MILE 1 3 2

132.039 SB
GROOVED SHOULDER

132.129 SB
SOUTH
91

MM 132.90

MATCH LINE SEE NEXT SHEET

A EXIT 20 129.917 SB
5
St. Johnsbury
Passumpsic
1 MILE

B 130.08 NB
TRUCK ROUTE
2 WEST
NEXT RIGHT

C EXIT 19 129.05 SB
93 SOUTH
Littleton N.H.
EXIT 1/2 MILE
NEXT EXIT 8 MILES

130.950 NB

MILE 1 3 1

131.040 NB
NORTH
91

131.130 NB
GROOVED SHOULDER

131.22 NB
SPEED LIMIT 65
MINIMUM 40

131.58 NB
EXIT 22
TO 5
St. Johnsbury
1 MILE
NEXT EXIT 5 MILES

131.69 NB

131.91 NB
EXIT 22
STEEP GRADE
TRUCKS USE
LOWER GEAR

MILE 1 3 2

132.14 NB
EXIT 22
TO 5
St. Johnsbury
NEXT RIGHT

MM 132.33

INTERCHANGE 22
SEE SHEET 16

MM 132.84

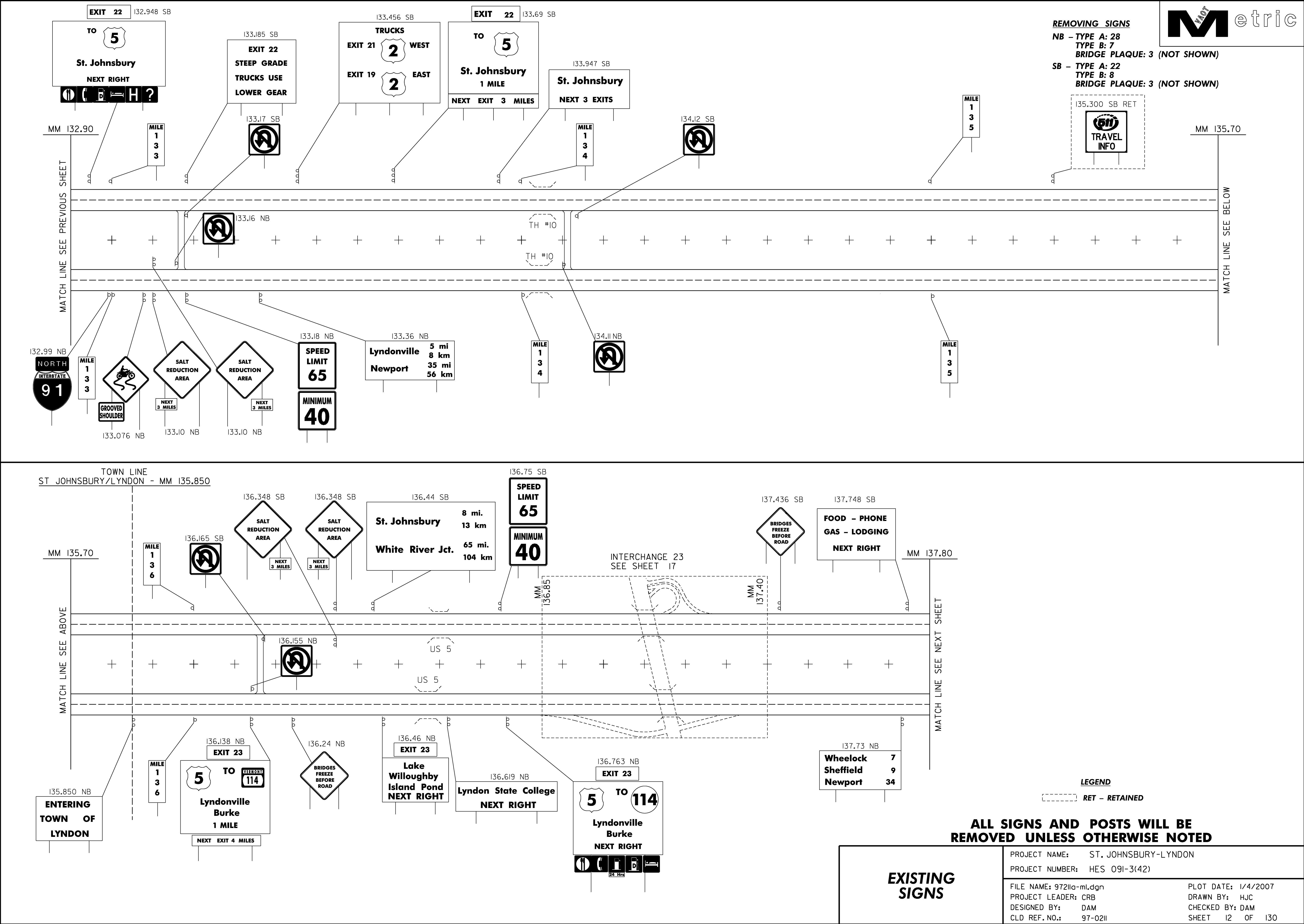
LEGEND

RET - RETAINED

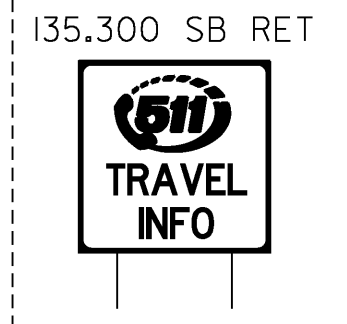
ALL SIGNS AND POSTS WILL BE
REMOVED UNLESS OTHERWISE NOTED

EXISTING
SIGNS

PROJECT NAME:	ST. JOHNSBURY-LYNDON
PROJECT NUMBER:	HES 091-3(42)
FILE NAME:	9721la-ml.dgn
PROJECT LEADER:	CRB
DESIGNED BY:	DAM
CLD REF. NO.:	97-0211
PLOT DATE:	1/4/2007
DRAWN BY:	HJC
CHECKED BY:	DAM
SHEET	11 OF 130



REMOVING SIGNS
NB – TYPE A: 28
TYPE B: 7
BRIDGE PLAQUE: 3 (NOT SHOWN)
SB – TYPE A: 22
TYPE B: 8
BRIDGE PLAQUE: 3 (NOT SHOWN)



LEGEND
RET – RETAINED

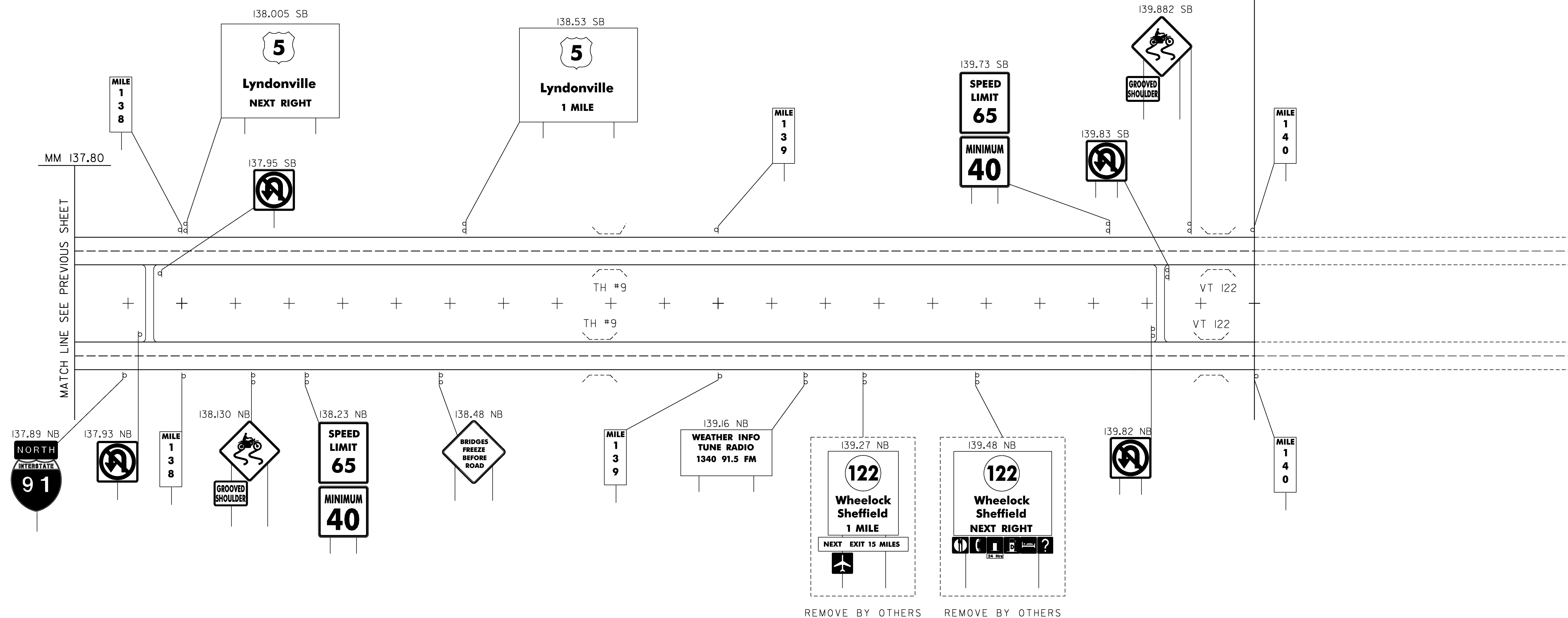
ALL SIGNS AND POSTS WILL BE REMOVED UNLESS OTHERWISE NOTED

EXISTING SIGNS	PROJECT NAME: ST. JOHNSBURY-LYNDON	
	PROJECT NUMBER: HES 091-3(42)	
	FILE NAME: 9721la-ml.dgn	PLOT DATE: 1/4/2007
	PROJECT LEADER: CRB	DRAWN BY: HJC
DESIGNED BY: DAM		CHECKED BY: DAM
CLD REF. NO.: 97-0211		SHEET 12 OF 130

REMOVING SIGNS

NB - TYPE A: 12
 TYPE B: 1
 BRIDGE PLAQUE: 2 (NOT SHOWN)
 SB - TYPE A: 9
 TYPE B: 2
 BRIDGE PLAQUE: 2 (NOT SHOWN)

END PROJECT
HES 091-3(42)
(MM 140.00)



LEGEND

RET - RETAINED

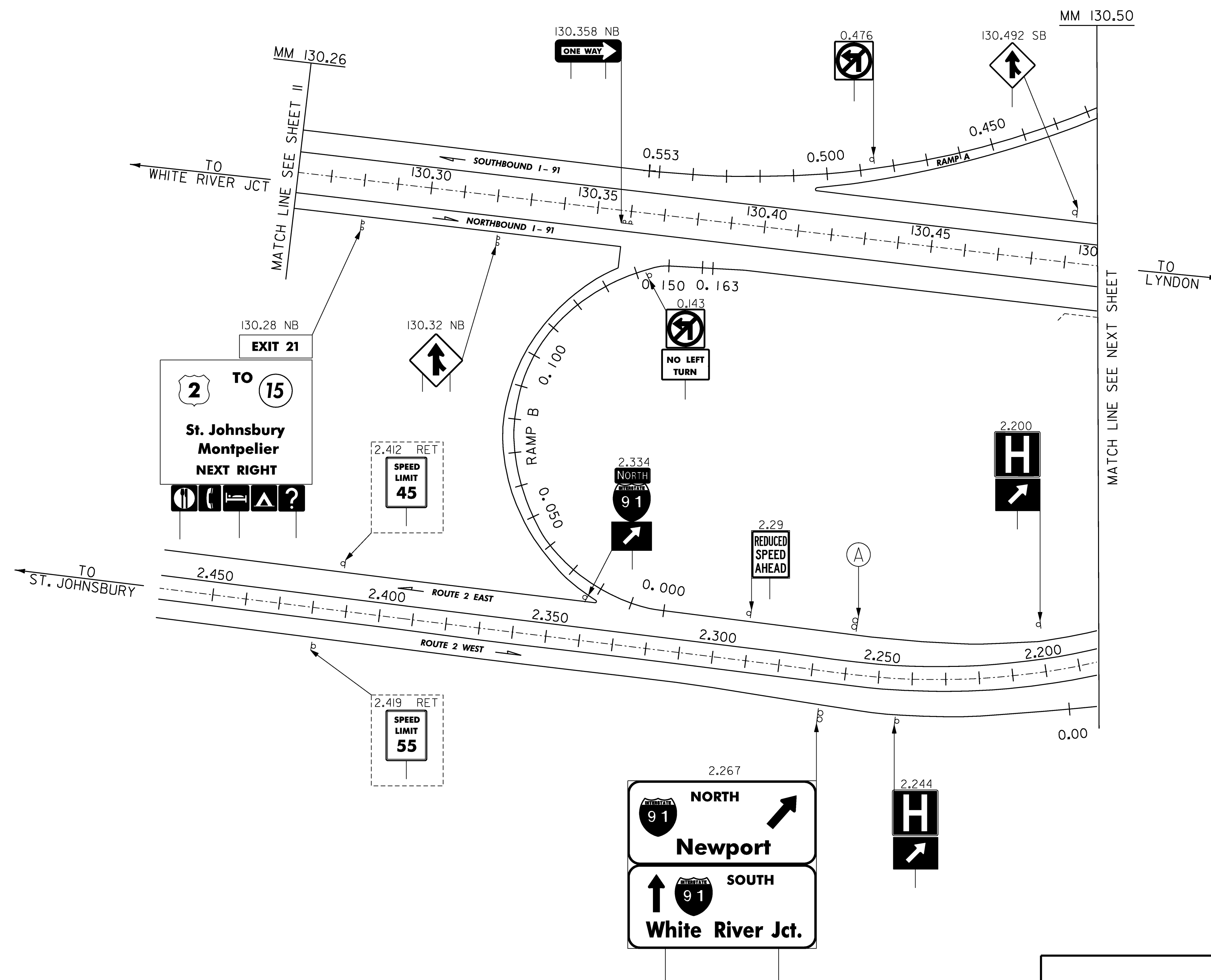
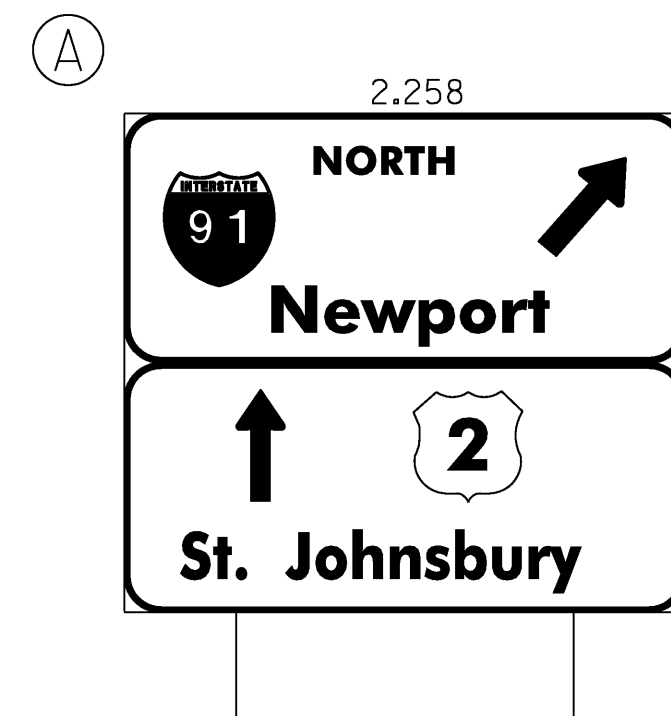
**ALL SIGNS AND POSTS WILL BE
 REMOVED UNLESS OTHERWISE NOTED**

EXISTING SIGNS

PROJECT NAME: ST. JOHNSBURY-LYNDON
 PROJECT NUMBER: HES 091-3(42)

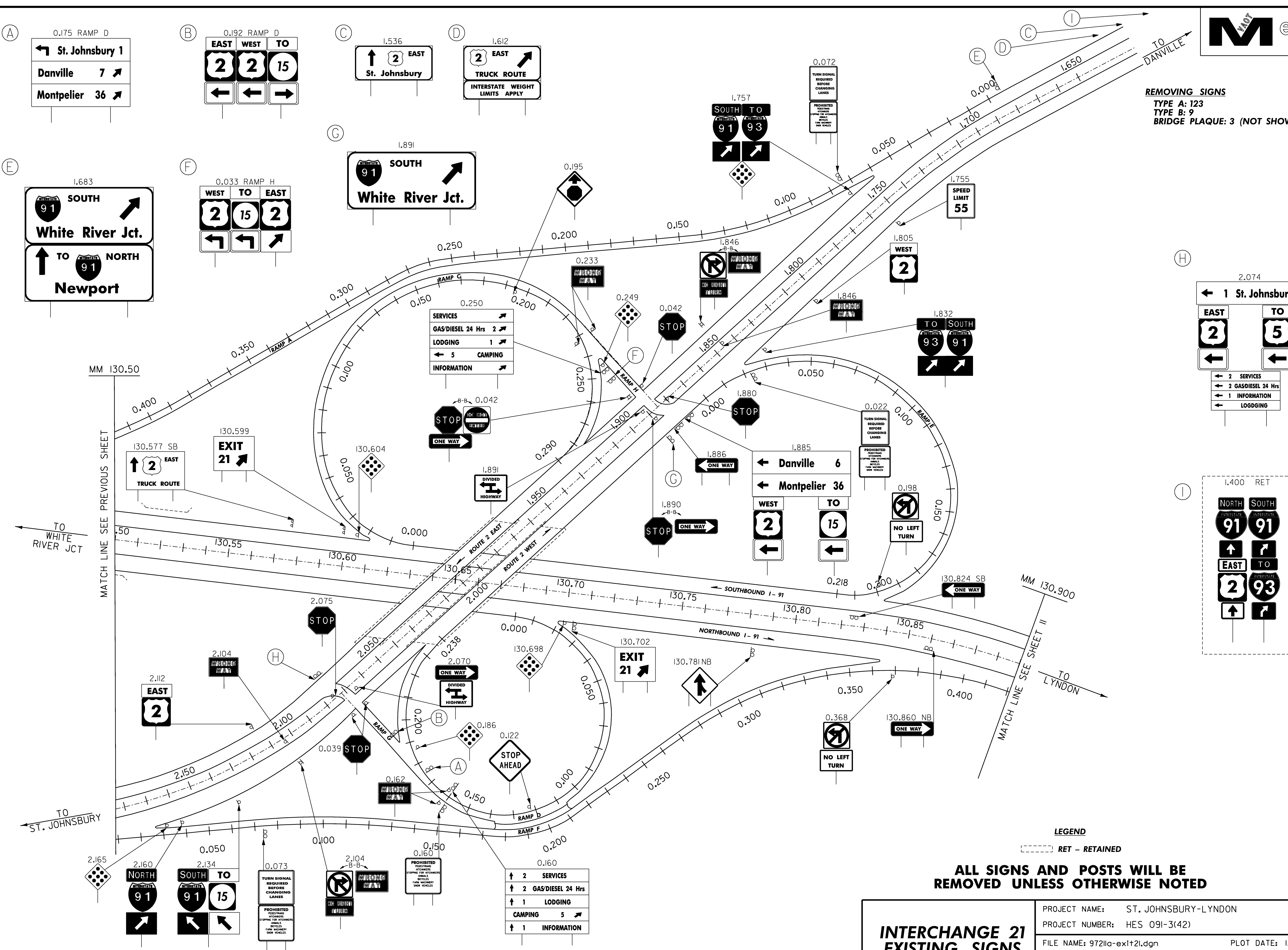
FILE NAME: 97211a-m1.dgn
 PROJECT LEADER: CRB
 DESIGNED BY: DAM
 CLD REF. NO.: 97-0211
 PLOT DATE: 1/4/2007
 DRAWN BY: HJC
 CHECKED BY: DAM
 SHEET 13 OF 130

REMOVING SIGNS
 TYPE A: 20
 TYPE B: 5
 BRIDGE PLAQUE: 1 (NOT SHOWN)



INTERCHANGE 21 EXISTING SIGNS	LEGEND RET - RETAINED	
	ALL SIGNS AND POSTS WILL BE REMOVED UNLESS OTHERWISE NOTED	
	PROJECT NAME: ST. JOHNSBURY-LYNDON	PLOT DATE: 1/4/2007
	PROJECT NUMBER: HES 091-3(42)	DRAWN BY: HJC
	FILE NAME: 9721la-exit21.dgn	CHECKED BY: DAM
	PROJECT LEADER: CRB	SHEET 14 OF 130
	DESIGNED BY: DAM	
	CLD REF. NO.: 97-0211	

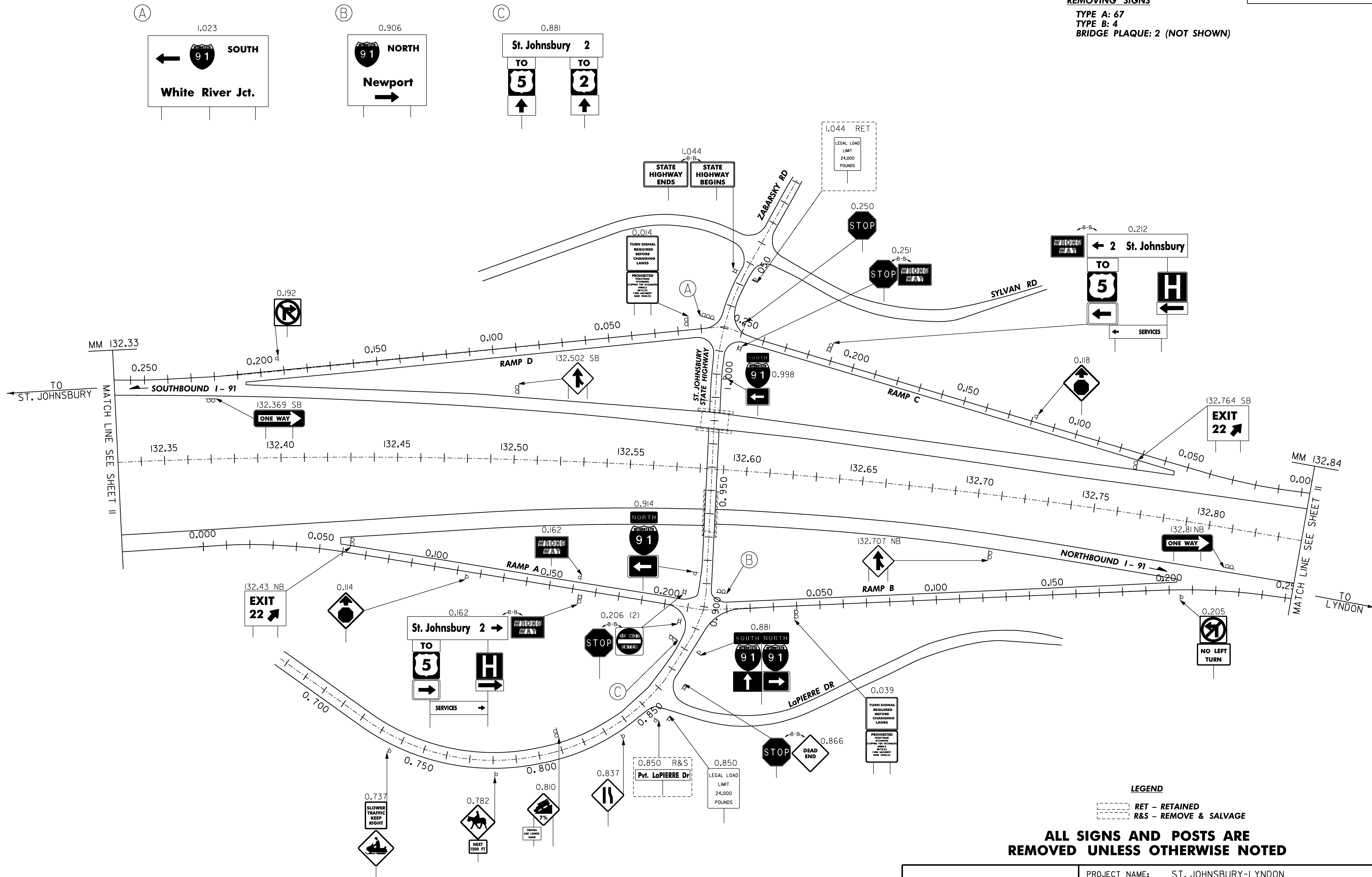
REMOVING SIGNS
TYPE A: 123
TYPE B: 9
BRIDGE PLAQUE: 3 (NOT SHOWN)



INTERCHANGE 21 EXISTING SIGNS	PROJECT NAME:	ST. JOHNSBURY-LYNDON
	PROJECT NUMBER:	HES 091-3(42)
	FILE NAME:	9721la-exit21.dgn
	CLD REF. NO.:	97-0211
	PLOT DATE:	1/4/2007
	PROJECT LEADER:	CRB
	DRAWN BY:	HJC
	DESIGNED BY:	DAM
	CHECKED BY:	DAM
	SHEET	15 OF 130

REMOVING SIGNS

TYPE A: 67
TYPE B: 4
BRIDGE PLAQUE: 2 (NOT SHOWN)



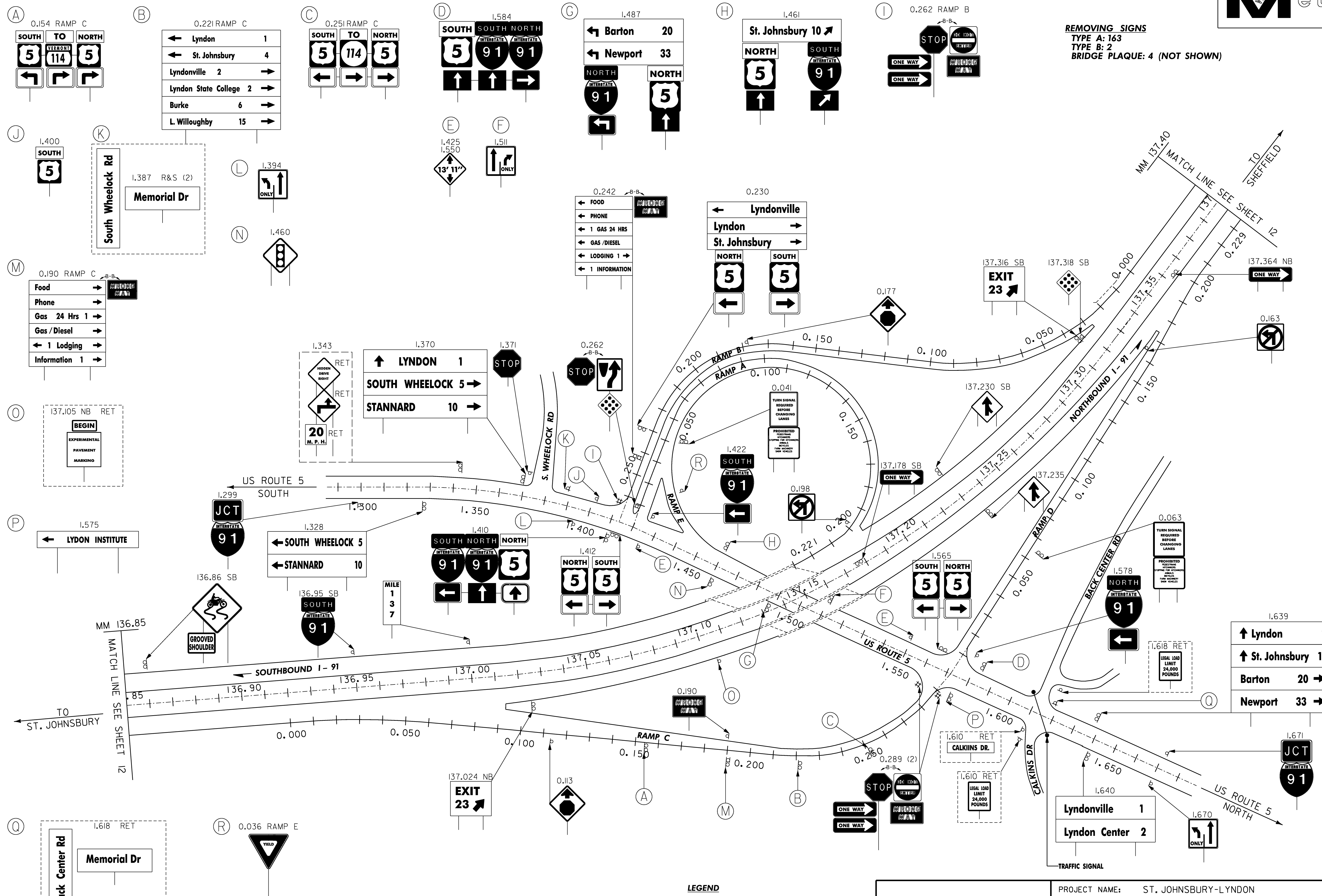
LEGEND

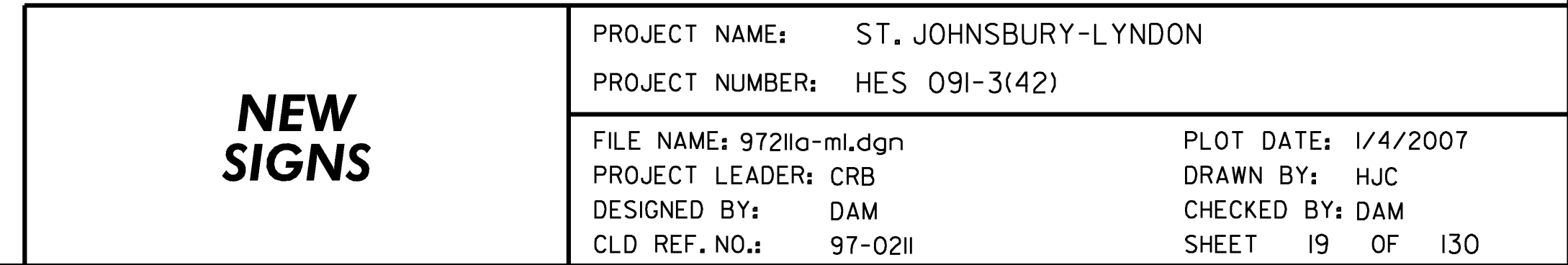
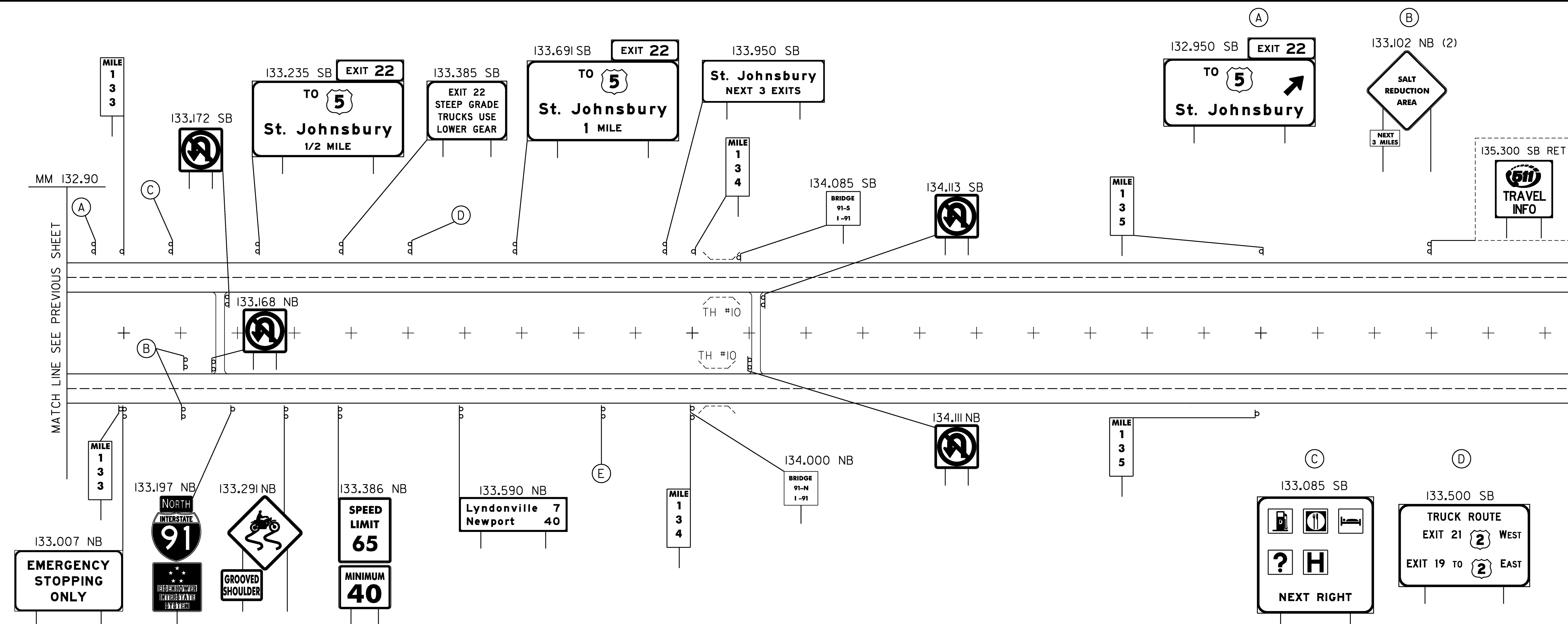
RET - RETAINED
R&S - REMOVE & SALVAGE

**ALL SIGNS AND POSTS ARE
REMOVED UNLESS OTHERWISE NOTED**

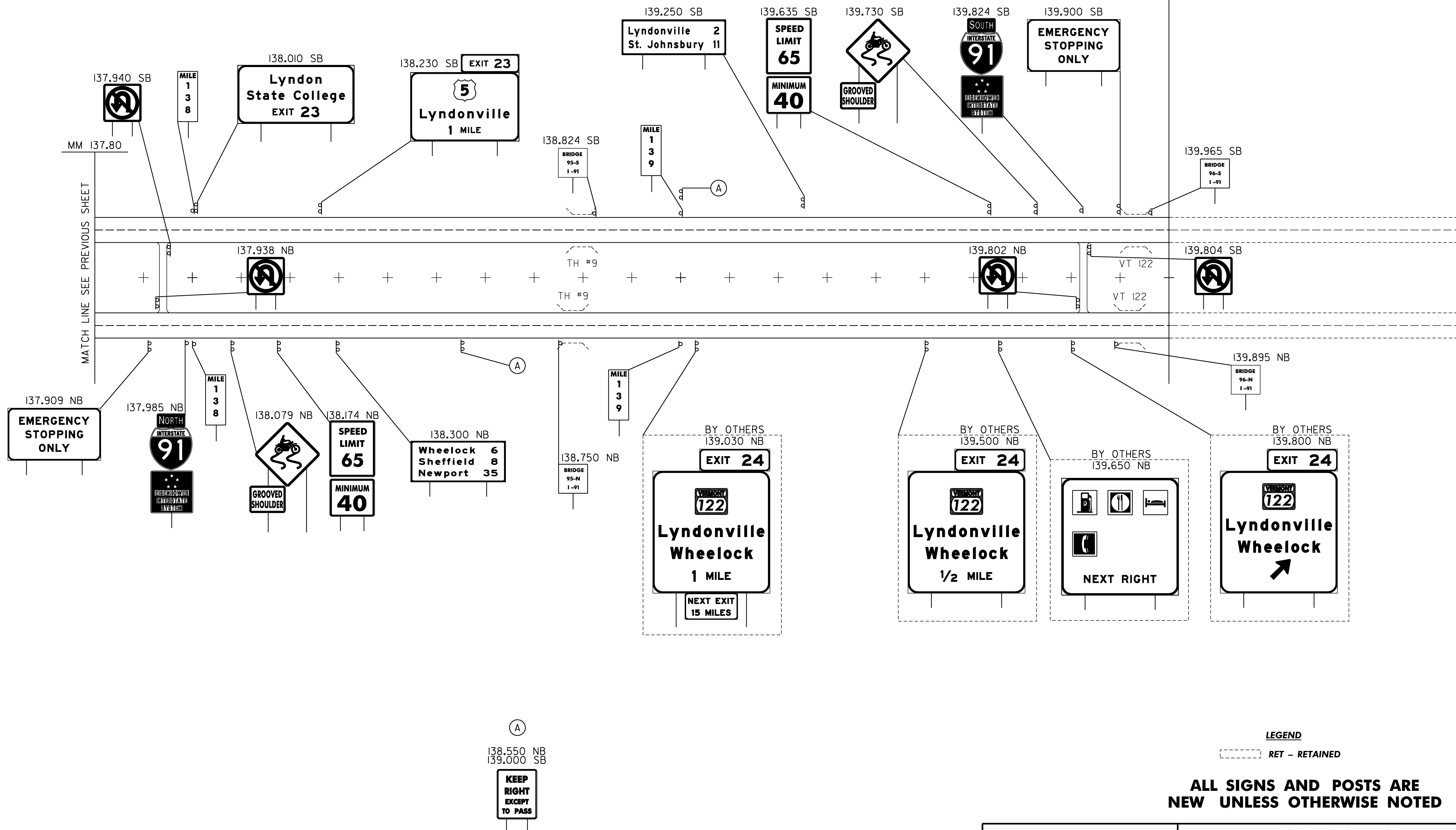
INTERCHANGE 22 EXISTING SIGNS

PROJECT NAME:	ST. JOHNSBURY-LYNDON
PROJECT NUMBER:	HES 091-3(42)
FILE NAME:	9721la-exit22.dgn
PROJECT LEADER:	CRB
DESIGNED BY:	DAM
CLD REF. NO.:	97-0211
PLOT DATE:	1/4/2007
DRAWN BY:	HJC
CHECKED BY:	DAM
SHEET	16 OF 130





END PROJECT
HES 091-3(42)
(MM 140.00)



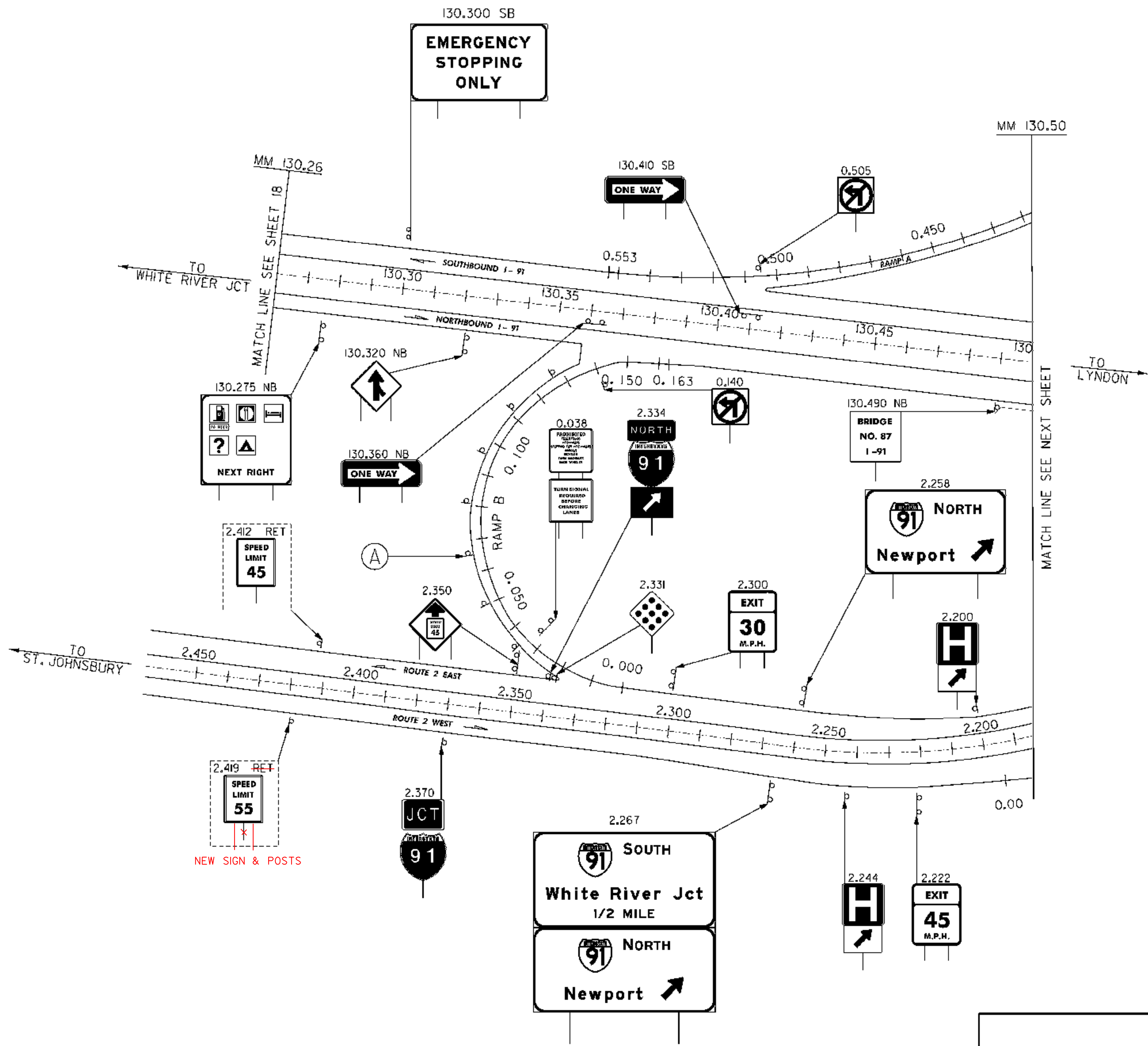
**NEW
 SIGNS**

PROJECT NAME: ST. JOHNSBURY-LYNDON
 PROJECT NUMBER: HES 091-3(42)

FILE NAME: 9721la-ml.dgn
 PROJECT LEADER: CRB
 DESIGNED BY: DAM
 CLD REF. NO.: 97-0211

PLOT DATE: 1/4/2007
 DRAWN BY: HJC
 CHECKED BY: DAM
 SHEET 20 OF 130

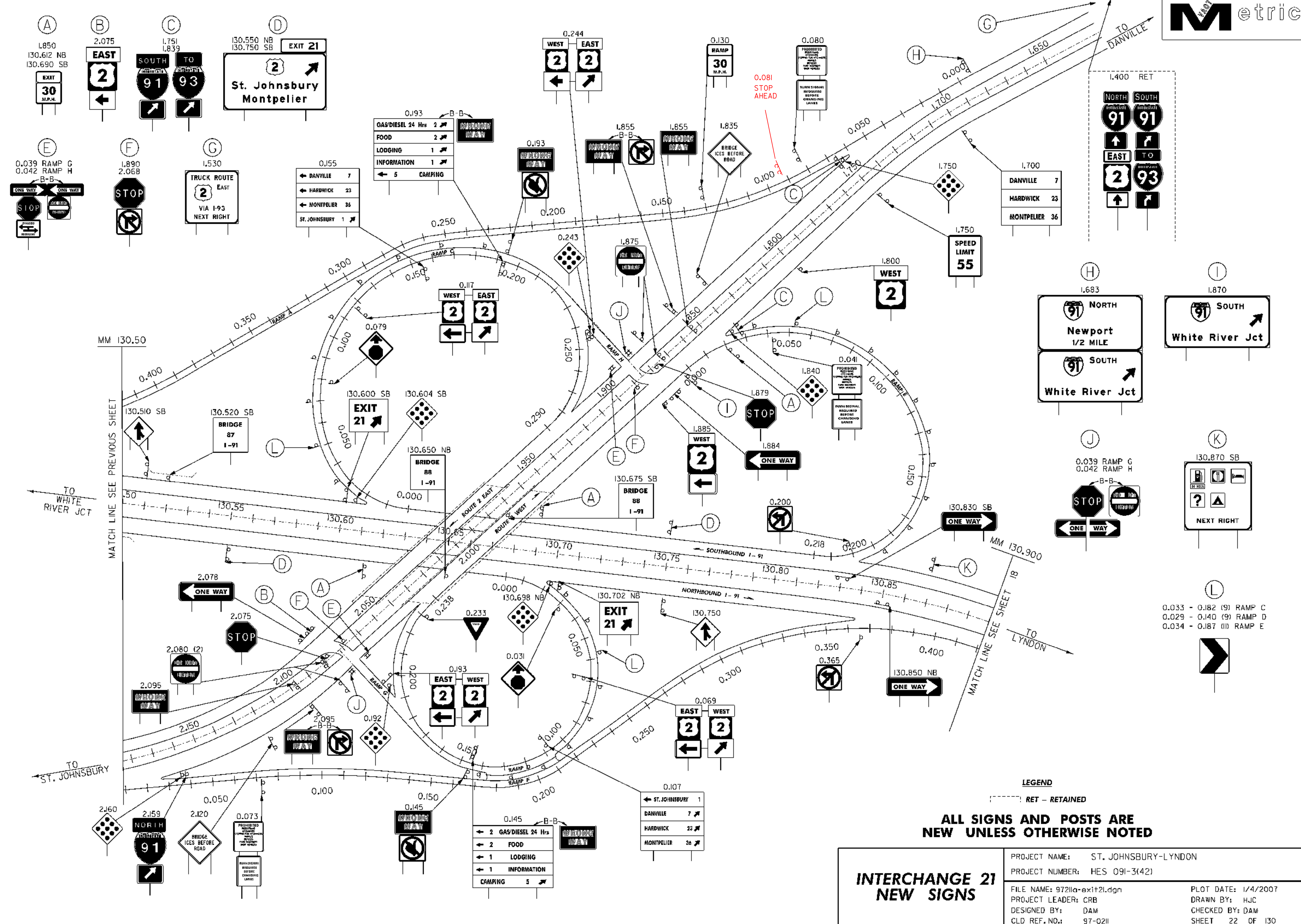
0.035 - 0.127 RAMP B (7)



LEGEND
[---] RET - RETAINED

ALL SIGNS AND POSTS ARE
NEW UNLESS OTHERWISE NOTED

INTERCHANGE 21 NEW SIGNS		PROJECT NAME: ST. JOHNSBURY-LYNDON	
		PROJECT NUMBER: HES 091-3(42)	
		FILE NAME: 97211a-ex1t21.dgn	PLOT DATE: 1/4/2007
		PROJECT LEADER: CRB	DRAWN BY: HJC
		DESIGNED BY: DAM	CHECKED BY: DAM
		CLD REF. NO.: 97-0211	SHEET 21 OF 130



LEGEND

--- RET - RETAINED

ALL SIGNS AND POSTS ARE
NEW UNLESS OTHERWISE NOTED

INTERCHANGE 21
NEW SIGNS

PROJECT NAME:	ST. JOHNSBURY-LYNDON
PROJECT NUMBER:	HES 091-3(42)
FILE NAME:	9721la-exit21.dgn
PROJECT LEADER:	CRB
DESIGNED BY:	DAM
CLD REF. NO.:	97-0211
PLOT DATE:	1/4/2007
DRAWN BY:	HJC
CHECKED BY:	DAM
SHEET	22 OF 130

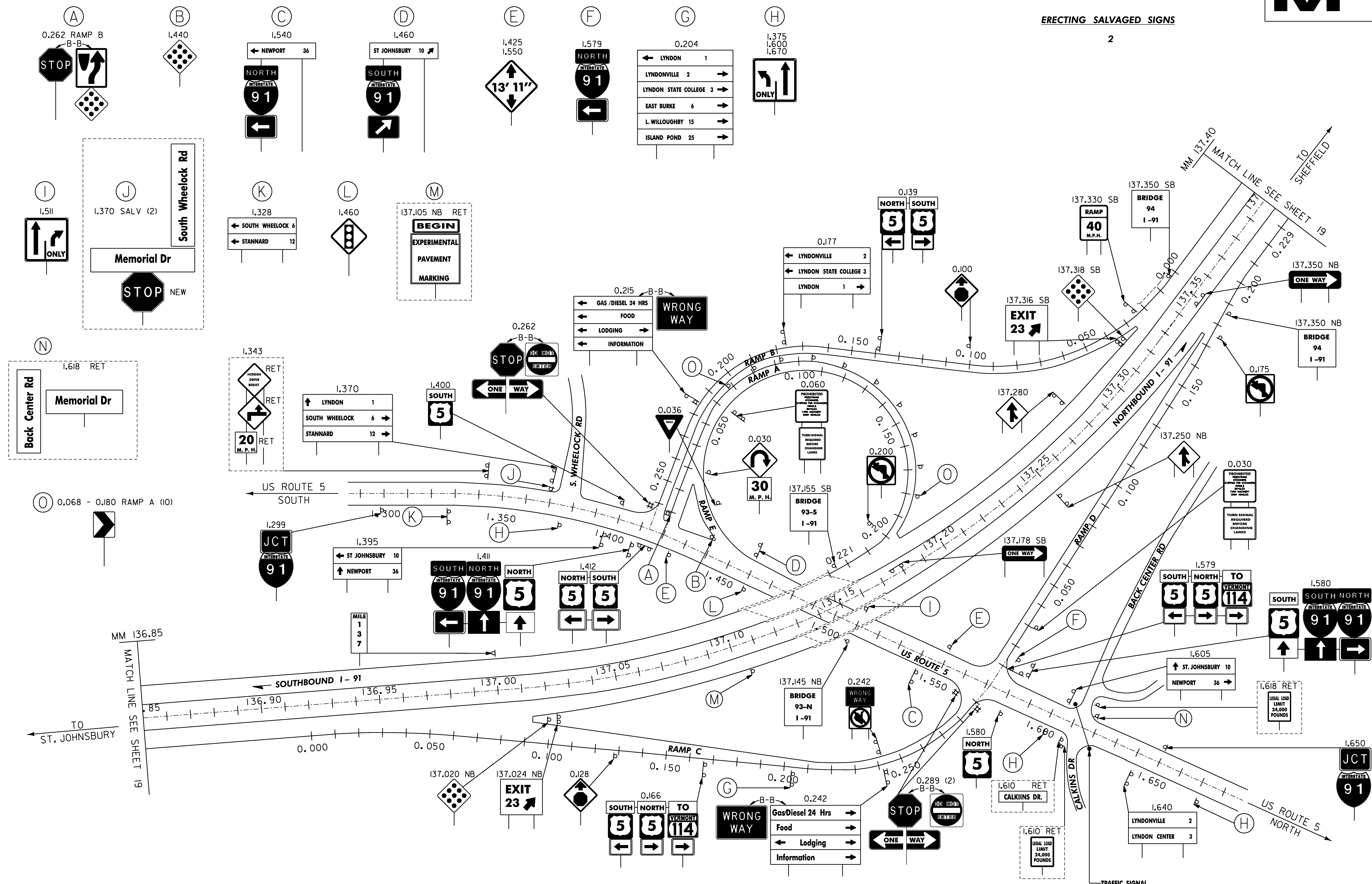


**ALL SIGNS AND POSTS WILL BE
NEW UNLESS OTHERWISE NOTED**

INTERCHANGE 22 NEW SIGNS

PROJECT NAME:	ST. JOHNSBURY-LYNDON
PROJECT NUMBER:	HES 091-3(42)

FILE NAME: 972lla-exit22.dgn	PLOT DATE: 1/4/2007
PROJECT LEADER: CRB	DRAWN BY: HJC
DESIGNED BY: DAM	CHECKED BY: DAM
CLD REF. NO.: 97-0211	SHEET 23 OF 130



LEGEND

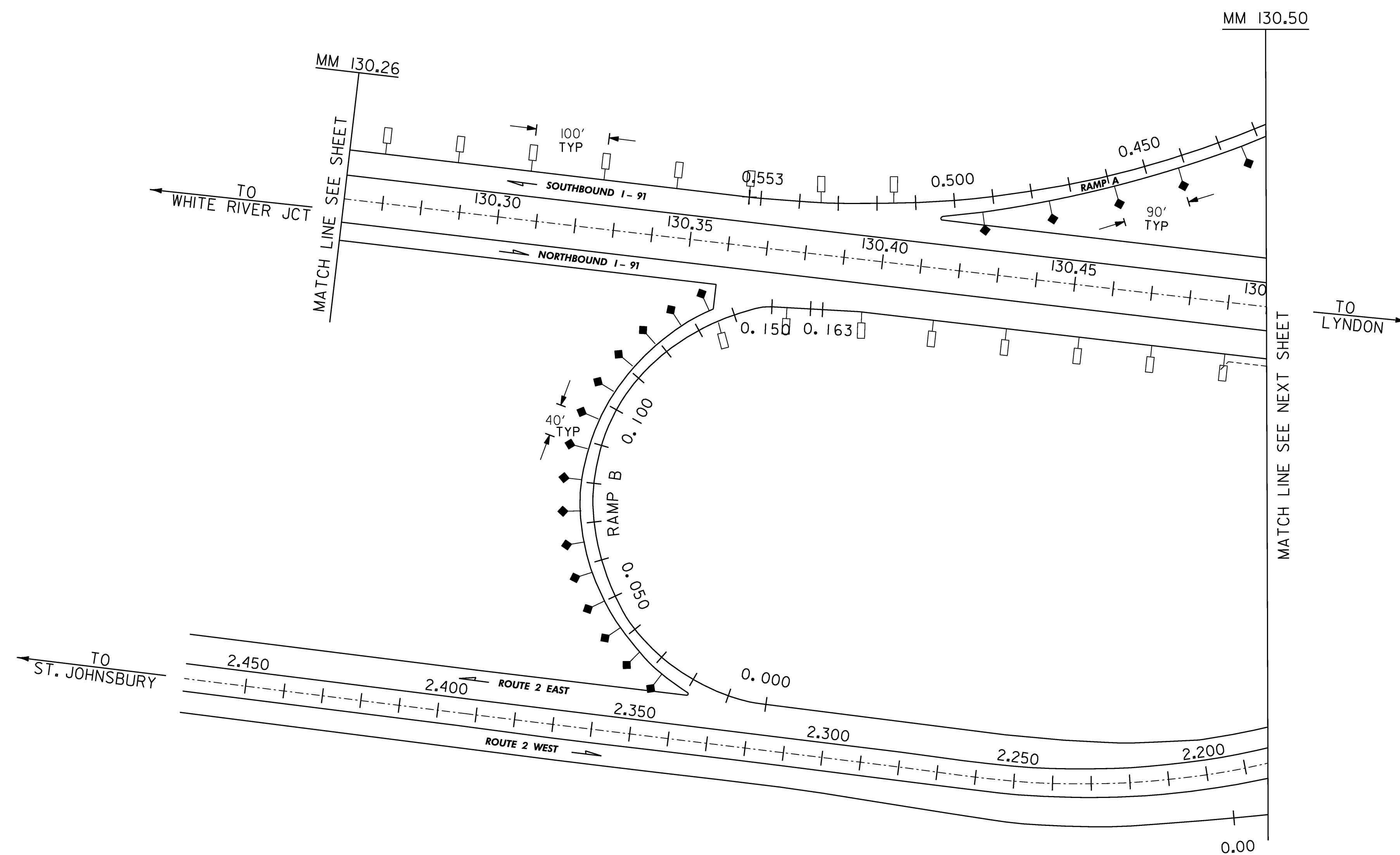
RET - RETAINED
SALV - SALVAGED

**ALL SIGNS AND POSTS ARE
NEW UNLESS OTHERWISE NOTED**

**INTERCHANGE 23
NEW SIGNS**

PROJECT NAME:	ST. JOHNSBURY-LYNDON
PROJECT NUMBER:	HES 091-3(42)
FILE NAME:	9721la-exit23.dgn
PROJECT LEADER:	CRB
DESIGNED BY:	DAM
CLD REF. NO.:	97-0211
PLOT DATE:	1/4/2007
DRAWN BY:	HJC
CHECKED BY:	DAM
SHEET	24 OF 130

Accel. lane taper ends at
130.061±, 1843' from Gore
Use 19 Type II Delineators



LEGEND

-  TYPE I (WHITE)
-  TYPE I (YELLOW)
-  TYPE II (WHITE)
-  TYPE III (RED ON BACK, WHITE)
-  TYPE III (RED ON BACK, YELLOW)

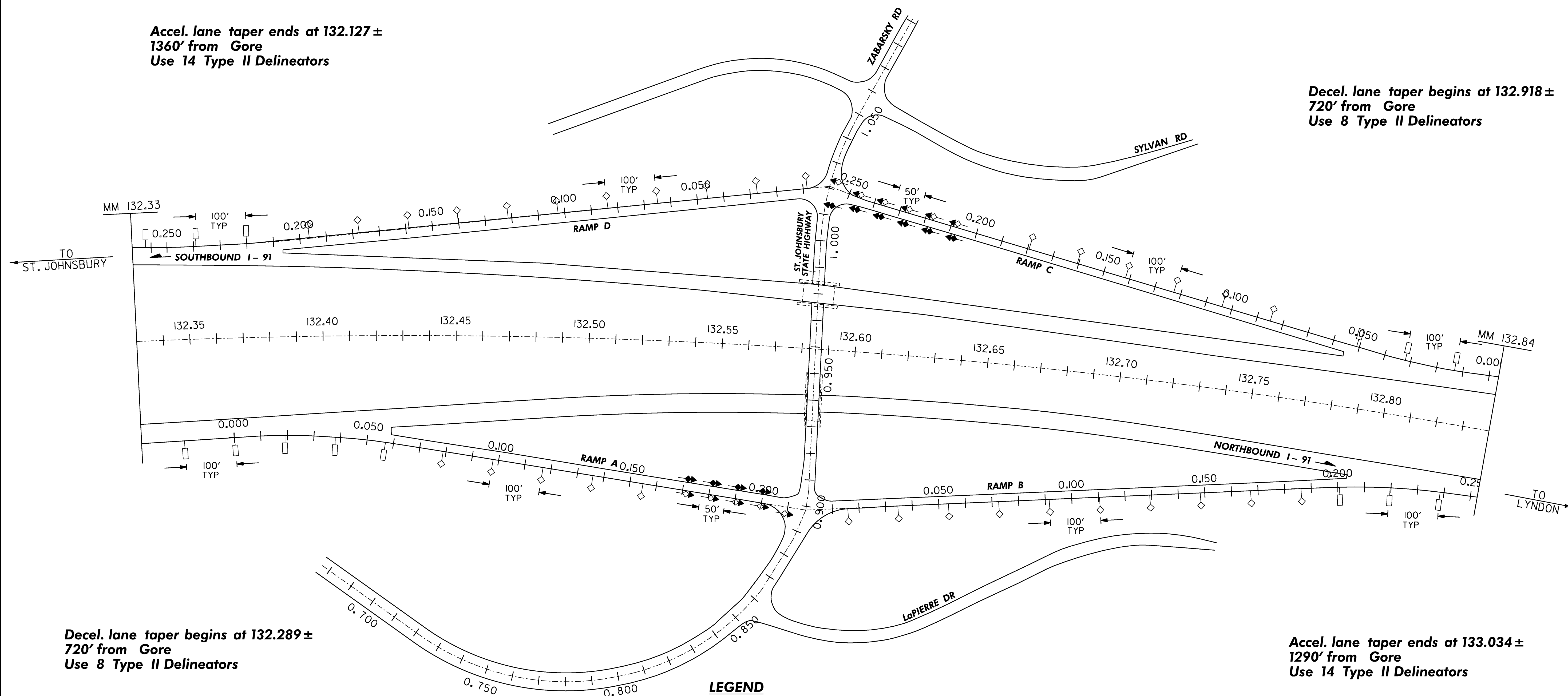
INTERCHANGE 21 DELINEATOR LAYOUT

PROJECT NAME: ST. JOHNSBURY-LYNDON
PROJECT NUMBER: HES 091-3(42)

FILE NAME: 9721la-ex1+21.dgn	PLOT DATE: 1/4/2007
PROJECT LEADER: CRB	DRAWN BY: HJC
DESIGNED BY: DAM	CHECKED BY: DAM
CLD REF. NO.: 97-0211	SHEET 25 OF 130



FILE NAME: 9721lo-ex1+2l.dgn	PLOT DATE: 1/4/2007
PROJECT LEADER: CRB	DRAWN BY: HJC
DESIGNED BY: DAM	CHECKED BY: DAM
CLD REF. NO.: 97-0211	SHEET 26 OF 130

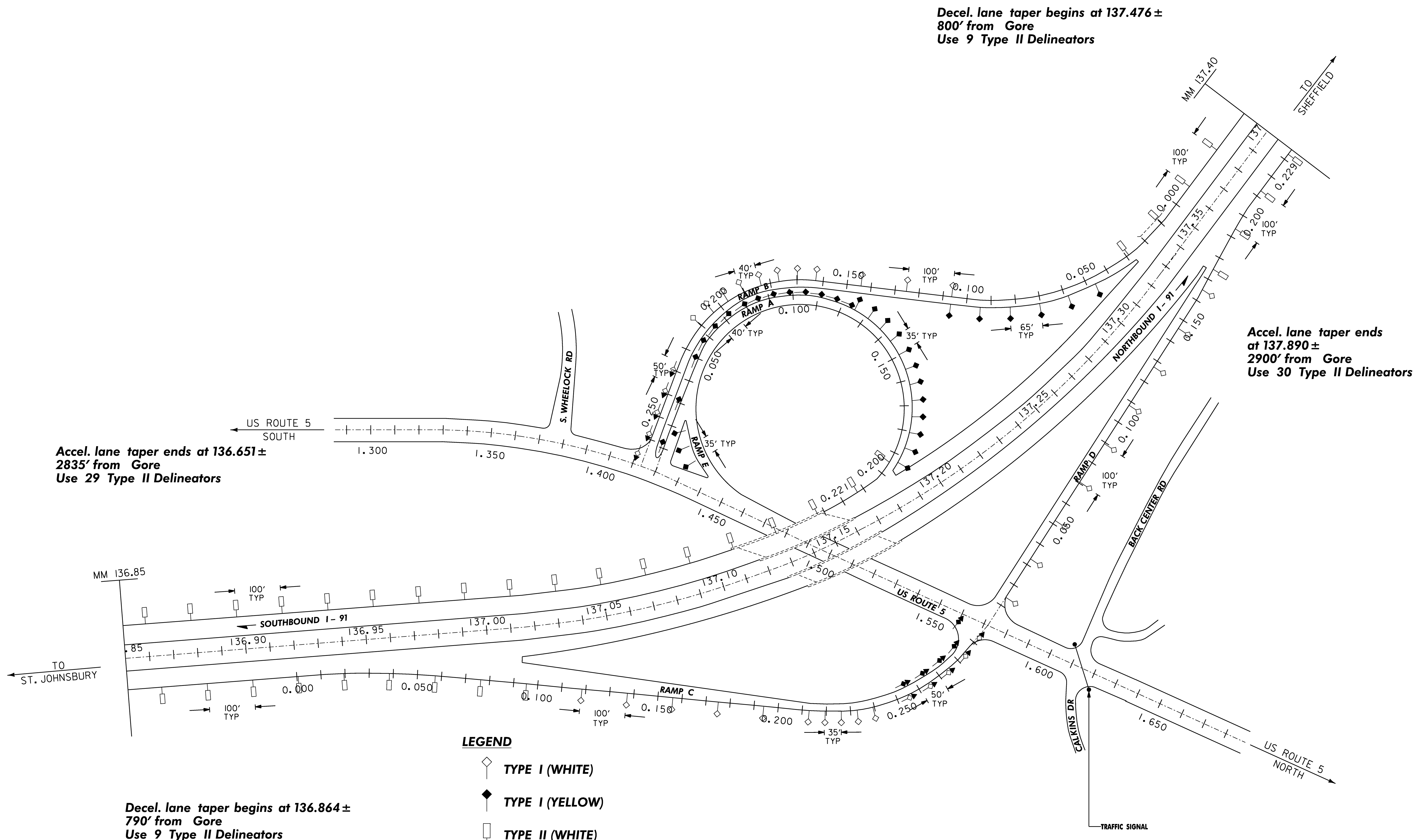


LEGEND

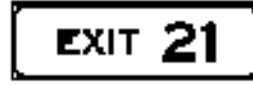
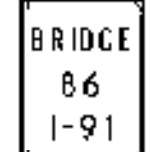
- ◇ TYPE I (WHITE)
- ◆ TYPE I (YELLOW)
- TYPE II (WHITE)
- ◈ TYPE III (RED ON BACK, WHITE)
- ◈ TYPE III (RED ON BACK, YELLOW)

INTERCHANGE 22 DELINEATOR LAYOUT

PROJECT NAME:	ST. JOHNSBURY-LYNDON
PROJECT NUMBER:	HES 091-3(42)
FILE NAME:	9721la-exit22.dgn
PROJECT LEADER:	CRB
DESIGNED BY:	DAM
CLD REF. NO.:	97-0211
PLOT DATE:	1/4/2007
DRAWN BY:	HJC
CHECKED BY:	DAM
SHEET	27 OF 130

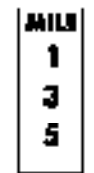
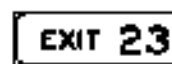


MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST		NEW SIGN POSTS																			REMARKS	SIGN DETAIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS	R E T A I N	S A L V A G E	NO OF P O S I S	FLANGED CHANNEL			SQUARE STEEL (mm)			ANCHOR S L E V E F	TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL					F R A M E S I G N	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
												kg/m	1.7	3.0	4.5	44	50		63	kg/m	75	100	100MD	FND- ACTION	75	90	100	125	kg/m					FTG. SIZE	600 mm	750 mm	MASS	POST SIZE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXIST. POST R E T A I N	NO. OF P O S T S	NEW SIGN POSTS																REMARKS	SIGN DETAIL							
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN			SALV TIS	FLANGED CHANNEL			SQUARE STEEL (mm)				TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER			
											kg/m	1.7	3.0	4.5	44	50	63	75	100	100MD	75	90	100	125	FTG. SIZE		600 mm	750 mm				MASS	POST SIZE	
											1.7	3.0	4.5	3.4	3.9	5.0	1.9	2.5	2.5	FND- ATION	11.3	13.6	16.1	21.8	800 mm	750 mm								
130.080 NB		1	2400	750	1.80																									E1-5		E-131		
		1	5400	3450		18.63				2													2		461 453	W250X32.7			Bolt Tension 126.3 kN	63				
130.109 NB		1	150	250	0.04					1		2.44 X		X				X												VD-701	70			
130.248 NB MED		1	900	900	0.81					2		8.53 X		X				X												R3-4		E-143		
130.275 NB		1	3600	3600		12.96				2												2		422 405	W200X26.6			Bolt Tension 87.4 kN SEE FOOTING DETAIL ON SHEET 3	63					
130.320 NB		1	1200	1200	1.44					2									21.7 X	kg										W4-1		E-150		
130.360 NB MED		1	900	300	0.27					2		8.53 X		X				X												R6-1R		E-142		
130.490 NB		1	150	250	0.04					1		2.44 X		X				X												VD-701	70			
130.550 NB		1	2400	750	1.80																									E1-5		E-131		
		1	5400	3000		16.20				2												2		481 468	W250X32.7			Bolt Tension 126.3 kN SEE FOOTING DETAIL ON SHEET 3	64					
130.612 NB		1	1200	1500	1.80					2									21.7 X											W13-2		E-150		
130.650 NB		1	150	250	0.04					1		2.44 X		X				X												VD-701	70			
130.698 NB		1	450	450	0.20					1		2.44 X		X				X												OM-1		E-150		
130.702 NB		1	1800	1500		2.70				2												2		93.0 X						E5-1a		E-131		
130.750 NB		1	1200	1200	1.44					2									20.7 X											W4-1		E-150		
130.850 NB MED		1	900	300	0.27					2		8.53 X		X				X												R6-1R		E-142		
											m	m	m	m	m	m	EA.	kg	kg	kg	kg													
											0.0	10.5	25.0	0.0	10.5	25.0	0	69.7	0.0	0.0	81.4 93.0													
											35.35						64.1			93.0														
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".											m			m			EA.		kg		EA.				EA.				kg					
											35.5			35.5			64.1		69.7		2				81.4				6		0		1326	

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXISTING POST RE T A I N	NO. OF P O S T S	NEW SIGN POSTS																REMARKS	SIGN DETAIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN			SALV TIS	FLANGED CHANNEL			SQUARE STEEL (mm)			TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				S I G N F R A M E	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
											kg/m	1.7	3.0	4.5	44	50	63	75	100	100MD	75	90	100	125	FTG. SIZE		600				750	MASS	POST SIZE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXIST POST		NO. OF POS IS		NEW SIGN POSTS																				REMARKS	SIGN DETAIL																																																																																																																																																																																																																																																																																																																																																																																																																																																				
												FLANGED CHANNEL				SQUARE STEEL (mm)			TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E S I G N	DETAIL ON SHEET NUMBER		STD. SHEET NUMBER																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m					kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXIST POST	NO. OF POS- ITS	NEW SIGN POSTS																REMARKS	SIGN DETAIL										
										FLANGED CHANNEL			SQUARE STEEL (mm)			TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER								
		kg/m	kg/m	kg/m	44	50	63	75	100	100MD	75	90	100	125	FTG. SIZE	600	750	MASS	POST SIZE																		
		E A	WIDTH (mm)	HIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS	R E T A I N		1.7	3.0	4.5	3.4	3.9	5.0	1.9	2.5	2.5	FND- ACTION	11.3	13.6	16.1	21.8	600 mm	750 mm											
133.168 NB MED		1	900	900	0.81					2			8.53 X		X		X																		R3-4	E-143	
133.197 NB		1	750	375	0.28																														M3-1	E-135	
		1	900	900	0.81																														M1-1	E-135	
		1	900	900	0.81					1										1	50.8 X														M1-10	E-135	
133.291 NB		1	1200	1200	1.44																														VW-397	69	
		1	600	450	0.27					2										2	92.1 X															VP-396	69
133.386 NB		1	1200	1500	1.80																														R2-1	E-142	
		1	1200	1200	1.44					2										2	121.4 X															VR-141	E-142
133.590 NB		1	2850	900		2.57				2										2	87.8 X														NUMBER 7 CHANGED TO 5	65	
133.840 NB		1	1200	1500	1.80					2								23.31 X																		VR-132	69
134.000 NB		1	150	250	0.04					1		2.44 X		X																						VD-701	70
134.000 NB		1	300	1200	0.36					1			3.66 X		X		X																			D10-3	E-139
134.111 NB MED		1	900	900	0.81 1.62					2			8.53 X		X		X																		R3-4	SIGN DESTROYED BY PLOWS NEW ONE INSTALLED	E-143
135.000 NB		1	300	1200	0.36					1			3.66 X		X		X																			D10-3	E-139
135.850 NB MED		1	900	600	0.54					2			8.53 X		X		X																			I-2	E-131
135.870 NB		1	2400	750	1.80																															E1-5	E-131
		1	4500	3600		16.20				2															2	456 378	W200X31.3									Bolt Tension 127.9 kN	65
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".											m	m	m	m	m	m	EA	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	EA	EA	kg	PROJECT NAME: ST. JOHNSBURY-LYNDON PROJECT NUMBER: HES 091-3(42) FILE NAME: tsssSLJ.xls PROJECT LEADER: CRB DESIGNED BY: PTS CLD REF. NO.: 97-0211 PLOT DATE: 1/4/2007 DRAWN BY: HJC CHECKED BY: DAM SHEET 33 OF 130						
											0.0	2.6 2.44	38.9 41.44	0.0	2.6	38.9	0	24.7	0.0	0.0	338.5 352.1	0.0	0.0	0.0													
												43.88					23.31	kg		EA	kg	352.1	EA	EA	456 378												
					SHEET TOTALS	m2 14.18 13.37	m2 18.77	EA 0	m2 0.00		m			m			23.31	kg		7			2	0													

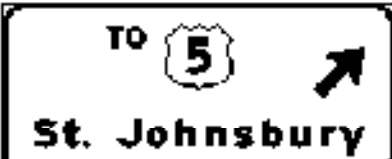
MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST R E T A I N	NO. OF P O S T S	NEW SIGN POSTS																				SIGN DETAIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS			kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST R E T A I N	NO OF P O S T S	NEW SIGN POSTS																		REMARKS	SIGN DETAIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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PROJECT NAME: ST. JOHNSBURY-LYNDON		
PROJECT NUMBER: HES 091-3(42)		
FILE NAME	tsssStJ.xls	PLOT DATE: 1/4/2007
PROJECT LEADER:	CRB	DRAWN BY: HJC
DESIGNED BY:	PTS	CHECKED BY: DAM
CLD REF. NO.:	97-0211	SHEET 36 OF 130

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXIST. POST R E T A I N	NO. OF P O S T S	NEW SIGN POSTS																REMARKS	SIGN DETAIL						
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN			SALV TIS	FLANGED CHANNEL			SQUARE STEEL (mm)				TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E S I G N E	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER		
											kg/m	1.7	3.0	4.5	44	50	63	AN CH OR	SI LE V	75	100	100MD	FND- ATION	75	90		100	125				FTG. SIZE	800 mm
130.039 SB		1	150	250	0.04					1	2.44 X	X			X													VD-701	NOT SHOWN ON PLANS.	70			
130.110 SB		1	1200	1200	1.44																							VW-397		69			
		1	600	450	0.27					2								22.2 X											VP-396		69		
130.170 SB		1	150	250	0.04					1	2.44 X	X			X														VD-701		70		
130.205 SB		1	750	375	0.28																								M3-1			E-135	
		1	900	900	0.81																								M1-1			E-135	
		1	900	900	0.81					1									1	50.8 X										M1-10			E-135
130.252 SB MED		1	900	900	0.81					2	8.53 X		X		X															R3-4			E-143
130.300 SB		1	1200	900	1.08					2								19.4 X												R8-7			E-142
130.410 SB MED		1	900	300	0.27					2	8.53 X		X		X															R6-1R			E-142
130.510 SB		1	1200	1200	1.44					2									2	95.6 X										W4-1			E-150
130.520 SB		1	150	250	0.04					1	2.44 X	X			X															VD-701		70	
130.600 SB		1	1800	1500		2.70				2									2	86.1 X										E5-1a			E-131
130.604 SB		1	450	450	0.20					1	2.44 X	X			X															OM-1			E-150
130.675 SB		1	150	250	0.04					1	2.44 X	X			X															VD-701		70	
130.690 SB		1	1200	1500	1.80					2									2	96.4 X										W13-2			E-150
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".											m	m	m	m	m	m	EA.	kg	kg	kg		kg	kg	kg	kg		PROJECT NAME: ST. JOHNSBURY-LYNDON PROJECT NUMBER: HES 091-3(42) FILE NAME: tsssSJJ.xls PLOT DATE: 1/4/2007 PROJECT LEADER: CRB DRAWN BY: HJC DESIGNED BY: PTS CHECKED BY: DAM CLD REF. NO.: 97-0211 SHEET 37 OF 130						
											0.0	13.1	17.2	0.0	13.1	17.2	0	47.0	0.0	0.0		314.1	0.0	0.0	0.0								
											29.26			0			41.6			kg	EA.	328.9			EA.	EA.	kg						
											m			m			41.6			kg	EA.	kg			EA.	EA.	kg						
											30.3			30.3			47.0			7	0			0	0								

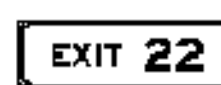
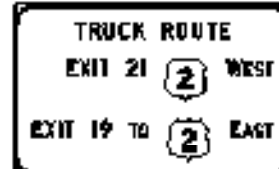
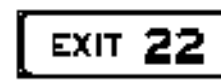
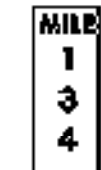
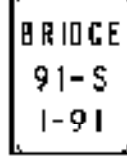
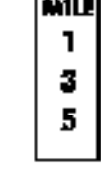
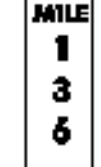
MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXISTING POSTS		NEW SIGN POSTS																REMARKS	SIGN DETAIL										
		E	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS	R	S	NO. OF POSTS	FLANGED CHANNEL			SQUARE STEEL (mm)				TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E S I G N	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER						
												kg/m	3.0	4.5	44	50	63	A	N	C	I	L	75	100	100MD	FND- ATION		75	90				100	125	FTG. SIZE	600 mm	750 mm	MASS
												1.7	3.0	4.5	3.4	3.9	5.0	1.9	2.5	2.5		11.3	13.8	16.4	21.8													
130.750 SB		1	2400	750	1.80																								E1-5		E-131							
		1	5400	3000		16.20					2												2		438 484	W250X32.7	Bolt Tension 126.3 kN SEE FOOTING DETAIL ON SHEET 3	64										
130.830 SB MED		1	900	300	0.27						2			8.53 X		X		X											R6-1R		E-142							
130.870 SB		1	3600	3600		12.96					2												2 MOD		385 374	W200X26.6	Bolt Tension 85.7 kN SEE FOOTING DETAIL ON SHEET 3	63										
130.930 SB		1	1200	1200	1.44						2								21.0 X									W4-1		E-150								
130.952 SB MED		1	900	900	0.81						2			8.53 X		X		X										R3-4		E-143								
131.000 SB		1	300	1200	0.36						1			3.51 X		X		X										D10-3		E-139								
131.040 SB		1	2400	750	1.80																							E1-5		E-131								
		1	5400	3450		18.63					2												2 MOD		426 462	W250X32.7	Bolt Tension 126.3 kN SEE FOOTING DETAIL ON SHEET 3	63										
131.236 SB		1	3150	2250		7.09					2										2			209.3 *					63									
131.470 SB		1	150	250	0.04						1			2.44 X		X		X										VD-701	70									
131.540 SB		1	2400	750	1.80																							E1-5		E-131								
		1	5400	3600		19.44					2												2		363 385	W200X31.3	Bolt Tension 150.6 kN	63										
131.702 SB MED		1	900	900	0.81						2			8.53 X		X		X										R3-4		E-143								
131.843 SB		1	1200	1500	1.80																							R2-1		E-142								
		1	1200	1200	1.44						2										2		131.8 X					VR-141		E-142								
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".													m	m	m	m	m	m	EA.	kg	kg	kg					kg	kg	kg	kg					PROJECT NAME: ST. JOHNSBURY-LYNDON PROJECT NUMBER: HES 091-3(42) FILE NAME: lssstj.xls PLOT DATE: 1/4/2007 PROJECT LEADER: CRB DRAWN BY: HJC DESIGNED BY: PTS CHECKED BY: DAM CLD REF. NO.: 97-0211 SHEET 38 OF 130			
													0.0	2.6	30.2	0.0	2.6	30.2	0	22.5	0.0	0.0					135.6 131.8	0.0	0.0	217.0 209.3								
													31.54			0			21.0			kg			341.1				4+4		1612							
													32.8			32.8			21.0			kg			352.6				8		0		1682					

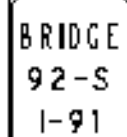
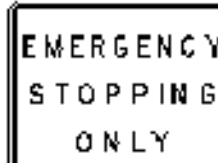
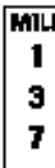
MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST		NEW SIGN POSTS																				REMARKS	SIGN DETAIL		
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS	R E T A I N	S A L V A G E	NO. OF P O S I T I O N S	FLANGED CHANNEL			SQUARE STEEL (mm)					TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL					F R A M E S I G N	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER
												kg/m	1.7	3.0	4.5	44	50	63	76	102	75	100	100MD	75	90	100	125	FTG. SIZE	600	750				
131.938 SB		1	1200	1200	1.44																										VW-397	69		
		1	600	450	0.27						2												2	99.9 X								VP-396	69	
132.000 SB		1	300	1200	0.36						1			3.66 X		X		X													D10-3		E-139	
132.032 SB		1	750	375	0.28																										M3-3		E-135	
		1	900	900	0.81																										M1-1		E-135	
		1	900	900	0.81						1												1	52.5 X								M1-10		E-135
132.108 SB		1	1200	900	1.08						2																				R8-7		E-142	
132.375 SB MED		1	900	300	0.27						2			8.53 X		X		X													R6-1R		E-142	
132.502 SB		1	1200	1200	1.44						2												2	93.0 X							W4-1		E-150	
132.592 SB		1	150	250	0.04						1			2.44 X		X		X													VD-701	70		
132.765 SB		1	1800	1500		2.70					2												2	96.4 X							E5-1a		E-131	
132.770 SB		1	450	450	0.20						1			2.44 X		X		X													OM-1		E-150	
132.960 SB		1	2400	750	1.80																										E1-5		E-131	
		1	5400	2400		12.96					2															2	292 307	W200X26.6		Bolt Tension 85.4 kN	64			
133.000 SB		1	300	1200	0.36						1			3.66 X		X		X													D10-3		E-139	
133.035 SB		1	150	250	0.04						1			2.44 X		X		X													VD-701	NOT SHOWN ON PLANS.	70	
133.085 SB		1	3600	3600		12.96					2															2 MOD	387 397	W200X26.6		Bolt Tension 86.7 kN SEE FOOTING DETAIL ON SHEET 3	64			
													m	m	m		EA.	kg	kg	kg		kg	kg	kg	kg									
													0.0	7.9 7.32	15.0 15.85		0.0	7.9	15.0								340.7 341.8	0.0	0.0	0.0				
													23.17				0		19.54			kg			2+2		679							
													22.9				22.9					7				4	0	704						
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".																																		
SHEET TOTALS					m2	m2	EA.	m2																										

PROJECT NAME: ST. JOHNSBURY-LYNDON
PROJECT NUMBER: HES 091-3(42)

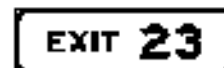
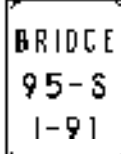
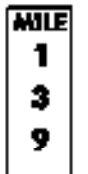
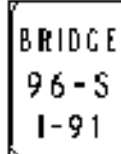
FILENAME: tsssSJ.xls
PROJECT LEADER: CRB
DESIGNED BY: PTS
CLD REF. NO.: 97-0211

PLOT DATE: 1/4/2007
DRAWN BY: HJC
CHECKED BY: DAM
SHEET 39 OF 130

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXIST. POST R E T A I N	NO. OF P O S T S	NEW SIGN POSTS																REMARKS	SIGN DETAIL								
		E A	WIDTH (mm)	H E I G H T (mm)	"A"	"B"	SALV SIGN			SALV TIS	FLANGED CHANNEL			SQUARE STEEL (mm)			TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E	O N S H E E T N U M B E R	S T D. S H E E T N U M B E R					
											kg/m	1.7	3.0	4.5	44	50	63	75	100	100MD	75	90	100	125	FTG. SIZE		600 mm				750 mm	MASS	POST SIZE		
											kg/m	3.4	3.9	5.0	kg/m	1.9	2.5	2.5	FND- ATION	11.3	13.6	16.1	21.8	600 mm	750 mm	MASS	POST SIZE								
133.172 SB MED		1	900	900	0.81					2		8.534 X		X		X													R3-4		E-143				
133.235 SB		1	2400	750	1.80																							E1-5		E-131					
		1	5400	2700		14.58				2												2		279 286	W200X26.6	Bolt Tension 93 kN SEE FOOTING DETAIL ON SHEET 3	64								
133.385 SB		1	2850	2100		5.99				2									2			201.0 X							64						
133.500 SB		1	4050	2550		10.33				2												2		243 251	W150X22.5	Bolt Tension 85.4 kN	67								
133.691 SB		1	2400	750	1.80																						E1-5		E-131						
		1	5400	2850		15.39				2													2		300 304	W200X26.6	Bolt Tension 102.5 kN SEE FOOTING DETAIL ON SHEET 3	64							
133.950 SB		1	4350	1500		6.53				2									2			189.4 X							67						
134.000 SB		1	300	1200	0.36					1		3.66 X		X		X												D10-3		E-139					
134.085 SB		1	150	250	0.04					1		2.44 X		X		X												VD-701	70						
134.113 SB MED		1	900	900	0.81					2		8.53 X		X		X												R3-4		E-143					
135.000 SB		1	300	1200	0.36					1		3.66 X		X		X												D10-3		E-139					
135.850 SB		1	900	600	0.54					2		8.53 X 8.53		X		X												I-2		E-131					
135.925 SB		1	1200	1500	1.80					2									2		94.72 X								VR-132	69					
136.000 SB		1	300	1200	0.36					1		3.66 X		X		X												D10-3		E-139					
											m	0.0	m	2.6	m	40.8	EA.	0	kg	0.0	kg	0.0	kg		kg	0.0	kg	0.0	kg	407.0 390.4					
											47.544			0																					
											m	43.4	-43.4			kg			0.0	EA.	6	485.1			kg	594.2	4+2			EA.	EA.	kg	822		
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".					SHEET TOTALS		m2	8.68	m2	52.82	EA.	0	m2	0.00																					
											PROJECT NAME: ST. JOHNSBURY-LYNDON PROJECT NUMBER: HES 091-3(42)																								
											FILE NAME: tsssStJ.xls PROJECT LEADER: CRB DESIGNED BY: PTS CLD REF. NO.: 97-0211																								
											PLOT DATE: 1/4/2007 DRAWN BY: HJC CHECKED BY: DAM SHEET 40 OF 130																								

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXISTING POST		NEW SIGN POSTS																REMARKS	SIGN DETAIL												
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS	R E T A I N	S A L V A G E	NO. OF P O S T S	FLANGED CHANNEL			SQUARE STEEL (mm)			TUBULAR ALUMINUM Dia (mm)			TUBULAR STEEL Dia (mm)				W-SHAPE STEEL				F R A M E S I G N	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER								
												kg/m	3.0	4.5	44	50	63	75	100	100MD	75	80	100	125	FTG. SIZE		600	750				MASS	POST SIZE						
												1.7	3.0	4.5	3.4	3.9	5.0	1.9	2.5	2.5	FND- ATION	11.3	13.6	16.1	21.8	600 mm	750 mm												
136.166 SB MED		1	900	900	0.81						2			8.53 X		X		X																R3-4		E-143			
136.175 SB		1	3600	900		3.24					2									2														67					
136.270 SB		1	1200	1500	1.80																														R2-1		E-142		
		1	1200	1200	1.44						2									2															VR-141		E-142		
136.365 SB		1	1200	1200	1.44																														69				
		1	600	450	0.27						2									2																W7-3a		E-152	
136.365 SB MED		1	1200	1200	1.44																															69			
		1	600	450	0.27						2									2																W7-3a		E-152	
136.460 SB		1	1200	1200	1.44																															VW-397		69	
		1	600	450	0.27						2									2																VP-396		69	
136.560 SB		1	750	375	0.28																															M3-3		E-135	
		1	900	900	0.81																															M1-1		E-135	
		1	900	900	0.81						1									1																M1-10		E-135	
136.625 SB		1	150	250	0.04						1				2.44 X		X		X																		VD-701		70
136.670 SB		1	1200	900	1.08						2																										R8-7		E-142
137.000 SB		1	300	1200	0.36						1				3.66 X		X		X																		D10-3		E-139
												m	m	m	m	m	m	EA	kg	kg	kg		kg	kg	kg	kg													
												0.0	2.6	13.8	0.0	2.6	13.8	0	22.8	0.0	0.0		462.1	0.0	155.8	0.0													
												2.44 12.19			0			18.67			464.92			629.32															
												14.63			0			18.67 kg			EA			629.32			EA	EA	kg										
												16.4			16.4			22.8			11			607.9			0	0	0										
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".												SHEET TOTALS			m2	m2	EA	m2																					
																																		</					

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXIST. POST RE- TAIN A I N G L	NO. OF P O S T S	NEW SIGN POSTS																			REMARKS	SIGN DETAIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		E WIDTH A (mm)	H E I G H T (mm)	"A"	"B"	SALV SIGN	SALV T I S			FLANGED CHANNEL			SQUARE STEEL (mm)				TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E S I G N		DETAIL ON SHEET NUMBER	STD. SHEET NUMBER																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
										kg/m	1.7	3.0	4.5	44	60	63	75	100	100MD	75	80	100	125	FTG. SIZE	600 mm	750 mm	MASS					POST SIZE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST		NEW SIGN POSTS																				REMARKS	SIGN DETAIL						
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS	R E T A I N	S R V A C E	NO. OF POS IS	FLANGED CHANNEL			SQUARE STEEL (mm)			ANCHOR S P R E E L E V E	TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E S I G N		DETAIL ON SHEET NUMBER	STD. SHEET NUMBER					
												kg/m	1.7	3.0	4.5	44	50		63	75	100	100MD	75	90	100	125	FTG. SIZE	600	750					MASS	POST SIZE			
138.230 SB		1	2400	750	1.80																								E1-5		E-131							
		1	4500	2850		12.83				2														2		335 287	W200X26.6	Bolt Tension 87.5 kN SEE FOOTING DETAIL ON SHEET 3	68									
138.824 SB		1	150	250	0.04					1		2.44 X		X			X												VD-701	70								
139.000 SB		1	300	1200	0.36					1		3.66 X		X			X												D10-3		E-139							
139.000 SB		1	1200	1500	1.80					2								22.3 X											VR-132	69								
139.260 SB		1	3150	900		2.84				2										2	103.3 X									68								
139.635 SB		1	1200	1500	1.80																								R2-1		E-142							
		1	1200	1200	1.44					2										2	116.24 X									VR-141		E-142						
139.730 SB		1	1200	1200	1.44																								VW-397	69								
		1	600	450	0.27					2										2	89.55 X									VP-396	69							
139.804 SB MED		1	900	900	0.81					2		8.53 X		X			X												R3-4		E-143							
139.824 SB		1	750	375	0.28																								M3-3		E-135							
		1	900	900	0.81																								M1-1		E-135							
		1	900	900	0.81					1										1	51.6 X									M1-10		E-135						
139.900 SB		1	1200	900	1.08					2								20.27 X											R8-7		E-142							
139.965 SB		1	150	250	0.04					1		2.44 X		X			X												VD-701	70								
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".											m	0.0	2.6	16.4	m	0.0	2.6	16.4	EA	0	kg	47.5	0.0	0.0	kg	347.7	0.0	0.0	kg	360.69								
																17.07				0					42.57					360.69								
					SHEET TOTALS	m2 12.78	m2 15.67	EA 0	m2 0.00		m	19.0			m	19.0			kg	47.5	7	kg	347.7	EA 2	EA 0	kg	335 287											
PROJECT NAME: ST. JOHNSBURY-LYNDON PROJECT NUMBER: HES 091-3(42)																											FILE NAME			tsssSIJ.xls			PLOT DATE			1/4/2007		
																											PROJECT LEADER:			CRB			DRAWN BY:			HJC		
																											DESIGNED BY:			PTS			CHECKED BY:			DAM		
																											CLD REF. NO.:			97-0211			SHEET			43 OF 130		

[illegible]

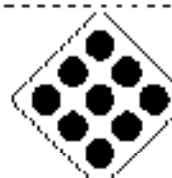
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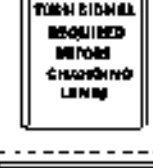
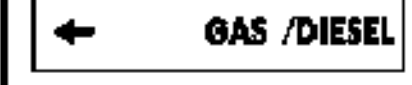
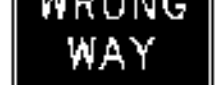
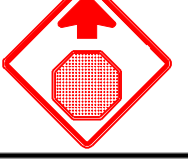
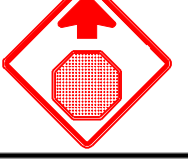
PROJECT NAME: ST. JOHNSBURY-LYNDON		
PROJECT NUMBER: HES 091-3(42)		
FILE NAME	IsssStJ.xls	PLOT DATE 1/4/2007
PROJECT LEADER:	CRB	DRAWN BY: HJC
DESIGNED BY:	PTS	CHECKED BY: DAM
CLD REF. NO.:	97-0211	SHEET 47 OF 130

[illegible]

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXISTING POST RE T A I N	NO. OF P O S I T S	NEW SIGN POSTS																REMARKS	SIGN DETAIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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2.159 RTE 2 LT		1	750	375	0.28																											M3-1		E-135																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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2.200 RTE 2 RT		1	750	750	0.56																											D9-2		E-132																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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2.222 RTE 2 LT		1	900	1200	1.08						2			9.76 X		X		X															W13-2		E-150																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
2.244 RTE 2 LT		1	750	750	0.56																											D9-2		E-132																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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2.258 RTE 2 RT		1	3750	2250		8.44					2													2	184 190		W150X18		Bolt Tension 53.4 kN	69																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
2.267 RTE 2 LT		1	4850	2550		12.37																											69																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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PROJECT NAME: ST. JOHNSBURY-LYNDON		
PROJECT NUMBER: HES 091-3(42)		
FILE NAME:	tsssStJ.xls	PLOT DATE: 1/4/2007
PROJECT LEADER:	CRB	DRAWN BY: HJC
DESIGNED BY:	PTS	CHECKED BY: DAM
CLD REF. NO.:	87-0211	SHEET 51 OF 130

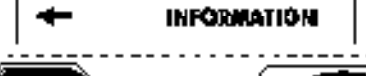
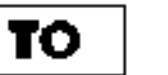
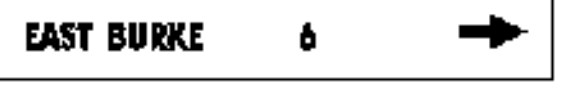
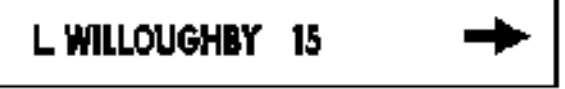
MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXIST. POST R E T A I N	NO. OF P O S T S	NEW SIGN POSTS														REMARKS	SIGN DETAIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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		1	525	375	0.20						1			X		X		X														M6-1		E-136A																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
		1	1800	300	0.54						2			8.54 X		X		X														D1-1a		E-123																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
0.195 RAMP C LT		1	900	600	0.54																										R5-1a		E-143																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
0.195 RAMP C RT	  	1	1800	250	0.45																										VD-502G BACK TO BACK R5-1a		E-133																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
		1	1370	190	0.26																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		1	900	600	0.54																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		1	1800	250	0.45																											VD-502F		E-133																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
		1	1370	190	0.26																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
0.076 "A" LT 0.140 "C" LT	 	1	1800	250	0.45																										VD-502L		E-133																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
		1	1370	190	0.26																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		1	1370	190	0.26						2																					VD-502I		E-133																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
0.076 "A" LT 0.140 "C" LT	 	1	1800	250	0.45																										VD-502H		E-133																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
		2	900	900	0.81						2			9.76 X																		ADDED SIGN																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".					10.94																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXIST. POST R E T A I N	NO. OF P O S T S	NEW SIGN POSTS																REMARKS	SIGN DETAIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN			SALV TIS	FLANGED CHANNEL			SQUARE STEEL (mm)			TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
											kg/m	kg/m	kg/m	44	50	83	75	100	100MM	75	90	100	125	FTG SIZE	600		750				MASS	POST SIZE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
										1.7	3.0	4.5	3.4	3.9	5.0	1.9	2.5	2.5	FND- ATION	11.3	13.6	16.1	21.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							</

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST		NEW SIGN POSTS																				REMARKS	SIGN DETAIL																			
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS	R E T A I N	S A L V A C I F	NO. OF P O S I T S	FLANGED CHANNEL			SQUARE STEEL (mm)			ANCHOR S P A C E	S L E V E E	TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL					SIGN FRAME	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER																	
												kg/m	1.7	3.0	4.5	44	50			63	kg/m	75	100	100MO	FND- ACTION	75	90	100	125	FTG. SIZE					600	750	MASS	POST SIZE													
																														kg/m	1.7	3.0	4.5	44	50	63	kg/m	75	100	100MO	FND- ACTION	75	90	100	125	600	750	MASS	POST SIZE		
INT.#22											1			4.27 X		X		X														VR-017	E-141																		
0.860 STJSH RT		1	750	750	0.56						1			4.27 X		X		X														W14-2																			
0.865 STJSH RT	 	1	750	750	0.56						1			4.27 X		X		X														R1-1	E-143																		
0.880 STJSH LT	 	1	600	300	0.18						1			4.27 X		X		X															M4-5	E-136A																	
		1	600	600	0.36																												M1-4	E-136A																	
0.880 STJSH RT	 	1	1800	300	0.54																												D1-1a	E-123																	
		1	1800	300	0.54																												D1-1a	E-123																	
	 	1	600	300	0.18																													M3-3	E-135																
		1	600	300	0.18																													M3-1	E-135																
	 	1	600	600	0.36																													M1-1	E-135																
		1	600	600	0.36																													M1-1	E-135																
	 	1	525	375	0.20						2												2	94.72 X										M6-3	E-135																
		1	525	375	0.20																													M6-1	E-135																
0.897 STJSH RT		1	600	300	0.18																													M4-5	E-136A																
		1	600	600	0.36																													M1-4	E-136A																
		1	525	375	0.20						1			4.88 X		X		X																M6-1	E-136A																
0.897 STJSH RT		1	600	300	0.18																													M3-1	E-135																
		1	600	600	0.36																													M1-1	E-135																
		1	525	375	0.20						1			4.88 X		X		X																M6-1	E-135																
0.915 STJSH LT		1	600	300	0.18																													M3-1	E-135																
		1	600	600	0.36																													M1-1	E-135																
		1	525	375	0.20						1			4.27 X		X		X																M6-1	E-135																
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".												m	m	m	m	m	m	EA	kg	kg	kg		kg	kg	kg	kg																									
												0.0	0.0	30.7 31.1	0.0	0.0	30.7 31.1	0	0.0	0.0	0.0		101.7 94.72	0.0	0.0	0.0																									
												31.1			0									94.72																											
SHEET TOTALS					m2	m2	EA	m2				m		30.7	m			kg	EA		kg	EA		EA	EA	kg																									
					6.89	0.00	1	0.00						30.7				0.0	2			0		0	0																										
PROJECT NAME: ST. JOHNSBURY-LYNDON PROJECT NUMBER: HES 091-3(42)																														FILE NAME: tsssStJ.xls				PLOT DATE: 1/4/2007																	
																														PROJECT LEADER: CRB				DRAWN BY: HJC																	
																														DESIGNED BY: PTS				CHECKED BY: DAM																	
																														CLD REF. NO.: 97-0211				SHEET 54 OF 130																	

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST RETAIN SALVAGE	NO. OF POS- ITIONS	NEW SIGN POSTS																			REMARKS	SIGN DETAIL	
											FLANGED CHANNEL			SQUARE STEEL (mm)			ANCHOR	SLEEVE	TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL					FRAME SIGN	DETAIL ON SHEET NUMBER
		kg/m	kg/m	kg/m	44	50	63	75			100	100MD	75	90	100	125			FTG. SIZE		MASS	POST SIZE										
A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS	1.7	3.0	4.5	3.4	3.9	5.0	1.9	2.5	2.5	FND- ATION	11.3	13.6	16.1	21.6	600 mm	750 mm	MASS	POST SIZE								
INT.#22																																
0.950 STJSH LT		1	1800	300	0.54																								D1-1a		E-123	
0.950 STJSH RT		1	1800	300	0.54																								D1-1a		E-123	
1.000 STJSH RT		1	600	300	0.18																								M3-3		E-135	
		1	600	600	0.36																								M1-1		E-135	
		1	525	375	0.20																								M6-1		E-135	
1.023 STJSH LT		1	600	300	0.18																								M3-3		E-135	
		1	600	600	0.36																								M1-1		E-135	
		1	525	375	0.20																								M6-1		E-135	
1.023 STJSH LT		1	600	300	0.18																								M4-5		E-136A	
		1	600	600	0.36																								M1-4		E-136A	
		1	525	375	0.20																								M6-1		E-136A	
1.023 STJSH LT	  	1	600	300	0.18																								M4-5		E-136A	
		1	600	300	0.18																								M3-1		E-135	
		1	600	300	0.18																								M3-3		E-135	
	  	1	600	600	0.36																								M1-4		E-136A	
		1	600	600	0.36																								M1-1		E-135	
		1	600	600	0.36																								M1-1		E-135	
	  	1	525	375	0.20																								M6-3		E-136A	
		1	525	375	0.20																								M6-3		E-135	
		1	525	375	0.20																								M6-1		E-135	
1.044 STJSH LT		1	600	450	0.27																								VR-039		E-141	
		1	600	750	0.45																								R2-1		E-142	
1.044 STJSH RT		1	600	450	0.27																								VR-038		E-141	
																												PROJECT NAME: ST. JOHNSBURY-LYNDON PROJECT NUMBER: HES 091-3(42)				
																												FILE NAME: tsssStJ.xls PLOT DATE: 1/4/2007				
																												PROJECT LEADER: CRB DRAWN BY: HJC				
																												DESIGNED BY: PTS CHECKED BY: DAM				
																												OLD REF. NO.: 97-0211 SHEET 55 OF 130				

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST		NEW SIGN POSTS																				REMARKS	SIGN DETAIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS	R E T A I N	S A L V A G E	NO OF P O S I T S	FLANGED CHANNEL			SQUARE STEEL (mm)			ANCHOR H O R	S L E V E	TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL					F R A M E S I G N E	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
												kg/m	1.7	3.0	4.5	44	50			63	kg/m	75	100	100MD	75	90	100	125	FTG. SIZE						MASS	POST SIZE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST R E T A I N	S A L V A G E	NO. OF P O S I T S	NEW SIGN POSTS																REMARKS	SIGN DETAIL									
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS				FLANGED CHANNEL			SQUARE STEEL (mm)			ANCHOR S L E V E F	TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E S I G N E	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER						
												kg/m	3.0	4.5	44	50	63		kg/m	75	100	100MD	75	80	100	125	FTG.		SIZE				600	750	MASS	POST SIZE		
		A	(mm)	(mm)							1.7	3.0	4.5	3.4	3.9	5.0		1.9	2.5	2.5	FIN- ATION	11.3	13.6	16.1	21.6	600 mm	750 mm											
0.215 RAMP B RT	 	1	1800 1370	250 190	0.45 0.26																													VD-502G BACK TO BACK R5-1a		E-133		
		1	1800 1370	250 190	0.45 0.26																													VD-502F		E-133		
		1	1800 1370	250 190	0.45 0.26																2												VD-502L		E-133			
		1	1370 1800	190 250	0.26 0.45						2										2												VD-502I		E-133			
0.262 RAMP B RT	 	1	900 750	300 750	0.27 0.56																													R6-1L BACK TO BACK R5-1		E-142		
	 	1	900	300	0.27						1			4.27 X		X		X															R6-1L BACK TO BACK R6-1R		E-142			
0.262 RAMP B LT	 	1	750	750	0.56																													R1-1 BACK TO BACK R4-7		E-143		
		1	600	750	0.45																													R4-7		E-144		
		1	450	450	0.20						1			4.27 X		X		X																OM-1		E-150		
INT.#23 0.128 RAMP C RT		1	900	900	0.81						1			4.27 X		X		X																W3-1a		E-150		
0.166 RAMP C RT	  	1	600	300	0.18																														M3-3		E-136A	
	  	1	600	300	0.18																														M3-1		E-136A	
	  	1	600	300	0.18																														M4-5		E-136A	
	  	1	600	600	0.36																														M1-4		E-136A	
	  	1	600	600	0.36																														M1-4		E-136A	
	  	1	750	600	0.45																														M1-4		E-136A	
	  	1	525	375	0.20																														M6-1		E-136A	
	  	1	525	375	0.20						2										2													M6-1		E-136A		
	  	1	525	375	0.20																														M6-1		E-136A	
0.204 RAMP C RT		1	1800	300	0.54																														D1-1a		E-123	
		1	1800	300	0.54																														D1-1a		E-123	
		1	1800	300	0.54																														D1-1a		E-123	
		1	1800	300	0.54																														D1-1a		E-123	
		1	1800	300	0.54																														D1-1a		E-123	
		1	1800	300	0.54						2										2														D1-1a		E-123	
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".											m		m		m		EA		kg		kg		kg				kg		kg		kg				PROJECT NAME: ST. JOHNSBURY-LYNDON PROJECT NUMBER: HES 091-3(42)			
											0.0		0.0		11.9 12.81		0.0		0.0		0.0		0.0		0.0				258.8 266.9		0.0		0.0					
					10.81								12.81		0																				FILE NAME: tsssStJ.xls		PLOT DATE: 1/4/2007	
					SHEET TOTALS		m2		m2		EA		m2						kg		EA		kg		EA		EA		kg						PROJECT LEADER: CRB		DRAWN BY: HJC	
					11.28		0.00		0		0.00				11.9		11.9		0.0		6		266.9		258.8		0		0		0				DESIGNED BY: PTS		CHECKED BY: DAM	
																																			CLD REF. NO.: 97-0211		SHEET 57 OF 130	

[illegible]

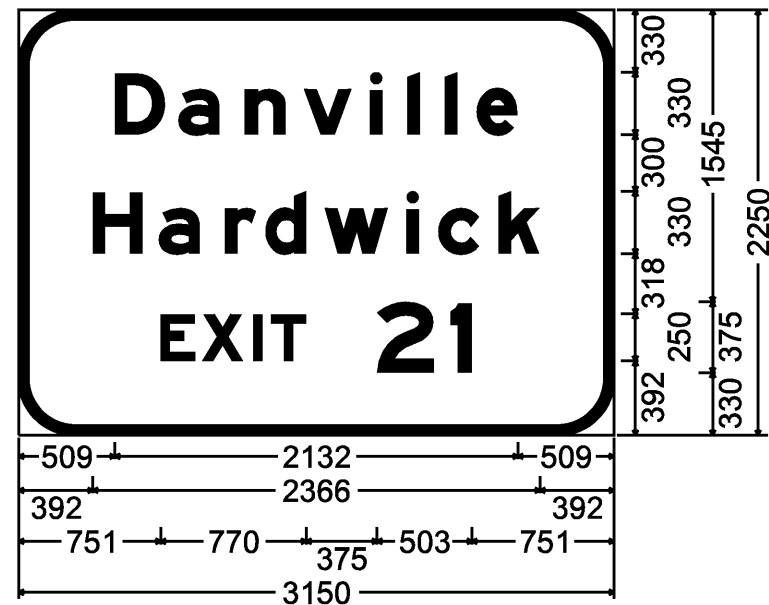
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MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS						EXISTING POST RETURN TAG IN	NO. OF POS- ITS	NEW SIGN POSTS																	REMARKS	SIGN DETAIL		
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS	FLANGED CHANNEL			SQUARE STEEL (mm)			ANCHOR S L E V F	TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				FRAME	DETAIL ON SHEET NUMBER		STD. SHEET NUMBER		
									kg/m			1.7	3.0	4.5		44	50	63	kg/m	3.4	3.9	5.0	75	100	100MB	FND- ATION					75	90
1.440 RTE 5 LT		1	450	450	0.20						1		2.44 X		X			X												OM-1	E-150	
1.460 RTE 5 LT		1	1800	300	0.54																									D1-1a	E-123	
		1	600	300	0.18																									M3-3	E-135	
		1	600	600	0.36																									M1-1	E-135	
		1	525	375	0.20						2		9.76 X		X			X												M6-2	E-135	
1.460 RTE 5 RT		1	900	900	0.81						1		4.27 X		X			X												W3-3	E-152	
1.511 RTE 5 LT		1	750	750	0.56						1		4.27 X		X			X												VR-921	E-145A	
1.540 RTE 5 RT		1	1800	300	0.54																									D1-1a	E-123	
		1	600	300	0.18																									M3-1	E-135	
		1	600	600	0.36																									M1-1	E-135	
		1	525	375	0.20						2		9.75 X		X			X												M6-1	E-135	
1.550 RTE 5 LT		1	900	900	0.81						1		4.27 X		X			X												W12-2	E-155	
1.579 RTE 5 LT		1	600	300	0.18																									M3-1	E-135	
		1	600	600	0.36																									M1-1	E-135	
		1	525	375	0.20						1		4.88 X		X			X												M6-1	E-135	
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".														m	m	m	m	m	m	EA.	kg	kg	kg		kg	kg	kg	kg				
														0.0	2.7	37.0	0.0	2.7	37.0	0	0.0	0.0	0.0		0.0	0.0	0.0	0.0				
														39.64			0				0.0				0.0							
														39.7			39.7				0.0			EA.	0			EA.	EA.	kg		
					SHEET TOTALS	m2	m2	EA.	m2					m			m				kg			EA.	kg			EA.	EA.	kg		
					5.68	0.00	0	0.00													0			0	0			0	0	0		
																	PROJECT NAME: ST. JOHNSBURY-LYNDON PROJECT NUMBER: HES 091-3(42)															
																	FILE NAME: tsssSJ.xls PLOT DATE: 1/4/2007															
																	PROJECT LEADER: CRB DRAWN BY: HJC															
																	DESIGNED BY: PTS CHECKED BY: DAM															
																	CLO REF. NO.: 97-0211 SHEET 60 OF 130															

[illegible]

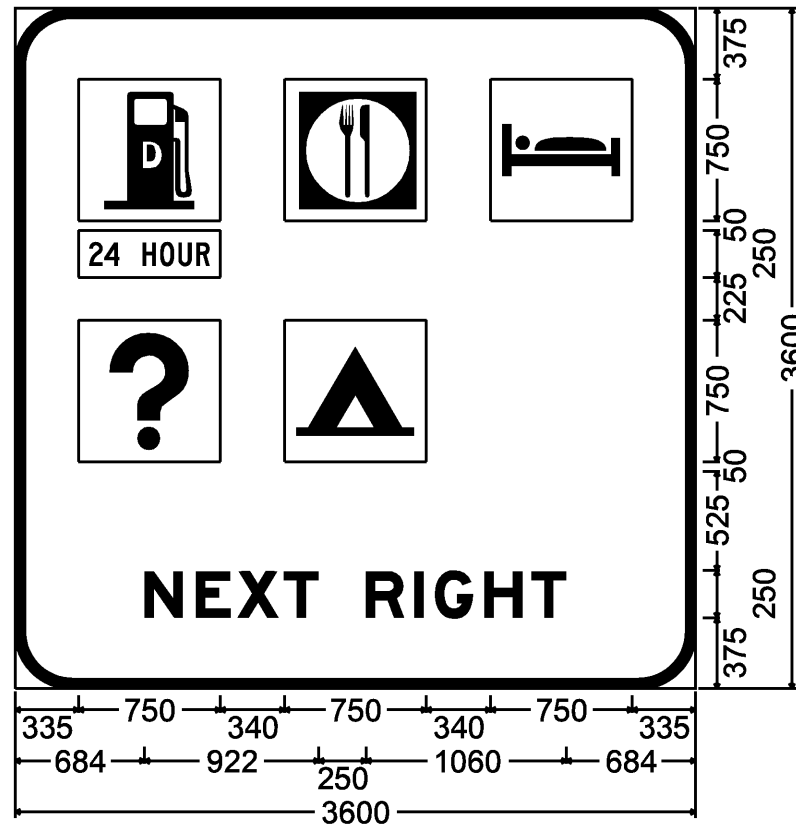
TO BOOK #	PAGES:	40	50	52	56	58	60	62	54
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M.M. 129.921 NB
M.M. 131.236 SB



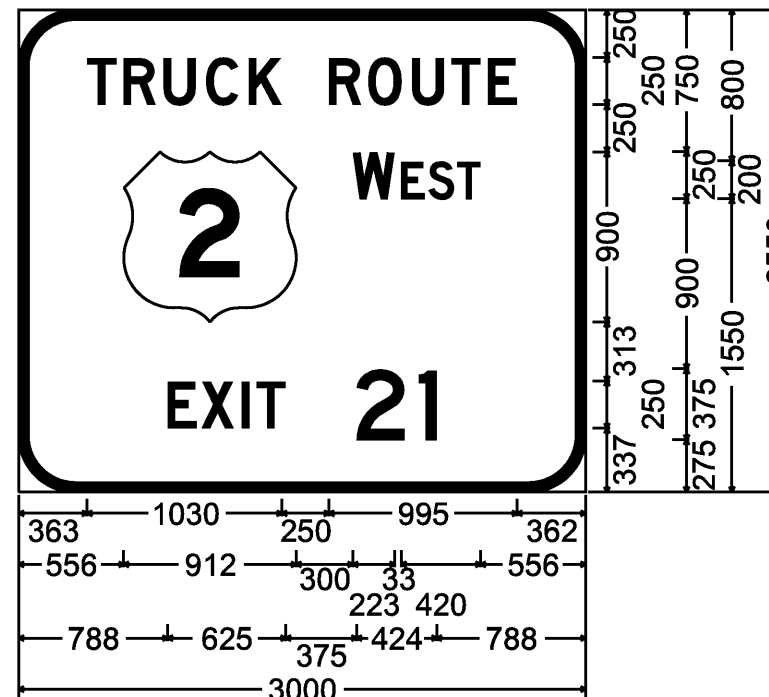
300mm Radius, 50mm Border, White on Green;
[Danville] E Mod 2K; [Hardwick] E Mod 2K; [EXIT 21] E Mod 2K;

M.M. 130.275 NB
M.M. 130.870 SB



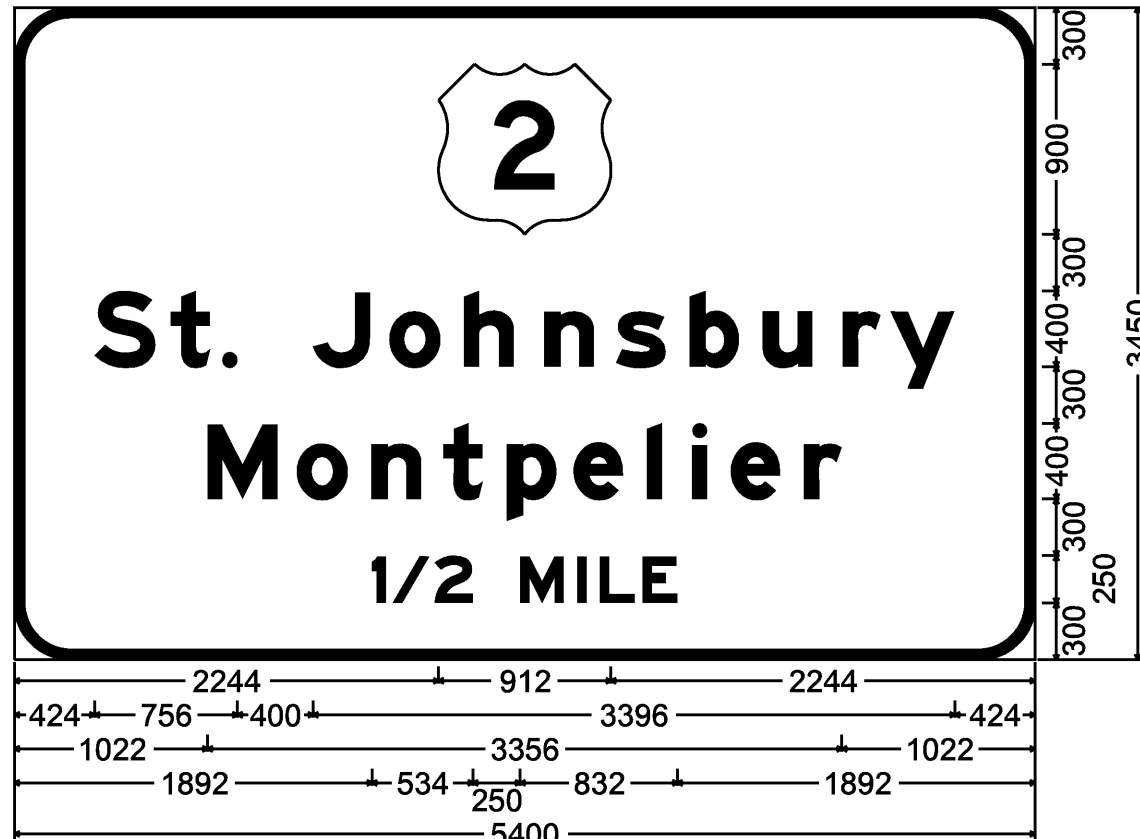
300mm Radius, 50mm Border, White on Blue;
[NEXT RIGHT] E Mod 2K;

M.M. 129.805 NB



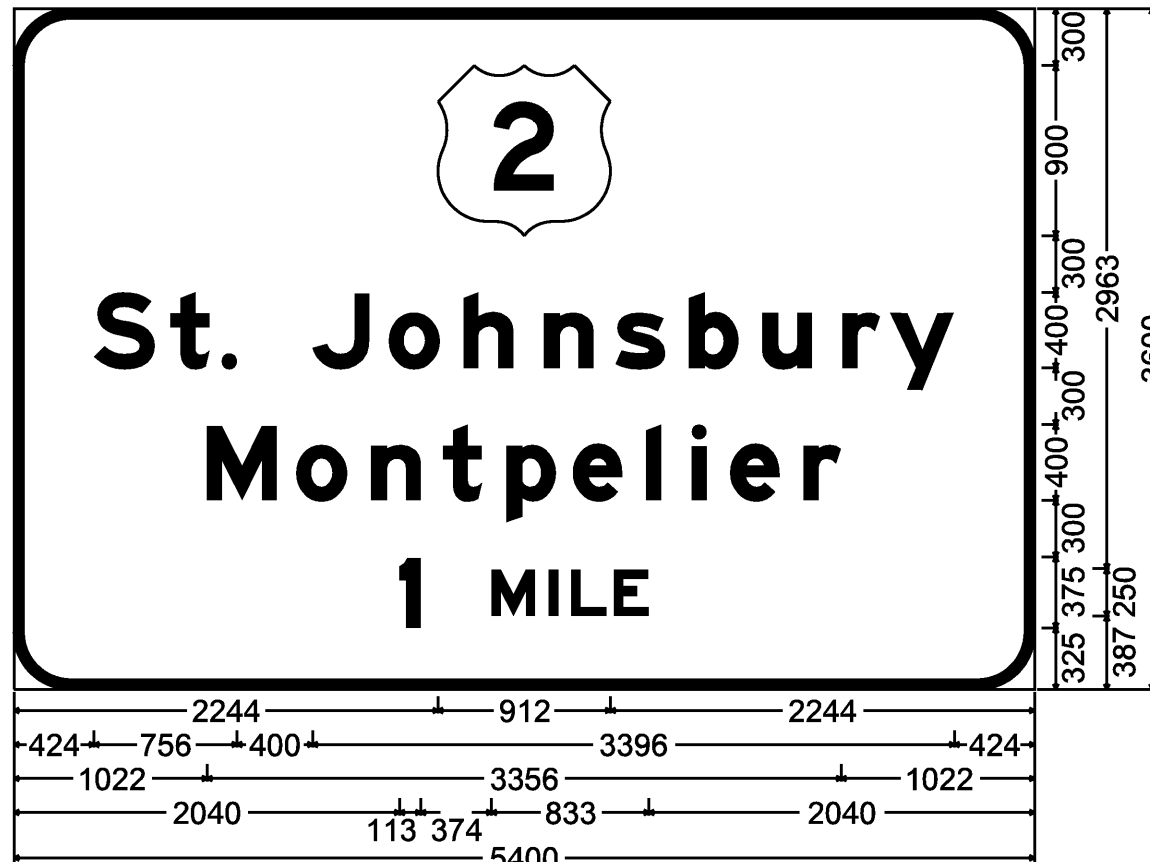
300mm Radius, 50mm Border, White on Green;
[TRUCK ROUTE] D 2K; [WEST] D 2K; [EXIT 21] D 2K;

M.M. 130.080 NB
M.M. 131.040 SB



300mm Radius, 50mm Border, White on Green;
[St. Johnsbury] E Mod 2K; [Montpelier] E Mod 2K; [1/2 MILE] E Mod 2K;

M.M. 129.647 NB
M.M. 131.540 SB



300mm Radius, 50mm Border, White on Green;
[St. Johnsbury] E Mod 2K; [Montpelier] E Mod 2K; [1 MILE] E Mod 2K;

GENERAL SIGN DETAIL NOTES

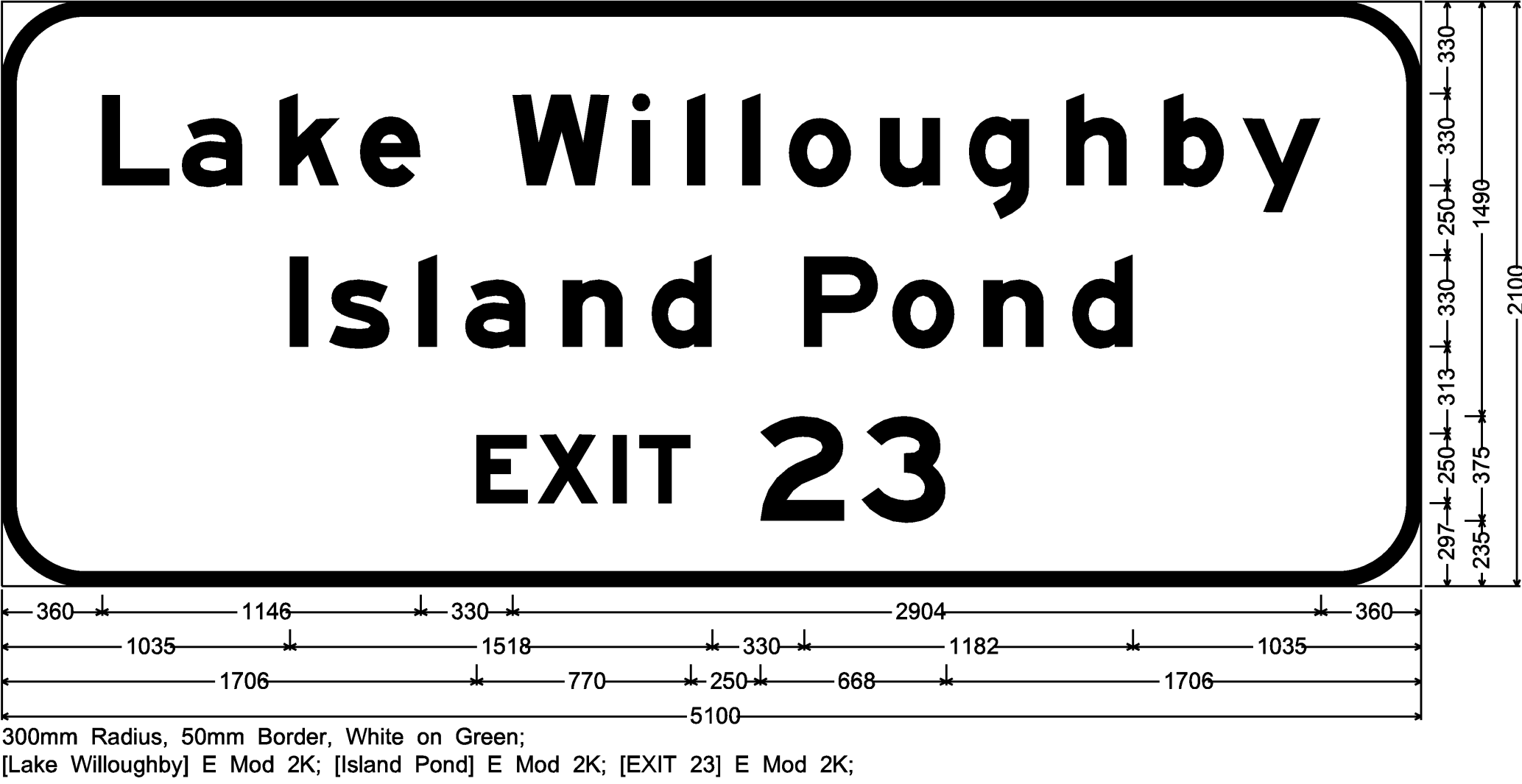
- THE NOTE BELOW EACH SIGN DETAIL INCLUDES THE CORNER RADII, BORDER WIDTH, TEXT COLOR, BACKGROUND COLOR AND TEXT SERIES TO BE USED.
- COLORS: UNLESS NOTED OTHERWISE, WHITE ON GREEN AND WHITE ON BLUE SIGNIFIES REFLECTORIZED WHITE TEXT ON A REFLECTORIZED GREEN OR BLUE BACKGROUND, RESPECTIVELY. BLACK ON YELLOW AND BLACK ON WHITE SIGNIFIES BLACK TEXT ON A REFLECTORIZED YELLOW OR WHITE BACKGROUND, RESPECTIVELY. ALL COLORS SHALL CONFORM WITH THE COLORS ADOPTED BY AASHTO AND APPROVED BY THE FHWA.
- TEXT LAYOUT DIMENSIONS ARE BASED ON THE STANDARD ALPHABETS SPACING CHARTS FOUND IN THE MUTCD "STANDARD HIGHWAY SIGNS" PUBLICATION. MINOR VARIATIONS IN TEXT DIMENSIONS ARE ACCEPTABLE BASED ON INDIVIDUAL MANUFACTURER'S LETTER FABRICATION. SIGNIFICANT CHANGES WHICH AFFECT SIGN APPEARANCE SHALL BE BROUGHT TO THE ATTENTION OF THE VTRANS' TRAFFIC AND SAFETY SECTION BEFORE FABRICATION.
- UNLESS NOTED OTHERWISE, THE DESIGN/DIMENSIONS FOR SYMBOLS SHOWN ON THESE SIGNS CAN BE FOUND IN VTRANS' STANDARDS OR IN THE STANDARD HIGHWAY SIGNS PUBLICATION.
- FOR GUIDE SIGN ROUTE MARKER DETAILS SEE STD'S E-I35, E-I36A AND E-I36B
- THE NOTE BELOW EACH GUIDE SIGN DETAIL SPECIFIES APPROPRIATE ARROW LENGTHS WHEN APPLICABLE. FOR ARROW DIMENSIONS REFER TO GUIDE SIGN ARROW DETAILS IN THE STANDARD HIGHWAY SIGNS PUBLICATION.

SIGN DETAIL
SHEET 1

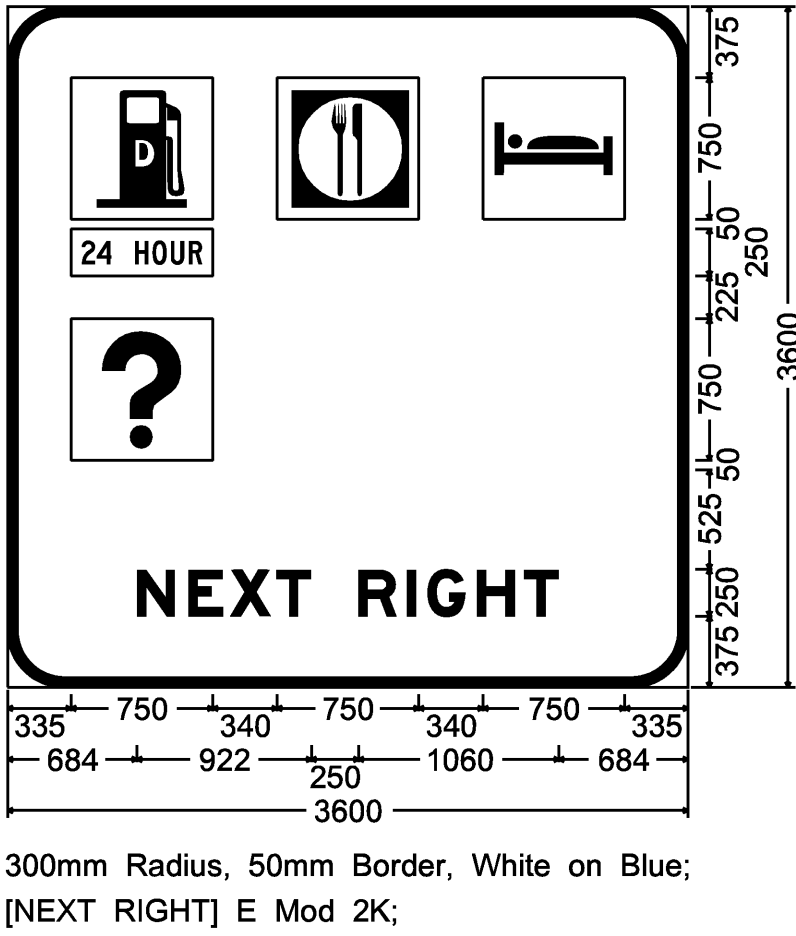
PROJECT NAME:	ST. JOHNSBURY-LYNDON
PROJECT NUMBER:	HES 09I-3(42)
FILE NAME: 972Ila-details.dgn	PLOT DATE: 1/4/2007
PROJECT LEADER: CRB	DRAWN BY: HJC
DESIGNED BY: PTS	CHECKED BY: DAM
CLD REF. NO.: 97-02II	SHEET 63 OF 130

M.M. 131.770 NB M.M. 133.385 SB	M.M. 132.300 NB M.M. 132.950 SB	Metric
EXIT 22 STEEP GRADE TRUCKS USE LOWER GEAR <		

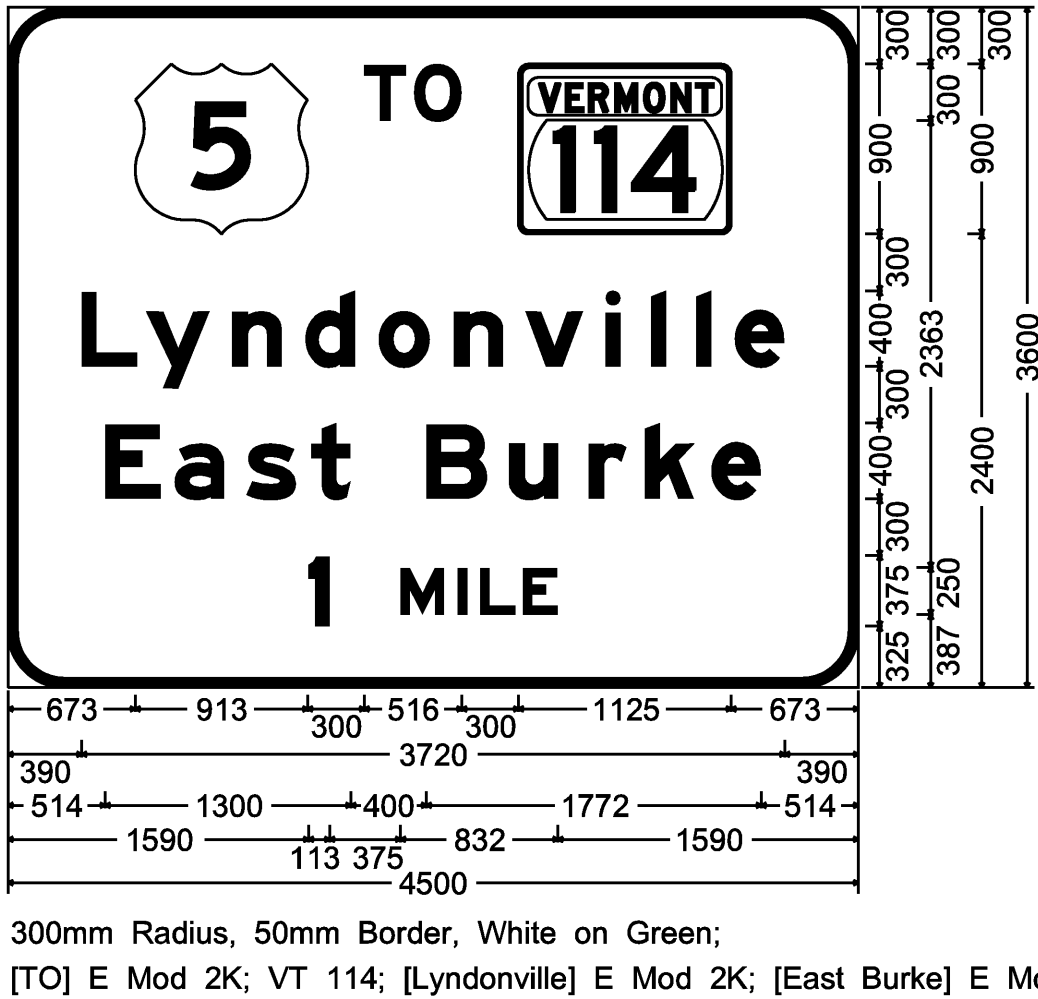
M.M. 136.138 NB



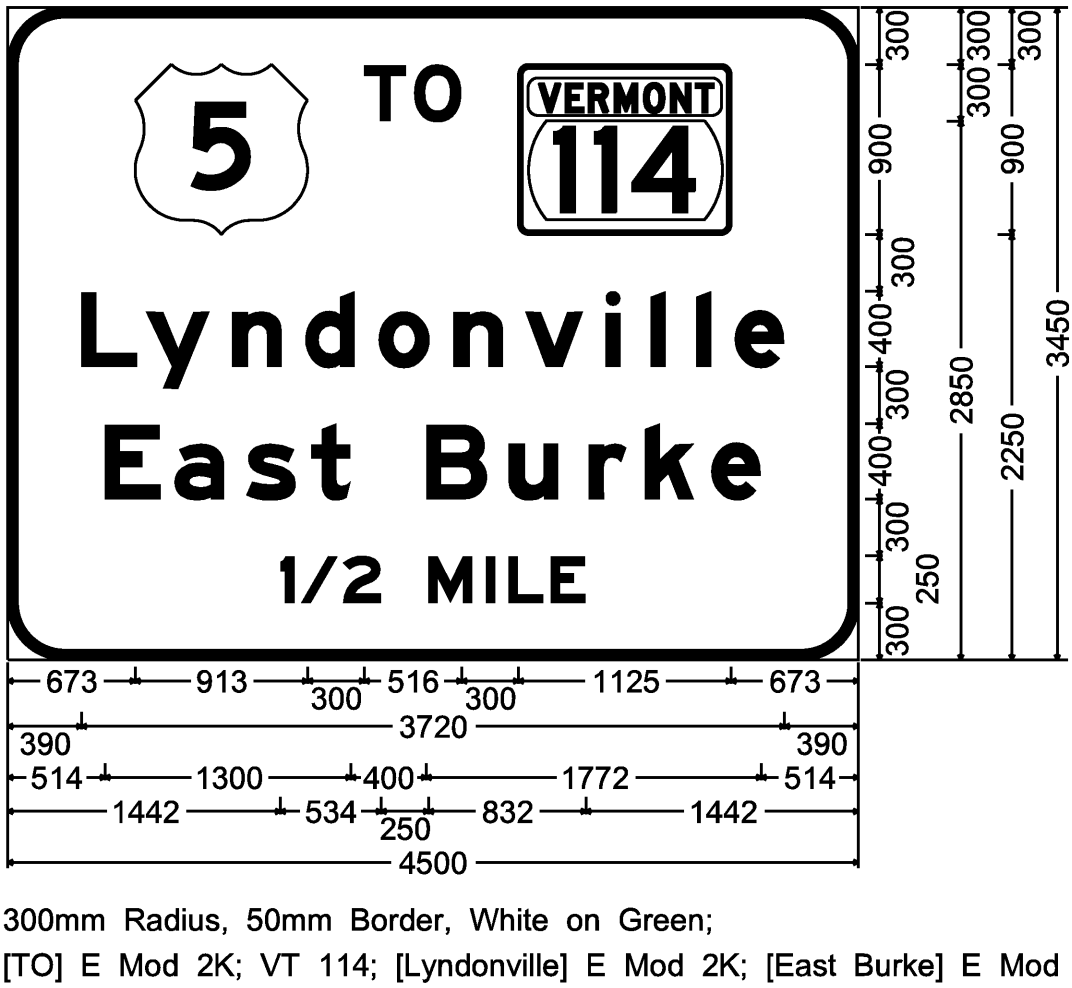
M.M. 136.612 NB
M.M. 137.614 SB



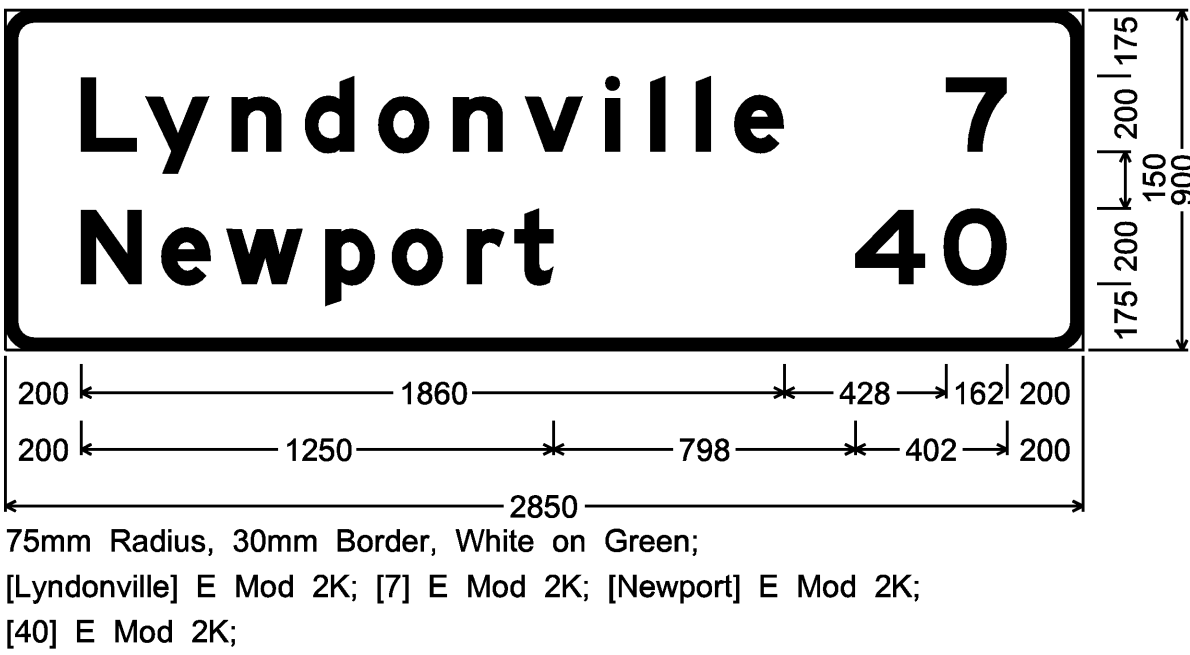
M.M. 135.870 NB



M.M. 136.450 NB



M.M. 133.590 NB



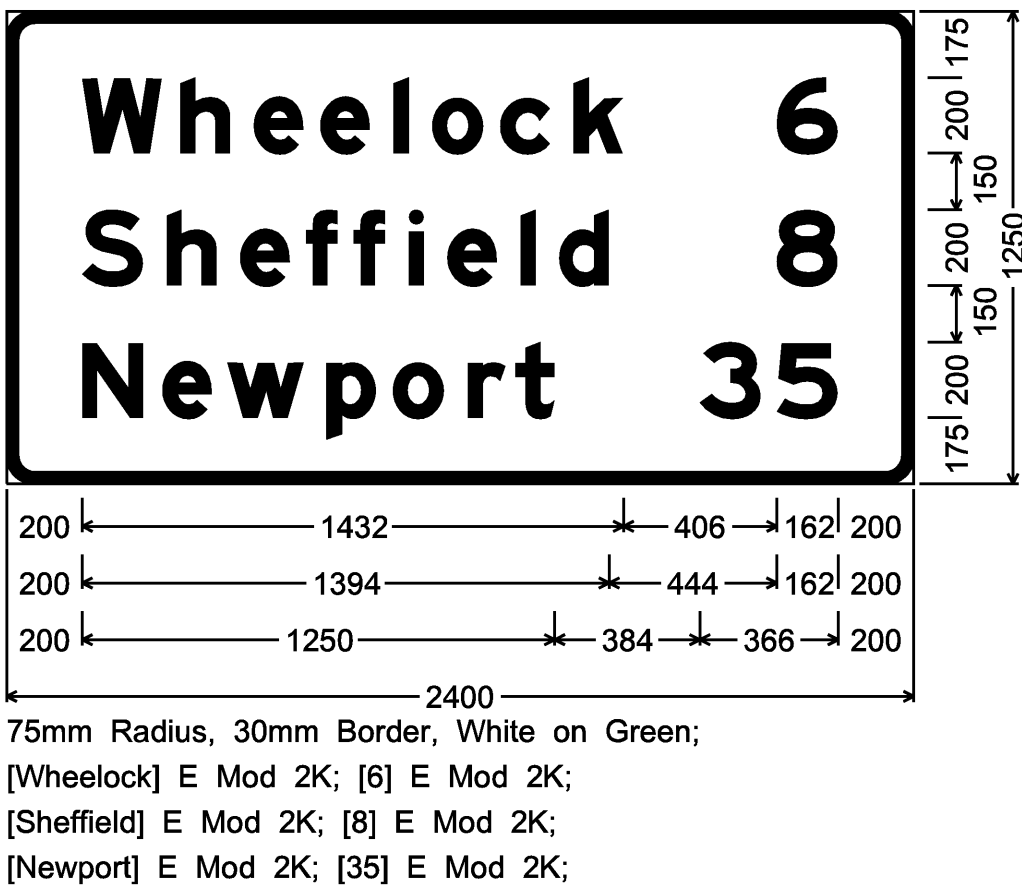
SEE GENERAL SIGN DETAIL NOTES ON SHEET 63.

SIGN DETAIL
SHEET 3

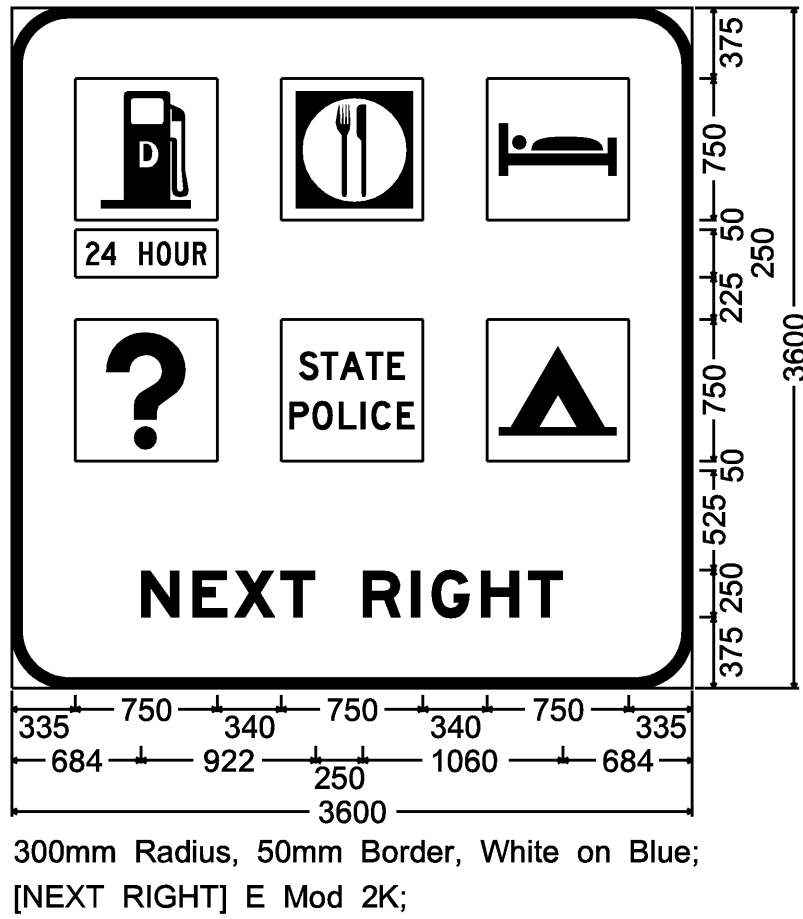
PROJECT NAME: ST. JOHNSBURY-LYNDON
PROJECT NUMBER: HES 09I-3(42)

FILE NAME: 972IIa-details.dgn PLOT DATE: 1/4/2007
PROJECT LEADER: CRB DRAWN BY: HJC
DESIGNED BY: PTS CHECKED BY: DAM
CLD REF. NO.: 97-02II SHEET 65 OF 130

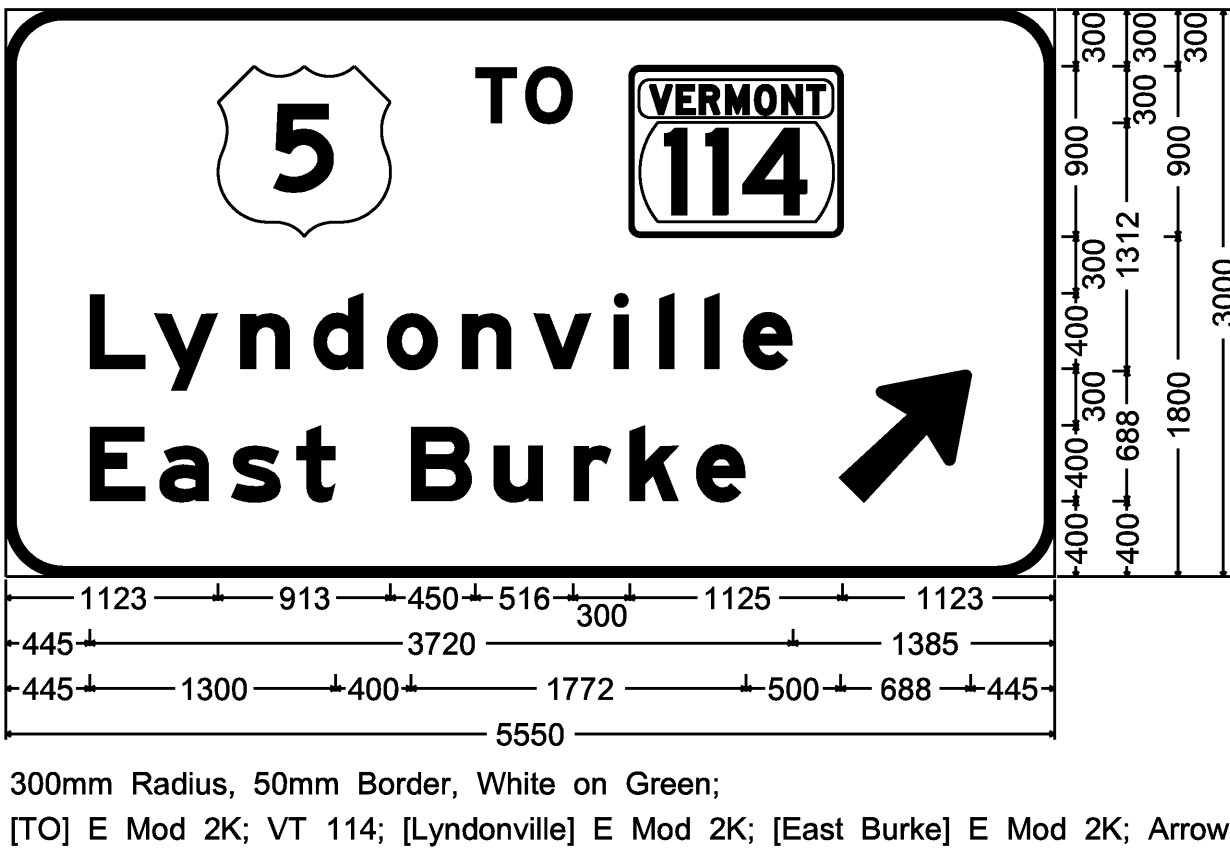
M.M. 138.300 NB



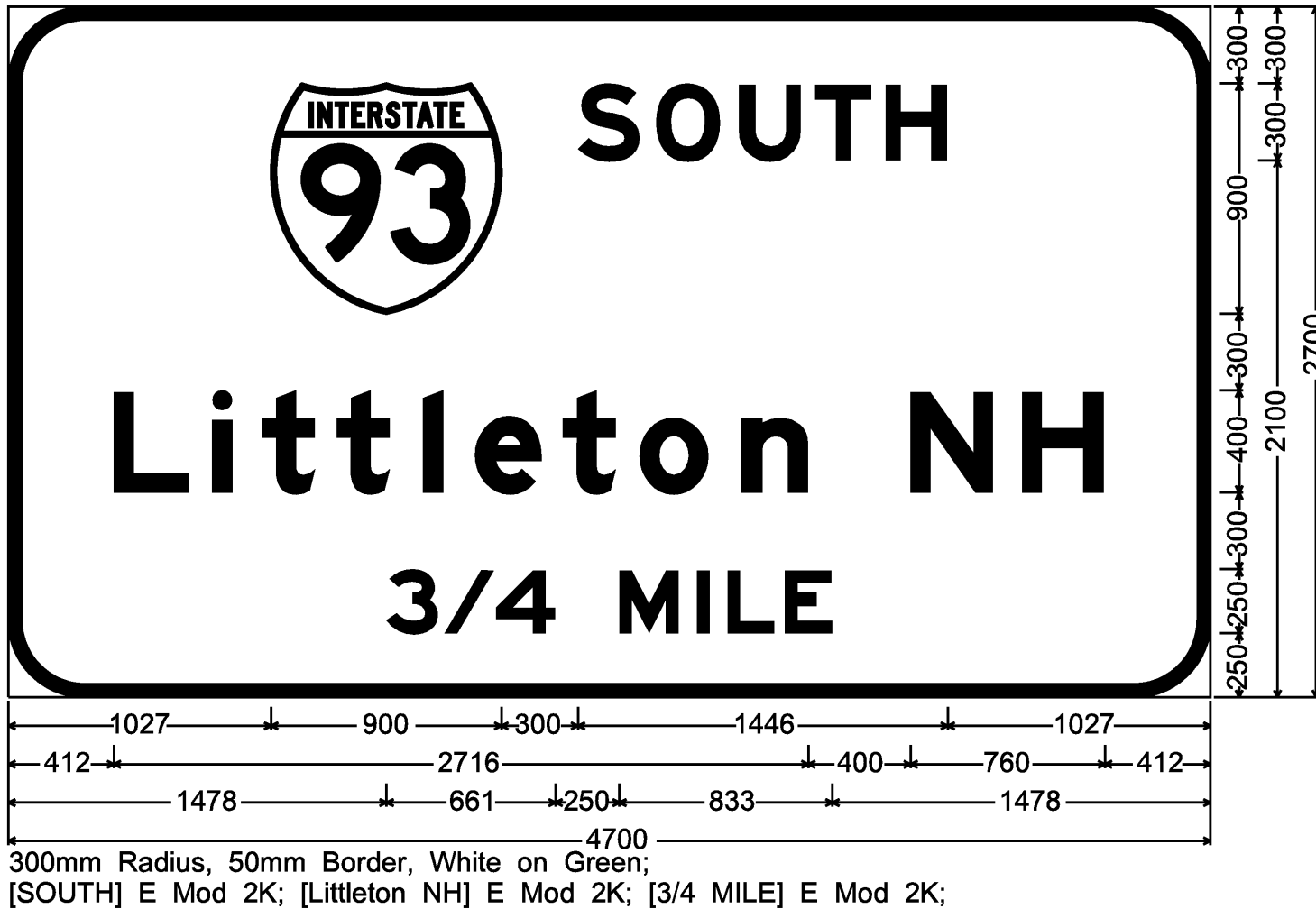
M.M. 129.400 SB



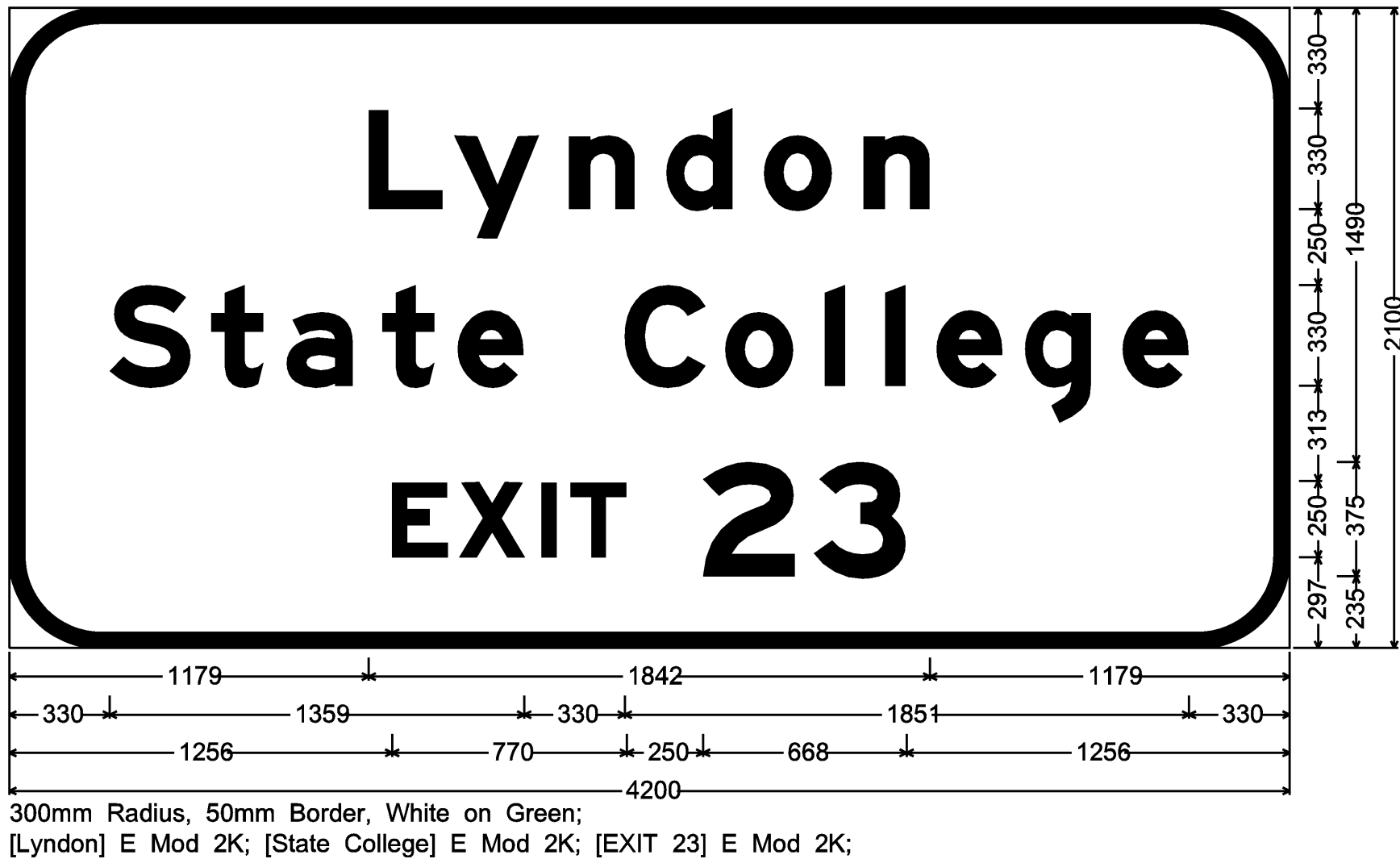
M.M. 136.820 NB



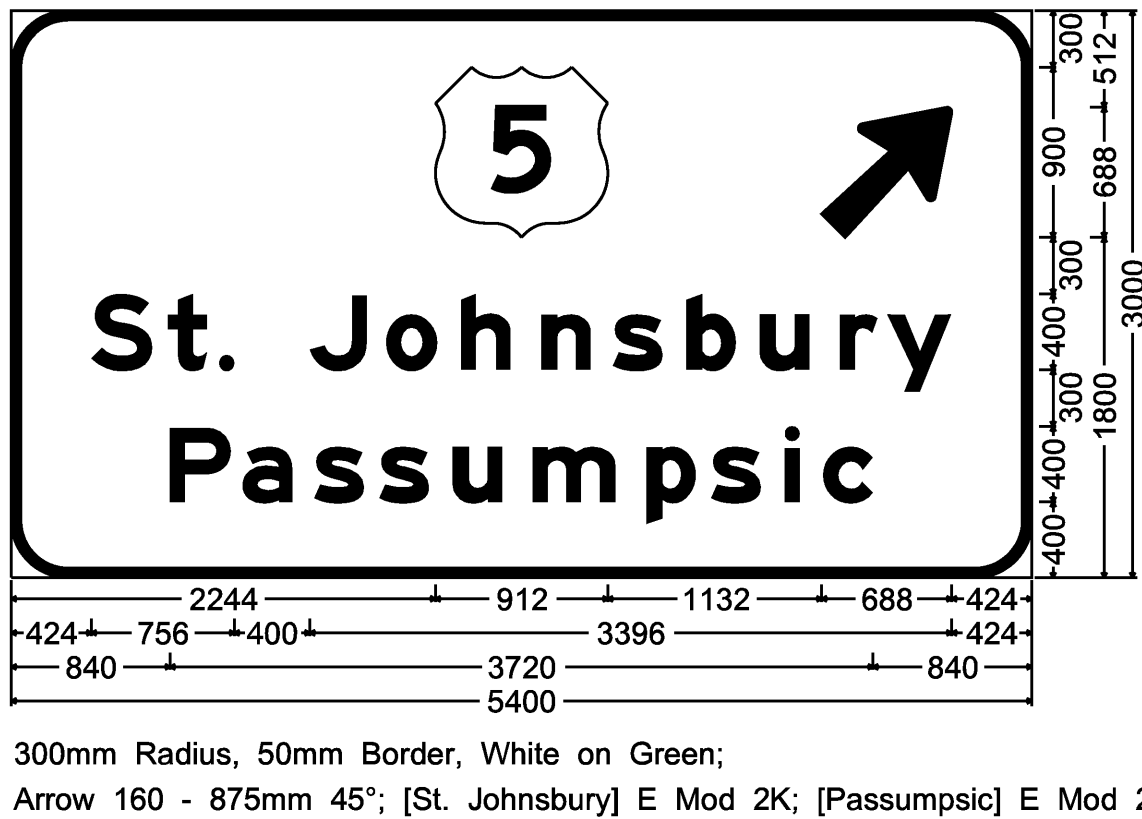
M.M. 129.130 SB OVERHEAD



M.M. 136.300 NB
M.M. 138.010 SB



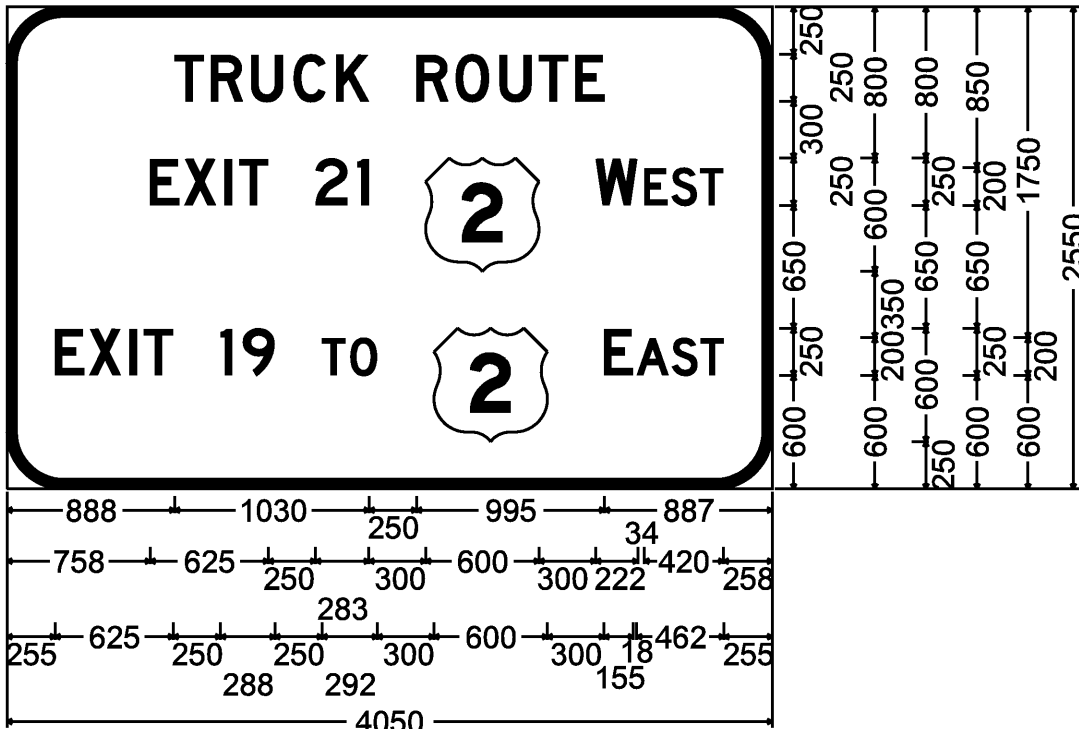
M.M. 129.130 SB OVERHEAD



SEE GENERAL SIGN DETAIL NOTES ON SHEET 63.

