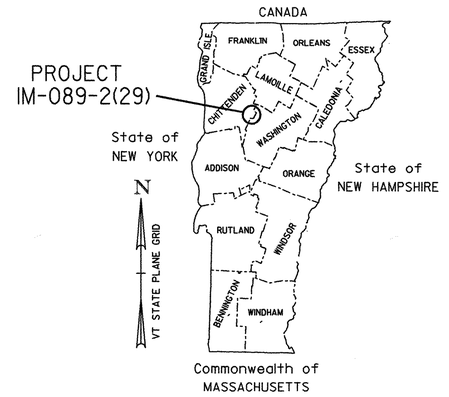
STATE OF VERMONT
AGENCY OF TRANSPORTATION

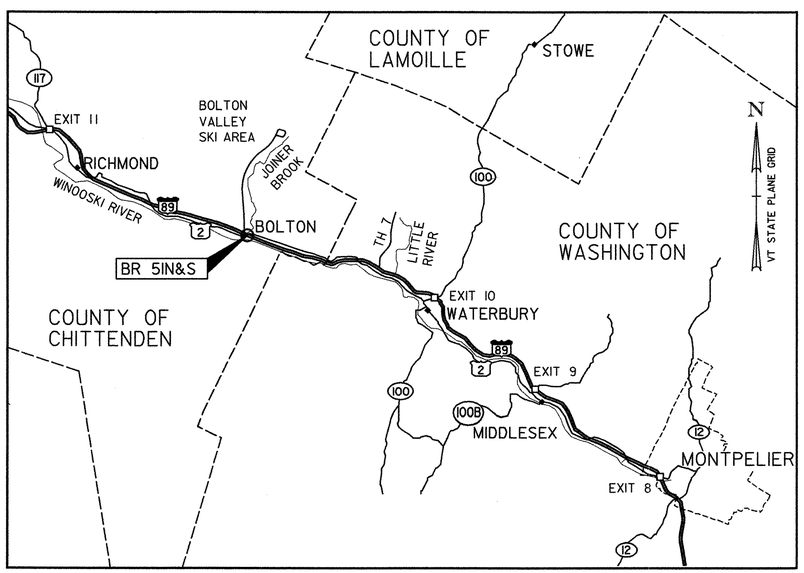
PROPOSED IMPROVEMENT

TOWN OF BOLTON
COUNTY OF CHITTENDEN
PROJECT AC IM 089-2(29)



ROUTE NO.:	I–89
BRIDGE NO.:	51N&S
PROJECT LOCATION:	BR 51N&S OVER U.S. ROUTE 2 & JOINER BROOK (MM 70.6)

PROJECT DESCRIPTION:	INSTALL TRAFFIC CONTROL, REHABILITATE STRUCTURES, REMOVE TRAFFIC CONTROL	
LENGTH OF STRUCTURES:	BR 51N 368.12′	BR 51S 454.49′
TOTAL LENGTH OF STRUCTURES:	822.61′	



CONVENTIONAL SIGNS

COUNTY LINE	
TOWN LINE	
LIMITS OF ACCESS	
POINT OF ACCESS	X
FENCE LINE	x x
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	SR
TOP OF CUT	
TOE OF SLOPE	

DATUM VERTICAL	NAVD 88
HORIZONTAL	NAD 83/92

RECORD PLANS

CONTRACTOR: WINTERSET, INC. – LYNDONVILLE, VT

RESIDENT ENGINEER: RICK HALE

CONSTRUCTION BEGAN: OCTOBER 29, 2004

CONSTRUCTION COMPLETE: OCTOBER 13, 2006

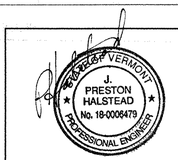
RECORD PLANS BY: R. HALE & N. GARBACIK

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

BY Rick Hale RESIDENT ENGINEER

DATE 4-9-9

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.



THIS SEAL APPLIES ONLY TO DRAWINGS SHOWING TVGA ENGINEERING, SURVEYING, P.C.

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.

APPROVED _____ DATE 4/9/07
DIRECTOR OF PROJECT DEVELOPMENT

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED _____ DATE Sept 10, 2007
DIVISION ADMINISTRATOR

TVGA ENGINEERING, SURVEYING, P.C.

PROJECT NAME: BOLTON
PROJECT NUMBER: AC IM 089-2(29)

SHEET 1 OF 307 SHEETS

INDEX OF SHEETS

ALL REBAR IN ABUTMENTS 1 AND 2, ALONG WITH PIER AND PIER CAPS, ARE TO BE ITEM 507.15 - REINFORCING STEEL AND NOT ITEM 507.17 - EPOXY COATED REINFORCING STEEL.

WHEREVER ON THESE PLANS THE "OLD ITEM" LISTED BELOW APPEARS, THE "NEW ITEM" SHALL APPLY.

OLD ITEM	NEW ITEM
501.60 - SILICA-FUME CONCRETE	501.33 - HIGH PERFORMANCE CONCRETE CLASS A
501.25 - CONCRETE CLASS B	501.34 - HIGH PERFORMANCE CONCRETE CLASS B

ANY REFERENCE IN THE PLANS OR SPECIFICATIONS TO VAOT OR AOT SHALL BE UNDERSTOOD AS REFERRING TO VERMONT AGENCY OF TRANSPORTATION.

THESE PLANS WERE ORIGINALLY PART OF THE MIDDLESEX-BOLTON IM 089-2(26) PROJECT, WHICH INCLUDED BRIDGES 43N&S, 48N&S, 49N&S, 50N&S, AND 5IN&S. THESE PLANS HAVE BEEN SEPARATED FROM THAT PROJECT TO FORM A NEW CONSTRUCTION CONTRACT FOR BRIDGES 5IN&S ONLY. ANY REFERENCE IN THESE PLANS OR IN THE SPECIFICATIONS TO BRIDGES 43N&S, 48N&S, 49N&S, OR 50N&S SHALL BE IGNORED.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta.
	Surv. Sta.

INDEX OF SHEETS

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 11stosht	Date 08/00
Bridge Sheet No. C-2	Sheet 2 of 307

TVGA ENGINEERING, SURVEYING, P.C.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET

SUMMARY OF ESTIMATED QUANTITIES															TOTALS			DESCRIPTIONS			DETAILED SUMMARY OF QUANTITIES		
51 N DETAILED SUMMARY					51 S DETAILED SUMMARY																		
SUPER-STRUCT.	APPR. SLABS 1 & 2	ABUT 1 & 2	PIERS 1, 3 & 4	PIER 2	SUPER-STRUCT.	APPR. SLABS 1 & 2	ABUT 1 & 2	PIERS 1, 2, 4 & 5	PIER 3	BRIDGE 51N TOTAL	BRIDGE 51S TOTAL	ROADWAY	TRAINING	EROSION CONTROL	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
		200					200			200	200					400		LF	SHOULDER BERM REMOVAL	203.99	EST.			
												20				20		CY	TRENCH EXCAVATION OF EARTH	204.20	EST.			
	70		30			70		30	105	100	205					305		CY	STRUCTURE EXCAVATION	204.25	15			
		35	30	150			35	30	105	215	170					385		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	19			
				280						280						280		CY	COFFERDAM EXCAVATION,EARTH	208.30	EST.			
				55						55						55		CY	COFFERDAM EXCAVATION,ROCK	208.35	EST.			
				1						1						1		LS	COFFERDAM	208.40	---			
												2030				2030		SY	COLD PLANING-BIT.PAVEMENT	210.10	8			
												3225				3225		LF	MILLED RUMBLE STRIPS	213.10	---			
												120				120		CY	SUBBASE OF GRAVEL	301.15	EST.			
	10					10				10	10					20		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35	2			
1.5	0.5				1.5	0.5				2	2	6				10		CWT	EMULSIFIED ASPHALT	404.65	---			
210					250					210	250	690				1150		TON	BITUMINOUS CONCRETE PAVEMENT (PG 58-34)	406.25	8			
390					480					390	480					870		CY	CONCRETE, CLASS A QC/QA	501.221	10			
55					65					55	65					120		CY	CONCRETE, HIGH PERFORMANCE CLASS A	501.33	4			
	75	55	70	225		70	55	85	195	425	405					830		CY	CONCRETE, HIGH PERFORMANCE CLASS B	501.34	23			
				1						1						1		LS	FURNISHING EQUIPMENT FOR DRIVING PILING (BR 51N)	504.10	---			
									1		1					1		LS	FURNISHING EQUIPMENT FOR DRIVING PILING (BR 51S)	504.10	---			
				670					1030	670	1030					1700		LF	CAST-IN-PLACE CONCRETE PILING (12 3/4" DIA. X 3/8" WALL - CONCRETE FILLED PIPE PILE)	505.25	20			
				1					1	1	1					2		EACH	DYNAMIC PILE LOADING TEST	505.45	---			
21800					21900					21800	21900					43700		LB	STRUCTURAL STEEL (ROLLED BEAM)	506.50	185			
341500					415000					341500	415000					756500		LB	STRUCTURAL STEEL(PLATE GIRDER)	506.55	699			
900					900					900	900					1800		LB	STRUCTURAL STEEL	506.60	EST.			
		6450	16300	15250			6500	19550	16950	38000	43000					81000		LB	REINFORCING STEEL	507.15	960			
		250					250			250	250					500		LF	DRILLING AND GROUTING DOWELS	507.16	EST.			
115150	9350				145700	9300				124500	155000					279500		LB	EPOXY COATED REINFORCING STEEL	507.17	1384			
		145	60				140	75		205	215					420		EACH	MECHANICAL BAR CONNECTOR (MOD. - INSTALL GALVANIC ANODE)	507.19	---			
1										1						1		LS	SHEAR CONNECTORS (4966 - 7/8" x 7" LONG - BR 51N)	508.15	---			
					1						1					1		LS	SHEAR CONNECTORS (6013 - 7/8" x 7" LONG - BR 51S)	508.15	---			
1										1						1		LS	STRUCTURAL PAINTING,SHOP APPLIED (BR 51N - 14 TONS)	513.25	---			
					1						1					1		LS	STRUCTURAL PAINTING,SHOP APPLIED (BR 51S - 14 TONS)	513.25	---			
1										1						1		LS	CONTAINMENT & ENVIRONMENTAL PROTECTION,SHOP (BR 51N - 14 TONS)	513.35	---			
					1						1					1		LS	CONTAINMENT & ENVIRONMENTAL PROTECTION,SHOP (BR 51S - 14 TONS)	513.35	---			
1										1						1		LS	SURFACE PREPARATION,SHOP (BR 51N - 14 TONS)	513.40	---			
					1						1					1		LS	SURFACE PREPARATION,SHOP (BR 51S - 14 TONS)	513.40	---			
12		9	15	14	12		9	20	14	50	55					105		GAL	WATER REPELLENT (MOD. - SILANE)	514.10	6			
		32					32			32	32					64		LF	BRIDGE EXPANSION JOINT (ASPHALTIC PLUG)	516.10	---			
89					89					89	89					178		LF	BRIDGE EXPANSION JOINT (VERMONT)	516.10	---			
1310					1620					1310	1620					2930		SY	SHEET MEMBRANE WATERPROOFING (TORCH APPLIED)	519.20	5			
780					960					780	960					1740		LF	REMOVAL OF EXISTING RAILING	525.10	EST.			

PROJECT NAME: **BOLTON**
PROJECT NUMBER: **IM 089-2(29)**

FILE NAME: **sa268qty.xls** PLOT DATE: **8/3/04**
PROJECT MANAGER: **SHERWARD FARNSWORTH** DRAWN BY: **STR6**
DESIGNED BY: **STR6** CHECKED BY: **STR6**
QUANTITY SHEET C-3 SHEET **3** OF **301**

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET

SUMMARY OF ESTIMATED QUANTITIES															TOTALS			DESCRIPTIONS			DETAILED SUMMARY OF QUANTITIES		
51 N DETAILED SUMMARY					51 S DETAILED SUMMARY																		
SUPER-STRUCT.	APPR. SLABS 1 & 2	ABUT 1 & 2	PIERS 1, 3 & 4	PIER 2	SUPER-STRUCT.	APPR. SLABS 1 & 2	ABUT 1 & 2	PIERS 1, 2, 4 & 5	PIER 3	BRIDGE 51N TOTAL	BRIDGE 51S TOTAL	ROADWAY	EROSION CONTROL	TRAINING	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
780					960					780	960					1740		LF	BRIDGE RAILING - NETC 2 RAIL	525.33	8			
1										1						1		LS	TRAFFIC PROTECTION FOR BRIDGE PROJECTS (BR 51N)	527.11	---			
					1						1					1		LS	TRAFFIC PROTECTION FOR BRIDGE PROJECTS (BR 51S)	527.11	---			
1400					1700					1400	1700					3100		SY	REMOVAL OF BRIDGE PAVEMENT	529.10	24			
0.4		0.1	0.1	0.4						1						1		EACH	PARTIAL REMOVAL OF STRUCTURE (BR 51N)	529.20	---			
					0.4		0.1	0.1	0.4		1					1		EACH	PARTIAL REMOVAL OF STRUCTURE (BR 51S)	529.20	---			
1										1						1		EACH	PARTIAL REMOVAL OF STRUCTURE (EXISTING STEEL BEAMS - BR 51N)	529.20	---			
					1						1					1		EACH	PARTIAL REMOVAL OF STRUCTURE (EXISTING STEEL BEAMS - BR 51S)	529.20	---			
		5		5			5		5	10	10					20		EACH	BEARING DEVICE ASSEMBLY (ELASTOMERIC - FIXED)	531.10	---			
		5	20				5	25		25	30					55		EACH	BEARING DEVICE ASSEMBLY (FABRIC - EXP.)	531.10	---			
		2	8				2	8		10	10					20		SY	REPAIR OF CONCRETE SUBSTRUCTURE SURFACE CLASS I	580.13	EST.			
			20					30		20	30					50		SY	REPAIR OF CONCRETE SUBSTRUCTURE SURFACE CLASS II	580.14	EST.			
			5					5		5	5					10		CY	REPAIR OF CONCRETE SUBSTRUCTURE SURFACE CLASS III	580.15	EST.			
			130					155		130	155					285		SY	FIBER REINFORCED POLYMER WRAP	580.40	7			
												30				30		LF	18" CPEP	601.0915	EST.			
		10					10			10	10					20		CY	STONE FILL, TYPE I	613.10	EST.			
													5			5		CY	STONE FILL, TYPE I (MOD. I - CHECK DAMS)	613.10	EST.			
													170			170		CY	STONE FILL, TYPE I (MOD. II - TRACKING PAD)	613.10	---			
													5			5		CY	STONE FILL, TYPE I (MOD. III - INLET PROTECTION)	613.10	---			
													20			20		CY	STONE FILL, TYPE I (MOD. IV - CRUSHED STONE BERM)	613.10	---			
		10					10			10	10					20		CY	STONE FILL, TYPE II	613.11	EST.			
		25					25			25	25					50		CY	STONE FILL, TYPE IV	613.13	EST.			
		160					160			160	160					320		LF	CAST-IN PLACE CONCRETE CURB, TYPE B	616.28	---			
100					100					100	100					200		LF	WOVEN WIRE FENCE W/STEEL POSTS	620.25	EST.			
100					100					100	100					200		LF	REMOVAL OF EXISTING FENCE	620.55	EST.			
													4150			4150		LF	SNOW FENCE (PDF)	620.70	102			
200					150					200	150					350		LF	SNOW BARRIER - GALVANIZED	620.75	5			
												175				175		LF	STEEL BEAM GUARD RAIL	621.20	---			
												4				4		EACH	MANUFACTURED TERMINAL SECTION (FLARED)	621.505	EST.			
												2				2		EACH	TRAILING END TERMINAL	621.52	---			
4					4					4	4					8		EACH	GUARD RAIL APPR. SECTION, NETC 2 RAIL	621.72	---			
												50				50		LF	REMOVING AND RESET GUARD RAIL	621.75	EST.			
												590				590		LF	REMOVL AND DISP OF GUARD RAIL	621.80	---			
												4350				4350		LF	TEMPORARY TRAFFIC BARRIER	621.90	---			
												1350				1350		HR	UNIFORMED TRAFFIC OFFICERS	630.10	EST.			
												850				850		HR	FLAGGERS	630.15	EST.			
															1	1		LS	FIELD OFFICE-ENGINEERS	631.10	---			
															1	1		LS	TESTING EQUIPMENT - CONCRETE	631.16	---			
															1	1		LS	TESTING EQUIPMENT - BITUMINOUS (MOD.)	631.17	---			
															1	1		LU	FIELD OFFICE - TELEPHONE (N.A.B.I.)	631.25	---			

PROJECT NAME: **BOLTON**
PROJECT NUMBER: **IM 089-2(29)**

FILE NAME: **sa268qty.xls** PLOT DATE: **8/3/04**
PROJECT MANAGER: **SHERWARD FARNSWORTH** DRAWN BY: **STR6**
DESIGNED BY: **TVGA** CHECKED BY: **TVGA**
QUANTITY SHEET C-4 SHEET **4** OF **301**

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET

SUMMARY OF ESTIMATED QUANTITIES

51 N DETAILED SUMMARY					51 S DETAILED SUMMARY														
SUPER-STRUCT.	APPR. SLABS 1 & 2	ABUT 1 & 2	PIERS 1, 3 & 4	PIER 2	SUPER-STRUCT.	APPR. SLABS 1 & 2	ABUT 1 & 2	PIERS 1, 2, 4 & 5	PIER 2	BRIDGE 51N TOTAL	BRIDGE 51S TOTAL	ROADWAY	TRAINING	EROSION CONTROL	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS
													1560			1560		HR	EMPLOYEE TRAINEESHIP
												1				1		LS	MOBILIZATION
												1				1		LS	TRAFFIC CONTROL
												1				1		LS	PUBLIC RELATIONS OFFICER
												2				2		EACH	PORTABLE CHANGEABLE MESSAGE SIGN
												5				5		EACH	PORTABLE ARROW BOARD
												1820				1820		LF	DURABLE 6" WHITE LINE
												1450				1450		LF	DURABLE 6" YELLOW LINE
												1950				1950		LF	TEMPORARY 4" WHITE LINE
												8900				8900		LF	TEMPORARY 4" WHITE LINE (TAPE, TYPE II)
												1700				1700		LF	TEMPORARY 4" YELLOW LINE
												13250				13250		LF	TEMPORARY 4" YELLOW LINE (TAPE, TYPE II)
												1350				1350		EACH	RAISED PAVEMENT MARKERS TYPE II
												4350				4350		SF	BLACK PAVEMENT MARKING MASKING TAPE
			20					20		20	20					40		SY	GEOTEXTILE UNDER STONE FILL
														500		500		SY	GEOTEXTILE FOR SILT FENCE
														300		300		LB	SEED
														2300		2300		LB	FERTILIZER
														10		10		TON	AGRICULTURAL LIMESTONE
														10		10		TON	HAY MULCH
														50		50		EACH	HAY BALES FOR EROSION CONTROL
														1		1		LS	EROSION PREVENTION & SEDIMENT CONTROL PLAN
														200		200		HR	MONITORING EROSION PREVENTION & SEDIMENT CONTROL PLAN
														1		1		LU	FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN (N.A.B.I.)
														21500		21500		SY	EROSION MATTING
												20				20		SF	TRAFFIC SIGNS, TYPE A (MOD.)
												30				30		LF	SQUARE TUBE SIGN POSTS AND ANCHOR
												2				2		EACH	REMOVING SIGNS
												2				2		EACH	ERECTING SALVAGED SIGNS

TOTALS

DESCRIPTIONS

ITEM NUMBER	ROUND
634.10	EST.
635.10	---
641.10	---
641.12	---
641.15	---
641.16	---
646.414	8
646.415	---
646.60	---
646.60	---
646.61	---
646.61	---
646.75	---
646.86	---
649.31	7
649.51	8
651.15	7
651.18	25
651.20	1
651.25	1
651.26	EST.
652.10	---
652.20	EST.
652.30	---
654.10	66
675.20	---
675.341	EST.
675.50	---
675.60	---

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS

PROJECT NAME: **BOLTON**
PROJECT NUMBER: **IM 089-2(29)**

FILE NAME: **sa268qty.xls**
PROJECT MANAGER: **SHERWARD FARNSWORTH**
DESIGNED BY: **STR6**
QUANTITY SHEET C-5

PLOT DATE: **8/3/04**
DRAWN BY: **STR6**
CHECKED BY: **STR6**
SHEET **5** OF **301**

GENERAL NOTES:

1. A FIELD SURVEY WAS CONDUCTED BY VAOT, IN WHICH THE FACES OF ABUTMENTS AND PIER SURFACES OF THE EXISTING BRIDGES WERE LOCATED. THIS INFORMATION WAS THEN USED, IN COMBINATION WITH ORIGINAL BRIDGE DESIGN PLANS, TO DEVELOP THE APPROXIMATE EXISTING STRUCTURE INFORMATION SHOWN IN THESE PLANS. THE ORIGINAL BRIDGE DESIGN PLANS ARE INCLUDED IN THIS PLAN SET, AND ARE FOR INFORMATION ONLY. TRAFFIC CONTROL PLANS WERE DEVELOPED BASED SOLELY ON ORIGINAL HIGHWAY DESIGN PLANS. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING ANY AND ALL DIMENSIONS APPLICABLE TO THIS PROJECT.

2. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO STATE OF VERMONT AGENCY OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" (2001) AND ITS LATEST REVISIONS, AND AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" (1996) AND ITS LATEST REVISIONS.

3. DESIGN IS FOR HS-25 LOADING APPLIED IN ACCORDANCE WITH THE PROVISIONS OF AASHTO STANDARD SPECIFICATIONS.

4. ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL AND ARE GIVEN AT 68°F, UNLESS SHOWN OTHERWISE.

5. ANY REFERENCE TO "LEFT" AND/OR "RIGHT" ON THE PLANS OR IN THE NOTES REFERS TO THE DIRECTION OF STATIONING AND NOT THE DIRECTION OF TRAFFIC.

6. ALL STRUCTURAL STEEL SHALL CONFORM TO AASHTO DESIGNATION M270, GRADE 50W, EXCEPT AS NOTED IN THE PLANS.

7. THE FOLLOWING TABLE OF DESIGN STRENGTHS APPLIES TO THESE PLANS FOR DESIGN PURPOSES:

   CONCRETE: f'_c = 4,000 PSI (BRIDGE DECKS)

   f'_c = 3,500 PSI (PIERS AND ABUTMENTS)

   EXISTING STRUCTURAL STEEL (BR 49N&S): AASHO M165

   F_Y = 33,000 PSI

   NEW STRUCTURAL STEEL: AASHTO M270, GR50W

   F_Y = 50,000 PSI

   EXISTING REINFORCING STEEL:

   F_Y = 40,000 PSI (GRADE 40)

   NEW REINFORCING STEEL:

   F_Y = 60,000 PSI (GRADE 60)

   NEW STEEL PIPE PILES: ASTM 252 GRADE 2

   F_Y = 35,000 PSI

8. ALL CONNECTIONS OF UNPAINTED MEMBERS SHALL BE MADE WITH 7/8" DIAMETER AASHTO M-164, TYPE 3 BOLTS IN 15/16" DIAMETER HOLES, EXCEPT AS NOTED IN THE PLANS. ALL CONNECTIONS OF PAINTED OR GALVANIZED MEMBERS SHALL BE MADE WITH AASHTO M-164 TYPE 1 GALVANIZED BOLTS. NEW OR EXISTING BOLTS THAT HAVE BEEN FULLY TIGHTENED SHALL NOT BE RE-USED.

9. WHERE CONNECTIONS ARE NOT DETAILED ON THE PLANS, THEY SHALL BE DETAILED BY THE FABRICATOR AND SUBMITTED TO THE STRUCTURES ENGINEER FOR APPROVAL.

10. ALL WELDING AND DIMENSIONAL TOLERANCES OF WELDED MEMBERS SHALL CONFORM TO THE LATEST ANSI / AASHTO / AWS BRIDGE WELDING CODE AND ITS LATEST REVISIONS.

11. WHERE GALVANIZING HAS BEEN REMOVED BY ANY MEANS FROM ANY BRIDGE COMPONENTS, INCLUDING DOWNSPOUTS AND ASSOCIATED HARDWARE, IT SHALL BE REPAIRED IN ACCORDANCE WITH SECTION 513 OF THE SPECIFICATIONS. COSTS FOR THIS WORK SHALL BE INCIDENTAL TO THE ITEM UNDER WHICH THE GALVANIZED COMPONENT IS PROVIDED.

12. ANY FORM BRACKET HOLES (IF REQUIRED) IN FASCIA STRINGERS OR STRINGER WEBS SHALL BE FILLED WITH BUTTONHEAD OR HEX-HEAD BOLTS, TYPE 3. FORM BRACKETS SHALL BE DESIGNED BY THE CONTRACTOR - MAXIMUM SPACING SHALL NOT EXCEED 4'-0" (TYP.).

13. ALL REINFORCING STEEL SHALL BE DETAILED AND FABRICATED USING PROCEDURES IN ACCORDANCE WITH APPLICABLE PUBLICATIONS OF THE CONCRETE REINFORCING STEEL INSTITUTE.

14. REINFORCEMENT PLACING TOLERANCES SHALL BE:

    SPACING +/- 1"

    CLEARANCE +/- 1/4"

15. MINIMUM COVER FOR REINFORCING STEEL (EXCEPT IN THE DECK) SHALL BE 2" IN BACK FACES OF SUBSTRUCTURES AGAINST EARTH, 4" IN PIER COLUMNS AND CAP BEAMS, AND 3" ELSEWHERE, UNLESS OTHERWISE SHOWN.

16. FLAME CUTTING OF EPOXY COATED REINFORCING STEEL SHALL NOT BE PERMITTED.

17. ALL DECK SLAB, CURTAINWALL, AND EXPANSION JOINT HEADER CONCRETE SHALL BE ITEM 501.221, "CONCRETE, CLASS A QC/QA", IN ACCORDANCE WITH THE SPECIAL PROVISIONS. ALL BRUSH CURB CONCRETE SHALL BE ITEM 501.33, "HIGH PERFORMANCE CONCRETE, CLASS A". ALL SUBSTRUCTURE CONCRETE SHALL BE ITEM 501.34, "HIGH PERFORMANCE CONCRETE, CLASS B", EXCEPT AS SHOWN IN THE PLANS.

18. ALL EXPOSED EDGES OF CONCRETE IN THE SUBSTRUCTURE AND THE SUPERSTRUCTURE SHALL BE CHAMFERED 1" X 1", UNLESS OTHERWISE SHOWN.

19. ABUTMENT CONCRETE ABOVE THE ADJACENT BRIDGE SEAT ELEVATIONS SHALL NOT BE PLACED UNTIL GIRDERS HAVE BEEN ERECTED, BEAM PROFILES HAVE BEEN TAKEN, AND FINAL FINISH GRADE OF DECK IS ESTABLISHED BY THE ENGINEER.

20. BRIDGE SEATS SHALL BE SLOPED 1/2" PER FOOT EXCEPT UNDER BEARING PLATES WHERE THE SURFACE SHALL BE LEVEL WITH A CONSTRUCTION TOLERANCE OF 0.005 RADIANS, UNLESS OTHERWISE SHOWN IN THE PLANS. THE ENTIRE BRIDGE SEAT SHALL BE SMOOTH STEEL TROWEL FINISHED.

21. IN ALL HORIZONTAL AND VERTICAL CONSTRUCTION JOINTS, SHEAR KEYS SHALL BE FORMED AS SHOWN IN THE TYPICAL BRIDGE DETAILS, BRIDGE SHEET C-46, AND THEY SHALL BE CONTINUOUS UP TO 3" FROM EACH END OF THE JOINT. THE UPWARD KEY SHALL BE PLACED INTEGRALLY WITH THE CONCRETE BELOW THE JOINT.

22. POLYURETHANE JOINT SEALER SHALL BE USED IN CURB CONSTRUCTION JOINTS OR AT FIXED END CURB JOINTS AS DIRECTED BY THE ENGINEER, IN ACCORDANCE WITH THE CURB JOINT DETAILS SHOWN IN THE TYPICAL BRIDGE DETAILS, BRIDGE SHEET C-46.

23. THE COST OF INSTALLING PVC WATERSTOPS, AS SHOWN IN THE PLANS, SHALL BE INCIDENTAL TO ITEM 501.34, "HIGH PERFORMANCE CONCRETE, CLASS B". THE TYPE OF PVC WATERSTOP TO BE USED SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR APPROVAL.

24. NOT USED.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta.
	Surv. Sta.

GENERAL NOTES (1 OF 2)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. genotes	Date 10/99
Bridge Sheet No. C-7	Sheet 7 of 307

TVGA ENGINEERING, SURVEYING, P.C.

GENERAL NOTES (CONTINUED):

25. ITEM 514.10, "WATER REPELLENT (MOD. - SILANE)" SHALL BE APPLIED TO ALL EXPOSED CONCRETE ON THE SUPERSTRUCTURE, EXCEPT THE BOTTOM OF THE DECK BETWEEN THE DRIP BEADS. IT SHALL ALSO BE APPLIED TO ALL EXPOSED SUBSTRUCTURES, EXCEPT AS NOTED IN NOTE 26.

26. WATER REPELLENT SHALL NOT BE APPLIED TO SURFACES THAT ARE TO BE COVERED BY FIBER REINFORCED POLYMER WRAP. IN ADDITION, THESE SURFACES SHALL BE PROTECTED FROM OVER-SPRAY OF WATER REPELLENT.

27. ABUTMENT AND PIER CONCRETE REPAIRS SHALL BE PERFORMED AS SHOWN IN THE SUBSTRUCTURE REPAIR DETAILS AND NOTES, BRIDGE SHEET C-45. THE SUBSTRUCTURE CONDITION SHEETS BRIDGE SHEETS SC-1 THROUGH SC-23, WERE DEVELOPED FROM NOTES OF AN OCTOBER 1996 PRELIMINARY INSPECTION, AND SHALL BE USED ONLY AS AN INDICATION OF THE GENERAL CONDITION OF THE SUBSTRUCTURE. A THOROUGH INSPECTION BY THE RESIDENT ENGINEER WILL BE MADE OF ALL SUBSTRUCTURE AREAS AT THE TIME OF CONSTRUCTION, AND THOSE AREAS FOUND TO HAVE SPALLED, DELAMINATED OR OTHERWISE UNSOUND CONCRETE WILL BE REPAIRED. THE CONTRACTOR SHALL SUPPLY ANY STAGING AND LADDERS REQUIRED FOR THIS INSPECTION, THE COST FOR WHICH SHALL BE INCIDENTAL TO ITEM 635.10, "MOBILIZATION". THE SUBSTRUCTURE CONDITION SHEETS, BRIDGE SHEETS SC-17, SC-18, SC-20, SC-21, AND SC-22 HAVE BEEN VISUALLY FIELD VERIFIED ON AUGUST 23, 2004 BY VERMONT AGENCY OF TRANSPORTATION STRUCTURES SECTION AND FOUND TO BE STILL CURRENT BUT, ACTUAL SOUNDINGS WERE NOT PREFORMED

28. ALL FABRIC TROUGHS AND DOWNSPOUTS SHALL BE THOROUGHLY FLUSHED BY THE CONTRACTOR AFTER ALL PAVING IS COMPLETED. ALL COSTS ASSOCIATED WITH THIS WORK SHALL BE INCIDENTAL TO ITEM 406.25, "BITUMINOUS CONCRETE PAVEMENT". FOLLOWING PAVING, ANY BITUMINOUS CONCRETE PAVEMENT THAT IS LODGED IN THE EXPANSION JOINTS, OR THAT ENTERS DRAIN TROUGHS, SCUPPERS, HOPPERS OR DOWNSPOUTS, SHALL BE REMOVED BY THE CONTRACTOR AT NO COST TO THE STATE.

29. SNOW FENCE SHALL BE INSTALLED ON BRIDGE RAIL OVER ALL ROADWAYS AS SHOWN ON SHEET C-50, AND PAID FOR UNDER ITEM 620.75, "SNOW BARRIER - GALVANIZED".

30. ALL NEW PILING AT PIER 2 (BR 51N) AND PIER 3 (BR 51S) SHALL BE CAST-IN-PLACE CONCRETE PILING, WITH A MAXIMUM DESIGN LOAD OF 200 KIPS. METAL SHELLS FOR THE CAST-IN-PLACE CONCRETE PILES SHALL BE CLOSED END PP 12¾" WITH A MINIMUM WALL THICKNESS OF 3/8" CONFORMING TO ASTM 252 GRADE 2. A 1" THICK FLAT STEEL PLATE CONFORMING TO AASHTO M270 GRADE 36 SHALL BE WELDED TO THE END OF THE SHELLS AS SHOWN IN THE TYPICAL BRIDGE DETAILS, BRIDGE SHEET C-46. THE FIRST PILE DRIVEN AT EACH PIER SHALL BE DYNAMICALLY TESTED IN ACCORDANCE WITH THE SPECIAL PROVISIONS. PILES SHALL BE DRIVEN TO AN ULTIMATE LOAD CAPACITY OF 450 KIPS. ALL COSTS TO BE INCLUDED UNDER ITEM 505.25, "CAST-IN-PLACE CONCRETE PILING".

31. COSTS FOR ALL WORK REQUIRED FOR REMOVAL OF EXISTING CONCRETE BRUSH CURBS, CONCRETE DECK, CURTAINWALLS, EXPANSION JOINT HARDWARE, BEARINGS, WINGWALLS, ABUTMENT AND PIER CONCRETE, ACCORDING TO THE LIMITS OF WORK DEFINED IN THE PLANS, SHALL BE INCLUDED UNDER ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE (BRXXX)". PAYMENT FOR THIS ITEM SHALL INCLUDE ALL INCIDENTAL EXCAVATION NECESSARY TO PERFORM THE REQUIRED STRUCTURE REMOVAL WORK UNLESS OTHERWISE SHOWN IN THE PLANS. PAYMENT FOR BACKFILL AROUND ABUTMENTS AND PIERS FOLLOWING PLACEMENT OF NEW CONCRETE SHALL BE MADE UNDER ITEM 204.30, "GRANULAR BACKFILL FOR STRUCTURES".

32. PAYMENT FOR REMOVAL OF EXISTING BRIDGE PAVEMENT SHALL BE MADE UNDER ITEM 529.10, "REMOVAL OF BRIDGE PAVEMENT". PAYMENT FOR REMOVAL OF EXISTING APPROACH SLABS, AND EXCAVATION REQUIRED FOR NEW APPROACH SLAB CONSTRUCTION SHALL BE MADE UNDER ITEM 204.25, "STRUCTURE EXCAVATION".

33. EXISTING STEEL BEAMS TO BE REMOVED SHALL BECOME PROPERTY OF THE CONTRACTOR. ALL COSTS ASSOCIATED WITH REMOVAL OF EXISTING STEEL BEAMS SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURES (EXISTING STEEL BEAMS - BR51X)" IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

34. ALL EXISTING BRIDGE RAIL SHALL BE SALVAGED AND DELIVERED TO THE VAOT DISTRICT 6 MIDDLESEX MAINTENANCE GARAGE. CARE SHALL BE TAKEN NOT TO DAMAGE THE RAIL DURING REMOVAL OR TRANSPORTATION. ALL COSTS ASSOCIATED WITH REMOVAL AND TRANSPORT OF THE BRIDGE RAIL SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 525.10, "REMOVAL OF EXISTING RAILING" IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

35. REMOVAL OF ALL EXISTING BRIDGE APPROACH RAIL AND GUARD RAIL AT LOCATIONS SHOWN ON THE PLANS SHALL BE PAID FOR UNDER ITEM 621.80, "REMOVAL AND DISPOSAL OF GUARD RAIL".

36. ALL EXISTING GRANITE CURB SHALL BE SALVAGED AND DELIVERED TO THE VAOT DISTRICT 6 MIDDLESEX MAINTENANCE GARAGE. CARE SHALL BE TAKEN NOT TO DAMAGE THE CURB DURING REMOVAL OR TRANSPORTATION. ALL COSTS ASSOCIATED WITH REMOVAL AND TRANSPORT OF THE CURB SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE (BRXXX)".

37. THE CONTRACTOR SHALL REMOVE VEGETATION AROUND EXISTING SUBSTRUCTURE COMPONENTS AS ORDERED BY THE ENGINEER, INCLUDING THE SMALL TREES UNDER BRIDGE 51N&S. COSTS FOR THIS WORK SHALL BE INCIDENTAL TO ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE (BRXXX)".

38. A PAD OF STONE FILL, TYPE II (MINIMUM SIZE 6' x 6' x 2' THICK) SHALL BE CONSTRUCTED UNDER EACH SCUPPER DOWNSPOUT WHERE INADEQUATE PROTECTION AGAINST EROSION EXISTS IN THE OPINION OF THE ENGINEER. STONE FILL, TYPE II SHALL BE PLACED ON SLOPES ADJACENT TO WINGWALLS WHERE, IN THE JUDGEMENT OF THE ENGINEER, RUN-OFF MAY CAUSE POTENTIAL EROSION. IN ADDITION, ABUTMENT SLOPES SHALL BE REPAIRED BY PLACING STONE FILL AND RE-GRADING AS DIRECTED BY THE ENGINEER. STONE FILL SHALL BE PROVIDED UNDER ITEMS 613.10, 613.11, AND 613.13, AS DIRECTED BY THE ENGINEER AT EACH LOCATION. COSTS FOR RE-GRADING SLOPES SHALL BE INCIDENTAL TO THE APPLICABLE STONE FILL ITEM.

39. NOT USED

40. THE CONTRACTOR SHALL CALL "DIG-SAFE" PRIOR TO PERFORMING ANY EXCAVATION, IN ACCORDANCE WITH DIG-SAFE'S RULES OF NOTIFICATION. THE COST OF COORDINATING WITH DIG-SAFE AND THE FOLLOWING UTILITY COMPANIES SHALL BE INCIDENTAL TO ITEM 635.10, "MOBILIZATION"; BELL ATLANTIC, BOLTON WATERWORKS, GREEN MOUNTAIN POWER CORP., AND NOVA CABLE. THE COST OF ANY EXPLORATORY EXCAVATION BY THE CONTRACTOR TO ASCERTAIN UTILITY LOCATIONS SHALL BE PAID UNDER ITEM 204.20, "TRENCH EXCAVATION OF EARTH" IN ACCORDANCE WITH THE SPECIAL PROVISIONS. ANY DAMAGE TO UTILITIES CAUSED BY THE CONTRACTOR SHALL BE REPAIRED IMMEDIATELY AS DIRECTED BY THE RESPECTIVE UTILITY COMPANY OR THE ENGINEER AT THE CONTRACTOR'S OWN EXPENSE.

41. FOR TRAFFIC CONTROL NOTES, SEE BRIDGE SHEETS TC-1A AND TC-1B.

42. AN ESTIMATED QUANTITY OF ITEM 404.65, "EMULSIFIED ASPHALT" HAS BEEN INCLUDED TO BE USED, AT THE DISCRETION OF THE ENGINEER, AS A TACK COAT BETWEEN THE LIFTS OF ALL PAVEMENT AT AN APPLICATION RATE OF 0.015 GAL/SY.

TVGA ENGINEERING, SURVEYING, P.C.

STATE OF VERMONT
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Town Of BOLTON	Bridge No.
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Highway No. I-89	Surv. Sta.

GENERAL NOTES (2 OF 2)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By Date J.P. HALSTEAD 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. genotes	Date 08/00
Bridge Sheet No. C-8	Sheet 8 of 307

BRIDGE DATA

BRIDGE NUMBER	SUBSTRUCTURE ELEMENTS NOMENCLATURE PROPOSED	SUBSTRUCTURE ELEMENTS NOMENCLATURE ORIGINAL	APPROX. SKEW	SPAN NUMBER	PROPOSED LENGTH @ CL CONSTRUCTION	EXISTING STEEL BEAMS CONFIGURATION	EXISTING STEEL BEAMS APPROXIMATE WEIGHT (1) TO BE REMOVED	EXISTING STEEL BEAMS APPROXIMATE WEIGHT (1) TO REMAIN	EXISTING UNDERGROUND UTILITIES
5IN	ABUTMENT 1	ABUTMENT 2	0°				274.8 TONS		
				1	38.15'	30WF108 (INTERIOR)			
						36WF150 (FASCIA)			
	PIER 1	PIER B	0°						
				2	88.95'	36WF300 W/ COVER PL.			
	PIER 2	PIER D	0°						
				3	84.35'				
						36WF300 W/ COVER PL.			
						36WF300 W/ COVER PL.			
						36WF194 W/ COVER PL.			
	PIER 3	PIER G	45° AHEAD LT.						CABLE TV
				4	98.71'	36WF300 W/ COVER PL'S.			
	PIER 4	PIER J	45° AHEAD LT.						TEL./WATER
				5	53.09'	33WF130 W/ COVER PL. (INTERIOR)			
						36WF150 (FASCIA)			
	ABUTMENT 2	ABUTMENT 4	45° AHEAD LT.						
5IS	ABUTMENT 1	ABUTMENT 1	0°				339.9 TONS		
				1	38.37'	30WF108 (INTERIOR)			
						36WF150 (FASCIA)			
	PIER 1	PIER A	0°						
				2	88.89'	36WF300 W/ COVER PL.			
	PIER 2	PIER C	0°						
				3	87.46'	36WF300 W/ COVER PL.			
	PIER 3	PIER E	0°						
				4	83.82'				
						36WF300 W/ COVER PL.			
						36WF300 W/ COVER PL.			
						36WF194 W/ COVER PL.			
	PIER 4	PIER F	45° AHEAD LT.						CABLE TV
				5	98.18'	36WF300 W/ COVER PL'S.			
	PIER 5	PIER H	45° AHEAD LT.						TEL./WATER
				6	52.86'	33WF130 W/ COVER PL. (INTERIOR)			
						36WF150 (FASCIA)			
	ABUTMENT 2	ABUTMENT 3	45° AHEAD LT.						

SCOPE OF WORK

BRIDGE NUMBER	PROPOSED DECK TREATMENT	PROPOSED JOINT	PROPOSED STEEL STRINGERS TREATMENT	PROPOSED STEEL STRINGERS APPROX. WT.	PROPOSED BEARING TREATMENT	PROPOSED SUBSTRUCTURE TREATMENT	PROPOSED MIN. VERT. CLEARANCE OVER ROADWAY
5IN	DO.	FIXED TYPE C	NEW 30" WF ROLLED BEAMS AASHTO M270 GR 50W (SPAN 1)	182.1 TONS	NEW ELASTOMERIC FIXED	SEE NOTE 3	14'-9"
		EXP. TYPE H			NEW ELAST. EXP./NEW ELAST. EXP.	NPC / LCR / FWPC	
					NEW ELASTOMERIC FIXED	REPLACE PIER	
			NEW 33" WEB CONTINUOUS PLATE GIRDERS AASHTO M270 GR 50W (SPANS 2-5)			NPC LCR / FWPC (SEE NOTE 5)	
					NEW ELASTOMERIC EXP.		
					NEW ELASTOMERIC EXP.		
		EXP. TYPE H			NEW ELASTOMERIC EXP.	SEE NOTE 2	
5IS	DO.	FIXED TYPE C	NEW 30" WF ROLLED BEAMS AASHTO M270 GR 50W (SPAN 1)	219.3 TONS	NEW ELASTOMERIC FIXED	SEE NOTE 3	16'-4"
		EXP. TYPE H			NEW ELAST. EXP./NEW ELAST. EXP.	NPC / LCR / FWPC	
					NEW ELASTOMERIC EXP.	REPLACE PIER	
					NEW ELASTOMERIC FIXED		
			NEW 33" WEB CONTINUOUS PLATE GIRDERS AASHTO M270 GR 50W (SPANS 2-6)			NPC LCR / FWPC (SEE NOTE 5)	
					NEW ELASTOMERIC EXP.		
					NEW ELASTOMERIC EXP.		
		EXP. TYPE H			NEW ELASTOMERIC EXP.	SEE NOTE 2	

SEQUENCE OF OPERATIONS:

PHASE I (FIRST CONSTRUCTION SEASON):

1. CONSTRUCT NORTHBOUND CROSSOVERS AS SHOWN IN TRAFFIC CONTROL PLANS.
2. SHIFT I-89 NORTHBOUND TRAFFIC TO I-89 SOUTHBOUND SIDE.
3. REHABILITATE BRIDGES 5IN.
4. SHIFT I-89 NORTHBOUND TRAFFIC BACK TO I-89 NORTHBOUND SIDE.

PHASE II (SECOND CONSTRUCTION SEASON):

1. CONSTRUCT SOUTHBOUND CROSSOVERS AS SHOWN IN TRAFFIC CONTROL PLANS.
2. SHIFT I-89 SOUTHBOUND TRAFFIC TO I-89 NORTHBOUND SIDE.
3. REHABILITATE BRIDGES 5IS.
4. SHIFT I-89 SOUTHBOUND TRAFFIC BACK TO I-89 SOUTHBOUND SIDE.

NOTES:

1. EXISTING STEEL WEIGHTS ARE APPROXIMATE, USING RATIO OF BRIDGE LENGTH TIMES THE TOTAL RECORD WEIGHT FOR EACH BRIDGE PAIR.
2. EXPANSION ABUTMENT TREATMENT INCLUDES: LOCALIZED CONCRETE REPAIR, REMOVE AND REPLACE WINGWALLS ABOVE BRIDGE SEAT ELEVATION, REMOVE BRIDGE SEAT AND REPLACE TO NEW SEAT ELEVATIONS, REMOVE CURTAINWALL, AND PLACE NEW BACKWALL.
3. FIXED ABUTMENT TREATMENT (EXCEPT BR 49N&S) INCLUDES: LOCALIZED CONCRETE REPAIR, REMOVE AND REPLACE WINGWALLS ABOVE BRIDGE SEAT ELEVATION, REMOVE BRIDGE SEAT AND REPLACE TO NEW SEAT ELEVATIONS, REMOVE CURTAINWALL AND REPLACE WITH NEW CURTAINWALL.
4. FIXED ABUTMENT TREATMENT (BR 49N&S) INCLUDES: LOCALIZED CONCRETE REPAIR, REMOVE AND REPLACE WINGWALLS ABOVE BRIDGE SEAT ELEVATION, REMOVE CURTAINWALL AND REPLACE WITH NEW CURTAINWALL.
5. AT BR 5IN&S, FIBER WRAPPING OF THE PIER COLUMNS TO BE APPLIED TO CERTAIN COLUMNS ONLY, AS SHOWN ON SUBSTRUCTURE REPAIR DETAILS AND NOTES, BRIDGE SHEET C-45.

PIER CODES

LCR	LOCALIZED CONCRETE REPAIR
NPC	NEW PIER CAP
FWPC	FIBER WRAP PIER COLUMNS

BEARING CODES

JCPG	JACK, CLEAN, PAINT, GREASE EXISTING BEARINGS
RIK	REPLACE EXISTING BEARINGS IN KIND

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
	Log Sta.
Highway No. I-89	Surv. Sta.

BRIDGE INFORMATION SUMMARY

Designed By P.W. SZUSTAK	Drawn By P.A. MEREWETHER
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. brgsum	Date 10/99
Bridge Sheet No. C-9	Sheet 9 of 307

TVGA ENGINEERING, SURVEYING, P.C.

GPS CONTROL POINTS

TRAV. 1

CGS AZIMUTH MARK STAMPED " BOLTON 1968 "

N = 80783.65800

E = 46756.16200

Z = 0.0

STATION DESCRIPTION

TO REACH FROM THE I-89 SOUTHBOUND BRIDGE OVER U.S. ROUTE 2 IN BOLTON GO SOUTHEAST ALONG I-89 SOUTHBOUND FOR 1.1 MI (1.8 KM) TO THE MARK ON THE LEFT IN THE MEDIAN. TO REACH FROM THE INTERSECTION OF I-89 NORTHBOUND AND THE CHITTENDEN/WASHINGTON COUNTY LINE GO NORTHWEST ALONG I-89 NORTHBOUND FOR 1.8 MI (2.9 KM) TO THE SITE.

THE MARK IS SET IN THE TOP OF THE SOUTHEAST END OF A LONG EXPOSED LEDGE IN THE MEDIAN.

IT IS 5.5 M (18.0 FT) SOUTHWEST OF AND ABOUT 2 M (6.6 FT) HIGHER THAN THE SOUTHWEST EDGE OF PAVEMENT OF I-89 NORTHBOUND, 6.9 M (22.6 FT) NORTHEAST OF THE NORTHEAST EDGE OF I-89 SOUTHBOUND, 2.2 (7.2 FT) NORTHWEST OF THE SOUTHEAST END OF THE LEDGE, AND 2.8 M (9.2 FT) NORTHWEST OF A FIBERGLASS WITNESS POST.

TRAV. 2

NGS SURVEY DISK STAMPED " GM 18 1979 "

N = 82308.36960

E = 43075.92900

Z = 354.120

STATION DESCRIPTION

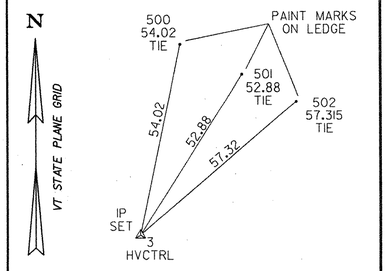
0.8 MI EAST FROM BOLTON.
TO REACH FROM THE INTERSECTION OF ROUTE I-89 AND THE CHITTENDEN/WASHINGTON COUNTY LINE (BOLTON/WATERBURY TOWN LINE) GO WNW ALONG ROUTE I-89 NORTHBOUND FOR 2.45 MI, 0.35 MI ESE ALONG U.S. ROUTE 2 FROM ITS INTERSECTION WITH THE BOLTON VALLEY ROAD (CL2-3), 34 FT NNE OF THE CENTERLINE OF U.S. ROUTE 2, 19.5 FEET WNW OF POLE NUMBER 187, AT THE ESE END OF A LEDGE CUT.

• DESCRIPTIONS PROVIDED BY VTGS

TRAVERSE TIES

TRAV. 3

N = 82451.0674
E = 42537.4678
Z = 356.785



TRAV. 4

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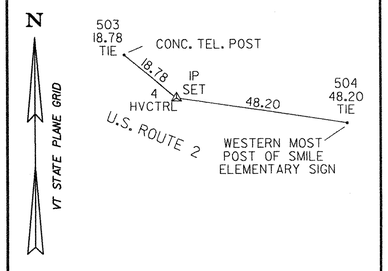
Z = 354.331



TRAV. 5

N = 82982.9432
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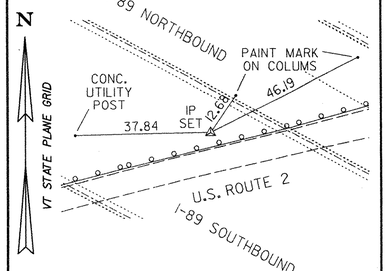
Z = 348.465



ALIGNMENT TIES

N =	N =	N =	N =	N =
E =	E =	E =	E =	E =

DATUM
VERTICAL NAVD 88
HORIZONTAL NAD 83/92

NOTES:

1. VAOT TO PROVIDE ALIGNMENT TIES DURING CONSTRUCTION.

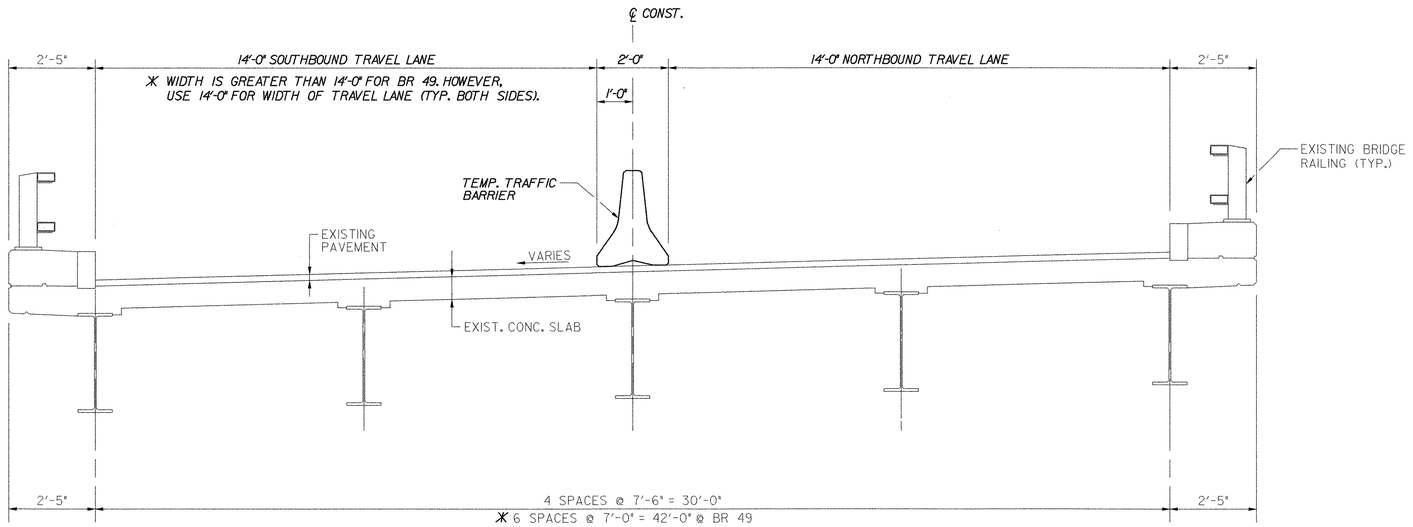
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. **51N&S**
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 OVER US ROUTE 2 AND JOINER BROOK

CONTROL POINT TIES (51N&S)

Designed By V.A.O.T.	Drawn By V.A.O.T.
Checked By V.A.O.T. Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51ties	Date 10/99
Bridge Sheet No. **C-13**	Sheet 13 of 307

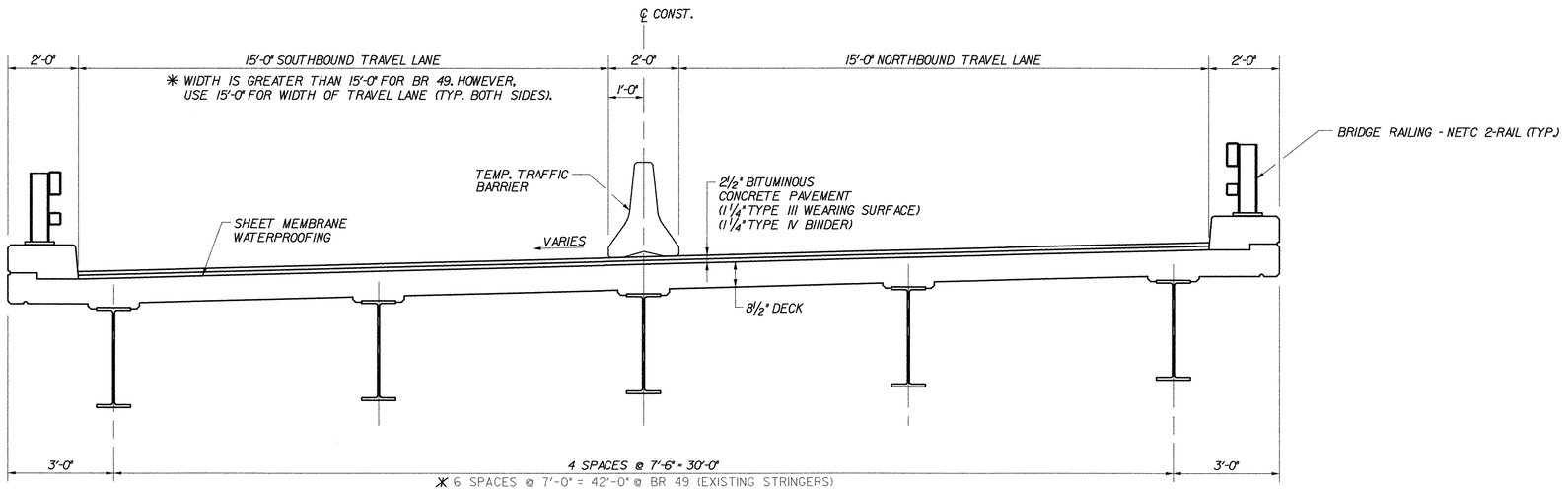


TYPICAL PHASE I TRAFFIC CONTROL ON EXISTING BRIDGE (SOUTHBOUND)

SCALE: ½" = 1'-0"

NOTE:

* TRANSVERSE SECTIONS FOR BR 43, 48, 50 AND 51 ARE SHOWN. TRANSVERSE SECTION FOR BR 49 IS SIMILAR EXCEPT AS NOTED.



TYPICAL PHASE II TRAFFIC CONTROL ON NEW BRIDGE (NORTHBOUND)

SCALE: ½" = 1'-0"

STATE OF VERMONT
AGENCY OF TRANSPORTATION

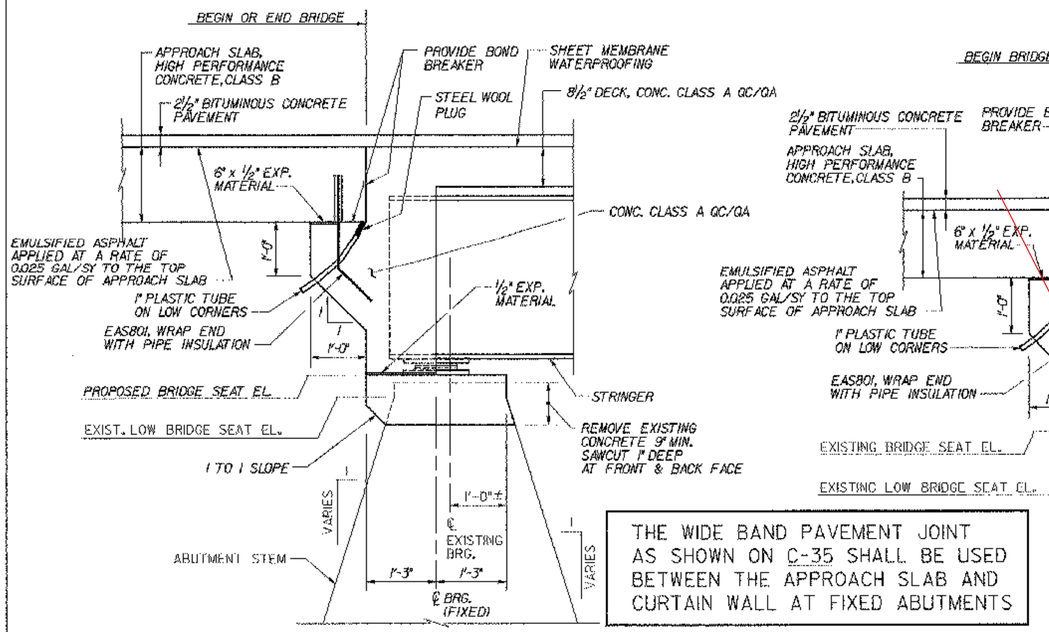
Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

TRANSVERSE SECTIONS

FOR TRAFFIC CONTROL

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. tstraf	Date 10/99
Bridge Sheet No. C-14	Sheet 14 of 307

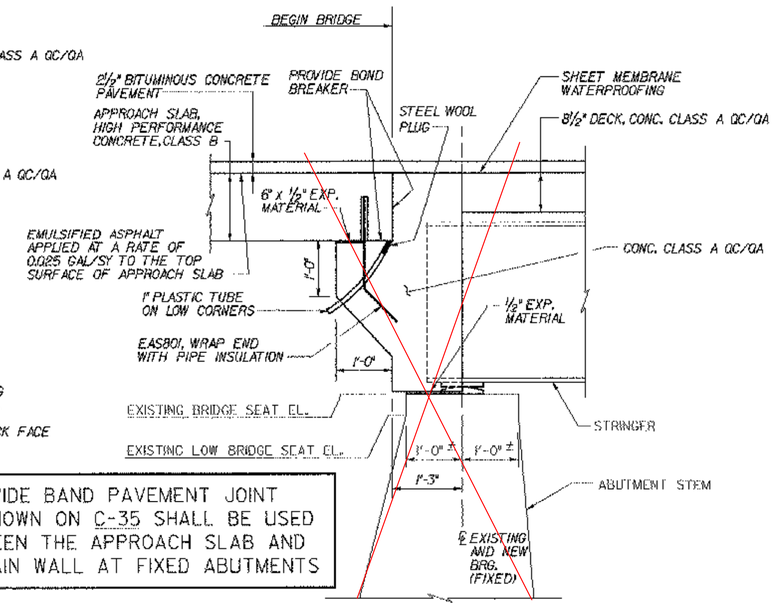
TVGA ENGINEERING, SURVEYING, P.C.



THE WIDE BAND PAVEMENT JOINT AS SHOWN ON C-35 SHALL BE USED BETWEEN THE APPROACH SLAB AND CURTAIN WALL AT FIXED ABUTMENTS

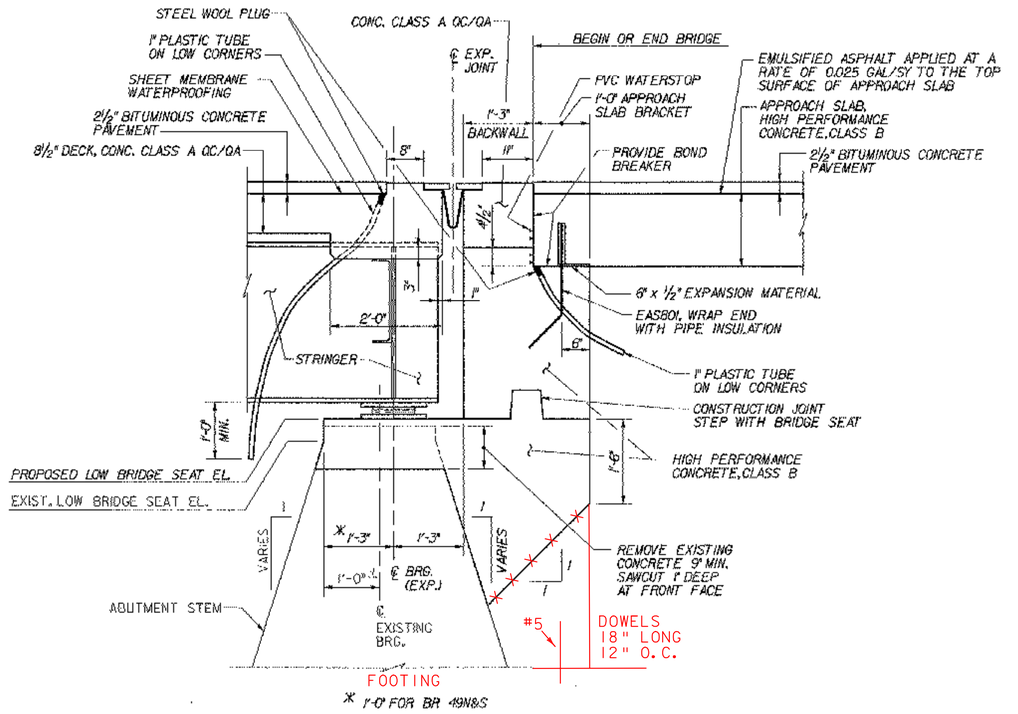
TYPICAL FIXED ABUT. DETAIL, TYPE "C"
(NORMAL TO ℄ BEARING)

SCALE: ¾"=1'-0"



FIXED ABUT. DETAIL, TYPE "C"
(NORMAL TO ℄ BEARING)
(BR 49N&S ONLY)

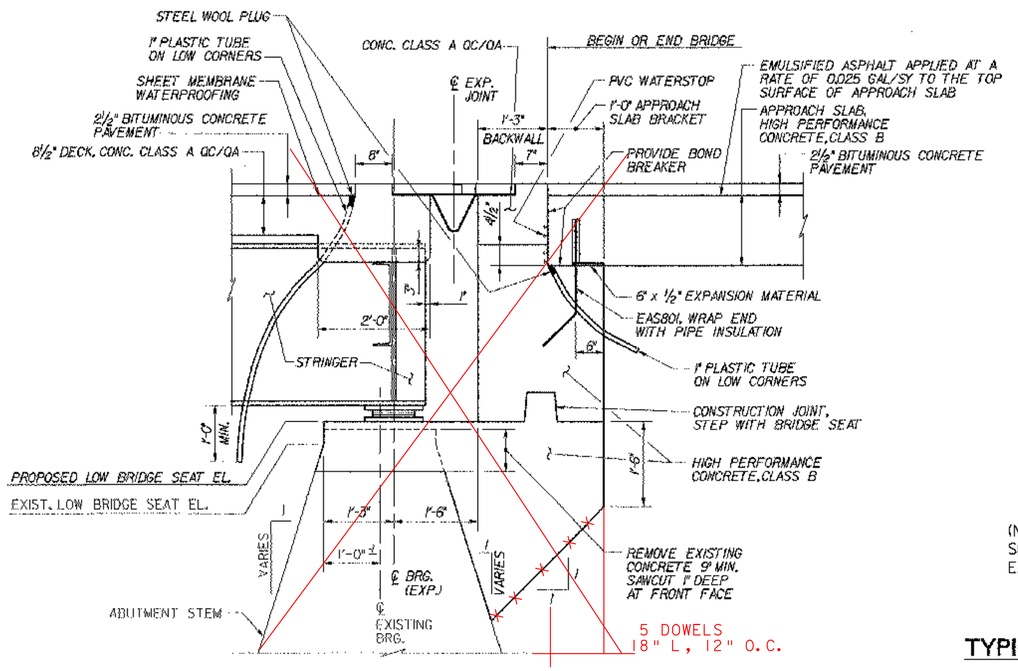
SCALE: ¾"=1'-0"



* 1'-0" FOR BR 49N&S

TYPICAL EXP. ABUT. DETAIL, TYPE "H"
(NORMAL TO ℄ BEARING)

SCALE: ¾"=1'-0"

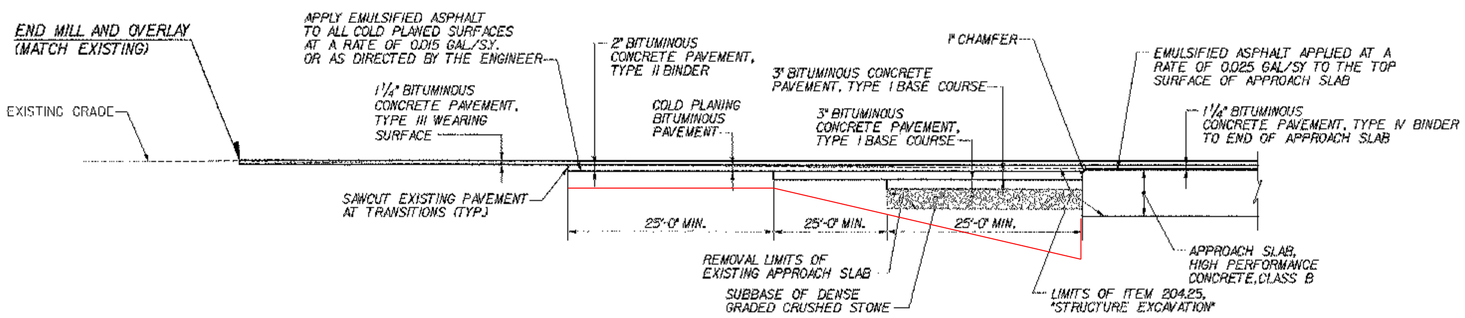


TYPICAL EXP. ABUT. DETAIL, FINGER JOINT
(NORMAL TO ℄ BEARING)

SCALE: ¾"=1'-0"

(NOT SHOWN - END OF DECK SLAB AT PIER SIMILAR TO END OF DECK SLAB AT TYPICAL EXP. ABUT. DETAIL, TYPE "H")

TYPICAL EXP. PIER DETAIL, TYPE "H"



APPROACH PAVEMENT TRANSITION DETAIL
N.T.S.

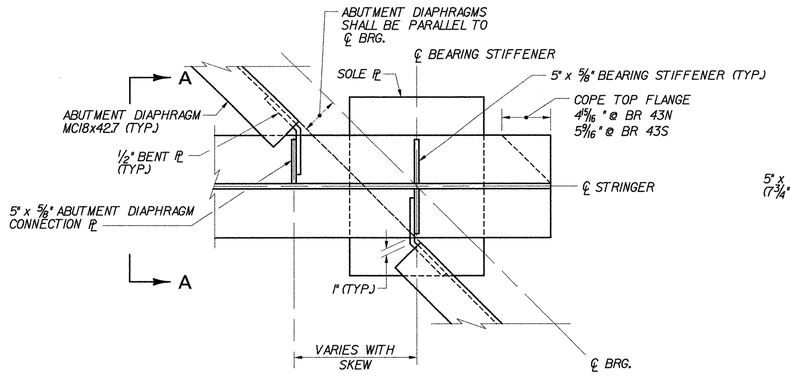
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of	BOLTON	Bridge No.	
Highway No.	I-89	Log Sta.	
		Surv. Sta.	

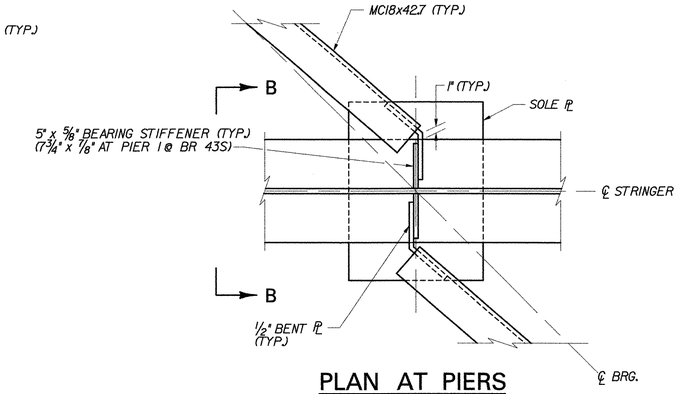
TYPICAL END OF DECK SLAB DETAILS

Designed By	P.W. SZUSTAK	Drawn By	R.A. BOTZENHART
Checked By	Date	Bridge Design Supervisor	
J.P. HALSTEAD	10/99	J.P. HALSTEAD	Date 10/99
PROJECT	BOLTON	PROJECT NO.	IM-089-2(29)
TVGA CAD Drawing No.	delabdet	Date	10/99
Bridge Sheet No.	C-15	Sheet	15 of 307

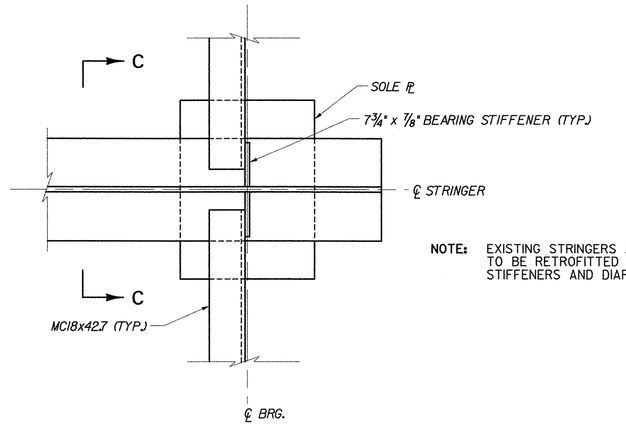
TVGA ENGINEERING, SURVEYING, P.C.