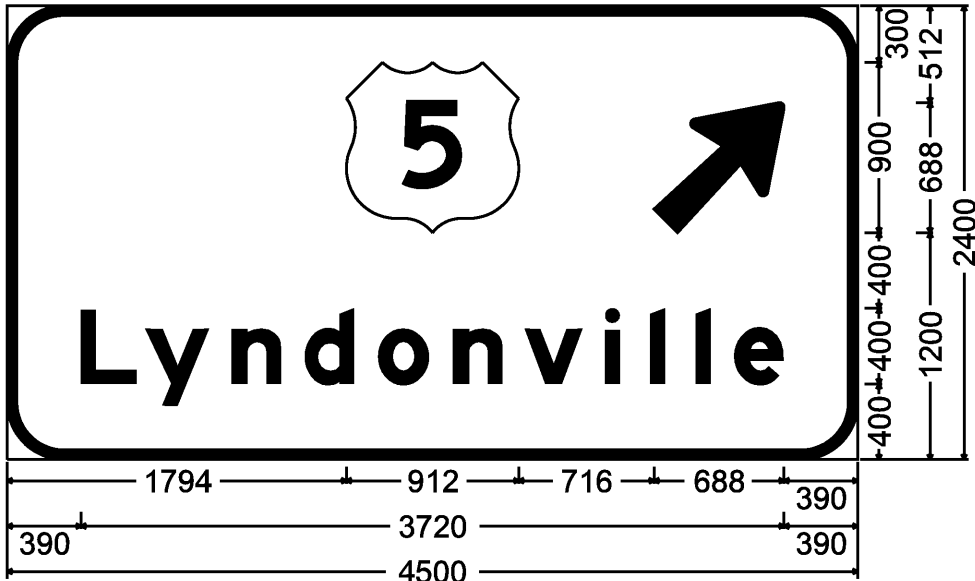
SIGN DETAIL SHEET 4	PROJECT NAME: ST. JOHNSBURY-LYNDON	
	PROJECT NUMBER: HES 09I-3(42)	
	FILE NAME: 972IIa-details.dgn	PLOT DATE: I/4/2007
	PROJECT LEADER: CRB	DRAWN BY: HJC
	DESIGNED BY: PTS	CHECKED BY: DAM
	CLD REF. NO.: 97-02II	SHEET 66 OF 130

M.M. 133.500 SB



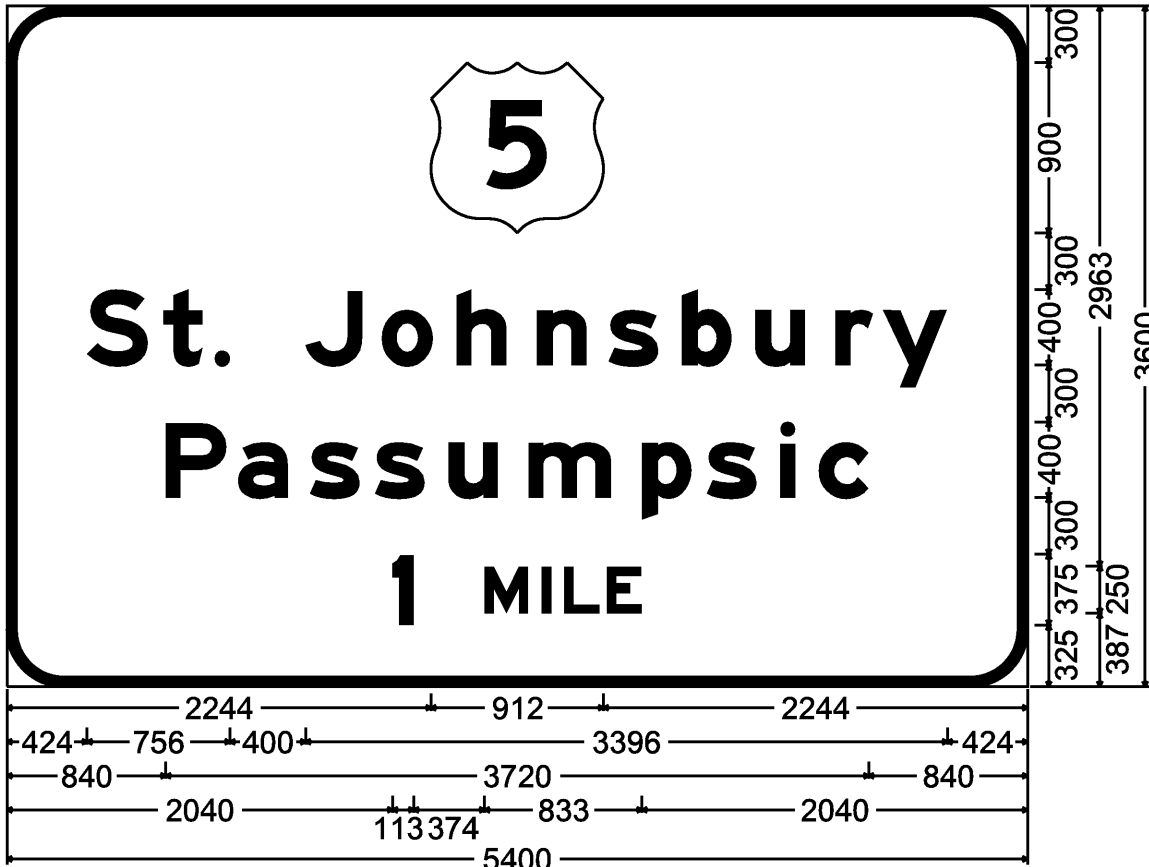
300mm Radius, 50mm Border, White on Green;
[TRUCK ROUTE] D 2K; [EXIT 21] D 2K; [WEST] D 2K; [EXIT 19 TO] D 2K; [EAST] D 2K;

M.M. 137.400 SB



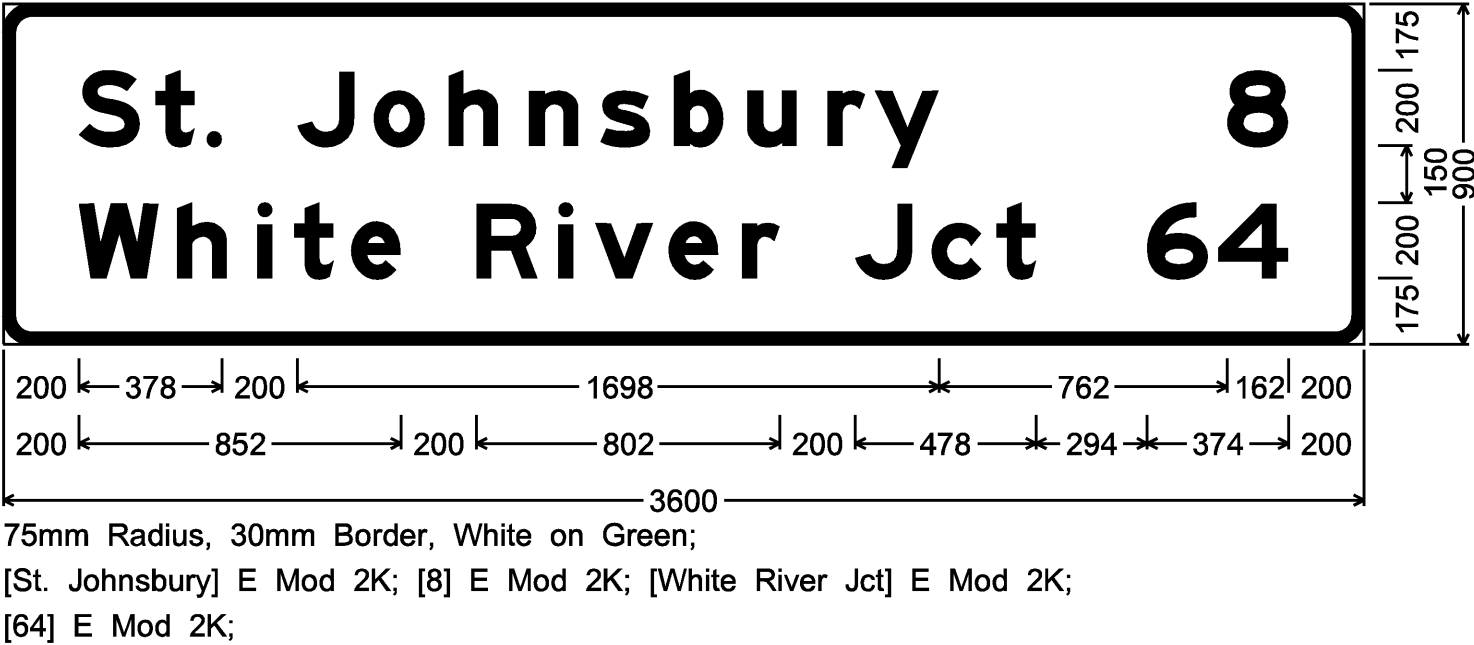
300mm Radius, 50mm Border, White on Green;
Arrow 160 - 875mm 45°; [Lyndonville] E Mod 2K;

M.M. 129.920 SB



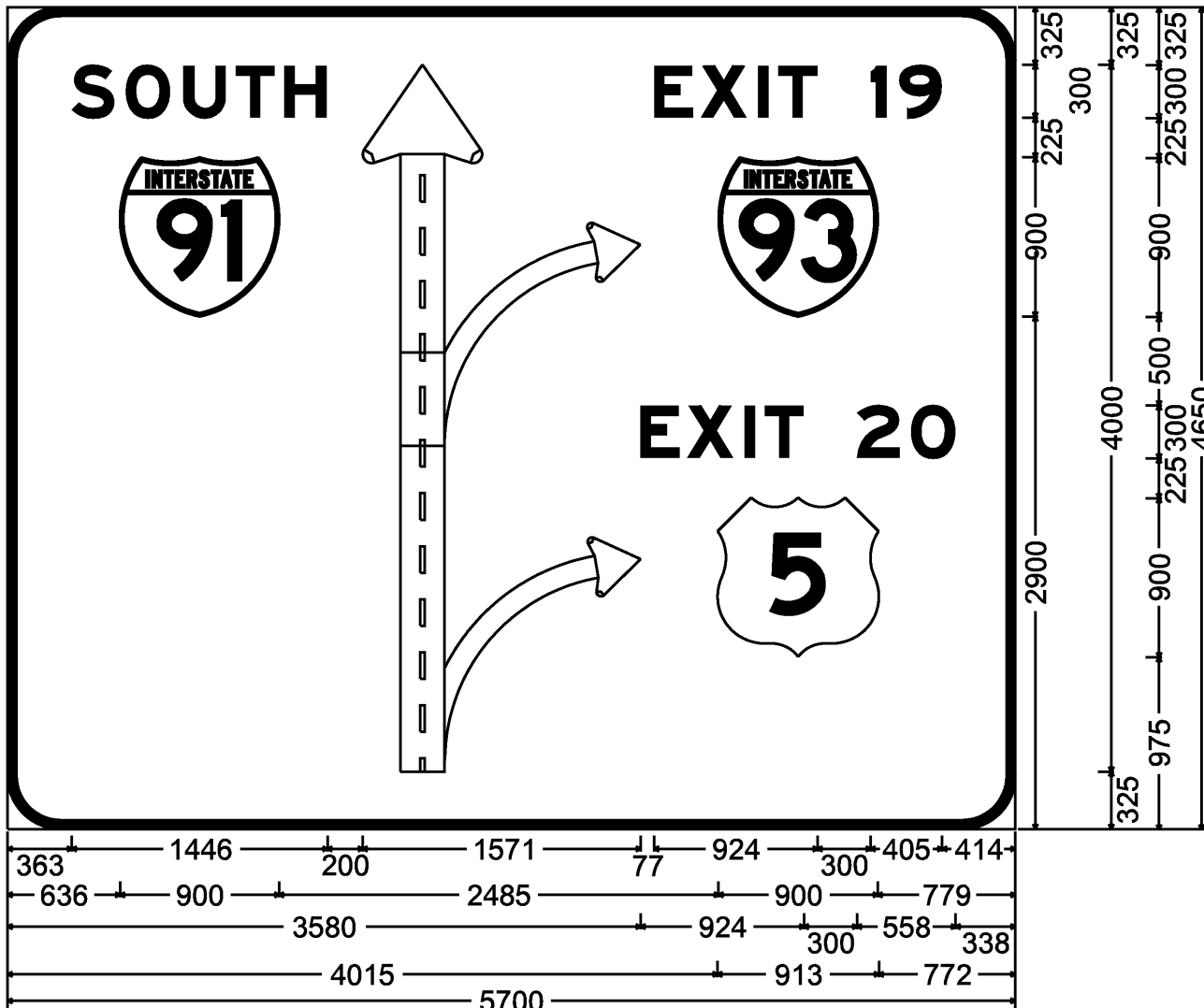
300mm Radius, 50mm Border, White on Green;
[St. Johnsbury] E Mod 2K; [Passumpsic] E Mod 2K; [1 MILE] E Mod 2K;

M.M. 136.175 SB

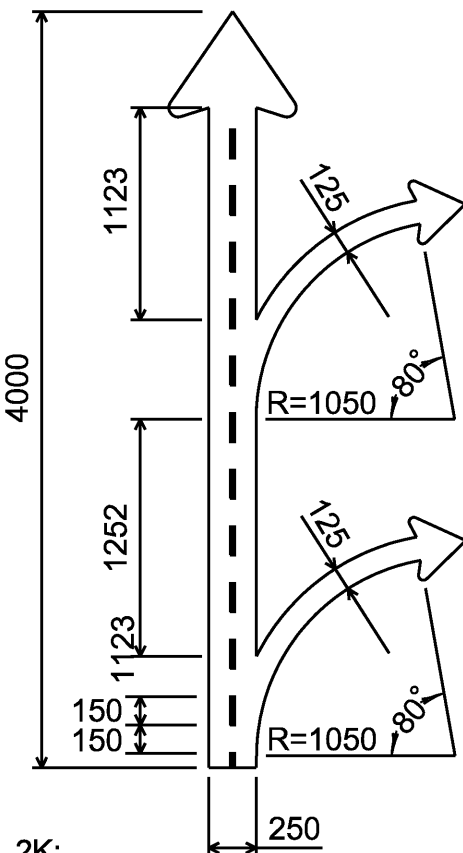


75mm Radius, 30mm Border, White on Green;
[St. Johnsbury] E Mod 2K; [8] E Mod 2K; [White River Jct] E Mod 2K;
[64] E Mod 2K;

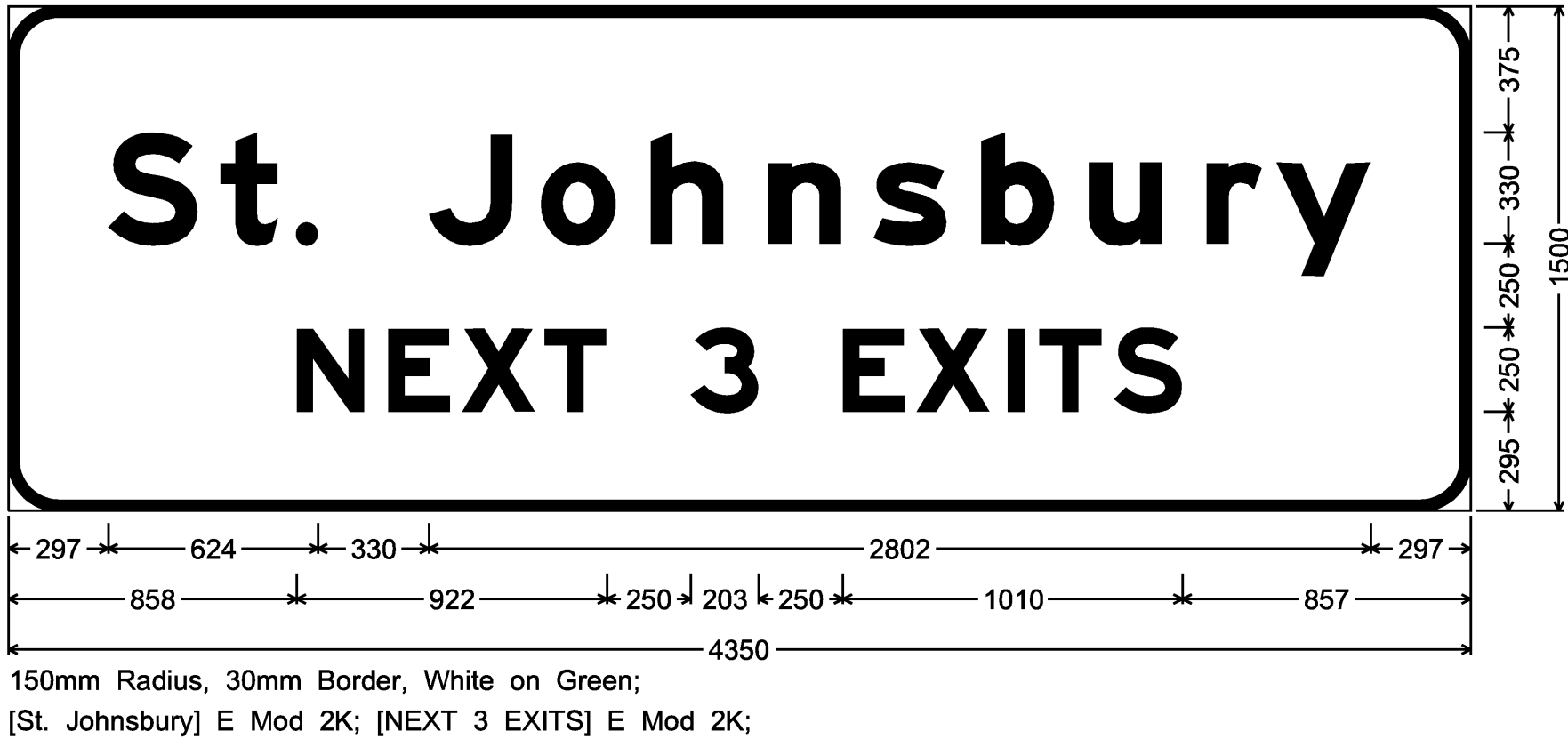
M.M. 129.564 SB



300mm Radius, 50mm Border, White on Green;
[SOUTH] E Mod 2K; Diagrammatic Arrow lane lines Black; [EXIT 19] E Mod 2K; [EXIT 20] E Mod 2K;



M.M. 133.950 SB



150mm Radius, 30mm Border, White on Green;
[St. Johnsbury] E Mod 2K; [NEXT 3 EXITS] E Mod 2K;

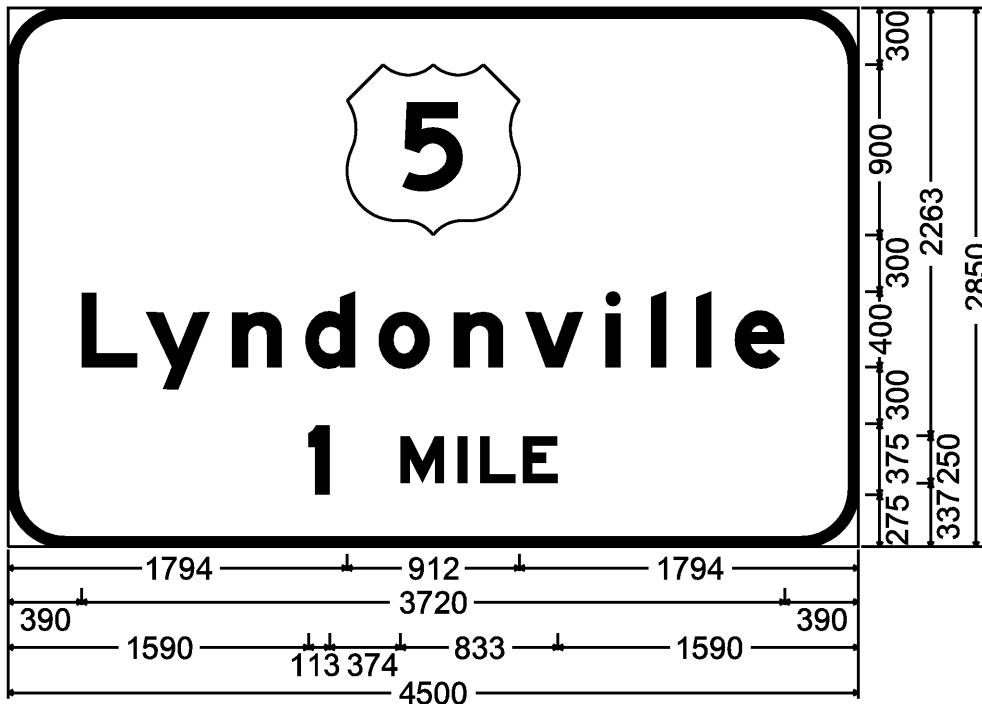
SEE GENERAL SIGN DETAIL NOTES ON SHEET 63.

SIGN DETAIL
SHEET 5

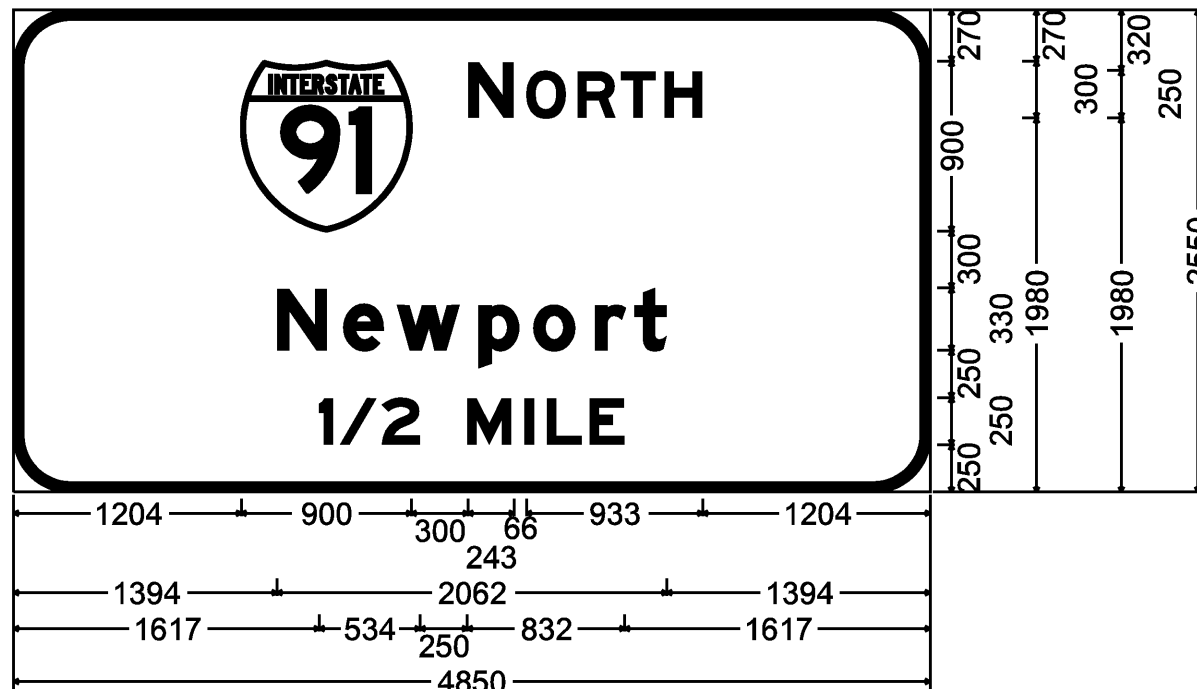
PROJECT NAME: ST. JOHNSBURY-LYNDON
PROJECT NUMBER: HES 091-3(42)
FILE NAME: 9721la-details.dgn PLOT DATE: 1/4/2007
PROJECT LEADER: CRB DRAWN BY: HJC
DESIGNED BY: PTS CHECKED BY: DAM
CLD REF. NO.: 97-0211 SHEET 67 OF 130

M.M. 138.230 SB

INT. # 21 RTE. 2
M.M. 1.683 RT

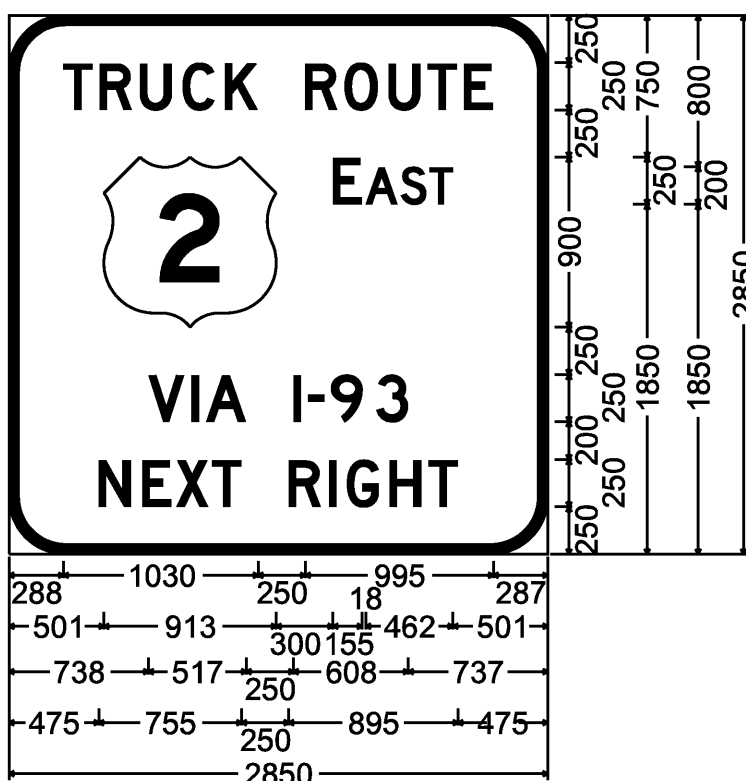


300mm Radius, 50mm Border, White on Green
[Lyndonville] E Mod 2K; [1 MILE] E Mod 2K;



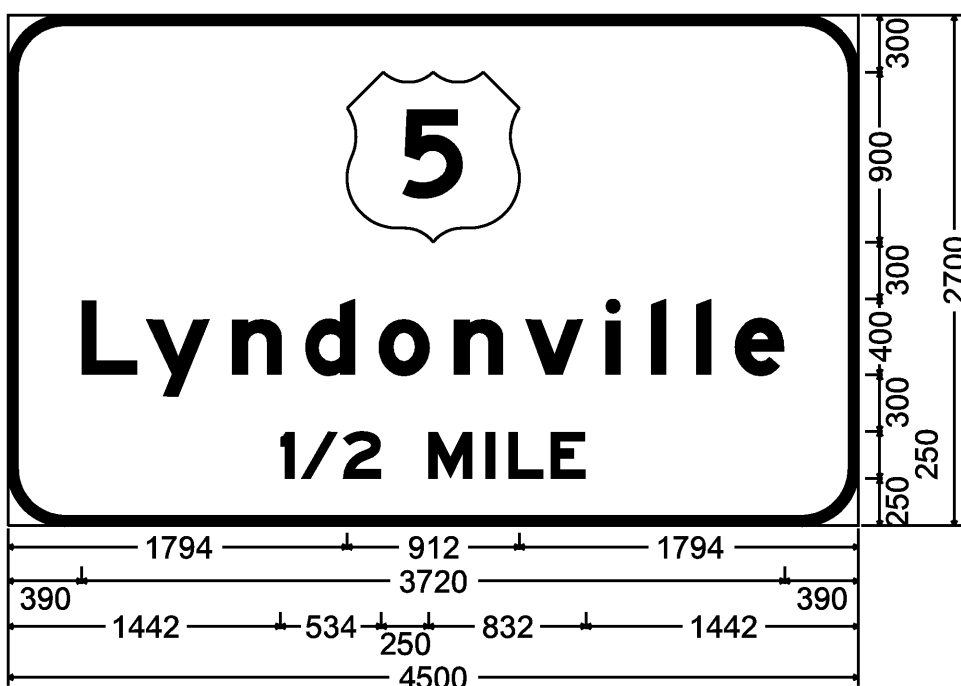
300mm Radius, 50mm Border, White on Green;
[NORTH] E Mod 2K; [Newport] E Mod 2K; [1/2 MILE] E Mod 2K;

INT. # 21 RTE. 2
M.M. 1.530 RT



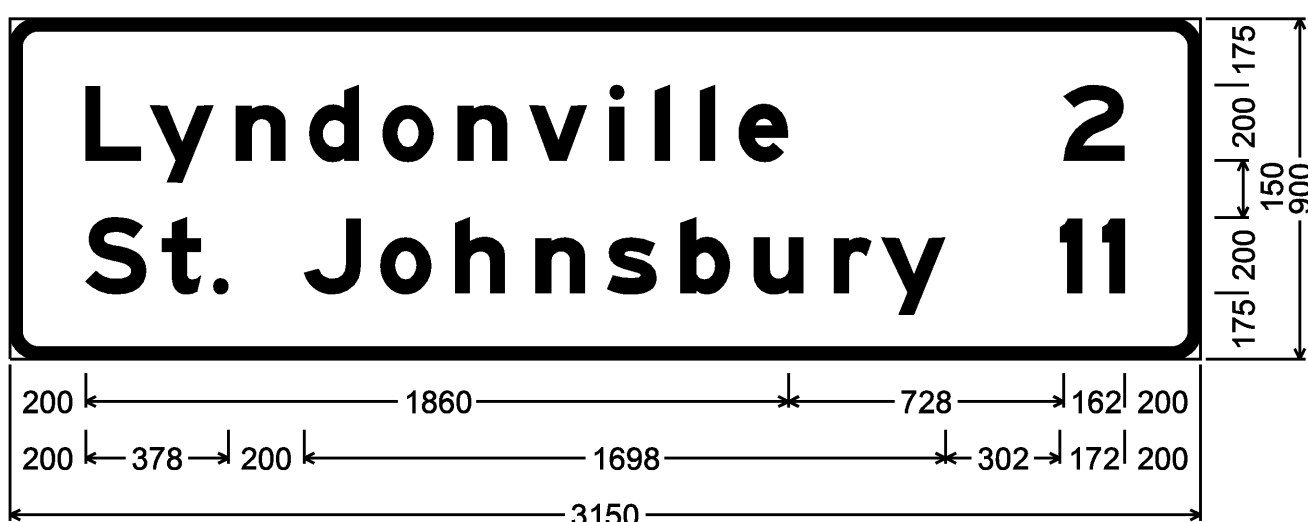
300mm Radius, 50mm Border, White on Green;
[TRUCK ROUTE] D 2K; [EAST] D 2K; [VIA I-93] D 2K;
[NEXT RIGHT] D 2K;

M.M. 137.764 SB



300mm Radius, 50mm Border, White on Green
[Lyndonville] E Mod 2K; [1/2 MILE] E Mod 2K;

M.M. 139.250 SB



75mm Radius, 30mm Border, White on Green;
[Lyndonville] E Mod 2K; [2] E Mod 2K; [St. Johnsbury] E Mod 2K;
[11] E Mod 2K;

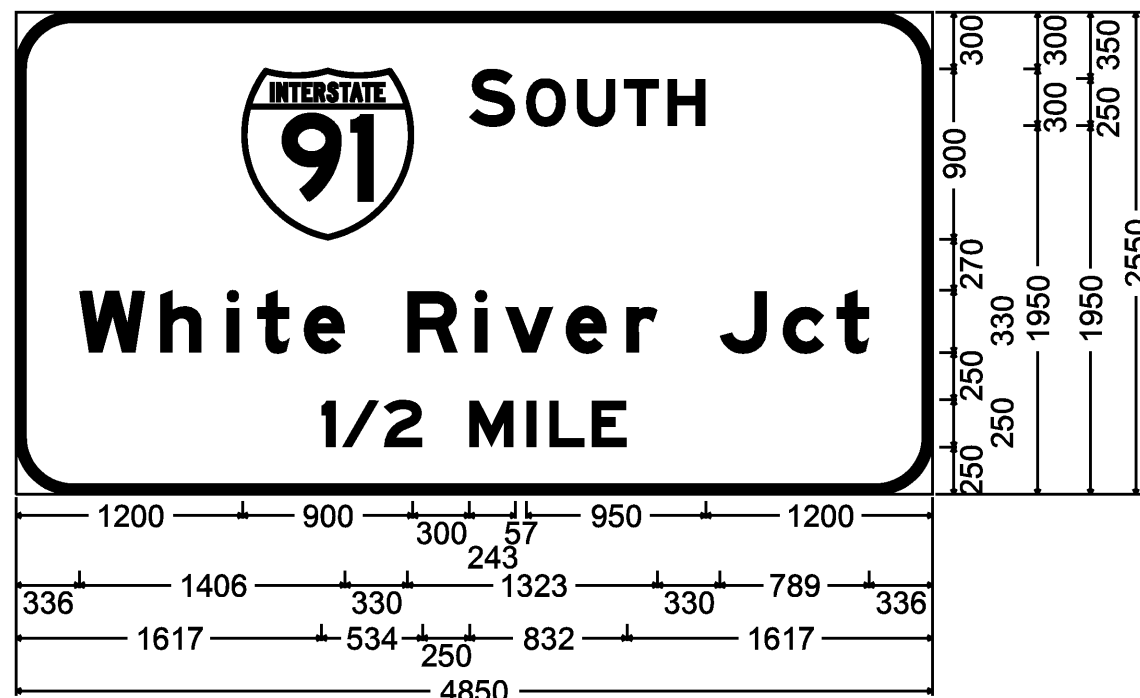
SEE GENERAL SIGN DETAIL NOTES ON SHEET 63.

**SIGN DETAIL
SHEET 6**

PROJECT NAME: ST. JOHNSBURY-LYNDON
PROJECT NUMBER: HES 09I-3(42)

FILE NAME: 9721la-details.dgn	PLOT DATE: 1/4/2007
PROJECT LEADER: CRB	DRAWN BY: HJC
DESIGNED BY: PTS	CHECKED BY: DAM
CLD REF. NO.: 97-02II	SHEET 68 OF 130

INT. # 21 RTE. 2
M.M. 2.267 LT



MISC.

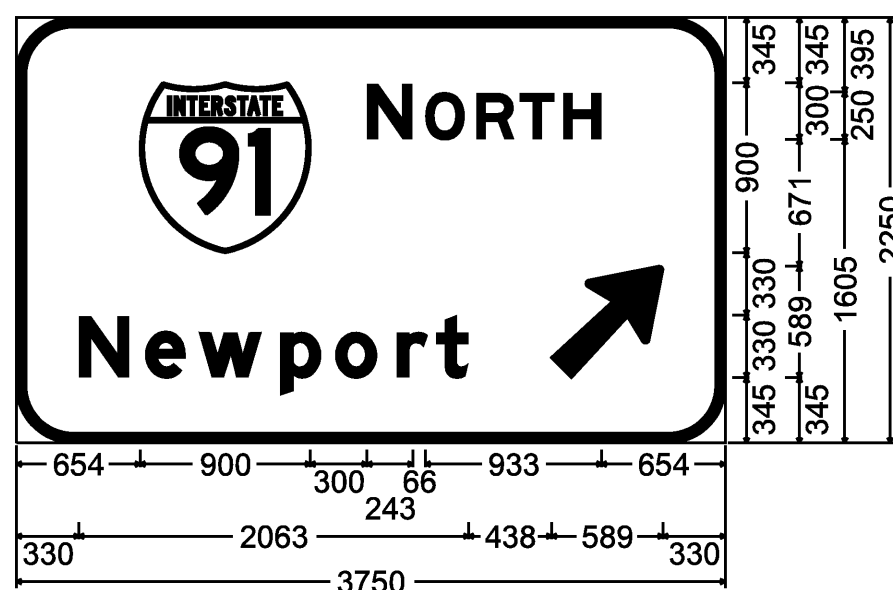


1200mm across sides 75mm Radius, 30mm Border, 20mm Indent, Black on Yellow;
[SALT] C 2K; [REDUCTION] C 2K;
[AREA] C 2K;



VR-132;
75mm Radius, 22mm Border, 20mm Indent, Black on White;
[KEEP] D, [RIGHT] D
[EXCEPT] D, [TO] D, [PASS] D

INT. # 21 RTE. 2
M.M. 2.258 RT

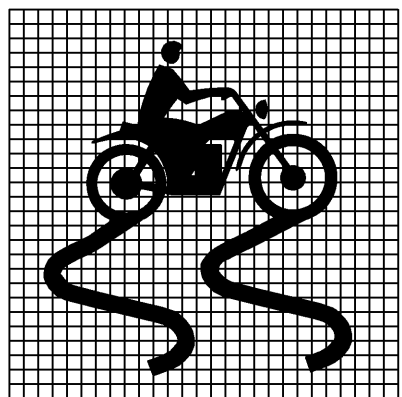


300mm Radius, 50mm Border, White on Green;
[NORTH] E Mod 2K; [Newport] E Mod 2K; Arrow 133 - 750mm 45°;

MISC.

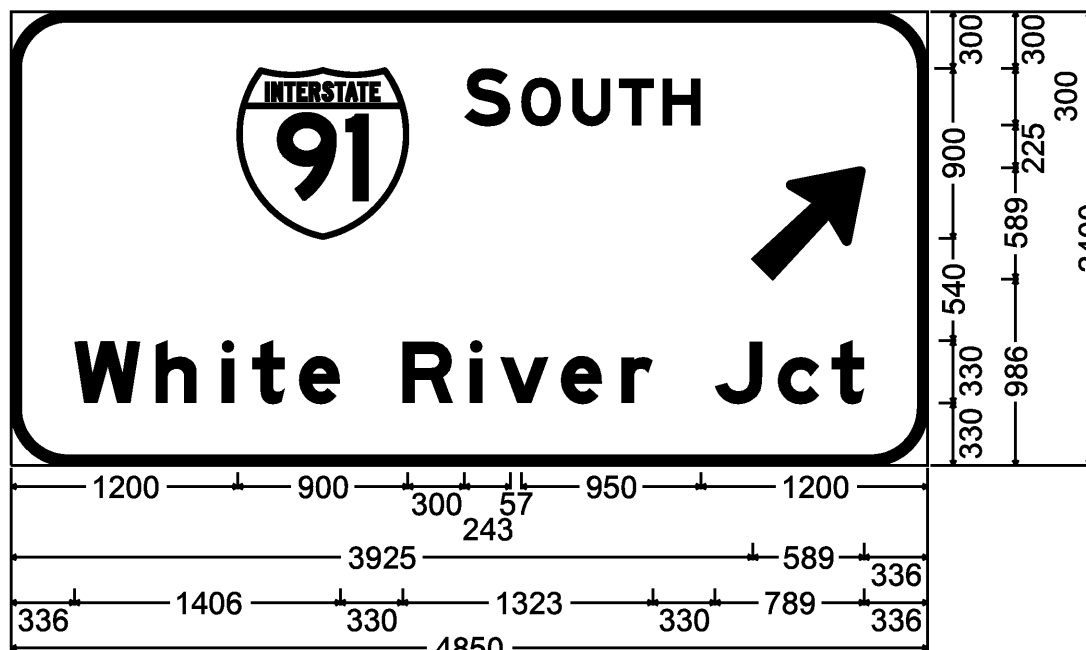


1200mm across sides 75mm Radius, 30mm Border, 20mm Indent, Black on Yellow;
motorcycle;



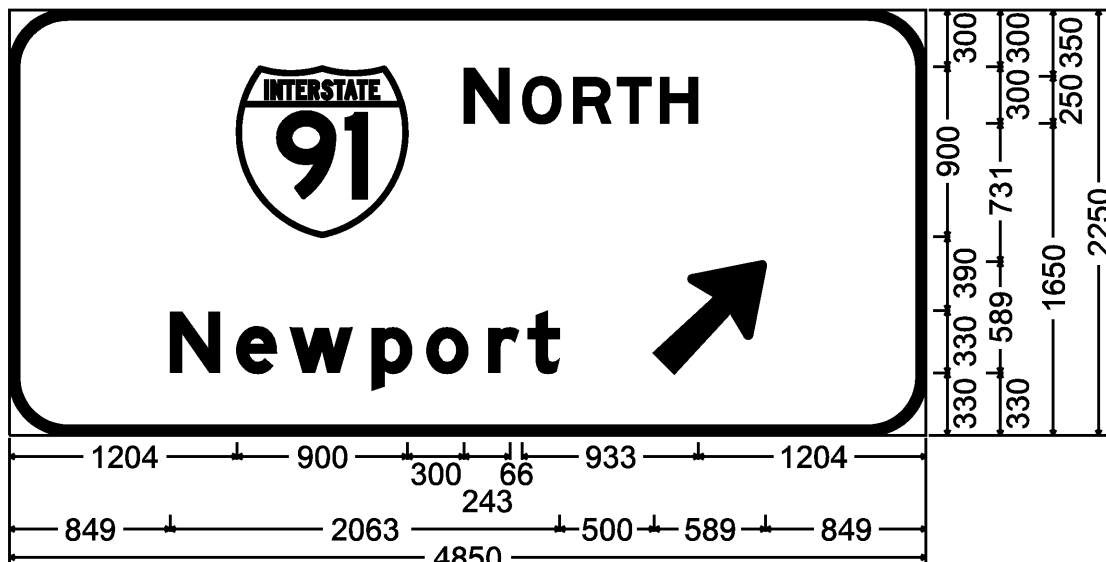
35mm Radius, 15mm Border, 10mm Indent, Black on Yellow;
[GROOVED] B;
[SHOULDER] B 70% spacing;

INT. # 21 RTE. 2
M.M. 1.683 RT
M.M. 1.870 LT



300mm Radius, 50mm Border, White on Green;
[SOUTH] E Mod 2K; Arrow 133 - 750mm 45°; [White River Jct] E Mod 2K;

INT. # 21 RTE. 2
M.M. 2.267 LT



305mm Radius, 50mm Border, White on Green;
[NORTH] E Mod 2K; [Newport] E Mod 2K; Arrow 133 - 750mm 45°;

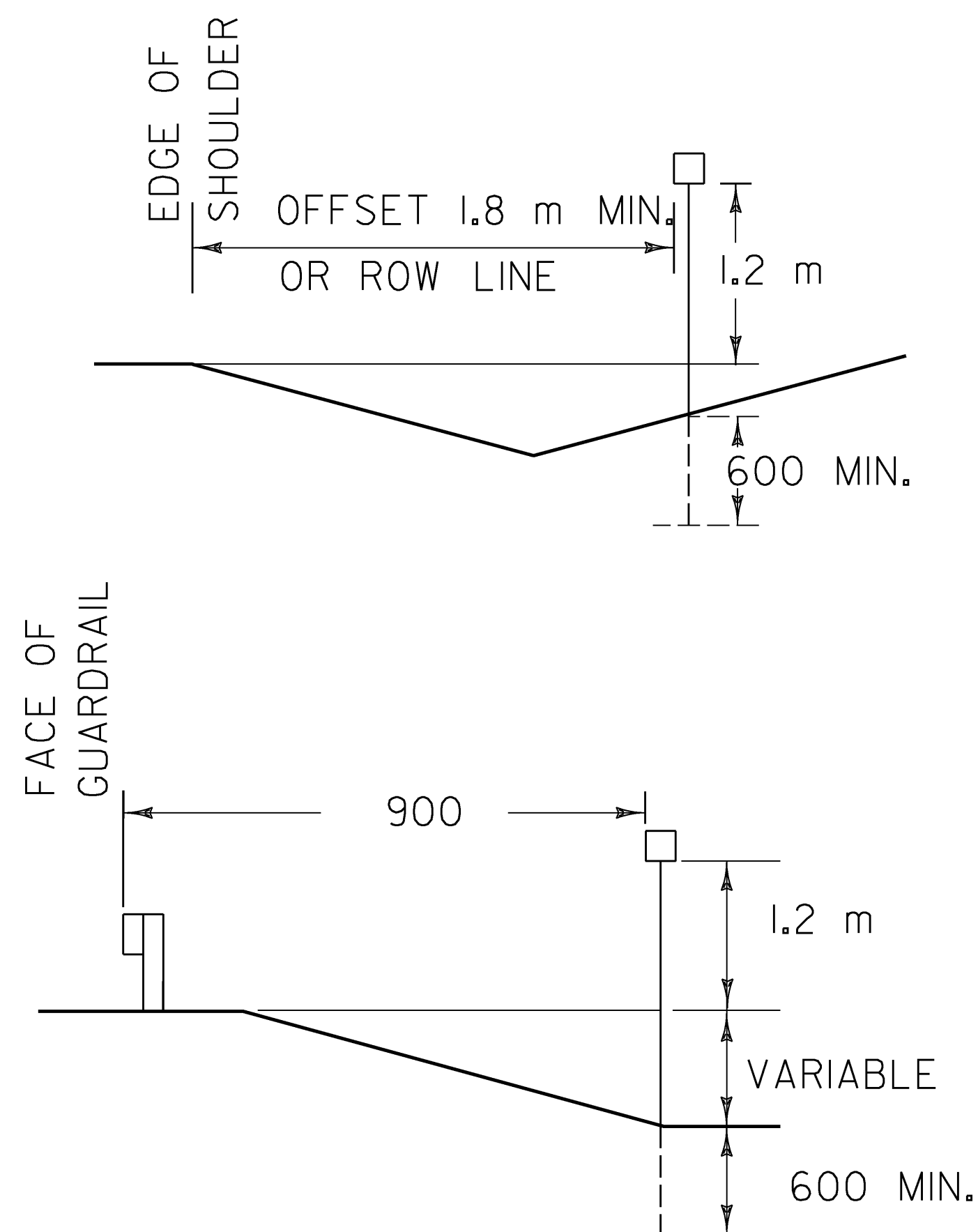
SEE GENERAL SIGN DETAIL NOTES ON SHEET 63.

SIGN DETAIL
SHEET 7

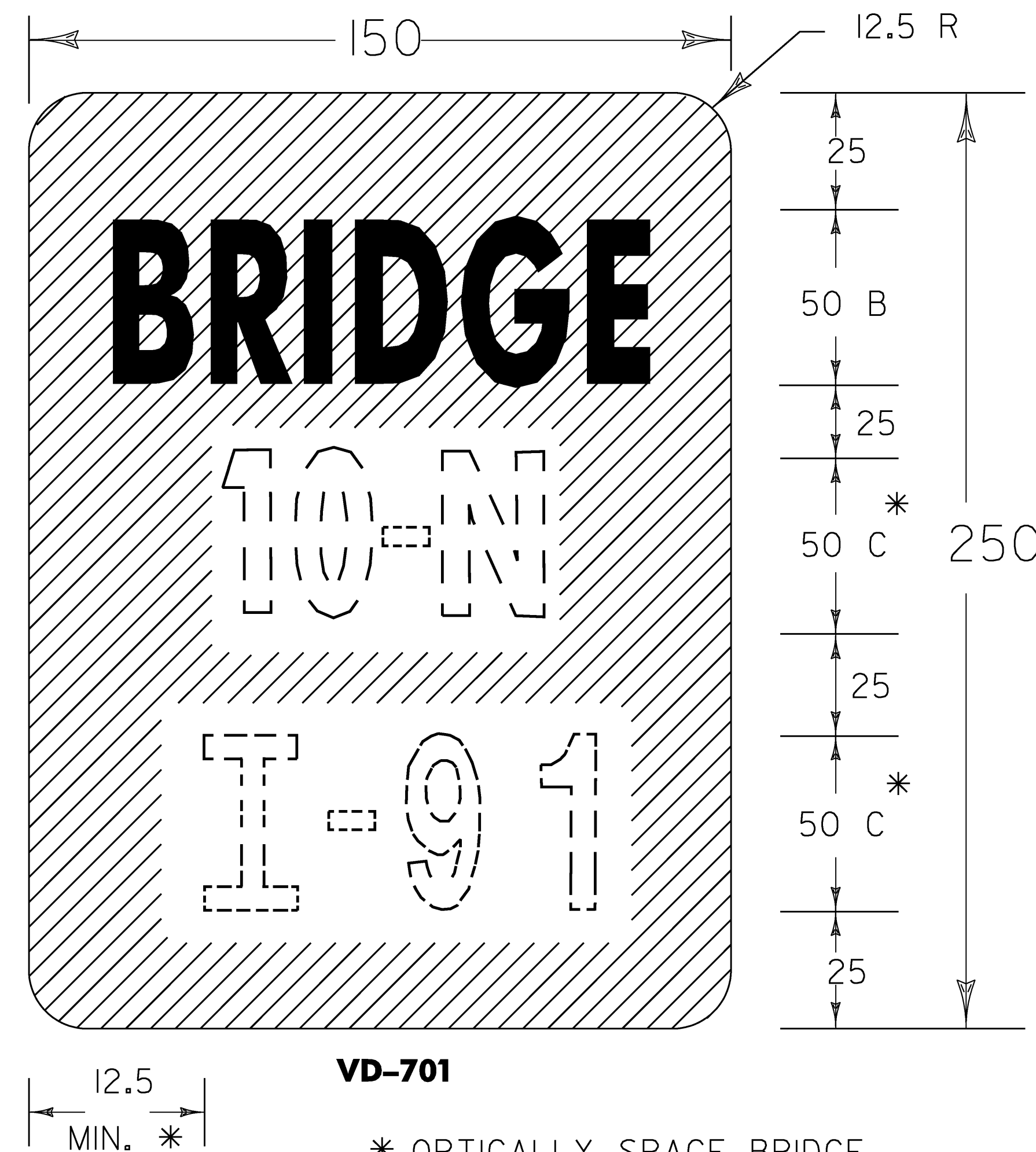
PROJECT NAME: ST. JOHNSBURY-LYNDON
PROJECT NUMBER: HES 091-3(42)

FILE NAME: 9721la-details.dgn
PROJECT LEADER: CRB
DESIGNED BY: PTS
CLD REF. NO.: 97-0211
PLOT DATE: 1/4/2007
DRAWN BY: HJC
CHECKED BY: DAM
SHEET 69 OF 130

HYPHEN DETAIL



FOR EXAMPLE, ROUTE NUMBERS
SHALL APPEAR AS: I-9I, US5, VT22



* OPTICALLY SPACE BRIDGE
AND ROUTE NUMBERS.
SERIES B LETTERS MAY
BE USED TO MAINTAIN
VISUAL INTEGRITY.

THE FOLLOWING BRIDGES ARE NOT SHOWN ON THE PLANS
BUT REQUIRE NEW PLAQUES. QUANTITIES FOR REMOVAL OF
EXISTING PLAQUES AND INSTALLATION OF NEW PLAQUES AND
POSTS HAVE BEEN ESTIMATED.

NB		SB	
130.039	85-I	130.039	85-I
133.010	90-IN	133.035	90-IS

NOTES:

GENERAL:
DOTTED LINES AND NUMERALS INDICATE TEXT THAT VARIES.

MATERIAL:
THE SIGN BASE MATERIAL SHALL BE 1mm FLAT SHEET ALUMINUM.

COLORS:
THE SIGN SHALL HAVE A RETROREFLECTORIZED WHITE TEXT ON
RETROREFLECTORIZED GREEN BACKGROUND. THE COLORS SHALL CONFORM WITH
THOSE FOUND IN STANDARD COLOR TOLERANCE CHARTS AS APPROVED BY THE U.S.
DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.

RETROREFLECTIVITY WILL BE EQUAL TO OR EXCEEDING ASTM TYPE III.

LETTERING:
LETTERS AND DIGITS SHALL CONFORM WITH THE STANDARD ALPHABETS
FOR HIGHWAY SIGNS AS PRINTED BY THE FEDERAL HIGHWAY ADMINISTRATION.

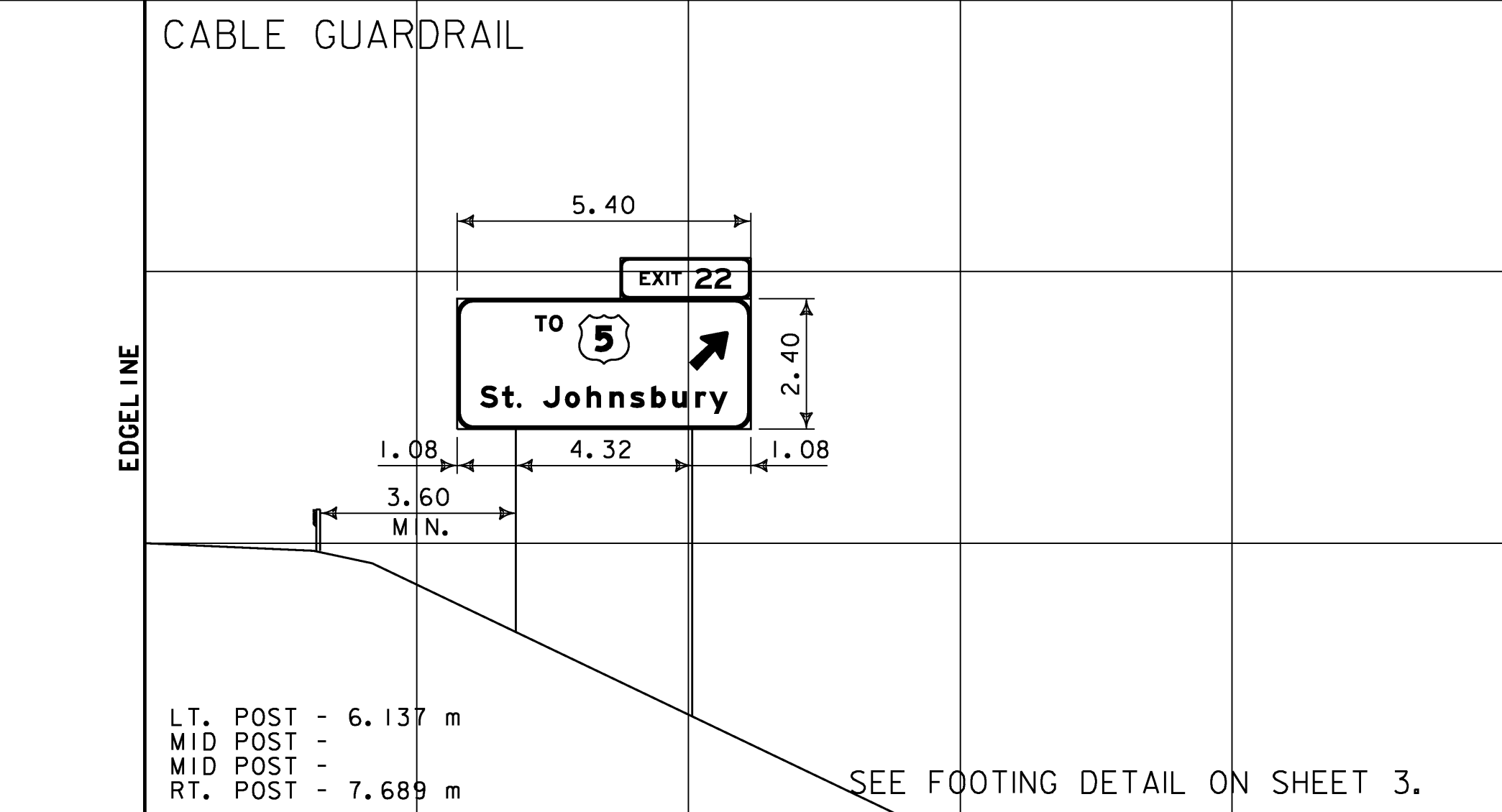
POSTS:
FLANGED CHANNEL STEEL 3 kg/m POSTS OR 45 mm SQUARE STEEL
WITH 50 mm ANCHOR SHALL BE USED. POST SHALL BE A MINIMUM OF 2.4 m.

BRIDGE PLAQUE DETAIL

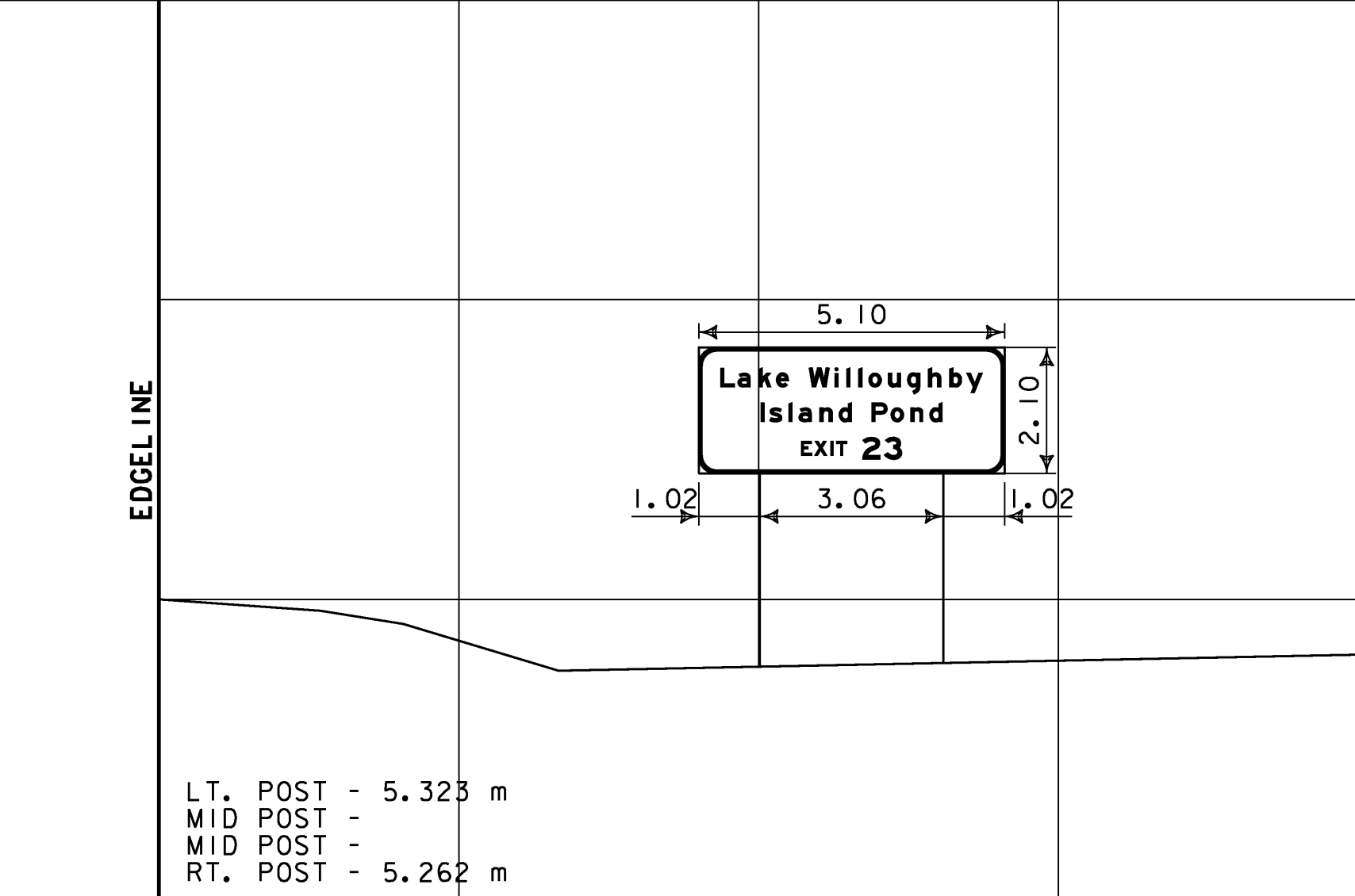
SIGN DETAIL SHEET 8

PROJECT NAME:	ST. JOHNSBURY-LYNDON		
PROJECT NUMBER:	HES 09I-3(42)		
FILE NAME:	972IIa-details.dgn	PLOT DATE:	1/4/2007
PROJECT LEADER:	CRB	DRAWN BY:	HJC
DESIGNED BY:	PTS	CHECKED BY:	DAM
CLD REF. NO.:	97-02II	SHEET	70 OF 130

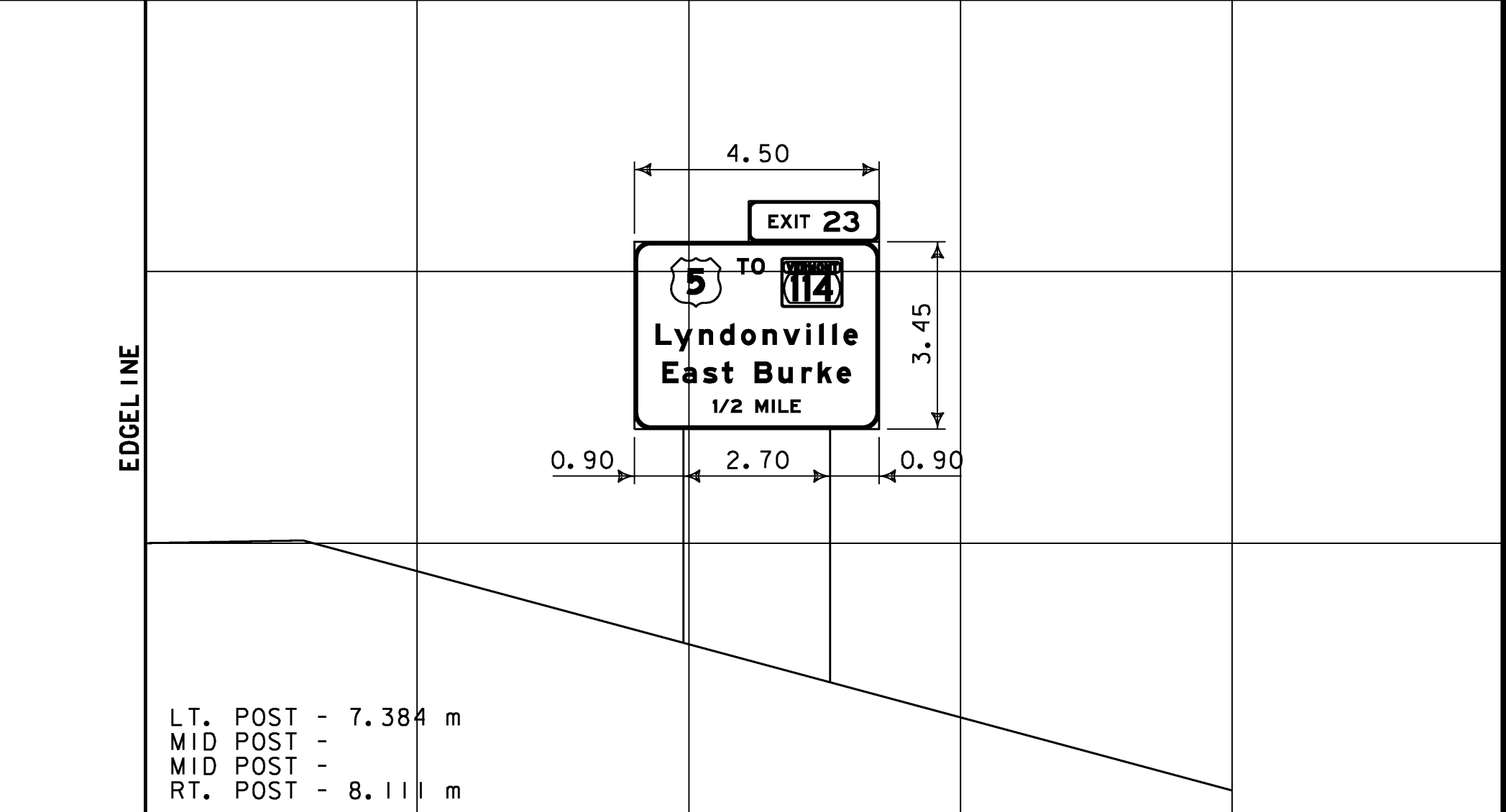
M.M. 132.300 NB



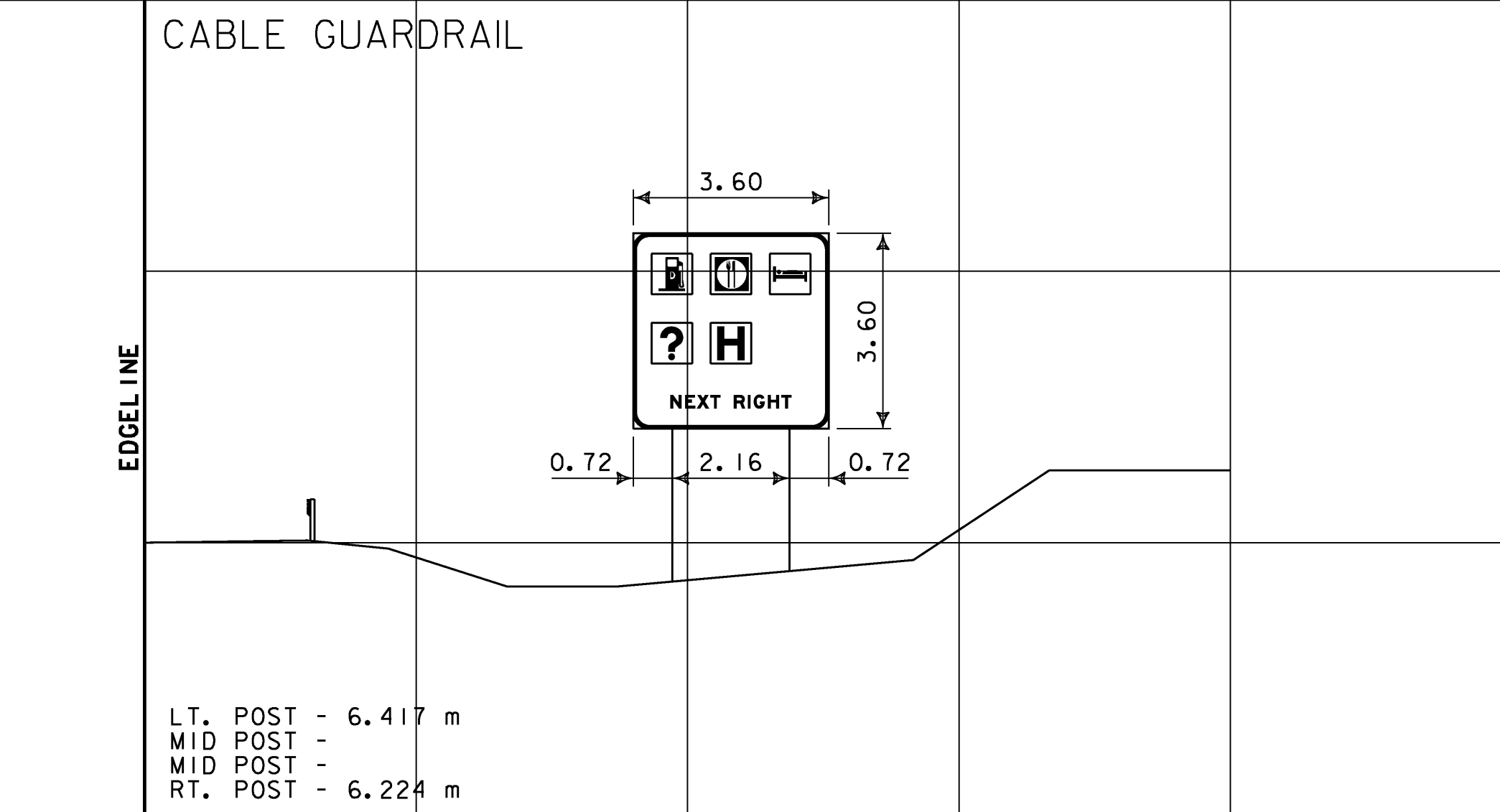
M.M. 136.138 NB



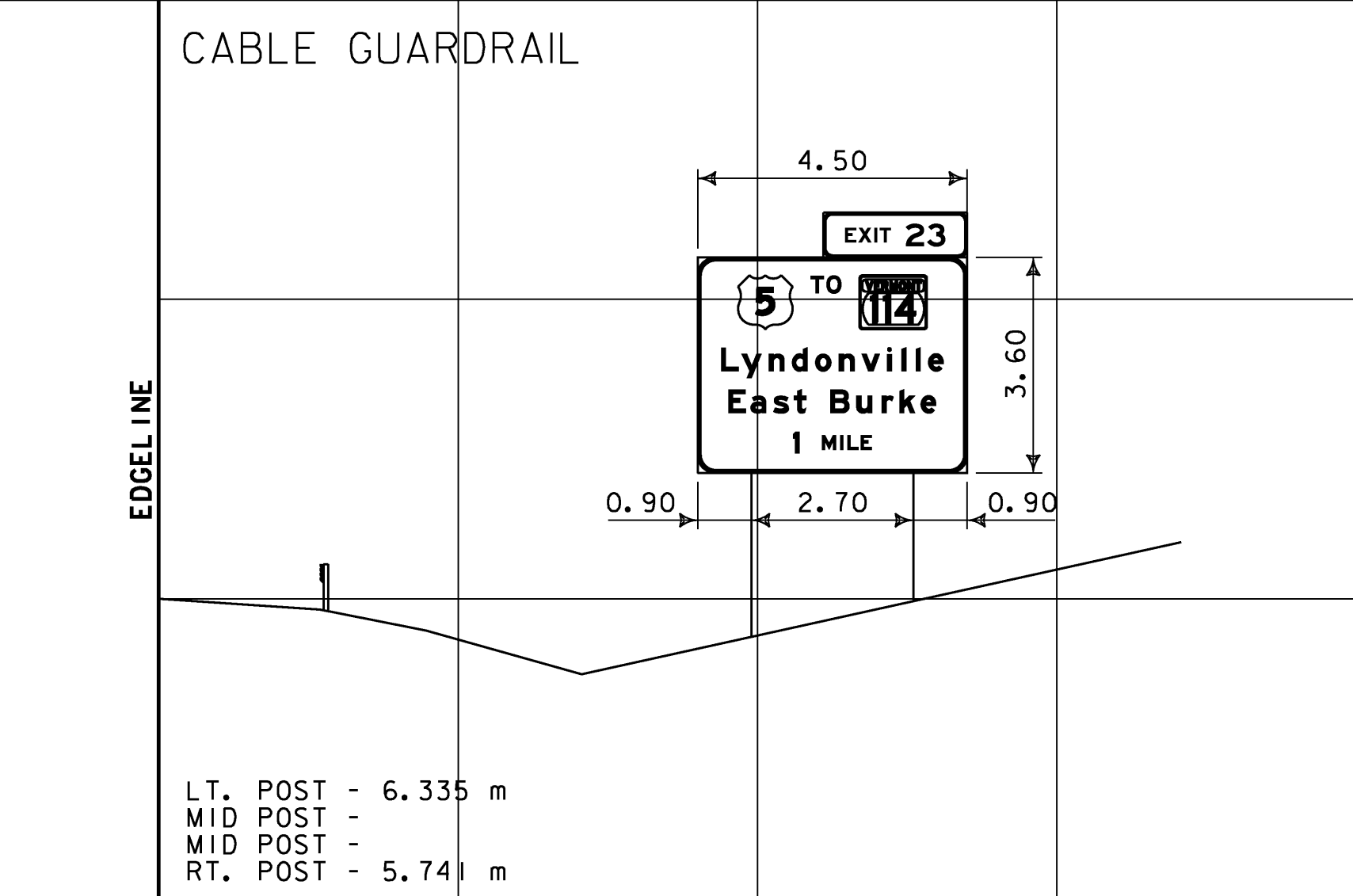
M.M. 136.450 NB



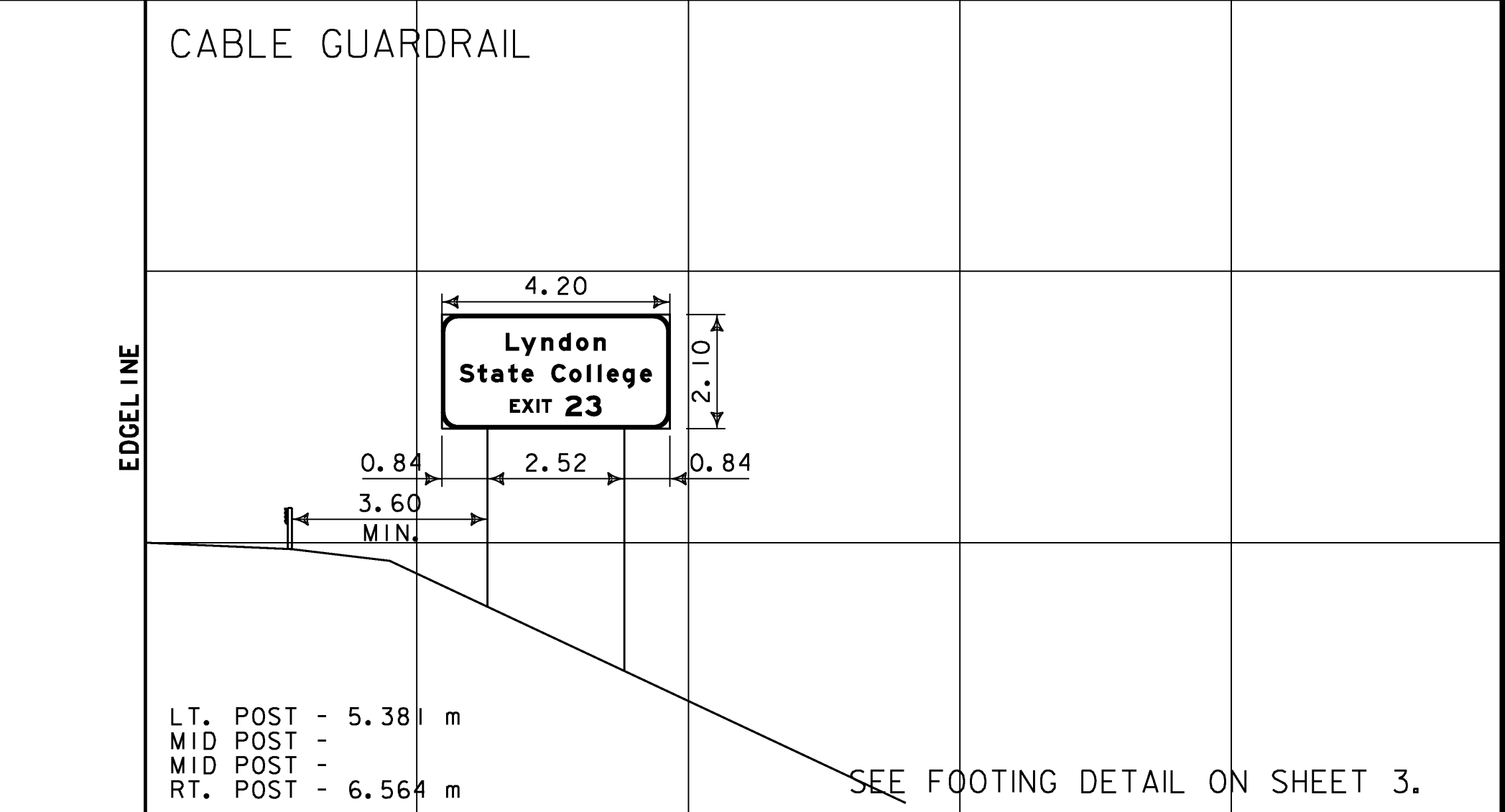
M.M. 132.143 NB



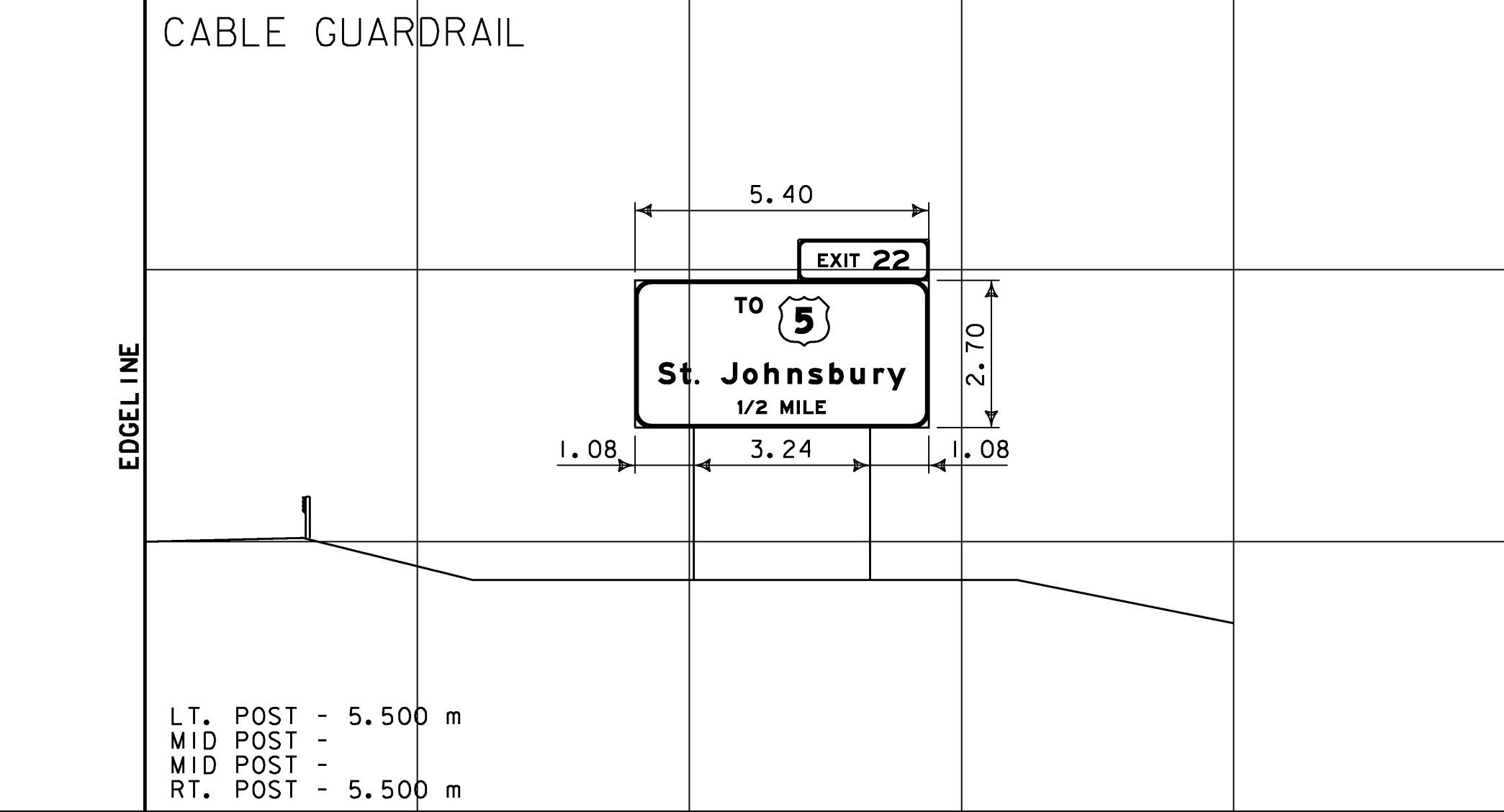
M.M. 135.870 NB



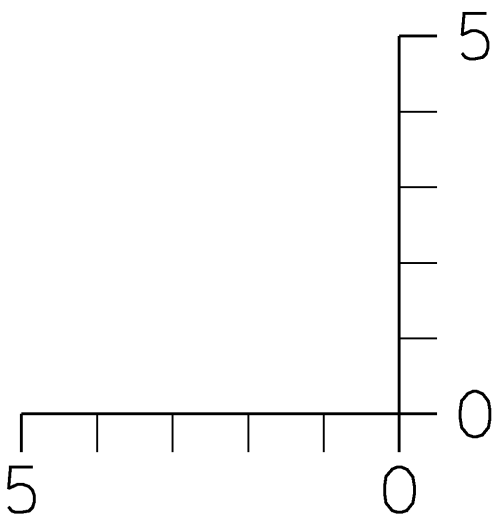
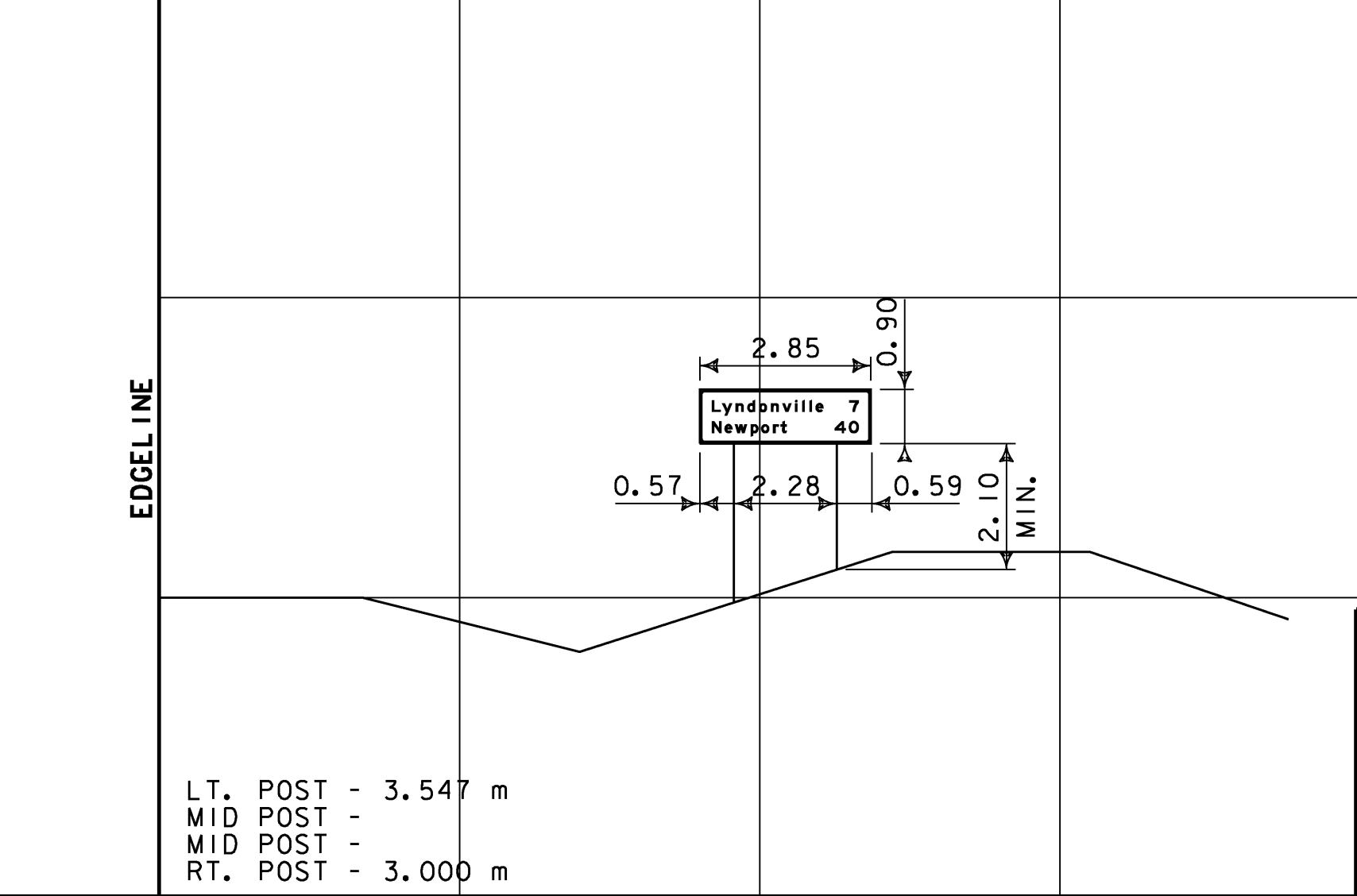
M.M. 136.300 NB



M.M. 131.908 NB



M.M. 133.590 NB

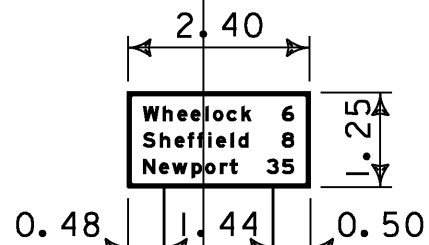


SIGN CROSS SECTION SHEET 2	PROJECT NAME: ST. JOHNSBURY-LYNDON	
	PROJECT NUMBER: HES 091-3(42)	
	FILE NAME: 9721la-xs.dgn	PLOT DATE: 1/4/2007
	PROJECT LEADER: CRB	DRAWN BY: HJC
	DESIGNED BY: DAM	CHECKED BY: DAM
	CLD REF. NO.: 97-0211	SHEET 72 OF 130

M.M. 138.300 NB

CABLE GUARDRAIL

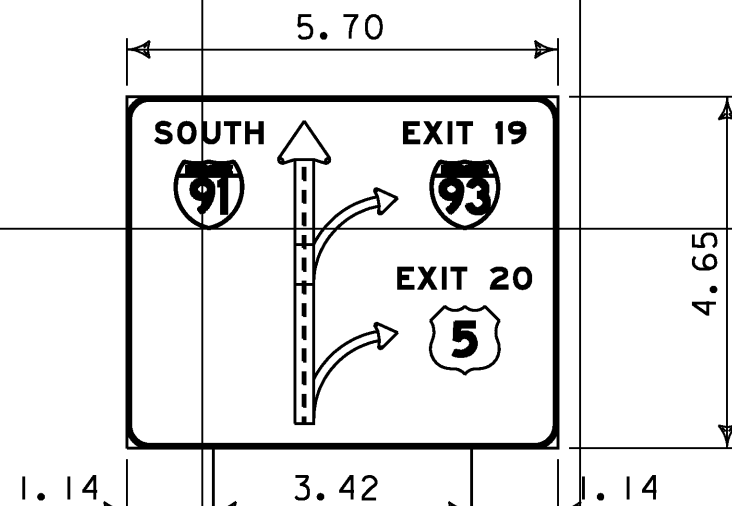
EDGE LINE



LT. POST - 4.094 m
MID POST -
MID POST -
RT. POST - 3.690 m

M.M. 129.564 SB

EDGE LINE

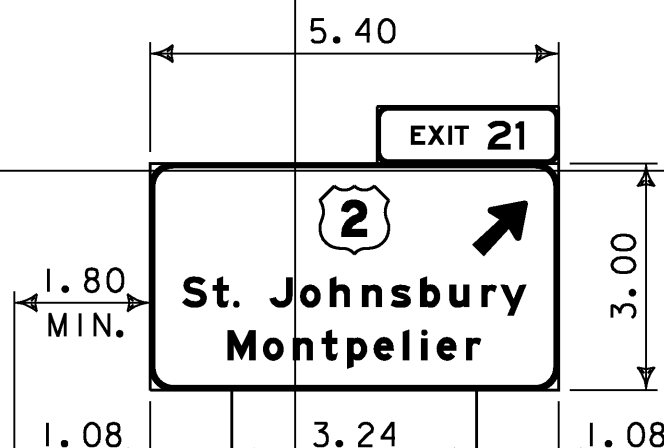


LT. POST - 7.742 m
MID POST -
MID POST -
RT. POST - 6.923 m

M.M. 130.750 SB

STEEL BEAM GUARDRAIL

EDGE LINE

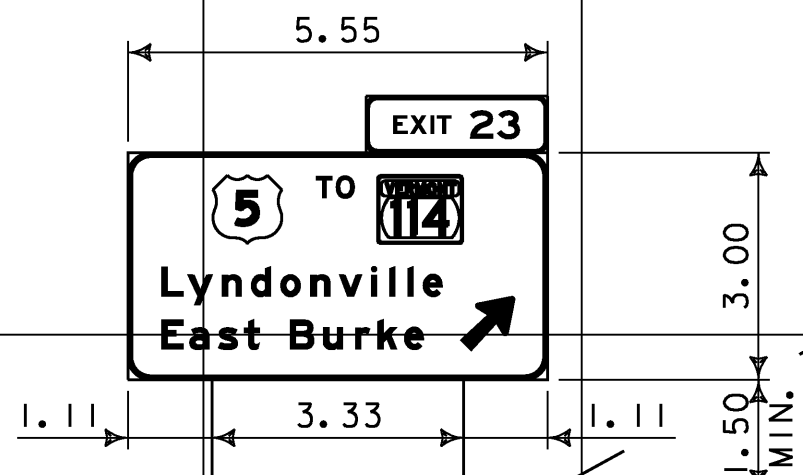


LT. POST - 6.510 m
MID POST -
MID POST -
RT. POST - 8.194 m

SEE FOOTING DETAIL ON SHEET 3.

M.M. 136.820 NB

EDGE LINE



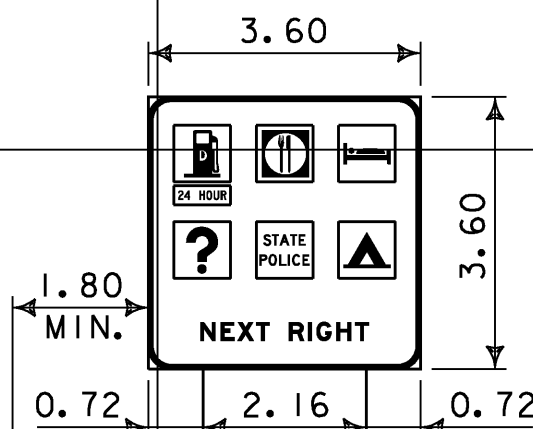
LT. POST - 7.027 m
MID POST -
MID POST -
RT. POST - 5.111 m

SEE FOOTING DETAIL ON SHEET 3.

M.M. 129.400 SB

STEEL BEAM GUARDRAIL

EDGE LINE

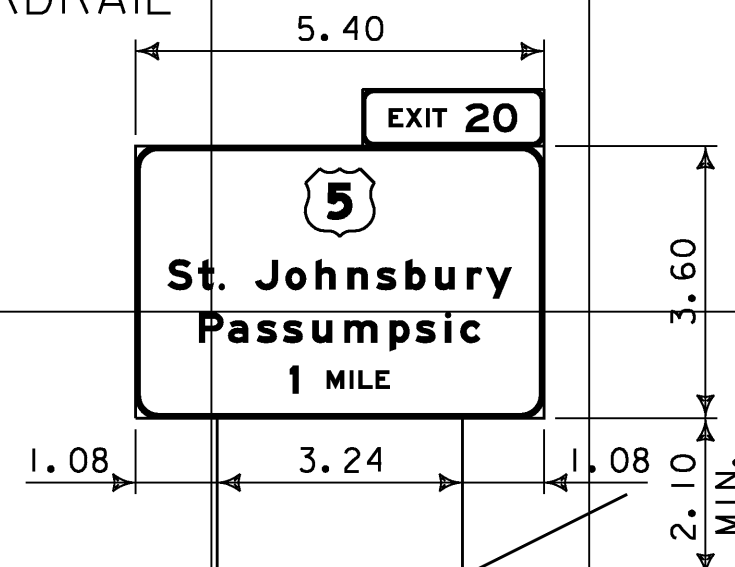


LT. POST - 6.470 m
MID POST -
MID POST -
RT. POST - 6.492 m

M.M. 129.920 SB

STEEL BEAM GUARDRAIL

EDGE LINE

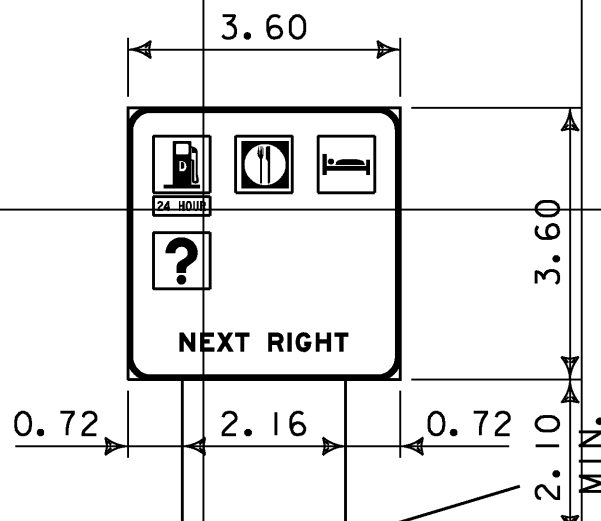


LT. POST - 7.320 m
MID POST -
MID POST -
RT. POST - 5.700 m

SEE FOOTING DETAIL ON SHEET 3.

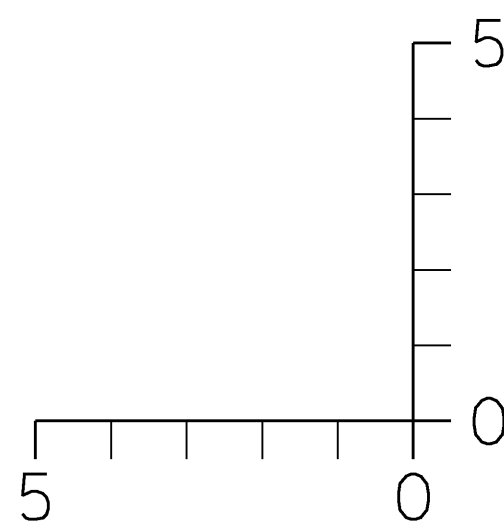
M.M. 136.612 NB

EDGE LINE



LT. POST - 6.469 m
MID POST -
MID POST -
RT. POST - 5.700 m

SEE FOOTING DETAIL ON SHEET 3.

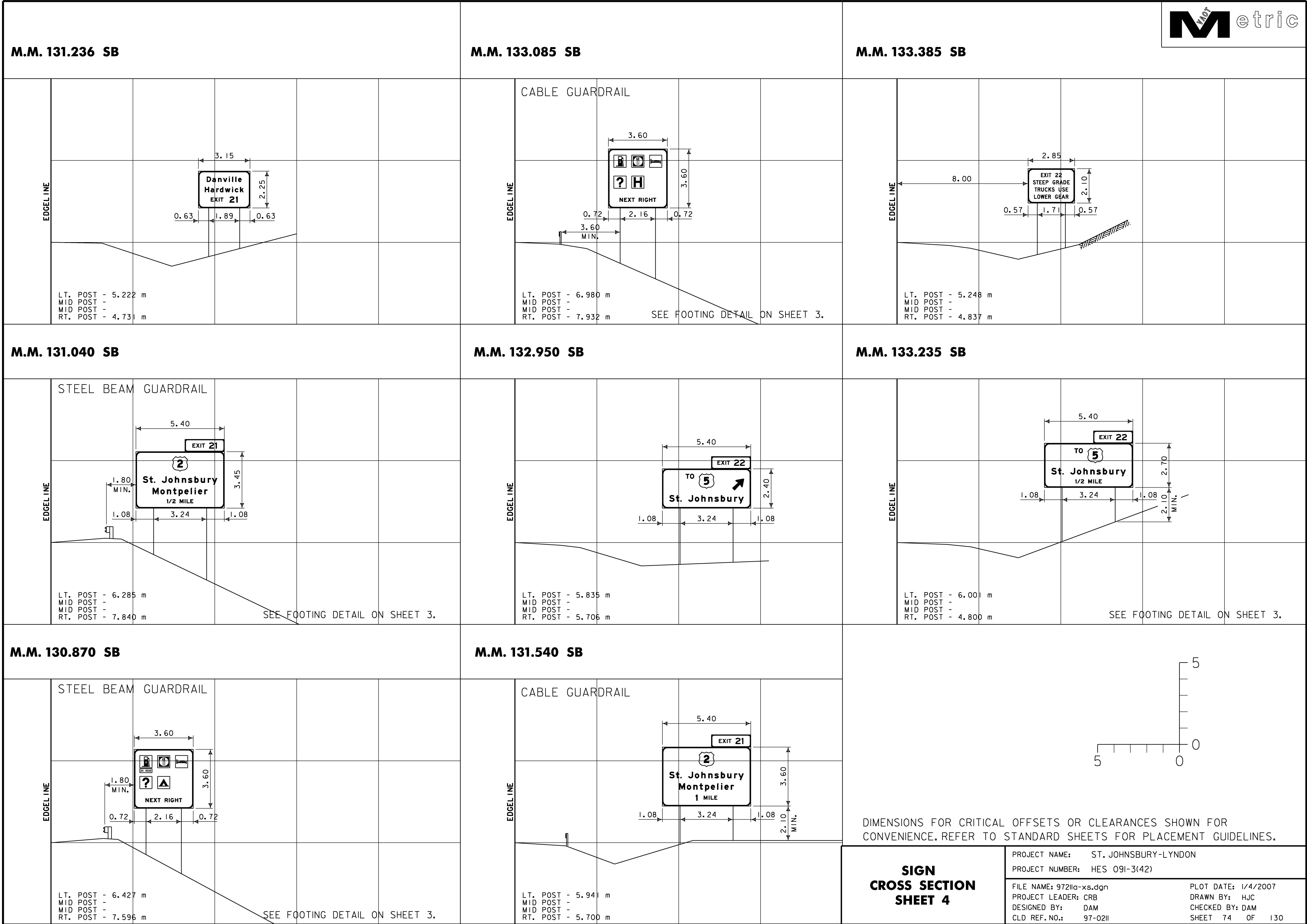


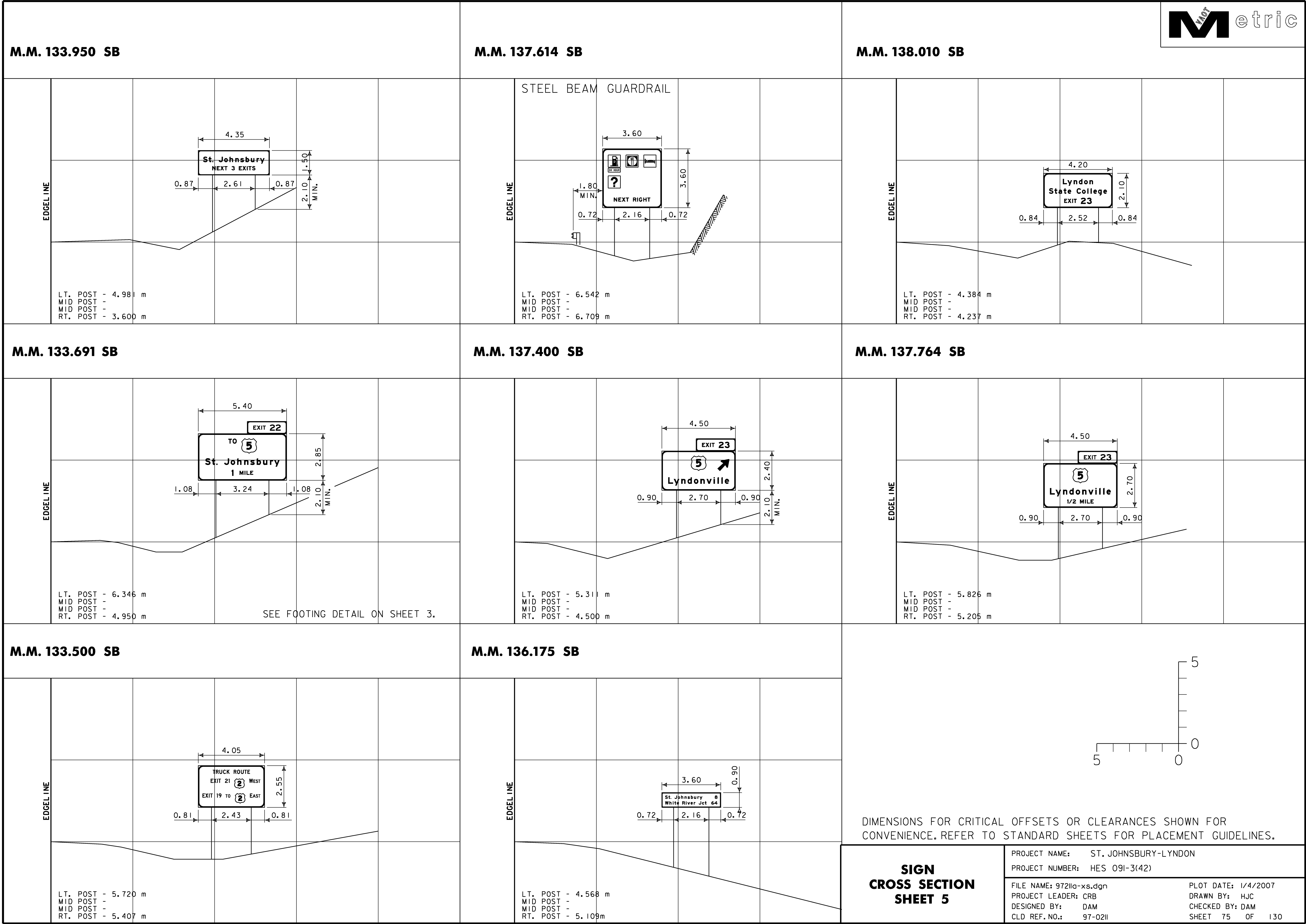
DIMENSIONS FOR CRITICAL OFFSETS OR CLEARANCES SHOWN FOR CONVENIENCE. REFER TO STANDARD SHEETS FOR PLACEMENT GUIDELINES.

**SIGN
CROSS SECTION
SHEET 3**

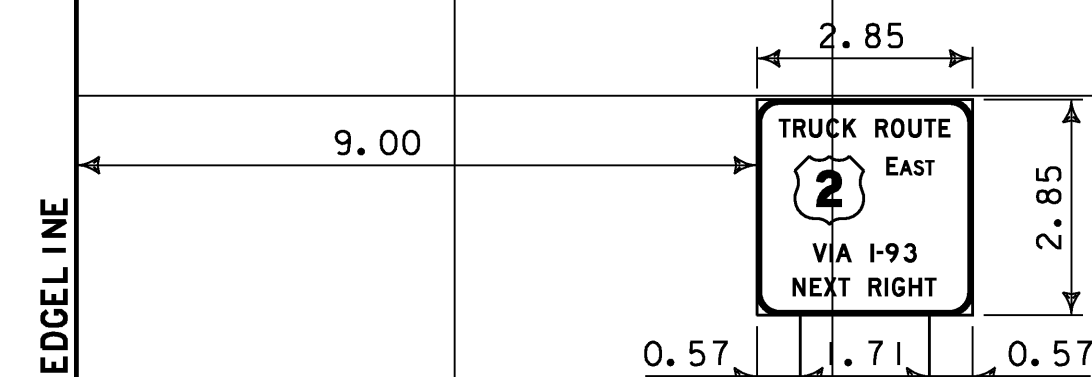
PROJECT NAME: ST. JOHNSBURY-LYNDON
PROJECT NUMBER: HES 091-3(42)

FILE NAME: 9721la-xs.dgn
PROJECT LEADER: CRB
DESIGNED BY: DAM
CLD REF. NO.: 97-0211
PLOT DATE: 1/4/2007
DRAWN BY: HJC
CHECKED BY: DAM
SHEET 73 OF 130



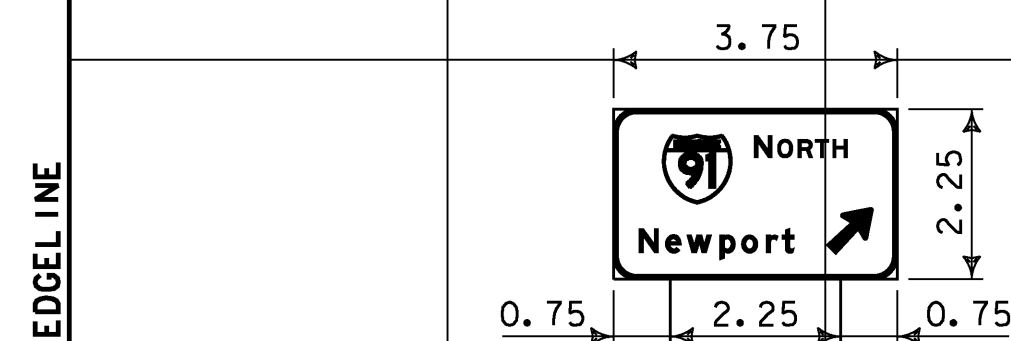


INTERCHANGE 21
ROUTE 2
M.M. 1.530 RT



LT. POST - 5.615 m
MID POST -
MID POST -
RT. POST - 4.964 m

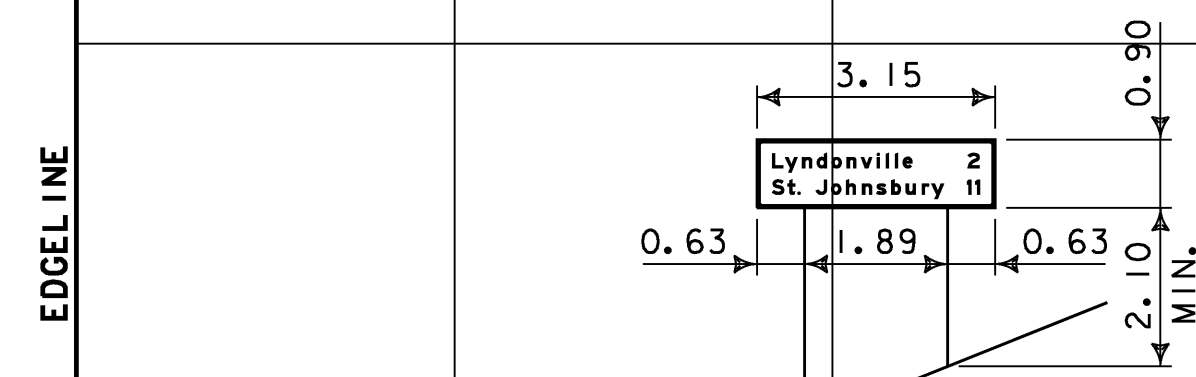
INTERCHANGE 21
ROUTE 2
M.M. 2.258 RT



LT. POST - 5.519 m
MID POST -
MID POST -
RT. POST - 5.002 m

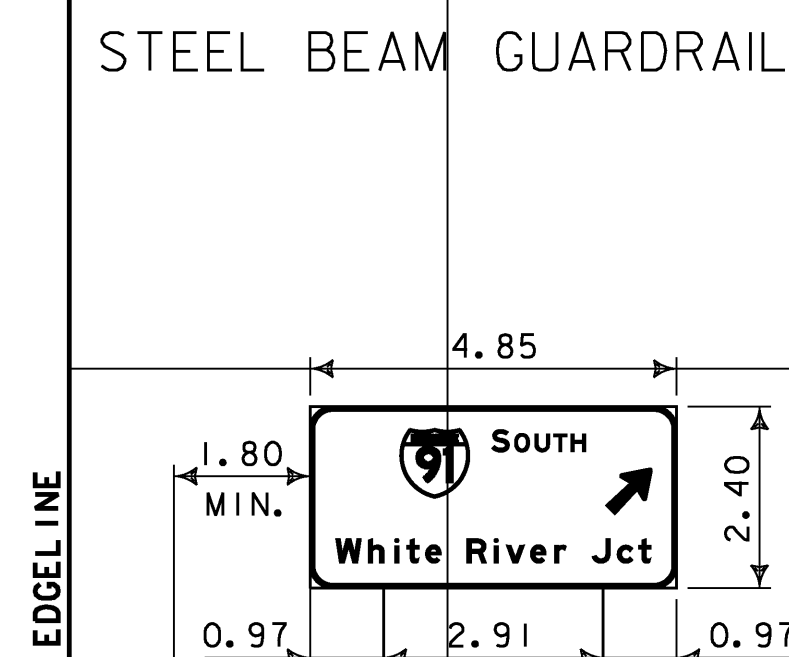


M.M. 139.250 SB



LT. POST - 3.757 m
MID POST -
MID POST -
RT. POST - 3.000 m

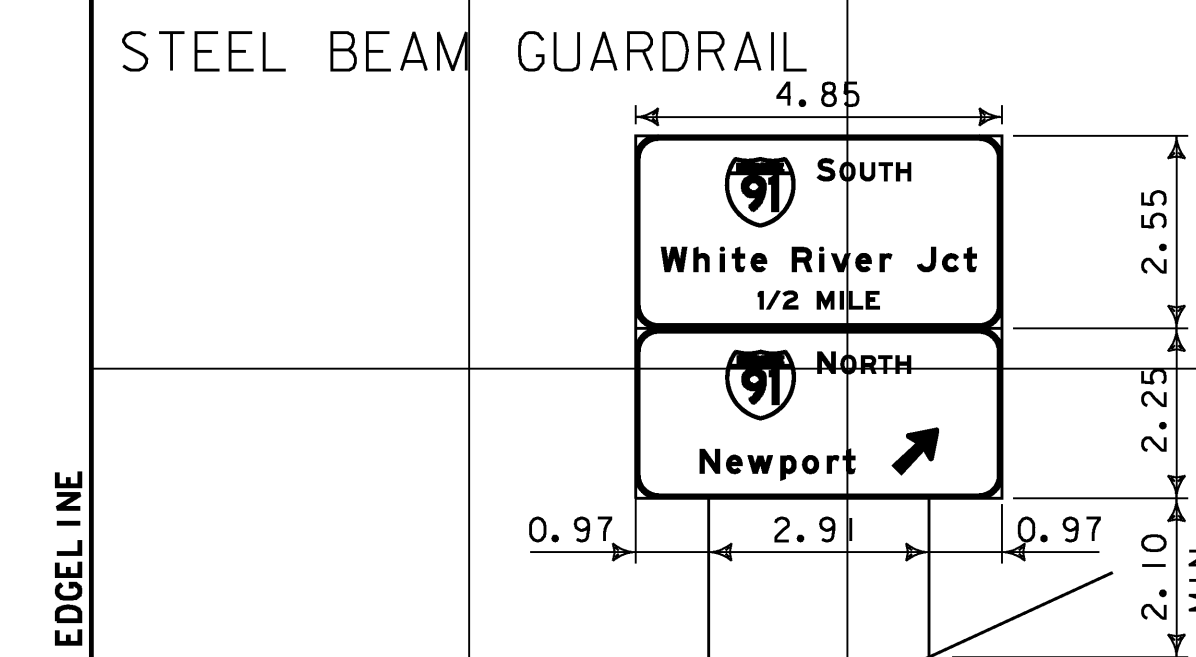
INTERCHANGE 21
ROUTE 2
M.M. 1.870 LT



LT. POST - 6.520 m
MID POST -
MID POST -
RT. POST - 8.500 m

SEE FOOTING DETAIL ON SHEET 3.

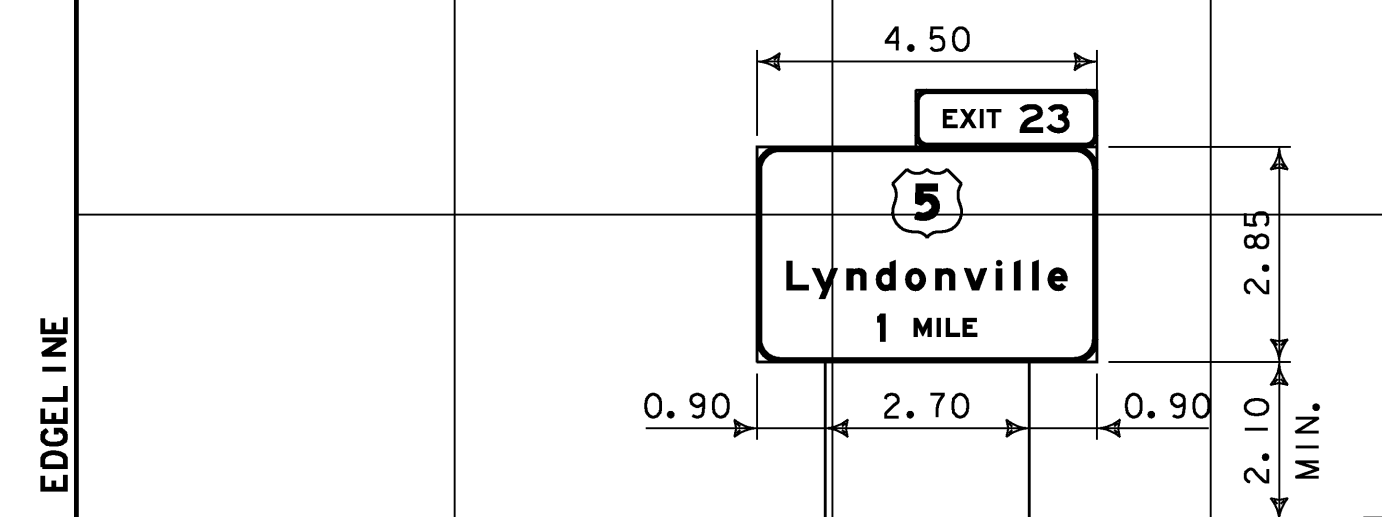
INTERCHANGE 21
ROUTE 2
M.M. 2.267 LT



LT. POST - 8.240 m
MID POST -
MID POST -
RT. POST - 6.900 m

SEE FOOTING DETAIL ON SHEET 3.

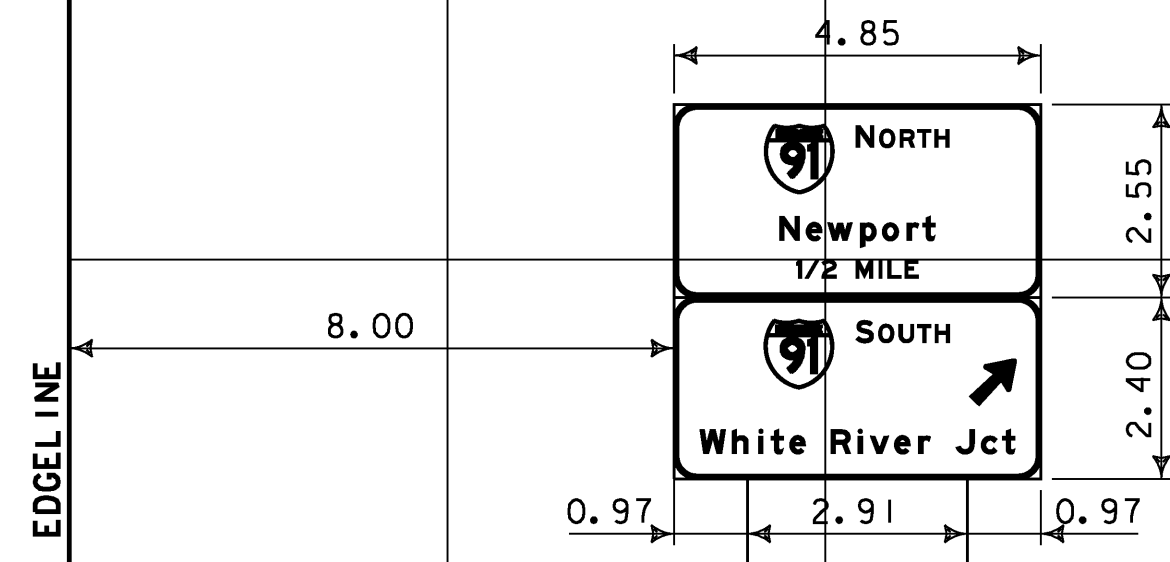
M.M. 138.230 SB



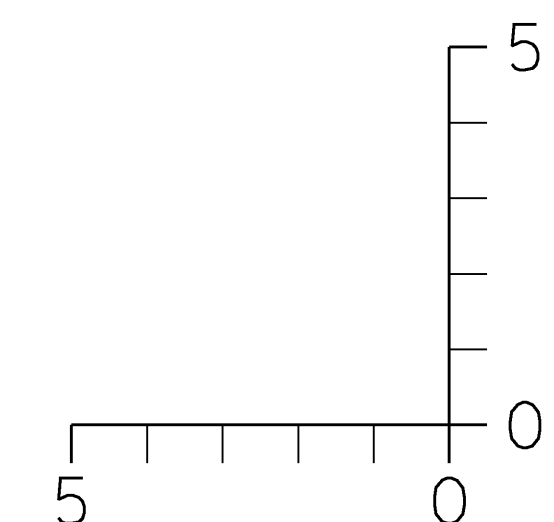
LT. POST - 5.802 m
MID POST -
MID POST -
RT. POST - 4.950 m

SEE FOOTING DETAIL ON SHEET 3.

INTERCHANGE 21
ROUTE 2
M.M. 1.683 RT



LT. POST - 7.807 m
MID POST -
MID POST -
RT. POST - 7.090 m



DIMENSIONS FOR CRITICAL OFFSETS OR CLEARANCES SHOWN FOR CONVENIENCE. REFER TO STANDARD SHEETS FOR PLACEMENT GUIDELINES.

SIGN
CROSS SECTION
SHEET 6

PROJECT NAME: ST. JOHNSBURY-LYNDON
PROJECT NUMBER: HES 091-3(42)

FILE NAME: 9721la-xs.dgn
PROJECT LEADER: CRB
DESIGNED BY: DAM
CLD REF. NO.: 97-0211
PLOT DATE: 1/4/2007
DRAWN BY: HJC
CHECKED BY: DAM
SHEET 76 OF 130

GENERAL NOTES

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION", DATED 2001, WITH CURRENT MODIFICATIONS.
2. OVERHEAD SIGN/SIGNAL SUPPORTS SHALL CONFORM TO AASHTO'S PUBLICATION ENTITLED "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS", DATED 2001 OR ITS LATEST EDITION.
3. ADDITIONAL DESIGN CRITERIA ARE AS FOLLOWS:
- CONCRETE f'_c = 10 MPa f'_c = 25 MPa
REINFORCING f_s = 165 MPa (GRADE 420)
FOOTING SOIL PRESSURE : 145 kPa (MAXIMUM)
- WIND LOAD AND ICE LOAD PER AASHTO "STANDARD SPECIFICATIONS"
4. ANCHOR BOLTS
- FOUR STAINLESS STEEL ANCHOR BOLTS WITH TWO HEXAGON NUTS, ONE WASHER AND ONE LOCK WASHER PER BOLT SHALL BE FURNISHED WITH EACH POLE. ANCHOR BOLT PLATES, WHEN USED, SHALL ALSO BE STAINLESS STEEL. SEE SUB-SECTION 714.09.
5. FLANGE BOLTS
- ALL FLANGE BOLTS AND HEX NUTS SHALL BE HIGH STRENGTH STEEL AND SHALL CONFORM TO ASTM A 325M. THE FLANGE BOLTS SHALL BE CAPABLE OF RESISTING 133% OF THE FULL DESIGN STRESS OF THE TUBE AT ITS YIELD STRENGTH STRESS.
6. HORIZONTAL AND VERTICAL MEMBERS
- STEEL TUBES SHALL BE FORMED AND WELDED WITH ONE CONTINUOUS LONGITUDINAL WELD ONLY. AFTER FORMING AND WELDING THEY SHALL BE COLD ROLLED TO ENSURE UNIFORMITY OF SIZE AND SMOOTHNESS OF WELD. THEY SHALL HAVE A MINIMUM YIELD STRENGTH OF 330 MPa. THERE SHALL BE NO TRANSVERSE WELDING EXCEPT AT THE FLANGE CONNECTIONS AND POLE BASE PLATES, WHERE THE TUBES SHALL TELESCOPE THE FLANGES AND PLATES AND BE CONTINUOUSLY WELDED BOTH SIDES INSIDE AND OUT TO WITHSTAND THE FULL TRANSFER OF THE BENDING STRENGTH TO THE BOLTS.
7. GALVANIZING
- ALL STEEL COMPONENTS, EXCEPT CONCRETE REINFORCING AND STAINLESS STEEL HARDWARE, ARE TO BE HOT DIPPED GALVANIZED AFTER FABRICATION. THE ASSEMBLIES SHALL BE DESIGNED AND FABRICATED TO PERMIT GALVANIZING ON ALL INTERIOR AND EXTERIOR SURFACES AND SHALL BE FREE OF POCKETS AND OTHER STRUCTURAL OBSTRUCTIONS THAT WILL NOT PERMIT PROPER DEPOSITION OF ZINC COATING. GALVANIZING SHALL BE IN ACCORDANCE WITH ASTM A 123 M AND ASTM A 153 M.
8. WELDING
- A. ALL DESIGN DETAILS, WORKMANSHIP, PROCEDURES AND INSPECTION SHALL CONFORM WITH SUB-SECTION 506.10.
- B. ALL WELDS SHALL BE AT LEAST AS STRONG AS THE MATERIAL(S) BEING WELDED.
9. FOOTINGS
- A. FOOTINGS SHALL BE DESIGNED TO RESIST LOADS EQUAL TO, OR GREATER THAN, THE MAXIMUM LOADS THAT THE POLE IS DESIGNED FOR.
- B. THREE TYPES OF FOUNDATIONS, AS OUTLINED IN AASHTO STANDARD SPECIFICATIONS (SEE NOTE 2) SECTION 1.8.2 (C) SHALL BE ALLOWED.
1. DRILLED SHAFTS,
2. SPREAD FOOTINGS AND
3. PILES.
- C. DRILLED SHAFT FOOTINGS SHALL BE POURED IN DRILLED SHAFTS AGAINST UNDISTURBED MATERIAL. THE TOP 600 mm OF SOIL SHALL BE NEGLECTED FOR DESIGN PURPOSES.

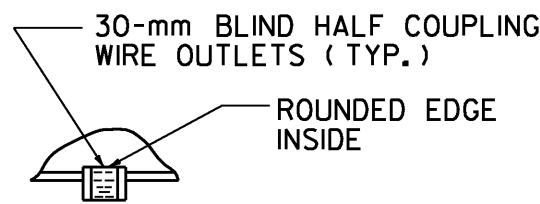
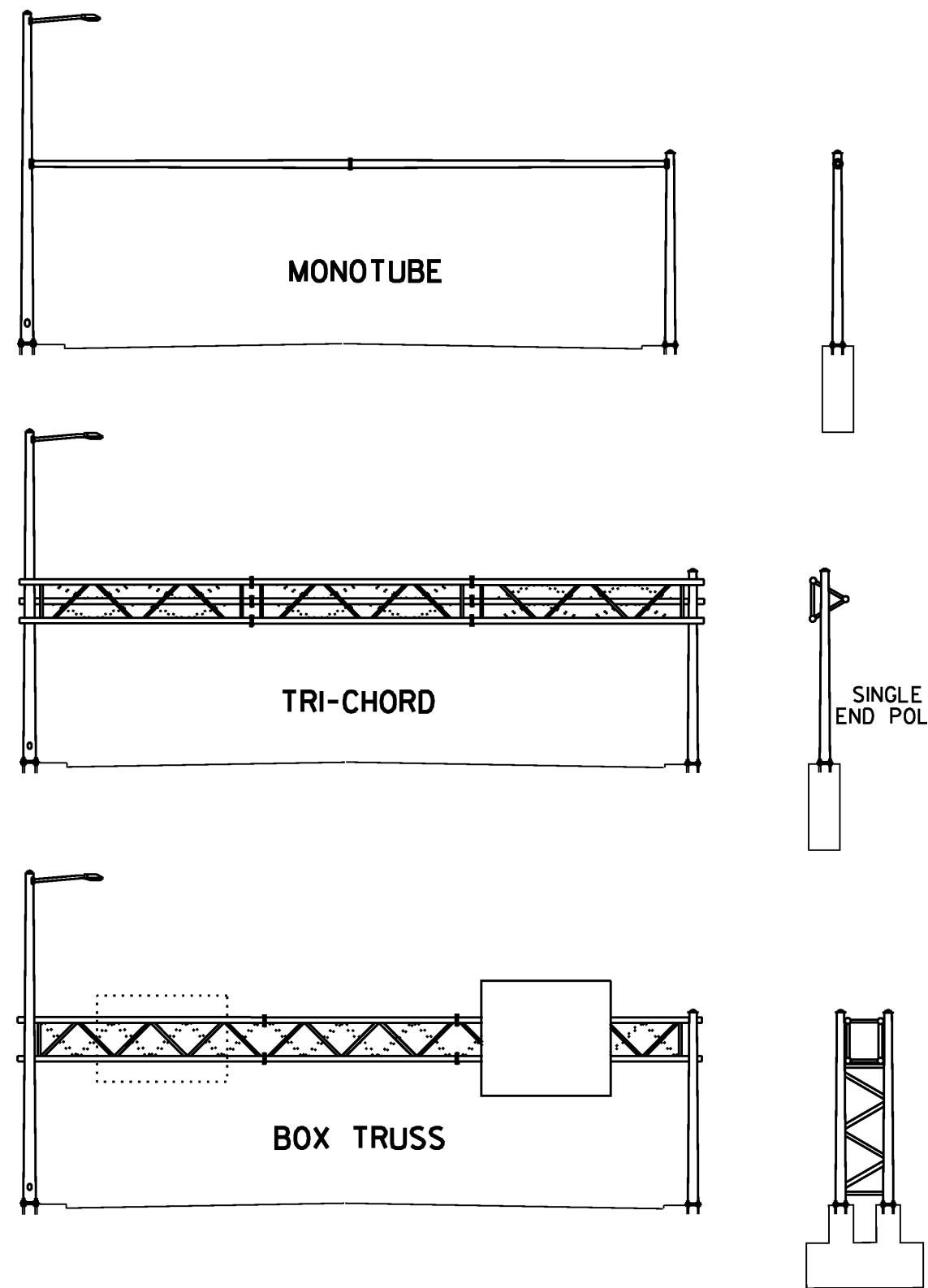
- D. AS AN ALTERNATIVE TO THE DRILLED HOLES, FOOTINGS MAY BE POURED IN EXCAVATED HOLES USING THE PROPER FORMS, WHICH MUST BE REMOVED. THE EXCAVATED HOLES SHALL BE AT LEAST 600 mm CLEAR OF THE FOOTING SIDES AND 300 mm DEEPER THAN THE FOOTING. CARE SHALL BE TAKEN TO AVOID EXCAVATING AROUND THE TOP OF THE FOOTING. THE BACKFILL MATERIAL SHALL BE COMPACTED AS DESCRIBED IN SUB-SECTION 204.12. DESIGN LIMITS AS FOR AUGERED FOOTING APPLY.
- E. WHERE THE DESIGN DEPTH OF A FOOTING CANNOT BE OBTAINED DUE TO UNFORSEEN FIELD CONDITIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND OBTAIN A REVISED FOOTING DETAIL FROM THE ENGINEER.
- F. ANY BACKFILL PLACED ADJACENT TO THE FOOTING SHALL BE GRANULAR MATERIAL MEETING THE REQUIREMENTS FOR GRANULAR BACKFILL FOR STRUCTURES, SUB-SECTION 704.08. CONCRETE FOR FOOTING SHALL CONFORM TO THE REQUIREMENTS OF CONCRETE, CLASS B, SECTION 501, STRUCTURAL CONCRETE. GROUT MATERIAL SHALL BE NON-SHRINKING MORTAR CONFORMING TO SUB-SECTION 707.03 (MORTAR TYPE IV).
- G. SIGNALS/SIGNS SHALL BE INSTALLED AND LEVELED AND POLES SHALL BE PLUMB PRIOR TO PLACING GROUT UNDER POLE BASE.
10. SHOP DRAWINGS (6 COPIES OF EACH) SHALL BE SUBMITTED TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION, STRUCTURES SECTION FOR APPROVAL PRIOR TO FABRICATION. THE SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING INFORMATION:
- A. DETAILED DRAWING OF EACH COMPONENT OF THE STRUCTURE.
- B. MATERIAL SPECIFICATION FOR EACH COMPONENT OF THE STRUCTURE, EITHER BY COMPLETE SPECIFICATION OR REFERENCE TO APPLICABLE ASTM STANDARDS.
- C. NOTATION OF PROJECT NAME, PROJECT NUMBER, ROUTE NUMBER AND STRUCTURE STATIONING (TO BE INCLUDED ON EACH SHEET).
- D. DETAILS FOR LOCATION OF SIGNS/SIGNALS AND ATTACHMENT HARDWARE FOR THE SUPPORT STRUCTURE.
- E. ALL ELEVATIONS AND DIMENSIONS NECESSARY TO PROVIDE A COMPLETE SET OF RECORD PLANS.
- F. DEAD LOAD DEFLECTION AND CAMBER INFORMATION.
- G. WELDING DETAILS AND PROCEDURES ARE REQUIRED FOR ALL WELDS. PROCEDURES SHALL BE SUBMITTED FOR APPROVAL WITH REFERENCE TO EACH WELD IDENTIFIED ON THE SHOP DRAWINGS. (SEE SUB-SECTION 506.10)
11. EACH OVERHEAD TRAFFIC SIGNAL/SIGN SUPPORT SHALL BE GROUNDED. THE GROUND SHALL CONSIST OF:
- A) AN INTERNAL GROUND LUG OPPOSITE THE HAND HOLE;
B) A 13.30 mm² (MIN.) SOFT DRAWN COPPER GROUNDING ELECTRODE CONDUCTOR.
C) A 16 X 2400 (MIN.) COPPER CLAD GROUNDING ELECTRODE. THE RESISTANCE TO GROUND SHALL BE 25 OHMS OR LESS. ADDITIONAL GROUNDING ELECTRODES MAY BE REQUIRED (MINIMUM SPACING SHALL BE 1800 mm).
- WHERE A POWER SERVICE, METER AND DISCONNECT ARE ATTACHED TO A POLE, THERE SHALL BE A CONTINUOUS GROUNDING ELECTRODE CONDUCTOR FROM THE METER AND DISCONNECT WHICH MAY RUN INTERNAL TO THE UPRIGHT, THROUGH THE DN16 FLEXIBLE TUBING IN THE CONCRETE BASE TO THE REQUIRED GROUNDING ELECTRODE(S). THE GROUNDING ELECTRODE CONDUCTOR FROM THE POLE GROUNDING LUG, CONTROLLER CABINET AND/OR LUMINAIRE MAY ATTACH TO THIS CONTINUOUS GROUNDING ELECTRODE CONDUCTOR FROM THE SERVICE METER AND DISCONNECT. THE CONTRACTOR SHALL PERFORM A RESISTANCE TO GROUND TEST ON THE CONTINUOUS GROUNDING ELECTRODE CONDUCTOR FROM THE SERVICE METER AND DISCONNECT AND PROVIDE A WRITTEN STATEMENT TO THE AREA ELECTRICAL INSPECTOR THAT THE GROUNDING ELECTRODE CONDUCTOR IS CONTINUOUS FROM THE SERVICE METER AND DISCONNECT AND THE RESISTANCE TO GROUND IS 25 OHMS OR LESS.
12. THE COST OF SIGNAL/SIGN SUPPORTS, INCLUDING ALL HARDWARE, SIGN BRACKETS, FOOTINGS AND LUMINAIRE ARMS SHALL BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 677.12, 677.13 OR 678.15, WHICHEVER IS APPLICABLE. THESE COMPONENTS SHALL CONFORM TO ALL APPLICABLE PROVISIONS OF SECTIONS 677, 678 AND 679.
13. HORIZONTAL MEMBERS SHALL BE CAMBERED AND THE VERTICAL POLES BACK-RAKED (WHERE APPLICABLE) TO THE ANTICIPATED DEAD LOAD DEFLECTION PLUS THE CAMBER, IF ANY, SPECIFIED ON THE PLANS.

14. AN EQUIVALENT ALTERNATE DESIGN MAY BE SUBSTITUTED FOR THE DETAILS AND MATERIALS SHOWN.
15. THE DETAILS OF DESIGN FOR THE STRUCTURE AND FOOTINGS ARE TO BE SUPPLIED BY THE CONTRACTOR AND/OR BY THE MANUFACTURER. THE STRUCTURE SHALL BE DESIGNED TO RESIST THE MAXIMUM LOADING AS OUTLINED IN THE AASHTO STANDARD SPECIFICATIONS (SEE NOTE 2). ALL DETAILS OF THE STRUCTURE AND THE FOOTING SHALL BE CHECKED AND STAMPED BY A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF VERMONT PRIOR TO SUBMITTAL OF THE SHOP DRAWINGS TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION.
16. IN ADDITION TO THE SHOP DRAWINGS OUTLINED IN NOTE 10, THE CONTRACTOR SHALL SUBMIT ALL DESIGN CALCULATIONS TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION, STRUCTURES SECTION, SHOWING THE FOLLOWING INFORMATION FOR EACH OF THE VERTICAL AND HORIZONTAL COMPONENTS OF THE STRUCTURE AND FOOTING:
- A. THE DESIGN AXIAL AND SHEAR FORCES AND BENDING AND TORSIONAL MOMENTS.
- B. THE DESIGN AXIAL, BENDING AND SHEAR STRESSES AND THE COMBINED STRESS RATIO.
- C. VIBRATION AND FATIGUE CALCULATIONS AS SET FORTH IN SECTION 9 OF THE AASHTO PUBLICATION REFERENCED IN NOTE 2.
- D. THE ALLOWABLE AXIAL, BENDING, AND SHEAR STRESSES.
- E. ITEMS A, B AND D SHALL BE SHOWN FOR EACH OF THE GROUP LOADINGS (I, II AND III) AND FOR THE BASIC WIND LOAD APPLIED TO THE TWO CASES OUTLINED IN THE AASHTO STANDARD SPECIFICATIONS (SEE NOTE 2) SECTION 1.2.5 (D)(4).
- F. FAILURE TO SUPPLY THE PROPER DESIGN INFORMATION SHALL BE CAUSE FOR REJECTION OF THE STRUCTURE.
- G. A MINIMUM OF FOUR (4) WEEKS SHALL BE REQUIRED FOR REVIEW BY THE STATE OF VERMONT AGENCY OF TRANSPORTATION STRUCTURES ENGINEER IN ACCORDANCE WITH SUBSECTION 105.03.
17. THE CONTRACTOR/MANUFACTURER SHALL BE RESPONSIBLE FOR COMPLETION OF THE STRUCTURE AND FOOTING DATA ON THE DETAIL SHEET(S).
18. FOR INSTALLATIONS WHERE BOTH "EXISTING" AND "FUTURE" CONDITIONS ARE SHOWN, THE SUPPORTS SHALL BE DESIGNED FOR THE MORE SEVERE OF THE TWO LOADING CONDITIONS. THE INFORMATION OUTLINED IN NOTE 16 ABOVE SHALL BE PROVIDED FOR BOTH THE LOADING CONDITIONS.
19. NOT USED.
20. BASE PLATES SHALL BE STAMPED WITH THE VERTICAL POLE DIAMETER, HEIGHT, YIELD STRENGTH, GAUGE AND THE HORIZONTAL MEMBER DIAMETER, LENGTH, YIELD STRENGTH AND GAUGE. ALTERNATELY, THE INFORMATION MAY BE STAMPED ON A METAL TAG RIVETED TO THE POLE NEAR THE HANDHOLE.

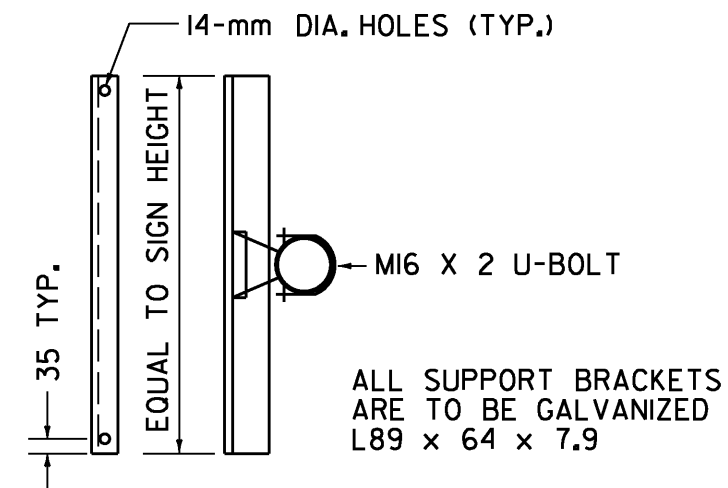
NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

ORIGINAL PREPARED - JUNE 13, 1997		
DATE	REVISIONS	BY
CANTILEVER / OVERHEAD SIGN SUPPORT NOTES		
PREPARED BY _____ DATE _____		
CHECKED BY _____ DATE _____		
DESIGN SUPERVISOR _____ DATE _____		
PROJ. _____		
TRAFFIC SHEET NO. _____ OF _____		
SHEET 77 OF 130 SHEETS		



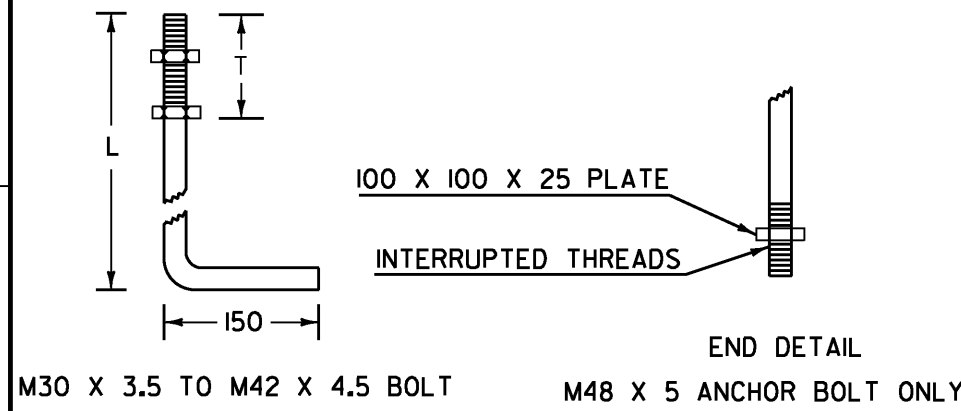


DETAIL A

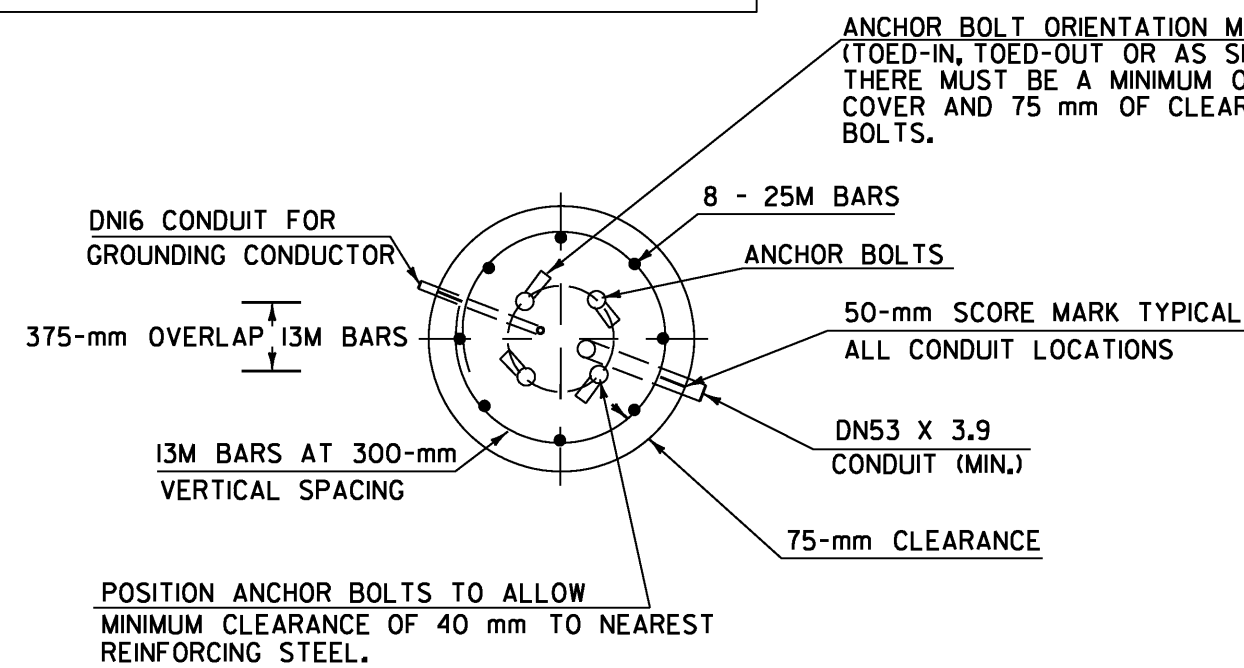


SIGN BRACKET DETAILS

ANCHOR BOLT DETAIL		
SIZE	L (mm)	T (mm)
M30 X 3.5 X 1200	1050	200
M36 X 4 X 1500	1350	230
M42 X 4.5 X 2250	2100	230
M48 X 5 X 2400	2400	230



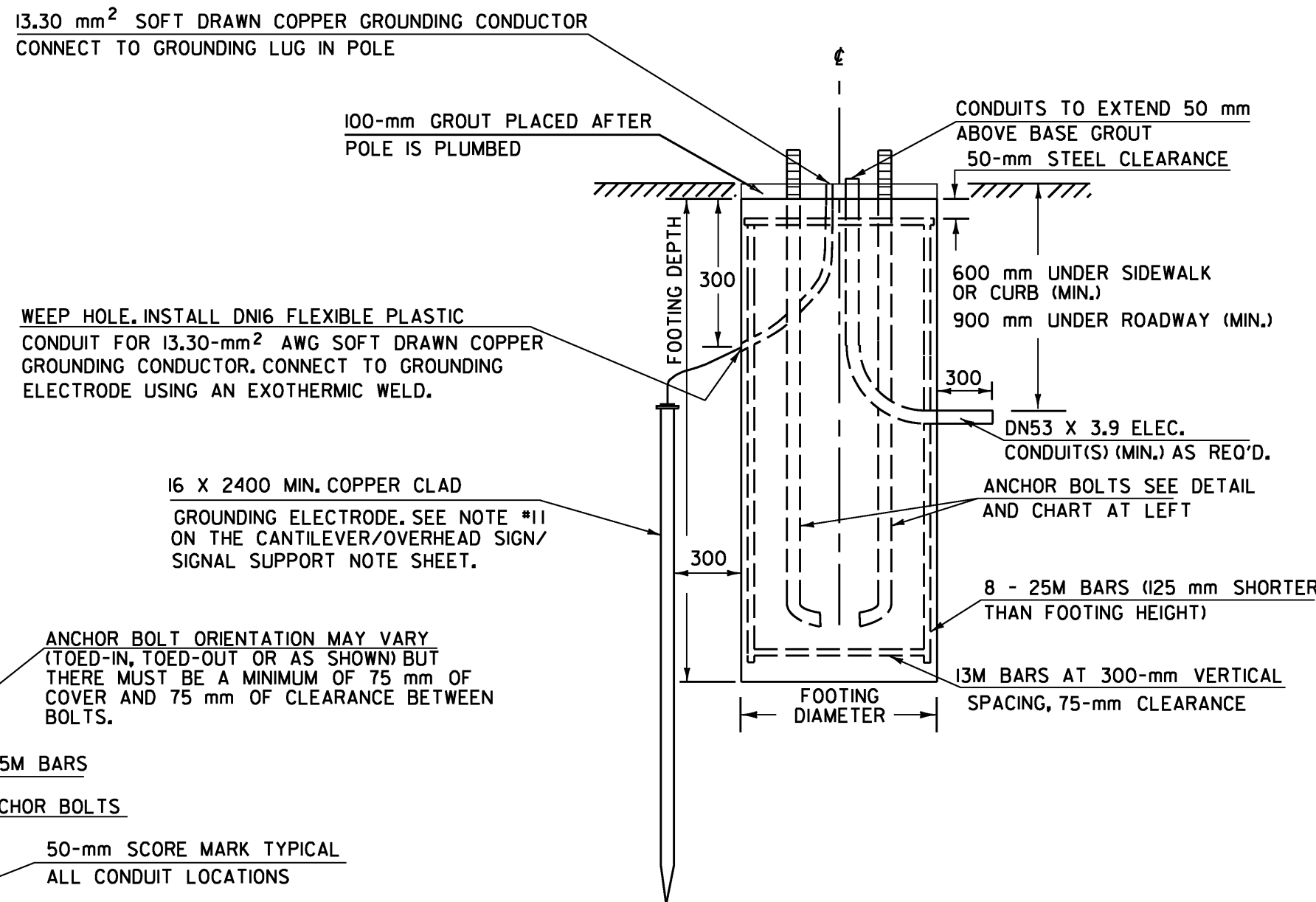
ANCHOR BOLT DETAIL



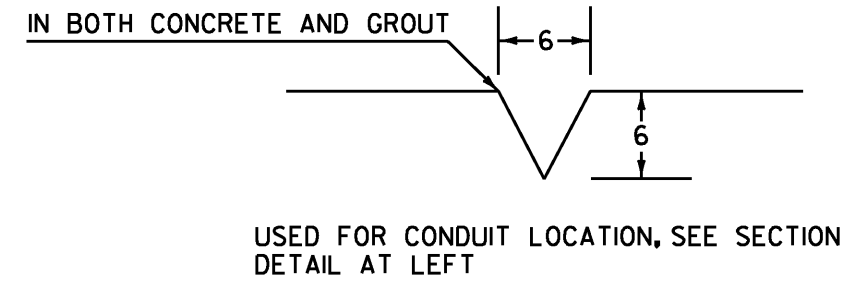
SECTION

OVERHEAD TRAFFIC SIGN BRIDGE FOOTING DETAIL

(SPREAD FOOTINGS OR PILES ARE OPTIONAL)



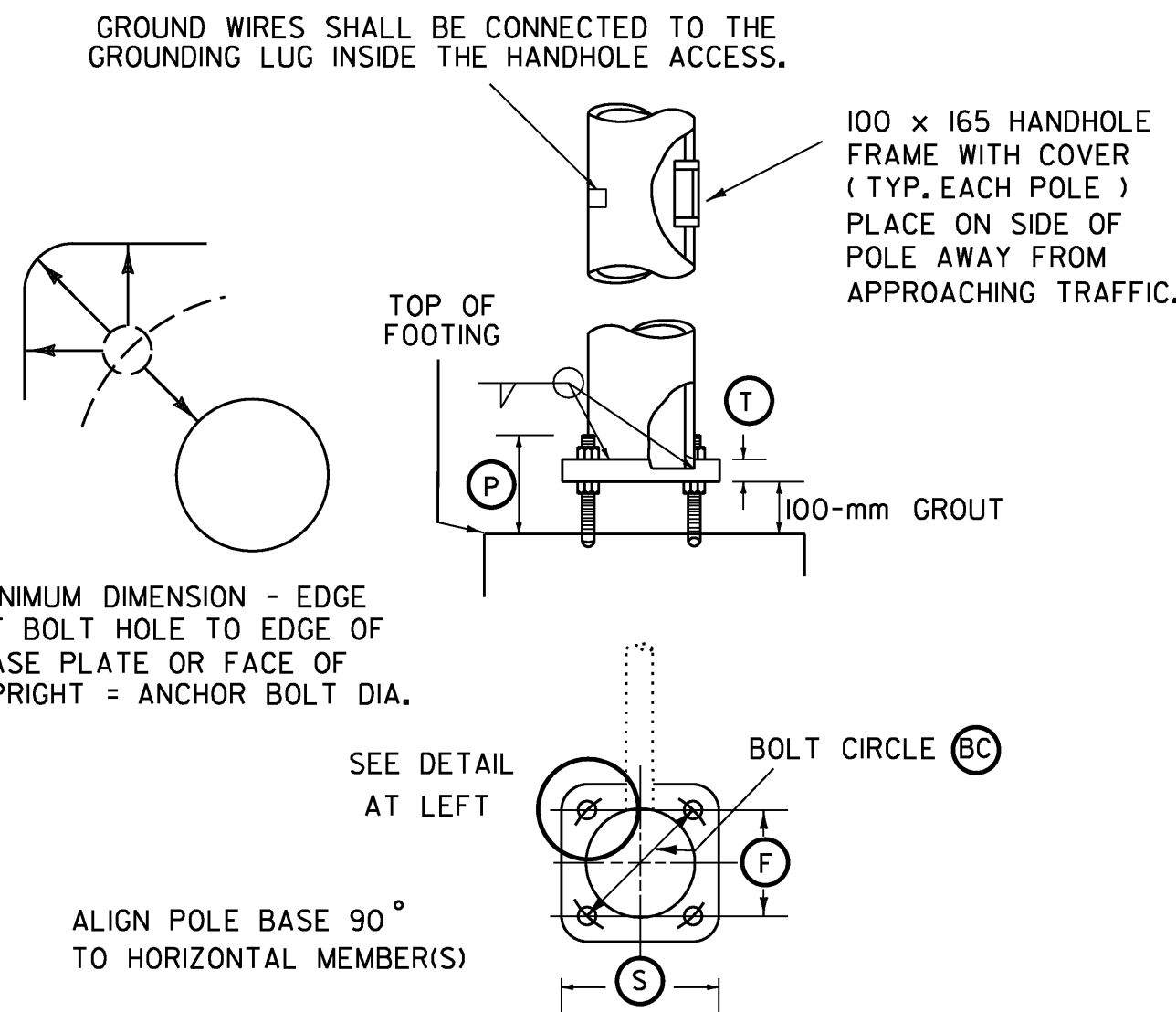
ELEVATION



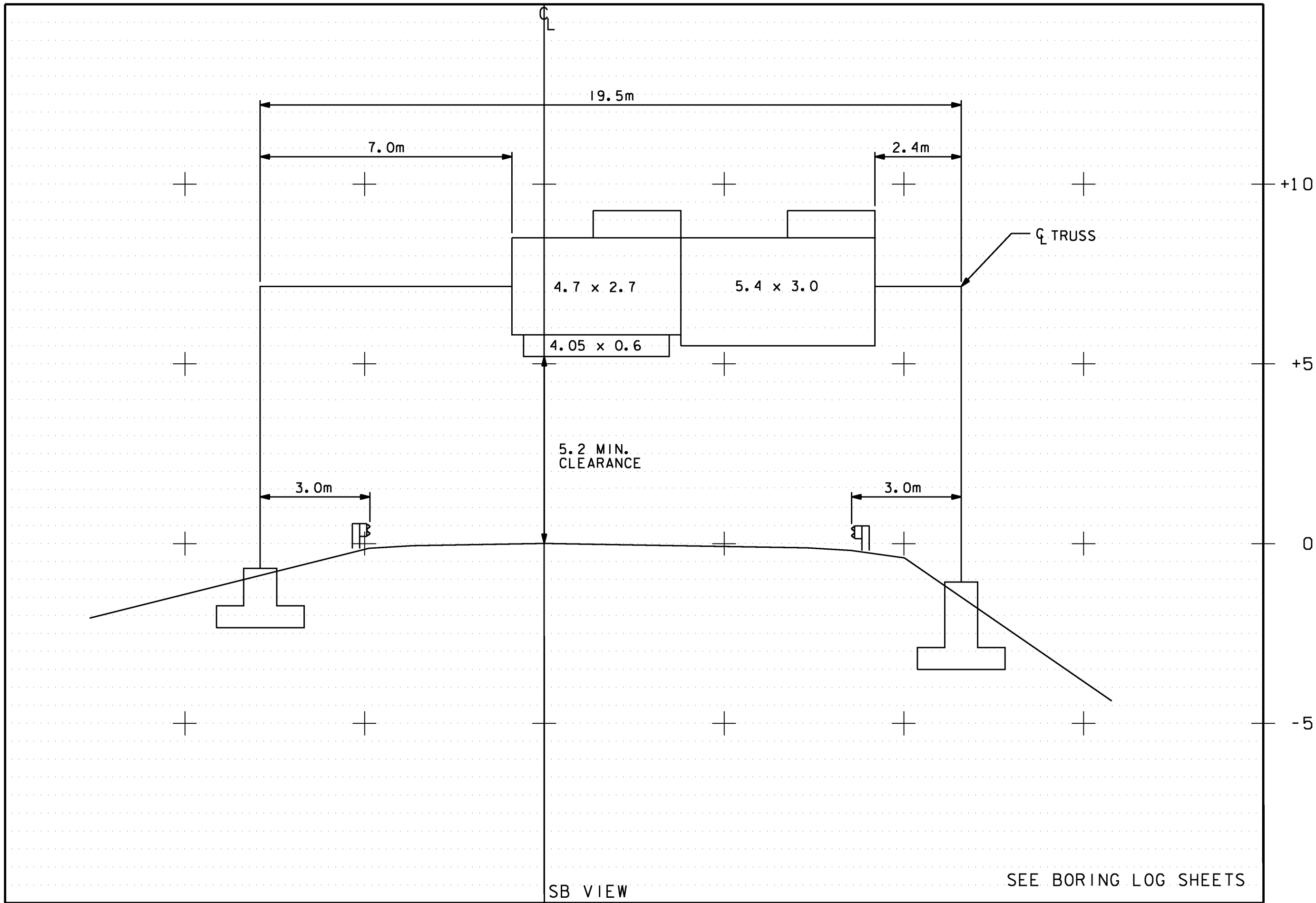
50-mm SCORE MARK DETAIL

NOTES:

1. SEE CANTILEVER / OVERHEAD SIGN / SIGNAL SUPPORTS NOTE SHEET FOR ADDITIONAL INFORMATION.
2. MANUFACTURER TO DETERMINE TYPE OF STRUCTURE REQUIRED.
3. MONOTUBES SHALL NOT BE USED FOR SIGNS OVER 3 m IN HEIGHT.
4. STREET LIGHTING IS OPTIONAL. SEE PLAN SHEETS OR SECTION.
5. MINIMUM CLEARANCE FROM SIGNS TO ROADWAY IS 5.2 m.

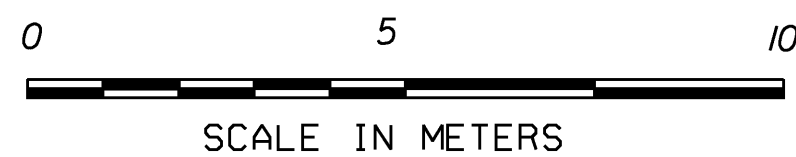


POLE BASE AND BASE PLATE DETAIL



(SEE SHEET 18 FOR LOCATION PLAN)

OVERHEAD SIGN BRIDGE CROSS SECTION



NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

DATE	REVISIONS	BY

OVERHEAD TRAFFIC SIGN BRIDGE / FOOTING DETAIL SHEET

PREPARED BY _____ DATE _____
CHECKED BY _____ DATE _____
DESIGN SUPERVISOR _____ DATE _____
PROJ. **M.M. 129.130 SB**
TRAFFIC SHEET NO. _____ OF _____
SHEET 78 OF 130 SHEETS



NOT TO SCALE

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH DIVISION SUBSURFACE INFORMATION				HOLE NO.: B-6 SHEET 1 OF 1 DATE STARTED: 6/25/02 DATE COMPLETED: 6/25/02						
PROJECT NAME: St. JOHNSBURY - LYNDON SITE NAME: OVERHEAD SIGNS STATION: MM 129.130 SOUTHBOUND GROUND EL.: NA				PROJECT NUMBER: HES 091-3 (42) SITE NO.: I-91 OFFSET: LEFT SIDE G.W. DEPTH:						
BORING CREW CREW CHIEF: YOUNG DRILLER: YOUNG LOGGER: SOMERS				BORING RIG: TRACK RIG BORING TYPE: WASH BORE SAMPLE TYPE: SPLIT BARREL						
DEPTH	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. %	GRAVEL %	SAND %	FINES %	LL	PI	
		A-4, SaSi, brn, Dry, Rec. = 1.4'	3	15.9	8.1	44.4	47.5			Grass & roots were within sample.
		A-4, SaSi, brn, Moist, Rec. = 0.9'	3	27.4	0.1	35.7	64.2			
5		No Rec.	6							
		A-2-4, SiSaGr, brn-gry, Moist, Rec. = 0.65'	40	18.1	37.1	32.1	30.8			
10		NXDC, 8.0'-11.0', Boulders								
15		NXDC, 14.0'-17.0', Boulders								
20		NXDC, 19.0'-21.0', Boulders								
25		Visual Class: Asphalted Compound, blk, Dry Rec. = 0.65'	6							
30		A-2-4, Sa, brn, Moist, Rec. = 0.25'	R	13	2.2	80.9	16.9			
		Hole stopped @ 32.0'								
35										
40										
45										

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH DIVISION SUBSURFACE INFORMATION				HOLE NO.: B-7 SHEET 1 OF 1 DATE STARTED: 6/26/02 DATE COMPLETED: 6/26/02						
PROJECT NAME: St. JOHNSBURY - LYNDON SITE NAME: OVERHEAD SIGNS STATION: MM 129.130 SOUTHBOUND GROUND EL.: NA				PROJECT NUMBER: HES 091-3 (42) SITE NO.: I-91 OFFSET: RIGHT SIDE G.W. DEPTH: 21.0 (6/26/02)						
BORING CREW CREW CHIEF: YOUNG DRILLER: YOUNG LOGGER: SOMERS				BORING RIG: TRACK RIG BORING TYPE: WASH BORE SAMPLE TYPE: SPLIT BARREL						
DEPTH	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. %	GRAVEL %	SAND %	FINES %	LL	PI	
		Visual Class: Topsoil, brn, Moist, Rec. = 0.5'	5							
		A-4, SaSi, brn, Moist, Rec. = 1.1'	9	21.5	7.6	42.7	49.7			
5		A-2-4, SiSa, brn, Moist, Rec. = 1.1'	10	18.1	6.2	64.9	28.9			
		A-1-b, SaSiGr, brn, Moist Rec. = 0.65'	17	11.9	56.7	21.4	21.9			
		A-1-a, Gr, gry, Moist, Rec. = 0.60' Sample had a small	30	7.7	79.3	9.7	11			section of si ty clay.
10		NXDC, 10.0'-12.0', Boulders								
15		NXDC, 13.75'-16.75', Boulders								
20		NXDC, 18.25'-20.0', Cleaned out casing								
		A-1-b, SaGr, brn-gry, Moist, Rec. = 0.9'	44	10.1	44.7	43.7	11.6			
25		A-2-4, SiSaGr, brn-gry, Moist, Rec. = 1.33'	80	18.6	40.3	33.2	26.5			
30		A-2-4, Sa, gry-brn, Moist, Rec. = 1.2'	47	14.2	17.1	66.5	16.4			
		Hole stopped @ 32.0'								
35		Drillers's Notes: Ground water elevation was 21.0' before casing was pulled (06/26/02).								
40										
45										

BORING LOG

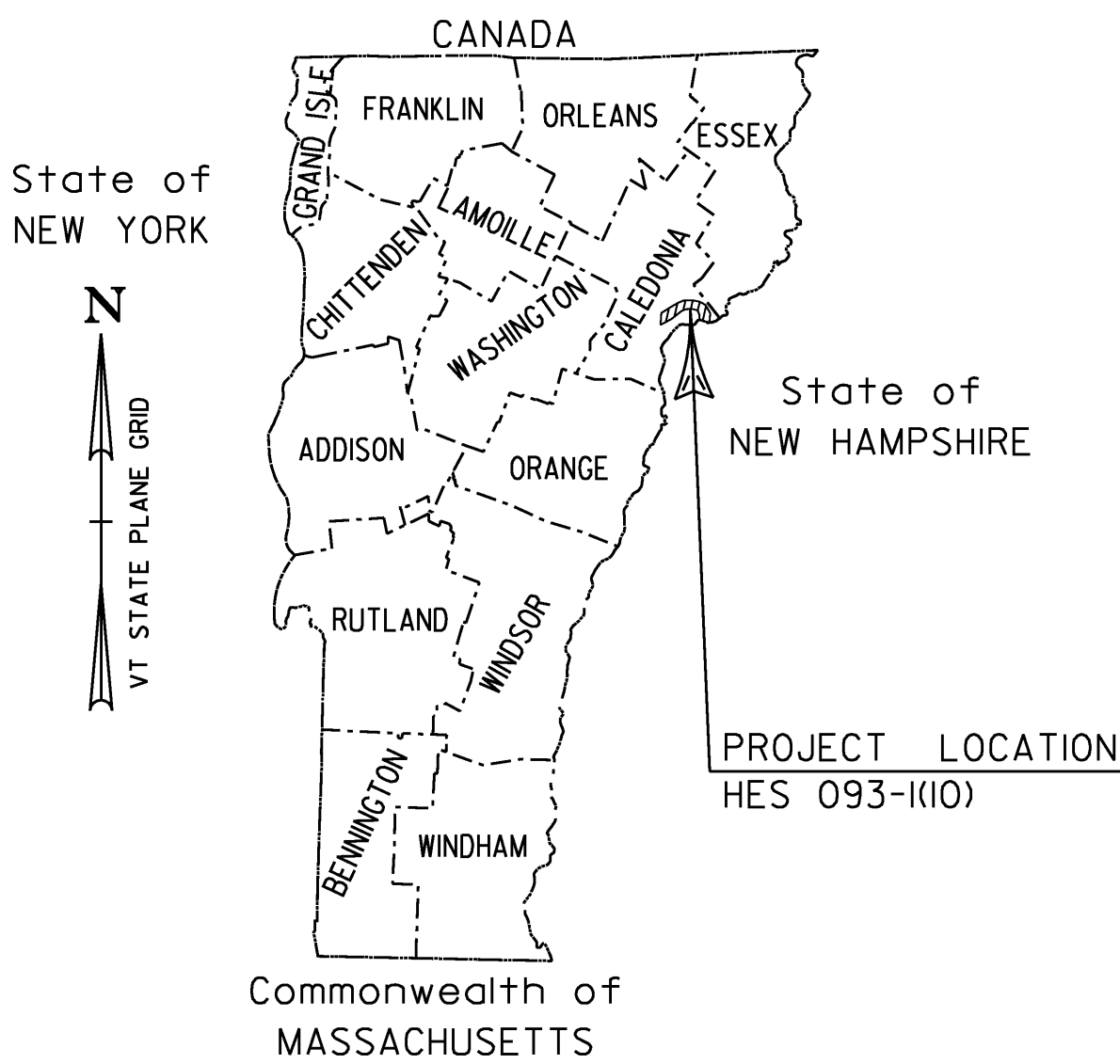
SHEET #1

SURVEYED BY	J. TOUCHETTE	DATE	07/02
DRAWN BY	C. C. BENDA	DATE	07/02
SQUAD LEADER			
DESIGN FILE NO.	/M&R/87a023/ma023bor.dgn		
IPARM FILE		DATE	1/4/2007
PROJ. NAME	St. JOHNSBURY - LYNDON		
PROJ. NO.	HES 091-3 (42)		
SHEET	79	OF	130 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
TOWN OF WATERFORD
COUNTY OF CALEDONIA



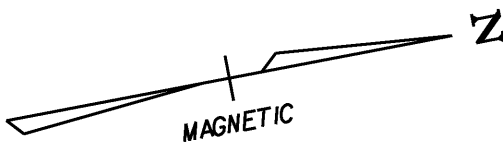
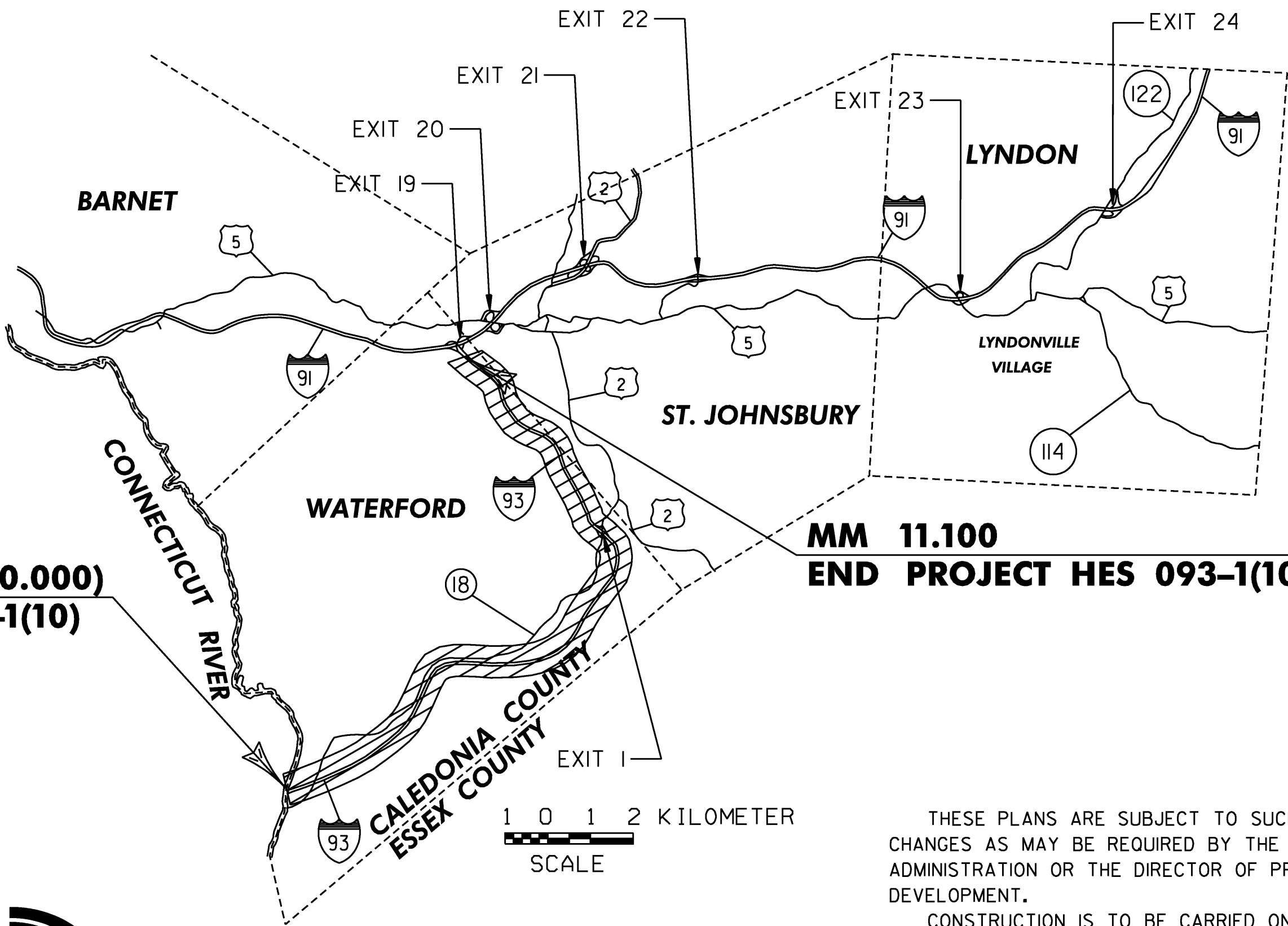
INTERSTATE ROUTE 93 (HES 093-1(10)) - SIGNS

BEGINNING AT A POINT AT THE NEW HAMPSHIRE / VERMONT STATE LINE IN THE TOWN OF
WATERFORD AND EXTENDING NORTHERLY APPROXIMATELY 17.86 KM (11.10 MI) TO MM 11.0

LENGTH OF ROADWAY 17 864 METERS = 11.10 MILES = 17.86 KILOMETERS
LENGTH OF PROJECT 17 864 METERS = 11.10 MILES = 17.86 KILOMETERS

WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES REMOVAL OF EXISTING
SIGNS AND PLACEMENT OF NEW SIGNS AND ASSOCIATED ELEMENTS ALONG THE
PROJECT LENGTH, RAMPS, AND INTERCHANGES.

TRAFFIC DATA	
NORTHBOUND	SOUTHBOUND
INTERSTATE 93	
2000 ADT = 4900	2000 ADT = 4900



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	

VT-NH STATE LINE (MM 0.000)
BEGIN PROJECT HES 093-1(10)

MM 11.100
END PROJECT HES 093-1(10)

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 2001, AS APPROVED BY THE
FEDERAL HIGHWAY ADMINISTRATION ON JANUARY 4, 2001
FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT
REVISIONS AND SUCH REVISED SPECIFICATIONS AND
SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE
PLANS.

Metric

UNLESS NOTED OTHERWISE
STATIONS ARE IN MILES
ELEVATIONS ARE IN METERS
DIMENSIONS ARE IN MILLIMETERS

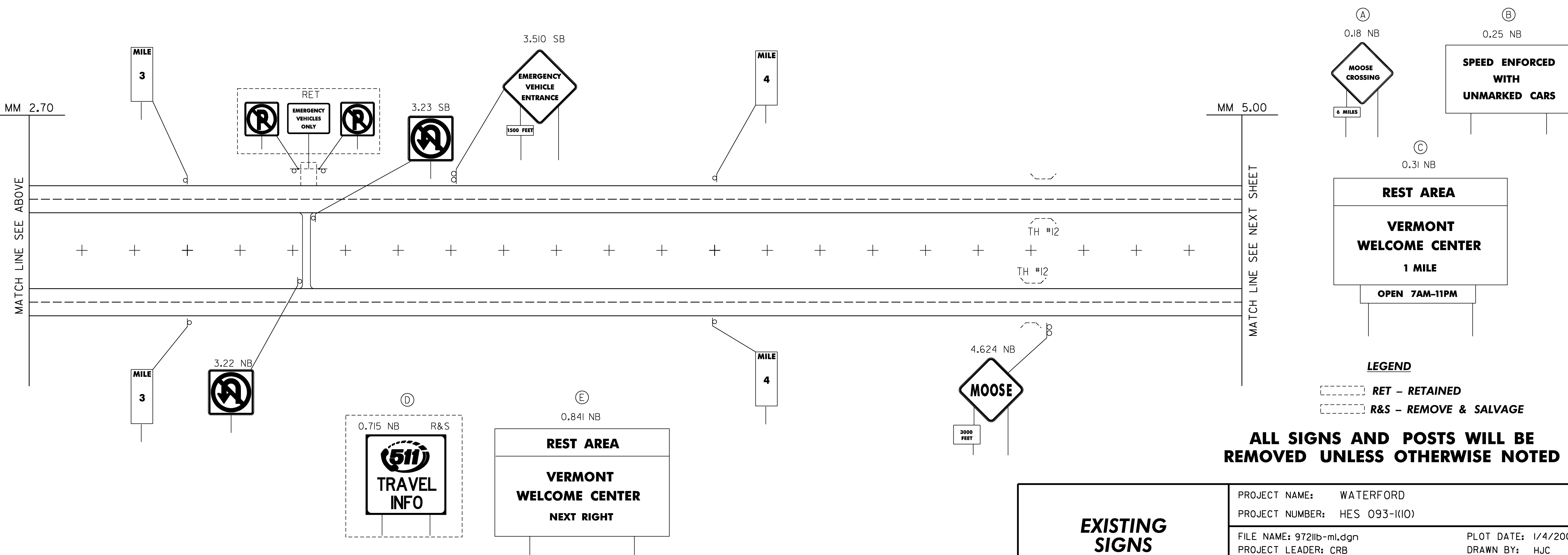
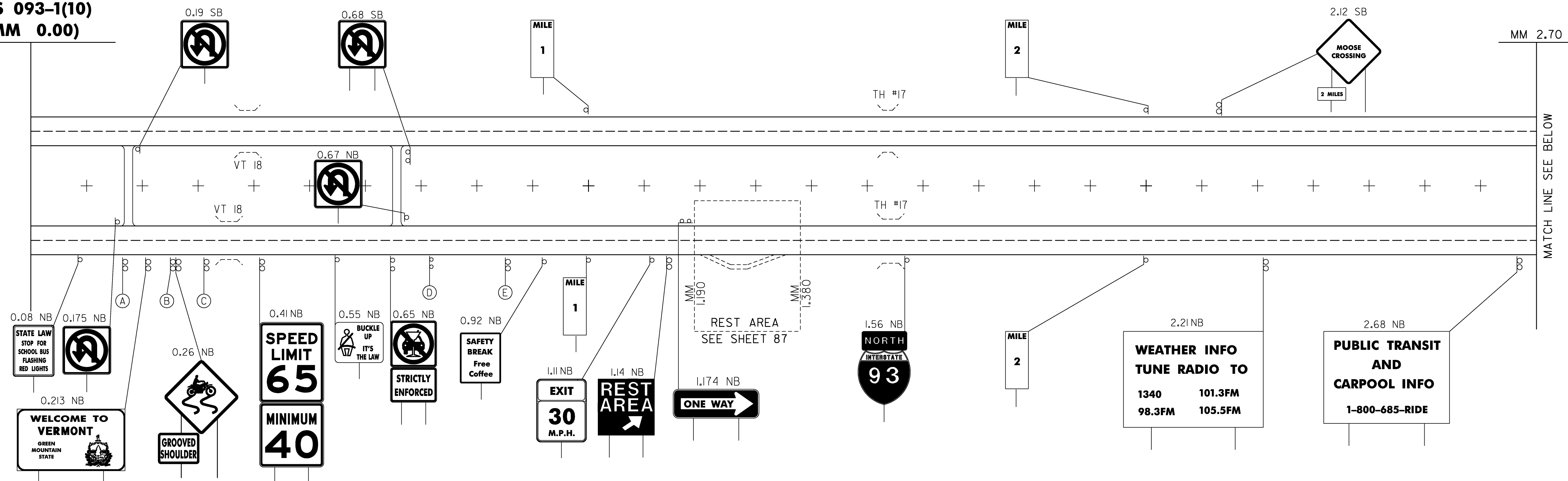
DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATOR
APPROVED _____ DATE _____
DIRECTOR OF PROGRAM DEVELOPMENT
APPROVED _____ DATE _____
PROJECT MANAGER : ROGER THOMPSON
PROJECT NAME : WATERFORD
PROJECT NUMBER : HES 093-1(10)
SHEET 80 OF 130 SHEETS

REMOVING SIGNS

NB - TYPE A: 24
TYPE B: 9
BRIDGE PLAQUE: 5 (NOT SHOWN)

SB - TYPE A: 11
TYPE B: 0
BRIDGE PLAQUE: 4 (NOT SHOWN)

BEGIN PROJECT
HES 093-1(10)
(MM 0.00)



LEGEND

RET - RETAINED
R&S - REMOVE & SALVAGE

**ALL SIGNS AND POSTS WILL BE
REMOVED UNLESS OTHERWISE NOTED**

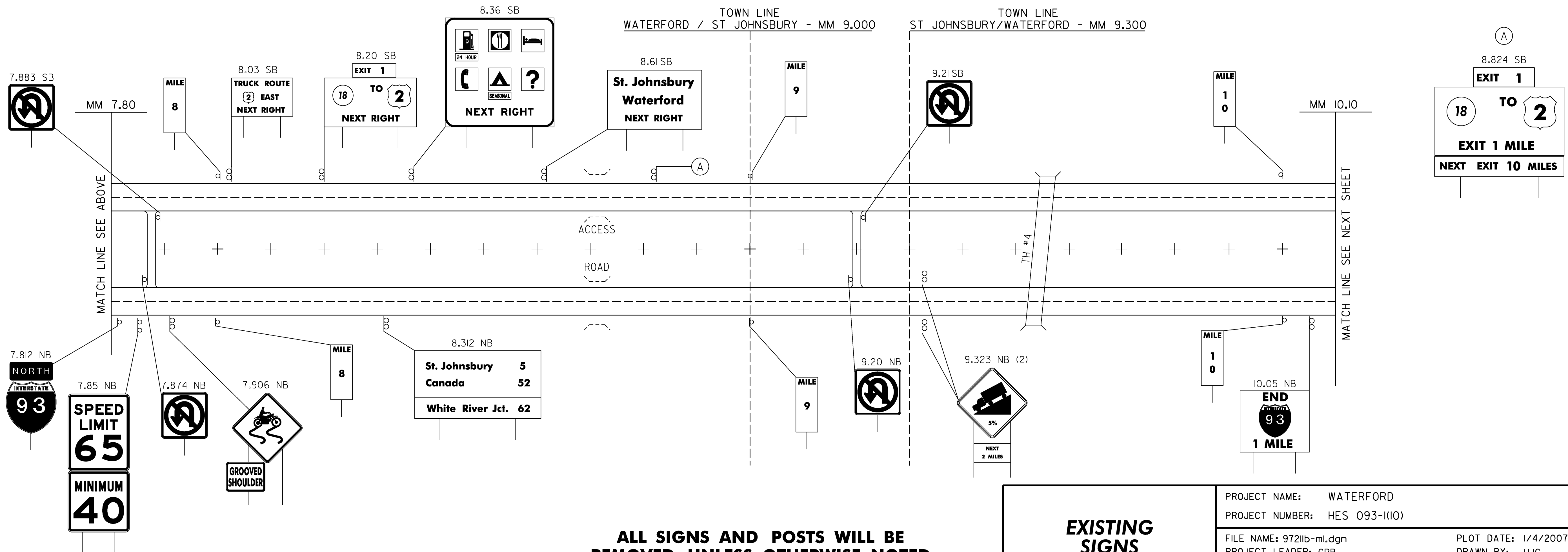
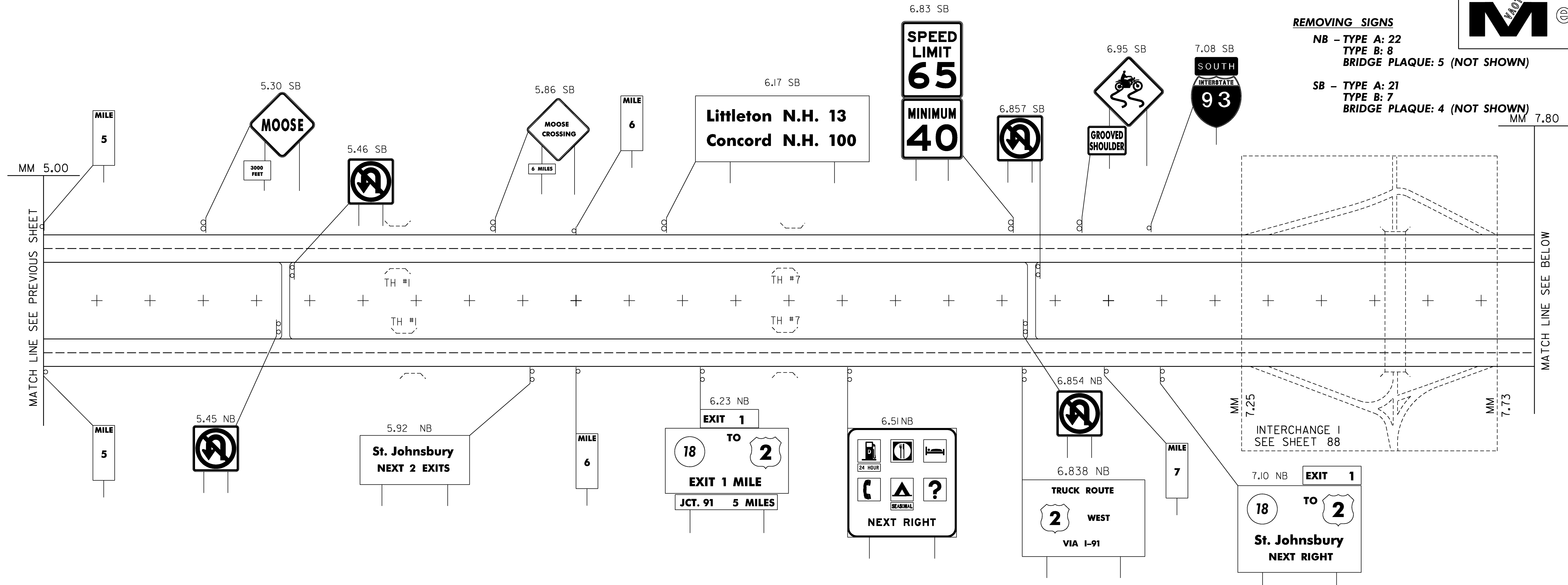
**EXISTING
SIGNS**

PROJECT NAME: WATERFORD
PROJECT NUMBER: HES 093-1(10)
FILE NAME: 97211b-m1.dgn
PROJECT LEADER: CRB
DESIGNED BY: DAM
CLD REF. NO.: 97-0211
PLOT DATE: 1/4/2007
DRAWN BY: HJC
CHECKED BY: DAM
SHEET 84 OF 130

REMOVING SIGNS

NB - TYPE A: 22
TYPE B: 8
BRIDGE PLAQUE: 5 (NOT SHOWN)

SB - TYPE A: 21
TYPE B: 7
BRIDGE PLAQUE: 4 (NOT SHOWN)



ALL SIGNS AND POSTS WILL BE
REMOVED UNLESS OTHERWISE NOTED

EXISTING
SIGNS

PROJECT NAME: WATERFORD
PROJECT NUMBER: HES 093-1(10)

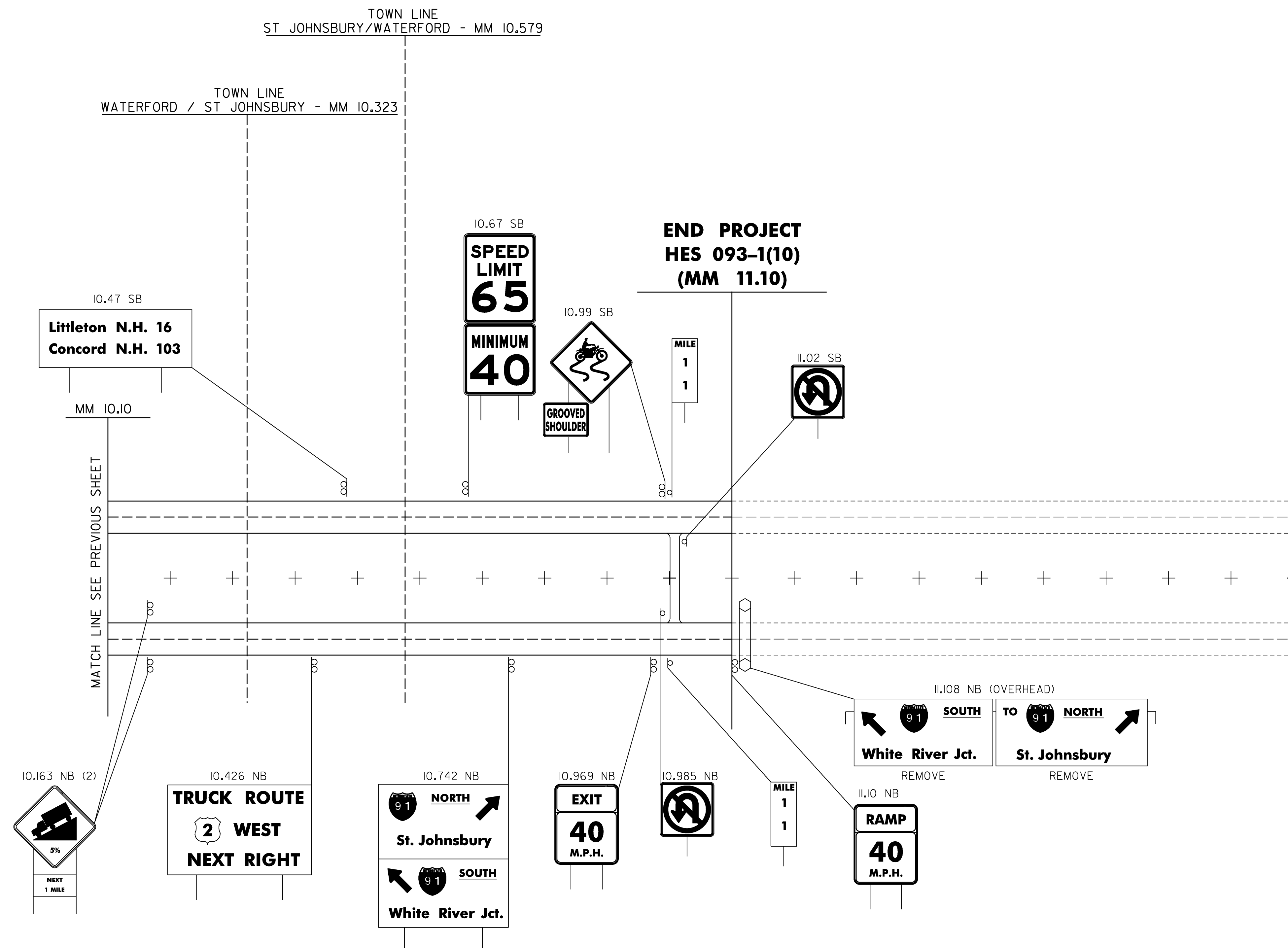
FILE NAME: 97211b-m1.dgn
PROJECT LEADER: CRB
DESIGNED BY: DAM
CLD REF. NO.: 97-0211

PLOT DATE: 1/4/2007
DRAWN BY: HJC
CHECKED BY: DAM
SHEET 85 OF 130

REMOVING SIGNS

NB - TYPE A: 8
TYPE B: 5

SB - TYPE A: 6
TYPE B: 1



**ALL SIGNS AND POSTS WILL BE
REMOVED UNLESS OTHERWISE NOTED**

**EXISTING
SIGNS**

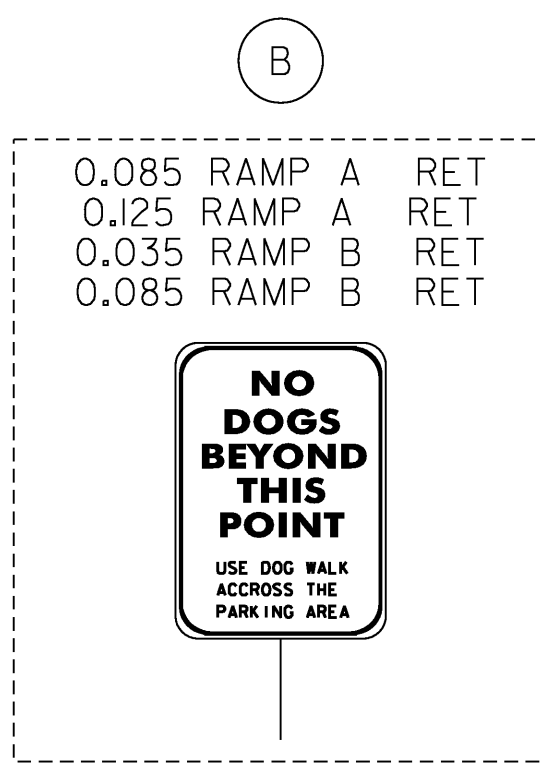
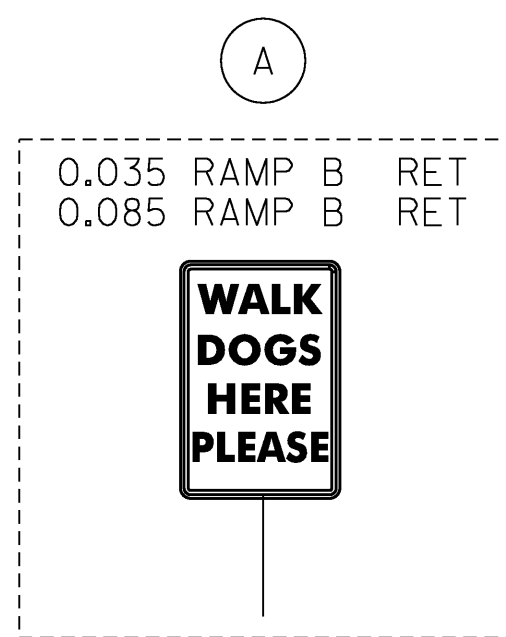
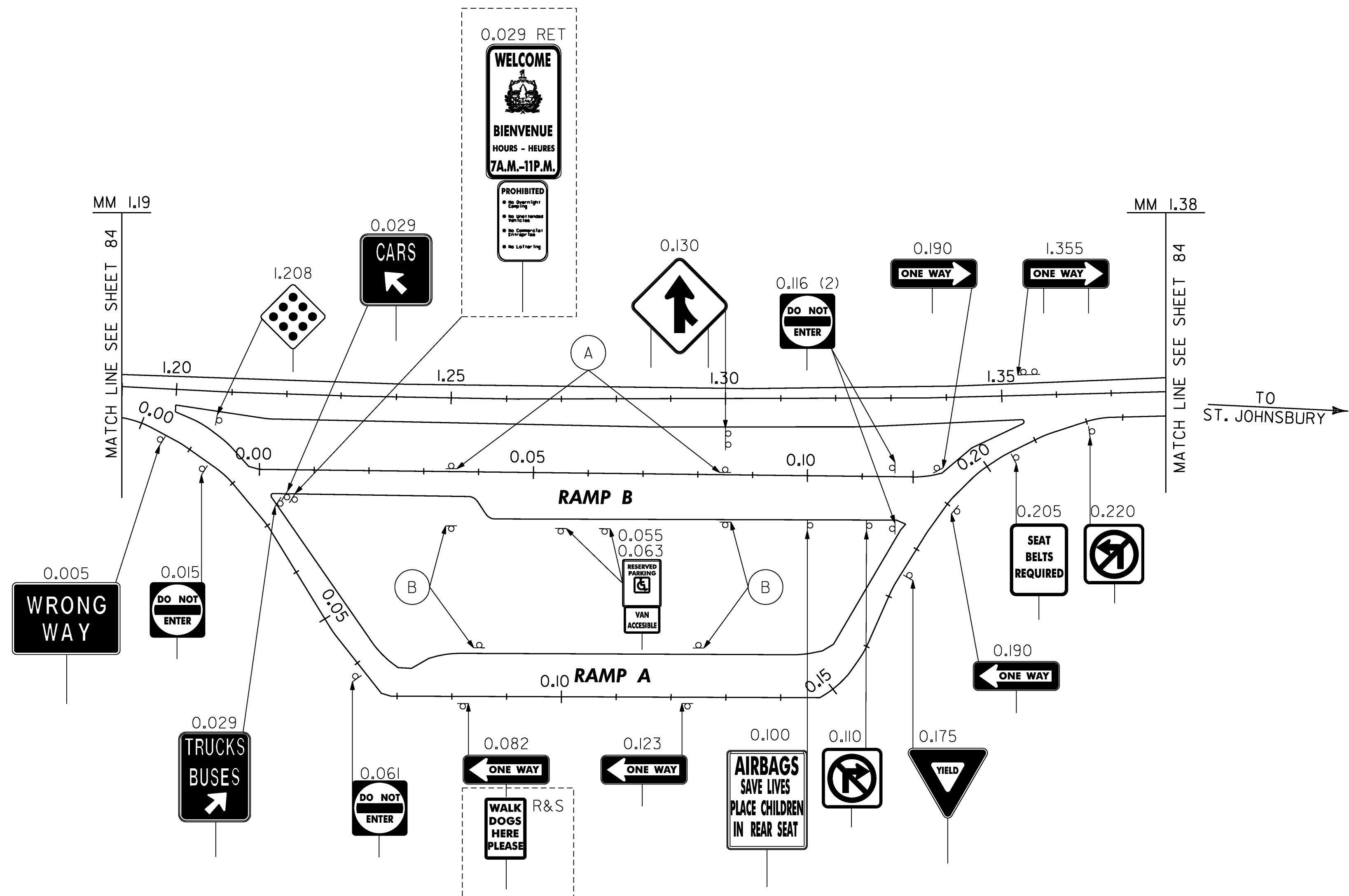
PROJECT NAME: WATERFORD
PROJECT NUMBER: HES 093-1(10)

FILE NAME: 97211b-m1.dgn
PROJECT LEADER: CRB
DESIGNED BY: DAM
CLD REF. NO.: 97-0211

PLOT DATE: 1/4/2007
DRAWN BY: HJC
CHECKED BY: DAM
SHEET 86 OF 130

REMOVING SIGNS

TYPE A: 24
TYPE B: 0



LEGEND

RET - RETAINED
R&S - REMOVE AND SALVAGE

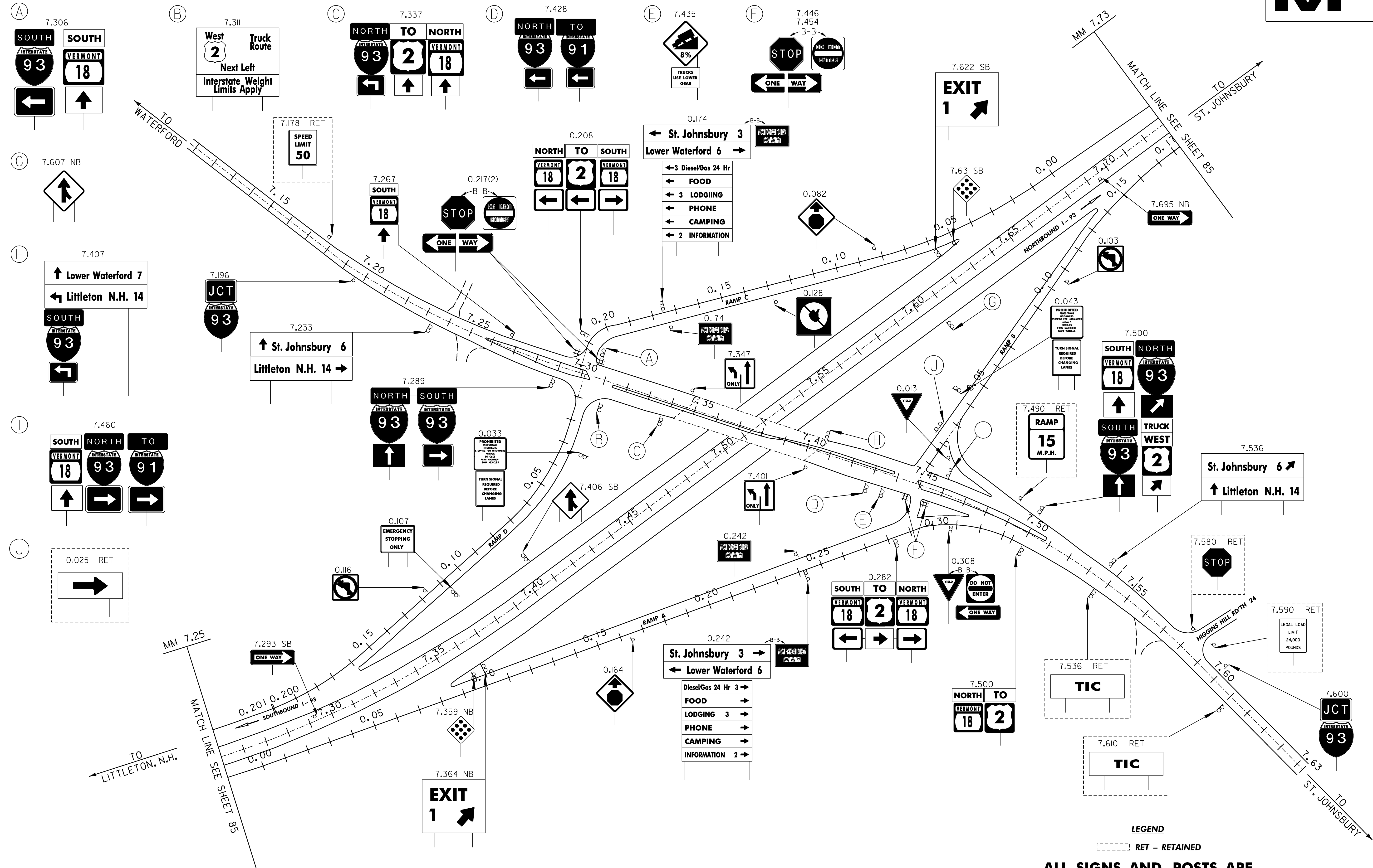
ALL SIGNS AND POSTS WILL BE
REMOVED UNLESS OTHERWISE NOTED

REST AREA
1.27 I-93 NB
EXISTING SIGNS

PROJECT NAME: WATERFORD
PROJECT NUMBER: HES 093-1(10)

FILE NAME: 97211b-ra.dgn
PROJECT LEADER: CRB
DESIGNED BY: DAM
CLD REF. NO.: 97-0211

PLOT DATE: 1/4/2007
DRAWN BY: HJC
CHECKED BY: DAM
SHEET 87 OF 130

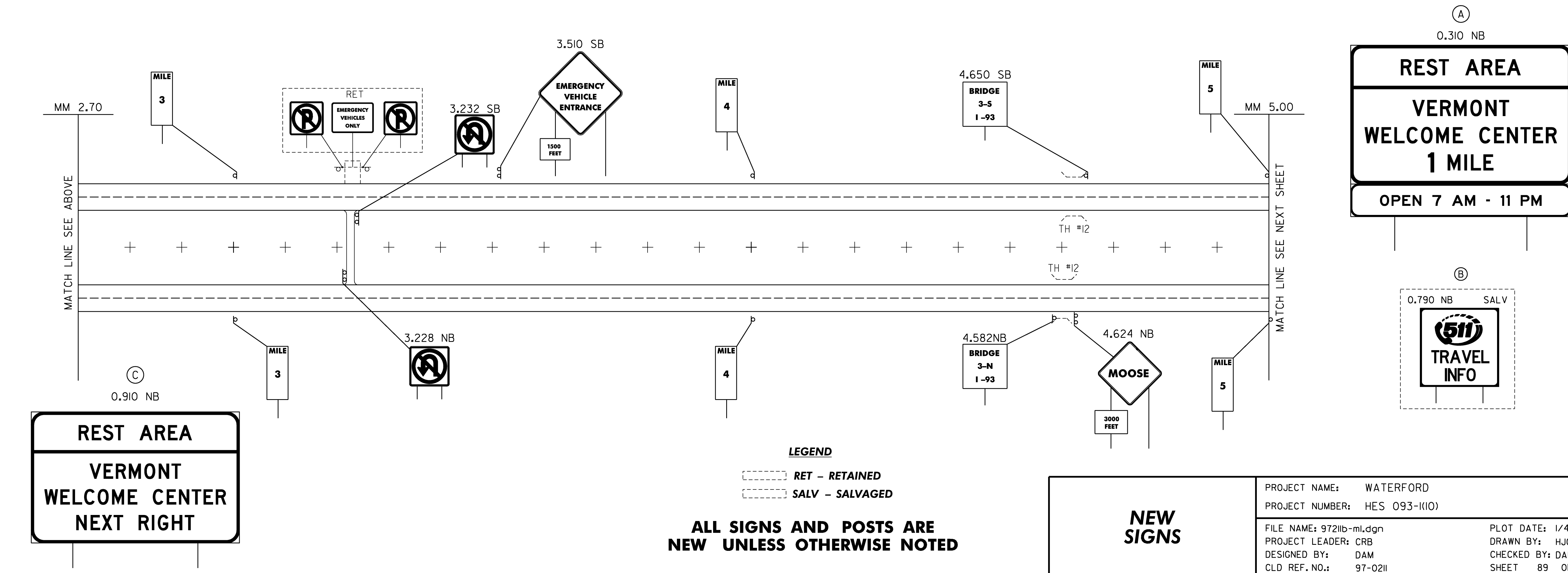
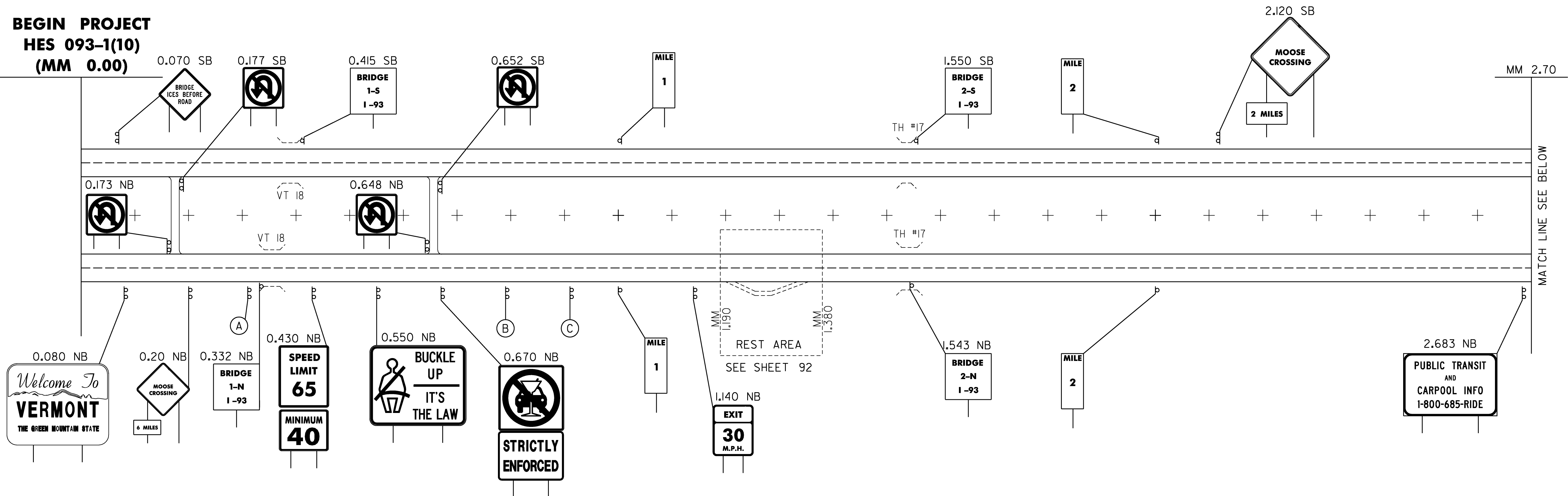


REMOVING SIGNS
 TYPE A: 149
 TYPE B: 3
 BRIDGE PLAQUE: 8 (NOT SHOWN)

INTERCHANGE 1 EXISTING SIGNS

PROJECT NAME:	WATERFORD	PLOT DATE:	1/4/2007
PROJECT NUMBER:	HES 093-1(10)	DRAWN BY:	HJC
FILE NAME:	9721lb-Exit1.dgn	CHECKED BY:	DAM
DESIGNED BY:	DAM	SHEET	88 OF 130
CLD REF. NO.:	97-0211		

BEGIN PROJECT
HES 093-1(10)
(MM 0.00)



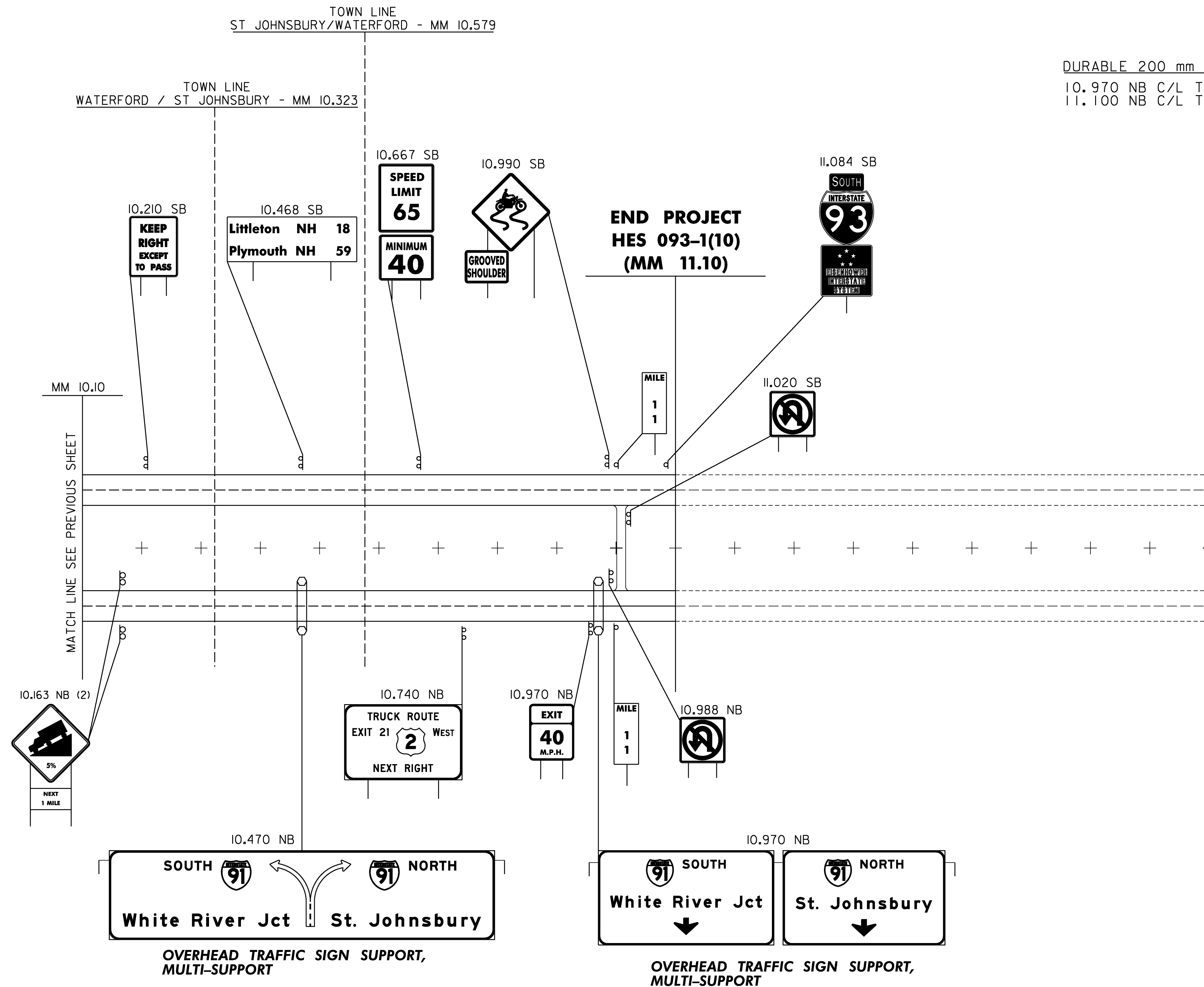
LEGEND

- RET RET - RETAINED
- SALV SALV - SALVAGED

**ALL SIGNS AND POSTS ARE
 NEW UNLESS OTHERWISE NOTED**

**NEW
 SIGNS**

PROJECT NAME:	WATERFORD
PROJECT NUMBER:	HES 093-1(10)
FILE NAME:	97211b-m1.dgn
PROJECT LEADER:	CRB
DESIGNED BY:	DAM
CLD REF. NO.:	97-0211
PLOT DATE:	1/4/2007
DRAWN BY:	HJC
CHECKED BY:	DAM
SHEET	89 OF 130



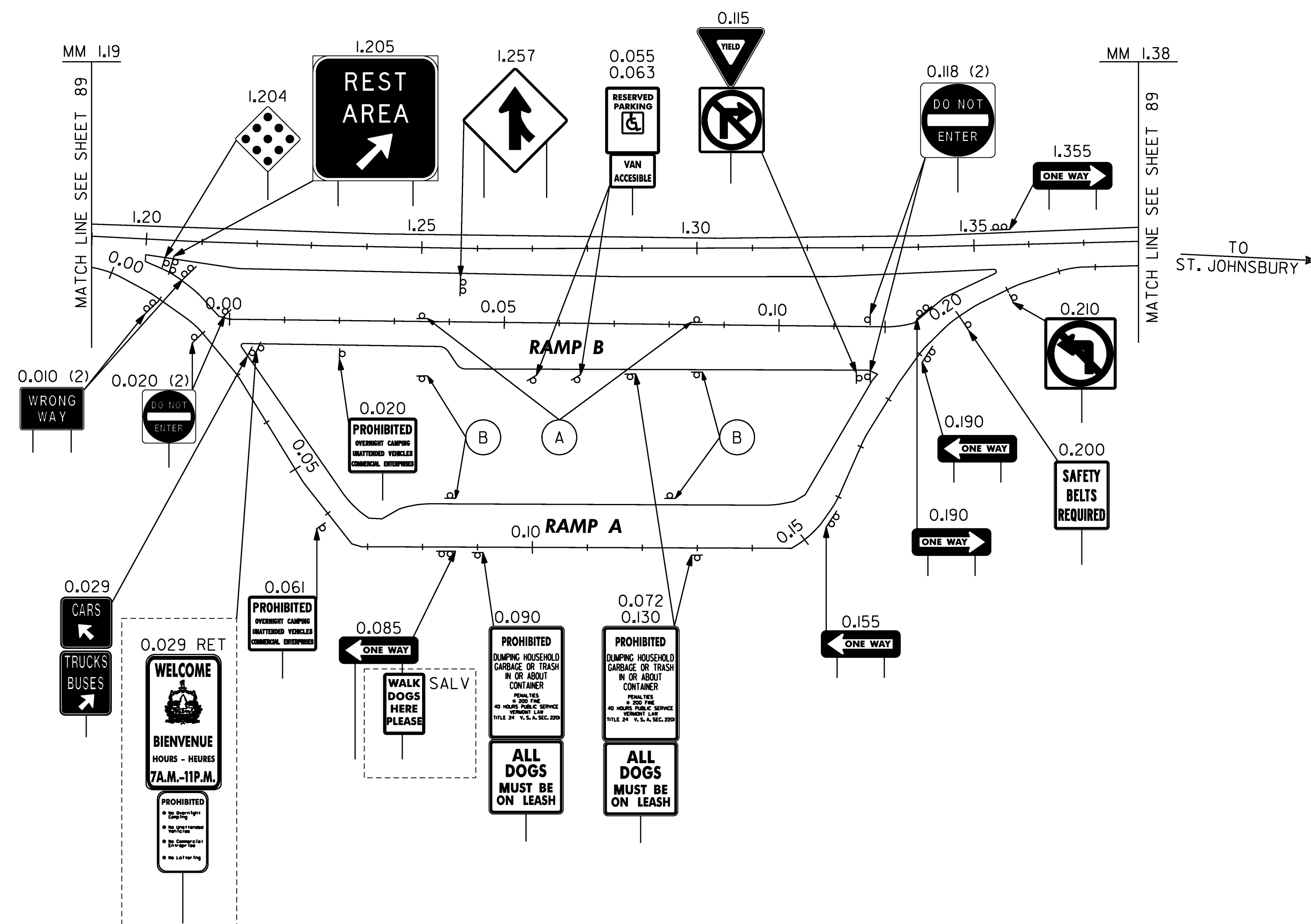
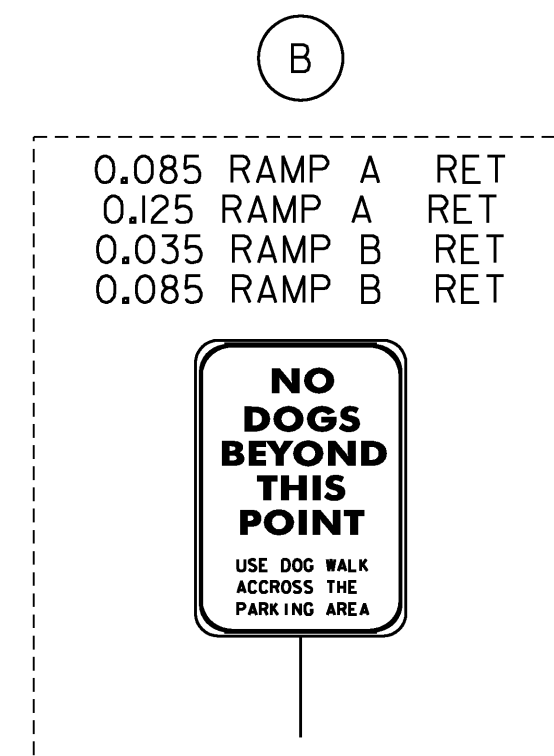
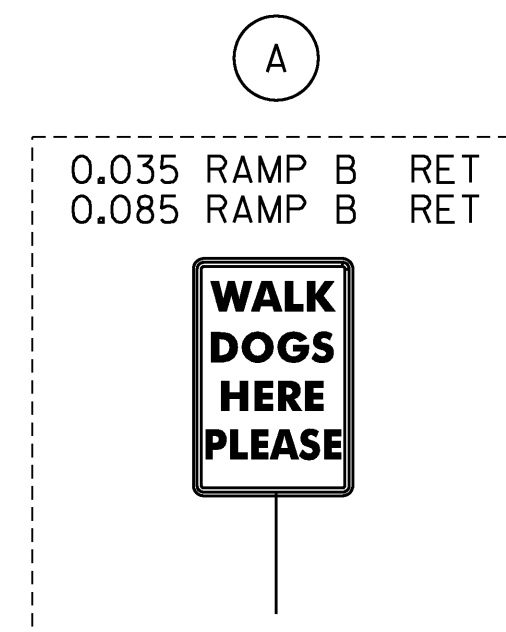
DURABLE 200 mm WHITE LINE (SOLID)
 10.970 NB C/L TO 11.100 NB C/L (209 m)
 11.100 NB C/L TO 0.057 EXIT 19 RAMP C (Theoretical Gore) (92 m)

ALL SIGNS AND POSTS ARE
 NEW UNLESS OTHERWISE NOTED

NEW
 SIGNS

PROJECT NAME: WATERFORD
 PROJECT NUMBER: HES 093-1(10)

FILE NAME: 97211b-m1.dgn PLOT DATE: 1/4/2007
 PROJECT LEADER: CRB DRAWN BY: HJC
 DESIGNED BY: DAM CHECKED BY: DAM
 CLD REF. NO.: 97-0211 SHEET 91 OF 130



LEGEND

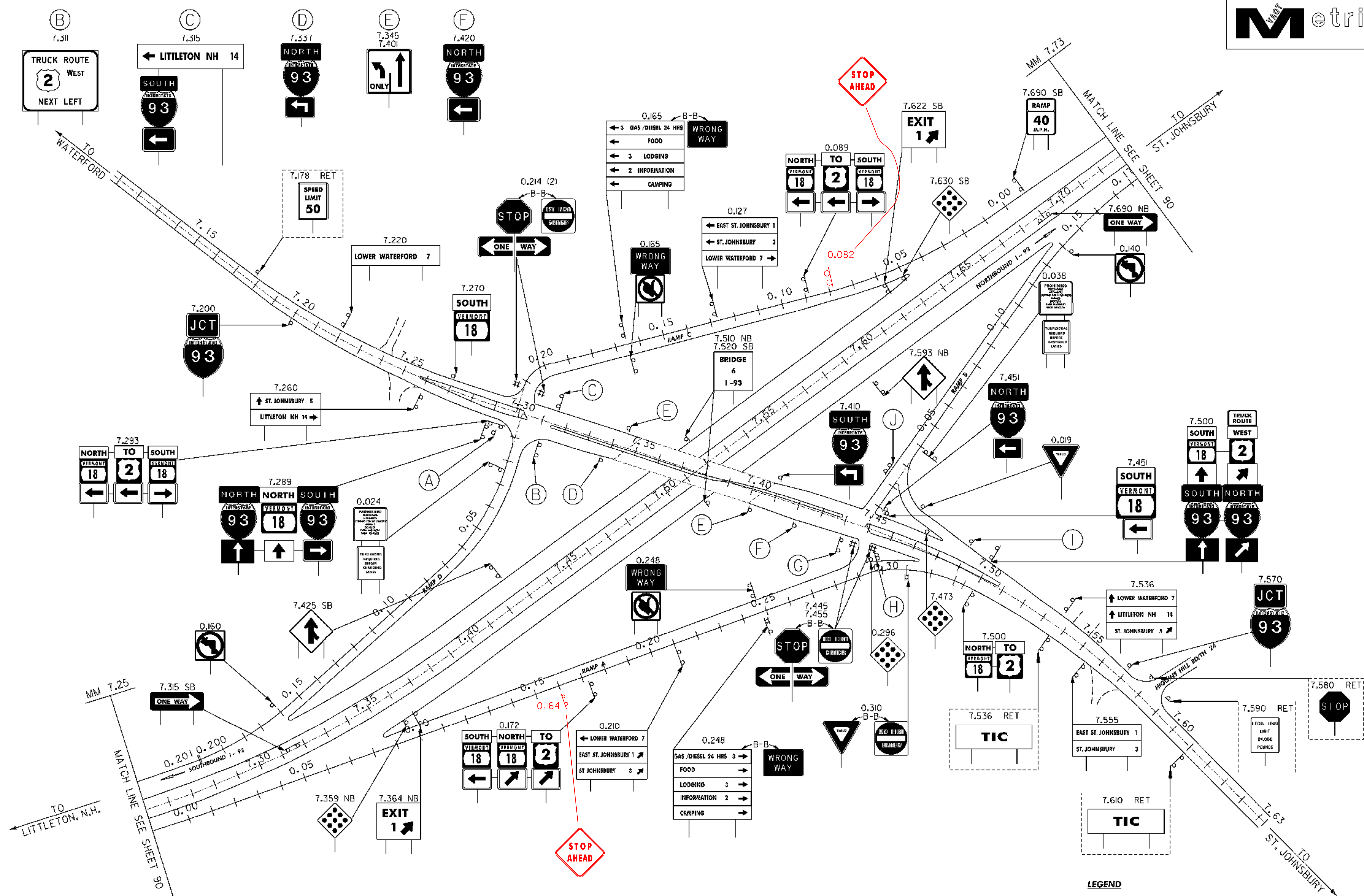
- RET RET - RETAINED
- SALV SALV - SALVAGED

**ALL SIGNS AND POSTS ARE
NEW UNLESS OTHERWISE NOTED**

**REST AREA
1.27 I-93 NB
NEW SIGNS**

PROJECT NAME: WATERFORD
PROJECT NUMBER: HES 093-1(10)

FILE NAME: 97211b-ra.dgn PLOT DATE: 1/4/2007
PROJECT LEADER: CRB DRAWN BY: HJC
DESIGNED BY: DAM CHECKED BY: DAM
CLD REF. NO.: 97-0211 SHEET 92 OF 130



LEGEND

RET - RETAINED

ALL SIGNS AND POSTS ARE
NEW UNLESS OTHERWISE NOTED

INTERCHANGE 1
NEW SIGNS

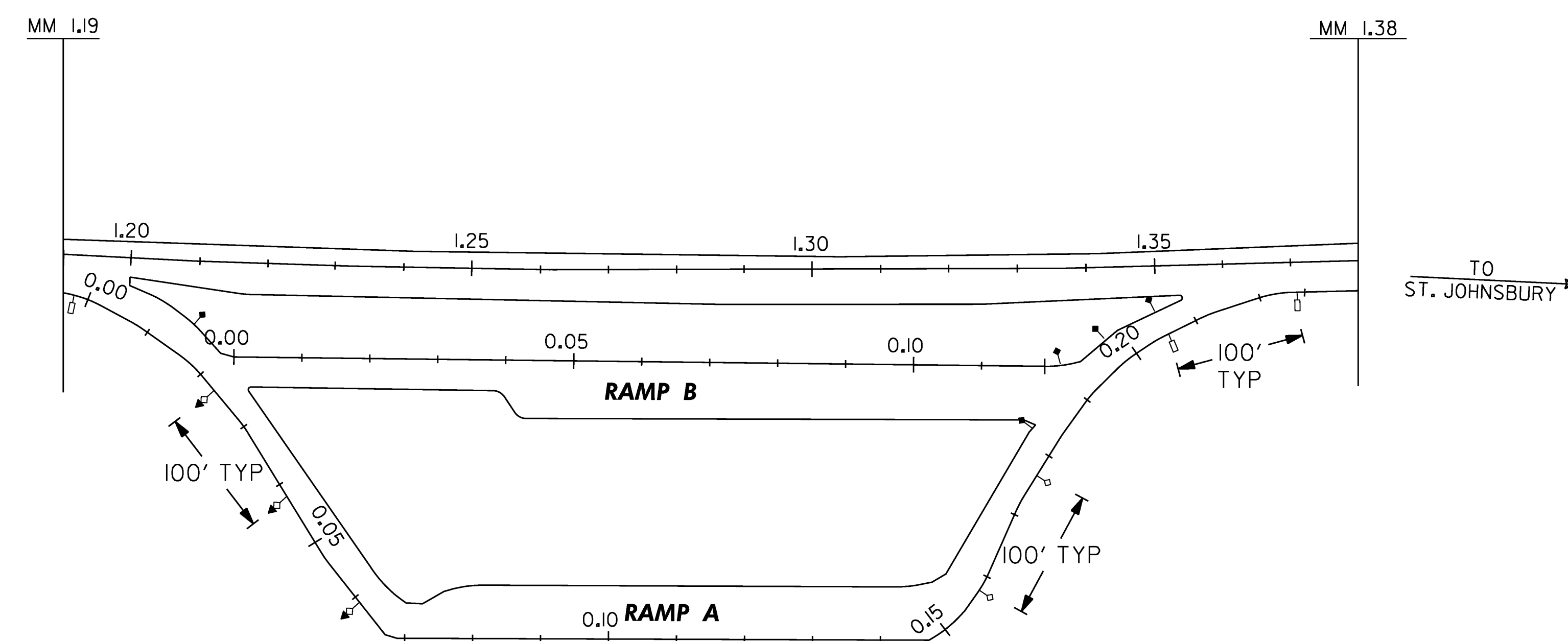
PROJECT NAME: WATERFORD
PROJECT NUMBER: HES 093-1101

FILE NAME: 9721lb-Ex11.dgn
PROJECT LEADER: CRB
DESIGNED BY: DAM
CLD REF. NO: 97-0211

PLOT DATE: 1/4/2007
DRAWN BY: HJC
CHECKED BY: DAM
SHEET 93 OF 130

**Decel. lane taper begins at 1.078 ±
685' from Gore
Use 8 Type II Delineators**

**Accel. lane taper ends at 1.655 ±
1610' from Gore
Use 17 Type II Delineators**

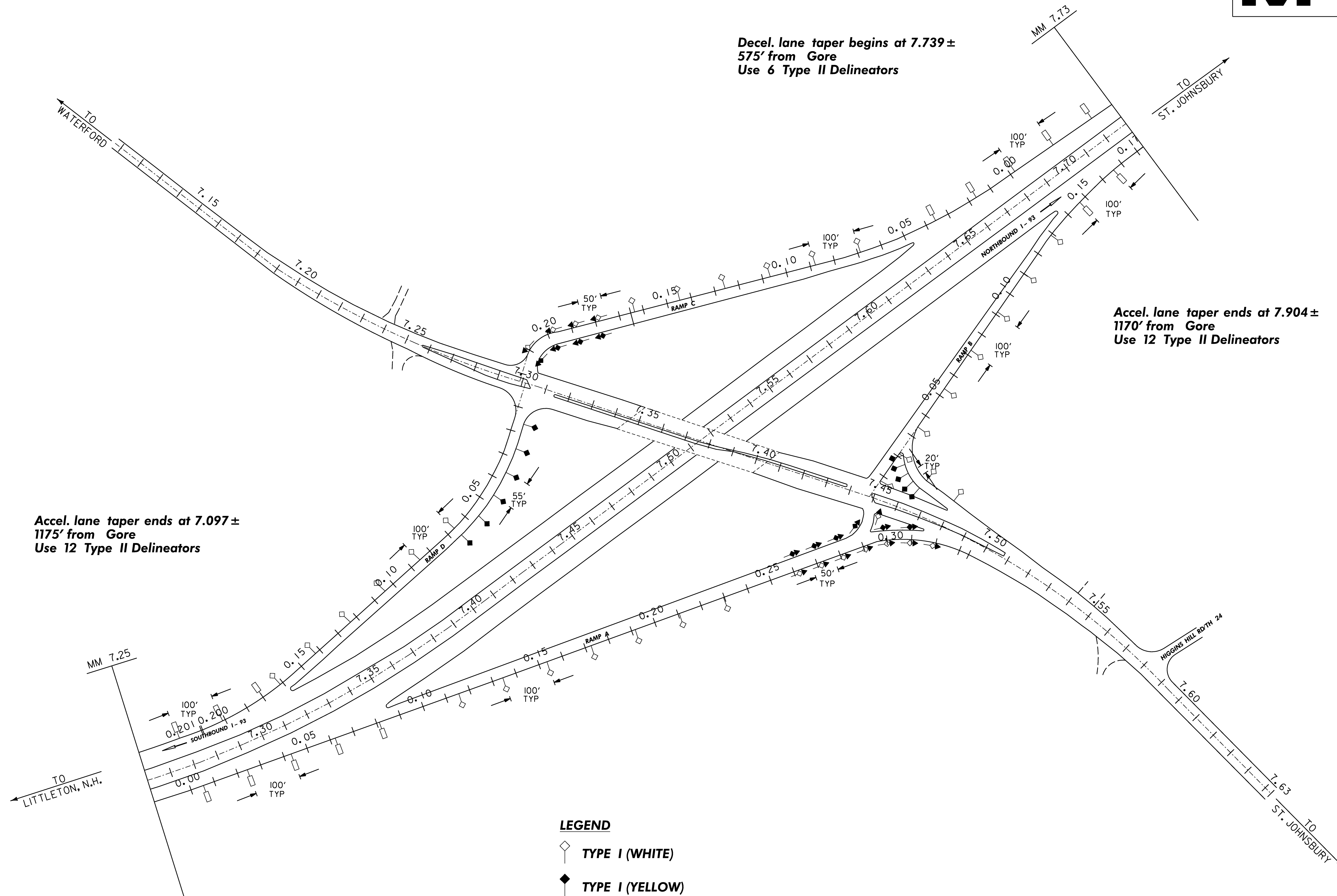


LEGEND

- ◇ TYPE I (WHITE)
- ◆ TYPE I (YELLOW)
- TYPE II (WHITE)
- ▲ TYPE III (RED ON BACK, WHITE)
- ◆ TYPE III (RED ON BACK, YELLOW)

**REST AREA
1.27 I-93 NB
DELINEATOR LAYOUT**

PROJECT NAME:	WATERFORD
PROJECT NUMBER:	HES 093-1(10)
FILE NAME:	97211b-ra.dgn
PROJECT LEADER:	CRB
DESIGNED BY:	DAM
CLD REF. NO.:	97-0211
PLOT DATE:	1/4/2007
DRAWN BY:	HJC
CHECKED BY:	DAM
SHEET	94 OF 130



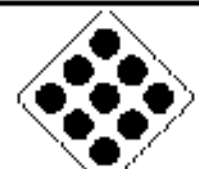
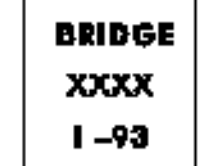
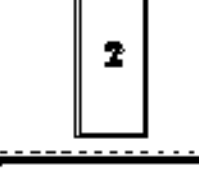
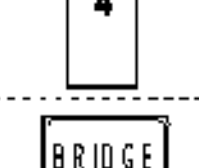
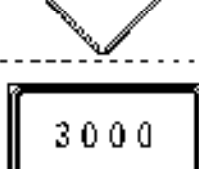
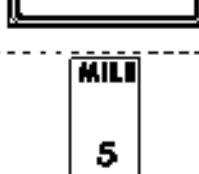
INTERCHANGE 1 DELINEATOR LAYOUT

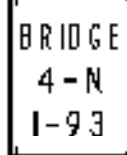
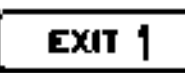
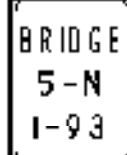
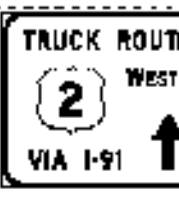
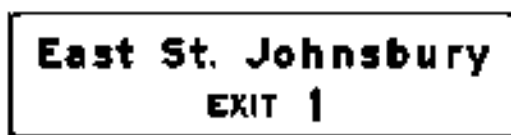
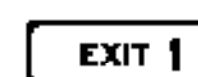
PROJECT NAME: WATERFORD
PROJECT NUMBER: HES 093-1(10)

FILE NAME: 9721lb-Ex1t1.dgn
PROJECT LEADER: CRB
DESIGNED BY: DAM
CLD REF. NO.: 97-0211

PLOT DATE: 1/4/2007
DRAWN BY: HJC
CHECKED BY: DAM
SHEET 95 OF 130

[illegible]

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXIST POST RE T A I N	NO. OF P O S T S	NEW SIGN POSTS																	REMARKS	SIGN DETAIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		E A	WIDTH (mm)	H E I G H T (mm)	"A"	"B"	SALV SIGN			SALV T I S	FLANGED CHANNEL			SQUARE STEEL (mm)				TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E S I G N	D E T A I L O N S H E E T N U M B E R	S T D. S H E E T N U M B E R																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
											kg/m	1.7	3.0	4.5	44	60	63	75	100	100MD	75	90	100	125	FTG. SIZE	600		750				MASS	POST SIZE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
1.204 NB		1	450	450	0.20					1	2.44 X		X			X																	OM-1		E-150																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
1.205 NB		1	1950	1950		3.80				2								2	96 X															E-131																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
1.257 NB		1	1200	1200	1.44					2								2	81 X														W4-1		E-150																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
1.355 NB MED		1	900	300	0.27					2	8.534 X		X			X																	R6-1R		E-142																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
1.407 NB TO 9.621 NB		6	150	250	0.24					6	14.64 X		X			X																VD-701	NOT SHOWN ON PLANS.	121																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
1.543 NB		1	150	250	0.04					1	2.44 X		X			X																	VD-701	121																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
2.000 NB		1	300	600	0.18					1	3.05 X		X			X																	D10-1		E-139																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
2.683 NB		1	1800	1200		2.16				2								2	89 X															E-131																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
3.000 NB		1	300	600	0.18					1	3.05 X		X			X																	D10-1		E-139																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
3.228 NB MED		1	900	900	0.81					2	8.534 X		X			X																	R3-4		E-143																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
4.000 NB		1	300	600	0.18					1	3.05 X		X			X																	D10-1		E-139																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".										m 0.0			m 23.5			m 41.4			m 0.0			m 23.5			m 41.4			EA. 0			kg 0.0			kg 0.0			kg 0.0			kg 386.2			kg 0.0			kg 0.0			kg 0.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXISTING SIGN TYPE	NO. OF POSTS	NEW SIGN POSTS																REMARKS	SIGN DETAIL																						
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN			SALV TIS	FLANGED CHANNEL			SQUARE STEEL (mm)			TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER																			
											kg/m	1.7	3.0	4.5	44	50	63	75	100	100MD	75	90	100	125	FTG. SIZE		600				750	MASS	POST SIZE																
											kg/m	3.4	3.9	5.0	kg/m	1.9	2.5	2.5	FND- ATION	11.3	13.6	16.1	21.8	mm	mm	MASS	POST SIZE																						
5.677 NB		1	150	250	0.04					1	2.44 X		X			X												VD-701	121																				
6.000 NB		1	300	600	0.18					1		3.05 X		X		X												D10-1		E-139																			
6.225 NB		1	2400	750	1.80																						E1-5		E-131																				
		1	5400	2850		15.39				2												2		324 289	W200X26.6		Bolt Tension 102.1 kN	116																					
6.368 NB		1	150	250	0.04					1	2.44 X		X			X											VD-701	121																					
6.510 NB		1	2850	2400		6.84				2								2				246 X						116																					
6.670 NB		1	5850	1500		8.78				2												2		232 272	W150X22.5		Bolt Tension 85.4 kN	116																					
6.840 NB		1	2400	750	1.80																						E1-5		E-131																				
		1	5250	2700		14.18				2												2		300 274	W200X26.6		Bolt Tension 90.7 kN	116																					
6.850 NB MED		1	900	900	0.81					2		8.534 X		X		X											R3-4		E-143																				
7.000 NB		1	300	600	0.18					1		2.90 X		X		X											D10-1		E-139																				
7.000 NB		1	3600	3600		12.96				2												2		393 349	W200X26.6		Bolt Tension 85.4 kN	116																					
7.200 NB		1	2400	750	1.80																						E1-5		E-131																				
		1	5400	2400		12.96				2												2		312 272	W200X26.6		Bolt Tension 85.4 kN	116																					
7.359 NB		1	450	450	0.20					1	2.44 X		X			X											OM-1		E-150																				
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FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".											m 0.0			m 7.9			m 16.0			m 0.0			m 7.9			m 16.0			EA. 0			kg 0.0			kg 0.0			kg 0.0			kg 213.0								
											21.8												2			246						1561			PROJECT NAME: WATERFORD PROJECT NUMBER: HES 093-1(10)														
											m			m			kg			EA.			kg			EA.			kg			FILE NAME: lsswWaterford.xls PROJECT LEADER: CRB DESIGNED BY: PTS CLD REF. NO.: 97-0211																	
											m			m			kg			EA.			kg			EA.			kg			PLOT DATE: 1/4/2007 DRAWN BY: HJC CHECKED BY: DAM SHEET 98 OF 130																	
											23.9			23.9			0.0			-4			-213.0			10			0			1426																	

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXISTING POST TYPE	NO. OF POSTS	NEW SIGN POSTS																REMARKS	SIGN DETAIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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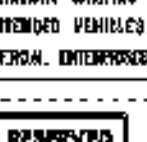
MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXISTING POST TYPE E T A I N	NO. OF P O S T S	NEW SIGN POSTS																REMARKS	SIGN DETAIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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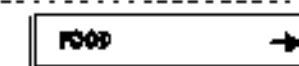
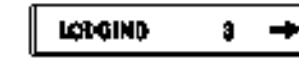
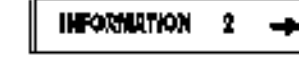
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MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXISTING POST		NEW SIGN POSTS																REMARKS	SIGN DETAIL																																
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS	R E T A I N	S A L V A G E	NO. OF P O S T S	FLANGED CHANNEL			SQUARE STEEL (mm)			TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER																												
												kg/m	1.7	3.0	4.5	44	50	63	75	100	100MM	75	90	100	125		FTG. SIZE	600				750	MASS	POST SIZE																									
												1.7	3.0	4.5	3.4	3.9	5.0	1.9	2.5	2.5	FND- ATION	11.3	13.6	16.1	21.8	600 mm	750 mm																																
6.723 SB		1	1200	1200	1.44																										VW-397	120																											
		1	600	450	0.27						2										2	96 X									VP-396	120																											
6.817 SB		1	750	375	0.28																										M3-3		E-135																										
		1	900	900	0.81																										M1-1		E-135																										
		1	900	900	0.81						1										1	53 X									M1-10		E-135																										
6.857 SB MED		1	900	900	0.81						2			8.534 X		X		X													R3-4		E-143																										
6.893 SB		1	1200	900	1.08						2										2	88 X									R8-7		E-142																										
7.000 SB		1	300	600	0.18						1			3.05 X		X		X													D10-1		E-139																										
7.315 SB MED		1	900	300	0.27						2			8.534 X		X		X													R8-1R		E-142																										
7.425 SB		1	1200	1200	1.44						2										2	92 X									W4-1		E-150																										
7.520 SB		1	150	250	0.04						1			2.44 X		X			X												VD-701	121																											
7.622 SB		1	1800	1500		2.70					2										2	97 X									E5-1a		E-131																										
7.630 SB		1	450	450	0.20						1			2.438 X		X			X												OM-1		E-150																										
7.675 SB TO 2.058 SB		4	150	250	0.16						4			9.76 X		X			X												VD-701		NOT SHOWN ON PLANS. SHEET 121 OF 130																										
7.690 SB		1	1200	1500	1.80						2										2	98 X									W13-3		E-150																										
7.750 SB		1	2400	750	1.80																										E1-5		E-131																										
		1	6000	3000		18.00					2													2	362 379	W200X31.3					Bolt Tension 126.3 kN SEE FOOTING DETAIL ON SHEET 3	118																											
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".													m	m	m	m	m	m	EA.	kg	kg	kg	kg																																				
													0.0	15.7 14.6	20.5 20.1	0.0	15.7	20.5		0	0.0	0.0	0.0	492.7																																			
													34.8									52.4																																					
													m			m			kg			EA.		kg				EA.		kg																													
					SHEET TOTALS		m2		m2		EA.		m2				m			kg			EA.		kg				EA.		kg																												
					11.39		20.70		0		0.00				36.2			36.2			0.0			11		492.7				2		0		379																									
																								PROJECT NAME: WATERFORD PROJECT NUMBER: HES 093-1(10)												FILE NAME: tsssWaterford.xls PROJECT LEADER: CRB DESIGNED BY: PTS CLO REF. NO.: 97-0211												PLOT DATE: 1/4/2007 DRAWN BY: HJC CHECKED BY: DAM SHEET 103 OF 130											

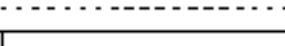
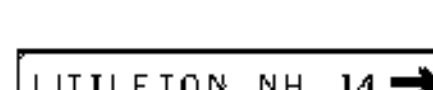
MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXIST POST RE T A I N	NO. OF P O S T S	NEW SIGN POSTS																REMARKS	SIGN DETAIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
										FLANGED CHANNEL				SQUARE STEEL (mm)			TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				S I G N F R A M E	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
		W I D T H (mm)	H E I G H T (mm)	"A"	"B"	SALV SIGN	SALV T I S			kg/m	44	60	63	kg/m	75	100	100MD	kg/m	FND- ATION	75	90	100	125	FTG. SIZE	600 mm		750 mm				MASS	POST SIZE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
										1.7	3.0	4.5	3.4	3.9	5.0	1.9	2.5	2.5																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		</

PROJECT NAME: WATERFORD		
PROJECT NUMBER: HES 093-1(10)		
FILE NAME:	tsssWaterford.xls	PLOT DATE: 1/4/2007
PROJECT LEADER:	CRB	DRAWN BY: HJC
DESIGNED BY:	PTS	CHECKED BY: DAM
CLD REF. NO.:	97-0211	SHEET 105 OF 130

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXIST POST		NO. OF POS IS	NEW SIGN POSTS																				REMARKS	SIGN DETAIL			
											FLANGED CHANNEL			SQUARE STEEL (mm)				TUBULAR ALUMINUM Dia (mm)			TUBULAR STEEL Dia (mm)				W-SHAPE STEEL				F R A M E S I G N	DETAIL ON SHEET NUMBER		STD. SHEET NUMBER			
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS	1.7	3.0	4.5	44	50	63	75	100	100MD	75	90	100	125	FTG. SIZE	600	750	MASS	POST SIZE									
REST AREA 1.27 NB 0.029 RAMP ALT		1	600	600	0.36																								VD-10L	119					
		1	600	750	0.45					1			4.877 X		X		X													VD-239R	119				
0.061 RAMP ART		1	750	600	0.45					1			4.267 X		X		X													VR-032		E-144			
0.085 RAMP ART		1	900	300	0.27																									R6-1L		E-142			
		1					X			2			8.534 X		X		X																		
0.090 RAMP ART		1	600	900	0.54																									VR-278		E-144			
		1	600	600	0.36					1			4.877 X		X		X													VR-648		E-144			
0.130 RAMP ART		1	600	900	0.54																									VR-278		E-144			
		1	600	600	0.36					1			4.877 X		X		X													VR-648		E-144			
0.155 RAMP ART		1	900	300	0.27					2			8.534 X		X		X													R6-1L		E-142			
0.190 RAMP ALT		1	900	300	0.27					2			8.534 X		X		X													R6-1R		E-142			
0.190 RAMP ART		1	900	300	0.27					2			8.534 X		X		X													R6-1L		E-142			
0.200 RAMP ART		1	600	750	0.45					1			4.267 X		X		X														119				
0.210 RAMP ART		1	600	600	0.36					1			4.267 X		X		X													R3-2		E-143			
REST AREA 1.27 NB 0.020 RAMP B RT		1	750	600	0.45					1			4.267 X		X		X													VR-032		E-144			
0.055 RAMP B RT		1	300	450	0.14																									119					
		1	300	150	0.05					1			4.267 X		X		X													R7-8A		E-132			
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".											m	m	m	m	m	EA.	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg					

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST R E T A I N	NO. OF P O S T S	NEW SIGN POSTS																				REMARKS	SIGN DETAIL			
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS			FLANGED CHANNEL			SQUARE STEEL (mm)			ANCHOR	S I F F V L	TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E S I G N		DETAIL ON SHEET NUMBER	STD. SHEET NUMBER		
											kg/m	kg/m	kg/m	44	50	63			75	100	100MC	FND- ATION	75	90	100	125	FTG SIZE	600 mm	750 mm					MASS	POST SIZE
											1.7	3.0	4.5	3.4	3.9	5.0			1.9	2.5	2.5														
REST AREA 1.27 NB 0.063 RAMP B RT		1	300	450	0.14																												119		
		1	300	150	0.05				1			4.267 X		X		X																R7-8A		E-132	
0.072 RAMP B RT		1	600	900	0.54																											VR-278		E-144	
		1	600	600	0.36				1			4.877 X		X		X																VR-648		E-144	
0.115 RAMP B RT		1			0.35																											R1-2 900X900X900		E-146	
		1	600	600	0.36				1			4.877 X		X		X																R3-1		E-143	
0.118 RAMP B LT		1	750	750	0.56				1			4.267 X		X		X																R5-1		E-143	
0.118 RAMP B RT		1	750	750	0.56				1			4.267 X		X		X																R5-1		E-143	
INT.#1 0.172 RAMP A RT		1	600	300	0.18																											M3-3		E136-B	
		1	600	300	0.18																											M3-1		E136-B	
		1	600	300	0.18																												M4-5		E-136A
		1	600	600	0.36																												M1-5		E-136B
		1	600	600	0.36																												M1-5		E-136B
		1	600	600	0.36																												M1-4		E-136A
		1	525	375	0.20																												M6-1		E-136A
		1	525	375	0.20				2													2	92 X									#3	M6-2		E136-B
		1	525	375	0.20																												M6-2		E-136A
0.210 RAMP A RT		1	1800	300	0.54																												D1-1a		E-123
		1	1800	300	0.54																												D1-1a		E-123
		1	1800	300	0.54				2													2	86 X										D1-1a		E-123
0.248 RAMP A RT		1	1800 1370	250 190	0.45 0.26																												VD-502G		E-133
		1	900	600	0.54																											BACK TO BACK R5-1a		E-143	
		1	1800 1370	250 190	0.45 0.26																												VD-502F		E-133
		1	1800 1370	250 190	0.45 0.26																												VD-502L		E-133
		1	1800 1370	250 190	0.45 0.26																												VD-502I		E-133
		1	1800 1370	250 190	0.45 0.26				2 2			9.75 X										2	93 X										VD-502C		E-133
0.164 RAMP A RT		1	900	900	0.81						m 0.0	m 0.0	m 20.7	m 0.0	m 0.0	m 20.7	EA. 0	kg 0.0	kg 0.0	kg 0.0	kg 244.2 271	kg 0.0	kg 0.0	kg 0.0	kg 0.0	EA. 0	EA. 0	kg 0							
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".					9.41						32.3			20.7				0.0			271				0		0								
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						
											m			m				kg			kg				EA.		EA.		kg						

[illegible]

MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST RETAIN	NO. OF POS IS	NEW SIGN POSTS																		REMARKS	SIGN DETAIL						
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN	SALV TIS			FLANGED CHANNEL			SQUARE STEEL (mm)			TUBULAR ALUMINUM DIA (mm)			TUBULAR STEEL DIA (mm)				W-SHAPE STEEL				F R A M E S I G N E		DETAIL ON SHEET NUMBER	STD. SHEET NUMBER					
											kg/m	kg/m	kg/m	44	50	63	75	100	100MD	75	90	100	125	FTG. SIZE	600 mm	750 mm	MASS					POST SIZE				
											1.7	3.0	4.5	3.4	3.9	5.0	1.9	2.5	2.5	FND- ACTION	11.3	13.6	16.1	21.6	600 mm	750 mm	MASS	POST SIZE								
INT.#1 0.165 RAMP C RT	 	1	1800 1370	250 190	0.45 0.26																												VD-502G BACK TO BACK R5-1a	E-133		
		1	1800 1370	250 190	0.45 0.26																													VD-502F	E-133	
		1	1800 1370	250 190	0.45 0.26																													VD-502L	E-133	
		1	1800 1370	250 190	0.45 0.26															2														VD-502I	E-133	
		1	1800 1370	250 190	0.45 0.26															2														VD-502C	E-133	
0.165 RAMP C LT		1	900	600	0.54																													R5-1a	E-143	
		1	600	600	0.36										9.754 X																			R9-4a	E-143	
0.214 RAMP C LT	 	1	750	750	0.56																													R1-1 BACK TO BACK R5-1	E-143	
		1	750	750	0.56																													R5-1	E-143	
	 	1	900	300	0.27															1														R6-1L BACK TO BACK R6-1R	E-142	
		1	900	300	0.27																														R6-1R	E-142
0.214 RAMP C RT	 	1	750	750	0.56																														R1-1 BACK TO BACK R5-1	E-143
		1	750	750	0.56																														R5-1	E-143
	 	1	900	300	0.27															1															R6-1L BACK TO BACK R6-1R	E-142
		1	900	300	0.27																														R6-1R	E-142
0.024 RAMP D RT		1	900	900	0.81																														VR-046	E-142
		1	900	900	0.81															2															VR-002	E-142
0.160 RAMP D RT		1	600	600	0.36															1															R3-2	E-143
INT.#1 7.200 RTE 18 RT		1	525	375	0.20																														M2-1	E-135
		1	600	600	0.36															1															M1-1	E-135
7.220 RTE 18 LT		1	1800	300	0.54															2															D2-1	E-123
7.260 RTE 18 RT		1	1800	300	0.54																														D1-1a	E-123
		1	1800	300	0.54															2															D1-1a	E-123
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".					10.22							m	m	m	EA.	kg	kg	kg		kg	kg	kg	kg													
												0.0	0.0	42.7	0	0.0	0.0	42.7	0	0.0	0.0	0.0	177.5	0.0	0.0	0.0										
												43.9				42.7				4				195												
												m				m				kg				EA.	kg		EA.	EA.	kg							
												42.7				42.7				0.0				8												

PROJECT NAME: WATERFORD		
PROJECT NUMBER: HES 093-1(10)		
FILE NAME:	tsssWaterford.xls	PLOT DATE: 1/4/2007
PROJECT LEADER:	CRB	DRAWN BY: HJC
DESIGNED BY:	PTS	CHECKED BY: DAM
CLD REF. NO.:	97-0211	SHEET 110 OF 130

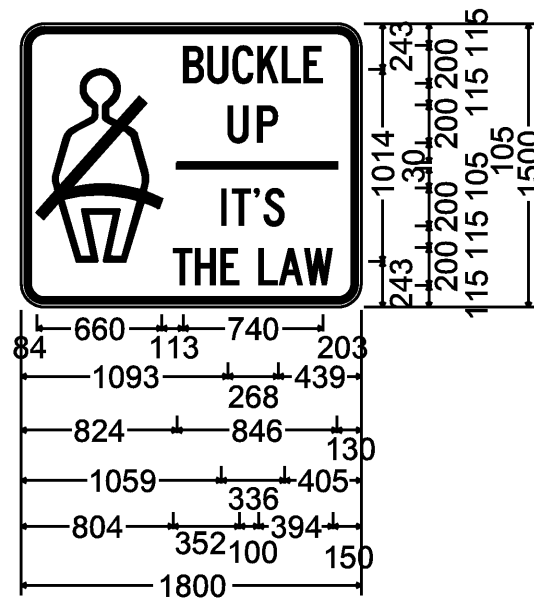
MILE MARKER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGNS				EXIST POST R E T A I N	S A I V A G L S	NO. OF P O S T S	NEW SIGN POSTS																		REMARKS	SIGN DETAIL																	
		E A	WIDTH (mm)	HEIGHT (mm)	"A"	"B"	SALV SIGN				SALV TIS	FLANGED CHANNEL			SQUARE STEEL (mm)			TUBULAR ALUMINUM Dia (mm)			TUBULAR STEEL Dia (mm)				W-SHAPE STEEL					F R A M E S I G N	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER															
												kg/m	3.0	4.5	44	50	63	75	100	100MD	75	90	100	125	FTG SIZE	600 mm	750 mm	MASS					POST SIZE														
												1.7	3.0	4.5	3.4	3.9	5.0	1.9	2.5	2.5	FND- ACTION	11.3	13.6	16.1	21.8	600 mm	750 mm	MASS	POST SIZE																		
7.337 RTE 18 RT		1	600	300	0.18																									M3-3	E-135																
		1	600	600	0.36																									M1-1	E-135																
		1	525	375	0.20					1			4.877 X		X		X													M5-1	E-135																
7.345 RTE 18 LT		1	750	750	0.56					1			4.267 X		X		X													VR-921	E-145A																
7.401 RTE 18 RT		1	750	750	0.56					1			4.267 X		X		X													VR-921	E-145A																
7.410 RTE 18 LT		1	600	300	0.18																									M3-3	E-135																
		1	600	600	0.36																									M1-1	E-135																
		1	525	375	0.20					1			4.877 X		X		X													M5-1	E-135																
7.420 RTE 18 RT		1	600	300	0.18																									M3-1	E-135																
		1	600	600	0.36																									M1-1	E-135																
		1	525	375	0.20					1			4.877 X		X		X													M6-1	E-135																
7.440 RTE 18 RT		1	900	900	0.81																									W7-1b																	
		1	600	450	0.27					2			9.754 X		X		X													W7-2b	E-152																
7.445 RTE 18 RT		1	750	750	0.56																									R1-1	E-143																
		1	750	750	0.56																									BACK TO BACK R5-1	E-143																
		1	900	300	0.27																									R6-1L	E-142																
		1	900	300	0.27					1			4.267 X		X		X													BACK TO BACK R6-1R	E-142																
													m 0.0	m 0.0	m 39.0	m 0.0	m 0.0	m 39.0	EA 0	kg 0.0	kg 0.0	kg 0.0	kg 0.0	kg 0.0	kg 0.0	kg 0.0	kg 0.0	kg 0.0	kg 0.0																		
													37.2																																		
													39.0			39.0			0.0			0			0			0																			
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE".					SHEET TOTALS		m2 6.08		m2 0.00		EA 0		m2 -0.00				m -39.0		m -39.0		kg 0.0		EA 0		kg 0.0		EA 0		EA 0		kg 0																
																		PROJECT NAME: WATERFORD PROJECT NUMBER: HES 093-1(10)										FILE NAME: tssssWaterford.xls PROJECT LEADER: CRB DESIGNED BY: PTS CLD REF. NO.: 97-0211										PLOT DATE: 1/4/2007 DRAWN BY: HJC CHECKED BY: DAM SHEET 111 OF 130									

[illegible]

[illegible]

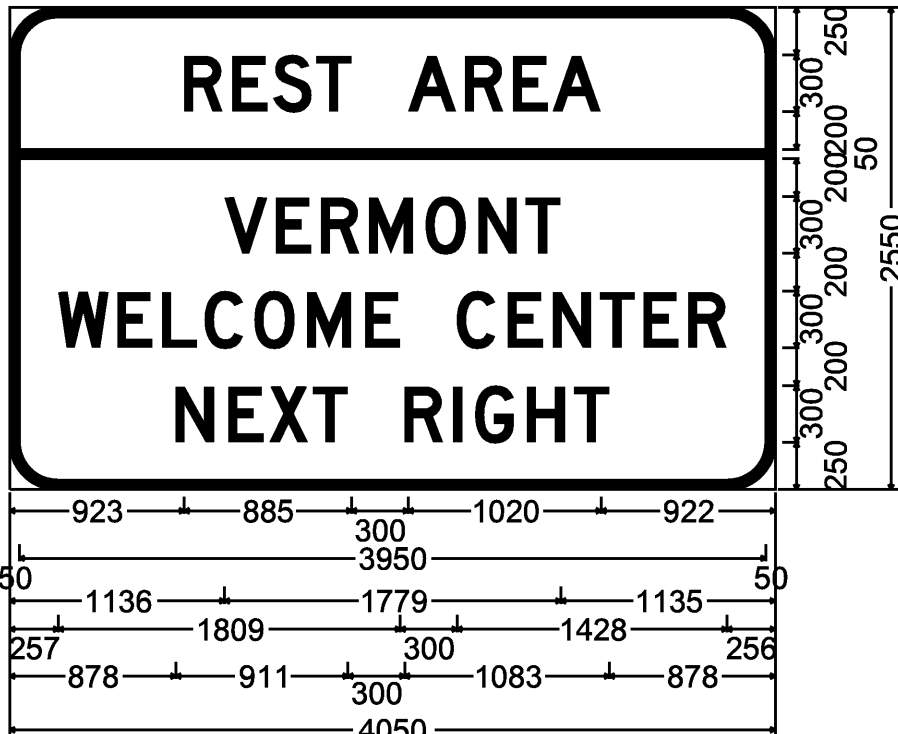
[illegible]

M.M. 0.550 NB



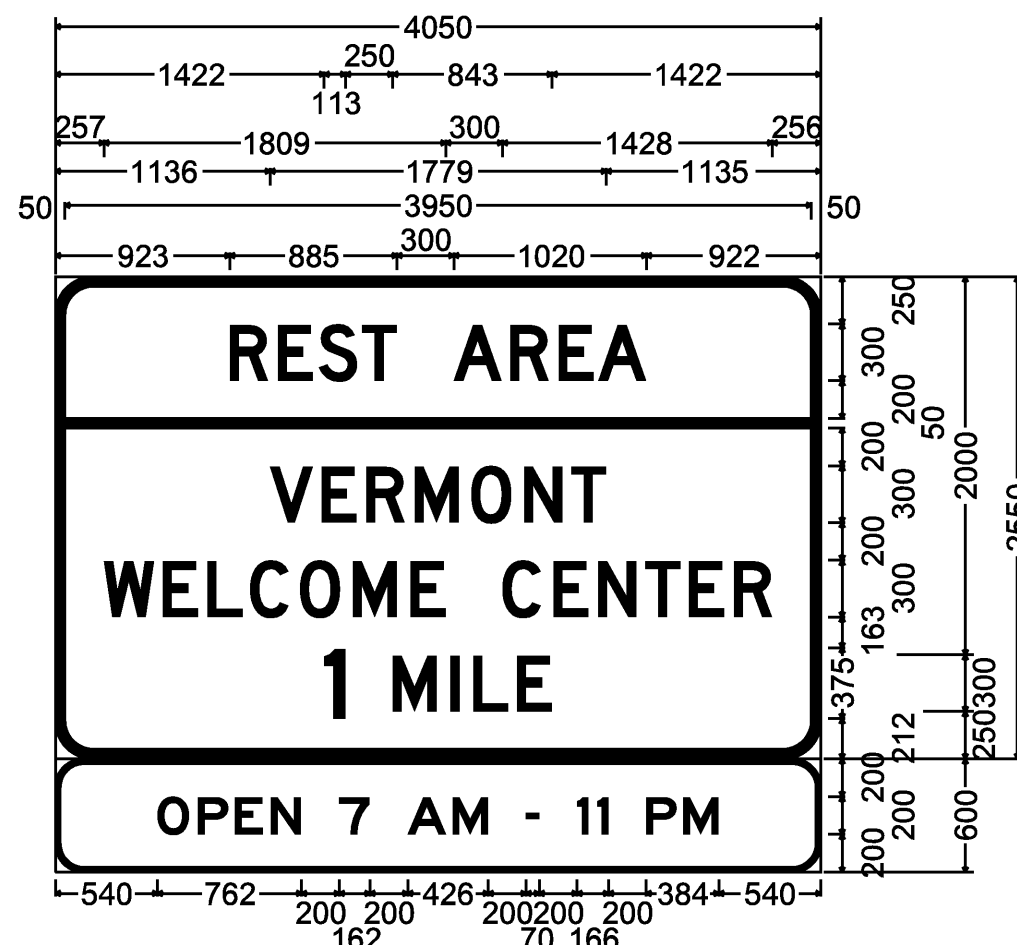
125mm Radius, 30mm Border, 20mm Indent, Black on White;
Person w/Seat Belt;
[BUCKLE] C 2K 50% spacing; [UP] C 2K;
[IT'S] C 2K;
[THE LAW] C 2K 50% spacing;

M.M. 0.910 NB



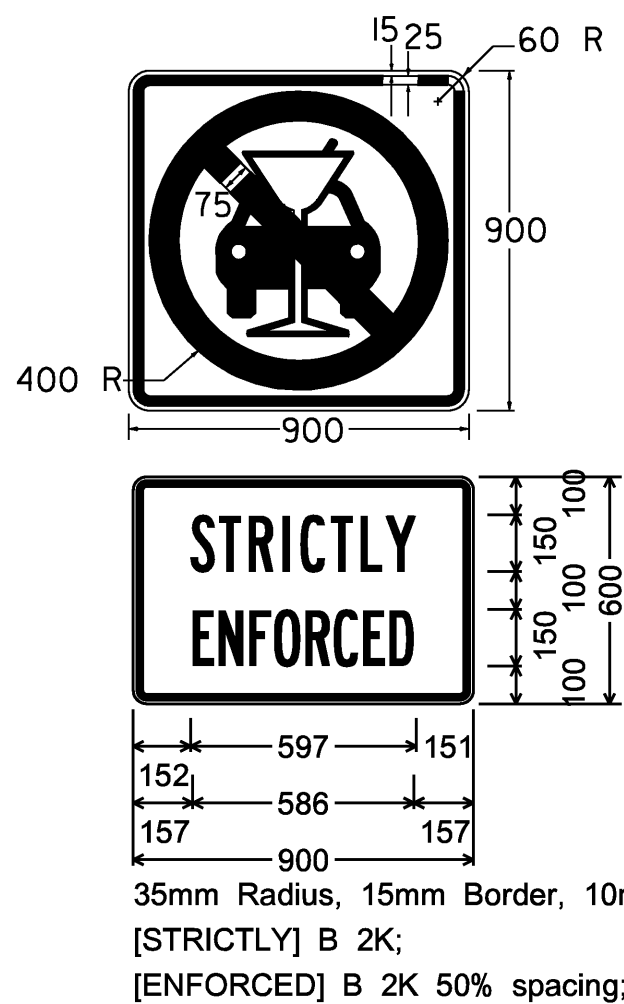
250mm Radius, 50mm Border, White on Blue;
[REST AREA] D 2K; [VERMONT] D 2K; [WELCOME CENTER] D 2K; [NEXT RIGHT] D 2K;

M.M. 0.310 NB



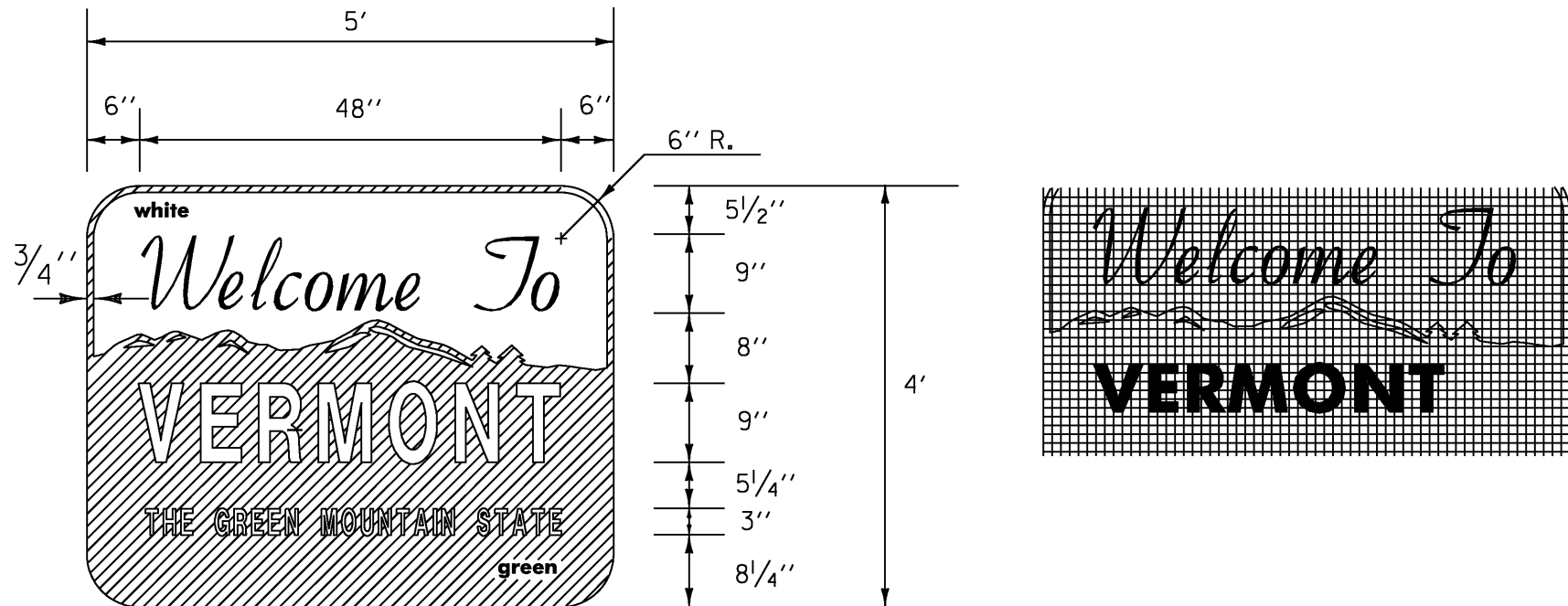
Advance Rest Area-Welcome Center Sign; 200mm Radius, 50mm Border, White on Blue;
[REST AREA] D 2K; [VERMONT] D 2K; [WELCOME CENTER] D 2K; [1] E 2K; [MILE] D 2K;
150mm Radius, 25mm Border, White on Blue;
[OPEN 7 AM - 11 PM] E 2K;

M.M. 0.670 NB



35mm Radius, 15mm Border, 10mm Indent, Black on Yellow;
[STRICTLY] B 2K;
[ENFORCED] B 2K 50% spacing;

M.M. 0.080 NB



VD-421
NOTE:
FOR THE WORDS 'WELCOME TO' USE GERBER FONT
MURRAY HILL BOLD OR EQUIVALENT. TEXT COLOR IS GREEN.
ALL OTHER TEXT USE GERBER FONT SOUVENIR
DEMIBOLD OR EQUIVALENT. TEXT COLOR IS WHITE.
REFER TO STD. E-131 FOR COLORS.
MATERIALS:
THE SIGN BASE MATERIALS USED FOR THIS SIGN MAY BE
ANY OF THE FOLLOWING OF THE MINIMUM THICKNESS NOTED.
FLAT SHEET ALUMINUM 0.100''
HIGH DENSITY OVERLAID PLYWOOD 5/8''

GENERAL SIGN DETAIL NOTES

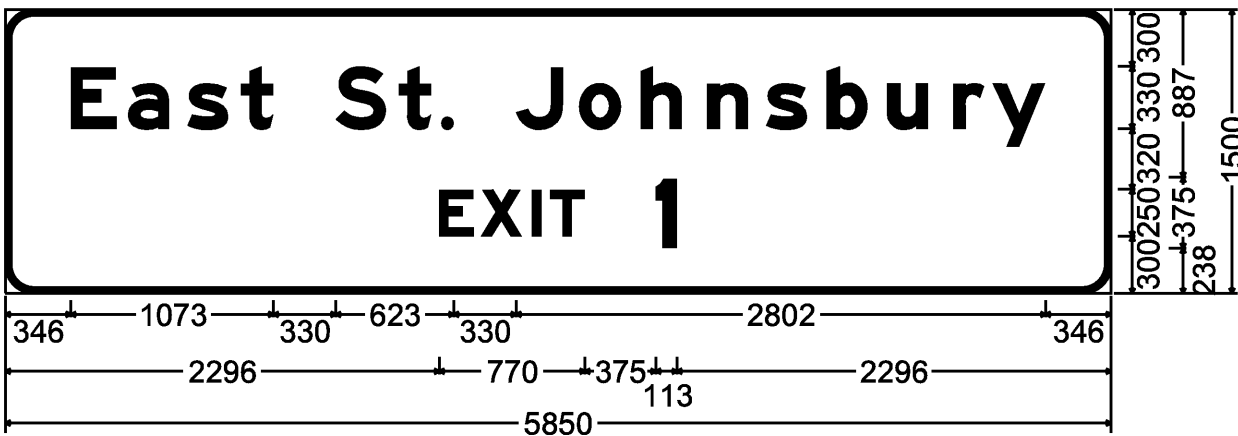
- THE NOTE BELOW EACH SIGN DETAIL INCLUDES THE CORNER RADIUS, BORDER WIDTH, TEXT COLOR, BACKGROUND COLOR AND TEXT SERIES TO BE USED.
- COLORS: UNLESS NOTED OTHERWISE, WHITE ON GREEN AND WHITE ON BLUE SIGNIFIES REFLECTORIZED WHITE TEXT ON A REFLECTORIZED GREEN OR BLUE BACKGROUND, RESPECTIVELY. BLACK ON YELLOW AND BLACK ON WHITE SIGNIFIES BLACK TEXT ON A REFLECTORIZED YELLOW OR WHITE BACKGROUND, RESPECTIVELY. ALL COLORS SHALL CONFORM WITH THE COLORS ADOPTED BY AASHTO AND APPROVED BY THE FHWA.
- TEXT LAYOUT DIMENSIONS ARE BASED ON THE STANDARD ALPHABETS SPACING CHARTS FOUND IN THE MUTCD "STANDARD HIGHWAY SIGNS" PUBLICATION. MINOR VARIATIONS IN TEXT DIMENSIONS ARE ACCEPTABLE BASED ON INDIVIDUAL MANUFACTURER'S LETTER FABRICATION. SIGNIFICANT CHANGES WHICH AFFECT SIGN APPEARANCE SHALL BE BROUGHT TO THE ATTENTION OF THE VTRANS' TRAFFIC AND SAFETY SECTION BEFORE FABRICATION.
- UNLESS NOTED OTHERWISE, THE DESIGN/DIMENSIONS FOR SYMBOLS SHOWN ON THESE SIGNS CAN BE FOUND IN VTRANS' STANDARDS OR IN THE STANDARD HIGHWAY SIGNS PUBLICATION.
- FOR GUIDE SIGN ROUTE MARKER DETAILS SEE STD'S E-135, E-136A AND E-136B
- THE NOTE BELOW EACH GUIDE SIGN DETAIL SPECIFIES APPROPRIATE ARROW LENGTHS WHEN APPLICABLE. FOR ARROW DIMENSIONS REFER TO GUIDE SIGN ARROW DETAILS IN THE STANDARD HIGHWAY SIGNS PUBLICATION.

SIGN DETAIL
SHEET 1

PROJECT NAME: WATERFORD
PROJECT NUMBER: HES 093-1(10)

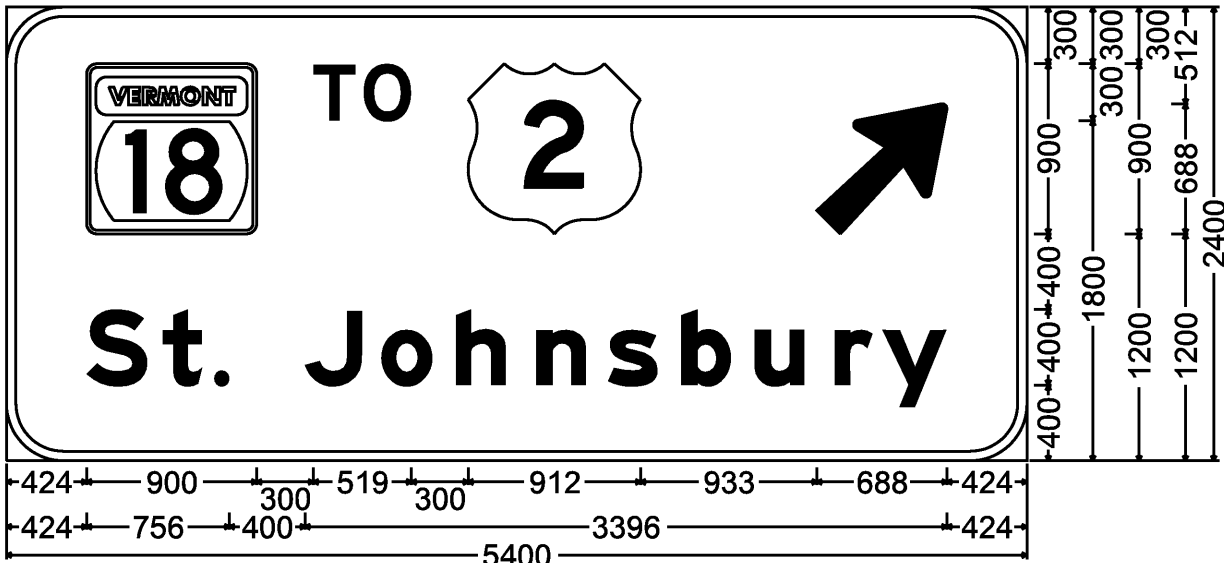
FILE NAME: 97211b-details.dgn
PROJECT LEADER: CRB
DESIGNED BY: PTS
CLD REF. NO.: 97-0211
PLOT DATE: 1/4/2007
DRAWN BY: HJC
CHECKED BY: DAM
SHEET 115 OF 130

M.M. 6.670 NB
M.M. 8.450 SB



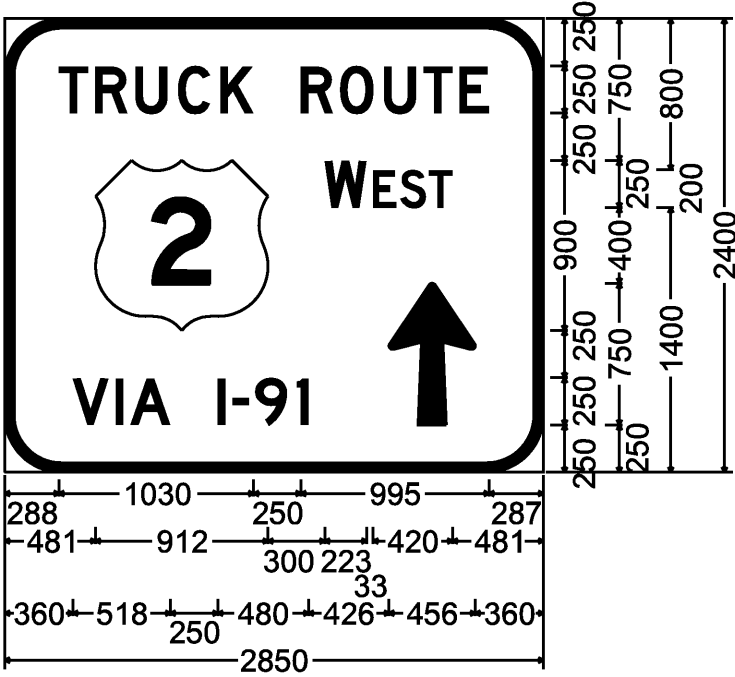
150mm Radius, 30mm Border, White on Green;
[East St. Johnsbury] E Mod 2K; [EXIT 1] E Mod 2K;

M.M. 7.200 NB



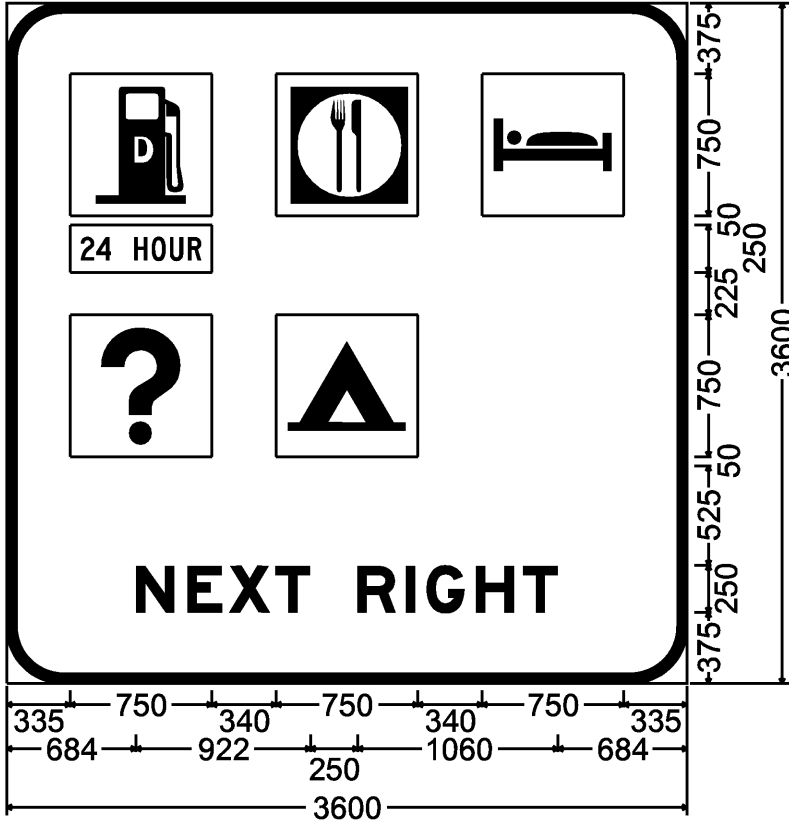
300mm Radius, 50mm Border, White on Green;
[TO] E 2K; Arrow 160 - 875mm 45°; [St. Johnsbury] E Mod 2K;

M.M. 6.510 NB



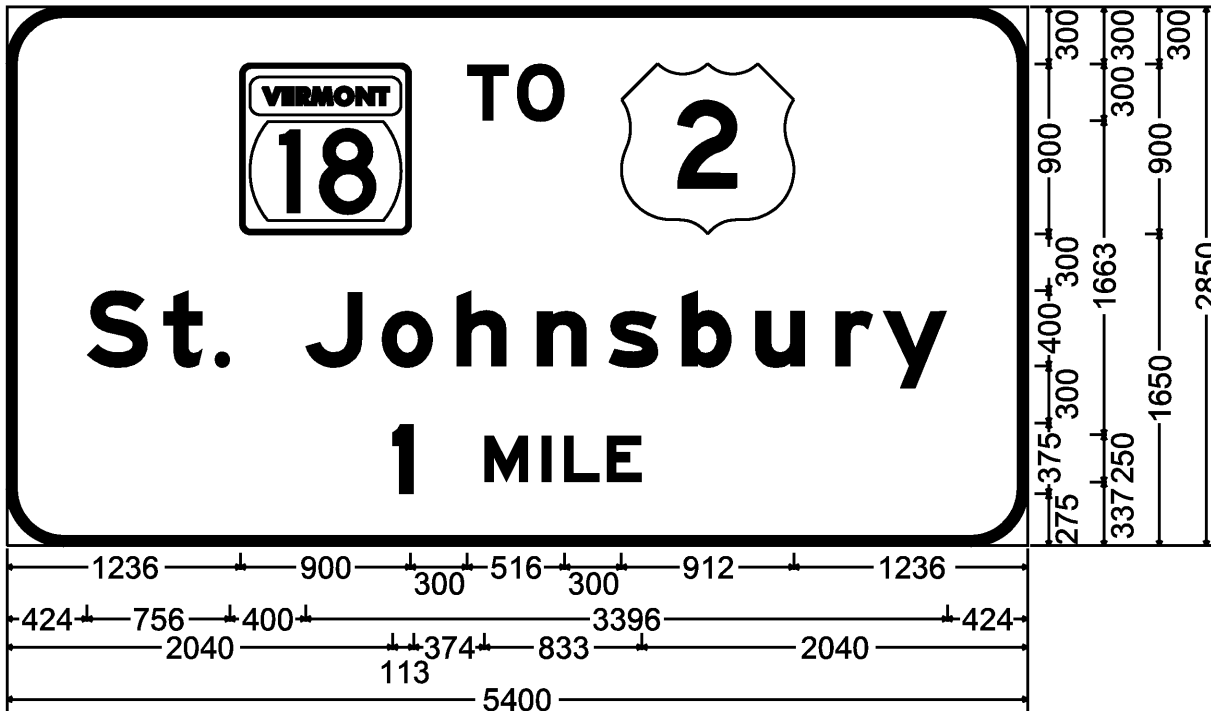
300mm Radius, 50mm Border, White on Green;
[TRUCK ROUTE] D 2K; [WEST] D 2K; [VIA I-91] D 2K;
Arrow 133 - 750mm 90°;

M.M. 7.000 NB
M.M. 8.040 SB



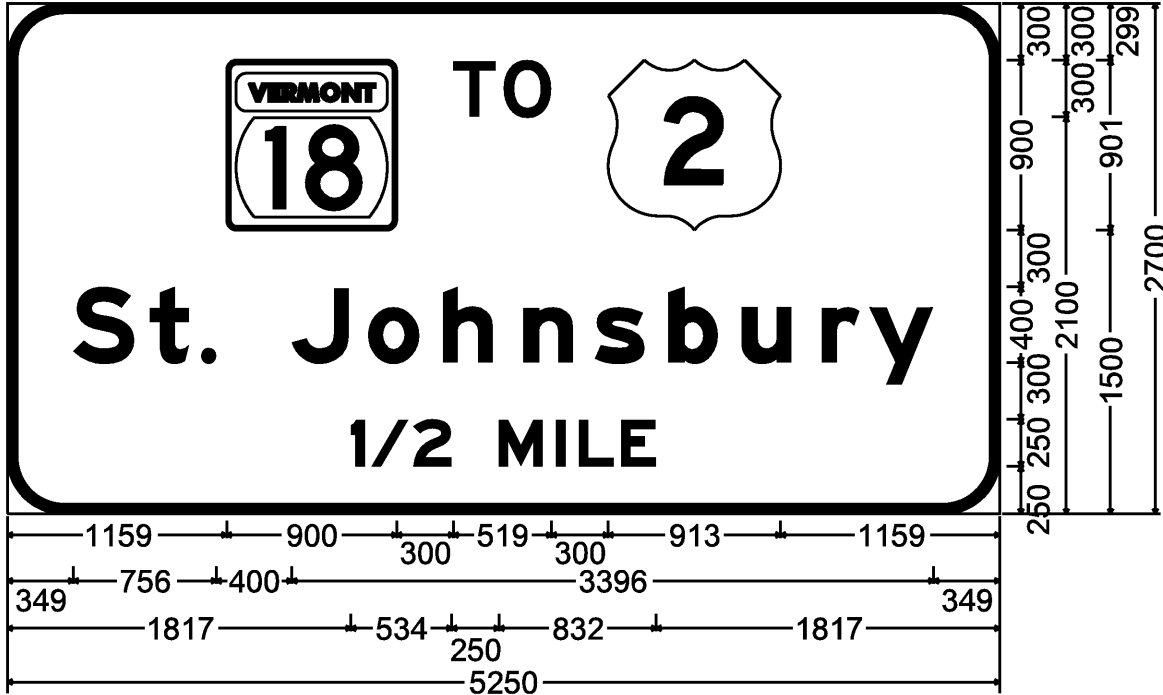
300mm Radius, 50mm Border, White on Blue;
[NEXT RIGHT] E Mod 2K;

M.M. 6.225 NB



300mm Radius, 50mm Border, White on Green;
[TO] E Mod 2K; [St. Johnsbury] E Mod 2K; [1 MILE] E Mod 2K;

M.M. 6.840 NB



300mm Radius, 50mm Border, White on Green;
[TO] E 2K; [St. Johnsbury] E Mod 2K; [1/2 MILE] E Mod 2K;

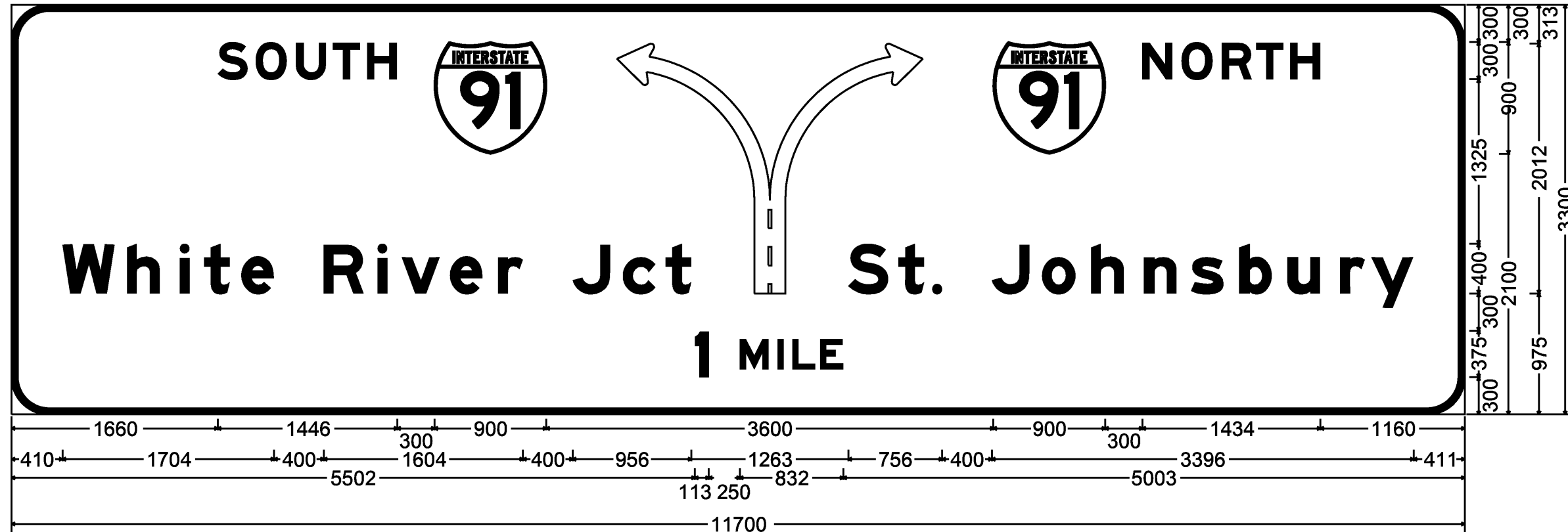
SEE GENERAL SIGN DETAIL NOTES ON SHEET 115.

SIGN DETAIL
SHEET 2

PROJECT NAME: WATERFORD
PROJECT NUMBER: HES 093-1101

FILE NAME: 97211b-details.dgn
PROJECT LEADER: CRB
DESIGNED BY: PTS
CLD REF. NO.: 97-0211
PLOT DATE: 1/4/2007
DRAWN BY: HJC
CHECKED BY: DAM
SHEET 116 OF 130

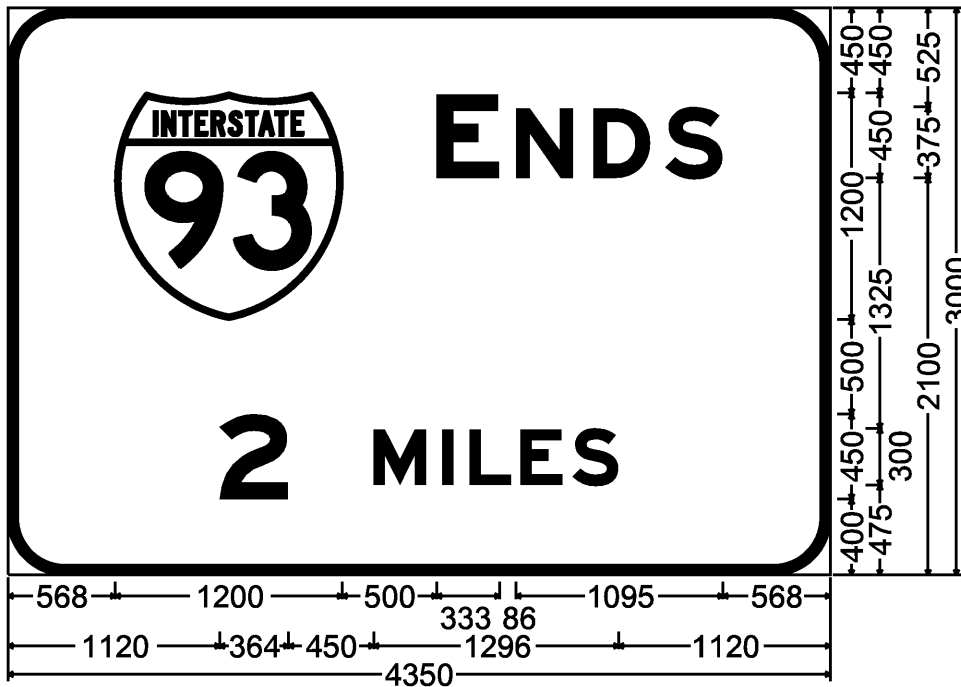
M.M. 10.050 NB
OVERHEAD



300mm Radius, 50mm Border, White on Green;
[SOUTH] E Mod 2K; [NORTH] E Mod 2K; [White River Jct] E Mod 2K; Diagrammatic Arrow lane lines Black; [St. Johnsbury] E Mod 2K; [1 MILE] E Mod 2K;

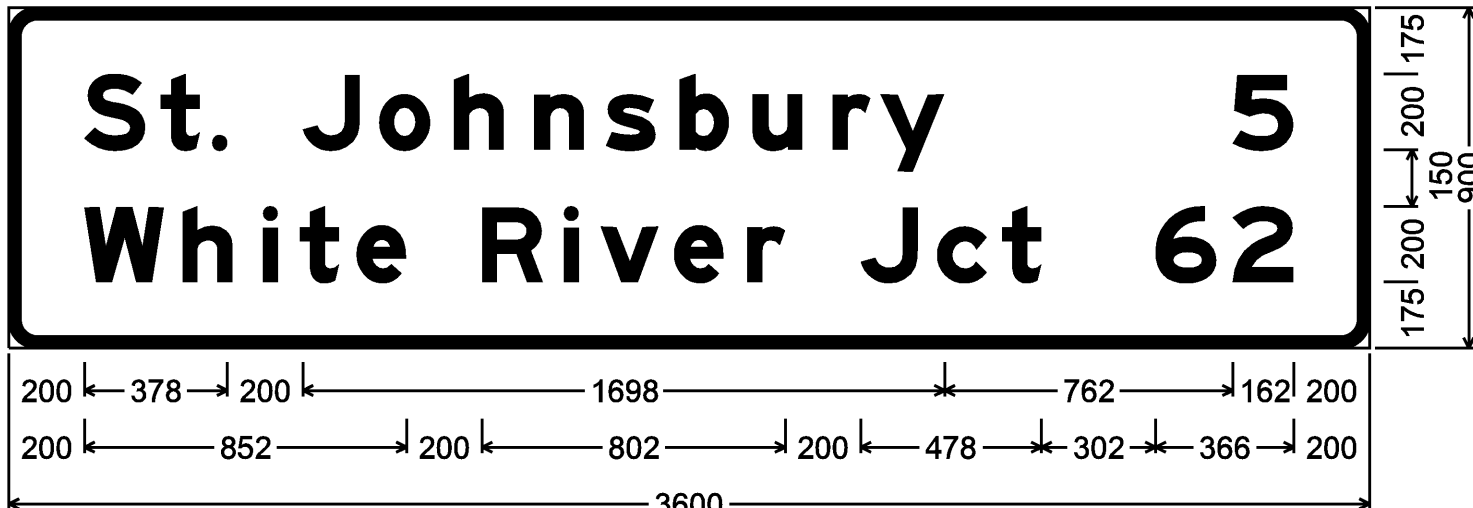
FOR ARROW DIMENSIONS SEE SHEET 119.

M.M. 8.980 NB



300mm Radius, 50mm Border, White on Green;
[ENDS] E Mod 2K; [2 MILES] E Mod 2K;

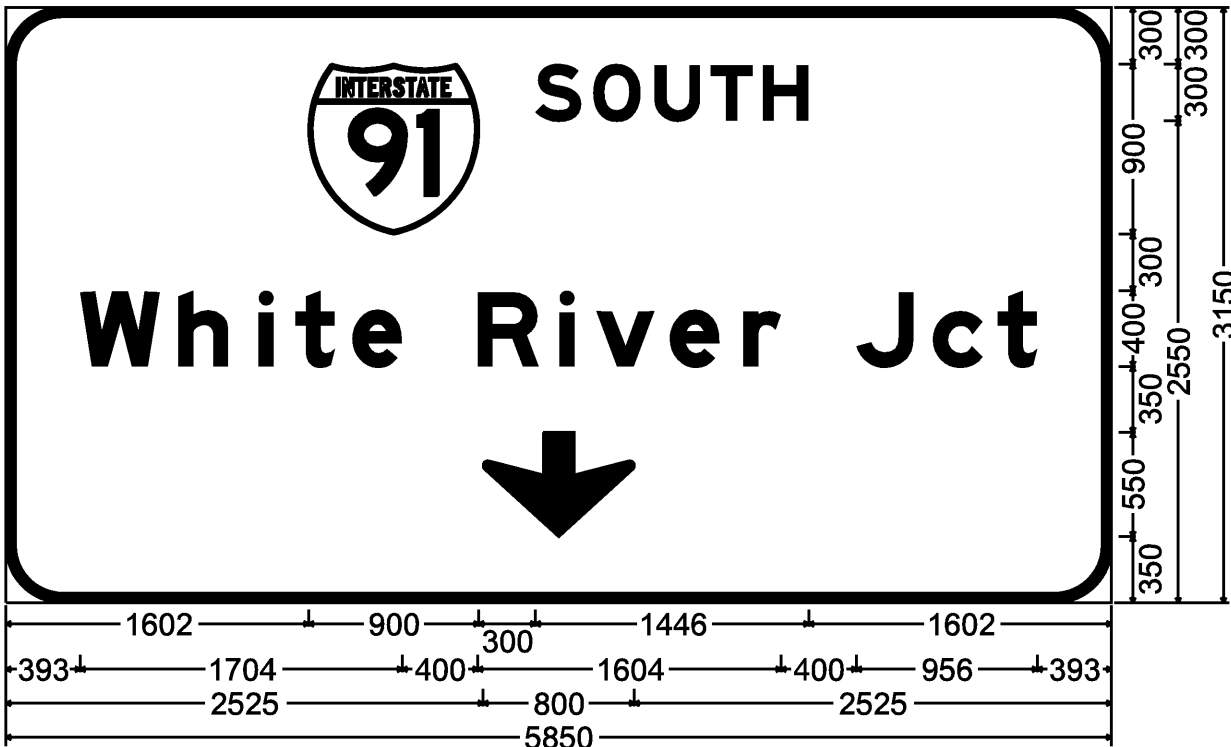
M.M. 8.316 NB



75mm Radius, 30mm Border, White on Green;
[St. Johnsbury] E Mod 2K; [White River Jct] E Mod 2K; [5] E Mod 2K;
[62] E Mod 2K;

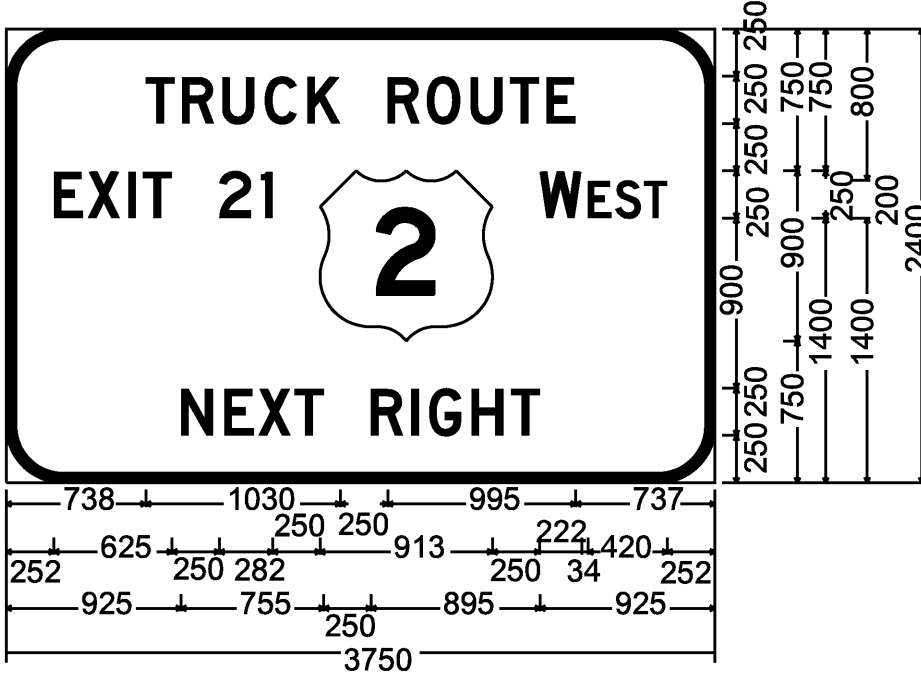
SEE GENERAL SIGN DETAIL NOTES ON SHEET 115.

M.M. 10.970 NB
OVERHEAD



300mm Radius, 50mm Border, White on Green;
[SOUTH] E Mod 2K; [White River Jct] E Mod 2K; Down Arrow 550mm 270°;

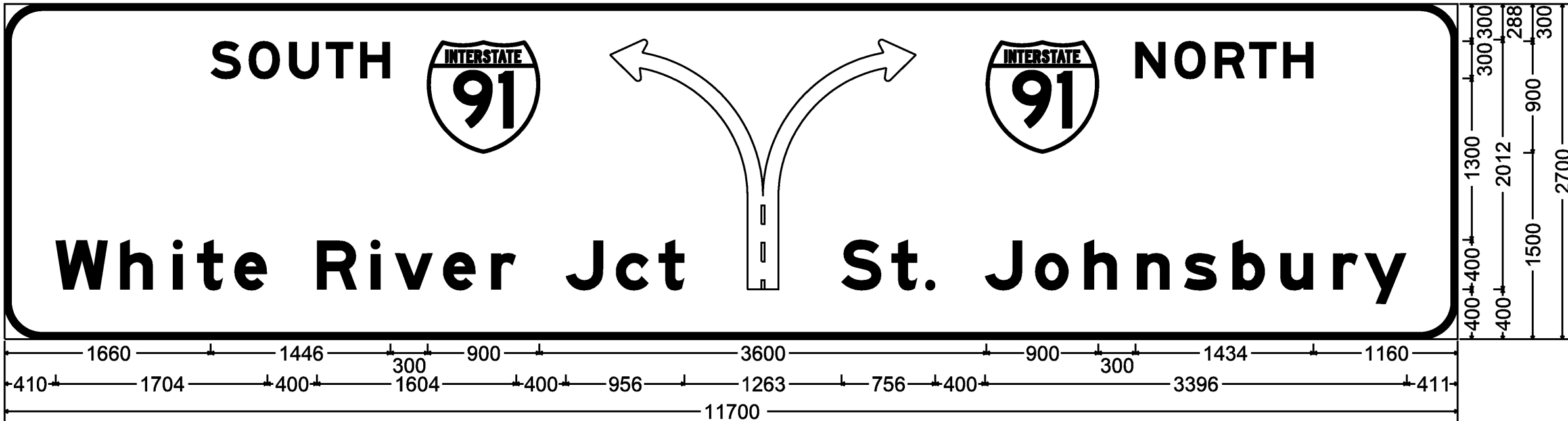
M.M. 10.740 NB



300mm Radius, 50mm Border, White on Green;
[TRUCK ROUTE] D 2K; [EXIT 21] D 2K; [WEST] D 2K; [NEXT RIGHT] D 2K;

M.M. 10.470 NB
OVERHEAD

FOR ARROW DIMENSIONS SEE SHEET 119.