PLAN AT EXPANSION ABUTMENTS
(BR 43N&S)
N.T.S.

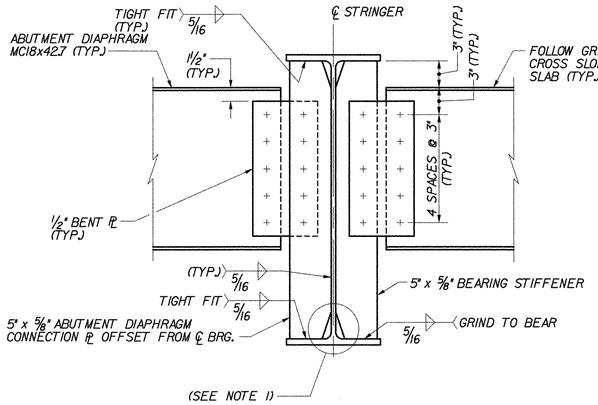


PLAN AT PIERS
(BR 43N&S)
N.T.S.

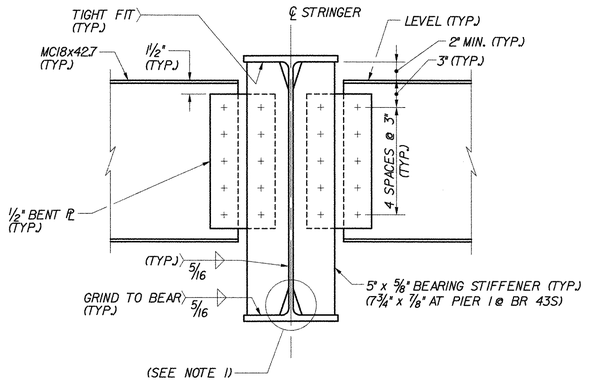


NOTE: EXISTING STRINGERS AT BR 49N&S ABUT. 2 TO BE RETROFITTED WITH NEW BRG. STIFFENERS AND DIAPHRAGMS.

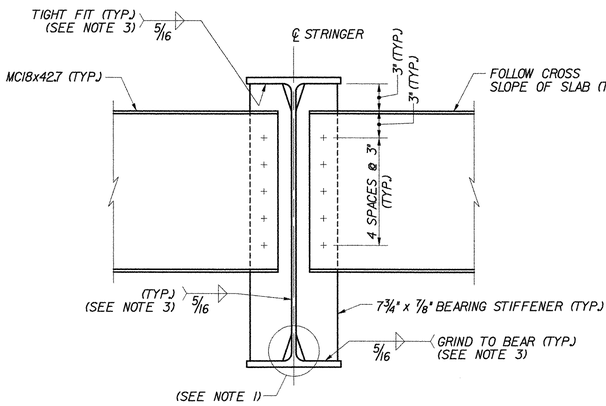
PLAN AT ABUTMENTS AND PIERS
(PIER 1 AT BR 51N&S)
(ABUTMENT 2 AT BR 49N&S)
N.T.S.



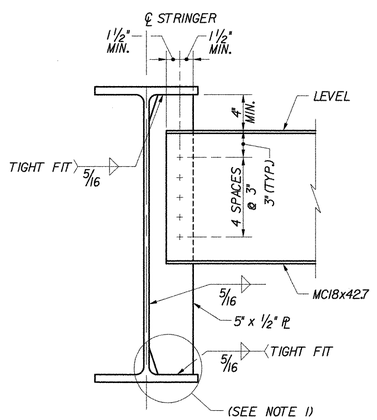
ELEVATION A–A
N.T.S.



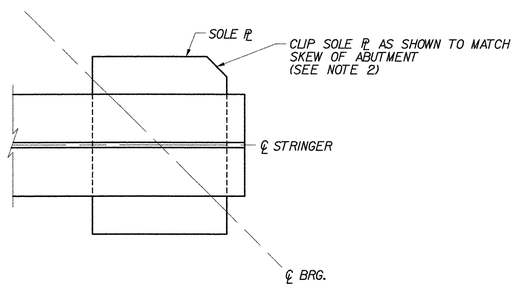
ELEVATION B–B
N.T.S.



ELEVATION C–C
N.T.S.



TYPICAL INTERMEDIATE DIAPHRAGM CONNECTION
N.T.S.



PLAN AT FIXED ABUTMENTS
(BR 43N&S SHOWN, ABUTMENT 1 AT BR 51N&S SIMILAR)
N.T.S.

NOTES:

1. FOR TYPICAL WELD TERMINATION AND COPING DETAIL, SEE TYPICAL PLATE GIRDER DETAILS (2 OF 2), BRIDGE SHEET C-18.
2. FOR DETAILS AND DIMENSIONS OF SOLE PLATE CLIP, SEE BEARING DETAILS ON BRIDGE SHEETS C-21 THROUGH C-25.
3. FIELD WELD AT BR 49N&S.
4. FOR DRIP PLATE DETAIL, SEE TYPICAL BRIDGE DETAILS, BRIDGE SHEET C-46.

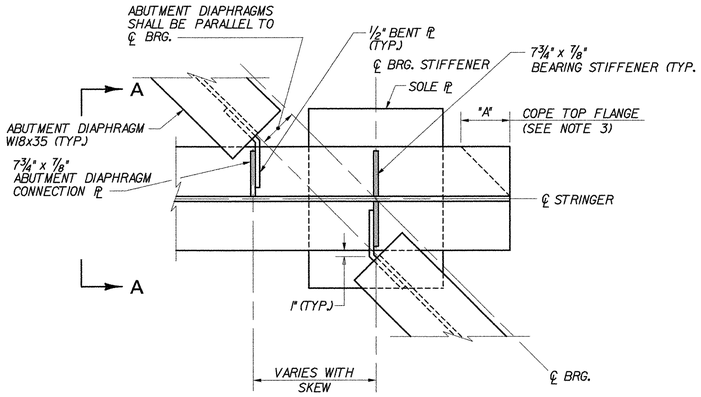
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

TYPICAL ROLLED BEAM DETAILS

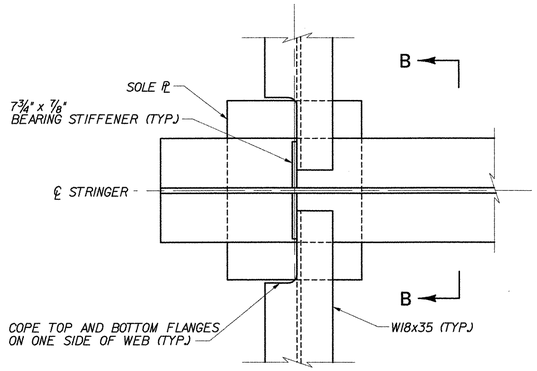
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. rollbeam	Date 10/99
Bridge Sheet No. C-16	Sheet 16 of 307

TVGA ENGINEERING, SURVEYING, P.C.



PLAN AT EXPANSION ABUTMENTS

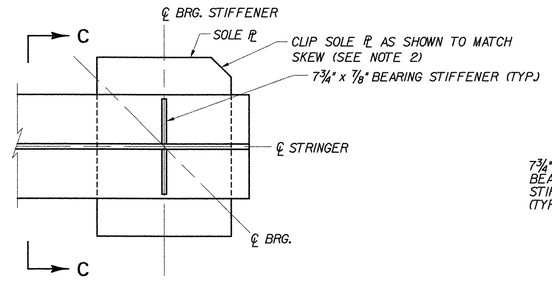
N.T.S.



PLAN AT PIERS WITH EXPANSION JOINTS

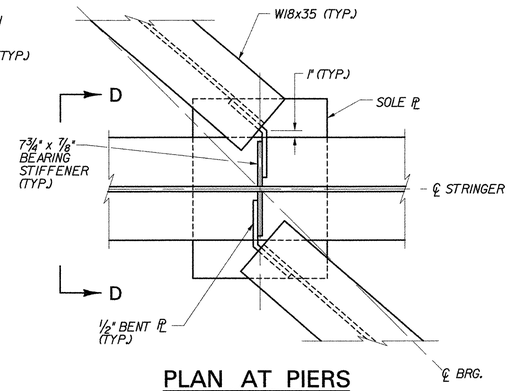
(PIER 1 AT BR51 N&S)

N.T.S.



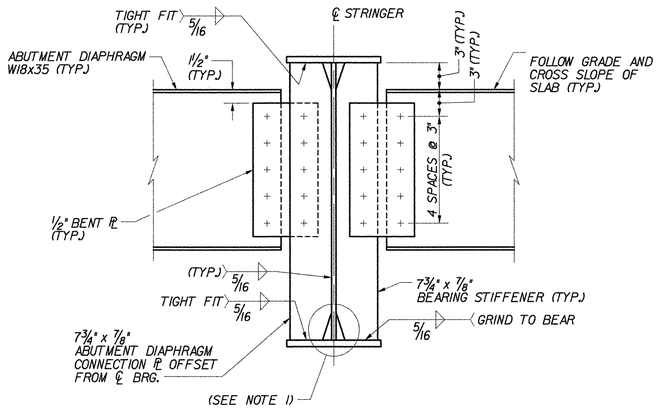
PLAN AT FIXED ABUTMENTS

N.T.S.



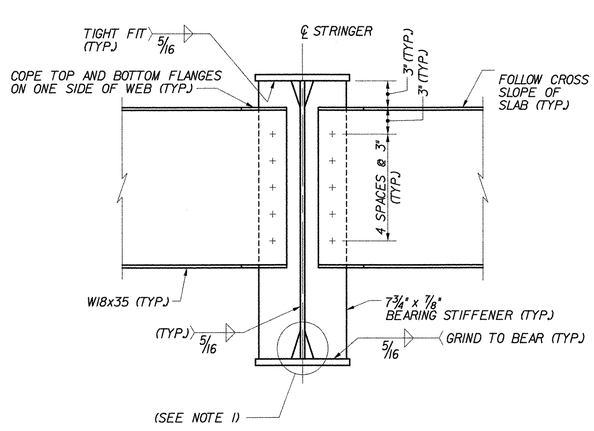
PLAN AT PIERS

N.T.S.



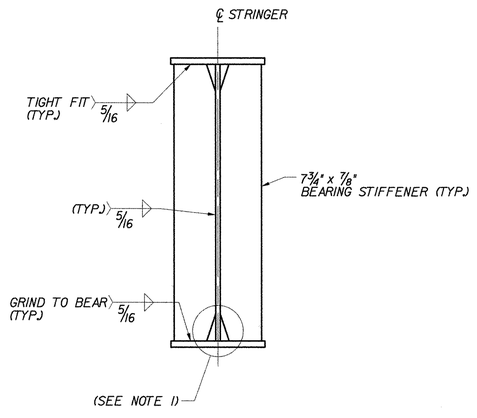
ELEVATION A–A

N.T.S.



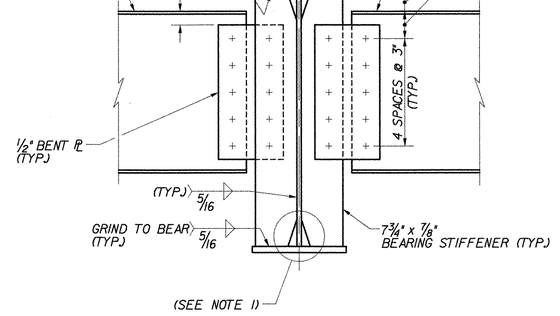
ELEVATION B–B

N.T.S.



ELEVATION C–C

N.T.S.



ELEVATION D–D

N.T.S.

NOTES:

1. FOR TYPICAL WELD TERMINATION AND COPING DETAIL, SEE TYPICAL PLATE GIRDER DETAILS (2 OF 2), BRIDGE SHEET C-18.
2. FOR DETAILS AND DIMENSIONS OF SOLE PLATE CLIP, SEE BEARING DETAILS ON BRIDGE SHEETS C-21 THROUGH C-25.
3. FOR TABLE OF TOP FLANGE COPE DIMENSION "A", SEE TYPICAL PLATE GIRDER DETAILS (2 OF 2), BRIDGE SHEET C-18.
4. THE TOP AND BOTTOM EDGES OF BEARING STIFFENERS SHALL BE CUT AT RIGHT ANGLES TO THE WEB.

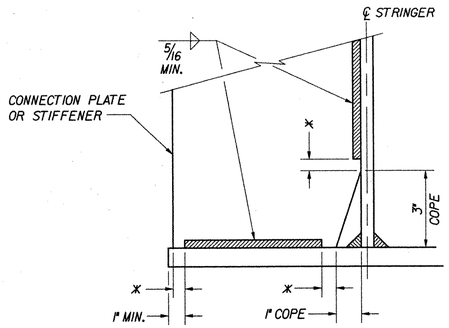
TVGA ENGINEERING, SURVEYING, P.C.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

TYPICAL PLATE GIRDER DETAILS (1 OF 2)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. girdrdet	Date 10/99
Bridge Sheet No. C-17	Sheet 17 of 307



TYPICAL WELD TERMINATION AND COPING DETAIL

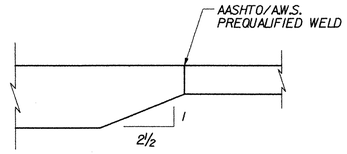
(PLATE GIRDER SHOWN – SIMILAR FOR ROLLED BEAM)

N.T.S.

X NO WELD PLACED FOR 1/4" MIN. 1/2" MAX.
(EXCEPT MUST MAINTAIN 1" MINIMUM FROM EDGE OF FLANGE)

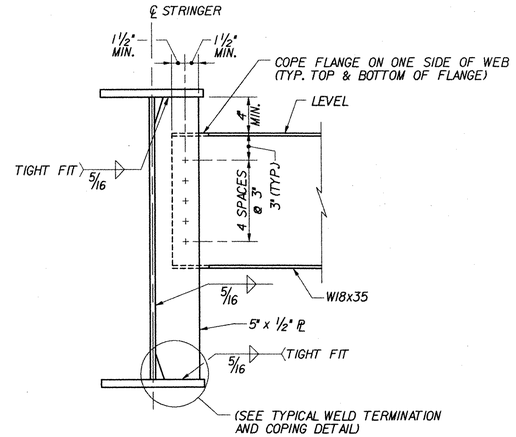
TOP FLANGE COPE		
BRIDGE	LOCATION	"A"
48N	ABUT. 2	4"
48S	ABUT. 1	3 3/8"
50N	ABUT. 2	7 3/8"
50S	ABUT. 1	8 3/16"
51N	ABUT. 2	8 1/8"
51S	ABUT. 1	8 1/4"

(SEE NOTE 1)



FLANGE BUTT SPLICE DETAIL

N.T.S.



INTERMEDIATE DIAPHRAGM CONNECTION

N.T.S.

NOTES:

1. FOR LAYOUT OF FLANGE COPE, SEE "PLAN AT EXPANSION ABUTMENTS" DETAIL, ON TYPICAL PLATE GIRDER DETAILS (1 OF 2), BRIDGE SHEET C-17.
2. FOR DRIP PLATE DETAIL, SEE TYPICAL BRIDGE DETAILS, BRIDGE SHEET C-46.

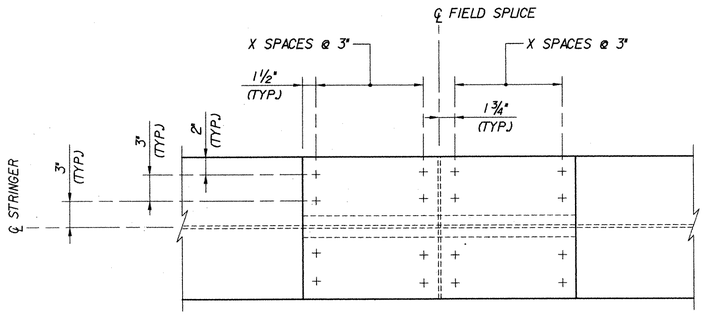
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
	Log Sta.
Highway No. I-89	Surv. Sta.

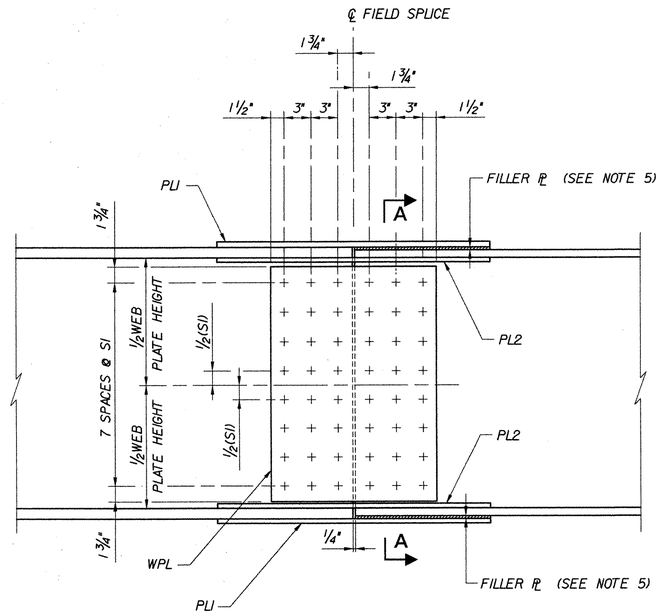
TYPICAL PLATE GIRDER DETAILS (2 OF 2)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. girdrde2	Date 10/99
Bridge Sheet No. C-18	Sheet 18 of 307

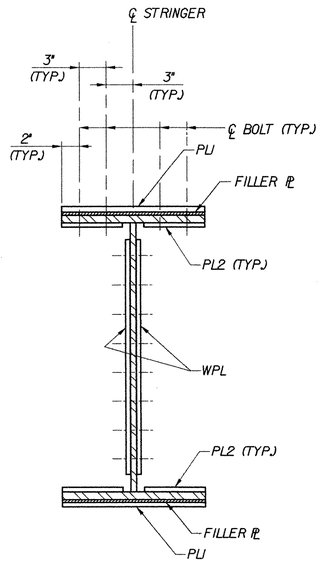
TVGA ENGINEERING, SURVEYING, P.C.



PLAN – TOP & BOTTOM FLANGES



ELEVATION



SECTION A–A

FIELD SPLICE @ BR 48, 50 & 51

NOT TO SCALE

SPLICE PLATE ID	PLATE SIZE
A	18 1/2" X 1/2" X 2'-2 1/4"
B	18 1/2" X 1/2" X 2'-5 3/4"
C	16" X 5/8" X 2'-6 1/2"
D	7" X 5/8" X 2'-6 1/2"
E	16" X 3/4" X 2'-6 1/2"
F	7" X 3/4" X 2'-6 1/2"
G	16" X 1" X 3'-0 1/2"
H	7" X 1" X 3'-0 1/2"

BR. NO.	SPLICE LOCATION	WEB SPLICE		FLANGE SPLICE		
		PLATE SIZE	BOLT SPACING	PLATE SIZE		NO. OF BOLT SPACES
		WPL	S1	PL1	PL2	X
48N	ALL	B	3 3/4"	C	D	4
48S	ALL	B	3 3/4"	C	D	4
50N	ALL	A	3 1/4"	C	D	4
50S	ALL	A	3 1/4"	C	D	4
51N	SPANS 2 & 4	B	3 3/4"	E	F	4
	SPAN 3	B	3 3/4"	G	H	5
51S	ALL	B	3 3/4"	E	F	4

NOTES:

1. BOLTS SHALL BE 7/8" DIA. AASHTO M164 TYPE 3 HIGH STRENGTH BOLTS IN 15/16" DIA. HOLES. NUTS AND WASHERS SHALL ALSO CONFORM TO AASHTO M164. BOLT LENGTHS SHALL BE SUCH THAT THE BOLT THREADS ARE EXCLUDED FROM THE SHEAR PLANE.
2. ALL FIELD SPLICE CONNECTIONS SHALL BE "SLIP CRITICAL" WITH A CLASS B SURFACE (BLAST CLEAN SURFACE) FOR THE CONTACT SURFACES OF BOLTED PARTS.
3. STEEL FOR SPLICE & FILLER PLATES SHALL BE AASHTO M270 GRADE 50W (ASTM A709, GRADE 50W).
4. HOLES FOR FIELD SPLICES SHALL BE DRILLED IN THE SHOP WHILE STRINGERS ARE ASSEMBLED TO FIT BEARING ELEVATIONS.
5. FILLER PLATE SIZE : MIN. THICKNESS = 1/16" WIDTH = 16" LENGTH = (1/2) (PLI) – 1/8"
6. ALL FLANGE AND WEB SPLICE PLATES SHALL BE CHARPY V-NOTCH TESTED IN ACCORDANCE WITH SECTION 714.01 OF THE SPECIFICATIONS.

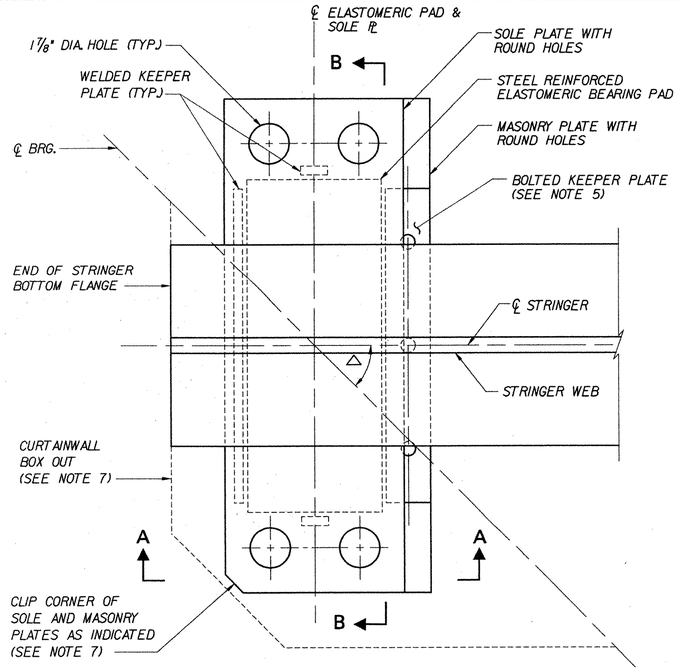
Hayashi Corporation
Consulting Engineers

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta.
	Surv. Sta.

TYPICAL GIRDER SPLICE DETAILS

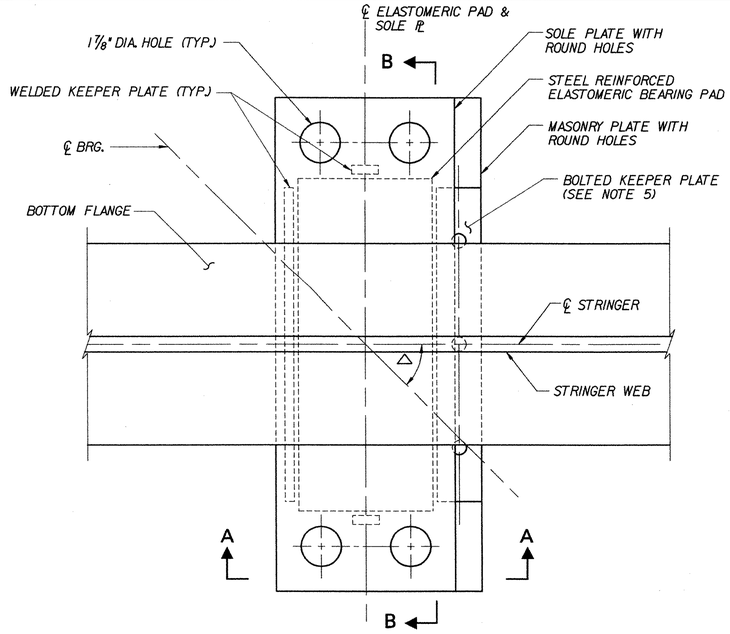
Designed By M.H. GALLO	Drawn By N.J. HOYT
Checked By K.L. JAMES Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 127fs2.dgn	Date 10/99
Bridge Sheet No. C-20	Sheet 20 of 307



(ANCHOR BOLTS NOT SHOWN FOR CLARITY)

BEARING PLAN AT ABUTMENT

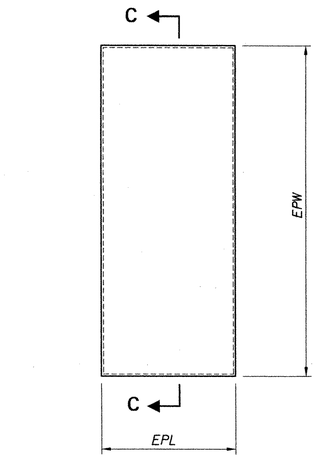
NOT TO SCALE



(ANCHOR BOLTS NOT SHOWN FOR CLARITY)

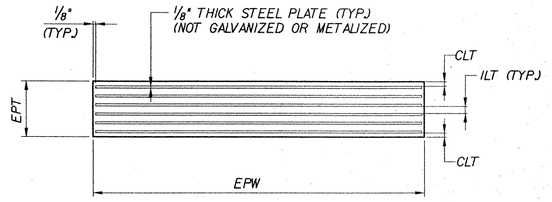
BEARING PLAN AT PIER

NOT TO SCALE



STEEL REINFORCED ELASTOMERIC PAD PLAN

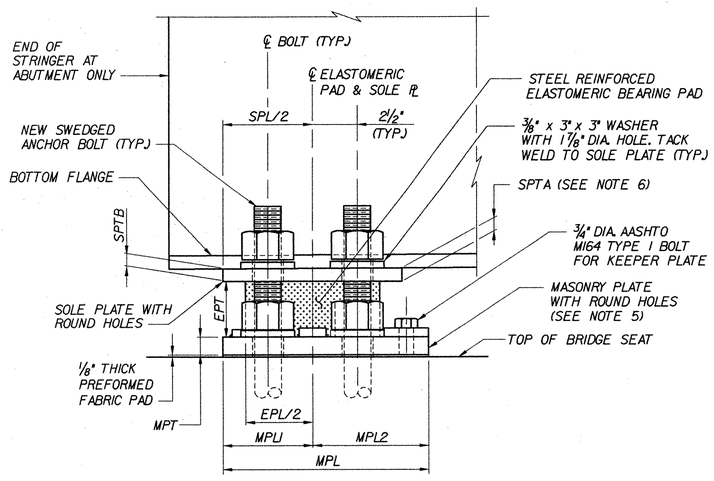
NOT TO SCALE



NOTE : NUMBER OF STEEL PLATES VARIES (SEE TABLE ON BRIDGE SHEET C-22)

SECTION C–C

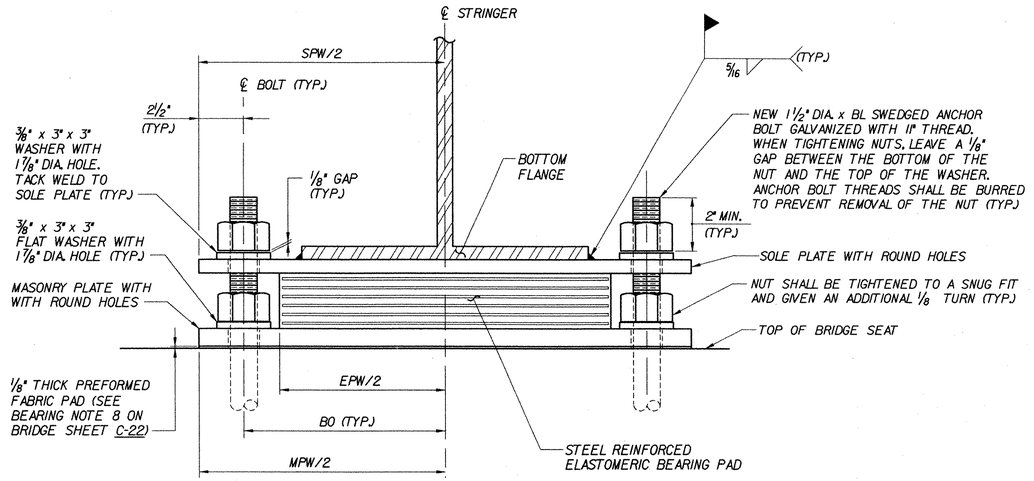
NOT TO SCALE



(BEARING AT ABUTMENT SHOWN, BEARING AT PIER SIMILAR)

SECTION A–A

NOT TO SCALE



SECTION B–B

NOT TO SCALE

NOTES:

1. SEE BRIDGE SHEET C-22 FOR BEARING NOTES & FIXED BEARING TABLES.
2. SEE BRIDGE SHEET C-25 FOR SOLE PLATE, MASONRY PLATE AND KEEPER PLATE DETAILS.
3. SKEW DIRECTION SHOWN IS 'AHEAD RIGHT'.
4. BEARING STIFFENERS/DIAPHRAGM CONNECTION PLATES ARE NOT SHOWN FOR CLARITY.
5. AT ABUTMENT, MASONRY PLATE SHALL BE ORIENTED SO THAT THE BOLTED KEEPER PLATE IS ACCESSIBLE FROM THE FACE OF THE ABUTMENT TO ACCOMMODATE ELASTOMERIC PAD REMOVAL, IF REQUIRED IN THE FUTURE. AT PIER, THE ENGINEER SHALL DETERMINE THE MASONRY PLATE ORIENTATION.
6. "SPTA" DIMENSION FOR SOLE PLATE SHALL BE MEASURED AND SET ON THE UPSTATION SIDE OF THE BEARING.
7. SOLE & MASONRY PLATES MAY REQUIRE ONE CORNER TO BE CLIPPED TO CLEAR CURTAINWALL AT FIXED ABUTMENTS ONLY. FOR DETAILS AND DIMENSIONS OF THE SOLE AND MASONRY PLATE CLIP, SEE BRIDGE SHEETS C-22 AND C-25. FOR CURTAINWALL DETAILS AND DIMENSIONS, SEE BRIDGE SHEET C-42.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

FIXED BEARING DETAILS

Designed By K.L. JAMES	Drawn By N.J. HOYT
Checked By M.H. GALLO Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99

Hayashi Corporation
Consulting Engineers

PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 127fxb2.dgn	Date 10/99
Bridge Sheet No. C-21	Sheet 21 of 307

FIXED BEARING GEOMETRY

BRIDGE NO.	SUB-STRUCTURE NO.	△ ASKEW ANGLE	DIRECTION OF SKEW	FIXED BEARING TYPE *	SOLE PLATE					MASONRY PLATE								ANCHOR BOLT	
					LENGTH (SPL)	WIDTH (SPW)	THICKNESS SPTA (UPSTATION)	THICKNESS SPTB (DOWNSTATION)	CORNER CLIP (SPCLIP)	LENGTH MPL1	LENGTH MPL2	LENGTH MPL	WIDTH (MPW)	THICKNESS (MPT)	CORNER CLIP (MPCLIP)	KEEPER PLATE WIDTH (KPW)	KEEPER PLATE OFFSET (KPO)	OFFSET (BO)	LENGTH (BL)
43N	ABUT. 1	44°42'11"	AHEAD RIGHT	AA	10 1/2"	24 1/2"	1"	1 1/4"	3/4"	5"	5 1/2"	10 1/2"	24 1/2"	7/8"	1/2"	14 1/2"	3"	9 3/4"	1'-11"
43S	ABUT. 2	45°05'18"	AHEAD RIGHT	BB	10"	22"	3/4"	1 1/8"	——	5 3/4"	7 1/4"	13"	22"	3/4"	——	12"	4 3/4"	8 1/2"	1'-11"
48N	ABUT. 1	66°34'38"	AHEAD LEFT	CC	13"	27 1/2"	7/8"	3/4"	——	5"	6 1/2"	11 1/2"	27 1/2"	1"	——	17 1/2"	4"	11 1/4"	1'-11"
48S	ABUT. 2	62°21'09"	AHEAD LEFT	CC	10"	27 1/2"	3/4"	3/4"	——	5"	6 1/2"	11 1/2"	27 1/2"	1"	——	17 1/2"	4"	11 1/4"	1'-11"
50N	ABUT. 1	44°11'07"	AHEAD RIGHT	AA	11"	26"	1 5/16"	1"	1 3/4"	5"	5 1/2"	10 1/2"	26"	1 1/8"	1 1/4"	14 1/2"	3"	10 1/2"	1'-11"
50S	ABUT. 2	45°44'11"	AHEAD RIGHT	AA	10"	26"	1 1/4"	1"	1 1/4"	5"	5 1/2"	10 1/2"	26"	1 1/8"	1 1/4"	14 1/2"	3"	10 1/2"	1'-11"
51N	ABUT. 1	90°00'00"	————	AA	10"	26"	1 1/8"	7/8"	——	5"	5 1/2"	10 1/2"	26"	1"	——	14 1/2"	3"	10 1/2"	1'-11"
51S	ABUT. 1	90°00'00"	————	AA	10 1/2"	26"	1 1/8"	7/8"	——	5"	5 1/2"	10 1/2"	26"	1"	——	14 1/2"	3"	10 1/2"	1'-11"
51N	PIER 2	90°00'00"	————	DD	14"	27 1/2"	15/16"	3/4"	——	6 3/4"	8 1/4"	15"	27 1/2"	1 1/8"	——	17 1/2"	5 3/4"	11 1/4"	1'-11"
51S	PIER 3	89°33'39"	AHEAD RIGHT	EE	13"	29 1/2"	1"	7/8"	——	6 1/4"	7 3/4"	14"	29 1/2"	1 1/8"	——	19 1/2"	5 1/4"	12 1/4"	2'-1"

* SEE TABLE OF "FIXED BEARING TYPE DETAILS" BELOW

FIXED BEARING TYPE DETAILS

FIXED BEARING TYPE	STEEL REINFORCED ELASTOMERIC BEARING PAD						
	LENGTH (EPL)	WIDTH (EPW)	THICKNESS (EPT)	COVER LAYER THICKNESS (CLT)	INTERNAL LAYER THICKNESS (ILT)	NO. OF INTERNAL ELASTOMER LAYERS	NO. OF INTERNAL STEEL PLATES
AA	5 1/2"	15 1/2"	2 5/8"	1/4"	3/8"	4	5
BB	9"	13"	3 1/8"	1/4"	1/2"	4	5
CC	7 1/2"	18 1/2"	3 1/8"	1/4"	1/2"	4	5
DD	11"	18 1/2"	2 7/8"	1/4"	5/8"	3	4
EE	10"	20 1/2"	5 1/8"	1/4"	5/8"	6	7

BEARING NOTES :

1. THESE NOTES ARE APPLICABLE FOR THE BEARINGS AND THEIR COMPONENTS SHOWN ON BRIDGE SHEETS C-21, C-23, C-24 AND C-25, IN ADDITION TO THIS SHEET.
2. SEE BRIDGE SHEET C-21 FOR FIXED BEARING DETAILS.
   SEE BRIDGE SHEET C-23 FOR EXPANSION BEARING DETAILS.
   SEE BRIDGE SHEET C-24 FOR EXPANSION BEARING TABLES.
   SEE BRIDGE SHEET C-25 FOR SOLE AND MASONRY PLATE DETAILS.
3. BEARING ASSEMBLIES, INCLUDING ELASTOMERIC PADS, ANCHOR BOLTS, INTERNAL STEEL PLATES, PTFE SHEET, STAINLESS STEEL PLATES, SOLE PLATES, MASONRY PLATES, PREFORMED FABRIC PADS, BOLTS, NUTS, WASHERS AND ALL WORK REQUIRED TO FABRICATE AND INSTALL BEARINGS TO BE PAID AS ITEM 531.10, "BEARING DEVICE ASSEMBLY".
4. THE FABRICATION, TESTING AND INSTALLATION OF THE BEARINGS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THESE CONTRACT PLANS, THE STANDARD SPECIFICATIONS, AND THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES DIVISION I - SECTION 14 AND DIVISION II - SECTION 18.
5. STEEL REINFORCED ELASTOMERIC BEARINGS WERE DESIGNED USING METHOD B IN AASHTO DIVISION I - SECTION 14.6.5.
6. ELASTOMER SHALL BE GRADE 4, 60 DUROMETER NEOPRENE CONFORMING TO AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DIVISION II, SECTION 18. THE AVERAGE SHEAR MODULUS (G) FOR THE ELASTOMER SHALL BE 150 PSI, WITH AN ALLOWABLE RANGE OF 127.5 PSI TO 172.5 PSI.
7. SOLE, MASONRY AND KEEPER PLATES SHALL CONFORM TO AASHTO M270 GRADE 50. ALL OTHER STEEL SHALL BE AASHTO M270 GRADE 36, EXCEPT AS NOTED OTHERWISE. ANCHOR BOLTS, NUTS AND WASHERS FOR BEARINGS SHALL CONFORM TO SUBSECTION 714.08 OF THE SPECIFICATIONS. UNLESS NOTED OTHERWISE, ALL STEEL PLATES AND ALL STEEL COMPONENTS (ANCHOR BOLTS, HIGH-STRENGTH BOLTS, NUTS, WASHERS, ETC.) SHALL BE GALVANIZED OR METALIZED PER SUBSECTION 506.15 OF THE SPECIFICATIONS.
8. MINIMUM EMBEDMENT OF ALL ANCHOR BOLTS SHALL BE 1'-3".
9. THE 1/8" THICK PREFORMED FABRIC PAD BENEATH THE MASONRY PLATE SHALL HAVE THE SAME SIZE AND ANCHOR BOLT HOLE LAYOUT AS THE CORRESPONDING MASONRY PLATE.
10. IN ADDITION TO THE REQUIREMENTS OF SUBSECTION 531.03 OF THE SPECIFICATIONS, THE FABRICATOR OF BEARINGS FURNISHED UNDER THIS SECTION SHALL SUBMIT VULCANIZING PROCEDURES IN ACCORDANCE WITH SUBSECTIONS 105.03 AND 506.04.
11. THE DESIGN COEFFICIENT OF FRICTION BETWEEN THE PTFE AND THE STAINLESS STEEL SHALL NOT EXCEED 0.06 AT 800 PSI COMPRESSIVE LOADING.
12. BEARING HEIGHTS AND DIMENSIONS SHOWN ARE BEFORE APPLICATION OF LOADS.
13. THE CONTRACTOR SHALL ENSURE THAT THE HEAT FROM WELDING THE SOLE PLATE TO THE STRINGER DOES NOT DAMAGE THE ELASTOMERIC MATERIAL OR ANY PART OF THE BEARING.
14. THE "A" DISTANCE IS THE SOLE PLATE ADJUSTMENT TO BE USED BEFORE DEAD LOADS ARE ADDED TO THE STRINGERS.

CONSTRUCTION NOTE:

CONCRETE SURFACES UNDER ALL BEARINGS SHALL BE LEVEL WITH A CONSTRUCTION TOLERANCE OF 0.005 RADIANS, EXCEPT FOR THE TOP OF THE PIERS AT BR 48N & 48S WHICH SHALL BE SLOPED TO MATCH THE ℄ CONSTRUCTION GRADE WITH A TOLERANCE OF 0.005 RADIANS.

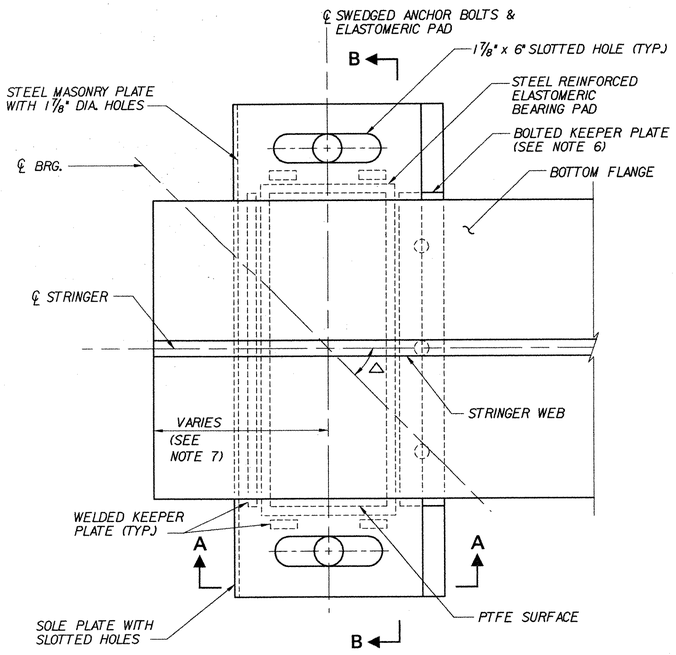
Hayashi Corporation
Consulting Engineers

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta.
	Surv. Sta.

BEARING NOTES & FIXED BRG. TABLES

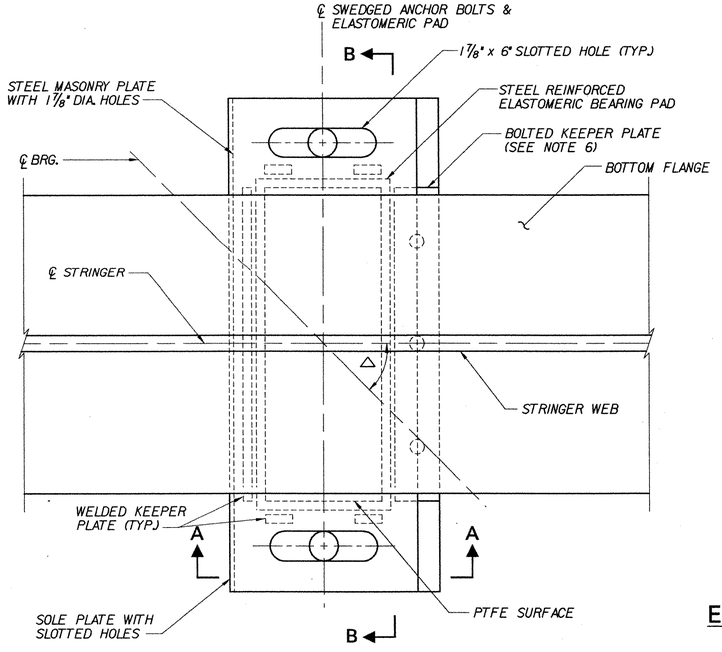
Designed By K.L. JAMES	Drawn By N.J. HOYT
Checked By M.H. GALLO Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 127tbll.dgn	Date 10/99
Bridge Sheet No. C-22	Sheet 22 of 307



(ANCHOR BOLTS NOT SHOWN FOR CLARITY)

BEARING PLAN AT ABUTMENT

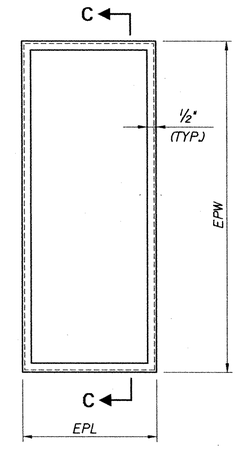
NOT TO SCALE



(ANCHOR BOLTS NOT SHOWN FOR CLARITY)

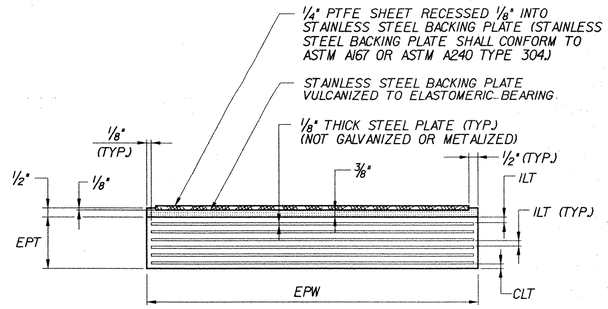
BEARING PLAN AT PIER

NOT TO SCALE



STEEL REINFORCED ELASTOMERIC PAD PLAN WITH PTFE SURFACE

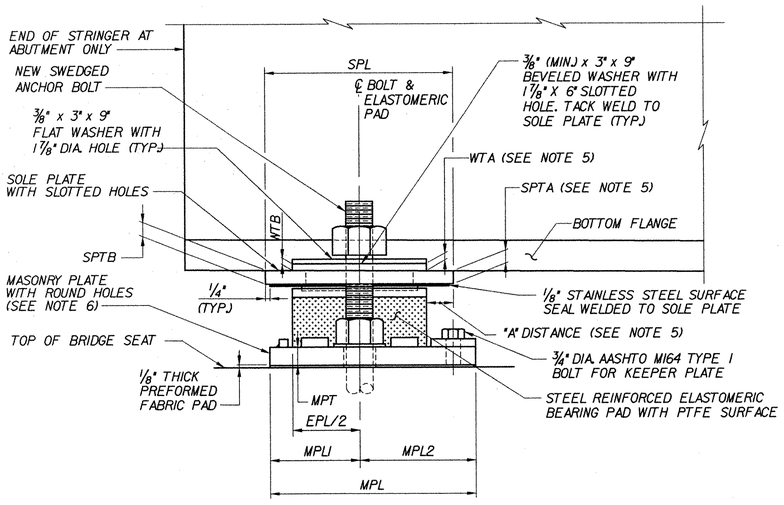
NOT TO SCALE



NOTE: NUMBER OF STEEL PLATES VARIES (SEE TABLE ON BRIDGE SHEET C-24)

SECTION C–C

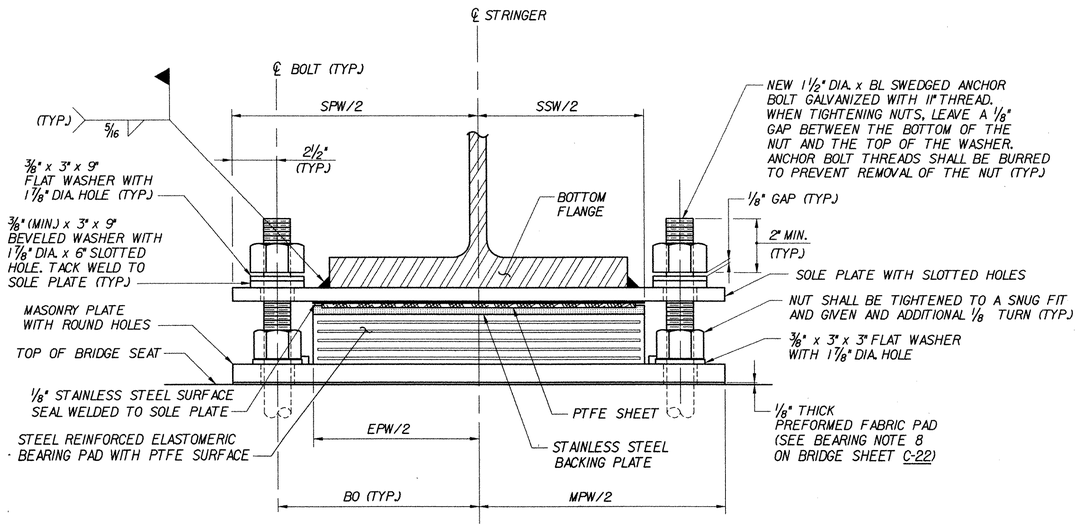
NOT TO SCALE



(BEARING AT ABUTMENT SHOWN, BEARING AT PIER SIMILAR)

SECTION A–A

NOT TO SCALE



SECTION B–B

NOT TO SCALE

NOTES:

1. SEE BRIDGE SHEET C-22 FOR BEARING NOTES AND C-24 FOR EXPANSION BEARING TABLES.
2. SEE BRIDGE SHEET C-25 FOR SOLE PLATE, MASONRY PLATE, AND KEEPER PLATE DETAILS.
3. SKEW DIRECTION SHOWN IS "AHEAD RIGHT".
4. BEARING STIFFENERS/DIAPHRAGM CONNECTION PLATES ARE NOT SHOWN FOR CLARITY.
5. THE "A" DISTANCE, "SPTA" AND "WTA" DIMENSIONS SHALL BE MEASURED AND SET ON THE UPSTATION SIDE OF THE BEARING.
6. AT ABUTMENT, MASONRY PLATE SHALL BE ORIENTED SO THAT THE BOLTED KEEPER PLATE IS ACCESSIBLE FROM THE FACE OF THE ABUTMENT TO ACCOMMODATE ELASTOMERIC PAD REMOVAL, IF REQUIRED IN THE FUTURE. AT PIER WITH ONE BEARING LINE, THE ENGINEER SHALL DETERMINE THE MASONRY PLATE ORIENTATION. AT PIER WITH TWO BEARING LINES (BR 5IN PIER 1 AND BR 5IS PIER 1), THE MASONRY PLATE SHALL BE ORIENTED SO THAT THE BOLTED KEEPER PLATE IS ACCESSIBLE FROM THE PIER FACE NEAREST TO THE BEARING LINE.
7. THE DISTANCE FROM ℄ BEARING TO THE END OF THE STRINGER VARIES AT EACH BEARING LOCATION. FOR THIS DIMENSION AT BRIDGES 43, 48, 50 AND 51, SEE THE STRINGER ELEVATION FOR EACH BRIDGE. FOR THIS DIMENSION AT BRIDGE 49, SEE THE TRANSVERSE SECTION, BRIDGE SHEET BR49-4.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

EXPANSION BEARING DETAILS

Designed By K.L. JAMES	Drawn By N.J. HOYT
Checked By M.H. GALLO Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 127exb2.dgn	Date 10/99
Bridge Sheet No. **C-23**	Sheet 23 of 307

Hayashi Corporation
Consulting Engineers

EXPANSION BEARING GEOMETRY

BRIDGE NO.	SUB-STRUCTURE NO.	△ ASKEW ANGLE	DIRECTION OF SKEW	EXPANSION BEARING TYPE *	SOLE PLATE				STAINLESS STEEL		MASONRY PLATE						ANCHOR BOLT		BEVELED WASHER THICKNESS		"A" DISTANCE (UPSTATION SIDE OF BEARING)						
					LENGTH (SPL)	WIDTH (SPW)	THICKNESS		LENGTH (SSL)	WIDTH (SSW)	LENGTH			WIDTH (MPW)	THICKNESS (MPT)	KEEPER PLATE WIDTH (KPW)	OFFSET (B0)	LENGTH (BL)	WTA (UPSTATION)	WTB (DOWNSTATION)	TEMPERATURE (°F)						
							SPTA (UPSTATION)	SPTB (DOWNSTATION)			MPL1	MPL2	MPL								0	15	30	45	60	75	90
ABUTMENT BEARINGS																											
43N	ABUT. 2	45°07'37"	AHEAD RIGHT	A	13 1/2"	22"	3/4"	1 1/4"	13"	13"	5 3/4"	7 1/4"	13"	22"	3/4"	12"	8 1/2"	2'-0"	11/16"	3/8"	1 5/8"	1 7/8"	2 1/16"	2 1/4"	2 7/16"	2 5/8"	2 7/8"
43S	ABUT. 1	44°35'15"	AHEAD RIGHT	B	12"	26"	1"	1 3/16"	11 1/2"	17"	4 1/2"	6"	10 1/2"	26"	7/8"	16"	10 1/2"	2'-1"	1/2"	3/8"	3 7/16"	3 3/16"	3"	2 3/4"	2 1/2"	2 5/16"	2 1/16"
48N	ABUT. 2	62°40'28"	AHEAD LEFT	C	12 1/2"	27 1/2"	3/4"	3/4"	12"	18 1/2"	5"	6 1/2"	11 1/2"	27 1/2"	1"	17 1/2"	11 1/4"	2'-0"	3/8"	3/8"	1 7/16"	1 13/16"	2 1/8"	2 1/2"	2 7/8"	3 3/16"	3 9/16"
48S	ABUT. 1	66°20'14"	AHEAD LEFT	C	13"	27 1/2"	7/8"	3/4"	12 1/2"	18 1/2"	5"	6 1/2"	11 1/2"	27 1/2"	1"	17 1/2"	11 1/4"	2'-0"	3/8"	3/8"	3 13/16"	3 7/16"	3 1/8"	2 3/4"	2 3/8"	2 1/16"	1 11/16"
49N	ABUT. 2	90°00'00"	————	C	10 1/2"	27 1/2"	3/4"	3/4"	10"	18 1/2"	5"	6 1/2"	11 1/2"	27 1/2"	1"	17 1/2"	11 1/4"	2'-0"	3/8"	3/8"	1 3/16"	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"	1 13/16"
49S	ABUT. 2	90°00'00"	————	C	10 1/2"	27 1/2"	3/4"	3/4"	10"	18 1/2"	5"	6 1/2"	11 1/2"	27 1/2"	1"	17 1/2"	11 1/4"	2'-0"	3/8"	3/8"	1 3/16"	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"	1 13/16"
50N	ABUT. 2	46°29'48"	AHEAD RIGHT	B	13"	26"	1 1/4"	1"	12 1/2"	17"	4 1/2"	6"	10 1/2"	26"	7/8"	16"	10 1/2"	2'-1"	3/8"	9/16"	2 7/16"	2 11/16"	3"	3 1/4"	3 1/2"	3 13/16"	4 1/16"
50S	ABUT. 1	43°31'43"	AHEAD RIGHT	B	12 1/2"	26"	1 7/16"	1"	12"	17"	4 1/2"	6"	10 1/2"	26"	7/8"	16"	10 1/2"	2'-1"	3/8"	11/16"	3 3/4"	3 1/2"	3 1/4"	3"	2 3/4"	2 1/2"	2 1/4"
** 51N	ABUT. 2	43°40'33"	AHEAD LEFT	G	11"	26"	3/4"	3/4"	10 1/2"	16 1/2"	4 1/2"	6"	10 1/2"	26"	7/8"	15 1/2"	10 1/2"	1'-11"	3/8"	3/8"	1 3/8"	1 11/16"	1 15/16"	2 1/4"	2 9/16"	2 13/16"	3 1/8"
** 51S	ABUT. 2	43°08'46"	AHEAD LEFT	G	11"	26"	3/4"	3/4"	10 1/2"	16 1/2"	4 1/2"	6"	10 1/2"	26"	7/8"	15 1/2"	10 1/2"	1'-11"	3/8"	3/8"	1 3/8"	1 11/16"	1 15/16"	2 1/4"	2 9/16"	2 13/16"	3 1/8"
PIER BEARINGS																											
43N	PIER 1	44°50'07"	AHEAD RIGHT	D	12 1/2"	23"	3/4"	1 1/8"	12"	14"	6 1/4"	7 3/4"	14"	23"	1 1/8"	13"	9"	2'-0"	5/8"	3/8"	1 1/16"	1 1/8"	1 3/16"	1 1/4"	1 5/16"	1 3/8"	1 7/16"
43N	PIER 2	45°01'13"	AHEAD RIGHT	D	13"	23"	3/4"	1 1/8"	12 1/2"	14"	6 1/4"	7 3/4"	14"	23"	1 1/8"	13"	9"	2'-0"	5/8"	3/8"	1 1/16"	1 3/16"	1 3/8"	1 1/2"	1 5/8"	1 13/16"	1 15/16"
43S	PIER 1	44°46'15"	AHEAD RIGHT	E	13 1/2"	27 1/2"	3/4"	1 1/16"	13"	18 1/2"	5 3/4"	7 1/4"	13"	27 1/2"	1 1/4"	17 1/2"	11 1/4"	2'-0"	9/16"	3/8"	2 11/16"	2 9/16"	2 3/8"	2 1/4"	2 1/8"	1 15/16"	1 13/16"
43S	PIER 2	44°58'53"	AHEAD RIGHT	D	13 1/2"	23"	3/4"	1 1/8"	13"	14"	6 1/4"	7 3/4"	14"	23"	1 1/8"	13"	9"	2'-0"	5/8"	3/8"	1 7/8"	1 7/8"	1 13/16"	1 3/4"	1 11/16"	1 5/8"	1 5/8"
48N	PIER 1	65°16'48"	AHEAD LEFT	F	14 1/2"	27 1/2"	3/4"	3/4"	14"	18 1/2"	7"	8 1/2"	15 1/2"	27 1/2"	1"	17 1/2"	11 1/4"	1'-11"	3/8"	3/8"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"	1 7/8"
48N	PIER 2	63°58'14"	AHEAD LEFT	F	15 1/2"	27 1/2"	3/4"	3/4"	15"	18 1/2"	7"	8 1/2"	15 1/2"	27 1/2"	1"	17 1/2"	11 1/4"	1'-11"	3/8"	3/8"	1 5/16"	1 9/16"	1 3/4"	2"	2 1/4"	2 7/16"	2 11/16"
48S	PIER 1	65°00'45"	AHEAD LEFT	F	15 1/2"	27 1/2"	3/4"	3/4"	15"	18 1/2"	7"	8 1/2"	15 1/2"	27 1/2"	1"	17 1/2"	11 1/4"	1'-11"	3/8"	3/8"	2 11/16"	2 7/16"	2 1/4"	2"	1 3/4"	1 9/16"	1 5/16"
48S	PIER 2	63°58'14"	AHEAD LEFT	F	14 1/2"	27 1/2"	3/4"	3/4"	14"	18 1/2"	7"	8 1/2"	15 1/2"	27 1/2"	1"	17 1/2"	11 1/4"	1'-11"	3/8"	3/8"	1 7/8"	1 3/4"	1 5/8"	1 1/2"	1 3/8"	1 1/4"	1 1/8"
50N	PIER 1	44°50'40"	AHEAD RIGHT	E	13"	27 1/2"	1 1/16"	3/4"	12 1/2"	18 1/2"	5 3/4"	7 1/4"	13"	27 1/2"	1 1/4"	17 1/2"	11 1/4"	2'-0"	3/8"	9/16"	1 3/4"	1 7/8"	1 15/16"	2"	2 1/16"	2 1/8"	2 1/4"
50N	PIER 2	45°48'12"	AHEAD RIGHT	E	13"	27 1/2"	1 1/16"	3/4"	12 1/2"	18 1/2"	5 3/4"	7 1/4"	13"	27 1/2"	1 1/4"	17 1/2"	11 1/4"	2'-0"	3/8"	9/16"	1 7/16"	1 5/8"	1 13/16"	2"	2 3/16"	2 3/8"	2 9/16"
50S	PIER 1	44°11'11"	AHEAD RIGHT	E	12 1/2"	27 1/2"	1 1/8"	3/4"	12"	18 1/2"	5 3/4"	7 1/4"	13"	27 1/2"	1 1/4"	17 1/2"	11 1/4"	2'-0"	3/8"	5/8"	2 5/16"	2 1/8"	1 15/16"	1 3/4"	1 9/16"	1 3/8"	1 3/16"
50S	PIER 2	45°05'50"	AHEAD RIGHT	E	12 1/2"	27 1/2"	1 1/8"	3/4"	12"	18 1/2"	5 3/4"	7 1/4"	13"	27 1/2"	1 1/4"	17 1/2"	11 1/4"	2'-0"	3/8"	5/8"	2"	1 7/8"	1 13/16"	1 3/4"	1 11/16"	1 5/8"	1 1/2"
51N	PIER 1(S1)	90°00'00"	————	H	9"	26"	3/4"	3/4"	8 1/2"	16"	4 1/2"	6"	10 1/2"	26"	7/8"	15"	10 1/2"	2'-0"	3/8"	3/8"	1 1/8"	1 3/16"	1 3/16"	1 1/4"	1 5/16"	1 5/16"	1 3/8"
51N	PIER 1(S2)	90°00'00"	————	J	9 1/2"	29"	15/16"	3/4"	9"	20"	4 3/4"	6 1/4"	11"	29"	7/8"	19"	12"	1'-11"	3/8"	9/16"	1 9/16"	1 7/16"	1 3/8"	1 1/4"	1 1/8"	1 1/16"	0 15/16"
** 51N	PIER 3	44°34'59"	AHEAD LEFT	K	13 1/2"	27 1/2"	7/8"	3/4"	13"	18 1/2"	6 3/4"	8 1/4"	15"	27 1/2"	1 1/8"	17 1/2"	11 1/4"	2'-0"	3/8"	1/2"	0 7/8"	1"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 5/8"
** 51N	PIER 4	43°59'35"	AHEAD LEFT	L	14"	29 1/2"	7/8"	7/8"	13 1/2"	20 1/2"	6 1/4"	7 3/4"	14"	29 1/2"	1 1/8"	19 1/2"	12 1/4"	2'-2"	3/8"	3/8"	1 5/16"	1 9/16"	1 3/4"	2"	2 1/4"	2 7/16"	2 11/16"
51S	PIER 1(S1)	90°00'00"	————	H	9"	26"	3/4"	3/4"	8 1/2"	16"	4 1/2"	6"	10 1/2"	26"	7/8"	15"	10 1/2"	2'-0"	3/8"	3/8"	1 1/8"	1 3/16"	1 3/16"	1 1/4"	1 5/16"	1 5/16"	1 3/8"
51S	PIER 1(S2)	90°00'00"	————	J	10 1/2"	29"	15/16"	3/4"	10"	20"	4 3/4"	6 1/4"	11"	29"	7/8"	19"	12"	1'-11"	3/8"	9/16"	2 3/8"	2 3/16"	1 15/16"	1 3/4"	1 9/16"	1 5/16"	1 1/8"
51S	PIER 2	90°00'00"	————	K	14 1/2"	27 1/2"	15/16"	3/4"	14"	18 1/2"	6 3/4"	8 1/4"	15"	27 1/2"	1 1/8"	17 1/2"	11 1/4"	2'-0"	3/8"	1/2"	2 1/16"	1 15/16"	1 7/8"	1 3/4"	1 5/8"	1 9/16"	1 7/16"
** 51S	PIER 4	44°03'21"	AHEAD LEFT	L	13"	29 1/2"	7/8"	7/8"	12 1/2"	20 1/2"	6 1/4"	7 3/4"	14"	29 1/2"	1 1/8"	19 1/2"	12 1/4"	2'-2"	3/8"	3/8"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"	1 7/8"
** 51S	PIER 5	43°27'53"	AHEAD LEFT	L	14"	29 1/2"	7/8"	7/8"	13 1/2"	20 1/2"	6 1/4"	7 3/4"	14"	29 1/2"	1 1/8"	19 1/2"	12 1/4"	2'-2"	3/8"	3/8"	1 5/16"	1 9/16"	1 3/4"	2"	2 1/4"	2 7/16"	2 11/16"

* SEE TABLE OF "EXPANSION BEARING TYPE DETAILS" BELOW

** THE "A" DISTANCES FOR THESE BEARINGS ARE FOR STRINGER 1 ONLY. SEE "BR 51 SUPPLEMENTARY "A" DISTANCE TABLE" FOR OTHER STRINGERS.

(S1) - SPAN 1
(S2) - SPAN 2

EXPANSION BEARING TYPE DETAILS

EXPANSION BEARING TYPE	STEEL REINFORCED ELASTOMERIC PAD WITH PTFE SURFACE						
	LENGTH (EPL)	WIDTH (EPW)	THICKNESS (EPT)	COVER LAYER THICKNESS (CLT)	INTERNAL LAYER THICKNESS (ILT)	NUMBER OF INTERNAL ELASTOMER LAYERS	NUMBER OF INTERNAL STEEL PLATES
A	9"	13"	2 3/4"	1/4"	1/2"	4	4
B	6 1/2"	17"	3 3/4"	1/4"	3/8"	7	7
C	7 1/2"	18 1/2"	2 3/4"	1/4"	1/2"	4	4
D	10"	14"	2 3/4"	1/4"	1/2"	4	4
E	9"	18 1/2"	2 3/4"	1/4"	1/2"	4	4
F	11 1/2"	18 1/2"	2 1/2"	1/4"	5/8"	3	3
G	6 1/2"	16 1/2"	2 1/4"	1/4"	3/8"	4	4
H	6 1/2"	16"	3 1/4"	1/4"	3/8"	6	6
J	7"	20"	2 1/8"	1/4"	1/2"	3	3
K	11"	18 1/2"	2 1/2"	1/4"	5/8"	3	3
L	10"	20 1/2"	4 3/4"	1/4"	5/8"	6	6

BR 51 SUPPLEMENTARY "A" DISTANCE TABLE

BRIDGE NO.	SUB-STRUCTURE NO.	STRINGER NO.	"A" DISTANCE (UPSTATION SIDE OF BEARING) TEMPERATURE (°F)						
			0	15	30	45	60	75	90
51N	ABUT. 2	2	1 3/8"	1 11/16"	1 15/16"	2 1/4"	2 9/16"	2 13/16"	3 1/8"
		3 & 4	1 7/16"	1 11/16"	2"	2 1/4"	2 1/2"	2 13/16"	3 1/16"
		5	1 1/2"	1 3/4"	2"	2 1/4"	2 1/2"	2 3/4"	3"
51S	ABUT. 2	2	1 3/8"	1 11/16"	1 15/16"	2 1/4"	2 9/16"	2 13/16"	3 1/8"
		3 & 4	1 7/16"	1 11/16"	2"	2 1/4"	2 1/2"	2 13/16"	3 1/16"
		5	1 1/2"	1 3/4"	2"	2 1/4"	2 1/2"	2 3/4"	3"
51N	PIER 3	2 & 3	0 15/16"	1 1/16"	1 1/8"	1 1/4"	1 3/8"	1 7/16"	1 9/16"
		4 & 5	1"	1 1/16"	1 3/16"	1 1/4"	1 5/16"	1 7/16"	1 1/2"
51N	PIER 4	2	1 5/16"	1 9/16"	1 3/4"	2"	2 1/4"	2 7/16"	2 11/16"
		3 & 4	1 3/8"	1 9/16"	1 13/16"	2"	2 3/16"	2 7/16"	2 5/8"
		5	1 7/16"	1 5/8"	1 13/16"	2"	2 3/16"	2 3/8"	2 9/16"
51S	PIER 4	2 & 3	1 3/16"	1 5/16"	1 3/8"	1 1/2"	1 5/8"	1 11/16"	1 13/16"
		4 & 5	1 1/4"	1 5/16"	1 7/16"	1 1/2"	1 9/16"	1 11/16"	1 3/4"
51S	PIER 5	2	1 5/16"	1 9/16"	1 3/4"	2"	2 1/4"	2 7/16"	2 11/16"
		3 & 4	1 3/8"	1 9/16"	1 13/16"	2"	2 3/16"	2 7/16"	2 5/8"
		5	1 7/16"	1 5/8"	1 13/16"	2"	2 3/16"	2 3/8"	2 9/16"

NOTES:

1. SEE EXPANSION BEARING DETAILS ON BRIDGE SHEET C-23.
2. SEE SOLE & MASONRY PLATE DETAILS ON BRIDGE SHEET C-25.
3. SEE BEARING NOTES ON BRIDGE SHEET C-22.