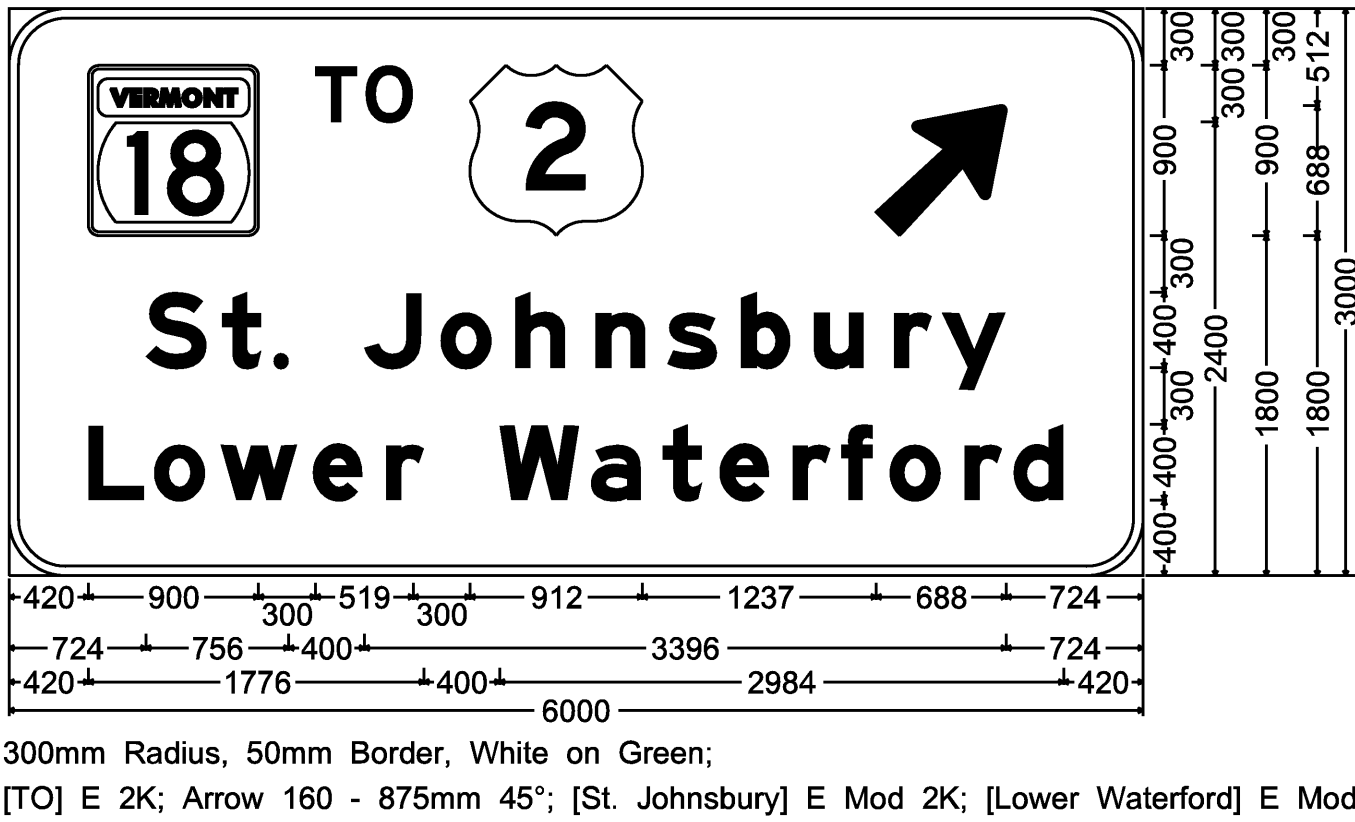
300mm Radius, 50mm Border, White on Green;
[SOUTH] E Mod 2K; [NORTH] E Mod 2K; [White River Jct] E Mod 2K; Diagrammatic Arrow lane lines Black; [St. Johnsbury] E Mod 2K;

SIGN DETAIL
SHEET 3

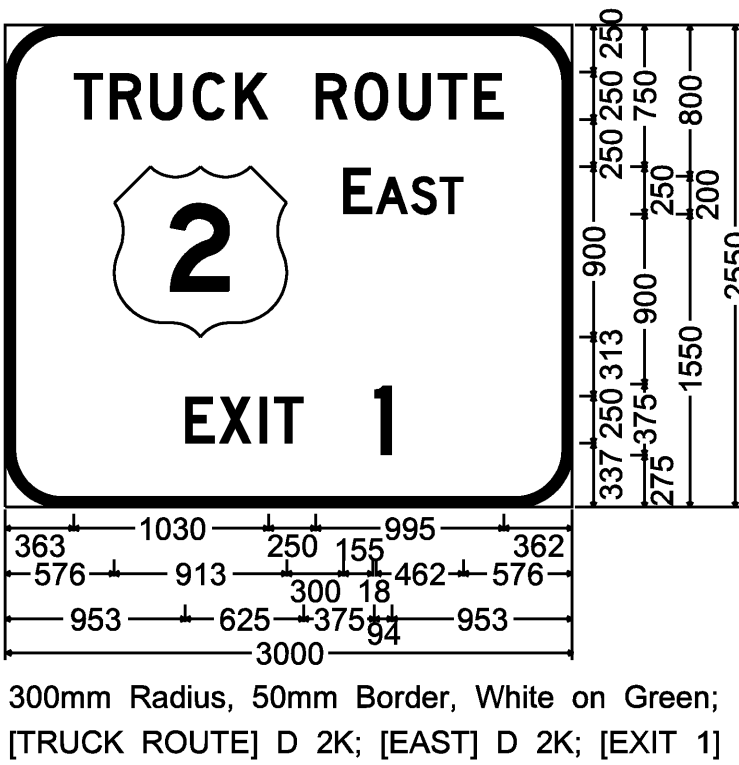
PROJECT NAME: WATERFORD
PROJECT NUMBER: HES 093-1110

FILE NAME: 97211b-details.dgn
PROJECT LEADER: CRB
DESIGNED BY: PTS
CLD REF. NO.: 97-0211
PLOT DATE: 1/4/2007
DRAWN BY: HJC
CHECKED BY: DAM
SHEET 117 OF 130

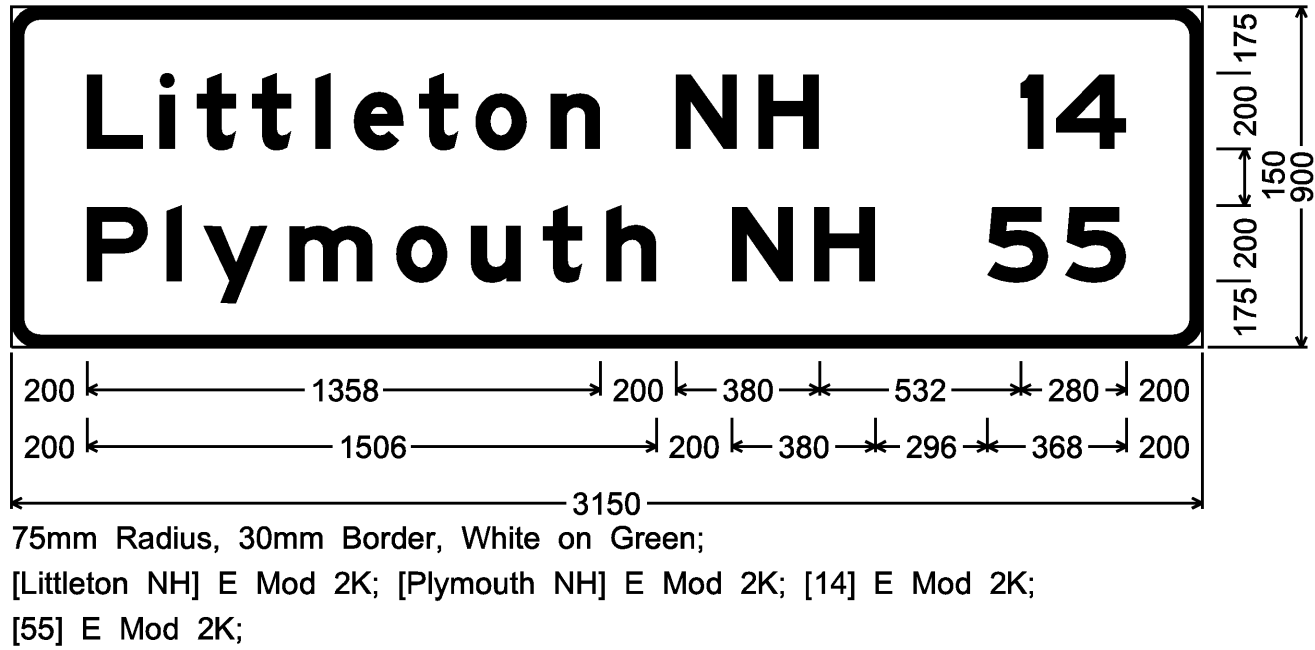
M.M. 7.750 SB



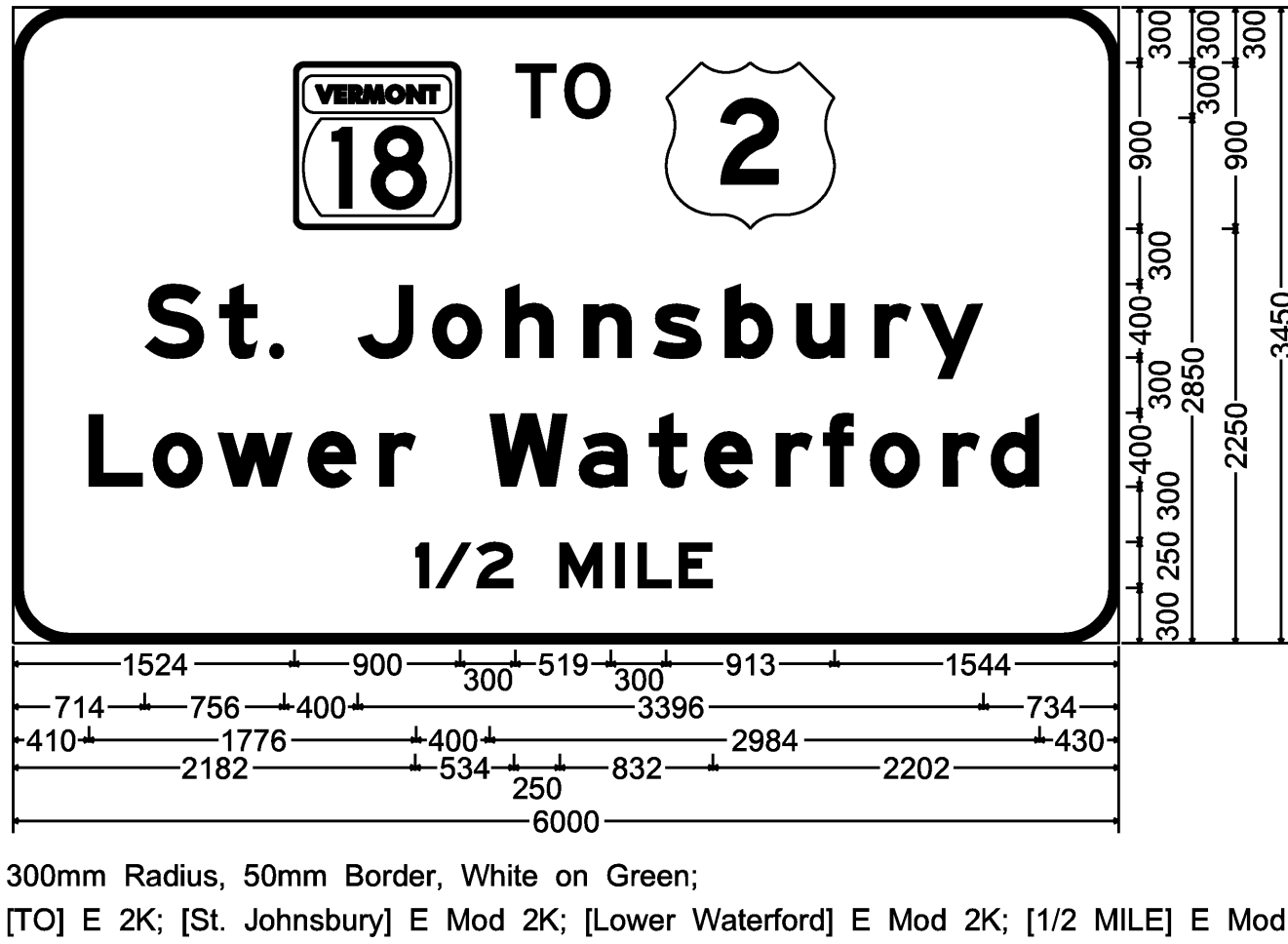
M.M. 8.610 SB



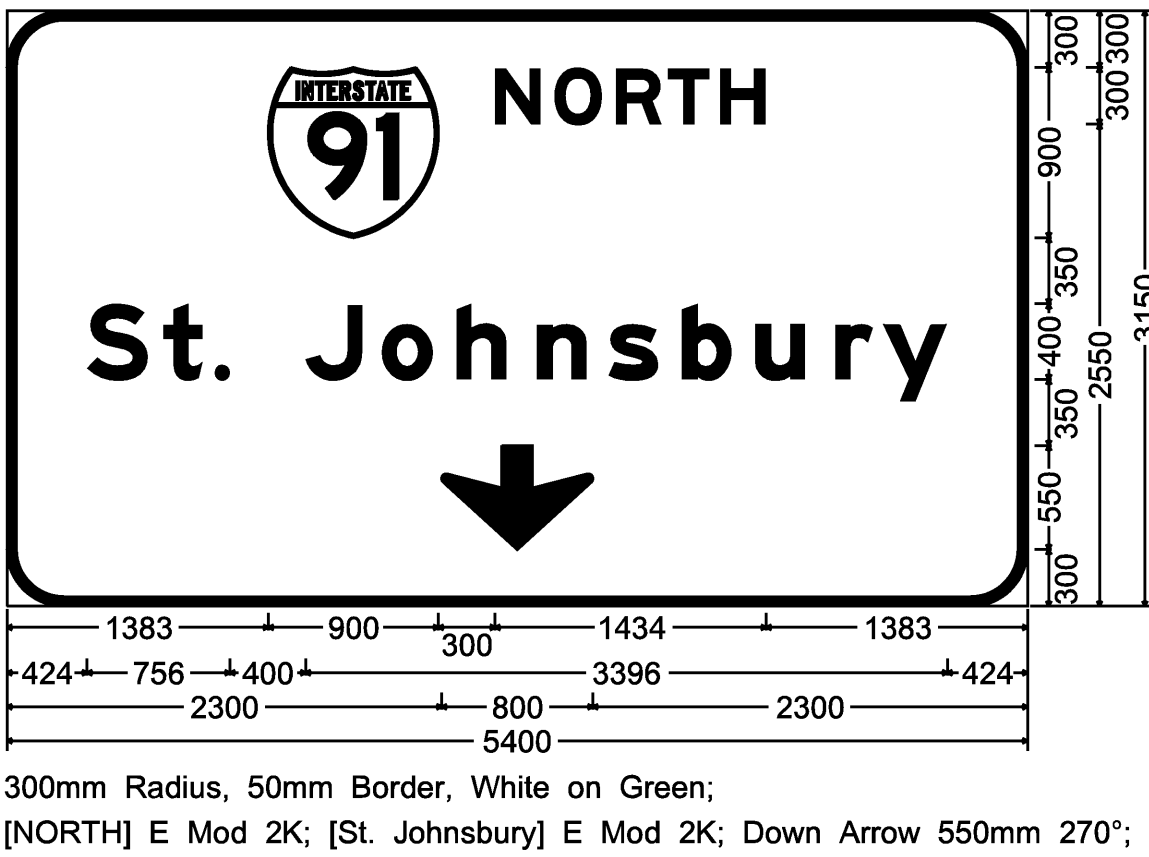
M.M. 6.435 SB



M.M. 8.214 SB



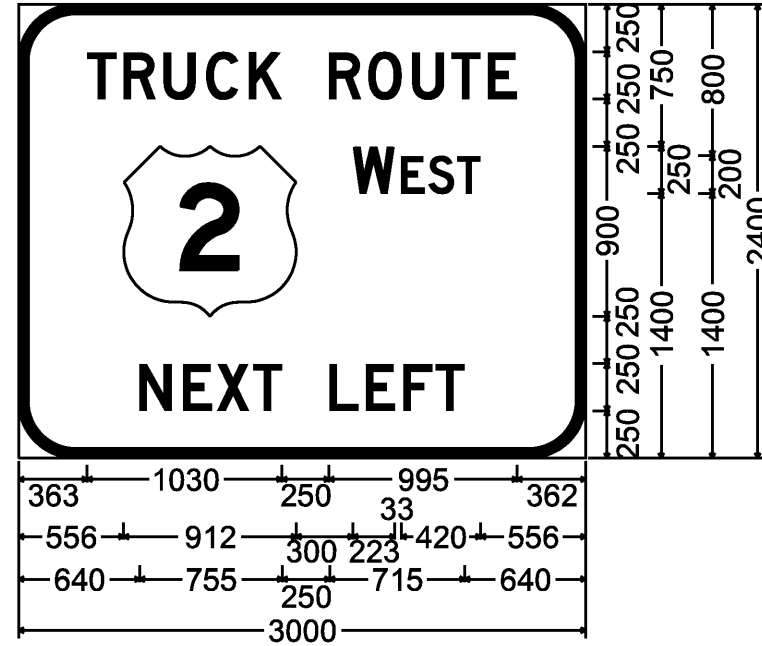
M.M. 10.970 NB
OVERHEAD



SEE GENERAL SIGN DETAIL NOTES ON SHEET 115.

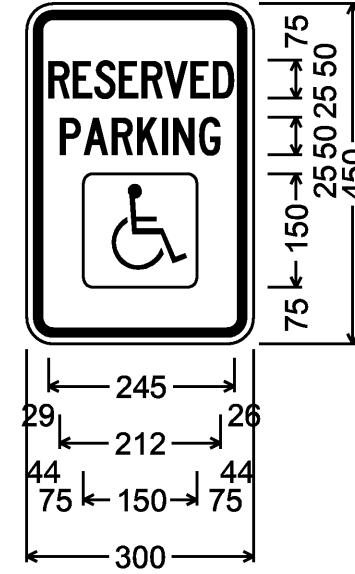
SIGN DETAIL SHEET 4	PROJECT NAME: WATERFORD	
	PROJECT NUMBER: HES 093-11010	
	FILE NAME: 97211b-details.dgn	PLOT DATE: 1/4/2007
	PROJECT LEADER: CRB	DRAWN BY: HJC
	DESIGNED BY: PTS	CHECKED BY: DAM
	CLD REF. NO.: 97-0211	SHEET 118 OF 130

INT. # 1 RTE 18
M.M. 7.300 RT

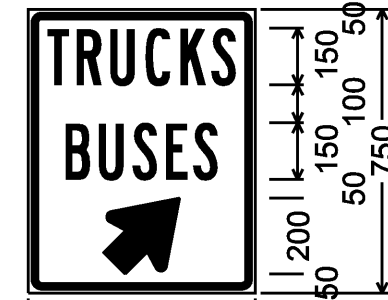


300mm Radius, 50mm Border, White on Green;
[TRUCK ROUTE] D 2K; [WEST] D 2K; [NEXT LEFT] D 2K;

REST AREA



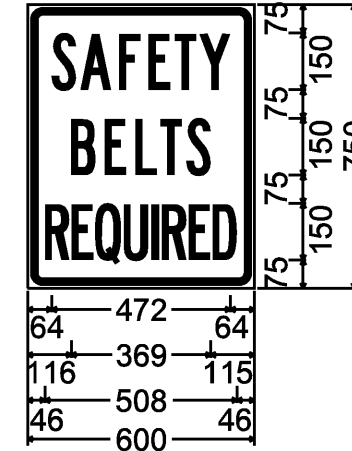
R7-8;
35mm Radius, 10mm Border, 10mm Indent, Green on White;
[RESERVED] C 2K 51% spacing;
[PARKING] C 2K 66% spacing;
Rounded Rectangle 13mm Radius Blue;



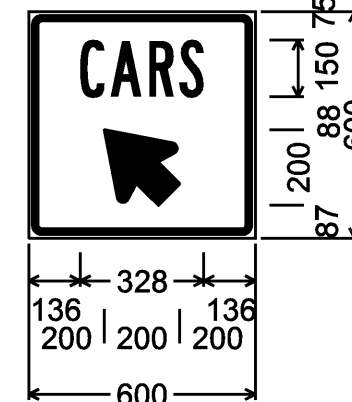
Technical drawing of a rectangular sign with the following dimensions and specifications:

- Overall width: 600
- Overall height: 200
- Top border: 15
- Left border: 51
- Right border: 99
- Internal horizontal segments: 498 (top), 402 (middle), 200 (bottom)
- Internal vertical segments: 200 (left), 200 (middle), 200 (right)

35mm Radius, 15mm Border, 10mm Indent, White on Blue;
 [TRUCKS] B 2K;
 [BUSES] B 2K;
 Standard Arrow 243mm X 211mm 45°;

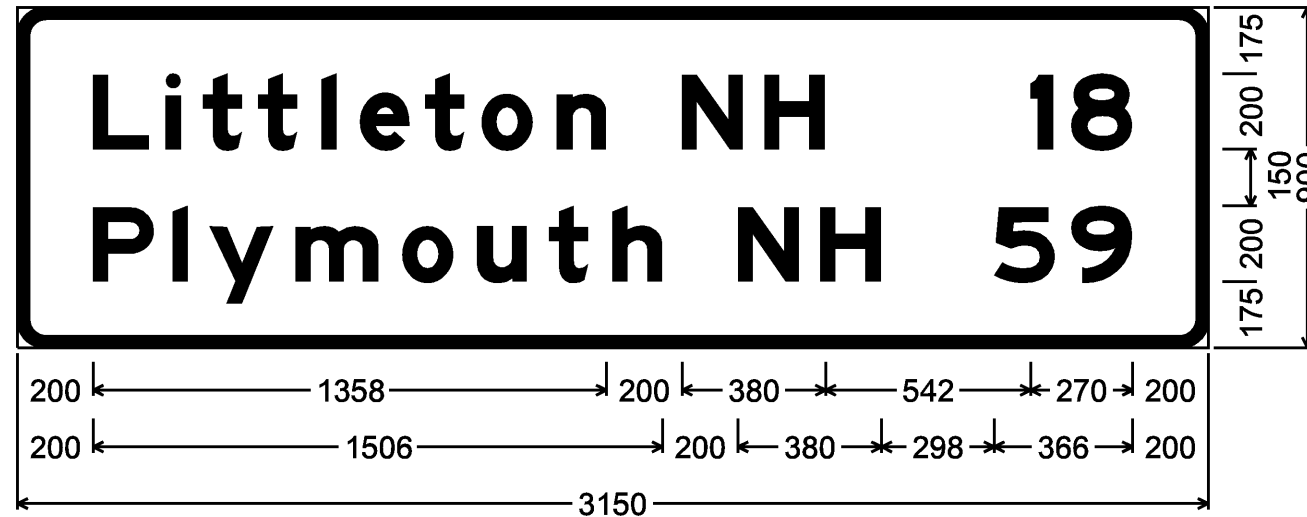


VR-602;
40mm Radius, 15mm Border, 10mm Indent, Black on White;
[SAFETY] B 2K;
[BELTS] B 2K;
[REQUIRED] B 2K 26% spacing;



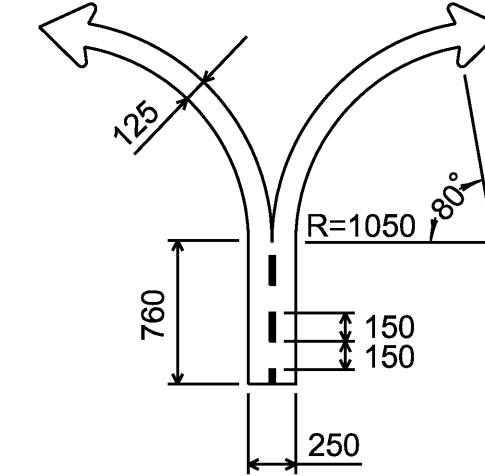
35mm Radius, 15mm Border, 10mm Indent, White on Blue;
[CARS] B 2K;
Standard Arrow 243mm X 211mm 135°;

M.M. 10.468 SB

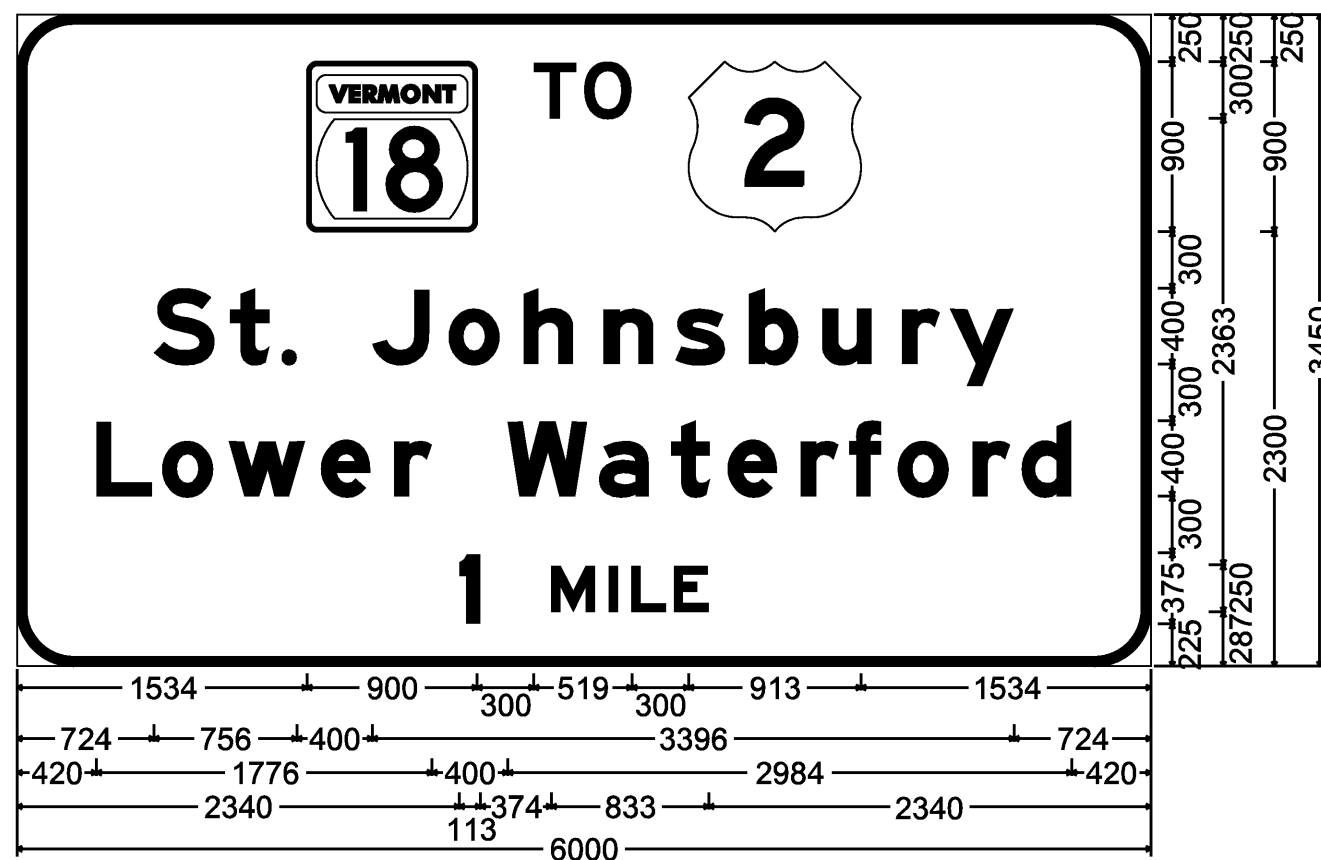


75mm Radius, 30mm Border, White on Green;
[Littleton NH] E Mod 2K; [Plymouth NH] E Mod 2K; [18] E Mod 2K;
[59] E Mod 2K;

**OVERHEAD SIGN
ARROWS**



M.M. 8.782 SB



300mm Radius, 50mm Border, White on Green;
[TO] E 2K; [St. Johnsbury] E Mod 2K; [Lower Waterford] E Mod 2K; [1 MILE] E Mod 2K;

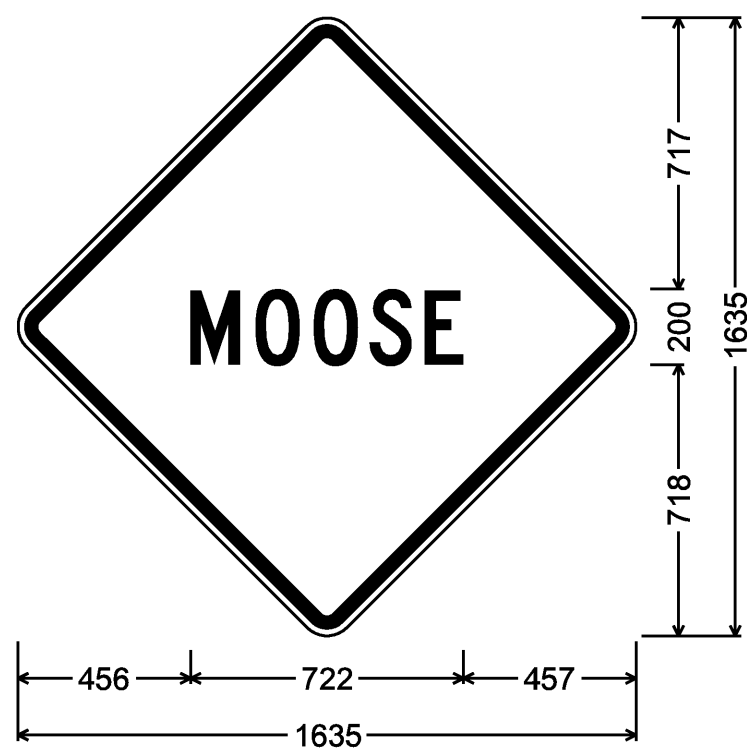
SEE GENERAL SIGN DETAIL NOTES ON SHEET 115.

**SIGN DETAIL
SHEET 5**

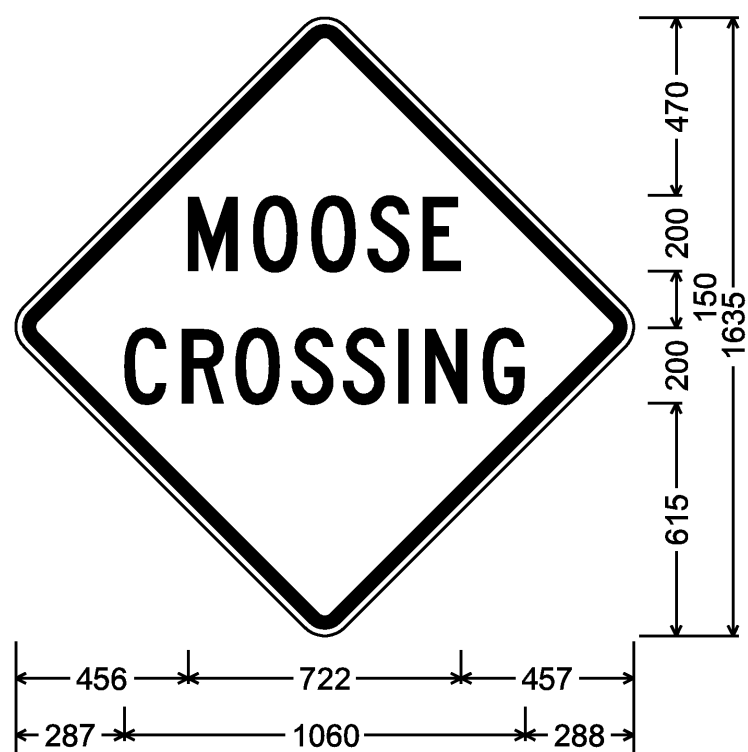
PROJECT NAME:	WATERFORD
PROJECT NUMBER:	HES 093-1(10)

FILE NAME: 9721lb-details.dgn	PLOT DATE: 1/4/2007
PROJECT LEADER: CRB	DRAWN BY: HJC
DESIGNED BY: PTS	CHECKED BY: DAM
CLD REF. NO.: 97-0211	SHEET 119 OF 130

MISC.

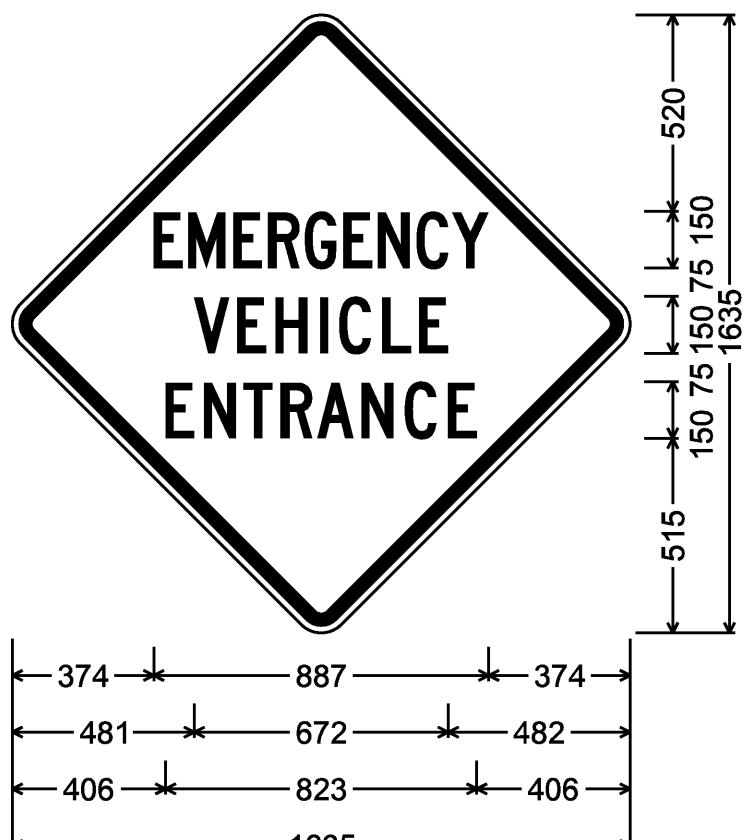


1200mm across sides 75mm Radius, 30mm Border, 20mm Indent, Black on Yellow;
[MOOSE] C 2K;

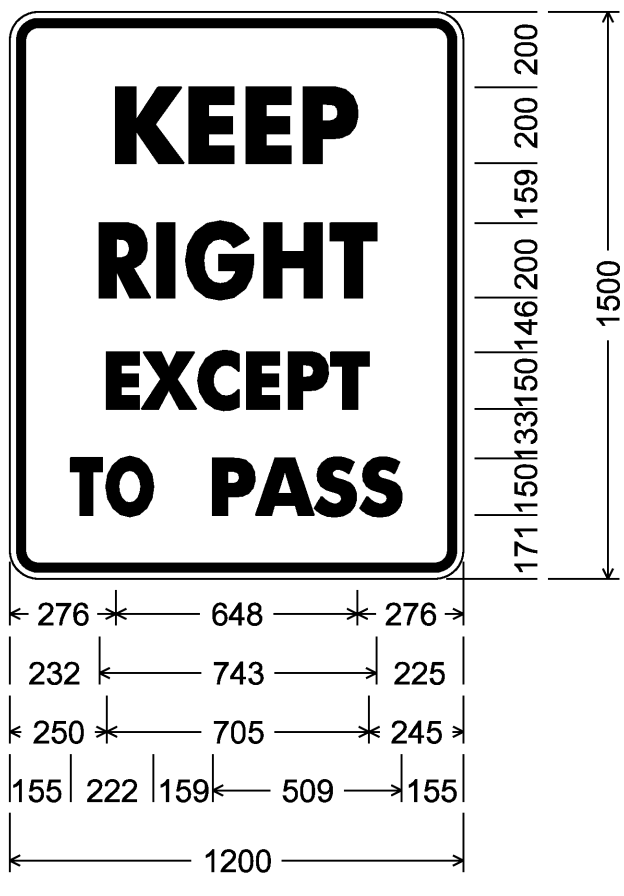


1200mm across sides 75mm Radius, 30mm Border, 20mm Indent, Black on Yellow;
[MOOSE] C 2K; [CROSSING] C 2K;

MISC.

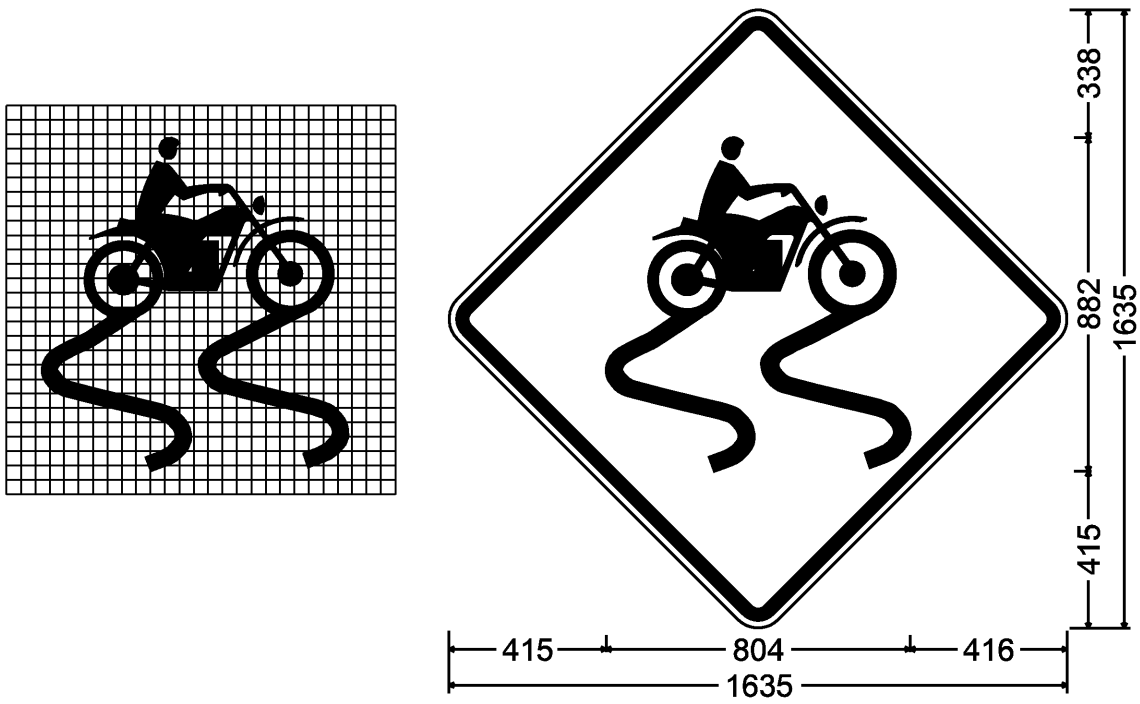


1200mm across sides 75mm Radius, 30mm Border, 20mm Indent, Black on Yellow;
[EMERGENCY] C 2K 60% spacing;
[VEHICLE] C 2K; [ENTRANCE] C 2K;

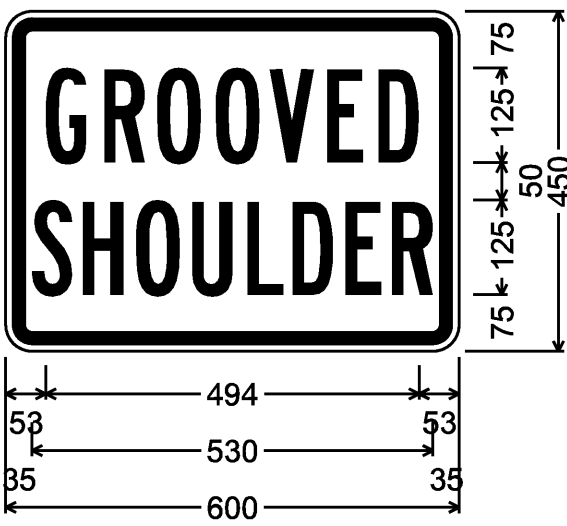


VR-132;
75mm Radius, 22mm Border, 20mm Indent, Black on White;
[KEEP] D, [RIGHT] D
[EXCEPT] D, [TO] D, [PASS] D

MISC.



1200mm across sides 75mm Radius, 30mm Border, 20mm Indent, Black on Yellow;
motorcycle;



35mm Radius, 15mm Border, 10mm Indent, Black on Yellow;
[GROOVED] B 2K;
[SHOULDER] B 2K 70% spacing;

SEE GENERAL SIGN DETAIL NOTES ON SHEET 115.

SIGN DETAIL
SHEET 6

PROJECT NAME: WATERFORD
PROJECT NUMBER: HES 093-1(10)

FILE NAME: 97211b-details.dgn
PROJECT LEADER: CRB
DESIGNED BY: PTS
CLD REF. NO.: 97-0211
PLOT DATE: 1/4/2007
DRAWN BY: HJC
CHECKED BY: DAM
SHEET 120 OF 130

150

12.5 R

25

50 B

25

50 C *

25

50 C *

25

250

BRIDGE

10-M

I-91

12.5

MIN. *

VD-701

* OPTICALLY SPACE BRIDGE

EDGE OF SHOULDER

OFFSET 1.8 m MIN.

OR ROW LINE

1.2 m

600 MIN.

FACE OF GUARDRAIL

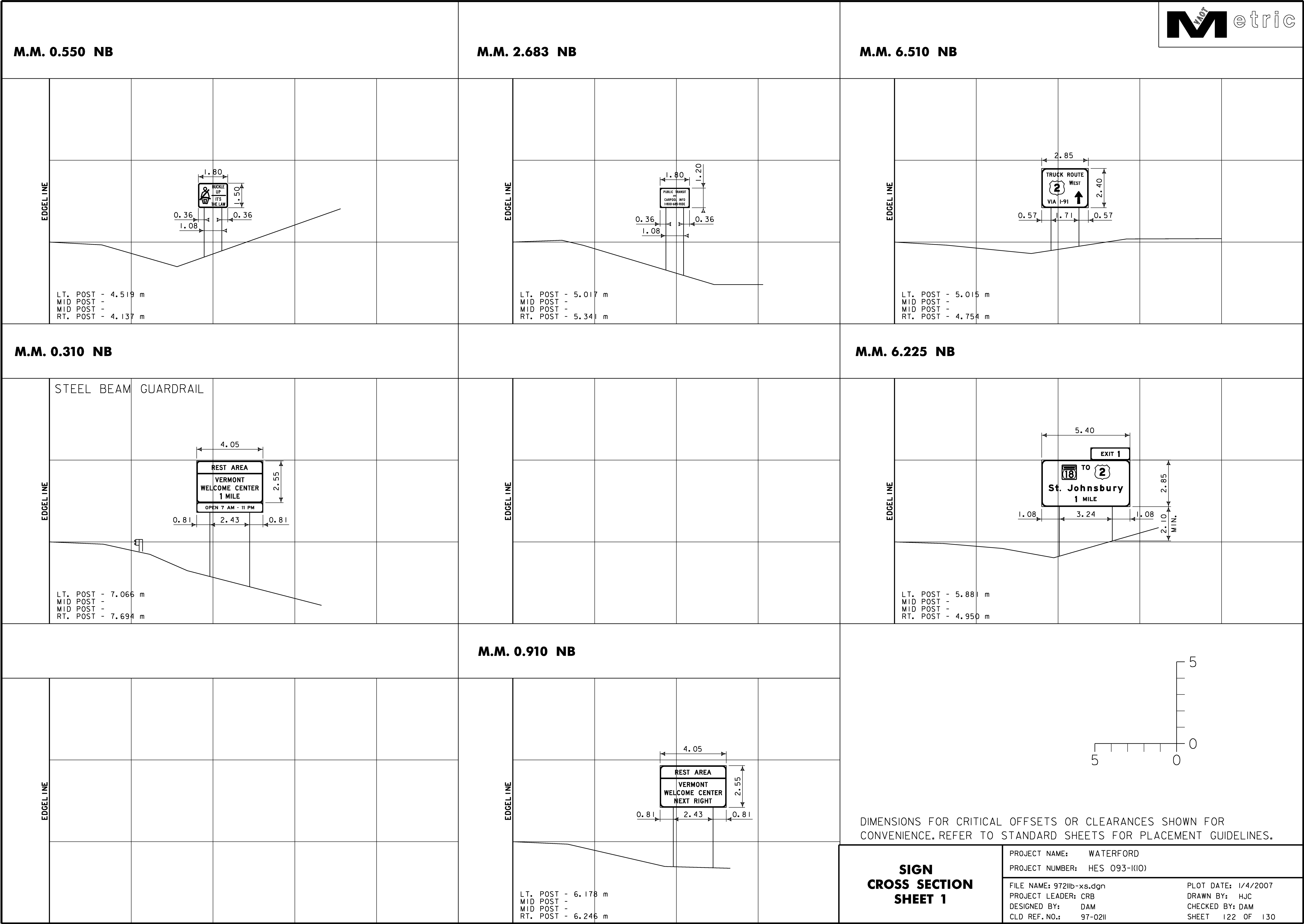
900

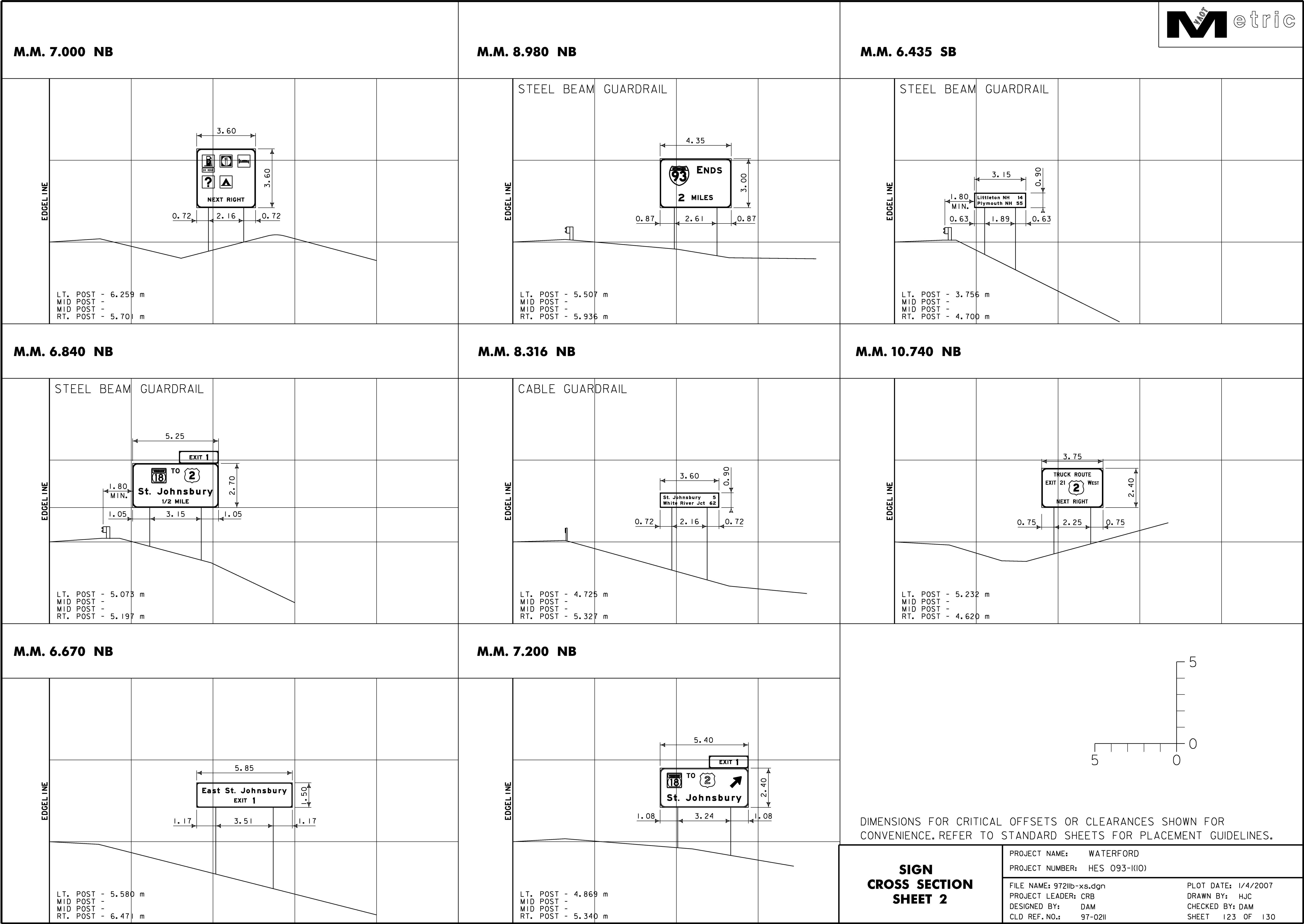
1.2 m

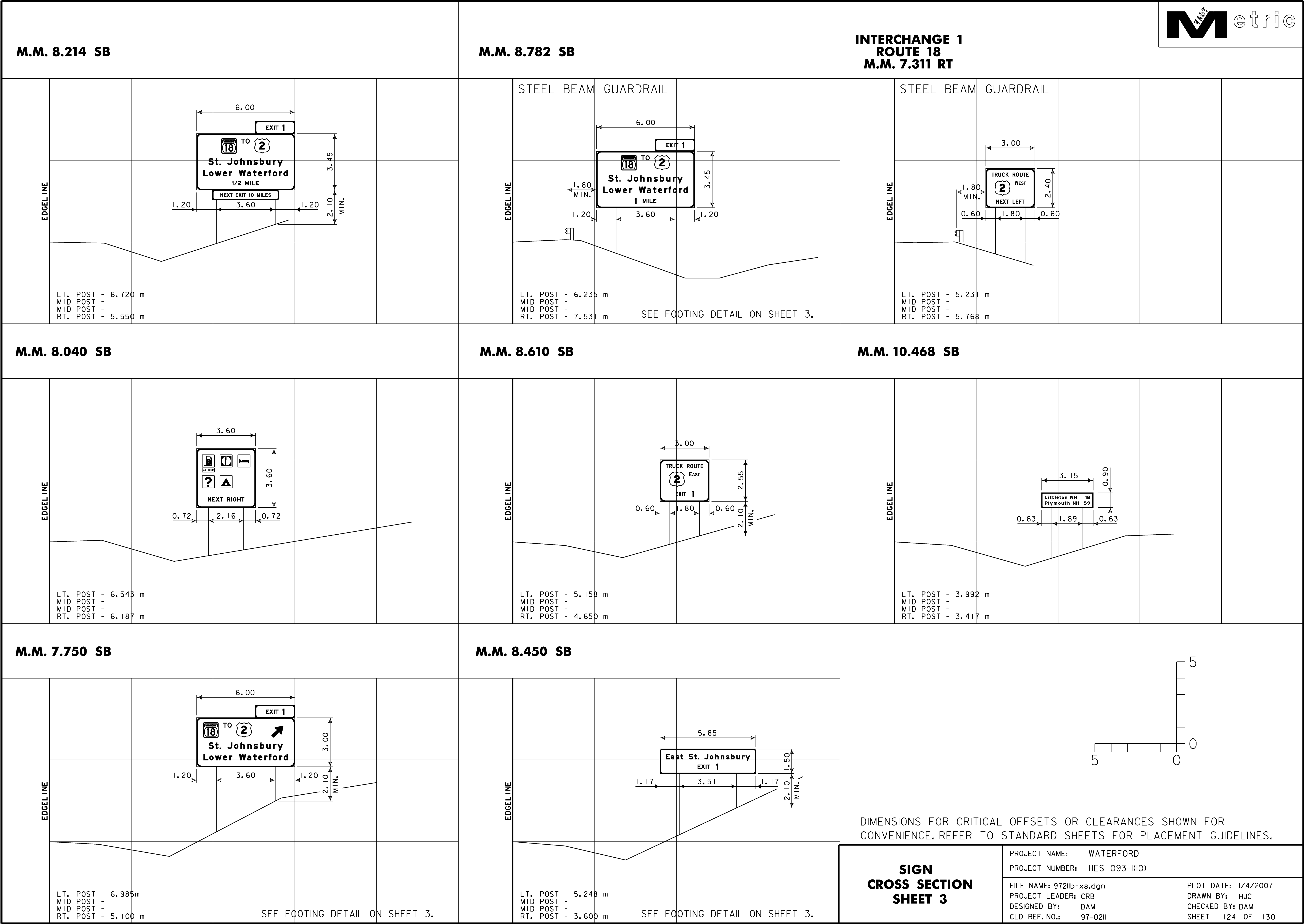
VARIABLE

600 MIN.

FILE NAME: 972lib-details.dgn	PLOT DATE: 1/4/2007
PROJECT LEADER: CRB	DRAWN BY: HJC
DESIGNED BY: PTS	CHECKED BY: DAM
CLD REF. NO.: 97-0211	SHEET 121 OF 130







GENERAL NOTES

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION", DATED 2001, WITH CURRENT MODIFICATIONS.
2. OVERHEAD SIGN/SIGNAL SUPPORTS SHALL CONFORM TO AASHTO'S PUBLICATION ENTITLED "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS", DATED 2001 OR ITS LATEST EDITION.
3. ADDITIONAL DESIGN CRITERIA ARE AS FOLLOWS:
- CONCRETE f'_c = 10 MPa f'_c = 25 MPa
REINFORCING f_s = 165 MPa (GRADE 420)
FOOTING SOIL PRESSURE : 145 kPa (MAXIMUM)
- WIND LOAD AND ICE LOAD PER AASHTO "STANDARD SPECIFICATIONS"
4. ANCHOR BOLTS
- FOUR STAINLESS STEEL ANCHOR BOLTS WITH TWO HEXAGON NUTS, ONE WASHER AND ONE LOCK WASHER PER BOLT SHALL BE FURNISHED WITH EACH POLE. ANCHOR BOLT PLATES, WHEN USED, SHALL ALSO BE STAINLESS STEEL. SEE SUB-SECTION 714.09.
5. FLANGE BOLTS
- ALL FLANGE BOLTS AND HEX NUTS SHALL BE HIGH STRENGTH STEEL AND SHALL CONFORM TO ASTM A 325M. THE FLANGE BOLTS SHALL BE CAPABLE OF RESISTING 133% OF THE FULL DESIGN STRESS OF THE TUBE AT ITS YIELD STRENGTH STRESS.
6. HORIZONTAL AND VERTICAL MEMBERS
- STEEL TUBES SHALL BE FORMED AND WELDED WITH ONE CONTINUOUS LONGITUDINAL WELD ONLY. AFTER FORMING AND WELDING THEY SHALL BE COLD ROLLED TO ENSURE UNIFORMITY OF SIZE AND SMOOTHNESS OF WELD. THEY SHALL HAVE A MINIMUM YIELD STRENGTH OF 330 MPa. THERE SHALL BE NO TRANSVERSE WELDING EXCEPT AT THE FLANGE CONNECTIONS AND POLE BASE PLATES, WHERE THE TUBES SHALL TELESCOPE THE FLANGES AND PLATES AND BE CONTINUOUSLY WELDED BOTH SIDES INSIDE AND OUT TO WITHSTAND THE FULL TRANSFER OF THE BENDING STRENGTH TO THE BOLTS.
7. GALVANIZING
- ALL STEEL COMPONENTS, EXCEPT CONCRETE REINFORCING AND STAINLESS STEEL HARDWARE, ARE TO BE HOT DIPPED GALVANIZED AFTER FABRICATION. THE ASSEMBLIES SHALL BE DESIGNED AND FABRICATED TO PERMIT GALVANIZING ON ALL INTERIOR AND EXTERIOR SURFACES AND SHALL BE FREE OF POCKETS AND OTHER STRUCTURAL OBSTRUCTIONS THAT WILL NOT PERMIT PROPER DEPOSITION OF ZINC COATING. GALVANIZING SHALL BE IN ACCORDANCE WITH ASTM A 123 M AND ASTM A 153 M.
8. WELDING
- A. ALL DESIGN DETAILS, WORKMANSHIP, PROCEDURES AND INSPECTION SHALL CONFORM WITH SUB-SECTION 506.10.
- B. ALL WELDS SHALL BE AT LEAST AS STRONG AS THE MATERIAL(S) BEING WELDED.
9. FOOTINGS
- A. FOOTINGS SHALL BE DESIGNED TO RESIST LOADS EQUAL TO, OR GREATER THAN, THE MAXIMUM LOADS THAT THE POLE IS DESIGNED FOR.
- B. THREE TYPES OF FOUNDATIONS, AS OUTLINED IN AASHTO STANDARD SPECIFICATIONS (SEE NOTE 2) SECTION 1.8.2 (C) SHALL BE ALLOWED.
1. DRILLED SHAFTS,
2. SPREAD FOOTINGS AND
3. PILES.
- C. DRILLED SHAFT FOOTINGS SHALL BE POURED IN DRILLED SHAFTS AGAINST UNDISTURBED MATERIAL. THE TOP 600 mm OF SOIL SHALL BE NEGLECTED FOR DESIGN PURPOSES.

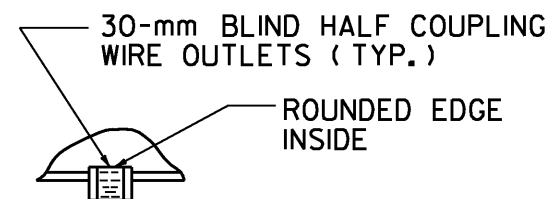
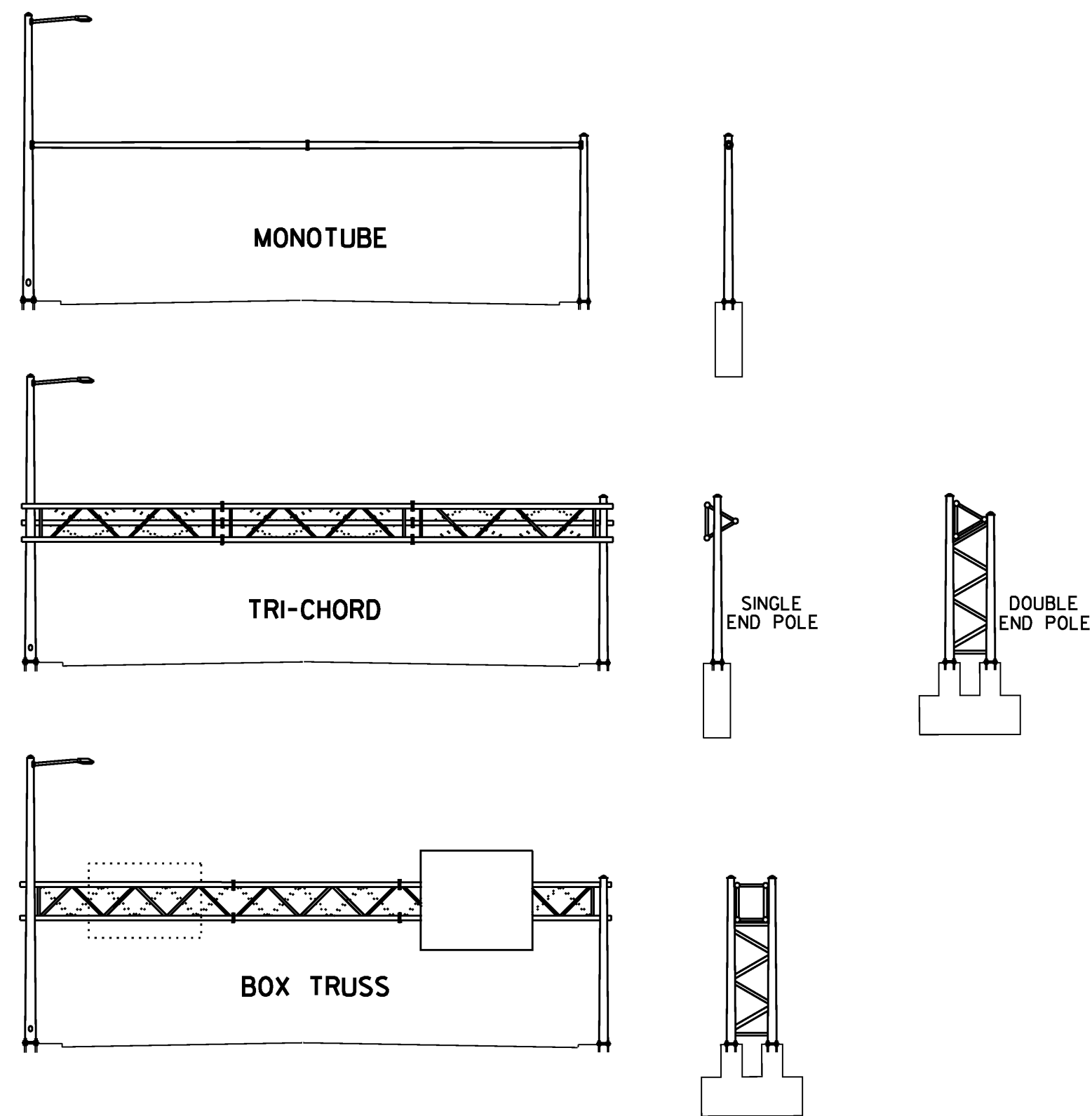
- D. AS AN ALTERNATIVE TO THE DRILLED HOLES, FOOTINGS MAY BE POURED IN EXCAVATED HOLES USING THE PROPER FORMS, WHICH MUST BE REMOVED. THE EXCAVATED HOLES SHALL BE AT LEAST 600 mm CLEAR OF THE FOOTING SIDES AND 300 mm DEEPER THAN THE FOOTING. CARE SHALL BE TAKEN TO AVOID EXCAVATING AROUND THE TOP OF THE FOOTING. THE BACKFILL MATERIAL SHALL BE COMPACTED AS DESCRIBED IN SUB-SECTION 204.12. DESIGN LIMITS AS FOR AUGERED FOOTING APPLY.
- E. WHERE THE DESIGN DEPTH OF A FOOTING CANNOT BE OBTAINED DUE TO UNFORSEEN FIELD CONDITIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND OBTAIN A REVISED FOOTING DETAIL FROM THE ENGINEER.
- F. ANY BACKFILL PLACED ADJACENT TO THE FOOTING SHALL BE GRANULAR MATERIAL MEETING THE REQUIREMENTS FOR GRANULAR BACKFILL FOR STRUCTURES, SUB-SECTION 704.08. CONCRETE FOR FOOTING SHALL CONFORM TO THE REQUIREMENTS OF CONCRETE, CLASS B, SECTION 501, STRUCTURAL CONCRETE. GROUT MATERIAL SHALL BE NON-SHRINKING MORTAR CONFORMING TO SUB-SECTION 707.03 (MORTAR TYPE IV).
- G. SIGNALS/SIGNS SHALL BE INSTALLED AND LEVELED AND POLES SHALL BE PLUMB PRIOR TO PLACING GROUT UNDER POLE BASE.
10. SHOP DRAWINGS (6 COPIES OF EACH) SHALL BE SUBMITTED TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION, STRUCTURES SECTION FOR APPROVAL PRIOR TO FABRICATION. THE SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING INFORMATION:
- A. DETAILED DRAWING OF EACH COMPONENT OF THE STRUCTURE.
- B. MATERIAL SPECIFICATION FOR EACH COMPONENT OF THE STRUCTURE, EITHER BY COMPLETE SPECIFICATION OR REFERENCE TO APPLICABLE ASTM STANDARDS.
- C. NOTATION OF PROJECT NAME, PROJECT NUMBER, ROUTE NUMBER AND STRUCTURE STATIONING (TO BE INCLUDED ON EACH SHEET).
- D. DETAILS FOR LOCATION OF SIGNS/SIGNALS AND ATTACHMENT HARDWARE FOR THE SUPPORT STRUCTURE.
- E. ALL ELEVATIONS AND DIMENSIONS NECESSARY TO PROVIDE A COMPLETE SET OF RECORD PLANS.
- F. DEAD LOAD DEFLECTION AND CAMBER INFORMATION.
- G. WELDING DETAILS AND PROCEDURES ARE REQUIRED FOR ALL WELDS. PROCEDURES SHALL BE SUBMITTED FOR APPROVAL WITH REFERENCE TO EACH WELD IDENTIFIED ON THE SHOP DRAWINGS. (SEE SUB-SECTION 506.10)
11. EACH OVERHEAD TRAFFIC SIGNAL/SIGN SUPPORT SHALL BE GROUNDED. THE GROUND SHALL CONSIST OF:
- A) AN INTERNAL GROUND LUG OPPOSITE THE HAND HOLE;
B) A 13.30 mm² (MIN.) SOFT DRAWN COPPER GROUNDING ELECTRODE CONDUCTOR.
C) A 16 X 2400 (MIN.) COPPER CLAD GROUNDING ELECTRODE. THE RESISTANCE TO GROUND SHALL BE 25 OHMS OR LESS. ADDITIONAL GROUNDING ELECTRODES MAY BE REQUIRED (MINIMUM SPACING SHALL BE 1800 mm).
- WHERE A POWER SERVICE, METER AND DISCONNECT ARE ATTACHED TO A POLE, THERE SHALL BE A CONTINUOUS GROUNDING ELECTRODE CONDUCTOR FROM THE METER AND DISCONNECT WHICH MAY RUN INTERNAL TO THE UPRIGHT, THROUGH THE DN16 FLEXIBLE TUBING IN THE CONCRETE BASE TO THE REQUIRED GROUNDING ELECTRODE(S). THE GROUNDING ELECTRODE CONDUCTOR FROM THE POLE GROUNDING LUG, CONTROLLER CABINET AND/OR LUMINAIRE MAY ATTACH TO THIS CONTINUOUS GROUNDING ELECTRODE CONDUCTOR FROM THE SERVICE METER AND DISCONNECT. THE CONTRACTOR SHALL PERFORM A RESISTANCE TO GROUND TEST ON THE CONTINUOUS GROUNDING ELECTRODE CONDUCTOR FROM THE SERVICE METER AND DISCONNECT AND PROVIDE A WRITTEN STATEMENT TO THE AREA ELECTRICAL INSPECTOR THAT THE GROUNDING ELECTRODE CONDUCTOR IS CONTINUOUS FROM THE SERVICE METER AND DISCONNECT AND THE RESISTANCE TO GROUND IS 25 OHMS OR LESS.
12. THE COST OF SIGNAL/SIGN SUPPORTS, INCLUDING ALL HARDWARE, SIGN BRACKETS, FOOTINGS AND LUMINAIRE ARMS SHALL BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 677.12, 677.13 OR 678.15, WHICHEVER IS APPLICABLE. THESE COMPONENTS SHALL CONFORM TO ALL APPLICABLE PROVISIONS OF SECTIONS 677, 678 AND 679.
13. HORIZONTAL MEMBERS SHALL BE CAMBERED AND THE VERTICAL POLES BACK-RAKED (WHERE APPLICABLE) TO THE ANTICIPATED DEAD LOAD DEFLECTION PLUS THE CAMBER, IF ANY, SPECIFIED ON THE PLANS.

14. AN EQUIVALENT ALTERNATE DESIGN MAY BE SUBSTITUTED FOR THE DETAILS AND MATERIALS SHOWN.
15. THE DETAILS OF DESIGN FOR THE STRUCTURE AND FOOTINGS ARE TO BE SUPPLIED BY THE CONTRACTOR AND/OR BY THE MANUFACTURER. THE STRUCTURE SHALL BE DESIGNED TO RESIST THE MAXIMUM LOADING AS OUTLINED IN THE AASHTO STANDARD SPECIFICATIONS (SEE NOTE 2). ALL DETAILS OF THE STRUCTURE AND THE FOOTING SHALL BE CHECKED AND STAMPED BY A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF VERMONT PRIOR TO SUBMITTAL OF THE SHOP DRAWINGS TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION.
16. IN ADDITION TO THE SHOP DRAWINGS OUTLINED IN NOTE 10, THE CONTRACTOR SHALL SUBMIT ALL DESIGN CALCULATIONS TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION, STRUCTURES SECTION, SHOWING THE FOLLOWING INFORMATION FOR EACH OF THE VERTICAL AND HORIZONTAL COMPONENTS OF THE STRUCTURE AND FOOTING:
- A. THE DESIGN AXIAL AND SHEAR FORCES AND BENDING AND TORSIONAL MOMENTS.
- B. THE DESIGN AXIAL, BENDING AND SHEAR STRESSES AND THE COMBINED STRESS RATIO.
- C. VIBRATION AND FATIGUE CALCULATIONS AS SET FORTH IN SECTION 9 OF THE AASHTO PUBLICATION REFERENCED IN NOTE 2.
- D. THE ALLOWABLE AXIAL, BENDING, AND SHEAR STRESSES.
- E. ITEMS A, B AND D SHALL BE SHOWN FOR EACH OF THE GROUP LOADINGS (I, II AND III) AND FOR THE BASIC WIND LOAD APPLIED TO THE TWO CASES OUTLINED IN THE AASHTO STANDARD SPECIFICATIONS (SEE NOTE 2) SECTION 1.2.5 (D)(4).
- F. FAILURE TO SUPPLY THE PROPER DESIGN INFORMATION SHALL BE CAUSE FOR REJECTION OF THE STRUCTURE.
- G. A MINIMUM OF FOUR (4) WEEKS SHALL BE REQUIRED FOR REVIEW BY THE STATE OF VERMONT AGENCY OF TRANSPORTATION STRUCTURES ENGINEER IN ACCORDANCE WITH SUBSECTION 105.03.
17. THE CONTRACTOR/MANUFACTURER SHALL BE RESPONSIBLE FOR COMPLETION OF THE STRUCTURE AND FOOTING DATA ON THE DETAIL SHEET(S).
18. FOR INSTALLATIONS WHERE BOTH "EXISTING" AND "FUTURE" CONDITIONS ARE SHOWN, THE SUPPORTS SHALL BE DESIGNED FOR THE MORE SEVERE OF THE TWO LOADING CONDITIONS. THE INFORMATION OUTLINED IN NOTE 16 ABOVE SHALL BE PROVIDED FOR BOTH THE LOADING CONDITIONS.
19. NOT USED.
20. BASE PLATES SHALL BE STAMPED WITH THE VERTICAL POLE DIAMETER, HEIGHT, YIELD STRENGTH, GAUGE AND THE HORIZONTAL MEMBER DIAMETER, LENGTH, YIELD STRENGTH AND GAUGE. ALTERNATELY, THE INFORMATION MAY BE STAMPED ON A METAL TAG RIVETED TO THE POLE NEAR THE HANDHOLE.

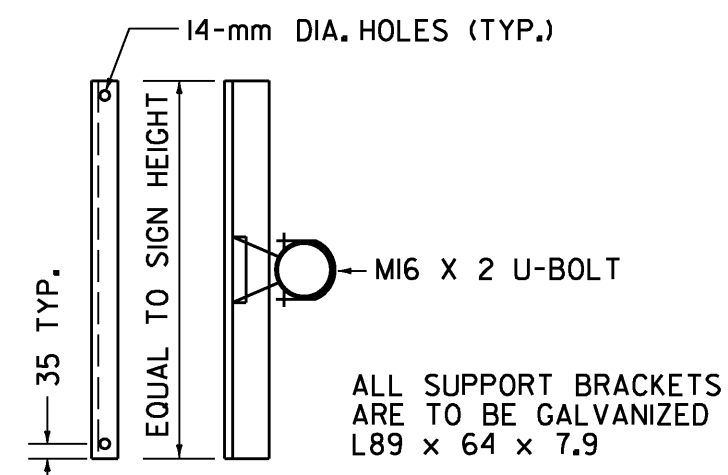
NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

ORIGINAL PREPARED - JUNE 13, 1997		CANTILEVER / OVERHEAD SIGN SUPPORT NOTES	PREPARED BY _____ DATE _____
DATE	REVISIONS		CHECKED BY _____ DATE _____
			DESIGN SUPERVISOR _____ DATE _____
			PROJ. _____
			TRAFFIC SHEET NO. _____ OF _____
			SHEET 125 OF 130 SHEETS





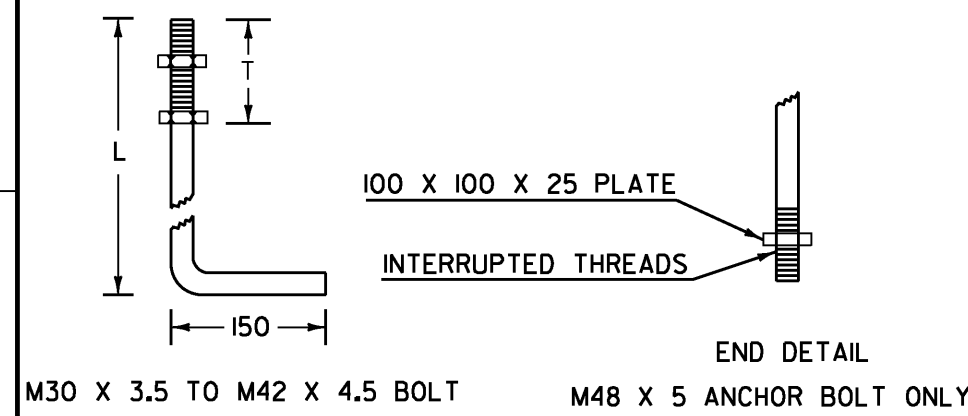
DETAIL A



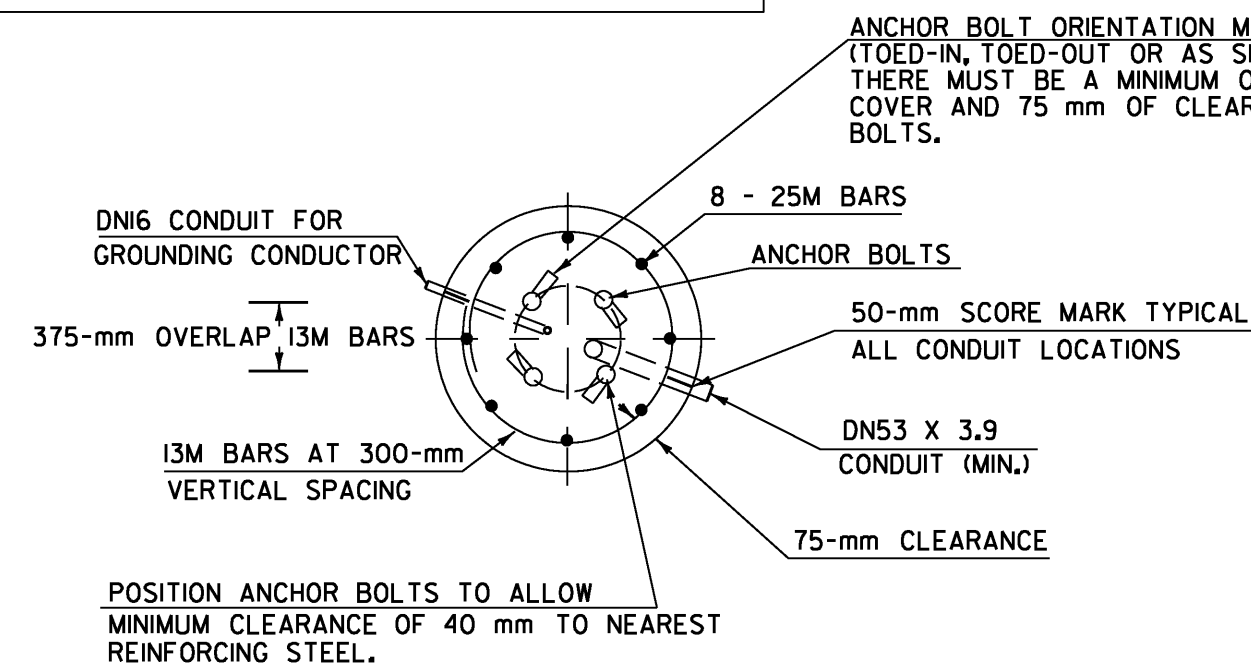
SIGN ON SINGLE MAST ARM

SIGN BRACKET DETAILS

ANCHOR BOLT DETAIL		
SIZE	L (mm)	T (mm)
M30 X 3.5 X 1200	1050	200
M36 X 4 X 1500	1350	230
M42 X 4.5 X 2250	2100	230
M48 X 5 X 2400	2400	230



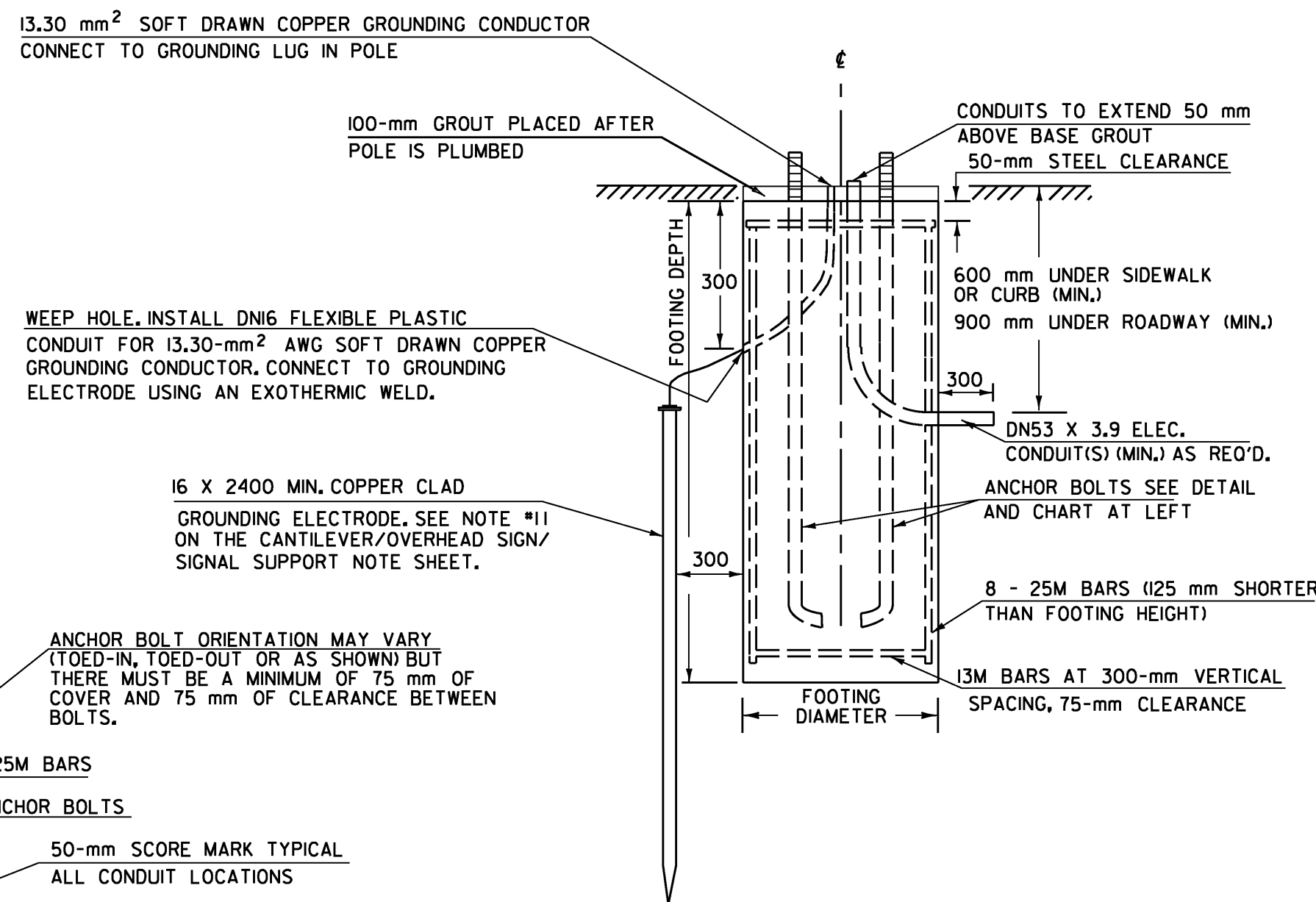
ANCHOR BOLT DETAIL



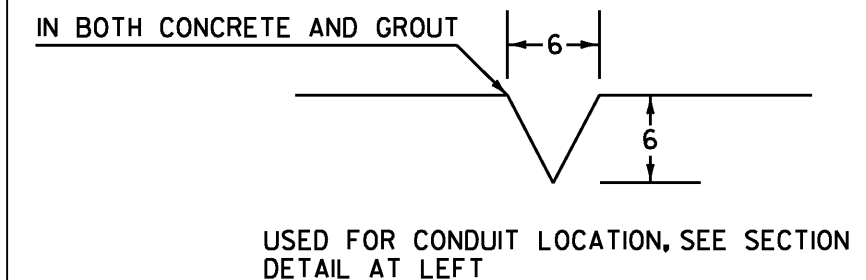
SECTION

OVERHEAD TRAFFIC SIGN BRIDGE FOOTING DETAIL

(SPREAD FOOTINGS OR PILES ARE OPTIONAL)



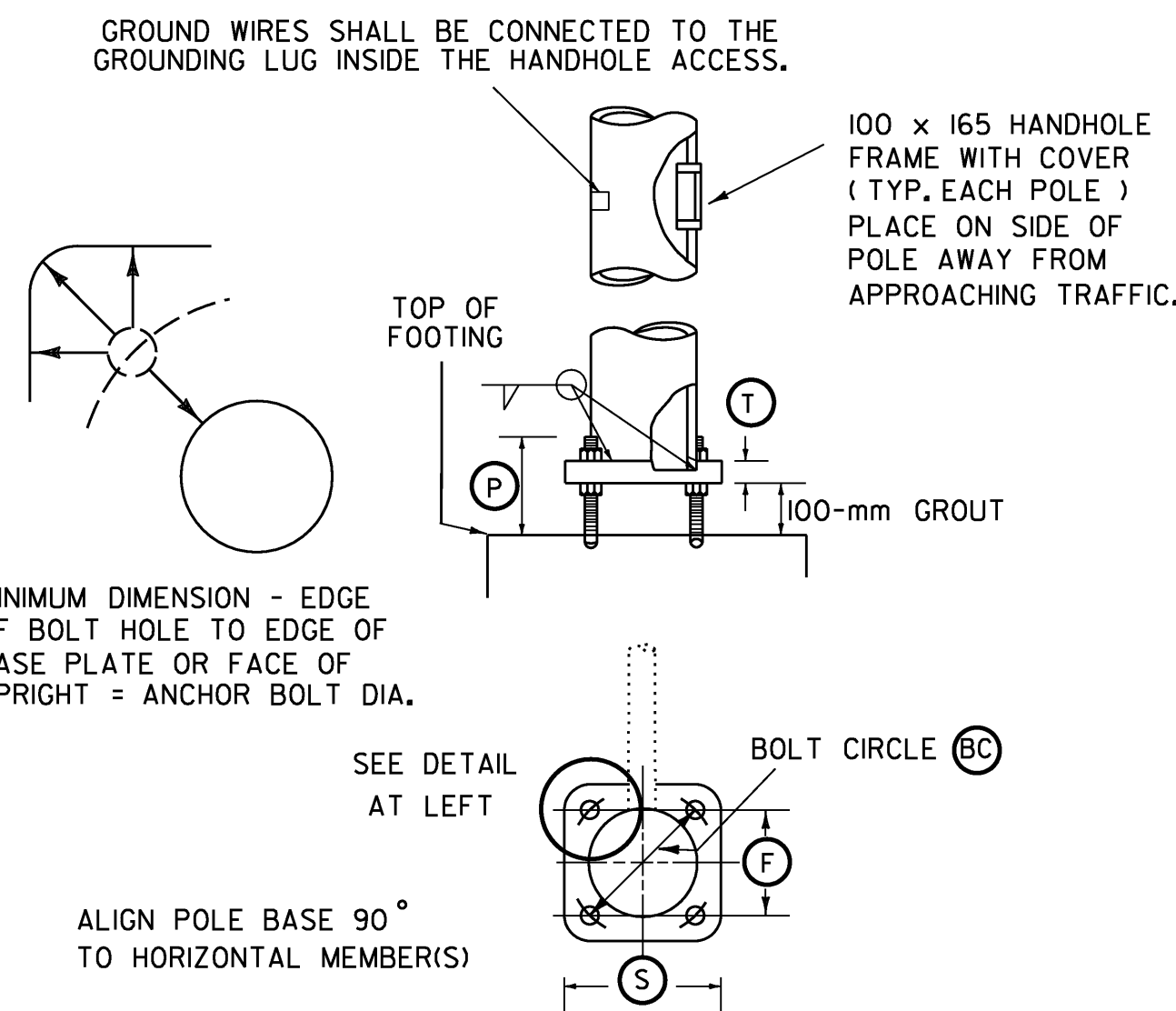
ELEVATION



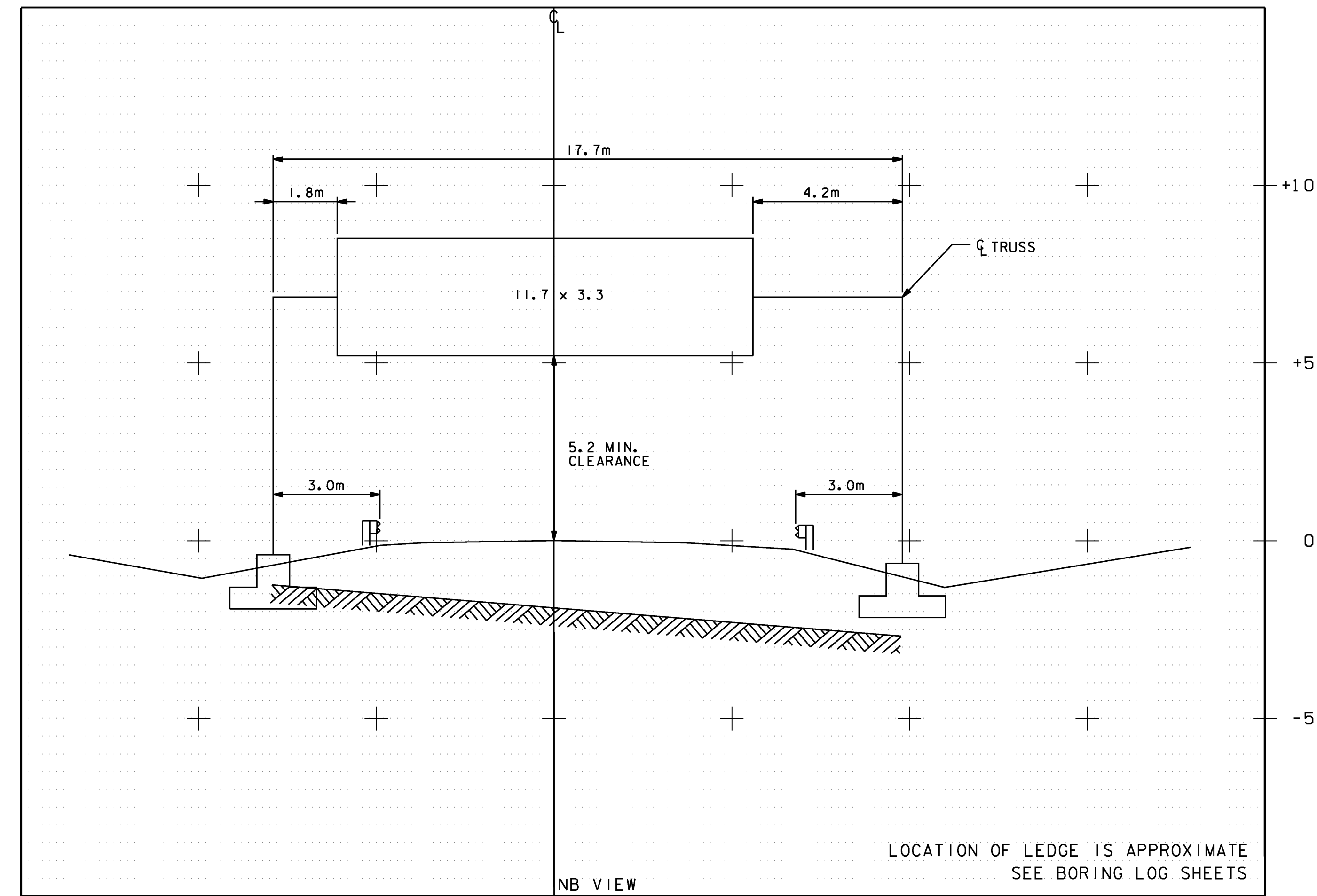
50-mm SCORE MARK DETAIL

NOTES:

1. SEE CANTILEVER / OVERHEAD SIGN / SIGNAL SUPPORTS NOTE SHEET FOR ADDITIONAL INFORMATION.
2. MANUFACTURER TO DETERMINE TYPE OF STRUCTURE REQUIRED.
3. MONOTUBES SHALL NOT BE USED FOR SIGNS OVER 3 m IN HEIGHT.
4. STREET LIGHTING IS OPTIONAL. SEE PLAN SHEETS OR SECTION.
5. MINIMUM CLEARANCE FROM SIGNS TO ROADWAY IS 5.2 m.

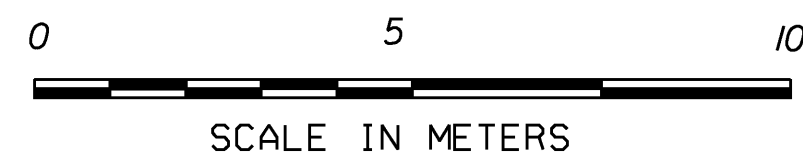


POLE BASE AND BASE PLATE DETAIL



(SEE SHEET 90 FOR LOCATION PLAN)

OVERHEAD SIGN BRIDGE CROSS SECTION



NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

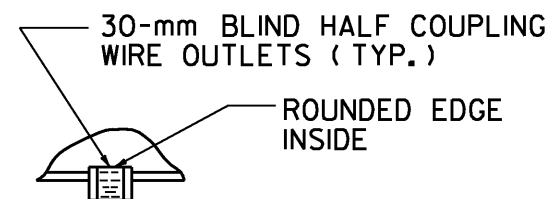
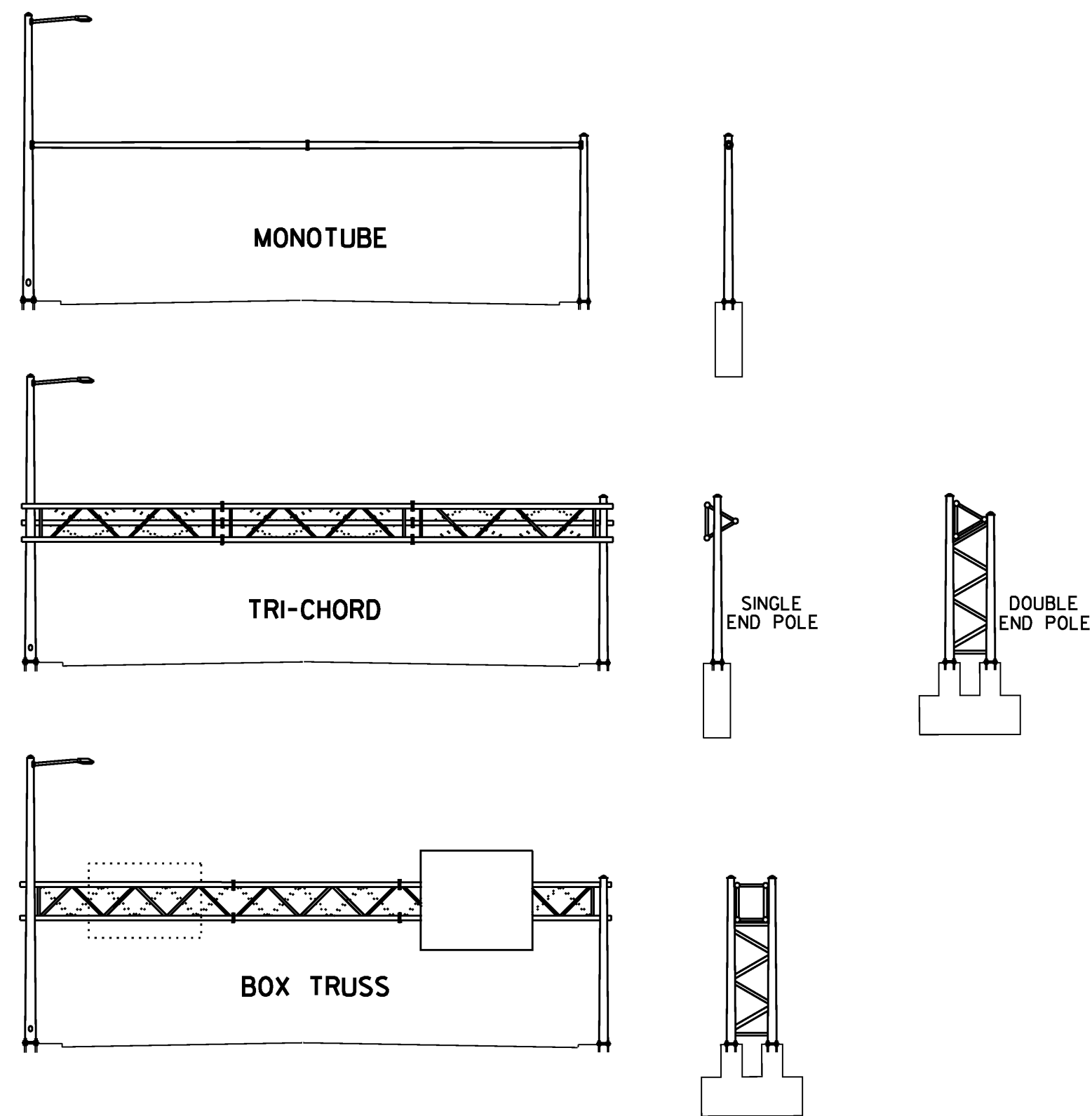
DATE	REVISIONS	BY

OVERHEAD TRAFFIC SIGN BRIDGE / FOOTING DETAIL SHEET #1

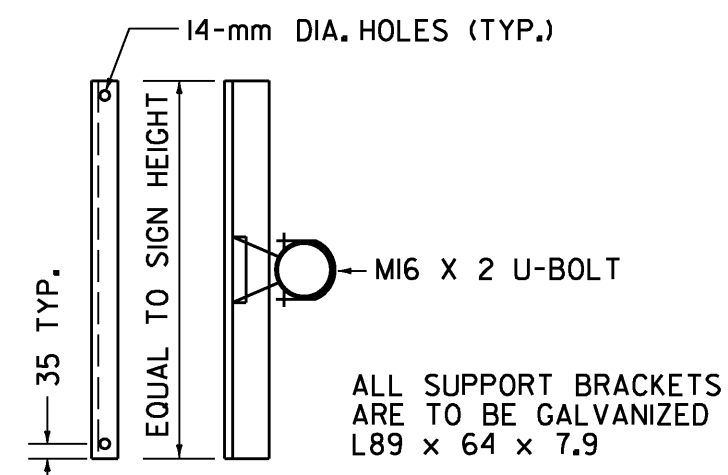
PREPARED BY _____ DATE _____
CHECKED BY _____ DATE _____
DESIGN SUPERVISOR _____ DATE _____
PROJ. **M.M. 10.050 NB**
TRAFFIC SHEET NO. _____ OF _____
SHEET 126 OF 130 SHEETS



NOT TO SCALE

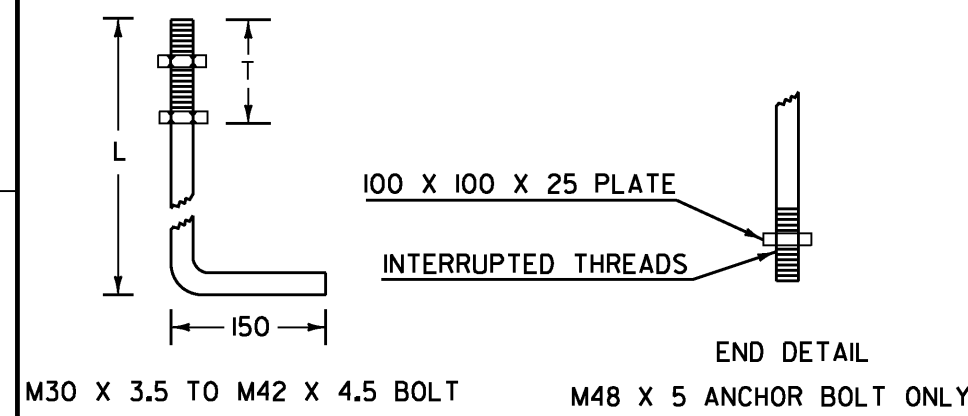


DETAIL A

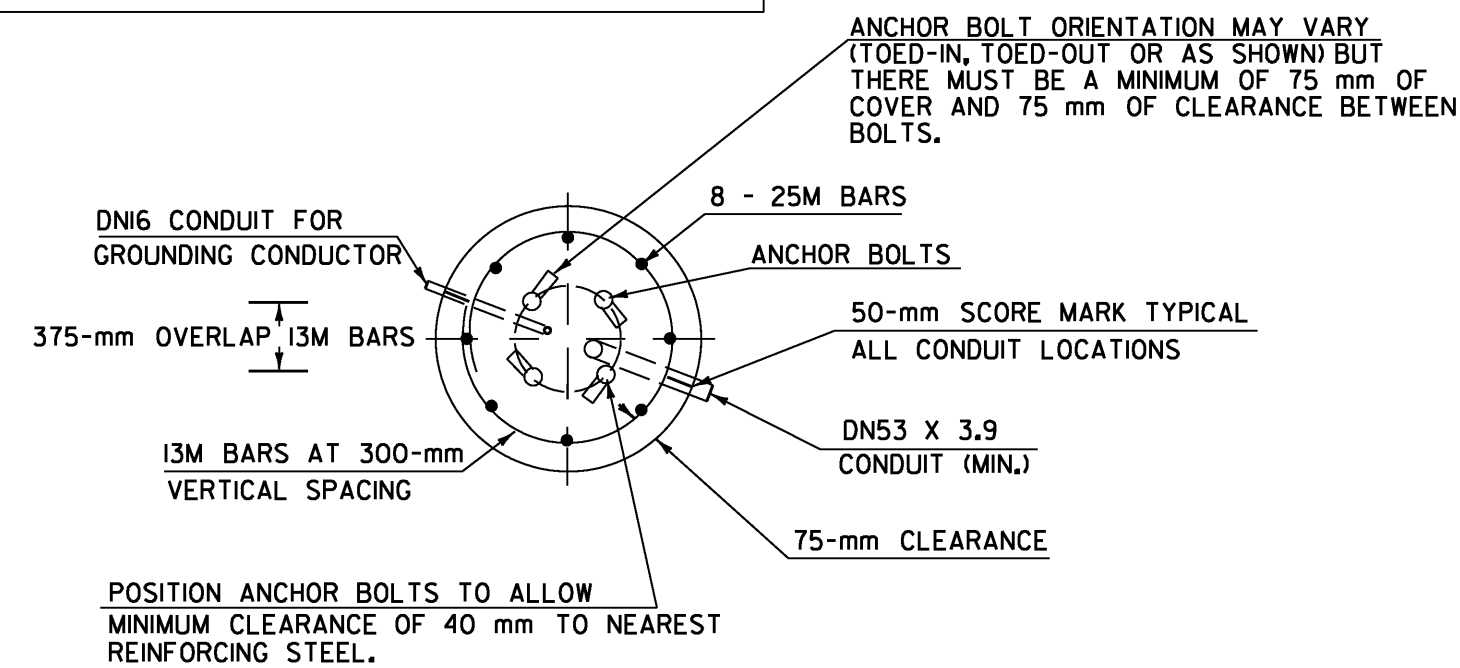


SIGN BRACKET DETAILS

ANCHOR BOLT DETAIL		
SIZE	L (mm)	T (mm)
M30 X 3.5 X 1200	1050	200
M36 X 4 X 1500	1350	230
M42 X 4.5 X 2250	2100	230
M48 X 5 X 2400	2400	230



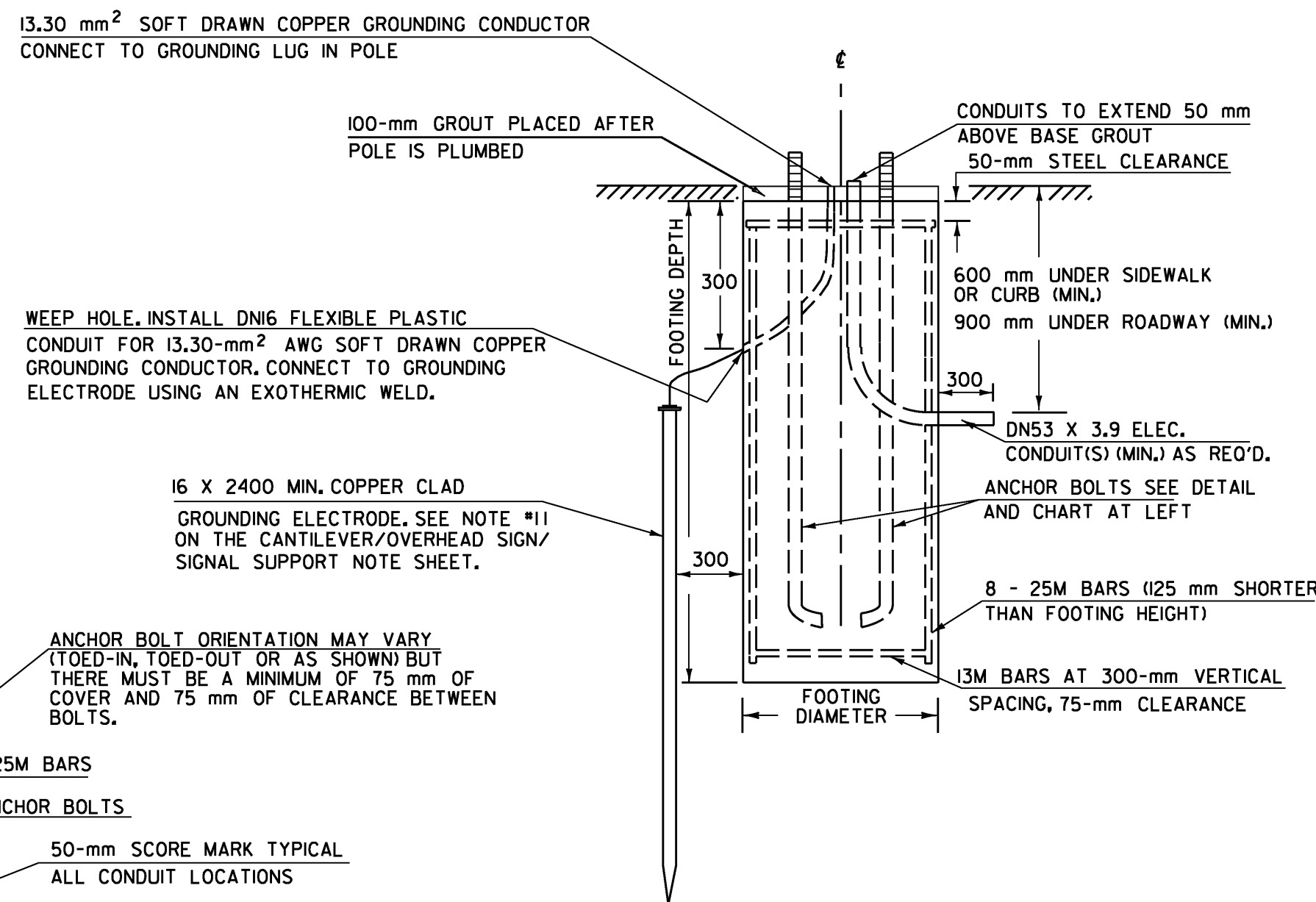
ANCHOR BOLT DETAIL



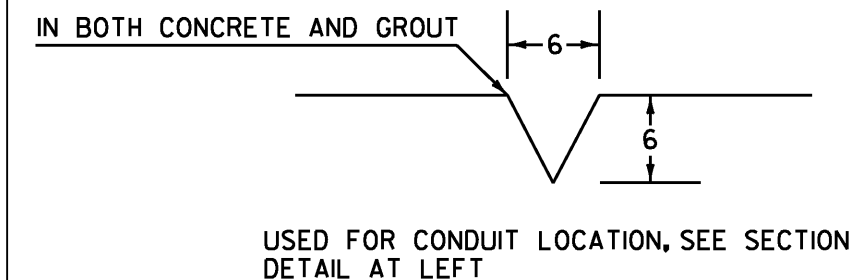
SECTION

OVERHEAD TRAFFIC SIGN BRIDGE FOOTING DETAIL

(SPREAD FOOTINGS OR PILES ARE OPTIONAL)



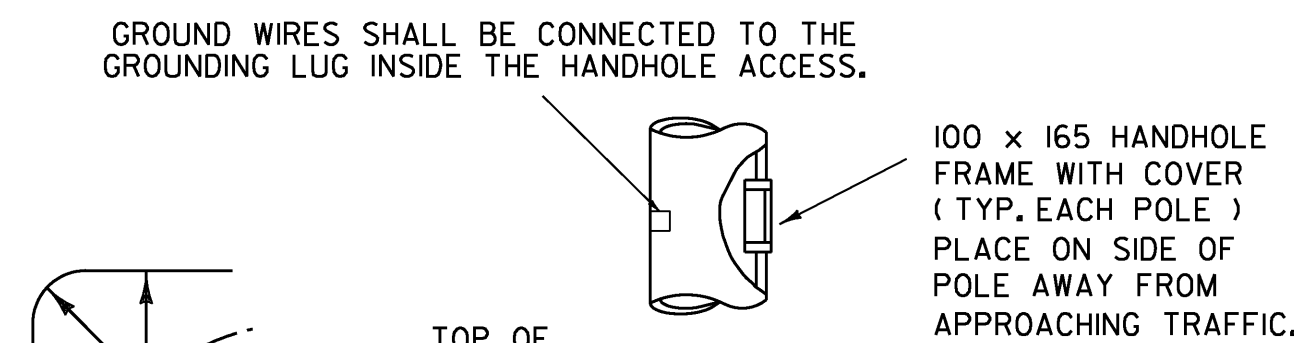
ELEVATION



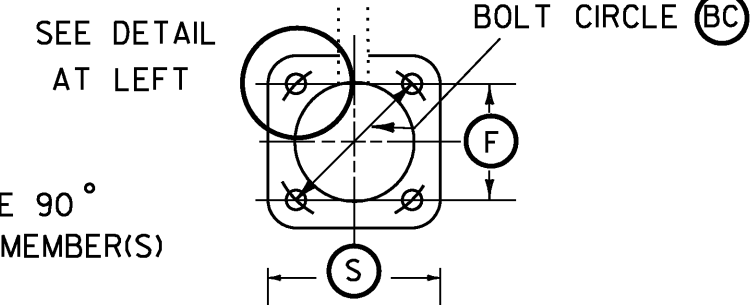
50-mm SCORE MARK DETAIL

NOTES:

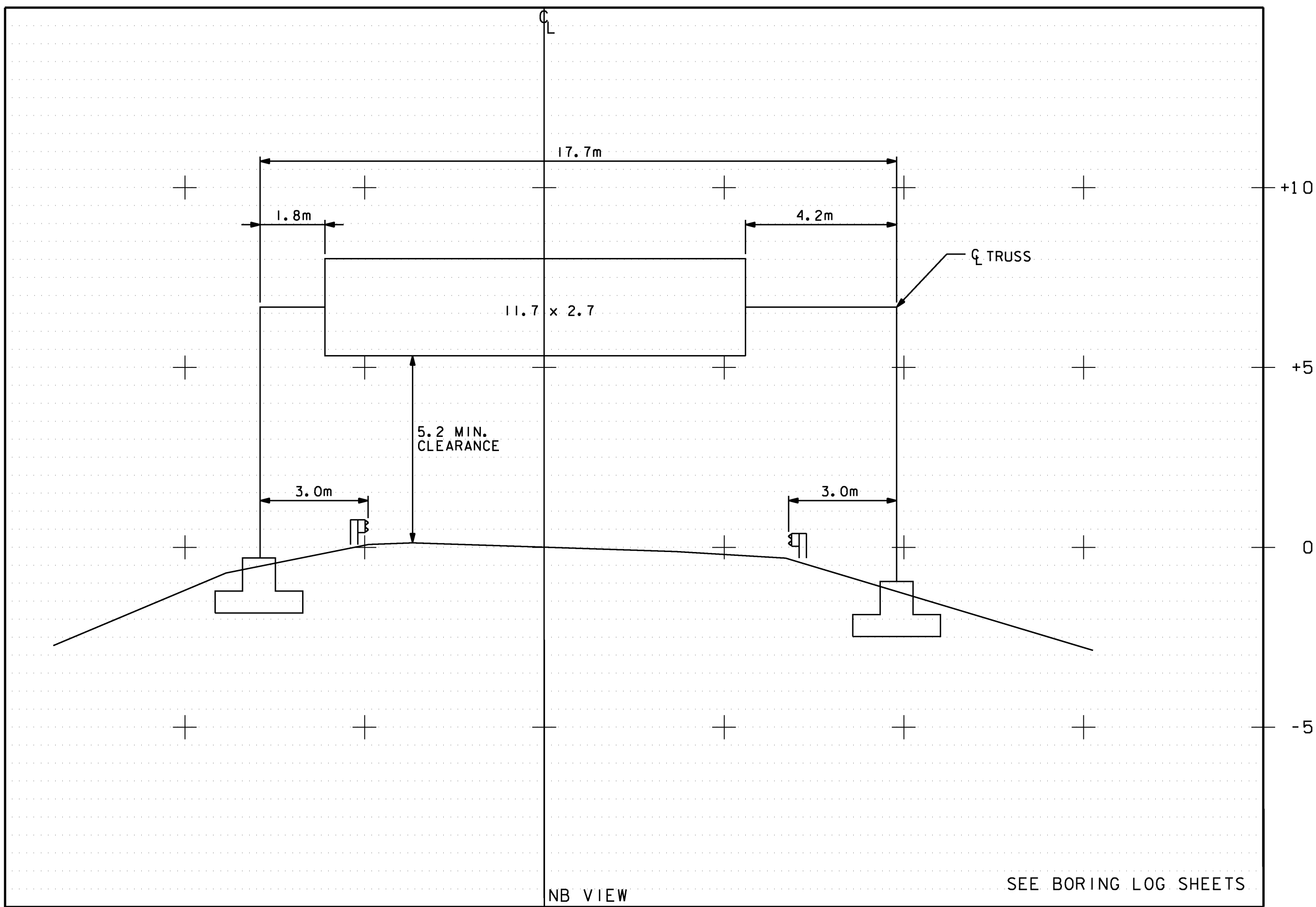
1. SEE CANTILEVER / OVERHEAD SIGN / SIGNAL SUPPORTS NOTE SHEET FOR ADDITIONAL INFORMATION.
2. MANUFACTURER TO DETERMINE TYPE OF STRUCTURE REQUIRED.
3. MONOTUBES SHALL NOT BE USED FOR SIGNS OVER 3 m IN HEIGHT.
4. STREET LIGHTING IS OPTIONAL. SEE PLAN SHEETS OR SECTION.
5. MINIMUM CLEARANCE FROM SIGNS TO ROADWAY IS 5.2 m.



MINIMUM DIMENSION - EDGE OF BOLT HOLE TO EDGE OF BASE PLATE OR FACE OF UPRIGHT = ANCHOR BOLT DIA.

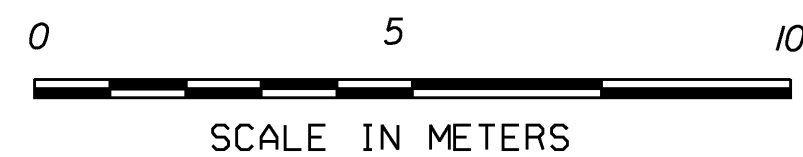


POLE BASE AND BASE PLATE DETAIL



(SEE SHEET 91 FOR LOCATION PLAN)

OVERHEAD SIGN BRIDGE CROSS SECTION



NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

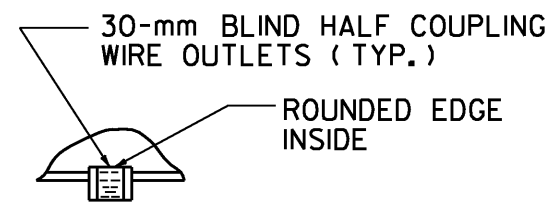
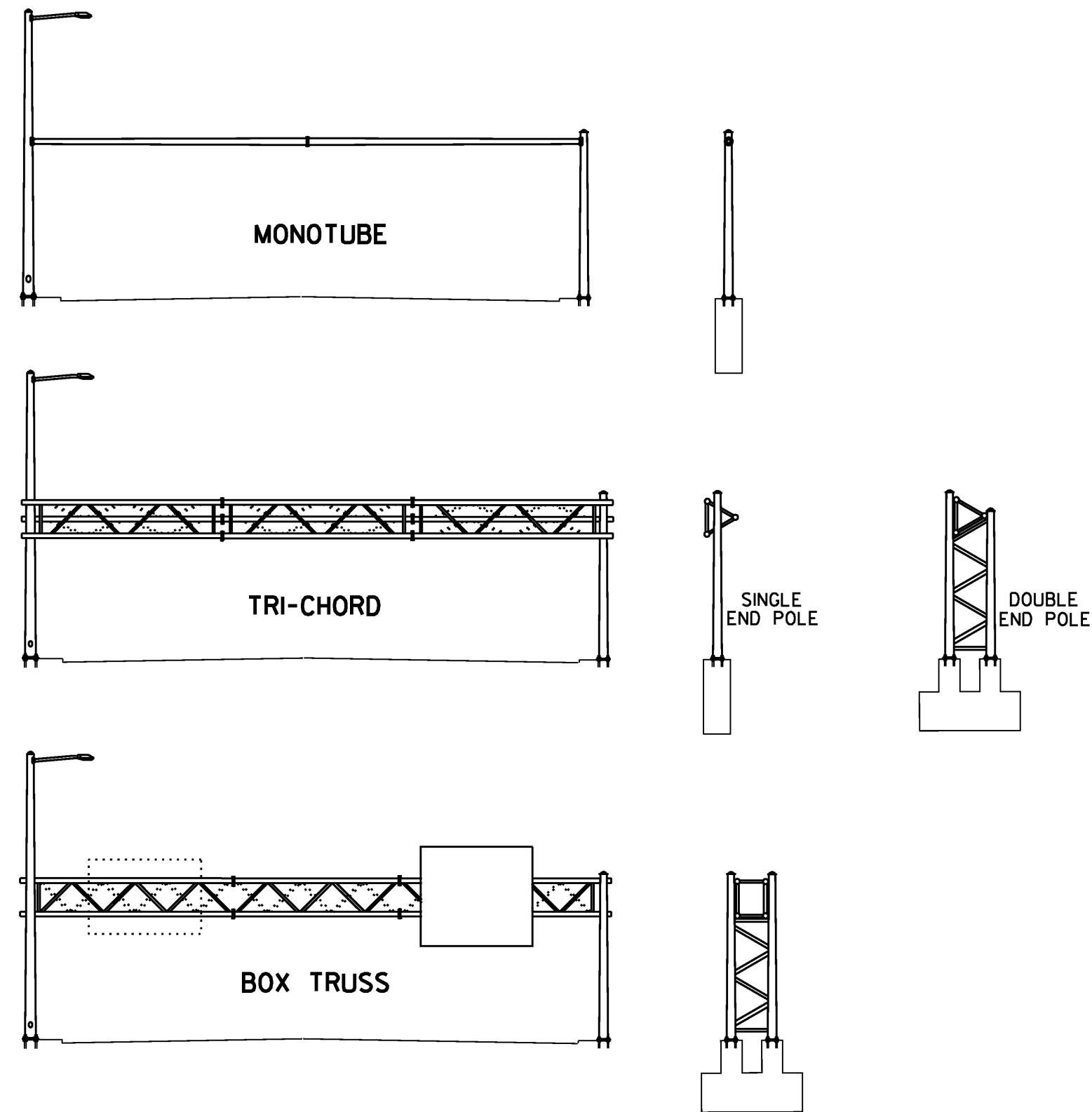
DATE	REVISIONS	BY

OVERHEAD TRAFFIC SIGN BRIDGE / FOOTING DETAIL SHEET #2

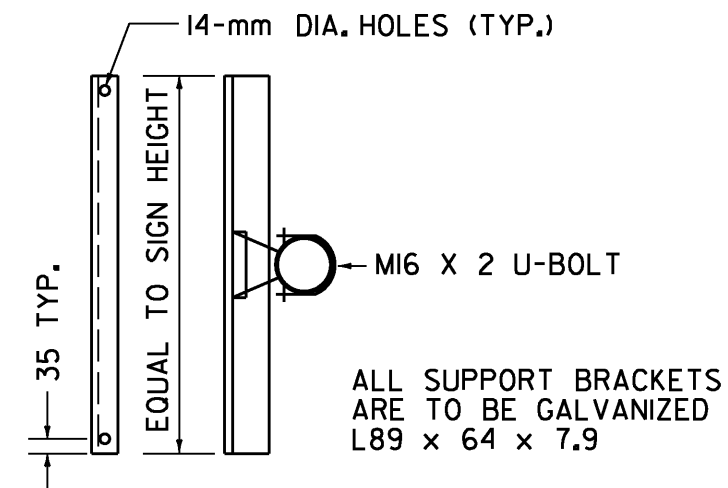
PREPARED BY _____ DATE _____
CHECKED BY _____ DATE _____
DESIGN SUPERVISOR _____ DATE _____
PROJ. **M.M. 10.470 NB**
TRAFFIC SHEET NO. _____ OF _____
SHEET 127 OF 130 SHEETS

Metric

NOT TO SCALE

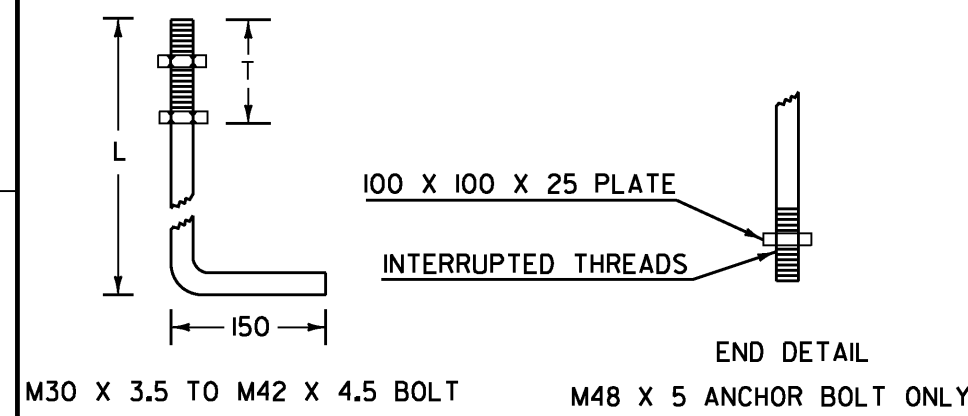


DETAIL A

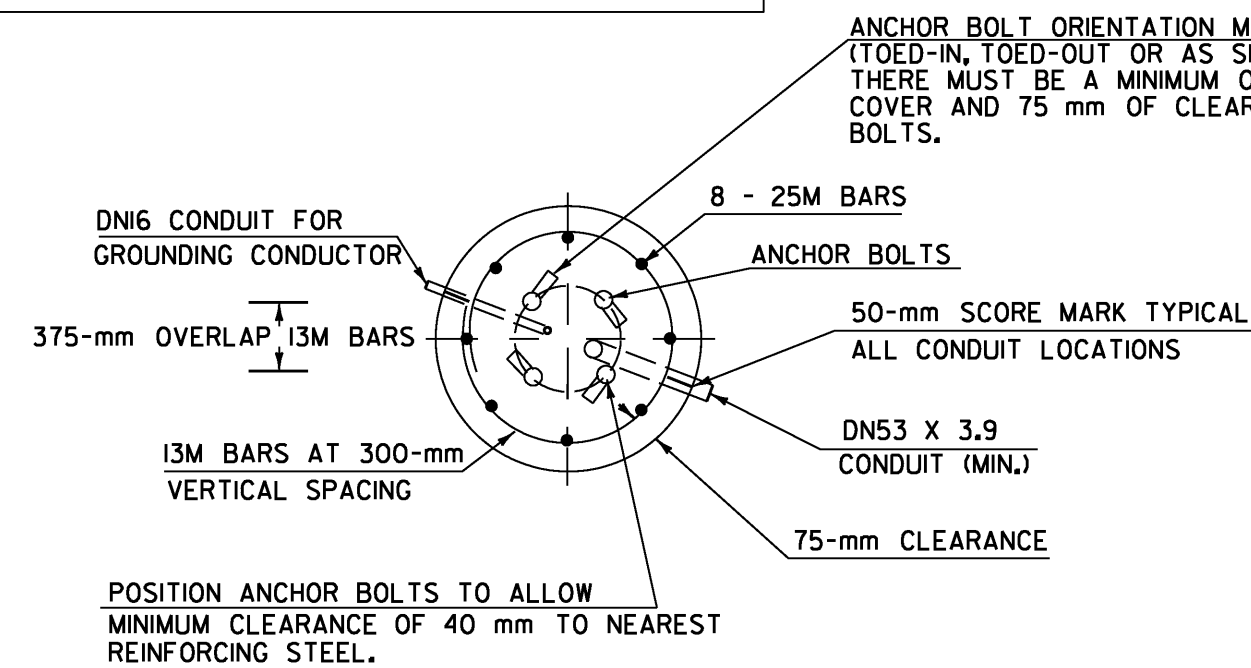


SIGN BRACKET DETAILS

ANCHOR BOLT DETAIL		
SIZE	L (mm)	T (mm)
M30 X 3.5 X 1200	1050	200
M36 X 4 X 1500	1350	230
M42 X 4.5 X 2250	2100	230
M48 X 5 X 2400	2400	230



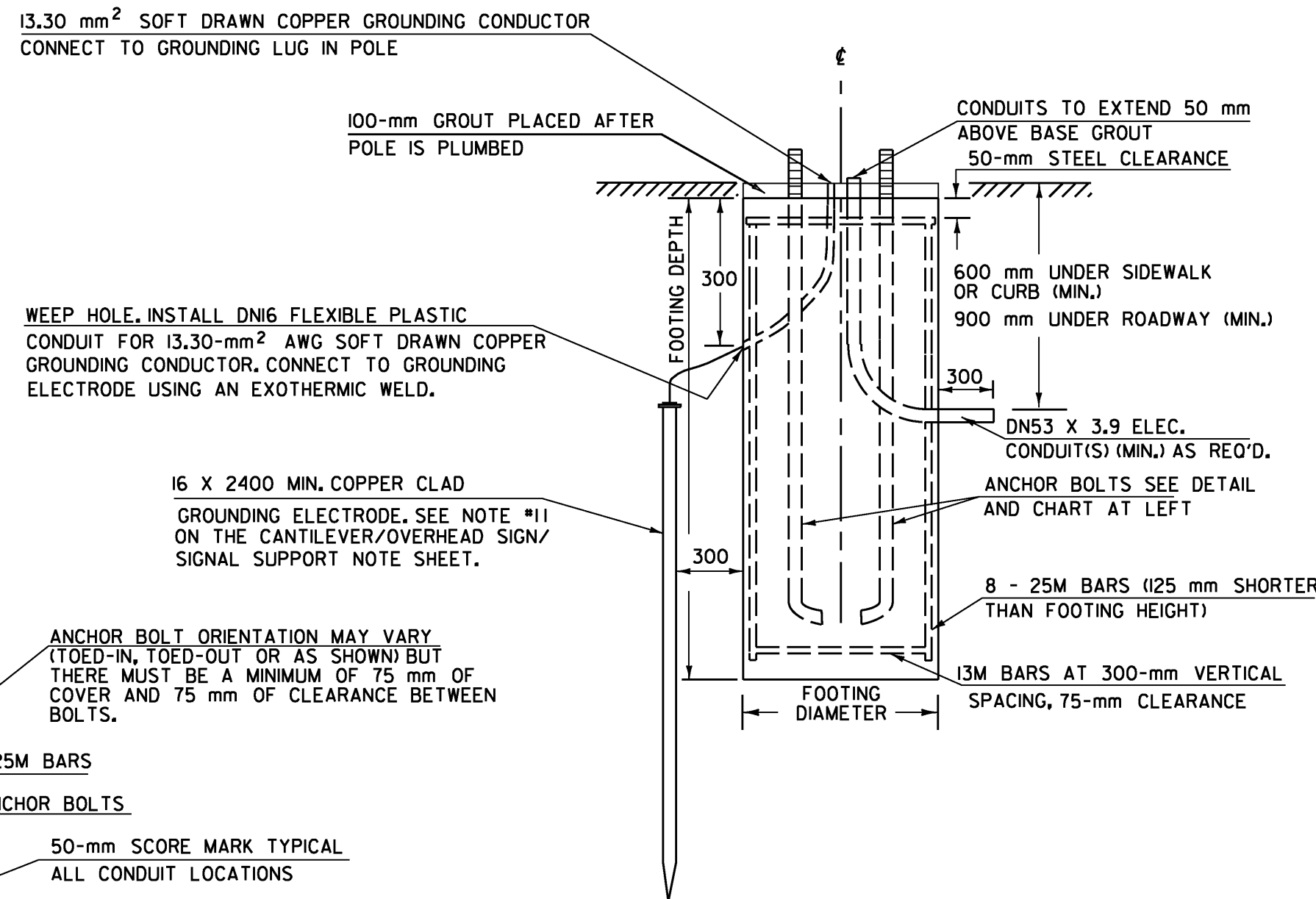
ANCHOR BOLT DETAIL



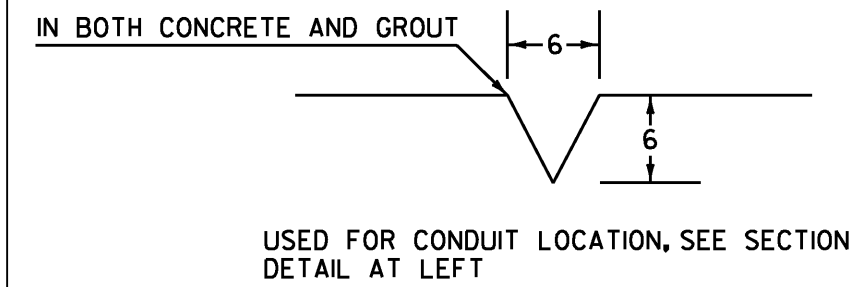
SECTION

OVERHEAD TRAFFIC SIGN BRIDGE FOOTING DETAIL

(SPREAD FOOTINGS OR PILES ARE OPTIONAL)



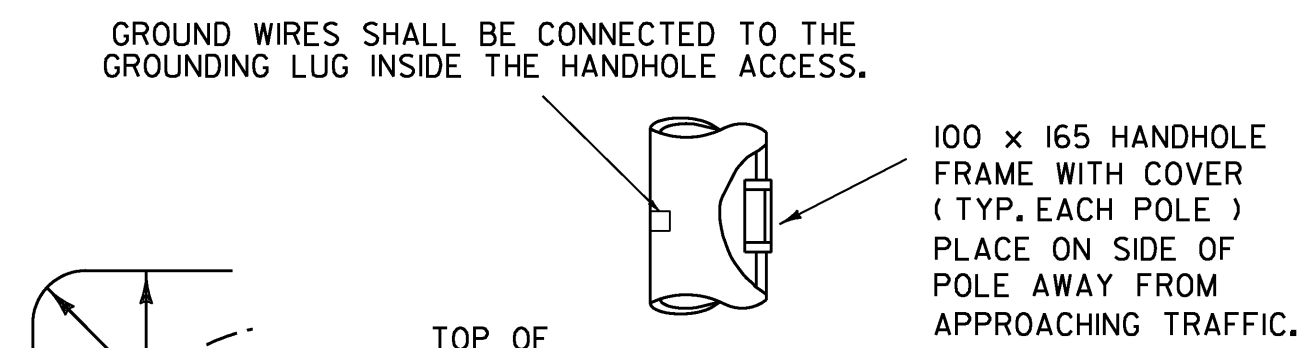
ELEVATION



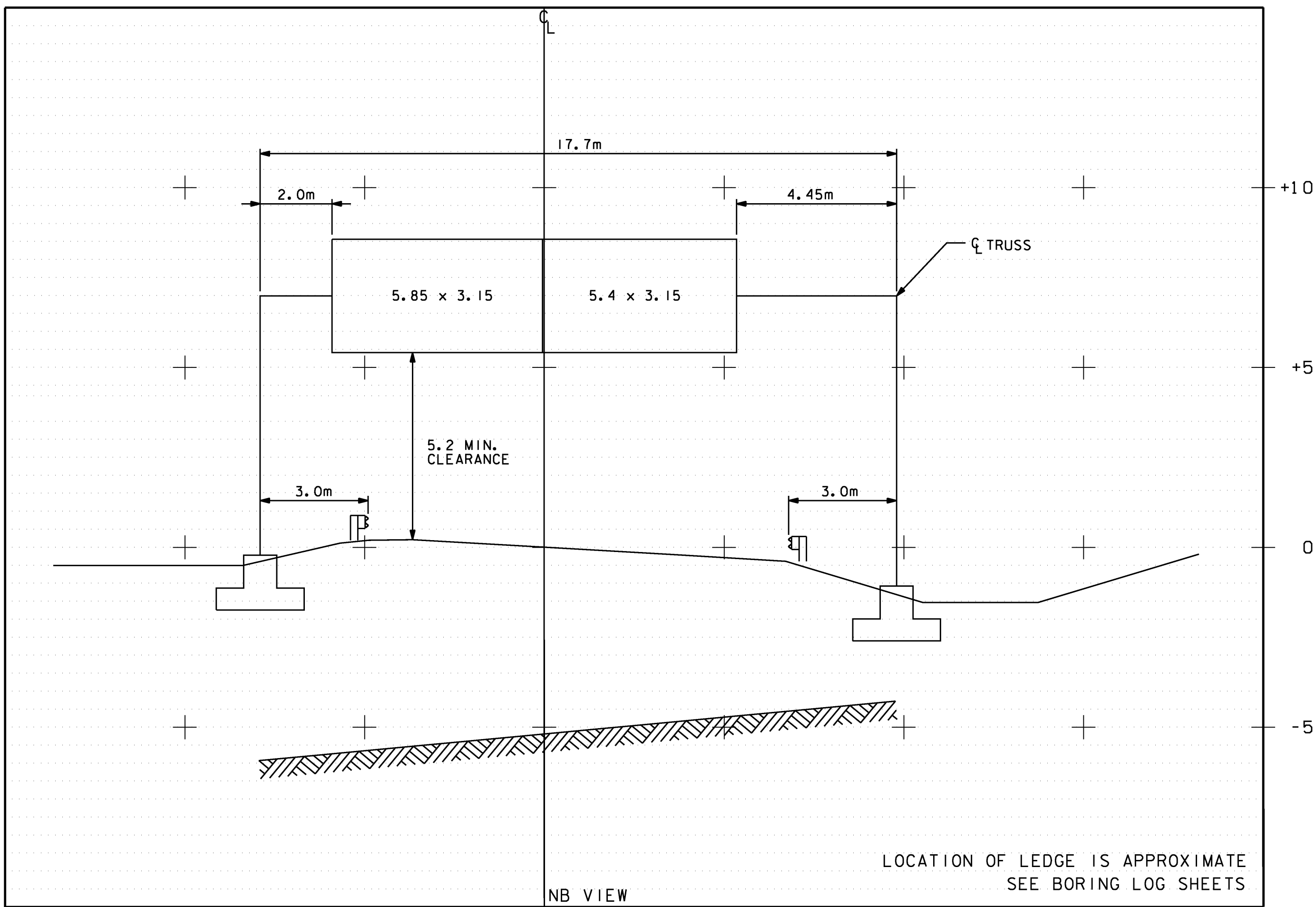
50-mm SCORE MARK DETAIL

NOTES:

1. SEE CANTILEVER / OVERHEAD SIGN / SIGNAL SUPPORTS NOTE SHEET FOR ADDITIONAL INFORMATION.
2. MANUFACTURER TO DETERMINE TYPE OF STRUCTURE REQUIRED.
3. MONOTUBES SHALL NOT BE USED FOR SIGNS OVER 3 m IN HEIGHT.
4. STREET LIGHTING IS OPTIONAL. SEE PLAN SHEETS OR SECTION.
5. MINIMUM CLEARANCE FROM SIGNS TO ROADWAY IS 5.2 m.

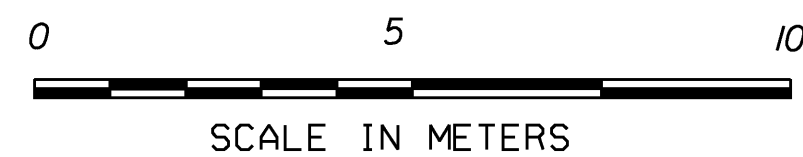


POLE BASE AND BASE PLATE DETAIL



(SEE SHEET 91 FOR LOCATION PLAN)

OVERHEAD SIGN BRIDGE CROSS SECTION



NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

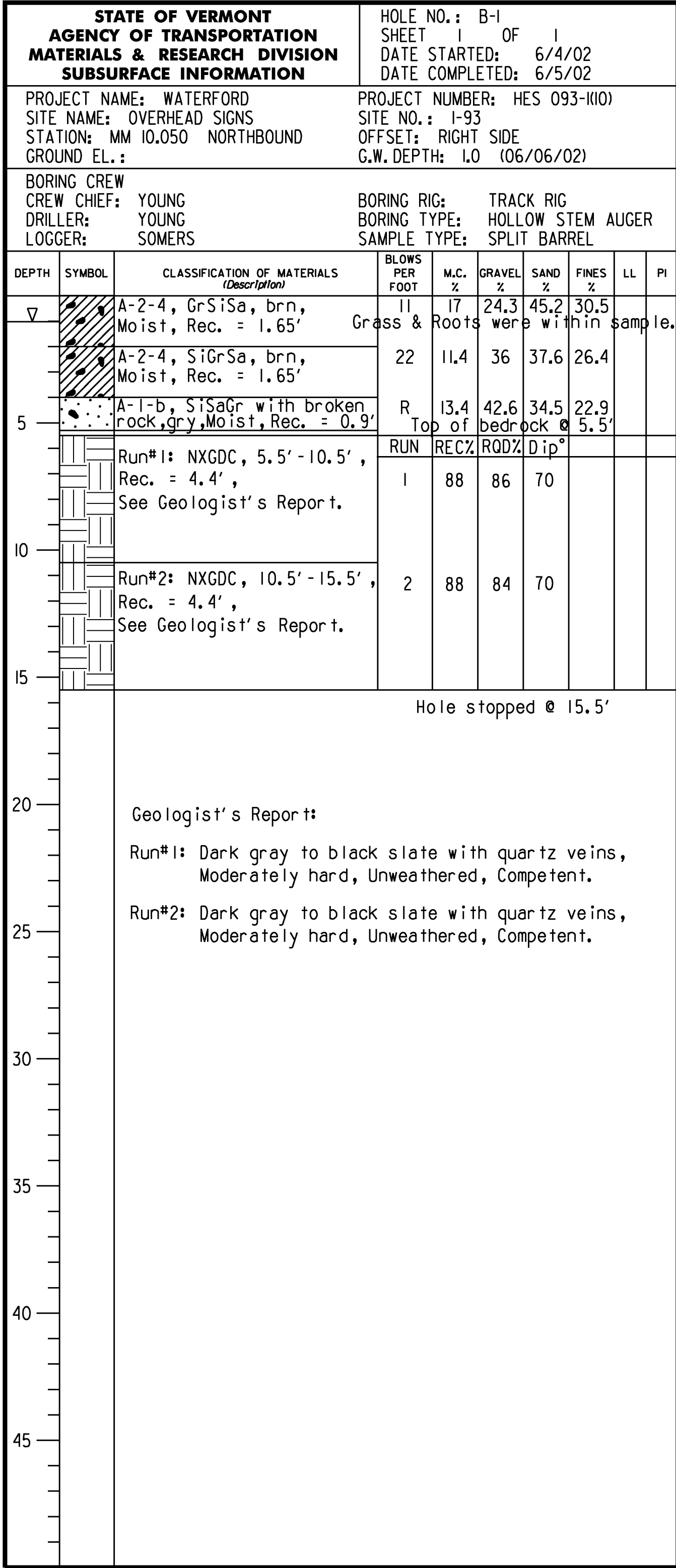
DATE	REVISIONS	BY

OVERHEAD TRAFFIC SIGN BRIDGE / FOOTING DETAIL SHEET #3

PREPARED BY _____ DATE _____
CHECKED BY _____ DATE _____
DESIGN SUPERVISOR _____ DATE _____
PROJ. **M.M. 10.970 NB**
TRAFFIC SHEET NO. _____ OF _____
SHEET 128 OF 130 SHEETS



NOT TO SCALE



STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH DIVISION SUBSURFACE INFORMATION				HOLE NO.: B-3 SHEET 1 OF 1 DATE STARTED: 6/6/02 DATE COMPLETED: 6/6/02					
PROJECT NAME: WATERFORD SITE NAME: OVERHEAD SIGNS STATION: MM 10.470 NORTHBOUND GROUND EL.:				PROJECT NUMBER: HES 093-1101 SITE NO.: I-93 OFFSET: RIGHT SIDE G.W. DEPTH:					
BORING CREW CREW CHIEF: YOUNG DRILLER: YOUNG LOGGER: SOMERS				BORING RIG: BORING TYPE: SAMPLE TYPE:		TRACK RIG WASH BORE SPLIT BARREL			
DEPTH	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. %	GRAVEL %	SAND %	FINES %	LL	PI
5		A-2-4, GrSiSa, brn, Moist, Rec. = 1.75'	6	11.5	20.8	48.5	30.7		
		Grass & Roots were within sample.							
		A-4, SiSa, brn, Moist, Rec. = 1.25'	13	14.8	19.9	43.7	36.4		
		A-2-4, SiGrSa, brn, Moist, Rec. = 1.0'	43	12.2	33	37.2	29.8		
10		A-2-4, SiGrSa, brn, Moist, Rec. = 1.1'	58	14.5	31.7	40.5	27.8		
		A-2-4, SiGrSa, brn, Moist, Rec. = 1.2'	45	12.4	30.6	39.6	29.8		
		A-2-4, GrSiSa, brn-gry, Moist, Rec. = 1.0'	25	15.3	21.6	42.9	35.5		
		Wood/Root was within sample.							
15		A-2-4, SiSa, brn-gry, Moist, Rec. = 0.9'	29	17.5	15.1	57.1	27.8		
20		A-2-4, SaSiGr, gry, Moist, Rec. = 0.6'	47	11.8	45.1	22.6	32.3		
		Wood/Root was within sample.							
25		A-2-4, SiGrSa, gry, Moist, Rec. = 1.3'	R	10.2	34.6	35.9	29.5		
30		29.0'-30.0', BXDC, Cleaned out casing, Into Boulder or Ledge.	Hole stopped @ 30.0'						
35									
40									
45									

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH DIVISION SUBSURFACE INFORMATION				HOLE NO.: B-4 SHEET 1 OF 1 DATE STARTED: 6/10/02 DATE COMPLETED: 6/10/02					
PROJECT NAME: WATERFORD SITE NAME: OVERHEAD SIGNS STATION: MM 10.470 NORTHBOUND GROUND EL.:				PROJECT NUMBER: HES 093-1101 SITE NO.: I-93 OFFSET: LEFT SIDE G.W. DEPTH: 12.7 (06/10/02)					
BORING CREW CREW CHIEF: YOUNG DRILLER: YOUNG LOGGER: SOMERS				BORING RIG: BORING TYPE: SAMPLE TYPE:		TRACK RIG WASH BORE SPLIT BARREL			
DEPTH	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. %	GRAVEL %	SAND %	FINES %	LL	PI
5		A-1-b, SaGr, brn, Moist, Rec. = 0.9'	11	9	50.1	34.8	15.1		
		A-1-b, SaGr, brn-gry, Moist, Rec. = 1.0'	23	9	43.7	37.2	19.1		
		A-2-4, GrSiSa, brn, Moist, Rec. = 1.2'	26	13.1	21.1	44.1	34.8		
		A-2-4, SiSa, brn, Moist, Rec. = 1.0'	24	13.8	20	46	34		
10		A-2-4, SiSaGr, brn, Moist, Rec. = 1.25'	29	11.6	38	34.9	27.1		
		A-2-4, GrSiSa, brn, Moist, Rec. = 1.33'	18	16.2	21.5	44.9	33.6		
15									
20		A-2-4, SiGrSa, brn, Moist, Rec. = 0.4'	2	18.8	34	35.3	30.7		
		A-2-4, SiSa, brn, Moist, Rec. = 1.33'	22	16.5	11	53.8	35.2		
25		BXDC, 23.75'-25.0', Boulder	20	13.7	32.3	25.5	42.2		
		A-4, SaGrSi, gry, Moist, Rec. = 1.2'							
30		BXDC, 29.2'-32.0', Boulders							
Hole stopped @ 32.0'									
35									
40									
45									

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH DIVISION SUBSURFACE INFORMATION				HOLE NO.: B-5 SHEET 1 OF 1 DATE STARTED: 6/11/02 DATE COMPLETED: 6/11/02					
PROJECT NAME: WATERFORD SITE NAME: OVERHEAD SIGNS STATION: MM 10.970 NORTHBOUND GROUND EL.:				PROJECT NUMBER: HES 093-1101 SITE NO.: I-93 OFFSET: RIGHT SIDE G.W. DEPTH: 0.5 (06/11/02) RAINY DAY					
BORING CREW CREW CHIEF: YOUNG DRILLER: YOUNG LOGGER: SOMERS				BORING RIG: TRACK RIG BORING TYPE: WASH BORE SAMPLE TYPE: SPLIT BARREL					
DEPTH	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. %	GRAVEL %	SAND %	FINES %	LL	PI
0		A-1-b, GrSa, brn, Moist, Rec. = 1.3'	13	9.5	40.1	41.7	18.2		
		Grass & Roots were within sample.							
		A-1-b, SaGr, brn, Moist, Rec. = 1.25'	43	11.3	42.3	38.1	19.6		
5		A-1-a, SaGr, brn, Moist, Rec. = 0.75'	54	10.3	60.7	27.5	11.8		
		A-1-a, Gr, brn, Moist, Rec. = 0.9'	37	9.4	75.1	15.7	9.2		
		A-1-b, SaGr, brn-gry, Moist, Rec. = 0.8'	41	10.5	52.2	29	18.8		
10		A-1-a, SaGr, gry, Moist, Rec. = 0.4'	8	61	25.5	13.5	10.4'		
		Run#1: NXGDC, 10.4'-15.4', Rec. = 5.0', See Geologist's Report.	RUN	RECZ	RODZ	Dip			
			1	100	84	60			
15		Hole stopped @ 15.4'							
20		Geologist's Report: Run#1: Gray shale (silicious) with quartz veins, Hard, Unweathered, Competent.							
25									
30									
35									
40									
45									

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH DIVISION SUBSURFACE INFORMATION				HOLE NO.: B-6 SHEET 1 OF 1 DATE STARTED: 6/13/02 DATE COMPLETED: 6/13/02					
PROJECT NAME: WATERFORD SITE NAME: OVERHEAD SIGNS STATION: MM 10.970 NORTHBOUND GROUND EL.:				PROJECT NUMBER: HES 093-1101 SITE NO.: I-93 OFFSET: LEFT SIDE G.W. DEPTH: 5.75 (06/13/02)					
BORING CREW CREW CHIEF: YOUNG DRILLER: YOUNG LOGGER: SOMERS				BORING RIG: BORING TYPE: SAMPLE TYPE:		TRACK RIG WASH BORE SPLIT BARREL			
DEPTH	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. %	GRAVEL %	SAND %	FINES %	LL	PI
		A-1-b, SaGr, brn, Moist, Rec. = 0.9'	10	10.6	50	30.8	19.2		
		Grass & Roots were within sample.							
		A-4, SiSa, gry, Moist, Rec. = 1.2'	40	12.6	17	42.8	40.2		
5		A-2-4, SiSa, gry-brn, Moist, Rec. = 1.25'	23	16.8	19.2	46.5	34.3		
		A-1-b, SiSaGr, gry, Moist, Rec. = 0.2'	34	12.2	50.9	25.8	23.3		
		A-2-4, SiGrSa, brn, Moist, Rec. = 1.33'	27	13.9	27.9	45.2	26.9		
10		A-2-4, GrSiSa, brn, Moist, Rec. = 0.8'	39	13	23.3	50.1	26.6		
15		A-1-b, SiSaGr, gry, Moist, Rec. = 1.5'	59	9.4	41.4	35.1	23.5		
		Top of bedrock @ 17.0'							
		Run#1: NXGDC, 17.0' - 20.25' Rec. = 2.1'	RUN	REC	RQD	Dip			
		See Geologist's Report.	1	65	55	60			
20		Run#2: NXGDC, 20.25' - 23.25' Rec. = 2.66'	2	89	75	60			
		See Geologist's Report.							
25		Hole stopped @ 23.25'							
		Geologist's Report:							
		Run#1: Gray silicious slate, Hard, Unweathered, Competent.							
30		Run#2: Gray silicious slate, Hard, Unweathered, Competent.							
35									
40									
45									

BORING LOG

SHEET #2

SURVEYED BY	J. TOUCHETTE	DATE	07/02
DRAWN BY	C. C. BENDA		
SQUAD LEADER			
DESIGN FILE NO.	/M&R/87a030/ma030bor.dgn		
IPARM FILE		DATE PLOTTED	1/4/2007
PROJ. NAME	WATERFORD		
PROJ. NO.	HES 093-1101		
SHEET	130 OF 130	SHEETS	



State of Vermont
PDD/Structures Design Section
National Life Building – Drawer 33
Montpelier, VT 05633-5001
www.aot.state.vt.us

(phone)

802-828-5621

(fax)

802-828-2437

(toll)

800-253-0191

Agency of Transportation

September 21, 2007

Highway Safety Corp
ATTN: Paul Radice
239 Commerce Street
P. O. Box 358
Glastonbury, CT 06033-0358

These sheets and welding specifications are sent as follow up to discussions between VTrans welding inspector Jeff Clark and Paul Radice of Highway Safety Corp. Paul and Jeff discussed the issues associated with following drawings and welding procedures. Jeff explained the issues noted in these shop drawings were already corrected and these drawings are sent as a follow up to complete the project file.

Project Name: ST Johnsbury - Lyndon Project #: HES 091-3(42)

Structure Identification: TRI-CHORD SIGN STRUCTURE – 191 MM 129.130 SB

The following Tri Chord Sign Structure details [Item #677.13, Name (OVERHEAD TRAFFIC SIGN SUPPORT, MULTI-SUPPORT)] for the above project (Vendor's Job #1587d) transmitted with your letter dated 23-July-07 have been reviewed and are being returned herewith.

Project Name: Waterford Project #: HES 093-19(10)

Structure Identification: TRI-CHORD SIGN STRUCTURE – 193 MM 10.050 NB

The following Tri Chord Sign Structure details [Item #677.13, Name (OVERHEAD TRAFFIC SIGN SUPPORT, MULTI-SUPPORT)] for the above project (Vendor's Job #1587e) transmitted with your letter dated 23-July-07 have been reviewed and are being returned herewith.

Structure Identification: TRI-CHORD SIGN STRUCTURE – 193 MM 10.470 NB

The following Tri Chord Sign Structure details [Item #677.13, Name (OVERHEAD TRAFFIC SIGN SUPPORT, MULTI-SUPPORT)] for the above project (Vendor's Job #1587f) transmitted with your letter dated 23-July-07 have been reviewed and are being returned herewith.

131 516N



Structure Identification: **TRI-CHORD SIGN STRUCTURE – 193 STA 10.970 NB**

The following **Tri Chord Sign Structure** details [Item #677.13, Name (OVERHEAD TRAFFIC SIGN SUPPORT, MULTI-SUPPORT)] for the above project (Vendor's Job #**1587g**) transmitted with your letter dated 23–July–07 have been reviewed and are being returned herewith.

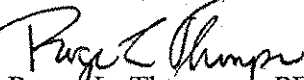
The Sheets noted below apply to all 4 structures listed above.

Sheets: 3 and 7 are approved as noted
Welding procedure WPS -1587-1 and 1587 -3 are approved
Welding procedure WPS -1587-2 is approved as noted

The Note Below refers to all structures

There shall be no fabrication done until all drawings and welding procedures are approved. You must provide notice to our fabrication inspector, Jeff Clark, as to the date fabrication represented by these drawings will begin. That notice must be received and acknowledged at least seven days prior to that date, as per Specification 506.03. Jeff may be contacted by phone at (802)828-0044 or email at jeff.clark@state.vt.us. Any material fabricated prior to the notification date is subject to rejection without further cause.

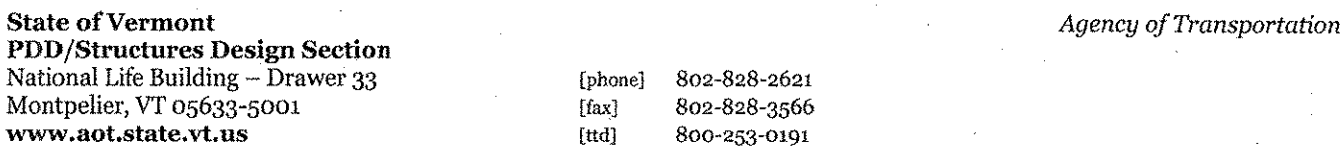
Sincerely,


Roger L. Thompson PE
Roadway Project Manager

Attachments

- cc: [X] Resident Engineer Jim Forest w/prints
[X] Shop Inspector Jeff Clark –letter only
[X] Contractor (Highway Safety)w/prints
[X] Sub Contractor (F.R. Lafayette)w/prints
[X] Construction Division – letter only
[X] Materials & Research Section (C&IA Unit) – letter only
[X] Files (Structures & Central)

132516N



Highway Safety Corp
ATTN: Paul Radice
239 Commerce Street
P. O. Box 358
Glastonbury, CT 06033-0358

Structure Identification: TRI-CHORD SIGN STRUCTURE – I91 MM 129.130 SB

Sheets: 1-3, 8 are approved.
Sheets: 4 -7 are approved as noted

Structure Identification: TRI-CHORD SIGN STRUCTURE – I93 MM 10.050 NB

Sheets: 1-3, 5 are approved
 Sheets: 4, 6-8 are approved as noted



VTTrans Working to Get You There
Vermont Agency of Transportation

Structure Identification: **TRI-CHORD SIGN STRUCTURE – 193 MM 10.470 NB**

The following **Tri Chord Sign Structure** details [Item #677.13, Name (OVERHEAD TRAFFIC SIGN SUPPORT, MULTI-SUPPORT)] for the above project (Vendor's Job #**1587D**) transmitted with your letter dated 23-July-07 have been reviewed and are being returned herewith.

Sheets: 1-3, 5 and 8 are approved
Sheets: 4, 6-7 are approved as noted

Calculations: The reviewer noticed that the width and location for sign 2 appears to be incorrect. The fabricator needs to verify this information and recheck the calculations. If during this check of the calculations the design changes; the fabricator will need to resubmit a complete set of drawings and calculations to VTtrans for review.

Structure Identification: **TRI-CHORD SIGN STRUCTURE – 193 STA 10.970 NB**

The following **Tri Chord Sign Structure** details [Item #677.13, Name (OVERHEAD TRAFFIC SIGN SUPPORT, MULTI-SUPPORT)] for the above project (Vendor's Job #**1587g**) transmitted with your letter dated 23-July-07 have been reviewed and are being returned herewith.

Sheets: 1-3, 5 and 8 are approved
Sheets: 4, 6-7 are approved as noted

Calculations: The reviewer noticed that the sign location for sign 1 appears to be incorrect. The fabricator needs to verify this information and recheck the calculations. If during this check of the calculations the design changes; the fabricator will need to resubmit a complete of drawings and calculations to VTtrans for to review.

The Note Below refers to all structures

There shall be no fabrication done until all drawings and welding procedures are approved. You must provide notice to our fabrication inspector, Jeff Clark, as to the date fabrication represented by these drawings will begin. That notice must be received and acknowledged at least seven days prior to that date, as per Specification 506.03. Jeff may be contacted by phone at (802)828-0044 or email at jeff.clark@state.vt.us. Any material fabricated prior to the notification date is subject to rejection without further cause.