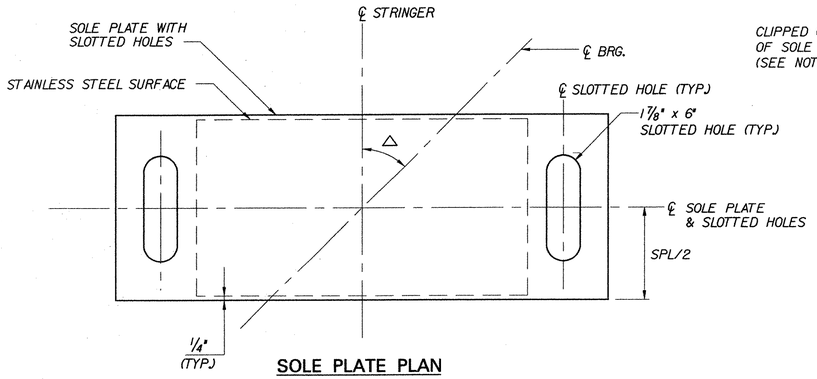
Hayashi Corporation
Consulting Engineers

STATE OF VERMONT
AGENCY OF TRANSPORTATION

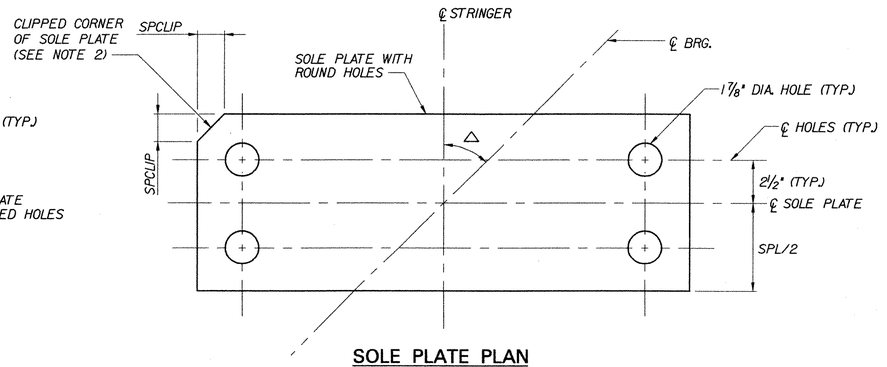
Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

EXPANSION BEARING TABLES

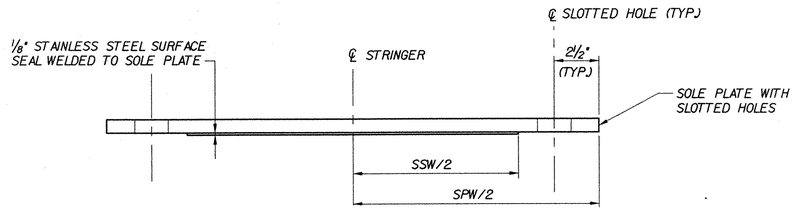
Designed By K.L. JAMES	Drawn By N.J. HOYT
Checked By M.H. GALLO Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. I27tbl2.dgn	Date 10/99
Bridge Sheet No. C-24	Sheet 24 of 307



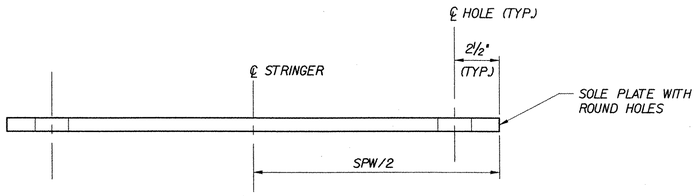
SOLE PLATE PLAN



SOLE PLATE PLAN



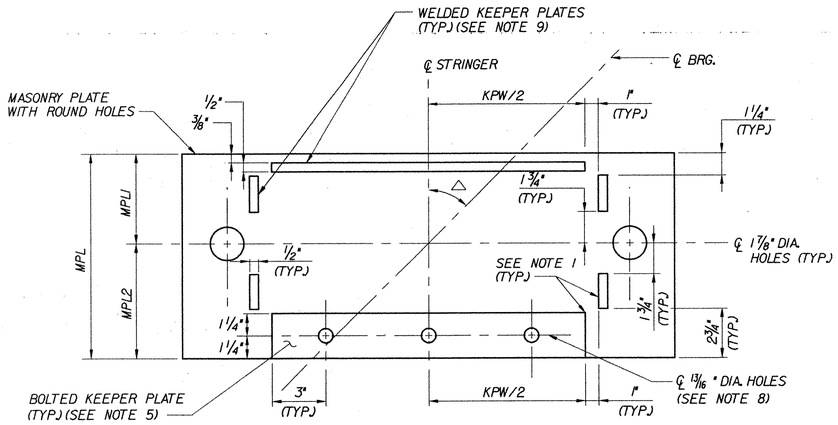
SOLE PLATE ELEVATION



SOLE PLATE ELEVATION

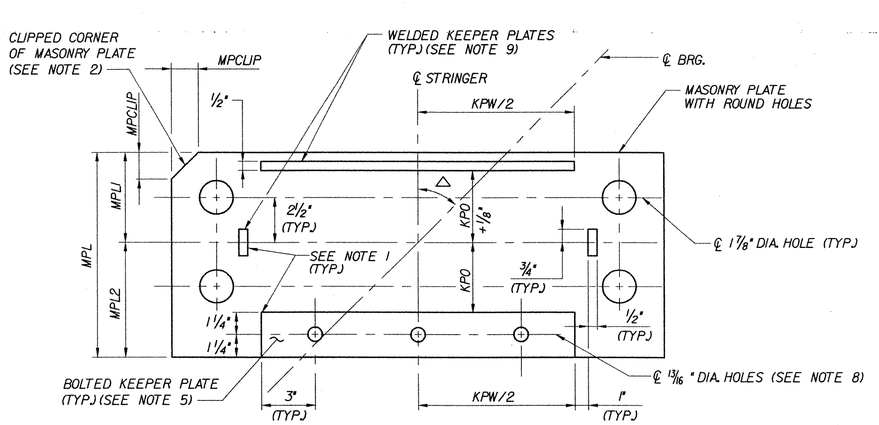
NOTES:

1. SPECIAL CARE SHALL BE TAKEN TO ENSURE THAT THE INSIDE CORNERS OF ALL KEEPER PLATES ARE GROUND PER SUBSECTION 531.04 OF THE SPECIFICATIONS TO REMOVE ALL SHARP EDGES WHICH MIGHT COME INTO CONTACT WITH THE ELASTOMERIC BEARING.
2. SOLE AND MASONRY PLATES AT FIXED BEARINGS MAY REQUIRE ONE CORNER TO BE CLIPPED TO CLEAR CURTAINWALL AT ABUTMENTS ONLY. SEE TABLE ON BRIDGE SHEET C-22 FOR CLIP DIMENSIONS.
3. KEEPER BOLT LENGTH SHALL BE 1 1/2". COAT KEEPER BOLTS AND HOLES WITH "NEVER SEIZE GREASE". BOLTS SHALL BE FITTED WITH 5/16" THICK WASHERS AND TIGHTENED TO A SNUG FIT. WASHERS SHALL CONFORM TO AASHTO M164.
4. SKEW DIRECTION SHOWN IS "AHEAD RIGHT".
5. BOLTED KEEPER PLATES ARE REMOVABLE TO ALLOW FOR FUTURE REPLACEMENT OF ELASTOMERIC BEARINGS, IF REQUIRED.
6. SEE BRIDGE SHEET C-22 FOR BEARING NOTES.
7. SEE BRIDGE SHEET C-21 FOR FIXED BEARING DETAILS.
   SEE BRIDGE SHEET C-22 FOR FIXED BEARING TABLES.
   SEE BRIDGE SHEET C-23 FOR EXPANSION BEARING DETAILS.
   SEE BRIDGE SHEET C-24 FOR EXPANSION BEARING TABLES.
8. THE HOLES IN THE MASONRY PLATE FOR THE KEEPER PLATE BOLTS SHALL BE THREADED FOR THE ENTIRE THICKNESS OF THE MASONRY PLATE. THE KEEPER PLATE HOLES SHALL NOT BE THREADED.
9. WELDING PROCEDURE SHALL PROVIDE SUFFICIENT PREHEAT TO ENSURE SOUNDNESS OF THE WELD.
10. THE MASONRY PLATES SHALL BE COMPLETELY FABRICATED WHEN GALVANIZED OR METALIZED EXCEPT THAT THE BOLTED KEEPER PLATES SHALL BE GALVANIZED OR METALIZED SEPARATELY.



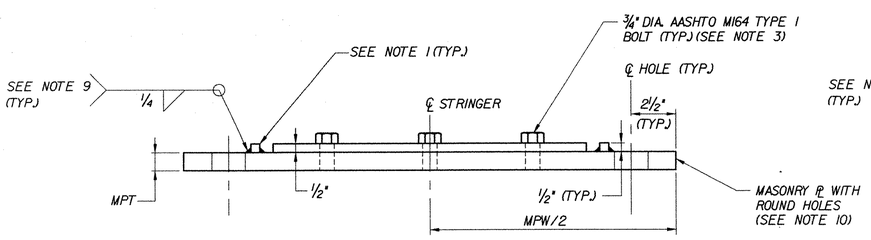
(BOLTS NOT SHOWN FOR CLARITY)

MASONRY PLATE PLAN



(BOLTS NOT SHOWN FOR CLARITY)

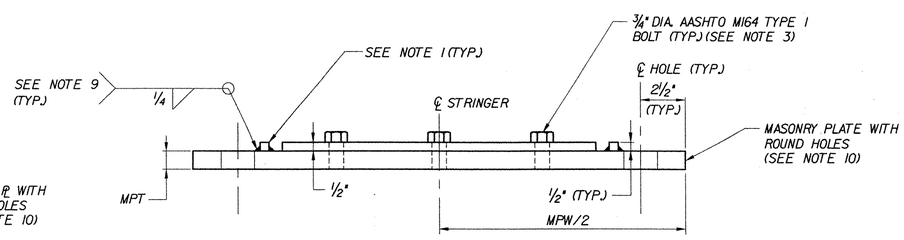
MASONRY PLATE PLAN



MASONRY PLATE ELEVATION

EXPANSION BEARING DETAILS

NOT TO SCALE



MASONRY PLATE ELEVATION

FIXED BEARING DETAILS

NOT TO SCALE

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of	BOLTON	Bridge No.	
Highway No.	I-89	Log Sta.	
		Surv. Sta.	

SOLE & MASONRY PLATE DETAILS

Designed By	K.L. JAMES	Drawn By	N.J. HOYT
Checked By	Date	Bridge Design Supervisor	
M.H. GALLO	10/99	J.P. HALSTEAD	Date 10/99
PROJECT	BOLTON	PROJECT NO.	IM-089-2(29)
TVGA CAD Drawing No.	127smpl.dgn	Date	10/99
Bridge Sheet No.	C-25	Sheet 25	of 307

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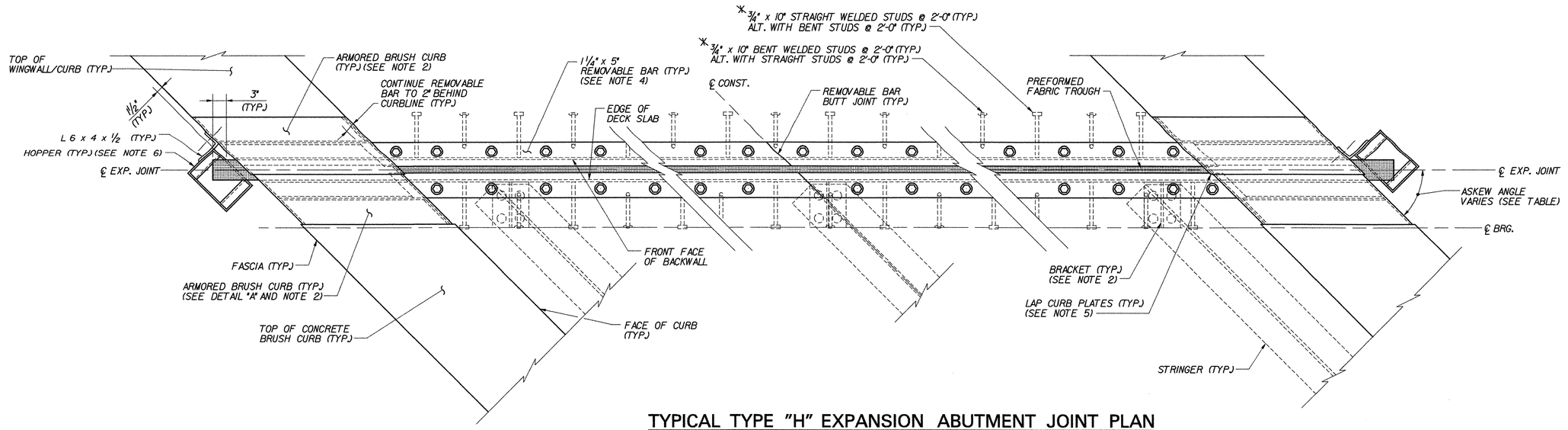
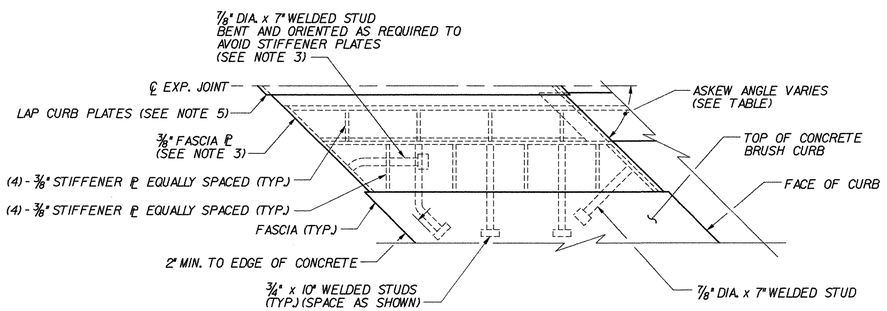


TYPICAL TYPE "H" EXPANSION ABUTMENT JOINT PLAN

(BR 51S SHOWN – BR 51N SIMILAR)

SCALE: 1"=1'-0"

* NOTE: STUDS NOT SHOWN IN BRUSH CURB FOR CLARITY



DETAIL "A"

(ONE QUADRANT OF ARMORED BRUSH CURB SHOWN – ALL OTHER QUADRANTS SIMILAR)

SCALE: 1½" = 1'-0"

BRIDGE	EXPANSION JOINT LOCATION	ASKEW ANGLE AT EXPANSION JOINT	DIRECTION OF SKEW	HOPPER LOCATION	DIRECTION OF CURB PLATE LAP
51N	ABUT. 2	43° 40' 33"	AHEAD LT.	LT.	REVERSE AS SHOWN
51S	ABUT. 2	43° 08' 46"	AHEAD LT.	LT.	AS SHOWN

NOTES:

1. TOP AND FACE OF BRUSH CURB ARE ATTACHED BY BOLTS AND ARE REMOVABLE TO ALLOW CLEANING AND/OR REPLACEMENT OF FABRIC TROUGH.
2. FOR TYPICAL SECTIONS OF EXPANSION JOINT AND ARMORED BRUSH CURB, SEE TYPE "H" ABUTMENT JOINT DETAILS, BRIDGE SHEETS C-28 AND C-29.
3. FOR VIEW OF FASCIA PLATES, AND LOCATION OF WELDED STUDS ON FASCIA PLATES, SEE TYPE "H" ABUTMENT JOINT DETAILS (3 OF 3), BRIDGE SHEET C-30.
4. BARS IN ROADWAY ARE REMOVABLE TO ALLOW CLEANING AND/OR REPLACEMENT OF FABRIC TROUGH.
5. LAP CURB PLATES IN DIRECTION OF TRAFFIC. SEE TABLE FOR DIRECTION OF LAP AT EACH EXPANSION JOINT LOCATION.
6. WHERE HOPPER IS NOT REQUIRED, PREFORMED FABRIC DRAIN TROUGH SHALL BE TERMINATED 2" INSIDE THE FASCIA.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta.
	Surv. Sta.

TYPICAL TYPE "H" ABUTMENT JOINT PLAN

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By Date J.P. HALSTEAD 06/04	Bridge Design Supervisor J.P. HALSTEAD Date 06/04
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. h-jointp	Date 06/04
Bridge Sheet No. C-27	Sheet 27 of 307

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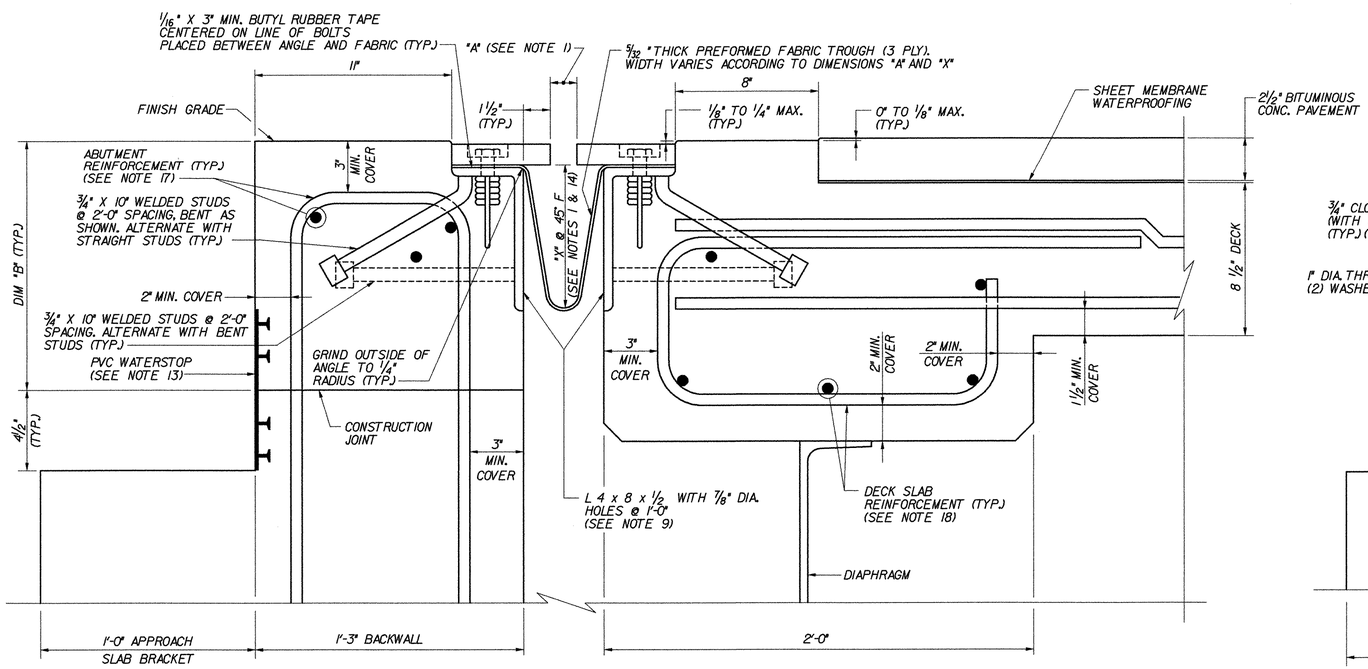
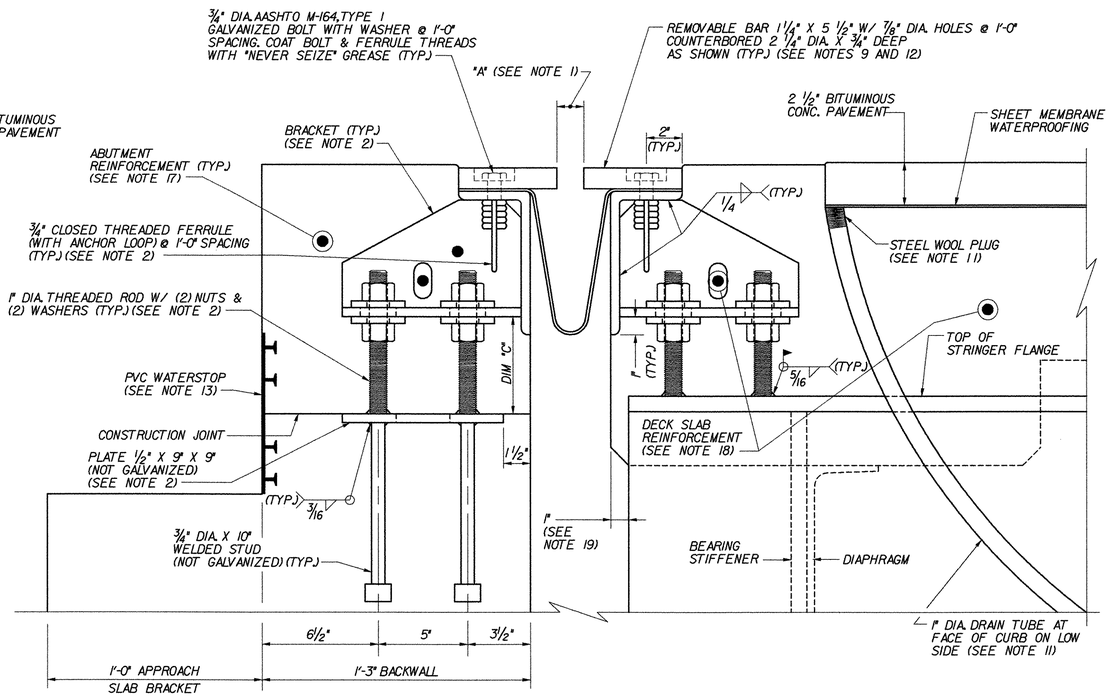


TYPICAL SECTION BETWEEN STRINGERS
(NORMAL TO ℄ BEARING)

SCALE: 3" = 1'-0"



TYPICAL SECTION AT STRINGERS
(NORMAL TO ℄ BEARING)

SCALE: 3" = 1'-0"

NOTES:

1. FOR TABLES OF "A" AND "X" DIMENSIONS, SEE TYPE "H" ABUTMENT JOINT DETAILS (2 OF 3), BRIDGE SHEET C-29.
2. FOR BRACKET, PLATE, WASHER AND ANCHOR FERRULE DETAILS, SEE TYPE "H" ABUTMENT JOINT DETAILS (2 OF 3), BRIDGE SHEET C-29.
3. DETAILS ON THIS SHEET ARE FOR ITEM 516.10, "BRIDGE EXPANSION JOINT".
4. PREFORMED FABRIC MATERIAL SHALL BE CONTINUOUS AND SHALL CONFORM TO SUBSECTION 707.07 OF THE SPECIFICATIONS.
5. BUTYL RUBBER TAPE SHALL CONFORM TO AASHTO SPECIFICATION M-198, TYPE B.
6. THE FINAL FINISH OF THE EXPANSION DEVICE SHALL BE COVERED DURING THE PLACING OF BRIDGE DECK CONCRETE.
7. ALL STEEL COMPONENTS SHALL BE AASHTO M270 GRADE 36, UNLESS OTHERWISE SPECIFIED. THREADED ROD AND ASSOCIATED NUTS AND WASHERS SHALL CONFORM TO SUBSECTION 714.08 OF THE SPECIFICATIONS. ALL STEEL COMPONENTS AND HARDWARE SHALL BE GALVANIZED OR METALIZED PER SUBSECTION 506.15 OF THE SPECIFICATIONS, UNLESS OTHERWISE SPECIFIED.
8. PAYMENT FOR ITEM 516.10, "BRIDGE EXPANSION JOINT" SHALL INCLUDE THE FABRICATION AND ERECTION OF THE COMPLETE JOINT ASSEMBLY INCLUDING ALL STEEL PLATES, BRACKETS, ANGLES, WELDED STUDS OR RODS, PREFORMED FABRIC DRAIN TROUGH MATERIAL AND PLASTIC DRAIN TUBES, BUTYL RUBBER TAPE AND ANY OTHER MISCELLANEOUS MATERIAL NECESSARY TO INSTALL JOINT.
9. THE 4 x 8 x 1/2 ANGLES SHALL BE FURNISHED AS ONE CONTINUOUS PIECE. THE 1 1/4" X 5 1/2" BARS EACH SIDE OF THE JOINT SHALL BE PROVIDED IN TWO EQUAL LENGTHS.
10. COAT CONCRETE CONTACT SURFACES WITH EPOXY BONDING COMPOUND MEETING THE REQUIREMENTS OF SUBSECTION 719.02 OF THE SPECIFICATIONS. PAYMENT SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 516.10, "BRIDGE EXPANSION JOINT".
11. A 1" DIAMETER PLASTIC DRAIN TUBE SHALL BE INSTALLED AS SHOWN AT THE FACE OF CURB. THE UPPER END IS TO BE PLUGGED WITH STEEL WOOL AND THE LOWER END IS TO EXTEND BELOW THE BOTTOM OF THE ADJACENT STRINGER. THE DRAIN TUBES SHALL BE FASTENED TO THE STRINGERS USING A METHOD APPROVED BY THE ENGINEER.
12. FILL COUNTERBORED HOLES WITH HOT POURED JOINT SEALER AFTER BOLT INSTALLATION. COSTS FOR THE WORK SHALL BE INCIDENTAL TO ITEM 516.10.
13. PAYMENT FOR WATERSTOP SHALL BE INCIDENTAL TO ITEM 501.34, "HIGH PERFORMANCE CONCRETE, CLASS B".
14. FABRIC TROUGHS SHALL BE INSTALLED SO THAT MINIMUM SLOPE IS 1% FOR POSITIVE DRAINAGE.
15. FABRIC TROUGH SHALL BE THOROUGHLY CLEANED AND FLUSHED AFTER PAVING OPERATION.
16. EXPANSION JOINTS SHALL BE SHOP ASSEMBLED AND SHIPPED AS ONE UNIT.
17. FOR ABUTMENT REINFORCEMENT DETAILS, SEE TYPICAL EXPANSION ABUTMENT REINFORCEMENT, BRIDGE SHEET C-40.
18. FOR DECK SLAB REINFORCEMENT, SEE THE TRANSVERSE SECTION AND DECK REINFORCEMENT PLANS FOR EACH BRIDGE.
19. THE DIMENSION FROM END OF EXISTING STRINGER TO END OF NEW DECK SLAB SHALL BE 3 1/2" ± AT BR 49N AND 4 3/4" ± AT BR 49S.
20. WORK THIS SHEET WITH TYPICAL END OF DECK SLAB DETAILS, BRIDGE SHEET C-15.

BRIDGE	LOCATION	DIM "B"	DIM "C"
43N	ABUT. 2	1'-2"	5 3/8"
43S	ABUT. 1	1'-2"	5 3/8"
49N	ABUT. 2	1'-1"	4 3/8"
49S	ABUT. 2	1'-1"	4 3/8"
50N	ABUT. 2	1'-2"	5 3/8"
50S	ABUT. 1	1'-2"	5 3/8"
51N	ABUT. 2	1'-2"	5 3/8"
51S	ABUT. 2	1'-2"	5 3/8"

* THESE DIMENSIONS ARE THEORETICAL AND MAY CHANGE DEPENDING UPON THE OUTCOME OF THE STRINGER PROFILES.

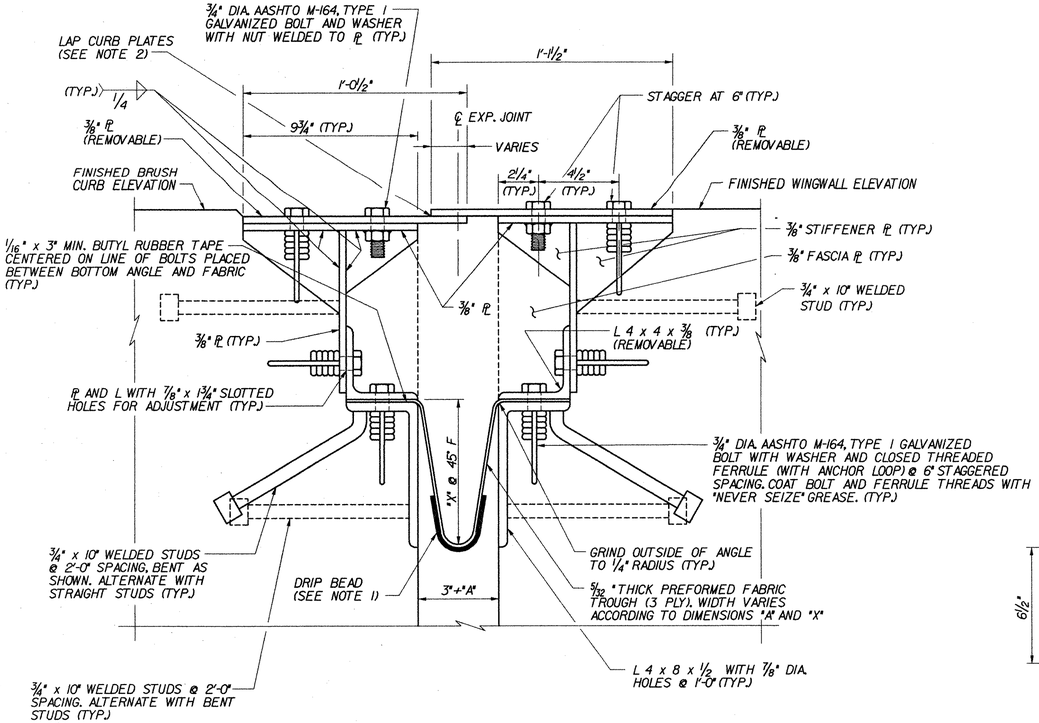
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta.
	Surv. Sta.

TYPE "H" ABUTMENT JOINT DETAILS (1 OF 3)

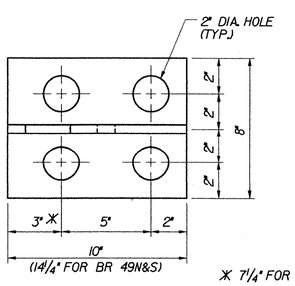
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. h-jointdl	Date 10/99
Bridge Sheet No. C-28	Sheet 28 of 307

TVGA ENGINEERING, SURVEYING, P.C.



TYPICAL SECTION AT ARMORED BRUSH CURB
(NORMAL TO ℄ BEARING)

SCALE: 3" = 1'-0"



* 7 1/4" FOR BR 49N&S

BRACKET PLAN
SCALE: 3" = 1'-0"

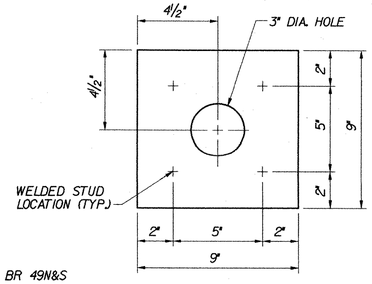
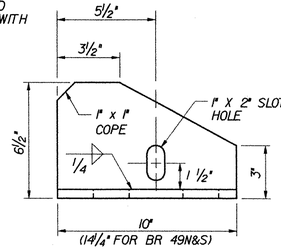


PLATE PLAN
(NOT GALVANIZED)

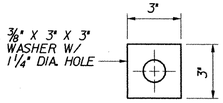
SCALE: 3" = 1'-0"

NOTE: ALL PLATES 1/2" THICK

ANCHOR FERRULE DETAIL
SCALE: 3" = 1'-0"

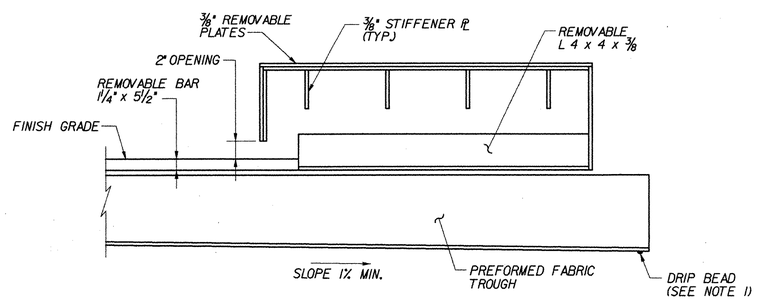


BRACKET ELEVATION
SCALE: 3" = 1'-0"



WASHER FOR BRACKET
SCALE: 3" = 1'-0"

BRIDGE	EXPANSION JOINT LOCATION	"X" @ 45° F		
		@ LEFT FASCIA	@ CL CONST.	@ RIGHT FASCIA
43N	ABUT. 2	8"	9 1/2"	9 1/2"
43S	ABUT. 1	8"	11"	11"
49N	ABUT. 2	8"	8"	8"
49S	ABUT. 2	8"	8"	8"
50N	ABUT. 2	8"	8"	8"
50S	ABUT. 1	8"	8"	8"
51N	ABUT. 2	8"	8"	8"
51S	ABUT. 2	8"	8"	8"



LONGITUDINAL SECTION THROUGH ARMORED BRUSH CURB
N.T.S.

BRIDGE	LOCATION	"A" DIMENSION							
		0° F	15° F	30° F	45° F	60° F	75° F	90° F	105° F
43N	ABUT. 2	1 5/8"	1 1/2"	1 3/8"	1 3/16"	1 1/16"	0 15/16"	0 13/16"	0 5/8"
43S	ABUT. 1	1 13/16"	1 5/8"	1 1/2"	1 5/16"	1 3/16"	1"	0 13/16"	0 11/16"
49N	ABUT. 2	1 7/16"	1 5/16"	1 3/16"	1 1/16"	0 15/16"	0 13/16"	0 3/4"	0 5/8"
49S	ABUT. 2	1 7/16"	1 5/16"	1 3/16"	1 1/16"	0 15/16"	0 13/16"	0 3/4"	0 5/8"
50N	ABUT. 2	2 1/16"	1 7/8"	1 11/16"	1 1/2"	1 5/16"	1 1/16"	0 7/8"	0 11/16"
50S	ABUT. 1	1 15/16"	1 3/4"	1 9/16"	1 3/8"	1 3/16"	1"	0 7/8"	0 11/16"
51N	ABUT. 2	2 1/8"	1 15/16"	1 3/4"	1 1/2"	1 5/16"	1 1/8"	0 15/16"	0 11/16"
51S	ABUT. 2	2 1/8"	1 7/8"	1 11/16"	1 1/2"	1 5/16"	1 1/8"	0 7/8"	0 11/16"

NOTES:

1. A DRIP BEAD OF 1/4" x 7" STRIP OF PREFORMED MATERIAL SHALL BE CEMENTED TO THE BOTTOM OF THE FABRIC TROUGH USING AN ADHESIVE APPROVED BY THE MANUFACTURER. THE DRIP BEAD SHALL BE APPLIED 1" FROM THE DOWNSPOUT END OF THE TROUGH.
2. LAP CURB PLATES IN DIRECTION OF TRAFFIC. FOR DIRECTION OF LAP AT EACH EXPANSION JOINT LOCATION, SEE TABLE ON TYPICAL TYPE "H" ABUTMENT JOINT PLAN, BRIDGE SHEET C-27.

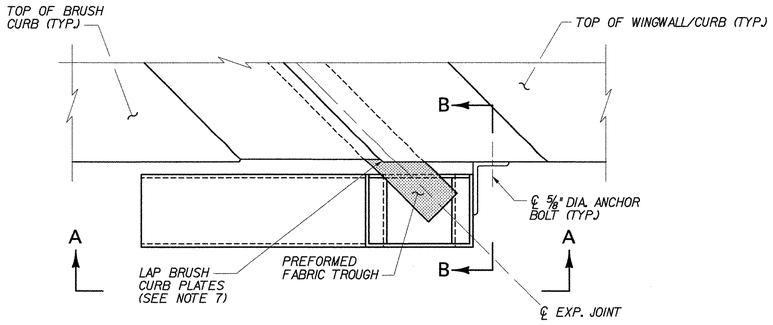
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

TYPE "H" ABUTMENT JOINT DETAILS (2 OF 3)

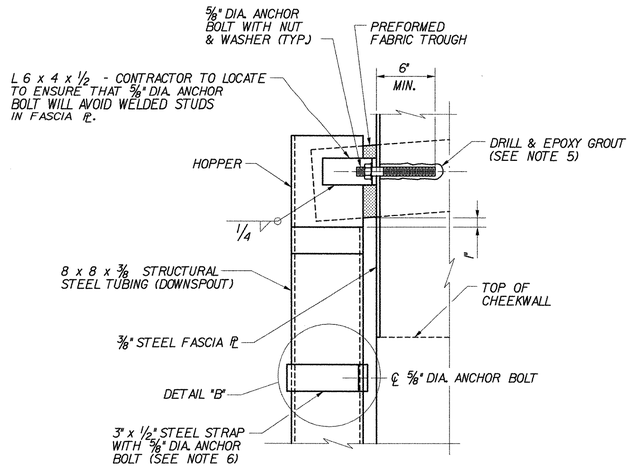
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. h-jointd2	Date 10/99
Bridge Sheet No. C-29	Sheet 29 of 307

TVGA ENGINEERING, SURVEYING, P.C.



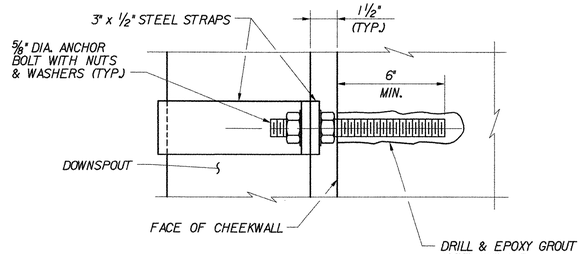
HOPPER LOCATION PLAN

SCALE: 1½" = 1'-0"



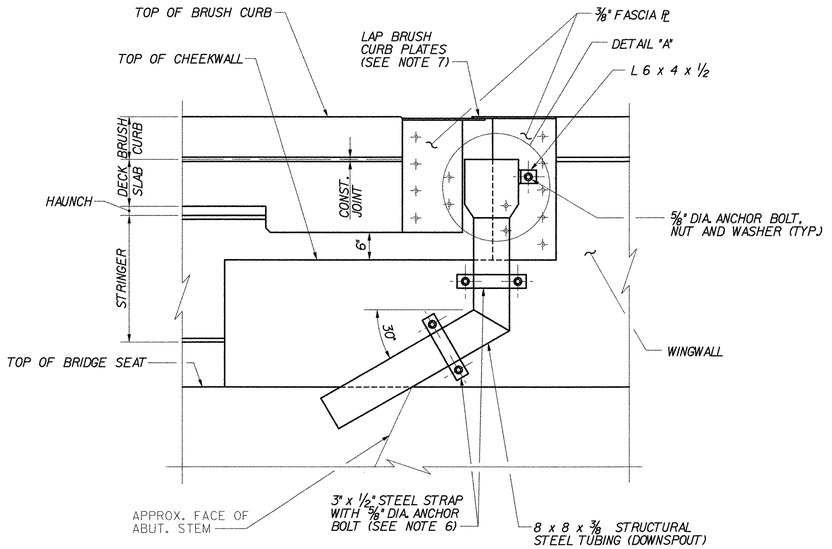
SECTION B–B

SCALE: 1½" = 1'-0"



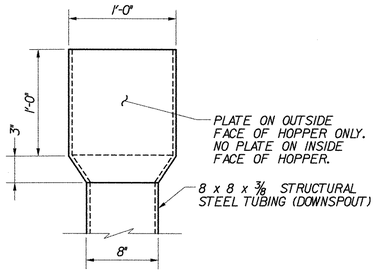
DETAIL "B"

N.T.S.



ELEVATION A–A

N.T.S.



DETAIL "A"

SCALE: 1½" = 1'-0"

NOTES:

1. WORK THIS SHEET WITH TYPICAL TYPE "H" ABUTMENT JOINT PLAN, BRIDGE SHEET C-27, TYPE "H" ABUTMENT JOINT DETAILS (1 OF 3), BRIDGE SHEET C-28, AND TYPICAL TYPE "H" ABUTMENT JOINT DETAILS (2 OF 3), BRIDGE SHEET C-29.

2. HOPPERS AND ALL COMPONENTS SHALL BE AASHTO M270 GRADE 36 STEEL. STRUCTURAL TUBING (DOWNSPOUT) SHALL BE ASTM A-500 OR A-501 STEEL. ALL STEEL SHALL BE GALVANIZED OR METALIZED IN ACCORDANCE WITH SECTION 506.15 OF THE SPECIFICATIONS. ALL HOPPER AND DOWNSPOUT WORK SHALL BE PAID FOR UNDER ITEM 506.60, "STRUCTURAL STEEL".

3. HOPPERS SHALL BE FABRICATED FROM 3/8" STEEL PLATE. THE FABRICATION WELDS SHALL BE 1/4" FILLET WELDS ON THE INSIDE OF THE HOPPER AND SHALL BE FULL LENGTH TO ENSURE A WATERTIGHT CONTAINER.

4. THE HOPPERS SHALL BE PLACED TO LEAVE A ONE INCH VERTICAL GAP BETWEEN THE BOTTOM OF THE TROUGH AND THE HOPPER. THE TROUGH SHOULD BE ENCLOSED AS MUCH AS POSSIBLE BY THE HOPPER BUT SHOULD NOT BE BENT OR BUCKLED TO RESTRICT THE FLOW OF WATER.

5. ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO SUBSECTION 714.08 OF THE SPECIFICATIONS, AND BE GALVANIZED IN ACCORDANCE WITH SUBSECTION 506.15. ANCHOR BOLTS SHALL BE DRILLED AND EPOXY GROUTED 6" MINIMUM INTO THE CONCRETE. DRILL AND EPOXY GROUT SYSTEM SHALL BE:
   - DAYTON SUPERIOR SURE-ANCHOR J-51 SYSTEM
   - HILTI, INC. HIT HY-150 SYSTEM
   - UNITEX PRO-POXY 300 FAST SYSTEM

   OR EQUIVALENT APPROVED BY VAOT MATERIALS SECTION. ALL COSTS FOR DRILLING AND EPOXY GROUTING ANCHOR BOLTS SHALL BE INCIDENTAL TO ITEM 506.60, "STRUCTURAL STEEL".

6. STRAPS SHALL NOT BE BENT IN THE FIELD.

7. LAP CURB PLATES IN DIRECTION OF TRAFFIC. FOR DIRECTION OF LAP AT EACH EXPANSION JOINT LOCATION, SEE TABLE ON TYPICAL TYPE "H" ABUTMENT JOINT PLAN, BRIDGE SHEET C-27.

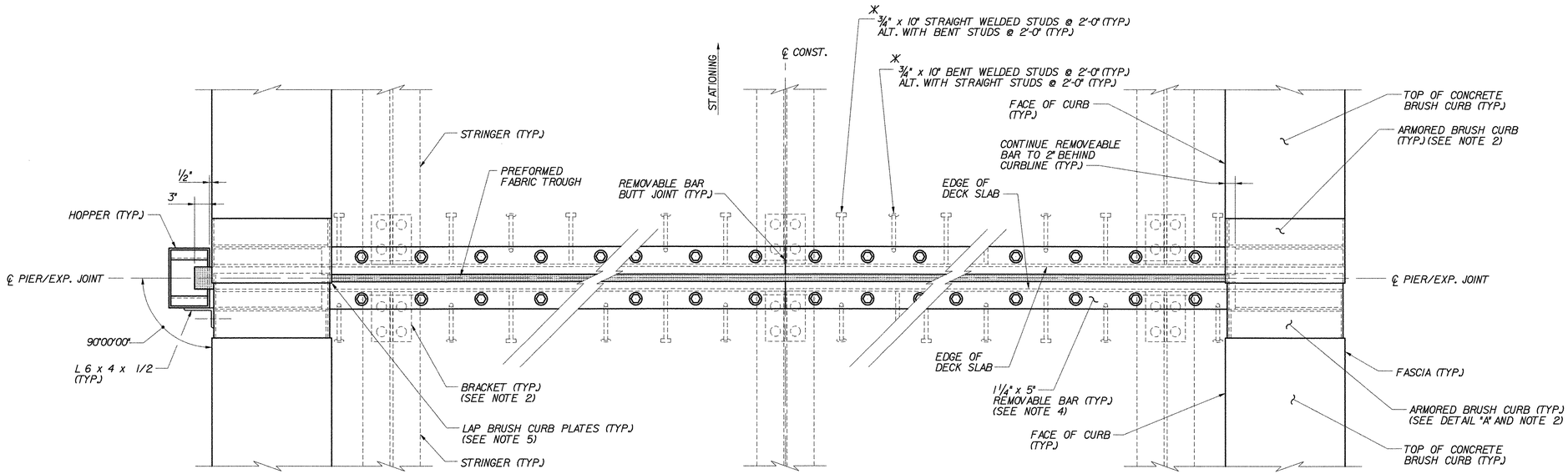
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

TYPE "H" ABUTMENT JOINT DETAILS (3 OF 3)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. h-jointd3	Date 10/99
Bridge Sheet No. C-30	Sheet 30 of 307

TVGA ENGINEERING, SURVEYING, P.C.

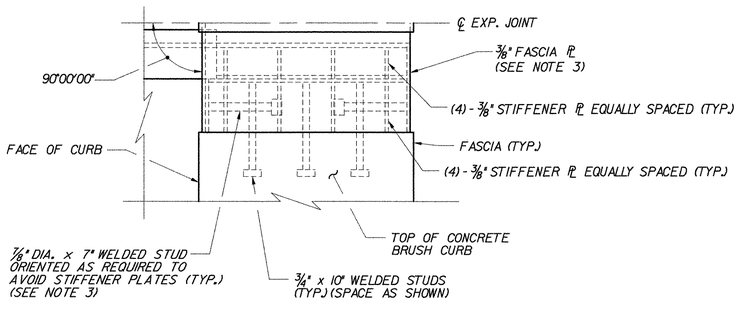


TYPICAL TYPE "H" EXPANSION JOINT PLAN

(PIER 1 AT BR51 N & S)

SCALE: 1"=1'-0"

* **NOTE:** STUDS NOT SHOWN IN BRUSH CURB FOR CLARITY.



DETAIL "A"

(ONE QUADRANT OF ARMORED BRUSH CURB SHOWN - ALL OTHER QUADRANTS SIMILAR)

SCALE: 1 1/2" = 1'-0"

NOTES:

1. TOP AND FACE OF BRUSH CURB ARE ATTACHED BY BOLTS AND ARE REMOVABLE TO ALLOW CLEANING AND/OR REPLACEMENT OF FABRIC TROUGH.
2. FOR TYPICAL SECTIONS OF EXPANSION JOINT AND ARMORED BRUSH CURB, SEE TYPE "H" PIER JOINT DETAILS, BRIDGE SHEETS C-32 AND C-33.
3. FOR VIEW OF FASCIA PLATES, AND APPROXIMATE LOCATION OF WELDED STUDS ON FASCIA PLATES, SEE END OF DECK SLAB IN ELEVATION A-A ON TYPE "H" ABUTMENT JOINT DETAILS (3 OF 3), BRIDGE SHEET C-30.
4. BARS IN ROADWAY ARE REMOVABLE TO ALLOW CLEANING AND/OR REPLACEMENT OF FABRIC TROUGH.
5. LAP BRUSH CURB PLATES IN DIRECTION OF TRAFFIC. LAP PLATES AS SHOWN FOR BR 51S. REVERSE LAP FOR BR 51N.

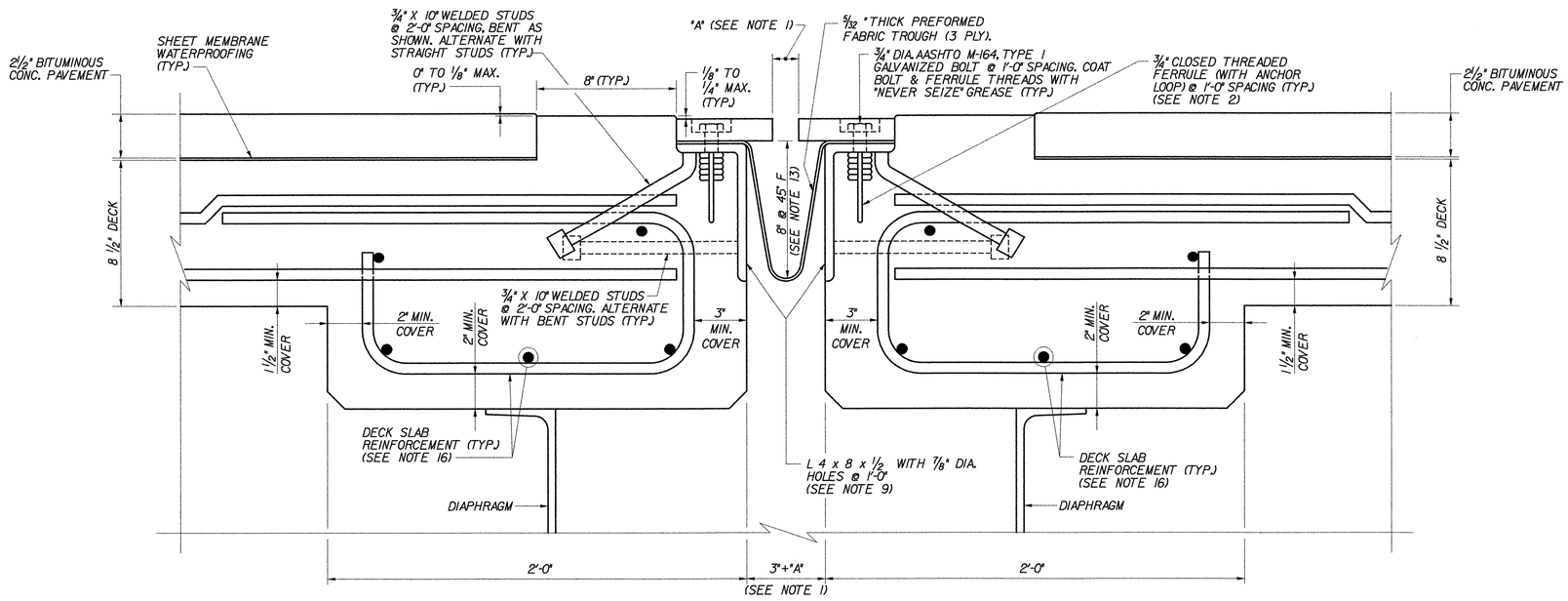
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

TYPICAL TYPE "H" PIER JOINT PLAN

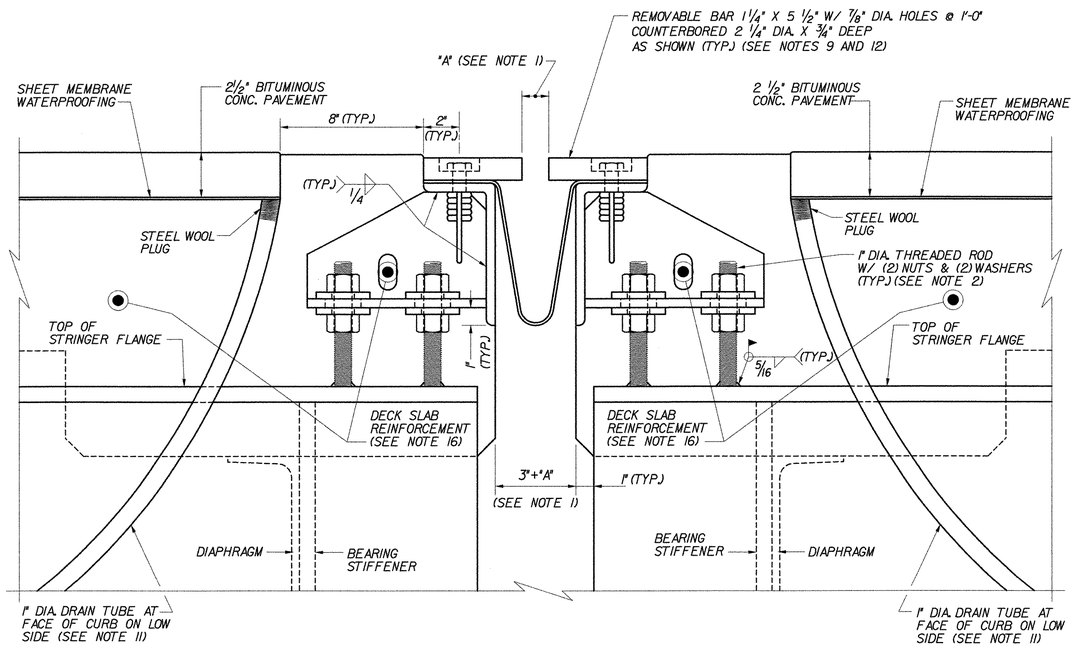
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. hjtpler1	Date 10/99
Bridge Sheet No. C-31	Sheet 31 of 307

TVGA ENGINEERING, SURVEYING, P.C.



TYPICAL SECTION BETWEEN STRINGERS
(NORMAL TO ℄ BEARING)

SCALE: 3" = 1'-0"



TYPICAL SECTION AT STRINGERS
(NORMAL TO ℄ BEARING)

SCALE: 3" = 1'-0"

NOTES:

1. FOR TABLE OF "A" DIMENSION, SEE TYPE "H" PIER JOINT DETAILS (2 OF 3), BRIDGE SHEET C-33.
2. FOR BRACKET, PLATE, WASHER AND ANCHOR FERRULE DETAILS, SEE TYPE "H" PIER JOINT DETAILS (2 OF 3), BRIDGE SHEET C-33.
3. DETAILS ON THIS SHEET ARE FOR ITEM 516.10, "BRIDGE EXPANSION JOINT".
4. PREFORMED FABRIC MATERIAL SHALL BE CONTINUOUS AND SHALL CONFORM TO SUBSECTION 707.07 OF THE SPECIFICATIONS.
5. BUTYL RUBBER TAPE SHALL CONFORM TO AASHTO SPECIFICATION M-198, TYPE B.
6. THE FINAL FINISH OF THE EXPANSION DEVICE SHALL BE COVERED DURING THE PLACING OF BRIDGE DECK CONCRETE.
7. ALL STEEL COMPONENTS SHALL BE AASHTO M270 GRADE 36, UNLESS OTHERWISE SPECIFIED. THREADED ROD AND ASSOCIATED NUTS AND WASHERS SHALL CONFORM TO SUBSECTION 714.08 OF THE SPECIFICATIONS. ALL STEEL COMPONENTS AND HARDWARE SHALL BE GALVANIZED OR METALIZED PER SUBSECTION 506.15 OF THE SPECIFICATIONS, UNLESS OTHERWISE SPECIFIED.
8. PAYMENT FOR ITEM 516.10, "BRIDGE EXPANSION JOINT" SHALL INCLUDE THE FABRICATION AND ERECTION OF THE COMPLETE JOINT ASSEMBLY INCLUDING ALL STEEL PLATES, BRACKETS, ANGLES, WELDED STUDS OR RODS, PREFORMED FABRIC DRAIN TROUGH MATERIAL AND PLASTIC DRAIN TUBES, BUTYL RUBBER TAPE AND ANY OTHER MISCELLANEOUS MATERIAL NECESSARY TO INSTALL JOINT.
9. THE 4 x 8 x ½ ANGLES SHALL BE FURNISHED AS ONE CONTINUOUS PIECE. THE 1¼" X 5 ½" BARS EACH SIDE OF THE JOINT SHALL BE PROVIDED IN TWO EQUAL LENGTHS.
10. COAT CONCRETE CONTACT SURFACES WITH EPOXY BONDING COMPOUND MEETING THE REQUIREMENTS OF SUBSECTION 719.02 OF THE SPECIFICATIONS. PAYMENT SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 516.10, "BRIDGE EXPANSION JOINT".
11. A 1" DIAMETER PLASTIC DRAIN TUBE SHALL BE INSTALLED AS SHOWN AT THE FACE OF CURB. THE UPPER END IS TO BE PLUGGED WITH STEEL WOOL AND THE LOWER END IS TO EXTEND BELOW THE BOTTOM OF THE ADJACENT STRINGER. THE DRAIN TUBES SHALL BE FASTENED TO THE STRINGERS USING A METHOD APPROVED BY THE ENGINEER.
12. FILL COUNTERBORED HOLES WITH HOT POURED JOINT SEALER AFTER BOLT INSTALLATION. COSTS FOR THE WORK SHALL BE INCIDENTAL TO ITEM 516.10.
13. FABRIC TROUGHS SHALL BE INSTALLED SO THAT MINIMUM SLOPE IS 1% FOR POSITIVE DRAINAGE.
14. FABRIC TROUGH SHALL BE THOROUGHLY CLEANED AND FLUSHED AFTER PAVING OPERATION.
15. EXPANSION JOINTS SHALL BE SHOP ASSEMBLED AND SHIPPED AS ONE UNIT.
16. FOR DECK SLAB REINFORCEMENT DETAILS, SEE THE TRANSVERSE SECTION AND DECK REINFORCEMENT PLANS FOR EACH BRIDGE.

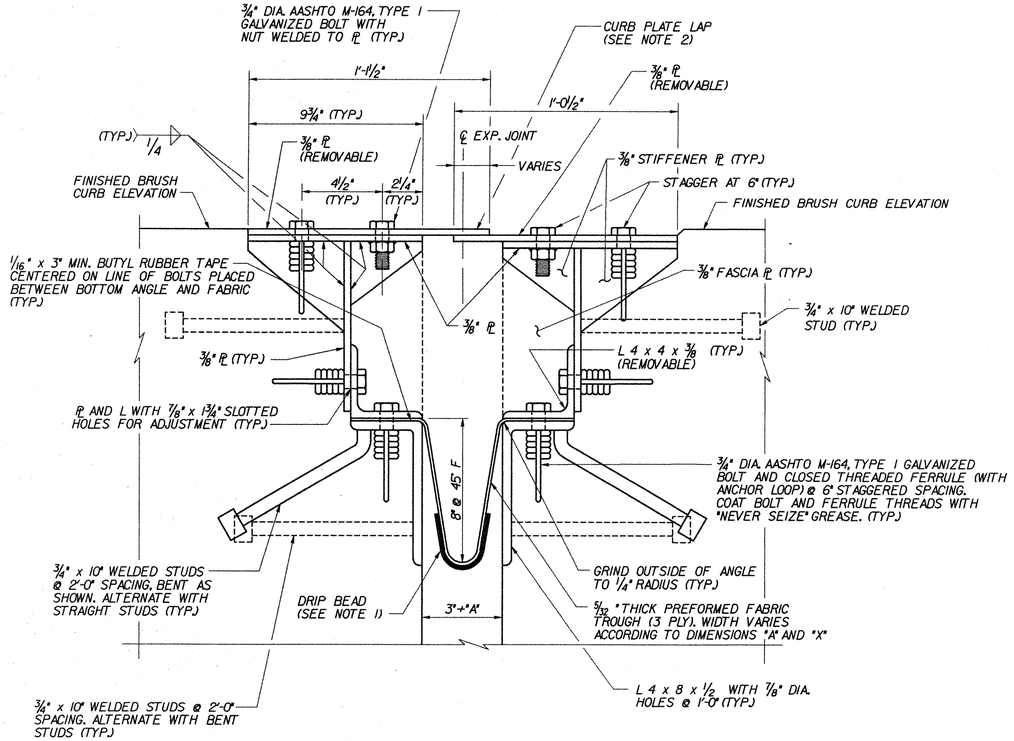
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

TYPE "H" PIER JOINT DETAILS (1 OF 3)

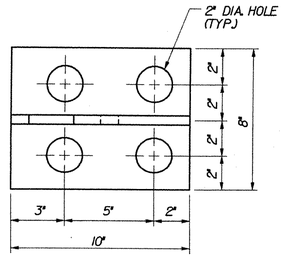
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. hjtpler2	Date 10/99
Bridge Sheet No. C-32	Sheet 32 of 307

TVGA ENGINEERING, SURVEYING, P.C.



TYPICAL SECTION AT ARMORED BRUSH CURB
(NORMAL TO ℄ BEARING)

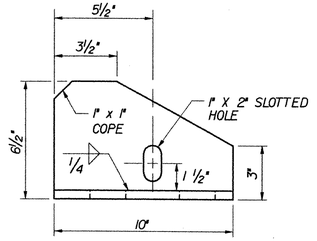
SCALE: 3" = 1'-0"



BRACKET PLAN

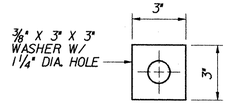
SCALE: 3" = 1'- 0"

NOTE: ALL PLATES 1/2" THICK



BRACKET ELEVATION

SCALE: 3" = 1'- 0"

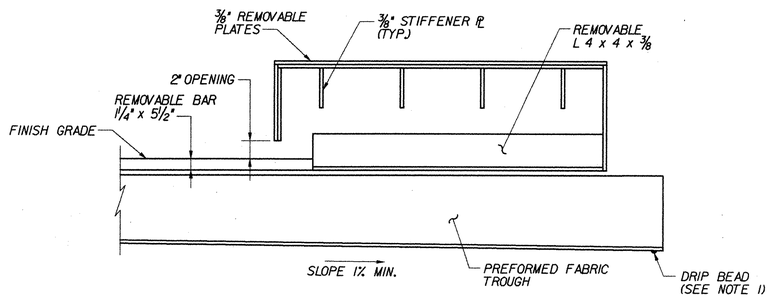


WASHER FOR BRACKET

SCALE: 3" = 1'- 0"

ANCHOR FERRULE DETAIL

SCALE: 3" = 1'- 0"



LONGITUDINAL SECTION THROUGH ARMORED BRUSH CURB

N.T.S.

BRIDGE	LOCATION	"A" DIMENSION							
		0° F	15° F	30° F	45° F	60° F	75° F	90° F	105° F
51N	PIER 1	1 11/16"	1 1/2"	1 3/8"	1 1/4"	1 1/16"	0 15/16"	0 13/16"	0 5/8"
51S	PIER 1	2 1/2"	2 1/4"	2"	1 3/4"	1 1/2"	1 1/4"	1"	0 3/4"

NOTES:

1. A DRIP BEAD OF 1/4" x 7" STRIP OF PREFORMED MATERIAL SHALL BE CEMENTED TO THE BOTTOM OF THE FABRIC TROUGH USING AN ADHESIVE APPROVED BY THE MANUFACTURER. THE DRIP BEAD SHALL BE APPLIED 1" FROM THE DOWNSPOUT END OF THE TROUGH.
2. LAP CURB PLATES IN DIRECTION OF TRAFFIC. SEE NOTE 5, BRIDGE SHEET C-31.

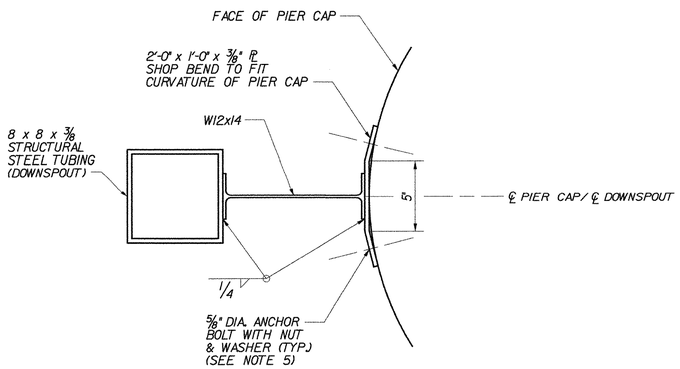
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

TYPE "H" PIER JOINT DETAILS (2 OF 3)

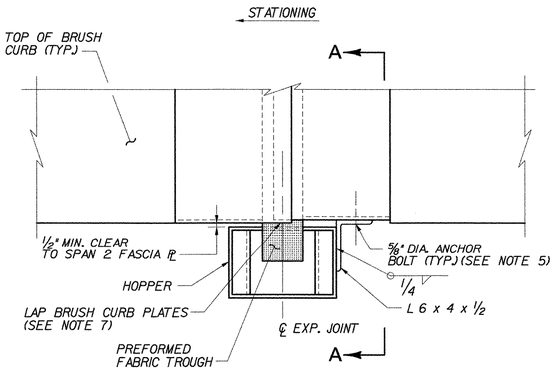
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. hjtpier3	Date 10/99
Bridge Sheet No. C-33	Sheet 33 of 307

TVGA ENGINEERING, SURVEYING, P.C.



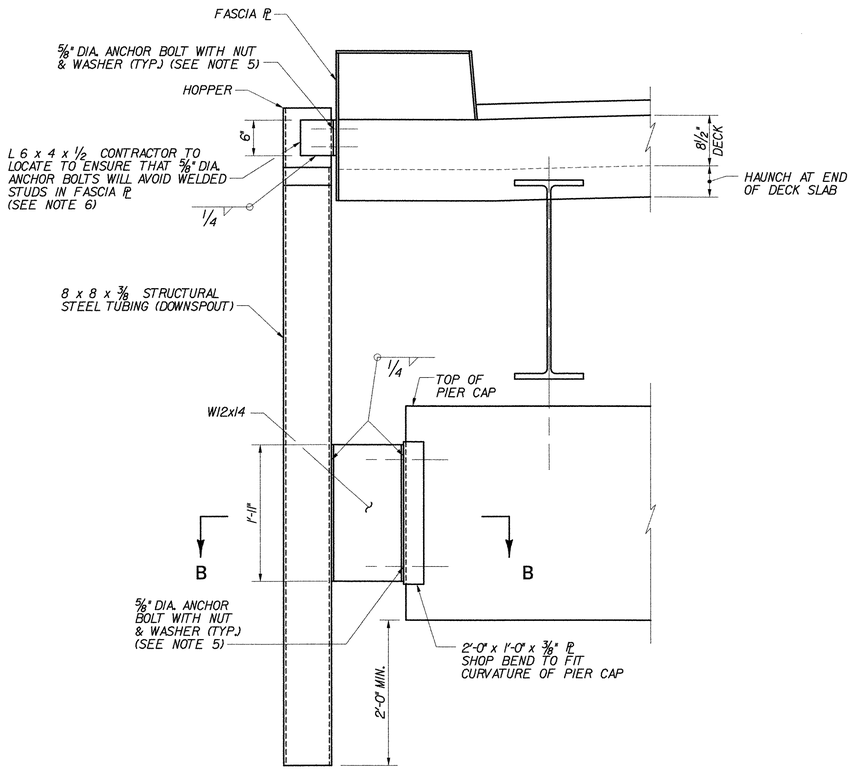
SECTION B–B

N.T.S.



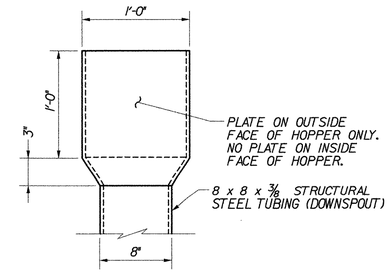
HOPPER LOCATION PLAN

SCALE: 1½" = 1'-0"



SECTION A–A

N.T.S.



HOPPER DETAIL

SCALE: 1½" = 1'-0"

NOTES:

1. WORK THIS SHEET WITH TYPICAL TYPE "H" PIER JOINT PLAN, BRIDGE SHEET C-31, TYPE "H" PIER JOINT DETAILS (1 OF 3), BRIDGE SHEET C-32, AND TYPICAL TYPE "H" PIER JOINT DETAILS (2 OF 3), BRIDGE SHEET C-33.

2. HOPPERS AND ALL COMPONENTS SHALL BE AASHTO M270 GRADE 36 STEEL. STRUCTURAL TUBING (DOWNSPOUT) SHALL BE ASTM A-500 OR A-501 STEEL. ALL STEEL SHALL BE GALVANIZED OR METALIZED IN ACCORDANCE WITH SECTION 506.15 OF THE SPECIFICATIONS. ALL HOPPER AND DOWNSPOUT WORK SHALL BE PAID FOR UNDER ITEM 506.60, "STRUCTURAL STEEL".

3. HOPPERS SHALL BE FABRICATED FROM 3/8" STEEL PLATE. THE FABRICATION WELDS SHALL BE 1/4" FILLET WELDS ON THE INSIDE OF THE HOPPER AND SHALL BE FULL LENGTH TO ENSURE A WATERTIGHT CONTAINER.

4. THE HOPPERS SHALL BE PLACED TO LEAVE A ONE INCH VERTICAL GAP BETWEEN THE BOTTOM OF THE TROUGH AND THE HOPPER. THE TROUGH SHOULD BE ENCLOSED AS MUCH AS POSSIBLE BY THE HOPPER BUT SHOULD NOT BE BENT OR BUCKLED TO RESTRICT THE FLOW OF WATER.

5. ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO SUBSECTION 714.08 OF THE SPECIFICATIONS, AND BE GALVANIZED IN ACCORDANCE WITH SUBSECTION 506.15. ANCHOR BOLTS SHALL BE DRILLED AND EPOXY GROUTED 10" MINIMUM INTO THE CONCRETE. DRILL AND EPOXY GROUT SYSTEM SHALL BE:
   - DAYTON SUPERIOR SURE-ANCHOR J-51 SYSTEM
   - HILTI, INC. HIT HY-150 SYSTEM
   - UNITEX PRO-POXY 300 FAST SYSTEM

   OR EQUIVALENT APPROVED BY VAOT MATERIALS SECTION. ALL COSTS FOR DRILLING AND EPOXY GROUTING ANCHOR BOLTS SHALL BE INCIDENTAL TO ITEM 506.60, "STRUCTURAL STEEL".

6. WELDED STUDS ON FASCIA PLATE NOT SHOWN FOR CLARITY. FOR APPROXIMATE PLACEMENT OF WELDED STUDS, SEE END OF DECK SLAB IN ELEVATION A-A ON TYPE "H" ABUTMENT JOINT DETAILS (3 OF 3), BRIDGE SHEET C-30.

7. LAP BRUSH CURB PLATES IN DIRECTION OF TRAFFIC. LAP PLATES AS SHOWN FOR BR 51S. REVERSE LAP FOR BR 51N.

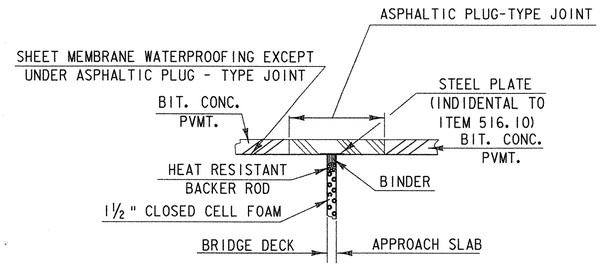
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
	Log Sta.
Highway No. I-89	Surv. Sta.

TYPE "H" PIER JOINT DETAILS (3 OF 3)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By Date J.P. HALSTEAD 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. hjtpler4	Date 10/99
Bridge Sheet No. C-34	Sheet 34 of 307

TVGA ENGINEERING, SURVEYING, P.C.



WIDE BAND PAVEMENT JOINT

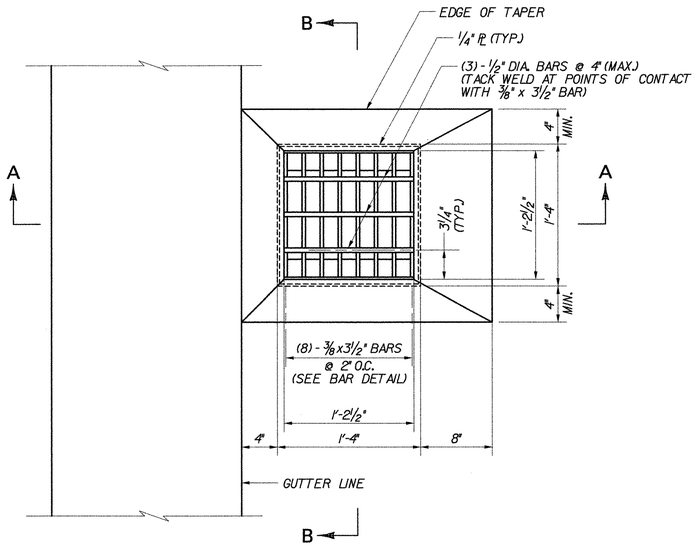
NOTE: WIDE BAND PAVEMENT JOINT SHALL BE PAID FOR UNDER THE ITEM 516.10 "BRIDGE EXPANSION JOINT".

SCALE 1" = 1'-0

1 9 6 3 0 1 2

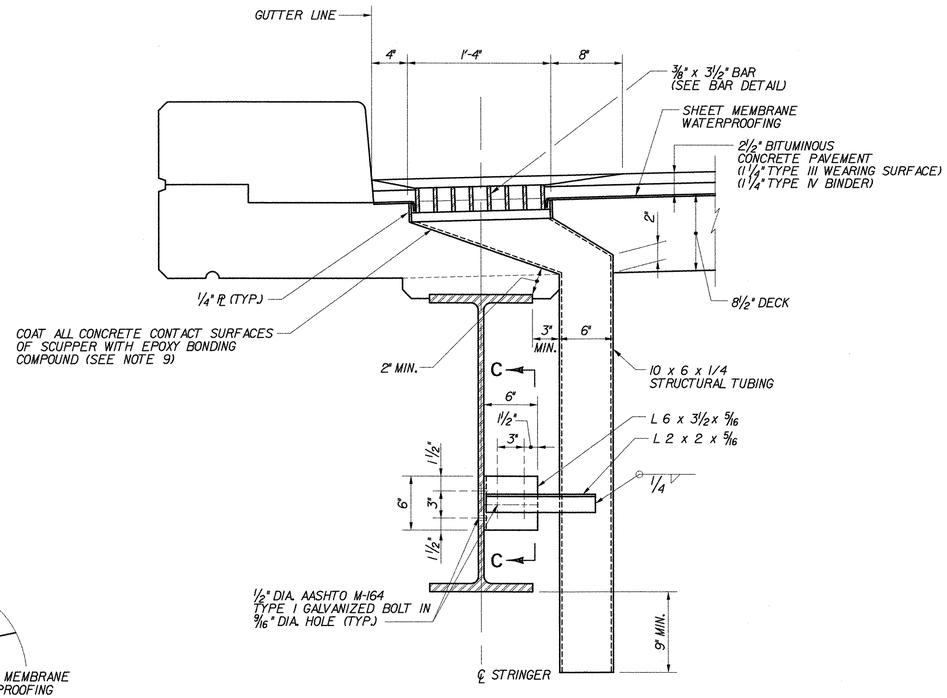
THIS JOINT TO BE USED ON ABUTMENT 1 NORTHBOUND AND SOUTHBOUND.