Sincerely,

Roger L. Thompson PE
Roadway Project Manager

134-5163

- Attachments
- cc: [X] Resident Engineer Jim Forest w/prints
[X] Shop Inspector Jeff Clark w/prints
[X] Contractor (Highway Safety)w/prints
[X] Sub Contractor (F.R. Lafayette)w/prints
[X] Construction Division – letter only
[X] Materials & Research Section (C&IA Unit) – letter only
[X] Files (Structures & Central)



DESIGN CALCULATIONS

OVERHEAD SIGN STRUCTURE
INTERSTATE ROUTE 91
STATION 129.130 SB
PROJECT No. AC IM 091-2(73)

VERMONT AGENCY OF TRANSPORTATION



[Signature] 7-23-2007
P. BRADFORD CHENEY DATE
PRESIDENT

SUBMITTED BY:	SUBMITTED TO:
CME ASSOCIATES, INC.	HIGHWAY SAFETY CORPORATION
333 EAST RIVER DRIVE, SUITE 400	239 COMMERCE STREET
EAST HARTFORD, CT 06108	P.O. BOX 358
	GLASTONBURY, CT 06033-0358
JULY 20, 2007	

Highway Safety Corporation
239 Commerce Street
Glastonbury, CT 06033-0358



Project: Highway Safety
By: APB
Date: 7/20/2006
Checked: JAR
Sheet No. of

State: Vermont
Project:
Sign Location: MM 129.130 SB

Overall Dimensions (all in feet)

Miscellaneous Data

Span	Left Post	Rt. Post	Truss Section Lengths			Number of	Wind Speed	Sign Weight	Ice Load?
L	H1	H2	Section 1	Section 2	Section 3	Truss	(mph)	(psf)	(yes/no)
63.97	23.94	25.73	31.99	31.99	0.00	2	90	3.65	yes

Sign Dimensions (all in feet)

Sign 1			Sign 2			Sign 3		
Length	Width	Location	Length	Width	Location	Length	Width	Location
L1	W1	D1	L2	W2	D2	L3	W3	D3
15.42	11.91	30.66	17.72	10.93	47.73	0.00	0.00	0.00

Overhead Truss Chords

Height of Truss	Width of Truss	1st Truss Section		2nd Truss Section		3rd Truss Section		Chord	Number
Dt (ft)	Wt (ft)	Outside Dia. (inches)	Wall Thick. (inches)	Outside Dia. (inches)	Wall Thick. (inches)	Outside Dia. (inches)	Wall Thick. (inches)	Yield Str. (ksi)	of Chords
3.00	3.00	4.000	0.228	4.00	0.228	4.000	0.228	42.0	3
4.000 0.228 <-- Values Used in computations									

Overhead Truss Diagonals

Equal Leg Angles		Round Pipe		Diagonal	Vertical	Horizontal	Drilled	Circular
Leg Size (inches)	Thickness (inches)	Outside Dia. (inches)	Thickness (inches)	Yield Str. (ksi)	diag. angle (deg)	diag. angle (deg)	Shafts for foundation ?	Footling Stem? (yes/no)
2.00	0.250	0.00	0.000	36.0	39	39	no	yes

No. of Posts per end 1 or 2

Left Post Verticals

Post Yield Str. (ksi)

Vertical diag. angle (deg)

Right Post Verticals

Post Yield Str. (ksi)

Spacing Sp (Feet)	Outside Dia. (inches)	Wall Thick. (inches)	Spacing Sp (Feet)	Outside Dia. (inches)	Wall Thick. (inches)	Yield Str. (ksi)			
1	0.00	14.000	0.500	42.0	45	0.000	14.000	0.500	42.000

Post Diagonals

Equal Leg Angles		Round Pipe		Diagonal
Leg Size (inches)	Thickness (inches)	Outside Dia. (inches)	Thickness (inches)	Yield Str. (ksi)
0.00	0.000	0.00	0.125	36.0
0.00	0.000	0.00	0.000	0.00
<-- Values Used in Computations				

Results

		D/C or CSR	OK / NG ?
Truss	Section 1 Chords	0.79	OK
	Section 2 Chords	0.66	OK
	Section 3 Chords	0.79	OK
	Truss Diagonals	0.60	OK
	Left Post	0.62	OK
	Right Post	0.92	OK
Posts	Left Post Diagonals	N/A	N/A
	Right Post Diagonals	N/A	N/A
Truss Deflections in Inches	Defl. Under DL + Ice	0.82	
	Allowable (L/150)	5.12	OK
	Camber	1.28	

Deflection OK

7/20/2007

1

Input

136 516W-8

Connection Design

Number of Posts per end	1
-------------------------	---

Baseplate and Anchor Bolt Input					Analysis Results									
Baseplate Thickness	Baseplate Yield Str. * ksi	Anchor Bolts per post		Bolt Circle Dia. (in)	Baseplate Dia. (in)	Stocket Weld Design		Anchor Bolts			Baseplate			
		No. of Bolts	Diameter inches			Yield Str. ksi	Weld Size inches	Total Weld Length (ft)	Embedment inches	Extension inches	Total Length inches	Anchor CBR	Bending ksi	
2.000	50.00	4	2.000	55	22.00	30.00	6.460	37.98	36.00	8.000	44.000	0.88	68.85	
4.6, 4.8												1.0	37.50	
													OK	Seal
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Truss Chord Splice Connection Input										Analysis Results									
Conn. Plate Thickness inches	Conn. Plate Yield Str. ksi	A325 Bolt Diameter inches	Number of Bolts							Socket Weld Design			Connection Bolts			Conn. Pl.			
										Bolt Circle Dia. (in)	Conn. Plate Dia. (in)	Weld Size inches	Total Weld Length (in)	Bolt Spacing inches	Bolt DVC ksi	Bending ksi			
0.750	50.00	0.750	4							7.00	10.00	0.225	25.13	5.450	0.36	25.13			
Input this area for monotubes also														2.25	1.0	37.50			
														OK	OK	OK	Actual		
																	Allowed		
																	Result		

Truss Diagonal Connection Input (for 1/2 connection)										Analysis Results									
Conn. Plate Thickness	Yield Str. * ksi	Conn. Plate Dia. (in)	Conn. Plate Yield Str. ksi	Conn. Plate Dia. (in)	Conn. Plate Yield Str. ksi	Conn. Plate Dia. (in)	Conn. Plate Yield Str. ksi	Conn. Plate Dia. (in)	Conn. Plate Yield Str. ksi	Diagonal Bot Force ksi	Conn. Plate Dia. (in)	Diagonal Weld Size inches	Total Weld Length (ft)	Diagonal Bot Force ksi	Conn. Plate Dia. (in)	Diagonal Weld Size inches	Total Weld Length (ft)	Diagonal Bot Force ksi	Conn. Plate Dia. (in)
0.750	50.00	0.750	50	0.750	50	0.750	50	0.750	50	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
Note: Enter zero for welded connection										OK									

Post Diagonal Connection Input (for 1/2 connection)										Analysis Results									
Conn. Plate Thickness	Yield Str. * ksi	Conn. Plate Dia. (in)	Conn. Plate Yield Str. ksi	Conn. Plate Dia. (in)	Conn. Plate Yield Str. ksi	Conn. Plate Dia. (in)	Conn. Plate Yield Str. ksi	Conn. Plate Dia. (in)	Conn. Plate Yield Str. ksi	Diagonal Bot Force ksi	Conn. Plate Dia. (in)	Diagonal Weld Size inches	Total Weld Length (ft)	Diagonal Bot Force ksi	Conn. Plate Dia. (in)	Diagonal Weld Size inches	Total Weld Length (ft)	Diagonal Bot Force ksi	Conn. Plate Dia. (in)
0.500	50.00	0.500	50	0.500	50	0.500	50	0.500	50	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
N/A SINGLE POST USED										OK									
Note: Enter zero for welded connection																			

Truss Support Connection (use W Shape)										Analysis Results									
Section	Weld Thickness	Weld Depth	Weld Yield Str. ksi	Member Dia. (in)	Member Yield Str. ksi	Member Dia. (in)	Member Yield Str. ksi	Member Dia. (in)	Member Yield Str. ksi	End Weld Length inches	End Weld Yield Str. ksi	End Weld Length inches	End Weld Yield Str. ksi	End Weld Length inches	End Weld Yield Str. ksi	End Weld Length inches	End Weld Yield Str. ksi	End Weld Length inches	End Weld Yield Str. ksi
W14x5	0.750	0.750	50.00	0.750	50.00	0.750	50.00	0.750	50.00	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
Use Weld 5 for most										OK									
Weld at around with 1/4" weld																			
N/A SINGLE POST USED																			

Truss Support Connection (For Tri-Chord)										Analysis Results									
Dist. from edge of post to C.L. of Plate	Depth of Plate at Plate	Depth of Plate at Plate	Depth of Plate at Plate	Depth of Plate at Plate	Depth of Plate at Plate	Depth of Plate at Plate	Depth of Plate at Plate	Depth of Plate at Plate	Depth of Plate at Plate	Weld Length inches	Weld Yield Str. ksi	Weld Length inches	Weld Yield Str. ksi	Weld Length inches	Weld Yield Str. ksi	Weld Length inches	Weld Yield Str. ksi	Weld Length inches	Weld Yield Str. ksi
9.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000
OK										OK									

Monotube Connection at Pole										Analysis Results									
Dist. of U-Post to C.L. of Plate	Plate Height	Plate Height	Plate Height	Plate Height	Plate Height	Plate Height	Plate Height	Plate Height	Plate Height	U-Post Length inches	U-Post Yield Str. ksi	U-Post Length inches	U-Post Yield Str. ksi	U-Post Length inches	U-Post Yield Str. ksi	U-Post Length inches	U-Post Yield Str. ksi	U-Post Length inches	U-Post Yield Str. ksi
0.750	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
OK										OK									
General Information																			
Post Dia. Thickness Diameter Thickness																			
14.00 0.50 4.00 0.226																			

Baseplate Design - Double End Post Design																
Anchor Bolt Analysis (4 bolt pattern, round baseplate)										Not Applicable, see single post design below						
Bot Circle Dia = 22.00 inches										Anchor Bolt Properties						
A bolts = 9.893 kg, in^4										Net Tensile Stress Area = A _t =		2.488	sq. inches			
I bolts = 694.57 in^4										Gross Area = A _g =		3.142	sq. inches			
S bolts = 64.96 in^3																
Base Plate Dia = 36.00 inches																
Allow Tensile Stress = F _t = 27.00 ksi																
Allow Shear Stress = F _v = 18.50 ksi																
										Baseplate Weld Information						
										AB Com.	AB Tens.	AB Shear	CSR	Post. Bending	Post. Axial	Max. Stress
										Stress	Stress	Stress	Eq. 5-24	(ksi)	(ksi)	(ksi)
										ksi	ksi	ksi	ksi			
Reactions		Max. Axial	Min. Axial	Moment	V	AB Com.	AB Tens.	AB Shear	CSR							
		kip	kip	kip-ft	kip	ksi	ksi	ksi	ksi							
Left Support	01	3.70	3.76	0.00	0.00	0.38	0.38	0.00	0.00	0.00	0.18	0.18	0.18	0.18	0.18	0.18
Right Support		4.21	4.21	0.00	0.00	0.42	0.42	0.00	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.20
Left Support	01C1	2.63	2.63	24.83	3.69	5.70	-5.14	0.39	0.04	4.32	0.13	4.45	4.45	4.45	4.45	4.45
Right Support		3.17	3.17	21.88	5.29	6.09	-4.48	0.93	0.03	3.80	0.18	3.95	3.95	3.95	3.95	3.95
Left Support	01C2	2.63	2.63	37.24	2.72	6.41	-7.85	0.27	0.08	6.48	0.13	6.61	6.61	6.61	6.61	6.61
Right Support		3.17	3.17	32.89	3.37	7.48	-6.65	0.34	0.08	5.71	0.15	5.86	5.86	5.86	5.86	5.86
Left Support	01C1	3.81	3.81	12.41	2.13	3.09	-2.33	0.21	0.01	2.16	0.18	2.34	2.34	2.34	2.34	2.34
Right Support		4.36	4.36	10.64	2.93	2.93	-1.98	0.28	0.01	1.90	0.21	2.11	2.11	2.11	2.11	2.11
Left Support	01C2	3.81	3.81	18.62	1.34	4.45	-3.68	0.13	0.02	3.24	0.18	3.42	3.42	3.42	3.42	3.42
Right Support		4.36	4.36	16.41	1.73	4.69	-3.15	0.17	0.01	2.85	0.21	3.06	3.06	3.06	3.06	3.06
						6.41	-7.85	0.27	0.08							6.61
Baseplate weld design										Not Applicable, see single post design below						
										S post = 69.01 in ⁴						
										A post = 21.21 in ³						
										Max. Weld Size = 0.4375 inches						
										Min. Weld Size = 0.25 inches						
										Force per inch of post edge = 3.30 kips per inch						
										Weld Stress based on Max. Weld Size = 5.34 ksi Based on double weld (pocket connection)						
										Weld Stress based on Min. Weld Size = 9.35 ksi Based on double weld (pocket connection)						
										Weld Yield Strength = 70 ksi						
										Allowable Weld Stress = 16.9 ksi						
										Required weld size = 0.124 inches						
										Design Weld Size = 0.25 inches Based on double weld (pocket connection)						
										Weld Length = 87.96 inches Based on double weld (pocket connection)						
Baseplate Thickness										Not Applicable, see single post design below						
										Width of Baseplate section = 8.000 inches						
										Thickness = 2.000 inches						
										Sx = 5.33 in ³						
										Bolt spacing = X = 17.28 inches Measured along circumference of bolt circle						
										Force per inch of post edge = 3.30 kips per inch						
										Moment in Baseplate = 68.68 kip inches						
										Bending Stress = 18.50 ksi						
										Allowable Bending Stress = 37.50 ksi						
										No vertical stiffeners needed						
										Capacity of 1/4" weld = 3.36 kips per inch						
										Length of 1/4" horizontal weld required on each leg of each vertical stiffener = X = 3.13 inches						

Truss Diagonal Splices		
Bolted Splice Design		
Maximum Axial Force in Diagonal =	7.90	kips
Bolt Dia. =	0.000	inches
Bolt Area =	#N/A	inches
Number of Bolts =	0	
Allowable Shear stress =	15	kai (AASHTO Table 10.32.3C) Galvanized surface
Allowable Load on Connection =	#N/A	kips (single shear)
Welded Splice Design		
Maximum Axial Force in Diagonal =	7.90	kips
Capacity of 1/4" weld =	6.72	kips per inch (double weld)
Required Length of Weld =	1.175	inches (based on 2 welds)
Minimum for angles =	8.0	inches (based on 2 welds 3" long)
Minimum for plates =	12.0	inches (based on 4 welds 3" long)
Minimum Weld Length =	6.0	inches
Connection Plate Design		
Total Force in 1/2 Plate =	7.90	kips
Stress in plate =	2.11	kai
Allowable stress =	30.00	kai
Connection Plate Weld		
Force per inch of weld =	0.79	kips per inch
Capacity of 1/4" weld =	6.72	kips per inch (double weld)

Post Diagonal Connections		
Bolted Splice Design		
NA - Single Post Design		
Maximum Axial Force in Diagonal =	0.00	kips
Bolt Dia. =	0.875	inches
Bolt Area =	0.601	inches
Number of Bolts =	0	
Allowable Shear stress =	15	kai (AASHTO Table 10.32.3C) Galvanized surface
Allowable Load on Connection =	0.0	kips (single shear)
Welded Splice Design		
Maximum Axial Force in Diagonal =	0.00	kips
Capacity of 1/4" weld =	6.72	kips per inch (double weld)
Required Length of Weld =	0.000	inches (based on 2 welds)
Minimum for angles =	8.0	inches (based on 2 welds 3" long)
Minimum for plates =	12.0	inches (based on 4 welds 3" long)
Minimum Weld Length =	12.0	inches
Connection Plate Design		
Total Force in 1/2 Plate =	0.00	kips
Stress in plate =	0.00	kai
Allowable stress =	30.00	kai
Connection Plate Weld		
Force per inch of weld =	0.00	kips per inch
Capacity of 1/4" weld =	6.72	kips per inch (double weld)

Truss Support Connection (uses W6x8.5)		
NA - See Connection Below		
Maximum Reaction =	4.38	kips (half reaction)
Capacity of 1/4" weld =	3.76	kips per inch (single weld)
Length of Weld Required =	0.649	inches (based on double weld)
Length of Weld Provided =	10.00	inches
Shear Capacity of Welds =	11.87	kips

Truss Support Connection (Single or Double pole) - Tri - Chord Only				
Maximum Reaction (Vvert) =	4.38	kips (max of left or right conn.)	Number of Chords =	3
Maximum Wind Load (Pwind) =	3.23	kips (max of left or right conn.)	Poles (per end) =	1
Reaction per chord connection (Vvert) =	2.19	kips	# of Connections =	2
Reaction per chord connection (Pwind) =	2.61	kips	Weld Size =	0.19 in
Area of Weld =	8.46	in ²		
Weld =	22.62	in ³		
N =	0.29	kai		
ft =	1.79	kai		
ft =	0.31	kai		
(ft*2+ft*ft)/2*12 =	2.12	kai		
Allowable stress of weld =	19	kai		

Monotube Support Connection (Single Vertical Pole)		
NA - See Connection Above		
Max Shear =	2.48	kips
Monotube Dia. =	14.00	in
U-bolt Leg Dia. =	0.75	in
Area of U-bolt Leg =	0.354	in ²
Tension in U-bolt Leg =	0.94	kips
Stress in U-bolt =	1.62	kai
Allowable U-bolt stress	18	kai
Stress Check	OK	Eq. S-21

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Circular Stem Design - For Use in Spread Footings with Circular Stem

f'c =	3.00	ksi	
Fy =	60	ksi	
Cc =	2.00	in	Clear cover is uniform around the cross section
h =	36.00	in	Outside Diameter of Column (Approx. 70" max)
Bar Size =	8	As =	0.44 in^2
		Dia =	0.75 in
Hoop Bar		As =	0.2 in^2
size =	4	Dia =	0.5 in
Spacing =	5.00	in	Approximate desired spacing of main reinforcing (assumes as max)
Φ=	1		

Determine if section is adequate for loads applied			
Mu =	167.26	ft-kips	Mu = Resultant moment = sqrt(Mstrong^2+Mweak^2)
Pu =	4.36	kips	IS SECTION OK? YES

Calculate location of steel reinforcing around perimeter of column:				
Dia. of inner ring of reinf. =		30.25 in		
perimeter =		95.03 in		
# of bars =	20	number of (even) bars that will fit in perimeter	Program allows 42 bars maximum OK	
Number of bar rows =	11			
spacing =	3.03	(in) actual vertical spacing of bars		
Note: Program orients bars so that one layer is on the centroid of column (conservative)				
Calculate location of bars with respect to the extreme compression fiber:				
Is rebar	Is steel used for	# bars in	Area of Steel Calculation	
Rebar level	level in	Tension or Comp.?	each level	As tension As comp
d1	2.88 in	Comp	1	0.44
d2	5.90 in	Comp	2	0.88
d3	8.93 in	Comp	2	0.88
d4	11.95 in	Comp	2	0.88
d5	14.98 in	Comp	2	0.88
d6	18.00 in	Steel Not Used	2	0.88
d7	21.03 in	Tension	2	0.88
d8	24.05 in	Tension	2	0.88
d9	27.08 in	Tension	2	0.88
d10	30.10 in	Tension	2	0.88
d11	33.13 in	Tension	1	0.44
d12	NA			
d13	NA			
d14	NA			
d15	NA			
d16	NA			
d17	NA			
			As tens =	3.96 As comp= 3.96
Centroid of Tension and Compression Steel from extreme compression fiber:				
d(tension) =	26.40 in			
d(comp) =	9.60 in			

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Find max axial force: $M=0$

stand. Spec. 8.16.4.2.1

$\Phi P_o = \Phi[0.85f'_c(A_g - A_{st}) + A_{st}f_y]$

$A_g = 1017.9 \text{ in}^2$

$A_{st} = 8.8 \text{ in}^2$

$\Phi P_o = 3101.1 \text{ kip}$ $M_n = 0$

Find axial and moment capacity at balanced strain condition:

Stand. Spec 8.16.4.2.3

$\Phi P_b = \Phi[0.85f'_c b' a_b + A'_s f_s (d - d') + A_s f_y d']$

$\Phi M_b = \Phi[0.85f'_c b' a_b (d - d' - a_b/2) + A'_s f_s (d - d') + A_s f_y d']$

$d = 26.40 \text{ (in)}$ dist from extreme compression fiber to centroid of tension steel

$d' = 9.60 \text{ (in)}$ dist from extreme compression fiber to centroid of comp. steel

$d'' = 8.40 \text{ (in)}$ dist from centroid of gross section to centroid of tension steel

$a_b = 14.06 \text{ in}$

$\beta_1 = 0.9$

$f_s = 33.57 \text{ ksi}$

$b = 35.13 \text{ in}$

$A'_s = 3.96 \text{ in}^2$

$A_s = 3.96 \text{ in}^2$

$\Phi P_b = 1155.10 \text{ kip}$

$\Phi M_b = 16831.00 \text{ in-kip} = 1410.92 \text{ ft-kip}$

Find Moment Capacity of Section: $P=0$

Note: neglect compression steel

$c = 5.89 \text{ (in)}$ with a % error of 0.05 % OK

$b = 25.51$

$\theta = 90.24$

$\rho = 0.00588$

$\rho_b = 0.022638$

Reinforcement Ratio: Used to check if $f_s=f_y$

$\Phi M_n = A_s f_y (d - a/2)$

$5643.78 \text{ in-kip} = 470.31 \text{ ft-kip}$

$P_n = 0$

is $\rho < .75\rho_b$? OK

Determine if section is adequate for loads applied

Mu = 167.26495 ft-kips
Pu = 4.3608873 kips

Points for interaction diagram:

Note: points are connected with straight lines

Article 8.15.4 Stand. Spec: The combined flexural and axial load capacity of compression members shall be taken as 35% of that from 8.16.4

P

M

1

1085.4

0

2

404.29

493.82

3

0

164.61

4

4.3608873

167.265

Point 4 is from actual loads

Linear Interpolation Program #1 (upper line)

Are you in upper region? No

Pu

Mu

Value Below

1085.40

0.00

Value at desired Loc.

4.36

x = 783.774

Max

Value Above

404.29

493.82

Linear Interpolation Program #2 (lower line)

Are you in lower region? Yes

Pu

Mu

Value Below

404.29

493.82

Value at desired Loc.

4.36

x = 168.161

Max

Value Above

0.00

164.61

143-515-A-3

[illegible]

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Section Properties

Number of Posts per end	1	Number of Chords	3
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Overhead Truss

Section 1													
Chord Area	Area, OFI	Dia. Area	Total I	Total S	Total Area	Chord	Weight	Ice Area	Wind Area	Wind Area	Diagonal	No. of Diags.	Diagonal
As	Is	Ad	Rtot	Stot	Atot	Rmin	per foot		Chord	Diags	R min	per plane	Length
2.68	4.771	0.94	1751	97.26	11.66	1.33	39.7	6.0	1.00	0.71	0.389	9	2.93
2.68	4.771	0.94	1751	84.13	11.66	1.33	39.7	8.0	1.00	0.71	0.389	9	2.93
m²	in²	in²	in³	in³	in²	in	lb/ft	ft²	ft²	ft²	in.		(feet)

Section 2													
Chord Area	Area, OFI	Dia. Area	Total I	Total S	Total Area	Chord	Weight	Ice Area	Wind Area	Wind Area	Diagonal	No. of Diags.	Diagonal
As	Is	Ad	Rtot	Stot	Atot	Rmin	per foot		Chord	Diags	R min	per plane	Length
2.68	4.771	0.94	1751	87.26	11.66	1.33	39.7	6.0	1.00	0.71	0.389	9	2.93
2.68	4.771	0.94	1751	84.13	11.66	1.33	39.7	6.0	1.00	0.71	0.389	9	2.93
m²	in²	in²	in³	in³	in²	in	lb/ft	ft²	ft²	ft²	in.		(feet)

Section 3 = Section 1													
Chord Area	Area, OFI	Dia. Area	Total I	Total S	Total Area	Chord	Weight	Ice Area	Wind Area	Wind Area	Diagonal	No. of Diags.	Diagonal
As	Is	Ad	Rtot	Stot	Atot	Rmin	per foot		Chord	Diags	R min	per plane	Length
2.68	4.77	0.94	1751	97.26	11.66	1.33	39.67	6.0	1.00	0.71	0.39	9.00	2.93
2.68	4.77	0.94	1751	84.13	11.66	1.33	39.67	6.0	1.00	0.71	0.39	9.00	2.93
m²	in²	in²	in³	in³	in²	in	lb/ft	ft²	ft²	ft²	in.		(feet)

Posts

Left Post													
Chord Area	Area, OFI	Diag. Area	Ixx	Sxx	Izz	Chord	Szz	Weight	Ice Area	Wind Area	Diagonal	Total Number	Diagonal
As	Is	Ad	Ixx	Sxx	Izz	Chord	per chord	per foot		Chord	R min	of Diagonals	Length
21.21	483.093	0.00	483.09	69.01	483.09	4.77	69.01	72.16	3.67	1.167	999	0	0.00
m²	in²	in²	in⁴	in³	in⁴	in	in³	lb/ft	ft²	ft²	in.		(feet)

Right Post													
Chord Area	Area, OFI	Diag. Area	Ixx	Sxx	Izz	Chord	Szz	Weight	Ice Area	Wind Area	Diagonal	Total Number	Diagonal
As	Is	Ad	Ixx	Sxx	Izz	Chord	per chord	per foot		Chord	R min	of Diagonals	Length
21.21	483.093	0.00	483.09	69.01	483.09	4.77	69.0	72.16	3.67	1.167	999	0	0.00
m²	in²	in²	in⁴	in³	in⁴	in	in³	lb/ft	ft²	ft²	in.		(feet)

Signs

Sign 1				Sign 2			
Area	Weight	Ice Load	I/W Ratio	Area	Weight	Ice Load	I/W Ratio
66.6	66.6	66.6	1.005672916	66.6	66.6	66.6	1.005672916
ft²	lbs	lbs		ft²	lbs	lbs	

Sign 3			
Area	Weight	Ice Load	I/W Ratio
0	0	0	0
ft²	lbs	lbs	

Section 1 & 3		Section 2	
Ice Area 4 =	6.0	Ice Area 4 =	8.0
Ice Area 3 =	6.0	Ice Area 3 =	6.0
Wind area diags 4 =	0.4713	Wind area diags 4 =	0.4713
Wind area diags 3 =	0.7070	Wind area diags 3 =	0.7070
Ice Area 1 =	1.047198	Ice Area 1 =	1.0472

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Wind Pressure Calculations

$P = 0.025 K_z K_{d t} V^2 C_d$					Velocity
Height	Dist	Basic Wind	Importance	Conversion	
Factor	Factor	Factor	Factor	Factor	
H_d	G	V	I	C_d	
0.95	1.14	95	1.0	1.00	

Calculation of Kz

$K_z = 2.01 (h/900)^{0.25} = 0.981$

Elevation

C.O.D

apertures

Horizontal Truss

SECTION 1				SECTION 2				Horizontal Truss Drag Coefficient Calculation (Cylindrical Members)							
Drag	Drag	Wind	Wind	Drag	Drag	Wind	Wind	Max	Max	C _d V ₁ ²	C _d V ₁ ²	Max	Max	C _d V ₁ ²	C _d V ₁ ²
Coeff	Coeff	Pressure	Pressure	Coeff	Coeff	Pressure	Pressure	Value	Value	Chord	Diagonal	Value	Value	Chord	Diagonal
(lb/ft ²)	(lb/ft ²)	(psf)	(psf)	(lb/ft ²)	(lb/ft ²)	(psf)	(psf)								
0	1.55	39	30.5	0	1.55	39	30.5	0	0	1.55	39	0	1.55	39	30.5
1.19	1.19	24.73	25.23	1.19	1.19	24.73	25.23	39	1.55	78	39	1.55	78	39	30.5
								78	0.45		78	0.45			

Signs

SIGN 1				SIGN 2				SIGN 3			
Drag	Wind	Drag	Wind	Drag	Wind	Drag	Wind	Drag	Wind	Drag	Wind
Coeff	Pressure	Coeff	Pressure	Coeff	Pressure	Coeff	Pressure	Coeff	Pressure	Coeff	Pressure
1.141	25.66	1.163	26.16	1.050	23.81						

Vertical Posts

LEFT SIDE				RIGHT SIDE			
Drag	Wind	Drag	Wind	Drag	Wind	Drag	Wind
Coeff	Pressure	Coeff	Pressure	Coeff	Pressure	Coeff	Pressure
0.45	10.11	0.45	10.11				

*For Group Load Combination II minimum pressure $P_s = 25$ psf

Weighted Avg Used for Group			
Section 1 Truss $P_z =$	30.30	30.30	
Section 2 Truss $P_z =$	30.30	30.30	
Sign 1 $P_z =$	25.66	25.66	
Sign 2 $P_z =$	26.16	26.16	
Sign 3 $P_z =$	23.81	23.81	
Left Post =	10.12	24.00	
Right Post =	10.12	25.00	

Drag Coefficient for Vertical Posts							
Left Vertical Post				Right Vertical Post			
Max	Max	Max	C _d V ₁ ²	Max	Max	Max	C _d V ₁ ²
Value	Cd	Value		Value	Cd	Value	
0	1.55	39	100.0	0	1.55	39	100.0
39	0.30	78		39	0.30	78	
78	0.45			78	0.45		

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Moments and Shears on Overhead Truss Due to Wind Loads

Span	Wind Load on truss Section 1	Wind Load on truss Section 2	Wind Load on truss (gft)	Wind Load on Signs Load (kips)	Dist. from Left (feet)	
feet	gft	gft	gft	(kips)	(feet)	
63.07	51.75	51.75	51.75	4.15	47.73	P1 Left Sign
				0.00	0.00	P2 Center Sign
						P3 Right Sign

Total Uniform Load =	0.002 k/ft	Total Load =	11.33 kips
Left Reaction	4.73 kips	Right Reaction	6.61 kips

Moments and Shears

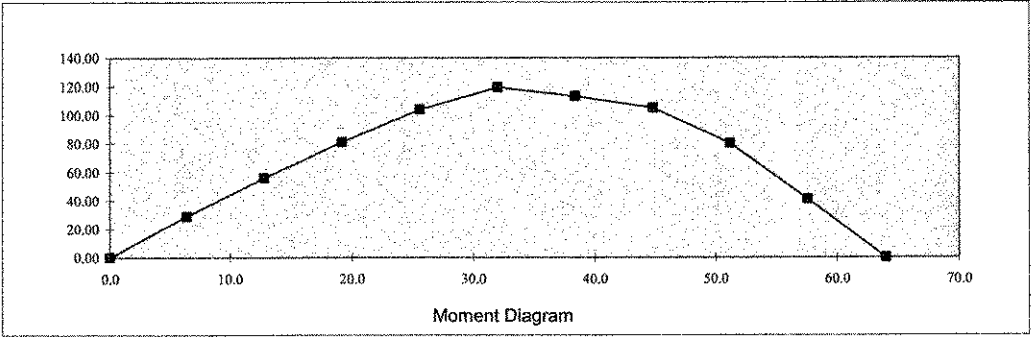
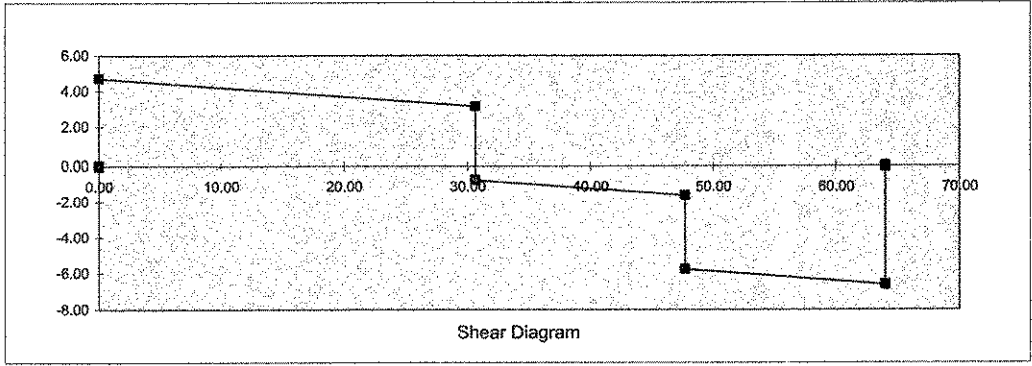
X/L	Distance	P1 dist.	P2 dist.	P3 dist.	Moment
0.0	0.0	0	0	0	0.00
0.1	6.4	0	0	6.397	26.17
0.2	12.8	0	0	12.794	56.23
0.3	19.2	0	0	19.191	81.17
0.4	25.6	0	0	25.588	103.99
0.5	32.0	1.325	0	31.966	119.66
0.6	38.4	7.722	0	38.362	113.36
0.7	44.8	14.119	0	44.779	105.04
0.8	51.2	20.518	3.440	51.176	80.31
0.9	57.6	26.913	9.843	57.573	41.21
1.0	64.0	33.31	16.24	63.97	0.00

Values for Shear Diagram	
0.00	0.00
0.00	4.73
0.00	5.14
30.66	-0.74
47.73	-1.62
47.73	-5.77
47.73	-1.62
47.73	-5.77
64.0	-6.61
64.0	0.00

Shear at Point Loads	Shear	Shear	Max or Min
	Left	Right	
At Left Reaction	0.00	0.00	4.73
At Point P1	120.88	3.14	-0.74
At Point P2	100.49	-1.62	-5.77
At Point P3	0.00	-3.30	-3.30
At Right Reaction	0.00	-6.61	0.00
			Maximums
			Minimums

Forces at Field Splices and Mid-Span

Left Side		Right Side		Mid-Span	
Location	31.99feet	Location	63.97feet	Location	31.99feet
Left Reaction	4.73 kips	Left Reaction	4.73 kips	Left Reaction	4.73 kips
Point Load 1	3.87 kips	Point Load 1	3.87 kips	Point Load 1	3.87 kips
Point Load 2	0.00 kips	Point Load 2	4.15 kips	Point Load 2	0.00 kips
Point Load 3	0.00 kips	Point Load 3	0.00 kips	Point Load 3	0.00 kips
Uniform Load	0.002 kips per foot	Uniform Load	0.002 kips per foot	Uniform Load	0.002 kips per foot
Shear at splice	-6.60 kips	Shear at splice	-6.61 kips	Shear at Mid-Span	-0.904 kips
Moment at splice	119.50 kips-feet	Moment at splice	-0.03 kips-feet	Mom. at Mid-Span	119.50 kips-feet



Group Load Combination III - Moments and Shears on Overhead Truss Due to Wind Loads

Span	Wind Load on Truss Section 1	Wind Load on Truss Section 2	Wind Load on Truss (gft)	Wind Load on Signs Load (kip)	Wind Load on Signs Dist. from Left (feet)	
feet	(gft)	(gft)	(gft)	(kip)		P1 Left Sign
63.97	51.75	51.75	51.75	4.15	47.73	P2 Center Sign
				0.00	0.00	P3 Right Sign
Total Uniform Load = 0.002 klf				Total Load = 11.20 kips		
Left Reaction				Right Reaction		
4.73 kips				6.61 kips		

Moments and Shears

X	Distance	P1 dist.	P2 dist.	P3 dist.	Moment
0.0	0.0	0	0	0	0.00
0.1	6.4	0	0	6.387	28.17
0.3	12.8	0	0	12.794	56.23
0.5	19.2	0	0	19.191	84.17
0.6	25.6	0	0	25.588	102.89
0.6	32.0	1.325	0	31.885	119.56
0.6	38.4	7.722	0	38.282	113.36
0.7	44.8	14.119	0	44.779	105.04
0.8	51.2	20.516	3.448	51.176	80.31
0.9	57.6	26.913	9.845	57.573	41.21
1.0	64.0	33.31	16.24	63.97	0.00

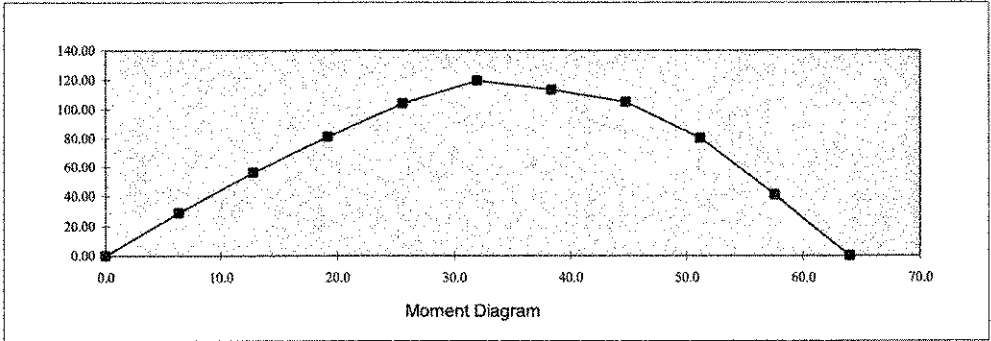
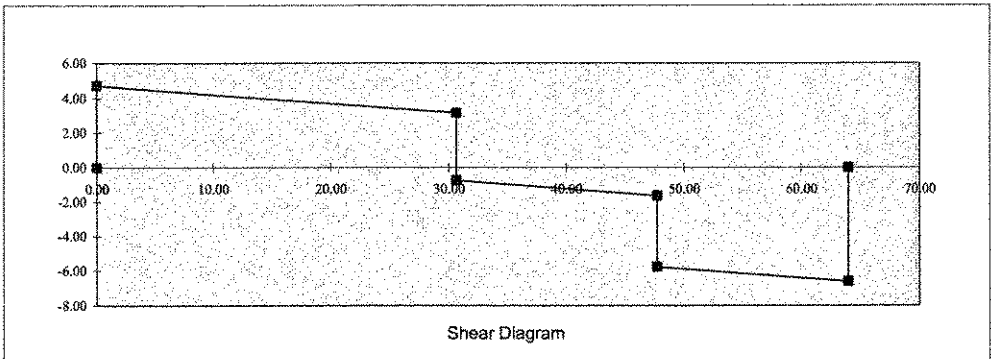
Values for Shear Diagram	
0.00	0.00
0.00	4.73
30.86	-0.74
47.73	-1.62
47.73	-5.77
47.73	-1.62
47.73	-5.77
64.0	-6.61
64.0	0.00

Shear at Point Loads	Shear Left	Shear Right	Max or Min
At Left Reaction	0.00	4.73	4.73
At Point P1	120.59	3.14	-3.14
At Point P2	100.49	-1.62	-5.77
At Point P3	0.00	-3.30	-3.30
At Right Reaction	0.00	-6.61	-6.61

Maximum	Minimum
119.56	4.73
0.00	-6.61

Forces at Field Splices and Mid-Span

Left Side	Right Side	Mid-Span
Location	Location	Location
31.69feet	63.97feet	31.69feet
Left Reaction	Left Reaction	Left Reaction
4.73 kips	4.73 kips	4.73 kips
Point Load 1	Point Load 1	Point Load 1
3.67 kips	3.67 kips	3.67 kips
Point Load 2	Point Load 2	Point Load 2
0.00 kips	4.15 kips	0.00 kips
Point Load 3	Point Load 3	Point Load 3
0.00 kips	0.00 kips	0.00 kips
Uniform Load	Uniform Load	Uniform Load
0.002 kips per foot	0.002 kips per foot	0.002 kips per foot
Shear at splice	Shear at splice	Shear at Mid-Span
-2.86 kips	-6.61 kips	-0.95 kips
Moment at splice	Moment at splice	Mom. at Mid-Span
119.56 kip feet	-0.03 kip feet	119.56 kip feet



148-sign-3

Moments and Shears on Overhead Truss Due to Dead Loads

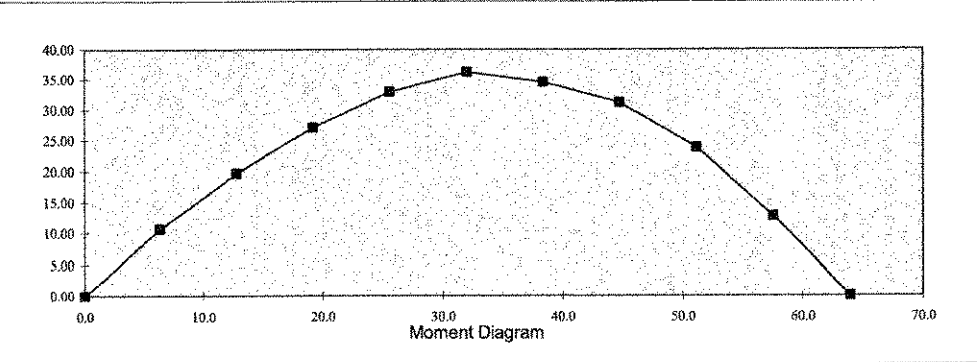
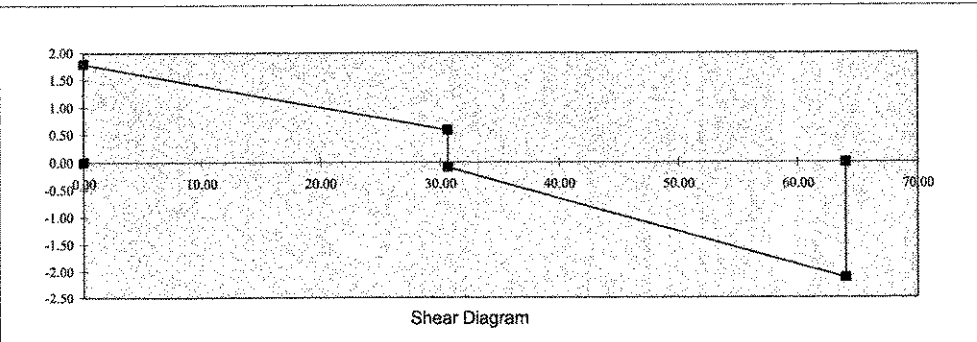
Span (feet)	Dead Load on Truss (kips)	Dead Load on Signs		Dist. from Left (feet)	
		Load (kips)	Dist. from Left (feet)		
63.97	50	0.66	30.66	P1	Left Sign
		0.71	42.73	P2	Corner Sign
		0.00	0.00	P3	Right Sign
Total Uniform Load =		0.04 k/ft		Total Load =	
				3.97 kips	
Left Reaction		1.79 kips		Right Reaction	
				2.11 kips	

Moments and Shears

SL	Distance	P1 dist.	P2 dist.	P3 dist.	Moment	Values for Shear Diagram	
0.0	0.0	0	0	0	0.00	0.00	0.00
0.1	6.6	0	0	6.597	19.07	0.00	1.79
0.2	13.2	0	0	12.794	19.71	0.00	0.68
0.3	19.8	0	0	19.191	27.13	30.66	-0.09
0.4	26.4	0	0	25.588	32.83	30.66	0.58
0.5	33.0	1.329	0	31.968	36.22	30.66	-0.09
0.6	39.6	7.722	0	38.362	34.61	30.66	0.58
0.7	46.2	14.119	0	44.779	31.20	30.66	-0.09
0.8	52.8	20.515	3.448	51.176	23.81	30.66	0.58
0.9	59.4	26.912	9.845	57.573	12.72	30.66	-0.09
1.0	66.0	33.31	16.24	63.97	0.00	30.66	0.58
						64.0	-2.11
						64.0	0.00
Shear at Point Loads			Shear: Left: Right:	Shear: Max or Min:			
At Left Reaction	0.00	0.00	1.79	1.79			
At Point P1	36.37	0.66	-0.09	0.58			
At Point P2	29.11	-0.76	-1.47	-1.47			
At Point P3	0.00	0.62	0.42	0.42			
At Right Reaction	0.00	-2.11	0.00	-2.11			
					Moment	Shear	
					Maximum	36.22	19
					Minimum	-0.09	-2.11

Forces at Field Splices and at Mid-Span

Left Side		Right Side		Mid-Span	
Location	31.99 feet	Location	63.97 feet	Location	31.99 feet
Left Reaction	1.79 kips	Left Reaction	1.79 kips	Left Reaction	1.79 kips
Point Load 1	0.66 kips	Point Load 1	0.66 kips	Point Load 1	0.66 kips
Point Load 2	0.00 kips	Point Load 2	0.71 kips	Point Load 2	0.00 kips
Point Load 3	0.00 kips	Point Load 3	0.00 kips	Point Load 3	0.00 kips
Uniform Load	0.04 kips per foot	Uniform Load	0.04 kips per foot	Uniform Load	0.04 kips per foot
Shear at splice	-0.14 kips	Shear at splice	-2.12 kips	Shear at splice	-0.14 kips
Moment at splice	36.22 kip feet	Moment at splice	-0.01 kip feet	Moment at splice	36.22 kip feet



Moments and Shears on Overhead Truss Due to Ice Loads

Span (feet)	Ice Load on truss (k/ft)	Ice Load on Signs		
		Load (kips)	Dist. from Left (feet)	
63.97	15	0.55	30.66	P1 Left Sign
		0.58	47.73	P2 Center Sign
		0.00	0.00	P3 Right Sign
Total Uniform Load =		0.05 k/ft		
		Total Load =		2.27 kips
Left Reaction				Right Reaction
1.00 kips				1.27 kips

Moments and Shears

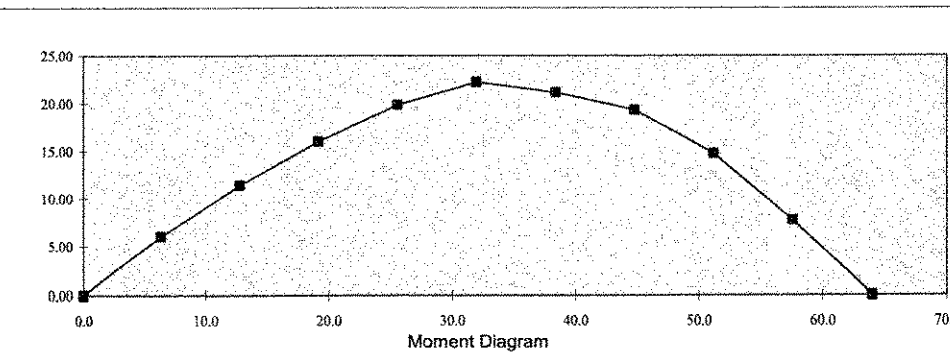
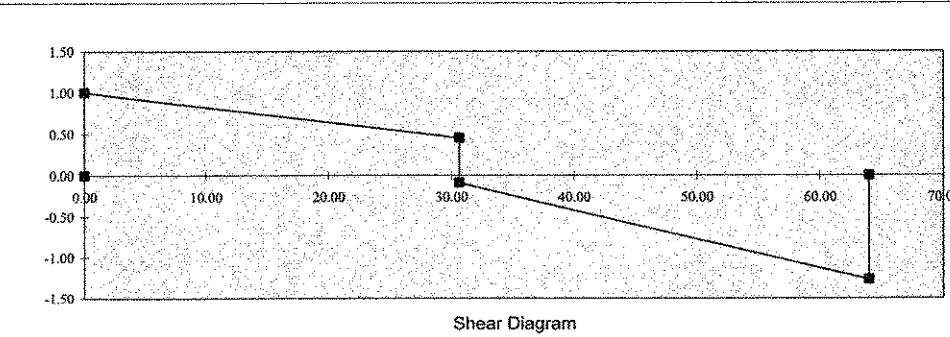
XL	Distance	P1 dist.	P2 dist.	P3 dist.	Moment	Values for Shear Diagram	
						0.00	0.00
0.0	0.0	0	0	0	0.00	0.00	0.00
0.1	6.4	0	0	0	6.367	0.00	1.00
0.2	12.8	0	0	0	12.794	0.00	0.00
0.3	19.2	0	0	0	19.181	0.00	0.00
0.4	25.6	0	0	0	25.568	0.00	0.00
0.5	32.0	1.303	0	0	31.955	0.00	0.00
0.6	38.4	7.722	0	0	38.392	0.00	0.00
0.7	44.8	14.119	0	0	44.779	0.00	0.00
0.8	51.2	20.516	3.444	0	51.178	0.00	0.00
0.9	57.6	26.913	9.843	0	57.573	0.00	0.00
1.0	64.0	33.31	16.24	0	63.97	0.00	0.00

Shear at Point Loads	Shear	Shear	Max or Min
At Left Reaction	0.00	0.00	1.00
At Point P1	22.39	0.46	0.46
At Point P2	-18.23	-0.46	-0.98
At Point P3	0.00	-0.12	-0.12
At Right Reaction	0.00	-1.27	0.00

Moment	Shear
Maximum	22.39
Minimum	-1.27

Forces at Field Splices and at Mid-Span

Left Side		Right Side		Mid-Span	
Location	31.99feet	Location	63.97feet	Location	31.99feet
Left Reaction	1.00 kips	Left Reaction	1.00 kips	Left Reaction	1.00 kips
Point Load 1	0.55 kips	Point Load 1	0.55 kips	Point Load 1	0.55 kips
Point Load 2	0.00 kips	Point Load 2	0.55 kips	Point Load 2	0.00 kips
Point Load 3	0.00 kips	Point Load 3	0.00 kips	Point Load 3	0.00 kips
Uniform Load	0.05 kips per foot	Uniform Load	0.05 kips per foot	Uniform Load	0.05 kips per foot
Shear at splice	-0.11 kips	Shear at splice	-1.27 kips	Shear at splice	-0.11 kips
Moment at splice	22.25 kip feet	Moment at splice	-0.01 kip feet	Moment at splice	22.25 kip feet



150-signs

Horizontal Truss Group Loads

Group	Load	Percent
1	DL	1.00
2	DL+WL	1.33
3	DL+WIND	1.33

Minimum Pz = 25.0 psf

Horizontal Overhead Truss Analysis

Location	DL	Wind (kip-ft)			DL	Wind (kip-ft)			DL	Wind (kip-ft)			DL	Wind (kip-ft)		
		ICE	WIND	WIND		ICE	WIND	WIND		ICE	WIND	WIND		ICE	WIND	WIND
		DL	ICE	WIND		DL	ICE	WIND		DL	ICE	WIND		DL	ICE	WIND
Left Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.73	1.79	1.00	0.00		
Left Splice	36.22	22.25	0.00	0.00	0.00	119.56	119.56	0.00	0.00	0.00	0.00	0.14	0.11	0.00		
Midspan	36.22	22.25	0.00	0.00	0.00	0.00	119.56	119.56	0.00	0.00	-0.89	0.89	-0.14	-0.11	0.00	
Sign 1	36.37	22.39	0.00	0.00	0.00	120.58	120.58	0.00	0.00	0.00	3.14	3.14	0.98	0.88	0.00	
Sign 2	29.11	18.23	0.00	0.00	0.00	100.48	100.48	0.00	0.00	0.00	5.77	5.77	1.47	0.88	0.00	
Sign 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.30	3.30	0.42	0.12	0.00	
Right Splice	-0.01	-0.01	0.00	0.00	0.00	-0.03	-0.03	0.00	0.00	0.00	6.81	6.81	2.12	1.27	0.00	
Right Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.81	6.81	2.11	1.27	0.00	

GROUP LOAD COMBINATIONS

Location	Section	Bending About Horizontal Axis			Bending About Vertical Axis			SHEAR Horizontal	SHEAR Vertical	Combined Forces			
		West	East	Axial	West	East	Axial			AXIAL (Pz)	SHEAR (Pz)	DIAGONAL	
		kip-ft	kip-ft	kip	kip-ft	kip-ft	kip						
		kip-ft	kip-ft	kip	kip-ft	kip-ft	kip						
Left Support	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	1.79	0.00	0.00	1.79	
Left Splice	31.99	1	36.22	4.47	11.98	0.00	0.00	0.00	0.14	11.98	0.00	0.14	
Midspan	31.99	1	36.22	4.47	11.98	0.00	0.00	0.00	0.14	11.98	0.00	0.00	
Sign 1	30.86	1	36.37	4.49	12.02	0.00	0.00	0.00	0.98	12.02	0.00	0.98	
Sign 2	47.73	2	29.11	3.59	8.83	0.00	0.00	0.00	1.47	0.00	9.63	1.47	
Sign 3	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.42	
Right Splice	63.97	1	-0.01	0.00	0.00	0.00	0.00	0.00	2.12	0.00	0.00	2.12	
Right Support	63.97	2	0.00	0.00	0.00	0.00	0.00	0.00	2.11	0.00	0.00	2.11	
Left Support	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	2.55	0.00	0.00	2.55	
Left Splice	31.99	1	27.23	3.36	8.00	89.90	12.82	34.36	0.60	0.10	43.36	0.00	0.00
Midspan	31.99	1	27.24	3.36	8.00	89.90	12.82	34.36	0.60	-0.10	43.36	0.00	-0.10
Sign 1	30.86	1	27.35	3.37	8.04	89.86	12.83	34.85	2.36	0.43	43.89	0.00	2.36
Sign 2	47.73	2	21.89	2.70	7.34	75.66	10.78	28.88	4.34	1.11	0.00	36.12	4.34
Sign 3	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	2.48	0.00	0.00	2.48	
Right Splice	63.97	1	-0.01	0.00	0.00	0.02	0.00	-0.01	4.97	-0.01	0.00	4.97	
Right Support	63.97	2	0.00	0.00	0.00	0.00	0.00	0.00	4.97	0.00	0.00	4.97	
Left Support	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	1.78	2.10	0.00	0.00	2.10
Left Splice	31.99	1	43.97	5.42	14.54	44.96	6.41	17.16	0.90	0.16	31.72	0.00	0.30
Midspan	31.99	1	43.87	5.42	14.54	44.86	6.41	17.16	0.90	-0.16	31.72	0.00	0.30
Sign 1	30.86	1	44.18	5.45	14.61	45.23	6.47	17.33	1.18	0.78	31.80	0.00	1.18
Sign 2	47.73	2	35.60	4.39	11.77	37.78	5.39	14.44	2.17	1.84	0.00	26.21	2.17
Sign 3	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	2.54	0.00	0.00	2.54	
Right Splice	63.97	1	-0.01	0.00	0.00	-0.07	0.00	0.00	2.48	-0.01	0.00	2.48	
Right Support	63.97	2	0.00	0.00	0.00	0.00	0.00	0.00	2.48	2.54	0.00	0.00	2.54

Location	Section	Monosube Forces					
		Section 1			Section 2		
		West	Midspan	H Shear	West	Midspan	H Shear
Left Support	0.00	1	0.00	0.00	0.00	0.00	0.00
Left Splice	31.99	1	36.22	0.00	0.00	0.14	0.00
Midspan	31.99	1	36.22	0.00	0.00	-0.14	0.00
Sign 1	30.86	1	36.37	0.00	0.00	0.98	0.00
Sign 2	47.73	2	0.00	0.00	0.00	29.11	0.00
Sign 3	0.00	1	0.00	0.00	0.00	0.00	0.00
Right Splice	63.97	1	-0.01	0.00	0.00	2.12	0.00
Right Support	63.97	2	0.00	0.00	0.00	0.00	2.11
Left Support	0.00	1	0.00	0.00	0.00	0.00	0.00
Left Splice	31.99	1	27.23	89.90	0.10	0.00	0.00
Midspan	31.99	1	27.24	89.90	-0.10	0.00	0.00
Sign 1	30.86	1	27.35	89.86	2.36	0.43	0.00
Sign 2	47.73	2	0.00	0.00	0.00	21.89	75.56
Sign 3	0.00	1	0.00	0.00	0.00	0.00	0.00
Right Splice	63.97	1	-0.01	0.02	4.97	1.59	0.00
Right Support	63.97	2	0.00	0.00	0.00	0.00	4.97
Left Support	0.00	1	0.00	0.00	0.00	0.00	0.00
Left Splice	31.99	1	43.97	44.96	0.30	0.16	0.00
Midspan	31.99	1	43.97	44.96	0.00	-0.16	0.00
Sign 1	30.86	1	44.18	45.33	1.18	0.78	0.00
Sign 2	47.73	2	0.00	0.00	0.00	26.80	37.78
Sign 3	0.00	1	0.00	0.00	0.00	0.00	0.00
Right Splice	63.97	1	-0.01	-0.01	2.48	2.54	0.00
Right Support	63.97	2	0.00	0.00	0.00	0.00	2.48

West	Midspan	SHEAR Horizontal	SHEAR Vertical
44.18	44.96	4.97	2.54
35.60	75.56	4.97	2.54
43.97	89.90	0.00	0.16

For Monosube Design Only - Section 1

For Monosube Design Only - Section 2

157 - Sign

VERTICAL TRUSS LOAD COMBINATIONS

Percent Overstress

Group I DL 1.00

Group II Case 1 DL + Wn + 2Wt 1.33 Wn = WIND FORCES IN THE X DIRECTION

Group II Case 2 DL + 8Wn + 3Wt 1.33

Group III Case 1 DL + ICE + 5Wn + 1Wt 1.33 Minimum wind pressure of 25 psf

Group III Case 2 DL + ICE + 3Wn + 1Wt 1.33 Minimum wind pressure of 25 psf

Location	LOADS	Vxx (kips/ft)				AXIAL (kips/ft)				Vyy				AXIAL			
		DL	ICE	WIND	WIND III	DL	ICE	WIND		DL	ICE	WIND	WIND III	DL	ICE	WIND	
Left Support		0.00	0.00	0.012	0.029	0.072	0.011	0.00		0.00	0.00	4.73	4.73	1.79	1.00	0.00	
Right Support		0.00	0.00	0.012	0.029	0.072	0.011	0.00		0.00	0.00	6.61	6.61	2.11	1.27	0.00	

Depth of Horizontal Truss	Total Left Post Ht	Total Right Post Ht
DL	Ht	Ht
3.00	27.27	29.09

LOAD COMBINATION RESULTS (Loads and Moments are for both posts)										Relative Stiffness Transverse Wind
Reactions		Mstrong	Mweak	Vstrong	Wind Tr	Axial				
		kips-ft	kips-ft	kips	kips	kips				kips
Left Support	G1	0.00	0.00	0.00	0	3.76				0
Right Support		0.00	0.00	0.00	0	4.21				0
Left Support	GW C1	94.89	24.83	3.90	0.99	2.63				6.24
Right Support		140.70	21.88	6.23	0.82	3.17				5.10
Left Support	GW C2	58.93	37.24	2.28	1.48	2.83				0.24
Right Support		84.42	32.82	3.14	1.23	3.17				5.10
Left Support	GW C3	49.87	12.41	2.08	0.49	3.81				6.24
Right Support		73.10	10.94	2.80	0.41	4.36				5.10
Left Support	GW C3	29.92	18.82	1.25	0.49	3.81				6.24
Right Support		43.86	16.41	1.89	0.41	4.36				5.10

Posts												
Left Post												
Chord Area	Max. Chl	Diag. Area	Ixx	Sxx	Izz	Chord	Szz	Weight	Ice Area	Wind Area	Diagonal	
As	Is	Ad	Ixtot	Sxtot	Rmin	Chord	R min					
21.21	483.093	0.00	453	69.01	483.09	4.77	69.0	72.16	3.67	1.187	99	
in ²	in ⁴	in ²	in ⁴	in ³	in ⁴	in	in ³	lb/ft	ft ² /ft	ft ² /ft	ft	
Right Post												
Chord Area	Max. Chl	Diag. Area	Ixx	Sxx	Izz	Chord	Szz	Weight	Ice Area	Wind Area	Diagonal	
As	Is	Ad	Ixtot	Sxtot	Rmin	Chord	R min					
21.21	483.093	0.00	453	69.01	483.09	4.77	69.0	72.16	3.67	1.187	99	
in ²	in ⁴	in ²	in ⁴	in ³	in ⁴	in	in ³	lb/ft	ft ² /ft	ft ² /ft	ft	

LOAD COMBINATION RESULTS (Per Post for design)												
Reactions		Max. Axial	Min. Axial	Mstrong	Mweak	Minax	V					
		kips	kips	kips-ft	kips-ft	kips-ft	kips					
Left Support	G1	3.76	3.76	0.00	0.00	0.00	0.00					
Right Support		4.21	4.21	0.00	0.00	0.00	0.00					
Left Support	GW C1	2.83	2.83	94.89	24.83	94.89	3.92					
Right Support		3.17	3.17	140.70	21.88	140.70	5.29					
Left Support	GW C2	2.83	2.83	58.93	37.24	58.93	2.72					
Right Support		3.17	3.17	84.42	32.82	84.42	3.37					
Left Support	GW C3	3.81	3.81	49.87	12.41	49.87	2.13					
Right Support		4.36	4.36	73.10	10.94	73.10	2.83					
Left Support	GW C3	3.81	3.81	29.92	18.82	29.92	1.34					
Right Support		4.36	4.36	43.86	16.41	43.86	1.73					

Number of Posts: 1

152-519-1

Horizontal Truss Analysis

Section 1 - Chords										
Unbraced Length (in.)	Pipe Diameter (in.)	Wall Thickness (in.)	Pipe Area (in.^2)	Chord Yield Str. (ksi)	Max. Axial Force kips	Column Slenderness Cc	kL/Rmin	Fa Compression (ksi)	Fa Compression (ksi)	RESULT C/D
72.0	4.000	0.226	2.68	42.0	43.69	116.7	53.95	16.31	20.52	0.79

Section 2 - Chords										
Unbraced Length (in.)	Pipe Diameter (in.)	Wall Thickness (in.)	Pipe Area (in.^2)	Chord Yield Str. (ksi)	Max. Axial Force kips	Column Slenderness Cc	kL/Rmin	Fa Compression (ksi)	Fa Compression (ksi)	RESULT C/D
72.0	4.000	0.226	2.68	42.0	36.12	116.7	53.95	13.48	20.52	0.66

Diagonals -Horizontal										
Unbraced Length (in.)	Pipe or Angle (in.)	Diagonal Area (in.^2)	R min (in.)	Chord Yield Str. (ksi)	Max. Axial Force kips	Column Slenderness Cc	kL/Rmin	Fa Compression (ksi)	Fa Compression (ksi)	RESULT C/D
35.2	ANGLE	0.94	0.39	36.0	7.90	126.1	90.43	8.42	14.15	0.60

Diagonals - Vertical										
Unbraced Length (in.)	Pipe or Angle (in.)	Diagonal Area (in.^2)	R min (in.)	Chord Yield Str. (ksi)	Max. Axial Force kips	Column Slenderness Cc	kL/Rmin	Fa Compression (ksi)	Fa Compression (ksi)	RESULT C/D
35.2	ANGLE	0.94	0.39	36.0	4.04	126.1	90.43	4.31	14.15	0.30

Deflections at Mid-Span		Uniform Load		Point Loads		Mid-Span
Span =	767.64 inches	Load	Load	Load	Dist. A	Dist. B
I =	1751 in^4	plf	k/inch	kips	inches	inches
Dead Load of Truss		40	0.0033059	0.66	367.92	399.72
Dead Load of Sign 1				0.71	572.76	194.88
Dead Load of Sign 2				0.00	0.00	0.00
Dead Load of Sign 3						
Ice on Truss		18	0.0014924	0.55	367.92	399.72
Ice on Sign 1				0.58	572.76	194.88
Ice on Sign 2				0.00	0.00	0.00
Ice on Sign 3						
Total Defl. (DL+Ice)						0.82 inches
Allowable Deflection						5.12 inches
Dead Load Deflection						0.51 inches
Extra Camber (L/1000)						0.76764 inches
Total Camber						1.28 inches

154-Sign-d

Horizontal Monotube Analysis

E = 29000 ksi (Young's Modulus)
k chord = 1.00

	Mvert	Mhoriz	SHEAR Horizontal	SHEAR Vertical	Max Axial
	kip-ft	kip-ft	kips	kips	Kips
Section 1	44.18	90.68	4.97	2.54	5.29
Section 2	35.60	75.95	4.97	2.54	5.29

Local Buckling AASHTO 5.5						
Section 1	Outside Dia (inches)	Wall Thick (inches)	Yield Str. (ksi)	λ	λ_p	Result
4.000	0.23	42.0		17.70	86.9	180.6 309.5 Compact

λ width-thickness ratio
 λ_p compact width-thickness ratio
 λ_r non-compact width-thickness ratio
 λ_{max} maximum width-thickness ratio
E 29000 ksi (Young's Modulus)

Local Buckling AASHTO 5.5						
Section 2	Outside Dia (inches)	Wall Thick (inches)	Yield Str. (ksi)	λ	λ_p	Result
4.000	0.23	42.0		17.70	86.9	180.6 309.5 Compact

Section 1					
Unbraced Length (ft.)	Pipe Diameter (in.)	Wall Thickness (in.)	Pipe Area (in ²)	Chord Yield Str. (ksi)	KL/Rmin
72.0	4.000	0.226	2.68	42.0	53.95

Section 2					
Unbraced Length (ft.)	Pipe Diameter (in.)	Wall Thickness (in.)	Pipe Area (in ²)	Chord Yield Str. (ksi)	KL/Rmin
72.0	4.000	0.226	2.68	42.0	53.95

GROUP 1	BENDING AND SHEAR STRESSES									
	Mmax kip-ft	S in ³	Ib ksi	Shear kips	Pipe Area in ²	f _v ksi	Axial kips	Area y in ²	f _a ksi	
	Section 1	100.88	97.26	12.44	5.58	2.68	2.08	5.29	2.68	1.97
	Section 2	83.52	97.26	10.31	5.58	2.68	2.08	5.29	2.68	1.97
	RESULTS									
	Fb ksi	Fv ksi	Fa ksi	Cc	R	KL/R	F _e ksi	Eqn. 5-17 CSR	Eqn. 5-18 CSR	Eqn. 5-19 MAX CSR
Section 1	27.72	13.86	21.75	116.75	1.33	53.95	51.30	0.550	0.607	0.607
Section 2	27.72	13.86	21.75	116.75	1.33	53.95	51.30	0.522	0.485	0.522

Fb Calculation			
Section 1	Term 1	Term 2	Term 3
Eqn. 5-17	0.078	0.449	0.023
Eqn. 5-18	0.091	0.494	0.023
Eqn. 5-19	0.091	0.449	0.023
Section 2	Term 1	Term 2	Term 3
Eqn. 5-17	0.078	0.372	0.023
Eqn. 5-18	0.091	0.409	0.023
Eqn. 5-19	0.091	0.372	0.023

156-sign-d

Highway Safety Corporation
Glastonbury, CT

Welding Procedure Specification

Material specification

ASTM A36, A572 gr 50, A709 Gr 36, ASTM A709 Gr 50, A500 gr B

Welding process

Gas Metal Arc Welding (GMAW)

Manual, semi-automatic, or automatic

Semi-Automatic

Position of welding

Horizontal (2F)

Filler metal specification

AWS A5.18

Filler metal classification

ER70S-3

Electrode and manufacturer

Lincoln Electric Lincoln Weld L-50

Flux and manufacturer

N/A

Shielding gas

85% Argon / 15% CO2

Flow rate

19-27 L / min

Single or multiple pass

Single

Single or multiple arc

Single

Welding current

DC

Polarity

Reverse

Welding progression

Stringers

Root treatment

None

Preheat and interpass temperature

Base Metal up to 3/4" (50°F) ; over 3/4-1 1/2" (70°F)

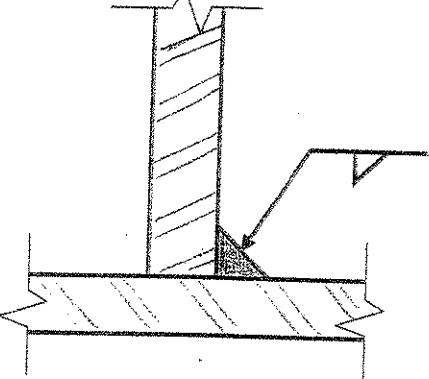
Postheat treatment

None

Electrode extension

3/4" ± 1/4"

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters		Travel speed	Joint detail
			Amps	Volts		
3/16"	1	0.045"	300 A ± 30	29 V ± 2	28 ipm ± 2	TYPICAL ALL FILLET WELDS 
1/4"	1	0.045"	300 A ± 30	29 V ± 2	14 ipm ± 2	

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RESUBMITTED BY: [Signature] DATE: 8-29-07

APPROVED: [Signature]

This procedure may vary due to fabrication sequence, fit-up, pass size, etc. within the limitation of variables given in section 5 of latest edition AWS D1.1

PAUL RADICE

CMR 98070221

QC EXP. 7/01/10

WPS no. W-1587-1

Revision no. 0

Supporting PQR no. Pre-qualified

Project Name St. Johnsbury, Lyndon, Waterford VT

Fabricator Highway Safety Corporation

Authorized by Paul Radice

Date 7/24/07

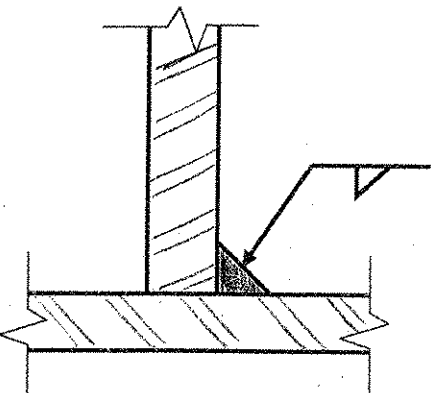
Project Number HES 091-3(42) & HES 093-1(10)

Highway Safety Corporation
Glastonbury, CT

Welding Procedure Specification

Material specification	ASTM A36, A572 gr 50, A709 Gr 36, ASTM A709 Gr 50, A500 gr B		
Welding process	Gas Metal Arc Welding (GMAW)		
Manual, semi-automatic, or automatic	Semi-Automatic		
Position of welding	Horizontal (2F)		
Filler metal specification	AWS A5.18		
Filler metal classification	ER70S-3		
Electrode and manufacturer	Lincoln Electric Lincoln Weld L-50		
Flux and manufacturer	N/A		
Shielding gas	85% Argon / 15% CO2	Flow rate	19-27 L / min
Single or multiple pass	Single		
Single or multiple arc	Single		
Welding current	DC		
Polarity	Reverse		
Welding progression	Stringers		
Root treatment	None		
Preheat and interpass temperature	Base Metal up to 3/4" (50°F) ; over 3/4-1 1/2" (70°F)		
Postheat treatment	None		
Electrode extension	3/4" ± 1/4"		

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters		Travel speed	Joint detail
			Amperes	Volts		
3/16"	1	0.045"	300 A ± 30	29 V ± 2	28 ipm ± 2	TYPICAL ALL FILLET WELDS 
1/4"	1	0.045"	300 A ± 30	29 V ± 2	14 ipm ± 2	

This procedure may vary due to fabrication sequence, fit-up, pass size, etc. within the limitation of variables given in section 5 of latest edition AWS D1.1



PAUL RADICE
CWI 98070221
QC1 EXP 7/01/10

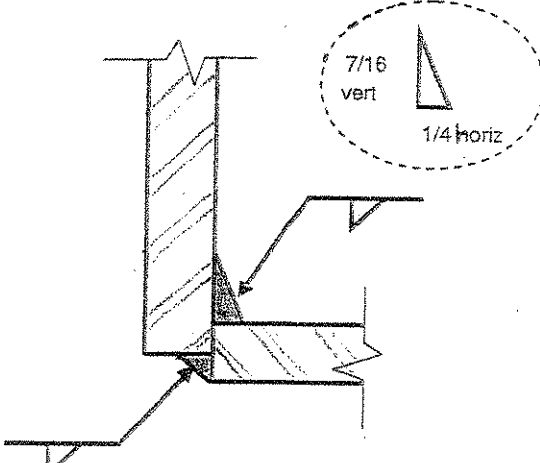
WPS no.	W-1587-1	Fabricator	Highway Safety Corporation
Revision no.	0	Authorized by	Paul Radice
Supporting POR no.	Pre-qualified	Date	7/24/07
Project Name	St. Johnsbury, Lyndon, Waterford VT	Project Number	HES 091-3(42) & HES 093-1(10)

Highway Safety Corporation
Glastonbury, CT

Welding Procedure Specification

Material specification	ASTM A36, A572 gr 50, A709 Gr 36, ASTM A709 Gr 50, A500 gr B		
Welding process	Gas Metal Arc Welding (GMAW)		
Manual, semi-automatic, or automatic	Semi-Automatic		
Position of welding	Horizontal (2F)		
Filler metal specification	AWS A5.18		
Filler metal classification	ER70S-3		
Electrode and manufacturer	Lincoln Electric Lincoln Weld L-50		
Flux and manufacturer	N/A		
Shielding gas	85% Argon / 15% CO2	Flow rate	19-27 L / min
Single or multiple pass	Single & Multiple		
Single or multiple arc	Single		
Welding current	DC		
Polarity	Reverse		
Welding progression	Stringers		
Root treatment	None		
Preheat and interpass temperature	Base Metal up to 3/4" (50°F) ; over 3/4-1 1/2" (70°F)		
Postheat treatment	None		
Electrode extension	3/4" ± 1/4"		

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters		Travel speed	Joint detail
7/16" x 1/4"	1 & 2	0.045"	300 A ± 30	29 V ± 2	14 ipm ± 2	UN-EQUAL LEG FILLET WELD @ BASE PLATE CONNECTION
						
RECEIVED CK'D BY: [Signature] DATE: AUG 14 2007 RESUBMITTED BY: [Signature] DATE: [Signature]						

This procedure may vary due to fabrication sequence, fit-up, pass size, etc. within the limitation of variables given in section 5 of latest edition AWS D1.1

WPS no.	W-1587-2	Fabricator	Highway Safety Corporation
Revision no.	0	Authorized by	Paul Radice
Supporting PQR no.	Pre-qualified	Date	7/24/07
Project Name	St. Johnsbury, Lyndon, Waterford VT	Project Number	HES 091-3(42) & HES 093-1(10)

Highway Safety Corporation

Glastonbury, CT

Welding Procedure Specification

Material specificationASTM A36, A572 gr 50, A709 Gr 36, ASTM A709 Gr 50, A500 gr B

Welding processGas Metal Arc Welding (GMAW)

Manual, semi-automatic, or automaticSemi-Automatic

Position of weldingHorizontal (2F)

Filler metal specificationAWS A5.18

Filler metal classificationER70S-3

Electrode and manufacturerLincoln Electric Lincoln Weld L-50

Flux and manufacturerN/A

Shielding gas85% Argon / 15% CO2Flow rate19-27 L / min

Single or multiple passSingle & Multiple

Single or multiple arcSingle

Welding currentDC

PolarityReverse

Welding progressionStringers

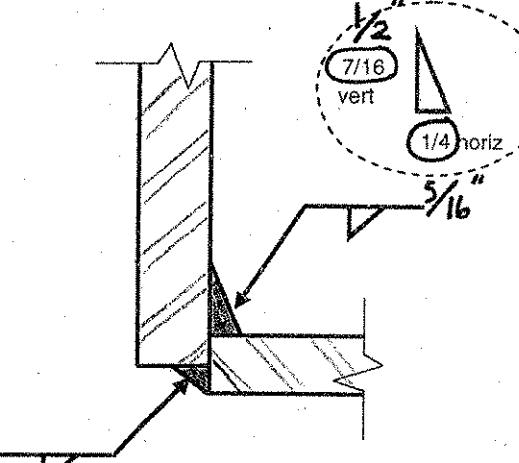
Root treatmentNone

Preheat and interpass temperatureBase Metal up to 3/4" (50°F) ; over 3/4-1 1/2" (70°F)

Postheat treatmentNone

Electrode extension3/4" ± 1/4"

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters		Travel speed	Joint detail.
			Amperes	Volts		
7/16" x 1/4"	1 & 2	0.045"	300 A ± 30	29 V ± 2	14 ipm ± 2	UN-EQUAL LEG FILLET WELD @ BASE PLATE CONNECTION 
			?			

This procedure may vary due to fabrication sequence, fit-up, pass size, etc. within the limitation of variables given in section 5 of latest edition AWS D1.1



PAUL RADICE
CWI 98070221
QC1 EXP 7/01/18

WPS no.W-1587-2

Revision no.0

Supporting PQR no.Pre-qualified

Project NameSt. Johnsbury, Lyndon, Waterford VT

FabricatorHighway Safety Corporation

Authorized byPaul Radice

Date7/24/07

Project NumberHES 091-3(42) & HES 093-1(10)

Highway Safety Corporation

Glastonbury, CT

Welding Procedure Specification

Material specification

ASTM A36, A572 gr 50, A709 Gr 36, ASTM A709 Gr 50, A500 gr B

Welding process

Gas Metal Arc Welding (GMAW)

Manual, semi-automatic, or automatic

Semi-Automatic

Position of welding

Horizontal (2F)

Filler metal specification

AWS A5.18

Filler metal classification

ER70S-3

Electrode and manufacturer

Lincoln Electric Lincoln Weld L-50

Flux and manufacturer

N/A

Shielding gas

85% Argon / 15% CO2

Flow rate

19-27 L / min

Single or multiple pass

Single

Single or multiple arc

Single

Welding current

DC

Polarity

Reverse

Welding progression

Stringers

Root treatment

None

Preheat and interpass temperature

Base Metal up to 3/4" (50°F) ; over 3/4-1 1/2" (70°F)

Postheat treatment

None

Electrode extension

3/4" ± 1/4"

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters		Travel speed	Joint detail
			Amps	Volts		
1/4"	1	0.045"	300 A ± 30	29 V ± 2	14 ipm ± 2	TYPICAL AT SUPPORT PLATE TO COLUMN POLE CONNECTION

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DATE 29 AUG 2007

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DATE 29 AUG 2007

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PAUL RADICE

CM 98070221

QC EXP. 7/01/10

WPS no.

W-1587-3

Fabricator

Highway Safety Corporation

Revision no.

0

Authorized by

Paul Radice

Supporting PQR no.

Pre-qualified

Date

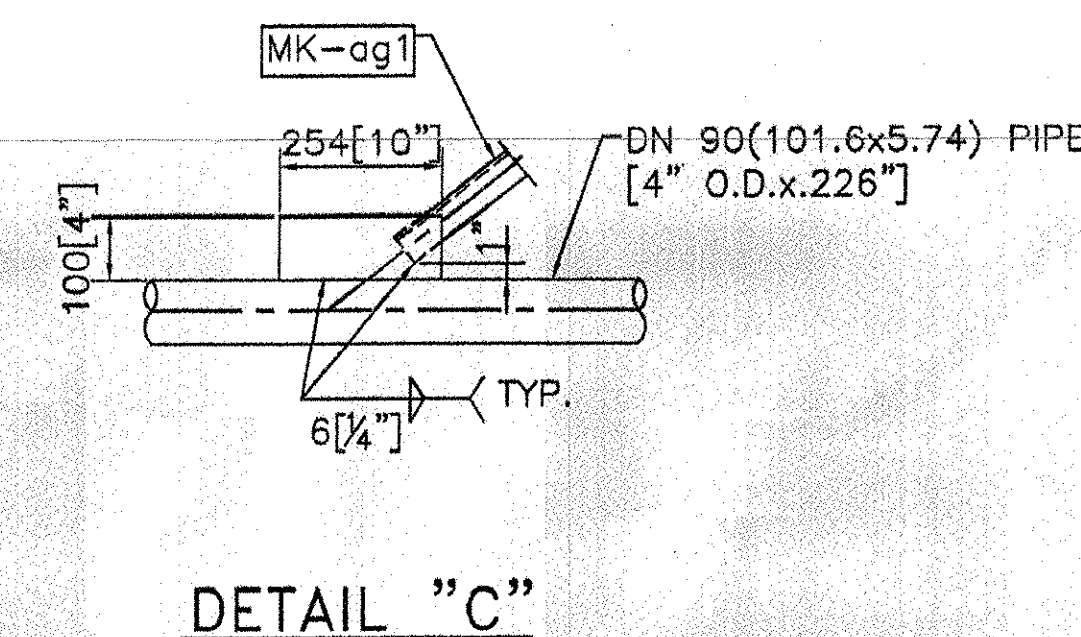
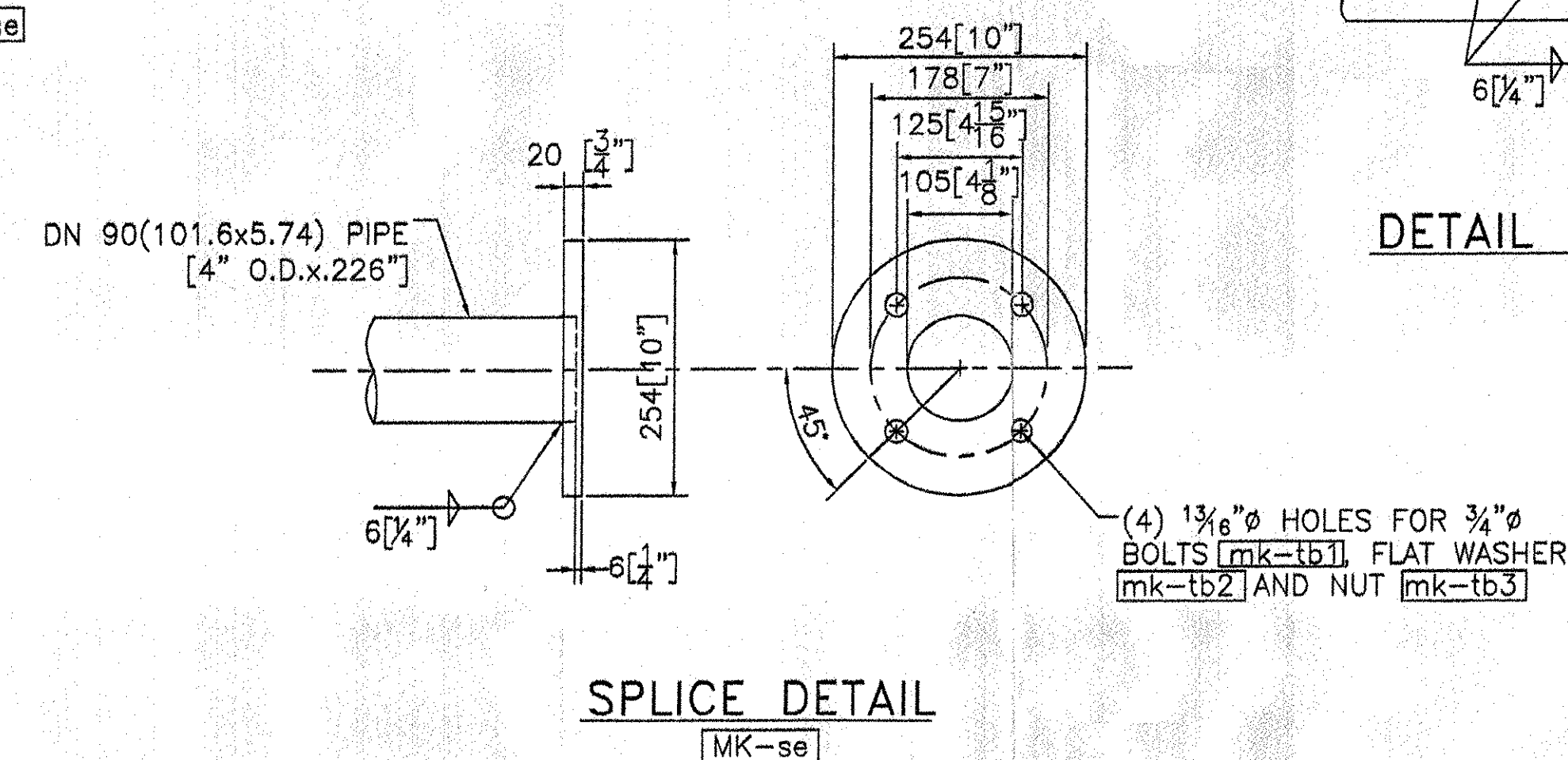
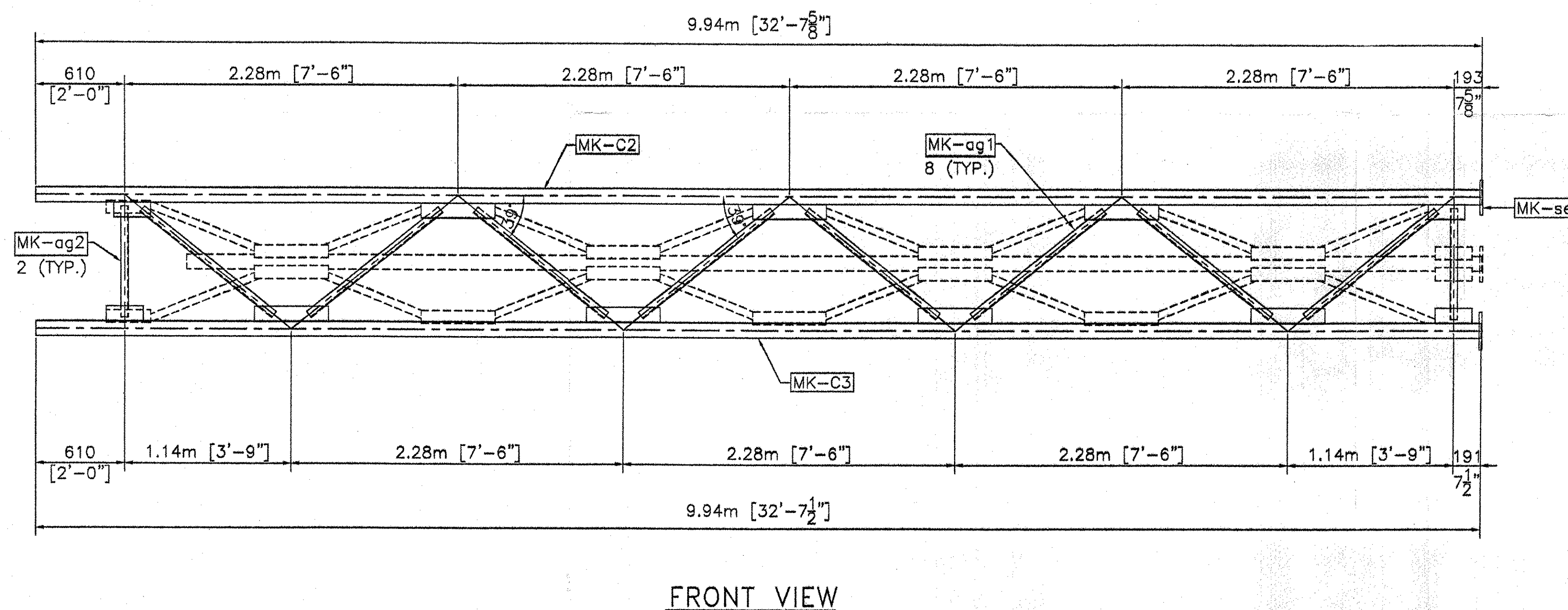
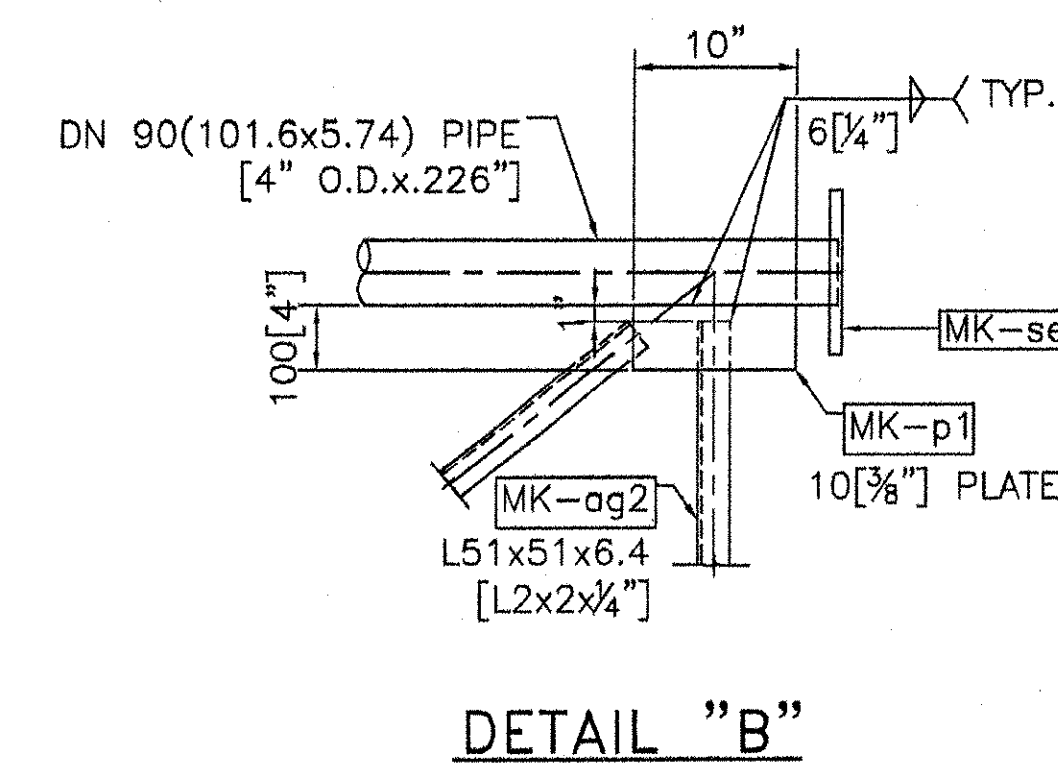
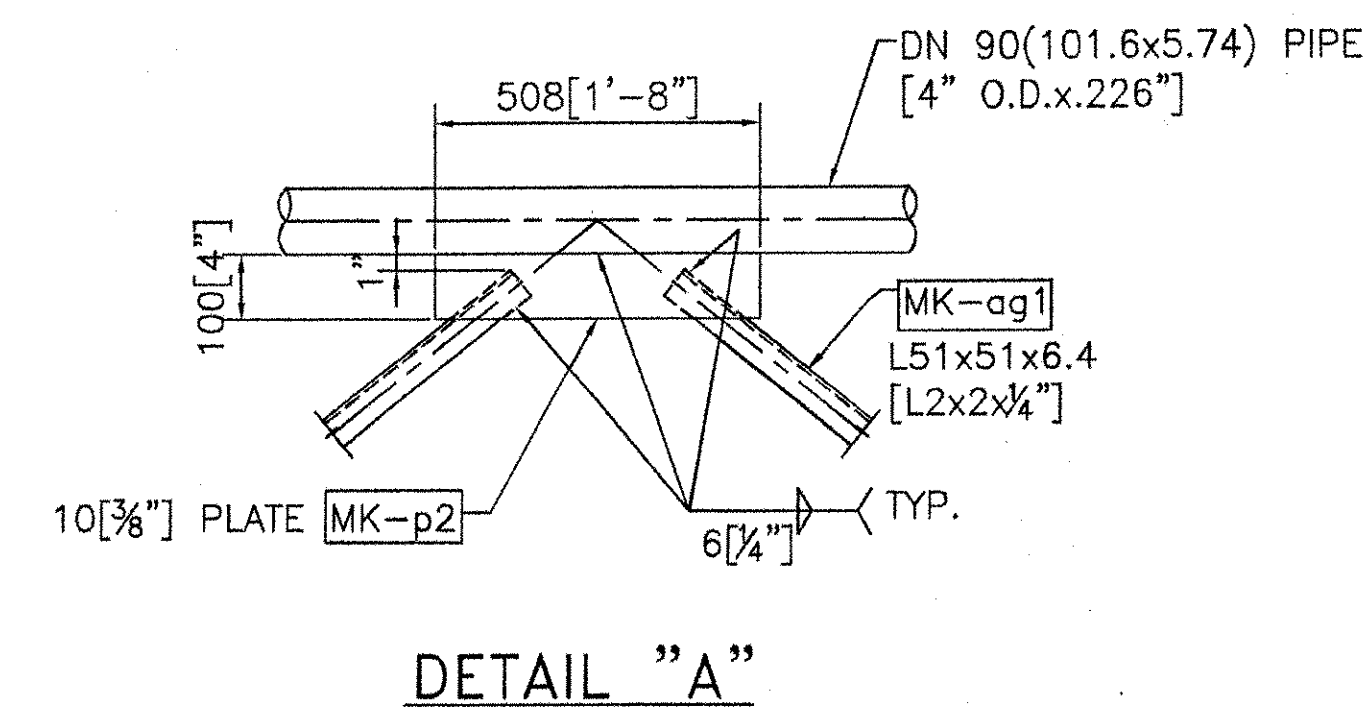
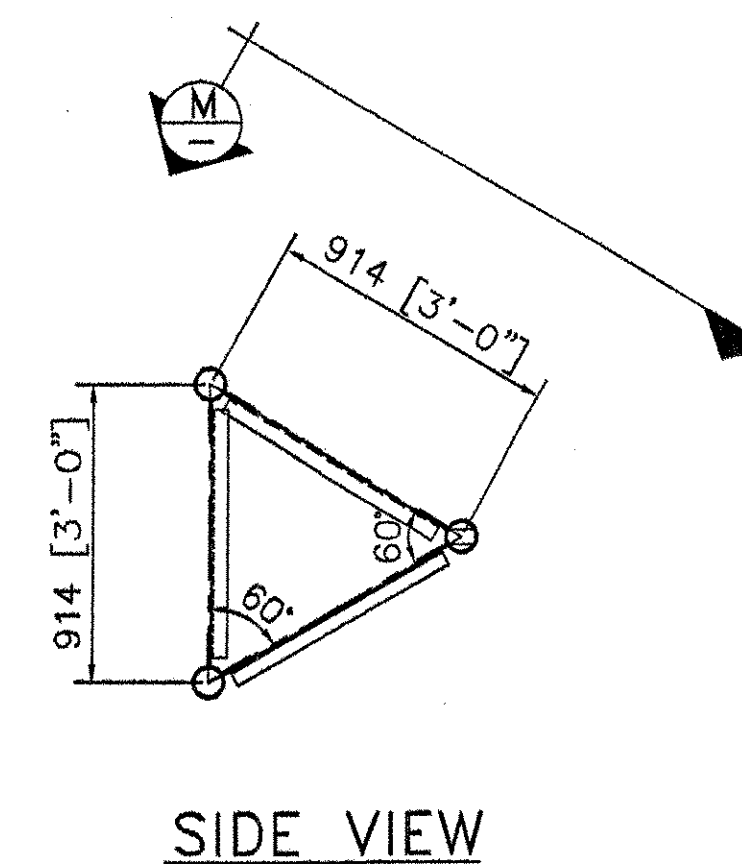
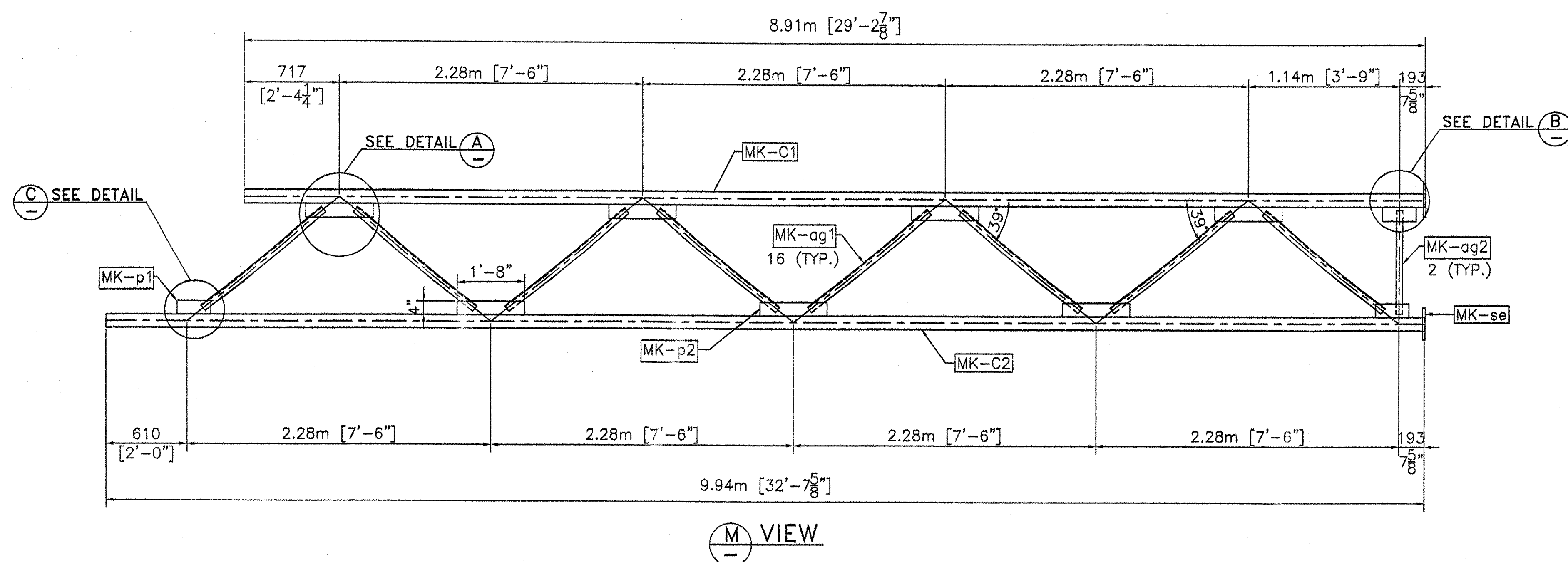
8/29/07

Project Name

St. Johnsbury, Lyndon, Waterford VT

Project Number

HES 091-3(42) & HES 093-1(10)



TRUSS 1

REVISIONS		
No.	Remarks	Date
0	Initial submittal	

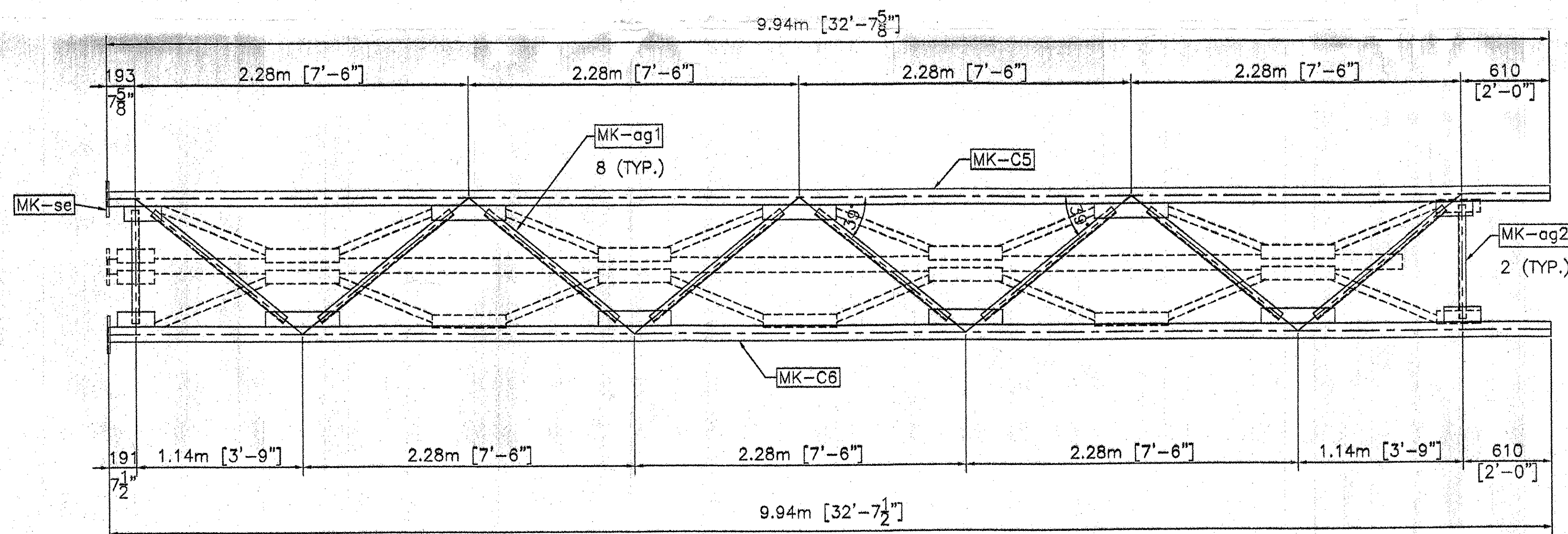
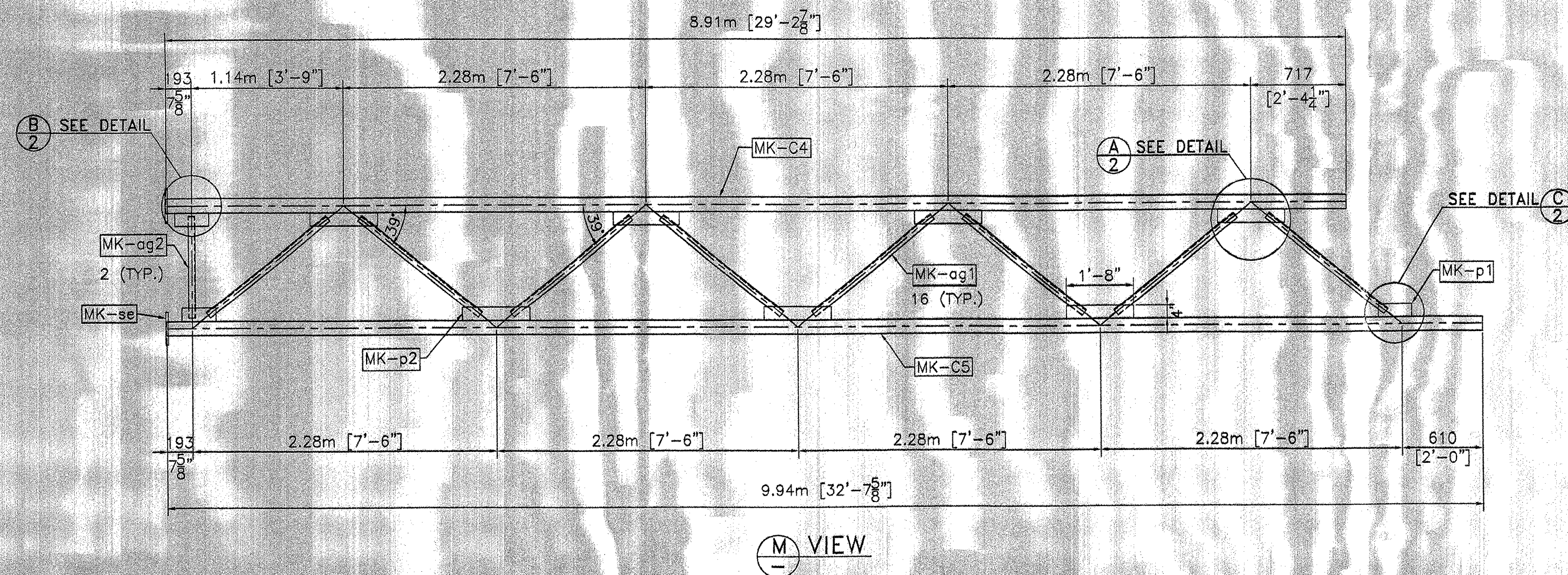
ALL DIMENSIONS SHOWN ARE IN MILLIMETERS (mm) UNLESS OTHERWISE NOTED. ENGLISH CONVERSION SHOWN IN [] FOR REFERENCE ONLY.

HIGHWAY SAFETY CORP.
GLASTONBURY, CT

TRI-CHORD SIGN STRUCTURE
STATE OF VERMONT
COUNTY OF CALEDONIA
MM 129.130 SB
PROJECT No. HES 091-3(42)
HES 093-1(10)

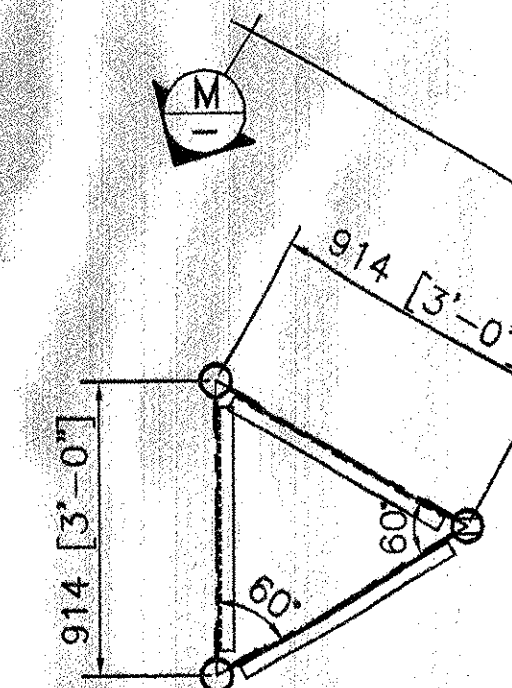
DATE: 5/23/07
SCALE: NTS
HSC REFERENCE NO.: 1587d
GENERAL CONTRACTOR: F.R. LAFAYETTE
SUB CONTRACTOR: F.R. LAFAYETTE

DRAWN: MHM
CHECKED: P. Radice
DATE: 5/23/07
SCALE: NTS
HSC REFERENCE NO.: 1587d
SIZE: D
SHEET NO.: 2 of 8



FRONT VIEW

TRUSS 2



SIDE VIEW

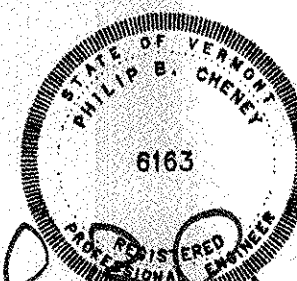
NOTE:

1. STRUCTURE DESIGNED IN ACCORDANCE WITH LATEST EDITION AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS.
2. ALL HOLES FOR HIGH STRENGTH FASTENERS SHALL BE DRILLED OR SUB-PUNCHED FULL SIZE. SLOTTED HOLES AND/OR VENT OR ACCESS HOLES MAY BE CUT WITH MECHANICALLY GUIDED PLASMA OR MECHANICALLY GUIDED FLAME TORCH.
3. GRIND SHARP CORNERS OF ALL PLATES TO A 1/8" MIN. RADIUS PRIOR TO GALVANIZING.
4. ALL WELDING SHALL BE PERFORMED BY QUALIFIED WELDERS IN ACCORDANCE WITH AWS D1.1.
5. ALL STEEL PLATES FOR STRUCTURAL COMPONENTS SHALL BE ASTM A709 GR. 50.
6. STEEL PLATES AND SHAPES FOR NON-STRUCTURAL COMPONENTS SHALL BE ASTM A709 GR. 36.
7. STEEL PIPES FOR STRUCTURAL MEMBERS SHALL HAVE MINIMUM YIELD OF 42 ksi AND SHALL CONFORM TO ONE OF THE FOLLOWING GRADES: ASTM A500 GR. B, OR API 5LX42.
8. UNLESS OTHERWISE NOTED, ALL BOLTS FOR STRUCTURAL CONNECTIONS SHALL BE M164 TYPE 1 (A325).
9. GALVANIZED U-BOLTS FOR CONNECTION OF SIGN HANGER BEAMS TO TRUSS SHALL BE ASTM F-1554 GR. 36.
10. ALL STRUCTURAL STEEL SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111 (ASTM A123).
11. ALL HARDWARE, UNLESS OTHERWISE NOTED, SHALL BE HOT-DIPPED GALVANIZED PER AASHTO M232 (ASTM A153).
12. ANCHOR HARDWARE SHALL BE STAINLESS STEEL AND MEET REQUIREMENTS OF VAOT STANDARD SPECIFICATION 714.09.
13. CONCRETE AND REBAR SHOWN IN FOOTING DESIGN TO BE FURNISHED BY OTHERS.
14. FOUNDATION DESIGN BASED ON USE OF 3000 psi MINIMUM CONCRETE.
15. SPACE BETWEEN THE TOP OF CONCRETE AND THE BOTTOM OF STEEL BASE PLATE SHALL BE FILLED WITH TYPE IV MORTAR AFTER LEVELING.
16. BOLTS INSTALLED IN STRUCTURAL CONNECTIONS SHALL BE PROVIDED AND TENSIONED PER APPLICABLE PROVISIONS OF VAOT STANDARD SPECIFICATIONS SECTION 506.

17. See Weld all connections when possible prior to galvanizing.

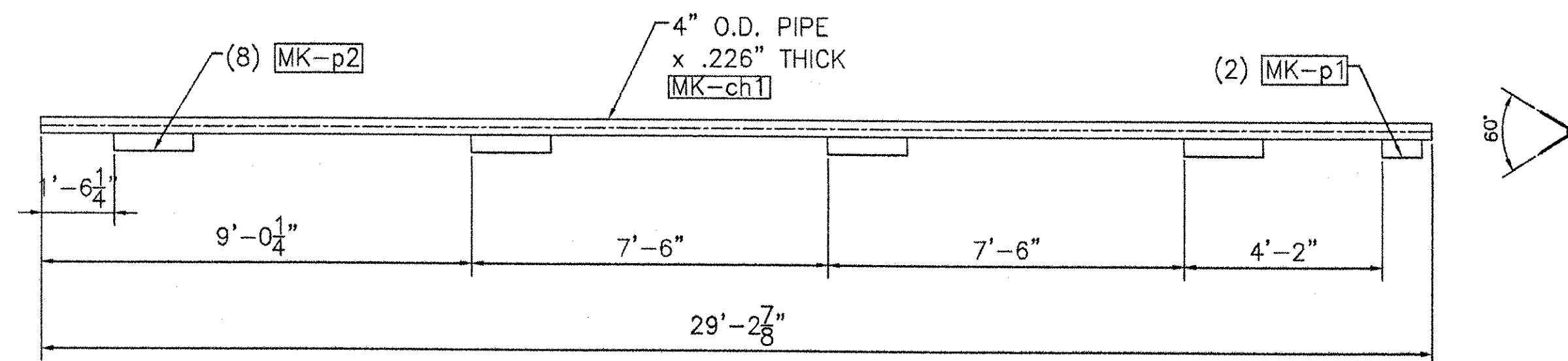
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JUL 27 2007
RESUBMIT APPROVED X [Signature]
DATE 07/31/07

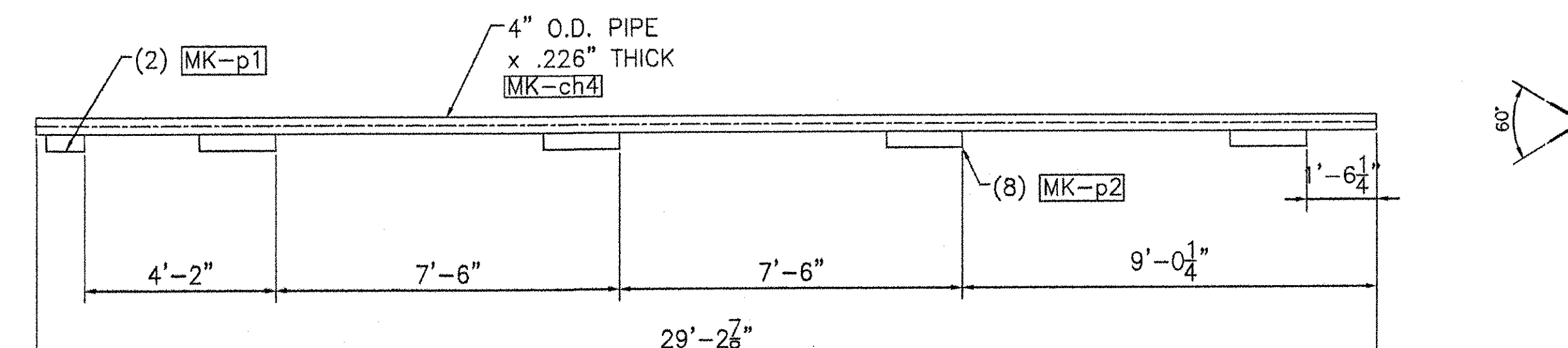


HIGHWAY SAFETY CORP. GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE STATE OF VERMONT COUNTY OF CALEDONIA MM 129.130 SB PROJECT No. HES 091-3(42) HES 093-1(10)	DRAWN: MHM CHECKED: P. Radice DATE: 5/23/07 SCALE: NTS HSC REFERENCE NO.: 1587d SIZE: D SHEET NO.: 3 of 8
GENERAL CONTRACTOR: SUB CONTRACTOR: F.R. LAFAYETTE	REVISION: 0

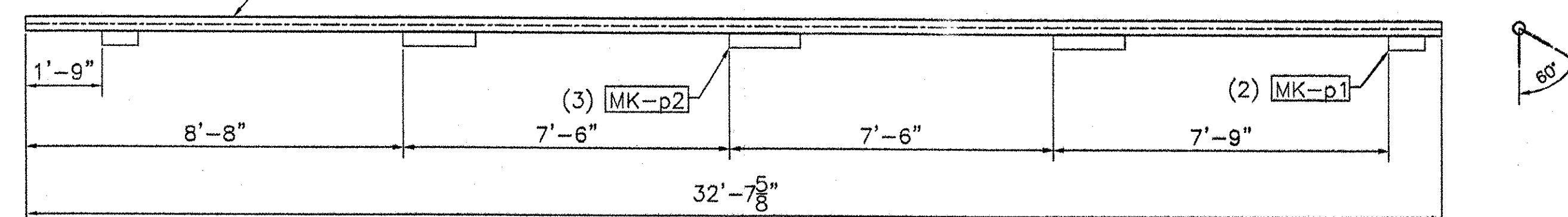
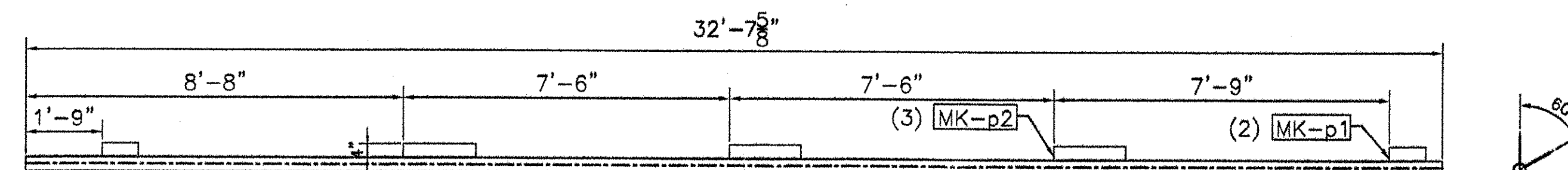
REVISIONS		
No.	Remarks	Date
0	Initial submittal	



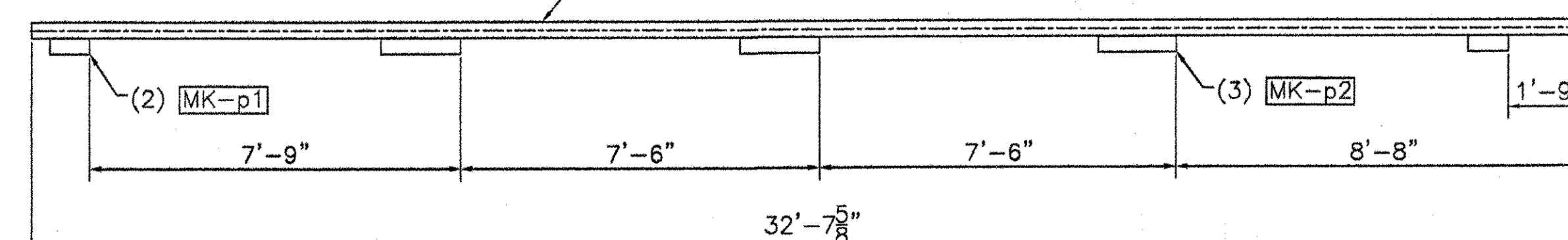
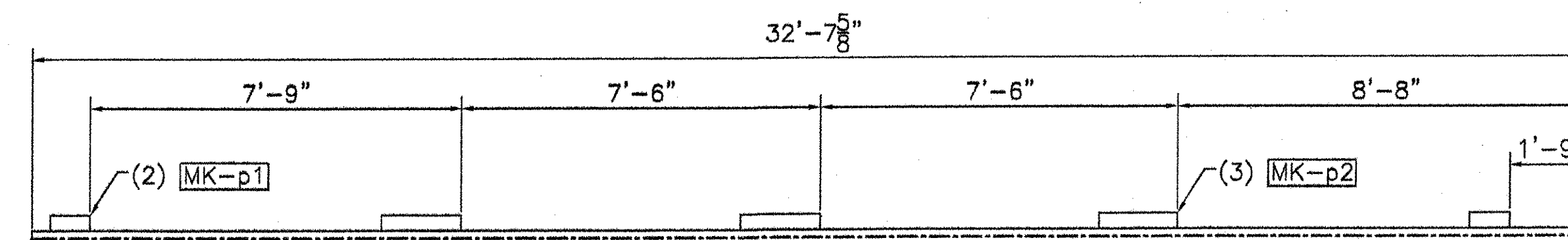
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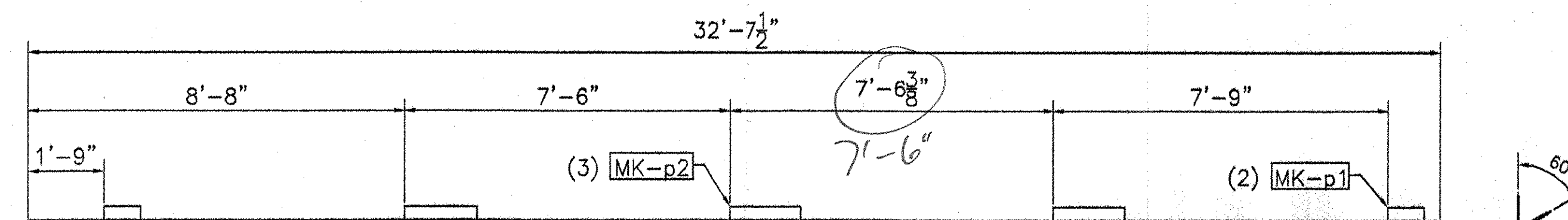
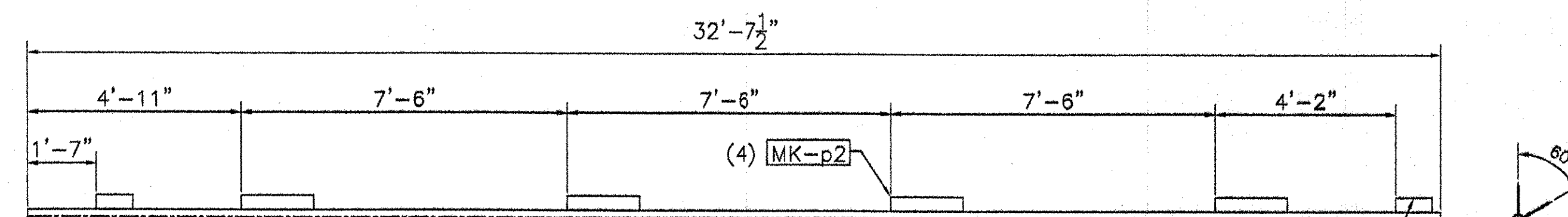
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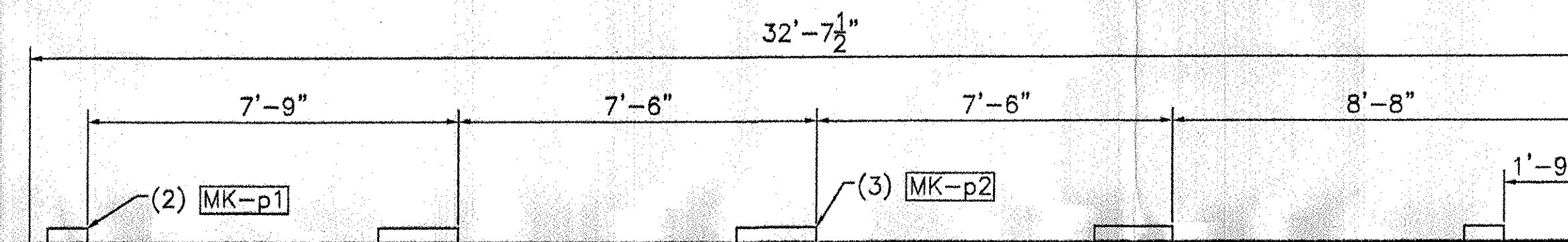
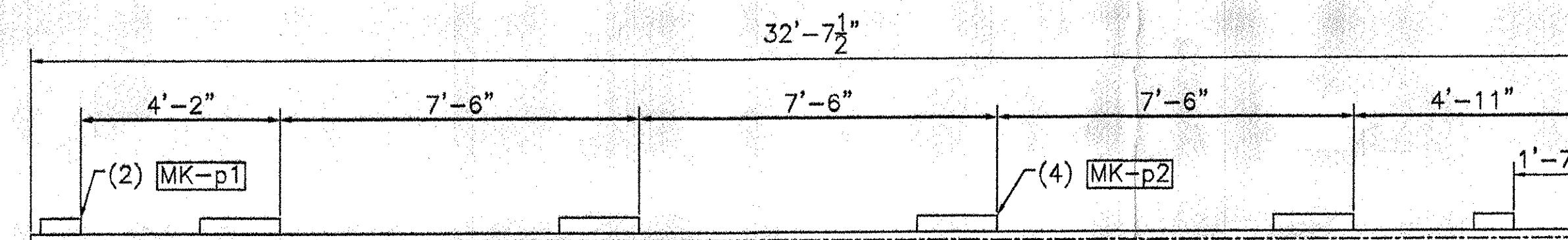
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MK-C5

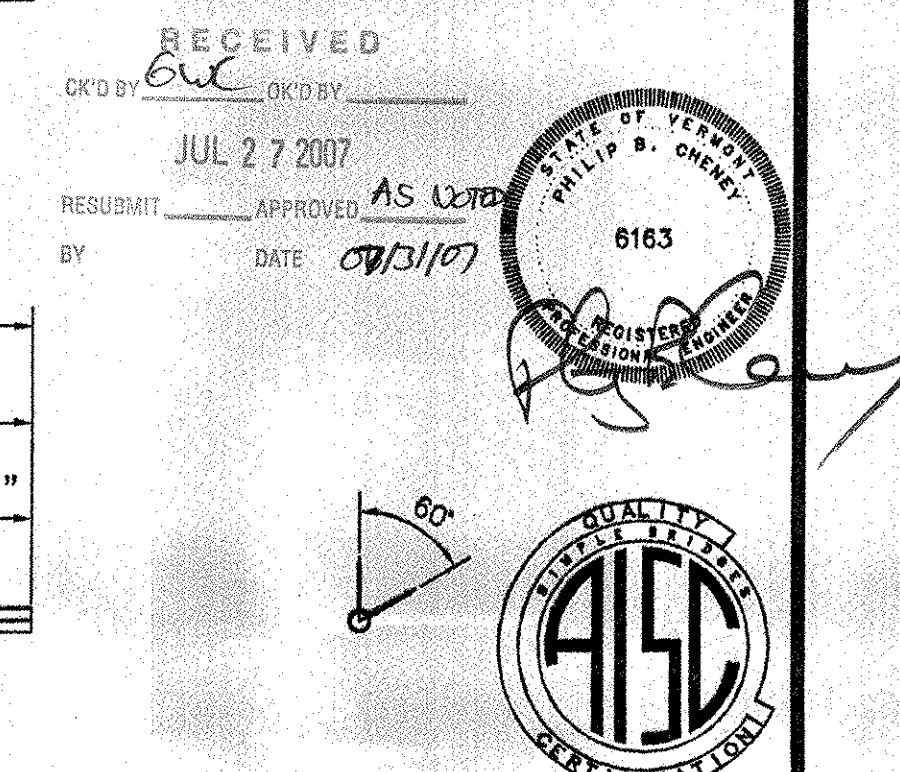


MK-C3



MK-C6

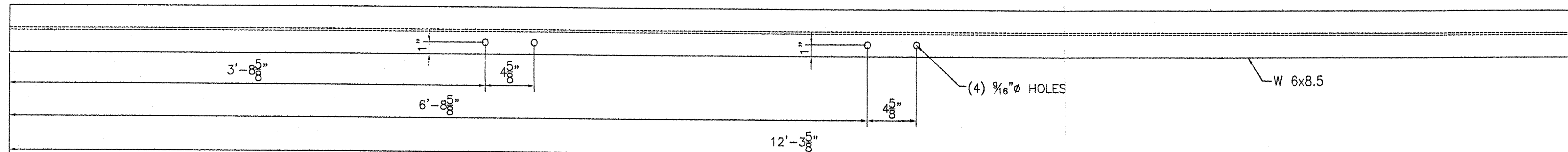
REVISIONS		
No.	Remarks	Date
0	Initial submittal	



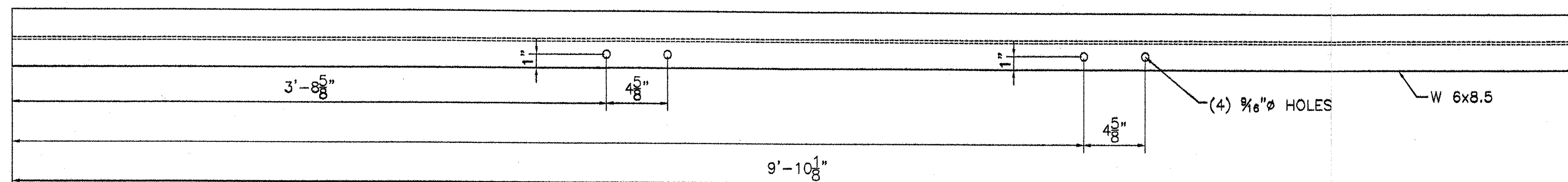
HIGHWAY SAFETY CORP.	
GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE	
STATE OF VERMONT	
COUNTY OF CALEDONIA	
MM 129.130 SB	
PROJECT No. HES 091-3(42)	
HES 093-1(10)	
GENERAL CONTRACTOR	DATE
SUB CONTRACTOR	DATE
F.R. LAFAYETTE	

DRAWN	MMH
CHECKED	P. Radice
DATE	5/23/07
SCALE	NTS
THIS REFERENCE NO.	1587d
SIZE	D
REVISION	0
SHEET NO.	5 of 8

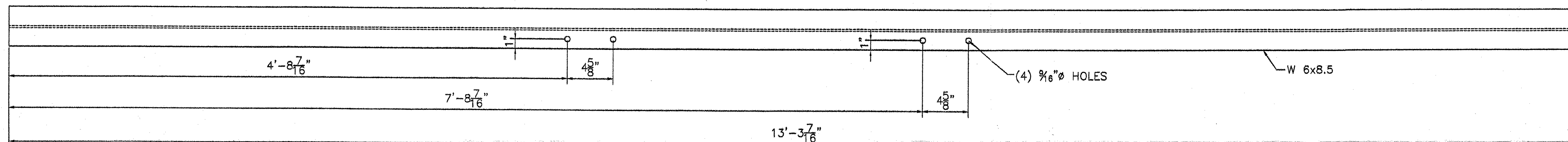
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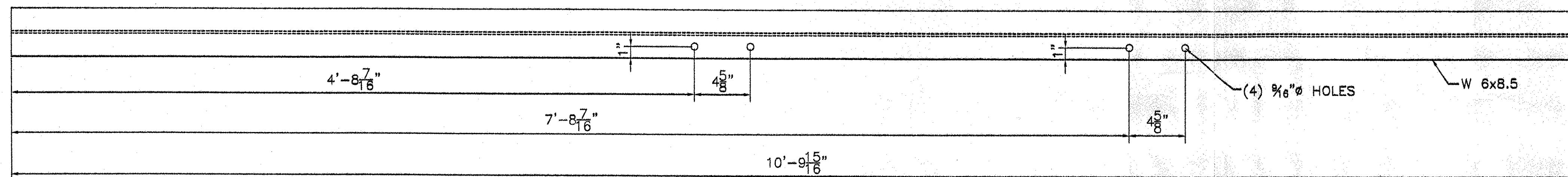
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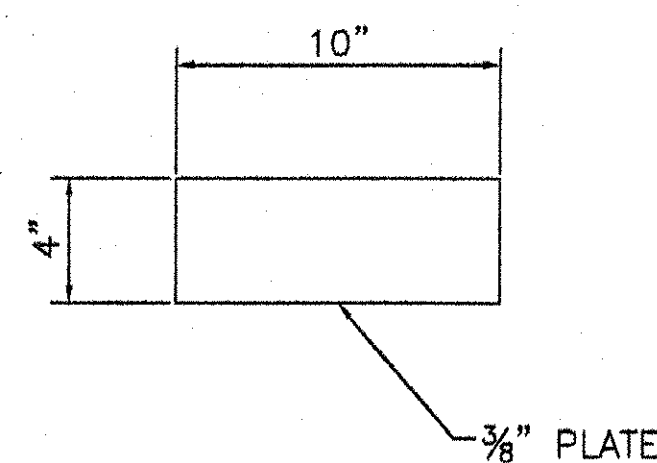
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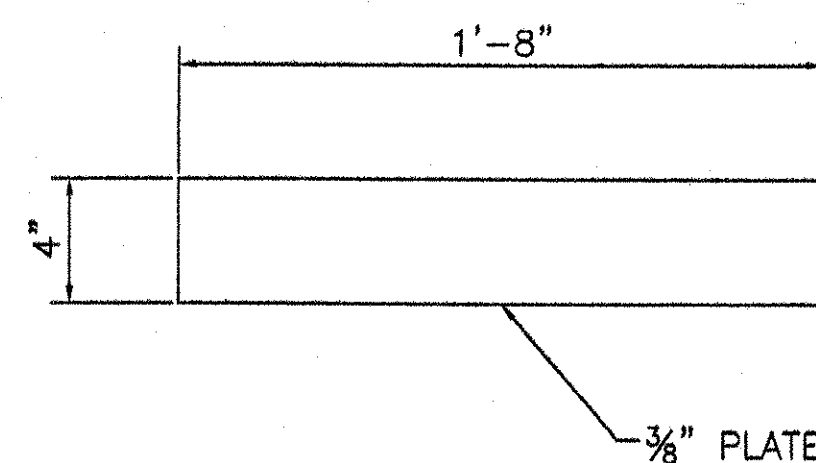
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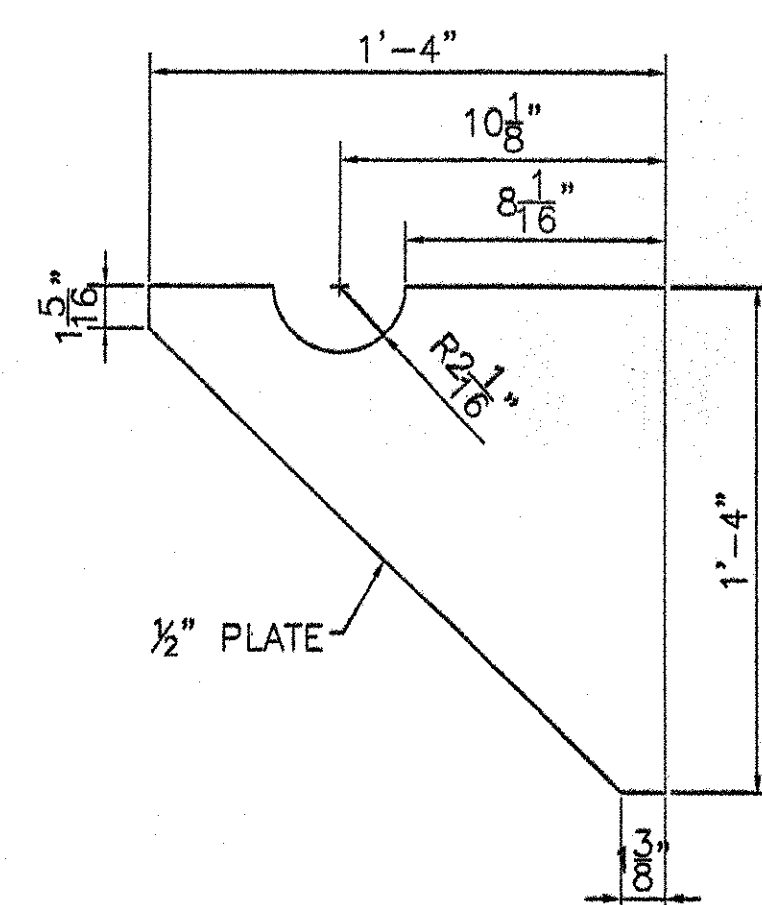
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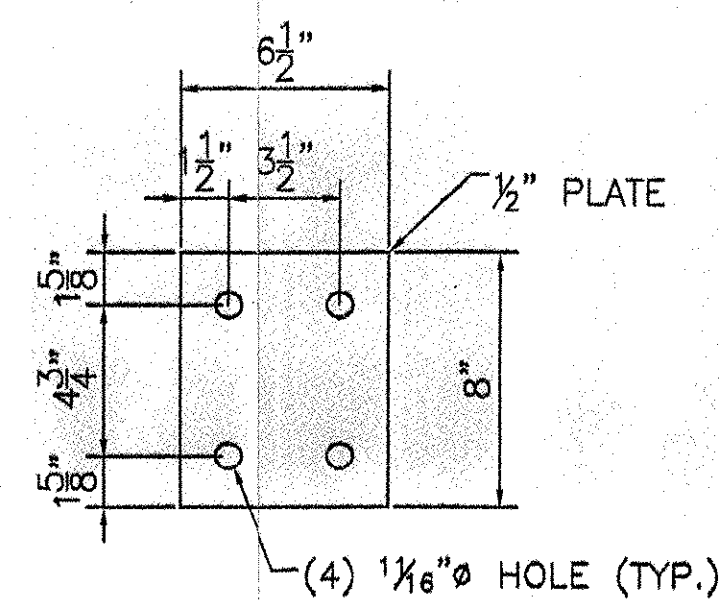
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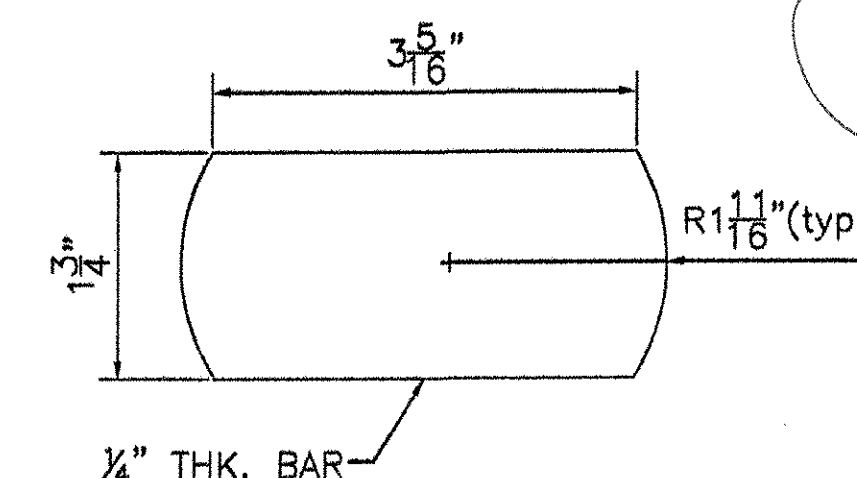
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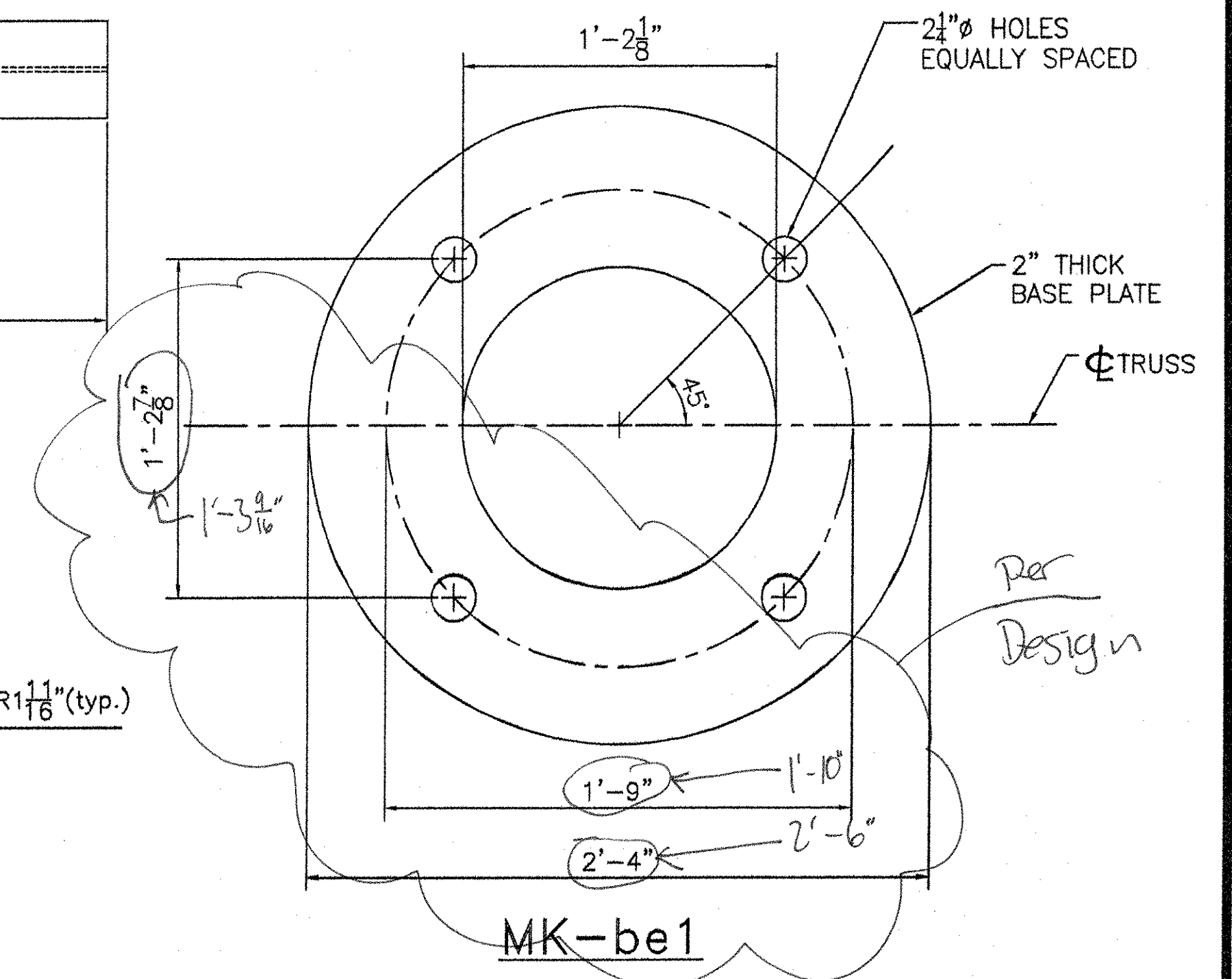
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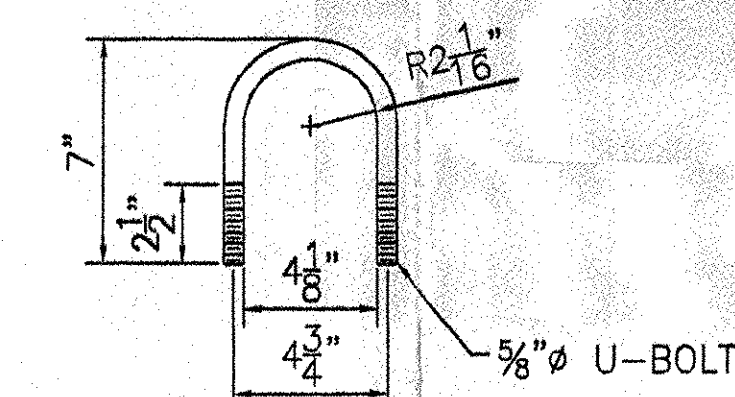
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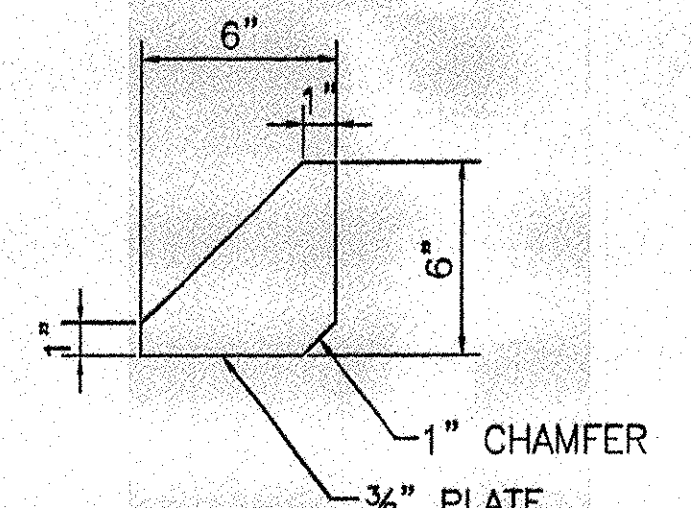
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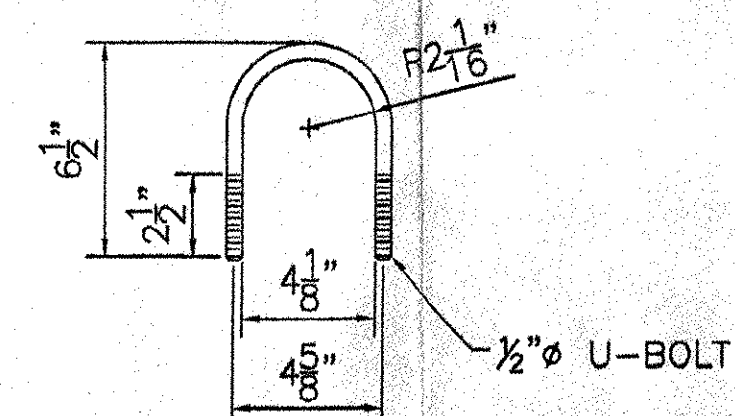
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MK-ubb

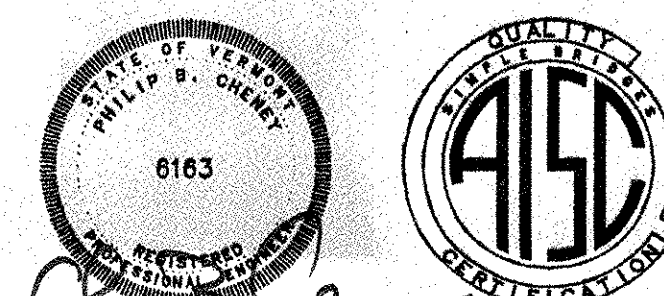


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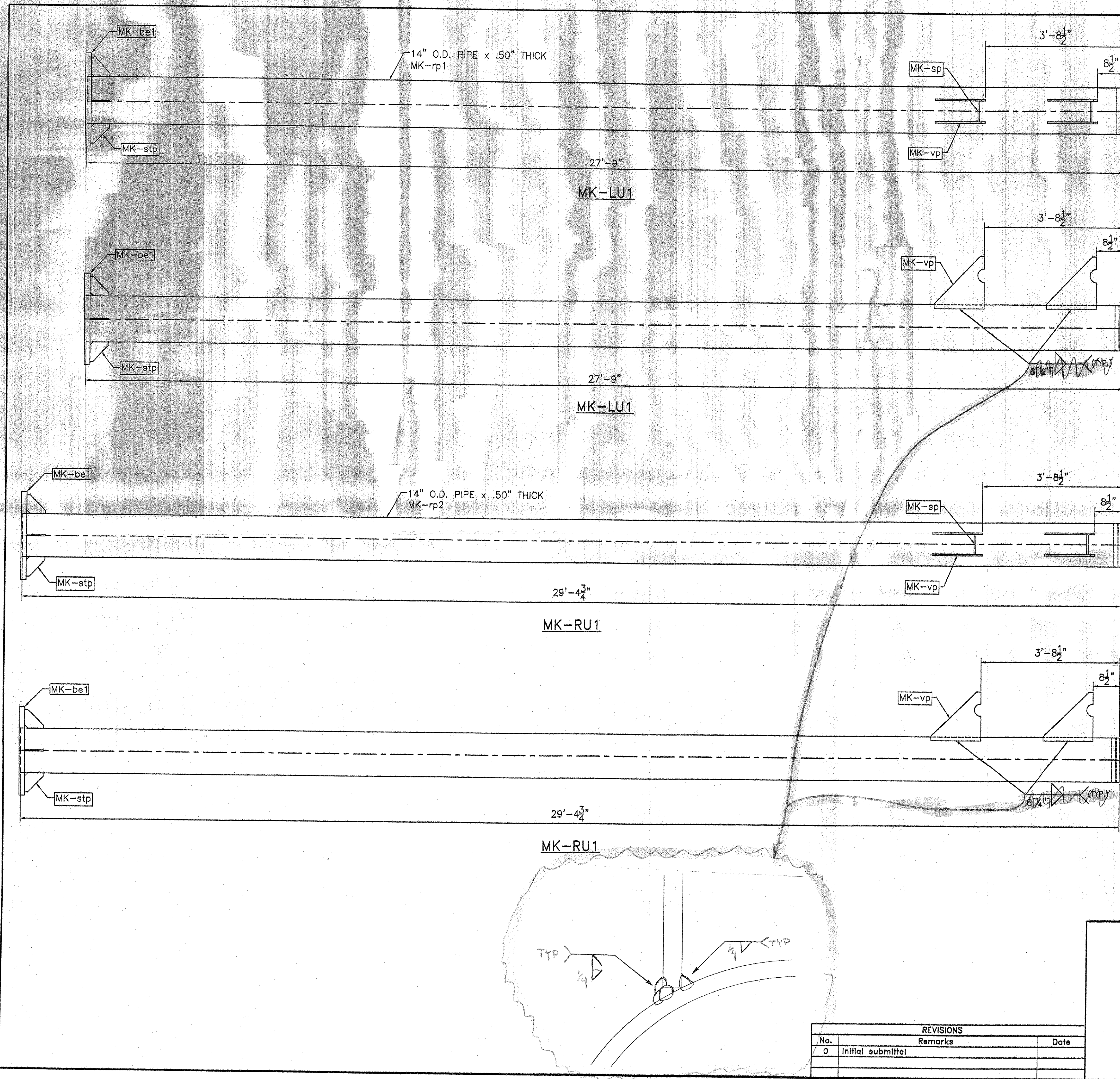
MK-su1

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RESUBMIT APPROVED AS NOTED
BY DATE 07/31/07



HIGHWAY SAFETY CORP. GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE STATE OF VERMONT COUNTY OF CALEDONIA MM 129.130 SB PROJECT No. HES 091-3(42) HES 093-1(10)	
GENERAL CONTRACTOR F.R. LAFAYETTE	DRAWN: MHM CHECKED: P. Radice DATE: 5/23/07 SCALE: NTS HSC REFERENCE NO.: 1587d SIZE: D REVISION: 0 SHEET NO.: 6 of 8

REVISIONS		
No.	Remarks	Date
0	Initial submittal	



erection mark	piece qty	item description	size/shape	length/hty per unit	material notes
TRUSS 1 ASSEMBLY					
CHORD PIPE ASSEMBLY					
ch1	1	pipe	4" O.D. x 0.226" wall	29'-2.875"	A500 gr B
p1	2	plate	PL 0.375" x 4"	10"	API 5L X42
p2	6	plate	PL 0.375" x 4"	1'-8"	A709 gr 50
ag1	16	angle	L2"x2"x25"	3'-9.50"	A36
ag2	2	angle	L2"x2"x25"	2'-5"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se	1	splice plate	0.75" x 10" O.D.		A709 gr 50
CHORD PIPE ASSEMBLY					
ch2	1	pipe	4" O.D. x 0.226" wall	32'-7.625"	A500 gr B
p1	4	plate	PL 0.375" x 4"	10"	API 5L X42
p2	6	plate	PL 0.375" x 4"	1'-8"	A709 gr 50
ag1	8	angle	L2"x2"x25"	3'-9.50"	A36
ag2	2	angle	L2"x2"x25"	2'-5"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se	1	splice plate	0.75" x 10" O.D.		A709 gr 50
CHORD PIPE ASSEMBLY					
ch3	1	pipe	4" O.D. x 0.226" wall	32'-7.50"	A500 gr B
p1	4	plate	PL 0.375" x 4"	10"	API 5L X42
p2	6	plate	PL 0.375" x 4"	1'-8"	A709 gr 50
ag1	8	angle	L2"x2"x25"	3'-9.50"	A36
ag2	2	angle	L2"x2"x25"	2'-5"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se	1	splice plate	0.75" x 10" O.D.		A709 gr 50
TRUSS 2 ASSEMBLY					
CHORD PIPE ASSEMBLY					
ch4	1	pipe	4" O.D. x 0.226" wall	29'-2.875"	A500 gr B
p1	2	plate	PL 0.375" x 4"	10"	API 5L X42
p2	6	plate	PL 0.375" x 4"	1'-8"	A709 gr 50
ag1	16	angle	L2"x2"x25"	3'-9.50"	A36
ag2	2	angle	L2"x2"x25"	2'-5"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se	1	splice plate	0.75" x 10" O.D.		A709 gr 50
CHORD PIPE ASSEMBLY					
ch5	1	pipe	4" O.D. x 0.226" wall	32'-7.625"	A500 gr B
p1	4	plate	PL 0.375" x 4"	10"	API 5L X42
p2	6	plate	PL 0.375" x 4"	1'-8"	A709 gr 50
ag1	8	angle	L2"x2"x25"	3'-9.50"	A36
ag2	2	angle	L2"x2"x25"	2'-5"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se	1	splice plate	0.75" x 10" O.D.		A709 gr 50
CHORD PIPE ASSEMBLY					
ch6	1	pipe	4" O.D. x 0.226" wall	32'-7.50"	A500 gr B
p1	4	plate	PL 0.375" x 4"	10"	API 5L X42
p2	6	plate	PL 0.375" x 4"	1'-8"	A709 gr 50
ag1	8	angle	L2"x2"x25"	3'-9.50"	A36
ag2	2	angle	L2"x2"x25"	2'-5"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se	1	splice plate	0.75" x 10" O.D.		A709 gr 50
VERTICAL PIPE ASSEMBLY					
LEFT PIPE ASSEMBLY					
sp	1	pipe	14" O.D. x 0.50" wall	27'-8"	A500 gr B
vp	4	plate	PL 0.5" x 8.5"	8"	API 5L X42
cp	1	plate	PL 0.5" x 1'-4"	1'-4"	A709 gr 50
cr	1	plate	0.25" x 1'-2.5" O.D.		A36
ar	1	angle	L 1.5"x1.5"x25"	1'-1"	A36
gt	1	gasket	1.25"x1'-2.5" O.D.		50 duro. Neoprene
nt	1	hex nut	.50" dia.		A503
tr	1	hex bolt	.50" dia.	1.5"	A325
w	1	washer	.50" dia.		F844
rw	1	rubber washer	.50" dia.		50 duro. Neoprene
sp	4	plate	PL 0.375" x 6"	8"	A709 gr 50
bp	1	base plate	2" x 2'-4" O.D. 7'-6" O.D.		A709 gr 50
RIGHT PIPE ASSEMBLY					
sp	1	pipe	14" O.D. x 0.50" wall	29'-4.75"	A500 gr B
vp	4	plate	PL 0.5" x 8.5"	8"	API 5L X42
cp	1	plate	PL 0.5" x 1'-4"	1'-4"	A709 gr 50
cr	1	plate	0.25" x 1'-2.5" O.D.		A36
ar	1	angle	L 1.5"x1.5"x25"	1'-1"	A36
gt	1	gasket	1.25"x1'-2.5" O.D.		50 duro. Neoprene
nt	1	hex nut	.50" dia.		A503
tr	1	hex bolt	.50" dia.	1.5"	A325
w	1	washer	.50" dia.		F844
rw	1	rubber washer	.50" dia.		50 duro. Neoprene
sp	4	plate	PL 0.375" x 6"	8"	A709 gr 50
bp	1	base plate	2" x 2'-4" O.D. 7'-6" O.D.		A709 gr 50
LOOSE ITEMS					
sv1	2	sign hanger	Wx8x5	12'-3.625"	A36
sv2	2	sign hanger	Wx8x5	9'-10.125"	A36
sv3	2	sign hanger	Wx8x5	13'-3.437"	A36
sv4	2	sign hanger	Wx8x5	16'-9.937"	A36
sb	8	set screw	0.625" dia.		F1554 Gr. 35
bn	16	lock nut	0.625" dia.		A503 DH
bw	16	washer	0.625" dia.		F435
su1	16	u-bolts	0.50" dia.	6.5"	F1554 Gr. 35
sk1	32	lock nut	0.50" dia.		A503 DH
sw1	32	washer	0.50" dia.		F435
sb1	16	hex bolt	0.75" dia.	3"	A325
sb2	16	washer	0.75" dia.		F543
sb3	16	hex nut	0.75" dia.		A503 DH
ab1	8	anchor bolt	2" dia.	3'-7"	S/S A276 T304
rs1	16	hex nut	2" dia.		S/S A194B T304
lk1	8	lock washer	2" dia.		S/S TY 304
w1	8	flat washer	2" dia.		S/S TY 304

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 JUL 2 7 2007
 RESUBMIT APPROVED AS NOTED
 BY DATE 07/3/07

STATE OF VERMONT
 PHILIP B. CHENEY
 6163

QUALITY ASSURED
 415C
 CERTIFICATION

HIGHWAY SAFETY CORP.
 GLASTONBURY, CT

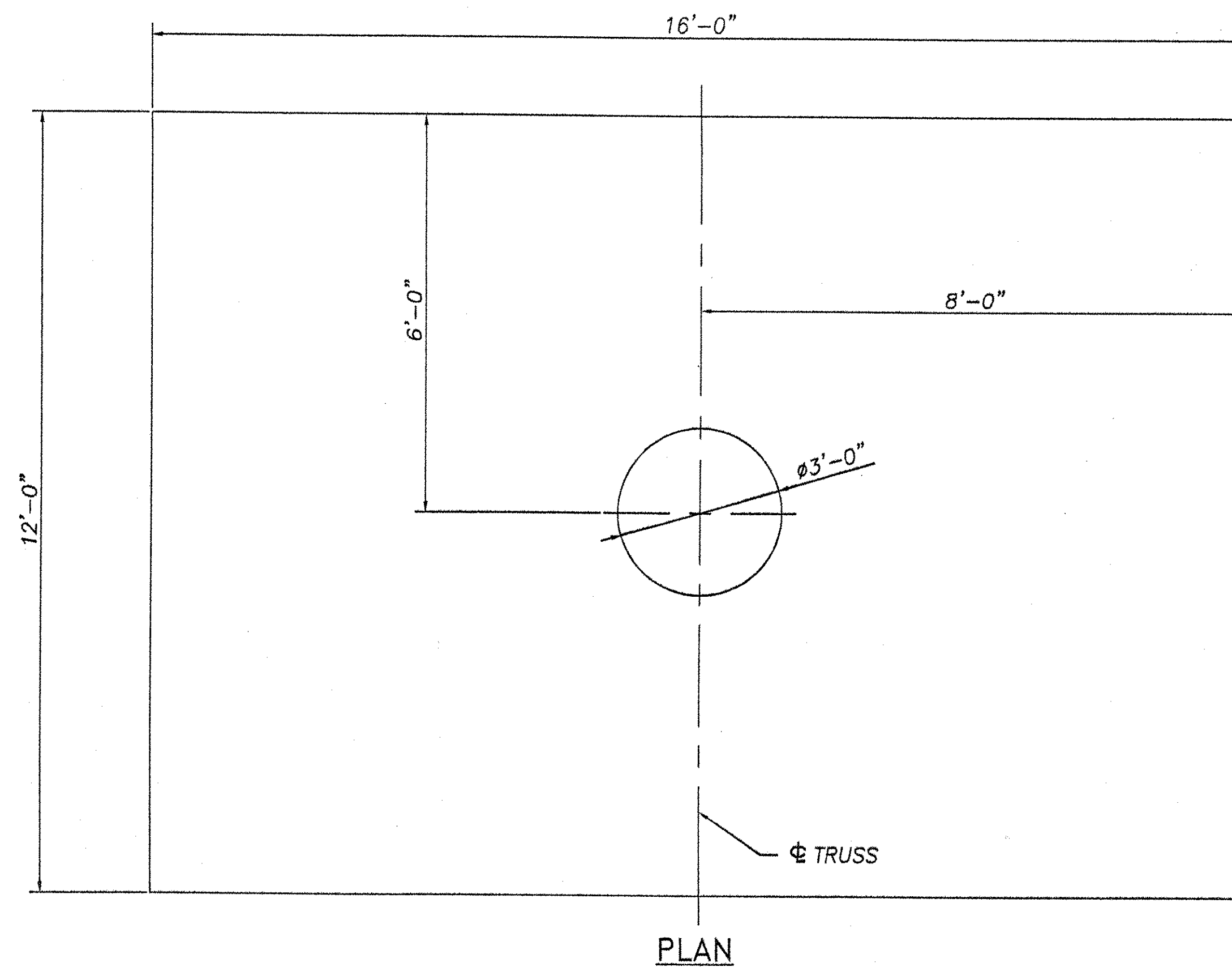
TRI-CHORD SIGN STRUCTURE
 STATE OF VERMONT
 COUNTY OF CALEDONIA
 MM 129.130 SB
 PROJECT No. HES 091-3(42)
 HES 093-1(10)

GENERAL CONTRACTOR
 SUB CONTRACTOR F.R. LAFAYETTE

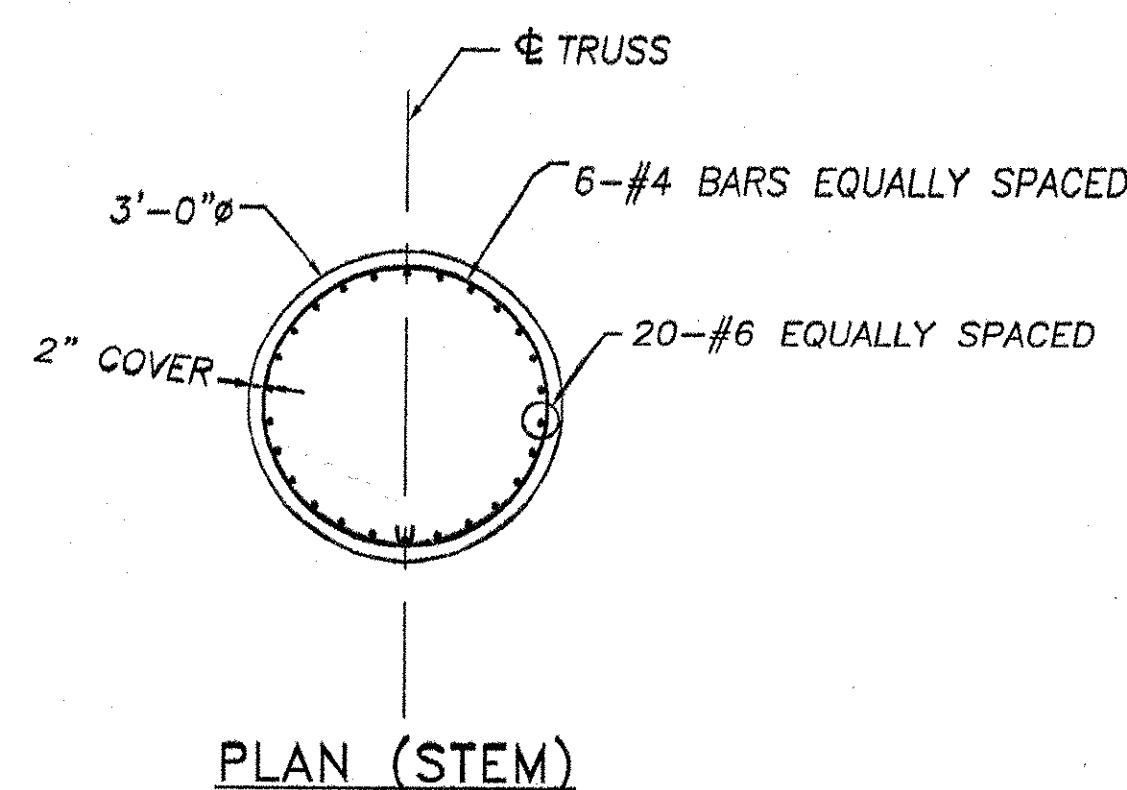
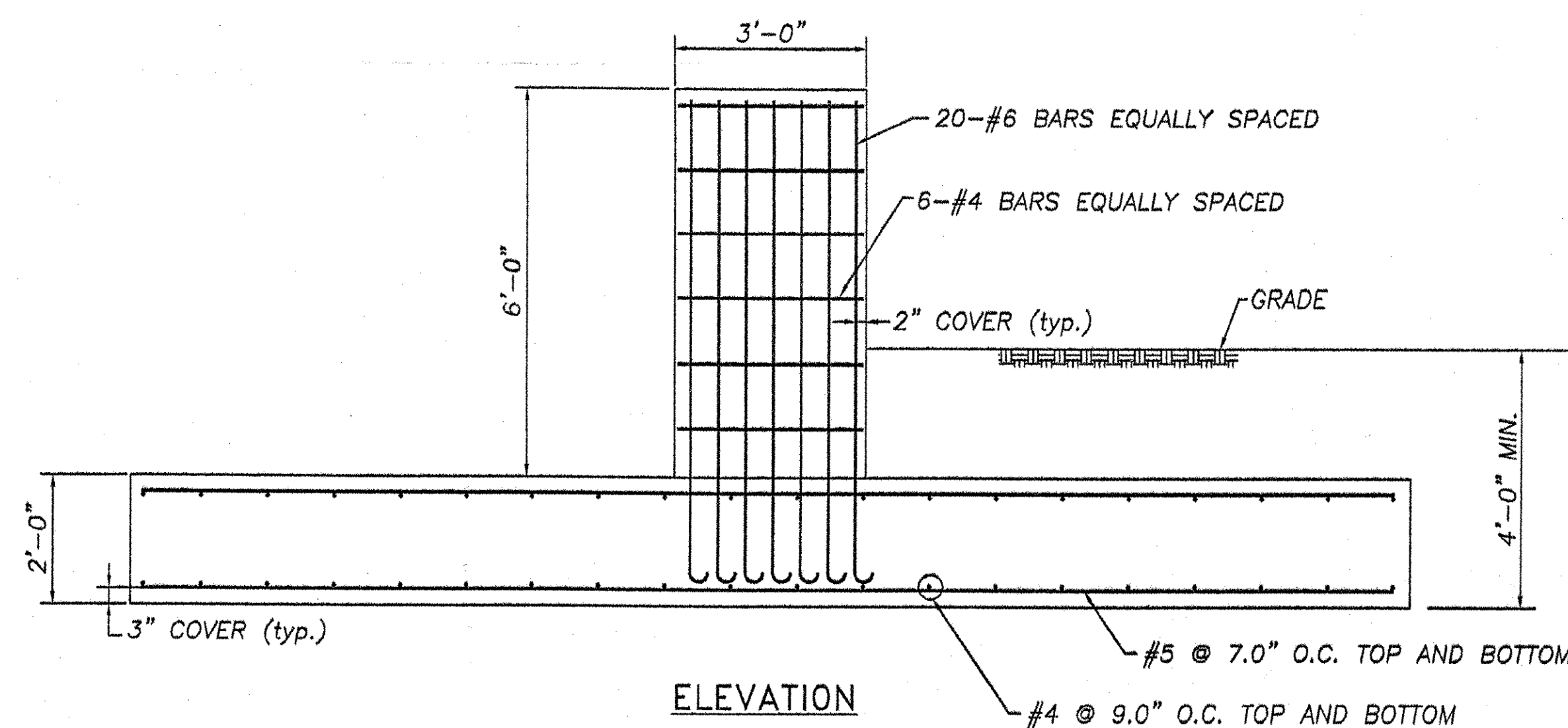
DRAWN: MMH
 CHECKED: P. Radice
 DATE: 5/23/07
 SCALE: N.T.S.
 HSC REFERENCE NO.: 1587d
 SIZE: D
 REVISION: 0
 SHEET NO.: 7 of 8

REVISIONS		
No.	Remarks	Date
0	Initial submittal	

168-6190-8

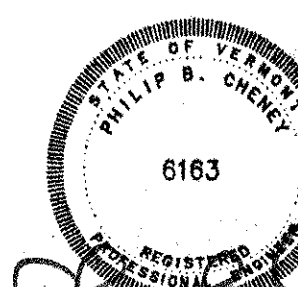


REBAR LIST		
REBAR	PCS. REQD.	LENGTH
#4	12	9'-4"
#4	88	13'-6"
#5	84	19'-6"
#6 (HOOK ONE END)	40	8'-6"



REVISIONS		
No.	Remarks	Date
0	Initial submittal	

RECEIVED
 CK'D BY *OK'D BY*
 JUL 27 2007
 RESUBMIT APPROVED *X*
 BY DATE 07/31/07



HIGHWAY SAFETY CORP. GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE STATE OF VERMONT COUNTY OF CALEDONIA MM 129.130 SB PROJECT No. HES 091-3(42) HES 093-1(10)	
DRAWN CHECKED <i>P. Radice</i> DATE SCALE HSC REFERENCE NO. 1587d	MMH 5/23/07 N.T.S. 1587d
GENERAL CONTRACTOR SUB CONTRACTOR F.R. LAFEYETTE	SIZE D REVISION 0 SHEET NO. 8 of 8

169-Sign-2

DESIGN CALCULATIONS

OVERHEAD SIGN STRUCTURE
INTERSTATE ROUTE 91
STATION 10.050 NB

PROJECT No. HES 091-3(42)
HES 093-1(10)

VERMONT AGENCY OF TRANSPORTATION



Philip B. Cheney 7-23-07
P. BRADFORD CHENEY DATE
PRESIDENT

SUBMITTED BY:

CME ASSOCIATES, INC.
333 EAST RIVER DRIVE, SUITE 400
EAST HARTFORD, CT 06108

JULY 20, 2007

SUBMITTED TO:

HIGHWAY SAFETY CORPORATION
239 COMMERCE STREET
P.O. BOX 358
GLASTONBURY, CT 06033-0358

Highway Safety Corporation

239 Commerce Street

Glastonbury, CT 06033-0358

Project: Highway Safety

By: APB

Checked: JAR

Date: 7/20/2007

Sheet No. of

Overhead Truss Sign Support Program

Tri-Chord Truss

Single Post Support

State: Vermont

Project:

Sign Location: MM 10.050 NB

Overall Dimensions (all in feet)

Span	Left Post Height	Rt. Post Height	Truss Section Lengths			Number of Truss Pieces	Wind Speed (mph)	Sign Weight (psf)	Ice Load?
L	H1	H2	Section 1 (feet)	Section 2 (feet)	Section 3 (feet)				(yes/no)
58.07	22.2	23.19	29.04	29.04	0.00	2	90	3.65	yes

Miscellaneous Data

Sign Dimensions (all in feet)

Sign 1			Sign 2			Sign 3		
Length L1	Width W1	Location D1	Length L2	Width W2	Location D2	Length L3	Width W3	Location D3
38.39	10.63	25.10	0.00	0.00	0.00	0.00	0.00	0.00

Overhead Truss Chords

Height of Truss D1 (ft)	Width of Truss W1 (ft)	1st Truss Section		2nd Truss Section		3rd Truss Section		Chord Yield Str. (ksi)	Number of Chords 1, 3 or 4
		Outside Dia. (inches)	Wall Thick. (inches)	Outside Dia. (inches)	Wall Thick. (inches)	Outside Dia. (inches)	Wall Thick. (inches)		
3.00	3.00	4.000	0.226	4.00	0.23	4.000	0.226	42.0	3

4.0000.226<-- Values Used in computations

Overhead Truss Diagonals

Equal Leg Angles		Round Pipe		Diagonal	Vertical	Horizontal	Drilled	Circular
Leg Size (inches)	Thickness (inches)	Outside Dia. (inches)	Thickness (inches)	diag. angle (deg)	diag. angle (deg)	diag. angle (deg)	Shafts for foundation ?	Footing Stem? (yes/no)
2.00	0.250	0.00	0.000	36.0	36	36	no	yes

No. of Posts per end 1 or 2

Left Post Verticals

Spacing Sp (Feet)	Outside Dia. (inches)	Wall Thick. (inches)
0.00	14.000	0.500

Post Yield Str. (ksi)

42.0

Vertical diag. angle (deg)

45

Right Post Verticals

Spacing Sp (Feet)	Outside Dia. (inches)	Wall Thick. (inches)
0.000	14.000	0.500

Post Yield Str. (ksi)

42.000

Post Diagonals

Equal Leg Angles		Round Pipe		Diagonal
Leg Size (inches)	Thickness (inches)	Outside Dia. (inches)	Thickness (inches)	Yield Str. (ksi)
0.00	0.000	3.00	0.125	36.0
0.00	0.000	0.00	0.000	0.00

<-- Values Used in Computations

Results

Truss

D/C or CSR		OK / NG ?
Section 1 Chords	0.96	OK
Section 2 Chords	0.00	OK
Section 3 Chords	NA	N/A
Truss Diagonals	0.60	OK

Posts

Left Post	0.79	OK
Right Post	0.68	OK
Left Post Diagonals	N/A	N/A
Right Post Diagonals	N/A	N/A

Truss Deflections in Inches

Defl. Under DL + Ice	0.66	
Allowable (L/150)	4.65	OK
Camber	1.10	

Deflection OK

7/20/2007

1

Input

176-sign-c

Truss Chord Splice Connection Input					Analysis Results						
Conn. Plate Thickness inches	Conn. Plate Yield Str., ksi	A325 Bolt Diameter inches	Number of Bolts		Socket Weld Design		Connection Bolts		Conn. Pl.		
					Bolt Circle Dia. inches	Conn. Plate Dia. inches	Weld Size inches	Total Weld Length (in.)	Bolt Spacing inches	Bolt D/C inches	Bending ksi
0.750	50.00	0.750	6		7.00	10.00	0.228	25.13	3.665	0.89	1.45
Input this area for monoflutes also									2.26	1.0	37.50
									OK	OK	OK
									OK	OK	Result

Post Diagonal Connection Input (for 1/2 connection)						Analysis Results			Post Weld Connection		
Conn. Plate Thickness	Conn. Plate 1/2 Length	Conn. Plate 1/2 Length	Conn. Plate 1/2 Length	AS25 Bolt Diameter	Number of Bolts per gage	Diagonal Bolt Stress	Diagonal Weld Length	Weld Size	Total Weld Length (in)	Weld Load	Capacity
0.500	12.000	12.000	12.000	0.875	0	N/A	0.00	0.250	0.000	0.000	Actual
N/A SINGLE POST WELDED CONNECTION						N/A	30.00	0.000		6.72	Capacity
Note: Enter zero for welded connection						N/A	OK	OK		OK	Result

Truss Support Connection (For Tri-Chord)				Analysis Results			
Dist. from edge of post to CL of chord	Depth of Plate	Full Width of Plate		World Stress (ksi)			
(inches)	(inches)	(inches)					
9.000	16.000	16.00					
inches							
			Actual Capacity Result				
				OK			
					1.375	6	1.155
					1.500	6	1.405
					1.750	5	1.899
					2.000	4.5	2.498
					2.250	4.5	3.264
					2.500	4	4.399
					2.750	4	4.934

-N/A FOR Tri-Chord		OK	Result	4.250	4	12.607	14.196
General Information				4.500	4	14.229	15.904
Post Dimensions		Chord Dimensions		4.750	4	15.950	17.721
Post Dia.	Thickness	Diameter	Thickness	5.000	4	17.769	19.635
14.00	0.50	4.00	0.226				

Baseplate Design - Double End Post Design														
Anchor Bolt Analysis (4 bolt pattern, round baseplate)										Not Applicable, see single post design below				
Bolt Circle Dia. = 22.00 inches										Anchor Bolt Properties				
A bolts = 12.091 ksi inches										Net Tensile Stress Area = A _t =		3.248	ksi inches	
I bolts = 889.01 in ⁴										Gross Area = A _g =		3.976	ksi inches	
S bolts = 24.70 in ³														
Base Plate Dia. = 22.00 inches														
Allow Tensile Stress = F _t = 27.50 ksi														
Allow Shear Stress = F _v = 16.50 ksi														
										Baseplate Weld Information				

Truss Diagonal Splices	
Bolted Splice Design	
Maximum Axial Force in Diagonal =	8.11 kips
Bolt Dia. =	0.000 inches
Bolt Area =	RN/A inches
Number of Bolts =	0
Allowable Shear stress =	15 ksi (AASHTO Table 10.32.3C) Galvanized surface
Allowable Load on Connection =	RN/A kips (single shear)
Welded Splice Design	
Maximum Axial Force in Diagonal =	8.11 kips
Capacity of 1/4" weld =	6.72 kips per inch (double weld)
Required Length of Weld =	1.207 inches (based on 2 welds)
Minimum for angles =	6.0 inches (based on 2 welds 3" long)
Minimum for plates =	12.0 inches (based on 4 welds 3" long)
Minimum Weld Length =	6.0 inches
Connection Plate Design	
Total Force in 1/2 Plate =	8.11 kips
Stress in plate =	2.16 ksi
Allowable stress =	30.00 ksi
Connection Plate Weld	
Force per inch of weld =	0.91 kips per inch
Capacity of 1/4" weld =	6.72 kips per inch (double weld)

Post Diagonal Connections	
Bolted Splice Design	
NA - Single Post Design	
Diagonal =	0.00 kips
Maximum Axial Force =	0.00 kips
Bolt Dia. =	0.875 inches
Bolt Area =	0.611 inches
Number of Bolts =	0
Allowable Shear stress =	15 ksi (AASHTO Table 10.32.3C) Galvanized surface
Allowable Load on Connection =	0.0 kips (single shear)
Welded Splice Design	
Maximum Axial Force in Diagonal =	0.00 kips
Capacity of 1/4" weld =	6.72 kips per inch (double weld)
Required Length of Weld =	0.000 inches (based on 2 welds)
Minimum for angles =	6.0 inches (based on 2 welds 3" long)
Minimum for plates =	12.0 inches (based on 4 welds 3" long)
Minimum Weld Length =	12.0 inches
Connection Plate Design	
Total Force in 1/2 Plate =	0.00 kips
Stress in plate =	0.00 ksi
Allowable stress =	30.00 ksi
Connection Plate Weld	
Force per inch of weld =	0.00 kips per inch
Capacity of 1/4" weld =	6.72 kips per inch (double weld)

Truss Support Connection (use W6x8.5)	
NA - See Connection Below	
Maximum Reaction =	4.03 kips (half reaction)
Capacity of 1st weld =	3.36 kips per inch (single weld)
Length of Weld Required =	0.600 inches (based on double weld)
Length of Weld Provided =	19.00 inches
Shear Capacity of W6x8.5 =	11.87 kips

Truss Support Connection (Single or Double pole) - Tri - Chord Only			
Maximum Reaction (Vert) =	4.03	kips (max of left or right conn.)	Number of Chords = 3
Maximum Weld Load (Weld) =	5.22	kips (max of left or right conn.)	Plates (per end) = 1
Reaction per chord connection (Vert) =	2.02	kips	# of Connections = 2
Reaction per chord connection (Weld) =	2.61	kips	Weld Size = 0.19 in
Area of Weld =	8.48	in ²	
Weld =	22.62	in ²	
W =	0.24	ksi	
W =	1.72	ksi	
R =	0.31	ksi	
(W ² +R ²)/2 =	2.06	ksi	
Allowable stress of weld =	15	ksi	

Monotube Support Connection (Single Vertical Pole)	
NA - See Connection Above	
Max Shear =	2.50 kips
Monotube Dia. =	44.00 in
U-bolt Leg Dia. =	0.75 in
Area of U-bolt Leg =	0.354 in ²
Tension in U-bolt Leg =	0.56 kips
Stress in U-bolt =	1.63 ksi
Allowable U-bolt stress =	15 ksi
Stress Check	OK
Eq. S-21	

180- sign - c

[illegible]

181 Sign-e

Circular Stem Design - For Use in Spread Footings with Circular Stem

F'c =	3.00	ksi	
Fy =	60	ksi	
Cc =	2.00	in	Clear cover is uniform around the cross section
h =	36.00	in	
Bar Size =	5	As =	0.31 in^2
		Dia =	0.625 in
Hoop Bar		As =	0.2 in^2
size =	4	Dia =	0.5 in
Spacing =	3.75	in	Approximate desired spacing of main reinforcing (assumes as max)
Φ=	1		

Determine if section is adequate for loads applied

Mu =	149.57	ft-kips	Mu = Resultant moment = sqrt(Mstrong^2+Mweak^2)
Pu =	4.93	kips	IS SECTION OK? YES

Calculate location of steel reinforcing around perimeter of column:

Dia. of inner ring of reinf =	30.375 in		
perimeter=	95.43 in		
# of bars =	26	number of (even) bars that will fit in perimeter	Program allows 42 bars maximum OK
Number of bar rows =	13		
spacing =	2.53	(in) actual vertical spacing of bars	

Note: Program orients bars so that one layer is on the centroid of column (conservative)

Calculate location of bars with respect to the extreme compression fiber:

Is rebar		Is steel used for		# bars in	Area of Steel Calculation	
Rebar level	level in		Tension or Comp.?	each level	As tension	As comp
d1	2.81 in	Comp	2			0.62
d2	5.34 in	Comp	2			0.62
d3	7.88 in	Comp	2			0.62
d4	10.41 in	Comp	2			0.62
d5	12.94 in	Comp	2			0.62
d6	15.47 in	Comp	2			0.62
d7	18.00 in	Steel Not Used	2			
d8	20.53 in	Tension	2		0.62	
d9	23.06 in	Tension	2		0.62	
d10	25.59 in	Tension	2		0.62	
d11	28.13 in	Tension	2		0.62	
d12	30.66 in	Tension	2		0.62	
d13	33.19 in	Tension	2		0.62	
d14	NA					
d15	NA					
d16	NA					
d17	NA					
As tens =					3.72 As comp=	3.72

Centroid of Tension and Compression Steel from extreme compression fiber:

d(tension) =	26.86 in
d(comp) =	9.14 in

Find axial and moment capacity at balanced strain condition:	Stand. Spec. 8.16.4.2.3
$\Phi P_b = \Phi[0.85f'_c b a' + A_s f_s' s + A_s f_s' s]$ $\Phi M_b = \Phi[0.85f'_c b a' (d - d'/2) + A_s f_s' s (d - d'/2) + A_s f_s' s d]$ $d = 26.86$ (in) dist from extreme compression fiber to centroid of tension steel $d' = 9.14$ (in) dist from extreme compression fiber to centroid of comp. steel $a' = 8.86$ (in) dist from centroid of gross section to centroid of tension steel $a_b = 14.31$ (in) $\beta_1 = 0.9$ $f'_s = 36.97$ ksi $b = 35.23$ (in) $A_s = 3.72$ in ² $\Phi P_b = 1199.78$ kip $\Phi M_b = 17138.38$ in-kip = 1428.20 ft-kip	

Determine if section is adequate for loads applied

Mu =	149.57266 ft-kips
Pu =	4.0300609 kips

Linear Interpolation Program #1 (upper line)				
Are you in upper region? No				
	Pu		Mu	
Value Below	1070.52		0.00	
Value at desired Loc.	4.03	x =	819.399	Max
Value Above	419.91		499.87	

7/20/2007 8

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[illegible]

Section Properties

Overhead Truss

Section 1															
	Area	Min. Off	Area	Dis. Area	Total I	Total S	Total Area	Chord	Weight	Ice Area	Wind Area	Wind Area	Wind Area	Disag.	Disag.
Hor. Axis	2.68	4.771	0.94	1751	97.26	11.61	1.33	39.5	6.0	1.00	0.71	0.389	8	2.88	
Vert. Axis	2.68	4.771	0.94	1751	97.26	11.61	1.33	39.5	6.0	1.00	0.71	0.389	8	2.88	
	in ²	in ²	in ²	in ²	in ²	in ²	in ²	in	lb/in	in ²	in ²	in ²	in ²	in	in
Section 2															
	Area	Min. Off	Area	Dis. Area	Total I	Total S	Total Area	Chord	Weight	Ice Area	Wind Area	Wind Area	Wind Area	Disag.	Disag.
Hor. Axis	2.68	4.771	0.94	1751	97.26	11.61	1.33	39.5	6.0	1.00	0.71	0.389	8	2.88	
Vert. Axis	2.68	4.771	0.94	1751	97.26	11.61	1.33	39.5	6.0	1.00	0.71	0.389	8	2.88	
	in ²	in ²	in ²	in ²	in ²	in ²	in ²	in	lb/in	in ²	in ²	in ²	in ²	in	in
Section 3 = Section 1															
	Area	Min. Off	Area	Dis. Area	Total I	Total S	Total Area	Chord	Weight	Ice Area	Wind Area	Wind Area	Wind Area	Disag.	Disag.
Hor. Axis	2.68	4.771	0.94	1751	97.26	11.61	1.33	39.5	6.0	1.00	0.71	0.389	8	2.88	
Vert. Axis	2.68	4.771	0.94	1751	97.26	11.61	1.33	39.5	6.0	1.00	0.71	0.389	8	2.88	
	in ²	in ²	in ²	in ²	in ²	in ²	in ²	in	lb/in	in ²	in ²	in ²	in ²	in	in

Posts

Left Post														Right Post													
Chord Area	Mon. Off.	Diag. Area	Box	Box	Box	Box	Chord	Sz	Weight	Ice Area	Wind Area	Diagonal	Total Number of	Diagonal													
Area	in	Area	in	in	in	in	in	in	lb	in	in	in	of Stayages	Length													
21.21	483.093	0.00	483.09	69.01	483.09	4.77	69.01	72.16	3.67	1.167	999	0	0.00	(feet)													
in ²	in	in ²	in	in	in	in	in	in	lb	in	in	in		(feet)													

Chord Area	Mon. Off.	Diag. Area	Box	Box	Box	Box	Chord	Sz	Weight	Ice Area	Wind Area	Diagonal	Total Number of	Diagonal
Area	in	Area	in	in	in	in	in	in	lb	in	in	in	of Stayages	Length
21.21	483.093	0.00	483.09	69.01	483.09	4.77	69.01	72.16	3.67	1.167	999	0	0.00	(feet)
in ²	in	in ²	in	in	in	in	in	in	lb	in	in	in		(feet)

Signs

Sign 1					Sign 2				
Area	Weight	Ice Load	L/W Ratio		Area	Weight	Ice Load	L/W Ratio	
416.7637	15.16	2.67	3.244718321	0	416.7637	15.16	2.67	3.244718321	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

Sign 3				
Area	Weight	Ice Load	L/W Ratio	
0	0	0	0	0
0	0	0	0	0

Section 1 & 3					Section 2				
Ice Area 4 =	6.0	Ice Area 4 =	6.0		Ice Area 4 =	6.0	Ice Area 4 =	6.0	
Ice Area 3 =	6.0	Ice Area 3 =	6.0		Ice Area 3 =	6.0	Ice Area 3 =	6.0	
Wind area diag 4 =	0.4713	Wind area diag 4 =	0.4713		Wind area diag 4 =	0.4713	Wind area diag 4 =	0.4713	
Wind area diag 3 =	0.7070	Wind area diag 3 =	0.7070		Wind area diag 3 =	0.7070	Wind area diag 3 =	0.7070	
Ice Area 1 =	1.047198	Ice Area 1 =	1.0472		Ice Area 1 =	1.0472	Ice Area 1 =	1.0472	

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Wind Pressure Calculations

$P_s = 0.625 K_z K_{zt} K_d V^2 C_d$					Velocity Conversion Factor
Height Factor	Exposure Factor	Basic Wind Velocity	Importance Factor	Directional Factor	
1.0	1.0	90	1.0	1.0	
0.94	1.14	65	1.0	1.0	

Calculation of Kz

$K_z = 2.01 (h/90)^{0.25} = 0.930$

Elevation

C.O.D.