PROJECT NAME: BOLTON	
PROJECT NUMBER: IM 089-2(29)	
FILE NAME: /99a268/str/sa268jt.dgn	PLOT DATE: 02-AUG-2004
PROJECT LEADER: SHERWARD FARNSWORTH	DRAWN BY: VAOT - PM
DESIGNED BY: VAOT - PM	CHECKED BY: VAOT - PM
EXPANSION JOINT - ASPHALT PLUG	SHEET 35 OF 307



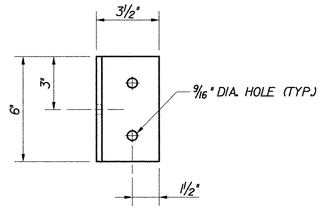
PLAN

SCALE: 1 1/2"=1'-0"



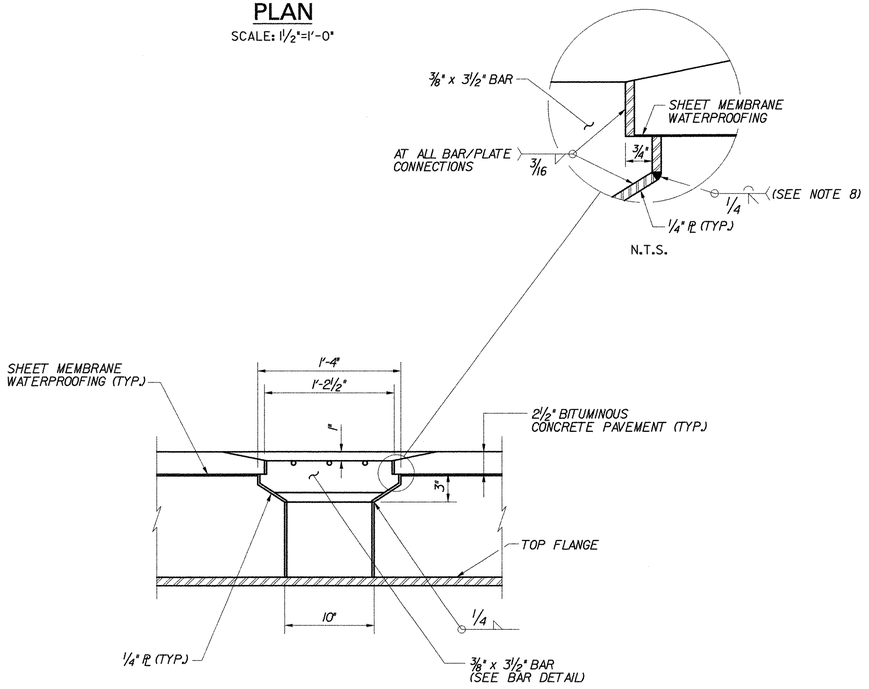
SECTION A–A

SCALE: 1 1/2"=1'-0"



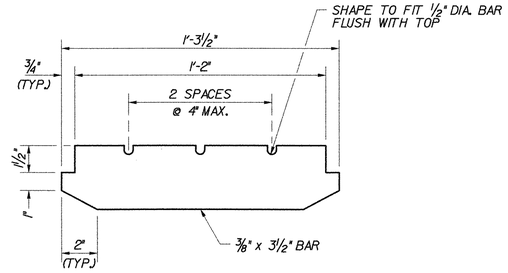
SECTION C–C

SCALE: 3"=1'-0"



SECTION B–B

SCALE: 1 1/2"=1'-0"



BAR DETAIL

SCALE: 3"=1'-0"

NOTES:

1. FOR LOCATION OF SCUPPERS, SEE FRAMING PLAN FOR EACH BRIDGE.
2. STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A-500 OR A-501.
3. ALL PLATES, BARS AND ANGLES SHALL CONFORM TO AASHTO M 270, GRADE 36. ALL BOLTS, NUTS AND WASHERS SHALL CONFORM TO AASHTO M-164, TYPE I.
4. SCUPPERS, INCLUDING COMPONENTS REQUIRED FOR ATTACHMENT TO SUPERSTRUCTURE, SHALL BE GALVANIZED OR METALIZED AFTER FABRICATION, IN ACCORDANCE WITH SUBSECTION 506.15 OF THE SPECIFICATIONS.
5. TOP SURFACE OF SCUPPERS MUST BE SLOPED TO MATCH ROADWAY CROSS SLOPE AND GRADE.
6. THE BAR AND GRATE SECTION MAY BE PREFABRICATED PROVIDING THAT THE GEOMETRY AND SECTION PROPERTIES ARE EQUIVALENT TO THE DETAILS SHOWN.
7. AT BR 43N&S, THE COST OF SCUPPERS SHALL BE PAID UNDER ITEM 506.50, "STRUCTURAL STEEL (ROLLED BEAM)". AT ALL OTHER LOCATIONS, THE COST SHALL BE PAID UNDER ITEM 506.55, "STRUCTURAL STEEL (PLATE GIRDER)".
8. SCUPPER MAY BE FABRICATED BY BENDING PLATES AT THESE JOINTS IN LIEU OF A WELDED CONNECTION. INSIDE RADII SHALL BE NOT GREATER THAN 1/2". GEOMETRICS OF BENT SECTION SHALL CONFORM TO 1/16" FABRICATION TOLERANCE.
9. EPOXY BONDING COMPOUND SHALL CONFORM TO THE REQUIREMENTS OF SECTION 719 OF THE SPECIFICATIONS. PAYMENT FOR EPOXY BONDING COMPOUND SHALL BE INCIDENTAL TO ITEM 501.221, "CONCRETE CLASS A QC/QA".

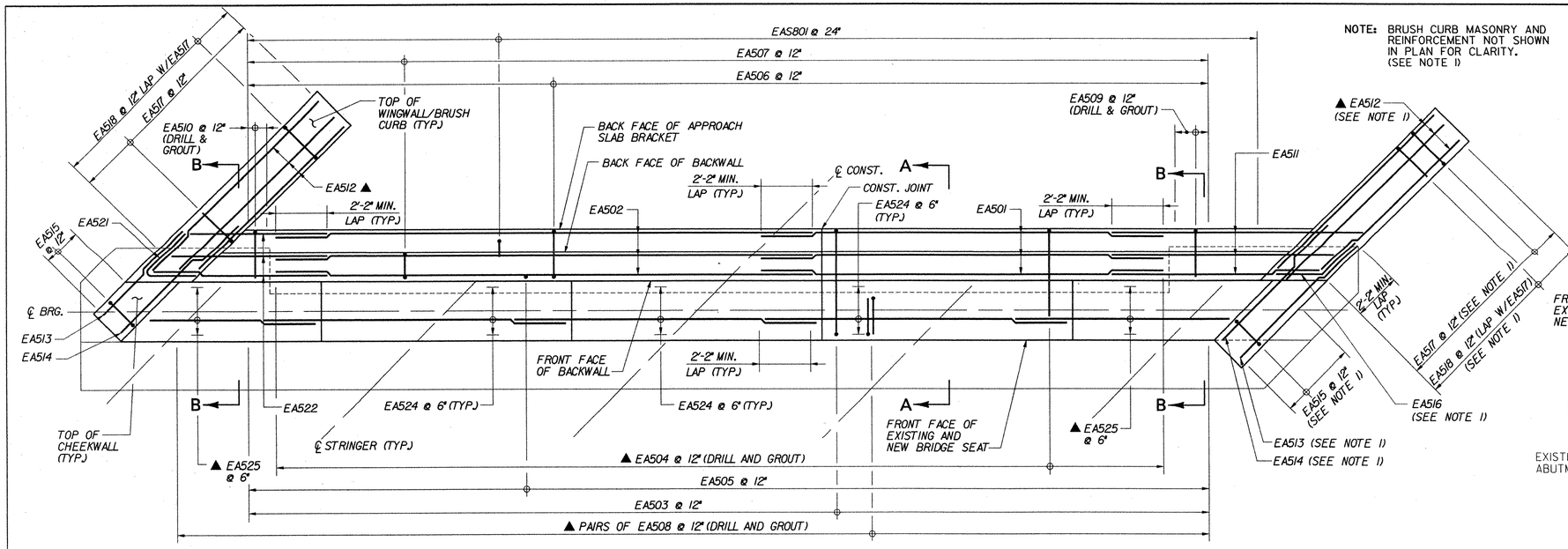
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

TYPICAL SCUPPER DETAILS

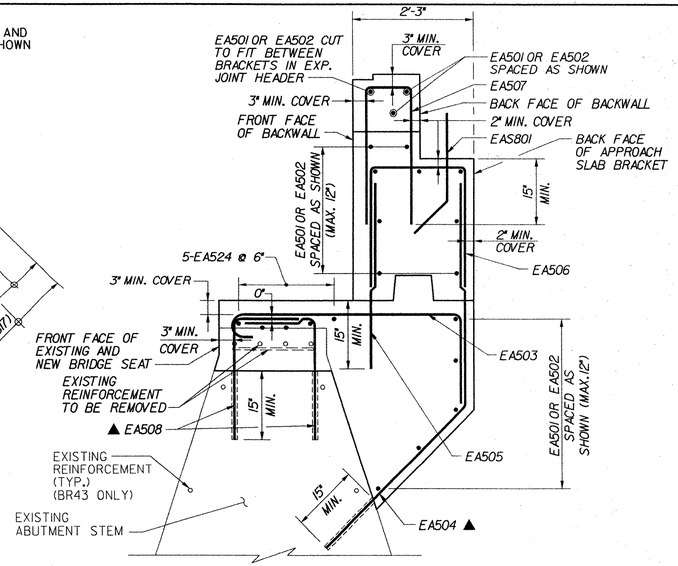
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. scup_det	Date 10/99
Bridge Sheet No. C-39	Sheet 39 of 307

TVGA ENGINEERING, SURVEYING, P.C.



PLAN
N.T.S.

NOTE: BRUSH CURB MASONRY AND REINFORCEMENT NOT SHOWN IN PLAN FOR CLARITY. (SEE NOTE 1)

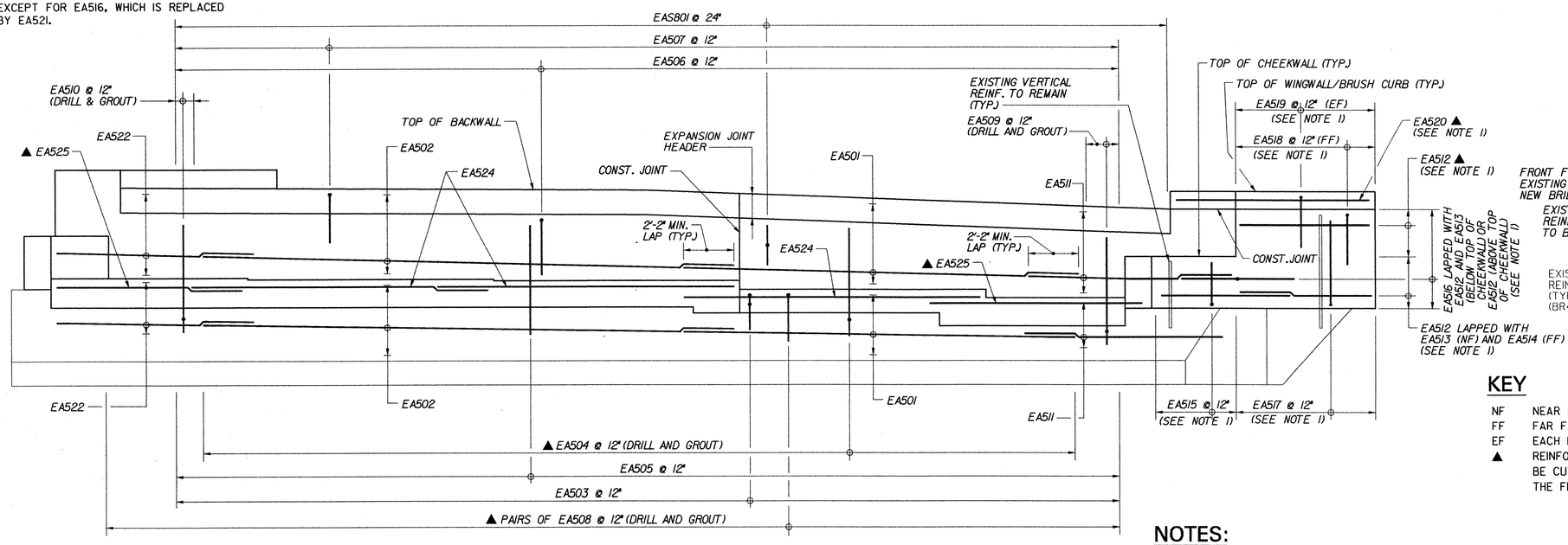


SECTION A–A
N.T.S.

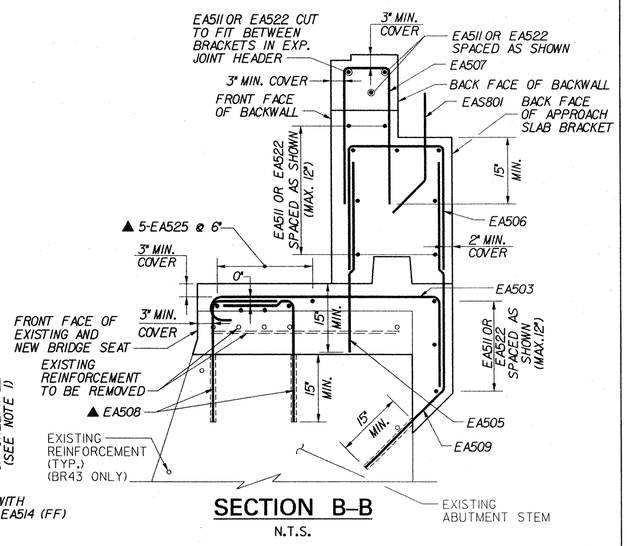
REINFORCEMENT LAYOUT SHOWN IS INTENDED AS GUIDANCE ONLY. CONTRACTOR MUST MAKE ADJUSTMENTS IN ORDER TO FIT ACTUAL FIELD CONDITIONS, AS APPROVED BY THE ENGINEER, AT NO ADDITIONAL EXPENSE TO THE CONTRACT.

NOTE: ACUTE WINGWALL REINFORCEMENT NOT SHOWN FOR CLARITY. LAYOUT SIMILAR TO OBTUSE WINGWALL, EXCEPT FOR EA516, WHICH IS REPLACED BY EA521.

CONSTRUCTION JOINT LOCATED AT STEP IN BRIDGE SEAT. LOCATION SHALL BE REVISED AS DIRECTED BY THE RESIDENT ENGINEER AS REQUIRED TO MATCH ANY CONSTRUCTION JOINT IN THE EXISTING ABUTMENT STEM. REQUIRED REVISIONS TO REINFORCING STEEL LENGTHS WILL BE MADE BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE CONTRACT.



ELEVATION
N.T.S.



SECTION B–B
N.T.S.

KEY

NF	NEAR FACE
FF	FAR FACE
EF	EACH FACE
▲	REINFORCEMENT TO BE CUT TO FIT IN THE FIELD

NOTES:

1. FOR ADDITIONAL WINGWALL AND BRUSH CURB DETAILS, SEE TYPICAL WINGWALL DETAILS, BRIDGE SHEETS C-43 AND C-44.
2. CONCRETE LIMITS AND DIMENSIONS ARE SHOWN IN ABUTMENT MASONRY PLANS FOR EACH BRIDGE.

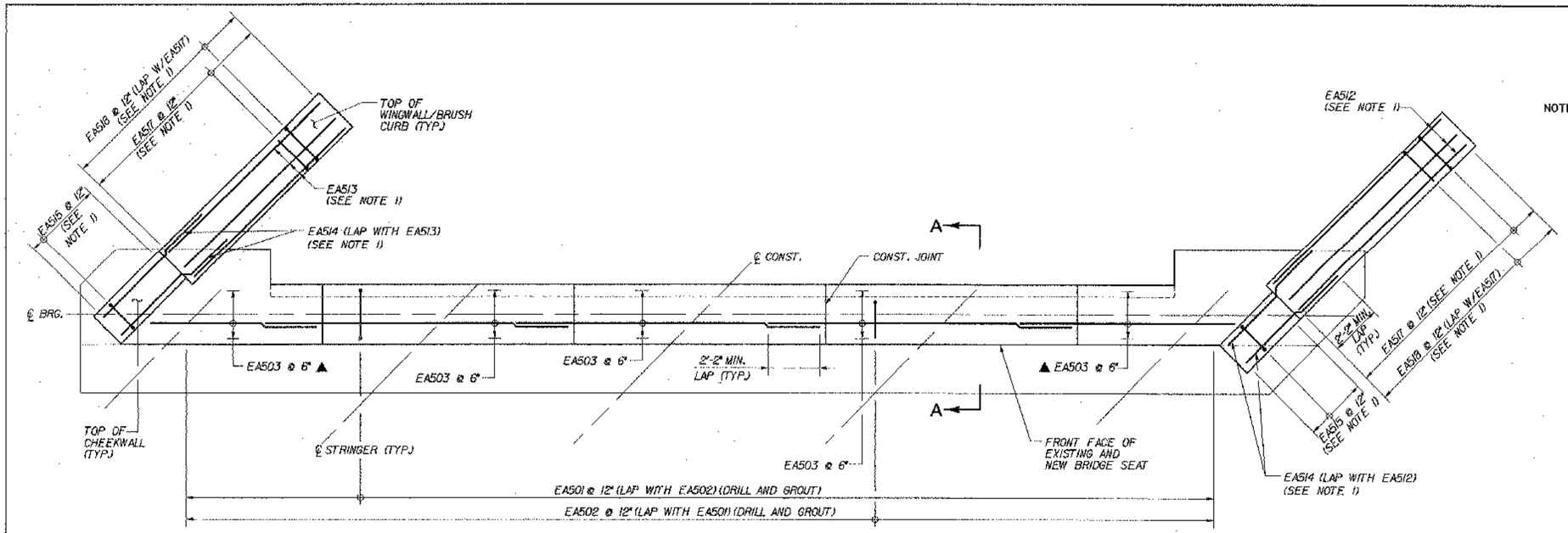
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

TYPICAL EXPANSION ABUTMENT REINFORCEMENT

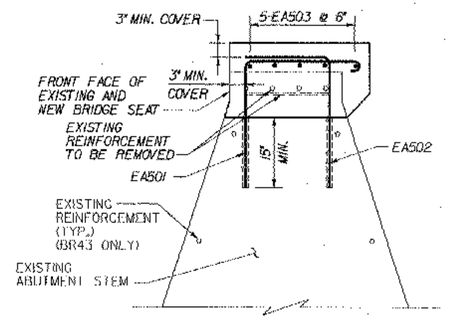
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. abrinf_e	Date 10/99
Bridge Sheet No. C-40	Sheet 40 of 307

TVGA ENGINEERING, SURVEYING, P.C.



PLAN
N.T.S.

NOTE: BRUSH CURB MASONRY AND REINFORCEMENT NOT SHOWN IN PLAN FOR CLARITY. (SEE NOTE 1)



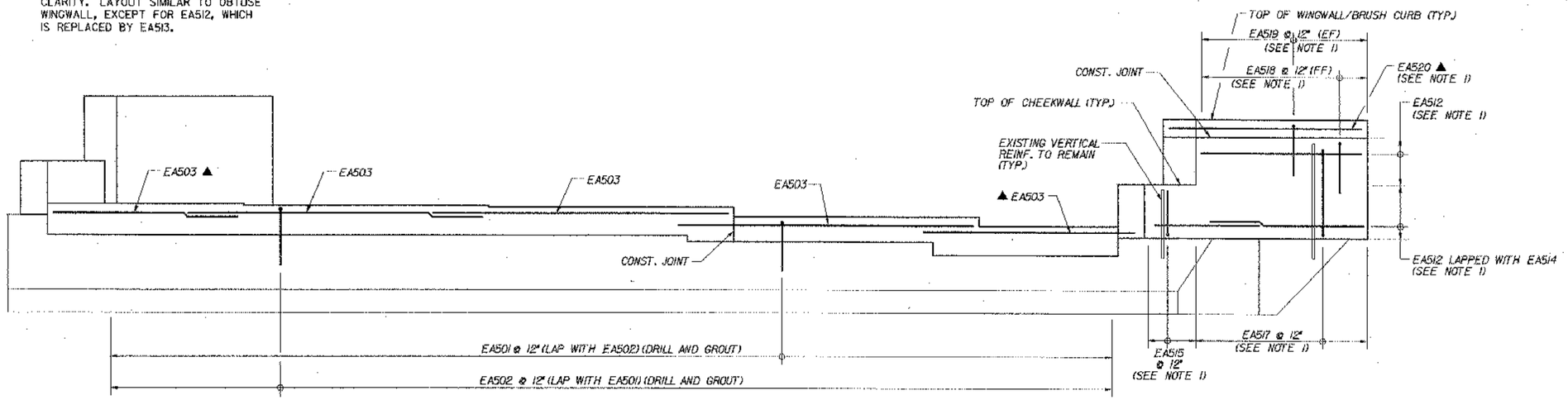
SECTION A-A
N.T.S.

REINFORCEMENT LAYOUT SHOWN IS INTENDED AS GUIDANCE ONLY. CONTRACTOR MUST MAKE ADJUSTMENTS IN ORDER TO FIT ACTUAL FIELD CONDITIONS, AS APPROVED BY THE ENGINEER, AT NO ADDITIONAL EXPENSE TO THE CONTRACT.

CONSTRUCTION JOINT LOCATED AT STEP IN BRIDGE SEAT. LOCATION SHALL BE REVISED AS DIRECTED BY THE RESIDENT ENGINEER AS REQUIRED TO MATCH ANY CONSTRUCTION JOINT IN THE EXISTING ABUTMENT STEM. REQUIRED REVISIONS TO REINFORCING STEEL LENGTHS WILL BE MADE BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE CONTRACT.

NO CONSTRUCTION JOINT EXISTING.
DID NOT PUT ONE IN NEW ABUTMENT CAP

NOTE: ACUTE WINGWALL REINFORCEMENT NOT SHOWN IN ELEVATION FOR CLARITY. LAYOUT SIMILAR TO OBTUSE WINGWALL, EXCEPT FOR EA512, WHICH IS REPLACED BY EA513.



ELEVATION
N.T.S.

KEY

NF	NEAR FACE
FF	FAR FACE
EF	EACH FACE
▲	REINFORCEMENT TO BE CUT TO FIT IN THE FIELD

NOTES:

1. FOR ADDITIONAL WINGWALL AND BRUSH CURB DETAILS, SEE TYPICAL WINGWALL DETAILS, BRIDGE SHEETS C-43 AND C-44.
2. CONCRETE LIMITS AND DIMENSIONS ARE SHOWN IN ABUTMENT MASONRY PLANS FOR EACH BRIDGE.

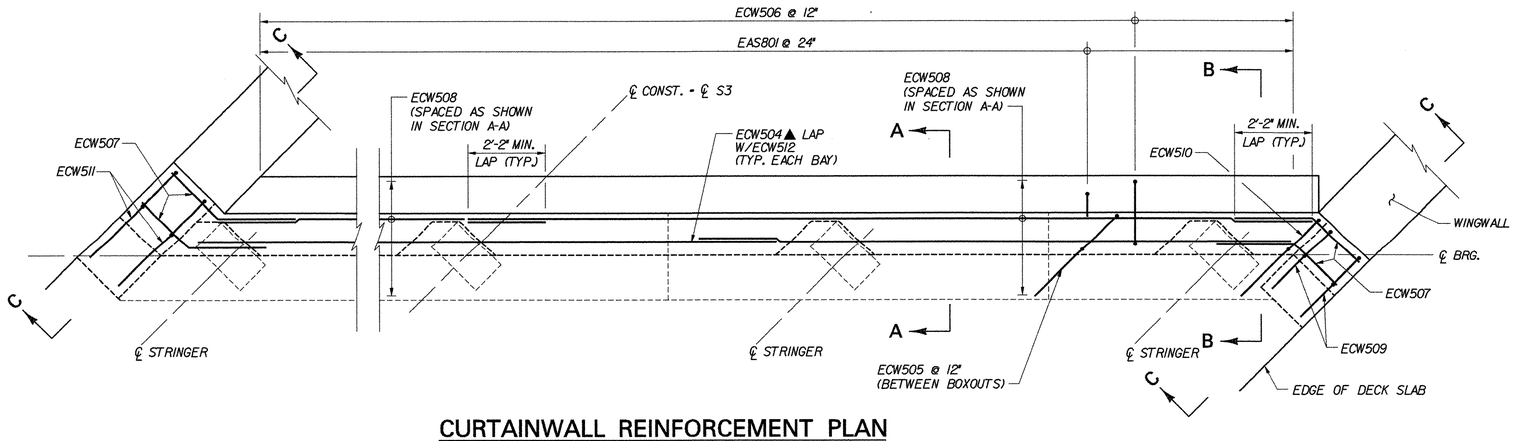
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta.
	Surv. Sta.

TYPICAL FIXED ABUTMENT
REINFORCEMENT

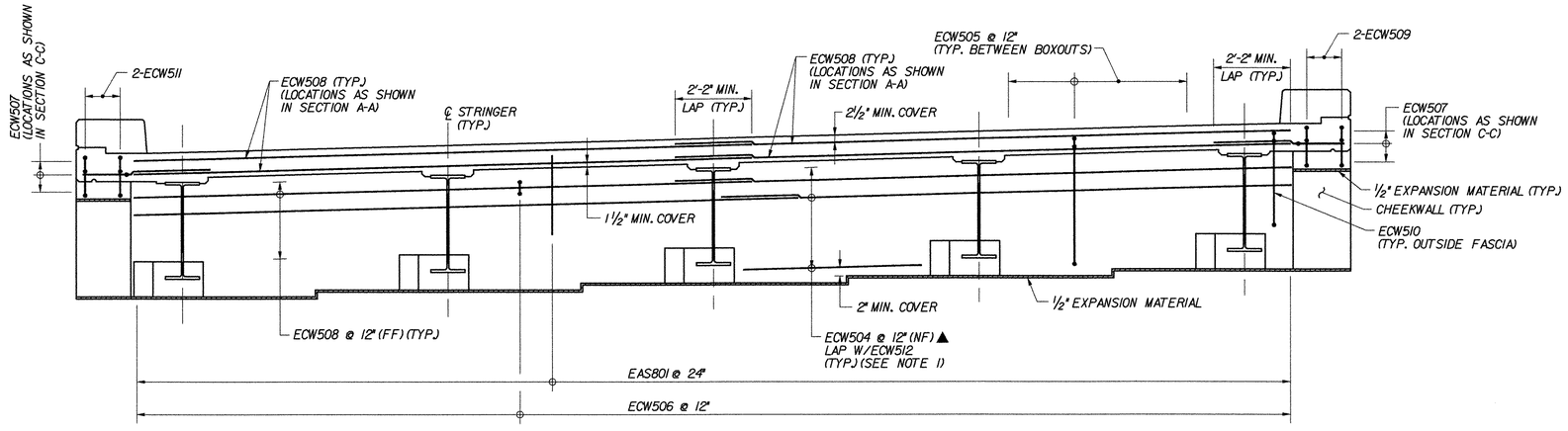
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. abrinf_f	Date 10/99
Bridge Sheet No. C-41	Sheet 41 of 307

TVGA ENGINEERING, SURVEYING, P.C.



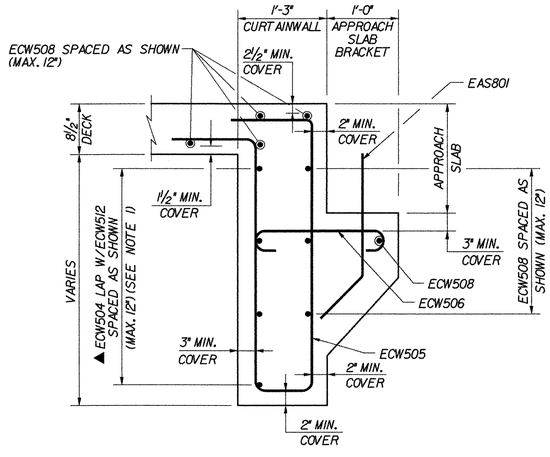
CURTAINWALL REINFORCEMENT PLAN

N.T.S.



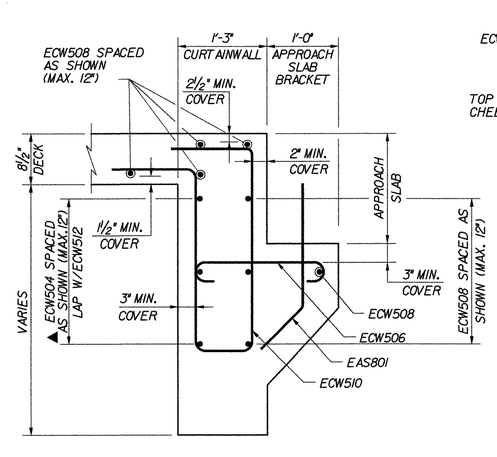
CURTAINWALL ELEVATION

N.T.S.



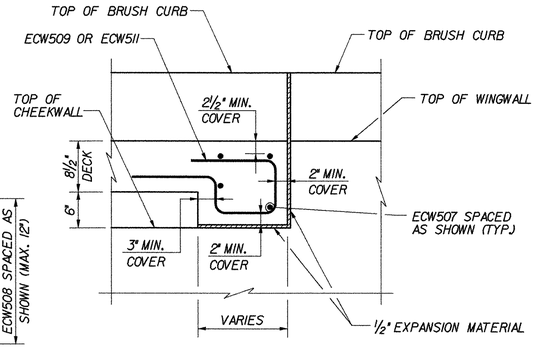
SECTION A–A

N.T.S.



SECTION B–B

N.T.S.

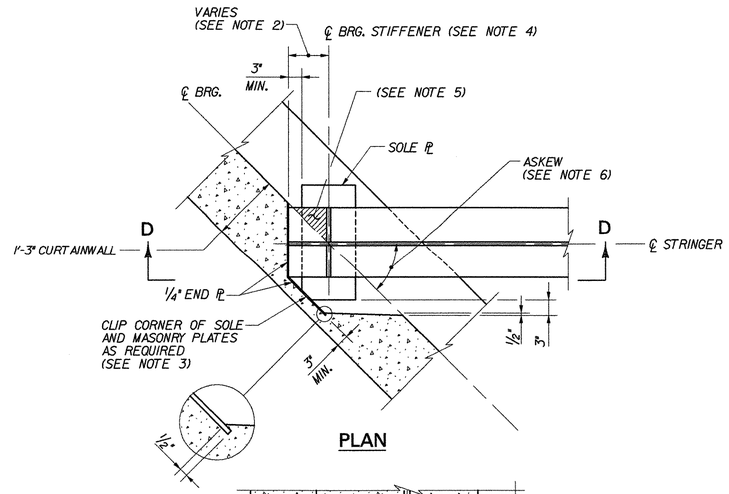


SECTION C–C

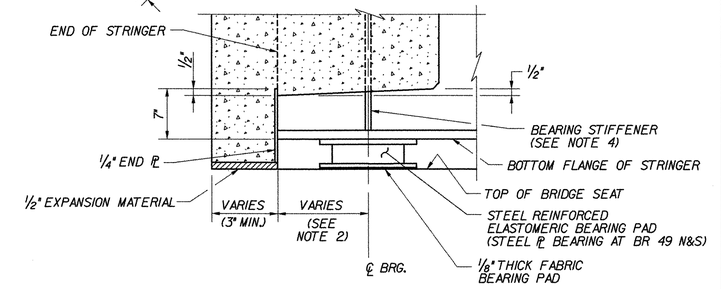
N.T.S.

KEY

NF	NEAR FACE
FF	FAR FACE
EF	EACH FACE
▲	REINFORCEMENT TO BE CUT TO FIT IN THE FIELD



PLAN



SECTION D–D

STRINGER BOXOUT DETAILS

N.T.S.

NOTES:

1. CUT BOTTOM ECW504 BARS TO FIT BETWEEN BOXOUTS.
2. THE DISTANCE FROM ℄ BEARING TO END OF STRINGER VARIES AT EACH BRIDGE. FOR THE DIMENSION AT BRIDGES 43, 48, 50 AND 51, SEE THE STRINGER ELEVATION FOR EACH BRIDGE. FOR THE DIMENSION AT BRIDGE 49, SEE TRANSVERSE SECTION (49N&S), BRIDGE SHEET BR49-4.
3. SOLE AND MASONRY PLATES MAY REQUIRE ONE CORNER TO BE CLIPPED TO CLEAR CURTAINWALL. FOR DETAILS AND DIMENSIONS OF THE CLIP, SEE FIXED BEARING DETAILS, BRIDGE SHEET C-21.
4. BEARING STIFFENER REQUIRED FOR PLATE GIRDER BRIDGES ONLY.
5. WHEN A BEARING STIFFENER IS REQUIRED, THE SHADED AREA (ABOVE THE BOXOUT) SHALL BE CONCRETE POURED CONTINUOUSLY WITH THE CURTAINWALL.
6. THE ASKEW ANGLE VARIES AT EACH SUBSTRUCTURE LOCATION. SEE THE ABUTMENT MASONRY DRAWINGS FOR EACH BRIDGE.

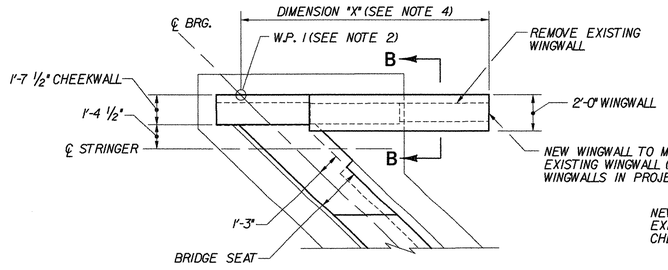
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

TYPICAL CURTAINWALL DETAILS

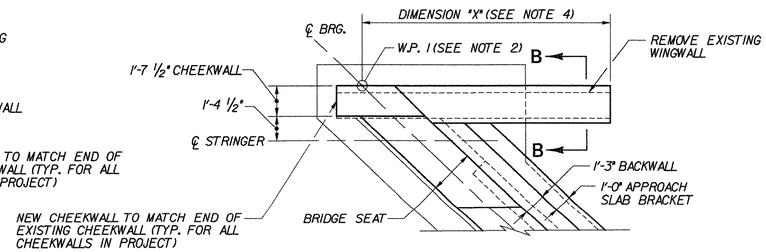
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. curtain	Date 10/99
Bridge Sheet No. C-42	Sheet 42 of 307

TVGA ENGINEERING, SURVEYING, P.C.



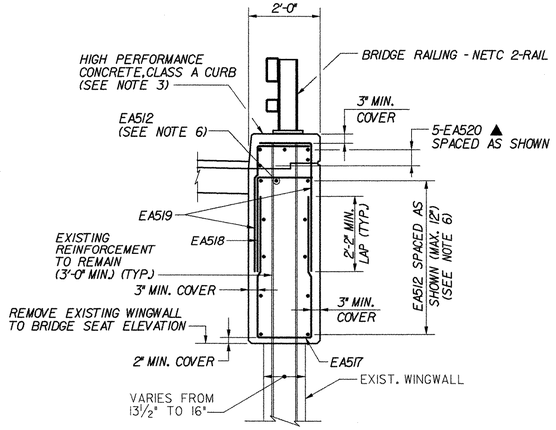
WINGWALL PLAN AT ACUTE CORNER OF FIXED ABUTMENTS

SCALE: 1/4"=1'-0"



WINGWALL PLAN AT ACUTE CORNER OF EXPANSION ABUTMENTS

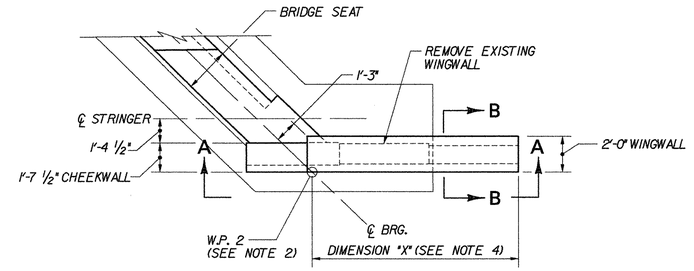
SCALE: 1/4"=1'-0"



SECTION B–B

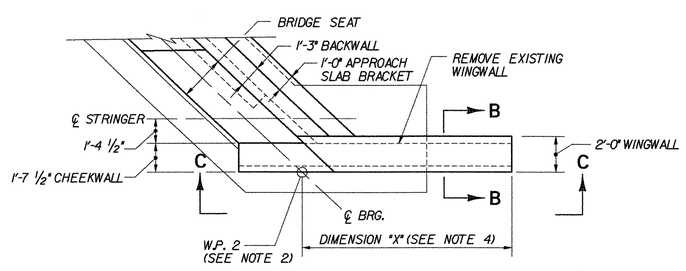
(ALL WINGWALLS SIMILAR)

SCALE: 1/2"=1'-0"



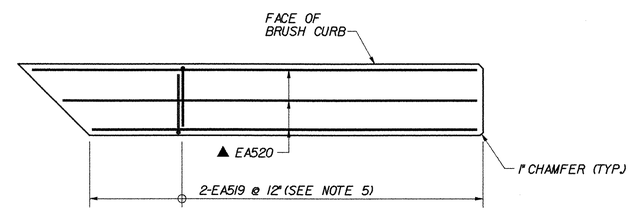
WINGWALL PLAN AT OBTUSE CORNER OF FIXED ABUTMENTS

SCALE: 1/4"=1'-0"



WINGWALL PLAN AT OBTUSE CORNER OF EXPANSION ABUTMENTS

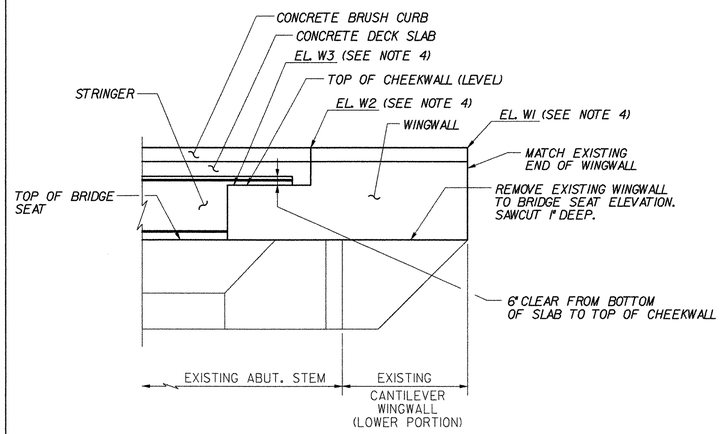
SCALE: 1/4"=1'-0"



BRUSH CURB END DETAIL

(CURB AT EXPANSION ABUT. SHOWN; FIXED SIMILAR)

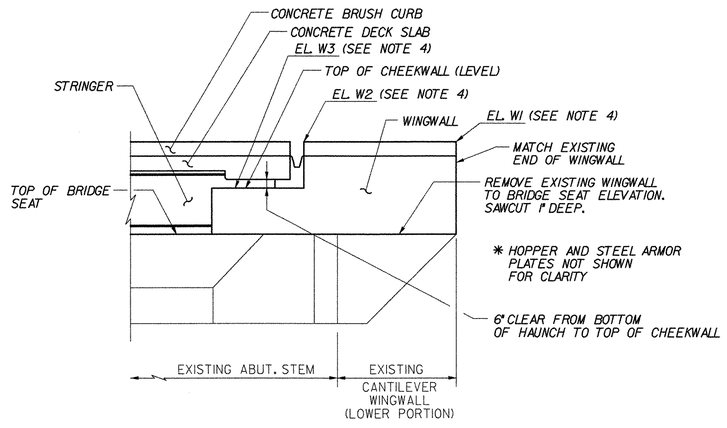
SCALE: 1/2"=1'-0"



ELEVATION A–A (FIXED ABUTMENTS)

(ACUTE CORNER SIMILAR)

SCALE: 1/4"=1'-0"



ELEVATION C–C (EXP. ABUTMENTS)

(ACUTE CORNER SIMILAR)

SCALE: 1/4"=1'-0"

NOTES:

1. DECK SLAB NOT SHOWN IN WINGWALL PLANS FOR CLARITY.
2. WORKING POINT (W.P.) 1 AND 2 LOCATIONS ARE SHOWN ON ABUTMENT MASONRY PLANS FOR EACH BRIDGE. FROM THE WORKING POINTS, THE CONTRACTOR MAY CONSTRUCT WINGWALLS CONCENTRIC TO THE CENTERLINE OF CONSTRUCTION, OR ON AN APPROXIMATE TANGENT LINE, AS APPROVED BY THE ENGINEER.
3. FOR DIMENSIONS OF CONCRETE CURB, SEE FASCIA DETAIL ON THE TRANSVERSE SECTION FOR EACH BRIDGE.
4. FOR TABLE OF DIMENSION "X" AND WINGWALL AND BRUSH CURB ELEVATIONS, SEE TYPICAL WINGWALL DETAILS (2 OF 2), BRIDGE SHEET C-44.
5. ADDITIONAL EA519 BARS WILL BE REQUIRED BELOW THE BRIDGE RAIL POSTS. FOR DETAILS OF THE REQUIRED STIRRUP SPACING, SEE NETC 2-RAIL STANDARD SHEET C-47. FOR LOCATIONS OF THE BRIDGE RAIL POSTS, SEE THE CURB AND RAIL LAYOUT PLANS FOR EACH BRIDGE.
6. AT FIXED ABUTMENTS, LONGITUDINAL REINFORCEMENT IN THE WINGWALL MAY BE EITHER EA512 OR EA513, AS SHOWN IN TYPICAL FIXED ABUTMENT REINFORCEMENT, BRIDGE SHEET C-41.

KEY

NF	NEAR FACE
FF	FAR FACE
EF	EACH FACE
▲	REINFORCEMENT TO BE CUT TO FIT IN THE FIELD

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta.
	Surv. Sta.

TYPICAL WINGWALL DETAILS (1 OF 2)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. wwdetail	Date 10/99
Bridge Sheet No. C-43	Sheet 43 of 307

TVGA ENGINEERING, SURVEYING, P.C.

WINGWALL AND BRUSH CURB ELEVATIONS

BRIDGE	LOCATION	SIDE OF BRIDGE	DIM. "X" (SEE NOTE 2)	ELEVATION W1	ELEVATION W2	ELEVATION W3
43N	ABUT. 1 (FIXED)	LEFT	9' - 11"	544.28	543.98	541.81
		RIGHT	13' - 3"	543.30	543.02	540.85
	ABUT. 2 (EXP.)	LEFT	13' - 3"	538.58	538.86	536.22
		RIGHT	10' - 3"	537.61	537.92	535.34
43S	ABUT. 1 (EXP.)	LEFT	10' - 0"	545.94	545.75	543.06
		RIGHT	13' - 1"	545.31	545.12	542.46
	ABUT. 2 (FIXED)	LEFT	13' - 4"	540.66	540.94	538.77
		RIGHT	10' - 6"	539.67	540.00	537.83
48N	ABUT. 1 (FIXED)	LEFT	14' - 8"	449.44	449.50	447.34
		RIGHT	13' - 11"	450.70	450.77	448.61
	ABUT. 2 (EXP.)	LEFT	18' - 8"	451.23	451.13	448.45
		RIGHT	19' - 9"	452.47	452.38	449.62
48S	ABUT. 1 (EXP.)	LEFT	13' - 4"	449.66	449.71	447.05
		RIGHT	12' - 6"	450.92	450.98	448.24
	ABUT. 2 (FIXED)	LEFT	18' - 9"	451.37	451.28	449.11
		RIGHT	19' - 9"	452.63	452.54	450.37
49N	ABUT. 1 (FIXED)	LEFT	14' - 1"	453.94	454.01	451.85
		RIGHT	14' - 2"	453.81	453.88	451.72
	ABUT. 2 (EXP.)	LEFT	13' - 10"	454.64	454.57	451.74
		RIGHT	13' - 10"	454.52	454.45	451.62
49S	ABUT. 1 (FIXED)	LEFT	13' - 11"	453.69	453.77	451.60
		RIGHT	13' - 10"	453.82	453.90	451.73
	ABUT. 2 (EXP.)	LEFT	13' - 11"	454.51	454.43	451.60
		RIGHT	14' - 1"	454.64	454.56	451.73
50N	ABUT. 1 (FIXED)	LEFT	11' - 6"	475.25	475.53	473.36
		RIGHT	13' - 10"	476.90	477.14	474.97
	ABUT. 2 (EXP.)	LEFT	13' - 6"	481.40	481.17	478.50
		RIGHT	26' - 6"	483.35	482.72	479.95
50S	ABUT. 1 (EXP.)	LEFT	11' - 9"	466.39	466.75	464.18
		RIGHT	13' - 10"	468.29	468.59	465.91
	ABUT. 2 (FIXED)	LEFT	13' - 3"	473.80	473.52	471.35
		RIGHT	11' - 3"	475.64	475.29	473.12
51N	ABUT. 1 (FIXED)	LEFT	9' - 5"	364.63	364.77	362.60
		RIGHT	9' - 5"	365.30	365.44	363.27
	ABUT. 2 (EXP.)	LEFT	12' - 0"	368.99	368.93	366.22
		RIGHT	14' - 4"	369.47	369.41	366.67
51S	ABUT. 1 (FIXED)	LEFT	9' - 5"	364.42	364.56	362.39
		RIGHT	9' - 5"	365.09	365.23	363.06
	ABUT. 2 (EXP.)	LEFT	16' - 4"	369.02	368.92	366.22
		RIGHT	18' - 7"	369.49	369.41	366.67

NOTES:

1. FOR LOCATIONS OF W1, W2, W3, AND DIMENSION "X", SEE TYPICAL WINGWALL DETAILS (1 OF 2), BRIDGE SHEET C-43.
2. DIMENSION "X" IS APPROXIMATE, BASED ON FIELD SURVEY INFORMATION. NEW WINGWALL TO MATCH END OF EXISTING WINGWALL.
3. REFERENCE TO "LEFT" AND "RIGHT" IS BASED ON THE DIRECTION OF STATIONING, NOT THE DIRECTION OF TRAFFIC.

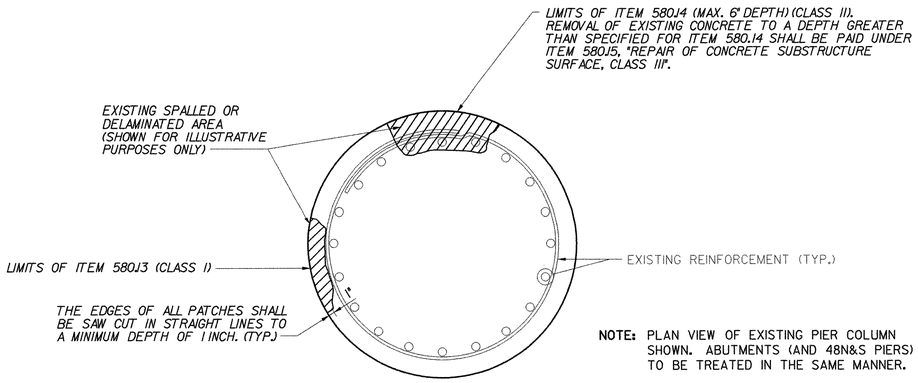
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta.
	Surv. Sta.

TYPICAL WINGWALL DETAILS (2 OF 2)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By Date J.P. HALSTEAD 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. wwdetail	Date 10/99
Bridge Sheet No. C-44	Sheet 44 of 307

TVGA ENGINEERING, SURVEYING, P.C.



NOTE: PLAN VIEW OF EXISTING PIER COLUMN SHOWN. ABUTMENTS (AND 48N&S PIERS) TO BE TREATED IN THE SAME MANNER.

CONCRETE REPAIR DETAIL

SCALE: 1" = 1'-0"

SUBSTRUCTURE REPAIR NOTES:

1. COLUMNS, ABUTMENTS, AND 48N&S PIERS SHALL BE REPAIRED USING THE FOLLOWING ITEMS:
   - 580.13 REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS I
   - 580.14 REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS II
   - 580.15 REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS III

2. THIS WORK SHALL INCLUDE REMOVAL AND DISPOSAL OF UNSOUND AND DELAMINATED CONCRETE FROM ALL ABUTMENTS AND PIERS AS DIRECTED BY THE ENGINEER. THE PREPARED SURFACES SHALL BE THOROUGHLY BLASTED TO REMOVE ALL LOOSE MATERIAL AND ANY CONTAMINANTS OR EFFLORESCENCE. THE REINFORCING STEEL (IF EXPOSED) SHALL BE BLASTED. THE MATERIAL USED TO FILL A PATCH SHALL BE PLACED AND FINISHED OR FORMED SO THAT THE FINAL SURFACE WILL HAVE THE SAME SCORE MARKS AND EXTERIOR FACE APPEARANCE AS THE ORIGINAL SURFACES BEING REPAIRED. THE SURFACE SHALL BE THOROUGHLY WETTED PRIOR TO PLACEMENT OF PATCHING MATERIAL OR NEW CONCRETE. IMMEDIATELY PRIOR TO PLACEMENT, THE SURFACE SHALL BE COATED WITH NEAT CEMENT PASTE, MIXED TO THE CONSISTENCY OF THICK LATEX PAINT (THOROUGHLY BRUSHED INTO THE SURFACE). WHEN "OVERHEAD AND VERTICAL CONCRETE REPAIR MATERIAL" CONFORMING WITH SUPPLEMENTAL SPECIFICATION 780.02 IS USED, THE BONDING AGENT (IF ANY REQUIRED) AND ITS APPLICATION PROCEDURE SHALL COMPLY WITH THE REQUIREMENTS OF THE PATCHING MATERIAL MANUFACTURER. PAYMENT FOR BONDING AGENT SHALL BE INCIDENTAL TO ITEM 580.13, 580.14, OR 580.15.

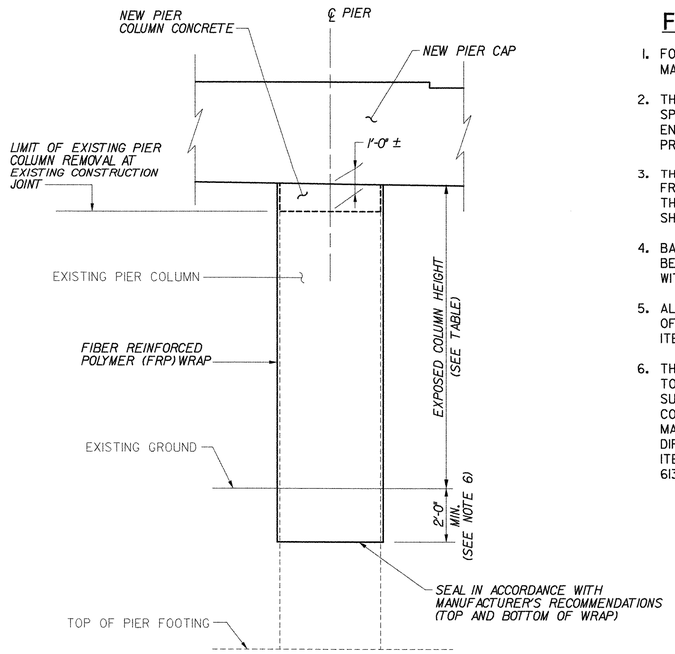
3. THE LIMITS FOR REMOVAL OF CONCRETE UNDER ITEM 580.13, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS I" SHALL BE FROM THE EXISTING CONCRETE SURFACE TO A MAXIMUM DEPTH OF THE OUTSIDE FACE OF THE REINFORCING STEEL. ALL WORK AND MATERIALS NECESSARY FOR PREPARING A PATCH AND FILLING IT SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 580.13. THE FILLING MATERIAL SHALL BE "OVERHEAD AND VERTICAL CONCRETE REPAIR MATERIAL" CONFORMING WITH SUPPLEMENTAL SPECIFICATION 780.02. THE EDGES OF ALL PATCHES SHALL BE SAW CUT IN STRAIGHT LINES TO A MINIMUM DEPTH OF 1 INCH. IF MORE THAN 1/4 OF THE REBAR IS EXPOSED OR THE BOND BETWEEN THE REBAR AND THE CONCRETE IS BROKEN, THEN PROCEED TO ITEM 580.14.

4. FOR CONCRETE NOT TO BE WRAPPED, THE LIMITS FOR REMOVAL OF CONCRETE UNDER ITEM 580.14, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS II" SHALL BE FROM THE EXISTING CONCRETE SURFACE TO A MINIMUM DEPTH OF 3/4" ± 1/4" INSIDE THE INSIDE FACE OF REINFORCING STEEL AND TO A MAXIMUM DEPTH OF 6" FROM THE EXISTING CONCRETE SURFACE. ALL WORK AND MATERIALS NECESSARY FOR PREPARING A PATCH AND FILLING SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 580.14. THE FILLING MATERIAL MAY BE EITHER "OVERHEAD AND VERTICAL CONCRETE REPAIR MATERIAL" CONFORMING WITH SUPPLEMENTAL SPECIFICATION 780.02, "CONCRETE CLASS AA" OR AN ACCEPTABLE PNEUMATICALLY APPLIED CONCRETE (SEE SPECIAL PROVISIONS). THE EDGES OF ALL PATCHES SHALL BE SAW CUT IN STRAIGHT LINES TO A MINIMUM DEPTH OF 1 INCH.

5. FOR CONCRETE TO BE WRAPPED, THE LIMITS FOR REMOVAL OF CONCRETE UNDER ITEM 580.14, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS II" SHALL BE FROM THE EXISTING CONCRETE SURFACE TO A MINIMUM DEPTH OF THE OUTSIDE FACE OF THE REINFORCING STEEL AND TO A MAXIMUM DEPTH OF 6" FROM THE EXISTING CONCRETE SURFACE. MINIMUM DEPTH OF 3/4" INSIDE THE INSIDE FACE OF REINFORCING STEEL IS NOT REQUIRED, AS LONG AS ALL UNSOUND CONCRETE IS REMOVED. ALL WORK AND MATERIALS NECESSARY FOR PREPARING A PATCH AND FILLING SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 580.14. THE FILLING MATERIAL MAY BE EITHER "OVERHEAD AND VERTICAL CONCRETE REPAIR MATERIAL" CONFORMING WITH SUPPLEMENTAL SPECIFICATION 780.02, "CONCRETE CLASS AA" OR AN ACCEPTABLE PNEUMATICALLY APPLIED CONCRETE (SEE SPECIAL PROVISIONS). THE EDGES OF ALL PATCHES SHALL BE SAW CUT IN STRAIGHT LINES TO A MINIMUM DEPTH OF 1 INCH.

6. THE LIMITS FOR REMOVAL OF CONCRETE UNDER THE ITEM 580.15, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS III" SHALL BE FROM THE EXISTING CONCRETE SURFACE TO A DEPTH OF GREATER THAN 6". ALL WORK AND MATERIALS NECESSARY FOR PREPARING A PATCH AND FILLING IT SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 580.15. THE FILLING MATERIAL MAY BE EITHER "CONCRETE CLASS AA, CLASS A, CLASS B" OR AN ACCEPTABLE PNEUMATICALLY APPLIED CONCRETE (SEE SPECIAL PROVISIONS). THE EDGES OF ALL PATCHES SHALL BE SAW CUT IN STRAIGHT LINES TO A MINIMUM DEPTH OF 1 INCH.

7. IF PNEUMATICALLY APPLIED CONCRETE IS SELECTED FOR REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS II OR III, THEN THIS TYPE OF CONCRETE REPAIR SHALL BE CONFINED ONLY TO VERTICAL AND OVERHEAD SURFACES OF THE SUBSTRUCTURE. ALSO, THE BRIDGE BEARINGS AND BEAMS SHALL BE COMPLETELY PROTECTED FROM REBOUND MATERIAL DURING SHOTCRETE APPLICATION PROCEDURES.



FRP COLUMN WRAP DETAIL

SCALE: 3/8" = 1'-0"

FRP COLUMN WRAP NOTES:

1. FOLLOWING REPAIR OF COLUMNS, ALLOW CURING OF CONCRETE REPAIR MATERIAL FOR 28 DAYS MINIMUM PRIOR TO WRAPPING.

2. THE CONTRACTOR SHALL SUBMIT FRP COLUMN WRAP DATA FROM THE SPECIFIC MANUFACTURER AND INSTALLATION PROCEDURES TO THE ENGINEER FOR APPROVAL, IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

3. THE CONTRACTOR SHALL APPLY A U.V. PROTECTIVE COATING ON THE FRP WRAP FOLLOWING CURING OF THE WRAP IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE COATING COLOR SHALL BE A NATURAL CONCRETE GREY, AS APPROVED BY THE ENGINEER.

4. BACKFILL OF EXISTING GROUND AT THE BASE OF THE COLUMNS SHALL BE ACCOMPLISHED AFTER THE COATING HAS CURED, IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

5. ALL COSTS ASSOCIATED WITH WRAPPING COLUMNS, WITH THE EXCEPTION OF CONCRETE REPAIRS, SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 580.40 "FIBER REINFORCED POLYMER WRAP."

6. THE DEPTH OF FRP WRAP SHOWN IS BELOW EXISTING GROUND, NOT BELOW TOP OF STONE FILL. ANY STONE FILL DISTURBED TO ALLOW REPAIR OF SUBSTRUCTURES OR WRAPPING OF PIERS SHALL BE REPLACED TO ITS ORIGINAL CONDITION AS DIRECTED BY THE ENGINEER. THE MINIMUM DEPTH OF FRP WRAP MAY BE INCREASED DUE TO REQUIRED LIMITS OF CONCRETE REPAIR, AS DIRECTED BY THE ENGINEER. REQUIRED EXCAVATION SHALL BE PAID FOR UNDER ITEM 204.25. REQUIRED BACKFILL SHALL BE PROVIDED UNDER ITEMS 204.30, 613.10, 613.11, OR 613.13, AS DIRECTED BY THE ENGINEER AT EACH PIER LOCATION.

BRIDGE	PIER	COLUMNS TO BE WRAPPED	AVERAGE EXPOSED COLUMN HEIGHT (APPROXIMATE)
43N	1	ALL	12'-9"
	2	ALL	9'-6"
43S	1	ALL	12'-9"
	2	ALL	8'-3"
51N	1	1, 2	19'-0"
	2	PIER TO BE REPLACED	-
	3	1, 3, 4	14'-10"
	4	1, 2	12'-2"
51S	1	1, 2, 3	19'-11"
	2	1, 2	19'-1"
	3	PIER TO BE REPLACED	-
	4	1, 2	16'-6"
	5	NONE	14'-5"

* COLUMNS ARE NUMBERED LEFT TO RIGHT LOOKING UPSTATION

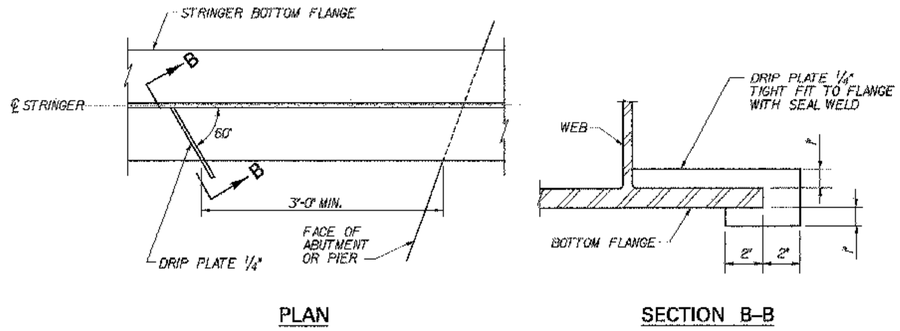
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

SUBSTRUCTURE REPAIR DETAILS AND NOTES

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. subrprdt	Date 10/99
Bridge Sheet No. C-45	Sheet 45 of 307

TVGA ENGINEERING, SURVEYING, P.C.



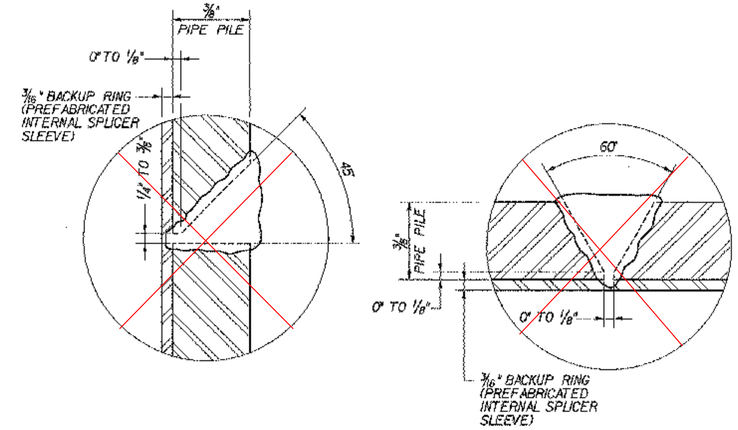
PLAN

SECTION B-B

DRIP PLATE DETAIL

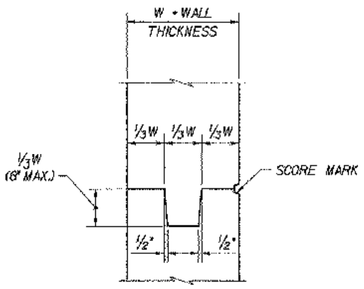
N.T.S.

NOTE: DRIP PLATES SHALL BE PLACED ON OUTSIDE EDGE OF FASCIA STRINGERS ON THE HIGH SIDE OF ALL PIERS AND LOW ABUTMENTS OR AS INDICATED ON PROJECT PLANS.



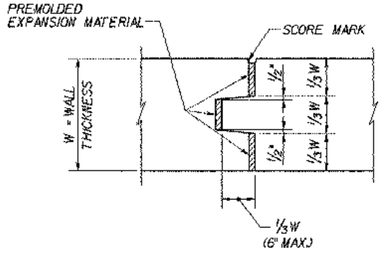
PIPE PILE SPLICE OPTIONS

N.T.S.



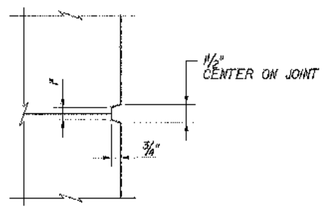
TYPICAL CONCRETE CONSTRUCTION JOINT

N.T.S.



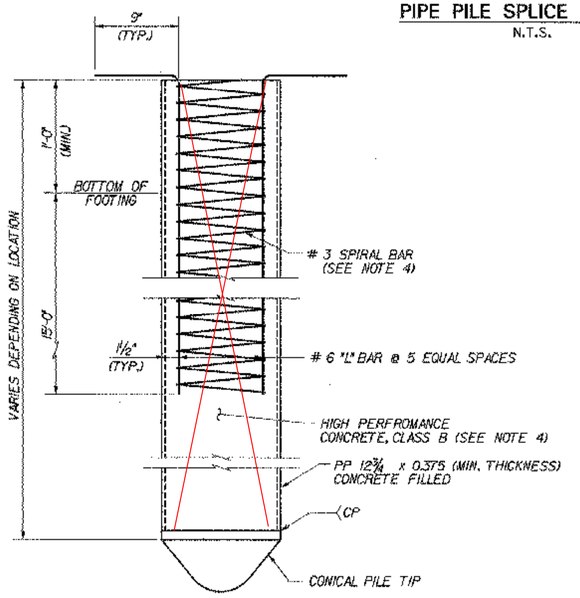
TYPICAL CONCRETE EXPANSION JOINT

N.T.S.



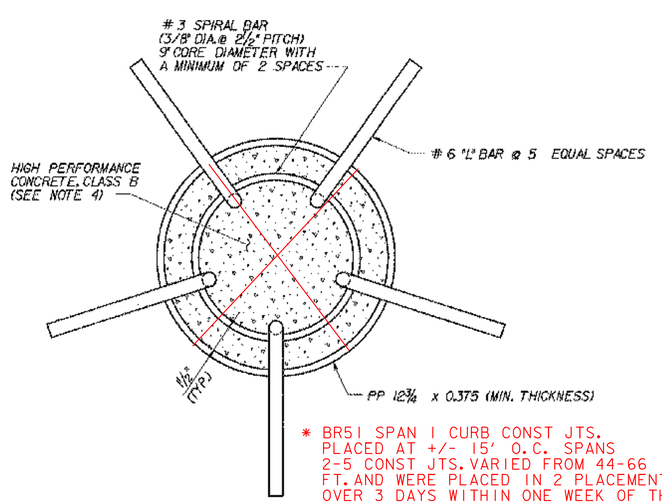
SCORE MARK DETAIL

N.T.S.



ELEVATION

SCALE: 1 1/2" = 1'-0"



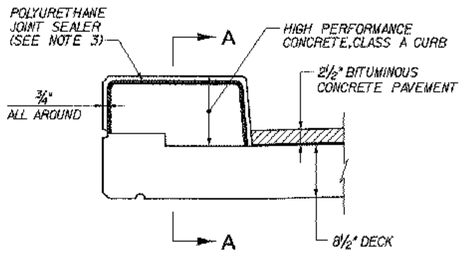
* BR51 SPAN 1 CURB CONST JTS. PLACED AT +/- 15' O.C. SPANS 2-5 CONST JTS. VARIED FROM 44-66 FT. AND WERE PLACED IN 2 PLACEMENTS OVER 3 DAYS WITHIN ONE WEEK OF THE COMPLETION OF DECK CURE. THIS WAS DONE AS AN EXPERIMENT WITH CONCURANCE OF STRUCTURES, CONTRUCTION, AND FHWA.

PLAN

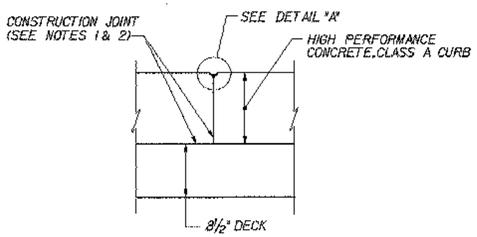
SCALE: 3" = 1'-0"

~~CAST-IN-PLACE CONCRETE PILING~~

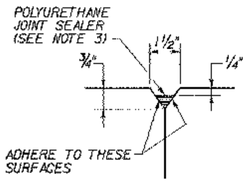
CONCRETE PILING CHANGE TO "H" PILING AS PER CHANGE ORDER #2 "H" PILING PAID AS LUMP SUM.



TYPICAL SECTION THRU CONCRETE CURB CONSTRUCTION JOINT



SECTION A-A



DETAIL "A"

CURB JOINT DETAILS

N.T.S.

NOTES:

1. CONSTRUCTION JOINTS THROUGH CONCRETE CURB SHALL BE SPACED MAXIMUM 15'-0" CENTER TO CENTER AND SHALL BE 1'-6" MINIMUM FROM THE CENTER OF THE NEAREST BRIDGE RAIL POST. CONCRETE SHALL BE PLACED IN ALTERNATING SECTIONS WITH A MINIMUM OF 48 HOURS DELAY BETWEEN ADJACENT POURS.
2. LONGITUDINAL REINFORCING SHALL PASS THROUGH CONCRETE CURB CONSTRUCTION JOINTS.
3. POLYURETHANE JOINT SEALER, PER SUBSECTION 524.06(c) OF THE SPECIFICATIONS, COLOR TO MATCH CONCRETE. COST SHALL BE INCIDENTAL TO ITEM 501.33, "HIGH PERFORMANCE CONCRETE, CLASS A".
4. THE COST OF CONCRETE, REINFORCING STEEL, AND CONICAL PILE TIP SHALL BE INCIDENTAL TO ITEM 505.25, "CAST-IN-PLACE CONCRETE PILING".

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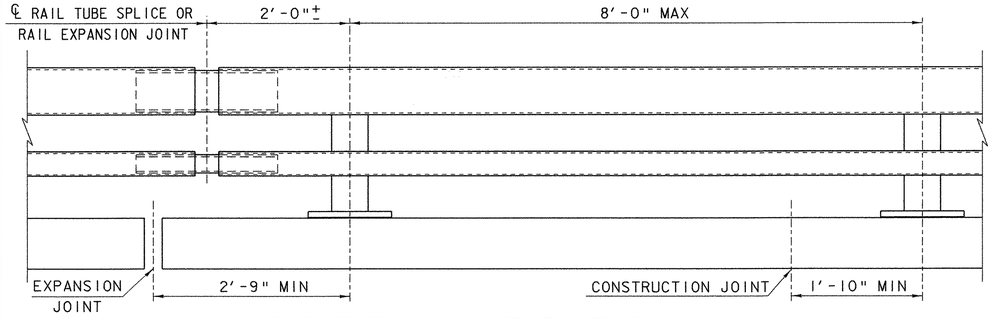
STATE OF VERMONT
AGENCY OF TRANSPORTATION

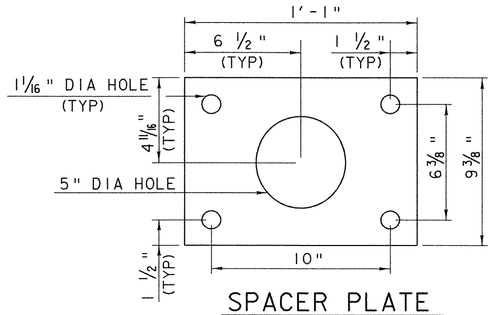
Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

TYPICAL BRIDGE DETAILS

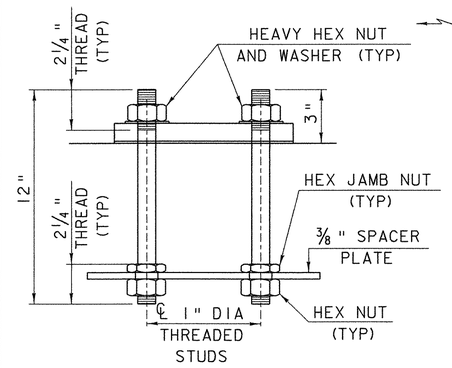
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. stddrdet	Date 10/99
Bridge Sheet No. C-46	Sheet 46 of 307



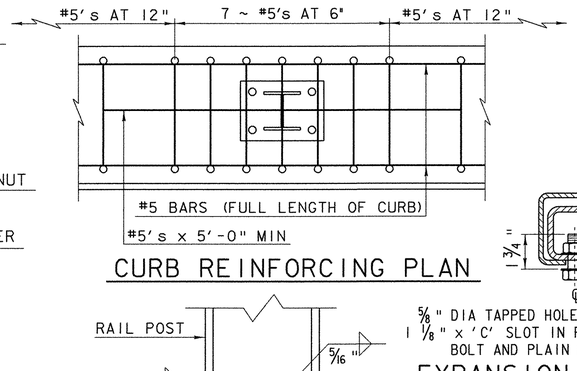
BRIDGE RAILING ELEVATION



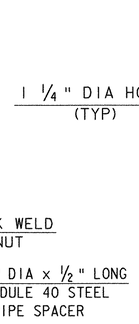
SPACER PLATE



RAIL POST ANCHORAGE



CURB REINFORCING PLAN



POST AND BASE PLATE

BASE WELD DETAIL

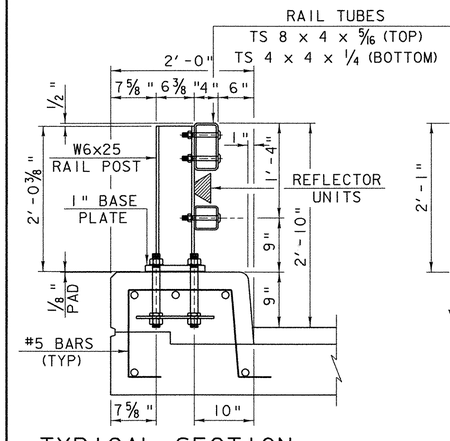
5/8" DIA TAPPED HOLE IN SPLICE TUBE AND 1 1/8" x 'C' SLOT IN RAIL TUBE FOR 5/8" DIA BOLT AND PLAIN HARDENED WASHER

EXPANSION JOINT SECTION

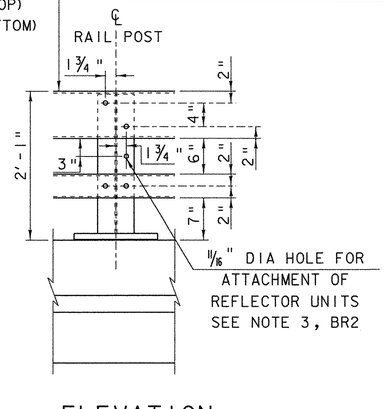
FOR DETAILS NOT SHOWN, SEE "RAIL TUBE SPLICE SECTION."