23.18055

Horizontal Truss

SECTION 1				SECTION 2				Horizontal Truss Drag Coefficient Calculation (Cylindrical Members)											
Drag Coeff (chord)	Drag Coeff (diagonal)	Wind Pressure (chord)	Wind Pressure (diagonal)	Drag Coeff (chord)	Drag Coeff (diagonal)	Wind Pressure (chord)	Wind Pressure (diagonal)	Sec Value	Max Value	C _d /C _m	C _d /C _m	Max Value	C _d	Max Value	C _d /C _m	C _d /C _m	Max Value	C _d	Max Value
1.10	1.70	24.44	37.78	1.10	1.70	24.44	37.78	5	1.10	30	30.0	5	0	1.10	30	30.0	30	1.68	78
								19	0.45			78	0.45						

Signs

SIGN 1				SIGN 2			
Drag Coeff	Wind Pressure	Drag Coeff	Wind Pressure	Drag Coeff	Wind Pressure	Drag Coeff	Wind Pressure
0	0	0	0	0	0	0	0
1.10	24.44	1.10	24.44	1.10	24.44	1.10	24.44

Vertical Posts

LEFT SIDE				RIGHT SIDE			
Drag Coeff	Wind Pressure	Drag Coeff	Wind Pressure	Drag Coeff	Wind Pressure	Drag Coeff	Wind Pressure
0	0	0	0	0	0	0	0
0.45	10.00	0.45	10.00	0.45	10.00	0.45	10.00

*For Group Load Combination II minimum pressure P_s = 20 psf

Weighted Avg. Wind for Group			
Section 1 Truss P _s	Section 2 Truss P _s	Sign 1 P _s	Sign 2 P _s
29.96	29.96	29.96	29.96
29.96	29.96	29.96	29.96
29.96	29.96	29.96	29.96
29.96	29.96	29.96	29.96
29.96	29.96	29.96	29.96
29.96	29.96	29.96	29.96
29.96	29.96	29.96	29.96
29.96	29.96	29.96	29.96
29.96	29.96	29.96	29.96

Drag Coefficient for Vertical Posts			
Sec Value	Max Value	C _d /C _m	C _d /C _m
5	1.10	30	100.0
30	0.30	78	100.0
78	0.45	78	100.0

Group Load Combination III - Moments and Shears on Overhead Truss Due to Wind Loads

Span	Wind Load on Truss	Wind Load on Truss	Wind Load on Truss	Wind Load on Splice Load (kips)	Wind Load on Splice Dist. from Left (feet)	
	Section 1	Section 2	6 ft Truss (ft)	(kips)	(feet)	
Net	0.00	0.00	0.00	0.00	25.10	P1 Left Sign
88.07	81.15	81.15	81.15	0.00	0.00	P2 Center Sign
				0.00	0.00	P3 Right Sign

Total Uniform Load =	0.001 k/ft	Total Load =	12.05 kips
Left Reaction	6.64 kips	Right Reaction	5.41 kips

Moments and Shears

XL	Distance	P1 dist.	P2 dist.	P3 dist.	Moment
0.0	0.0	0	0	0	0.00
0.1	5.8	0	5.807	5.807	37.89
0.2	11.6	0	11.614	11.614	73.88
0.3	17.4	0	17.421	17.421	107.86
0.4	23.2	0	23.228	23.228	140.42
0.5	29.0	3.926	29.035	29.035	135.49
0.6	34.8	9.742	34.842	34.842	111.54
0.7	40.6	15.549	40.649	40.649	66.47
0.8	46.5	21.356	46.456	46.456	58.37
0.9	52.3	27.163	52.263	52.263	38.53
1.0	58.1	32.97	58.07	58.07	0.00

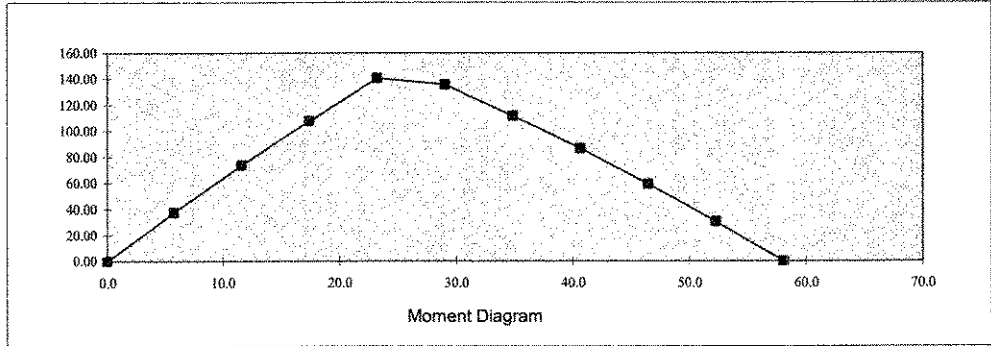
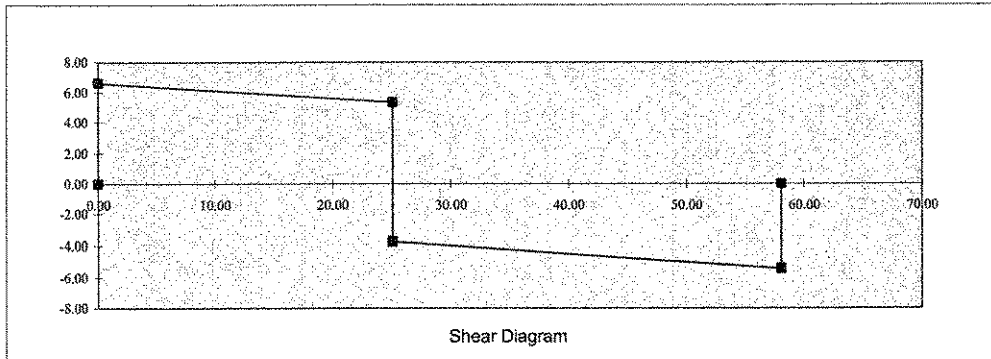
Values for Shear Diagram	
0.00	0.00
0.00	6.64
25.10	5.36
25.10	-3.72
25.10	5.36
25.10	-3.72
25.10	5.36
25.10	-3.72
58.1	-5.41
58.1	0.00

Shear at Point Loads	Shear Left	Shear Right	Max or Min
At Left Reaction	0.00	6.64	6.64
At Point P1	109.53	5.36	-3.72
At Point P2	0.00	-2.44	-2.44
At Point P3	0.00	-2.44	-2.44
At Right Reaction	0.00	-5.41	-5.41

Maximum	109.53	6.64
Minimum	0.00	-5.41

Forces at Field Splices and Mid-Span

Left Side	Location	29.04feet	Right Side	Location	58.07feet	Mid-Span	Location	29.04feet
Left Reaction	6.64 kips		Left Reaction	6.64 kips		Left Reaction	6.64 kips	
Point Load 1	9.08 kips		Point Load 1	9.08 kips		Point Load 1	9.08 kips	
Point Load 2	0.00 kips		Point Load 2	0.00 kips		Point Load 2	0.00 kips	
Point Load 3	0.00 kips		Point Load 3	0.00 kips		Point Load 3	0.00 kips	
Uniform Load	0.001 kips per foot		Uniform Load	0.001 kips per foot		Uniform Load	0.001 kips per foot	
Shear at splice	-3.92 kips		Shear at splice	-5.41 kips		Shear at Mid-Span	-3.92 kips	
Moment at splice	135.49 kip feet		Moment at splice	0.00 kip feet		Moment at Mid-Span	135.49 kip feet	



Moments and Shears on Overhead Truss Due to Dead Loads

Span (feet)	Dead Load on Truss (kips)	Dead Load on Signs		
		Load (kips)	Dist from Left (feet)	
58.07	40	1.02	25.10	P1 Left Sign
		0.00	0.00	P2 Center Sign
		0.00	0.00	P3 Right Sign

Total Uniform Load =	0.04 klf	Total Load =	3.81 kips
Left Reaction	2.01 kips	Right Reaction	1.80 kips

Moments and Shears

X/L	Distance	P1 dist	P2 dist	P3 dist	Moment
0.0	0.0	0	0	0	0.00
0.1	5.8	0	5.807	5.807	11.00
0.2	11.6	0	11.614	11.614	20.66
0.3	17.4	0	17.421	17.421	29.00
0.4	23.2	0	23.228	23.228	36.00
0.5	29.0	3.925	29.035	29.035	30.70
0.6	34.8	9.742	34.842	34.842	21.22
0.7	40.6	15.549	40.649	40.649	25.41
0.8	46.5	21.355	46.455	46.455	16.27
0.9	52.3	27.161	52.261	52.261	9.40
1.0	58.1	32.97	58.07	58.07	0.00

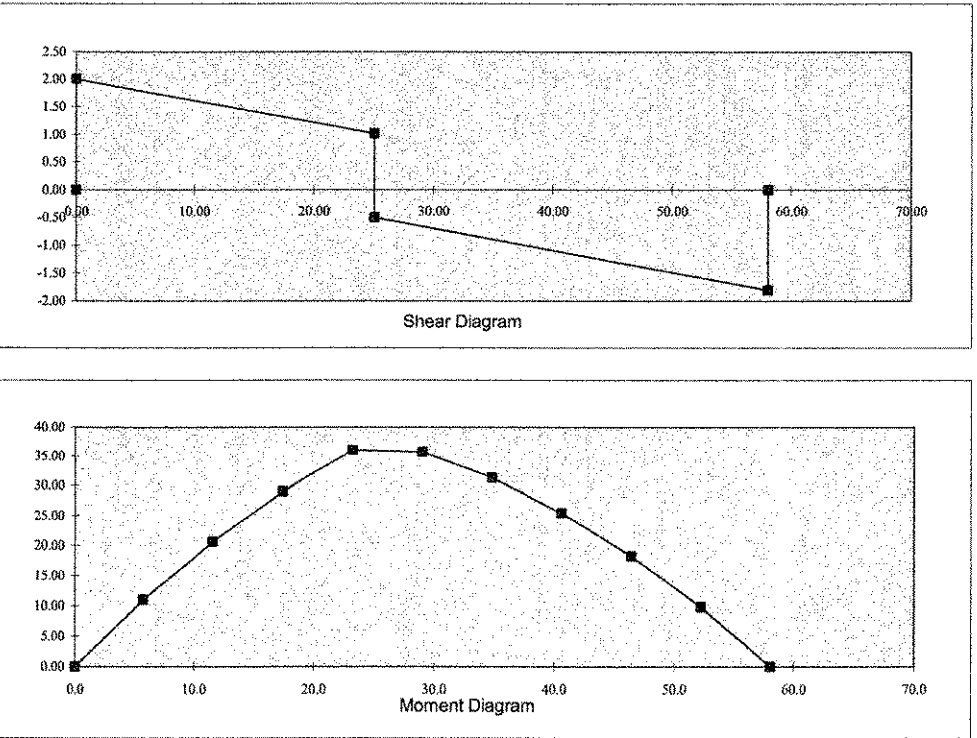
Values for Shear Diagram	
	0.00
0.00	0.00
25.10	-0.50
25.10	1.02
25.10	-0.50
25.10	1.02
25.10	-0.50
25.10	1.02
25.10	-0.50
58.1	-1.80
58.1	0.00

Shear at Point Loads		Shear	Shear	Max or Min
At Left Reaction	0.00	0.00	2.01	2.01
At Point P1	37.87	1.02	-0.80	1.02
At Point P2	0.00	0.49	0.49	0.49
At Point P3	0.00	0.49	0.49	0.49
At Right Reaction	0.00	-1.80	0.00	-1.80

Maximum		Moment	Shear
Maximum	30.00	2.01	
Minimum	0.00	-1.80	

Forces at Field Splices and at Mid-Span

Left Side		Right Side		Mid-Span	
Location	29.04 feet	Location	58.07 feet	Location	29.04 feet
Left Reaction	2.01 kips	Left Reaction	2.01 kips	Left Reaction	2.01 kips
Point Load 1	1.52 kips	Point Load 1	1.52 kips	Point Load 1	1.52 kips
Point Load 2	0.00 kips	Point Load 2	0.00 kips	Point Load 2	0.00 kips
Point Load 3	0.00 kips	Point Load 3	0.00 kips	Point Load 3	0.00 kips
Uniform Load	0.04 kips per foot	Uniform Load	0.04 kips per foot	Uniform Load	0.04 kips per foot
Shear at splice	-0.66 kips	Shear at splice	-1.80 kips	Shear at splice	-0.66 kips
Moment at splice	35.70 kip feet	Moment at splice	0.00 kip feet	Moment at splice	35.70 kip feet



Moments and Shears on Overhead Truss Due to Ice Loads

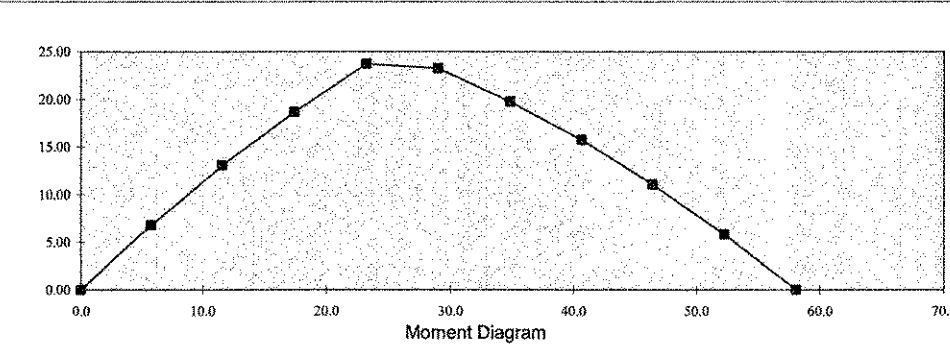
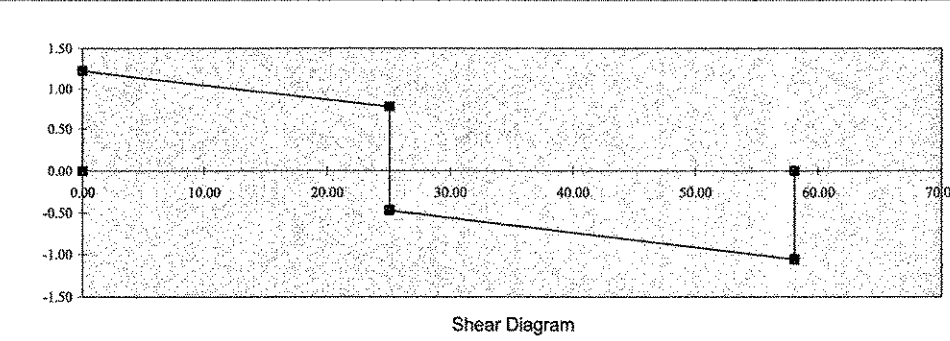
Span (feet)	Ice Load		Ice Load on Signs	
	on truss (k/ft)	Load (kips)	Dist. from Left (feet)	
58.07	1.8	1.23	25.10	P1 Left Sign
	0.00	0.00		P2 Center Sign
	0.00	0.00		P3 Right Sign
Total Uniform Load =		0.02 k/ft	Total Load =	
			2.29 kips	
Left Reaction		1.23 kips	Right Reaction	
			1.06 kips	

Moments and Shears

X/L	Distance	P1 dist.	P2 dist.	P3 dist.	Moment
0.0	0.0	0	0	0	0.00
0.1	5.9	0	5.897	5.897	6.83
0.2	11.8	0	11.614	11.614	13.06
0.3	17.4	0	17.421	17.421	18.68
0.4	23.2	0	23.228	23.228	23.70
0.5	29.0	3.895	29.055	29.055	23.20
0.6	34.8	9.742	34.842	34.842	19.77
0.7	40.6	15.549	40.649	40.649	15.73
0.8	46.5	21.356	46.456	46.456	11.09
0.9	52.3	27.163	52.263	52.263	5.85
1.0	58.1	32.97	58.07	58.07	0.00
Values for Shear Diagram					
	0.00	0.00			
	0.00	1.23			
	25.10	0.78			
	25.10	-0.47			
	25.10	0.78			
	25.10	-0.47			
	25.10	0.78			
	25.10	-0.47			
	58.1	-1.06			
	58.1	0.00			
Shear at Point Loads					
		Shear	Shear	Max or Min	
		Left	Right		
At Left Reaction	0.00	0.00	1.23	1.23	
At Point P1	25.10	0.78	-0.47	0.78	
At Point P2	0.00	-0.02	-0.02	-0.02	Moment
At Point P3	0.00	-0.02	-0.02	-0.02	Minimum
At Right Reaction	0.00	-1.06	0.00	-1.06	Maximum
					0.00
					-1.06

Forces at Field Splices and at Mid-Span

Left Side		Right Side		Mid-Span	
Location	29.04/feet	Location	58.07/feet	Location	29.04/feet
Left Reaction	1.23 kips	Left Reaction	1.23 kips	Left Reaction	1.23 kips
Point Load 1	1.23 kips	Point Load 1	1.23 kips	Point Load 1	1.23 kips
Point Load 2	0.00 kips	Point Load 2	0.00 kips	Point Load 2	0.00 kips
Point Load 3	0.00 kips	Point Load 3	0.00 kips	Point Load 3	0.00 kips
Uniform Load	0.02 kips per foot	Uniform Load	0.02 kips per foot	Uniform Load	0.02 kips per foot
Shear at splice	-0.54 kips	Shear at splice	-1.06 kips	Shear at splice	-0.54 kips
Moment at splice	23.20 kip feet	Moment at splice	0.00 kip feet	Moment at splice	23.20 kip feet



Horizontal Truss Group Loads

Group	Load	Percent	
Load	Combination	Overhead	Remark
1	DL	1.00	
2	DL+WL	1.33	
3	DL+WL+SW	1.33	Minimum Pz = 25.0 pcf

Horizontal Overhead Truss Analysis

Location	Mwnt (kip-ft)				Mhntc (kip-ft)				Vhntc (kip)				Vvnt (kip)			
	DL	ICE	WIND	WIND II	DL	ICE	WIND	WIND II	DL	ICE	WIND	WIND II	DL	ICE	WIND	WIND II
Left Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	2.01	1.21	0.00	0.00	0.00
Left Splice	35.70	23.20	0.00	0.00	0.00	0.00	135.49	135.49	0.00	0.00	3.92	3.92	0.68	0.54	0.00	0.00
Midspan	35.70	23.20	0.00	0.00	0.00	0.00	135.49	135.49	0.00	0.00	3.92	3.92	-0.66	-0.54	0.00	0.00
Sign 1	37.87	25.19	0.00	0.00	0.00	0.00	150.53	150.53	0.00	0.00	5.38	5.38	1.02	0.79	0.00	0.00
Sign 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.44	2.44	0.49	0.02	0.00	0.00
Sign 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.44	2.44	0.49	0.02	0.00	0.00
Right Splice	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.41	5.41	1.80	1.06	0.00	0.00
Right Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.41	5.41	1.80	1.06	0.00	0.00

GROUP LOAD COMBINATIONS

Location	Section	Bending About Horizontal Axis				Bending About Vertical Axis				SHEAR	SHEAR	Combined Forces		
		Mwnt	Max	Min	Stress	Mhntc	Max	Min	Stress			Section 1	Section 2	Diagonal
Left Support	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.01
Left Splice	29.04	1	35.70	4.40	11.80	0.00	0.00	0.00	0.00	0.00	0.68	11.80	0.00	0.68
Midspan	29.04	1	35.70	4.40	11.80	0.00	0.00	0.00	0.00	-0.66	11.80	0.00	0.00	0.00
Sign 1	25.10	1	37.87	4.68	12.55	0.00	0.00	0.00	0.00	1.02	12.55	0.00	1.02	0.00
Sign 2	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.49
Sign 3	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.49
Right Splice	58.07	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	0.00	0.00	1.80	0.00
Right Support	58.07	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	0.00	0.00	1.80	0.00
Left Support	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.98	1.51	0.00	0.00	4.98
Left Splice	29.04	1	26.84	3.31	8.87	101.87	14.53	38.94	2.95	0.49	47.81	0.00	0.00	2.95
Midspan	29.04	1	26.84	3.31	8.87	101.87	14.53	38.94	-2.95	-0.49	47.81	0.00	0.00	-2.95
Sign 1	25.10	1	28.55	3.32	9.44	113.18	15.14	43.28	4.03	0.76	52.70	0.00	0.00	4.03
Sign 2	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	1.83	0.37	0.00	0.00	0.00	1.83
Sign 3	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	1.83	0.37	0.00	0.00	0.00	1.83
Right Splice	58.07	1	0.00	0.00	0.00	0.00	0.00	0.00	4.07	1.36	0.00	0.00	0.00	4.07
Right Support	58.07	1	0.00	0.00	0.00	0.00	0.00	0.00	4.07	1.36	0.00	0.00	0.00	4.07
Left Support	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	2.56	2.43	0.00	0.00	0.00	2.56
Left Splice	29.04	1	44.28	5.46	14.64	20.93	7.27	19.47	1.46	0.90	34.11	0.00	0.00	1.46
Midspan	29.04	1	44.28	5.46	14.64	20.93	7.27	19.47	-1.46	-0.90	34.11	0.00	0.00	-1.46
Sign 1	25.10	1	47.49	6.68	15.70	26.65	8.07	21.62	2.01	1.36	37.33	0.00	0.00	2.01
Sign 2	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.36	0.00	0.00	0.00	0.92
Sign 3	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.36	0.00	0.00	0.00	0.92
Right Splice	58.07	1	0.00	0.00	0.00	0.00	0.00	0.00	2.03	2.15	0.00	0.00	0.00	2.15
Right Support	58.07	1	0.00	0.00	0.00	0.00	0.00	0.00	2.03	2.15	0.00	0.00	0.00	2.15

Location	Section	Monosube Forces							Section 2	V Shear
		Mwnt	Mhntc	H Shear	V Shear	Mwnt	Mhntc	H Shear		
Left Support	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Left Splice	29.04	1	35.70	0.00	0.00	0.68	0.00	0.00	0.00	0.00
Midspan	29.04	1	35.70	0.00	0.00	-0.66	0.00	0.00	0.00	0.00
Sign 1	25.10	1	37.87	0.00	0.00	1.02	0.00	0.00	0.00	0.00
Sign 2	0.00	1	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00
Sign 3	0.00	1	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00
Right Splice	58.07	1	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.00
Right Support	58.07	1	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.00
Left Support	0.00	1	0.00	0.00	4.98	1.51	0.00	0.00	0.00	0.00
Left Splice	29.04	1	26.84	101.87	-2.95	-0.49	0.00	0.00	0.00	0.00
Midspan	29.04	1	26.84	101.87	-2.95	-0.49	0.00	0.00	0.00	0.00
Sign 1	25.10	1	28.55	113.18	4.03	0.76	0.00	0.00	0.00	0.00
Sign 2	0.00	1	0.00	0.00	1.83	0.37	0.00	0.00	0.00	0.00
Sign 3	0.00	1	0.00	0.00	1.83	0.37	0.00	0.00	0.00	0.00
Right Splice	58.07	1	0.00	0.00	4.07	1.36	0.00	0.00	0.00	0.00
Right Support	58.07	1	0.00	0.00	4.07	1.36	0.00	0.00	0.00	0.00
Left Support	0.00	1	0.00	0.00	2.56	2.43	0.00	0.00	0.00	0.00
Left Splice	29.04	1	44.28	50.93	1.48	0.90	0.00	0.00	0.00	0.00
Midspan	29.04	1	44.28	50.93	1.48	-0.90	0.00	0.00	0.00	0.00
Sign 1	25.10	1	47.49	56.69	2.01	1.36	0.00	0.00	0.00	0.00
Sign 2	0.00	1	0.00	0.00	0.92	0.36	0.00	0.00	0.00	0.00
Sign 3	0.00	1	0.00	0.00	0.92	0.36	0.00	0.00	0.00	0.00
Right Splice	58.07	1	0.00	0.00	2.03	2.15	0.00	0.00	0.00	0.00
Right Support	58.07	1	0.00	0.00	2.03	2.15	0.00	0.00	0.00	0.00

For Monosube Design Only - Section 1	Monosube Forces			
	Mwnt	Mhntc	SHEAR	SHEAR
	kip-ft	kip-ft	kip	kip
At Splice	47.49	113.18	4.99	2.43
	0.00	0.00	0.00	0.00

170-SIGW-E

VERTICAL TRUSS LOAD COMBINATIONS

Percent Overstress 1.00

Group I DL Wn = WIND FORCES IN THE X DIRECTION

Group II Case 1 DL + Wn + .2Wt 1.33

Group II Case 2 DL + .5Wn + .3Wt 1.33

Group III Case 1 DL + ICE + .5Wn + .1Wt 1.33

Group III Case 2 DL + ICE + .3Wn + .15Wt 1.33

Minimum wind pressure of 25 psf

LOADS ON VERTICAL POSTS		Vsx (kip/ft)						AXIAL (kip/ft)					
Location	LOADS	DL			WIND III			DL			WIND		
		ICE	WIND	WIND III	ICE	WIND	WIND	ICE	WIND	WIND III	ICE	WIND	WIND
Left Support		0.00	0.00	0.012	0.029	0.072	0.011	0.00	0.00	0.00	6.64	6.64	2.01
Right Support		0.00	0.00	0.012	0.029	0.072	0.011	0.00	0.00	0.00	8.41	8.41	1.80

Depth of Horizontal Truss	Total Left Post Ht.	Total Right Post Ht.	Relative Stiffness Transverse Wind
3.00	25.63	26.52	WT

LOAD COMBINATION RESULTS (Loads and Moments are for both posts)									
Reactions	Max. Left	Max. Right	Max. Left	Max. Right	Max. Left	Max. Right	Max. Left	Max. Right	Max. Left
Left Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Right Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Left Support	122.83	23.68	2.24	1.91	2.00	2.00	6.39	6.39	6.39
Right Support	104.85	21.91	4.30	0.90	2.79	2.79	5.98	5.98	5.98
Left Support	73.70	35.49	3.13	1.51	2.90	2.90	6.39	6.39	6.39
Right Support	62.01	32.87	2.58	1.35	2.79	2.79	5.98	5.98	5.98
Left Support	63.56	11.83	2.79	0.50	4.03	4.03	6.39	6.39	6.39
Right Support	54.74	10.96	2.32	0.45	3.81	3.81	5.98	5.98	5.98
Left Support	38.14	17.74	1.67	0.50	4.03	4.03	6.39	6.39	6.39
Right Support	32.84	16.44	1.39	0.45	3.81	3.81	5.98	5.98	5.98

Posts													
Left Post													
Chord Area	Max. Left	Max. Right	Chord Area	Max. Left	Max. Right	Chord Area	Max. Left	Max. Right	Chord Area	Max. Left	Max. Right	Chord Area	Max. Left
As	As	As	Ad	Ad	Ad	Ad	Ad	Ad	Ad	Ad	Ad	Ad	Ad
21.21	483.093	0.00	483	69.01	483.09	4.77	69.0	72.16	3.67	1.167	99	99	99
Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt

Right Post													
Chord Area	Max. Left	Max. Right	Chord Area	Max. Left	Max. Right	Chord Area	Max. Left	Max. Right	Chord Area	Max. Left	Max. Right	Chord Area	Max. Left
As	As	As	Ad	Ad	Ad	Ad	Ad	Ad	Ad	Ad	Ad	Ad	Ad
21.21	483.093	0.00	483	69.01	483.09	4.77	69.0	72.16	3.67	1.167	99	99	99
Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt

LOAD COMBINATION RESULTS (Per Post for design)									
Reactions	Max. Left	Max. Right	Max. Left	Max. Right	Max. Left	Max. Right	Max. Left	Max. Right	Max. Left
Left Support	3.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Right Support	3.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Left Support	2.90	2.90	122.83	23.68	122.83	5.31	5.31	5.31	5.31
Right Support	2.79	2.79	104.85	21.91	104.85	4.39	4.39	4.39	4.39
Left Support	2.90	2.90	73.70	35.49	73.70	3.47	3.47	3.47	3.47
Right Support	2.79	2.79	62.01	32.87	62.01	2.91	2.91	2.91	2.91
Left Support	4.03	4.03	63.56	11.83	63.56	2.92	2.92	2.92	2.92
Right Support	3.81	3.81	54.74	10.96	54.74	2.37	2.37	2.37	2.37
Left Support	4.03	4.03	38.14	17.74	38.14	1.74	1.74	1.74	1.74
Right Support	3.81	3.81	32.84	16.44	32.84	1.46	1.46	1.46	1.46

Number of Posts: 1

Horizontal Truss Analysis

FALSE

Section 1 - Chords										
Unbraced Length (in.)	Pipe Diameter (in.)	Wall Thickness (in.)	Pipe Area (in^2)	Chord Yield Str. (ksi)	Max. Axial Force (kips)	Column Slenderness Cc	kL/Rmin	fa Compression (ksi)	Fa Compression (ksi)	RESULT C/D
72.0	4.000	0.226	2.68	42.0	52.70	116.7	53.95	19.67	20.52	0.96

Section 2 - Chords										
Unbraced Length (in.)	Pipe Diameter (in.)	Wall Thickness (in.)	Pipe Area (in^2)	Chord Yield Str. (ksi)	Max. Axial Force (kips)	Column Slenderness Cc	kL/Rmin	fa Compression (ksi)	Fa Compression (ksi)	RESULT C/D
72.0	4.000	0.226	2.68	42.0	0.00	116.7	53.95	0.00	20.52	0.00

Diagonals - Horizontal										
Unbraced Length (in.)	Pipe or Angle	Diagonal Area (in^2)	R min (in.)	Chord Yield Str. (ksi)	Max. Axial Force (kips)	Column Slenderness Cc	kL/Rmin	fa Compression (ksi)	Fa Compression (ksi)	RESULT C/D
34.6	ANGLE	0.94	0.39	36.0	8.11	126.1	88.97	8.65	14.32	0.60

Diagonals - Vertical										
Unbraced Length (in.)	Pipe or Angle	Diagonal Area (in^2)	R min (in.)	Chord Yield Str. (ksi)	Max. Axial Force (kips)	Column Slenderness Cc	kL/Rmin	fa Compression (ksi)	Fa Compression (ksi)	RESULT C/D
34.6	ANGLE	0.94	0.39	36.0	3.95	126.1	88.97	4.22	14.32	0.29

Deflections at Mid-Span					Uniform Load		Point Loads			Mid-Span
Span = 696.84 inches					Load	Load	Load	Dist. A	Dist. B	Deflection
I = 1751 in ⁴					plf	k/inch	kips	inches	inches	inches
Dead Load of Truss					40	0.0032918				0.20
Dead Load of Sign 1							1.52	301.20	395.64	0.2055
Dead Load of Sign 2							0.00	0.00	0.00	0.0000
Dead Load of Sign 3							0.00	0.00	0.00	0.0000
Ice on Truss					18	0.0014924				0.09
Ice on Sign 1							1.25	301.20	395.64	0.1689
Ice on Sign 2							0.00	0.00	0.00	0.0000
Ice on Sign 3							0.00	0.00	0.00	0.0000

Total Defl. (DL+Ice)	0.66	inches
Allowable Deflection	4.65	inches

Dead Load Deflection	0.40	inches
Extra Camber (L/1000)	0.69684	inches
Total Camber	1.10	inches

192-Side-e

VERTICAL TRUSS ANALYSIS

Number of Posts1

Load Results ASSUMED IS

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

Input Data

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

Diaphragm

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

with-thickness ratio

correct with thickness ratio

incorrect with thickness ratio

maximum with thickness ratio

20000 for Young's Modulus

Post Design Values

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

Fa calculated for KLhy only

Left Support

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

Right Support

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

Left Support

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

Right Support

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

Observed Data (kip/in)	Wall Thickness (in)	Yield Str.	L	tp	tf	3 in max	Result
14.000	0.50	42.0	28.00	88.8	305.9	Compass	

7/20/2007

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V.T. And

193-5161-e

Horizontal Monotube Analysis

	Mvert	Mhoriz	SHEAR Horizontal	SHEAR Vertical	Max Axial
	kip-ft	kip-ft	kips	kips	Kips
Section 1	47.49	113.18	4.99	2.43	5.31
Section 2	0.00	0.00	0.00	0.00	5.31

E = 29000 ksi (Young's Modulus)
k chord = 1.00

Local Buckling AASHTO 5.5						
Section 1						
Outside Dia. (inches)	Wall Thick. (inches)	Yield Str. (ksi)	λ	λ_p	λ_r	λ_{max}
4.000	0.23	42.0	17.70	86.9	180.6	309.5
Compact						

Local Buckling AASHTO 5.5						
Section 2						
Outside Dia. (inches)	Wall Thick. (inches)	Yield Str. (ksi)	λ	λ_p	λ_r	λ_{max}
4.000	0.23	42.0	17.70	86.9	180.6	309.5
Compact						

λ width-thickness ratio
 λ_p compact width-thickness ratio
 λ_r non-compact width-thickness ratio
 λ_{max} maximum width-thickness ratio
E 29000 ksi (Young's Modulus)

Section 1					
Unbraced Length (ft.)	Pipe Diameter (in.)	Wall Thickness (in.)	Pipe Area (in²)	Chord Yield Str. (ksi)	IL/Rmin
72.0	4.000	0.226	2.68	42.0	53.95

Section 2					
Unbraced Length (ft.)	Pipe Diameter (in.)	Wall Thickness (in.)	Pipe Area (in²)	Chord Yield Str. (ksi)	IL/Rmin
72.0	4.000	0.226	2.68	42.0	53.95

circle 1	BENDING AND SHEAR STRESSES									
	Mmax kip-ft	S in³	Ib ksi	Shear kips	Pipe Area in²	Iv ksi	Axial kips	Area y in²	fa ksi	
	Section 1	97.26	122.74	15.14	5.55	2.68	2.07	5.31	2.68	1.98
	Section 2	0.00	97.26	0.00	0.00	2.68	0.00	5.31	2.68	1.98
	RESULTS									
	Fb ksi	Fv ksi	Fa ksi	Cc	R	KL/R	Fa' ksi	Eqn. 5-17 CSR	Eqn. 5-18 CSR	Eqn. 5-19 CSR
	Section 1	27.72	13.86	21.75	116.75	1.33	53.95	51.30	0.647	0.715
	Section 2	27.72	13.86	21.75	116.75	1.33	53.95	51.30	0.079	0.091
	Fb Calculation									
	Term 1	Term 2	Term 3							

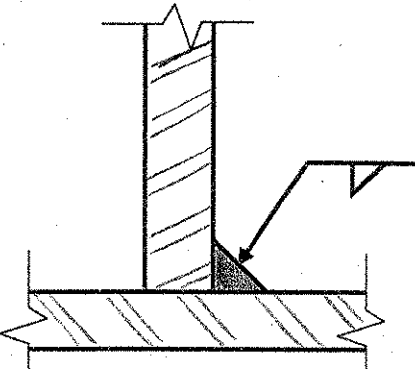
Section 1	Term 1	Term 2	Term 3
Eqn. 5-17	0.079	0.548	0.022
Eqn. 5-18	0.091	0.601	0.022
Eqn. 5-19	0.091	0.548	0.022
Section 2	Term 1	Term 2	Term 3
Eqn. 5-17	0.079	0.000	0.000
Eqn. 5-18	0.091	0.000	0.000
Eqn. 5-19	0.091	0.000	0.000

Highway Safety Corporation
Glastonbury, CT

Welding Procedure Specification

Material specification	ASTM A36, A572 gr 50, A709 Gr 36, ASTM A709 Gr 50, A500 gr B	
Welding process	Gas Metal Arc Welding (GMAW)	
Manual, semi-automatic, or automatic	Semi-Automatic	
Position of welding	Horizontal (2F)	
Filler metal specification	AWS A5.18	
Filler metal classification	ER70S-3	
Electrode and manufacturer	Lincoln Electric Lincoln Weld L-50	
Flux and manufacturer	N/A	
Shielding gas	85% Argon / 15% CO2	Flow rate 19-27 L / min
Single or multiple pass	Single	
Single or multiple arc	Single	
Welding current	DC	
Polarity	Reverse	
Welding progression	Stringers	
Root treatment	None	
Preheat and interpass temperature	Base Metal up to 3/4" (50°F) ; over 3/4-1 1/2" (70°F)	
Postheat treatment	None	
Electrode extension	3/4" ± 1/4"	

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters		Travel speed	Joint detail
			Amperes	Volts		
3/16"	1	0.045"	300 A ± 30	29 V ± 2	28 ipm ± 2	TYPICAL ALL FILLET WELDS 
1/4"	1	0.045"	300 A ± 30	29 V ± 2	14 ipm ± 2	

.This procedure may vary due to fabrication sequence, fit-up, pass size, etc. within the limitation of variables given in section 5 of latest edition AWS D1.1



PAUL RADICE
CWI 98070221
OC1 EXP. 7/01/10

WPS no. **W-1587-1**

Revision no. **0**

Supporting POR no. **Pre-qualified**

Project Name **St. Johnsbury, Lyndon, Waterford VT**

Fabricator **Highway Safety Corporation**

Authorized by **Paul Radice**

Date **7/24/07**

Project Number **HES 091-3(42) & HES 093-1(10)**

186-516A-C

Highway Safety Corporation

Glastonbury, CT

Welding Procedure Specification

Material specification ASTM A36, A572 gr 50, A709 Gr 36, ASTM A709 Gr 50, A500 gr B

Welding process Gas Metal Arc Welding (GMAW)

Manual, semi-automatic, or automatic Semi-Automatic

Position of welding Horizontal (2F)

Filler metal specification AWS A5.18

Filler metal classification ER70S-3

Electrode and manufacturer Lincoln Electric Lincoln Weld L-50

Flux and manufacturer N/A

Shielding gas 85% Argon / 15% CO2 Flow rate 19-27 L / min

Single or multiple pass Single & Multiple

Single or multiple arc Single

Welding current DC

Polarity Reverse

Welding progression Stringers

Root treatment None

Preheat and interpass temperature Base Metal up to 3/4" (50°F) ; over 3/4-1 1/2" (70°F)

Postheat treatment None

Electrode extension 3/4" ± 1/4"

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters		Travel speed	Joint detail
			Amperes	Volts		
7/16" x 1/4"	1 & 2	0.045"	300 A ± 30	29 V ± 2	14 ipm ± 2	UN-EQUAL LEG FILLET WELD @ BASE PLATE CONNECTION

This procedure may vary due to fabrication sequence, fit-up, pass size, etc. within the limitation of variables given in section 5 of latest edition AWS D1.1



PAUL RADICE

CWI

0070221

001

EXP. 7/31/16

WPS no. W-1587-2

Fabricator Highway Safety Corporation

Revision no. 0

Authorized by Paul Radice

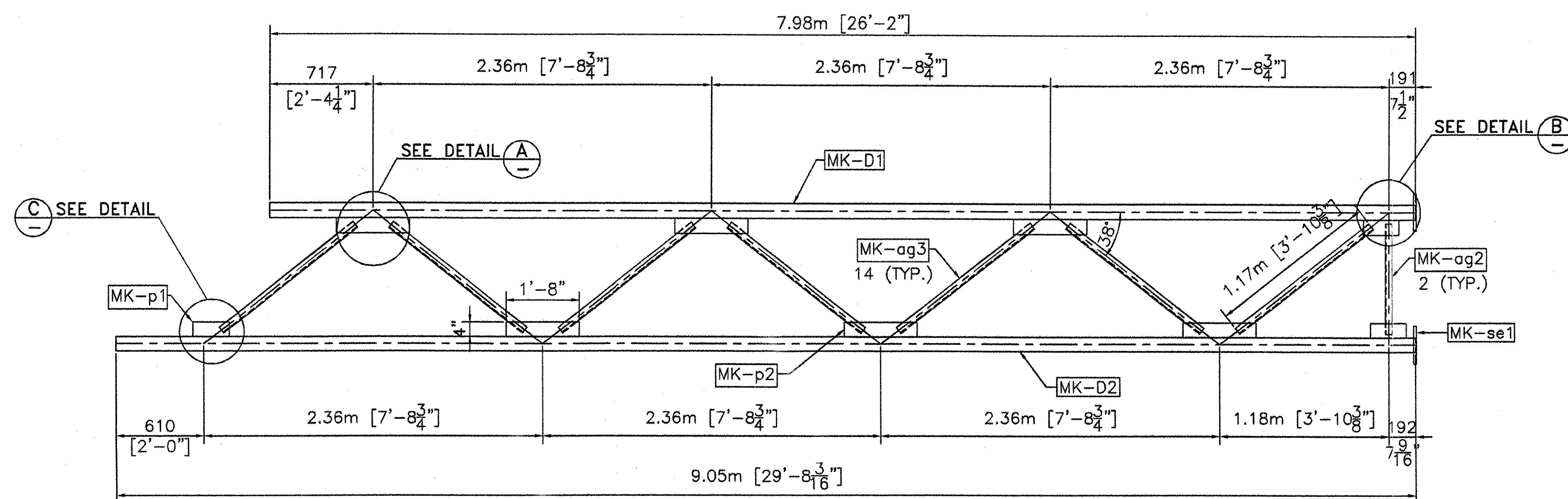
Supporting PQR no. Pre-qualified

Date 7/24/07

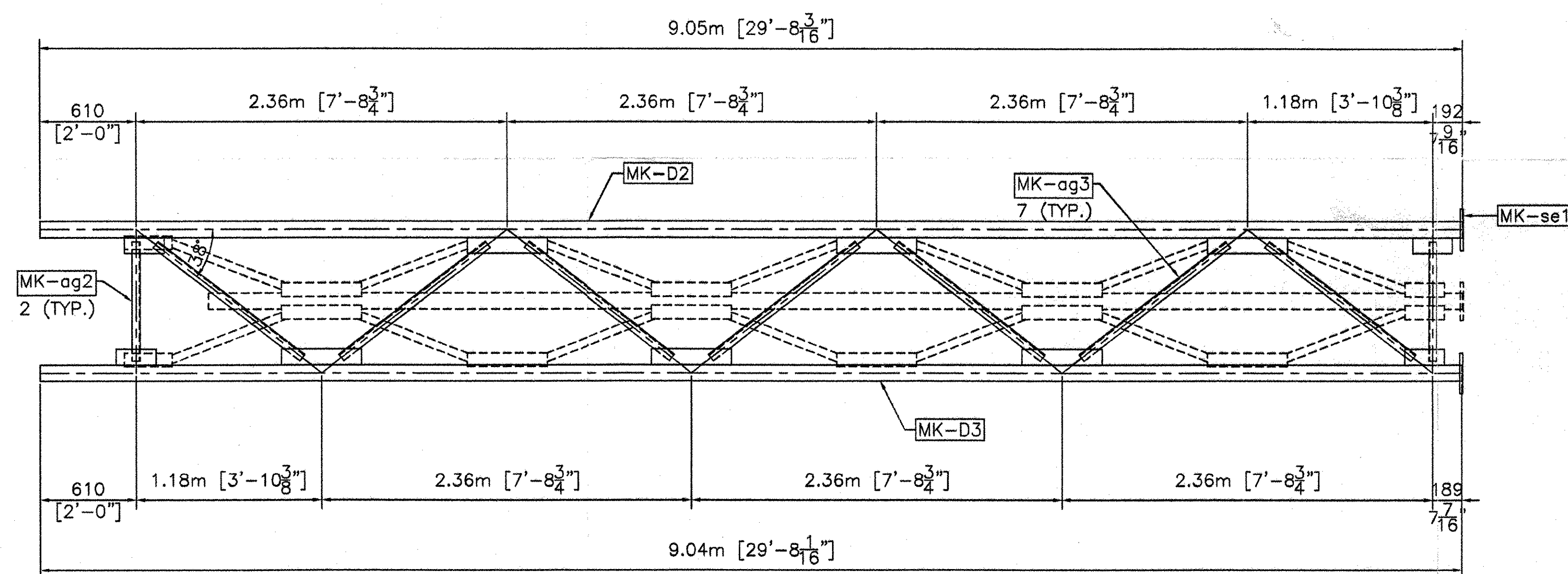
Project Name St. Johnsbury, Lyndon, Waterford VT

Project Number HES 091-3(42) & HES 093-1(10)

12-56A2

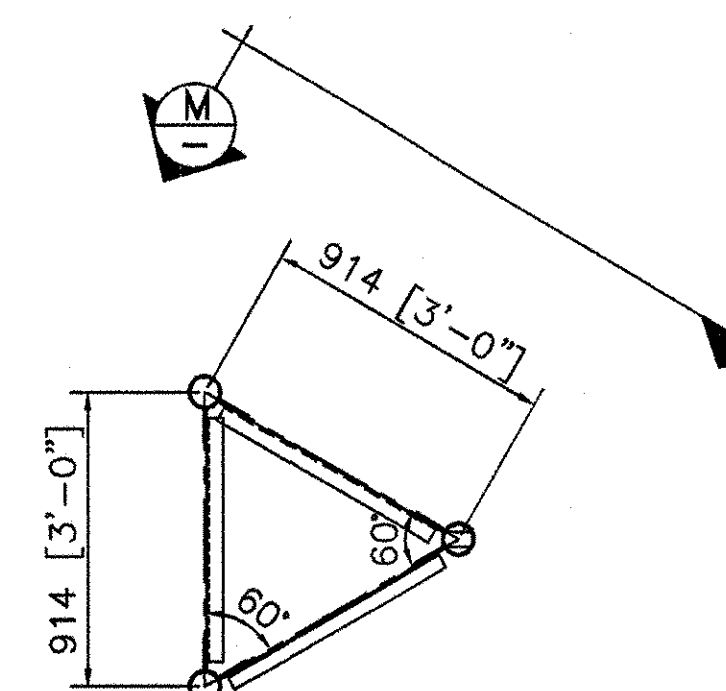


VIEW

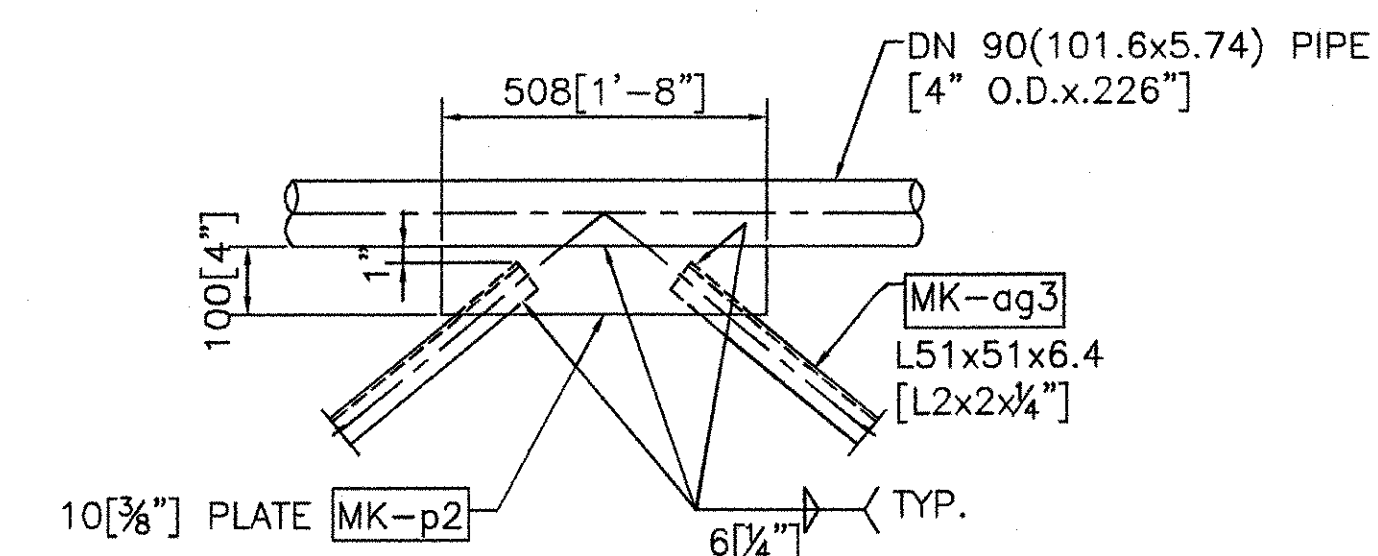


FRONT VIEW

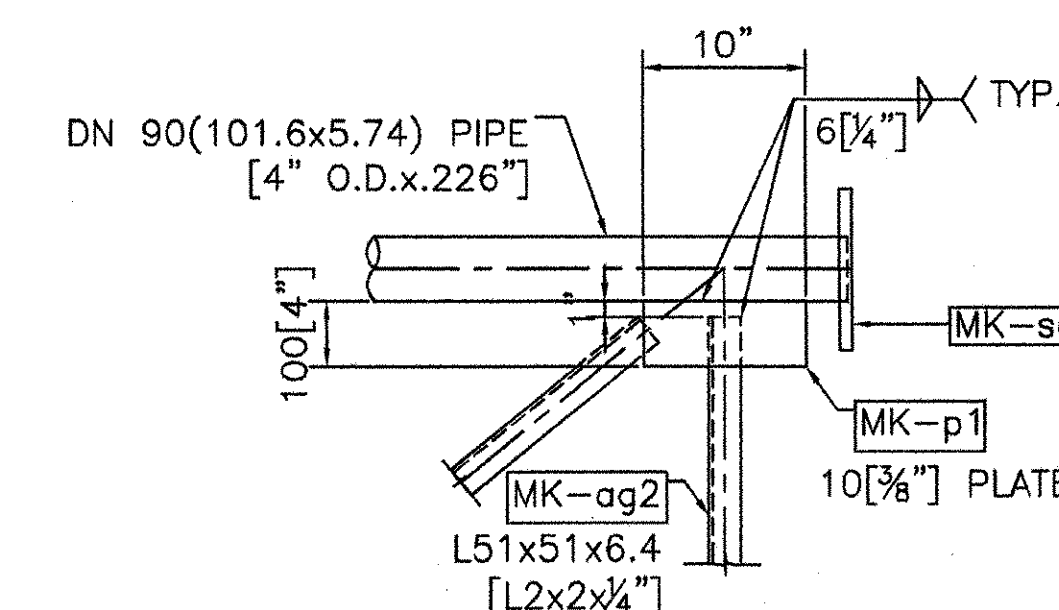
TRUSS 1



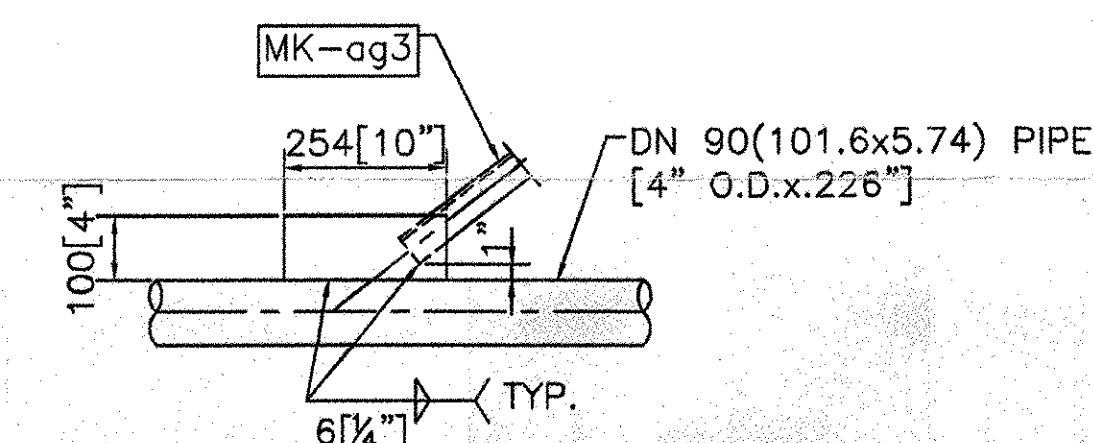
SIDE VIEW



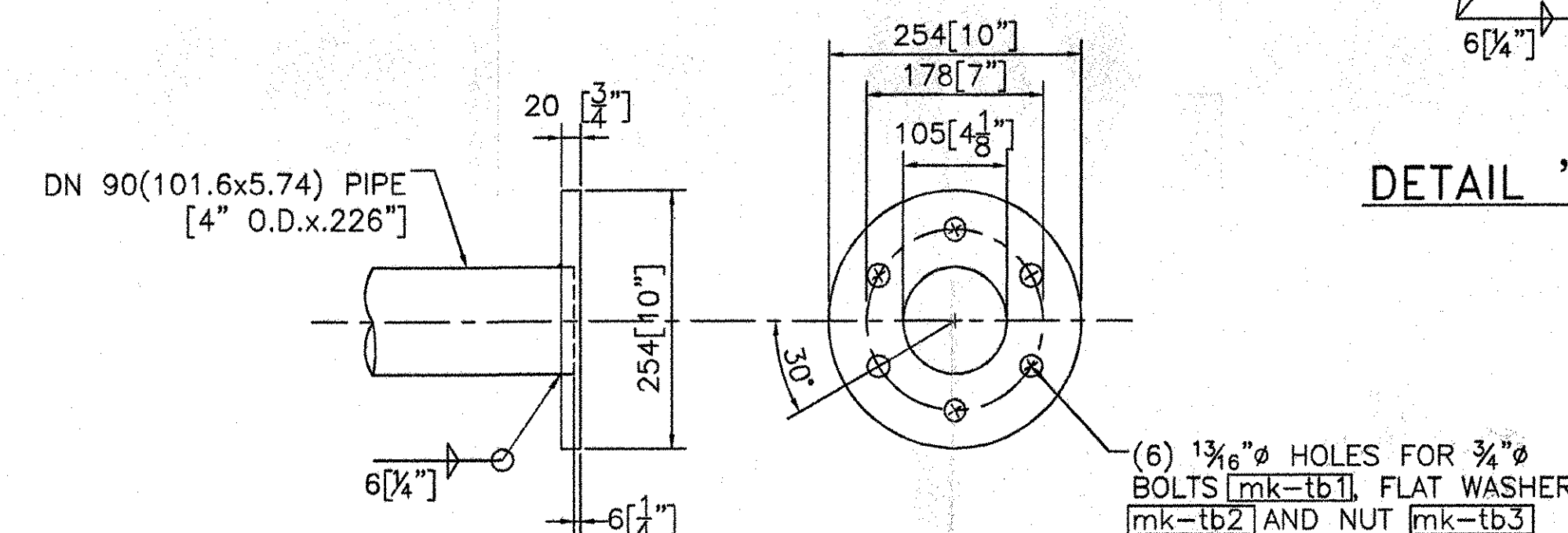
DETAIL "A"



DETAIL "B"



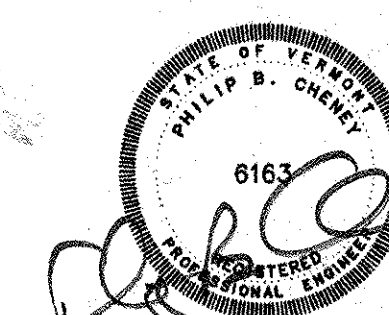
DETAIL "C"



SPLICE DETAIL

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS (mm) UNLESS OTHERWISE NOTED. ENGLISH CONVERSION SHOWN IN [] FOR REFERENCE ONLY.

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BY DATE 08/02/07



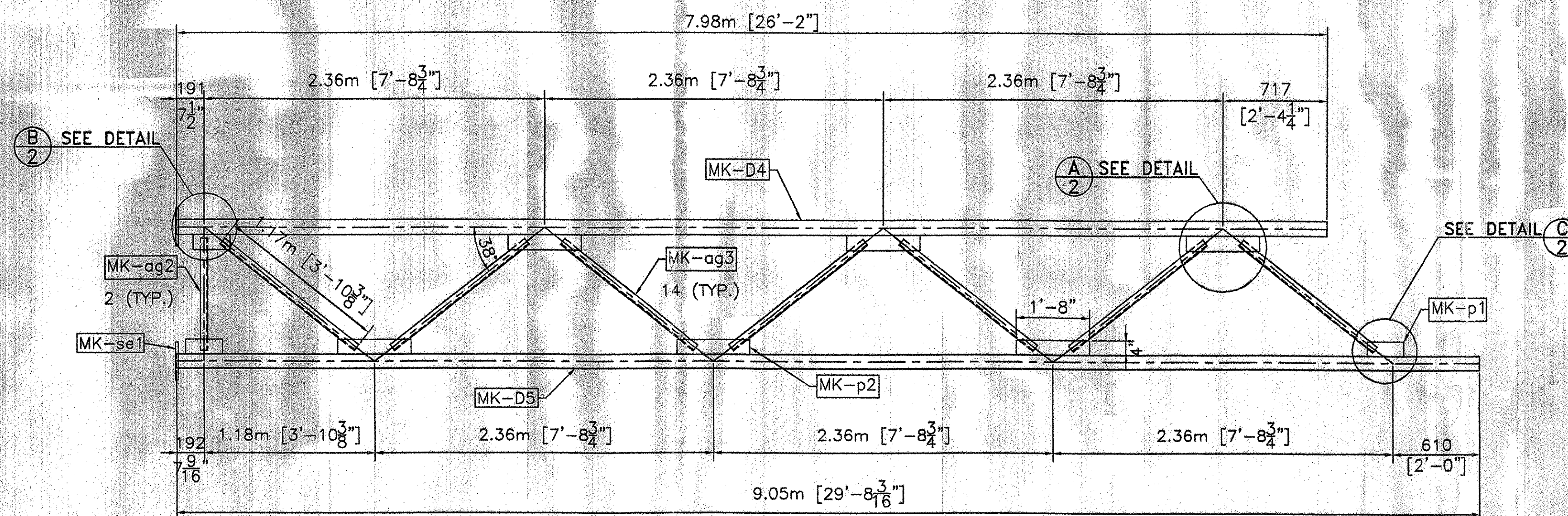
HIGHWAY SAFETY CORP.
GLASTONBURY, CT

TRI-CHORD SIGN STRUCTURE
STATE OF VERMONT
COUNTY OF CALEDONIA
MM 10.050 NB
PROJECT No. HES 091-3(42)
HES 093-1(10)

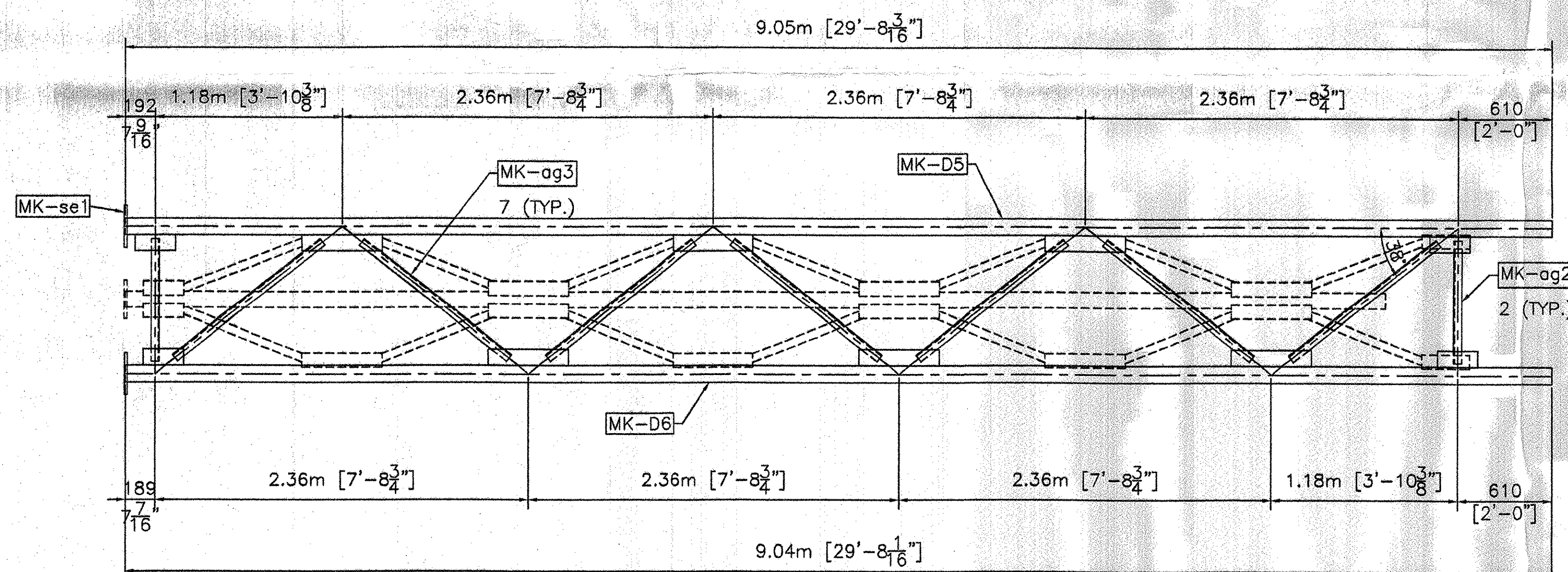
GENERAL CONTRACTOR
SUB CONTRACTOR F.R. LAFAYETTE

DRAWN MHM
CHECKED P Radice
DATE 5/23/07
SCALE NTS
HSC REFERENCE NO.
1587e
SIZE D REVISION 0
SHEET NO. 2 of 8

REVISIONS		
No.	Remarks	Date
0	Initial submittal	

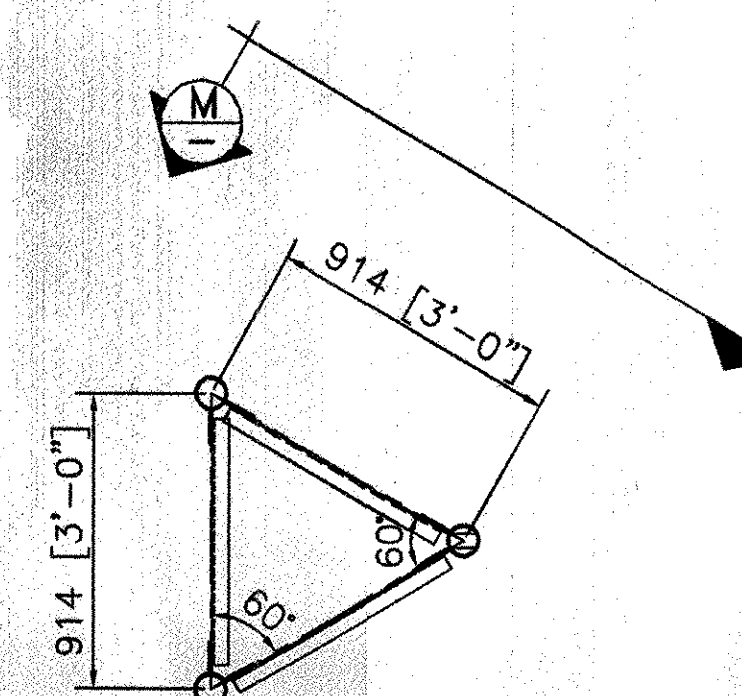


VIEW



FRONT VIEW

TRUSS 2

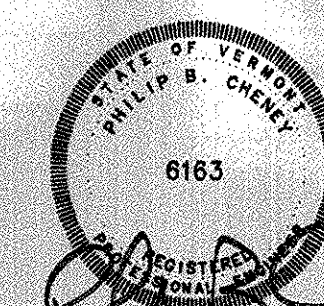


SIDE VIEW

- NOTE:**
1. STRUCTURE DESIGNED IN ACCORDANCE WITH LATEST EDITION AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS.
 2. ALL HOLES FOR HIGH STRENGTH FASTENERS SHALL BE DRILLED OR SUB-PUNCHED FULL SIZE. SLOTTED HOLES AND/OR VENT OR ACCESS HOLES MAY BE CUT WITH MECHANICALLY GUIDED PLASMA OR MECHANICALLY GUIDED FLAME TORCH.
 3. GRIND SHARP CORNERS OF ALL PLATES TO A $\frac{1}{16}$ " MIN. RADIUS PRIOR TO GALVANIZING.
 4. ALL WELDING SHALL BE PERFORMED BY QUALIFIED WELDERS IN ACCORDANCE WITH AWS D1.1.
 5. ALL STEEL PLATES FOR STRUCTURAL COMPONENTS SHALL BE ASTM A709 GR. 50.
 6. STEEL PLATES AND SHAPES FOR NON-STRUCTURAL COMPONENTS SHALL BE ASTM A709 GR. 36.
 7. STEEL PIPES FOR STRUCTURAL MEMBERS SHALL HAVE MINIMUM YIELD OF 42 ksi AND SHALL CONFORM TO ONE OF THE FOLLOWING GRADES: ASTM A500 GR. B, OR API 5LX42.
 8. UNLESS OTHERWISE NOTED, ALL BOLTS FOR STRUCTURAL CONNECTIONS SHALL BE M164 TYPE 1 (A325).
 9. GALVANIZED U-BOLTS FOR CONNECTION OF SIGN HANGER BEAMS TO TRUSS SHALL BE ASTM F-1554 GR. 36.
 10. ALL STRUCTURAL STEEL SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111 (ASTM A123).
 11. ALL HARDWARE, UNLESS OTHERWISE NOTED, SHALL BE HOT-DIPPED GALVANIZED PER AASHTO M232 (ASTM A153).
 12. ANCHOR HARDWARE SHALL BE STAINLESS STEEL AND MEET REQUIREMENTS OF VAOT STANDARD SPECIFICATION 714.09.
 13. CONCRETE AND REBAR SHOWN IN FOOTING DESIGN TO BE FURNISHED BY OTHERS.
 14. FOUNDATION DESIGN BASED ON USE OF 3000 psi MINIMUM CONCRETE.
 15. SPACE BETWEEN THE TOP OF CONCRETE AND THE BOTTOM OF STEEL BASE PLATE SHALL BE FILLED WITH TYPE IV MORTAR AFTER LEVELING.
 16. BOLTS INSTALLED IN STRUCTURAL CONNECTIONS SHALL BE PROVIDED AND TENSIONED PER APPLICABLE PROVISIONS OF VAOT STANDARD SPECIFICATIONS SECTION 506.
 17. SEAL WELD ALL CONNECTIONS WHEN POSSIBLE PRIOR TO GALVANIZING.

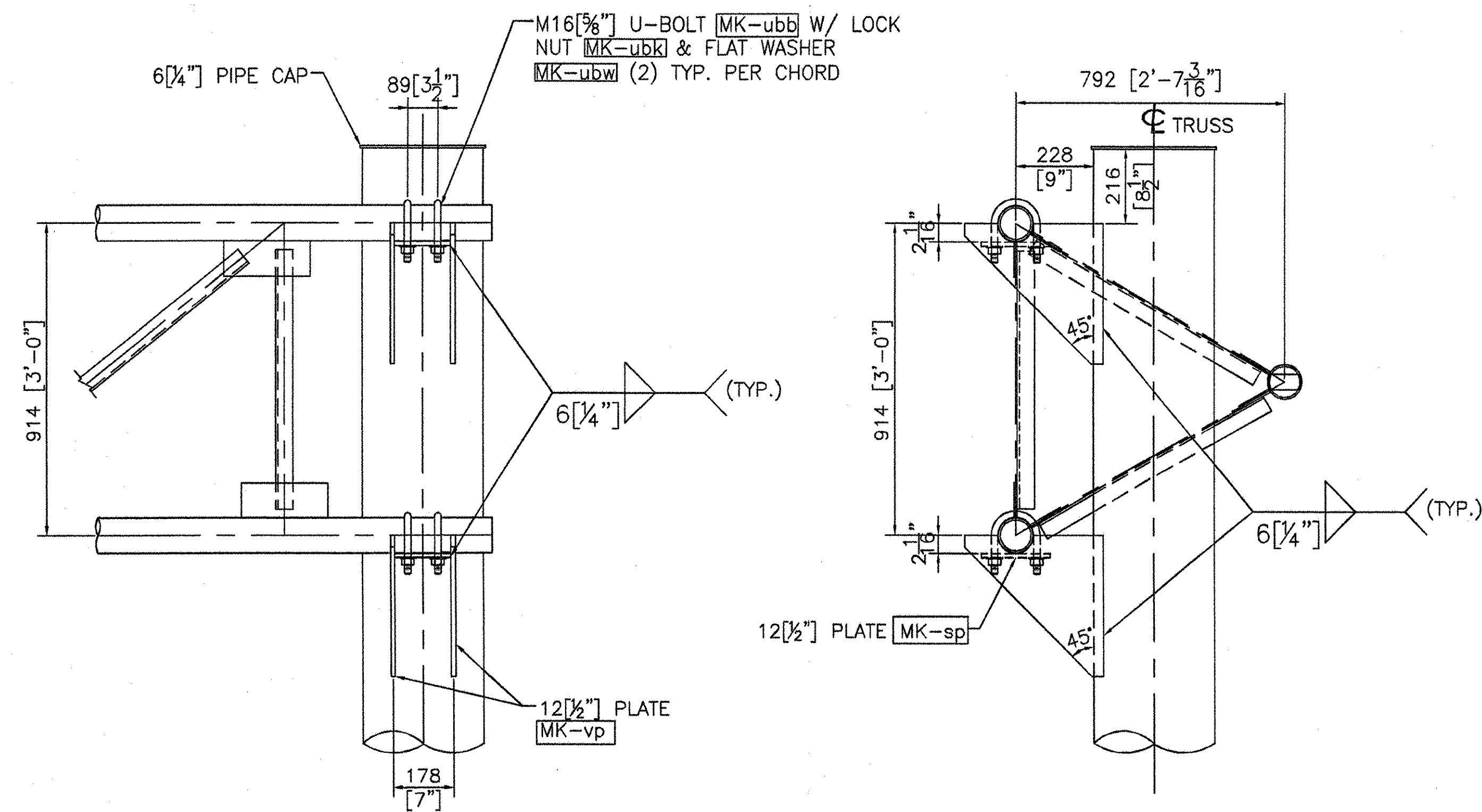
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BY DATE 08/02/07

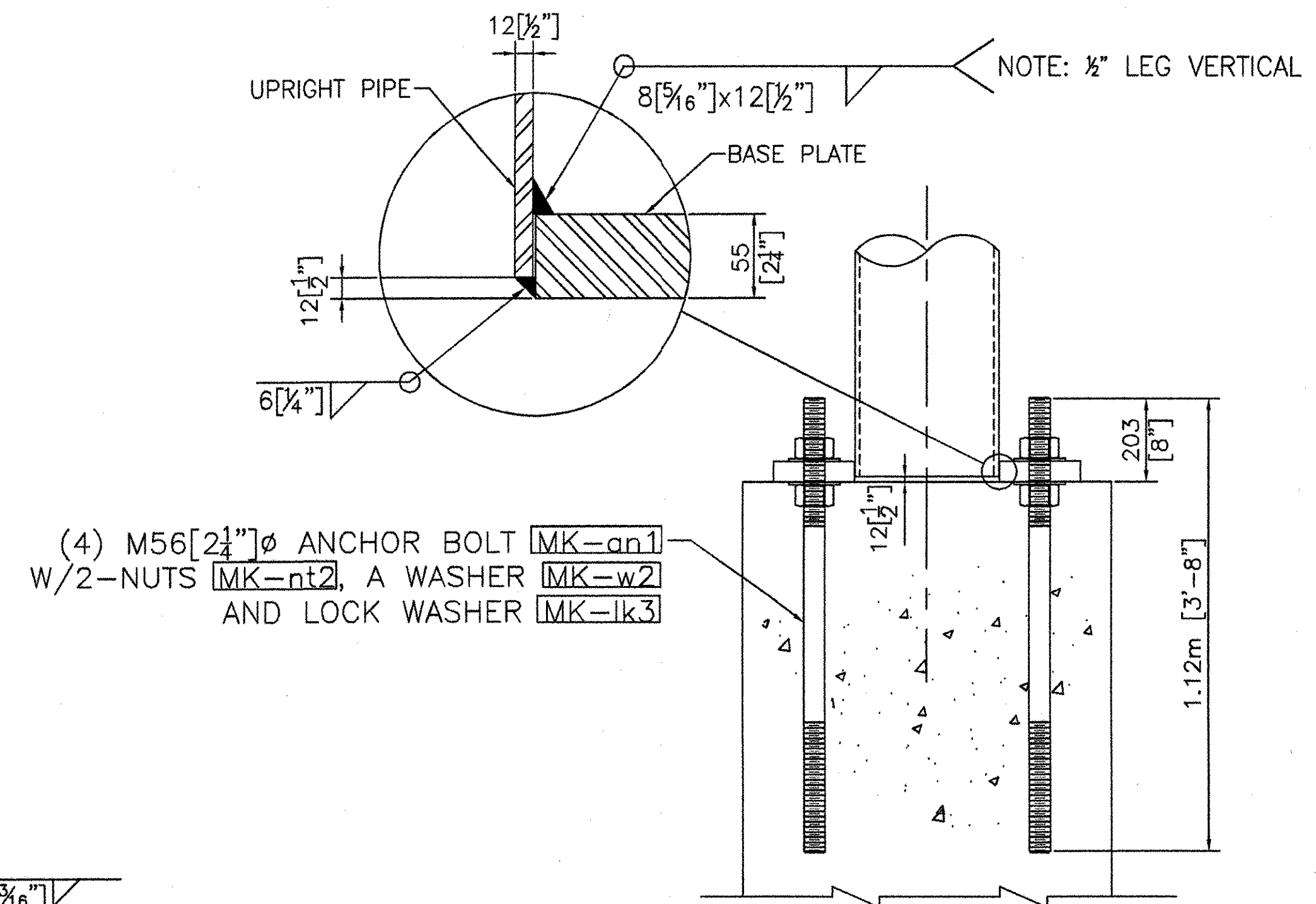


HIGHWAY SAFETY CORP. GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE STATE OF VERMONT COUNTY OF CALEDONIA MM 10.050 NB PROJECT No. HES 091-3(42) HES 093-1(10)	DRAWN: MHM CHECKED: P. Radice DATE: 5/23/07 SCALE: NTS HSC REFERENCE NO.: 1587e GENERAL CONTRACTOR: D SUB CONTRACTOR: F.R. LAFAYETTE SIZE: D SHEET NO.: 3 of 8

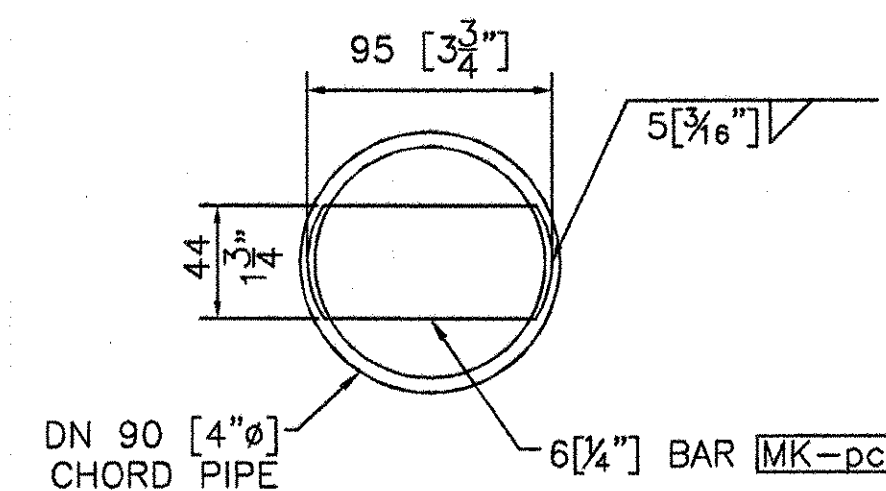
REVISIONS		
No.	Remarks	Date
0	Initial submittal	



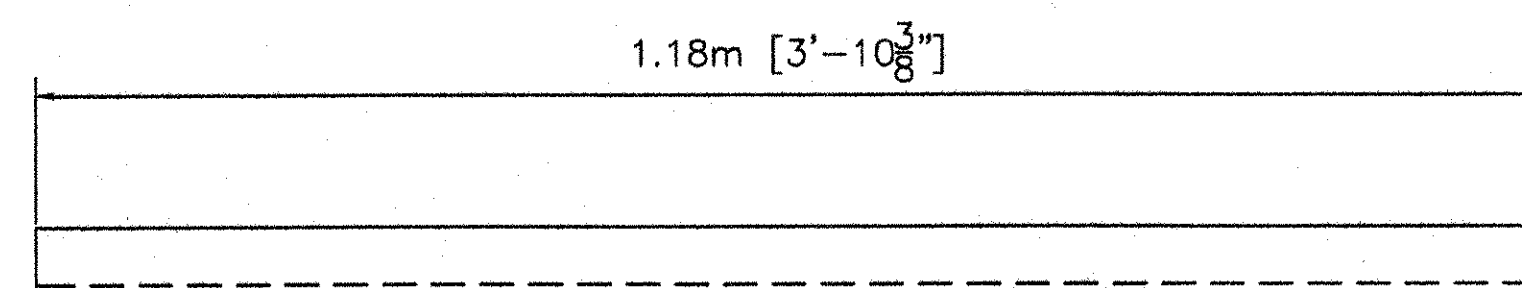
TRUSS CONNECTION DETAIL



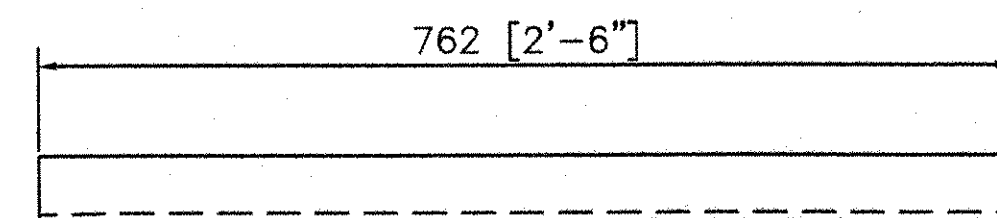
ANCHORAGE ASSEMBLY



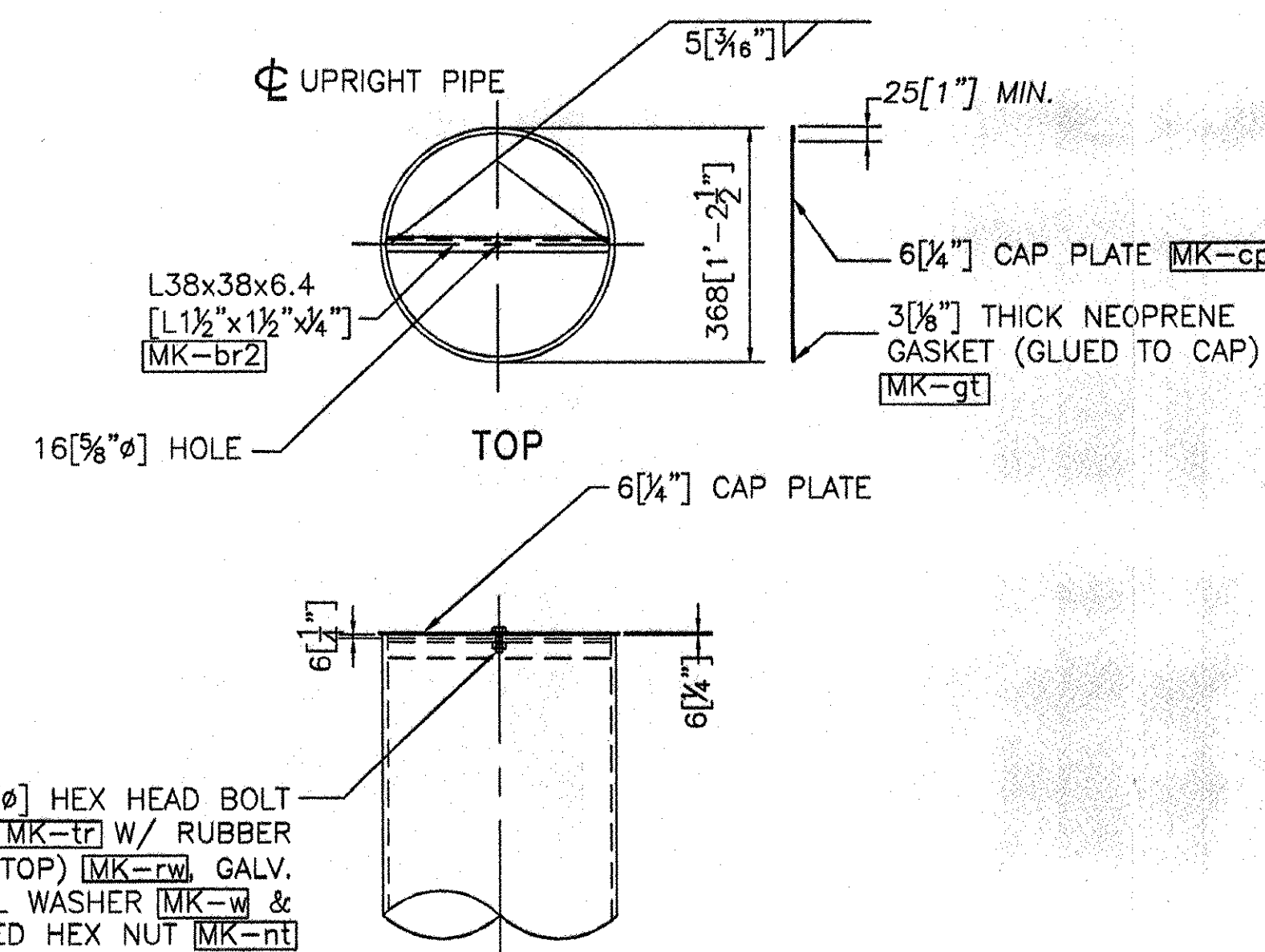
PLUG DETAIL
(EACH END OF TRUSS CHORD)



MK-ag3
L51x51x6.4
[L2x2x 1/4"]



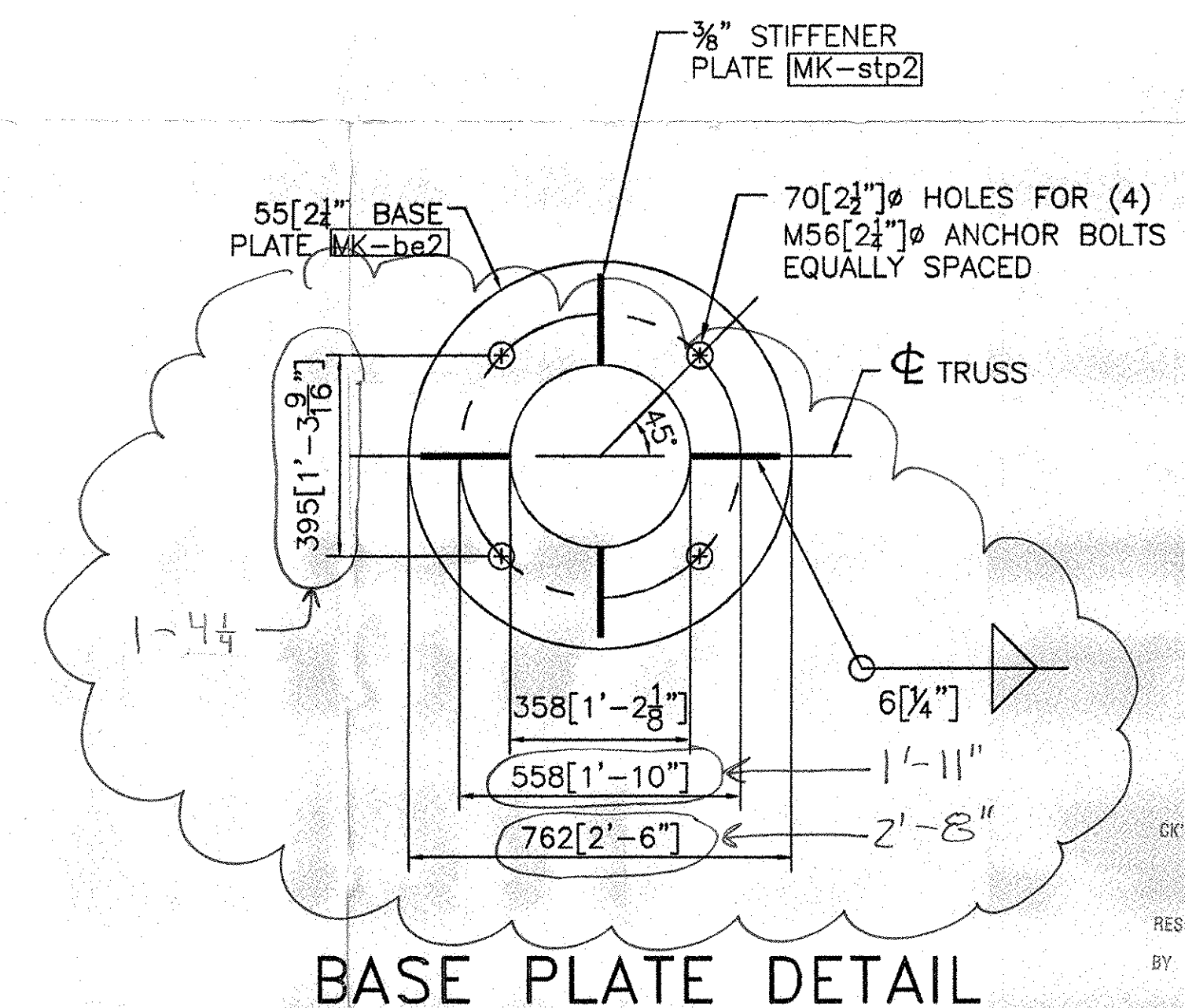
MK-ag2
L51x51x6.4
[L2x2x 1/4"]



UPRIGHT CAP DETAIL

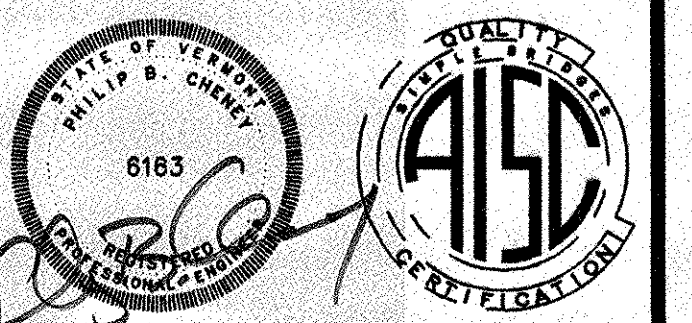
ASSEMBLE CAP TO POST PRIOR TO SHIPPING.

NOTE:
BASE PLATE SHALL BE STAMPED WITH THE VERTICAL POLE DIAMETER (VD.), HEIGHT (VHT.), YIELD STRENGTH (VYS.), GAUGE (VGE.), AND SAME FOR HORIZONTAL MEMBER (HD.), (HYS.), AND (HGE.).



BASE PLATE DETAIL

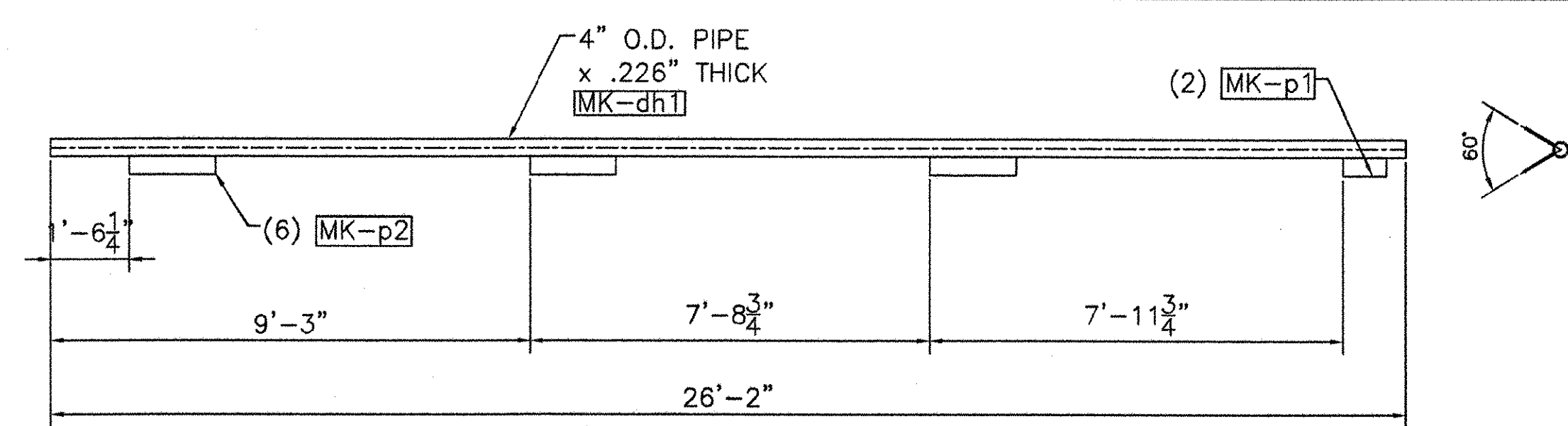
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JUL 27 2007
RESUBMIT: [Signature] APPROVED: [Signature] AS NOTED
BY: [Signature] DATE: 08/02/07



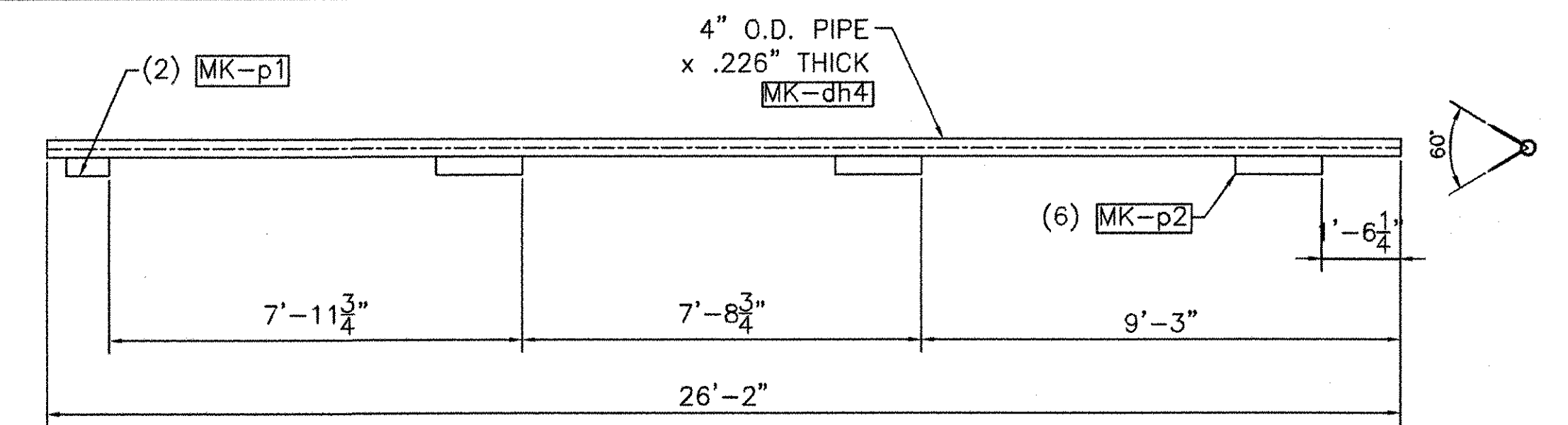
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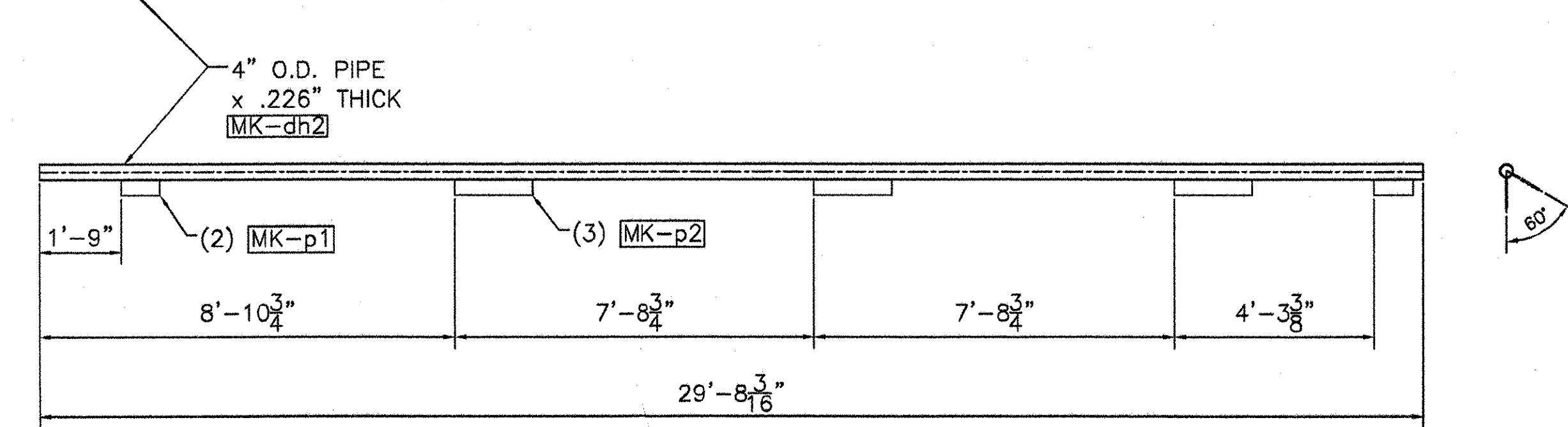
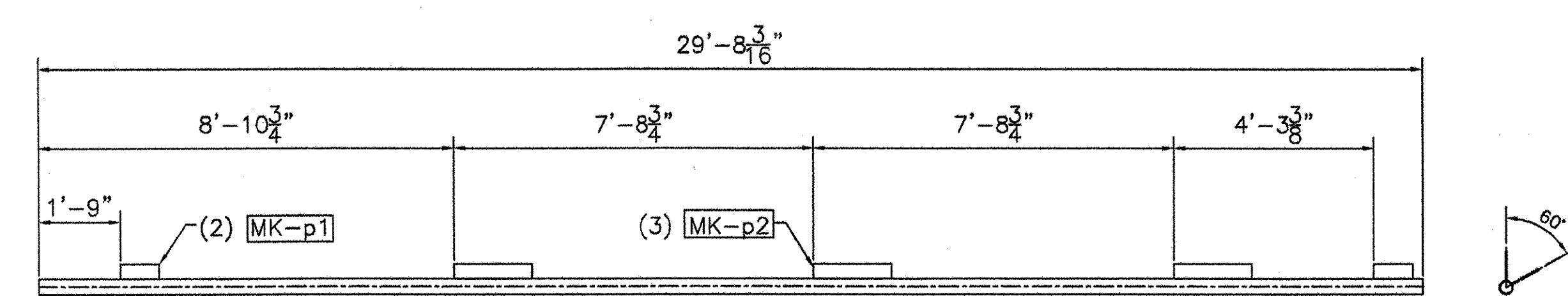
HIGHWAY SAFETY CORP. GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE STATE OF VERMONT COUNTY OF CALEDONIA MM 10.050 NB PROJECT No. HES 091-3(42) HES 093-1(10)	
DRAWN: MMH CHECKED: P. Radice DATE: 5/23/07 SCALE: NTS HSC REFERENCE NO.: 1587e GENERAL CONTRACTOR: [Signature] SUB CONTRACTOR: F.R. LAFAYETTE	SIZE: D REVISION: 0 SHEET NO.: 4 of 8



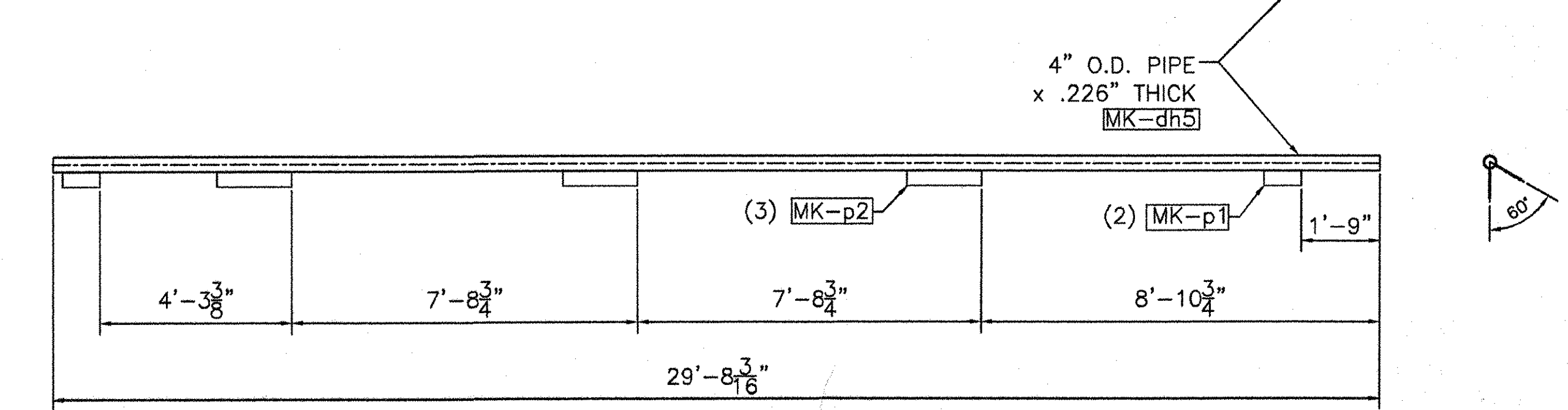
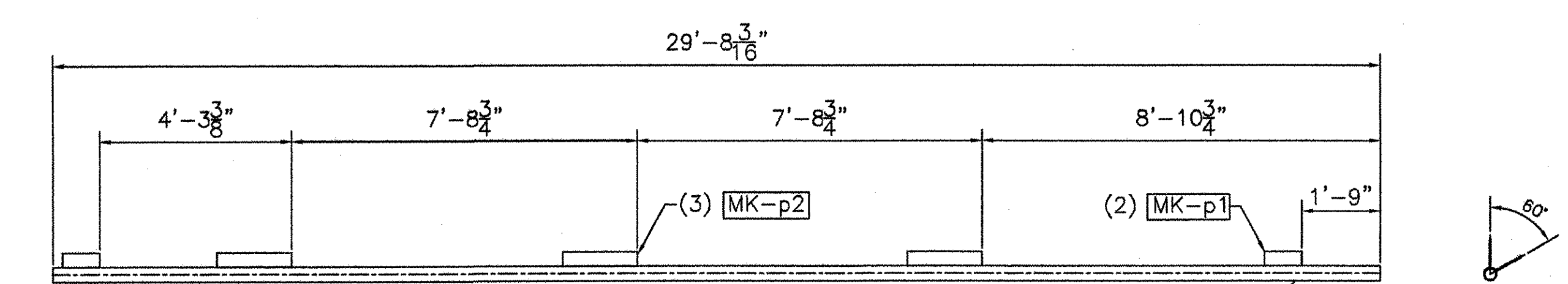
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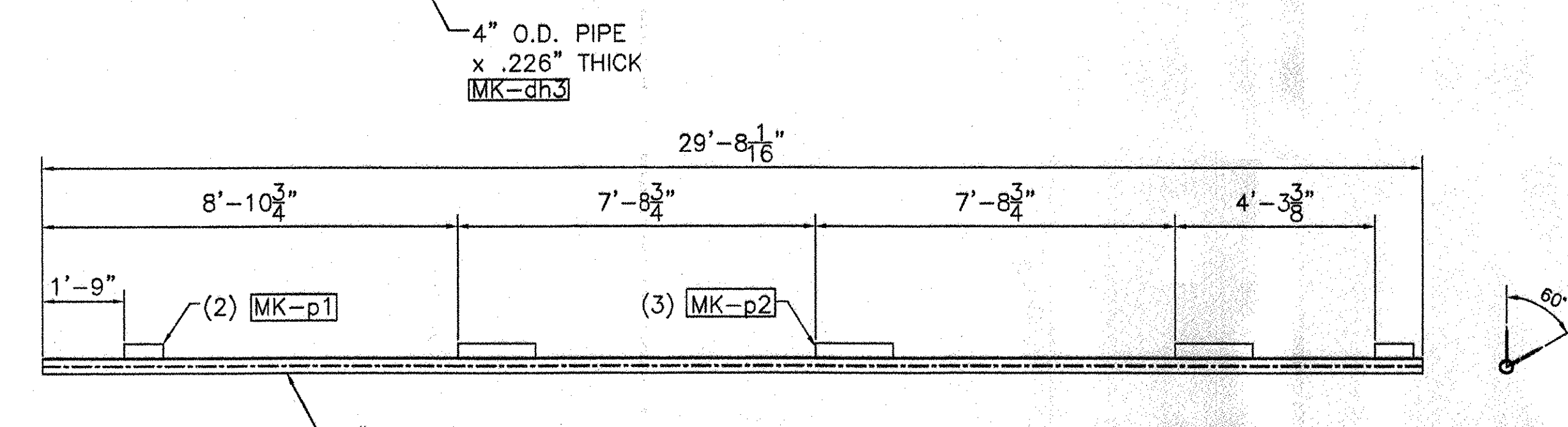
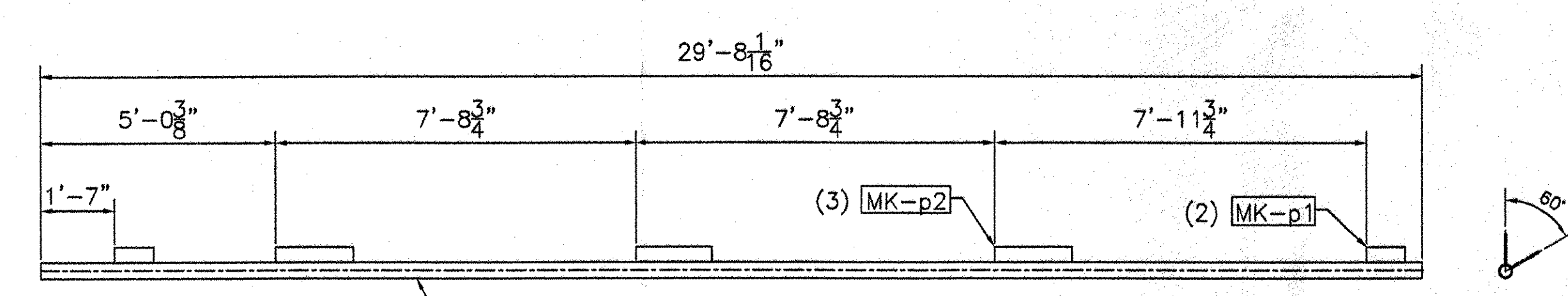
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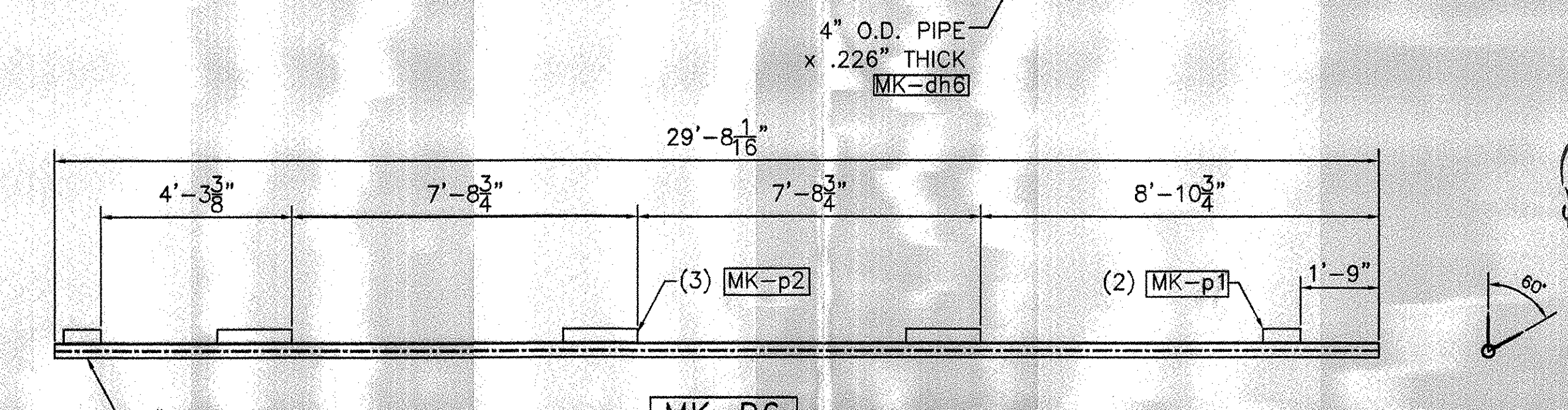
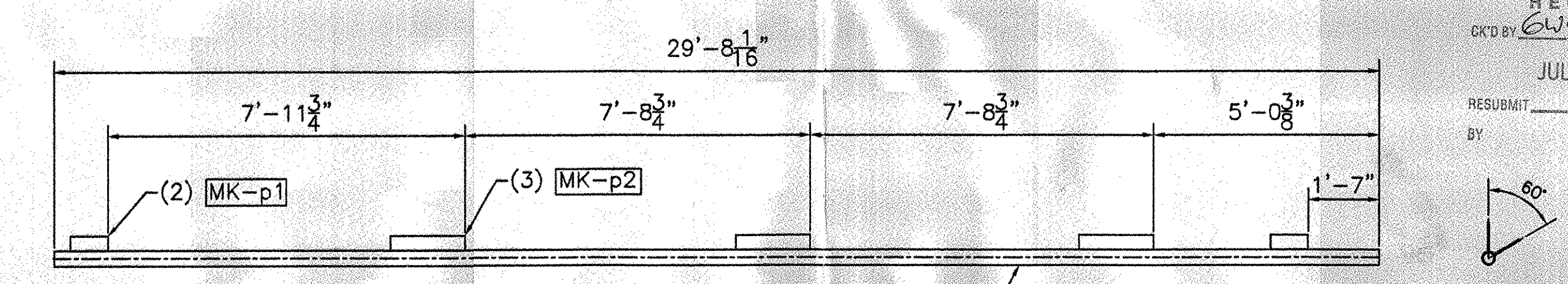
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MK-D5

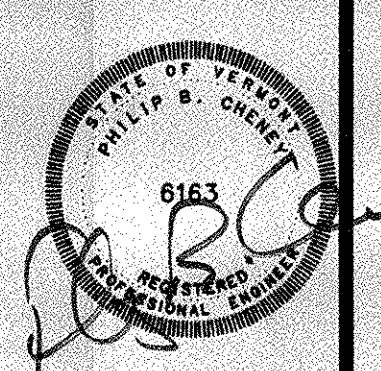


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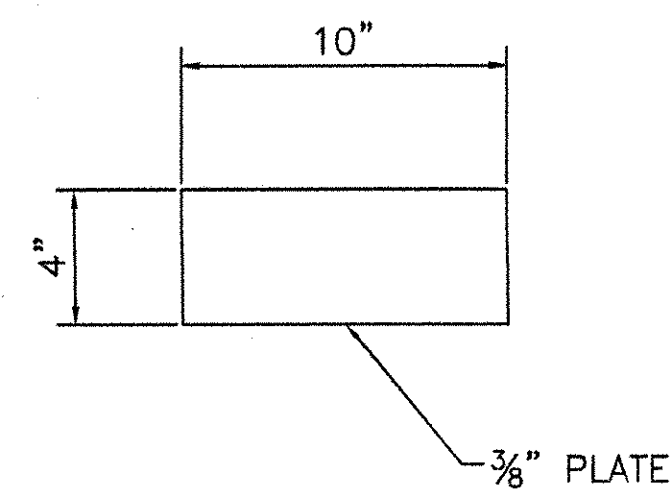
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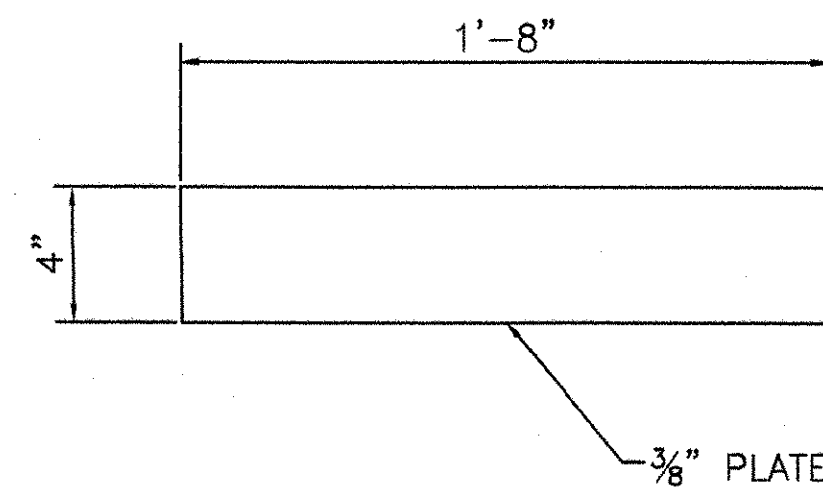


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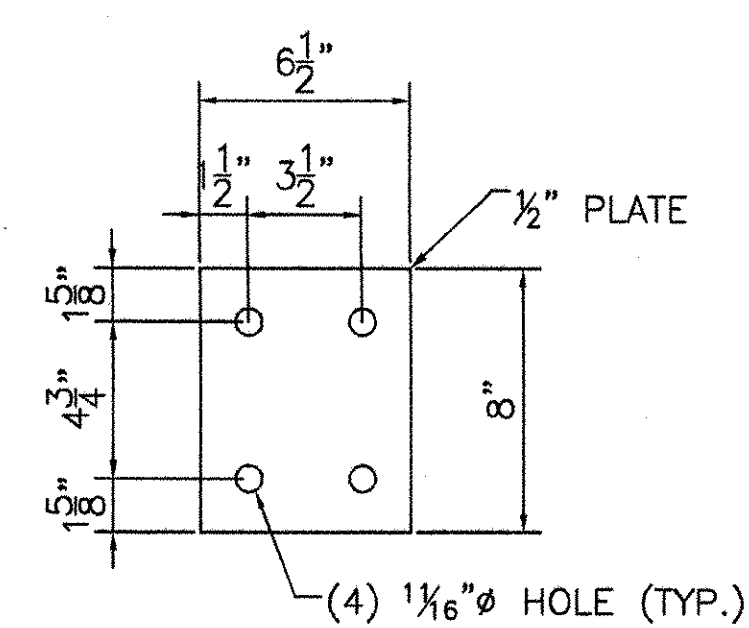
HIGHWAY SAFETY CORP. GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE STATE OF VERMONT COUNTY OF CALEDONIA MM 10.050 NB PROJECT No. HES 091-3(42) HES 093-1(10)	
GENERAL CONTRACTOR SUB CONTRACTOR F.R. LAFAYETTE	DRAWN: MHM CHECKED: P. Radice DATE: 5/23/07 SCALE: NTS HSC REFERENCE NO.: 1587e SIZE: D REVISION: 0 SHEET NO.: 5 of 8



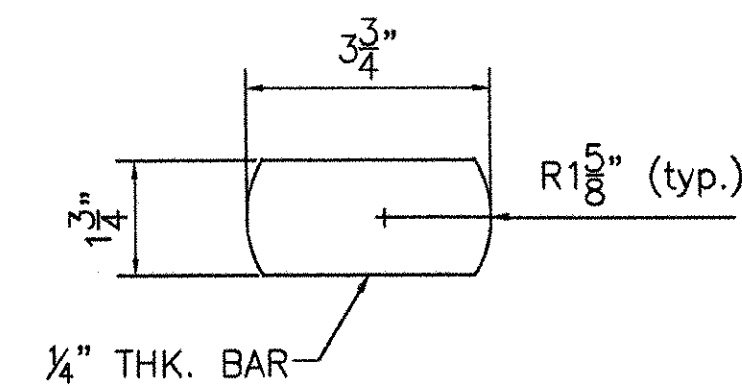
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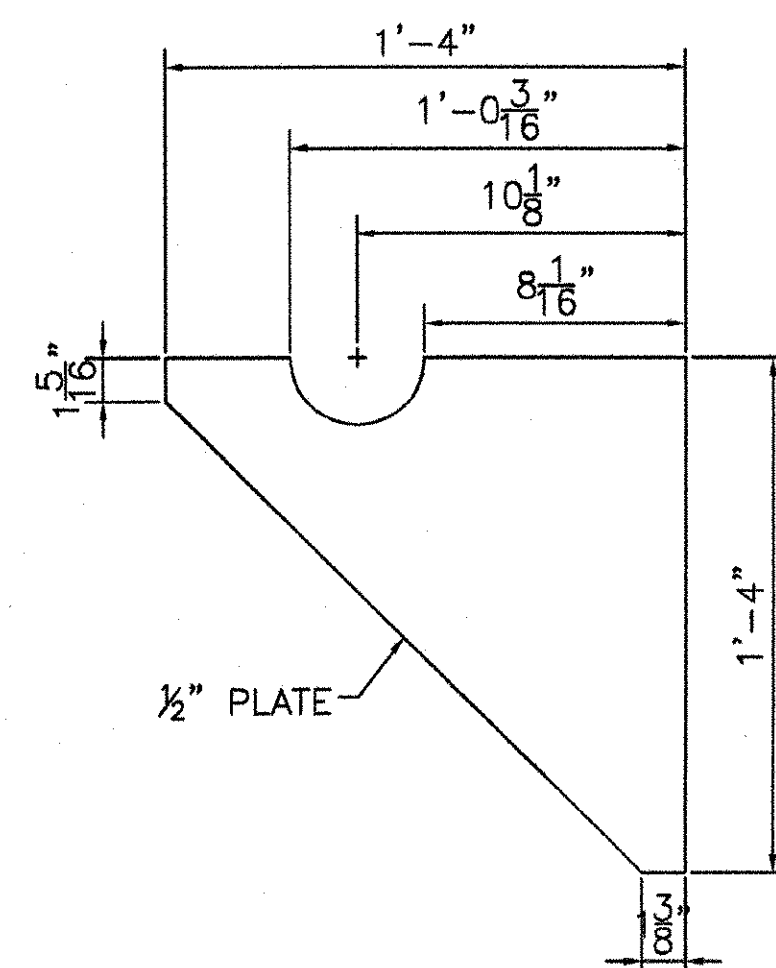
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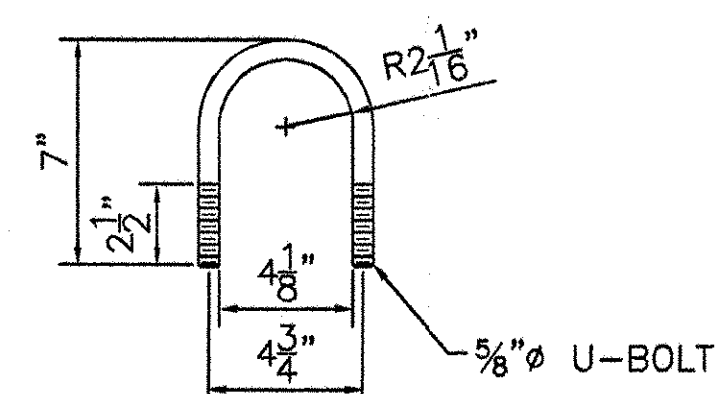
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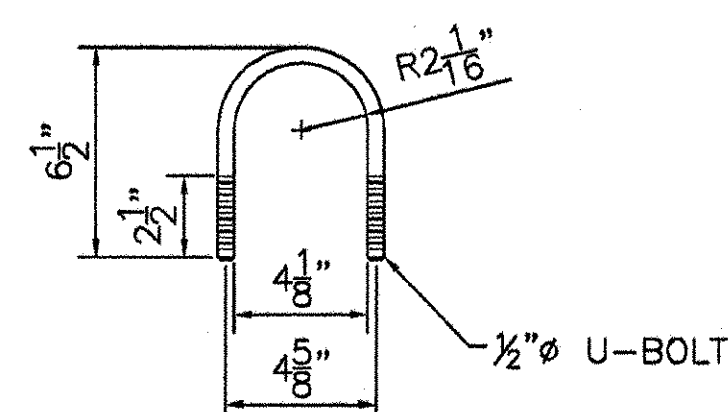
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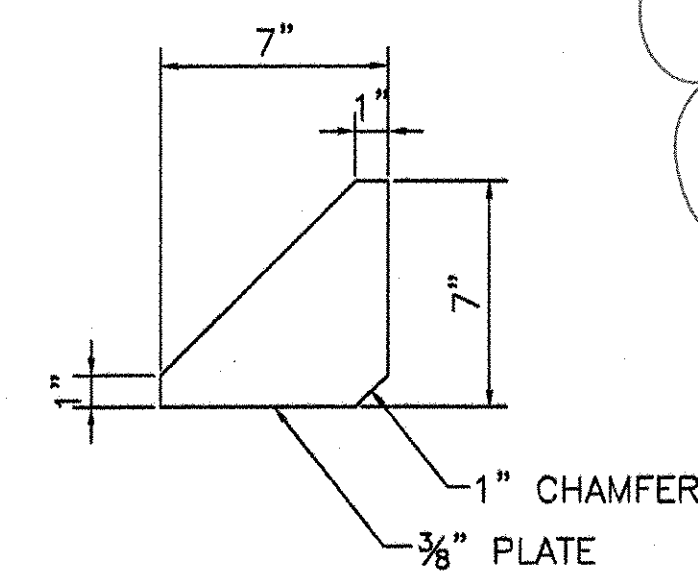
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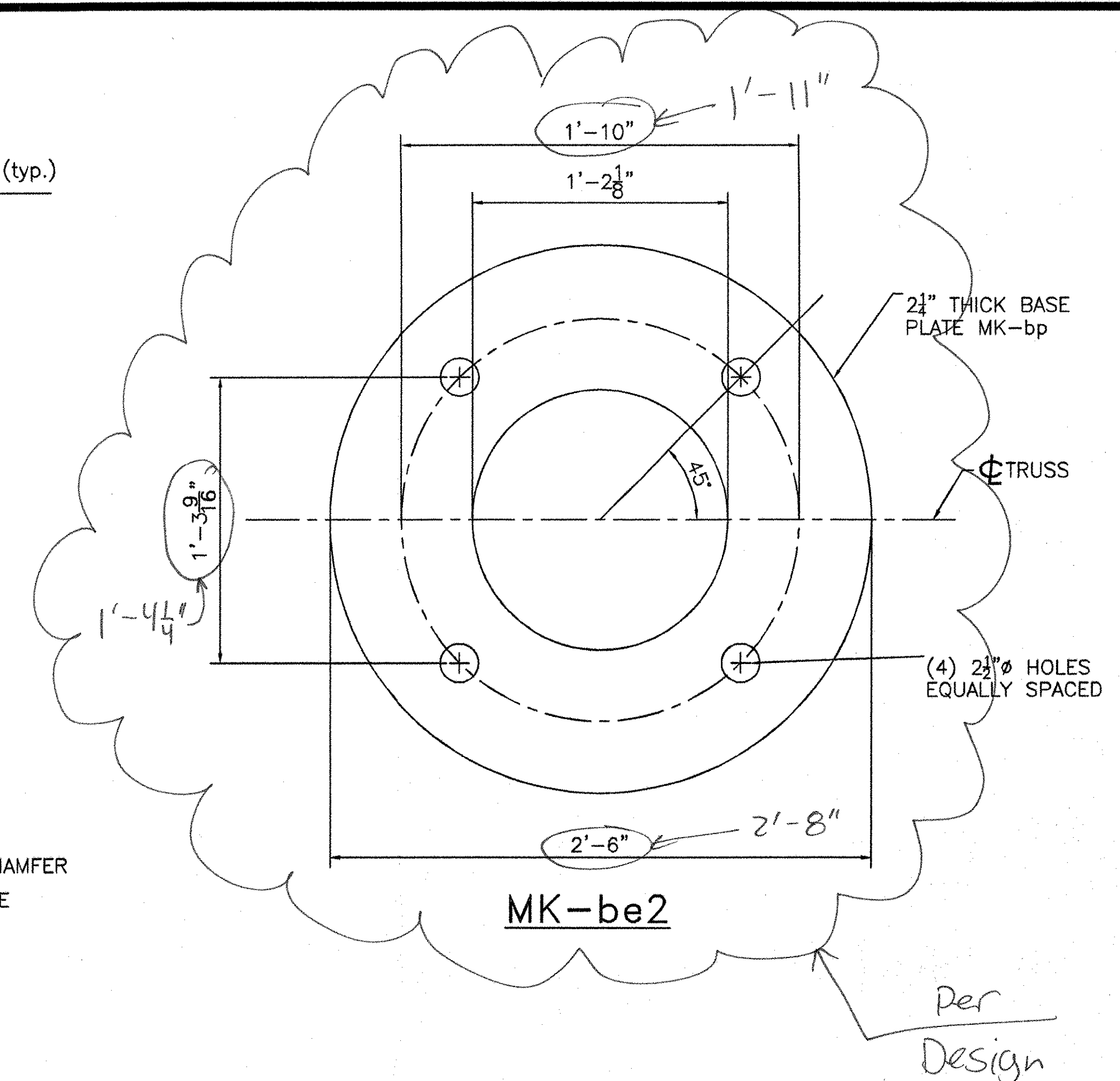
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MK-su1

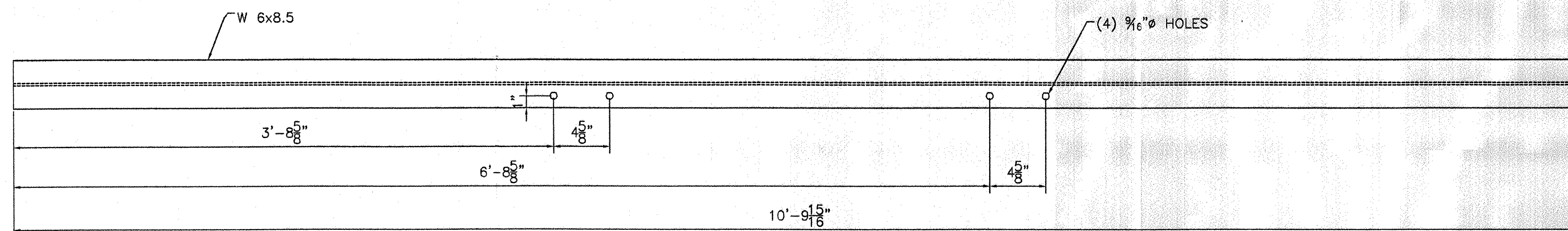


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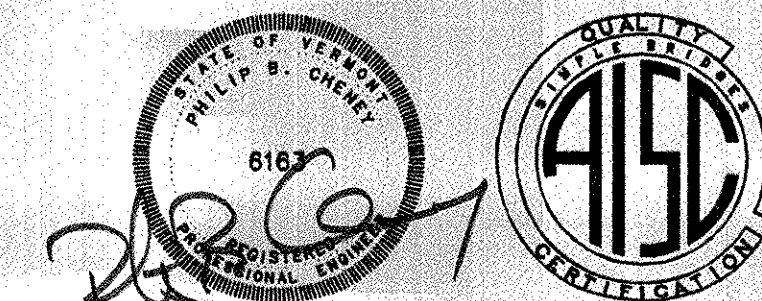
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Per
Design



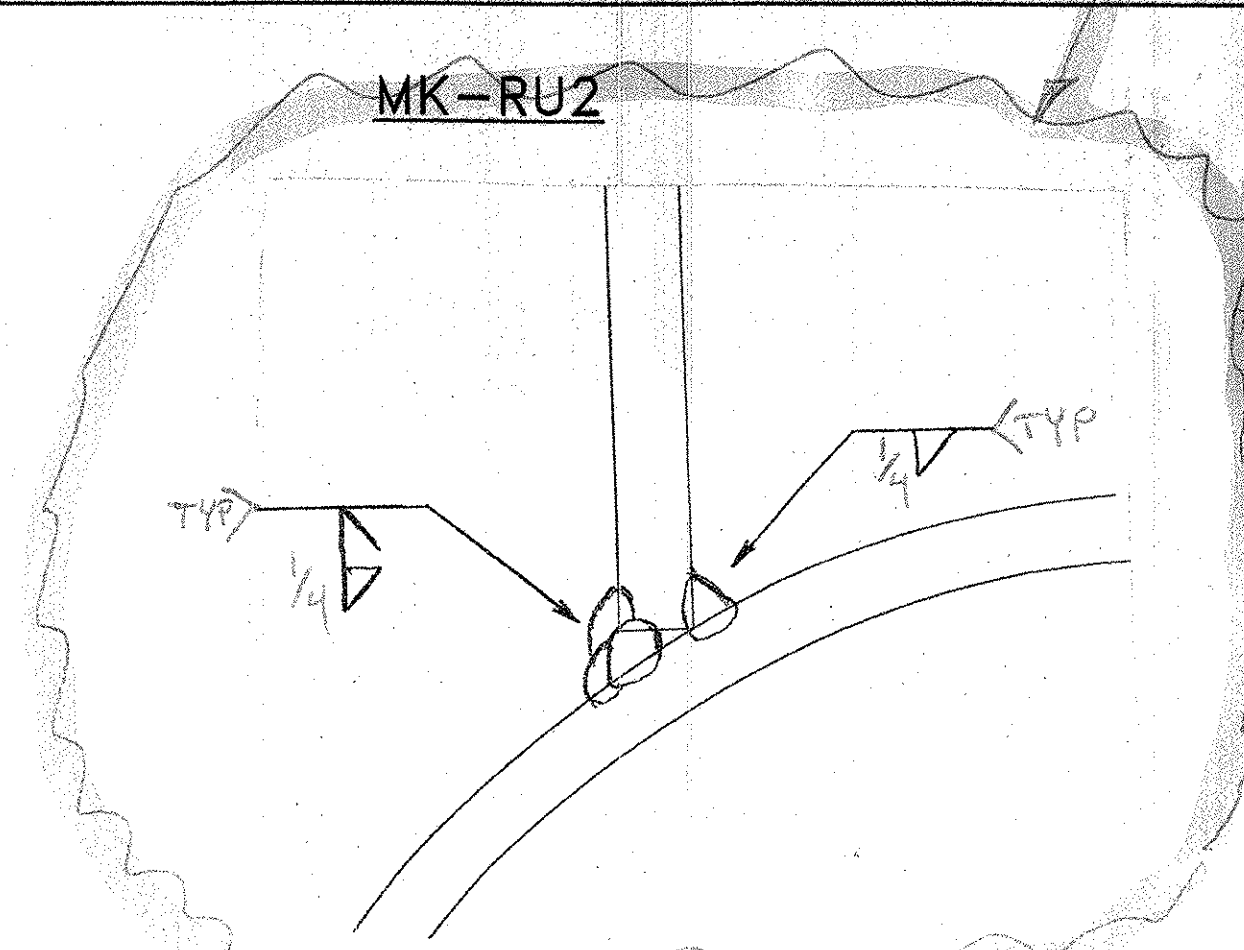
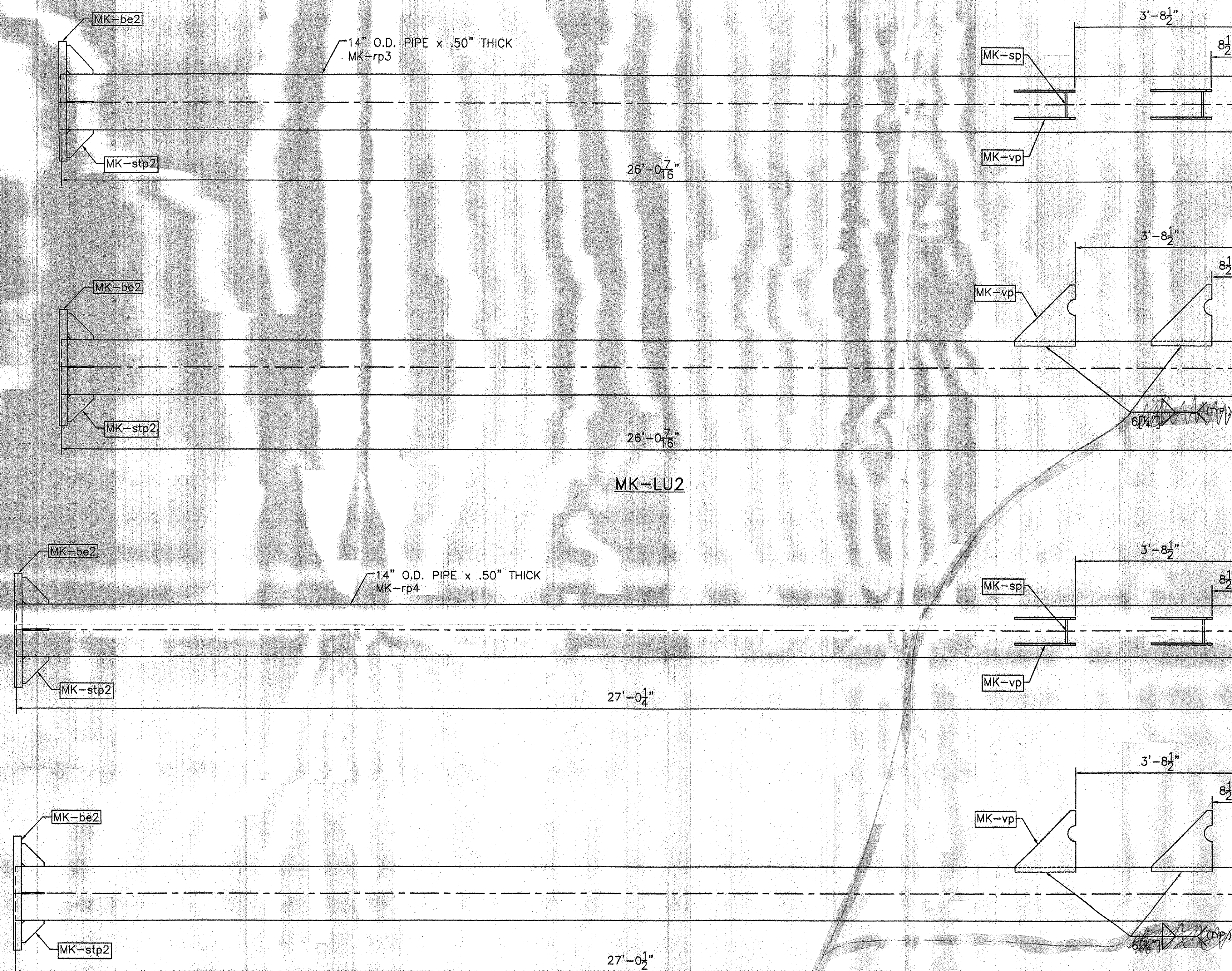
MK-sv6

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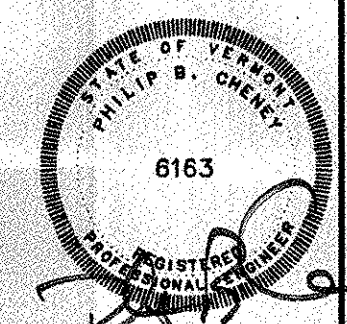
HIGHWAY SAFETY CORP. GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE STATE OF VERMONT COUNTY OF CALEDONIA MM 10.050 NB PROJECT No. HES 091-3(42) HES 093-1(10)	
GENERAL CONTRACTOR	F.R. LAFAYETTE
SUB CONTRACTOR	
DRAWN CHECKED <i>P Radice</i> DATE 5/23/07 SCALE NTS HSC REFERENCE NO. 1587e SIZE D SHEET NO. 6 of 8	MHM 5/23/07 NTS 1587e 0