SPLICE TABLE					
T	A	B	C	L	X
N/A	4"	2"	--	20"	3/4"
EXPANSION JOINT TABLE					
<4"	4"	2"	2 1/2"	20"	2 1/2"
>4" <6 1/2"	5 1/2"	2 3/8"	3 1/2"	23 3/4"	4"
>6 1/2" <9"	6 1/2"	3 3/8"	9"*	27 3/4"	5"
>9" <13"	8 1/2"	4 3/8"	11"*	33 3/4"	7"

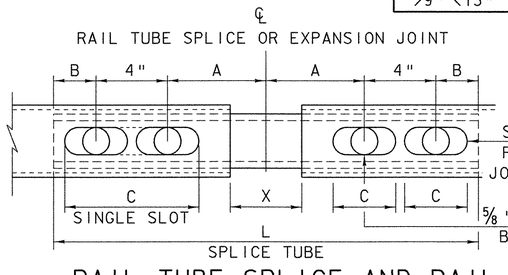
T = TOTAL MOVEMENT BETWEEN BRIDGE EXPANSION JOINTS. SEE NOTE 6.
* = SINGLE SLOT



TYPICAL SECTION

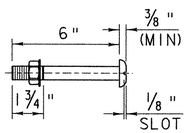


ELEVATION



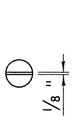
RAIL TUBE SPLICE AND RAIL EXPANSION JOINT DETAIL

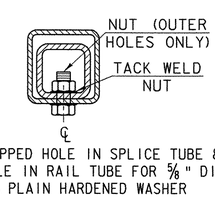
(BOTTOM VIEW)



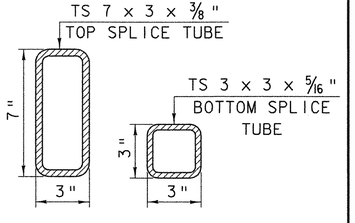
3/4" DIA M164 (TYPE I) ROUND HEAD BOLT

(WITH WASHER AND PREVAILING TORQUE TYPE LOCK NUT)
(SEE NOTE #9)
ONLY FULL DIAMETER BODY BOLTS WILL BE ALLOWED.





5/8" DIA TAPPED HOLE IN SPLICE TUBE & 3/4" DIA HOLE IN RAIL TUBE FOR 5/8" DIA BOLT & PLAIN HARDENED WASHER



RAIL TUBE SPLICE SECTION

NOTES

1. ALL WORK AND MATERIALS SHALL CONFORM TO THE PROVISIONS OF SECTION 525, "RAILINGS OF THE STANDARD SPECIFICATION FOR CONSTRUCTION."
2. TUBING AND POSTS SHALL MEET THE REQUIREMENTS OF SECTION 732, "RAILING MATERIALS OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION" EXCEPT THE DROP-WEIGHT TEAR TEST IN SECTION 732 SHALL NOT APPLY TO THE STRUCTURAL TUBING IN THIS STANDARD.
3. ALL EXPOSED CUT OR SHEARED EDGES SHALL BE ROUNDED TO A 1/16" RADIUS AND BE FREE OF BURRS.
4. RAIL POSTS SHALL BE SET NORMAL TO GRADE.
5. SECTIONS OF RAIL TUBE SHALL BE ATTACHED TO A MINIMUM OF TWO (2) RAIL POSTS AND PREFERABLY TO AT LEAST FOUR (4) POSTS.
6. RAIL TUBE EXPANSION JOINTS SHALL BE PROVIDED IN ANY RAIL BAY SPANNING A SUPERSTRUCTURE EXPANSION JOINT. EXPANSION JOINT WIDTH SHALL BE "X" AT 45°F AND WILL BE ADJUSTED IN THE FIELD BY THE ENGINEER FOR OTHER TEMPERATURES.
7. ALL PARTS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111, EXCEPT THAT HARDWARE SHALL MEET THE REQUIREMENTS OF AASHTO M232.
8. RAIL POSTS ANCHORING NUTS SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ONE-EIGHTH TURN.
9. RAIL TUBES SHALL BE ATTACHED USING 3/4" FULL DIAMETER BODY AASHTO M164 (TYPE I) ROUND HEAD BOLTS INSERTED THROUGH THE FACE OF THE TUBE. HOLES IN POSTS SHALL BE 1/16" LARGER THAN THE BOLT SIZE.
10. HOLES IN RAILS FOR RAIL TUBE ATTACHMENT MAY BE FIELD-DRILLED. HOLES SHALL BE COATED WITH AN APPROVED ZINC-RICH PAINT PRIOR TO ERECTION.
11. IF THERE IS A CONFLICT BETWEEN THESE STANDARD DETAILS AND THE DESIGN, THE REQUIREMENTS OF THE DESIGN DRAWINGS SHALL BE FOLLOWED.
12. ANY BENDING OF RAIL SHALL BE BY SHOP PROCEDURE ONLY.
13. THE FABRICATOR SHALL SUBMIT SHOP DRAWINGS INCLUDING WELDING PROCEDURES TO THE STRUCTURES SECTION FOR APPROVAL IN ACCORDANCE WITH THE PROVISION OF 506.04, SHOP DRAWINGS. ALL WELDING SHALL CONFORM WITH SECTION 506.10.
14. RAIL POSTS AND BASE PLATES SHALL BE TESTED FOR IMPACT PROPERTIES IN ACCORDANCE WITH ASTM A-370 CHARPY IMPACT TESTING USING TYPE A SPECIMEN.

MATERIALS

RAIL TUBES.....ASTM A500, GRADE B OR ASTM A501
RAIL POSTS AND BASE PLATES.....ASTM A709A709M, GRADE 50
ALL OTHER SHAPES AND PLATES.....ASTM A709/A709M, GRADE 36
ANCHOR STUDS.....ASTM A449
ALL OTHER BOLTS (UNLESS NOTED).....AASHTO M164, TYPE I

NUTS FOR AASHTO M164 (ASTM A325) BOLTS AND FOR ANCHOR STUDS SHALL COMPLY WITH AASHTO M291 (ASTM A563).

WASHERS SHALL COMPLY WITH AASHTO M293 (ASTM F436) SPECIFICATIONS.

1/8" PAD SHALL COMPLY WITH STANDARD SPECIFICATION SUBSECTION 731.01 OR 731.02.

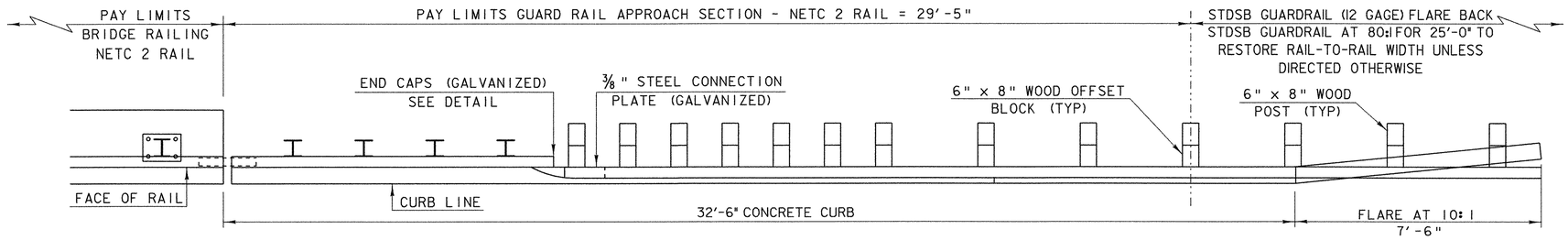
VERMONT AGENCY OF TRANSPORTATION

DETAIL BR1

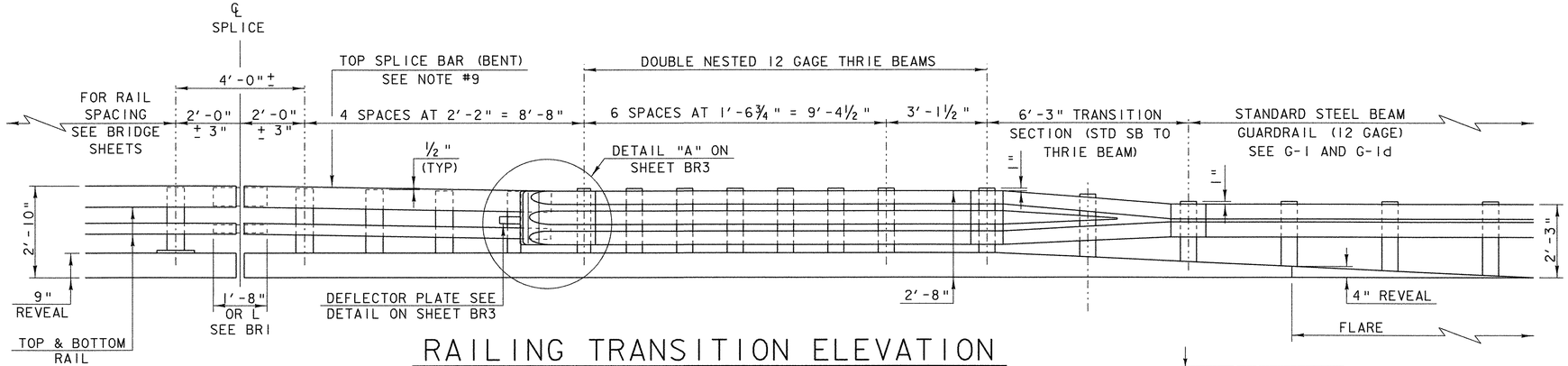
BRIDGE RAILING - NETC 2 RAIL

PROJECT NAME: BOLTON
PROJECT NUMBER: IM 089-2(29)

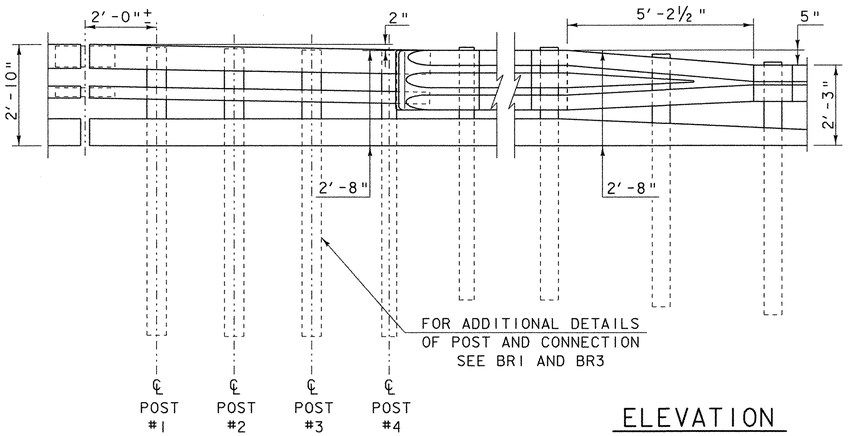
FILE NAME: /99a268/str/sa268brail.dgn
PROJECT LEADER: SHERWARD FARNSWORTH
DESIGNED BY: STR
DETAIL BRI
PLOT DATE: 02-AUG-2004
DRAWN BY: STR
CHECKED BY: STR
SHEET 47 OF 307



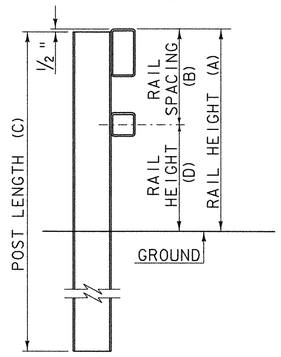
RAILING TRANSITION PLAN



RAILING TRANSITION ELEVATION



ELEVATION

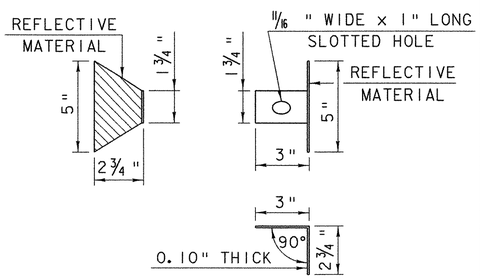


TYPICAL SECTION

POST NUMBER	RAIL HEIGHT (A)	RAIL SPACING (B)	POST LENGTH (C)	RAIL HEIGHT (D)
1	2'-9 1/2"	1'-3 3/4"	8'-0"	1'-5 3/4"
2	2'-9"	1'-3 1/2"	8'-0"	1'-5 1/2"
3	2'-8 1/2"	1'-3 3/16"	8'-0"	1'-5 5/16"
4	2'-8"	1'-2 7/8"	8'-0"	1'-5 1/8"

NOTES

1. REFER TO SHEET BR1 FOR ADDITIONAL DETAILS, NOTES AND MATERIAL SPECIFICATIONS.
2. PAYMENT FOR GUARD RAIL APPROACH SECTION - NETC 2 RAIL SHALL INCLUDE THE TERMINAL CONNECTOR, THE CONNECTION PLATE, THE DEFLECTOR PLATE, RAIL, POSTS, BLOCKS AND ATTACHMENT HARDWARE.
3. THE REFLECTORIZED ALUMINUM DELINEATION IS TO BE ERECTED EVERY 30' (OR CLOSEST POST) WITH A 5/8" DIAMETER BOLT. DELINEATORS SHALL MEET SPECIFICATION REQUIREMENTS FOR ASTM B209 ALLOY 5052-H32.
4. REFLECTIVE MATERIAL SHALL MEET REQUIREMENTS OF SUBSECTION 750.08 AND SHALL BE OF ENCAPSULATED LENS SILVER OR AMBER. AMBER IS TO BE INSTALLED ON THE DRIVER'S LEFT AND SILVER ON THEIR RIGHT.
5. ON BRIDGES WITH A SIDWALK, DELINEATORS ARE NOT TO BE INSTALLED ON THE SIDEWALK SIDE OF THE BRIDGE (I.E. DELINEATORS INSTALLED ONLY ON THE CURB SIDE AND ON THE APPROACH ON THE CURB SIDE). PAYMENT SHALL BE SUBSIDIARY TO ALL OTHER ITEMS.
6. ALL APPROACH RAIL SPLICES SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC FLOW.
7. ALL BRIDGE APPROACH RAIL MATERIALS, DIMENSION SIZES AND NOTES SHALL BE THE SAME AS THOSE OF THE BRIDGE RAIL, UNLESS OTHERWISE NOTED.
8. APPROACH RAIL BOLTS SHALL BE ASTM A307 GRADE A AND NUTS SHALL BE AASHTO M291 (ASTM A563 GRADE A OR BETTER (GALVANIZED). WASHERS SHALL BE ASTM F844.
9. WELD TOP SPLICE BAR TO FIT BEND. USE COMPLETE PENETRATION WELD (B-U2).
10. THE CONCRETE CURB WILL BE PAID FOR AS ITEM 616.28, "CAST-IN-PLACE CONCRETE CURB, TYPE B."



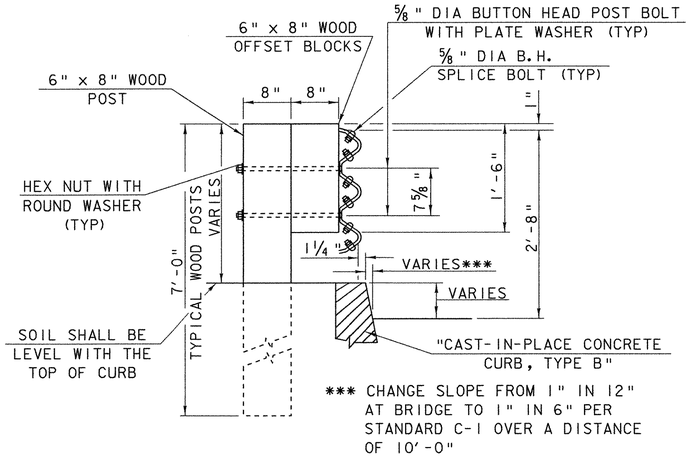
DELINEATION DEVICE DETAILS

DETAIL BR2

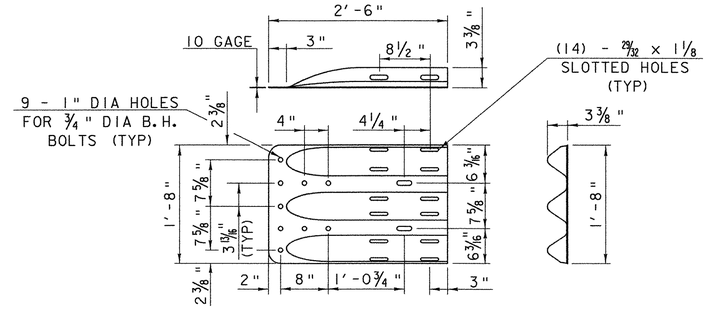
BRIDGE RAILING - NETC 2 RAIL - THRIE BEAM APPROACH RAIL

PROJECT NAME: BOLTON
PROJECT NUMBER: IM 089-2(29)

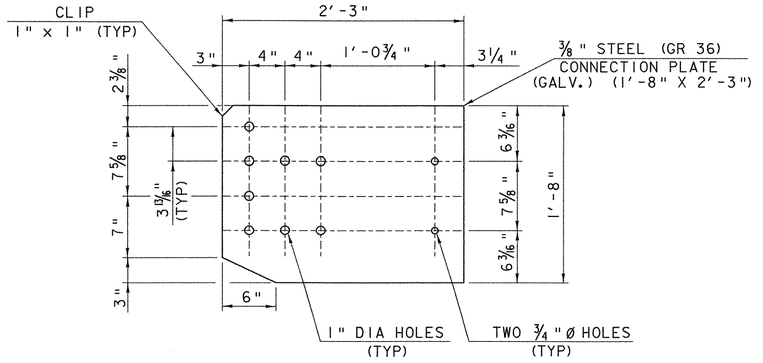
FILE NAME: /99a268/str/sa268brail.dgn
PROJECT LEADER: SHERWARD FARNSWORTH
DESIGNED BY: STR
DETAIL BR2
PLOT DATE: 02-AUG-2004
DRAWN BY: STR
CHECKED BY: STR
SHEET 48 OF 307



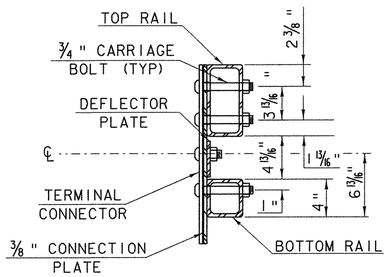
WOOD POST-RAIL ASSEMBLY



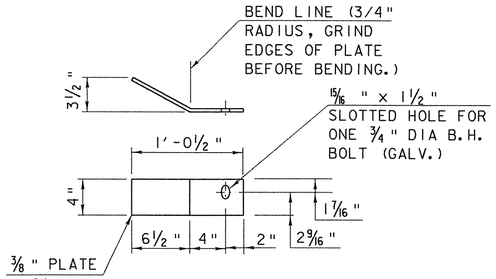
THRIE-BEAM TERMINAL CONNECTOR (HM-TF-13/RE-67)



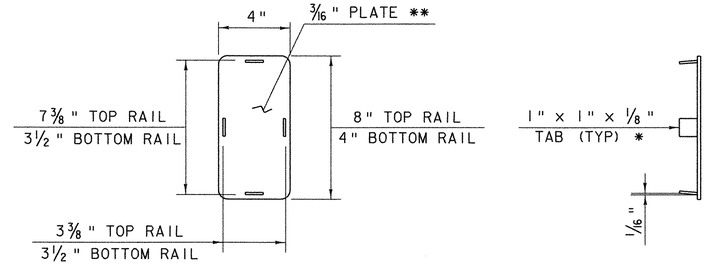
CONNECTION PLATE



SECTION C-C (CONNECTION PLATE)

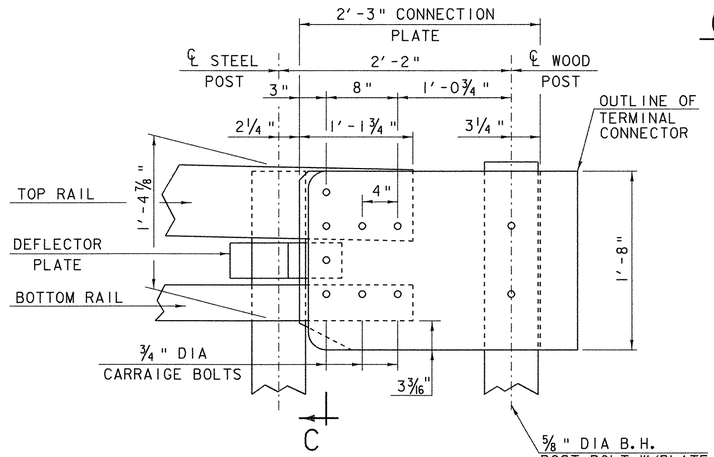


DEFLECTOR PLATE DETAIL

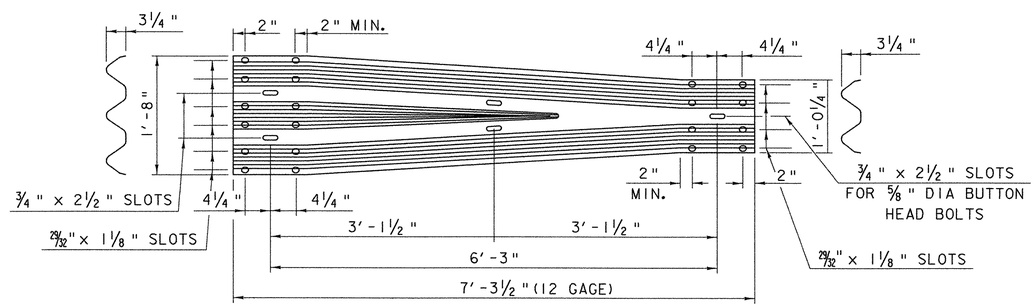


* WELD TABS TO END CAP PLATE IN TAPERED POSITION SO CAP CAN BE JAMMED INTO END OF RAIL TUBE.
** ROUND CORNERS 1/2 " RADIUS (TYP)

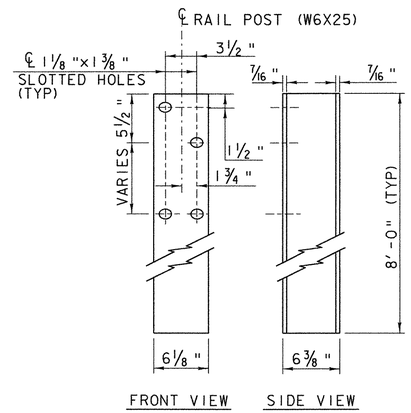
END CAP DETAIL



DETAIL A



THRIE-BEAM TO STD SB TRANSITION SECTION (HM-TF-13/RE-69)



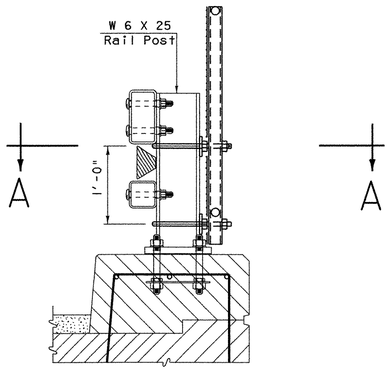
RAIL POST

VERMONT AGENCY OF TRANSPORTATION

DETAIL BR3

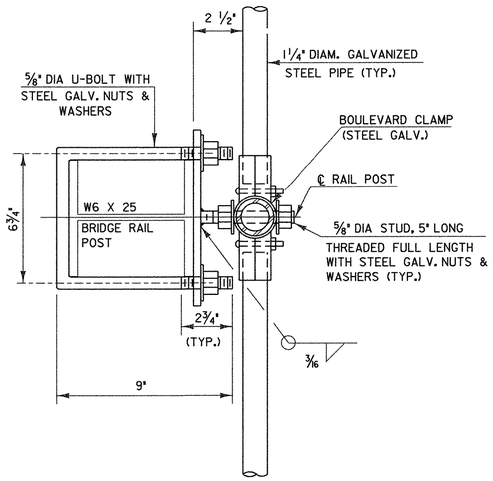
BRIDGE RAILING - NETC 2 RAIL - THRIE BEAM APPROACH RAIL

PROJECT NAME:	BOLTON
PROJECT NUMBER:	IM 089-2(29)
FILE NAME: /99a268/str/sa268brail.dgn	PLOT DATE: 02-AUG-2004
PROJECT LEADER: SHERWARD FARNSWORTH	DRAWN BY: STR
DESIGNED BY: STR	CHECKED BY: STR
DETAIL BR3	SHEET 49 OF 307

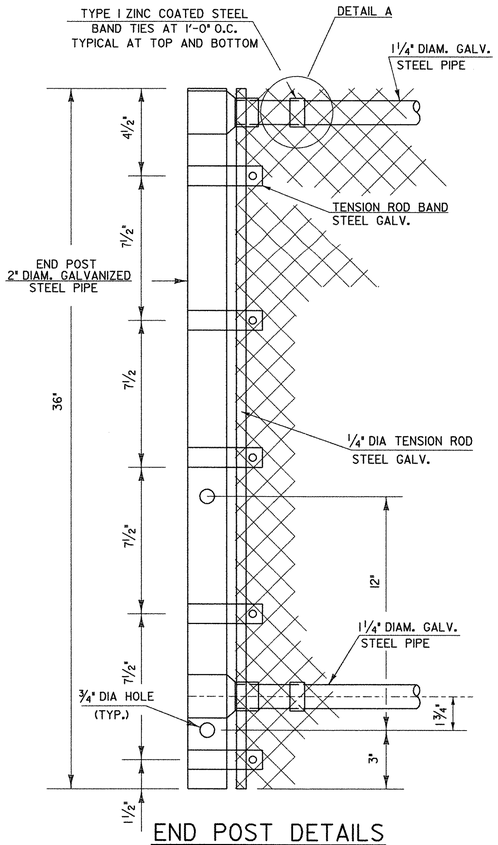


TYPICAL SECTION

NOTE: FOR DIMENSIONS SEE SHEETS BR1 & BR2.



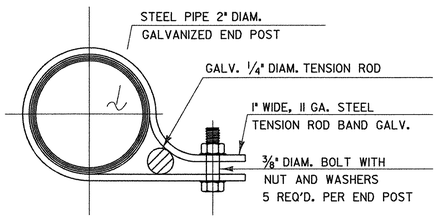
SECTION A-A



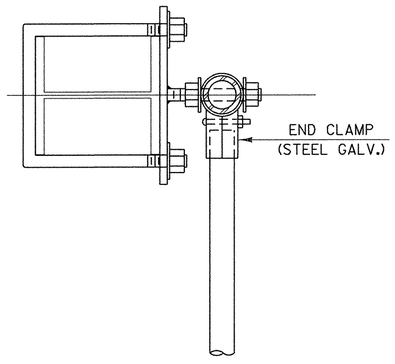
END POST DETAILS

NOTES

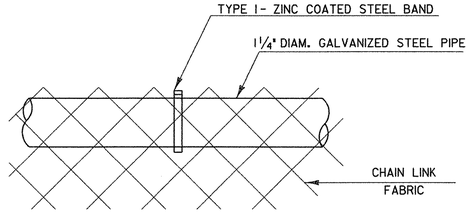
1. THREADS OF STUDS AND U-BOLTS TO BE 5/8-11 UNC.
2. ALL CONNECTION PLATES TO BE GALVANIZED AFTER FABRICATION.
3. 1 ¼" PIPE LENGTH SHALL BE FIELD CUT TO FIT POST SPACING.
4. CHAIN LINK FABRIC TO BE KNUCKLED TOP AND BOTTOM.
5. ALL BOLTS, THREADED STUDS AND WASHERS SHALL CONFORM TO THE SPECIFICATIONS FOR AASHTO M-164, TYPE 1. NUTS SHALL CONFORM TO AASHTO M-291.
6. ALL STEEL PLATES SHALL CONFORM TO THE SPECIFICATION FOR AASHTO M270 GRADE 36.
7. ALL GALVANIZING SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-181 WITH HARDWARE AND FITTINGS CONFORMING TO THE REQUIREMENTS OF AASHTO M-111 OR AASHTO M-232 WHICHEVER IS APPLICABLE. ALL BOLTS, NUTS AND WASHERS SHALL BE EITHER HOT-DIP GALVANIZED IN ACCORDANCE WITH THE ABOVE AASHTO REQUIREMENTS OR MECHANICALLY GALVANIZED USING A MECHANICALLY DEPOSITED PROCESS CONFORMING TO THE REQUIREMENTS OF AASHTO M-298, CLASS 110.
8. GALVANIZED CHAIN-LINK FABRIC SHALL BE TYPE I (ZINC) CLASS D AS SPECIFIED IN AASHTO M-181.
9. SNOW BARRIER SHALL BEGIN AT THE BRIDGE RAIL POST WHICH WILL PROVIDE A MINIMUM DISTANCE OF 20' (AS SHOWN) OR AS DIRECTED BY THE ENGINEER.
10. ALL REFERENCES TO THE DIAMETERS OF GALVANIZED STEEL PIPE SHALL REFER TO THE OUTSIDE DIAMETER (O.D.).
11. ALL POSTS, RAILS AND HARDWARE SHALL BE ZINC COATED AND CONFORM TO THE REQUIREMENTS OF AASHTO M-181, GRADE 1 OR GRADE 2.



TENSION ROD BAND



PLAN VIEW AT END POST



DETAIL A

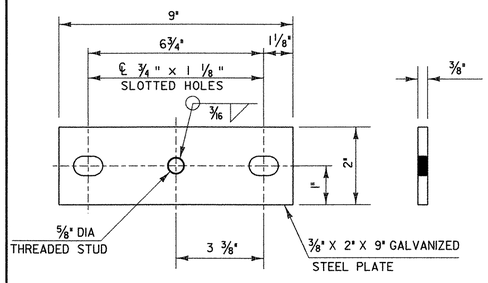
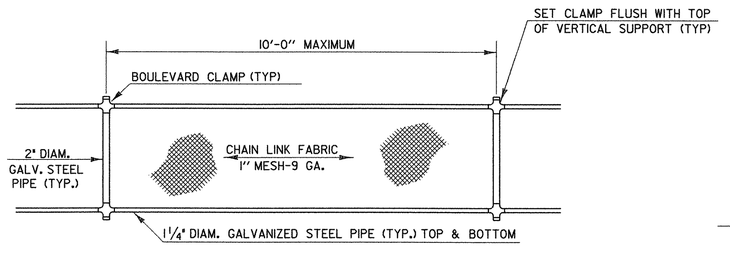
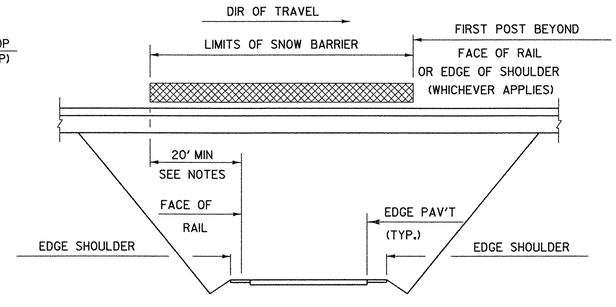


PLATE DETAILS



ELEVATION SNOW BARRIER



SCHEMATIC SNOW BARRIER LIMITS

VERMONT AGENCY OF TRANSPORTATION

DETAIL BR4

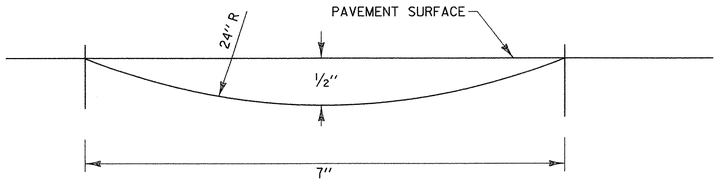
SNOW FENCE FOR BRIDGE RAILING - N.E.T.C. 2 RAIL

PROJECT NAME: BOLTON
PROJECT NUMBER: IM 089-2(29)

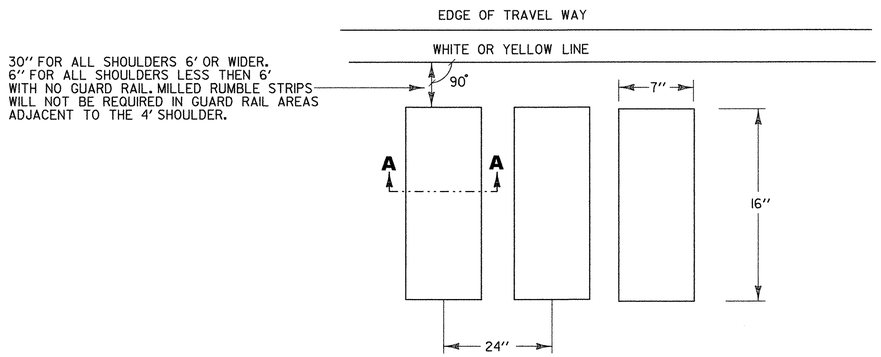
FILE NAME: /99a268/str/sa268brail.dgn
PROJECT LEADER: SHERWARD FARNSWORTH
DESIGNED BY: STR
DETAIL BR4

PLOT DATE: 02-AUG-2004
DRAWN BY: STR
CHECKED BY: STR
SHEET 50 OF 307

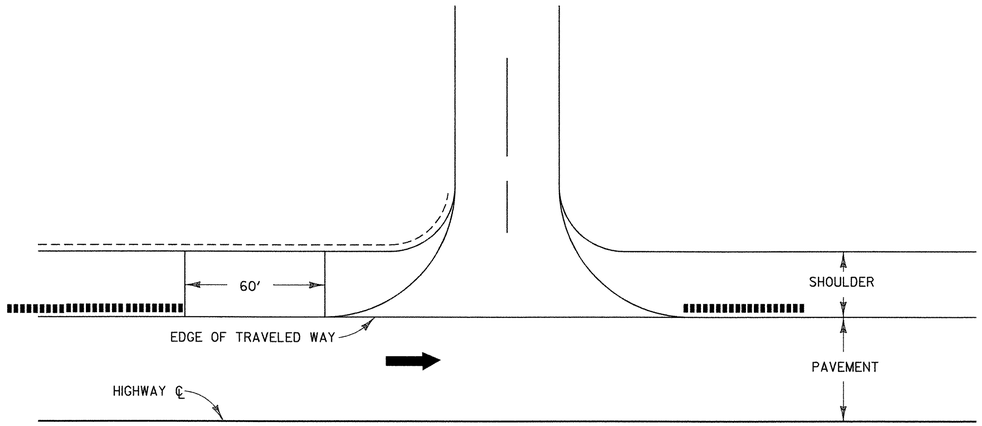
TYPICAL MILLING DETAIL



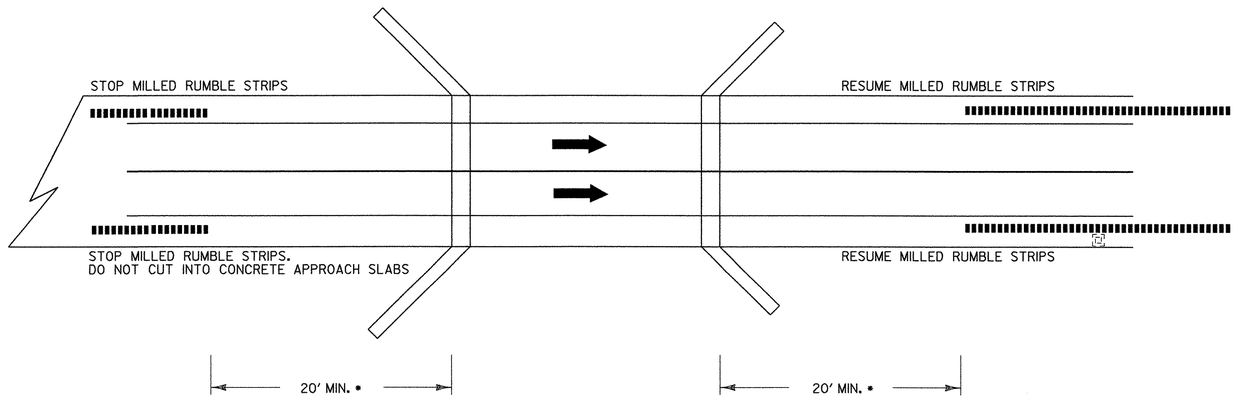
SECTION A–A



U TURN DETAIL



BRIDGE DETAIL



* NOTE: BRIDGE RAIL WILL DETERMINE MINIMUM DISTANCE IN SOME CASES.

LEGEND

DIRECTION OF TRAFFIC FLOW

MILLED RUMBLE STRIPS

NOT TO SCALE

THIS IS PAV. MAG. SECTION DETAIL RUMBLE STRIP #2 AS OF 06/21/04.

MILLED RUMBLE STRIPS DETAIL

PROJECT NAME: BOLTON
PROJECT NUMBER: IM 089-2(29)

FILE NAME: /str/99a268/sa268rum.dgn
PROJECT LEADER: SHERWARD FARNSWORTH
DESIGNED BY: PAVEMENT
IPARM FILE NAME: sa268rum.i

PLOT DATE: 02-AUG-2004
DRAWN BY: PAVEMENT
CHECKED BY: PAVEMENT
SHEET 51 OF 307

STATE OF VERMONT
AGENCY OF TRANSPORTATION

EROSION PREVENTION & SEDIMENT CONTROL NARRATIVE

DESCRIPTION OF PROJECT

This project involves reconstruction of Bridges 51N & 51S on Interstate 89, mm 70.6, over Joiner Brook, and U.S. Route 2 in the town of Bolton. Work includes replacement of superstructure steel, bearings, deck slabs, approach slabs, bridge rail, and approach rail. Work also includes replacement of pier #2 at Bridge 51N, and pier #3 at Bridge 51S with new wall piers, replacement of pier caps on all other piers, pier column repair, application of fiber reinforced polymer wrap as indicated, and construction of new backwalls at expansion abutments and new curtainwalls at fixed abutments. Traffic will be detoured with the use of crossovers onto the adjoining bridge creating 2 way traffic. Total disturbed area (excluding waste, borrow, and contractor's off-site staging areas) equals 4.24 acres.

*Disturbed area breakdown:
- Median Crossovers - 1.85 Acres
- Areas Around & Under Bridges - 1.57 Acres
- Abutment Access from US 2 & TH - 0.71 Acre
- Resident Engineer's Field Office - 0.11 Acre

SITE INVENTORY & ANALYSIS

OFF SITE DRAINAGE CHARACTERISTICS:
The property surrounding the project site consists of well established vegetation, moderate to steeply sloping, mixed softwood and hardwood forest with well defined drainage ways. Due to the nature of the surrounding terrain, runoff water entering the project site will be primarily limited to that which is conveyed within roadway ditches.

DRAINAGE, WATERWAYS, BODIES OF WATER:
Joiner Brook is located in the project area. It outlets into The Winooski River, approximately 800 ft. south of the project area. There are no other waterways or bodies of water within the project area. Runoff water entering the project area will be primarily limited to that which is conveyed via roadway ditches along I-89, US 2, and The Bolton Access Road.

TOPOGRAPHY, EXISTING ROADS, BUILDINGS, UTILITIES:
The topography of the project site is mountainous and wooded. The project area does not encroach upon any buildings. Joiner Brook is contained by stone lined river banks along each side. Development along the northern side of U.S. Route 2 consists of The Smilie Memorial School. To the north of U.S. Route 2, (Bolton Access Rd. and Curtis Lane), and to the south of U.S. Route 2, (Joiner Brook Rd.), exists primarily single family residences. Overhead utilitiy services exist along the northern side of U.S. Route 2. Underground television cables are buried south of pier 4 (51S), and pier 3 (51N). Underground telephone cables, and a water line are buried between piers 5 (51S) & 4 (51N) and the north shoulder of U.S. Route 2.

VEGETATION:
A mix of hardwood and softwood trees of all sizes exist in the vicinity of the project area, very few within the project area. The triangular shaped section of land, bordered by Joiner Brook, U.S. Route 2, and Joiner Brook Rd., consists mainly of small trees, weeds, and other overgrown vegetation. Impacts to vegetation in this area will be limited to that which is affected by construction equipment accessing the bridge piers. Following construction, vegetation will be reestablished using standard seed and mulch practices.

SOILS:
The majority of the soil found within the project area is Hadley Very Fine Sandy Loam (Hf), 0 to 3% slopes. It is well drained to moderately well drained, and has an Erodibility Factor (K-Value) of 0.49. Typically, cultivated Hadley soil has a very dark grayish-brown very fine sandy loam surface layer about 6'' thick. The material under this is dark grayish-brown very fine sandy loam to a depth of about 27'' with a dark grayish-brown silt loam below this depth. Also present in the vicinity of the project are Agawam Fine Sandy Loam (AgA), 0 to 5% slopes, friable (brittle), well drained soils (K-Value 0.28) that consist of fine sandy loam over sandy material; Stetson Gravelly Fine Sandy Loam (StC), 12 to 20% slopes, deep, very friable, and somewhat excessively drained (K-Value 0.17); Munson & Raynham Silt Loam (MyB), 2 to 6% slopes, brown silt loam surface layer about 8" thick, over 7" of friable grayish-brown and olive silt loam (K-Value 0.49); Marlowe Extremely Stoney Loam (MeE), 20 to 60% slopes, on hillsides or ridges, moderately deep with rapid surface runoff (K-Value 0.20); Hartland Very Fine Sandy Loam (HiD), 12 to 25% slopes, deep and well drained (K-Value 0.49)

*Generally, K-Values indicate the following:
- 0.23 and lower - low erodibility
- 0.24 to 0.36 - moderate erodibility
- 0.37 and higher - high erodibility

SENSITIVE RESOURCE AREAS:
No 'Threatened & Endangered Species' have been identified within the project limits and there will be no adverse effect to agricultural or archaeological features. Joiner Brook is the only identified resource and there are no mapped wetlands within the vicinity of the project.

PROXIMITY TO NATURAL OR MAN-MADE WATER FEATURES:
Disturbance of soils near waterway consists of that which is necessary to construct pier 2 (51N), partially reconstruct other piers, related abutment work, and approach work. One cofferdam will be required as pier 2 (51N) will require a new footing to be placed near the stream bank, although the stream bank will not be disturbed. All cofferdam work will take place more than 10 ft. from the top of the bank. No work within 15 feet of Joiner Brook will be below Q2.33 flow elevation.

TEMPORARY EROSION PREVENTION & SEDIMENT CONTROL

TEMPORARY EROSION PREVENTION MEASURES TO BE UTILIZED INCLUDE:
"Project Demarcation Fencing," denoted -PDF- on the plans, to delineate the limits the contractor can access with construction equipment. This measure limits the area that can be disturbed and exposed to erosion.

Seeding, mulching and biodegradable erosion control matting, or an equivalent product, will be utilized on all slopes steeper than 3:1 that are not lined with stone fill. These slopes shall be stabilized within 48 hours of reaching final grade or during intermittent phases of construction activity.

Tracking of all exposed slopes, combined with temporary mulching, will also be utilized on a regular basis. Any slopes to be exposed for several days prior to final grading shall be tracked and mulched. The forecast of rainfall events shall also trigger protection of exposed slopes.

Temporary stone check dams will be placed in ditches if stone lining is not being accomplished simultaneously with the ditch work. Check dams reduce flow velocities and thus reduce the potential for erosion. They will be placed along the ditches such that the elevation of the top of each check dam corresponds with the elevation of the toe of the preceding upslope check dam (See 'Erosion Controls Details' sheet). The check dams may be removed once the stone lining of the ditches is complete and the surrounding area is stabilized.

TEMPORARY MEASURES TO CONTROL SEDIMENT TRANSPORT INCLUDE:
Silt fence will be installed a distance of 5 to 10 feet from the toe of slopes to prevent sediment transport to down gradient areas. Each line of silt fence will be placed along the contour with ends turned slightly uphill to create a ponding effect should water try to run along the fencing and around the ends. The maximum slope length between separate runs of silt fence is 100 feet. Silt fence shall be installed prior to any upslope earthwork.

Stabilized construction entrances to the project site, staging areas, as well as waste and borrow areas shall be established. The minimum size of a stabilized construction entrance is 12 ft. by 50 ft. All surface water flowing to or diverted towards a construction entrance shall be piped under the stone. Pipes shall be appropriately sized for the contributing area, however, no pipes smaller than 6 inches diameter shall be used. See typical detail on 'Erosion Prevention & Sediment Control Plan' sheet for materials and construction method to be utilized when constructing a stabilized entrance.

The sediment settling basin to be used for dewatering purposes should be sized based upon the pumping rate and target particle size to be settled out. The following sizing criteria is based upon a target particle size of 0.01 mm and is provided as general guidance. (See Sediment Settling Basin Sizing Criteria.)

The construction of crossovers, removal of crossovers, removal and/or reshaping of slopes around abutments, and/or construction and removal of temporary access roads from U. S. Route 2 or town highways, will extend the construction season into October or November. Therefore a large quantity of Items "654.10 - Erosion Matting", "613.10 - Stone Fill, Type I (Mod. Crushed Stone Berms)", and other erosion control items have been included for use under Winter Erosion Prevention & Sediment Control Plan for this project.

PERMANENT EROSION CONTROL MEASURES

PERMANENT EROSION CONTROL MEASURES TO BE UTILIZED INCLUDE:
Stone lining of roadway ditches (if disturbed) with clean, angular Stone Fill, Type I will be used to prevent erosion during storm events. See 'Erosion Control Details' sheet for typical ditch section.

Grass, or other suitable ground cover will be established outside of the roadway limits where stone lining has not been specified.

GRADING PLAN & CONSTRUCTION TIME TABLE

GRADING PLAN & CONSTRUCTION TIME TABLE APPEARS ON SHEET 71 OF 307.

GENERAL EROSION & SEDIMENT CONTROL GUIDELINES

The Erosion Control Plans are meant as a guideline for preventing erosion and controlling sediment transport. The work outlined in this narrative consists of applying measures throughout the life of the project to control erosion and minimize the sedimentation of receiving waters. The measures include stabilization and structural practices, stormwater controls and other pollution prevention controls.

Coordinate the installation, use, and removal of erosion and sediment control measures with construction activities to ensure economical, effective and continuous erosion and sediment control. Employ temporary stabilization practices in incremental stages as construction proceeds. The contractor will use additional erosion control measures as necessitated by the sequence of construction and as directed by the Engineer. See section 105.23 of the Vermont AOT Standard Specifications for Construction, dated 2001.

Install all erosion and sediment control measures as shown in the Erosion Prevention and Sediment Control Plan, or as directed by the Engineer. Do not modify the type, size, or location of any control or practice without approval of the Engineer and On-site Coordinator. Any changes shall be noted on the plans, in the weekly inspection report, and reported to the appropriate authority in a timely manner. Inspect all control measures weekly and after each rainfall event. Initiate repair measures promptly once damage is discovered.

Measures such as temporary stone check dams, silt fence, and sediment basins shall be checked regularly for accumulation of sediment. Sediment build-up shall be removed when the level of sediment reaches one-half the height of the control measure. Sediments shall be disposed of in an approved area such that they will not be subject to erosion.

Preventing initial soil erosion is much more effective than treating eroded sediment. Therefore, stabilize all disturbed areas promptly after construction activity has temporarily or permanently ceased. Temporary vegetation shall be established if the area is to be without construction activity for a period of 14 days. Perimeter control measures shall be installed following clearing, but prior to the start of any grubbing or grading activity, install other temporary controls in incremental stages as construction proceeds.

Maintaining vegetated buffers along stream banks, wetlands or other sensitive areas is a crucial erosion and sediment control measure that should be established wherever possible.

Control only sediment-laden runoff generated by the project site. Collect and route clean offsite runoff around or through the project site using diversion berms, diversion channels, culverts and/or temporary pipes.

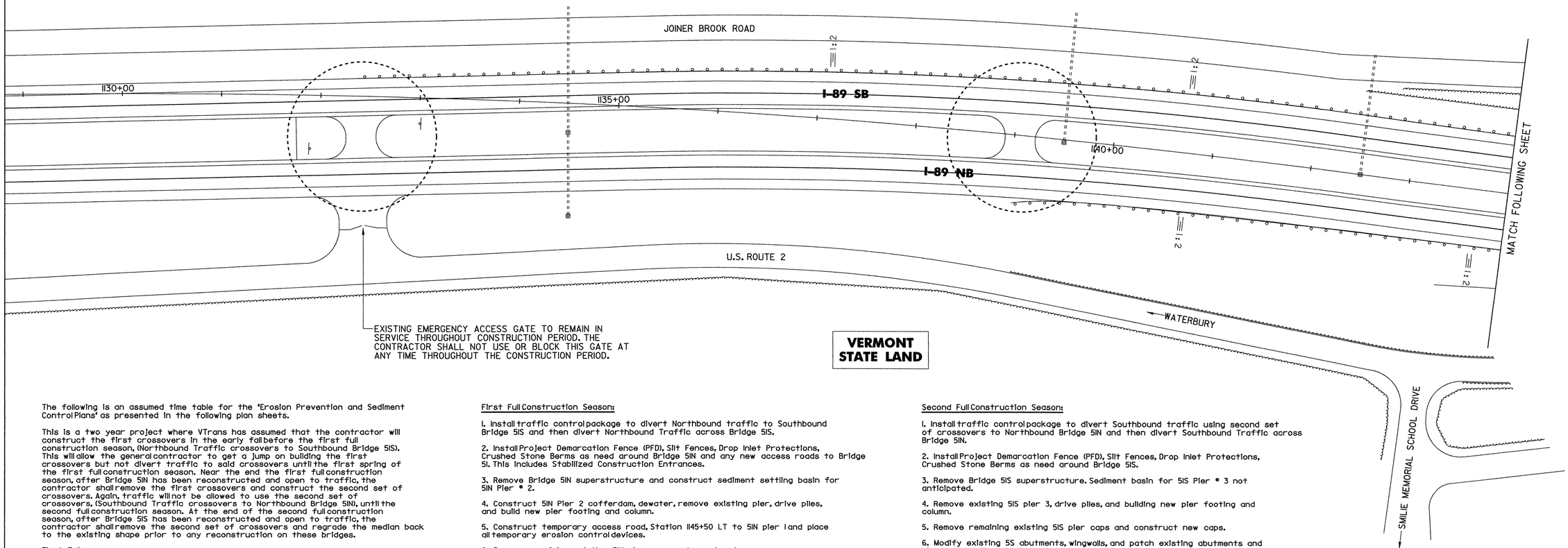
Do not allow construction equipment to operate on the down slope side of perimeter control measures.

SIZING REQUIREMENT FOR SEDIMENT SETTLING BASIN

PUMP FLOW RATE		REQUIRED SURFACE AREA		LENGTH / WIDTH = 2:1			
Q(gpm)	Q(m^3/s)	(ft^2)	(m^2)	L (ft)	W (ft)	L (m)	W (m)
50	0.0032	595	55	35.0	17.0	10.6	5.3
100	0.0063	1200	111	49.0	24.5	15.0	7.5
150	0.0095	1776	165	59.6	29.8	18.2	9.1
200	0.0126	2368	220	68.8	34.4	21.0	10.5
250	0.0158	2970	276	77.0	38.5	23.4	11.7
300	0.0189	3560	330	84.4	42.2	25.8	12.9
350	0.0221	4155	386	91.2	45.6	27.8	13.9

PROJECT NAME:	**BOLTON**
PROJECT NUMBER:	**IM 089-2(29)**
FILE NAME:	**/PW/99A268/sa268ecn.xls**
PROJECT LEADER:	**FARNSWORTH**
DESIGNED BY:	**STR6**
EROSION CONTROL NARRATIVE	
PLOT DATE:	**3/18/2004**
DRAWN BY:	**WEEBER**
CHECKED BY:	**FARNSWORTH**
SHEET	**70** OF **307**

THE ONLY CHANGE FROM THE PRE-CONSTRUCTION CONDITION OF THE PROJECT TO THE POST-CONSTRUCTION CONDITION, IS THE RELOCATION OF THE U-TURN AT STATION 1139+05.00. IT WILL BE REMOVED IN ORDER TO CONSTRUCT CROSSOVERS. THE PROPOSED LOCATION OF THE NEW U-TURN WILL BE STATION 1132+40.00.



The following is an assumed time table for the 'Erosion Prevention and Sediment Control Plans' as presented in the following plan sheets.

This is a two year project where VTrans has assumed that the contractor will construct the first crossovers in the early fall before the first full construction season, (Northbound Traffic crossovers to Southbound Bridge 51S). This will allow the general contractor to get a jump on building the first crossovers but not divert traffic to said crossovers until the first spring of the first full construction season. Near the end the first full construction season, after Bridge 51N has been reconstructed and open to traffic, the contractor shall remove the first crossovers and construct the second set of crossovers. Again, traffic will not be allowed to use the second set of crossovers, (Southbound Traffic crossovers to Northbound Bridge 51N), until the second full construction season. At the end of the second full construction season, after Bridge 51S has been reconstructed and open to traffic, the contractor shall remove the second set of crossovers and regrade the median back to the existing shape prior to any reconstruction on these bridges.

First Fall:

1. Install Project Demarcation Fence (PFD), Silt Fences, Drop Inlet Protections, Crushed Stone Berms as need in median areas for first set of crossovers.

2. Construct new U-Turn at median Station 1132+40.

3. Construct first crossovers, Northbound traffic to Southbound Bridge 51S. This includes paving crossovers.

4. Construct temporary access roads to Northbound lanes at stations 1138+90 RT and 1152+00 RT including Stabilized Construction Entrances. Guardrail next to US Rte 2, ML Station 1138+90 RT, must remain in place over winter.

5. Install any remaining Crush Stone Berms in median and down slope of temporary access roads. Place Erosion Matting on all slopes as per time guide lines in Item 652.30 'Maintenance of Erosion Prevention & Sediment Control Plan'. All slopes and ditches are to be stabilized.

First Full Construction Season:

1. Install traffic control package to divert Northbound traffic to Southbound Bridge 51S and then divert Northbound Traffic across Bridge 51S.

2. Install Project Demarcation Fence (PFD), Silt Fences, Drop Inlet Protections, Crushed Stone Berms as need around Bridge 51N and any new access roads to Bridge 51. This includes Stabilized Construction Entrances.

3. Remove Bridge 51N superstructure and construct sediment settling basin for 51N Pier # 2.

4. Construct 51N Pier 2 cofferdam, dewater, remove existing pier, drive piles, and build new pier footing and column.

5. Construct temporary access road, Station 1145+50 LT to 51N pier 1 and place all temporary erosion control devices.

6. Remove remaining existing 51N pier caps and construct new caps.

7. Modify existing 51N abutments, wingwalls, and patch existing abutments and pier columns.

8. Erect structural steel, pour decks, approach slabs & curbs, install roadway & bridge guard rail, membrane, and pave bridge and approaches.

9. Place pavement markings and open Northbound bridge to Northbound traffic.

10. Remove temporary concrete barrier and temporary pavement from crossover.

11. Reconstruct median crossovers, Southbound Traffic crossovers to Northbound Bridge 51N, and pave. No traffic on second crossover set until second full construction season. Remove temporary access roads to Northbound lanes.

12. Construct temporary access roads to Southbound lanes at stations 1142+80 LT and 1151+30 LT including stabilized construction entrances.

13. Install any remaining crush stone berms in median and down slope of temporary access roads. Place erosion matting on all slopes as per time guide lines in Item 652.30 'Maintenance of Erosion Prevention & Sediment Control Plan'. All slopes and ditches are to be stabilized.

Second Full Construction Season:

1. Install traffic control package to divert Southbound traffic using second set of crossovers to Northbound Bridge 51N and then divert Southbound Traffic across Bridge 51N.

2. Install Project Demarcation Fence (PFD), Silt Fences, Drop Inlet Protections, Crushed Stone Berms as need around Bridge 51S.

3. Remove Bridge 51S superstructure. Sediment basin for 51S Pier # 3 not anticipated.

4. Remove existing 51S pier 3, drive piles, and building new pier footing and column.

5. Remove remaining existing 51S pier caps and construct new caps.

6. Modify existing 5S abutments, wingwalls, and patch existing abutments and pier columns. Wrap both Northbound and Southbound columns as called for in plans.

7. Erect structural steel, pour decks, approach slabs & curbs, install roadway & bridge guard rail, membrane, and pave bridge and approaches.

8. Place pavement markings and open Southbound bridge to Southbound traffic.

9. Remove second set of median crossovers and access roads to southbound lanes. Reshape medians and temporary access roads.

10. Place Erosion Matting on all slopes as per time guide lines in Item 652.30 'Maintenance of Erosion Prevention & Sediment Control Plan'. All slopes and ditches are to be stabilized. Only remove silt fences from established slope area.

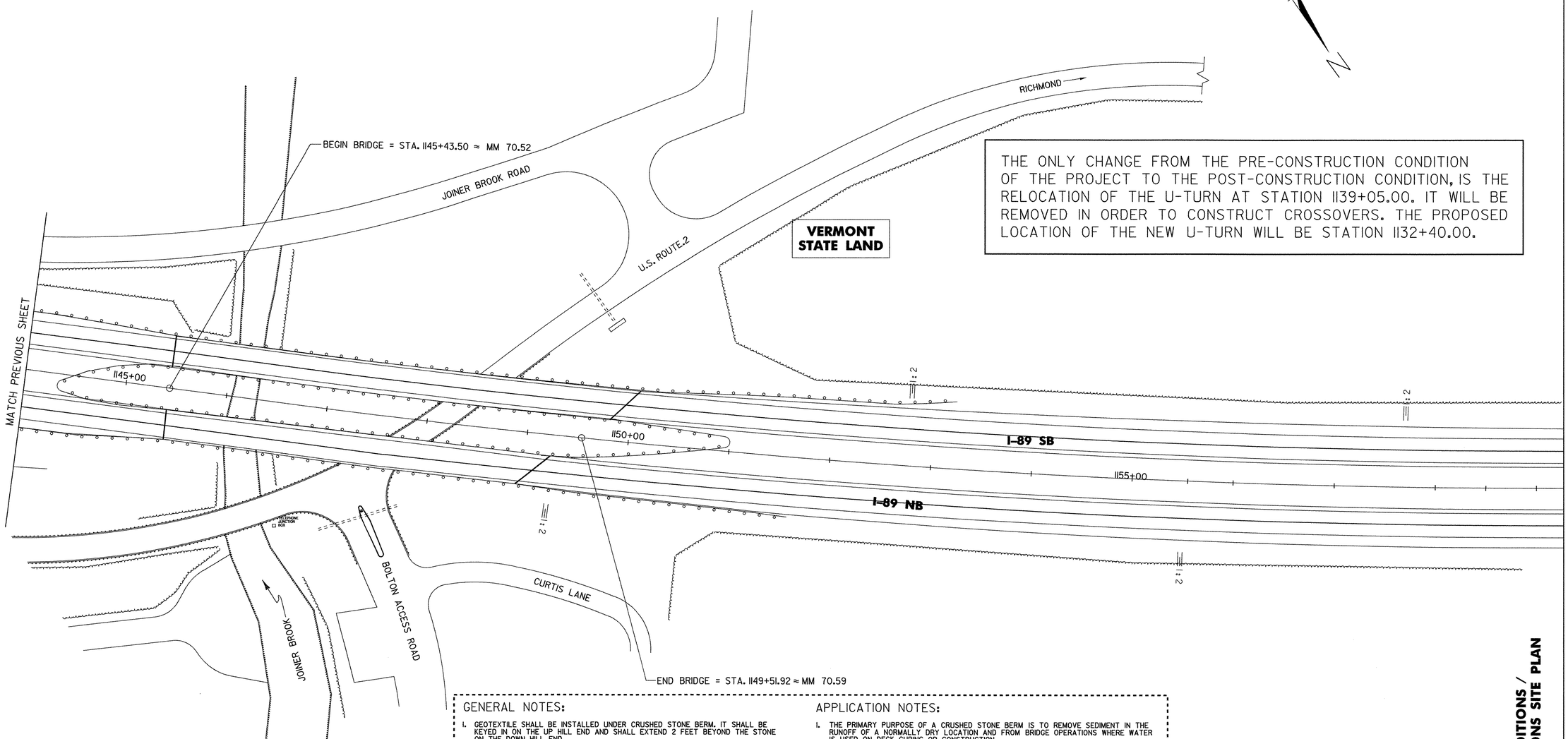
11. The median U-Turn at Station 1132+40 is to remain at this location.

Spring following Second Full Construction Season:

After all temporary slopes have established grass cover, as per contract specifications, the remaining silt fences and temporary crushed stone dams are to be removed. Temporary crushed stone dams may be leveled and blended into existing ditches providing the final shape will not cause problems when mowing of ditches or slopes.

EXISTING CONDITIONS / FINAL CONDITIONS SITE PLAN SHEET 1

PROJECT NAME:	BOLTON
PROJECT NUMBER:	IM 089-2(29)
FILE NAME: PW/99A268/sa268bdr.dgn	PLOT DATE: 02-AUG-2004
PROJECT LEADER: Farnsworth	DRAWN BY: Weeber
DESIGNED BY: STR6	CHECKED BY: Farnsworth
sa268ecfc1.i	SHEET 71 OF 307



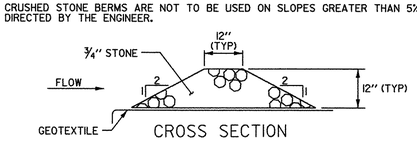
THE ONLY CHANGE FROM THE PRE-CONSTRUCTION CONDITION OF THE PROJECT TO THE POST-CONSTRUCTION CONDITION, IS THE RELOCATION OF THE U-TURN AT STATION 1139+05.00. IT WILL BE REMOVED IN ORDER TO CONSTRUCT CROSSOVERS. THE PROPOSED LOCATION OF THE NEW U-TURN WILL BE STATION 1132+40.00.

GENERAL NOTES:

1. GEOTEXTILE SHALL BE INSTALLED UNDER CRUSHED STONE BERM. IT SHALL BE KEYED IN ON THE UP HILL END AND SHALL EXTEND 2 FEET BEYOND THE STONE ON THE DOWN HILL END.
2. STONE FOR THE CRUSHED STONE BERM SHALL BE CRUSHED ¾" STONE, CLEANED AND WASHED IN AN APPROVED MANNER, RESULTING IN MATERIAL THAT IS FREE OF ORGANIC MATTER AND FINE PARTICLES.
3. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.
4. MEASURES SHALL BE CLEANED AND REPAIRED AS NEEDED. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES ONE-HALF OF THE MEASURE HEIGHT. SEDIMENT SHALL BE DISPOSED OF AS UNSUITABLE MATERIAL.
5. AT TIME OF REMOVAL OF THE CRUSHED STONE BERMS, THE DISTURBED AREA SHALL BE REPAIRED AND STABILIZED.
6. PAYMENT FOR INSTALLATION AND REMOVAL OF CRUSHED STONE BERMS SHALL BE MADE UNDER APPLICABLE ITEMS INCLUDED IN THE CONTRACT PLANS OR UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM.
7. PAYMENT FOR MONITORING CRUSHED STONE BERMS SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.
8. PAYMENT FOR MAINTAINING CRUSHED STONE BERMS SHALL BE MADE UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM, UNLESS MAINTENANCE IS REQUIRED DUE TO POOR INSTALLATION PRACTICES.

APPLICATION NOTES:

1. THE PRIMARY PURPOSE OF A CRUSHED STONE BERM IS TO REMOVE SEDIMENT IN THE RUNOFF OF A NORMALLY DRY LOCATION AND FROM BRIDGE OPERATIONS WHERE WATER IS USED ON DECK CURING OR CONSTRUCTION.
2. CRUSHED STONE BERMS ARE TO FILTER OUT SEDIMENT WITHIN THE CRUSHED STONE BERM AND ALSO TO CAPTURE SEDIMENT THAT FALLS OUT OF SUSPENSION BEHIND THE CRUSHED STONE BERM.
3. DETAILS SHOWN SHALL BE USED FOR TEMPORARY INSTALLATION ONLY.
4. CRUSHED STONE BERMS ARE NOT TO BE USED ON SLOPES GREATER THAN 5% UNLESS DIRECTED BY THE ENGINEER.



CROSS SECTION

CRUSHED STONE BERM - TEMPORARY (3/4" STONE)

0 50 100
SCALE

EXISTING CONDITIONS / FINAL CONDITIONS SITE PLAN
SHEET 2

PROJECT NAME: BOLTON
PROJECT NUMBER: IM 089-2(29)

FILE NAME: PW/99A268/sa268bdr.dgn
PROJECT LEADER: Farnsworth
DESIGNED BY: STR6
sa268ecfc2.1

PLOT DATE: 26-AUG-2004
DRAWN BY: Weeber
CHECKED BY: Farnsworth
SHEET 72 OF 307

CONVENTIONAL SYMBOLS

- R.O.W. BOUNDARY
- R.O.W. FENCE
- EXISTING GUARD RAIL
- EDGE OF RIVER
- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF RUNOFF FLOW
- PROPOSED TEMPORARY CULVERT
- EXISTING CULVERT
- WOODS
- EXISTING DROP INLET

CONSTRUCT NEW PERMANENT U-TURN PRIOR TO ANY CONSTRUCTION ACTIVITY. ERECT SALVAGED SIGNS FROM EXISTING U-TURN AT STATION 1139+05.00

SOIL TYPE Hf

JOINER BROOK ROAD

1130+00

1135+00

I-89 SB

I-89 NB

40+00

PDF

JERSEY BARRIER

24'

U.S. ROUTE 2

MATCH FOLLOWING SHEET

WATERBURY

EXISTING EMERGENCY ACCESS GATE TO REMAIN IN SERVICE THROUGHOUT CONSTRUCTION PERIOD. THE CONTRACTOR SHALL NOT USE OR BLOCK THIS GATE AT ANY TIME THROUGHOUT THE CONSTRUCTION PERIOD.

VERMONT STATE LAND

EXCAVATE AND REMOVE EXISTING U-TURN AFTER CONSTRUCTION OF NEW U-TURN.

SOIL TYPE Sto

SMILIE MEMORIAL SCHOOL DRIVE

SOIL TYPE AgA

0 50 100
SCALE

NOTES

SILT FENCE INSTALLATION WILL REQUIRE PHASING TO MAXIMIZE EFFECTIVENESS. INSTALL AND/OR MOVE SILT FENCE AS CONSTRUCTION PROGRESSES TO OBTAIN THE GREATEST PREVENTION OF SEDIMENT TRANSPORT. ALL SILT FENCE INSTALLATION SHALL BE PROPERLY KEYED INTO THE GROUND AND SUPPORTED AS SHOWN ON THE 'EROSION PREVENTION & SEDIMENT CONTROL DETAILS' SHEET. SILT FENCE SHOULD BE INSTALLED PARALLEL TO THE CONTOURS TO PREVENT CONCENTRATION OF RUNOFF. THE ENDS OF EACH RUN OF SILT FENCE SHALL BE TURNED UPHILL TO PROVIDE A SMALL POOL FOR SILT, SHOULD WATER TRY TO RUN AROUND THE END OF THE SILT FENCE.

ALL ITEMS ASSOCIATED WITH STABILIZED CONSTRUCTION ENTRANCES, AND CROSSOVERS WILL BE INCIDENTAL TO ITEM *641.10, TRAFFIC CONTROL.

PDF FENCES (ITEM *620.70, SNOW FENCE (PDF) ARE NOT TO REMAIN IN PLACE OVER THE WINTER IF THEY INTERFERE WITH SNOW REMOVAL, OR AID IN THE FORMATION OF SNOW DRIFTS THAT IMPEDE TRAFFIC.

TEMPORARY STONE CHECK DAMS SHALL BE KEYED INTO THE GROUND AND CONSTRUCTED AS PER THE 'EROSION PREVENTION & SEDIMENT CONTROL DETAILS' SHEET. THE PURPOSE OF TEMPORARY CHECK DAMS IS TO REDUCE RUNOFF VELOCITIES THUS PREVENTING EROSION.

SURFACE ROUGHENING HELPS REDUCE RUNOFF VELOCITIES AND INCREASES INFILTRATION RATES. ROUGHENING MAY BE ACCOMPLISHED BY A NUMBER OF METHODS SUCH AS TRACKINGUP AND DOWN THE SLOPE WITH A BULL-DOZER, TRACKING ACROSS THE SLOPE WITH A WHEELED VEHICLE OR ANY METHOD OF SCARIFYING THE SLOPE SUCH THAT THE GROOVES CREATED RUN PERPENDICULAR TO THE DIRECTION OF WATER RUNOFF.