REVISIONS		
No.	Remarks	Date
0	Initial submittal	

erection mark	piece qty	item description	size/shape	length/qty per unit	material notes
TRUSS 1 ASSEMBLY					
CHORD PIPE ASSEMBLY					
dh1	1	pipe	4" O.D. x 0.226" wall	26'-2"	A500 gr B
p1	2	plate	PL 0.375" x 4"	10"	API 5LX42
p2	6	plate	PL 0.375" x 4"	1'-8"	A708 gr 50
ag3	14	angle	L2"x2"x25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x25"	2'-6"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A708 gr 50
D2 CHORD PIPE ASSEMBLY					
dh2	1	pipe	4" O.D. x 0.226" wall	29'-8.187"	A500 gr B
p1	4	plate	PL 0.375" x 4"	10"	API 5LX42
p2	6	plate	PL 0.375" x 4"	1'-8"	A708 gr 50
ag3	7	angle	L2"x2"x25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x25"	2'-6"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A708 gr 50
D3 CHORD PIPE ASSEMBLY					
dh3	1	pipe	4" O.D. x 0.226" wall	29'-8.062"	A500 gr B
p1	4	plate	PL 0.375" x 4"	10"	API 5LX42
p2	6	plate	PL 0.375" x 4"	1'-8"	A708 gr 50
ag3	7	angle	L2"x2"x25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x25"	2'-6"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A708 gr 50
TRUSS 2 ASSEMBLY					
CHORD PIPE ASSEMBLY					
dh4	1	pipe	4" O.D. x 0.226" wall	26'-2"	A500 gr B
p1	2	plate	PL 0.375" x 4"	10"	API 5LX42
p2	6	plate	PL 0.375" x 4"	1'-8"	A708 gr 50
ag3	14	angle	L2"x2"x25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x25"	2'-6"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A708 gr 50
D5 CHORD PIPE ASSEMBLY					
dh5	1	pipe	4" O.D. x 0.226" wall	29'-8.187"	A500 gr B
p1	4	plate	PL 0.375" x 4"	10"	API 5LX42
p2	6	plate	PL 0.375" x 4"	1'-8"	A708 gr 50
ag3	7	angle	L2"x2"x25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x25"	2'-6"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A708 gr 50
D6 CHORD PIPE ASSEMBLY					
dh6	1	pipe	4" O.D. x 0.226" wall	29'-8.062"	A500 gr B
p1	4	plate	PL 0.375" x 4"	10"	API 5LX42
p2	6	plate	PL 0.375" x 4"	1'-8"	A708 gr 50
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A708 gr 50
VERTICAL PIPE ASSEMBLY					
LEFT PIPE ASSEMBLY					
rp3	1	pipe	14" O.D. x 0.50" wall	26'-0.437"	A500 gr B
sp	2	plate	PL 0.5" x 6.5"	8"	API 5LX42
vp	4	plate	PL 0.5" x 1'-4"	1'-4"	A708 gr 50
cp	1	plate	0.25" x 1'-2.5" O.D.		A36
br2	1	angle	L1.5"x1.5"x25"	1'-1"	A36
gt	1	gasket	125"x1'-2.5" O.D.		50 duro. Neoprene
nl	1	hex nut	50" dia.		A563
tr	1	hex bolt	50" dia.	1.5"	A325
w	1	washer	50" dia.		F844
rw	1	rubber washer	50" dia.		50 duro. Neoprene
stb2	4	plate	PL 0.375" x 7"	7"	A708 gr 50
be2	1	base plate	2.25" x 2'-6" O.D.		A708 gr 50
RU2 RIGHT PIPE ASSEMBLY					
rp4	1	pipe	14" O.D. x 0.50" wall	27'-0.50"	A500 gr B
sp	2	plate	PL 0.5" x 6.5"	8"	API 5LX42
vp	4	plate	PL 0.5" x 1'-4"	1'-4"	A708 gr 50
cp	1	plate	0.25" x 1'-2.5" O.D.		A36
br2	1	angle	L1.5"x1.5"x25"	1'-1"	A36
gt	1	gasket	125"x1'-2.5" O.D.		50 duro. Neoprene
nl	1	hex nut	50" dia.		A563
tr	1	hex bolt	50" dia.	1.5"	A325
w	1	washer	50" dia.		F844
rw	1	rubber washer	50" dia.		50 duro. Neoprene
stb2	4	plate	PL 0.375" x 7"	7"	A708 gr 50
be2	1	base plate	2.25" x 2'-6" O.D.		A708 gr 50
LOOSE ITEMS					
svs	10	sign hanger	W6x8.5	10'-0.937"	A36
ubk	8	u-bolt	0.625" dia.	7"	F1554 Gr. 36
lwk	16	lock nut	0.625" dia.		A563 DH
ubw	16	washer	0.625" dia.		F436
sur	20	u-bolt	0.50" dia.	6.5"	F1554 Gr. 36
skt	40	lock nut	0.50" dia.		A563 DH
ew	40	washer	0.50" dia.		F436
bt1	24	hex bolt	0.75" dia.	3"	A325
bt2	24	washer	0.75" dia.		F543
bt3	24	hex nut	0.75" dia.		A563 DH
an	8	anchor bolt	2.25" dia.	3'-8"	S/S A276 T304
lt	16	hex nut	2.25" dia.		S/S A1943 T304
lt3	8	lock washer	2.25" dia.		S/S TY 304
w2	8	flat washer	2.25" dia.		S/S TY 304

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 JUL 27 2007
 RESUBMIT: *[Signature]* APPROVED: *[Signature]*
 BY: *[Signature]* DATE: 08/02/07



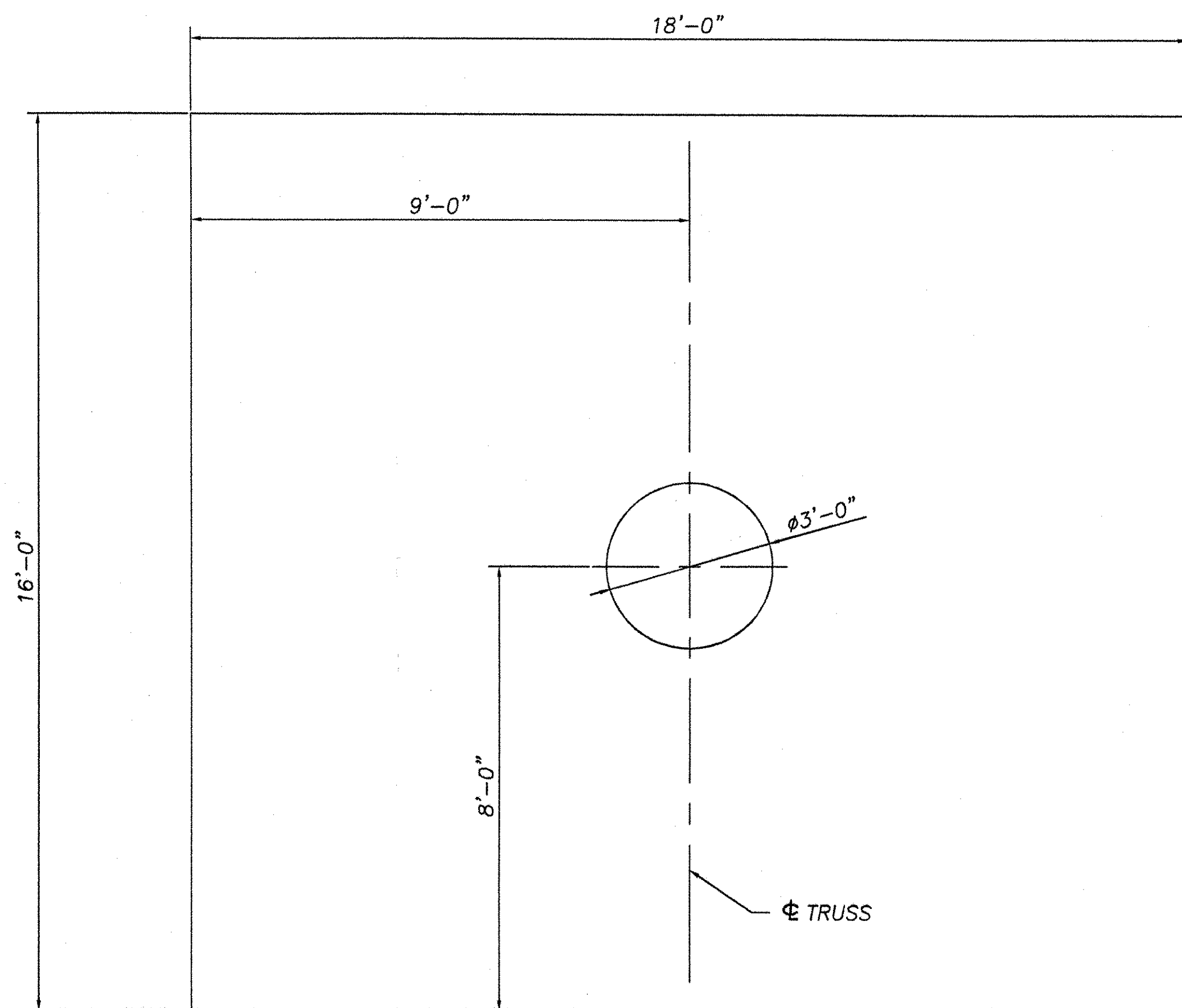
HIGHWAY SAFETY CORP.
 GLASTONBURY, CT

TRI-CHORD SIGN STRUCTURE
 STATE OF VERMONT
 COUNTY OF CALEDONIA
 MM 10.050 NB
 PROJECT No. HES 091-3(42)
 HES 093-1(10)

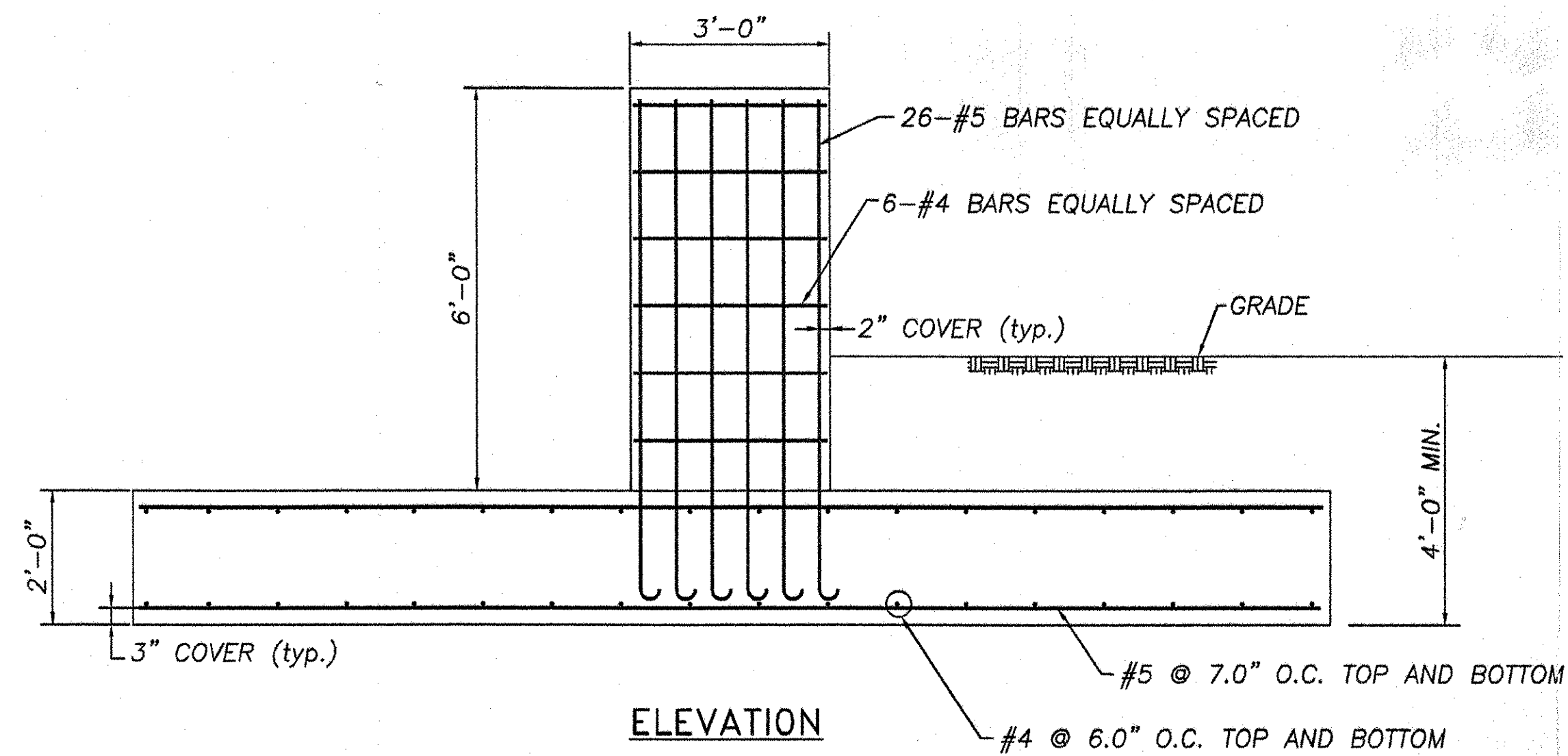
GENERAL CONTRACTOR: *[Blank]*
 SUB CONTRACTOR: F.R. LAFAYETTE

DRAWN: MHM
 CHECKED: P. Radice
 DATE: 5/23/07
 SCALE: N.T.S.
 HSC REFERENCE NO.: 1587e
 SIZE: D REVISION: 0
 SHEET NO.: 7 of 8

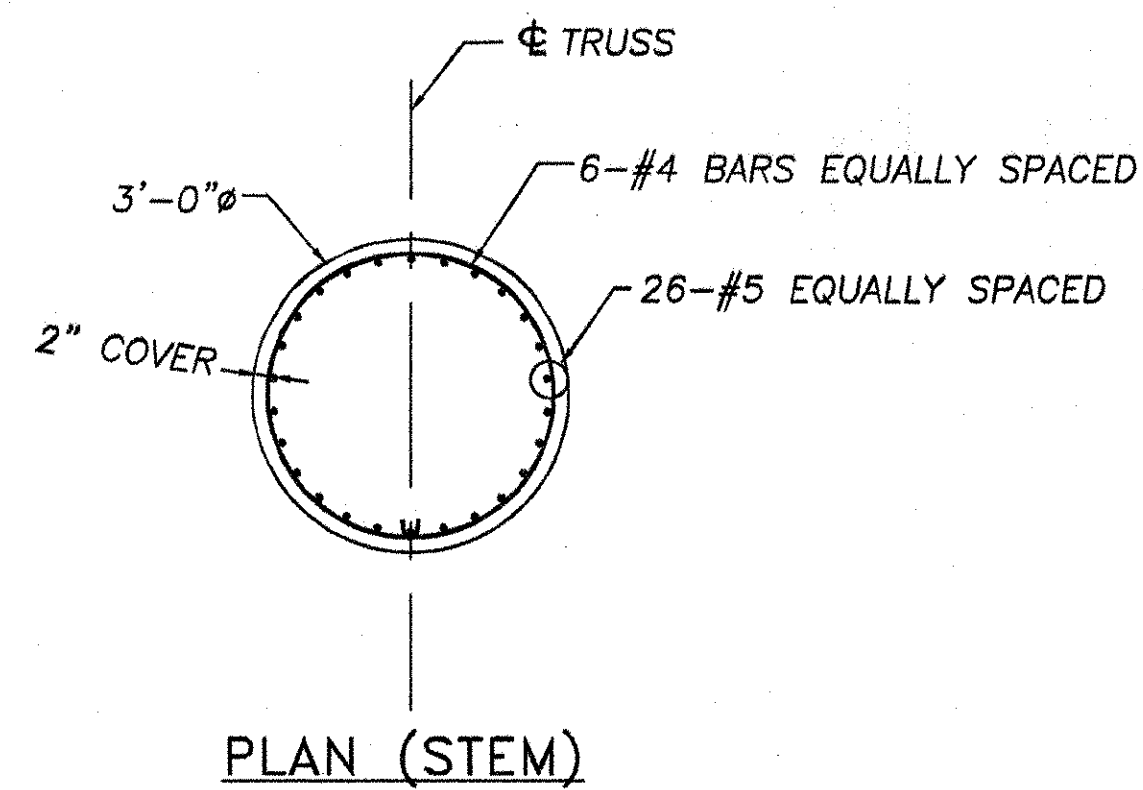
204-516N-e



PLAN



ELEVATION



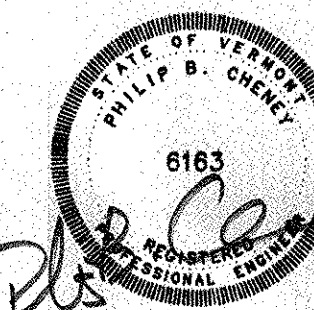
PLAN (STEM)

REBAR LIST

REBAR	PCS. REQD.	LENGTH
#4	12	9'-4"
#4	144	15'-6"
#5	96	17'-6"
#5 (HOOK ONE END)	52	8'-6"

108

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 OK'D BY EWC OK'D BY _____
 JUL 27 2007
 RESUBMIT _____ APPROVED AS NOTED
 BY _____ DATE 08/02/07

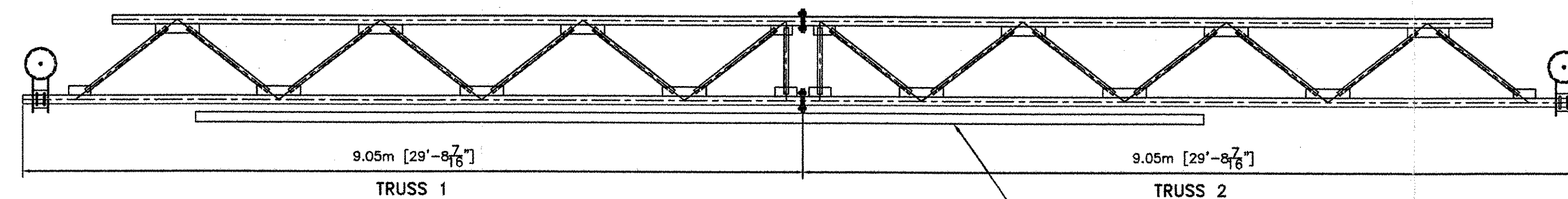


HIGHWAY SAFETY CORP.	
GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE	
STATE OF VERMONT	
COUNTY OF CALEDONIA	
MM 10.050 NB	
PROJECT No. HES 091-3(42)	
HES 093-1(10)	
GENERAL CONTRACTOR	DATE
SUB CONTRACTOR	REVISION
F.R. LAFEYETTE	0
SHEET NO. 8 of 8	

REVISIONS		
No.	Remarks	Date
0	Initial submittal	

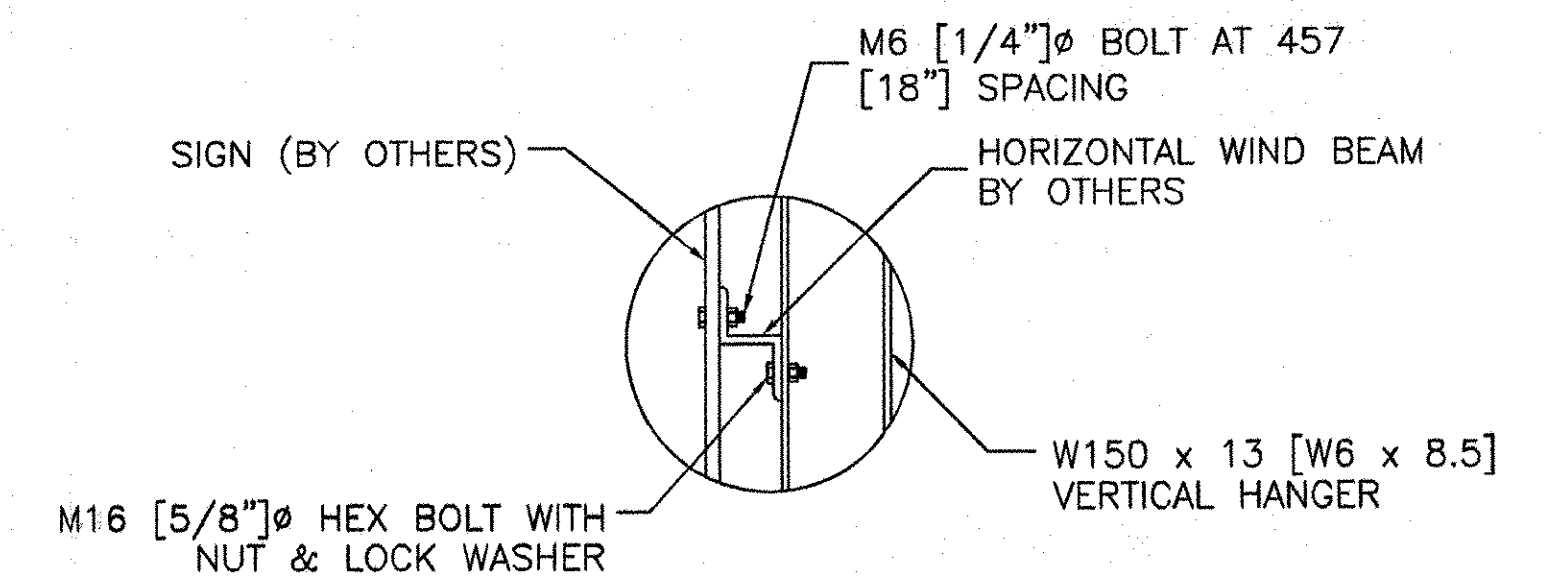
Footings

205-Sign-C

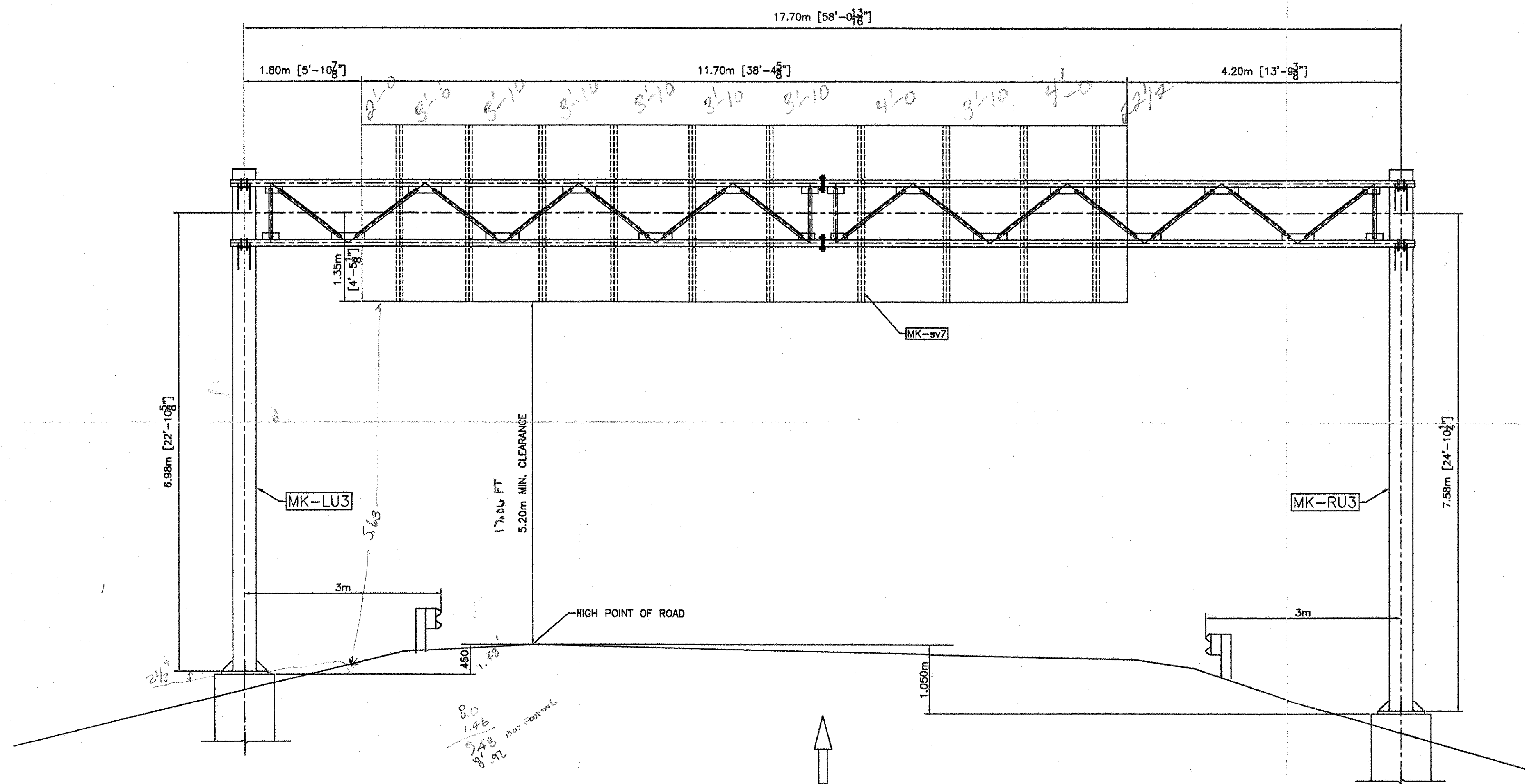


SECTION A

SIGN PANEL (typ.)
BY OTHERS



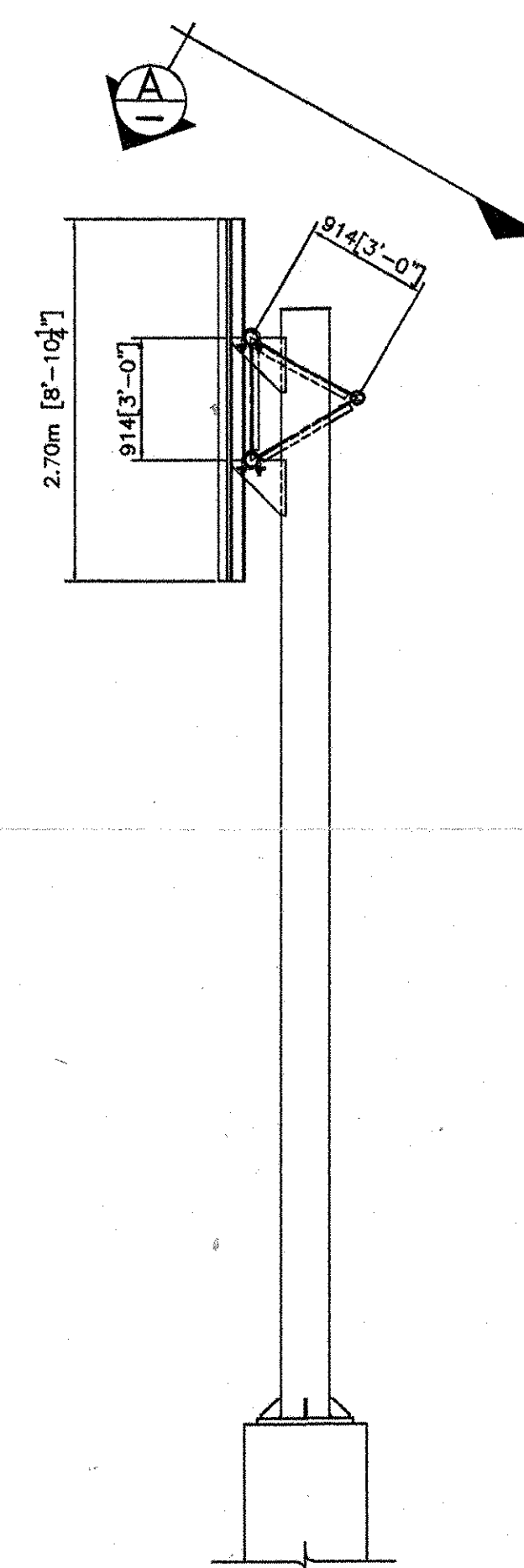
SIGN ATTACHMENT DETAIL



ELEVATION

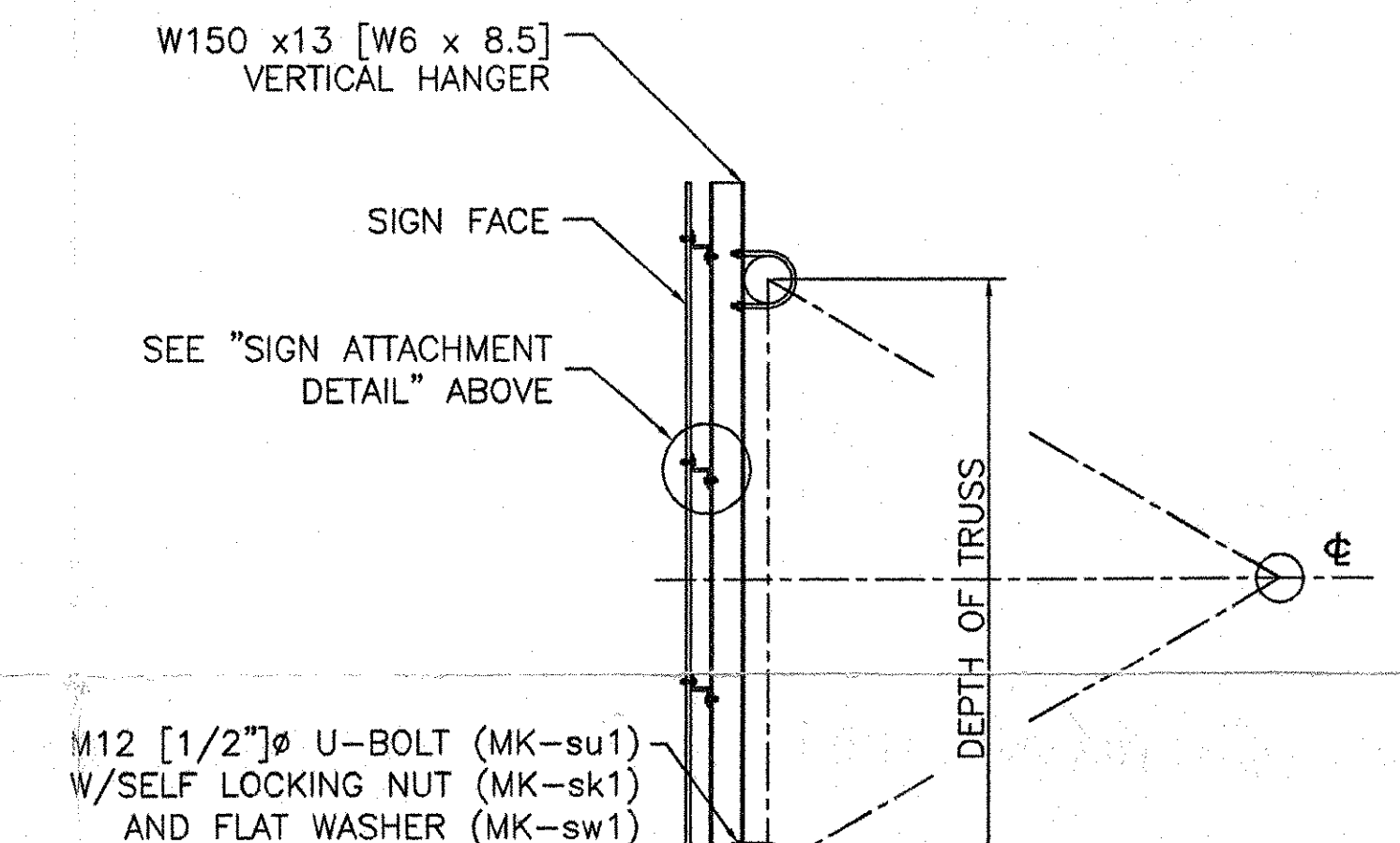
LOOKING AT FACE OF SIGN
(OUT OF PLANE CHORDS NOT SHOWN FOR CLARITY)

FOOTING ELEVATION IS ASSUMED.
CONTRACTOR TO VERIFY ELEVATIONS
BEFORE FABRICATION.

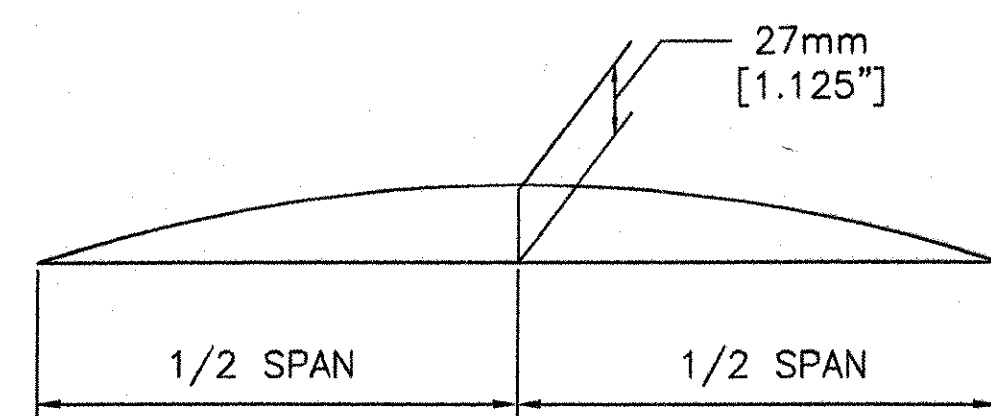


DIRECTION OF TRAFFIC

SIDE VIEW



SIGN MOUNTING DETAIL
VERTICAL HANGER BEAMS & U-BOLTS INCLUDED



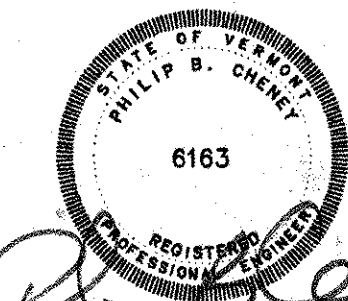
CAMBER DIAGRAM

NOTE:

CAMBER WILL BE ACHIEVED BY SHORTENING LOWER CHORD
PIPES BY AN AMOUNT SUCH THAT POSITIVE UPWARD DEFLECTION
IS PRODUCED WHEN TRUSSES ARE BROUGHT TOGETHER AT
SPICES.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS (mm) UNLESS OTHERWISE
NOTED. ENGLISH CONVERSION SHOWN IN [] FOR REFERENCE ONLY.

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BY _____ DATE 08/07/07



HIGHWAY SAFETY CORP.
GLASTONBURY, CT

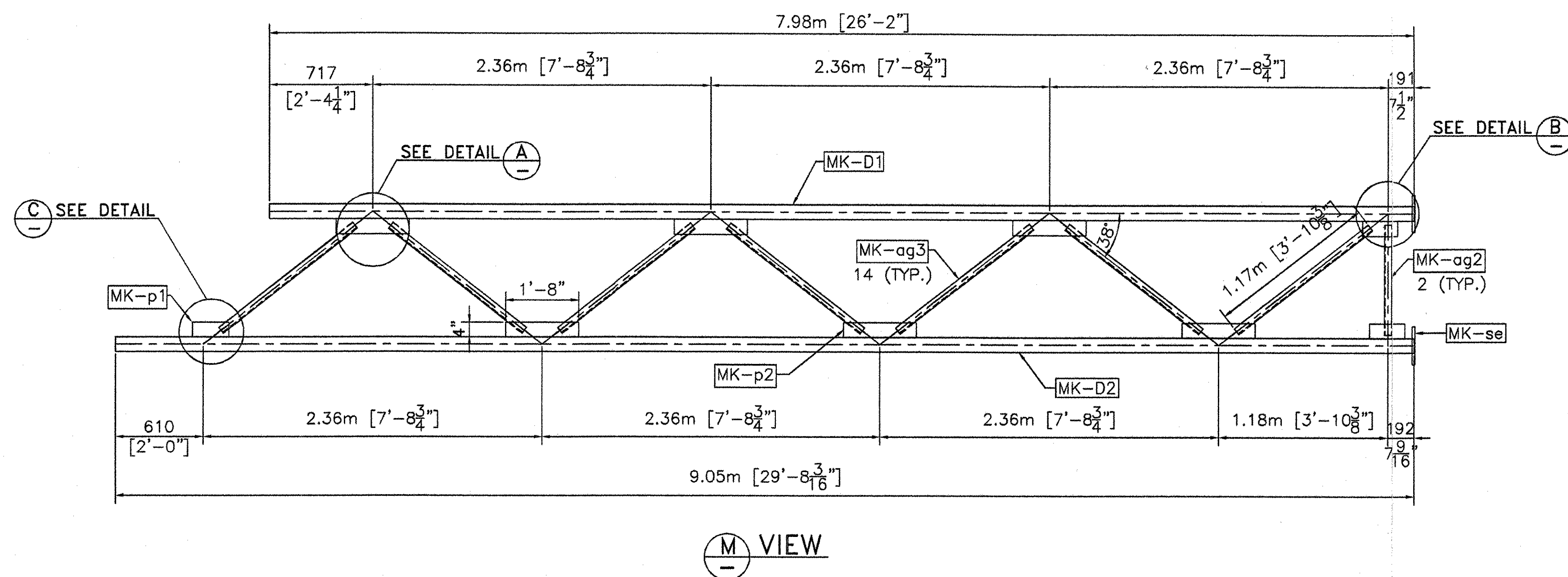
TRI-CHORD SIGN STRUCTURE
STATE OF VERMONT
COUNTY OF CALEDONIA
MM 10.470 NB
PROJECT No. HES 091-3(42)
HES 093-1(10)

GENERAL CONTRACTOR
SUB CONTRACTOR
F.R. LAFAYETTE

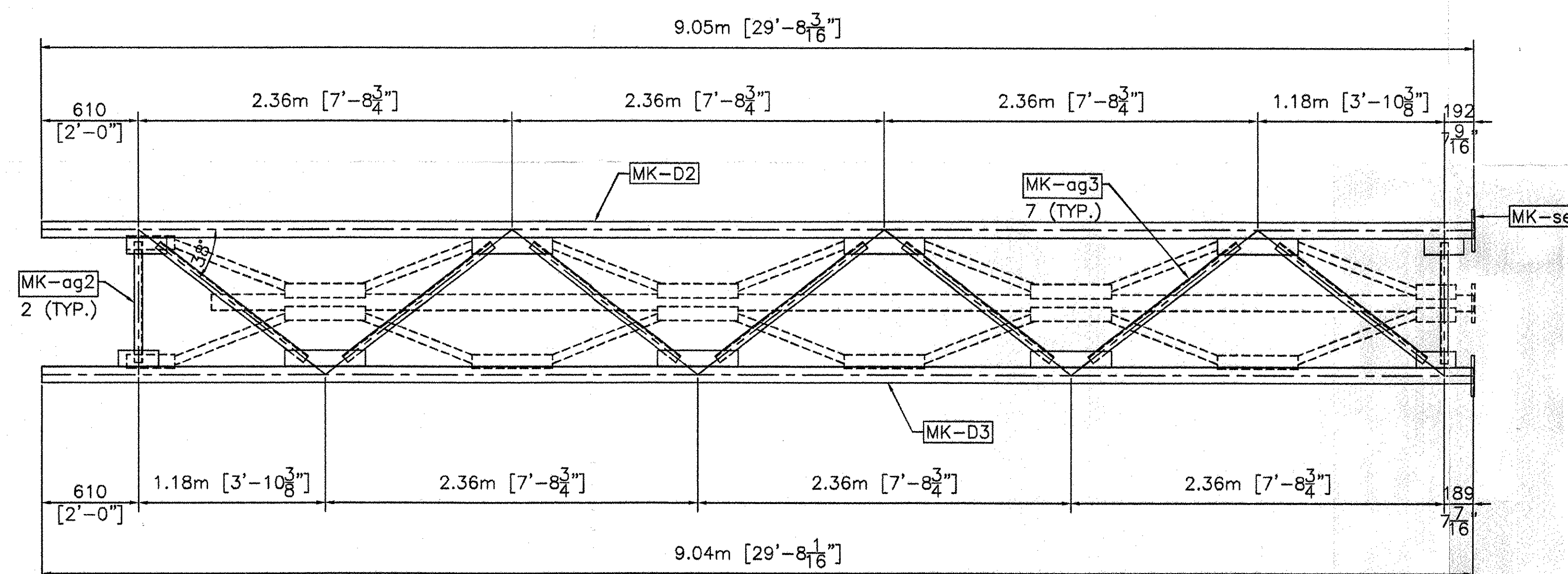
DRAWN MHM
CHECKED P. Radice
DATE 5/23/07
SCALE N.T.S.
HSC REFERENCE NO. 1587f
SIZE D REVISION 0
SHEET NO. 1 of 8

REVISIONS		
No.	Remarks	Date
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210-516N-2

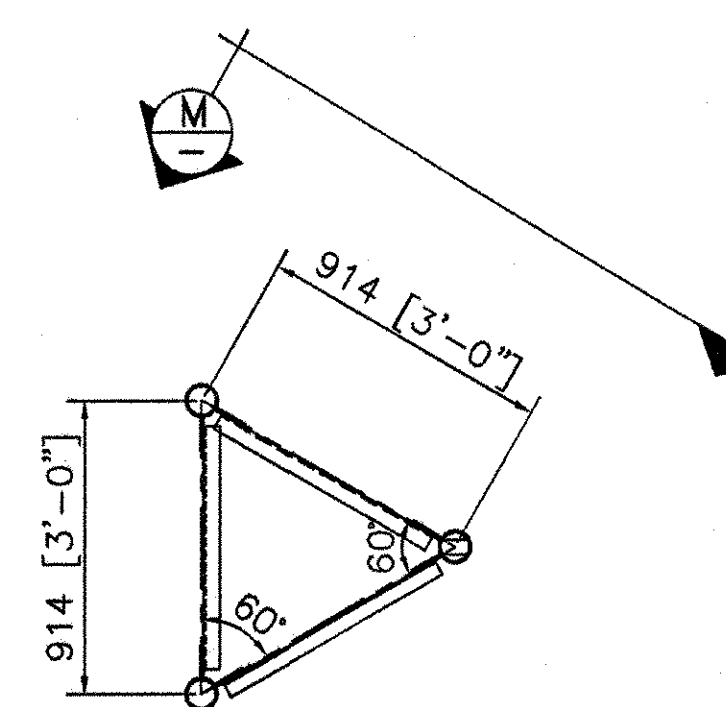


VIEW

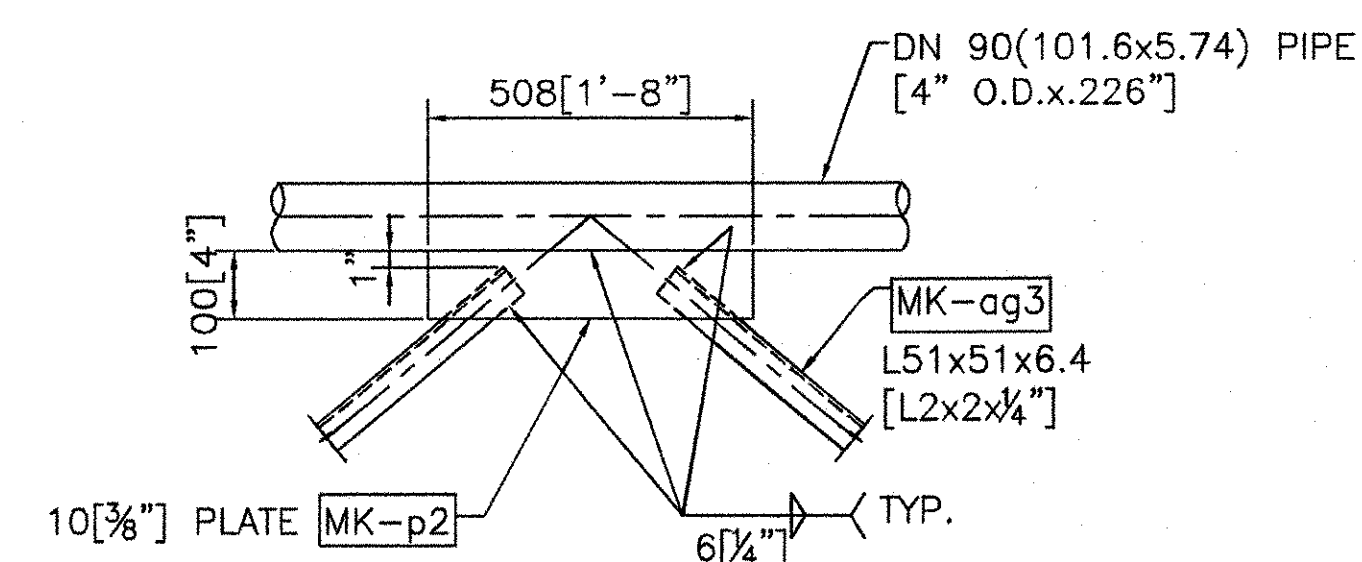


FRONT VIEW

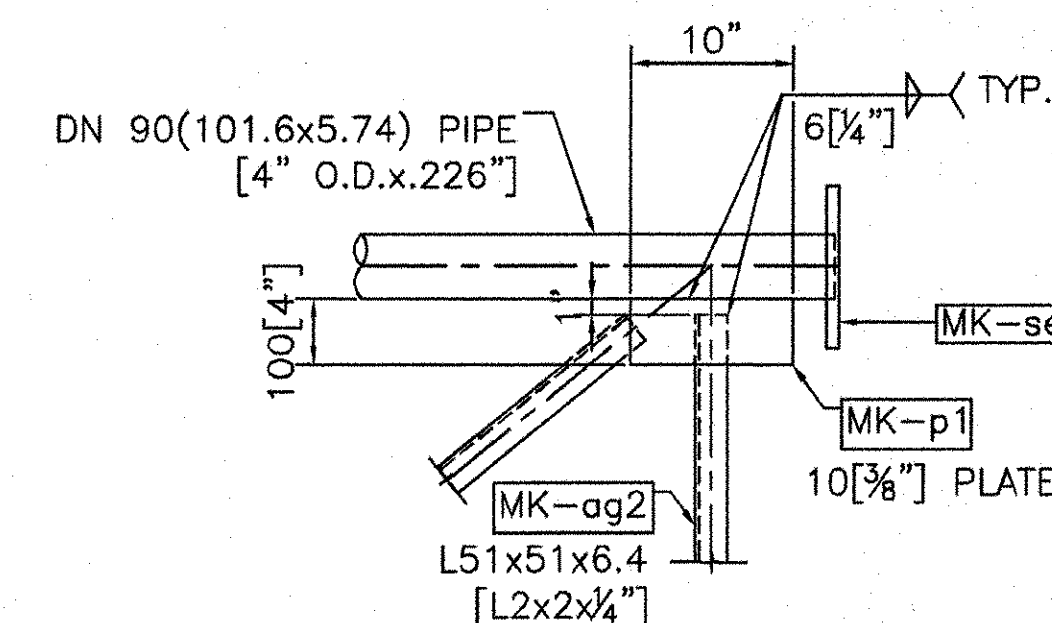
TRUSS 1



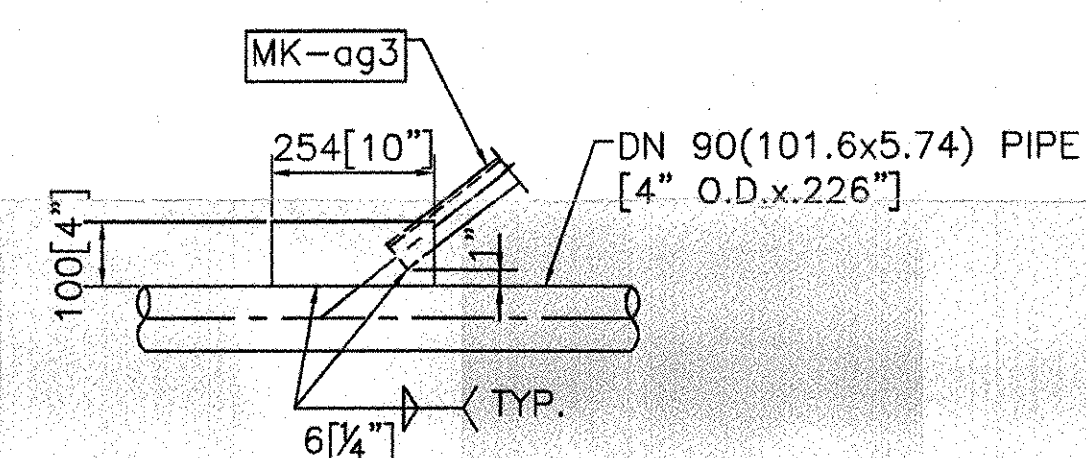
SIDE VIEW



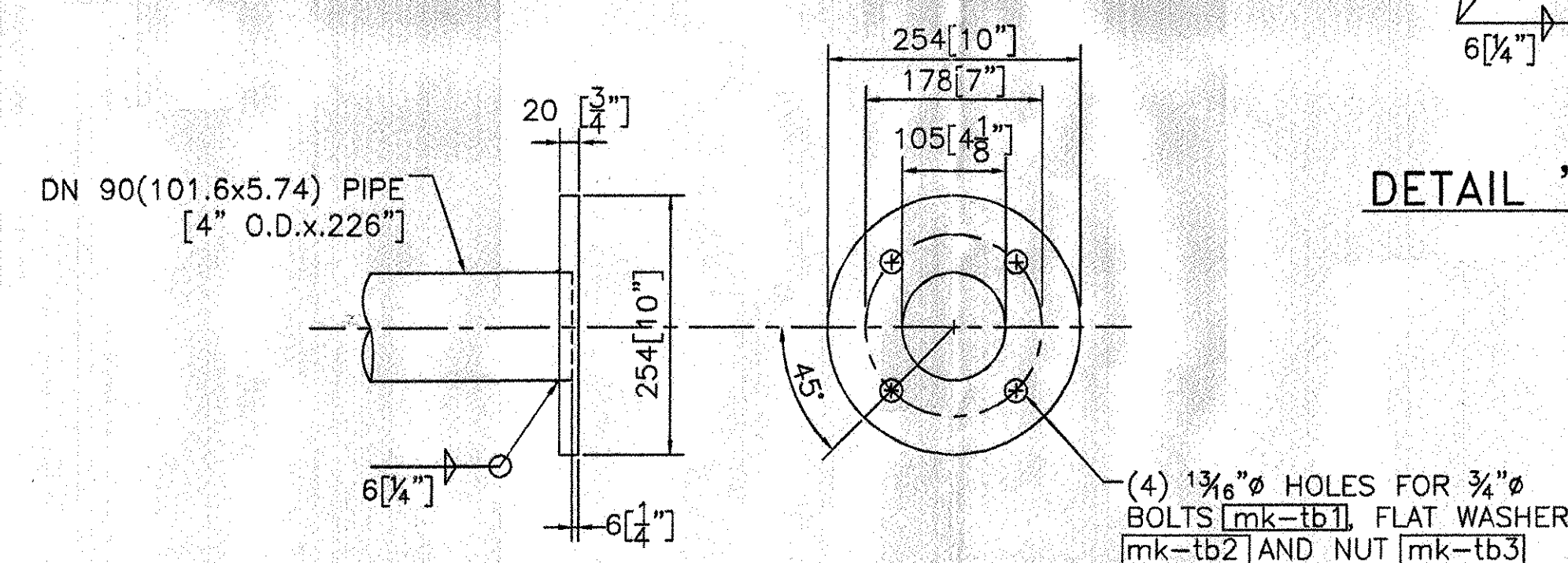
DETAIL "A"



DETAIL "B"



DETAIL "C"

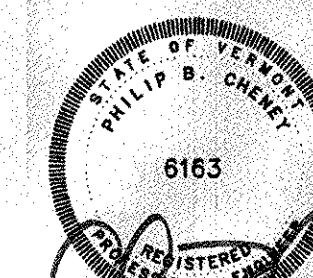


SPLICE DETAIL

MK-se

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS (mm) UNLESS OTHERWISE NOTED. ENGLISH CONVERSION SHOWN IN [] FOR REFERENCE ONLY.

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HIGHWAY SAFETY CORP.
GLASTONBURY, CT

TRI-CHORD SIGN STRUCTURE
STATE OF VERMONT
COUNTY OF CALEDONIA
MM 10.470 NB
PROJECT No. HES 091-3(42)
HES 093-1(10)

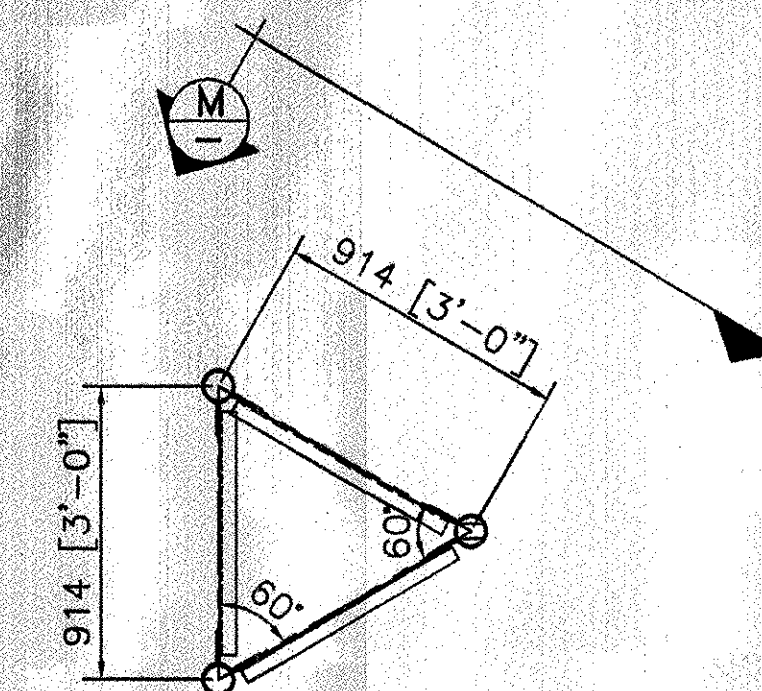
GENERAL CONTRACTOR

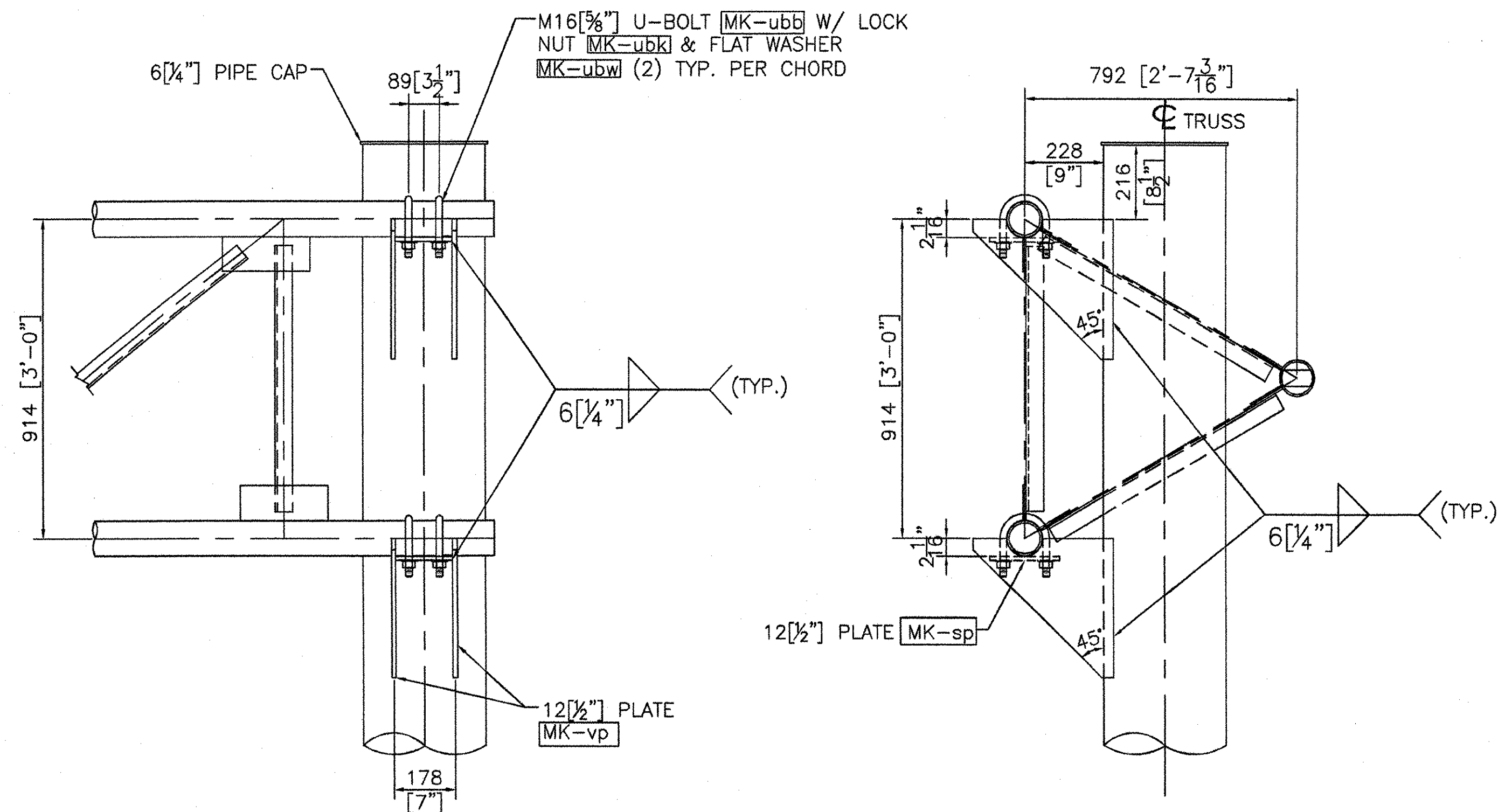
SUB CONTRACTOR

F.R. LAFAYETTE

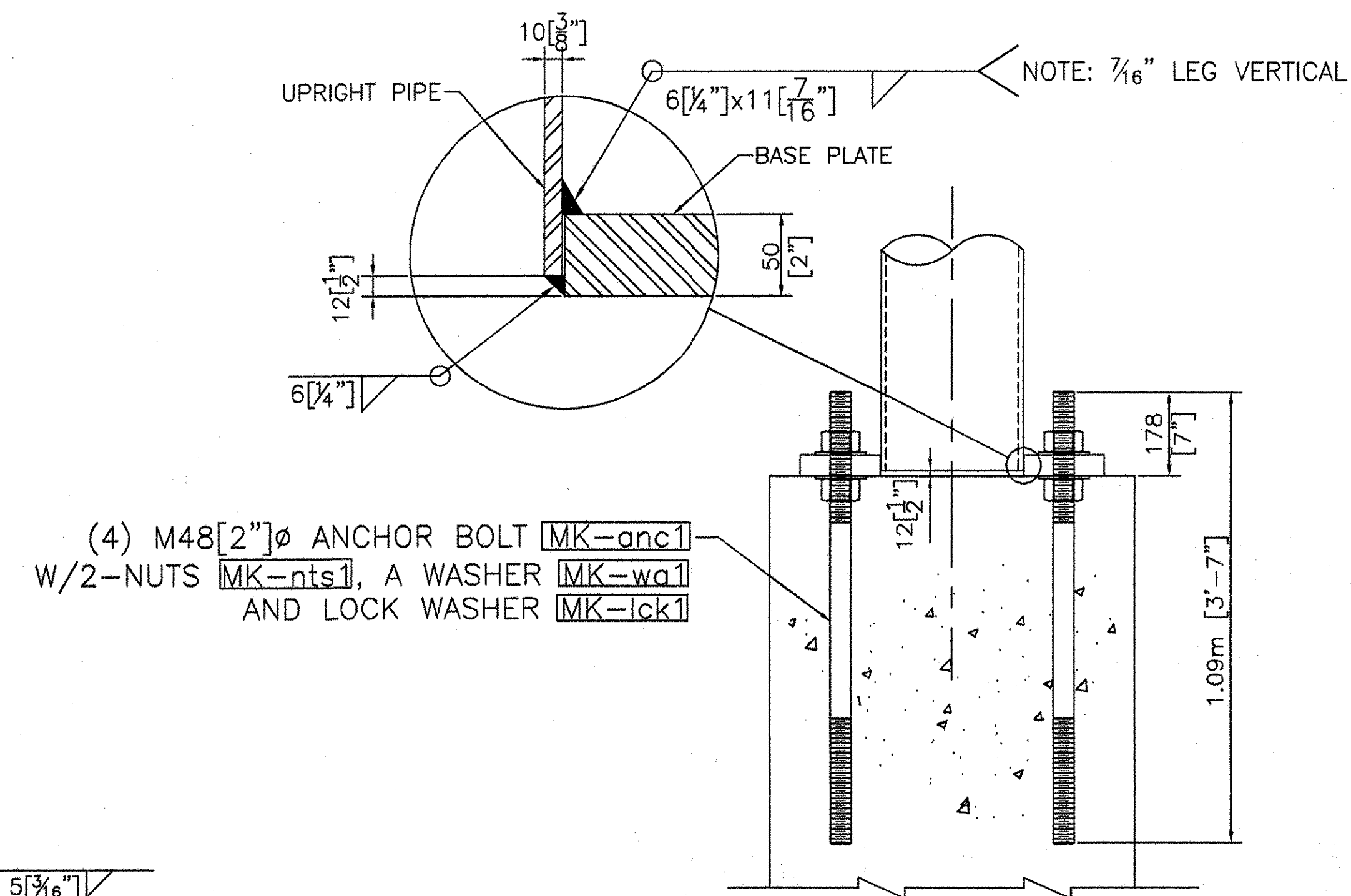
DRAWN: MHM
CHECKED: P Radice
DATE: 5/23/07
SCALE: NTS
HSC REFERENCE NO.: 1587f
SIZE: D
REVISION: 0
SHEET NO.: 2 of 8

REVISIONS		
No.	Remarks	Date
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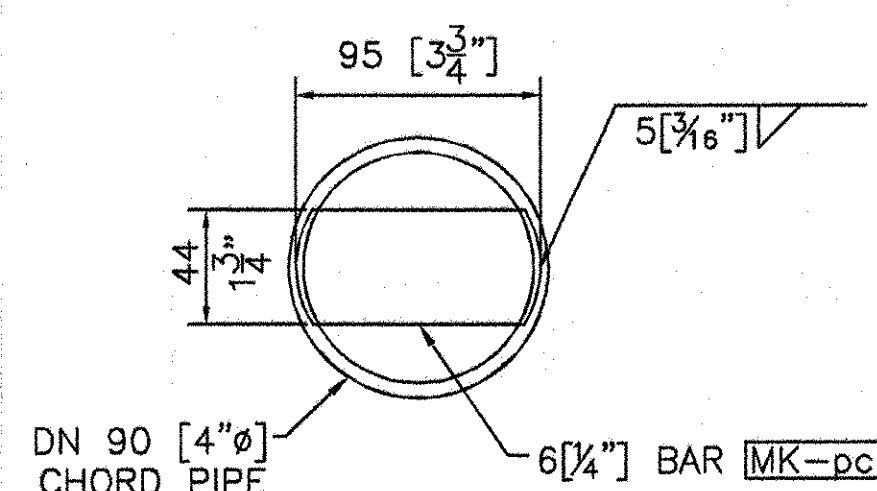




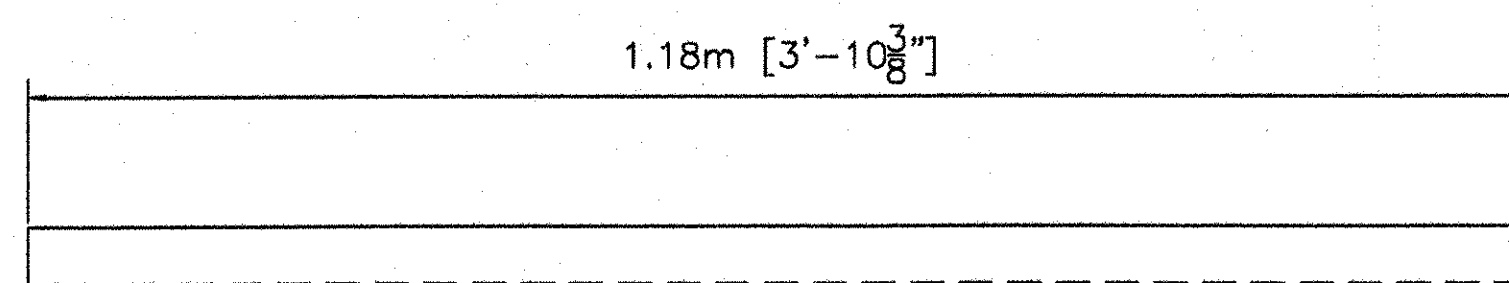
TRUSS CONNECTION DETAIL



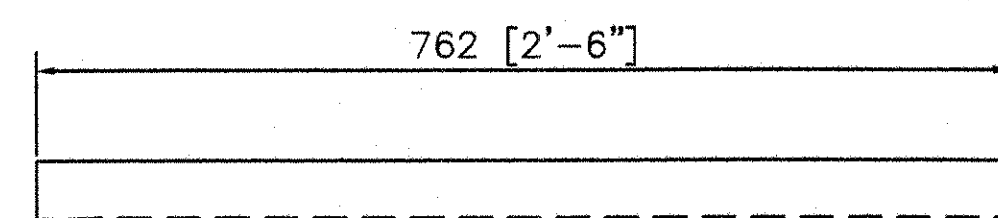
ANCHORAGE ASSEMBLY



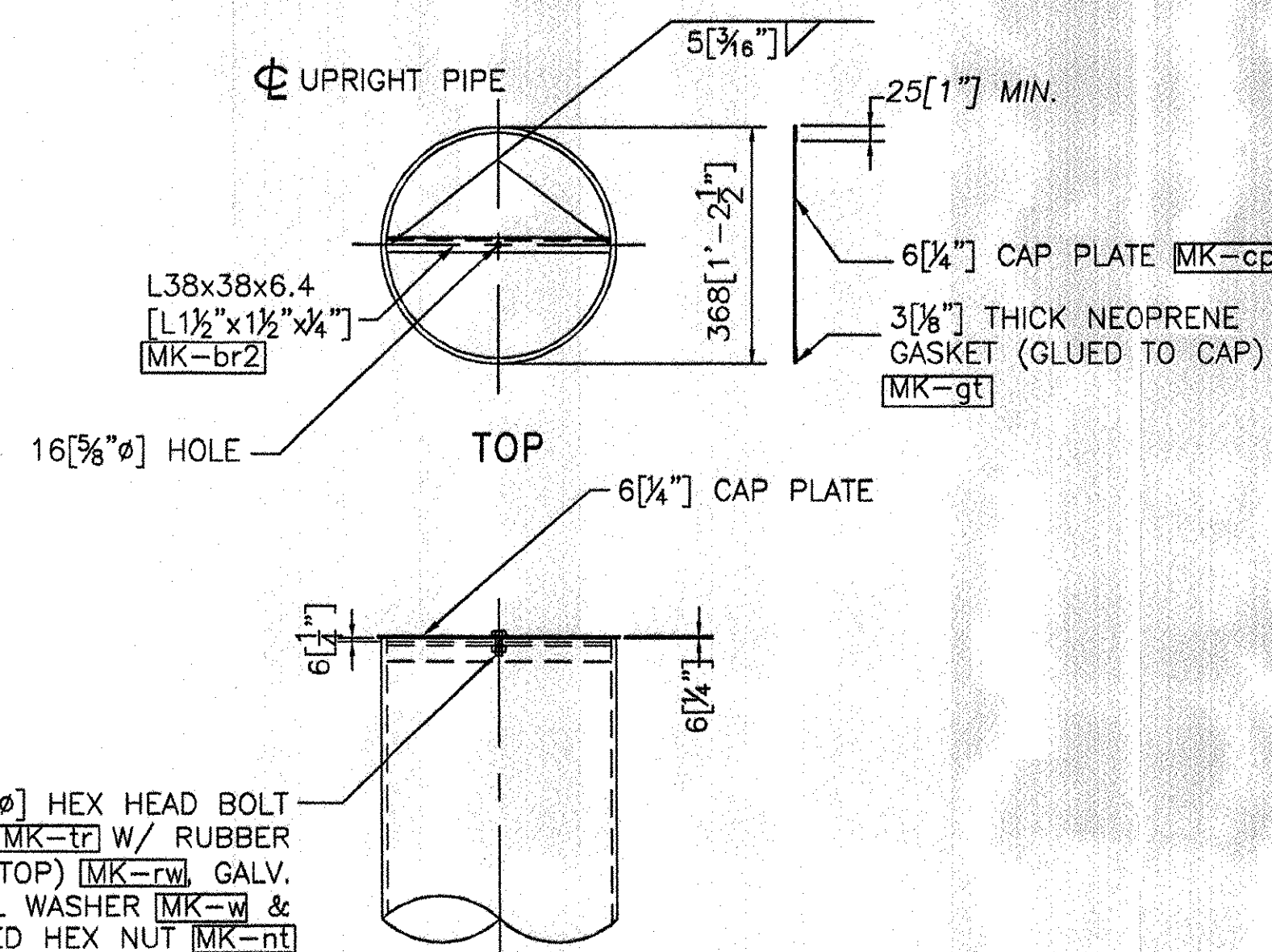
PLUG DETAIL
(EACH END OF TRUSS CHORD)



MK-ag3
L51x51x6.4
[L2x2x1/4"]



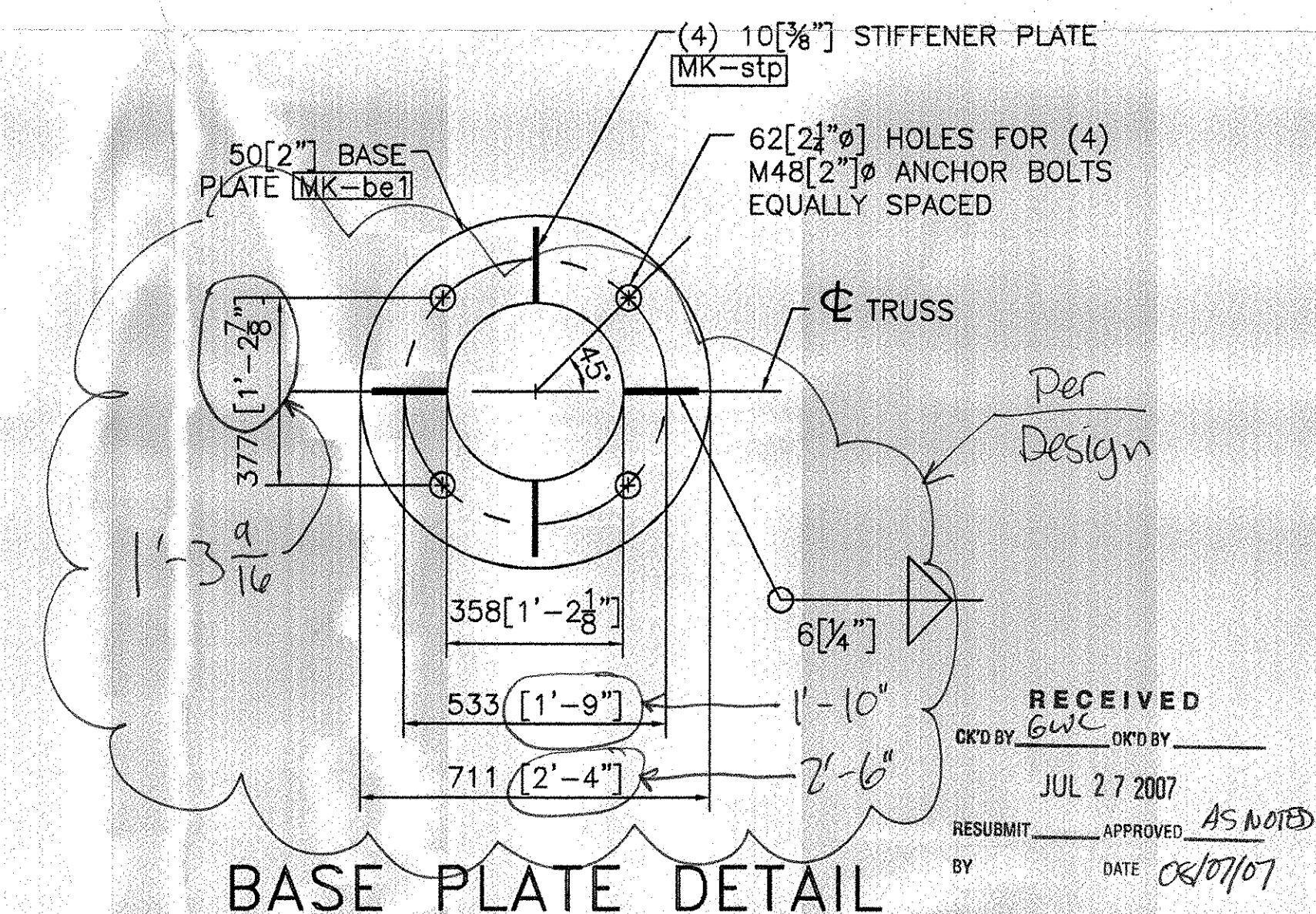
MK-ag2
L51x51x6.4
[L2x2x1/4"]



UPRIGHT CAP DETAIL

ASSEMBLE CAP TO POST PRIOR TO SHIPPING.

NOTE:
BASE PLATE SHALL BE STAMPED WITH THE VERTICAL POLE DIAMETER (VD.), HEIGHT (VHT.), YIELD STRENGTH (VYS.), GAUGE (VGE.), AND SAME FOR HORIZONTAL MEMBER (HD.), (HYS.), AND (HGE.).

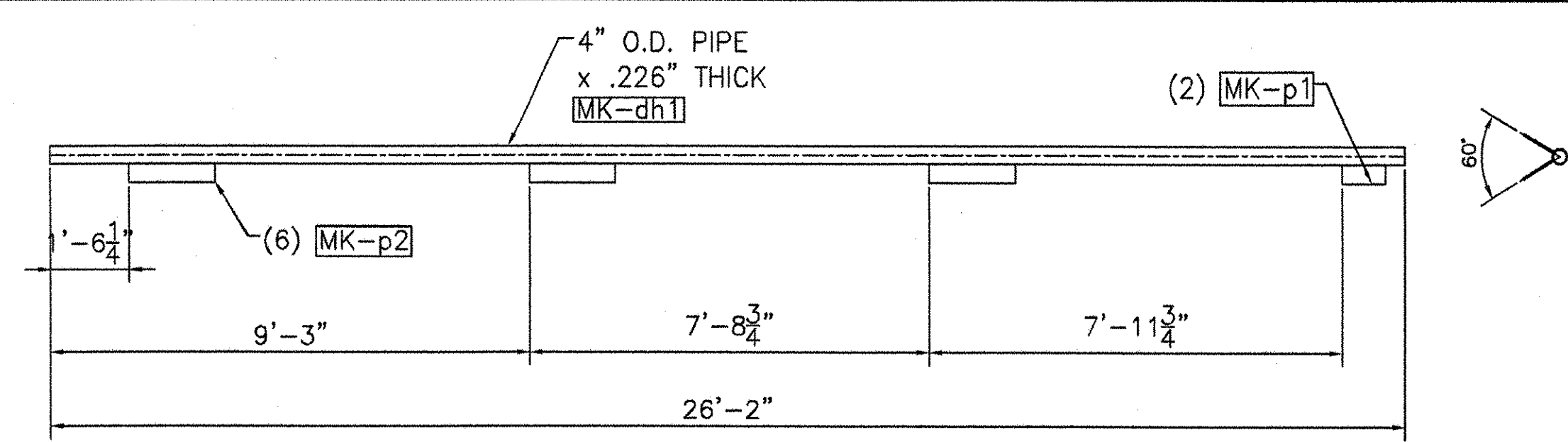


BASE PLATE DETAIL

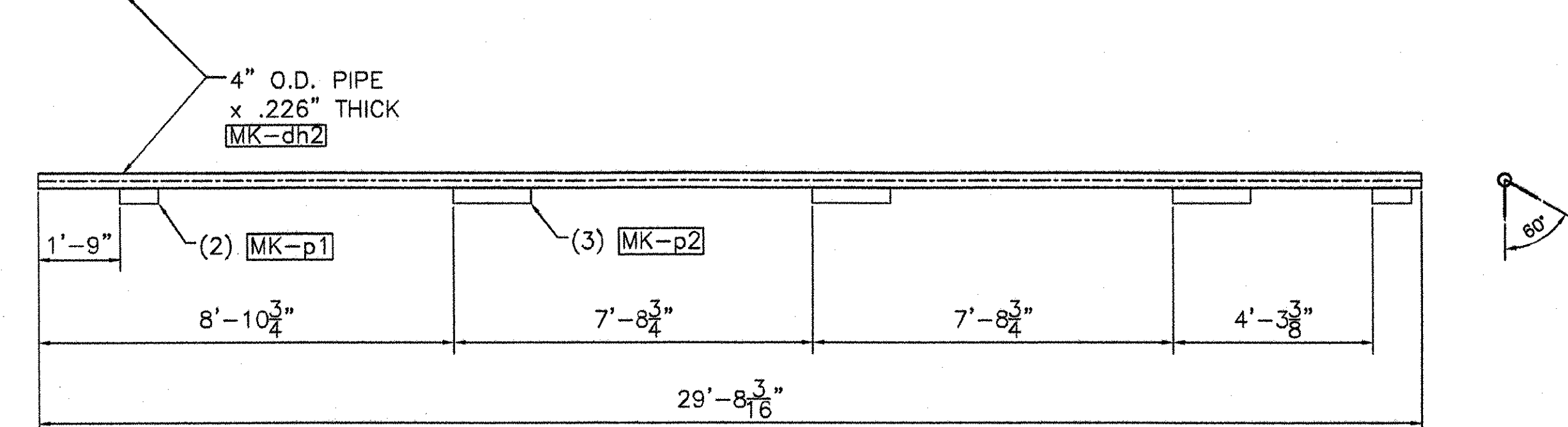
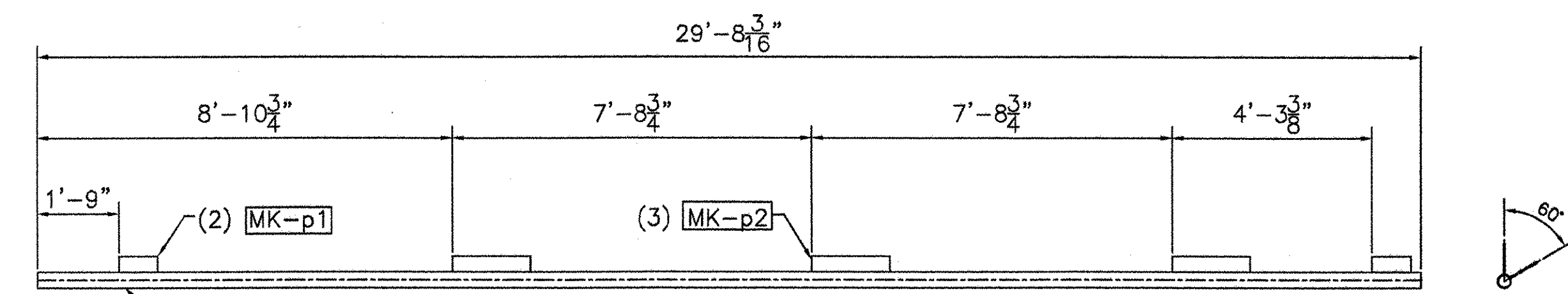
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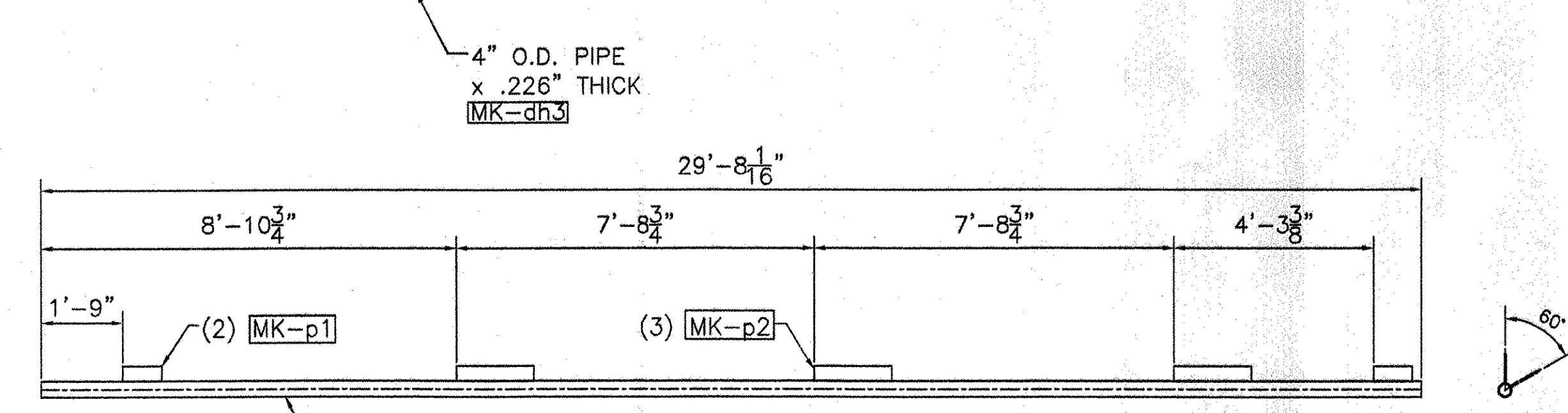
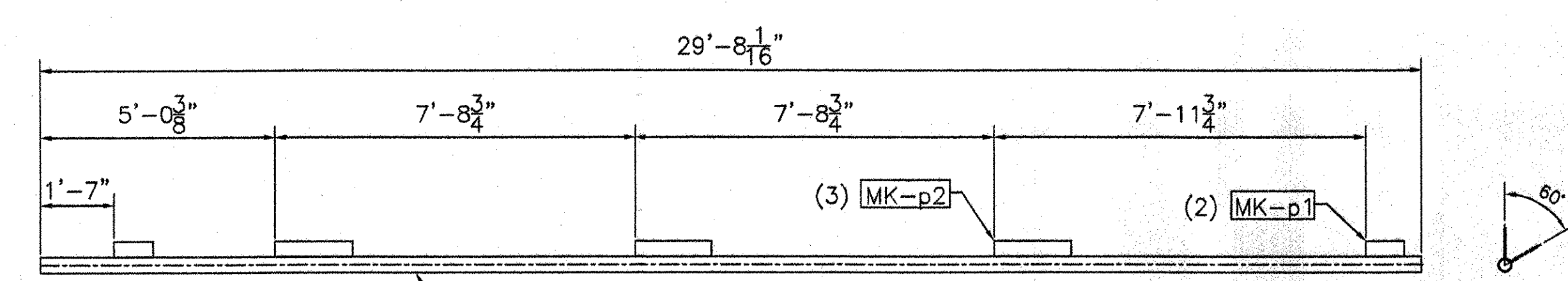
HIGHWAY SAFETY CORP.	
GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE	
STATE OF VERMONT	
COUNTY OF CALEDONIA	
MM 10.470 NB	
PROJECT No. HES 091-3(42)	
HES 093-1(10)	
GENERAL CONTRACTOR	F.R. LAFAYETTE
SUB CONTRACTOR	
DRAWN	MMH
CHECKED	<i>P. Radice</i>
DATE	5/23/07
SCALE	NTS
HSC REFERENCE NO.	1587f
SIZE	D
REVISION	0
SHEET NO.	4 of 8



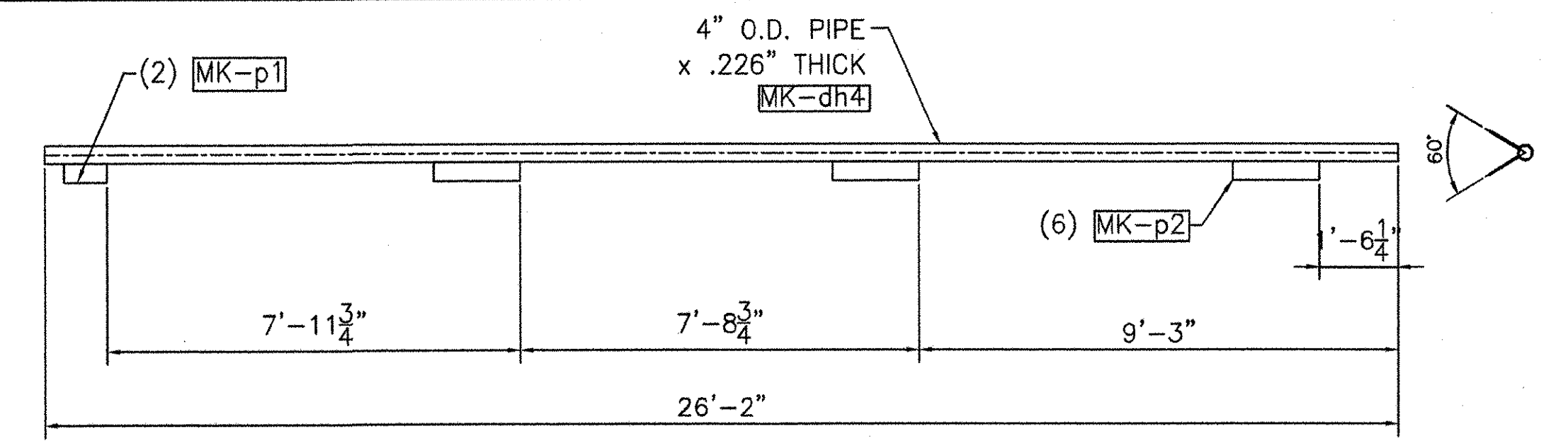
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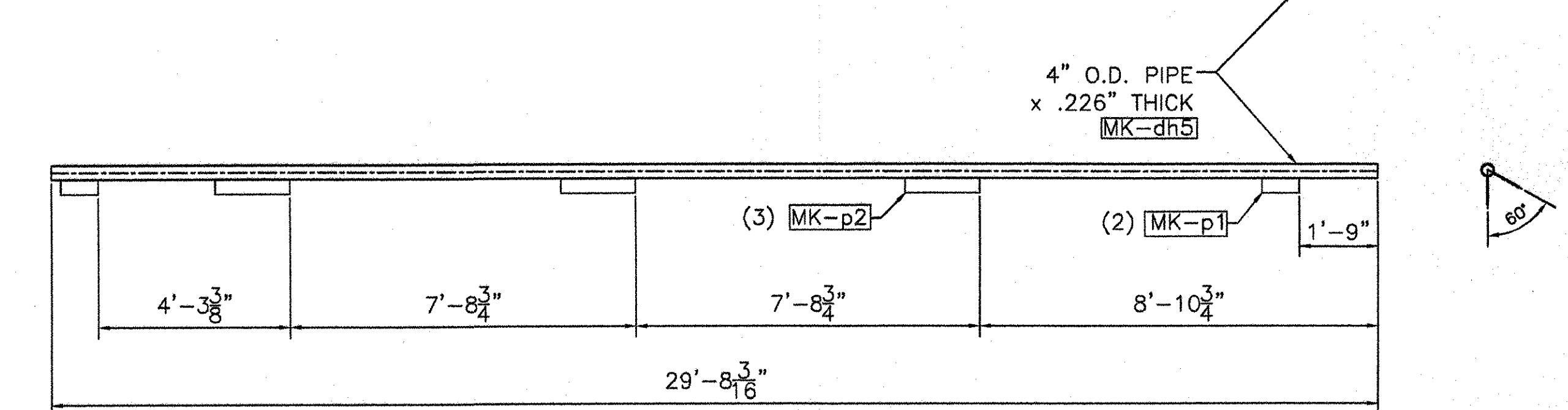
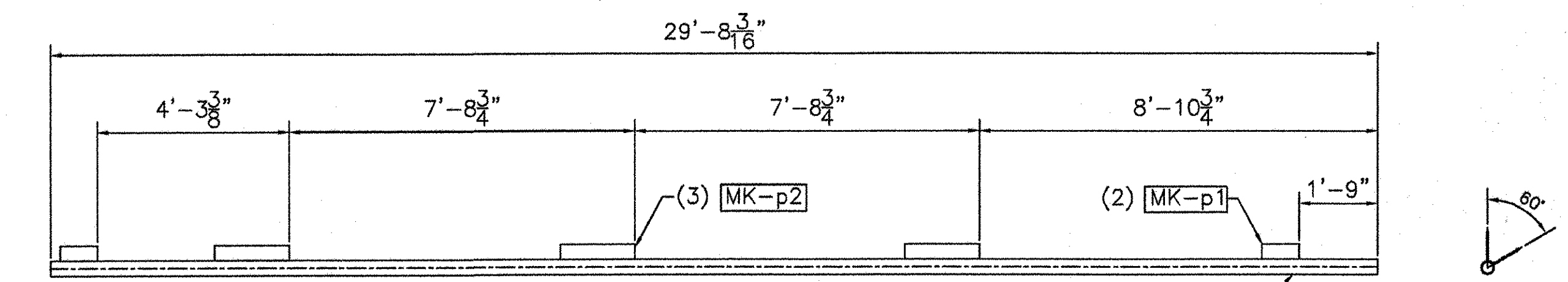
MK-D2



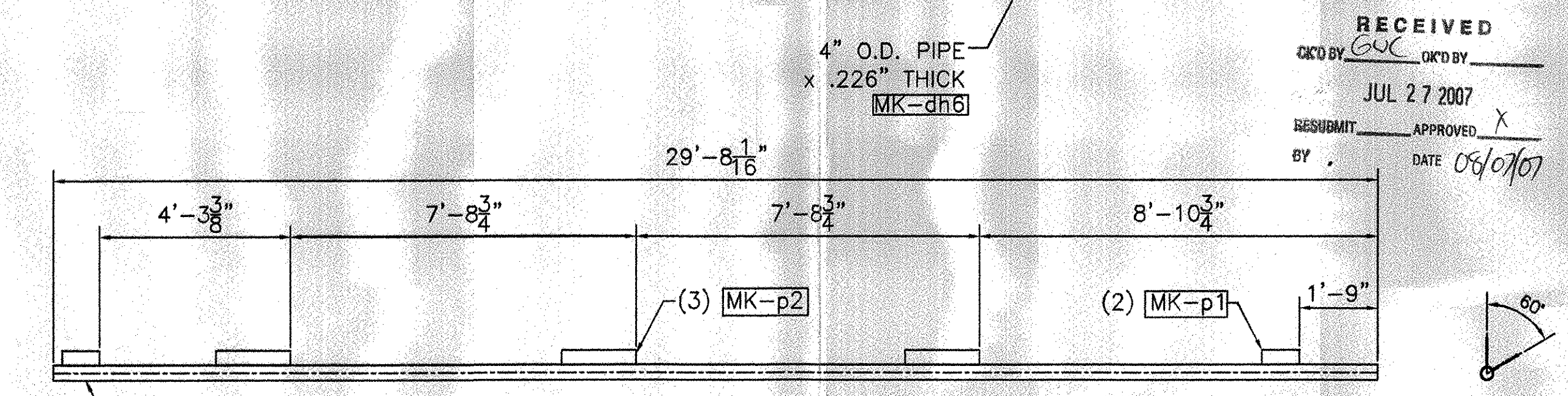
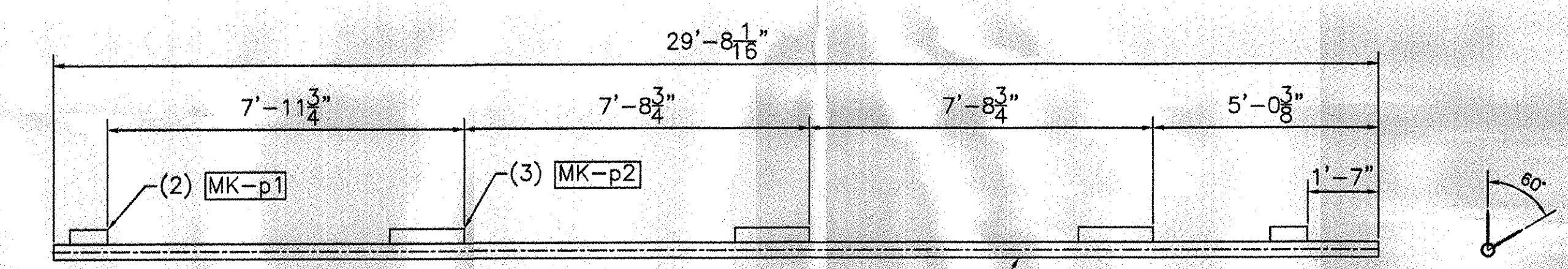
MK-D3



MK-D4

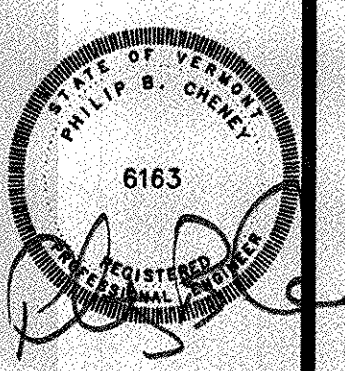


MK-D5



MK-D6

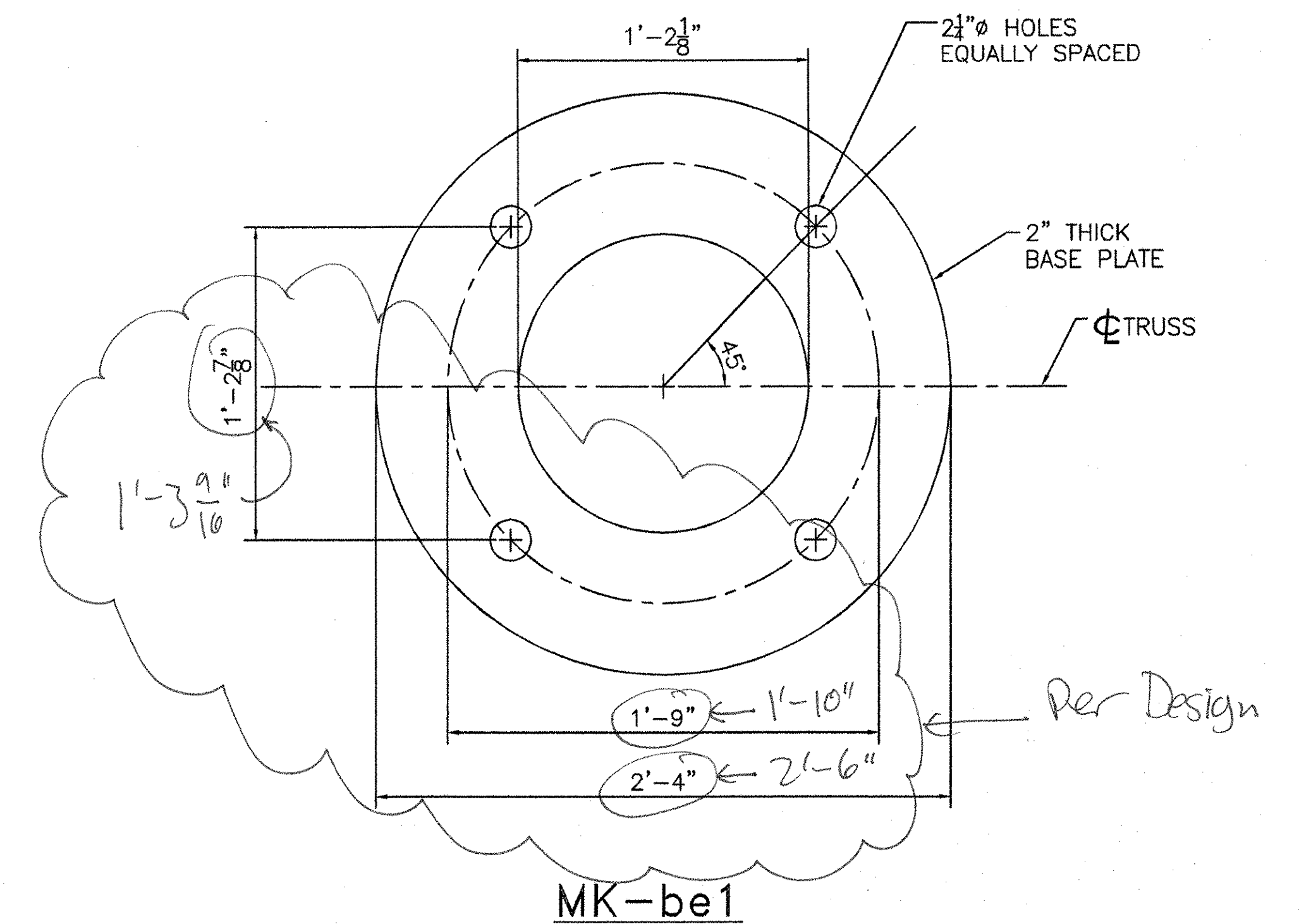
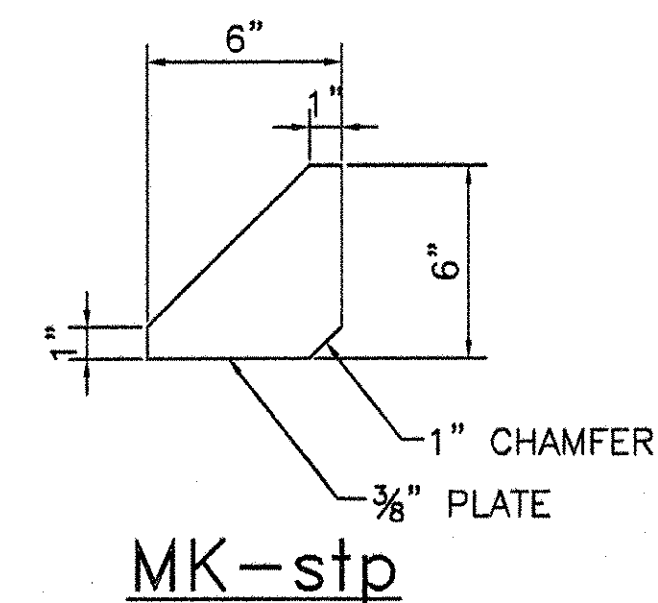
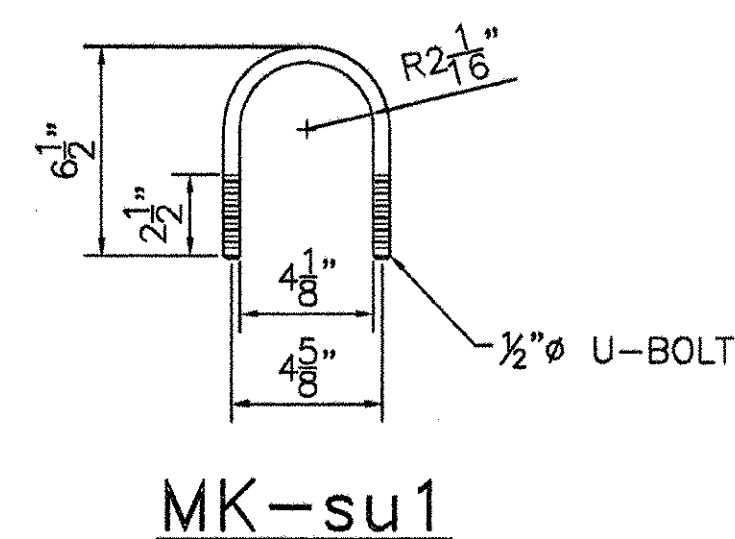
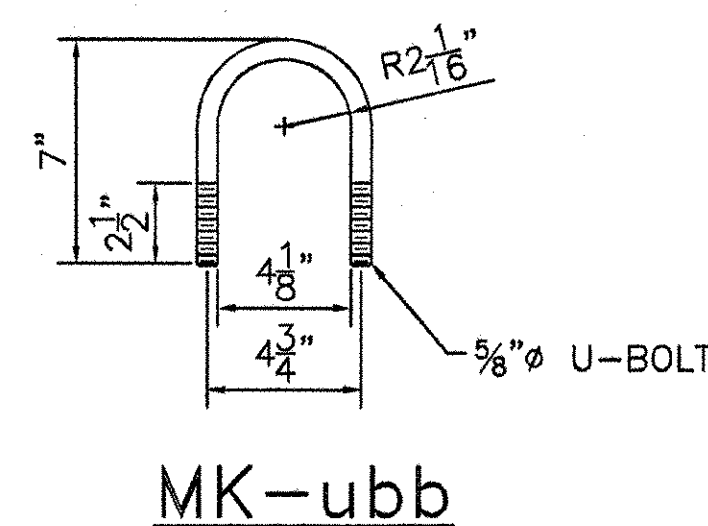
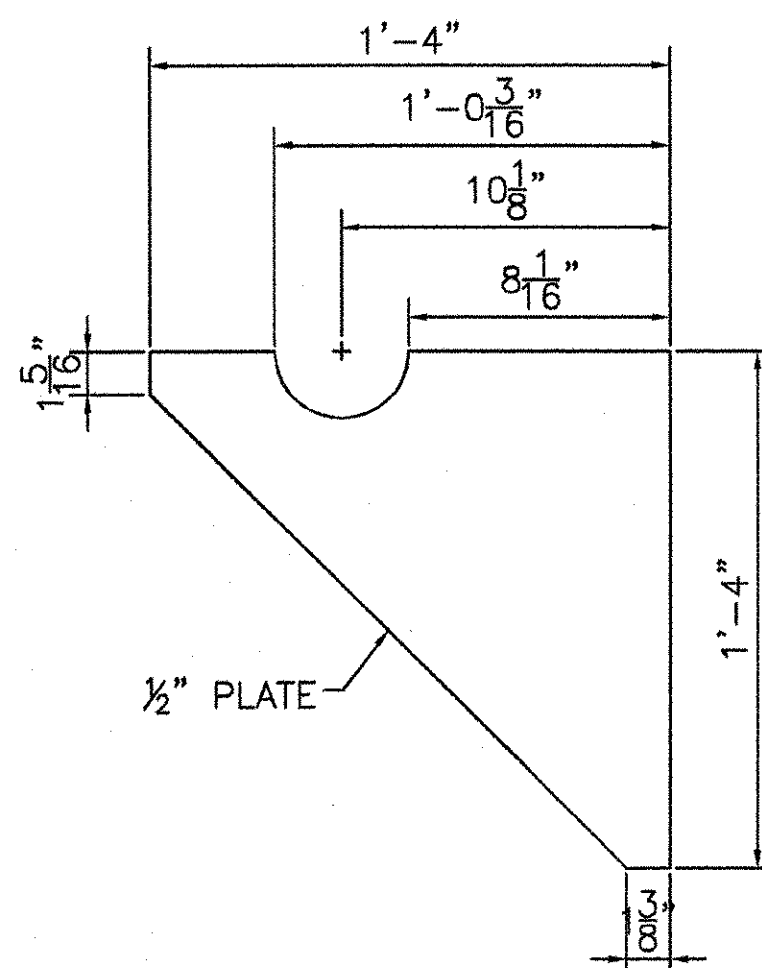
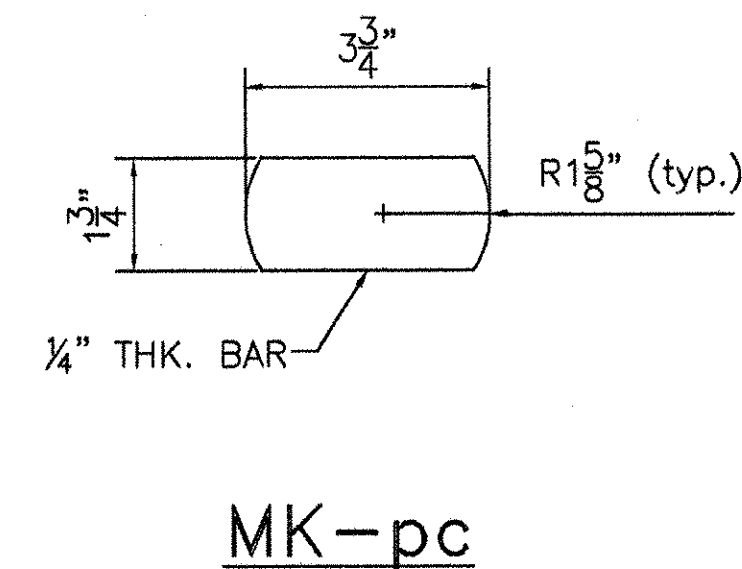
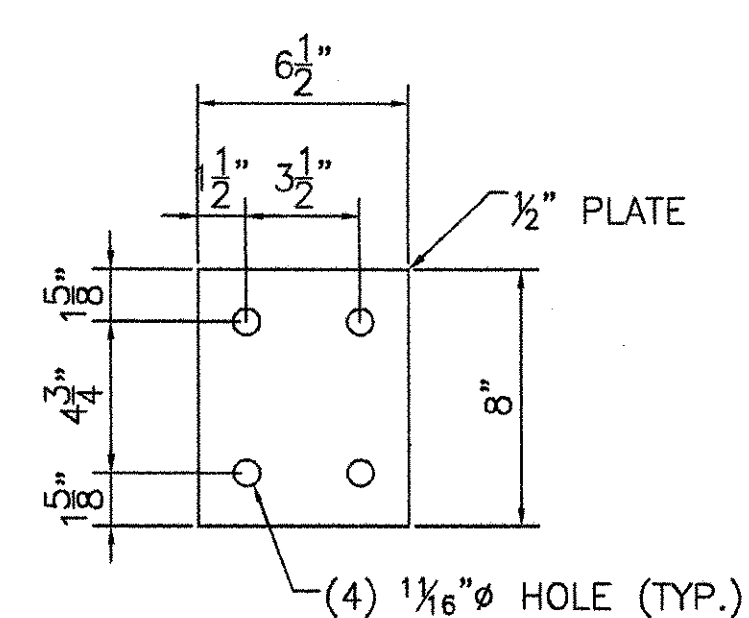
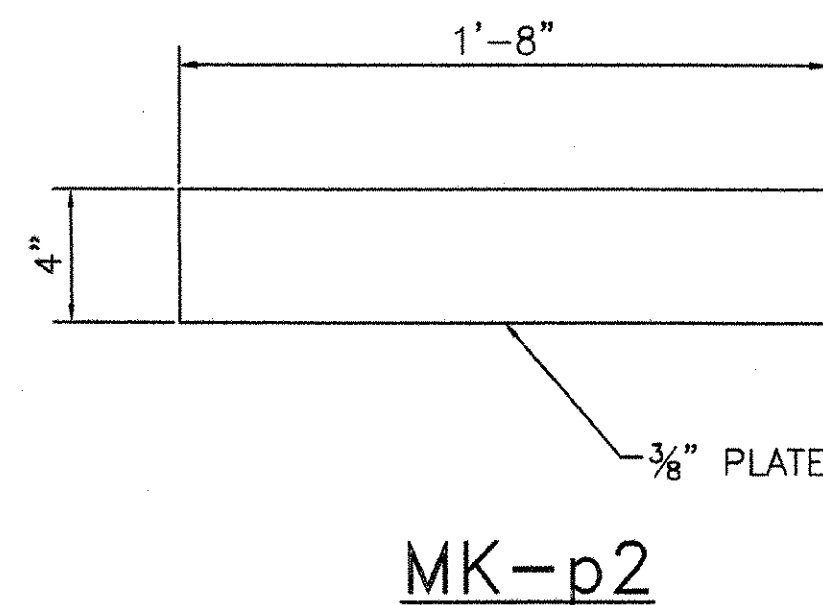
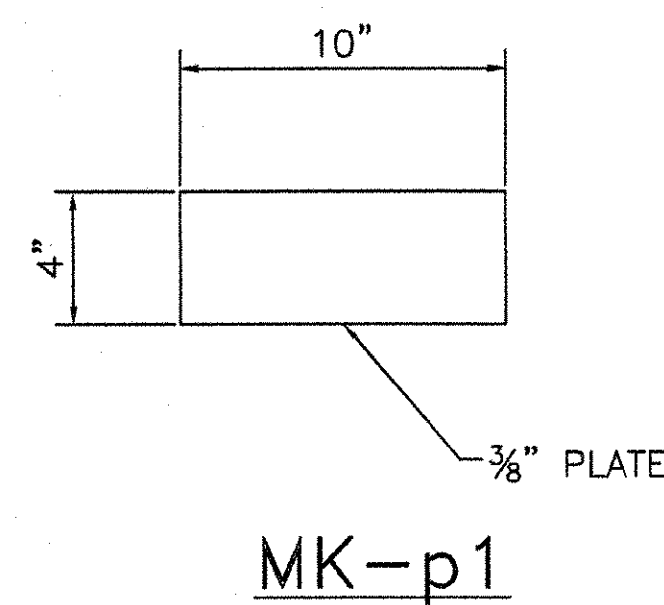
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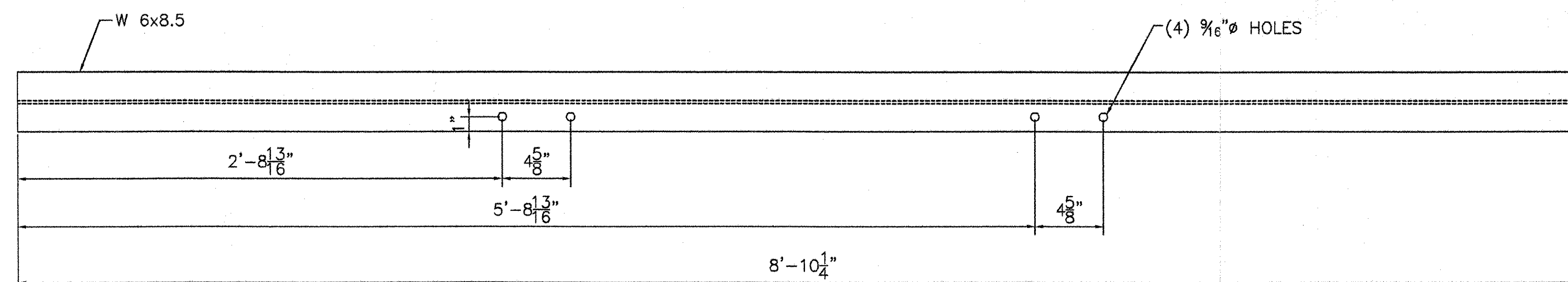
REVISIONS		
No.	Remarks	Date
0	Initial submittal	

HIGHWAY SAFETY CORP. GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE STATE OF VERMONT COUNTY OF CALEDONIA MM 10.470 NB PROJECT No. HES 091-3(42) HES 093-1(10)	
GENERAL CONTRACTOR SUB CONTRACTOR	F.R. LAFAYETTE
DRAWN CHECKED DATE SCALE HSC REFERENCE NO. SIZE SHEET NO.	MHM P Radice 5/23/07 NTS 1587f D REVISION 0 5 of 8

214-516N-4



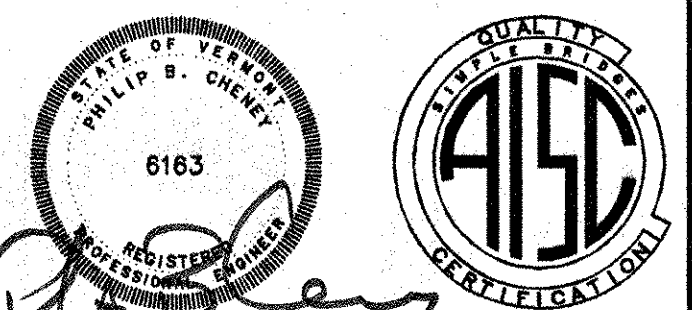
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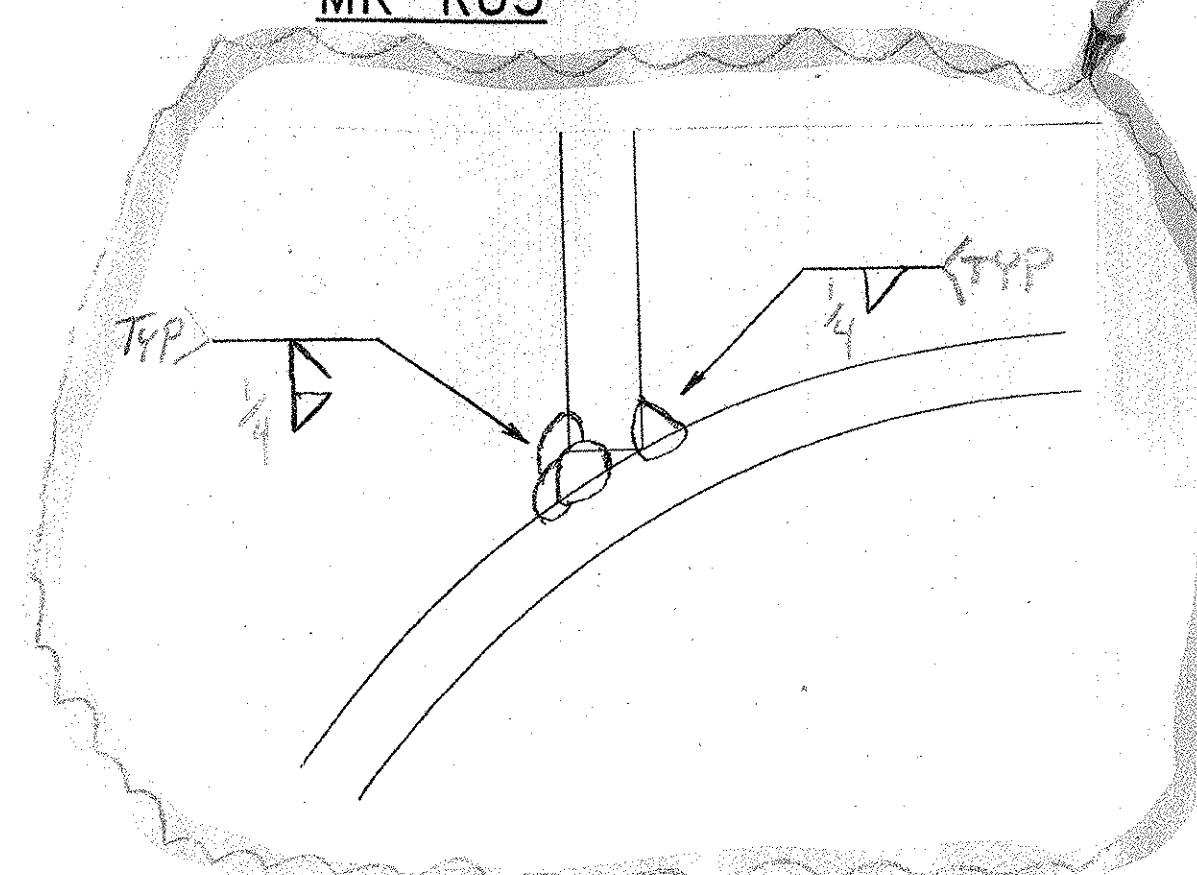
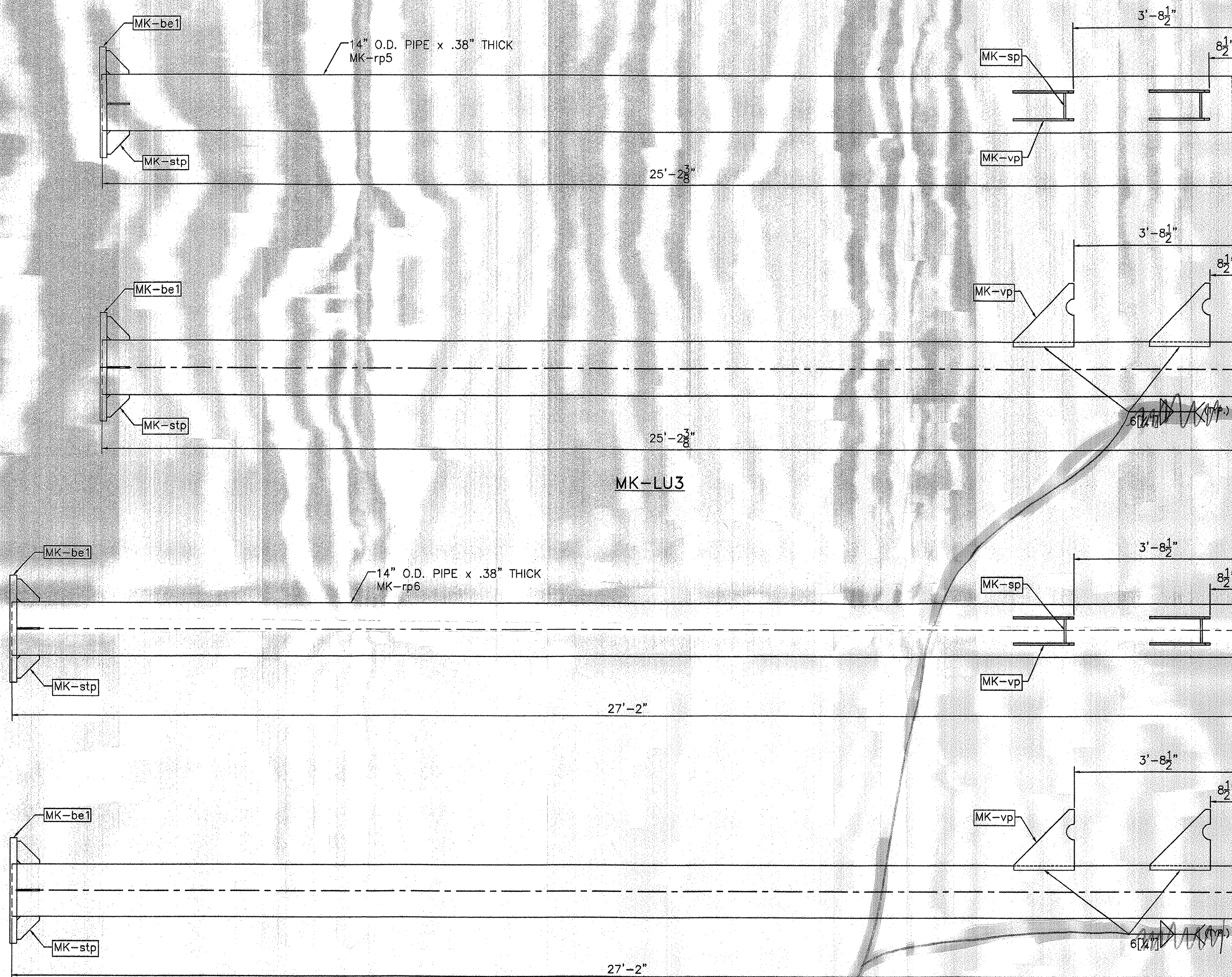
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No.	Remarks	Date
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 JUL 27 2007
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 BY _____ DATE 08/07/07



HIGHWAY SAFETY CORP. GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE STATE OF VERMONT COUNTY OF CALEDONIA MM 10.470 NB PROJECT No. HES 091-3(42) HES 093-1(10)	
GENERAL CONTRACTOR	DRAWN: <u>MMH</u>
SUB CONTRACTOR	CHECKED: <u>P. Radice</u>
	DATE: <u>5/23/07</u>
	SCALE: <u>NTS</u>
	HSC REFERENCE NO. <u>1587f</u>
	SIZE: <u>D</u> REVISION: <u>0</u>
	SHEET NO. <u>6 of 8</u>



REVISIONS		
No.	Remarks	Date
0	Initial submittal	

erection mark	piece qty	item description	size/shape	length/qty per unit	material notes
TRUSS 1 ASSEMBLY					
CHORD PIPE ASSEMBLY					
dh1	1	pipe	4" O.D. x 0.226" wall	26'-2"	A500 gr B
p1	2	plate	PL 0.375" x 4"	10"	API 5LX42
p2	6	plate	PL 0.375" x 4"	1'-8"	A709 gr 50
ag3	14	angle	L2"x2"x.25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x.25"	2'-6"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A709 gr 50
D2 CHORD PIPE ASSEMBLY					
dh2	1	pipe	4" O.D. x 0.226" wall	29'-8.167"	A500 gr B
p1	2	plate	PL 0.375" x 4"	10"	API 5LX42
p2	6	plate	PL 0.375" x 4"	1'-8"	A709 gr 50
ag3	14	angle	L2"x2"x.25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x.25"	2'-6"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A709 gr 50
D3 CHORD PIPE ASSEMBLY					
dh3	1	pipe	4" O.D. x 0.226" wall	29'-8.062"	A500 gr B
p1	2	plate	PL 0.375" x 4"	10"	API 5LX42
p2	6	plate	PL 0.375" x 4"	1'-8"	A709 gr 50
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A709 gr 50
TRUSS 2 ASSEMBLY					
CHORD PIPE ASSEMBLY					
dh4	1	pipe	4" O.D. x 0.226" wall	26'-2"	A500 gr B
p1	2	plate	PL 0.375" x 4"	10"	API 5LX42
p2	6	plate	PL 0.375" x 4"	1'-8"	A709 gr 50
ag3	14	angle	L2"x2"x.25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x.25"	2'-6"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A709 gr 50
D5 CHORD PIPE ASSEMBLY					
dh5	1	pipe	4" O.D. x 0.226" wall	29'-8.167"	A500 gr B
p1	2	plate	PL 0.375" x 4"	10"	API 5LX42
p2	6	plate	PL 0.375" x 4"	1'-8"	A709 gr 50
ag3	14	angle	L2"x2"x.25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x.25"	2'-6"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A709 gr 50
D6 CHORD PIPE ASSEMBLY					
dh6	1	pipe	4" O.D. x 0.226" wall	29'-8.062"	A500 gr B
p1	2	plate	PL 0.375" x 4"	10"	API 5LX42
p2	6	plate	PL 0.375" x 4"	1'-8"	A709 gr 50
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A709 gr 50
VERTICAL PIPE ASSEMBLY					
LU3 LEFT PIPE ASSEMBLY					
rp5	1	pipe	14" O.D. x 0.38" wall	25'-2.375"	A500 gr B
sp	2	plate	PL 0.5" x 6.5"	6"	API 5LX42
vp	4	plate	PL 0.5" x 1'-4"	1'-4"	A709 gr 50
cp	1	plate	0.25" x 1'-2.5" O.D.		A36
br2	1	angle	L1.5"x1.5"x.25"	1'-1"	A36
gt	1	gasket	1.25"x1'-2.5" O.D.		50 duro. Neoprene
rt	1	hex nut	.50" dia.		A563
rt	1	hex bolt	.50" dia.	1.5"	A325
w	1	washer	.50" dia.		F944
rw	1	rubber washer	.50" dia.		50 duro. Neoprene
stp	4	plate	PL 0.375" x 6"	6"	A709 gr 50
be1	1	base plate	2' x 2'-4" O.D.		A709 gr 50
RU3 RIGHT PIPE ASSEMBLY					
rp5	1	pipe	14" O.D. x 0.38" wall	27'-2"	A500 gr B
sp	2	plate	PL 0.5" x 6.5"	6"	API 5LX42
vp	4	plate	PL 0.5" x 1'-4"	1'-4"	A709 gr 50
cp	1	plate	0.25" x 1'-2.5" O.D.		A36
br2	1	angle	L1.5"x1.5"x.25"	1'-1"	A36
gt	1	gasket	1.25"x1'-2.5" O.D.		50 duro. Neoprene
rt	1	hex nut	.50" dia.		A563
rt	1	hex bolt	.50" dia.	1.5"	A325
w	1	washer	.50" dia.		F944
rw	1	rubber washer	.50" dia.		50 duro. Neoprene
stp	4	plate	PL 0.375" x 6"	6"	A709 gr 50
be1	1	base plate	2' x 2'-4" O.D.		A709 gr 50
LOOSE ITEMS					
sv7	10	sign hanger	W8x4.5	10'-9.937"	A36
ub8	8	u-bolt	0.625" dia.	7"	F1554 Gr. 36
ubk	16	lock nut	0.625" dia.		A563 DH
ubw	16	washer	0.625" dia.		F436
su1	20	u-bolt	0.50" dia.	6.5"	F1554 Gr. 36
sk1	40	lock nut	0.50" dia.		A563 DH
sw1	40	washer	0.50" dia.		F436
tb1	16	hex bolt	0.75" dia.	3"	A325
tb2	16	washer	0.75" dia.		F436
tb3	16	hex nut	0.75" dia.		A563 DH
anc1	8	anchor bolt	2" dia.	3'-7"	S/S A276 T304
na1	16	hex nut	2" dia.		S/S A194B T304
lk1	8	lock washer	2" dia.		S/S TY 304
wa1	8	flat washer	2" dia.		S/S TY 304

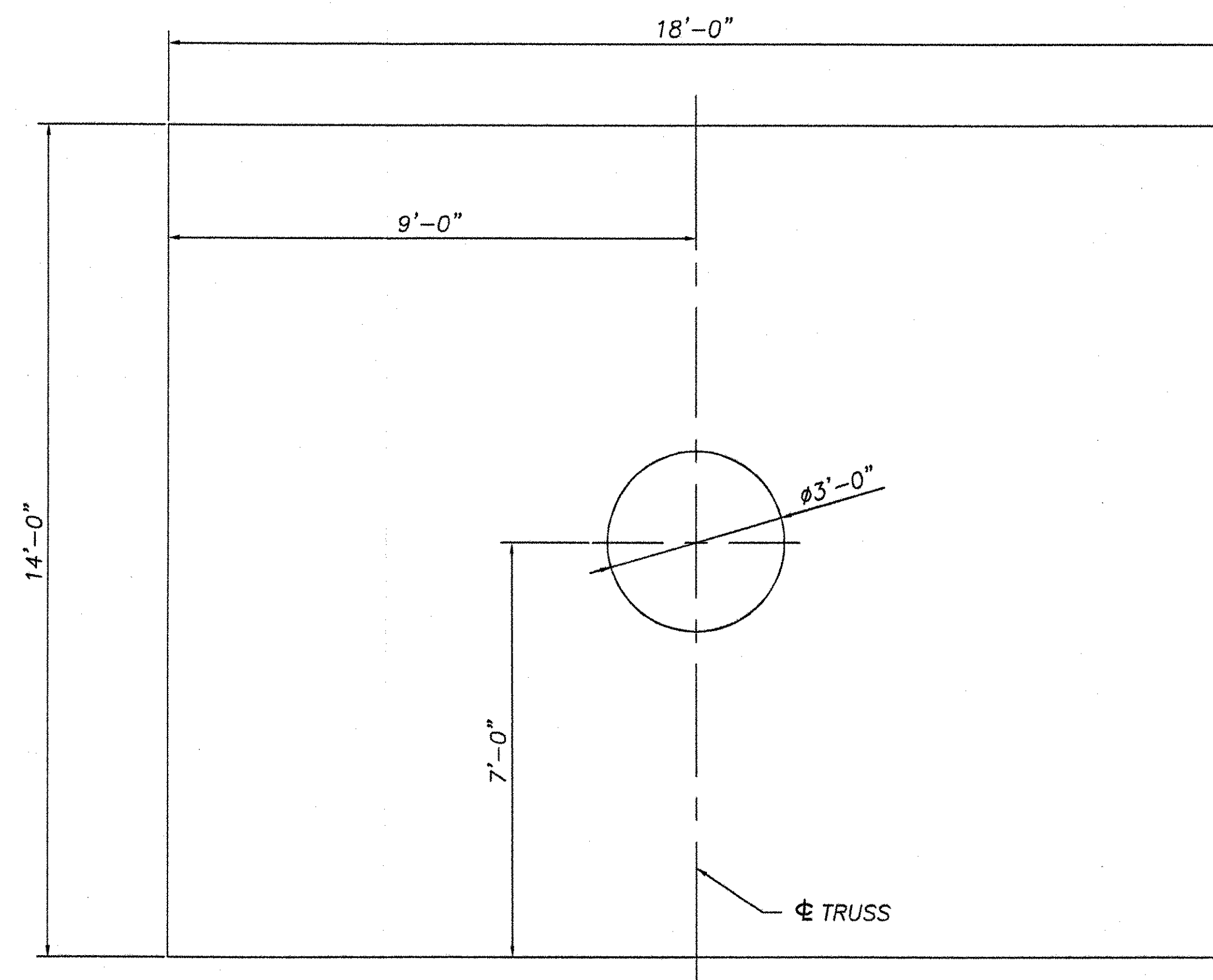
HIGHWAY SAFETY CORP.
GLASTONBURY, CT

TRI-CHORD SIGN STRUCTURE	DRAWN	MMH
STATE OF VERMONT	CHECKED	P. Radice
COUNTY OF CALEDONIA	DATE	5/23/07
MM 10.470 NB	SCALE	N.T.S.
PROJECT No. HES 091-3(42)	HSC REFERENCE NO.	1587f
HES 093-1(10)	SIZE	D
GENERAL CONTRACTOR	REVISION	0
SUB CONTRACTOR	SHEET NO.	7 of 8

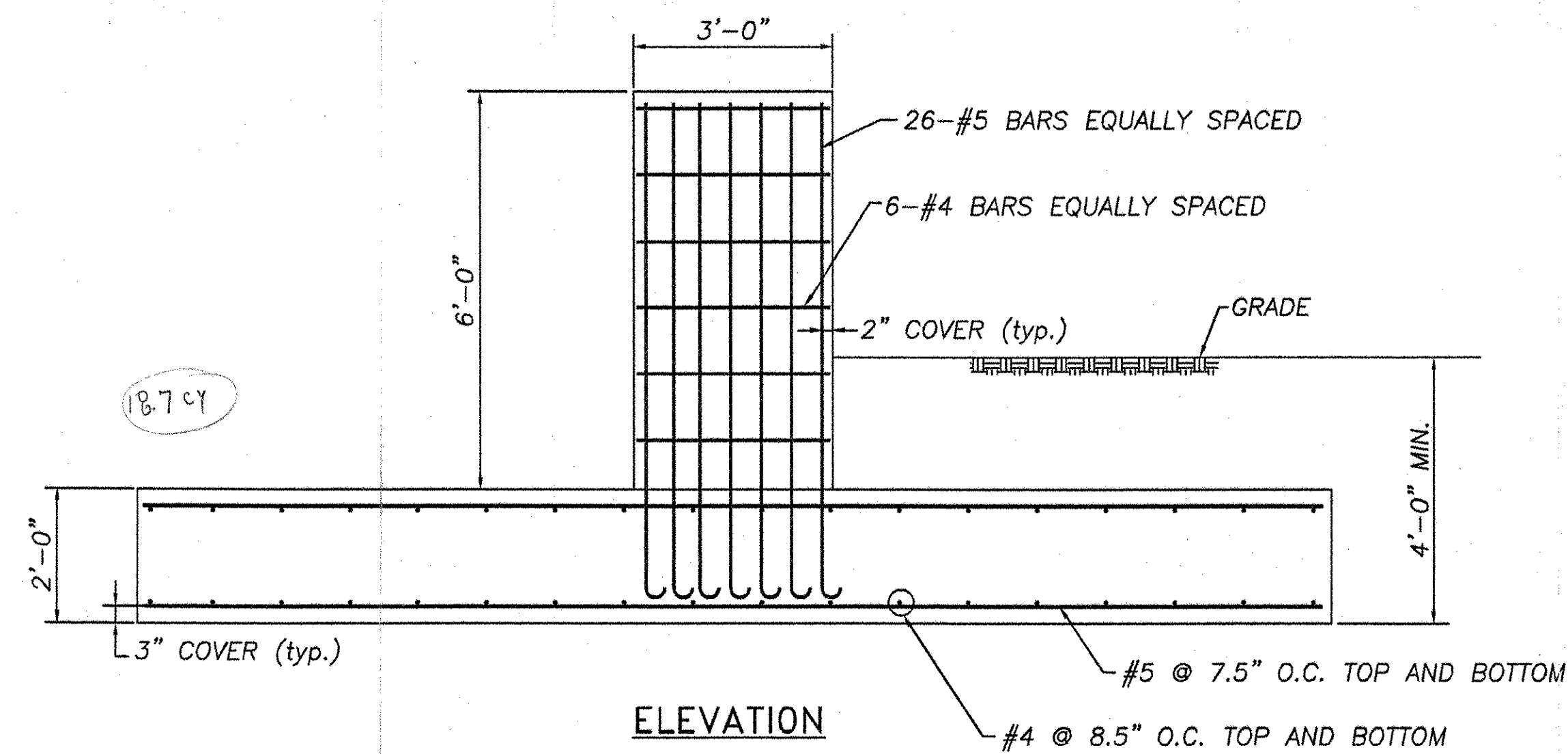
RECEIVED
JUL 27 2007
RESUBMIT APPROV
BY DATE 05/07/07

6163

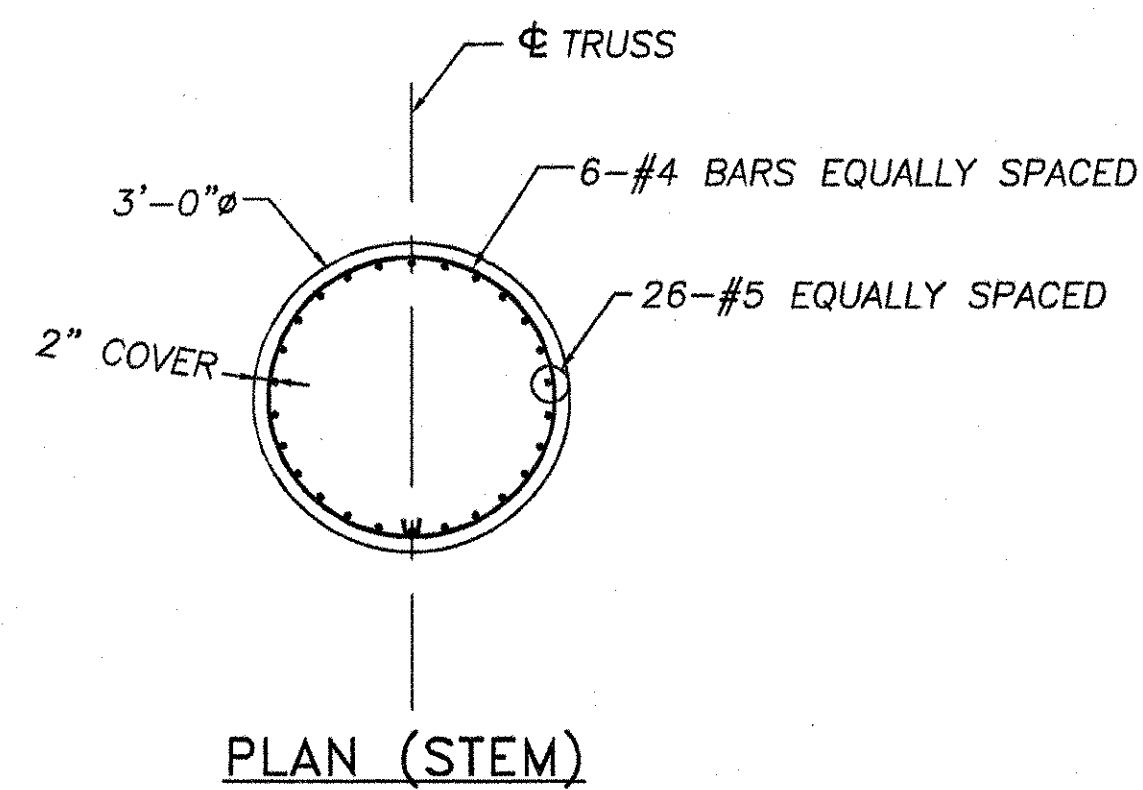
QUALITY
AISC
CERTIFICATION



PLAN



ELEVATION



PLAN (STEM)

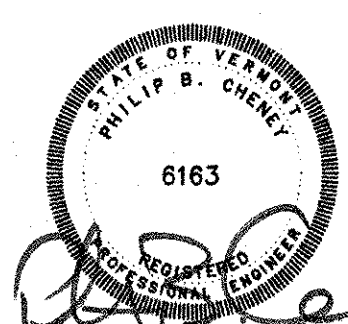
REBAR LIST

REBAR	PCS. REQD.	LENGTH
#4	12	9'-4"
#4	104	13'-6"
#5	92	17'-6"
#5 (HOOK ONE END)	52	8'-6"

NB 10.47

REVISIONS		
No.	Remarks	Date
0	Initial submittal	

RECEIVED
 CK'D BY *EV* OK'D BY _____
 JUL 27 2007
 RESUBMIT _____ APPROVED *X*
 BY _____ DATE 08/07/07



HIGHWAY SAFETY CORP. GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE STATE OF VERMONT COUNTY OF CALEDONIA MM 10.470 NB PROJECT No. HES 091-3(42) HES 093-1(10)	
GENERAL CONTRACTOR	DRAWN: MHM
SUB CONTRACTOR	CHECKED: <i>P. Radice</i>
	DATE: 5/23/07
	SCALE: N.T.S.
	HSC REFERENCE NO. 1587f
	SHEET NO. 8 of 8

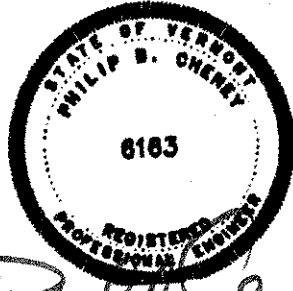
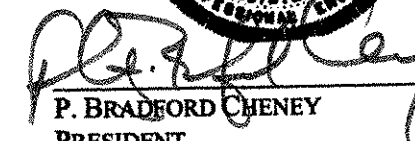
217-SIGN-F

10.97

DESIGN CALCULATIONS

OVERHEAD SIGN STRUCTURE
INTERSTATE ROUTE 91
STATION 10.970 NB
PROJECT No. HES 091-3(42)
HES 093-1(10)

VERMONT AGENCY OF TRANSPORTATION



P. BRADFORD CHENEY
PRESIDENT
DATE 7.23.07

SUBMITTED BY:	SUBMITTED TO:
CME ASSOCIATES, INC.	HIGHWAY SAFETY CORPORATION
333 EAST RIVER DRIVE, SUITE 400	239 COMMERCE STREET
EAST HARTFORD, CT 06108	P.O. BOX 358
	GLASTONBURY, CT 06033-0358
JULY 20, 2007	

ADD SIGN-G

Highway Safety Corporation
239 Commerce Street
Glastonbury, CT 06033-0358



Project: Highway Safety
By: APB
Date: 7/20/2007
Sheet No. _____ of _____

Checked: JAR

Overhead Truss Sign Support Program

Tri-Chord Truss

Single Post Support

State: Vermont

Project: _____

Sign Location: MM 10.070 NB

Overall Dimensions (all in feet)

Span	Left Post Height	Rt. Post Height	Truss Section Lengths			Number of Truss Pieces	Wind Speed (mph)	Sign Weight (pcf)	Ice Load?
			Section 1 (feet)	Section 2 (feet)	Section 3 (feet)				
L	H1	H2							
58.07	22.86	25.16	29.04	29.04	0.00	2	90	3.65	yes

Miscellaneous Data

Span	Left Post Height	Rt. Post Height	Section 1 Length	Section 2 Length	Section 3 Length	Number of Truss Pieces	Wind Speed	Sign Weight	Ice Load
L	H1	H2					(mph)	(pcf)	(yes/no)
58.07	22.86	25.16	29.04	29.04	0.00	2	90	3.65	yes

Sign Dimensions (all in feet)

Sign 1			Sign 2			Sign 3		
Length	Width	Location	Length	Width	Location	Length	Width	Location
L1	W1	D1	L2	W2	D2	L3	W3	D3
19.19	10.33	16.16	17.72	9.50	34.62	0.00	0.00	0.00

Overhead Truss Chords

Height of Truss	Width of Truss	1st Truss Section		2nd Truss Section		3rd Truss Section		Chord Yield Str. (ksi)	Number of Chords
		Outside Dia. (inches)	Wall Thick. (inches)	Outside Dia. (inches)	Wall Thick. (inches)	Outside Dia. (inches)	Wall Thick. (inches)		
Dt (ft)	Wt (ft)								1, 3 or 4
3.00	3.00	4.000	0.226	4.00	0.22	4.000	0.226	42.0	3
4.000 0.226 <-- Values Used in computations									

Overhead Truss Diagonals

Equal Leg Angles		Round Pipe		Diagonal Yield Str. (ksi)	Vertical diag. angle (deg)	Horizontal diag. angle (deg)	Drilled Shafts for foundation ?	Circular Footing Stem? (yes/no)
Leg Size (inches)	Thickness (inches)	Outside Dia. (inches)	Thickness (inches)					
2.00	0.250	0.00	0.000	36.0	35	35	no	yes

No. of Posts per end

Left Post Verticals

Post Yield Str. (ksi)

Vertical diag. angle (deg)

Right Post Verticals

Spacing Sp (Feet)

Outside Dia. (inches)

Wall Thick. (inches)

Post Yield Str. (ksi)

1 or 2	Spacing Sp (Feet)	Outside Dia. (inches)	Wall Thick. (inches)						
1	0.00	14.000	0.500	42.0	45	0.000	14.000	0.500	42.000

Post Diagonals

Equal Leg Angles		Round Pipe		Diagonal Yield Str. (ksi)
Leg Size (inches)	Thickness (inches)	Outside Dia. (inches)	Thickness (inches)	
0.00	0.000	0.00	0.125	36.0
0.00	0.000	0.00	0.000	0.00
<-- Values Used in Computations				

Results

Truss

Posts

	D/C or CSR	OK / NG ?
Section 1 Chords	0.64	OK
Section 2 Chords	0.64	OK
Section 3 Chords	NA	N/A
Truss Diagonals	0.54	OK
Left Post	0.74	OK
Right Post	0.66	OK
Left Post Diagonals	N/A	N/A
Right Post Diagonals	N/A	N/A

Truss Deflections

in Inches

	Defl. Under DL + Ice	Allowable (L/150)	Camber
	0.57	4.65	1.05

Deflection OK

Connection Design

Number of Posts per end

1

Baseplate and Anchor Bolt Input

Baseplate Thickness	Baseplate Yield Str. ksi	No. of Bolts	Anchor Bolt Diameter (dia) inches	Yield Str. (ksi)*	Bot Circle Dia (in)	Baseplate Dia (in)	Socket Weld Size	Total Weld Length (in)	Embedment inches	Anchor Bolt Extension inches	Total Length inches	Anchor Bolt Bending Capacity	Baseplate Bending Capacity
7/16	50.0	4	1/2	50.0	60	22.00	3/16	87.99	36.00	8.000	45.000	0.92	42.95
												OK	
												See Note	

* Normal Yield Strengths (36, 55, 110 ksi)

AASHTO M214

Note: If Base plate bending stress exceeded, add vertical stiffeners.

Length of required 1/4" weld on each leg of each stiffener = 3.00 inches

Truss Chord Splice Connection Input

Conn. Plate Thickness	Conn. Plate Yield Str. ksi	Conn. Plate A325 Bolt Diameter inches	Number of Bolts
0.750	50.00	0.750	6

Input this area for mininutubes also

Analysis Results

Bot Circle Dia (in)	Conn Plate Dia (in)	Weld Size inches	Total Weld Length (in)	Bot Spacing in	Bot D/C in	Conn. R. Bending
7.00	10.00	3/32	25.13	3.65	0.47	7.70
						Actual
						2.25 1.0 37.50 Allowed
						OK OK OK Result

Truss Diagonal Connection Input (for 1/2 connection)

Conn. Plate Thickness	Conn. Plate Yield Str. (ksi)	Conn. Plate A325 Bolt Diameter inches	Number of Bolts
0.375	10.000	50.00	0

See Note

Note: Enter zero for welded connection

Analysis Results

Diagonal Bolt Force kips	Conn Plate Shear kips	Diagonal Weld Length inches	Diagonal Weld Size inches	Diagonal Total Weld Length (in)	Diagonal Weld Load Min	Diagonal Capacity
N/A	1.95	6.0	Actual	0.000	20.00	0.731
N/A	30.00	1.089	Capacity/required		8.32	Capacity
N/A	OK	OK	Result		OK	Result

Post Diagonal Connection Input (for 1/2 connection)

Conn. Plate Thickness	Conn. Plate Yield Str. (ksi)	Conn. Plate A325 Bolt Diameter inches	Number of Bolts
0.500	10.000	50.00	0.375

See Note

Note: Enter zero for welded connection

Analysis Results

Diagonal Bolt Force kips	Conn Plate Shear kips	Diagonal Weld Length inches	Diagonal Weld Size inches	Diagonal Total Weld Length (in)	Diagonal Weld Load Min	Diagonal Capacity
N/A	0.00	0.00	Actual	0.000	20.00	0.000
N/A	30.00	0.000	Capacity/required		8.32	Capacity
N/A	OK	OK	Result		OK	Result

Truss Support Connection (use W Shape)

Section	Web Thickness	Web Depth inches	Member Depth inches	Member Yield Str. ksi
W8x5	0.110	3.375	3.000	50.0

Use Web 5 for most

Weld at around web 1st weld

N/A SINGLE POST USED

See Note

Analysis Results

End Weld Length inches	End Weld Load kips	End Shear Load kips
15.0	11.87	Capacity
15.0	11.87	Capacity
OK	OK	Result

Truss Support Connection (For Tri-Chord)

Dist. from edge of post to CL of plate inches	Depth of Plate inches	Plate of Plate inches	Full Width of Plate inches
0.000	18.000	18.00	18.00

See Note

Analysis Results

Weld Length inches	Weld Load kips	Shear Load kips
1.91	1.91	Capacity
18.00	18.00	Capacity
OK	OK	Result

Manitube Connection at Pole

Die. of U-bolts	Saddle Post Top	Saddle Height inches	Depth of Connection inches	U-bolts Strength of U-bolts (ksi)	U-bolts Yield Strength (ksi)	U-bolts Stress (ksi)
0.75	15	0.0	1.2	0.75	0.75	1.47

N/A CLIP TOP CHORD

See Note

General Information

Post Dia.	Thickness	Diameter	Thickness
14.00	0.50	4.00	0.229

Analysis Results

Bot Dia.	n	Thrusts Per sq. in.	A req. sq. inches	A Gross sq. inches
0.500	13	0.142	0.186	
0.625	11	0.220	0.507	
0.750	10	0.334	0.442	
0.875	9	0.462	0.801	
1.000	8	0.606	0.785	
1.125	7	0.763	0.984	
1.250	7	0.969	1.227	
1.375	6	1.155	1.485	
1.500	6	1.405	1.707	
1.750	6	1.889	2.406	
2.000	4.5	2.498	3.142	
2.250	4.5	3.248	3.976	
2.500	4	3.999	4.509	
2.750	4	4.934	5.940	
3.000	4	5.967	7.689	
3.250	4	7.209	8.206	
3.500	4	8.329	9.621	
4.000	4	11.083	12.566	
4.500	4	12.607	14.186	
4.900	4	14.229	15.904	
4.700	4	15.060	17.721	
5.000	4	17.769	19.635	

222-Sign-9

7/20/2007

Conn.