EROSION PREVENTION & SEDIMENT CONTROL LEGEND

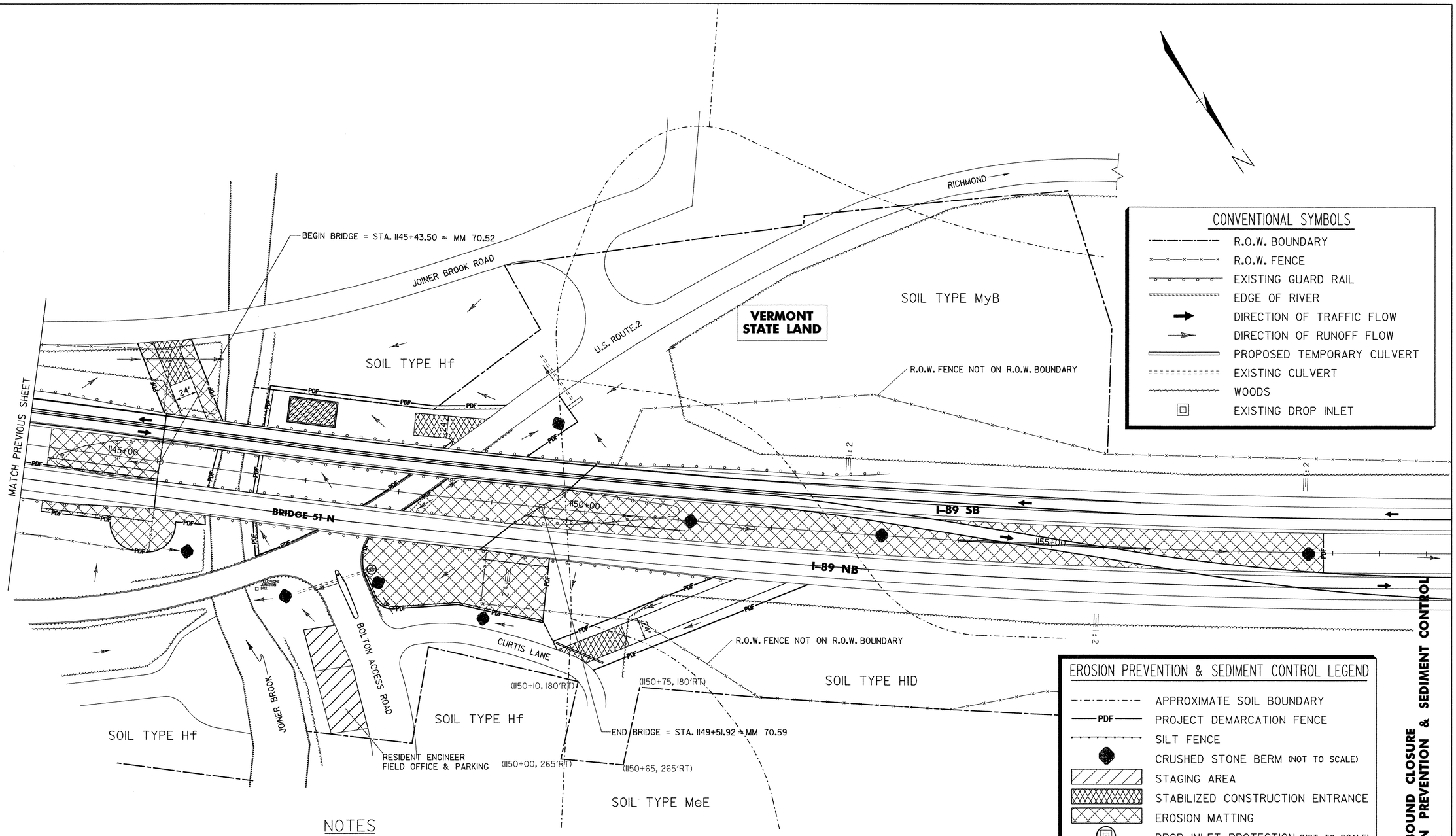
- APPROXIMATE SOIL BOUNDARY
- PDF — PROJECT DEMARCATION FENCE
- SILT FENCE
- CRUSHED STONE BERM (NOT TO SCALE)
- STAGING AREA
- STABILIZED CONSTRUCTION ENTRANCE
- EROSION MATTING
- DROP INLET PROTECTION (NOT TO SCALE)
- SEDIMENT SETTLING BASIN (IF NECESSARY)

NORTHBOUND CLOSURE
EROSION PREVENTION & SEDIMENT CONTROL
SHEET 1

PROJECT NAME: BOLTON
PROJECT NUMBER: IM 089-2(29)

FILE NAME: PW/99A268/sa268bdr.dgn
PROJECT LEADER: Farnsworth
DESIGNED BY: STR6
sa268epscl.1

PLOT DATE: 26-AUG-2004
DRAWN BY: Weeber
CHECKED BY: Farnsworth
SHEET 73 OF 307



CONVENTIONAL SYMBOLS

- R.O.W. BOUNDARY
- R.O.W. FENCE
- EXISTING GUARD RAIL
- EDGE OF RIVER
- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF RUNOFF FLOW
- PROPOSED TEMPORARY CULVERT
- EXISTING CULVERT
- WOODS
- EXISTING DROP INLET

EROSION PREVENTION & SEDIMENT CONTROL LEGEND

- APPROXIMATE SOIL BOUNDARY
- PDF — PROJECT DEMARCATION FENCE
- SILT FENCE
- CRUSHED STONE BERM (NOT TO SCALE)
- STAGING AREA
- STABILIZED CONSTRUCTION ENTRANCE
- EROSION MATTING
- DROP INLET PROTECTION (NOT TO SCALE)
- SEDIMENT SETTLING BASIN (IF NECESSARY)

NOTES

SILT FENCE INSTALLATION WILL REQUIRE PHASING TO MAXIMIZE EFFECTIVENESS. INSTALL AND/OR MOVE SILT FENCE AS CONSTRUCTION PROGRESSES TO OBTAIN THE GREATEST PREVENTION OF SEDIMENT TRANSPORT. ALL SILT FENCE INSTALLATION SHALL BE PROPERLY KEYED INTO THE GROUND AND SUPPORTED AS SHOWN ON THE 'EROSION PREVENTION & SEDIMENT CONTROL DETAILS' SHEET. SILT FENCE SHOULD BE INSTALLED PARALLEL TO THE CONTOURS TO PREVENT CONCENTRATION OF RUNOFF. THE ENDS OF EACH RUN OF SILT FENCE SHALL BE TURNED UPHILL TO PROVIDE A SMALL POOL FOR SILT, SHOULD WATER TRY TO RUN AROUND THE END OF THE SILT FENCE.

ALL ITEMS ASSOCIATED WITH STABILIZED CONSTRUCTION ENTRANCES, AND CROSSOVERS WILL BE INCIDENTAL TO ITEM #641.10, TRAFFIC CONTROL.

PDF FENCES (ITEM #620.70, SNOW FENCE (PDF) ARE NOT TO REMAIN IN PLACE OVER THE WINTER IF THEY INTERFERE WITH SNOW REMOVAL, OR AID IN THE FORMATION OF SNOW DRIFTS THAT IMPEDE TRAFFIC.

TEMPORARY STONE CHECK DAMS SHALL BE KEYED INTO THE GROUND AND CONSTRUCTED AS PER THE 'EROSION PREVENTION & SEDIMENT CONTROL DETAILS' SHEET. THE PURPOSE OF TEMPORARY CHECK DAMS IS TO REDUCE RUNOFF VELOCITIES THUS PREVENTING EROSION.

SURFACE ROUGHENING HELPS REDUCE RUNOFF VELOCITIES AND INCREASES INFILTRATION RATES. ROUGHENING MAY BE ACCOMPLISHED BY A NUMBER OF METHODS SUCH AS TRACKINGUP AND DOWN THE SLOPE WITH A BULL-DOZER, TRACKING ACROSS THE SLOPE WITH A WHEELED VEHICLE OR ANY METHOD OF SCARIFYING THE SLOPE SUCH THAT THE GROOVES CREATED RUN PERPENDICULAR TO THE DIRECTION OF WATER RUNOFF.

0 50 100
SCALE

NORTHBOUND CLOSURE
EROSION PREVENTION & SEDIMENT CONTROL
SHEET 2

PROJECT NAME: BOLTON
PROJECT NUMBER: IM 089-2(29)

FILE NAME: PW/99A268/sa268bdr.dgn
PROJECT LEADER: Farnsworth
DESIGNED BY: STR6
sa268epsc2.1

PLOT DATE: 26-AUG-2004
DRAWN BY: Weeber
CHECKED BY: Farnsworth
SHEET 74 OF 307

CONVENTIONAL SYMBOLS

- R.O.W. BOUNDARY
- R.O.W. FENCE
- EXISTING GUARD RAIL
- EDGE OF RIVER
- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF RUNOFF FLOW
- PROPOSED TEMPORARY CULVERT
- EXISTING CULVERT
- WOODS
- EXISTING DROP INLET

N

SOIL TYPE Hf

JOINER BROOK ROAD

1130+00

1135+00

I-89 SB

I-89 NB

80+00

PDF

MATCH FOLLOWING SHEET

U.S. ROUTE 2

WATERBURY

EXISTING EMERGENCY ACCESS GATE TO REMAIN IN SERVICE THROUGHOUT CONSTRUCTION PERIOD. THE CONTRACTOR SHALL NOT USE OR BLOCK THIS GATE AT ANY TIME THROUGHOUT THE CONSTRUCTION PERIOD.

VERMONT STATE LAND

SOIL TYPE Stc

SMILIE MEMORIAL SCHOOL DRIVE

SOIL TYPE AgA

0 50 100

SCALE

NOTES

SILT FENCE INSTALLATION WILL REQUIRE PHASING TO MAXIMIZE EFFECTIVENESS. INSTALL AND/OR MOVE SILT FENCE AS CONSTRUCTION PROGRESSES TO OBTAIN THE GREATEST PREVENTION OF SEDIMENT TRANSPORT. ALL SILT FENCE INSTALLATION SHALL BE PROPERLY KEYED INTO THE GROUND AND SUPPORTED AS SHOWN ON THE 'EROSION PREVENTION & SEDIMENT CONTROL DETAILS' SHEET. SILT FENCE SHOULD BE INSTALLED PARALLEL TO THE CONTOURS TO PREVENT CONCENTRATION OF RUNOFF. THE ENDS OF EACH RUN OF SILT FENCE SHALL BE TURNED UPHILL TO PROVIDE A SMALL POOL FOR SILT, SHOULD WATER TRY TO RUN AROUND THE END OF THE SILT FENCE.

ALL ITEMS ASSOCIATED WITH STABILIZED CONSTRUCTION ENTRANCES, AND CROSSOVERS WILL BE INCIDENTAL TO ITEM *641.10, TRAFFIC CONTROL.

PDF FENCES (ITEM *620.70, SNOW FENCE (PDF) ARE NOT TO REMAIN IN PLACE OVER THE WINTER IF THEY INTERFERE WITH SNOW REMOVAL, OR AID IN THE FORMATION OF SNOW DRIFTS THAT IMPEDE TRAFFIC.

TEMPORARY STONE CHECK DAMS SHALL BE KEYED INTO THE GROUND AND CONSTRUCTED AS PER THE 'EROSION PREVENTION & SEDIMENT CONTROL DETAILS' SHEET. THE PURPOSE OF TEMPORARY CHECK DAMS IS TO REDUCE RUNOFF VELOCITIES THUS PREVENTING EROSION.

SURFACE ROUGHENING HELPS REDUCE RUNOFF VELOCITIES AND INCREASES INFILTRATION RATES. ROUGHENING MAY BE ACCOMPLISHED BY A NUMBER OF METHODS SUCH AS TRACKINGUP AND DOWN THE SLOPE WITH A BULL-DOZER, TRACKING ACROSS THE SLOPE WITH A WHEELED VEHICLE OR ANY METHOD OF SCARIFYING THE SLOPE SUCH THAT THE GROOVES CREATED RUN PERPENDICULAR TO THE DIRECTION OF WATER RUNOFF.

EROSION PREVENTION & SEDIMENT CONTROL LEGEND

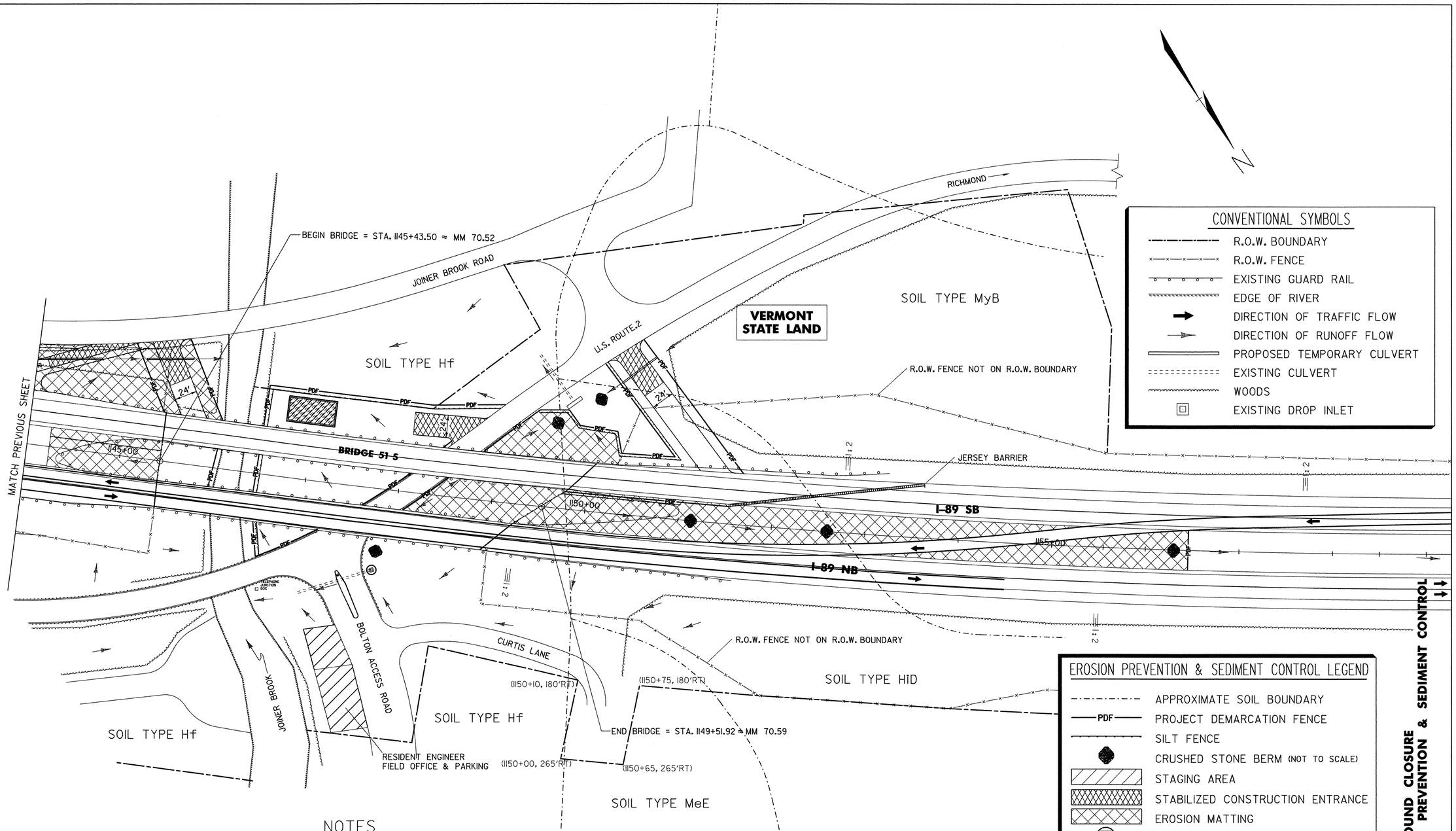
- APPROXIMATE SOIL BOUNDARY
- PDF — PROJECT DEMARCATION FENCE
- SILT FENCE
- CRUSHED STONE BERM (NOT TO SCALE)
- STAGING AREA
- STABILIZED CONSTRUCTION ENTRANCE
- EROSION MATTING
- DROP INLET PROTECTION (NOT TO SCALE)
- SEDIMENT SETTLING BASIN (IF NECESSARY)

SOUTHBOUND CLOSURE
EROSION PREVENTION & SEDIMENT CONTROL
SHEET 1

PROJECT NAME: BOLTON
PROJECT NUMBER: IM 089-2(29)

FILE NAME: PW/99A268/sa268bdr.dgn
PROJECT LEADER: Farnsworth
DESIGNED BY: STR6
sa268epsc3.1

PLOT DATE: 26-AUG-2004
DRAWN BY: Weeber
CHECKED BY: Farnsworth
SHEET 75 OF 307



CONVENTIONAL SYMBOLS

- R.O.W. BOUNDARY
- R.O.W. FENCE
- EXISTING GUARD RAIL
- EDGE OF RIVER
- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF RUNOFF FLOW
- PROPOSED TEMPORARY CULVERT
- EXISTING CULVERT
- WOODS
- EXISTING DROP INLET

EROSION PREVENTION & SEDIMENT CONTROL LEGEND

- APPROXIMATE SOIL BOUNDARY
- PDF — PROJECT DEMARCATION FENCE
- SILT FENCE
- CRUSHED STONE BERM (NOT TO SCALE)
- STAGING AREA
- STABILIZED CONSTRUCTION ENTRANCE
- EROSION MATTING
- DROP INLET PROTECTION (NOT TO SCALE)
- SEDIMENT SETTLING BASIN (IF NECESSARY)

NOTES

SILT FENCE INSTALLATION WILL REQUIRE PHASING TO MAXIMIZE EFFECTIVENESS. INSTALL AND/OR MOVE SILT FENCE AS CONSTRUCTION PROGRESSES TO OBTAIN THE GREATEST PREVENTION OF SEDIMENT TRANSPORT. ALL SILT FENCE INSTALLATION SHALL BE PROPERLY KEYED INTO THE GROUND AND SUPPORTED AS SHOWN ON THE 'EROSION PREVENTION & SEDIMENT CONTROL DETAILS' SHEET. SILT FENCE SHOULD BE INSTALLED PARALLEL TO THE CONTOURS TO PREVENT CONCENTRATION OF RUNOFF. THE ENDS OF EACH RUN OF SILT FENCE SHALL BE TURNED UPHILL TO PROVIDE A SMALL POOL FOR SILT, SHOULD WATER TRY TO RUN AROUND THE END OF THE SILT FENCE.

ALL ITEMS ASSOCIATED WITH STABILIZED CONSTRUCTION ENTRANCES, AND CROSSOVERS WILL BE INCIDENTAL TO ITEM #641.10, TRAFFIC CONTROL.

PDF FENCES (ITEM #620.70, SNOW FENCE (PDF) ARE NOT TO REMAIN IN PLACE OVER THE WINTER IF THEY INTERFERE WITH SNOW REMOVAL, OR AID IN THE FORMATION OF SNOW DRIFTS THAT IMPEDE TRAFFIC.

TEMPORARY STONE CHECK DAMS SHALL BE KEYED INTO THE GROUND AND CONSTRUCTED AS PER THE 'EROSION PREVENTION & SEDIMENT CONTROL DETAILS' SHEET. THE PURPOSE OF TEMPORARY CHECK DAMS IS TO REDUCE RUNOFF VELOCITIES THUS PREVENTING EROSION.

SURFACE ROUGHENING HELPS REDUCE RUNOFF VELOCITIES AND INCREASES INFILTRATION RATES. ROUGHENING MAY BE ACCOMPLISHED BY A NUMBER OF METHODS SUCH AS TRACKINGUP AND DOWN THE SLOPE WITH A BULL-DOZER, TRACKING ACROSS THE SLOPE WITH A WHEELED VEHICLE OR ANY METHOD OF SCARIFYING THE SLOPE SUCH THAT THE GROOVES CREATED RUN PERPENDICULAR TO THE DIRECTION OF WATER RUNOFF.

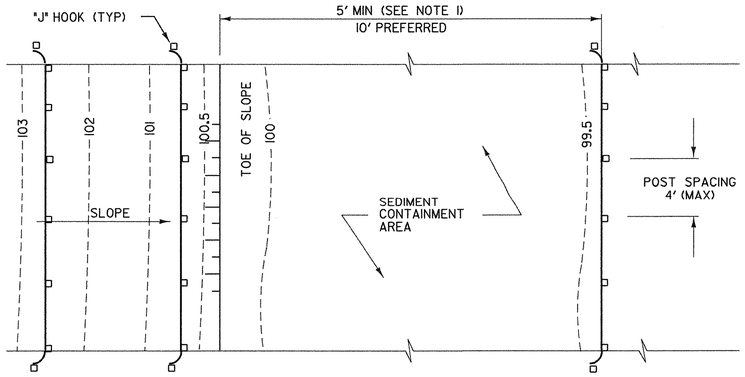
0 50 100
SCALE

SOUTHBOUND CLOSURE
EROSION PREVENTION & SEDIMENT CONTROL
SHEET 2

PROJECT NAME: BOLTON
PROJECT NUMBER: IM 089-2(29)

FILE NAME: PW/99A268/sa268bdr.dgn
PROJECT LEADER: Farnsworth
DESIGNED BY: STR6
sa268epsc4.i

PLOT DATE: 26-AUG-2004
DRAWN BY: Weeber
CHECKED BY: Farnsworth
SHEET 76 OF 307



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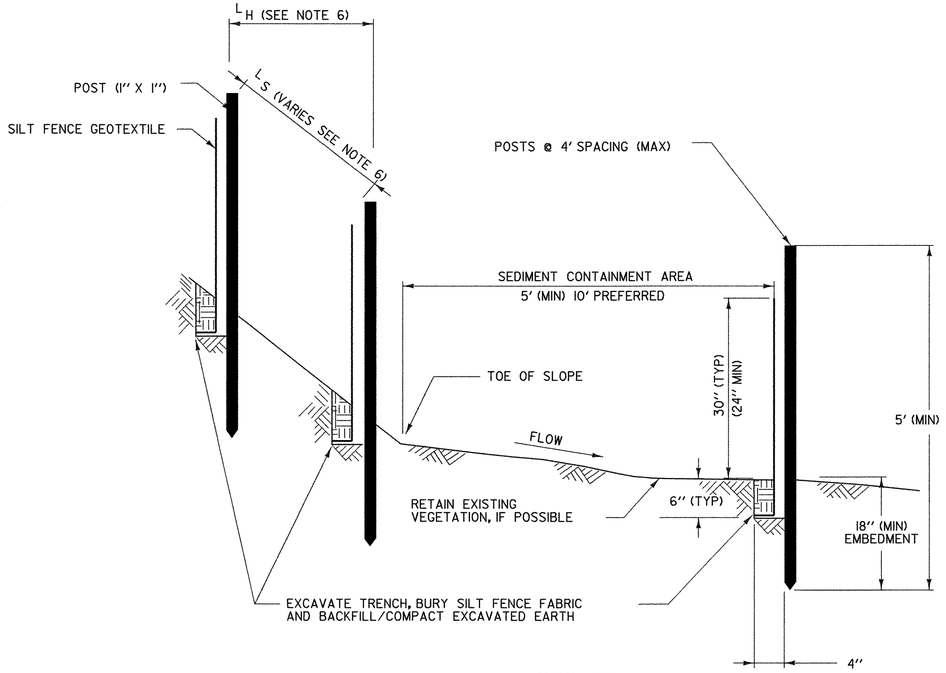


SECTION

SILT FENCE - TEMPORARY

SILT FENCE

APPLICATION NOTES:

A. THE PRIMARY PURPOSE OF SILT FENCE IS TO REDUCE RUNOFF VELOCITY AND TRAP SEDIMENT. VELOCITY IS REDUCED, WATER IS IMPOUNDED BEHIND THE MEASURE, AND SEDIMENT FALLS OUT OF SUSPENSION.

B. SILT FENCE SHALL BE INSTALLED ON A LINE OF EQUAL ELEVATION (CONTOUR). IT MAY BE INSTALLED AT INTERMEDIATE POINTS UP SLOPES AS WELL AS AT THE BOTTOM, AS SHOWN IN THE DETAIL.

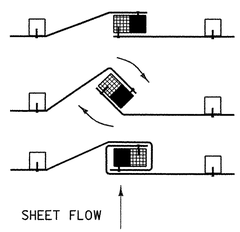
C. SILT FENCE SHALL NOT BE USED ACROSS CONCENTRATED FLOW.

GENERAL NOTES:

1. SILT FENCE SHALL GENERALLY BE PLACED A MINIMUM OF 5 FEET BEYOND TOE OF SLOPE, 10 FEET PREFERRED, TO PROVIDE ADEQUATE AREA FOR SEDIMENT STORAGE AND FACILITATE MAINTENANCE OF SEDIMENT CONTAINMENT AREA.
2. ALL ENDS SHALL BE "J" HOOKED TO TRAP SEDIMENT.
3. IN AREAS WITH TWO SLOPES, SILT FENCE SHALL BE USED TO ERECT A DAM AND TRAP SEDIMENT AT THE BASE OF THE STEEPER SLOPE.
4. THE BOTTOM EDGE OF SILT FENCE SHALL BE BURIED A MINIMUM OF 6 INCHES BELOW GROUND, AND KEYED IN 4 INCHES. THE FENCE SHALL BE INSTALLED WITH THE POSTS ON THE DOWNSTREAM SIDE OF THE FABRIC.
5. MAXIMUM DRAINAGE AREA TRIBUTARY TO 100 FEET OF SILT FENCE SHALL BE 0.25 ACRES.
6. THE FOLLOWING ARE MAXIMUM SLOPE LENGTHS FOR THESE MEASURES:

CONSTRUCTED SLOPE	SLOPE LENGTH (LS) FT	HORIZONTAL LENGTH (LH) FT
3 : 1	80	75
4 : 1	130	125
5 : 1	200	200
> 5 : 1	250	250

7. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.
8. MEASURES SHALL BE CLEANED AND REPAIRED AS NEEDED. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES ONE-HALF OF THE MEASURE HEIGHT. SEDIMENT SHALL BE DISPOSED OF AS UNSUITABLE MATERIAL.
9. SILT FENCE SHALL BE REMOVED WHEN THE AREA HAS BEEN STABILIZED. AT TIME OF REMOVAL OF THE SILT FENCE, THE DISTURBED AREA SHALL BE REPAIRED AND STABILIZED.
10. PAYMENT FOR INSTALLATION AND REMOVAL OF SILT FENCE SHALL BE MADE UNDER THE GEOTEXTILE FOR SILT FENCE ITEM.
11. PAYMENT FOR MONITORING SILT FENCE SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.
12. PAYMENT FOR MAINTAINING SILT FENCE SHALL BE MADE UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM, UNLESS MAINTENANCE IS REQUIRED DUE TO POOR INSTALLATION PRACTICES.



1. PLACE THE END POST OF ONE FENCE INSIDE THE END POST OF THE OTHER FENCE.
2. ROTATE BOTH POSTS AT LEAST 180 DEGREES IN A CLOCKWISE DIRECTION TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL
3. DRIVE BOTH POSTS 18 INCHES INTO THE GROUND AND BURY THE FLAP IN THE TRENCH.

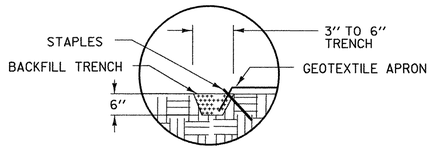
SPLICING DETAIL

EROSION PREVENTION & SEDIMENT CONTROL DETAILS: SILT FENCE

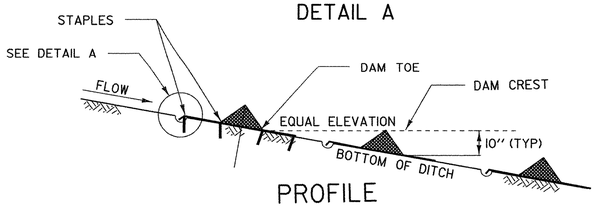
PROJECT NAME: BOLTON
PROJECT NUMBER: IM 089-2(29)

FILE NAME: PW/99A268/sa268epscl.dgn
PROJECT LEADER: Farnsworth
DESIGNED BY: STR6
sa268epscldet.1

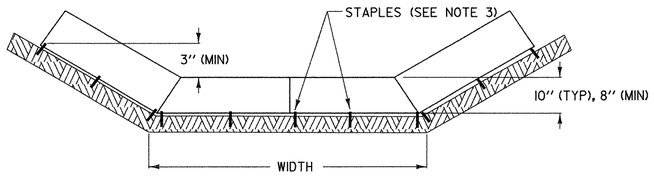
PLOT DATE: 02-AUG-2004
DRAWN BY: Weeber
CHECKED BY: Farnsworth
SHEET 81 OF 307



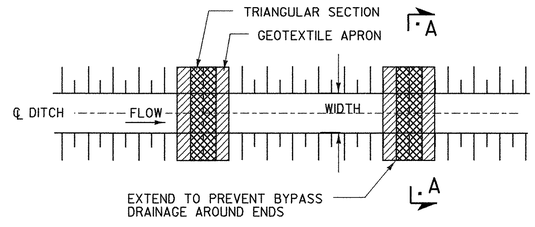
DETAIL A



PROFILE



SECTION A-A

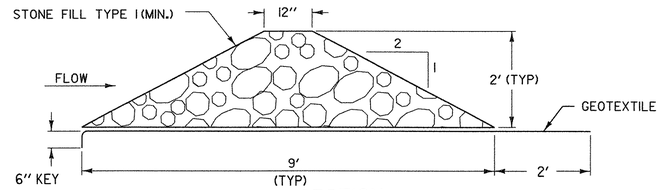


PLAN

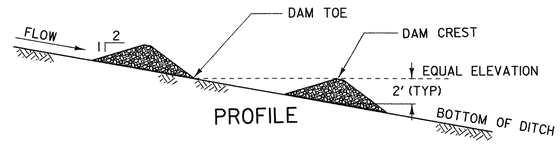
CHECK DAM - TEMPORARY (PREFABRICATED)

PREFABRICATED CHECK DAM PLACEMENT INTERVAL	
DITCH SLOPE	PLACEMENT INTERVAL **
1%	50 FT
2 %	40 FT
3 %	25 FT
4 %	20 FT
5 %	15 FT

** BASED ON 10" TYPICAL HEIGHT



CROSS SECTION



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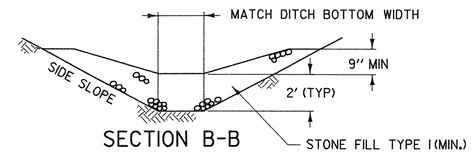
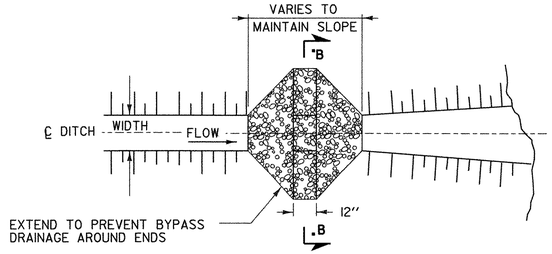


SECTION B-B



PLAN

CHECK DAM - TEMPORARY (STONE)

STONE CHECK DAM PLACEMENT INTERVAL	
DITCH SLOPE	PLACEMENT INTERVAL **
1%	200 FT
2 %	100 FT
3 %	65 FT
4 %	50 FT
5 %	40 FT
6 %	30 FT
8 %	25 FT
10 %	20 FT

** BASED ON 2' TYPICAL HEIGHT

CHECK DAMS

APPLICATION NOTES:

A. THE PRIMARY PURPOSE OF A CHECK DAM IS TO REDUCE EROSION IN A CHANNEL BY REDUCING FLOW VELOCITY.

B. CHECK DAMS WILL CAPTURE SEDIMENT THAT FALLS OUT OF SUSPENSION BEHIND THE CHECK DAM DUE TO DECREASED VELOCITY.

C. CHECK DAMS ARE NOT INTENDED TO FILTER SEDIMENT FROM TURBID WATER.

D. DETAILS SHOWN SHALL BE USED FOR TEMPORARY INSTALLATION ONLY.

E. PREFABRICATED DAMS ARE NOT TO BE USED ON SLOPES GREATER THAN 5% OR PER MANUFACTURER'S SPECIFICATIONS.

F. PREFABRICATED DAM SPECIFICATIONS SHALL BE PROVIDED TO THE ENGINEER FOR APPROVAL PRIOR TO USE.

GENERAL NOTES:

1. GEOTEXTILE SHALL BE INSTALLED UNDER STONE FILL. IT SHALL BE KEYED IN ON THE UP HILL END AND SHALL EXTEND 2 FEET BEYOND THE STONE ON THE DOWN HILL END.

2. CORE MATERIAL FOR THE STONE CHECK DAM SHALL MEET THE GRADATION REQUIREMENTS OF STONE FILL TYPE I (MIN.). STONE SIZE SHOULD BE INCREASED WITH INCREASED SLOPE AND VELOCITY.

3. THE UPHILL END OF THE APRON FOR THE PREFABRICATED CHECK DAM SHALL BE STAPLED AND BURIED AS SHOWN IN DETAIL 'A' OR AS RECOMMENDED BY THE MANUFACTURERS LITERATURE.

4. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.

5. MEASURES SHALL BE CLEANED AND REPAIRED AS NEEDED. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES ONE-HALF OF THE MEASURE HEIGHT. SEDIMENT SHALL BE DISPOSED OF AS UNSUITABLE MATERIAL.

6. AT TIME OF REMOVAL OF THE CHECK DAMS, THE DISTURBED AREA SHALL BE REPAIRED AND STABILIZED.

7. PAYMENT FOR INSTALLATION AND REMOVAL OF CHECK DAMS SHALL BE MADE UNDER APPLICABLE ITEMS INCLUDED IN THE CONTRACT PLANS OR UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM.

8. PAYMENT FOR MONITORING CHECK DAMS SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.

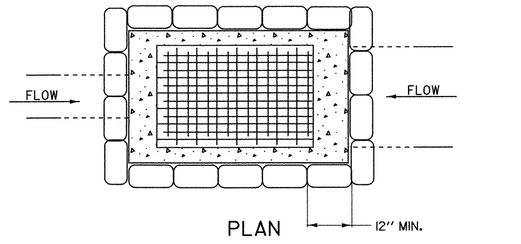
9. PAYMENT FOR MAINTAINING CHECK DAMS SHALL BE MADE UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM, UNLESS MAINTENANCE IS REQUIRED DUE TO POOR INSTALLATION PRACTICES.

EROSION PREVENTION & SEDIMENT CONTROL DETAILS: CHECK DAMS

PROJECT NAME: BOLTON
PROJECT NUMBER: IM 089-2(29)

FILE NAME: PW/99A268/sa268epscl.dgn
PROJECT LEADER: Farnsworth
DESIGNED BY: STR6
sa268epsc2det.i

PLOT DATE: 26-AUG-2004
DRAWN BY: Weeber
CHECKED BY: Farnsworth
SHEET 82 OF 307



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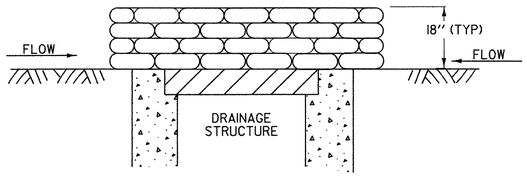
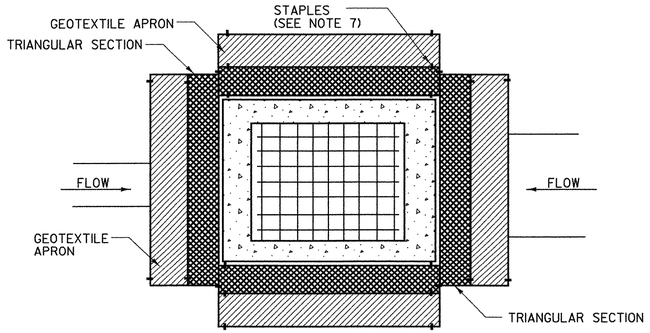
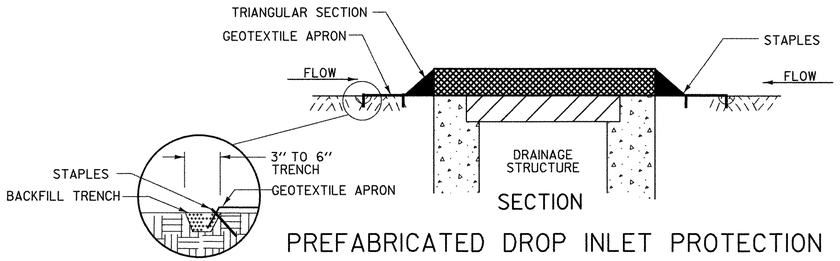


SECTION

GRAVEL BAG DROP INLET PROTECTION



PLAN



SECTION

DETAIL A

PREFABRICATED DROP INLET PROTECTION

DROP INLET PROTECTION

APPLICATION NOTES:

A. THE PRIMARY PURPOSE OF DRAINAGE STRUCTURE INLET PROTECTION IS TO PREVENT SEDIMENT FROM ENTERING A DRAINAGE SYSTEM BY PONDING WATER WHICH ALLOWS SEDIMENT TO FALL OUT OF SUSPENSION.

B. THESE EXAMPLES OF DROP INLET PROTECTION ARE NOT INTENDED FOR USE ON GRADES. ON GRADE THEY MAY CAUSE WATER TO BYPASS THE STRUCTURE, CREATING ADDITIONAL EROSION OR FLOODING.

C. POSSIBLE MODIFICATIONS FOR USE ON GRADE INCLUDE ADDING A BERM DOWNSTREAM OF THE INLET TO CREATE PONDING. CHECK DAMS MAY ALSO BE USED UPSTREAM OF THE INLET TO SLOW VELOCITIES.

D. PREFABRICATED DROP INLET PROTECTION SPECIFICATIONS SHALL BE PROVIDED TO THE ENGINEER FOR APPROVAL PRIOR TO USE.

GENERAL NOTES:

1. THE TOP OF THE INLET PROTECTION SHALL BE SET AT THE MAXIMUM DESIRED WATER LEVEL, BASED ON FIELD LOCATION AND CONDITIONS.

2. SILT FENCE GEOTEXTILE SHALL BE A SINGLE CONTINUOUS PIECE TO ELIMINATE JOINTS.

3. SPACE SILT FENCE POSTS EVENLY AROUND INLET WITH A MAXIMUM SPACING OF 3 FEET. DRIVE POSTS A MINIMUM OF 18 INCHES INTO GROUND. WIRE MESH MAY BE REQUIRED BEHIND GEOTEXTILE TO PROVIDE SUPPORT.

4. SILT FENCE GEOTEXTILE SHALL BE EMBEDDED A MINIMUM OF 6 INCHES AND BACKFILLED. GEOTEXTILE SHALL BE SECURELY FASTENED TO POSTS AND FRAME.

5. GRAVEL BAGS SHALL BE FILLED WITH CLEAN STONE, RATHER THAN SAND, TO PREVENT SEDIMENT FROM ENTERING A DRAINAGE SYSTEM IF BAGS ARE DAMAGED DURING USE.

6. GRAVEL BAGS SHALL BE INDIVIDUALLY TIED, DOUBLE BAGGED AND INVERSELY INSERTED. GRAVEL BAGS SHALL LAP THE JOINTS BETWEEN THE BAGS IN THE LAYER BELOW.

7. SECURE THE ENDS OF THE APRON FOR THE PREFABRICATED DRAINAGE STRUCTURE INLET PROTECTION WITH STAPLES AS DETAILED IN THE PLAN VIEW OR AS RECOMMENDED BY THE MANUFACTURERS LITERATURE.

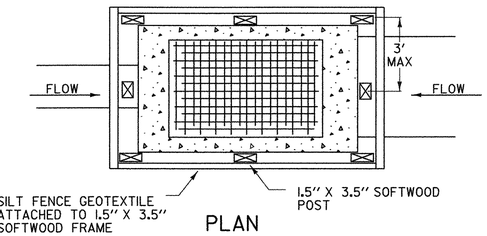
8. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.

9. MEASURES SHALL BE CLEANED AND REPAIRED AS NEEDED, SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES ONE-HALF OF THE MEASURE HEIGHT. SEDIMENT SHALL BE DISPOSED OF AS UNSUITABLE MATERIAL.

10. PAYMENT OF INLET PROTECTION SHALL BE MADE UNDER APPLICABLE ITEMS INCLUDED IN THE CONTRACT PLANS OR UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM.

11. PAYMENT FOR MONITORING INLET PROTECTION SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.

12. PAYMENT FOR MAINTAINING INLET PROTECTION SHALL BE MADE UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM, UNLESS MAINTENANCE IS REQUIRED DUE TO POOR INSTALLATION PRACTICES.



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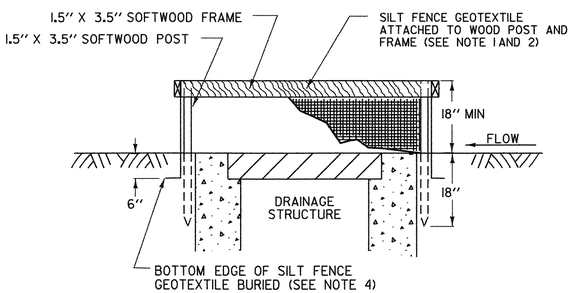
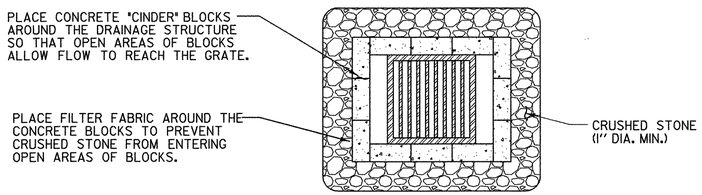


SECTION

SILT FENCE DROP INLET PROTECTION



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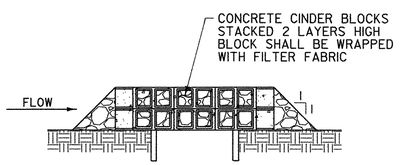
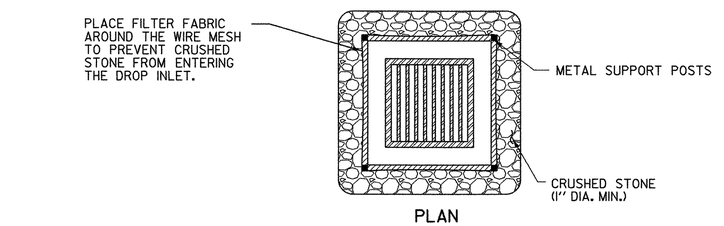
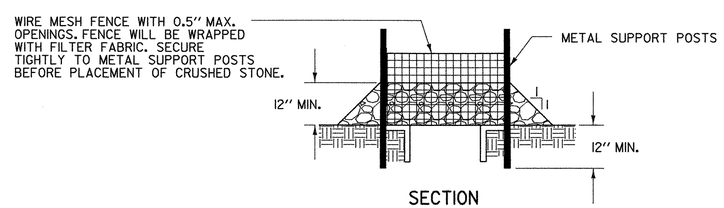


SECTION

ROCK BARRIER DROP INLET PROTECTION TEMPORARY PAVED AREAS



PLAN

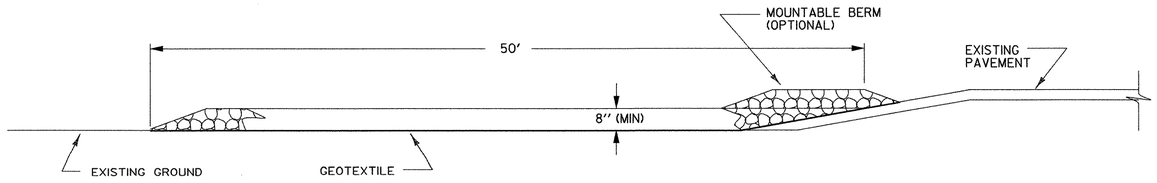


SECTION

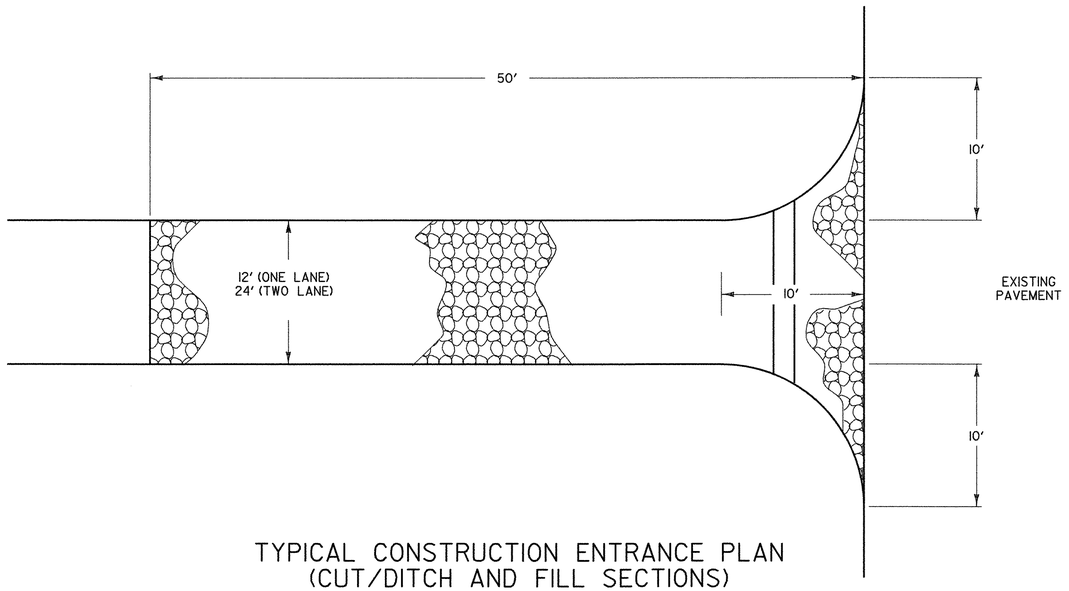
ROCK BARRIER INLET PROTECTION TEMPORARY UNPAVED AREAS

EROSION PREVENTION & SEDIMENT CONTROL DETAILS: DROP INLET PROTECTION

PROJECT NAME:	BOLTON
PROJECT NUMBER:	IM 089-2(29)
FILE NAME: PW/99A268/sa268epsc3.dgn	PLOT DATE: 02-AUG-2004
PROJECT LEADER: Farnsworth	DRAWN BY: Weeber
DESIGNED BY: STR6	CHECKED BY: Farnsworth
sa268epsc3det.I	SHEET 83 OF 307



TYPICAL CONSTRUCTION ENTRANCE PROFILE
(CUT AND DITCH SECTIONS)



TYPICAL CONSTRUCTION ENTRANCE PLAN
(CUT/DITCH AND FILL SECTIONS)

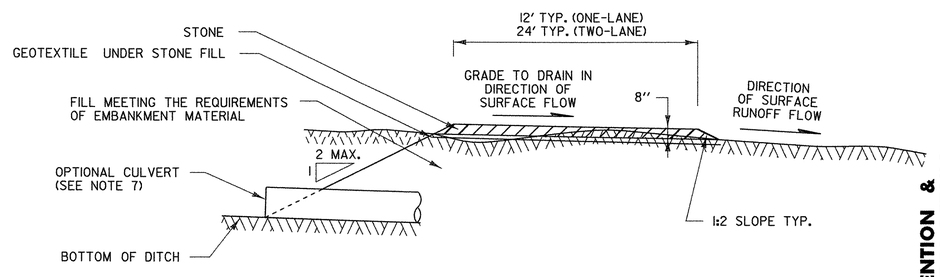
STABILIZED CONSTRUCTION ENTRANCE

APPLICATION NOTES:

A. THE PURPOSE OF A STABILIZED CONSTRUCTION ENTRANCE IS TO REDUCE OR ELIMINATE THE TRACKING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY OR STREETS.

GENERAL NOTES:

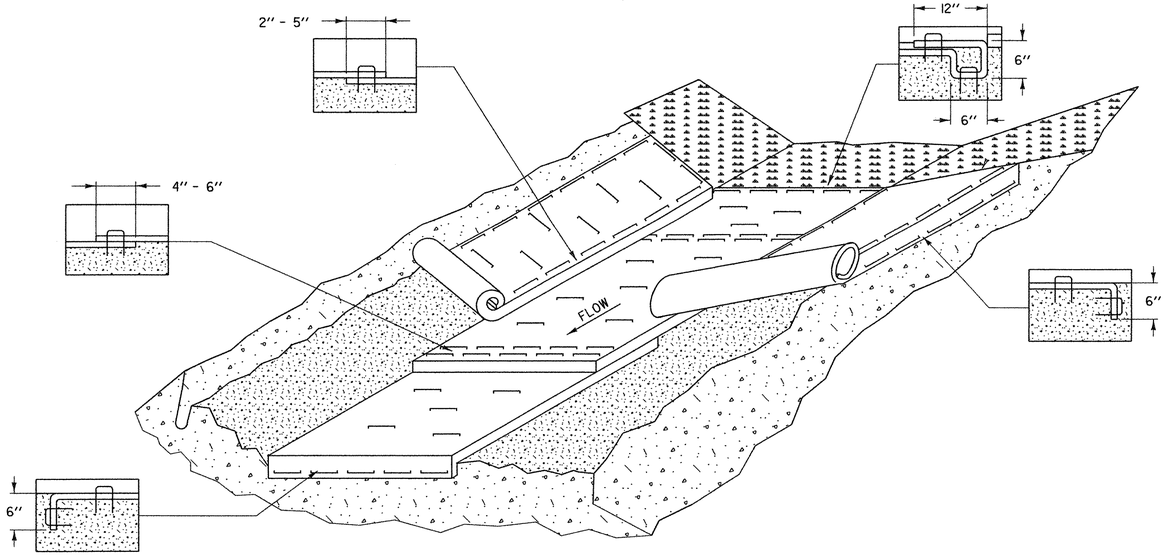
1. STONE SIZE - USE CLEAN STONE WITH GRADATION BETWEEN 2 INCHES AND 4 INCHES .
2. LENGTH - 50 FEET (MIN)
3. THICKNESS - 8 INCHES (MIN)
4. WIDTH - 12 FEET (MIN)
5. GEOTEXTILE UNDER STONE WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE AS DIRECTED BY THE ENGINEER. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. PROPOSED DRAINAGE PIPES SHALL BE SIZED WITH SUFFICIENT CAPACITY TO CARRY DITCH FLOWS. ALTERNATIVE WAYS OF TRANSPORTING DITCH DRAINAGE ACROSS CONSTRUCTION ENTRANCES MAY BE PROPOSED BY THE CONTRACTOR FOR APPROVAL BY THE ENGINEER.
8. WHEN WASHING OF VEHICLE IS NECESSARY, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.
10. MAINTENANCE- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
11. AT THE TIME OF REMOVAL OF THE STABILIZED CONSTRUCTION ENTRANCE THE DISTURBED AREA SHALL BE REPAIRED AND STABILIZED.
12. PAYMENT OF THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE MADE UNDER APPLICABLE ITEMS INCLUDED IN THE CONTRACT PLANS OR UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM.
13. PAYMENT FOR MONITORING STABILIZED CONSTRUCTION ENTRANCES SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.
14. PAYMENT FOR MAINTAINING THE CONSTRUCTION ENTRANCE SHALL BE MADE UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM, UNLESS MAINTENANCE IS REQUIRED DUE TO POOR INSTALLATION PRACTICES.



TYPICAL CONSTRUCTION ENTRANCE SECTION

EROSION PREVENTION & SEDIMENT CONTROL DETAILS: STABILIZED CONSTRUCTION ENTRANCE

PROJECT NAME:	BOLTON
PROJECT NUMBER:	IM 089-2(29)
FILE NAME: PW/99A268/sa268epscl.dgn	PLOT DATE: 26-AUG-2004
PROJECT LEADER: Farnsworth	DRAWN BY: Weeber
DESIGNED BY: STR6	CHECKED BY: Farnsworth
sa268epsc4det.I	SHEET 84 OF 307



EROSION PROTECTION FOR DITCHES

APPLICATION NOTES:

A. THE PURPOSE OF LINING THE DITCH WITH EROSION MATTING IS TO REDUCE EROSION AND AID THE ESTABLISHMENT OF VEGETATION AT LOW VELOCITIES.

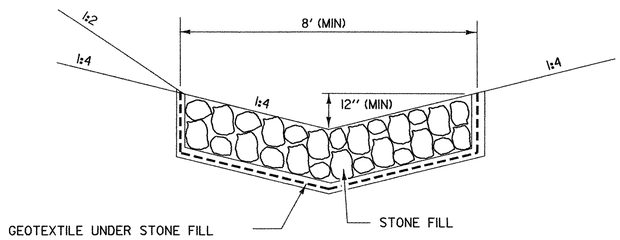
B. THE FOLLOWING CHARTS SHALL BE USED TO DETERMINE THE APPROPRIATE EROSION CONTROL MEASURE:

DITCH AND CHANNEL PROTECTION	
SLOPE	LINING
< 1%	GRASS
1% TO 4 %	EROSION MATTING
4 % TO 10 %	STONE FILL, TYPE I
> 10 %	STONE FILL, TYPE II

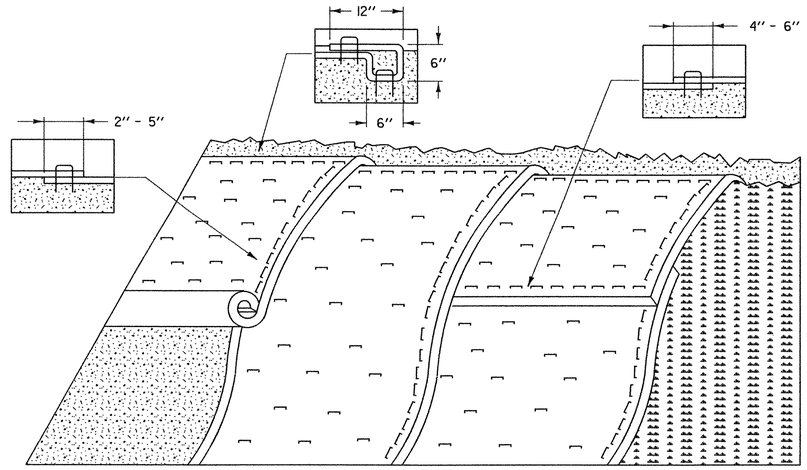
STONE FILL THICKNESS	
STONE FILL TYPE	THICKNESS
TYPE I	1 FT
TYPE II	2 FT

GENERAL NOTES:

1. WATER MAY NEED TO BE DIVERTED TO ALLOW PROPER MATTING INSTALLATION.
2. GRADE AND SMOOTH CHANNEL TO PROVIDE GOOD MATTING TO SOIL SURFACE CONTACT.
3. APPLY FERTILIZER, LIME, AND SEED PRIOR TO PLACING MATTING.
4. INSTALL MATTING IN THE CENTER OF THE CHANNEL, IN THE DIRECTION OF THE WATER FLOW.
5. INSTALL MATTING ON THE SIDE SLOPES OF THE CHANNEL, OVERLAPPING THE CENTER MAT.
6. ANCHOR MATTING AS SHOWN, UTILIZING ANCHOR STAPLES. STAPLE PLACEMENT SHALL BE DETERMINED BY THE MANUFACTURER'S INTALLATION INSTRUCTIONS.
7. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.
8. MEASURES SHALL BE REPAIRED AND RESTAPLED AS NECESSARY TO ENSURE PROPER FUNCTION.
9. PAYMENT FOR INSTALLATION OF MATTING SHALL BE MADE UNDER THE EROSION CONTROL WITH MATTING ITEM.
10. PAYMENT FOR MONITORING EROSION CONTROL MATTING SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.
11. PAYMENT FOR MAINTAINING DITCH PROTECTION SHALL BE MADE UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM, UNLESS MAINTENANCE IS REQUIRED DUE TO POOR INSTALLATION PRACTICES.



TEMPORARY STONE LINED DITCH



EROSION PREVENTION FOR SIDE SLOPES

APPLICATION NOTES:

A. THE PURPOSE OF MATTING ON SIDE SLOPES IS TO REDUCE EROSION AND AID THE STABLISHMENT OF VEGETATION

B. EROSION CONTROL MATTING SHALL BE USED FOR THE FOLLOWING REASONS:

- SIDE SLOPES > 3:1 (H:V)
- AREAS WHERE SEED AND MULCH WILL NOT STAY IN PLACE ALONE
- WHERE SEEDING IS OUTSIDE THE GROWING SEASON.

GENERAL NOTES:

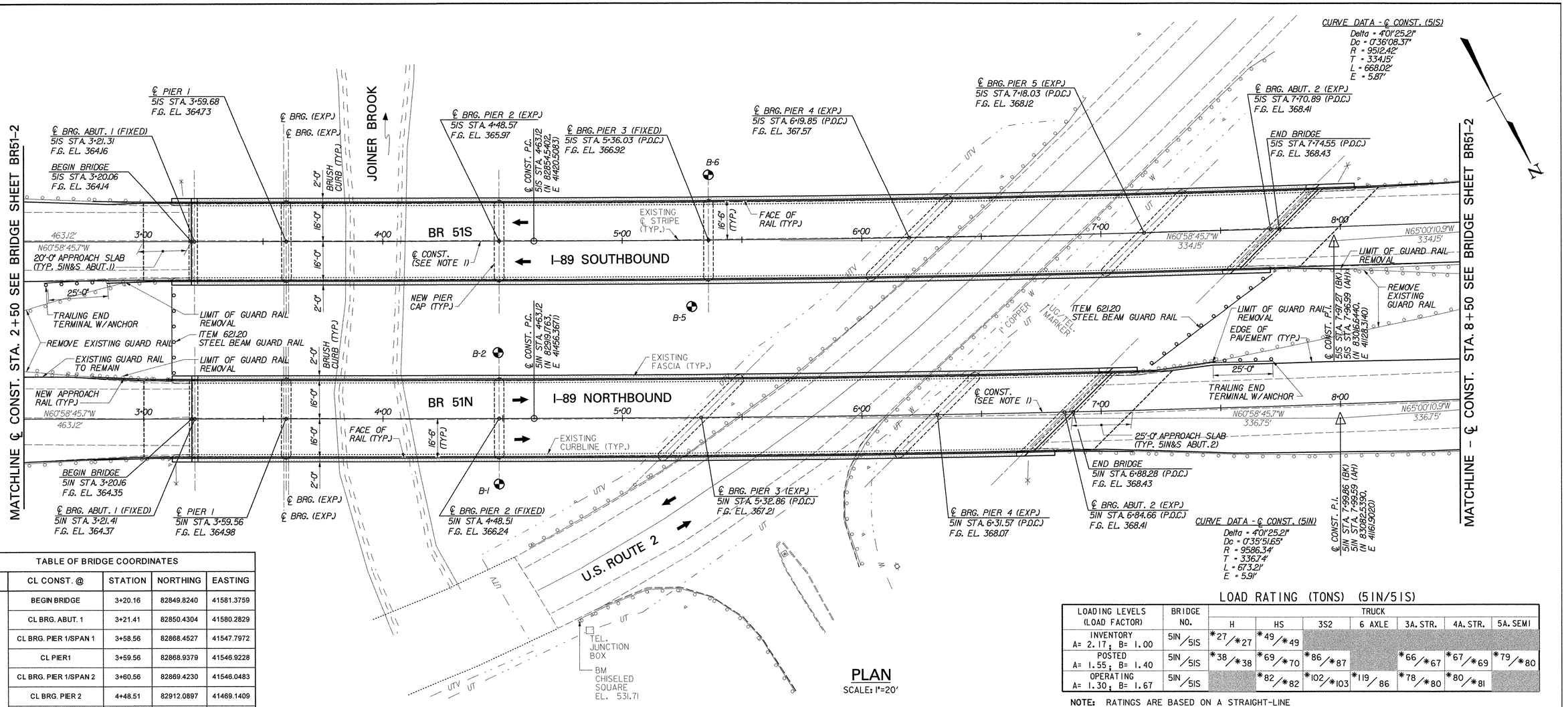
1. GRADE AND SMOOTH THE SLOPE TO PROVIDE GOOD MATTING TO SOIL SURFACE CONTACT.
2. APPLY FERTILIZER, LIME, AND SEED PRIOR TO PLACING MATTING.
3. ANCHOR MATTING AS SHOWN, UTILIZING ANCHOR STAPLES. STAPLE PLACEMENT SHALL BE DETERMINED BY THE MANUFACTURER'S INTALLATION INSTRUCTIONS.
4. UNROLL MATTING VERTICALLY DOWN SLOPE IN THE DIRECTION OF WATER FLOW.
5. OVERLAP UPPER MATTING OVER LOWER MATTING AS SHOWN.
6. OVERLAP ADJACENT MATTING AS SHOWN.
7. CUT EXCESS MATTING AT END OF SLOPE AND ANCHOR THE END.
8. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.
9. MATTING SHALL BE REPAIRED AND RESTAPLED AS NECESSARY TO ENSURE PROPER FUNCTION.
10. PAYMENT FOR INSTALLATION OF MATTING SHALL BE MADE UNDER THE EROSION CONTROL WITH MATTING ITEM.
11. PAYMENT FOR MONITORING EROSION CONTROL MATTING SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.
12. PAYMENT FOR MAINTAINING SLOPE PROTECTION SHALL BE MADE UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM, UNLESS MAINTENANCE IS REQUIRED DUE TO POOR INSTALLATION PRACTICES.

EROSION PREVENTION & SEDIMENT CONTROL DETAILS: DITCH AND SLOPE PROTECTION

PROJECT NAME: BOLTON
PROJECT NUMBER: IM 089-2(29)

FILE NAME: PW/99A268/sa268epsc5.dgn
PROJECT LEADER: Farnsworth
DESIGNED BY: STR6
sa268epsc5det.I

PLOT DATE: 02-AUG-2004
DRAWN BY: Weeber
CHECKED BY: Farnsworth
SHEET 85 OF 307



PLAN
SCALE: 1"=20'

TABLE OF BRIDGE COORDINATES				
BRIDGE	CL CONST. @	STATION	NORTHING	EASTING
51N	BEGIN BRIDGE	3+20.16	82849.8240	41581.3759
	CL BRG. ABUT. 1	3+21.41	82850.4304	41580.2829
	CL BRG. PIER 1/SPAN 1	3+58.56	82868.4527	41547.7972
	CL PIER1	3+59.56	82868.9379	41546.9228
	CL BRG. PIER 1/SPAN 2	3+60.56	82869.4230	41546.0483
	CL BRG. PIER 2	4+48.51	82912.0897	41469.1409
	CL BRG. PIER 3	5+32.86	82952.7878	41395.2589
	CL BRG. PIER 4	6+31.57	82999.5982	41308.3546
	CL BRG. ABUT. 2	6+84.66	83024.4039	41261.4161
	END BRIDGE	6+88.28	83026.0858	41258.2105
51S	BEGIN BRIDGE	3+20.06	82785.1394	41545.6046
	CL BRG. ABUT. 1	3+21.31	82785.7458	41544.5115
	CL BRG. PIER 1/SPAN 1	3+58.68	82803.8749	41511.8335
	CL PIER 1	3+59.68	82804.3600	41510.9590
	CL BRG. PIER 1/SPAN 2	3+60.68	82804.8451	41510.0846
	CL BRG. PIER 2	4+48.57	82847.4827	41433.2296
	CL BRG. PIER 3	5+36.03	82889.6670	41356.6157
	CL BRG. PIER 4	6+19.85	82929.4423	41282.8345
	CL BRG. PIER 5	7+18.03	82975.2030	41195.9715
	CL BRG. ABUT. 2	7+70.89	82999.4686	41149.0102
	END BRIDGE	7+74.55	83001.1390	41145.7537

BR 51N&S SPECIFIC CONSTRUCTION NOTES:

1. THE PROPOSED CONSTRUCTION CENTERLINE FOR EACH BRIDGE WAS ESTABLISHED BASED ON BEST FIT BETWEEN EXISTING CURB LINES. IT DOES NOT EXACTLY MATCH THE ORIGINAL CONSTRUCTION CENTERLINE.
2. FOR CONTROL POINT LOCATION MAP, SEE GENERAL PLAN (5IN&S) (2 OF2), BRIDGE SHEET BR5I-2.
3. FOR BORING LOGS, SEE BRIDGE SHEETS BR5I-3 AND BR5I-4.
4. REPLACE SUPERSTRUCTURE STEEL, BEARINGS, DECK SLABS, APPROACH SLABS, BRIDGE RAIL AND APPROACH RAIL.
5. NEW SCUPPERS ARE REQUIRED ON THESE BRIDGES. FOR LOCATION OF NEW SCUPPERS, SEE THE FRAMING PLAN FOR EACH BRIDGE.
6. REPLACE PIER NO. 2 AT BRIDGE 5IN AND PIER NO. 3 AT BRIDGE 5IS WITH NEW WALL PIERS. REPLACE PIER CAPS ON ALL OTHER PIERS. REPAIR PIER COLUMNS AND APPLY FIBER REINFORCED POLYMER WRAP TO COLUMNS AS INDICATED ON THE PLANS.
7. CONSTRUCT NEW BACKWALLS AT EXPANSION ABUTMENTS AND NEW CURTAINWALLS AT FIXED ABUTMENTS. REBUILD ABUTMENT BRIDGE SEATS AND MODIFY WINGWALLS AS SHOWN IN THE PLANS.

LOAD RATING (TONS) (5IN/5IS)

LOADING LEVELS (LOAD FACTOR)	BRIDGE NO.	TRUCK						
		H	HS	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
INVENTORY A= 2.17; B= 1.00	5IN/5IS	*27/*27	*49/*49					
POSTED A= 1.55; B= 1.40	5IN/5IS	*38/*38	*69/*70	*86/*87		*66/*67	*67/*69	*79/*80
OPERATING A= 1.30; B= 1.67	5IN/5IS		*82/*82	*102/*103	*119/86	*78/*80	*80/*81	

NOTE: RATINGS ARE BASED ON A STRAIGHT-LINE GIRDER ANALYSIS, DIVIDED BY 1.05 TO ACCOUNT FOR THE EFFECTS OF CURVATURE.

$$\text{STRENGTH RF} = \frac{\phi M_N - 1.3 M_{DL}}{A \times M_{LL+I}} \qquad \text{*SERVICEABILITY RF} = B\left[\frac{0.95 F_y S_{LL+I} - M_{DL}\frac{S_{LL+I}}{S_{DL}} - M_{SDL}\frac{S_{LL+I}}{S_{SDL}}}{1.67 M_{LL+I}}\right]$$

LEGEND

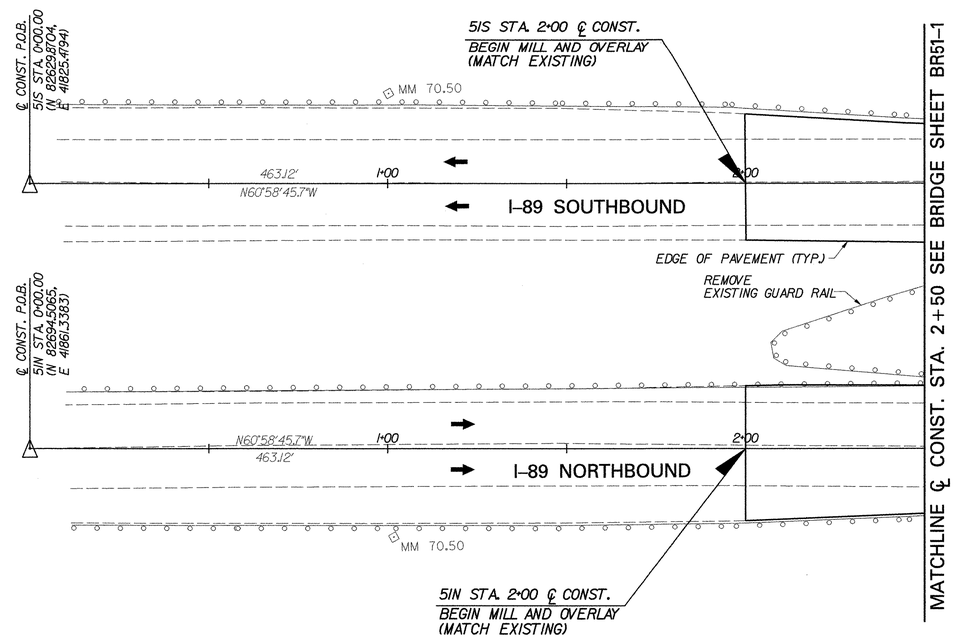
BORING LOCATION

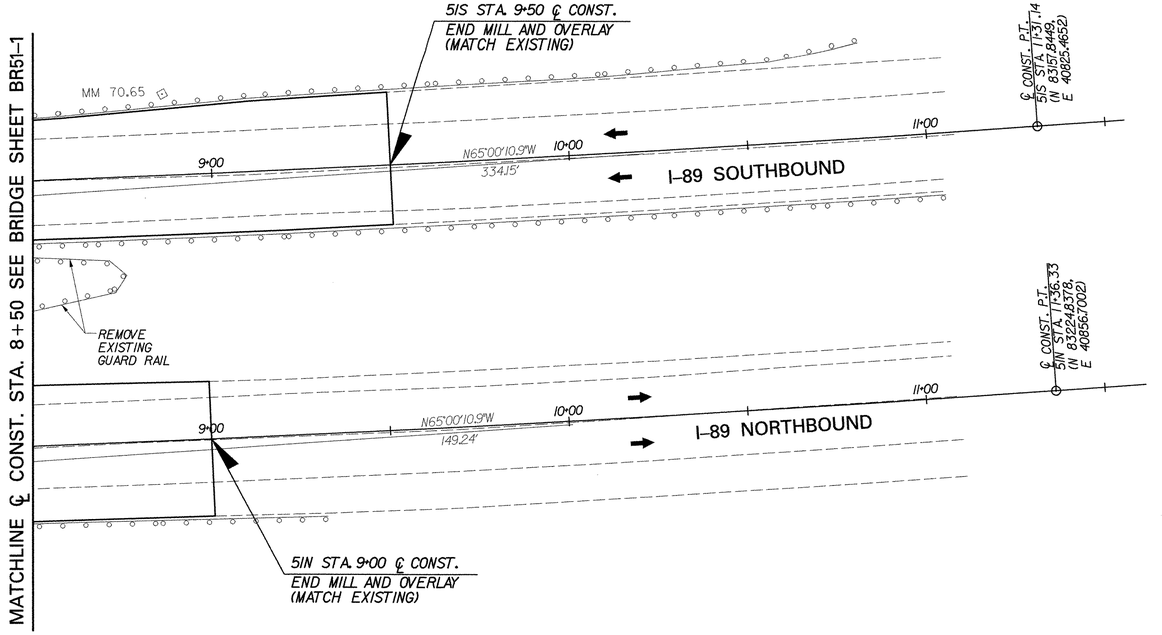
20 0 20
SCALE IN FEET

TVGA ENGINEERING, SURVEYING, P.C.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

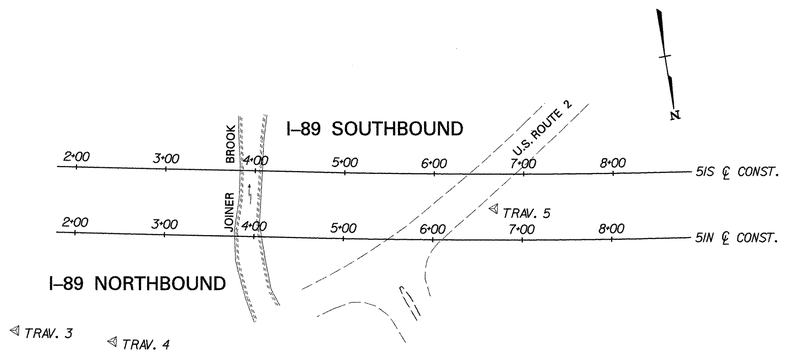
Town Of BOLTON	Bridge No. 51N&S
Highway No. I-89	Log Sta. / Surv. Sta.
I-89 OVER U.S. ROUTE 2 AND JOINER BROOK	
GENERAL PLAN (51N&S) (1 OF 2)	
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 5Igpl	Date 06/04
Bridge Sheet No. **BR5I-1**	Sheet 99 of 307





PLAN

SCALE: 1"=20'



CONTROL POINT LOCATION MAP

N.T.S.

20 0 20

SCALE IN FEET

NOTES:

1. FOR CONTROL POINT TIE SKETCHES, SEE CONTROL POINT TIES (5IN&S), BRIDGE SHEET C-13.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. **51N&S**
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 OVER U.S. ROUTE 2 AND JOINER BROOK

GENERAL PLAN (51N&S) (2 OF 2)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51gp2	Date 06/04
Bridge Sheet No. **BR51-2**	Sheet 100 of 307

TVGA ENGINEERING, SURVEYING, P.C.

SOIL CLASSIFICATION

AASHTO	
A1	Gravel and Sand
A3	Fine Sand
A2	Silty or Clayey Gravel and Sand
A4	Silty Soil - Low Compressibility
A5	Silty Soil - Highly Compressible
A6	Clayey Soil - Low Compressibility
A7	Clayey Soil - Highly Compressible

ROCK QUALITY DESIGNATION

R.Q.D. (%)	ROCK DESCRIPTION
<25	Very Poor
25 to 50	Poor
51 to 75	Fair
76 to 90	Good
>90	Excellent

SHEAR STRENGTH

UNDRAINED SHEAR STRENGTH IN P.S.F.	CONSISTENCY
<250	Very Soft
250-500	Soft
500-1000	Med. Stiff
1000-2000	Stiff
2000-4000	Very Stiff
>4000	Hard

CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

DENSITY (GRANULAR SOILS)		CONSISTENCY (COHESIVE SOILS)	
N	DESCRIPTIVE TERM	N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

COMMONLY USED SYMBOLS

▼	Water Elevation
⦻	Standard Penetration Boring
⊕	Auger Boring
⊙	Rod Sounding
S	Sample
N	Standard Penetration Test Blow Count Per Foot For: 2" O.D. Sampler 1⅜" I.D. Sampler Hammer Weight Of 140 Lbs. Hammer Fall Of 30"
VS	Field Vane Shear Test
US	Undisturbed Soil Sample
B	Blast
DC	Diamond Core
MD	Mud Drill
WA	Wash Ahead
HSA	Hollow Stem Auger
AX	Core Size 1⅛"
BX	Core Size 1⅝"
NX	Core Size 2 ⅛"
M	Double Tube Core Barrel Used
LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index
NP	Non Plastic
w	Moisture Content (Dry Wgt. Basis)
D	Dry
M	Moist
MTW	Moist To Wet
W	Wet
Sat	Saturated
Bo	Boulder
Gr	Gravel
Sa	Sand
Si	Silt
Cl	Clay
HP	Hardpan
Le	Ledge
NLTD	No Ledge To Depth
CNPF	Can Not Penetrate Further
TLOB	To Ledge Or Boulder
NR	No Recovery
Rec.	Recovery
%Rec.	Percent Recovery
RQD	Rock Quality Designation
CBR	California Bearing Ratio
<	Less Than
>	Greater Than
R	Refusal (N > 100)

COLOR

blk	Black	pnk	Pink
bl	Blue	pu	Purple
brn	Brown	rd	Red
dk	Dark	tn	Tan
gry	Gray	wh	White
gn	Green	yel	Yellow
lt	Light	mltc	Multicolored
or	Orange		

DEFINITIONS (AASHTO)

BEDROCK (LEDGE) - Rock in its native location of indefinite thickness.

BOULDER - A rock fragment with an average dimension > 12 inches.

COBBLE - Rock fragments with an average dimension between 3 and 12 inches.

GRAVEL - Rounded particles of rock < 3" and > 0.0787" (#10 sieve).

SAND - Particles of rock < 0.0787" (#10 sieve) and > 0.0029" (#200 sieve).

SILT - Soil < 0.0029" (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.

CLAY - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.

VARVED - Alternate layers of silt and clay.

HARDPAN - Extremely dense soil, cemented layer, not softened when wet.

MUCK - Soft organic soil (containing > 10% organic material.

MOISTURE CONTENT - Weight of water divided by dry weight of soil.

FLOWING SAND - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.

STRIKE - Angle from magnetic north to line of intersection of bed with a horizontal plane.

DIP - Inclination of bed with a horizontal plane.

PROPOSED BOTTOM OF FOOTING, PIER NO. 2, EL.= 324.75'

ESTIMATED PILE PENETRATION = 55'

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION
SUBSURFACE INFORMATION

HOLE NO.: B-1
SHEET 1 OF 2
DATE STARTED: 3/18/99
DATE COMPLETED: 3/25/99

PROJECT NAME: MIDDLESEX-BOLTON
SITE NAME: BR-51
STATION: 4+48.00 North Bound
GROUND EL.: 339.66
PROJECT NUMBER: IM089-2 (26)
SITE NO.: I-89
OFFSET: 27.00
G.W. DEPTH:

BORING CREW
CREW CHIEF: MCGLYNN
DRILLER: CHABOT
LOGGER: TALLMAN
BORING RIG: SKID 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
		Advanced casing to 70.0' No sampling.							
70		A-4, SaSi, gry, MTW, Rec. = 1.4'	76	25.6		40.7	59.3		
80		A-1-a, SaGr, gry, Moist Rec. = 0.5'	95	9.6	61.5	29.2	9.3		
90		A-4, SiSa, gry, MTW, Rec. = 1.5'	86	23.8	0.1	61.5	38.4		

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION
SUBSURFACE INFORMATION

HOLE NO.: B-1
SHEET 2 OF 2
DATE STARTED: 3/18/99
DATE COMPLETED: 3/25/99

PROJECT NAME: MIDDLESEX-BOLTON
SITE NAME: BR-51
STATION: 4+48.00 North Bound
GROUND EL.: 339.66
PROJECT NUMBER: IM089-2 (26)
SITE NO.: I-89
OFFSET: 27.00
G.W. DEPTH:

BORING CREW
CREW CHIEF: MCGLYNN
DRILLER: CHABOT
LOGGER: TALLMAN
BORING RIG: SKID 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
100		A-4, SiSa, gry, MTW, Rec. = 2.0'	79	25.4		57.9	42.1		
110		A-4, SiSa, gry, MTW, Rec. = 1.7'	R	21.6		59.7	40.3		
120		A-4, SiSa, gry, Moist, Rec. = 1.4'	R	19.1	0.2	63.5	36.3		
130		A-2-4, Sa, gry, MTW, Rec. = 2.0'	R	22.4		80.3	19.7		
140		A-1-b, SaGr, gry, Moist Rec. = 0.5'	R	11.2	58.9	28	13.1		
150		A-1-a, Gr, gry, MTW, Rec. = 0.3'	R	3.9	98.1	1.9			
160		A-1-b, SaGr, gry, MTW, Rec. = 1.2'	R	14.9	40.6	39.9	19.5		
170		BXDC, 168.0'-169.0', Boulders, Rec. = 0.7'							
		Hole stopped @ 169.5'							

Note: Bentonite plug installed at 14.0'

PROPOSED BOTTOM OF FOOTING, PIER NO. 2, EL.= 324.75'

ESTIMATED PILE PENETRATION = 55'

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION
SUBSURFACE INFORMATION

HOLE NO.: B-2
SHEET 1 OF 2
DATE STARTED: 3/3/99
DATE COMPLETED: 3/17/99

PROJECT NAME: MIDDLESEX-BOLTON
SITE NAME: BR-51
STATION: 4+49.00 North Bound
GROUND EL.: 338.78
PROJECT NUMBER: IM089-2 (26)
SITE NO.: I-89
OFFSET: -27.00
G.W. DEPTH:

BORING CREW
CREW CHIEF: TALLMAN
DRILLER: RUSSELL
LOGGER: WILDER
BORING RIG: SKID 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
5		A-4, Si, brn, MTW, Rec. = 0.9'	6	31.2	2.3	6.4	91.3		
10		A-1-b, SaGr, gry/brn, Moist, Rec. = 0.6'	40	12.3	47.4	37.9	14.7		
15		BXDC, 14.5'-17.0', BOULDERS							
20		A-4, Si, Lt/brn, MTW, Rec. = 1.8'	13	38.9		1.1	98.9		
25		A-4, Si, brn, MTW, Rec. = 1.6'	21	27	8.5	9.7	81.8		
30		A-4, Si, gry, MTW, Rec. = 1.4'	18	32.5	5.7	16.5	77.8		
35		A-4, Si, brn/gry, MTW, Rec. = 0.9'	26	31.8	0.5	5.9	93.6		
40		A-4, SaSi, brn/gry, MTW, Rec. = 0.7'	22	32.3	4.3	31	64.7		
45		A-4, Si, Lt/gry, MTW, Rec. = 1.1'	36	28.2	0.8	19.5	79.7		
50		A-4, SiSa, Lt/gry, MTW, Rec. = 1.0'	22	25.5	1.8	58.3	39.9		
55		A-4, SiSa, Lt/gry, MTW, Rec. = 1.2'	48	21.8	5.5	52	42.5		
60		A-4, Si, gry, MTW, Rec. = 1.3'	38	24.4	2.8	19.8	77.4		
65		A-4, SaSi, gry, MTW, Rec. = 1.1'	79	22.5	5.1	38.1	56.8		
70		A-2-4, Sa, gry, Moist, Rec. = 0.7'	54	20.7	0.3	85.7	14		
75		A-1-a, SaGr, gry, Moist, Rec. = 0.5'	44	12.5	53.4	43.2	3.4		
80		A-3, Sa, gry, Moist, Rec. = 1.0'	49	20.4	0.2	93	6.8		
85		Advanced casing due to casing binding up.							
90		A-2-4, Sa, gry, Moist, Rec. = 1.1'	69	20.1	0.1	81.1	18.8		
95		Advanced casing due to casing binding up.							

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION
SUBSURFACE INFORMATION

HOLE NO.: B-2
SHEET 2 OF 2
DATE STARTED: 3/3/99
DATE COMPLETED: 3/17/99

PROJECT NAME: MIDDLESEX-BOLTON
SITE NAME: BR-51
STATION: 4+49.00 North Bound
GROUND EL.: 338.78
PROJECT NUMBER: IM089-2 (26)
SITE NO.: I-89
OFFSET: -27.00
G.W. DEPTH:

BORING CREW
CREW CHIEF: TALLMAN
DRILLER: RUSSELL
LOGGER: WILDER
BORING RIG: SKID 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
105		A-4, SiSa, gry, MTW, Rec. = 1.1'	84	22.5	0.8	51.4	47.8		
110		A-4, SiSa, gry, Moist, Rec. = 1.2'	46	20.2		55.1	44.9		
		Hole stopped @ 112.0'							

GENERAL NOTES

1. The subsurface explorations shown herein were made between and by the Agency.
2. Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by the Agency and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.
3. Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration
4. Engineering judgement was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgement by the Contractor.
5. Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.
6. Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. **51N**
Highway No. I-89	Log Sta. / Surv. Sta.
I-89 NB OVER US ROUTE 2 AND JOINER BROOK	
BORING LOG (51N)	
Designed By V.A.O.T.	Drawn By V.A.O.T.
Checked By V.A.O.T. Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51bores	Date 10/99
Bridge Sheet No. **BR51-3**	Sheet 101 of 307

SOIL CLASSIFICATION

AASHTO

A1	Gravel and Sand
A3	Fine Sand
A2	Silty or Clayey Gravel and Sand
A4	Silty Soil - Low Compressibility
A5	Silty Soil - Highly Compressible
A6	Clayey Soil - Low Compressibility
A7	Clayey Soil - Highly Compressible

ROCK QUALITY DESIGNATION

R.Q.D. (%)	ROCK DESCRIPTION
<25	Very Poor
25 to 50	Poor
51 to 75	Fair
76 to 90	Good
>90	Excellent

SHEAR STRENGTH

UNDRAINED SHEAR STRENGTH IN P.S.F.	CONSISTENCY
<250	Very Soft
250-500	Soft
500-1000	Med. Stiff
1000-2000	Stiff
2000-4000	Very Stiff
>4000	Hard

CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

DENSITY (GRANULAR SOILS) N	DESCRIPTIVE TERM	CONSISTENCY (COHESIVE SOILS) N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

COMMONLY USED SYMBOLS

▼	Water Elevation
	Standard Penetration Boring
⊕	Auger Boring
⊙	Rod Sounding
S	Sample
N	Standard Penetration Test Blow Count Per Foot For: 2" O.D. Sampler, 1 3/8" I.D. Sampler, Hammer Weight Of 140 Lbs., Hammer Fall Of 30"
VS	Field Vane Shear Test
US	Undisturbed Soil Sample
B	Blast
DC	Diamond Core
MD	Mud Drill
WA	Wash Ahead
HSA	Hollow Stem Auger
AX	Core Size 1 1/8"
BX	Core Size 1 5/8"
NX	Core Size 2 1/8"
M	Double Tube Core Barrel Used
LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index
NP	Non Plastic
w	Moisture Content (Dry Wgt. Basis)
D	Dry
M	Moist
MTW	Moist To Wet
W	Wet
Sat	Saturated
Bo	Boulder
Gr	Gravel
Sa	Sand
Si	Silt
Cl	Clay
HP	Hardpan
Le	Ledge
NLTD	No Ledge To Depth
CNPF	Can Not Penetrate Further
TLOB	To Ledge Or Boulder
NR	No Recovery
Rec.	Recovery
%Rec.	Percent Recovery
RQD	Rock Quality Designation
CBR	California Bearing Ratio
<	Less Than
>	Greater Than
R	Refusal (N > 100)

COLOR

blk	Black	pnk	Pink
bl	Blue	pu	Purple
brn	Brown	rd	Red
dk	Dark	tn	Tan
gry	Gray	wh	White
gn	Green	yel	Yellow
lt	Light	mltc	Multicolored
or	Orange		

DEFINITIONS (AASHTO)

BEDROCK (LEDGE) - Rock in its native location of indefinite thickness.

BOULDER - A rock fragment with an average dimension > 12 inches.

COBBLE - Rock fragments with an average dimension between 3 and 12 inches.

GRAVEL - Rounded particles of rock < 3" and > 0.0787" (#10 sieve).

SAND - Particles of rock < 0.0787" (#10 sieve) and > 0.0029" (#200 sieve).

SILT - Soil < 0.0029" (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.

CLAY - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.

VARVED - Alternate layers of silt and clay.

HARDPAN - Extremely dense soil, cemented layer, not softened when wet.

MUCK - Soft organic soil (containing > 10% organic material.

MOISTURE CONTENT - Weight of water divided by dry weight of soil.

FLOWING SAND - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.

STRIKE - Angle from magnetic north to line of intersection of bed with a horizontal plane.

DIP - Inclination of bed with a horizontal plane.

PROPOSED BOTTOM OF FOOTING, PIER NO. 3, EL. 330.75

ESTIMATED PILE PENETRATION = 85'

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION
SUBSURFACE INFORMATION

HOLE NO.: B-5
SHEET 1 OF 2
DATE STARTED: 3/9/99
DATE COMPLETED: 3/16/99

PROJECT NAME: MIDDLESEX-BOLTON
SITE NAME: BR-51
STATION: 5+31.00 South Bound
GROUND EL.: 341.24

PROJECT NUMBER: IM089-2 (26)
SITE NO.: I-89
OFFSET: 27.00
G.W. DEPTH:

BORING CREW
CREW CHIEF: MCGLYNN
DRILLER: CHABOT
LOGGER: WILDER

BORING RIG: SKID 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
5		A-4, Si, brn, MTW, Rec. = 1.4'	12	20.9	19.5	18.6	61.9		
10		A-1-a, SaGr, gry, Moist, Rec. = 1.1'	33	13.7	61.4	29.1	9.5		
15		BX Starter Barrel, 15.0'-16.0', Rec. = 0.5', Boulders							
20		A-4, Si, brn, MTW, Rec. = 2.0'	7	35.2		0.9	99.1		
25		A-4, Si, brn, MTW, Rec. = 1.8'	6	33.4		2.1	97.9		
30		A-4, Si, brn, MTW, Rec. = 1.7'	16	30.3		3.7	96.3		
35		A-4, Si, gry, MTW, Rec. = 2.0'	10	31.6	0.7	0.7	98.6		
40		A-4, Si, gry, MTW, Rec. = 2.0'	10	28.6		7.2	92.8		
50		A-4, Si, gry, MTW, Rec. = 1.8'	13	27.2	0.5	13.4	86.1		
60		A-4, Si, gry, MTW, Rec. = 1.9'	33	28.2		12.3	87.7		
70		A-3, Sa, gry, MTW, Rec. = 1.0'	28	21.1	0.2	89.5	10.3		
80		A-2-4, Sa, gry, Moist, Rec. = 2.0'	R	15.7	0.3	87.5	12.2		
90		A-4, SiSa, gry, Moist, Rec. = 0.3'	47	12.8	4.7	64.2	31.1		

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION
SUBSURFACE INFORMATION

HOLE NO.: B-5
SHEET 2 OF 2
DATE STARTED: 3/9/99
DATE COMPLETED: 3/16/99

PROJECT NAME: MIDDLESEX-BOLTON
SITE NAME: BR-51
STATION: 5+31.00 South Bound
GROUND EL.: 341.24

PROJECT NUMBER: IM089-2 (26)
SITE NO.: I-89
OFFSET: 27.00
G.W. DEPTH:

BORING CREW
CREW CHIEF: MCGLYNN
DRILLER: CHABOT
LOGGER: WILDER

BORING RIG: SKID 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
105		A-4, SaSi, gry, MTW, Rec. = 1.8'	36	26.0	0.1	27	72.9		
110		A-4, Si, gry, MTW, Rec. = 2.0'	42	27		17.7	82.3		
120		Broken Rock, gry, MTW, Rec. = 0.1'	53	5.2					

Hole stopped @ 123.0' in Boulders

Note: Bentonite plug installed at 16.0'

PROPOSED BOTTOM OF FOOTING, PIER NO. 3, EL. 330.75

ESTIMATED PILE PENETRATION = 85'

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION
SUBSURFACE INFORMATION

HOLE NO.: B-6
SHEET 1 OF 2
DATE STARTED: 2/18/99
DATE COMPLETED: 3/5/99

PROJECT NAME: MIDDLESEX-BOLTON
SITE NAME: BR-51
STATION: 5+36.00 South Bound
GROUND EL.: 340.78

PROJECT NUMBER: IM089-2 (26)
SITE NO.: I-89
OFFSET: -27.00
G.W. DEPTH:

BORING CREW
CREW CHIEF: MCGLYNN
DRILLER: CHABOT
LOGGER: WILDER

BORING RIG: SKID 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
5		A-4, Si, brn, MTW, Rec. = 1.3'	23	27.5	6.2	13.1	80.7		
		A-1-b, SaGr, brn, Moist, Rec. = 0.5'	16	16.9	57.8	27	15.2		
10		A-1-a, SaGr, brn, Moist, Rec. = 1.3'	21	11.4	70.6	24.2	5.2		
		A-1-a, SaGr, brn, Moist, Rec. = 1.25'	26	11.3	68	23.4	8.6		
15		A-4, Si, brn, MTW, Rec. = 2.0'	5	36.3	1.8	11.6	86.6		
20		A-4, Si, gry, MTW, Rec. = 2.0'	8	37.1		1.3	98.7		
		A-4, Si, gry, MTW, Rec. = 2.0'	6	40.6		2.9	97.1		
25		A-4, Si, gry, MTW, Rec. = 2.0'	9	30.9		9.3	90.7		
		A-4, Si, gry, MTW, Rec. = 1.75'	11	26.2	0.4	2.1	97.5		
30		A-4, Si, gry, MTW, Rec. = 1.8'	8	32	2.4	6.5	91.2		
35		A-4, Si, gry, MTW, Rec. = 0.9'	15	27.9	0.3	3.4	96.3		
40		A-4, Si, gry, MTW, Rec. = 1.2'	12	22.8		4.4	95.6		
50		A-4, SaSi, gry, MTW, Rec. = 1.1'	17	23.8		26.7	73.3		
55		A-4, SaSi, gry, MTW, Rec. = 1.3'	36	26.1	1.4	34.6	64		
60		A-4, SaSi, gry, MTW, Rec. = 1.0'	29	21.9		46.3	53.7		
65		A-2-4, Sa, gry, MTW, Rec. = 0.6'	9	24.5	0.4	84	15.6		
70		A-2-4, Sa, gry, MTW, Rec. = 0.6'	13	20.8	0.4	85.2	14.4		
75		No Rec.	24						
80		A-3, Sa, gry, Moist, Rec. = 1.2'	55	20.2	0.2	90.3	9.5		
85		A-3, GrSa, gry, Moist, Rec. = 1.5'	55	16	22.2	67.5	10.3		
90		A-2-4, Sa, gry, Moist, Rec. = 1.5'	26	19.8	0.9	86.9	12.2		
95		A-2-4, Sa, gry, MTW, Rec. = 1.0'	85	22.7		82.3	17.7		

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION
SUBSURFACE INFORMATION

HOLE NO.: B-6
SHEET 2 OF 2
DATE STARTED: 2/18/99
DATE COMPLETED: 3/5/99

PROJECT NAME: MIDDLESEX-BOLTON
SITE NAME: BR-51
STATION: 5+36.00 South Bound
GROUND EL.: 340.78

PROJECT NUMBER: IM089-2 (26)
SITE NO.: I-89
OFFSET: -27.00
G.W. DEPTH:

BORING CREW
CREW CHIEF: MCGLYNN
DRILLER: CHABOT
LOGGER: WILDER

BORING RIG: SKID 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, gry, MTW, Rec. = 1.5'	19	24.6		36.9	63.1		
105		A-4, SiSa, gry, MTW, Rec. = 1.3'	40	21.4	0.1	62.8	37.1		
110		A-1-b, GrSa, gry, Moist, Rec. = 1.4'	83	15.1	31.5	56.1	12.4		
120		No Lab Sample Received, Field classification was silt, gry, moist, rec. = 0.1'	42						
130		Broken Cobble, Rec. = 1.1'	74	8.1					
135		BXMDC, 136'-140', Boulder, Rec. = 1.1'							
140		Broken Cobble, Rec. = 1.3'	73	8.1					
145		BX Starter Barrel, 144'-149', Boulders, Rec. = 1.3'							
150		BX Starter Barrel, 149.0'-156.5', Boulders, Rec. = 0.8'							

Hole stopped @ 156.5'

Note: Bentonite plug installed at 18.5'

GENERAL NOTES

1. The subsurface explorations shown herein were made between and by the Agency.
2. Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by the Agency and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.
3. Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration
4. Engineering judgement was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgement by the Contractor.
5. Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.
6. Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.

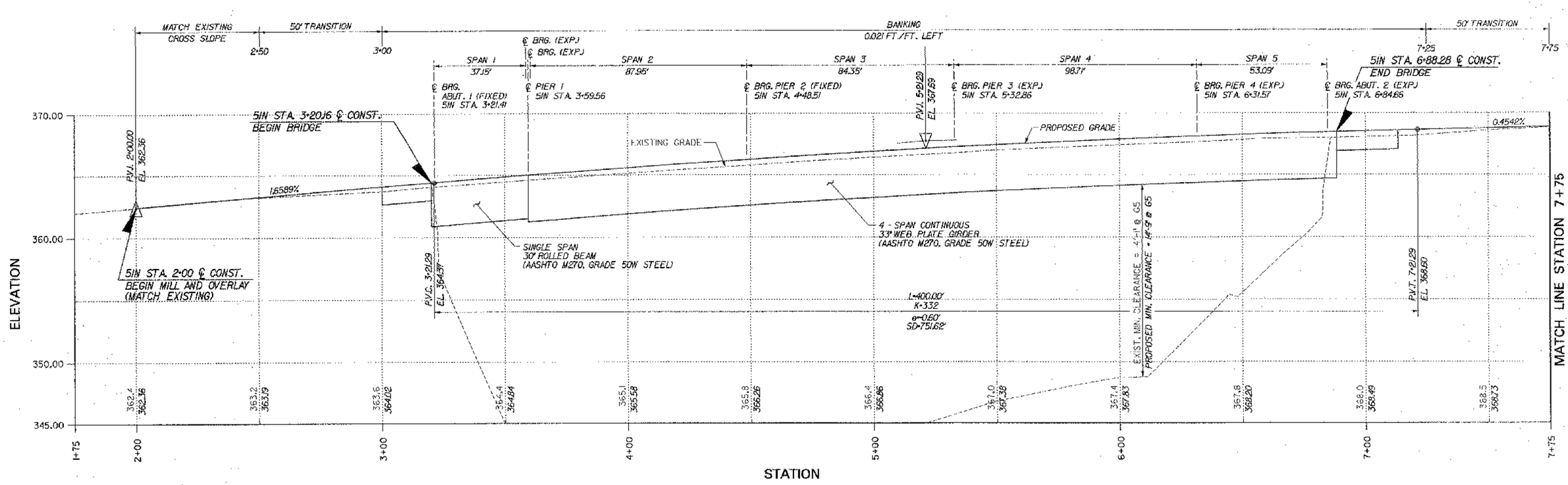
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51S
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 SB OVER US ROUTE 2 AND JOINER BROOK

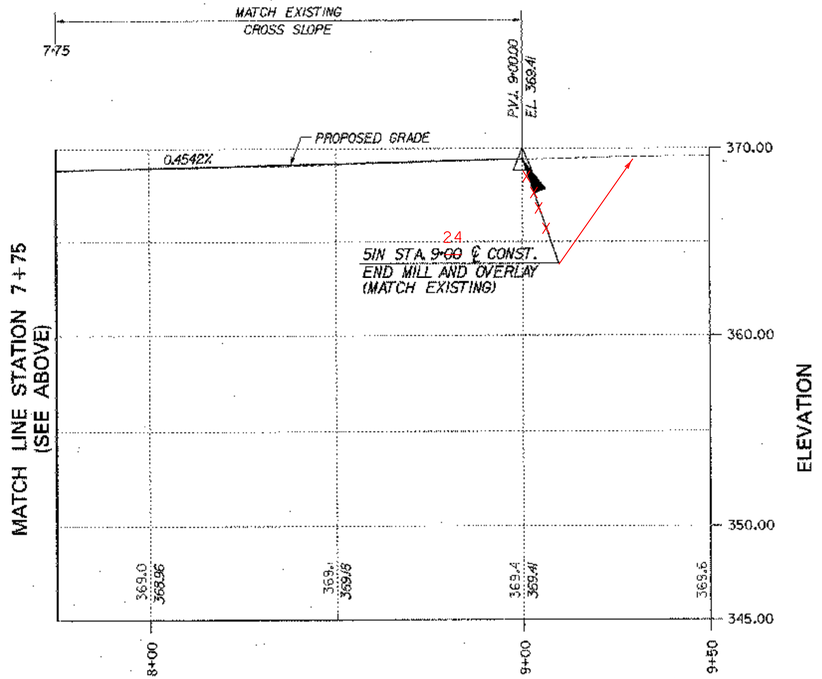
BORING LOG (51S)

Designed By V.A.O.T.	Drawn By V.A.O.T.
Checked By V.A.O.T. Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51bores	Date 10/99
Bridge Sheet No. BR51-4	Sheet 102 of 307

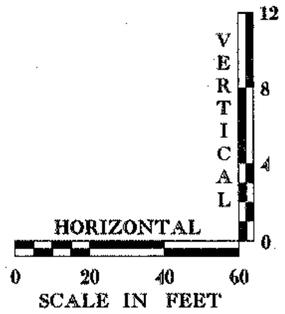


PROFILE – (BR 51N)

AS A RESULT OF BEAM PROILES, THE GRADE OF BR 51N WAS RAISED 1 INCH (0.08') TO MEET TO MEET THE MINIMUM HAUNCH REQUIREMENTS.



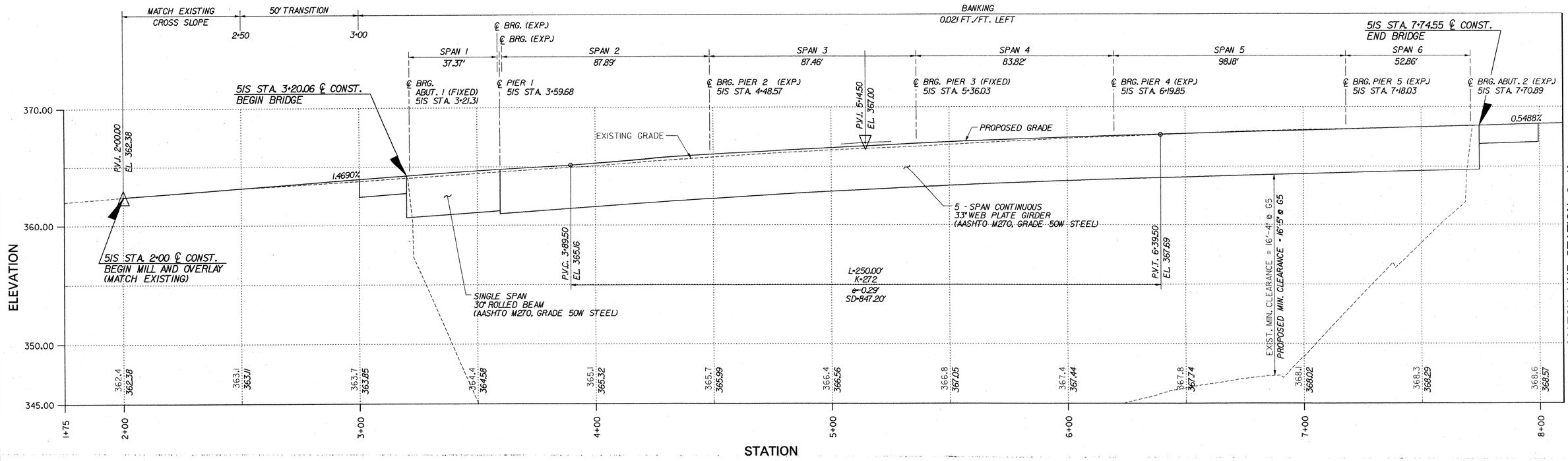
PROFILE – (BR 51N)



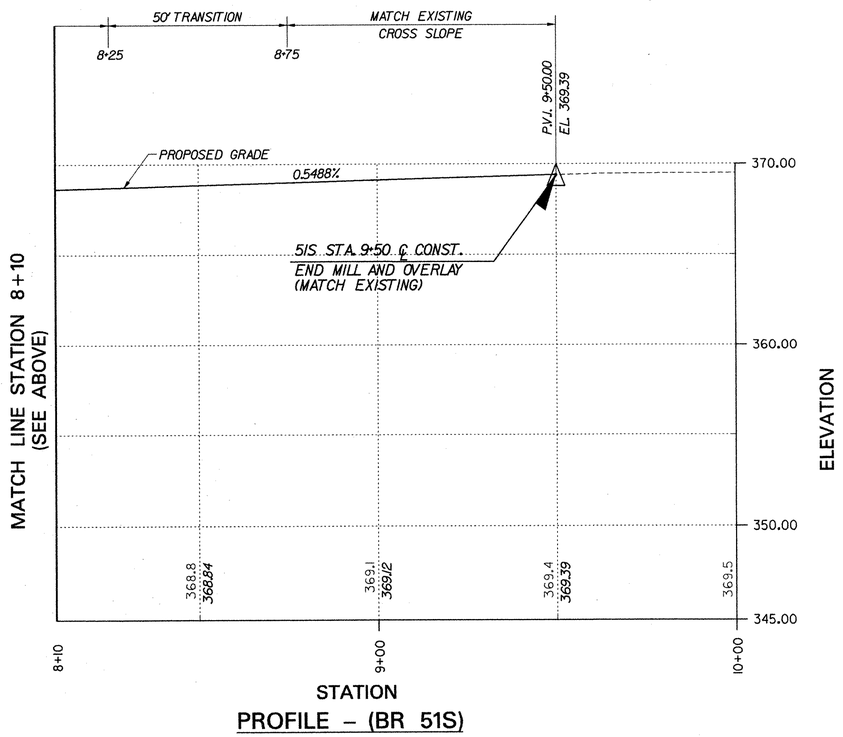
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51N
Highway No. I-89	Log Sta. / Surv. Sta.
I-89 NB OVER U.S. ROUTE 2 AND JOINER BROOK	
PROFILE (51N)	
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51nprof	Date 10/99
Bridge Sheet No. BR51-5	Sheet 103 of 307

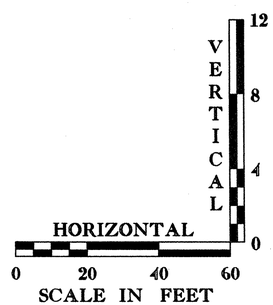
TVGA ENGINEERING, SURVEYING, P.C.



PROFILE – (BR 51S)



PROFILE – (BR 51S)

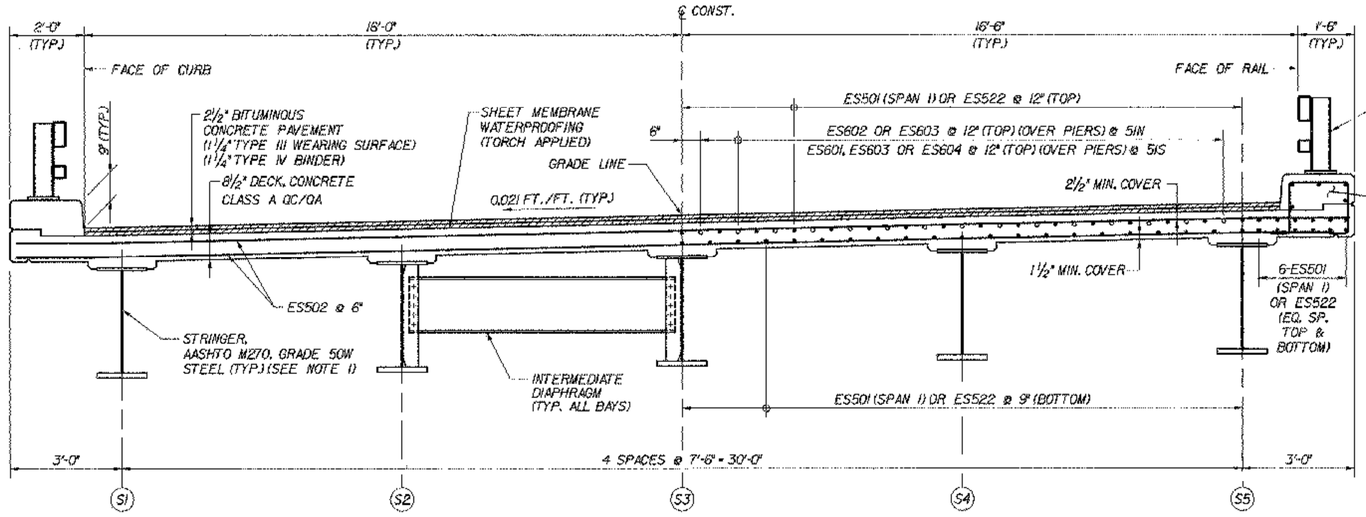


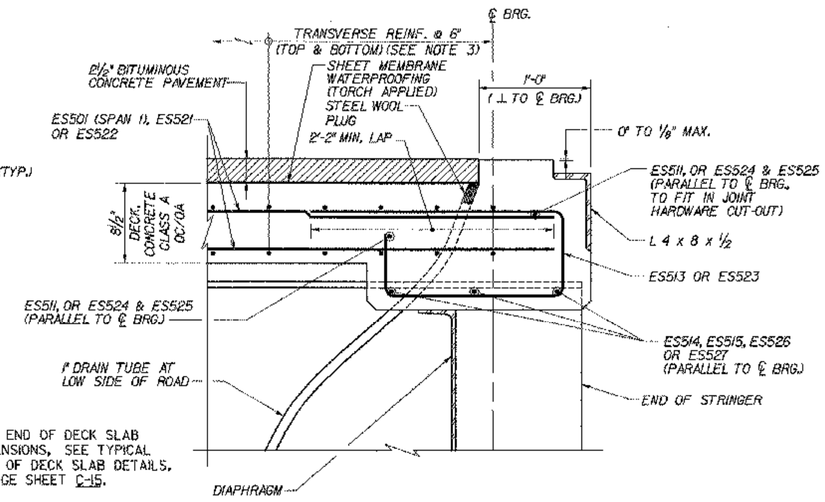
TVGA ENGINEERING, SURVEYING, P.C.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51S
Highway No. I-89	Log Sta. / Surv. Sta.
I-89 SB OVER U.S. ROUTE 2 AND JOINER BROOK	
PROFILE (51S)	
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51sprof	Date 10/99
Bridge Sheet No. BR51-6	Sheet 104 of 307

NOTE: LONGITUDINAL REINFORCEMENT LAYOUT IN LEFT SIDE OF DECK IS SIMILAR TO RIGHT SIDE. SEE DECK REINFORCEMENT PLANS FOR DETAILS.





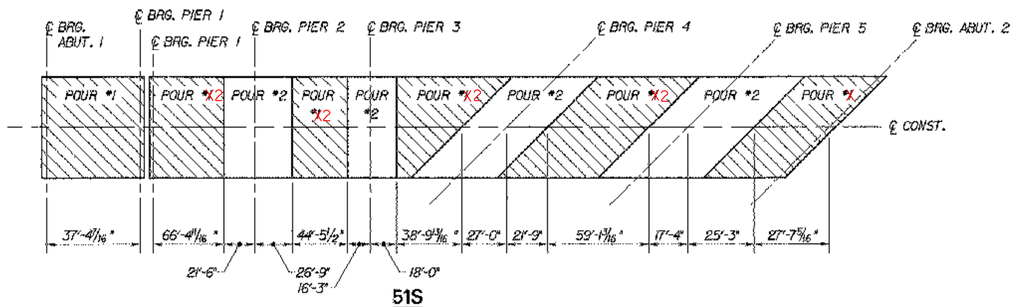
NOTE: FOR END OF DECK SLAB DIMENSIONS, SEE TYPICAL END OF DECK SLAB DETAILS, BRIDGE SHEET C-15.

END OF DECK SLAB REINFORCEMENT DETAIL
(EXP. END)

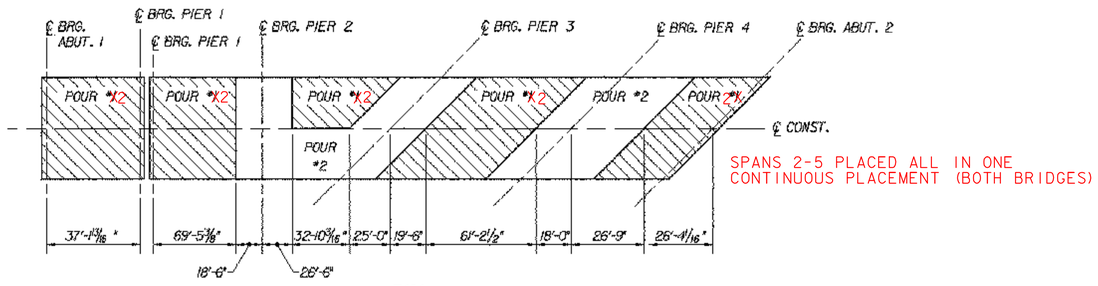
SCALE: 1½" = 1'-0"

TRANSVERSE SECTION – BR 51N&S

SCALE: ½" = 1'-0"



51S



51N

SPANS 2-5 PLACED ALL IN ONE CONTINUOUS PLACEMENT (BOTH BRIDGES)

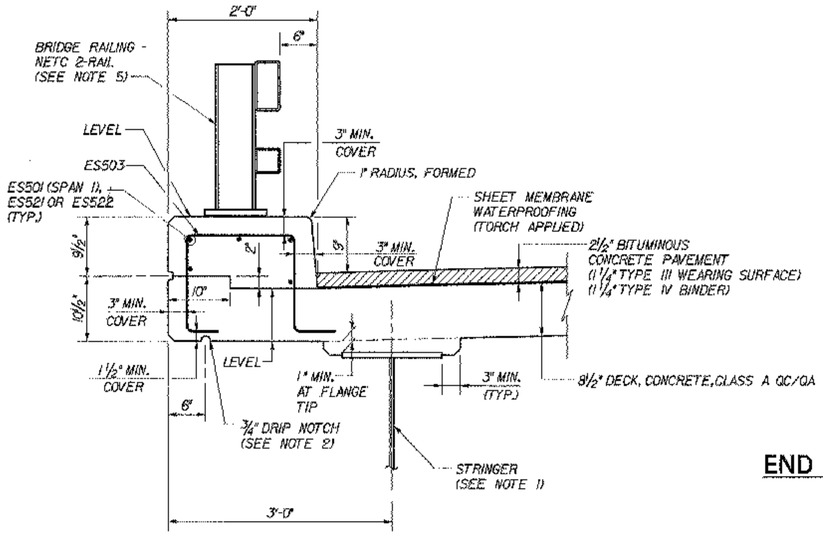
DECK POUR SEQUENCE

N.T.S.

DECK SLAB PLACEMENT NOTES

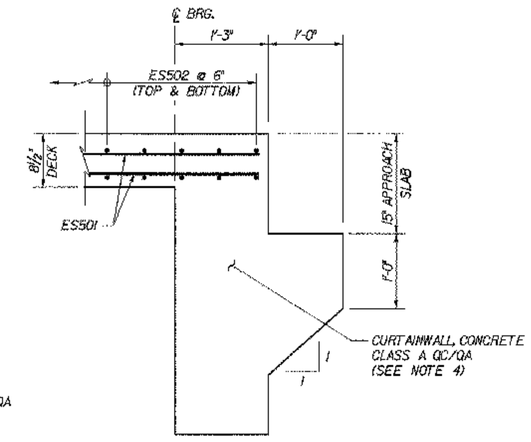
A. EACH CONCRETE DECK POUR SHALL BE PLACED CONTINUOUSLY WITHIN ONE EIGHT HOUR WORKING DAY. THERE SHALL BE A MINIMUM DELAY PERIOD OF 96 HOURS AFTER COMPLETION OF EACH POUR BEFORE BEGINNING ANOTHER POUR. INDIVIDUAL POUR NUMBERS AS SHOWN MAY BE COMBINED INTO A SINGLE POUR IF APPROVED BY THE VAOT STRUCTURES ENGINEER.

B. THE DECK CONCRETE SHALL BE RETARDED SUFFICIENTLY TO REMAIN PLASTIC UNTIL EACH POUR IS COMPLETE. THE QUANTITY OF RETARDANT SHALL BE APPROVED BY THE CONCRETE ENGINEER PRIOR TO PLACEMENT. ANY DEVIATIONS FROM THIS PROCEDURE MUST BE APPROVED BY THE VAOT STRUCTURES ENGINEER IN WRITING BEFORE THE POUR BEGINS.



FASCIA DETAIL

SCALE: 1"=1'-0"



END OF DECK SLAB REINFORCEMENT DETAIL
(FIXED END)

SCALE: 1" = 1'-0"

NOTES:

1. PLATE GIRDER SHOWN. ROLLED BEAM SIMILAR. FOR STRINGER SIZES SEE STRINGER ELEVATIONS, BRIDGE SHEETS BR51-14, BR51-15, BR51-18 AND BR51-19.
2. END DRIP NOTCH 5 FEET BEFORE END OF SLAB AT "DOWNHILL" ABUTMENTS AT 45°.
3. FOR DETAILS OF TRANSVERSE REINFORCEMENT SEE DECK REINFORCEMENT PLANS, BRIDGE SHEETS BR51-8 AND BR51-9.
4. FOR CURTAINWALL DETAILS AND REINFORCEMENT LAYOUT, SEE TYPICAL CURTAINWALL DETAILS, BRIDGE SHEET C-42.
5. FOR DETAILS OF NETC BRIDGE RAIL AND APPROACH SECTION, SEE SHEETS C-47, C-48, AND C-49.

TVGA ENGINEERING, SURVEYING, P.C.

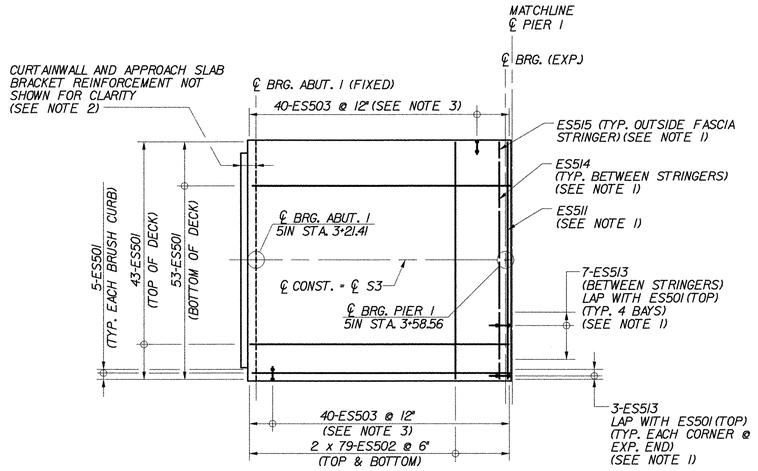
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of	BOLTON	Bridge No.	51N&S
Highway No.	I-89	Log Sta.	
		Surv. Sta.	

I-89 OVER U.S. ROUTE 2 AND JOINER BROOK

TRANSVERSE SECTION (51N&S)

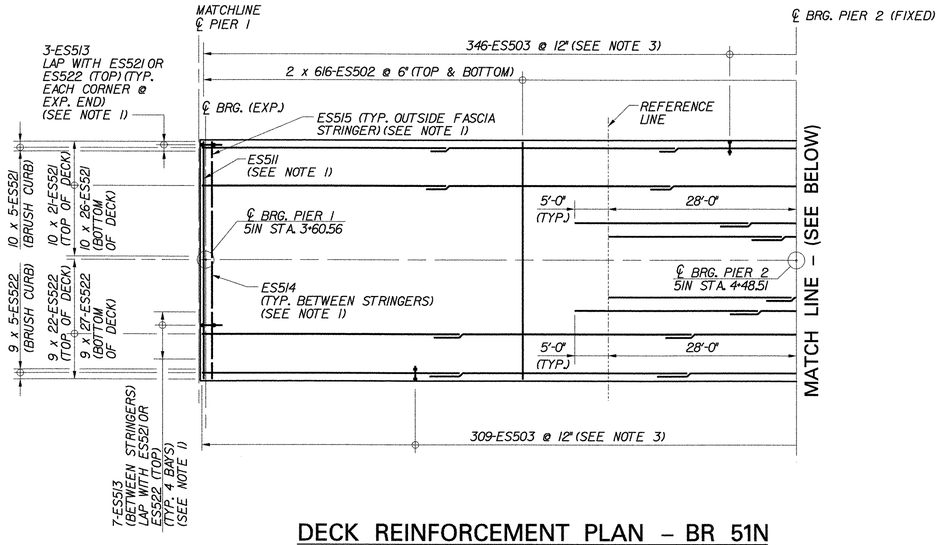
Designed By	P.W. SZUSTAK	Drawn By	R.A. BOTZENHART
Checked By	Date	Bridge Design Supervisor	
J.P. HALSTEAD	10/99	J.P. HALSTEAD	Date 10/99
PROJECT	BOLTON	PROJECT NO.	IM-089-2(29)
TVGA CAD Drawing No.	51tsect		Date 10/99
Bridge Sheet No.	BR51-7	Sheet	105 of 307



DECK REINFORCEMENT PLAN – BR 51N

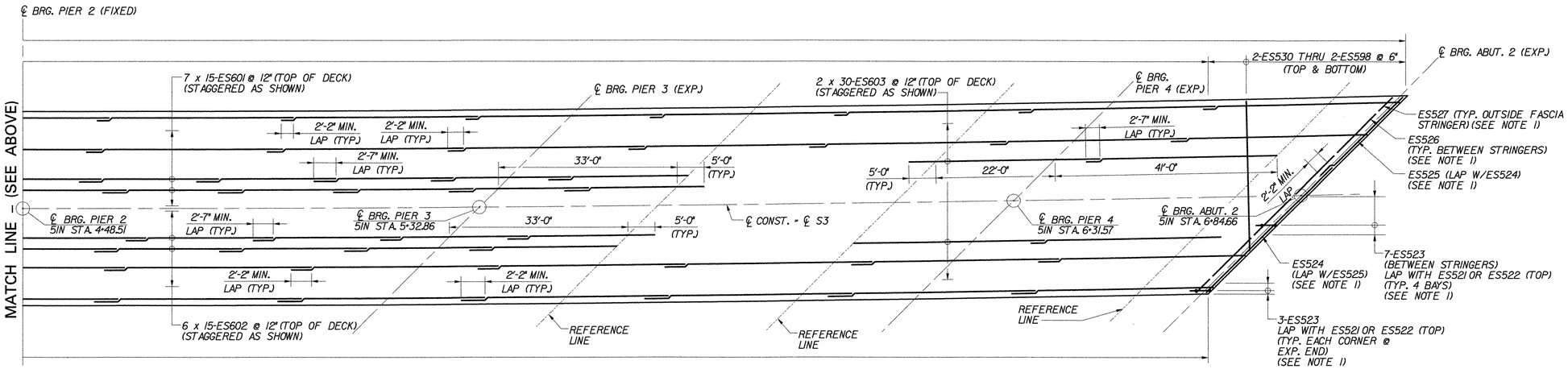
SPAN 1

SCALE: 3/32 " = 1'-0"



DECK REINFORCEMENT PLAN – BR 51N

SCALE: 3/32 " = 1'-0"



DECK REINFORCEMENT PLAN – BR 51N

SCALE: 3/32 " = 1'-0"

KEY

NF	NEAR FACE
FF	FAR FACE
EF	EACH FACE
▲	REINFORCEMENT TO BE CUT TO FIT IN THE FIELD

NOTES:

1. FOR END OF DECK SLAB DETAILS, SEE TRANSVERSE SECTION (5IN&S), BRIDGE SHEET BR51-7.
2. FOR CURTAINWALL REINFORCEMENT, SEE TYPICAL CURTAINWALL DETAILS, BRIDGE SHEET C-42.
3. THE QUANTITY OF ES503 BARS SHOWN DOES NOT INCLUDE ADDITIONAL BARS REQUIRED BELOW THE BRIDGE RAIL POSTS. FOR DETAILS OF THE REQUIRED STIRRUP SPACING, SEE NETC 2-RAIL SHEET C-47. FOR LOCATIONS OF THE BRIDGE RAIL POSTS, SEE CURB AND RAIL LAYOUT PLANS, BRIDGE SHEET BR51-11.

TVGA ENGINEERING, SURVEYING, P.C.

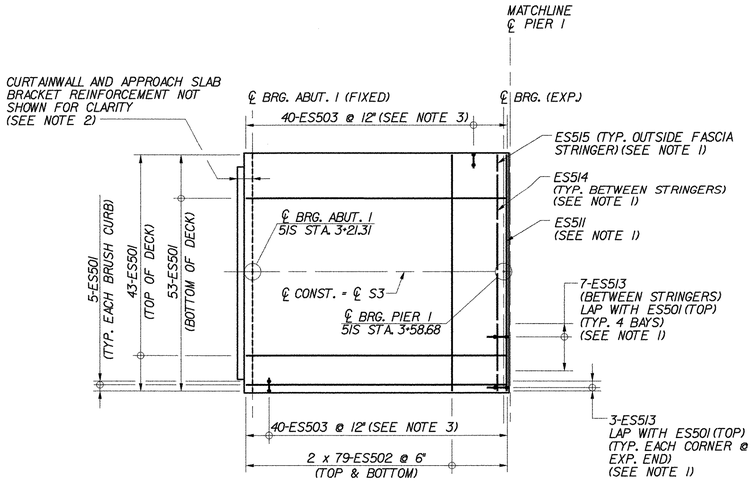
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. **51N**
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 OVER U.S. ROUTE 2 AND JOINER BROOK

DECK REINFORCEMENT PLAN (51N)

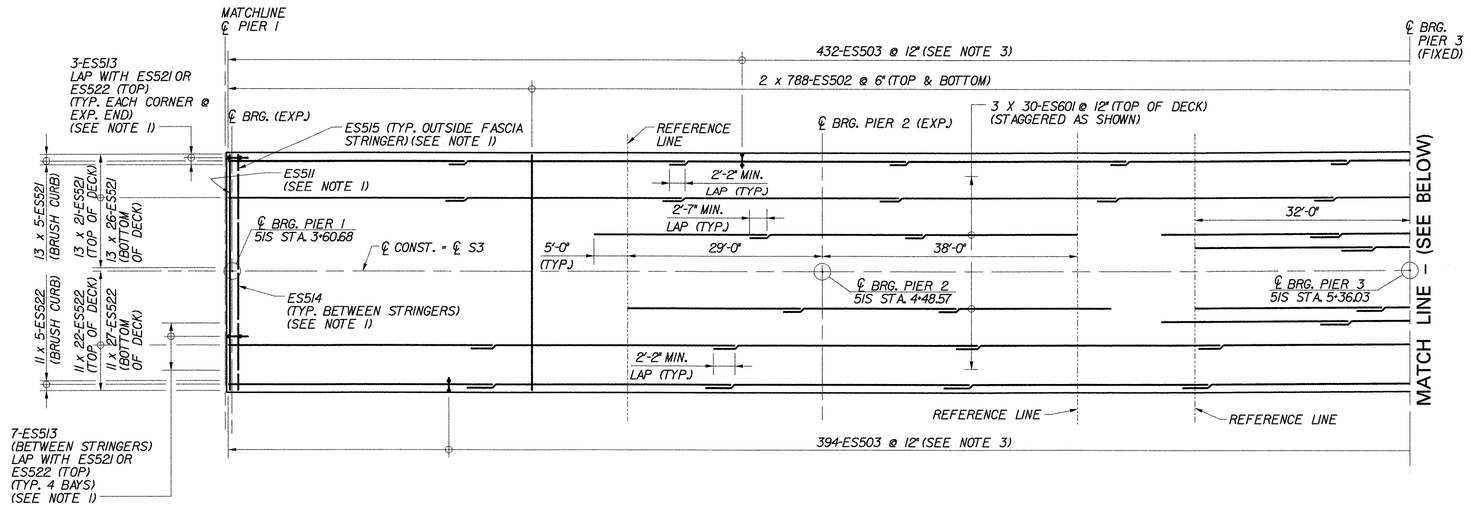
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51ndrp2	Date 10/99
Bridge Sheet No. **BR51-8**	Sheet 106 of 307



DECK REINFORCEMENT PLAN – BR 51S

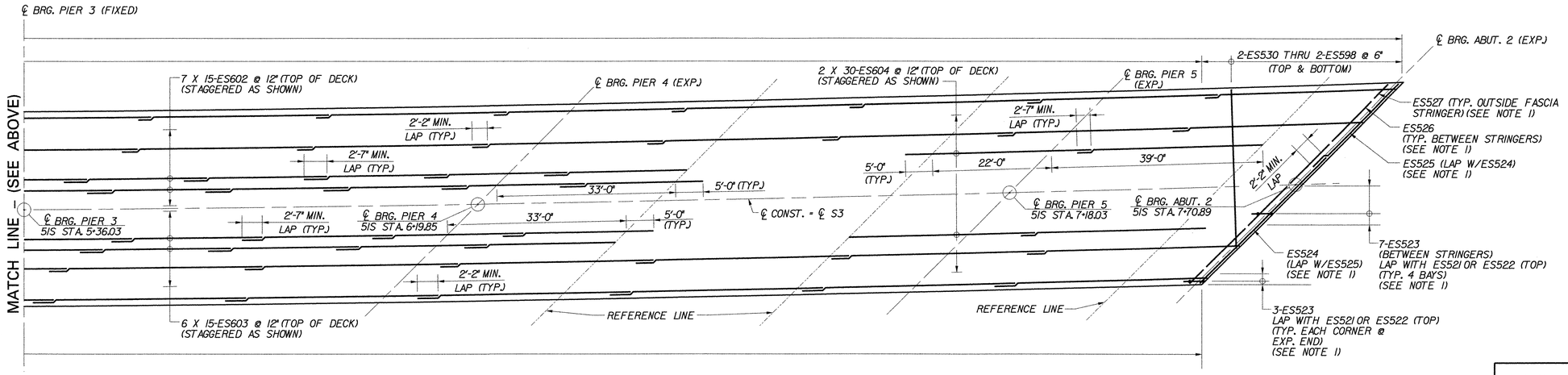
SPAN 1

SCALE: 3/32 " = 1'-0"



DECK REINFORCEMENT PLAN – BR 51S

SCALE: 3/32 " = 1'-0"



DECK REINFORCEMENT PLAN – BR 51S

SCALE: 3/32 " = 1'-0"

KEY

NF	NEAR FACE
FF	FAR FACE
EF	EACH FACE
▲	REINFORCEMENT TO BE CUT TO FIT IN THE FIELD

NOTES:

1. FOR END OF DECK SLAB DETAILS, SEE TRANSVERSE SECTION (5IN&S), BRIDGE SHEET BR51-7.
2. FOR CURTAINWALL REINFORCEMENT, SEE TYPICAL CURTAINWALL DETAILS, BRIDGE SHEET C-42.
3. THE QUANTITY OF ES503 BARS SHOWN DOES NOT INCLUDE ADDITIONAL BARS REQUIRED BELOW THE BRIDGE RAIL POSTS. FOR DETAILS OF THE REQUIRED STIRRUP SPACING, SEE NETC 2-RAIL SHEET C-47. FOR LOCATIONS OF THE BRIDGE RAIL POSTS, SEE CURB AND RAIL LAYOUT PLANS, BRIDGE SHEET BR51-11.

TVGA ENGINEERING, SURVEYING, P.C.

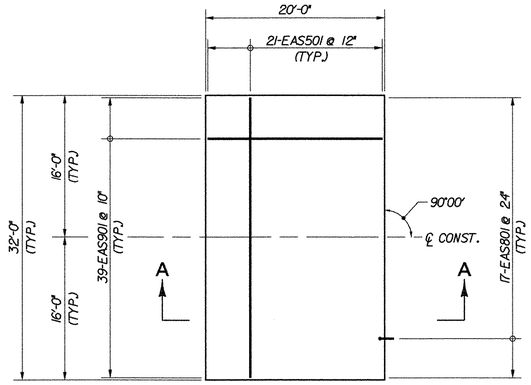
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. **51S**
Highway No. I-89	Log Sta. / Surv. Sta.

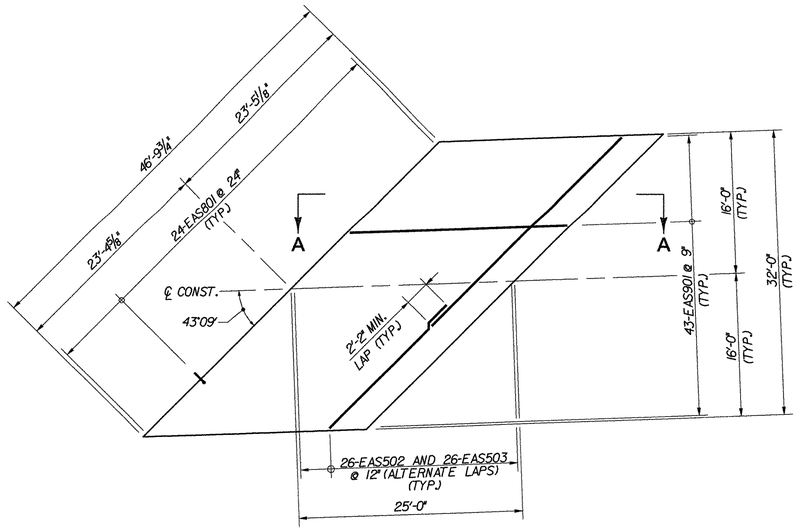
I-89 OVER U.S. ROUTE 2 AND JOINER BROOK

DECK REINFORCEMENT PLAN (51S)

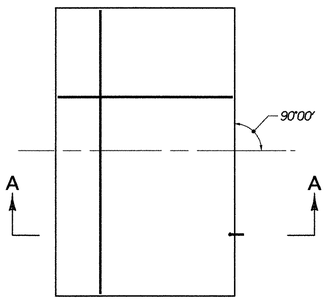
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51sdrp2	Date 10/99
Bridge Sheet No. **BR51-9**	Sheet 107 of 307



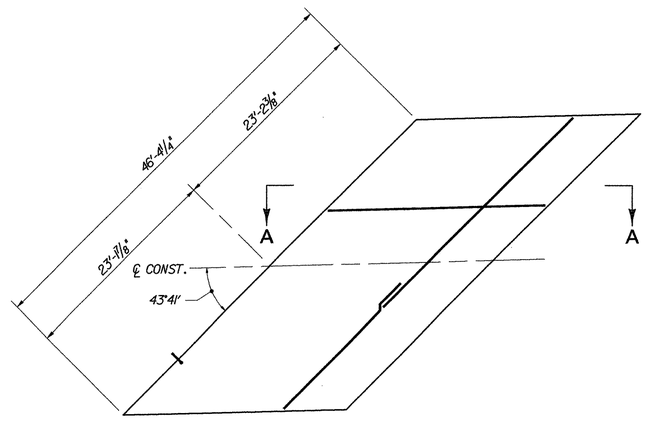
BR 51S ABUTMENT 1



BR 51S ABUTMENT 2



BR 51N ABUTMENT 1

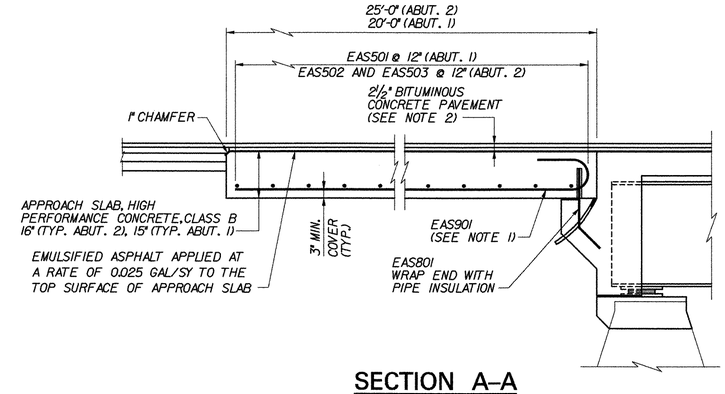


BR 51N ABUTMENT 2

APPROACH SLAB PLANS (51N&S)

SCALE: ⅛" = 1'-0"

TOP OF APPROACH SLAB ELEVATIONS					
BR 51N			BR 51S		
LOCATION	STATION	ELEVATION	LOCATION	STATION	ELEVATION
A	3+20.16	363.81	A	3+20.06	363.60
B	3+20.16	364.14	B	3+20.06	363.93
C	3+20.16	364.48	C	3+20.06	364.27
D	3+00.16	363.48	D	3+00.06	363.30
E	3+00.16	363.81	E	3+00.06	363.64
F	3+00.16	364.15	F	3+00.06	363.98
G	7+05.09	367.97	G	7+91.68	367.97
H	6+88.28	368.22	H	7+74.55	368.22
J	6+71.55	368.46	J	7+57.51	368.46
K	7+30.18	368.09	K	8+16.77	368.11
L	7+13.28	368.35	L	7+99.55	368.35
M	6+96.47	368.60	M	7+82.42	368.60



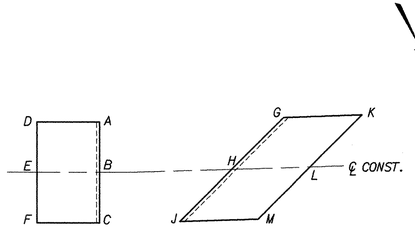
SECTION A–A

(APPROACH SLAB AT FIXED ABUT. SHOWN; SLAB AT EXPANSION ABUT. SIMILAR)

N.T.S.

NOTES:

1. TIP HOOK END OF BAR AS REQUIRED TO ACHIEVE MINIMUM COVER.
2. FOR DETAILS OF APPROACH SLAB PAVEMENT AND TRANSITION TO EXISTING PAVEMENT, SEE DETAIL ON TYPICAL END OF DECK SLAB DETAILS, BRIDGE SHEET C-15.



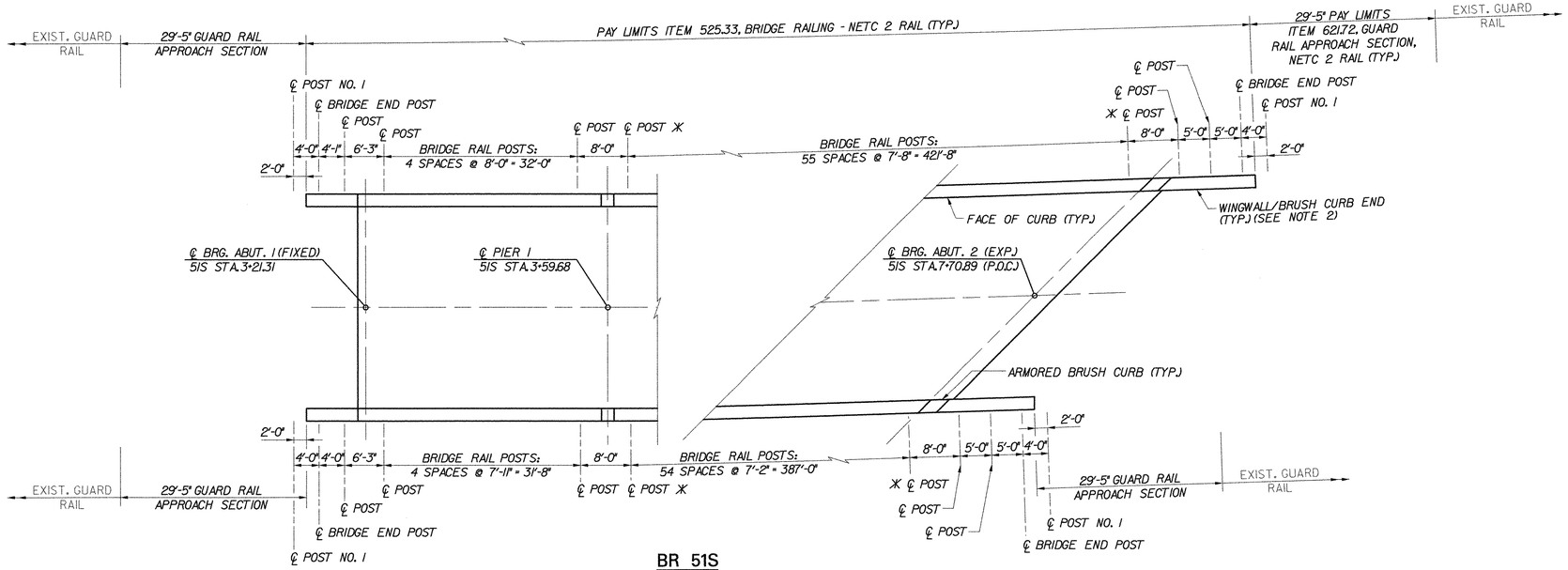
ABUTMENT 1 ABUTMENT 2

APPROACH SLAB ELEVATION KEY

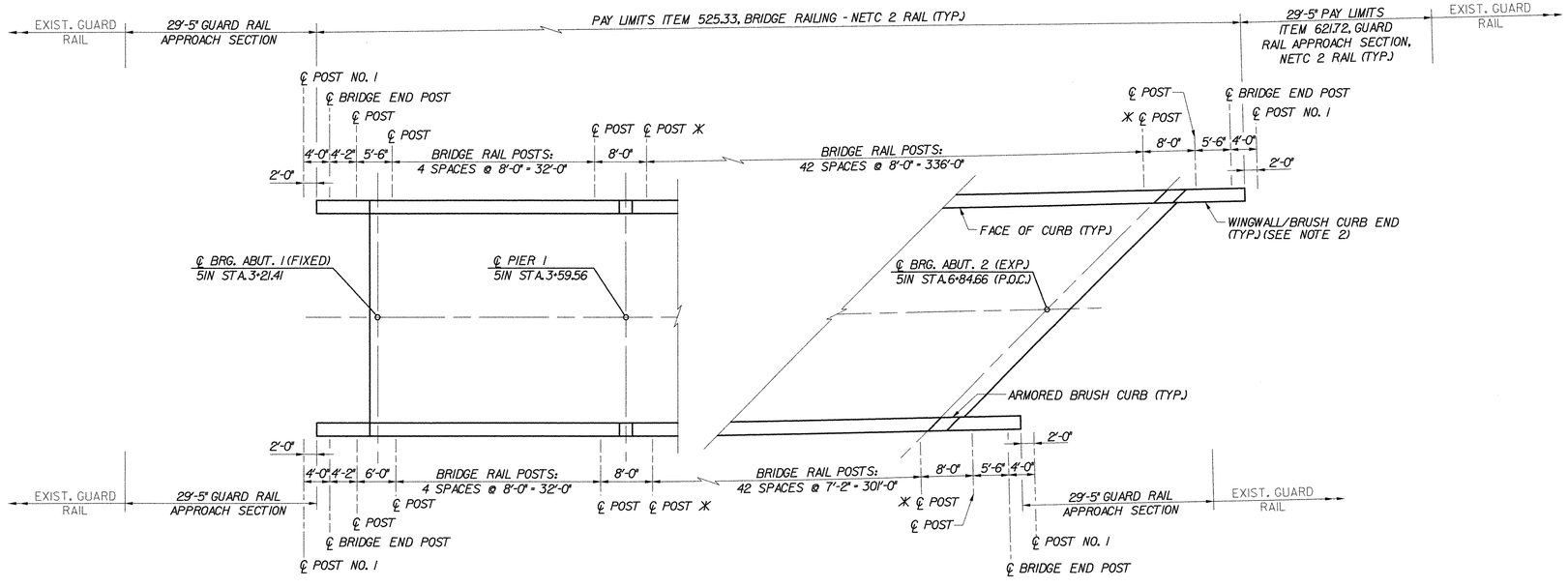
N.T.S.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51N&S
Highway No. I-89	Log Sta. / Surv. Sta.
I-89 OVER U.S. ROUTE 2 AND JOINER BROOK	
APPROACH SLAB DETAILS (51N&S)	
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA ENGINEERING, SURVEYING, P.C.	TVGA CAD Drawing No. 51apslab Date 10/99
	Bridge Sheet No. BR51-10 Sheet 108 of 307



BR 51S



BR 51N

RAILING LAYOUT

SCALE: 3/32 "=1'-0"

℄ RAIL EXPANSION JOINT SHALL BE LOCATED 2'-0" FROM ℄ OF INDICATED POST, ON BRIDGE EXPANSION JOINT SIDE OF POST.