Anchor Bolt Design - Double End Post Design												
Anchor Bolt Analysis (4 bolt pattern, round baseplate)						Not Applicable, see single post design below						
Bot Circle Dia. = 23.00 inches						Anchor Bolt Properties						
A bolts = 12.891 sq. inches						Net Tensile Stress Area = A _N =		3.540		sq. inches		
I bolts = 859.01 in ⁴						Circle Area = A _g =		3.570		sq. inches		
S bolts = 74.70 in ³												
Base Plate Dia. = 32.00 inches												
Allow Tensile Stress = F _t = 21.50 ksi												
Allow Shear Stress = F _v = 16.50 ksi												
						Baseplate Weld Information						
Reactions	Max. Axial kips	Min. Axial kips	Moment kip-ft	V kips	AB Com. Stress ksi	AB Tens. Stress ksi	AB Shear Stress ksi	C&R Eq. 5-24	Post. Bending Str. (psi)	Post. Axial Str. (psi)	Max. Strain	Max. Stress ksi
Left Support	01	3.81	3.81	0.00	0.00	0.29	0.00	0.00	0.00	0.18	0.18	0.18
Right Support		3.77	3.77	0.00	0.00	0.28	0.00	0.00	0.00	0.18	0.18	0.18
Left Support	GA C1	2.86	2.86	23.26	4.63	3.96	-3.52	0.37	0.02	4.04	0.13	4.18
Right Support		2.84	2.84	19.87	3.92	3.36	-2.84	0.39	0.01	3.42	0.13	3.55
Left Support	GA C2	2.86	2.86	34.89	3.19	5.63	-6.38	0.35	0.04	6.07	0.13	6.20
Right Support		2.84	2.84	28.51	2.97	4.86	-4.52	0.39	0.03	5.13	0.13	5.26
Left Support	GA C3	3.95	3.95	11.63	2.58	2.17	-1.56	0.20	0.00	2.02	0.19	2.21
Right Support		3.81	3.81	9.84	2.14	1.87	-1.29	0.17	0.00	1.71	0.18	1.89
Left Support	GA C4	3.95	3.95	17.44	1.62	3.11	-2.50	0.12	0.01	3.03	0.19	3.22
Right Support		3.81	3.81	14.78	1.32	2.60	-2.09	0.10	0.01	2.87	0.18	2.75
						5.63	-5.38	0.37	0.04			6.20
Baseplate weld design												
Not Applicable, see single post design below												
S post = 89.01 in ⁴												
A post = 21.21 in ²												
Max. Weld Size = 0.4375 inches												
Min. Weld Size = 0.25 inches												
Force per inch of post edge = 3.10 kips per inch												
Weld Stress based on Max. Weld Size = 3.01 ksi Based on double weld (socket connection)												
Weld Stress based on Min. Weld Size = 8.77 ksi Based on double weld (socket connection)												
Weld Yield Strength = 70 ksi												
Allowable Weld Stress = 18.9 ksi												
Required weld size = 0.116 inches												
Design Weld Size = 6.25 inches												
Weld Length = 87.96 inches												
Based on double weld (socket connection)												
Based on double weld (socket connection)												
Baseplate Thickness												
Not Applicable, see single post design below												
Width of Baseplate section = 9.600 inches												
Thickness = 2.250 inches												
S _x = 7.59 in ³												
Bolt spacing = X = 18.06 inches												
Measured along circumference of bolt circle												
Force per inch of post edge = 3.10 kips per inch												
Moment in Baseplate = 101.18 kip inches												
Bending Stress = 13.32 ksi												
Allowable Bending Stress = 37.50 ksi												
No vertical stiffeners needed												
Capacity of 1/4" weld = 3.36 kips per inch												
Length of 1/4" horizontal weld required on each lag of each vertical stiffener = X = 2.82 inches												

223-sign-9

Anchor Bolt Analysis

Base Bolt Analysis

Number of Bolts = 4

Bolt Circle Dia. = 23.00 inches

A bolts = 12.99 in² inches

Bolts = 859.21 in² in²

Spacing bolts = 74.70 in² in²

Base Plate Data

Base Plate Dia. = 32.00 inches

Allow Tensile Stress = F_t = 27.50 ksi

Allow Shear Stress = F_v = 18.50 ksi

Anchor Bolt Properties

Net Tensile Stress Area = A_t = 3.248 in² inches

Stress Area = A_s = 3.976 in² inches

Results	inches				AS Tens. Stress ksi	AS Shear Stress ksi	CSR
	Actual	Spec	M ₂	Shear			
g1	3.81	3.80	0.00	0.00	-0.59	0.00	0.00
g1-c1	2.86	114.19	23.58	4.83	21.86	0.37	0.63
g1-c2	2.86	68.51	34.89	3.19	16.39	0.25	0.36
g1-c3	3.95	99.34	11.83	2.98	11.10	0.20	0.16
g1-c4	3.95	35.60	17.64	1.90	8.22	0.12	0.09
					21.88	0.37	0.63

Baseplate weld design

3 post = 69.01 in² in²

4 post = 21.21 in² inches

Max. Weld Stress = 6.4376 inches

Min. Weld Stress = 0.25 inches

Force per inch of post edge = 9.59 kips per inch

Weld Stress based on Max. Weld Stress = 16.16 ksi

Weld Stress based on Min. Weld Stress = 0.59 ksi

Weld Yield Strength = 70 ksi

Allowable Weld Stress = 35.00 ksi

Required weld = 0.374 inches

Design Weld = 0.3749 inches

Weld Length = 8.276 inches

Based on double weld (socket connection)

Based on double weld (socket connection)

Based on double weld (socket connection)

Based on double weld (socket connection)

Baseplate Thickness

Width of Baseplate section = 9.000 inches

Thickness = 2.250 inches

S_x = 7.59 in³ in³

Bolt spacing = 16.08 inches

Force per inch of post edge = 9.59 kips per inch

Moment at Baseplate = 37.50 kip inches

Bending Stress = 42.86 ksi

Allowable Bending Stress = 20.00 ksi

Baseplate stress exceeded, add vertical stiffeners

Capacity of 1/4" weld = 3.36 kips per inch

Length of 1/4" weld required on each leg of each vertical stiffener = 10.87 inches

Measured along circumference of bolt circle

Truss Chord Splices

Bolt Stresses

Maximum Chord Force = 35.47 kips

Max. Chord Diameter = 4.00 inches

Bolt Circle Dia. = 7.000 inches

Bolt Area = 0.34 in² in²

A_{bolts} = 2.007 in² inches

Bolt Tensile Stress = 17.67 ksi

Allow Tensile Stress = F_t = 27.50 ksi

Demand/Capacity Ratio = 0.64

5 bolts

AS (A325 bolts)

Plate Stresses

Width of conn. plate section = 3.00 inches

Thickness = 0.87 inches

Bolt Circle Circumference = 21.99 inches

Bolt Spacing = 0.281 in² in²

Chord Circumference = 27.09 inches

Force per inch along circumference = 1.61 kips per inch

Moment at Chord, plate = 2.17 kip inches

Bending Stress = 7.60 ksi

Allowable Bending Stress = 37.50 ksi

Weld Stresses

Max. Weld Stress = 0.928 inches

Min. Weld Stress = 0.29 inches

Force per inch of plate edge = 2.92 kips per inch

Weld Stress based on Max. Weld Stress = 8.28 ksi

Weld Stress based on Min. Weld Stress = 2.59 ksi

Weld Yield Strength = 70 ksi

Allowable Weld Stress = 18.0 ksi

Required weld = 0.108 inches

Design Weld = 0.225 inches

Weld Length = 3.238 inches

Based on double weld (socket connection)

Based on double weld (socket connection)

Based on double weld (socket connection)

Based on double weld (socket connection)

For Monotube Only

Moment	Wrench	SHEAR Horizontal	SHEAR Vertical	Bolt Tens	Bolt Shear
kip-ft	kip-ft	kip	kip	ksi	ksi
36.07	73.28	0.18	0.66	27.98	0.10
				81.67 ksi	
				0.20 kip	
				12.29 in ²	
				3.61 in ²	
				28.50 ksi	
				19.00 ksi	
				CSR =	

Bolt stresses based on AS22.84 (ASME/PTC Table 10.3.28)

Bolt stresses indicated by 0.00 are based on 1 inch diameter

224-Sign-9

Truss Diagonal Splices			
Bolted Splice Design			
Maximum Axial Force in Diagonal =	7.31	kips	
Bolt Dia. =	0.600	inches	
Bolt Area =	#N/A	inches	
Number of Bolts =	0		
Allowable Shear stress =	15	ksi (AASHTO Table 10.32.3C) Galvanized surface	
Allowable Load on Connection =	#N/A	kips (single shear)	
Welded Splice Design			
Maximum Axial Force in Diagonal =	7.31	kips	
Capacity of 1/4" weld =	6.72	kips per inch (double weld)	
Required Length of Weld =	1.089	inches (based on 2 welds)	
Minimum for angles =	6.0	inches (based on 2 welds 3" long)	
Minimum for pipes =	12.0	inches (based on 4 welds 3" long)	
Minimum Weld Length =	6.0	inches	
Connection Plate Design			
Total Force in 1/2 Plate =	7.31	kips	
Stress in plate =	1.95	ksi	
Allowable stress =	30.00	ksi	
Connection Plate Weld			
Force per inch of weld =	0.73	kips per inch	
Capacity of 1/4" weld =	6.72	kips per inch (double weld)	

Post Diagonal Connections			
Bolted Splice Design			
NA - Single Post Design			
Maximum Axial Force in Diagonal =	0.00	kips	
Bolt Dia. =	0.600	inches	
Bolt Area =	0.601	inches	
Number of Bolts =	0		
Allowable Shear stress =	15	ksi (AASHTO Table 10.32.3C) Galvanized surface	
Allowable Load on Connection =	0.0	kips (single shear)	
Welded Splice Design			
Maximum Axial Force in Diagonal =	0.00	kips	
Capacity of 1/4" weld =	6.72	kips per inch (double weld)	
Required Length of Weld =	0.000	inches (based on 2 welds)	
Minimum for angles =	6.0	inches (based on 2 welds 3" long)	
Minimum for pipes =	12.0	inches (based on 4 welds 3" long)	
Minimum Weld Length =	12.0	inches	
Connection Plate Design			
Total Force in 1/2 Plate =	0.00	kips	
Stress in plate =	0.00	ksi	
Allowable stress =	30.00	ksi	
Connection Plate Weld			
Force per inch of weld =	0.00	kips per inch	
Capacity of 1/4" weld =	6.72	kips per inch (double weld)	

Truss Support Connection (use W8x8.5)			
NA - See Connection Below			
Maximum Reaction =	3.95	kips (half reaction)	
Capacity of 1/4" weld =	3.36	kips per inch (single weld)	
Length of Weld Required =	0.589	inches (based on double weld)	
Length of Weld Provided =	19.00	inches	
Shear Capacity of W8x8.5 =	11.87	kips	

Truss Support Connection (Single or Double pole) - Tri - Chord Only			
Maximum Reaction (Vert) =	3.95	kips (max of left or right conn.)	Number of Chords = 3
Maximum Wind Load (Hori) =	4.73	kips (max of left or right conn.)	Pole (per end) = 1
Reaction per chord connection (Vert) =	1.97	kips	# of Connectors = 2
Reaction per chord connection (Hori) =	2.37	kips	Weld Size = 0.19 in
Area of Weld =	8.48	in ²	
Weld =	22.82	in ³	
It =	0.29	ksi	
It =	1.02	ksi	
It =	0.29	ksi	
(It ² +It ² +It ²)/12 =	1.91	ksi	
Allowable stress of weld =	19	ksi	

Monotube Support Connection (Single Vertical Pole)			
NA - See Connection Above			
Max Shear =	2.25	kips	Div by 2 because 2 u-bolts are always used
Monotube Dia. =	14.00	in	
U-bolt Leg Dia. =	0.75	in	
Area of U-bolt Leg =	0.334	in ²	
Tension in U-bolt Leg =	0.49	kips	Based on depth of saddle equal to 0.5 * Diameter of Monotube
Stress in U-bolt =	1.47	ksi	
Allowable U-bolt stress =	18	ksi	Eq. 5-21
Stress Check =	OK		

Circular Stem Design - For Use in Spread Footings with Circular Stem

f'c =	3.00	ksi	
Fy =	60	ksi	
Cc =	2.00	in	Clear cover is uniform around the cross section
h =	36.00	in	Outside Diameter of Column (Approx. 70" max)
Bar Size =	5	As =	0.31 in^2
		Dia =	0.625 in
Hoop Bar size =	4	As =	0.2 in^2
Spacing =	3.75	Dia =	0.5 in
Φ =	1		Approximate desired spacing of main reinforcing (assumes as max)

Determine if section is adequate for loads applied			
Mu =	139.19	ft-kips	Mu = Resultant moment = sqrt(Mstrong^2+Mweak^2)
Pu =	3.95	kips	IS SECTION OK? YES

Calculate location of steel reinforcing around perimeter of column:				
Dia. of inner ring of reinf =		30.375 in		
perimeter =		95.43 in		
# of bars =	26	number of (even) bars that will fit in perimeter	Program allows 42 bars maximum OK	
Number of bar rows =	13			
spacing =	2.53	(in) actual vertical spacing of bars		
Note: Program orients bars so that one layer is on the centroid of column (conservative)				
Calculate location of bars with respect to the extreme compression fiber:				
Is rebar	Is steel used for	# bars in	Area of Steel Calculation	
Rebar level	level in	Tension or Comp.?	each level	As tension As comp
d1	2.81 in	Comp	2	0.62
d2	5.34 in	Comp	2	0.62
d3	7.88 in	Comp	2	0.62
d4	10.41 in	Comp	2	0.62
d5	12.94 in	Comp	2	0.62
d6	15.47 in	Comp	2	0.62
d7	18.00 in	Steel Not Used	2	
d8	20.53 in	Tension	2	0.62
d9	23.06 in	Tension	2	0.62
d10	25.59 in	Tension	2	0.62
d11	28.13 in	Tension	2	0.62
d12	30.66 in	Tension	2	0.62
d13	33.19 in	Tension	2	0.62
d14	NA			
d15	NA			
d16	NA			
d17	NA			
			As tens =	3.72 As comp 3.72
Centroid of Tension and Compression Steel from extreme compression fiber:				
d(tension) =	26.86 in			
d(comp) =	9.14 in			

Find max axial force: **M=0** stand. Spec. 8.16.4.2.1

$\Phi P_0 = \Phi [0.85 f'_c (A_g - A_{st}) + A_{st} f_y]$

$A_g = 1017.9 \text{ in}^2$
 $A_{st} = 8.1 \text{ in}^2$

$\Phi P_0 = 3058.6 \text{ kip}$ $M_n = 0$

Find axial and moment capacity at balanced strain condition:	Stand. Spec 8.16.4.2.3
$\Phi P_b = \Phi[0.85f'_c b'ab + A_s f'_s A_s - A_s f_y]$ $\Phi M_b = \Phi[0.85f'_c b'ab(d-d' - ab/2) + A_s f'_s s(d-d' - ab/2) + A_s f_y d]$ $d = 26.86$ (in) dist from extreme compression fiber to centroid of tension steel $d' = 3.14$ (in) dist from extreme compression fiber to centroid of comp. steel $d'' = 8.86$ (in) dist from centroid of gross section to centroid of tension steel $ab = 14.31$ in $\beta_1 = 0.9$ $f'_s = 36.97$ ksi $b = 35.23$ in $A_s = 3.72$ in ² $\Phi P_b = 1199.76$ kip	$A_s = 3.72$ in ² $\Phi M_b = 17138.36$ ft-kip
$\Phi M_b = 17138.36$ ft-kip $\Phi M_b = 1428.20$ ft-kip	

Find Moment Capacity of Section: P=0 Note: neglect compression steel

c = 5.64 (in) with a % error of	0.06 % OK	Reinforcement Ratio: Used to check if $f_s = f_y$ $\rho = 0.005527$ $\rho_b = 0.022638$
b = 25.06		
$\theta = 88.22$		

$\Phi M_n = A_s f_y (d - a/2)$ is $\rho < 75\rho_b$? OK

5428.57 ft-kip-in-kip = 452.38 ft-kip $P_n = 0$

Determine if section is adequate for loads applied

Mu =	139.19075 ft-kips
Pu =	3.9463256 kips

Points for interaction diagram:		Note: points are connected with straight lines	
Article 8.15.4 Stand. Spec: The combined flexural and axial load capacity of compression members shall be taken as 35% of that from 8.16.4			
	P	M	
1	1070.5	0	
2	419.91	499.87	
3	0	158.33	
4	3.9463256	139.1908	Point 4 is from actual loads

Linear Interpolation Program #1 (upper line)			
Are you in upper region? No			
	Pu	Mu	
Value Below	1070.52	0.00	
Value at desired Loc.	3.95	x = 819.464	Max
Value Above	419.91	499.87	

Linear Interpolation Program #2 (lower line)				
Are you in lower region? Yes				
	Pu		Mu	
Value Below	419.91		499.87	
Value at desired Loc.	3.95	x =	161.543	Max
Value Above	0.00		158.33	

ZZ8-Sign-g

[illegible]

Section Properties

Number of Posts per end	1	Number of Chords	3
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Overhead Truss

Section 1													
Chord Area	Mom. Of I	Dis. Area	Total I	Total S	Total Area	Chord	Weight	Ice Area	Wind Area	Wind Area	Diagonal	No. of Diags.	Diagonal
Ao	Iy	Ad	Ibd	Stot	Astot	Rmin	per foot	Chord	Diags.	R min	per plane	Length	
2.68	4.771	0.94	1751	97.26	11.61	1.33	39.5	6.0	1.00	0.71	0.389	8	2.88
2.68	4.771	0.94	1751	84.13	11.61	1.33	39.5	6.0	1.00	0.71	0.389	8	2.88
in ²	in ⁴	in ²	in ⁴	in ³	in ²	in	lb/ft	ft ² /ft	ft ² /ft	ft	in.		(feet)
Section 2													
Chord Area	Mom. Of I	Dis. Area	Total I	Total S	Total Area	Chord	Weight	Ice Area	Wind Area	Wind Area	Diagonal	No. of Diags.	Diagonal
Ao	Iy	Ad	Ibd	Stot	Astot	Rmin	per foot	Chord	Diags.	R min	per plane	Length	
2.88	4.771	0.94	1751	97.26	11.61	1.33	39.5	6.0	1.00	0.71	0.389	8	2.88
2.88	4.771	0.94	1751	84.13	11.61	1.33	39.5	6.0	1.00	0.71	0.389	8	2.88
in ²	in ⁴	in ²	in ⁴	in ³	in ²	in	lb/ft	ft ² /ft	ft ² /ft	ft	in.		(feet)
Section 3 = Section 1													
Chord Area	Mom. Of I	Dis. Area	Total I	Total S	Total Area	Chord	Weight	Ice Area	Wind Area	Wind Area	Diagonal	No. of Diags.	Diagonal
Ao	Iy	Ad	Ibd	Stot	Astot	Rmin	per foot	Chord	Diags.	R min	per plane	Length	
2.68	4.77	0.94	1751	97.26	11.61	1.33	39.50	6.0	1.00	0.71	0.39	8.00	2.88
2.68	4.77	0.94	1751	84.13	11.61	1.33	39.50	6.0	1.00	0.71	0.39	8.00	2.88
in ²	in ⁴	in ²	in ⁴	in ³	in ²	in	lb/ft	ft ² /ft	ft ² /ft	ft	in.		(feet)

Posts

Left Post													
Chord Area	Mom. Of I	Diag. Area	Ixx	Sxx	Izz	Chord	Szz	Weight	Ice Area	Wind Area	Diagonal	Total Number	Diagonal
Ao	Iy	Ad	Ibd	Stot	Iyzt	Chord	post	Rmin	Chord	Diags.	R min	of Diagonals	Length
21.21	483.093	0.00	483.09	69.01	483.09	4.77	69.01	72.16	3.67	1.167	999	0	0.00
in ²	in ⁴	in ²	in ⁴	in ³	in ⁴	in	in ³	lb/ft	ft ² /ft	ft ² /ft	in.		(feet)
Right Post													
Chord Area	Mom. Of I	Diag. Area	Ixx	Sxx	Izz	Chord	Szz	Weight	Ice Area	Wind Area	Diagonal	Total Number	Diagonal
Ao	Iy	Ad	Ibd	Stot	Iyzt	Chord	post	Rmin	Chord	Diags.	R min	of Diagonals	Length
21.21	483.093	0.00	483.09	69.01	483.09	4.77	69.0	72.16	3.67	1.167	999	0	0.00
in ²	in ⁴	in ²	in ⁴	in ³	in ⁴	in	in ³	lb/ft	ft ² /ft	ft ² /ft	in.		(feet)

Signs

Sign 1				Sign 2			
Area	Weight	Ice Load	L/W Ratio	Area	Weight	Ice Load	L/W Ratio
166.2367	724	205	1.65719603	166.2367	724	205	1.65719603
ft ²	lb	lb		ft ²	lb	lb	

Sign 3			
Area	Weight	Ice Load	L/W Ratio
0	0	0	0
ft ²	lb	lb	

Section 1 & 3		Section 2	
Ice Area 4 =	6.0	Ice Area 4 =	6.0
Ice Area 3 =	6.0	Ice Area 3 =	6.0
Wind area diags 4 =	0.4713	Wind area diags 4 =	0.4713
Wind area diags 3 =	0.7070	Wind area diags 3 =	0.7070
Ice Area 1 =	1.047196	Ice Area 1 =	1.0472

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Moments and Shears on Overhead Truss Due to Wind Loads

Span	Wind Load on Truss Section 1	Wind Load on Truss Section 2	Wind Load on Truss (ft)	Wind Load on Signs Load (kips)	Dist. from Left (feet)
feet	0.00	0.00	0.00	4.25	15.15
	51.51	51.51	51.51	3.53	34.62
26.07				0.00	0.00

P1 Left Sign
P2 Center Sign
P3 Right Sign

Total Uniform Load =	0.052 k/ft	Total Load =	10.77 kips
Left Reaction	5.99 kips	Right Reaction	4.78 kips

Moments and Shears

K/L	Distance	P1 dist.	P2 dist.	P3 dist.	Moment
0.0	0.0	0	0	0	0.00
0.1	5.8	0	0	5.807	23.50
0.2	11.6	0	0	11.614	66.08
0.3	17.4	1.261	0	17.421	91.13
0.4	23.2	7.068	0	23.228	95.16
0.5	29.0	12.875	0	29.035	97.48
0.6	34.8	18.682	0.226	34.842	97.22
0.7	40.6	24.489	6.033	40.649	75.52
0.8	46.5	30.296	11.84	46.456	52.08
0.9	52.3	36.103	17.647	52.263	29.91
1.0	58.1	41.91	23.454	58.07	0.00

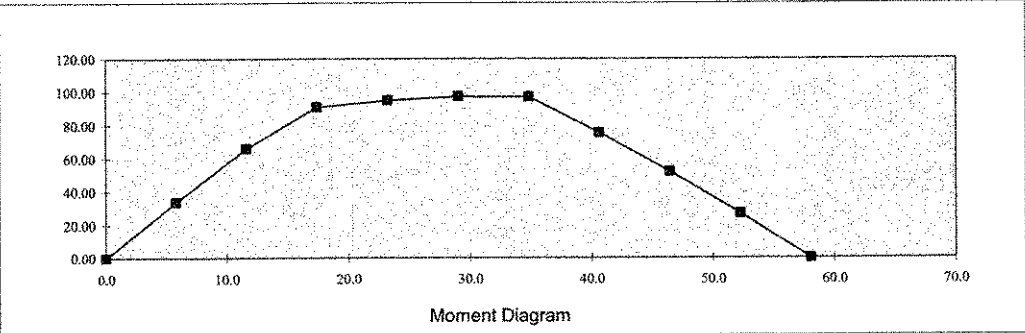
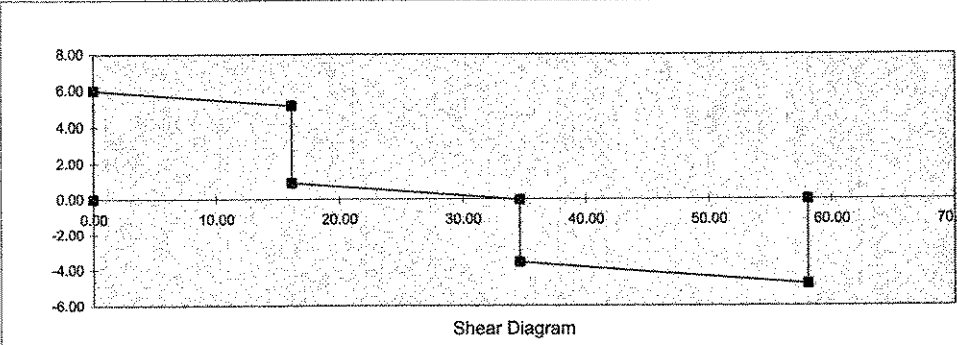
0.00	0.00
0.00	5.99
16.16	5.15
34.62	0.91
34.62	-0.04
34.62	-3.58
34.62	-0.04
34.62	-3.58
58.1	0.00

Shear at Point Loads	Shear	Shear	Max or Min
	Left	Right	
At Left Reaction	0.00	5.99	5.99
At Point P1	90.02	5.15	5.15
At Point P2	98.00	-0.04	-3.58
At Point P3	0.00	-1.79	-1.79
At Right Reaction	0.00	-4.78	-4.78

Max	Min
Maximums	Minimums
97.48	5.99
0.00	-4.78

Forces at Field Splices and Mid-Span

Left Side	Right Side	Mid-Span
Location	Location	Location
29.04 feet	58.07 feet	29.04 feet
Left Reaction	Left Reaction	Left Reaction
5.99 kips	5.99 kips	5.99 kips
Point Load 1	Point Load 1	Point Load 1
4.25 kips	4.25 kips	4.25 kips
Point Load 2	Point Load 2	Point Load 2
0.00 kips	3.53 kips	0.00 kips
Point Load 3	Point Load 3	Point Load 3
0.00 kips	0.00 kips	0.00 kips
Uniform Load	Uniform Load	Uniform Load
0.052 kips per foot	0.052 kips per foot	0.052 kips per foot
Shear at splice	Shear at splice	Shear at Mid-Span
0.25 kips	-4.78 kips	0.25 kips
Moment at splice	Moment at splice	Mom. at Mid-Span
97.48 kip feet	0.00 kip feet	97.48 kip feet



Group Load Combination III - Moments and Shears on Overhead Truss Due to Wind Loads

Span	Wind Load on Truss Section 1	Wind Load on Truss Section 2	Wind Load on Truss Section 3	Wind Load on Truss Section 4	Wind Load on Signs
feet	(gft)	(gft)	(gft)	(gft)	(feet)
58.07	91.91	91.91	91.91	91.91	10.77
Total Uniform Load =					10.77 kips
Left Reaction					5.39 kips
Right Reaction					5.38 kips

Moments and Shears

SL	Distance	P1 dist	P2 dist	P3 dist	Moment
0.0	0.0	0	0	0	0.00
0.1	5.8	0	0	5.807	33.90
0.2	11.6	0	0	11.614	68.08
0.3	17.4	0	0	17.421	91.13
0.4	23.2	7.088	0	23.228	95.18
0.5	29.0	12.875	0	29.035	87.48
0.6	34.8	18.662	0.208	34.842	57.22
0.7	40.6	24.449	6.033	40.649	75.52
0.8	46.5	30.236	11.84	46.456	52.08
0.9	52.3	36.023	17.647	52.263	28.91
1.0	58.1	41.81	23.454	58.07	0.00

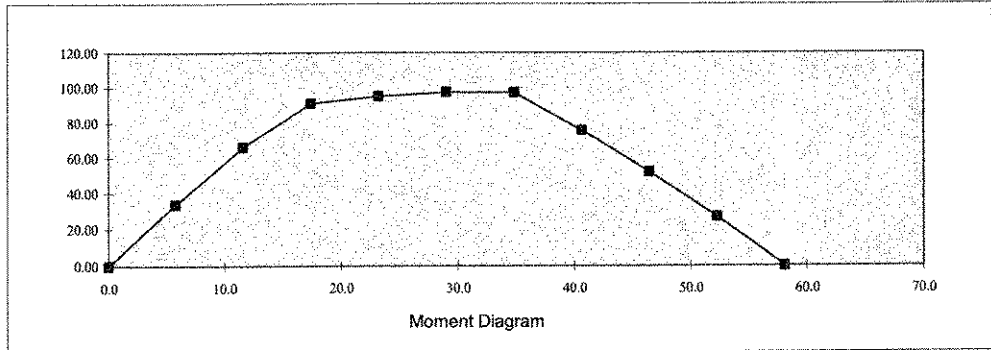
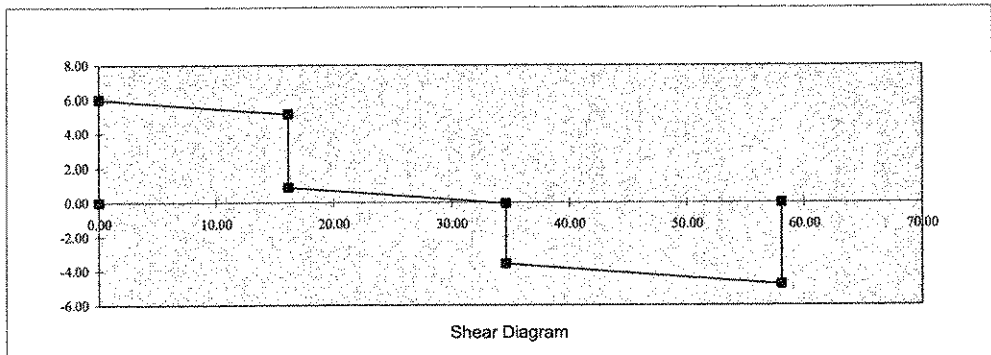
Values for Shear Diagram	
0.00	0.00
0.00	5.99
16.16	5.15
16.16	0.91
34.62	-0.04
34.62	-3.58
34.62	-0.04
34.62	-3.58
58.1	-4.78
58.1	0.00

Shear at Point Loads	Shear	Left	Right	Max or Min
At Left Reaction	0.00	0.00	5.39	5.39
At Point P1	50.02	5.15	0.91	5.15
At Point P2	98.05	-0.04	-3.58	-3.58
At Point P3	0.00	-1.79	-1.79	-1.79
At Right Reaction	0.00	-4.78	0.00	-4.78

Maximums	Minimums
57.46	5.95
0.00	-4.78

Forces at Field Splices and Mid-Span

Left Side	Right Side	Mid-Span
Location	Location	Location
29.04/feet	58.07/feet	29.04/feet
Left Reaction	Left Reaction	Left Reaction
5.39 kips	5.39 kips	5.39 kips
Point Load 1	Point Load 1	Point Load 1
4.25 kips	4.25 kips	4.25 kips
Point Load 2	Point Load 2	Point Load 2
0.00 kips	3.53 kips	0.00 kips
Point Load 3	Point Load 3	Point Load 3
0.00 kips	0.00 kips	0.00 kips
Uniform Load	Uniform Load	Uniform Load
0.052 kips per foot	0.052 kips per foot	0.052 kips per foot
Shear at splice	Shear at splice	Shear at Mid-Span
1.25 kips	-4.78 kips	0.25 kips
Moment at splice	Moment at splice	Moment at Mid-Span
97.46 kip feet	0.00 kip feet	97.46 kip feet



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Moments and Shears on Overhead Truss Due to Dead Loads

Span (feet)	Dead Load on Truss (kips)	Dead Load on Signs			
		Load (kips)	Dist. from Left (feet)	Dist. from Right (feet)	
58.07	40	0.72	16.76	41.31	P1 Left Sign
		0.61	34.02	24.05	P2 Center Sign
		0.05	0.00	58.07	P3 Right Sign
Total Uniform Load =		0.04 klf		Total Load =	
				5.89 kips	
Left Reaction				Right Reaction	
1.50 kips				1.71 kips	

Moments and Shears

X/L	Distance	P1 dist.	P2 dist.	P3 dist.	Moment
0.0	0.0	0	0	0	0.00
0.1	8.8	0	0	5.807	10.47
0.2	17.6	0	0	11.614	19.60
0.3	26.4	0	0	17.421	28.49
0.4	35.2	7.008	0	23.228	36.76
0.5	44.0	12.815	0	29.035	44.70
0.6	52.8	18.622	0.200	34.842	51.77
0.7	61.6	24.429	0.603	40.649	57.87
0.8	70.4	30.236	1.004	46.456	62.58
0.9	79.2	36.043	1.407	52.263	65.95
1.0	88.0	41.850	1.810	58.070	67.00

Values for Shear Diagram	
0.00	0.00
0.00	1.92
16.16	0.56
16.16	1.28
16.16	0.56
16.16	1.28
16.16	0.56
16.16	1.28
16.16	0.56
58.1	-1.71
58.1	0.00

Shear at Point Loads	
At Left Reaction	0.00
At Point P1	25.83
At Point P2	29.35
At Point P3	0.00
At Right Reaction	0.00

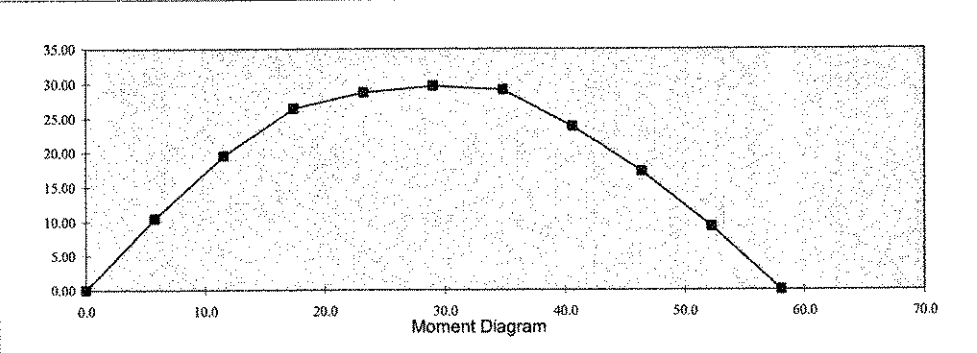
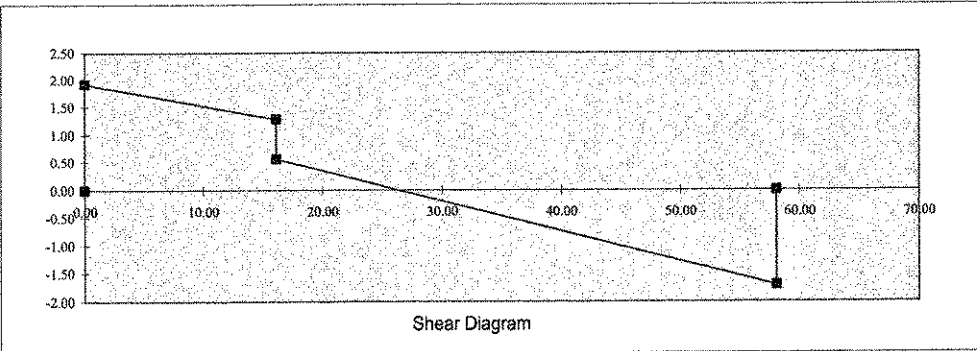
Max or Min	
Left	Right
1.92	1.92
0.56	1.28
-0.79	-0.79
0.56	0.56
-1.71	-1.71

Moment	
0.00	0.00
29.70	0.00
0.00	0.00
0.00	0.00
0.00	0.00

Shear	
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

Forces at Field Splices and at Mid-Span

Left Side		Right Side		Mid-Span	
Location	29.04/feet	Location	58.07/feet	Location	29.04/feet
Left Reaction	1.92 kips	Left Reaction	1.92 kips	Left Reaction	1.92 kips
Point Load 1	0.72 kips	Point Load 1	0.72 kips	Point Load 1	0.72 kips
Point Load 2	0.00 kips	Point Load 2	0.61 kips	Point Load 2	0.00 kips
Point Load 3	0.00 kips	Point Load 3	0.00 kips	Point Load 3	0.00 kips
Uniform Load	0.04 kips per foot	Uniform Load	0.04 kips per foot	Uniform Load	0.04 kips per foot
Shear at splice	0.00 kips	Shear at splice	-1.71 kips	Shear at splice	0.00 kips
Moment at splice	29.70 kip-feet	Moment at splice	0.00 kip-feet	Moment at splice	29.70 kip-feet



Moments and Shears on Overhead Truss Due to Ice Loads

Span (feet)	Ice Load on Truss (psf)	Ice Load on Signs		P1 Left Sign	P2 Center Sign	P3 Right Sign
		Load (kips)	Dist. from Left (feet)			
55.07	16	0.59	16.16			
		0.50	34.62			
		0.00	0.00			
Total Uniform Load =		0.02 klf		Total Load =		
				2.14 kips		
Left Reaction				Right Reaction		
				0.99 kips		

Moments and Shears

Dist.	Distance	P1 dist.	P2 dist.	P3 dist.	Moment
0.0	0.0	0	0	0	0.00
0.1	5.8	0	0	5.807	6.39
0.2	11.6	0	0	11.614	12.78
0.3	17.4	1.281	0	17.421	16.82
0.4	23.2	7.086	0	23.228	17.75
0.5	29.0	12.875	0	29.035	16.39
0.6	34.8	18.662	0.228	34.842	18.08
0.7	40.6	24.459	6.193	40.646	14.47
0.8	46.5	30.260	11.94	46.458	10.22
0.9	52.3	36.103	17.647	52.303	5.43
1.0	58.1	41.91	23.454	58.07	0.00

Values for Shear Diagram	
0.00	0.00
0.00	1.15
16.16	0.86
16.16	0.27
16.16	0.86
16.16	0.27
16.16	0.86
16.16	0.27
58.1	-0.99
58.1	0.00

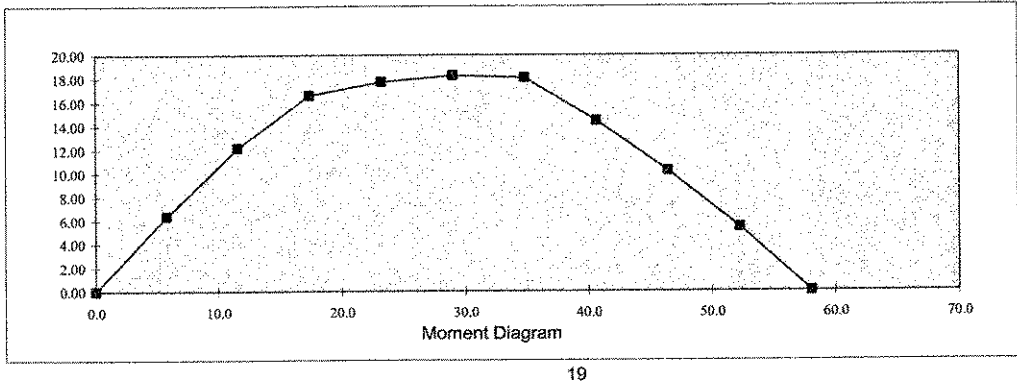
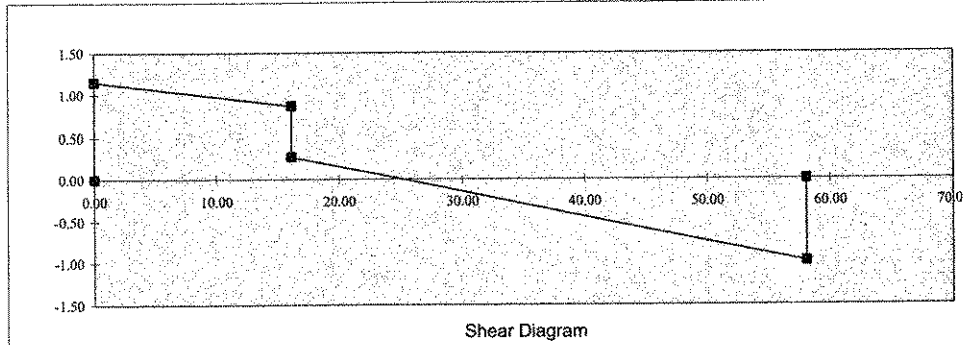
Shear at Point Loads	
Location	Shear
At Left Reaction	0.00
At Point P1	16.30
At Point P2	16.21
At Point P3	0.00
At Right Reaction	0.00

Shear	Shear	Max or Min
Left	Right	
0.00	0.00	1.15
0.86	0.27	0.86
-0.97	-0.57	-0.57
0.05	0.05	0.05
-0.99	0.00	-0.99

Moment	Shear
Maximum	18.28
Minimum	0.00

Forces at Field Splices and at Mid-Span

Left Side		Right Side		Mid-Span	
Location	29.04/feet	Location	58.07/feet	Location	29.04/feet
Left Reaction	1.15 kips	Left Reaction	1.15 kips	Left Reaction	1.15 kips
Point Load 1	0.59 kips	Point Load 1	0.59 kips	Point Load 1	0.59 kips
Point Load 2	0.00 kips	Point Load 2	0.50 kips	Point Load 2	0.00 kips
Point Load 3	0.00 kips	Point Load 3	0.00 kips	Point Load 3	0.00 kips
Uniform Load	0.02 kips per foot	Uniform Load	0.02 kips per foot	Uniform Load	0.02 kips per foot
Shear at splice	0.04 kips	Shear at splice	-0.99 kips	Shear at splice	0.04 kips
Moment at splice	18.28 kip feet	Moment at splice	0.00 kip feet	Moment at splice	16.29 kip feet



Group	Load	Percent	Remark
1	DL	1.00	
2	DL+W	1.33	
3	DL+Ice+SW	1.33	Minimum Pz = 25.0 psf

GROUP LOAD COMBINATIONS																				
	Location	Section	Bending About Horizontal Axis						Bending About Vertical Axis						SHEAR Horizontal	SHEAR Vertical	Constant Forces			
			X		Y		Z		X		Y		Z				Axial	Torsion	SEAR (P-P)	
			Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min						Section 1
	0		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.00	0.00	0.00	0.00	0.00
GROUP LOAD 1	Left Support	21.04		29.70	3.08	8.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.82	0.00	0.00	0.00	0.00	0.00	0.00
	Midspan	21.04		29.70	3.08	8.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.82	0.00	0.00	0.00	0.00	0.00	0.00
	Sign 1	26.16		28.83	3.19	8.84	0.00	0.00	0.00	0.00	0.00	0.00	1.28	8.84	0.00	0.00	1.28	8.84	0.00	1.28
	Sign 2	26.16		28.83	3.19	8.84	0.00	0.00	0.00	0.00	0.00	0.00	1.28	8.84	0.00	0.00	1.28	8.84	0.00	1.28
	Sign 3	30.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.58	0.00	0.58	
	Right Support	58.07		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.71	0.00	0.00	1.71	0.00	1.71	
GROUP LOAD 2	Left Support	22.16		31.78	2.76	7.80	72.28	16.18	28.01	0.00	0.00	0.00	0.00	35.39	0.18	0.00	0.00	35.39	0.18	0.18
	Midspan	29.04		22.33	2.76	7.38	72.28	16.05	28.01	0.00	0.00	0.00	0.00	34.00	0.18	0.00	0.00	33.89	0.18	0.18
	Sign 1	16.16		19.42	2.40	6.42	67.69	9.85	25.51	38.88	0.00	0.00	0.00	32.00	0.08	0.00	0.00	31.92	0.08	0.08
	Sign 2	22.16		22.62	2.76	7.72	72.70	16.17	28.17	0.00	0.00	0.00	0.00	35.48	0.09	0.00	0.00	35.47	0.09	0.09
	Sign 3	30.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.44	0.00	0.00	1.25	0.44	0.44	
	Right Support	58.07		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.26	0.26	0.00	0.00	3.26	0.26	0.26
GROUP LOAD 3	Left Support	26.07		36.07	4.43	11.93	38.64	5.23	14.00	0.00	0.00	0.00	0.00	29.93	0.00	0.00	29.93	0.00	0.00	0.00
	Midspan	29.04		36.07	4.43	11.93	38.64	5.23	14.00	0.00	0.00	0.00	0.00	29.93	0.00	0.00	29.93	0.00	0.00	0.00
	Sign 1	31.56		31.56	10.47	18.94	36.95	12.04	1.94	1.84	0.00	0.00	0.00	1.44	0.00	0.00	1.44	0.00	1.44	0.00
	Sign 2	34.82		34.82	11.41	19.82	36.95	12.58	14.09	1.94	1.84	0.00	0.00	1.54	0.00	0.00	1.54	0.00	1.54	0.00
	Sign 3	41.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.68	0.00	0.68	0.00
	Right Support	58.07		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	2.03	0.00	0.00	1.80	2.03	0.00	2.03
GROUP LOAD 4	Right Support	58.07		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	2.03	0.00	0.00	1.80	2.03	0.00	2.03
	Right Support	58.07		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	2.03	0.00	0.00	1.80	2.03	0.00	2.03
													4.04	2.31			35.39	38.47	4.00	

Moment	Moisture	SHEAR Horizontal	SHEAR Vertical
kip-ft	kip-ft	kips	kips
38.07	73.28	4.50	2.31
35.76	73.70	2.69	1.02
36.07	73.26	0.18	0.06

VERTICAL TRUSS LOAD COMBINATIONS

Percent Overstress

Group I DL 1.00

Group II Case 1 DL + Wn + .2Wt 1.33

Group II Case 2 DL + .5Wn + .2Wt 1.33

Group III Case 1 DL + ICE + .5Wn + .1Wt 1.33

Group III Case 2 DL + ICE + .5Wn + .15Wt 1.33

Wn = WIND FORCES IN THE X DIRECTION

Minimum wind pressure of 25 psf

Location	LOADS	VWX (kip/ft)				AXIAL (kip/ft)				VWX				AXIAL			
		DL	ICE	WIND	WIND II	DL	ICE	WIND		DL	ICE	WIND	WIND II	DL	ICE	WIND	
Left Support		0.00	0.00	0.012	0.028	0.072	0.011	0.00		0.00	0.00	5.99	5.99	1.92	1.15	0.00	
Right Support		0.00	0.00	0.012	0.028	0.072	0.011	0.00		0.00	0.00	4.78	4.78	1.71	0.99	0.00	

Depth of Horizontal Truss	Total Left Post Ht.	Total Right Post Ht.
Dt	Ht	Ht
3.00	20.19	25.49

LOAD COMBINATION RESULTS (Loads and Moments are for both posts)										Relative Stiffness Transverse Wind
Reactions		Strong	Weak	Strong	Wind T1	Wind T2	Wind T3	Wind T4	Wind T5	Wt
Left Support	G1	0.00	0.00	0.00	0	3.81				0
Right Support		0.00	0.00	0.00	0	3.77				0
Left Support	GRC1	114.19	23.26	4.73	0.96	2.86				6.10
Right Support		100.67	19.67	3.85	0.75	2.84				4.67
Left Support	GRC2	68.51	34.89	2.84	1.45	2.86				6.10
Right Support		60.40	29.51	2.31	1.13	2.84				4.67
Left Support	GRC1	68.34	11.63	2.54	0.46	3.95				6.10
Right Support		52.99	8.84	2.11	0.38	3.81				4.67
Left Support	GRC2	35.80	17.44	1.53	0.46	3.95				6.10
Right Support		31.80	14.76	1.27	0.38	3.81				4.67

Posts													
Left Post													
Chord Area	Max. Df	Diag. Area	Isx	Sxx	Izz	Chord	Szz	Weight	Ice Area	Wind Area	Diagonal	Chord	R min
As	Is	Ad	Isx	Sxx	Izz	Chord	Szz	Weight	Ice Area	Wind Area	Diagonal	Chord	R min
21.21	483.053	0.00	483	69.01	483.09	4.77	69.0	72.16	3.67	1.187	ss		
Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt

Right Post													
Chord Area	Max. Df	Diag. Area	Isx	Sxx	Izz	Chord	Szz	Weight	Ice Area	Wind Area	Diagonal	Chord	R min
As	Is	Ad	Isx	Sxx	Izz	Chord	Szz	Weight	Ice Area	Wind Area	Diagonal	Chord	R min
21.21	483.053	0.00	483	69.01	483.09	4.77	69.0	72.16	3.67	1.187	ss		
Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt	Wt

LOAD COMBINATION RESULTS (Per Post for design)													
Reactions		Max. Axial	Min. Axial	Strong	Weak	Max. V							
Left Support	G1	3.81	0.00	0.00	0.00	0.00							
Right Support		3.77	0.00	0.00	0.00	0.00							
Left Support	GRC1	2.86	2.86	114.19	23.26	114.19	4.83						
Right Support		2.84	2.84	100.67	19.67	100.67	3.92						
Left Support	GRC2	2.86	2.86	68.51	34.89	68.51	3.19						
Right Support		2.84	2.84	60.40	29.51	60.40	2.57						
Left Support	GRC1	3.95	3.95	68.34	11.63	68.34	2.58						
Right Support		3.81	3.81	52.99	8.84	52.99	2.14						
Left Support	GRC2	3.95	3.95	35.80	17.44	35.80	1.60						
Right Support		3.81	3.81	31.80	14.76	31.80	1.32						

Number of Posts: 1

Horizontal Truss Analysis

FALSE

Section 1 - Chords										
Unbraced Length (in.)	Pipe Diameter (in.)	Wall Thickness (in.)	Pipe Area (in.^2)	Chord Yield Str. (ksi)	Max. Axial Force (kips)	Column Slenderness Cc	kL/Rmin	fa Compression (ksi)	Fa Compression (ksi)	RESULT C/D
72.0	4.000	0.226	2.68	42.0	35.39	116.7	53.95	13.21	20.52	0.64

Section 2 - Chords										
Unbraced Length (in.)	Pipe Diameter (in.)	Wall Thickness (in.)	Pipe Area (in.^2)	Chord Yield Str. (ksi)	Max. Axial Force (kips)	Column Slenderness Cc	kL/Rmin	fa Compression (ksi)	Fa Compression (ksi)	RESULT C/D
72.0	4.000	0.226	2.68	42.0	35.47	116.7	53.95	13.24	20.52	0.64

Diagonals -Horizontal										
Unbraced Length (in.)	Pipe or Angle	Diagonal Area (in.^2)	R min (in.)	Chord Yield Str. (ksi)	Max. Axial Force (kips)	Column Slenderness Cc	kL/Rmin	fa Compression (ksi)	Fa Compression (ksi)	RESULT C/D
34.6	ANGLE	0.94	0.39	36.0	7.31	126.1	88.97	7.80	14.32	0.54

Diagonals - Vertical										
Unbraced Length (in.)	Pipe or Angle	Diagonal Area (in.^2)	R min (in.)	Chord Yield Str. (ksi)	Max. Axial Force (kips)	Column Slenderness Cc	kL/Rmin	fa Compression (ksi)	Fa Compression (ksi)	RESULT C/D
34.6	ANGLE	0.94	0.39	36.0	3.75	126.1	88.97	4.00	14.32	0.28

Deflections at Mid-Span		Uniform Load		Point Loads		Mid-Span
Span =	696.84 inches	Load	Load	Load	Dist. A	Dist. B
I =	1751 in^4	plf	k/inch	kips	inches	inches
Dead Load of Truss		40	0.0032918	0.72	193.92	502.92
Dead Load of Sign 1				0.61	415.39	281.45
Dead Load of Sign 2				0.00	0.00	0.00
Dead Load of Sign 3						
Ice on Truss		18	0.0014924	0.59	193.92	502.92
Ice on Sign 1				0.50	415.39	281.45
Ice on Sign 2				0.00	0.00	0.00
Ice on Sign 3						
Total Defl. (DL+Ice)						0.57 inches
Allowable Deflection						4.65 inches
Dead Load Deflection						0.35 inches
Extra Camber (L/1000)						0.89684 inches
Total Camber						1.05 inches

VERTICAL TRUSS ANALYSIS

Number of Pans

1

Left End

Overall Dia (mm)

Wall Thick (mm)

Yield St. (MPa)

14.000

0.00

42.0

28.00

98.0

185.0

325.0

Compact

Right End

Overall Dia (mm)

Wall Thick (mm)

Yield St. (MPa)

14.000

0.00

42.0

28.00

98.0

185.0

325.0

Compact

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240-sign-g

Horizontal Monotube Analysis

E = 29000 ksi (Young's Modulus)
k chord = 1.00

	Mvert	Mhoriz	SHEAR Horizontal	SHEAR Vertical	Max Axial
	kip-ft	kip-ft	kips	kips	Kips
Section 1	38.07	73.28	4.50	2.31	4.83
Section 2	35.76	73.70	2.69	1.02	4.83

Local Buckling AASHTO 5.5						
Section 1						
Outside Dia (inches)	Wall Thick (inches)	Yield Str. (ksi)	λ	λ_p	λ_r	λ_{max}
4.000	0.23	42.0	17.70	86.9	180.6	306.5
Compact						

Local Buckling AASHTO 5.5						
Section 2						
Outside Dia (inches)	Wall Thick (inches)	Yield Str. (ksi)	λ	λ_p	λ_r	λ_{max}
4.000	0.23	42.0	17.70	86.9	180.6	306.5
Compact						

λ width-thickness ratio
 λ_p compact width-thickness ratio
 λ_r non-compact width-thickness ratio
 λ_{max} maximum width-thickness ratio
E 29000 ksi (Young's Modulus)

Section 1						
Unbraced Length (ft.)	Pipe Diameter (in.)	Wall Thickness (in.)	Pipe Area (in ²)	Chord Yield Str. (ksi)	KL/Rmin	
72.0	4.000	0.226	2.68	42.0	53.95	

Section 2						
Unbraced Length (ft.)	Pipe Diameter (in.)	Wall Thickness (in.)	Pipe Area (in ²)	Chord Yield Str. (ksi)	KL/Rmin	
72.0	4.000	0.226	2.68	42.0	53.95	

Group 1	BENDING AND SHEAR STRESSES									
	Mmax	S	fb	Shear	Pipe Area	Iv	Axial	Area y	fa	
	kip-ft	in ³	ksi	kips	in ²	ksi	kips	in ²	ksi	
	Section 1	81.07	97.26	10.08	5.96	2.68	1.88	4.83	2.68	1.80
	Section 2	81.92	97.26	10.11	2.87	2.68	1.07	4.83	2.68	1.80

RESULTS										
	Fb	Fv	Fa	Cc	R	KL/R	Fe'	Eqn. 5-17 CSR	Eqn. 5-18 CSR	Eqn. 5-19 CSR
	ksi	ksi	ksi				ksi			MAX CSR
Section 1	27.72	13.86	21.75	116.75	1.33	53.95	51.30	0.454	0.498	0.465
Section 2	27.72	13.86	21.75	116.75	1.33	53.95	51.30	0.442	0.498	0.453

Fb Calculation				
Section 1	Term 1	Term 2	Term 3	
Eqn. 5-17	0.072	0.364	0.019	
Eqn. 5-18	0.083	0.388	0.019	
Eqn. 5-19	0.083	0.364	0.019	
Section 2	Term 1	Term 2	Term 3	
Eqn. 5-17	0.072	0.365	0.006	
Eqn. 5-18	0.083	0.398	0.006	
Eqn. 5-19	0.083	0.365	0.006	

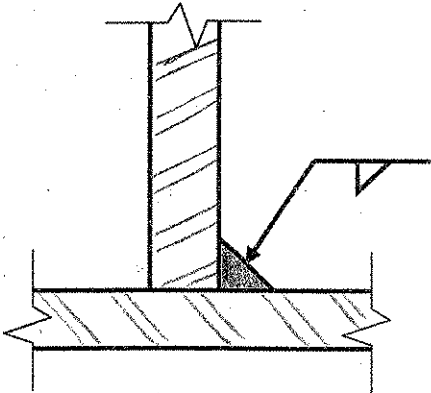
compact (ksi)	Non-Compact (ksi)	End
2	2	2
72.09	72.09	72.09

Highway Safety Corporation
Glastonbury, CT

Welding Procedure Specification

Material specification	ASTM A36, A572 gr 50, A709 Gr 36, ASTM A709 Gr 50, A500 gr B		
Welding process	Gas Metal Arc Welding (GMAW)		
Manual, semi-automatic, or automatic	Semi-Automatic		
Position of welding	Horizontal (2F)		
Filler metal specification	AWS A5.18		
Filler metal classification	ER70S-3		
Electrode and manufacturer	Lincoln Electric Lincoln Weld L-50		
Flux and manufacturer	N/A		
Shielding gas	85% Argon / 15% CO2	Flow rate	19-27 L / min
Single or multiple pass	Single		
Single or multiple arc	Single		
Welding current	DC		
Polarity	Reverse		
Welding progression	Stringers		
Root treatment	None		
Preheat and interpass temperature	Base Metal up to 3/4" (50°F) ; over 3/4-1 1/2" (70°F)		
Postheat treatment	None		
Electrode extension	3/4" ± 1/4"		

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters		Travel speed	Joint detail
			Amperes	Volts		
3/16"	1	0.045"	300 A ± 30	29 V ± 2	28 ipm ± 2	TYPICAL ALL FILLET WELDS 
1/4"	1	0.045"	300 A ± 30	29 V ± 2	14 ipm ± 2	

This procedure may vary due to fabrication sequence, fit-up, pass size, etc. within the limitation of variables given in section 5 of latest edition AWS D1.1

WPS no.

W-1587-1

Revision no.

0

Supporting PQR no.

Pre-qualified

Project Name

St. Johnsbury, Lyndon, Waterford VT

Fabricator

Highway Safety Corporation

Authorized by

Paul Radice

Date

7/24/07

Project Number

HES 091-3(42) & HES 093-1(10)

PAUL RADICE

QC1

98070221

EXP. 7/01/10

242-5130

CS

Highway Safety Corporation

Glastonbury, CT

Welding Procedure Specification

Material specification ASTM A36, A572 gr 50, A709 Gr 36, ASTM A709 Gr 50, A500 gr B

Welding process Gas Metal Arc Welding (GMAW)

Manual, semi-automatic, or automatic Semi-Automatic

Position of welding Horizontal (2F)

Filler metal specification AWS A5.18

Filler metal classification ER70S-3

Electrode and manufacturer Lincoln Electric Lincoln Weld L-50

Flux and manufacturer N/A

Shielding gas 85% Argon / 15% CO2 Flow rate 19-27 L / min

Single or multiple pass Single & Multiple

Single or multiple arc Single

Welding current DC

Polarity Reverse

Welding progression Stringers

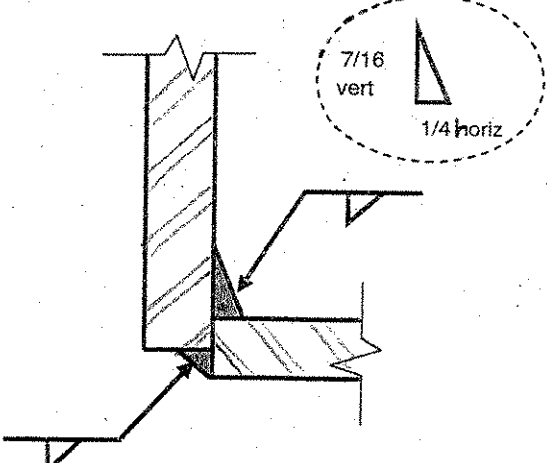
Root treatment None

Preheat and interpass temperature Base Metal up to 3/4" (50°F) ; over 3/4-1 1/2" (70°F)

Postheat treatment None

Electrode extension 3/4" ± 1/4"

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters		Travel speed	Joint detail
			Amperes	Volts		
7/16" x 1/4"	1 & 2	0.045"	300 A ± 30	29 V ± 2	14 ipm ± 2	UN-EQUAL LEG FILLET WELD @ BASE PLATE CONNECTION 

This procedure may vary due to fabrication sequence, fit-up, pass size, etc. within the limitation of variables given in section 5 of latest edition AWS D1.1.

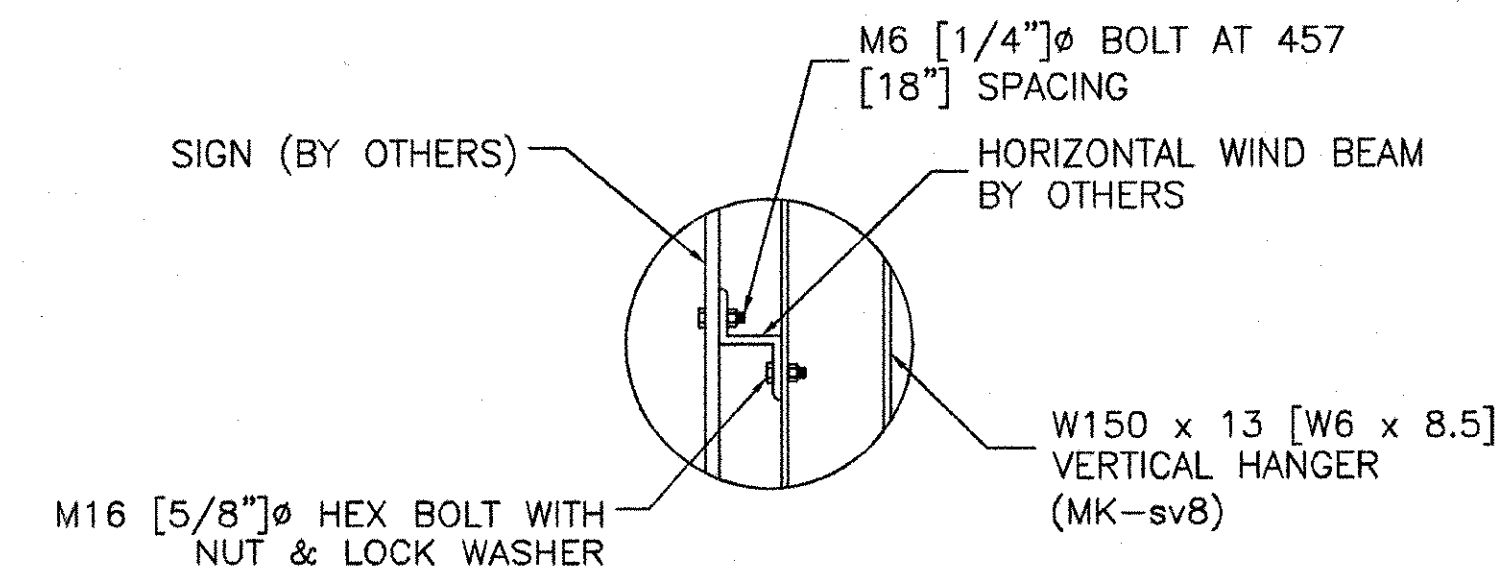
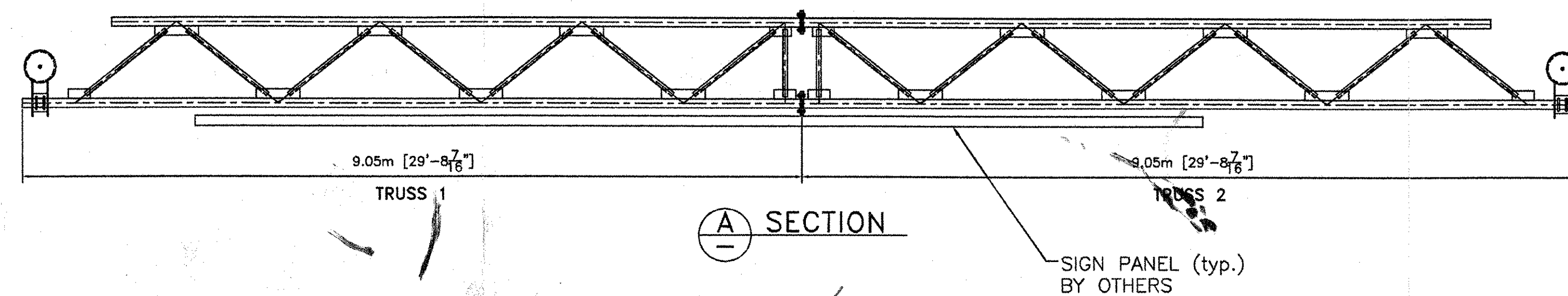
 PAUL RADICE
CWI 98078271
QC1 EEP 7/6/14

WPS no. W-1587-2 Fabricator Highway Safety Corporation

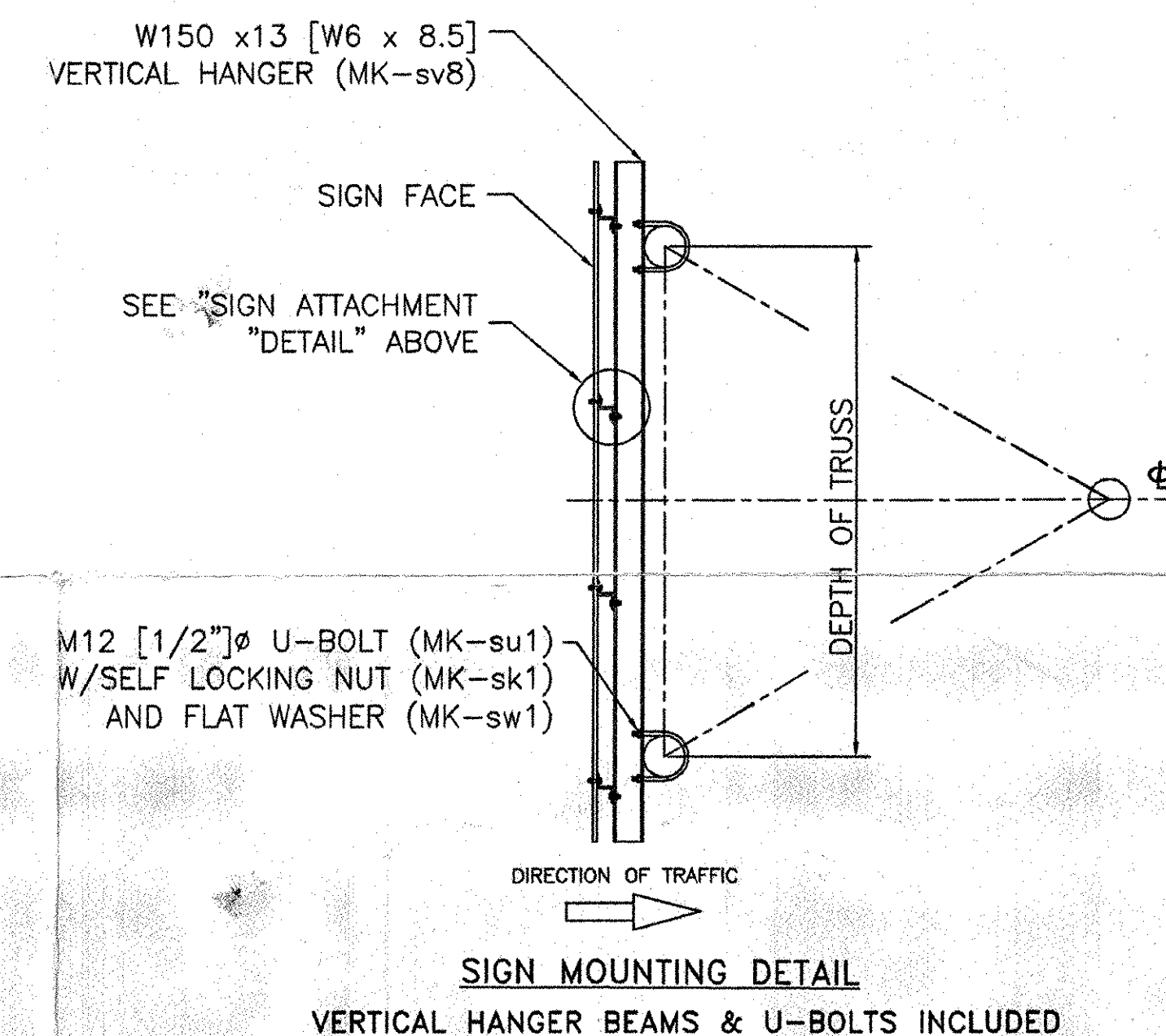
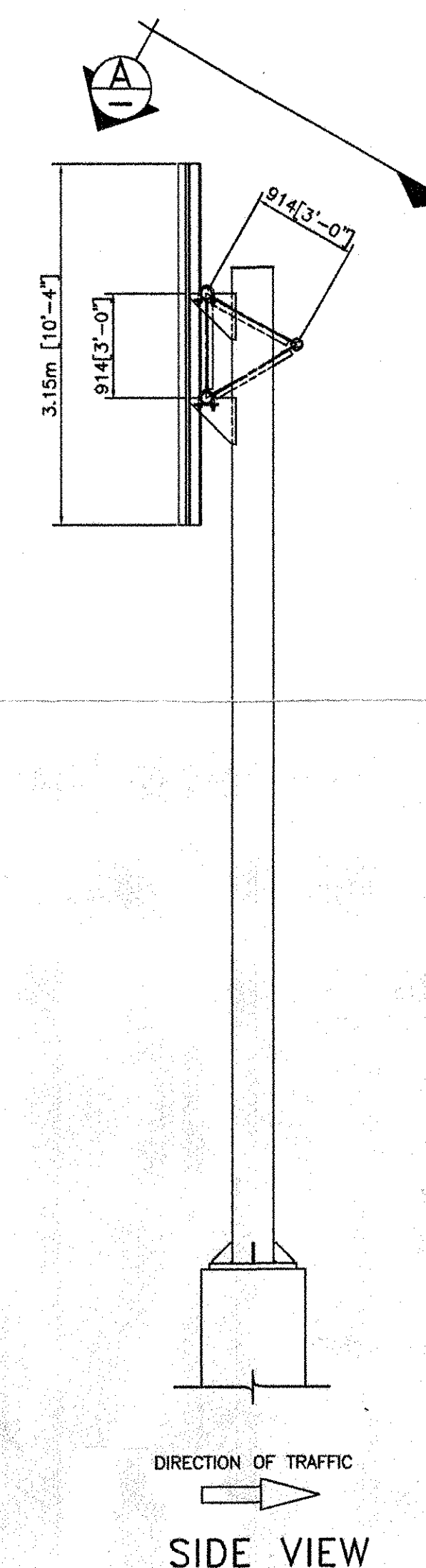
Revision no. 0 Authorized by Paul Radice 245-5161-9

Supporting PQR no. Pre-qualified Date 7/24/07

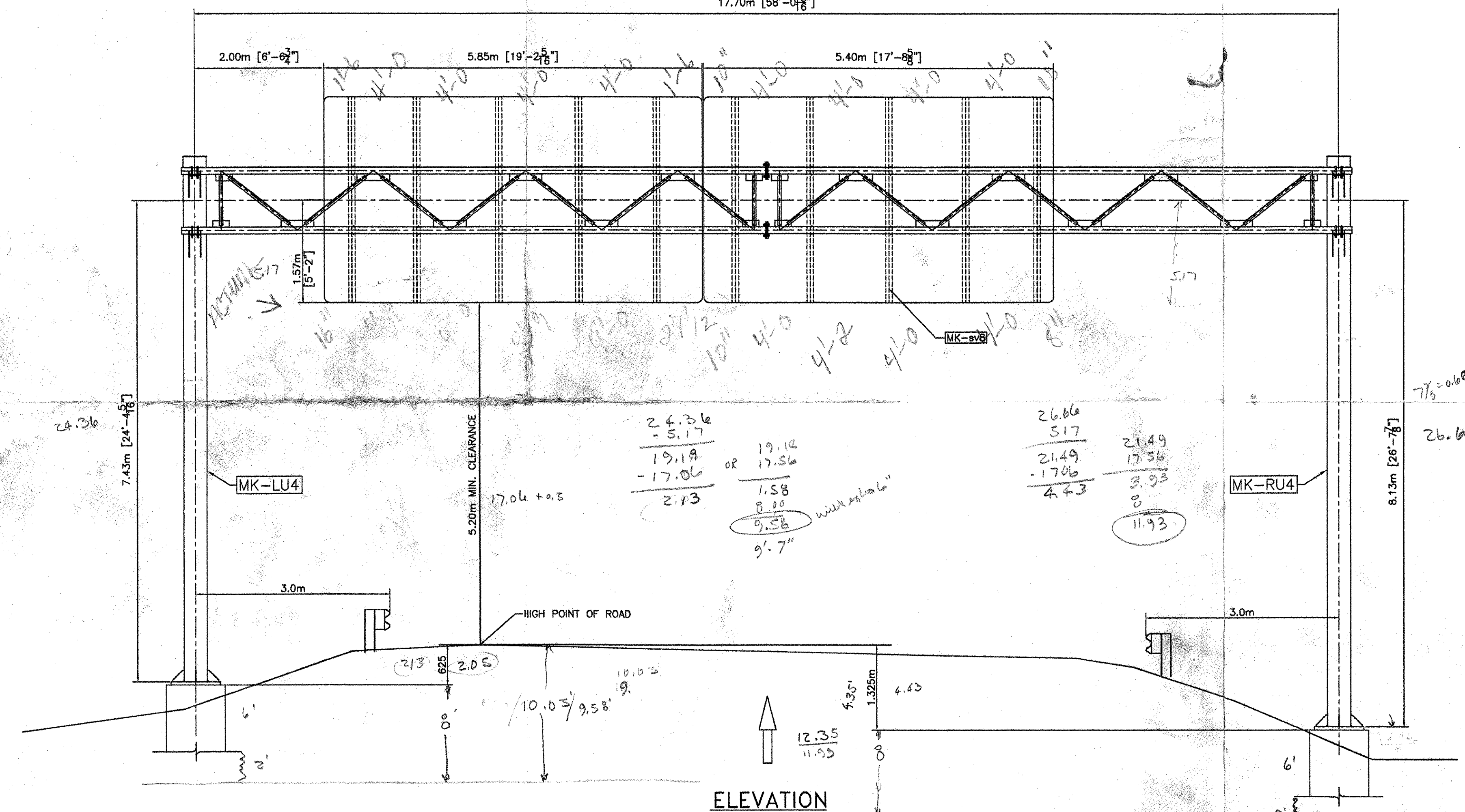
Project Name St. Johnsbury, Lyndon, Waterford VT Project Number HES 091-3(42) & HES 093-1(10)



SIGN ATTACHMENT DETAIL



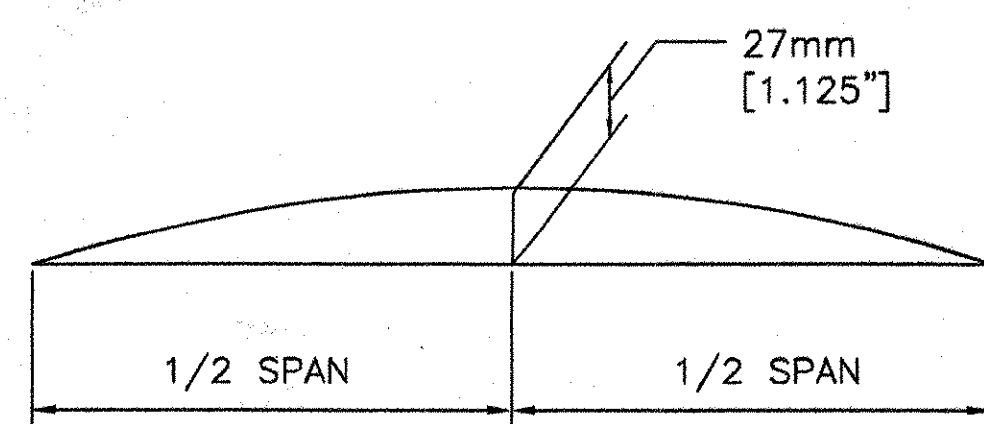
SIGN MOUNTING DETAIL
VERTICAL HANGER BEAMS & U-BOLTS INCLUDED



ELEVATION

LOOKING AT FACE OF SIGN
(OUT OF PLANE CHORDS NOT SHOWN FOR CLARITY)

FOOTING ELEVATION IS ASSUMED.
CONTRACTOR TO VERIFY ELEVATIONS
BEFORE FABRICATION.



CAMBER DIAGRAM

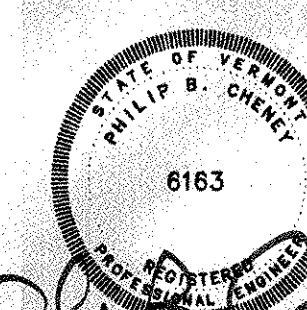
NOTE:

CAMBER WILL BE ACHIEVED BY SHORTENING LOWER CHORD
PIPES BY AN AMOUNT SUCH THAT POSITIVE UPWARD DEFLECTION
IS PRODUCED WHEN TRUSSES ARE BROUGHT TOGETHER AT
SPICES.

REVISIONS		
No.	Remarks	Date
0	Initial submittal	

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS (mm) UNLESS OTHERWISE
NOTED. ENGLISH CONVERSION SHOWN IN [] FOR REFERENCE ONLY.

RECEIVED
OK'D BY *ELC* OK'D BY
JUL 27 2007
RESUBMIT APPROVED
BY DATE 08/08/07

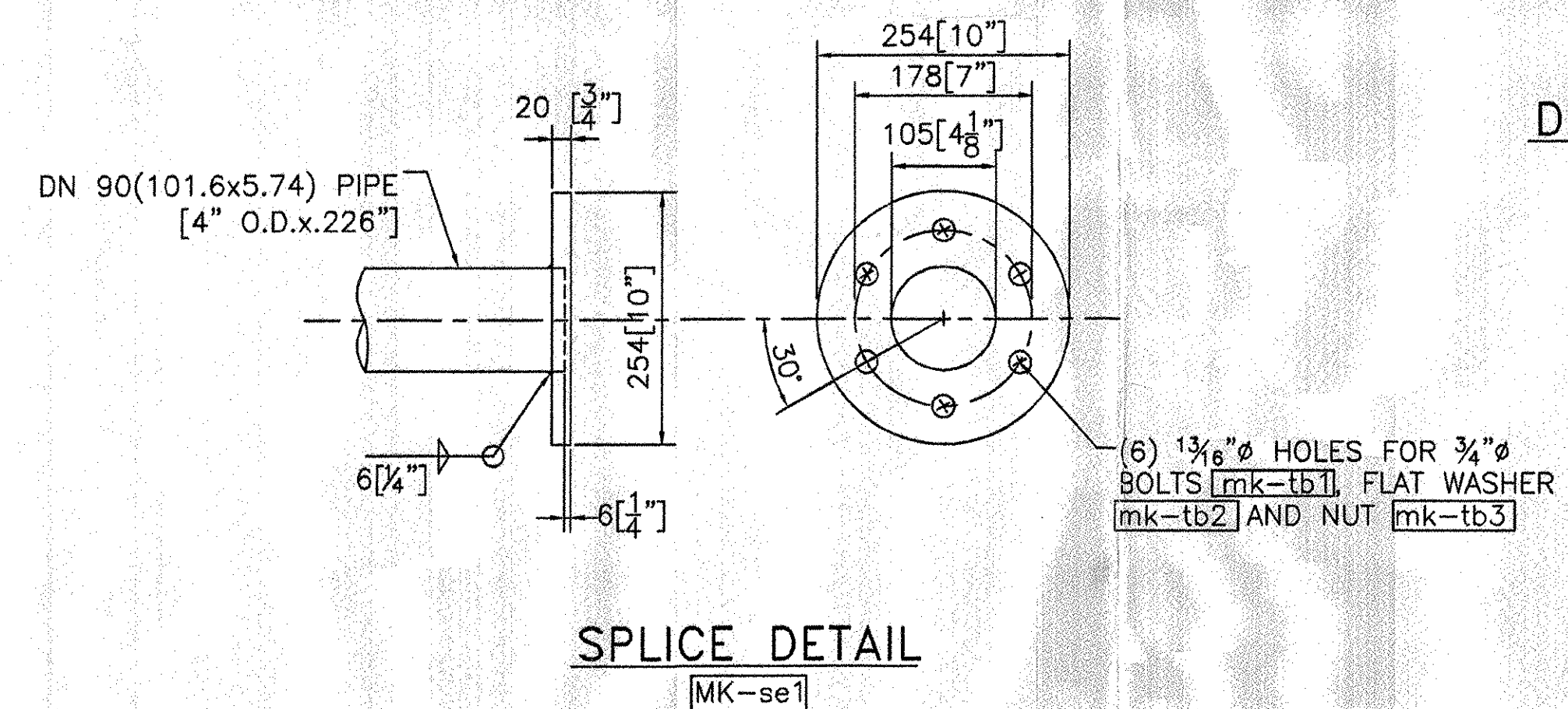
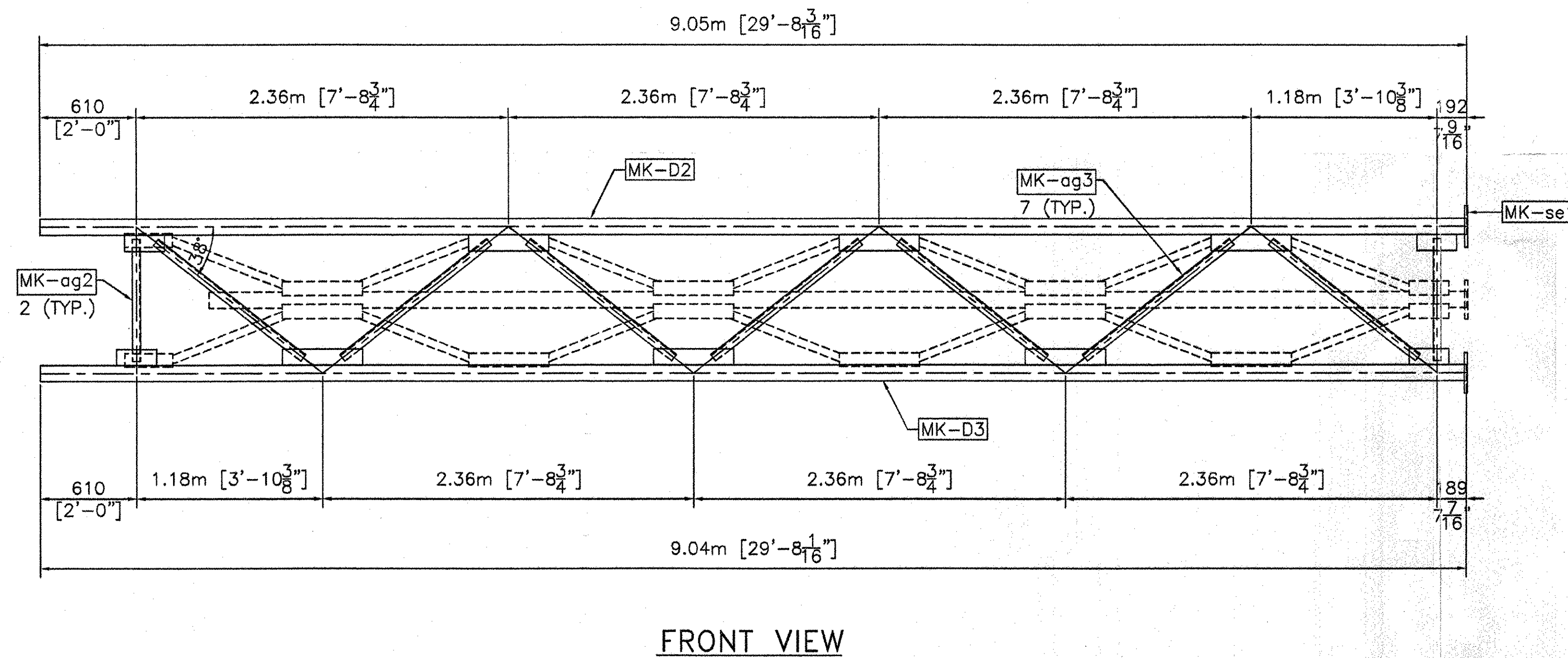
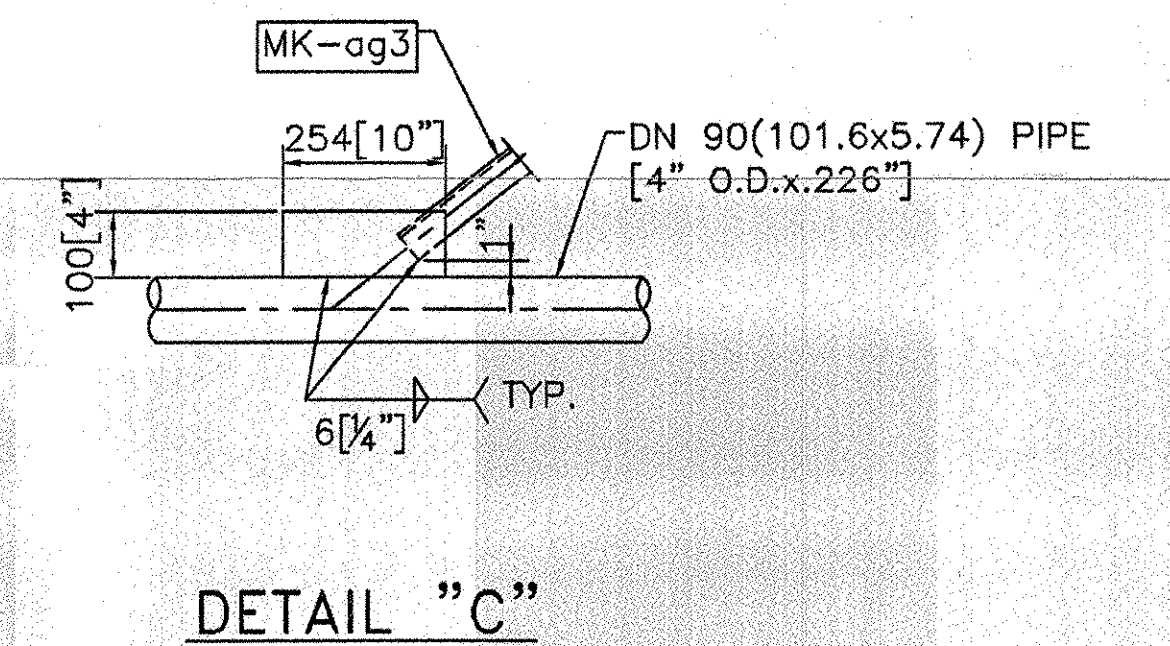
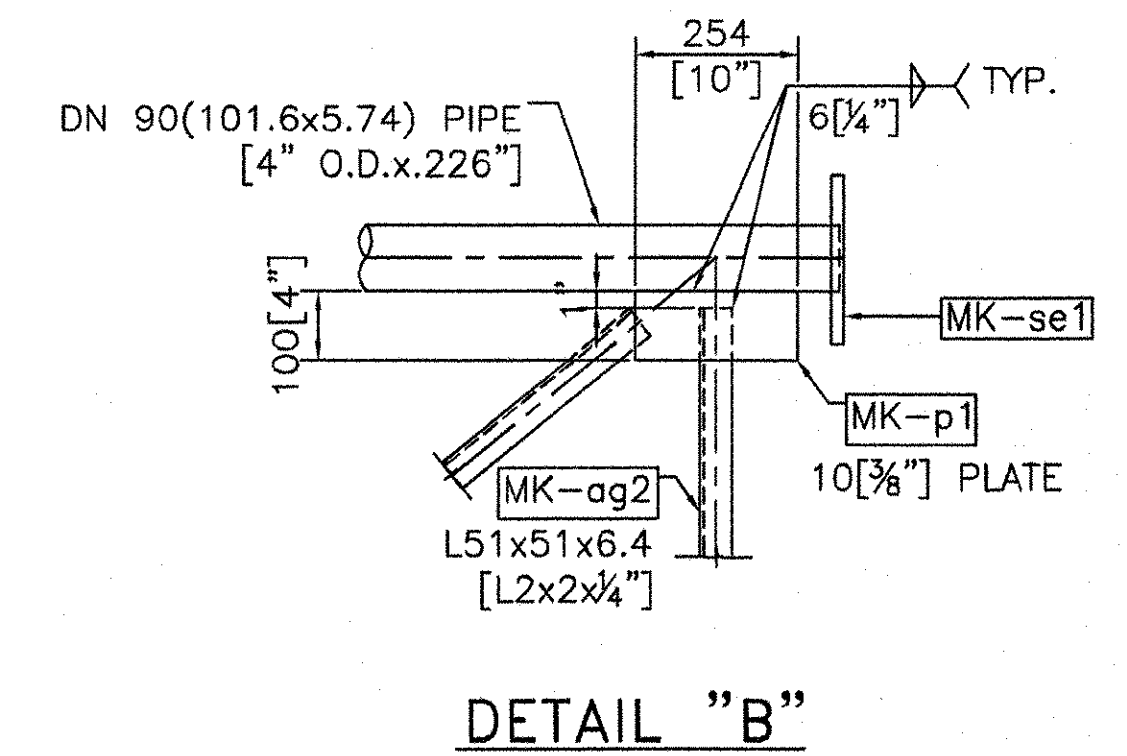
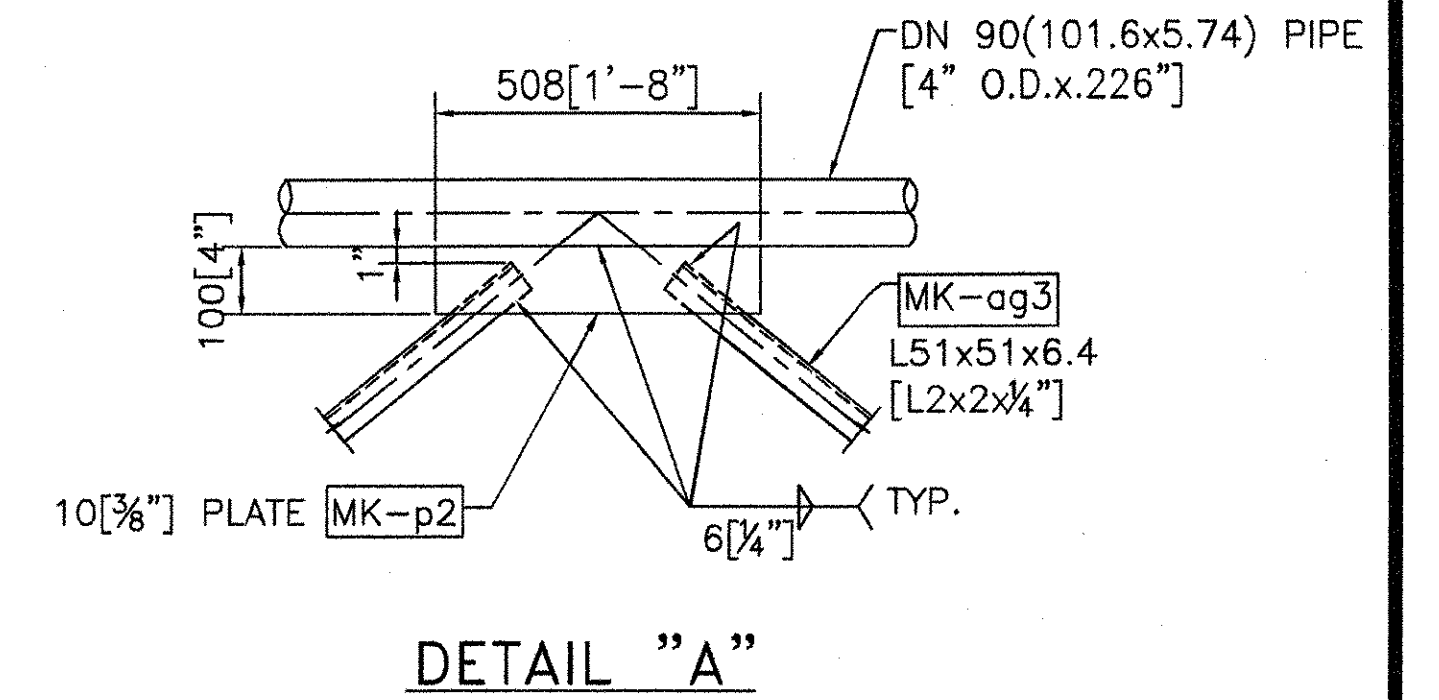
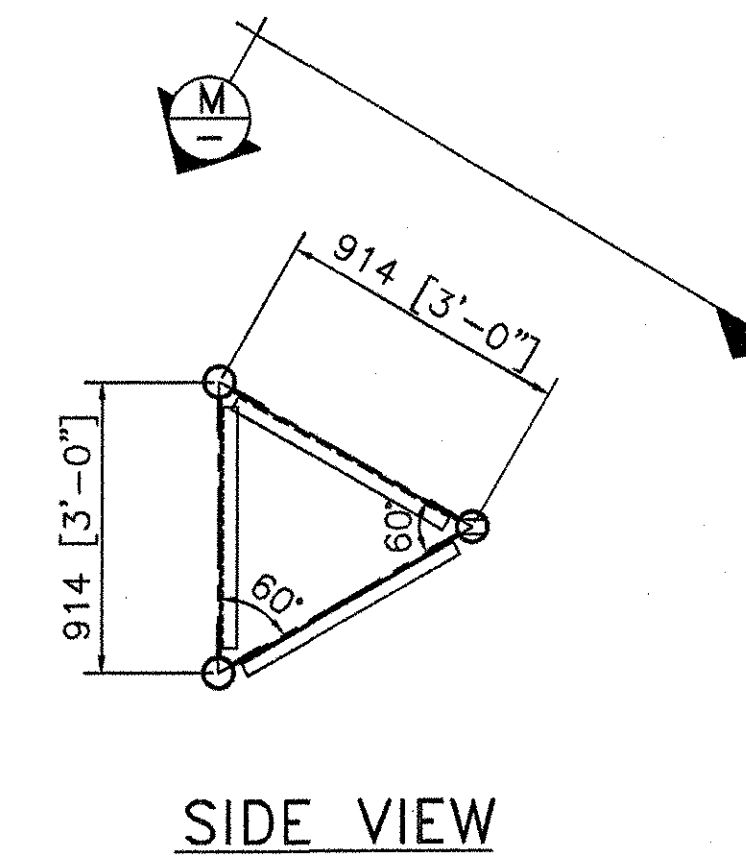
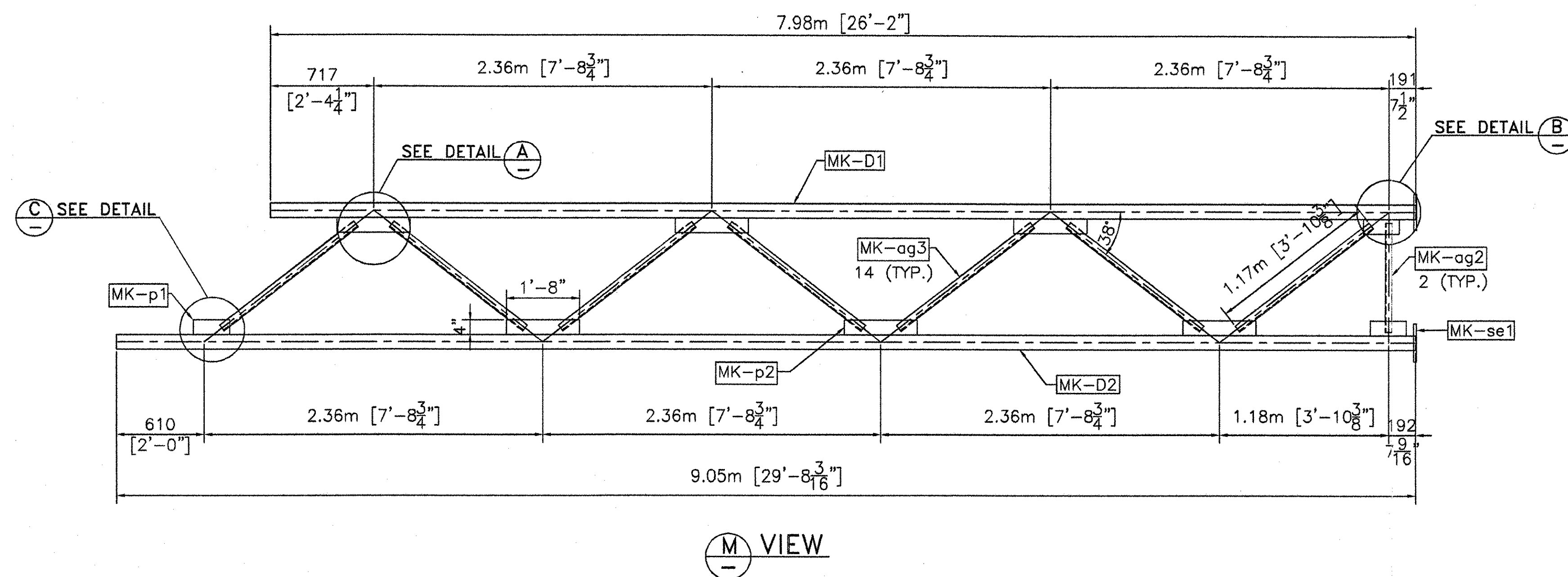


HIGHWAY SAFETY CORP.
GLASTONBURY, CT

TRI-CHORD SIGN STRUCTURE
STATE OF VERMONT
COUNTY OF CALEDONIA
MM 10.970 NB
PROJECT No. HES 091-3(42)
HES 093-1(10)

DRAWN MHM
CHECKED *P. Radice*
DATE 5/23/07
SCALE N.T.S.
HSC REFERENCE NO. 1587g
SIZE D REVISION 0
SHEET NO. 1 of 8

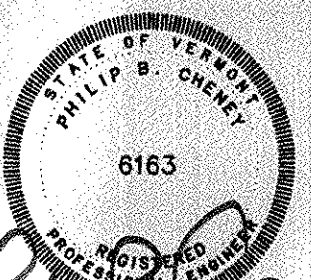
GENERAL CONTRACTOR
SUB CONTRACTOR F.R. LAFAYETTE



TRUSS 1

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RECEIVED
CHECKED BY: GVC OK'D BY: _____
JUL 27 2007
RESUBMIT: _____ APPROVED: X
BY: _____ DATE: 08/08/07



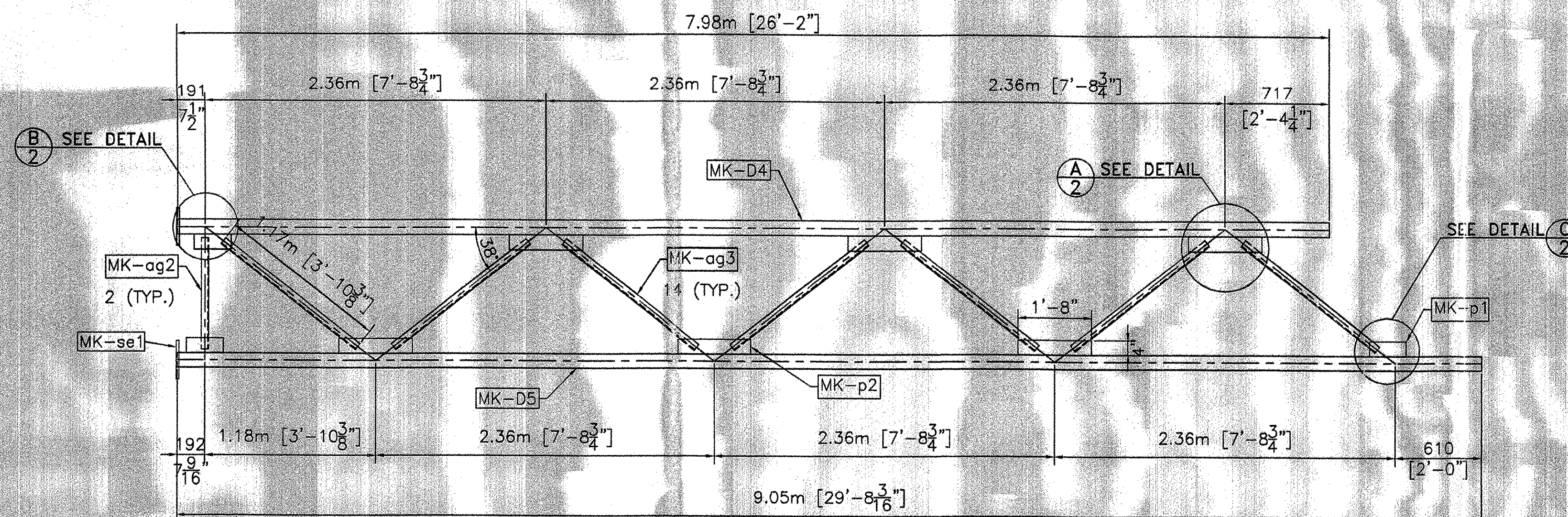
HIGHWAY SAFETY CORP.
GLASTONBURY, CT

TRI-CHORD SIGN STRUCTURE
STATE OF VERMONT
COUNTY OF CALEDONIA
MM 10.970 NB
PROJECT No. HES 091-3(42)
HES 093-1(10)

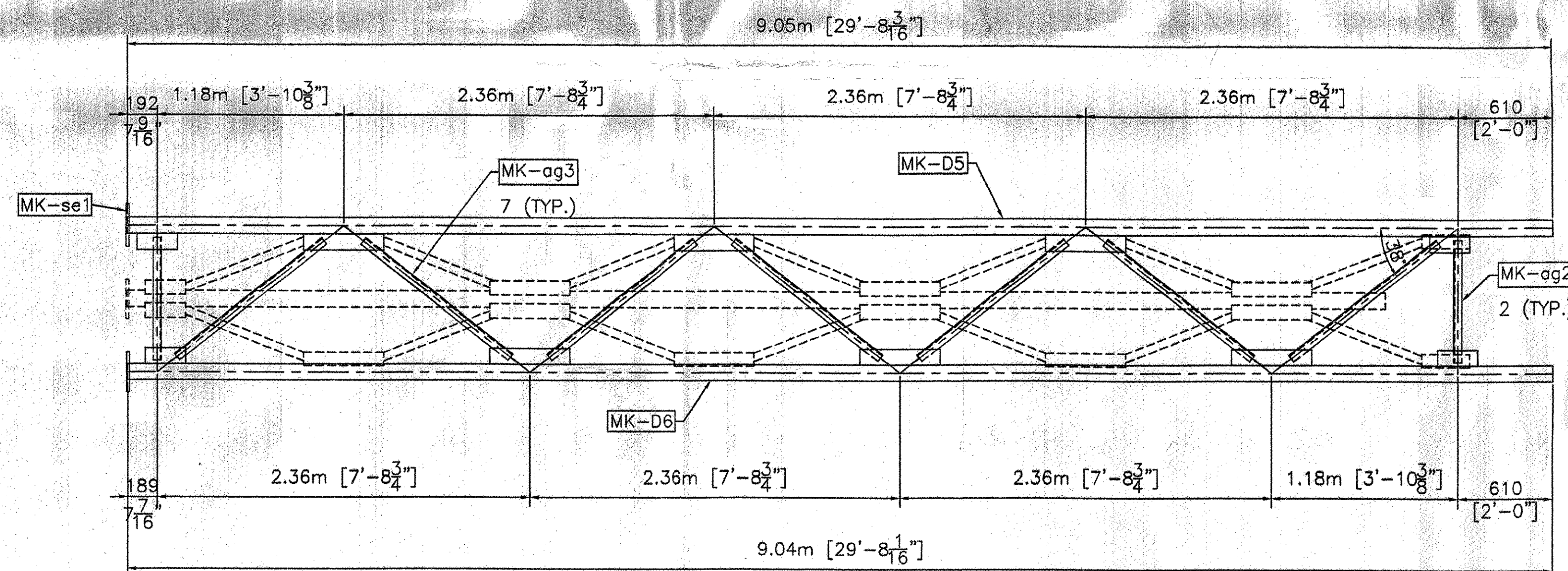
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DATE: 5/23/07
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HSC REFERENCE NO.: 1587g
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SHEET NO.: 2 of 8

REVISIONS		
No.	Remarks	Date
0	Initial submittal	

GENERAL CONTRACTOR
SUB CONTRACTOR: F.R. LAFAYETTE

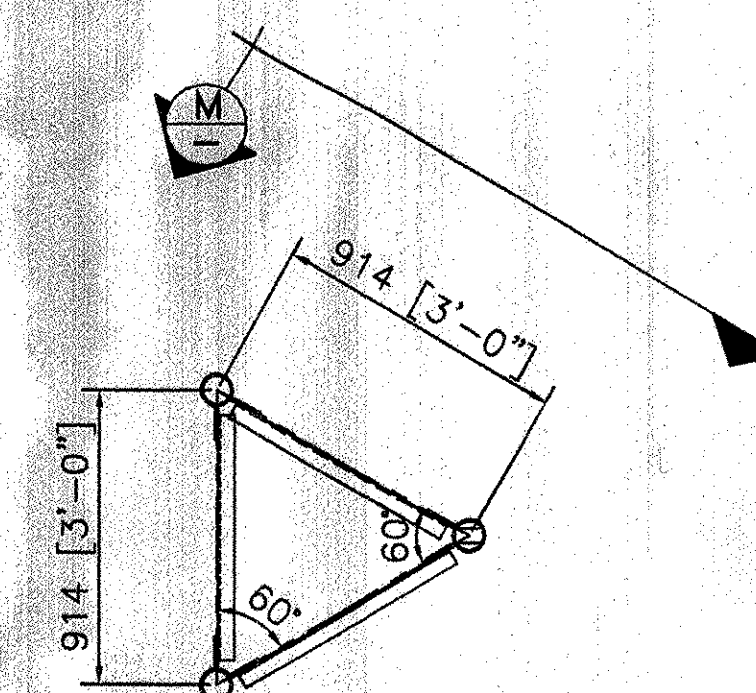


(M) VIEW



FRONT VIEW

TRUSS 2



SIDE VIEW

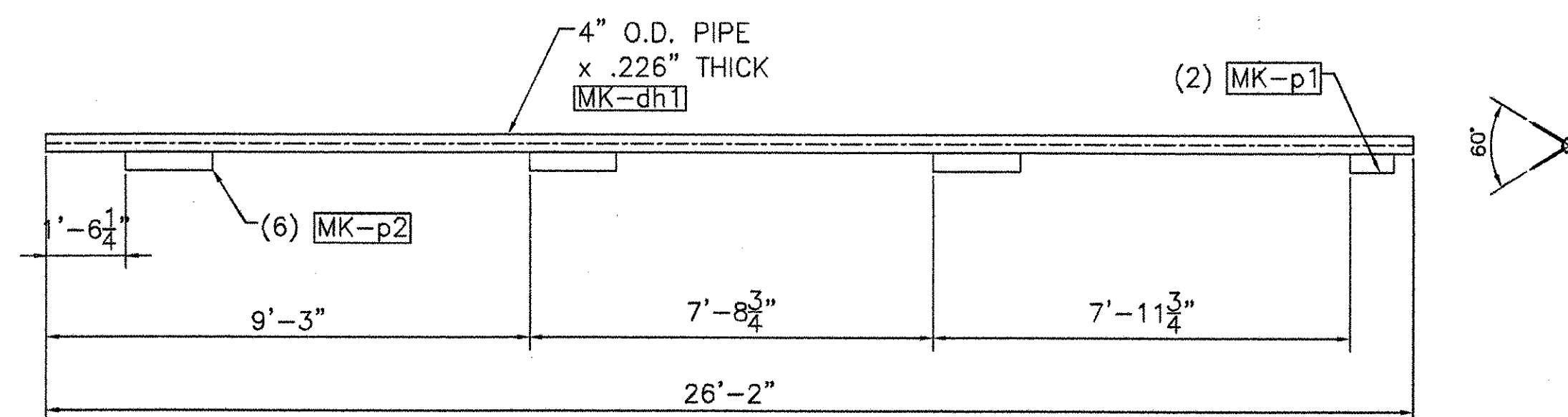
- NOTE:**
1. STRUCTURE DESIGNED IN ACCORDANCE WITH LATEST EDITION AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS.
 2. ALL HOLES FOR HIGH STRENGTH FASTENERS SHALL BE DRILLED OR SUB-PUNCHED FULL SIZE. SLOTTED HOLES AND/OR VENT OR ACCESS HOLES MAY BE CUT WITH MECHANICALLY GUIDED PLASMA OR MECHANICALLY GUIDED FLAME TORCH.
 3. GRIND SHARP CORNERS OF ALL PLATES TO A 1/8" MIN. RADIUS PRIOR TO GALVANIZING.
 4. ALL WELDING SHALL BE PERFORMED BY QUALIFIED WELDERS IN ACCORDANCE WITH AWS D1.1.
 5. ALL STEEL PLATES FOR STRUCTURAL COMPONENTS SHALL BE ASTM A709 GR. 50.
 6. STEEL PLATES AND SHAPES FOR NON-STRUCTURAL COMPONENTS SHALL BE ASTM A709 GR. 36.
 7. STEEL PIPES FOR STRUCTURAL MEMBERS SHALL HAVE MINIMUM YIELD OF 42 ksi AND SHALL CONFORM TO ONE OF THE FOLLOWING GRADES: ASTM A500 GR. B, OR API 5LX42.
 8. UNLESS OTHERWISE NOTED, ALL BOLTS FOR STRUCTURAL CONNECTIONS SHALL BE M164 TYPE 1 (A325).
 9. GALVANIZED U-BOLTS FOR CONNECTION OF SIGN HANGER BEAMS TO TRUSS SHALL BE ASTM F-1554 GR. 36.
 10. ALL STRUCTURAL STEEL SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111 (ASTM A123).
 11. ALL HARDWARE, UNLESS OTHERWISE NOTED, SHALL BE HOT-DIPPED GALVANIZED PER AASHTO M232 (ASTM A153).
 12. ANCHOR HARDWARE SHALL BE STAINLESS STEEL AND MEET REQUIREMENTS OF VAOT STANDARD SPECIFICATION 714.09.
 13. CONCRETE AND REBAR SHOWN IN FOOTING DESIGN TO BE FURNISHED BY OTHERS.
 14. FOUNDATION DESIGN BASED ON USE OF 3000 psi MINIMUM CONCRETE.
 15. SPACE BETWEEN THE TOP OF CONCRETE AND THE BOTTOM OF STEEL BASE PLATE SHALL BE FILLED WITH TYPE IV MORTAR AFTER LEVELING.
 16. BOLTS INSTALLED IN STRUCTURAL CONNECTIONS SHALL BE PROVIDED AND TENSIONED PER APPLICABLE PROVISIONS OF VAOT STANDARD SPECIFICATIONS SECTION 506.

SEE WED ALL CONNECTIONS WHEN POSSIBLE PRIOR TO GALVANIZING

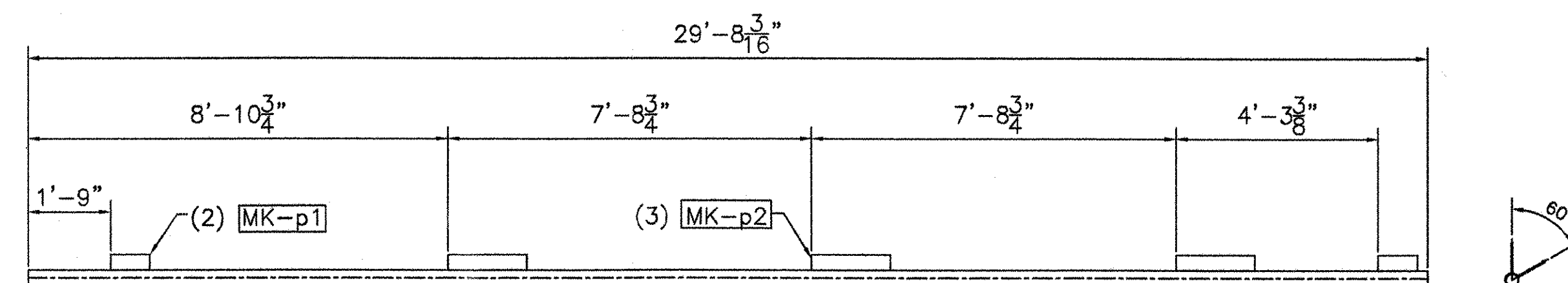
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REVISIONS		
No.	Remarks	Date
0	Initial submittal	

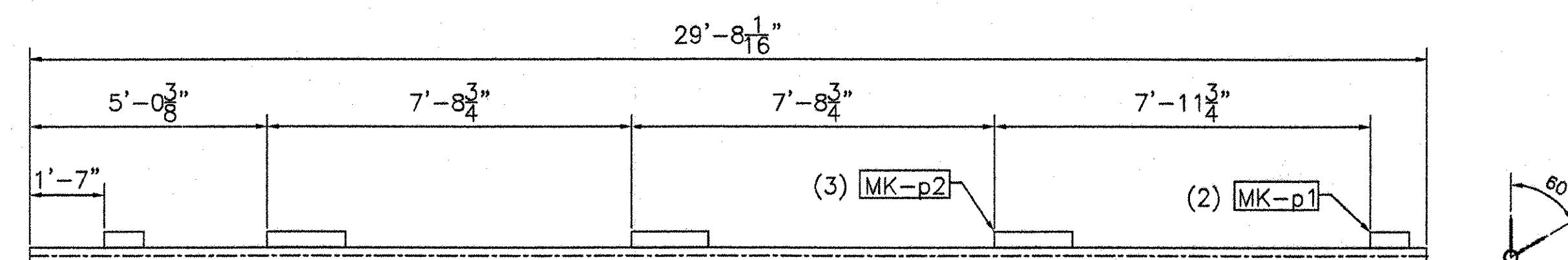
HIGHWAY SAFETY CORP. GLASTONBURY, CT		DRAWN: MHM CHECKED: P. Radice DATE: 5/23/07 SCALE: NTS HSC REFERENCE NO.: 1587g	
		GENERAL CONTRACTOR: F.R. LAFAYETTE SUB CONTRACTOR: F.R. LAFAYETTE	
TRI-CHORD SIGN STRUCTURE STATE OF VERMONT COUNTY OF CALEDONIA MM 10.970 NB PROJECT No. HES 091-3(42) HES 093-1(10)		SHEET NO.: 3 of 8	



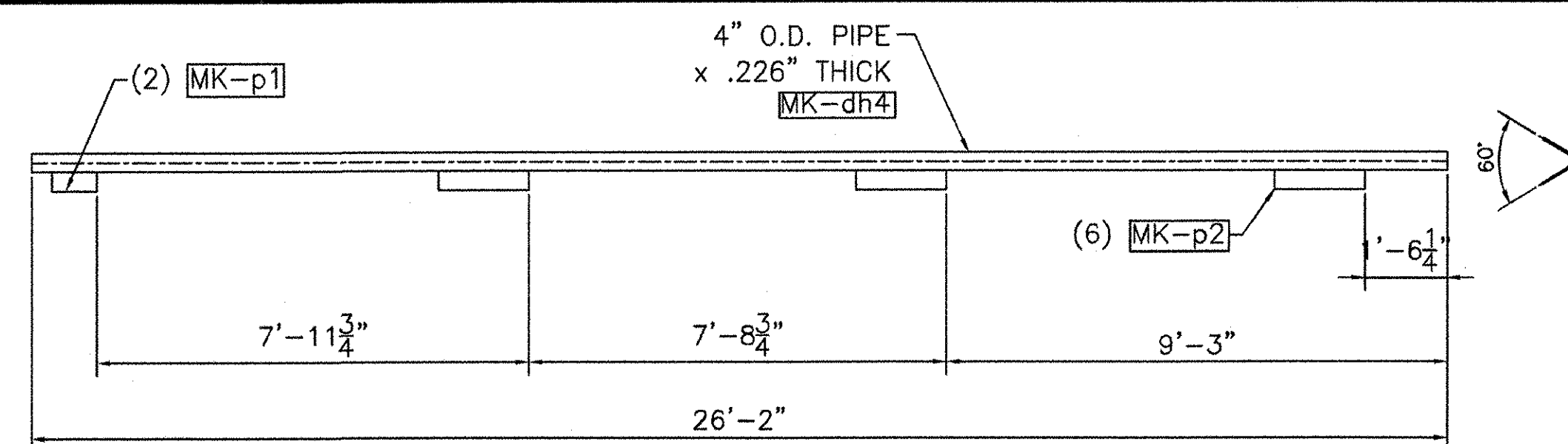
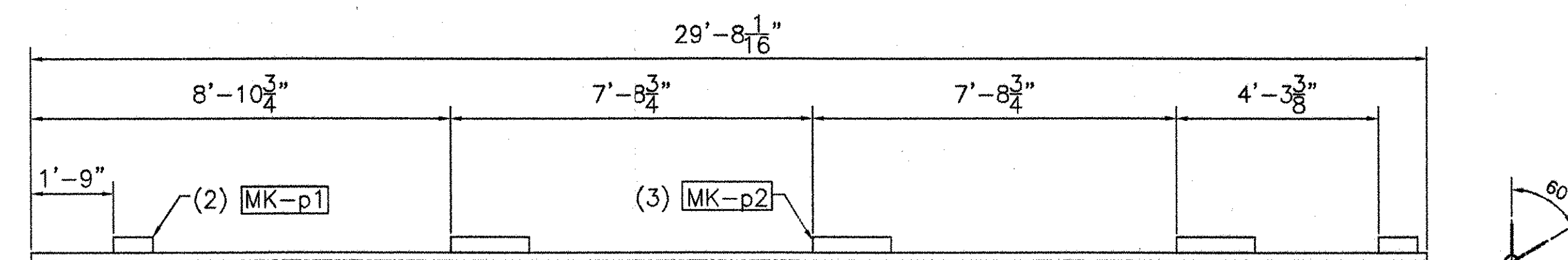
MK-D1



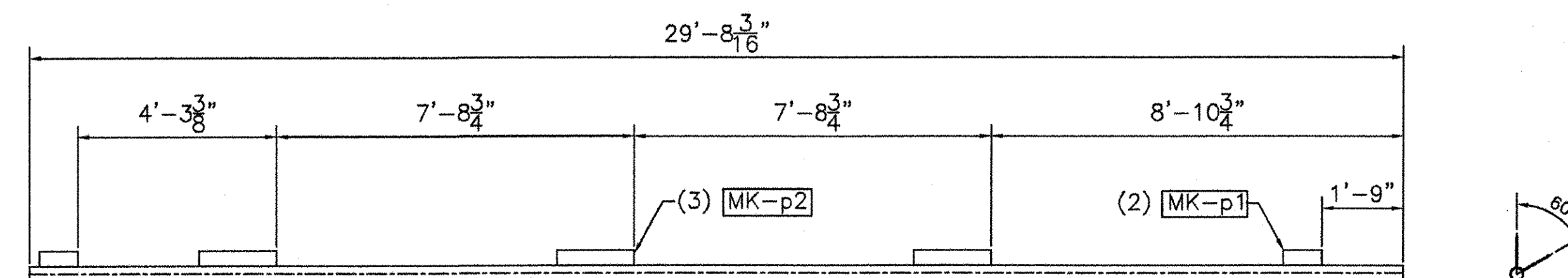
MK-D2



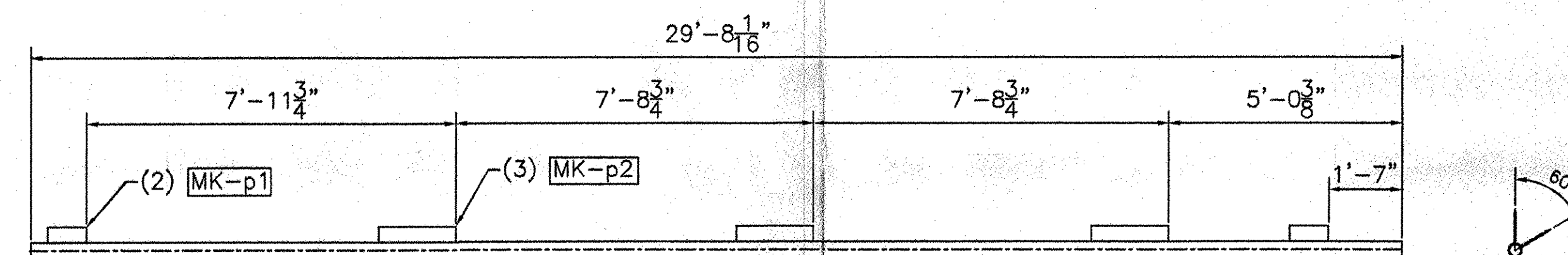
MK-D3



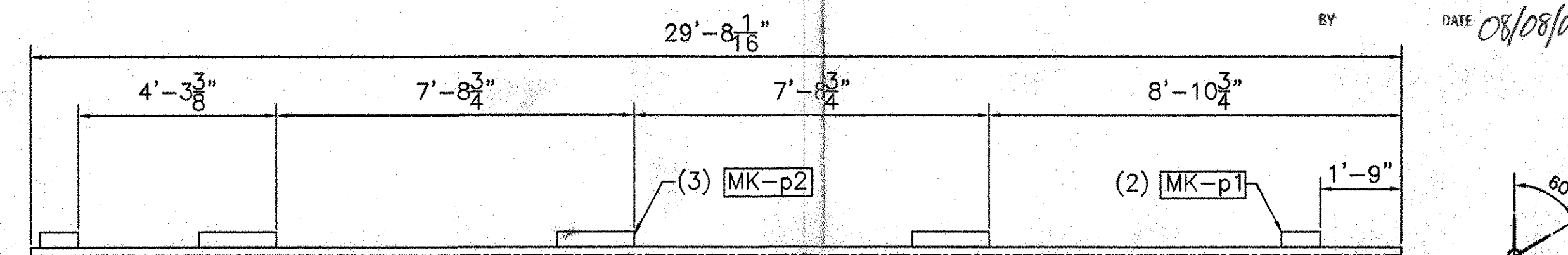
MK-D4



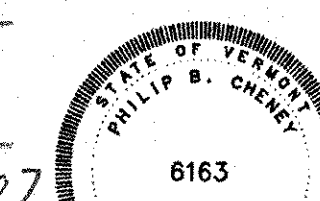
MK-D5



MK-D6

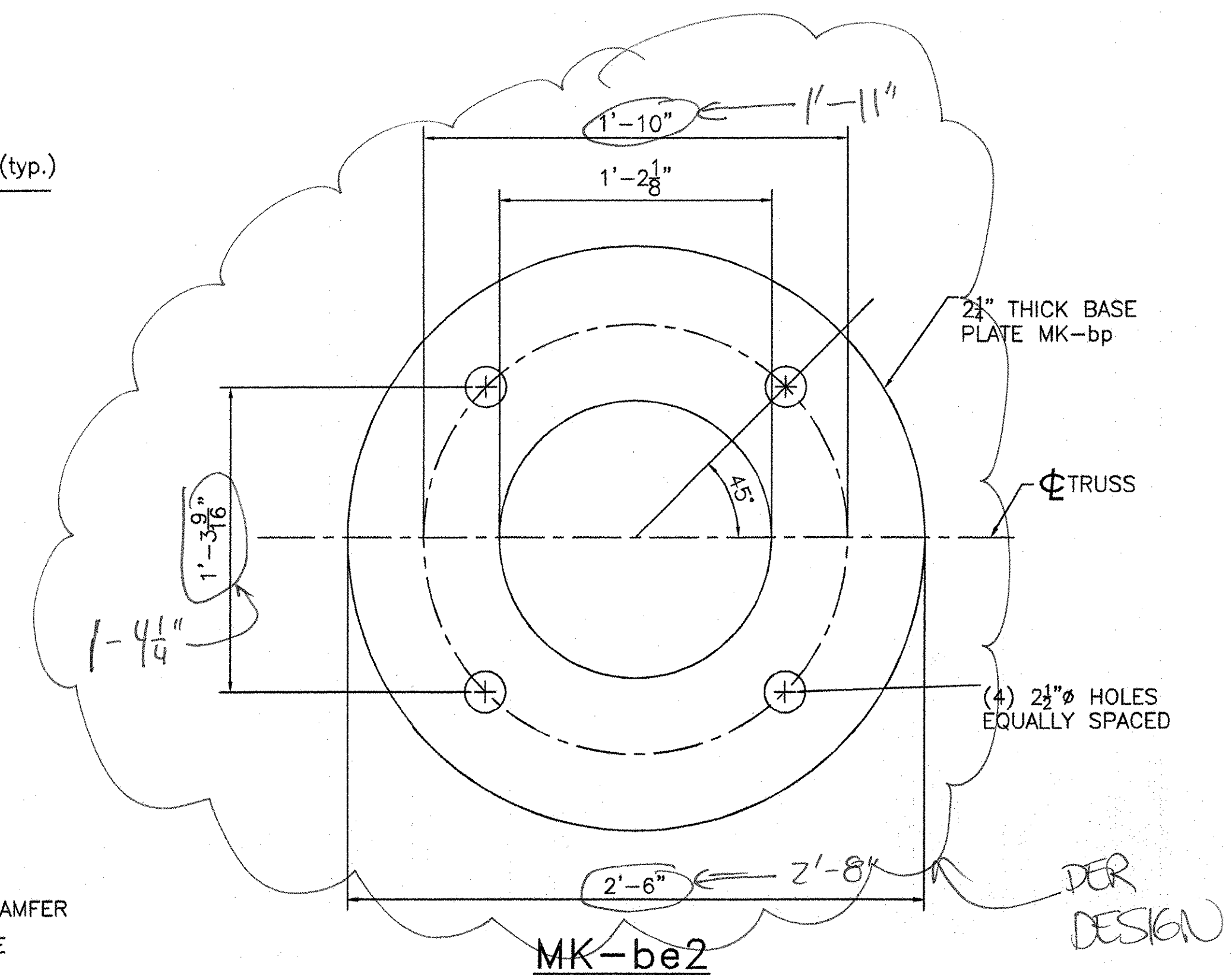
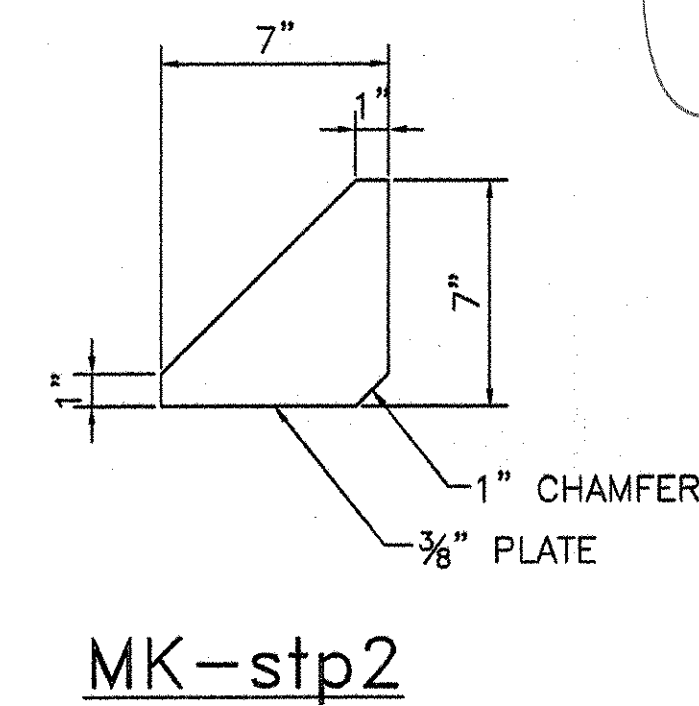
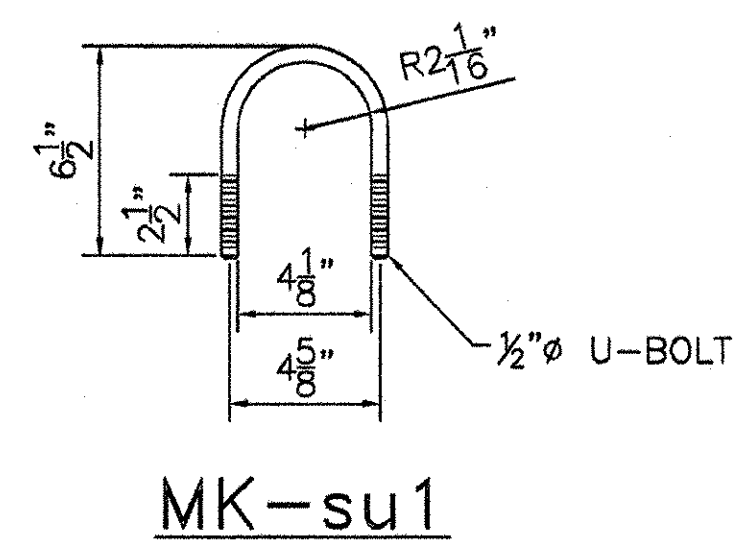
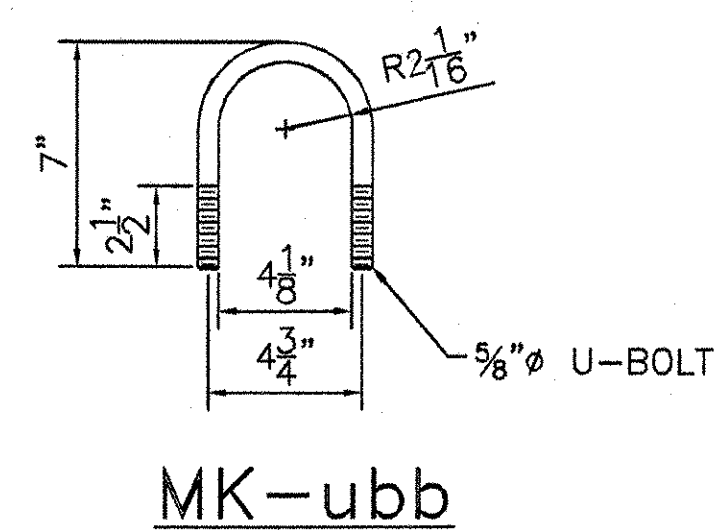
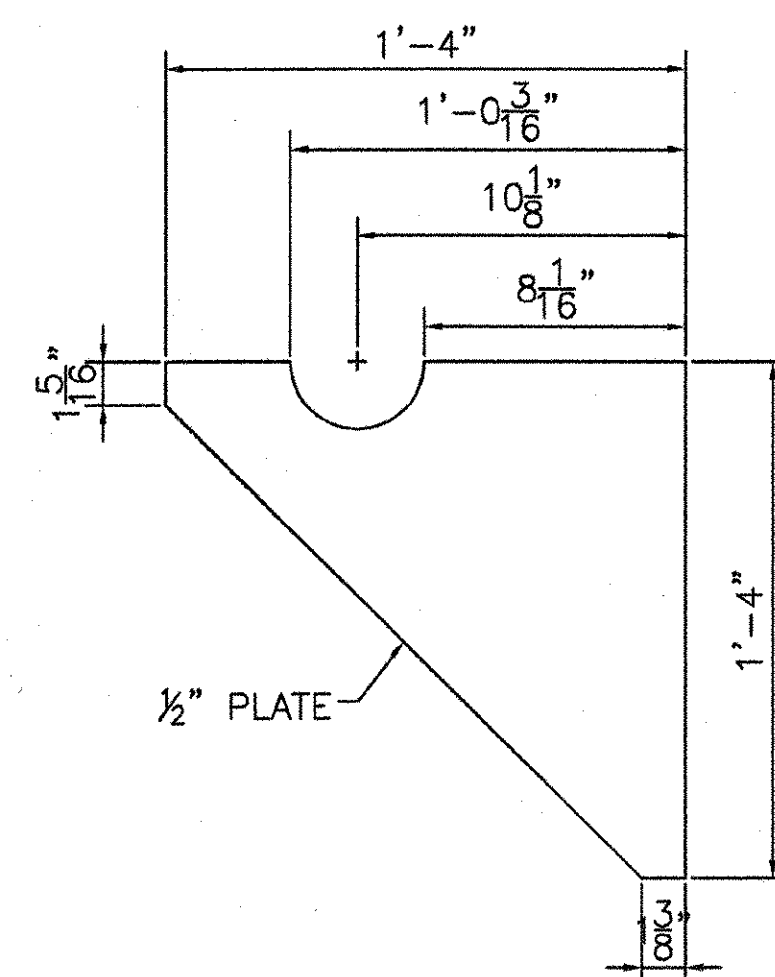
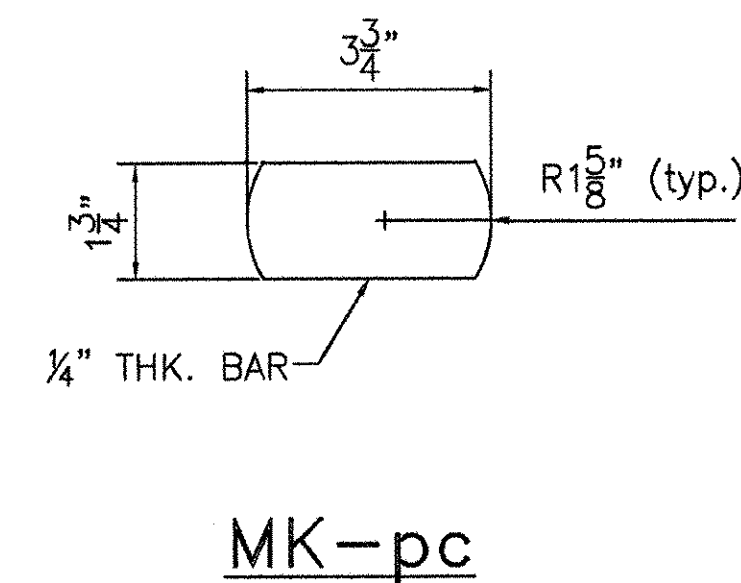
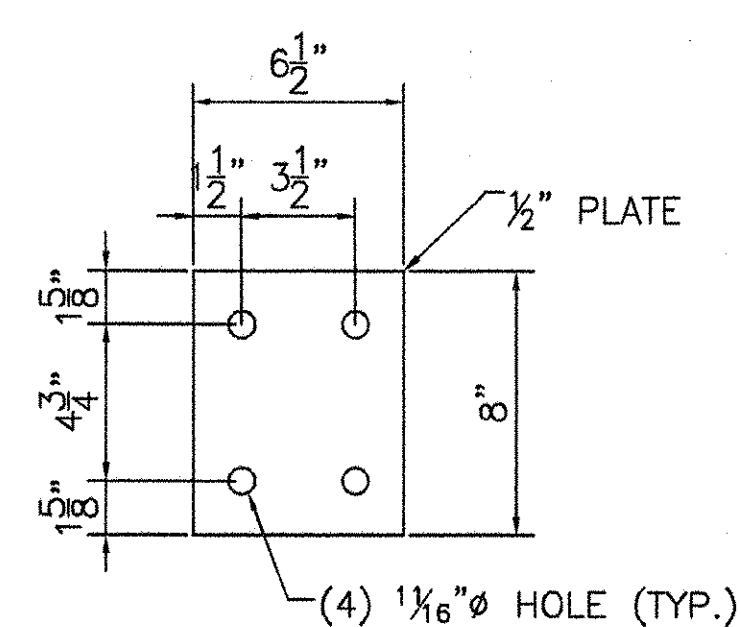
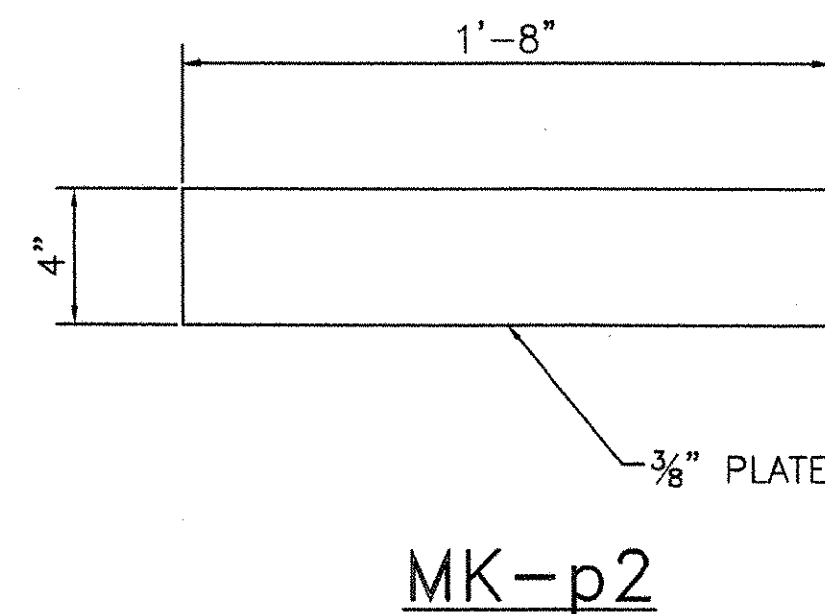
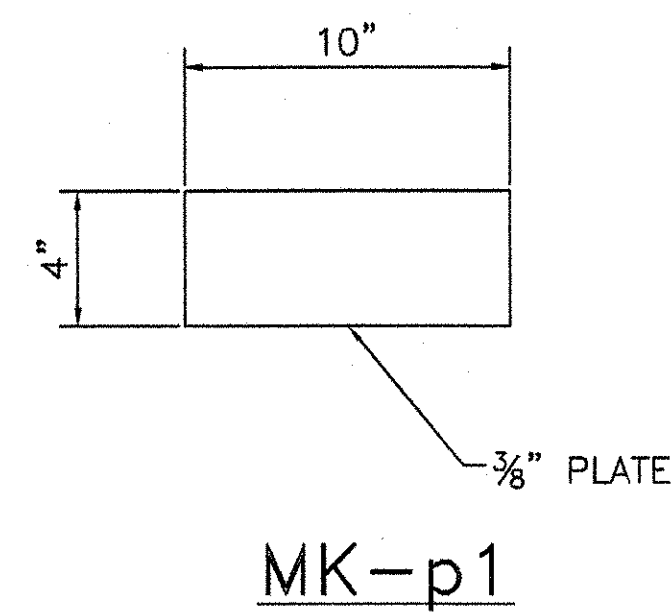


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JUL 27 2007
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BY _____ DATE *08/08/07*

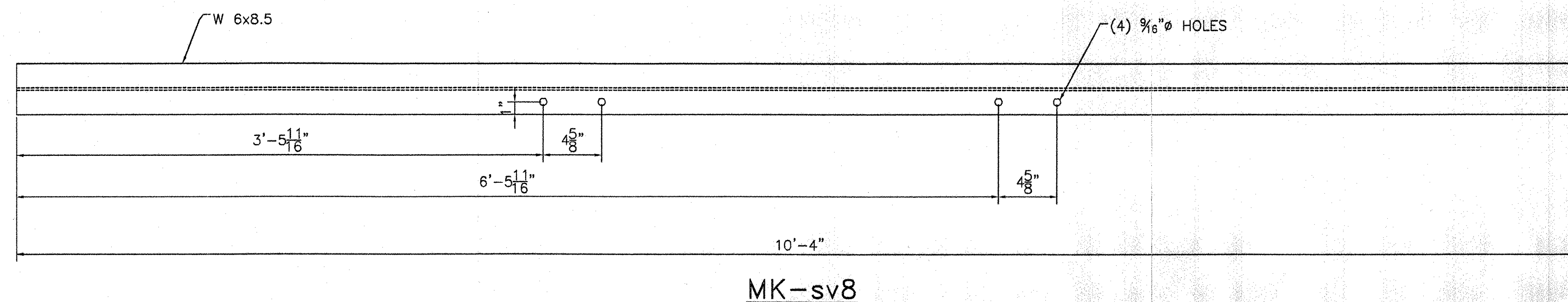


REVISIONS		
No.	Remarks	Date
0	Initial submittal	

HIGHWAY SAFETY CORP. GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE STATE OF VERMONT COUNTY OF CALEDONIA MM 10.970 NB PROJECT No. HES 091-3(42) HES 093-1(10)	
GENERAL CONTRACTOR SUB CONTRACTOR	F.R. LAFAYETTE
DRAWN: MHM CHECKED: P. Radice DATE: 5/23/07 SCALE: NTS HSC REFERENCE NO.: 1587g SIZE: D REVISION: 0 SHEET NO.: 5 of 8	



MK-vp



MK-sv8

REVISIONS		
No.	Remarks	Date
0	Initial submittal	

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 RESUBMIT _____ APPROVED AS NOTED
 BY _____ DATE 08/08/07

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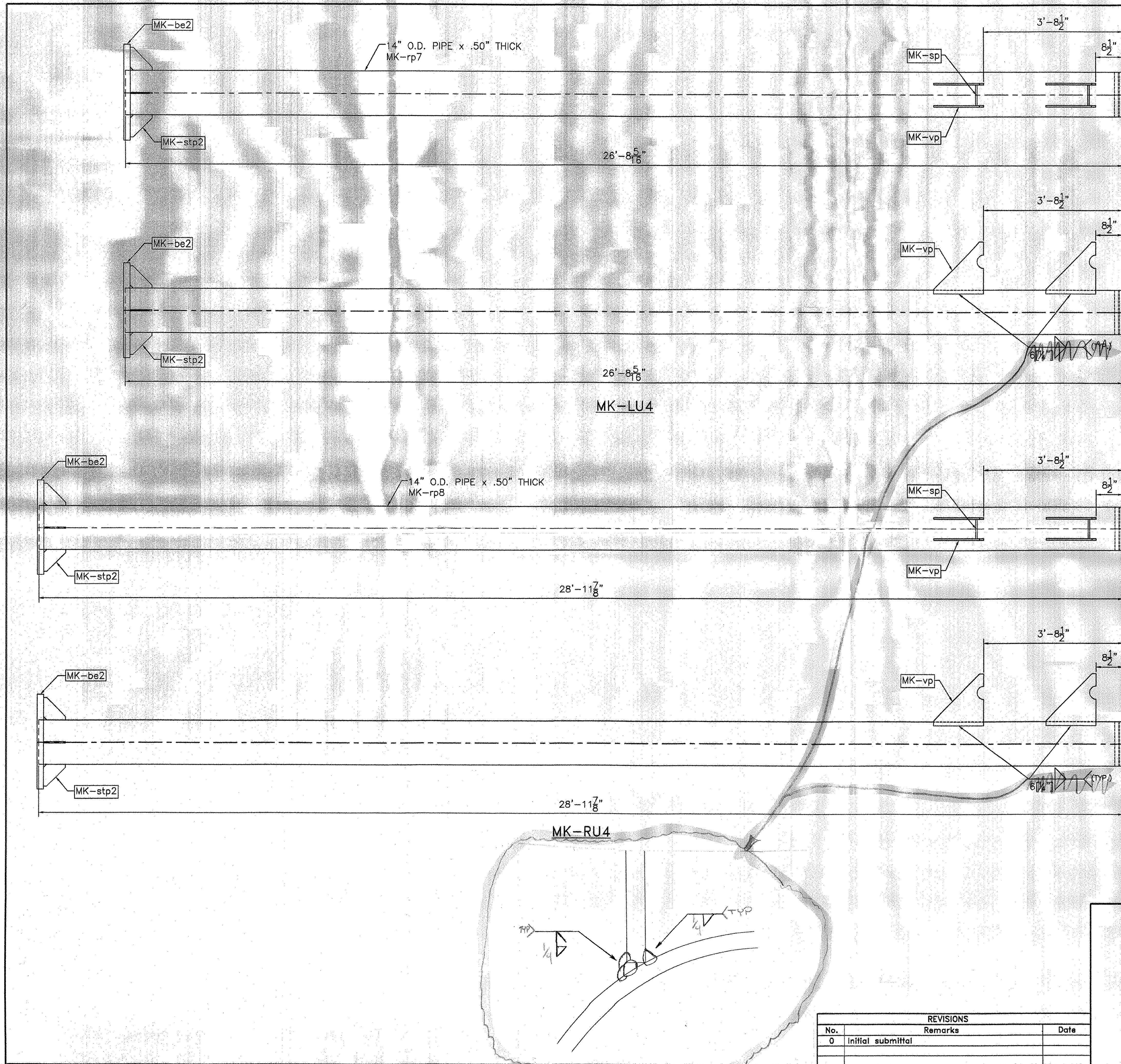
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HIGHWAY SAFETY CORP.
 GLASTONBURY, CT

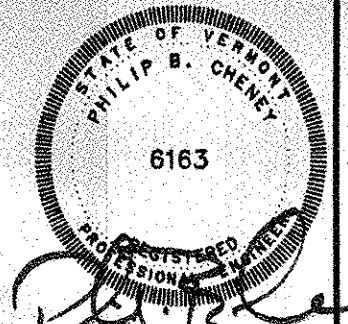
TRI-CHORD SIGN STRUCTURE
 STATE OF VERMONT
 COUNTY OF CALEDONIA
 MM 10.970 NB
 PROJECT No. HES 091-3(42)
 HES 093-1(10)

GENERAL CONTRACTOR
 SUB CONTRACTOR F.R. LAFAYETTE

DRAWN MHM
 CHECKED P. Radice
 DATE 5/23/07
 SCALE NTS
 HSC REFERENCE NO. 1587g
 SIZE D REVISION 0
 SHEET NO. 6 of 8



erection mark	piece qty	item description	size/shape	length/qty per unit	material notes
TRUSS 1 ASSEMBLY					
D1 CHORD PIPE ASSEMBLY					
dh1	1	pipe	4" O.D. x 0.226" wall	26'-2"	A500 gr B
p1	2	plate	PL 0.375" x 4"	10"	A709 gr 50
p2	6	plate	PL 0.375" x 4"	7'-8"	A709 gr 50
ag3	14	angle	L2"x2"x25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x25"	2'-4"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A709 gr 50
D2 CHORD PIPE ASSEMBLY					
dh2	1	pipe	4" O.D. x 0.226" wall	29'-8.187"	A500 gr B
p1	4	plate	PL 0.375" x 4"	10"	A709 gr 50
p2	6	plate	PL 0.375" x 4"	7'-8"	A709 gr 50
ag3	7	angle	L2"x2"x25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x25"	2'-4"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A709 gr 50
D3 CHORD PIPE ASSEMBLY					
dh3	1	pipe	4" O.D. x 0.226" wall	29'-8.062"	A500 gr B
p1	4	plate	PL 0.375" x 4"	10"	A709 gr 50
p2	6	plate	PL 0.375" x 4"	7'-8"	A709 gr 50
ag3	7	angle	L2"x2"x25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x25"	2'-4"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A709 gr 50
TRUSS 2 ASSEMBLY					
D4 CHORD PIPE ASSEMBLY					
dh4	1	pipe	4" O.D. x 0.226" wall	26'-2"	A500 gr B
p1	2	plate	PL 0.375" x 4"	10"	A709 gr 50
p2	6	plate	PL 0.375" x 4"	7'-8"	A709 gr 50
ag3	14	angle	L2"x2"x25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x25"	2'-4"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A709 gr 50
D5 CHORD PIPE ASSEMBLY					
dh5	1	pipe	4" O.D. x 0.226" wall	29'-8.187"	A500 gr B
p1	4	plate	PL 0.375" x 4"	10"	A709 gr 50
p2	6	plate	PL 0.375" x 4"	7'-8"	A709 gr 50
ag3	7	angle	L2"x2"x25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x25"	2'-4"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A709 gr 50
D6 CHORD PIPE ASSEMBLY					
dh6	1	pipe	4" O.D. x 0.226" wall	29'-8.062"	A500 gr B
p1	4	plate	PL 0.375" x 4"	10"	A709 gr 50
p2	6	plate	PL 0.375" x 4"	7'-8"	A709 gr 50
ag3	7	angle	L2"x2"x25"	3'-10.375"	A36
ag2	2	angle	L2"x2"x25"	2'-4"	A36
pc	1	plate	0.25" x 1.75"	3.75"	A36
se1	1	splice plate	0.75" x 10" O.D.		A709 gr 50
VERTICAL PIPE ASSEMBLY					
LU4 LEFT PIPE ASSEMBLY					
rp7	1	pipe	14" O.D. x 0.50" wall	26'-8.313"	A501 gr B
sp	2	plate	PL 0.5" x 6.5"	8"	A709 gr 50
wp	4	plate	PL 0.5" x 1.4"	1'-4"	A709 gr 50
cp	1	plate	2.25" x 1'-2.5" O.D.		A36
br2	1	angle	L1.5"x1.5"x25"	1'-1"	A36
gt	1	gasket	125"x1'-2.5" O.D.		50 duro Neoprene
nr	1	hex nut	50" dia		A363
tr	1	hex bolt	50" dia	1.5"	A325
w	1	washer	50" dia		F344
rw	1	rubber washer	50" dia		50 duro Neoprene
sp2	4	plate	PL 0.375" x 7"	7"	A709 gr 50
be2	1	base plate	2.25" x 2'-6" O.D.		A709 gr 50
RU4 RIGHT PIPE ASSEMBLY					
rp8	1	pipe	14" O.D. x 0.50" wall	23'-11.875"	A501 gr B
sp	2	plate	PL 0.5" x 6.5"	8"	A709 gr 50
wp	4	plate	PL 0.5" x 1.4"	1'-4"	A709 gr 50
cp	1	plate	2.25" x 1'-2.5" O.D.		A36
br2	1	angle	L1.5"x1.5"x25"	1'-1"	A36
gt	1	gasket	125"x1'-2.5" O.D.		50 duro Neoprene
nr	1	hex nut	50" dia		A363
tr	1	hex bolt	50" dia	1.5"	A325
w	1	washer	50" dia		F344
rw	1	rubber washer	50" dia		50 duro Neoprene
sp2	4	plate	PL 0.375" x 7"	7"	A709 gr 50
be2	1	base plate	2.25" x 2'-6" O.D.		A709 gr 50
LOOSE ITEMS					
sv5	10	sign hanger	M10x8.5	10'-4"	A36
ub6	8	u-bolt	3.625" dia	7"	F1554 Gr. 36
ubk	16	lock nut	3.625" dia		A563 DH
ubw	16	washer	3.625" dia		F436
uk1	20	lock nut	3.50" dia	8.5"	F1554 Gr. 36
uk1	40	lock nut	3.50" dia		A563 DH
sw1	40	washer	3.50" dia		F436
ub1	24	hex bolt	3.75" dia	3"	A325
ub2	24	washer	3.75" dia		F443
ub3	24	hex nut	3.75" dia		A563 DH
an1	16	anchor bolt	2.25" dia	3'-6"	S/S A276 T304
an2	16	hex nut	2.25" dia		S/S A194B T304
ra	8	lock washer	2.25" dia		S/S TY 304
w2	8	flat washer	2.25" dia		S/S TY 304

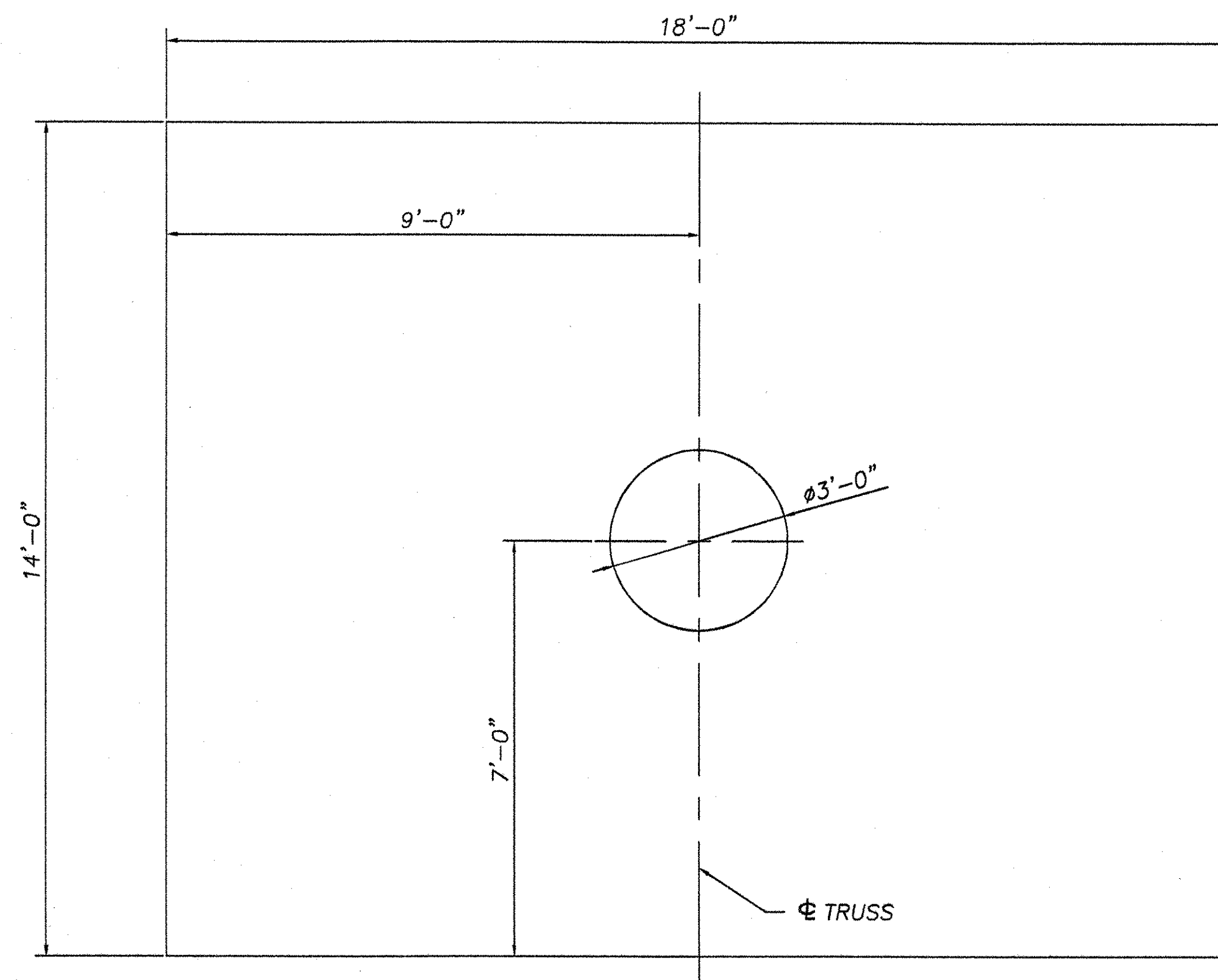


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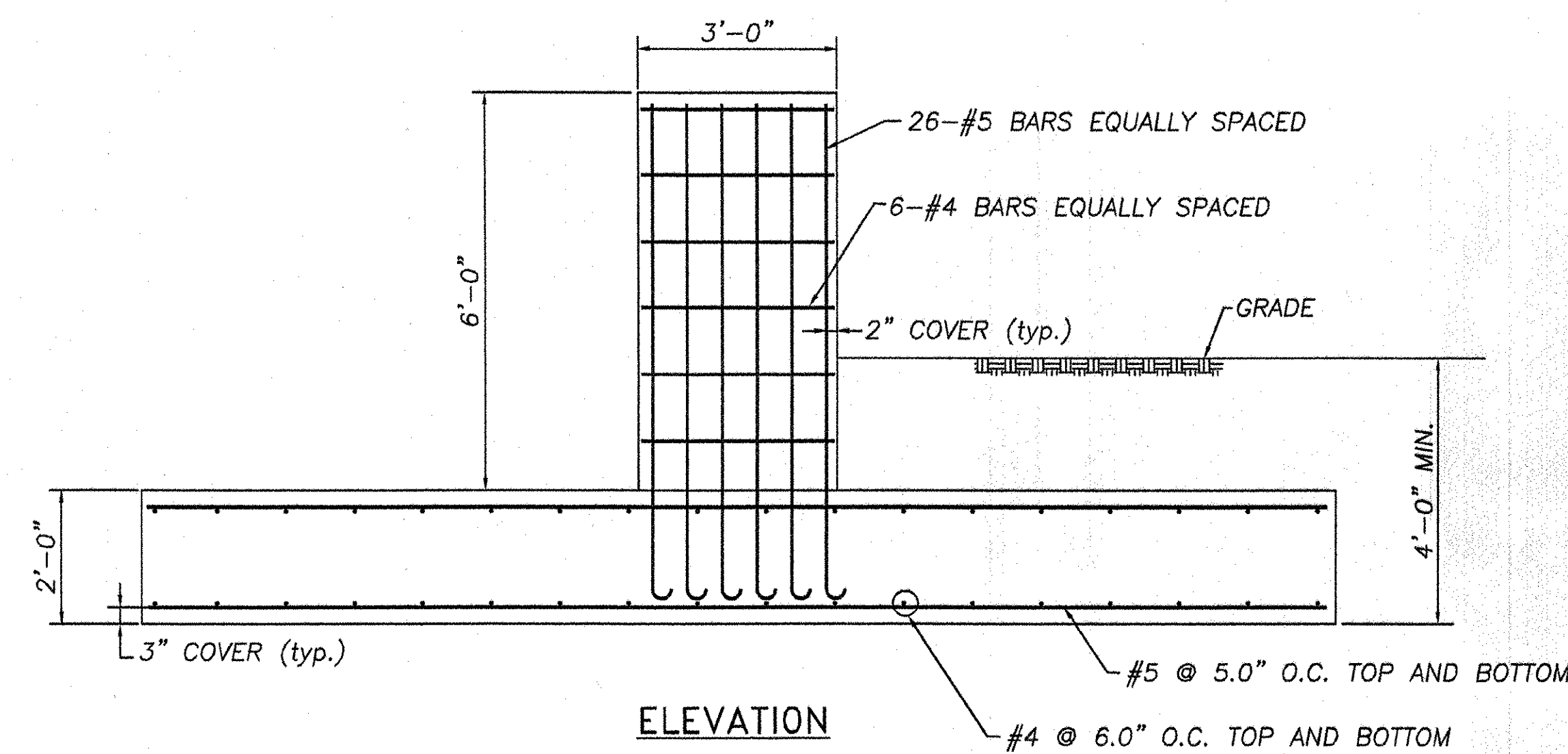
HIGHWAY SAFETY CORP. GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE STATE OF VERMONT COUNTY OF CALEDONIA MM 10.970 NB PROJECT No. HES 091-3(42) HES 093-1(10)	
GENERAL CONTRACTOR SUB CONTRACTOR	F.R. LAFAYETTE
DRAWN CHECKED DATE SCALE HSC REFERENCE NO. SIZE SHEET NO.	MHM P Radice 5/23/07 N.T.S. 1587g 0 7 of 8

REVISIONS		
No.	Remarks	Date
0	Initial submittal	

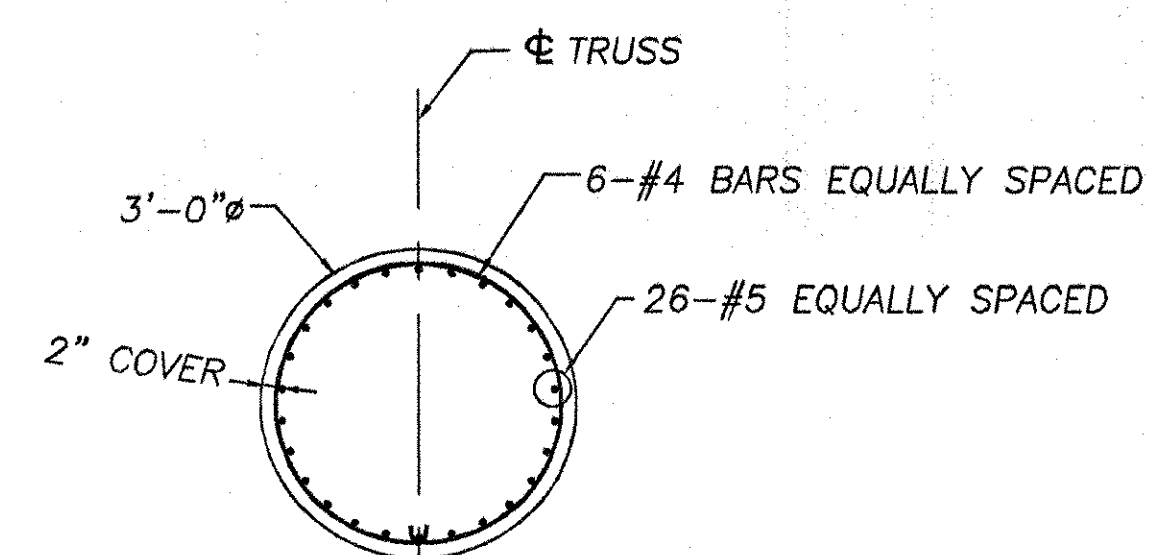


18.67' $\approx$ 7

PLAN



ELEVATION

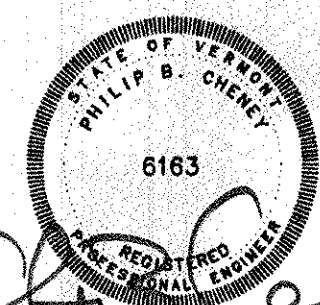


PLAN (STEM)

REBAR LIST

REBAR	PCS. REQD.	LENGTH
#4	12	9'-4"
#4	144	13'-6"
#5	136	17'-6"
#5 (HOOK ONE END)	52	8'-6"

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HIGHWAY SAFETY CORP. GLASTONBURY, CT	
TRI-CHORD SIGN STRUCTURE STATE OF VERMONT COUNTY OF CALEDONIA MM 10.970 NB PROJECT No. HES 091-3(42) HES 093-1(10)	
GENERAL CONTRACTOR	1587g
SUB CONTRACTOR	8 of 8

REVISIONS		
No.	Remarks	Date
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