CONSTRUCTION NOTE:
END OF WINGWALLS HAVE BEEN LOCATED APPROXIMATELY BY VAOT SURVEY. CONTRACTOR SHALL VERIFY REQUIRED RAIL LENGTHS PRIOR TO SUBMITTING SHOP DRAWINGS FOR APPROVAL.

NOTES:

1. FOR NETC 2-RAIL BRIDGE RAILING DETAILS AND INFORMATION ABOUT THE NETC GUARD RAIL APPROACH SECTION, SEE SHEETS C-47, C-48, AND C-49.
2. FOR BRUSH CURB END DETAIL, SEE TYPICAL WINGWALL DETAILS (1 OF 2), BRIDGE SHEET C-43.
3. A QUANTITY OF 40'-0" OF ITEM 616.28 "CAST-IN-PLACE CEMENT CONCRETE CURB, TYPE B" SHALL BE PLACED AT THE END OF EACH WINGWALL. SEE GUARD RAIL APPROACH SECTION, NETC 2 RAIL, BRIDGE SHEETS C-47 AND C-48 FOR DETAILS.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

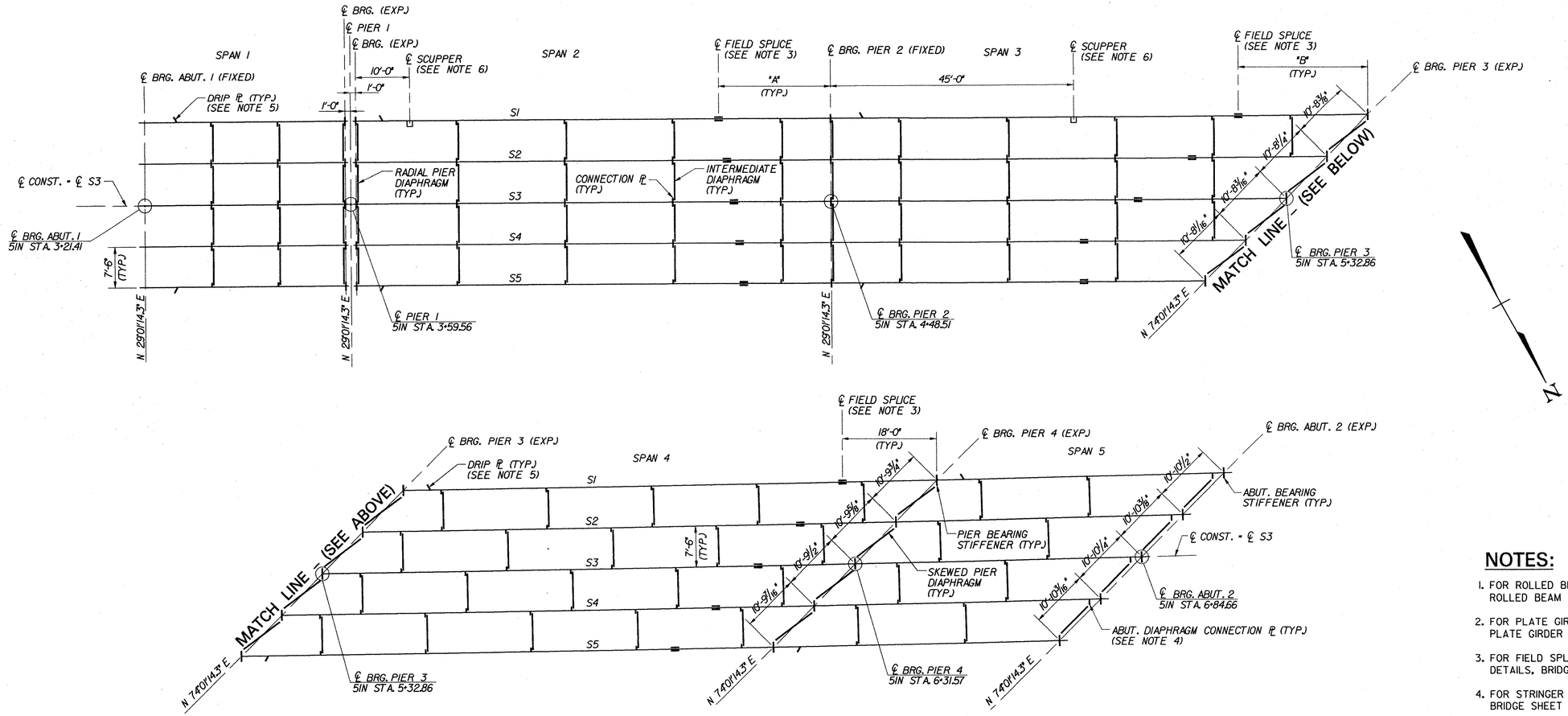
Town Of BOLTON	Bridge No. 51N&S
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 OVER US ROUTE 2 AND JOINER BROOK

CURB AND RAIL LAYOUT PLANS (51N&S)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51brrail	Date 10/99
Bridge Sheet No. BR51-11	Sheet 109 of 307

TVGA ENGINEERING, SURVEYING, P.C.



FRAMING PLAN – BR 51N

SCALE: 3/32" = 1'-0"

STRINGER	SPLICE LOCATIONS "A"	"B"
S1	20'-9"	24'-0"
S2	19'-3"	25'-0"
S3	18'-0"	27'-6"
S4	17'-0"	30'-0"
S5	16'-3"	22'-6"

NOTES:

1. FOR ROLLED BEAM AND DIAPHRAGM DETAILS, SEE TYPICAL ROLLED BEAM DETAILS, BRIDGE SHEET C-16.
2. FOR PLATE GIRDER AND DIAPHRAGM DETAILS, SEE TYPICAL PLATE GIRDER DETAILS, BRIDGE SHEETS C-17 AND C-18.
3. FOR FIELD SPLICE DETAILS, SEE TYPICAL GIRDER SPLICE DETAILS, BRIDGE SHEET C-20.
4. FOR STRINGER LAYOUT TABLE, SEE FRAMING PLAN (51N) (2 OF 2), BRIDGE SHEET BR51-13.
5. FOR DRIP PLATE DETAIL, SEE TYPICAL BRIDGE DETAILS, BRIDGE SHEET C-46.
6. FOR SCUPPER DETAILS, SEE TYPICAL SCUPPER DETAILS, BRIDGE SHEET C-39.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

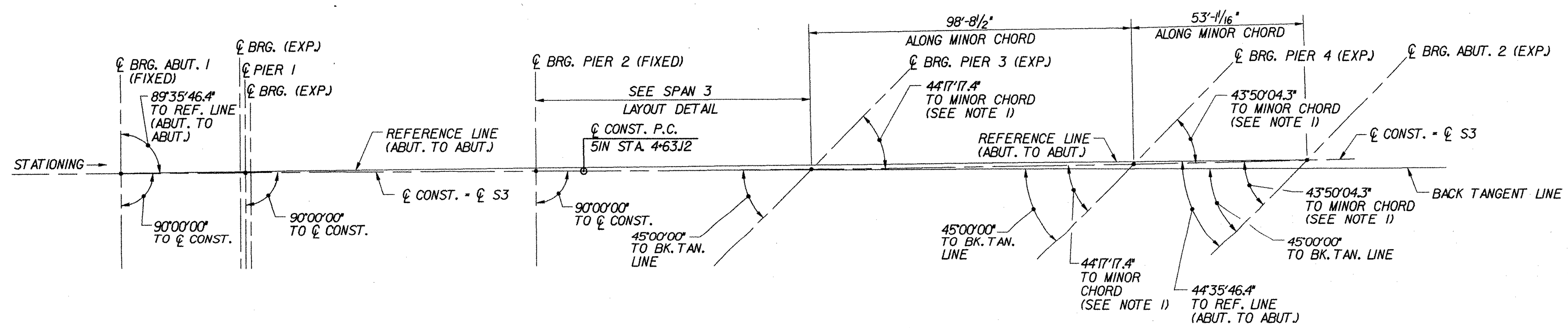
Town Of BOLTON	Bridge No. **51N**
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 NB OVER U.S. ROUTE 2 AND JOINER BROOK

FRAMING PLAN (51N) (1 OF 2)

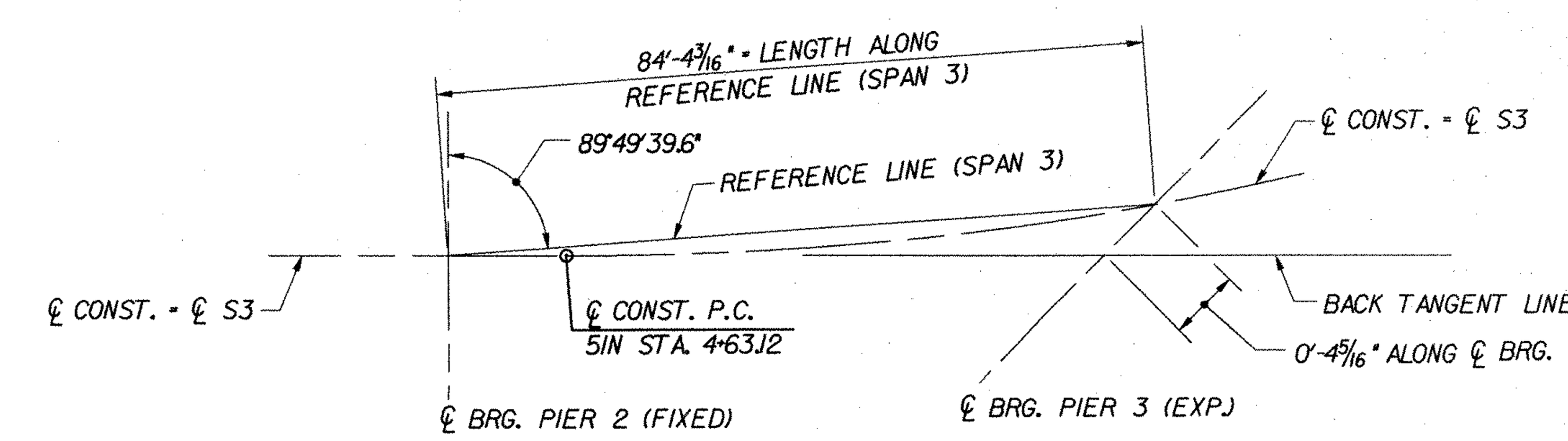
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51nfp	Date 10/99
Bridge Sheet No. **BR51-12**	Sheet 110 of 307

TVGA ENGINEERING, SURVEYING, P.C.



LAYOUT DIAGRAM

N.T.S.



SPAN 3 LAYOUT DETAIL

N.T.S.

BEARING STIFFENER / CONNECTION PLATE SPACING (ALONG ARC)

STRINGER NUMBER	STRINGER RADIUS	SIDE	SPAN 1			TOTAL C-C BRG.	SPAN 2					TOTAL C-C BRG.
S1	9571.34'	LEFT				37' - 1 13/16"						87' - 11 3/8"
		RIGHT	12' - 4"	12' - 4"	12' - 5 13/16"		20' - 0"	20' - 0"	20' - 0"	20' - 0"	7' - 11 3/8"	
S2	9578.84'	LEFT	12' - 4"	12' - 4"	12' - 5 13/16"	37' - 1 13/16"	20' - 0"	20' - 0"	20' - 0"	20' - 0"	7' - 11 3/8"	87' - 11 3/8"
		RIGHT	12' - 4"	12' - 4"	12' - 5 13/16"		20' - 0"	20' - 0"	20' - 0"	20' - 0"	7' - 11 3/8"	
S3	9586.34'	LEFT	12' - 4"	12' - 4"	12' - 5 13/16"	37' - 1 13/16"	20' - 0"	20' - 0"	20' - 0"	20' - 0"	7' - 11 3/8"	87' - 11 3/8"
		RIGHT	12' - 4"	12' - 4"	12' - 5 13/16"		20' - 0"	20' - 0"	20' - 0"	20' - 0"	7' - 11 3/8"	
S4	9593.84'	LEFT	12' - 4"	12' - 4"	12' - 5 13/16"	37' - 1 13/16"	20' - 0"	20' - 0"	20' - 0"	20' - 0"	7' - 11 3/8"	87' - 11 3/8"
		RIGHT	12' - 4"	12' - 4"	12' - 5 13/16"		20' - 0"	20' - 0"	20' - 0"	20' - 0"	7' - 11 3/8"	
S5	9601.34'	LEFT	12' - 4"	12' - 4"	12' - 5 13/16"	37' - 1 13/16"	20' - 0"	20' - 0"	20' - 0"	20' - 0"	7' - 11 3/8"	87' - 11 3/8"
		RIGHT										

STRINGER NUMBER	SIDE	SPAN 3						TOTAL C-C BRG.
S1	LEFT							99' - 5 11/16"
	RIGHT	13' - 0"	20' - 0"	20' - 0"	18' - 0"	14' - 6"	13' - 11 11/16"	
S2	LEFT	13' - 0"	20' - 0"	20' - 0"	18' - 0"	14' - 6"	6' - 4 15/16"	91' - 10 15/16"
	RIGHT	13' - 0"	20' - 0"	20' - 0"	18' - 0"	20' - 10 15/16"		
S3	LEFT	13' - 0"	20' - 0"	20' - 0"	18' - 0"	13' - 4 3/16"		84' - 4 3/16"
	RIGHT	13' - 0"	20' - 0"	20' - 0"	18' - 0"	13' - 4 3/16"		
S4	LEFT	13' - 0"	20' - 0"	20' - 0"	18' - 0"	5' - 9 9/16"		76' - 9 9/16"
	RIGHT	13' - 0"	20' - 0"	20' - 0"	23' - 9 9/16"			
S5	LEFT	13' - 0"	20' - 0"	20' - 0"	16' - 3"			69' - 3"
	RIGHT							

STRINGER NUMBER	SIDE	SPAN 4						TOTAL C-C BRG.
S1	LEFT							98' - 10 7/16"
	RIGHT	7' - 4 3/8"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	13' - 6 1/16"	
S2	LEFT	15' - 0"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	5' - 9 1/2"	98' - 9 1/2"
	RIGHT	7' - 4 1/2"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	13' - 5"	
S3	LEFT	15' - 0"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	5' - 8 9/16"	98' - 8 9/16"
	RIGHT	7' - 4 5/8"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	13' - 3 15/16"	
S4	LEFT	15' - 0"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	5' - 7 9/16"	98' - 7 9/16"
	RIGHT	7' - 4 13/16"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	13' - 2 3/4"	
S5	LEFT	15' - 0"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	5' - 6 5/8"	98' - 6 5/8"
	RIGHT							

STRINGER NUMBER	SIDE	SPAN 5			TOTAL C-C BRG.
S1	LEFT				53' - 2 3/16"
	RIGHT	8' - 2 3/16"	20' - 0"	25' - 0"	
S2	LEFT	15' - 11 15/16"	20' - 0"	17' - 1 11/16"	53' - 1 5/8"
	RIGHT	8' - 1 5/8"	20' - 0"	25' - 0"	
S3	LEFT	15' - 11 3/16"	20' - 0"	17' - 1 7/8"	53' - 1 1/16"
	RIGHT	8' - 1 1/16"	20' - 0"	25' - 0"	
S4	LEFT	15' - 10 9/16"	20' - 0"	17' - 2"	53' - 0 9/16"
	RIGHT	8' - 0 9/16"	20' - 0"	25' - 0"	
S5	LEFT	15' - 9 13/16"	20' - 0"	17' - 2 3/16"	53' - 0"
	RIGHT				

STRINGER LAYOUT TABLE

(SEE NOTE 2)

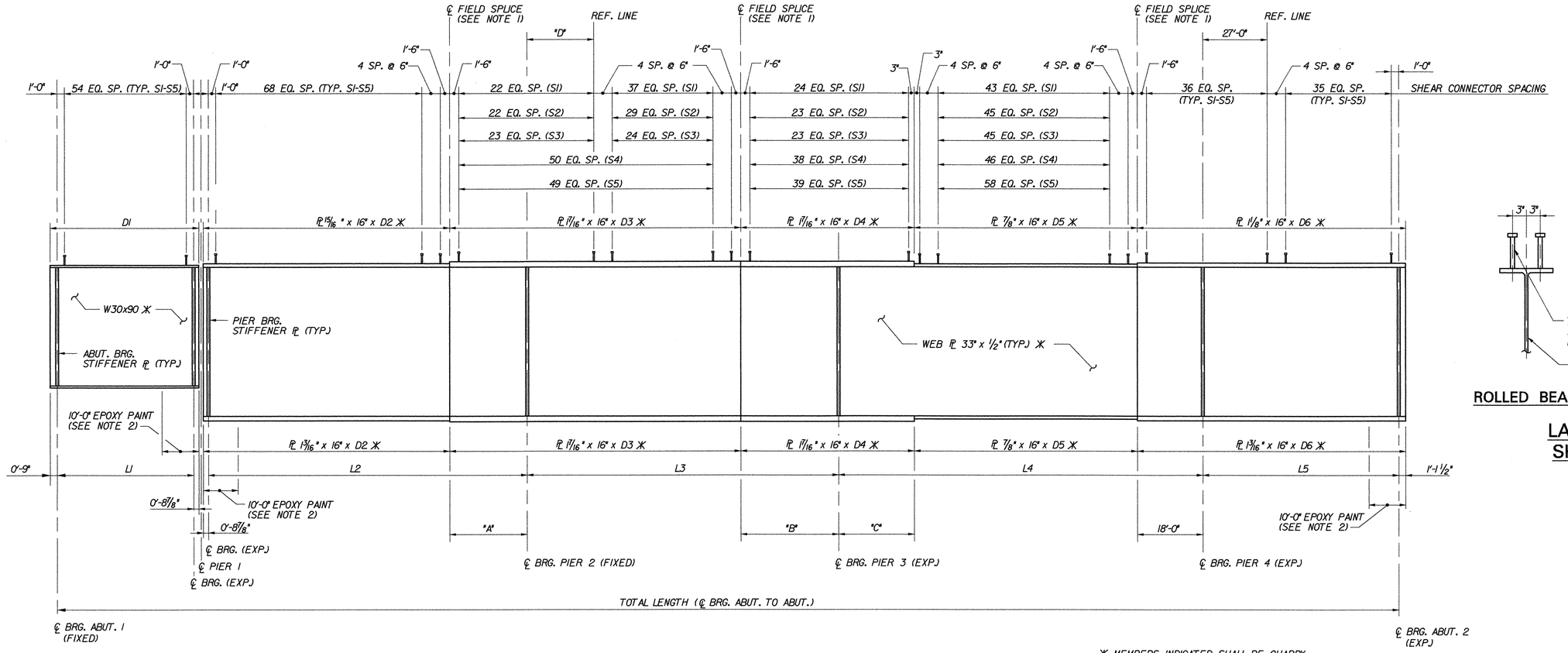
NOTES:

1. MINOR CHORDS NOT SHOWN FOR CLARITY.
2. STRINGER LAYOUT DIMENSIONS BEGIN AND END AT ABUTMENT CENTERLINES OF BEARING. LOCATION OF ABUTMENT DIAPHRAGM CONNECTION PLATES NOT INCLUDED IN TABLE. THE CONTRACTOR SHALL PROVIDE THIS DIMENSION IN SHOP DRAWINGS IN ACCORDANCE WITH DETAILS TYPICAL PLATE GIRDER DETAILS, BRIDGE SHEETS C-17 AND C-18.
3. WORK THIS SHEET WITH FRAMING PLAN (51N) (1 OF 2), BRIDGE SHEET BR51-12.

TVGA ENGINEERING, SURVEYING, P.C.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of	BOLTON	Bridge No.	51N
Highway No.	I-89	Log Sta. / Surv. Sta.	
I-89 NB OVER U.S. ROUTE 2 AND JOINER BROOK			
FRAMING PLAN (51N) (2 OF 2)			
Designed By	P.W. SZUSTAK	Drawn By	R.A. BOTZENHART
Checked By J.P. HALSTEAD	Date 10/99	Bridge Design Supervisor J.P. HALSTEAD	Date 10/99
PROJECT	BOLTON	PROJECT NO.	IM-089-2(29)
TVGA CAD Drawing No.	51nfp	Date	10/99
Bridge Sheet No.	BR51-13	Sheet	111 of 307



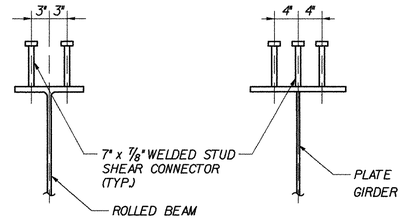
STRINGER ELEVATION

N.T.S.

* MEMBERS INDICATED SHALL BE CHARPY V-NOTCH TESTED IN ACCORDANCE WITH SECTION 714.01 OF THE SPECIFICATIONS.

BR 51N							
STRINGER	RADIUS	SPAN LENGTHS (ALONG ARC) L1	L2	L3	L4	L5	TOTAL LENGTH (CL BRG. ABUT. TO ABUT.)
S1	9571.34'	37' - 1 13/16"	87' - 11 3/8"	99' - 5 11/16"	98' - 10 7/16"	53' - 2 3/16"	378' - 7 1/2"
S2	9578.84'	37' - 1 13/16"	87' - 11 3/8"	91' - 10 15/16"	98' - 9 1/2"	53' - 1 5/8"	370' - 11 1/4"
S3	9586.34'	37' - 1 13/16"	87' - 11 3/8"	84' - 4 3/16"	98' - 8 9/16"	53' - 1 1/16"	363' - 3"
S4	9593.84'	37' - 1 13/16"	87' - 11 3/8"	76' - 9 9/16"	98' - 7 9/16"	53' - 0 9/16"	355' - 6 7/8"
S5	9601.34'	37' - 1 13/16"	87' - 11 3/8"	69' - 3"	98' - 6 5/8"	53' - 0"	347' - 10 13/16"
STRINGER	SECTION LENGTHS (ALONG ARC) D1	D2	D3	D4	D5	D6	
S1	38' - 7 11/16"	67' - 11 1/4"	96' - 2 11/16"	46' - 3"	58' - 7 7/16"	72' - 3 11/16"	
S2	38' - 7 11/16"	69' - 5 1/4"	86' - 1 15/16"	45' - 6"	60' - 3 1/2"	72' - 3 1/8"	
S3	38' - 7 11/16"	70' - 8 1/4"	74' - 10 3/16"	46' - 9"	61' - 5 9/16"	72' - 2 9/16"	
S4	38' - 7 11/16"	71' - 8 1/4"	63' - 9 9/16"	48' - 3"	62' - 4 9/16"	72' - 2 1/16"	
S5	38' - 7 11/16"	72' - 5 1/4"	63' - 0"	40' - 0"	63' - 0 5/8"	72' - 1 1/2"	

STRINGER	"A"	"B"	"C"	"D"
S1	20'-9"	24'-0"	22'-3"	24'-0"
S2	19'-3"	25'-0"	20'-6"	25'-3"
S3	18'-0"	27'-6"	19'-3"	27'-9"
S4	17'-0"	30'-0"	18'-3"	27'-9"
S5	16'-3"	22'-6"	17'-6"	27'-9"



ROLLED BEAM PLATE GIRDER

LATERAL SPACING OF SHEAR CONNECTORS

N.T.S.

NOTES:

1. FOR FIELD SPLICE DETAILS, SEE TYPICAL GIRDER SPLICE DETAILS, BRIDGE SHEET C-20.
2. ALL STRUCTURAL STEEL WITHIN 10 FEET OF END OF STRINGER AT EXPANSION ENDS SHALL BE COATED WITH A PROTECTIVE PAINT SYSTEM, WITH THE FINAL COAT TO BE DARK BROWN (COLOR CHIP #20059) TO BLEND WITH THE WEATHERING STEEL. THE COST OF PAINTING SHALL BE PAID FOR UNDER ITEM 513.25, "STRUCTURAL PAINTING, SHOP APPLIED".

STATE OF VERMONT
AGENCY OF TRANSPORTATION

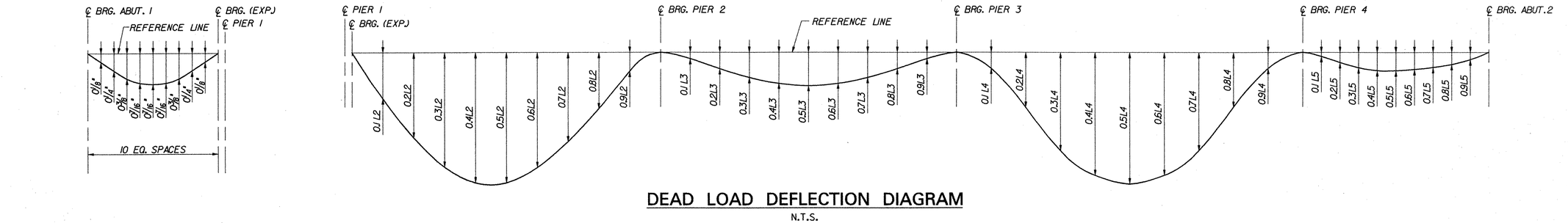
Town Of BOLTON	Bridge No. 51N
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 NB OVER U.S. ROUTE 2 AND JOINER BROOK

STRINGER ELEVATION (51N) (1 OF 2)

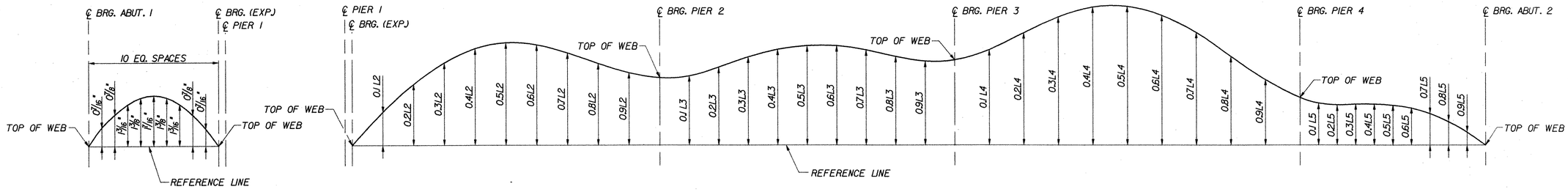
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51nstrel	Date 08/00
Bridge Sheet No. BR51-14	Sheet 112 of 307

TVGA ENGINEERING, SURVEYING, P.C.



DEAD LOAD DEFLECTION DIAGRAM

N.T.S.



CAMBER DIAGRAM

N.T.S.

DL DEFLECTION (SPANS 2 THROUGH 5)

STRINGER	CL PIER 1	0.1 L2	0.2 L2	0.3 L2	0.4 L2	0.5 L2	0.6 L2	0.7 L2	0.8 L2	0.9 L2	CL PIER 2	0.1 L3	0.2 L3	0.3 L3	0.4 L3	0.5 L3	0.6 L3	0.7 L3	0.8 L3	0.9 L3	CL PIER 3	0.1 L4	0.2 L4	0.3 L4	0.4 L4	0.5 L4	0.6 L4	0.7 L4	0.8 L4	0.9 L4	CL PIER 4	0.1 L5	0.2 L5	0.3 L5	0.4 L5	0.5 L5	0.6 L5	0.7 L5	0.8 L5	0.9 L5	CL ABUT. 2
S1	0"	0 13/16"	1 1/2"	2"	2 1/4"	2 3/16"	1 7/8"	1 7/16"	0 7/8"	0 5/16"	0"	0"	0 3/16"	0 1/2"	0 11/16"	0 13/16"	0 11/16"	0 1/2"	0 3/16"	0"	0"	0 3/8"	0 15/16"	1 9/16"	2 1/16"	2 1/4"	2 1/8"	1 3/4"	1 1/8"	0 1/2"	0"	-0 1/8"	-0 3/16"	-0 3/16"	-0 1/8"	-0 1/16"	-0 1/16"	0"	0"	0"	0"
S2	0"	0 7/8"	1 5/8"	2 1/8"	2 3/8"	2 3/8"	2 1/16"	1 5/8"	1"	0 7/16"	0"	-0 1/8"	-0 1/16"	0 1/16"	0 3/16"	0 1/4"	0 3/16"	0 1/16"	-0 1/16"	-0 1/8"	0"	0 7/16"	1 1/8"	1 3/4"	2 1/4"	2 7/16"	2 5/16"	1 7/8"	1 3/16"	0 1/2"	0"	-0 1/8"	-0 3/16"	-0 3/16"	-0 3/16"	-0 1/8"	-0 1/16"	-0 1/16"	0"	0"	0"
S3	0"	0 15/16"	1 11/16"	2 1/4"	2 9/16"	2 9/16"	2 1/4"	1 3/4"	1 1/8"	0 1/2"	0"	-0 1/4"	-0 1/4"	-0 1/4"	-0 3/16"	-0 3/16"	-0 3/16"	-0 1/4"	-0 1/4"	-0 3/16"	0"	0 1/2"	1 1/4"	1 7/8"	2 3/8"	2 9/16"	2 3/8"	1 15/16"	1 1/4"	0 9/16"	0"	-0 1/8"	-0 3/16"	-0 3/16"	-0 3/16"	-0 1/8"	-0 1/16"	-0 1/16"	0"	0"	0"
S4	0"	0 15/16"	1 3/4"	2 3/8"	2 5/8"	2 11/16"	2 3/8"	1 7/8"	1 3/16"	0 9/16"	0"	-0 1/4"	-0 3/8"	-0 7/16"	-0 7/16"	-0 7/16"	-0 7/16"	-0 7/16"	-0 3/8"	-0 1/4"	0"	0 9/16"	1 5/16"	2"	2 1/2"	2 11/16"	2 1/2"	2"	1 5/16"	0 9/16"	0"	-0 3/16"	-0 1/4"	-0 1/4"	-0 3/16"	-0 3/16"	-0 1/8"	-0 1/16"	0"	0"	0"
S5	0"	0 15/16"	1 13/16"	2 7/16"	2 3/4"	2 3/4"	2 1/2"	1 15/16"	1 1/4"	0 9/16"	0"	-0 5/16"	-0 1/2"	-0 9/16"	-0 5/8"	-0 5/8"	-0 9/16"	-0 9/16"	-0 7/16"	-0 5/16"	0"	0 5/8"	1 3/8"	2 1/8"	2 5/8"	2 3/4"	2 9/16"	2 1/16"	1 5/16"	0 9/16"	0"	-0 3/16"	-0 1/4"	-0 1/4"	-0 3/16"	-0 3/16"	-0 1/8"	-0 1/16"	-0 1/16"	0"	0"

TOTAL CAMBER (SPANS 2 THROUGH 5)

STRINGER	CL PIER 1	0.1 L2	0.2 L2	0.3 L2	0.4 L2	0.5 L2	0.6 L2	0.7 L2	0.8 L2	0.9 L2	CL PIER 2	0.1 L3	0.2 L3	0.3 L3	0.4 L3	0.5 L3	0.6 L3	0.7 L3	0.8 L3	0.9 L3	CL PIER 3	0.1 L4	0.2 L4	0.3 L4	0.4 L4	0.5 L4	0.6 L4	0.7 L4	0.8 L4	0.9 L4	CL PIER 4	0.1 L5	0.2 L5	0.3 L5	0.4 L5	0.5 L5	0.6 L5	0.7 L5	0.8 L5	0.9 L5	CL ABUT. 2
S1	0"	1 7/16"	2 7/8"	4 1/8"	4 15/16"	5 5/16"	5 1/4"	4 7/8"	4 1/2"	4 1/8"	4"	4 5/16"	5"	5 13/16"	6 5/16"	6 5/8"	6 9/16"	6 1/4"	5 11/16"	5 1/4"	5 1/8"	5 1/2"	6 3/16"	6 15/16"	7 7/16"	7 7/16"	7"	6 1/16"	4 7/8"	3 11/16"	2 3/4"	2 7/16"	2 3/8"	2 3/8"	2 5/16"	2 1/4"	2 1/16"	1 3/4"	1 1/4"	0 5/8"	0"
S2	0"	1 1/2"	3"	4 3/16"	5"	5 7/16"	5 3/8"	5 1/16"	4 9/16"	4 1/8"	3 7/8"	4 1/16"	4 5/8"	5 3/16"	5 11/16"	5 15/16"	5 7/8"	5 5/8"	5 5/16"	5"	4 15/16"	5 3/8"	6 1/8"	6 15/16"	7 7/16"	7 1/2"	7 1/16"	6 1/8"	4 7/8"	3 5/8"	2 11/16"	2 3/8"	2 5/16"	2 1/4"	2 1/4"	2 1/8"	2"	1 11/16"	1 1/4"	0 11/16"	0"
S3	0"	1 11/16"	3 3/16"	4 3/8"	5 1/8"	5 9/16"	5 1/2"	5 3/16"	4 5/8"	4 1/16"	3 3/4"	3 13/16"	4 1/4"	4 3/4"	5 1/8"	5 5/16"	5 5/16"	5 1/8"	4 7/8"	4 11/16"	4 3/4"	5 1/4"	6 1/16"	6 7/8"	7 7/16"	7 1/2"	7"	6 1/8"	4 7/8"	3 5/8"	2 5/8"	2 5/16"	2 3/16"	2 1/8"	2 1/8"	2 1/8"	2"	1 5/8"	1 1/4"	0 11/16"	0"
S4	0"	1 9/16"	3 1/16"	4 5/16"	5 3/16"	5 5/8"	5 9/16"	5 3/16"	4 5/8"	4"	3 5/8"	3 5/8"	3 15/16"	4 3/8"	4 3/4"	4 7/8"	4 15/16"	4 3/4"	4 7/16"	4 5/16"	4 1/2"	5 1/8"	5 15/16"	6 7/8"	7 3/8"	7 7/16"	6 15/16"	6"	4 3/4"	3 1/2"	2 1/2"	2 3/16"	2 1/16"	2"	2"	2"	1 7/8"	1 5/8"	1 3/16"	0 11/16"	0"
S5	0"	1 9/16"	3 1/8"	4 7/16"	5 1/4"	5 5/8"	5 1/2"	5 1/16"	4 7/16"	3 15/16"	3 1/2"	3 1/2"	3 11/16"	4 1/8"	4 7/16"	4 9/16"	4 9/16"	4 3/8"	4 3/16"	4 1/8"	4 5/16"	4 15/16"	5 13/16"	6 3/4"	7 5/16"	7 3/8"	6 15/16"	6"	4 3/4"	3 7/16"	2 7/16"	2 1/8"	2"	2"	2"	2"	1 7/8"	1 9/16"	1 1/8"	0 5/8"	0"

STATE OF VERMONT
AGENCY OF TRANSPORTATION

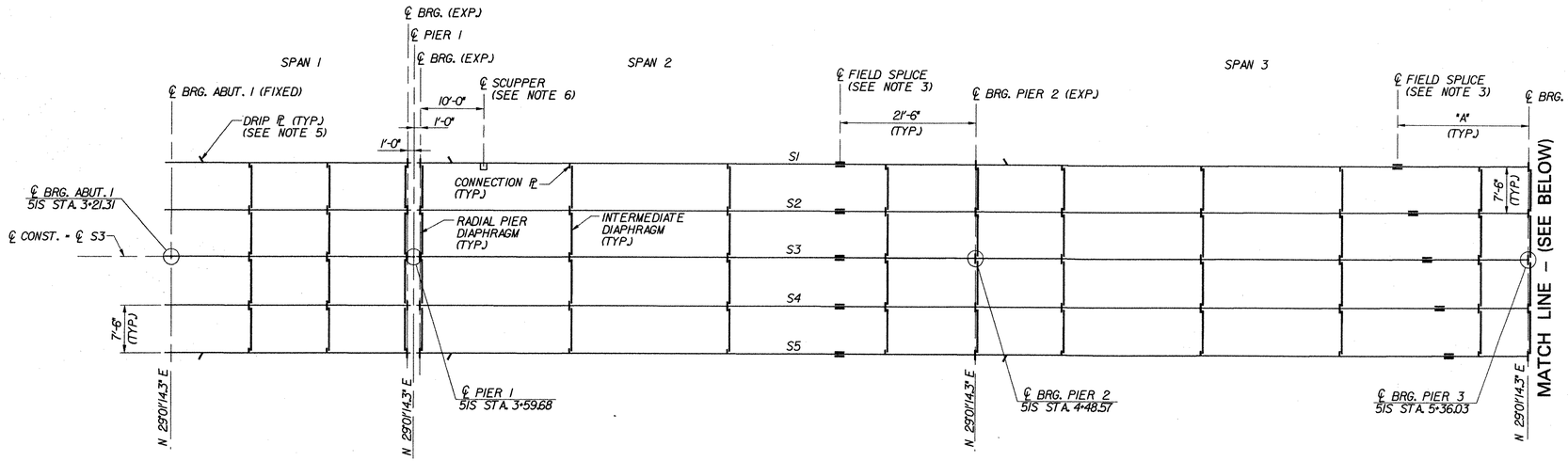
Town Of BOLTON	Bridge No. **51N**
Highway No. I-89	Log Sta. / Surv. Sta.

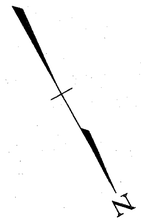
I-89 NB OVER U.S. ROUTE 2 AND JOINER BROOK

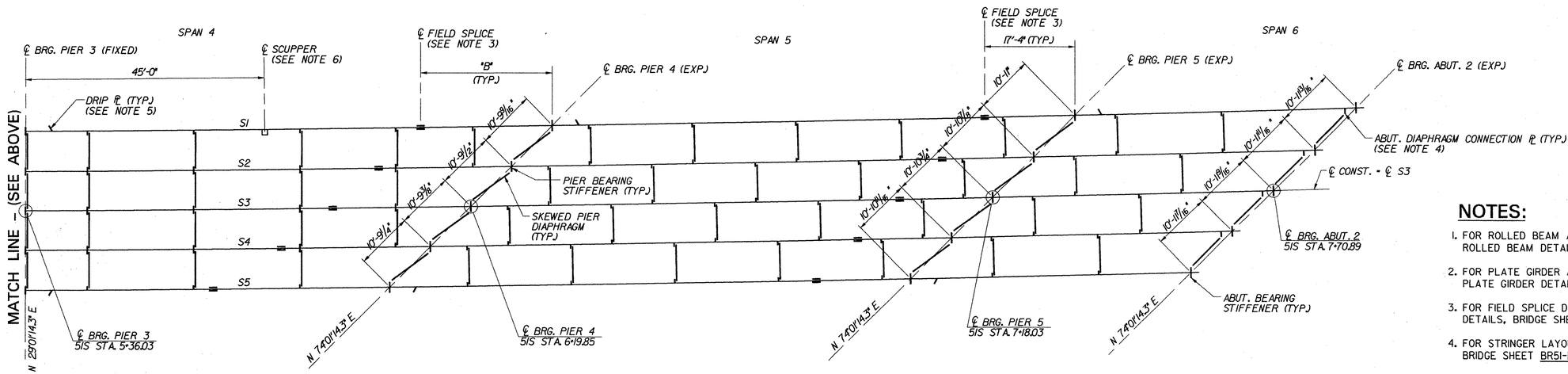
STRINGER ELEVATION (51N) (2 OF 2)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51nstrel	Date 10/99
Bridge Sheet No. **BR51-15**	Sheet 113 of 307

TVGA ENGINEERING, SURVEYING, P.C.







FRAMING PLAN – BR 51S

SCALE: 3/32 " = 1'-0"

NOTES:

1. FOR ROLLED BEAM AND DIAPHRAGM DETAILS, SEE TYPICAL ROLLED BEAM DETAILS, BRIDGE SHEET C-16.
2. FOR PLATE GIRDER AND DIAPHRAGM DETAILS, SEE TYPICAL PLATE GIRDER DETAILS, BRIDGE SHEETS C-17 AND C-18.
3. FOR FIELD SPLICE DETAILS, SEE TYPICAL GIRDER SPLICE DETAILS, BRIDGE SHEET C-20.
4. FOR STRINGER LAYOUT TABLE, SEE FRAMING PLAN (51S) (2 OF 2), BRIDGE SHEET BR51-17.
5. FOR DRIP PLATE DETAIL, SEE TYPICAL BRIDGE DETAILS, BRIDGE SHEET C-46.
6. FOR SCUPPER DETAILS, SEE TYPICAL SCUPPER DETAILS, BRIDGE SHEET C-39.

STRINGER	SPLICE LOCATIONS	
	"A"	"B"
S1	20'-9"	24'-9"
S2	18'-3"	25'-0"
S3	16'-0"	26'-0"
S4	14'-0"	28'-0"
S5	12'-6"	33'-3"

TVGA ENGINEERING, SURVEYING, P.C.

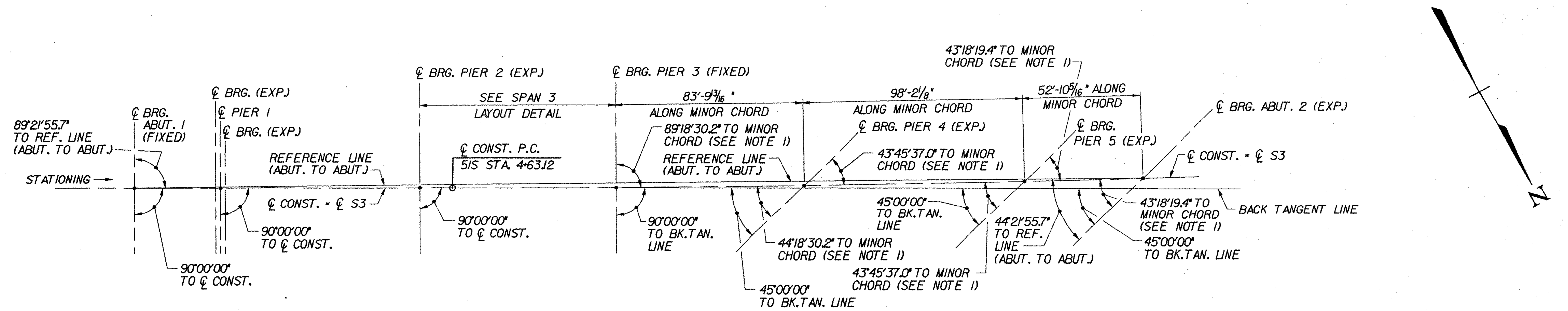
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. **51S**
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 SB OVER U.S. ROUTE 2 AND JOINER BROOK

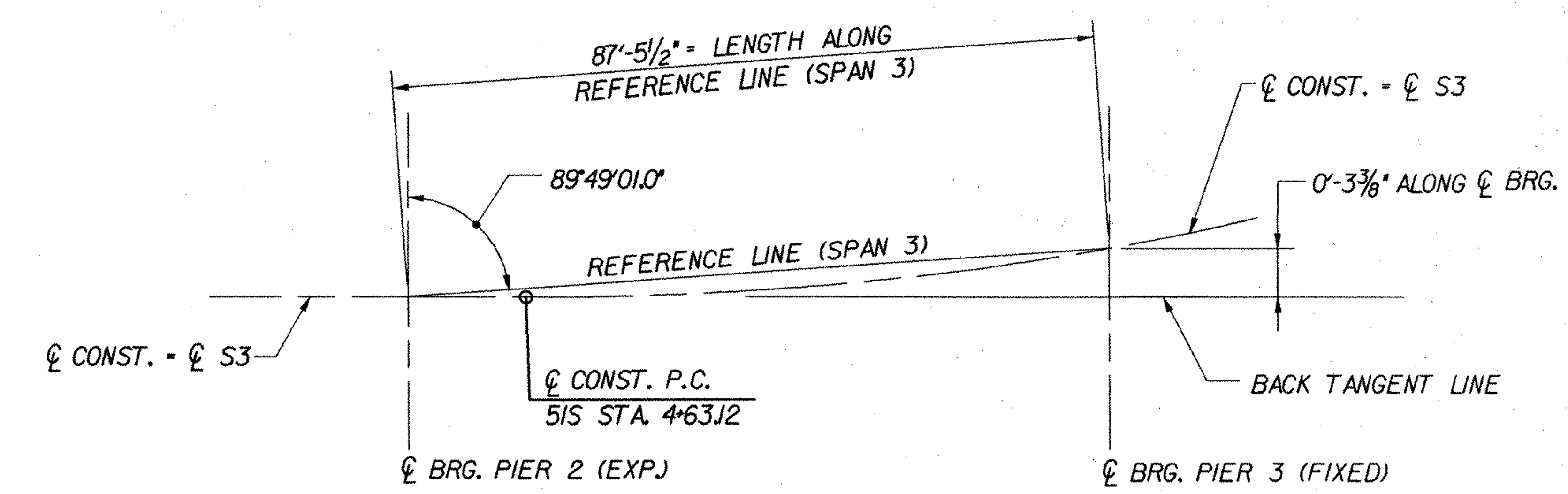
FRAMING PLAN (51S) (1 OF 2)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51sfp	Date 10/99
Bridge Sheet No. **BR51-16**	Sheet 114 of 307



LAYOUT DIAGRAM

N.T.S.



SPAN 3 LAYOUT DETAIL

N.T.S.

BEARING STIFFENER / CONNECTION PLATE SPACING (ALONG ARC)

STRINGER NUMBER	STRINGER RADIUS	SIDE	SPAN 1			TOTAL C-C BRG.	SPAN 2				TOTAL C-C BRG.
S1	9497.42'	LEFT				37' - 4 7/16"					87' - 10 11/16"
		RIGHT	12' - 4"	12' - 4"	12' - 8 7/16"		25' - 0"	25' - 0"	25' - 0"	12' - 10 11/16"	
S2	9504.92'	LEFT	12' - 4"	12' - 4"	12' - 8 7/16"	37' - 4 7/16"	25' - 0"	25' - 0"	25' - 0"	12' - 10 11/16"	87' - 10 11/16"
		RIGHT	12' - 4"	12' - 4"	12' - 8 7/16"		25' - 0"	25' - 0"	25' - 0"	12' - 10 11/16"	
S3	9512.42'	LEFT	12' - 4"	12' - 4"	12' - 8 7/16"	37' - 4 7/16"	25' - 0"	25' - 0"	25' - 0"	12' - 10 11/16"	87' - 10 11/16"
		RIGHT	12' - 4"	12' - 4"	12' - 8 7/16"		25' - 0"	25' - 0"	25' - 0"	12' - 10 11/16"	
S4	9519.92'	LEFT	12' - 4"	12' - 4"	12' - 8 7/16"	37' - 4 7/16"	25' - 0"	25' - 0"	25' - 0"	12' - 10 11/16"	87' - 10 11/16"
		RIGHT	12' - 4"	12' - 4"	12' - 8 7/16"		25' - 0"	25' - 0"	25' - 0"	12' - 10 11/16"	
S5	9527.42'	LEFT	12' - 4"	12' - 4"	12' - 8 7/16"	37' - 4 7/16"	25' - 0"	25' - 0"	25' - 0"	12' - 10 11/16"	87' - 10 11/16"
		RIGHT									

STRINGER NUMBER	STRINGER RADIUS	SIDE	SPAN 3					TOTAL C-C BRG.	SPAN 4						TOTAL C-C BRG.
S1	9497.42'	LEFT						87' - 5 1/2"							99' - 1 1/16"
		RIGHT	14' - 0"	22' - 0"	22' - 0"	22' - 0"	7' - 5 1/2"		12' - 0"	20' - 0"	20' - 0"	18' - 0"	14' - 6"	14' - 7 1/16"	
S2	9504.92'	LEFT	14' - 0"	22' - 0"	22' - 0"	22' - 0"	7' - 5 1/2"	87' - 5 1/2"	12' - 0"	20' - 0"	20' - 0"	18' - 0"	14' - 6"	6' - 11 7/16"	91' - 5 7/16"
		RIGHT	14' - 0"	22' - 0"	22' - 0"	22' - 0"	7' - 5 1/2"		12' - 0"	20' - 0"	20' - 0"	18' - 0"	21' - 5 7/16"	21' - 5 7/16"	
S3	9512.42'	LEFT	14' - 0"	22' - 0"	22' - 0"	22' - 0"	7' - 5 1/2"	87' - 5 1/2"	12' - 0"	20' - 0"	20' - 0"	18' - 0"	13' - 9 13/16"	13' - 9 13/16"	83' - 9 13/16"
		RIGHT	14' - 0"	22' - 0"	22' - 0"	22' - 0"	7' - 5 1/2"		12' - 0"	20' - 0"	20' - 0"	18' - 0"	13' - 9 13/16"		
S4	9519.92'	LEFT	14' - 0"	22' - 0"	22' - 0"	22' - 0"	7' - 5 1/2"	87' - 5 1/2"	12' - 0"	20' - 0"	20' - 0"	18' - 0"	6' - 2 3/8"		76' - 2 3/8"
		RIGHT	14' - 0"	22' - 0"	22' - 0"	22' - 0"	7' - 5 1/2"		12' - 0"	20' - 0"	20' - 0"	24' - 2 3/8"			
S5	9527.42'	LEFT	14' - 0"	22' - 0"	22' - 0"	22' - 0"	7' - 5 1/2"	87' - 5 1/2"	12' - 0"	20' - 0"	20' - 0"	16' - 6 15/16"			68' - 6 15/16"
		RIGHT													

STRINGER NUMBER	STRINGER RADIUS	SIDE	SPAN 5						TOTAL C-C BRG.	SPAN 6			TOTAL C-C BRG.
S1	9497.42'	LEFT							98' - 4 3/16"				52' - 11 1/2"
		RIGHT	7' - 2 5/8"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	13' - 1 9/16"		7' - 11 1/2"	20' - 0"	25' - 0"	
S2	9504.92'	LEFT	15' - 0"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	5' - 3 3/16"	98' - 3 3/16"	15' - 10 15/16"	20' - 0"	16' - 11 15/16"	52' - 10 7/8"
		RIGHT	7' - 2 13/16"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	13' - 0 3/8"		7' - 10 7/8"	20' - 0"	25' - 0"	
S3	9512.42'	LEFT	15' - 0"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	5' - 2 3/16"	98' - 2 3/16"	15' - 10 3/16"	20' - 0"	17' - 0 1/8"	52' - 10 5/16"
		RIGHT	7' - 2 15/16"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	12' - 11 1/4"		7' - 10 5/16"	20' - 0"	25' - 0"	
S4	9519.92'	LEFT	15' - 0"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	5' - 1 1/8"	98' - 1 1/8"	15' - 9 1/2"	20' - 0"	17' - 0 1/4"	52' - 9 3/4"
		RIGHT	7' - 3 1/8"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	12' - 10"		7' - 9 3/4"	20' - 0"	25' - 0"	
S5	9527.42'	LEFT	15' - 0"	19' - 6"	19' - 6"	19' - 6"	19' - 6"	5' - 0 3/16"	98' - 0 3/16"	15' - 8 3/4"	20' - 0"	17' - 0 7/16"	52' - 9 3/16"
		RIGHT											

STRINGER LAYOUT TABLE

(SEE NOTE 2)

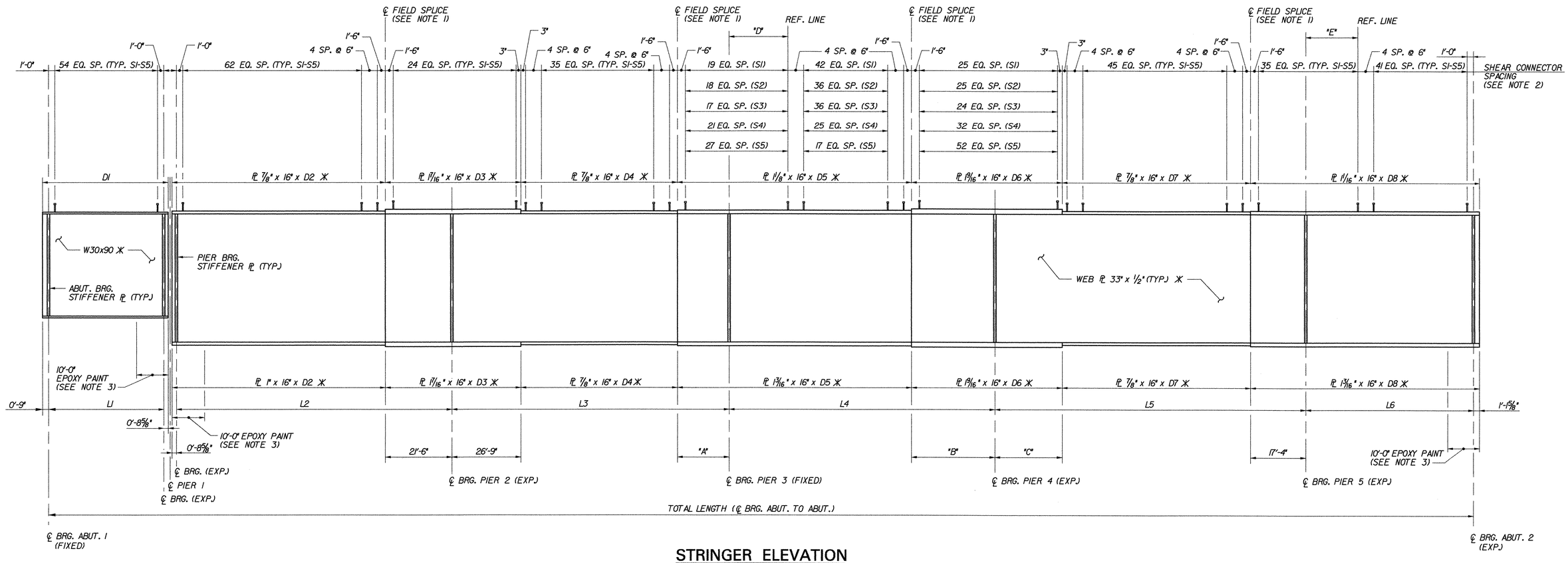
NOTES:

1. MINOR CHORDS NOT SHOWN FOR CLARITY.
2. STRINGER LAYOUT DIMENSIONS BEGIN AND END AT ABUTMENT CENTERLINES OF BEARING. LOCATION OF ABUTMENT DIAPHRAGM CONNECTION PLATES NOT INCLUDED IN TABLE. THE CONTRACTOR SHALL PROVIDE THIS DIMENSION IN SHOP DRAWINGS IN ACCORDANCE WITH DETAILS TYPICAL PLATE GIRDER DETAILS, BRIDGE SHEETS C-17 AND C-18.
3. WORK THIS SHEET WITH FRAMING PLAN (51S) (1 OF 2), BRIDGE SHEET BR51-16.

TVGA ENGINEERING, SURVEYING, P.C.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of	BOLTON	Bridge No.	**51S**
Highway No.	I-89	Log Sta. / Surv. Sta.	
I-89 SB OVER U.S. ROUTE 2 AND JOINER BROOK			
FRAMING PLAN (51S) (2 OF 2)			
Designed By	P.W. SZUSTAK	Drawn By	R.A. BOTZENHART
Checked By J.P. HALSTEAD	Date 10/99	Bridge Design Supervisor J.P. HALSTEAD	Date 10/99
PROJECT	BOLTON	PROJECT NO.	IM-089-2(29)
TVGA CAD Drawing No.	51sfp	Date	10/99
Bridge Sheet No.	**BR51-17**	Sheet	115 of 307



STRINGER ELEVATION

N.T.S.

BR 51S								
		SPAN LENGTHS (ALONG ARC)						TOTAL LENGTH
STRINGER	RADIUS	L1	L2	L3	L4	L5	L6	(CL BRG. ABUT. TO ABUT.)
S1	9497.42'	37' - 4 7/16"	87' - 10 11/16"	87' - 5 1/2"	99' - 1 1/16"	98' - 4 3/16"	52' - 11 1/2"	465' - 1 3/8"
S2	9504.92'	37' - 4 7/16"	87' - 10 11/16"	87' - 5 1/2"	91' - 5 7/16"	98' - 3 3/16"	52' - 10 7/8"	457' - 4 1/8"
S3	9512.42'	37' - 4 7/16"	87' - 10 11/16"	87' - 5 1/2"	83' - 9 13/16"	98' - 2 3/16"	52' - 10 5/16"	449' - 6 15/16"
S4	9519.92'	37' - 4 7/16"	87' - 10 11/16"	87' - 5 1/2"	76' - 2 3/8"	98' - 1 1/8"	52' - 9 3/4"	441' - 9 7/8"
S5	9527.42'	37' - 4 7/16"	87' - 10 11/16"	87' - 5 1/2"	68' - 6 15/16"	98' - 0 3/16"	52' - 9 3/16"	434' - 0 15/16"
		SECTION LENGTHS (ALONG ARC)						
STRINGER	D1	D2	D3	D4	D5	D6	D7	D8
S1	38' - 10 1/16"	67' - 1 5/16"	48' - 3"	39' - 11 1/2"	95' - 1 1/16"	49' - 9"	56' - 0 3/16"	71' - 5 1/8"
S2	38' - 10 1/16"	67' - 1 5/16"	48' - 3"	42' - 5 1/2"	84' - 8 7/16"	48' - 0"	57' - 11 3/16"	71' - 4 1/2"
S3	38' - 10 1/16"	67' - 1 5/16"	48' - 3"	44' - 8 1/2"	73' - 9 13/16"	47' - 6"	59' - 4 3/16"	71' - 3 15/16"
S4	38' - 10 1/16"	67' - 1 5/16"	48' - 3"	46' - 8 1/2"	62' - 2 3/8"	48' - 4"	60' - 5 1/8"	71' - 3 3/8"
S5	38' - 10 1/16"	67' - 1 5/16"	48' - 3"	48' - 2 1/2"	47' - 9 15/16"	52' - 9"	61' - 2 3/16"	71' - 2 13/16"

STRINGER	"A"	"B"	"C"	"D"	"E"
S1	20'-9"	24'-9"	25'-0"	16'-9"	23'-6"
S2	18'-3"	25'-0"	23'-0"	16'-6"	24'-6"
S3	16'-0"	26'-0"	21'-6"	16'-9"	25'-3"
S4	14'-0"	28'-0"	20'-4"	17'-9"	26'-0"
S5	12'-6"	33'-3"	19'-6"	21'-6"	26'-6"

* MEMBERS INDICATED SHALL BE CHARPY V-NOTCH TESTED IN ACCORDANCE WITH SECTION 714.01 OF THE STANDARD SPECIFICATIONS.

NOTES:

1. FOR FIELD SPLICE DETAILS, SEE TYPICAL GIRDER SPLICE DETAILS, BRIDGE SHEET C-20.
2. FOR LATERAL SPACING OF SHEAR CONNECTORS, SEE STRINGER ELEVATION (5IN) (1 OF 2), BRIDGE SHEET BR51-14.
3. ALL STRUCTURAL STEEL WITHIN 10 FEET OF END OF STRINGER AT EXPANSION ENDS SHALL BE COATED WITH A PROTECTIVE PAINT SYSTEM, WITH THE FINAL COAT TO BE DARK BROWN (COLOR CHIP #20059) TO BLEND WITH THE WEATHERING STEEL. THE COST OF PAINTING SHALL BE PAID FOR UNDER ITEM 513.25, "STRUCTURAL PAINTING, SHOP APPLIED".

STATE OF VERMONT
AGENCY OF TRANSPORTATION

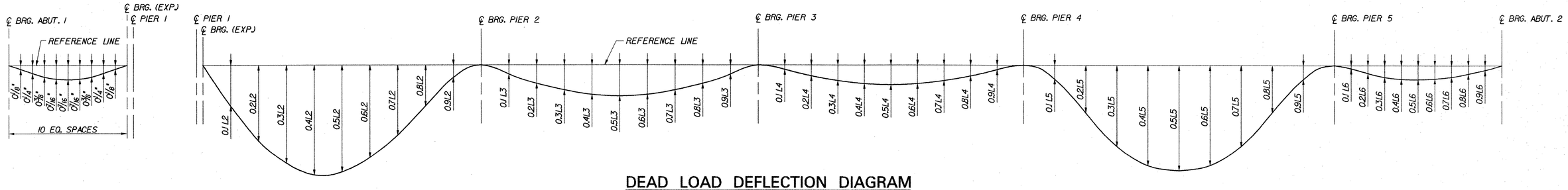
Town Of BOLTON	Bridge No. 51S
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 SB OVER U.S. ROUTE 2 AND JOINER BROOK

STRINGER ELEVATION (51S) (1 OF 2)

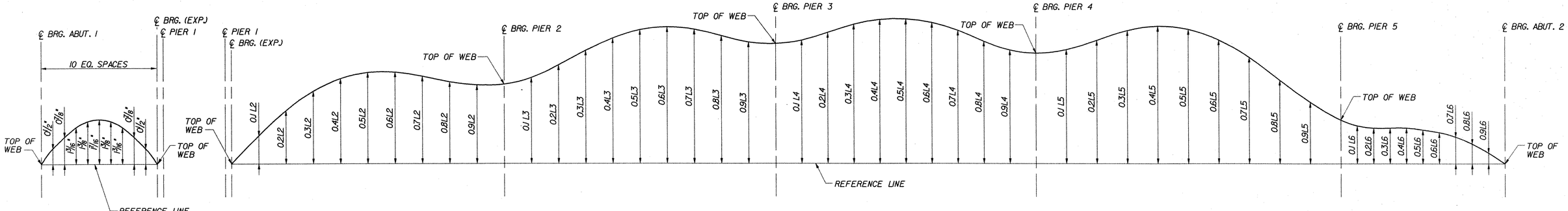
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51sstrel	Date 08/00
Bridge Sheet No. BR51-18	Sheet 116 of 307

TVGA ENGINEERING, SURVEYING, P.C.



DEAD LOAD DEFLECTION DIAGRAM

N.T.S.



CAMBER DIAGRAM

N.T.S.

DL DEFLECTION (SPANS 2 THROUGH 6)

STRINGER	CL PIER 1	0.1 L2	0.2 L2	0.3 L2	0.4 L2	0.5 L2	0.6 L2	0.7 L2	0.8 L2	0.9 L2	CL PIER 2	0.1 L3	0.2 L3	0.3 L3	0.4 L3	0.5 L3	0.6 L3	0.7 L3	0.8 L3	0.9 L3	CL PIER 3	0.1 L4	0.2 L4	0.3 L4	0.4 L4	0.5 L4	0.6 L4	0.7 L4	0.8 L4	0.9 L4	CL PIER 4	0.1 L5	0.2 L5	0.3 L5	0.4 L5	0.5 L5	0.6 L5	0.7 L5	0.8 L5	0.9 L5	CL PIER 5	0.1 L6	0.2 L6	0.3 L6	0.4 L6	0.5 L6	0.6 L6	0.7 L6	0.8 L6	0.9 L6	CL ABUT. 2
S1	0"	0 15/16"	1 11/16"	2 1/4"	2 1/2"	2 7/16"	2 1/8"	1 5/8"	1"	0 3/8"	0"	-0 1/8"	-0 1/16"	0 1/8"	0 5/16"	0 3/8"	0 3/8"	0 1/4"	0 1/16"	-0 1/16"	0"	0 5/16"	0 3/4"	1 3/16"	1 7/16"	1 1/2"	1 5/16"	0 15/16"	0 1/2"	0 1/8"	0"	0 1/4"	0 11/16"	1 1/4"	1 11/16"	1 15/16"	1 7/8"	1 9/16"	1"	0 7/16"	0"	-0 1/8"	-0 1/8"	-0 1/8"	-0 1/16"	-0 1/16"	0"	0"	0"	0"	0"
S2	0"	0 7/8"	1 5/8"	2 3/16"	2 7/16"	2 3/8"	2 1/16"	1 9/16"	0 15/16"	0 3/8"	0"	-0 1/8"	0"	0 1/4"	0 7/16"	0 9/16"	0 9/16"	0 7/16"	0 1/4"	0 1/16"	0"	0 1/8"	0 7/16"	0 11/16"	0 13/16"	0 13/16"	0 11/16"	0 7/16"	0 3/16"	0"	0"	0 5/16"	0 7/8"	1 7/16"	1 7/8"	2 1/8"	2"	1 5/8"	1 1/16"	0 7/16"	0"	-0 1/8"	-0 3/16"	-0 3/16"	-0 1/8"	-0 1/16"	0"	0"	0"	0"	0"
S3	0"	0 7/8"	1 5/8"	2 1/8"	2 3/8"	2 5/16"	2"	1 1/2"	0 7/8"	0 3/8"	0"	-0 1/16"	0 1/16"	0 5/16"	0 9/16"	0 3/4"	0 3/4"	0 5/8"	0 3/8"	0 1/8"	0"	0"	0 1/8"	0 1/4"	0 5/16"	0 5/16"	0 1/4"	0 1/8"	-0 1/16"	-0 1/8"	0"	0 3/8"	1"	1 5/8"	2 1/16"	2 1/4"	2 3/16"	1 3/4"	1 1/8"	0 1/2"	0"	-0 1/8"	-0 3/16"	-0 3/16"	-0 1/8"	-0 1/8"	-0 1/16"	0"	0"	0"	0"
S4	0"	0 7/8"	1 5/8"	2 1/8"	2 5/16"	2 1/4"	1 15/16"	1 7/16"	0 7/8"	0 5/16"	0"	-0 1/16"	0 1/8"	0 7/16"	0 11/16"	0 7/8"	0 7/8"	0 3/4"	0 1/2"	0 3/16"	0"	-0 1/16"	-0 1/16"	0"	0"	0"	-0 1/16"	-0 1/8"	-0 3/16"	-0 3/16"	0"	0 1/2"	1 1/8"	1 3/4"	2 3/16"	2 3/8"	2 1/4"	1 13/16"	1 3/16"	0 1/2"	0"	-0 1/8"	-0 3/16"	-0 3/16"	-0 3/16"	-0 1/8"	-0 1/16"	0"	0"	0"	0"
S5	0"	0 7/8"	1 9/16"	2 1/16"	2 5/16"	2 1/4"	1 15/16"	1 7/16"	0 13/16"	0 5/16"	0"	0"	0 3/16"	0 1/2"	0 13/16"	1"	1"	0 7/8"	0 5/8"	0 1/4"	0"	-0 1/8"	-0 3/16"	-0 3/16"	-0 1/4"	-0 1/4"	-0 5/16"	-0 5/16"	-0 5/16"	-0 3/16"	0"	0 1/2"	1 3/16"	1 7/8"	2 5/16"	2 1/2"	2 5/16"	1 7/8"	1 1/4"	0 1/2"	0"	-0 1/8"	-0 3/16"	-0 3/16"	-0 3/16"	-0 1/8"	-0 1/16"	-0 1/16"	0"	0"	0"

TOTAL CAMBER (SPANS 2 THROUGH 6)

STRINGER	CL PIER 1	0.1 L2	0.2 L2	0.3 L2	0.4 L2	0.5 L2	0.6 L2	0.7 L2	0.8 L2	0.9 L2	CL PIER 2	0.1 L3	0.2 L3	0.3 L3	0.4 L3	0.5 L3	0.6 L3	0.7 L3	0.8 L3	0.9 L3	CL PIER 3	0.1 L4	0.2 L4	0.3 L4	0.4 L4	0.5 L4	0.6 L4	0.7 L4	0.8 L4	0.9 L4	CL PIER 4	0.1 L5	0.2 L5	0.3 L5	0.4 L5	0.5 L5	0.6 L5	0.7 L5	0.8 L5	0.9 L5	CL PIER 5	0.1 L6	0.2 L6	0.3 L6	0.4 L6	0.5 L6	0.6 L6	0.7 L6	0.8 L6	0.9 L6	CL ABUT. 2
S1	0"	1 3/4"	3 5/16"	4 3/4"	5 3/4"	6 5/16"	6 3/8"	6 1/4"	5 13/16"	5 7/16"	5 7/16"	5 3/4"	6 5/16"	7 1/16"	7 5/8"	8"	8 1/8"	8"	7 3/4"	7 9/16"	7 5/8"	8 1/16"	8 5/8"	9 1/4"	9 9/16"	9 9/16"	9 1/8"	8 5/16"	7 3/8"	6 9/16"	6 1/16"	5 15/16"	6 3/8"	6 15/16"	7 1/4"	7 1/4"	6 11/16"	5 11/16"	4 5/16"	3"	2 1/8"	1 13/16"	1 3/4"	1 13/16"	1 7/8"	1 15/16"	1 7/8"	1 9/16"	1 3/16"	0 5/8"	0"
S2	0"	1 11/16"	3 1/4"	4 5/8"	5 5/8"	6 3/16"	6 5/16"	6 1/8"	5 11/16"	5 3/8"	5 3/8"	5 11/16"	6 5/16"	7 1/16"	7 11/16"	8 1/8"	8 1/4"	8 1/16"	7 13/16"	7 9/16"	7 1/2"	7 11/16"	8 3/16"	8 5/8"	9 1/4"	9 9/16"	9 1/8"	8 5/16"	7 3/8"	6 15/16"	6 3/16"	6 3/8"	6 15/16"	7 3/16"	7 9/16"	7 1/2"	6 15/16"	5 15/16"	4 1/2"	3 1/8"	2 1/8"	1 7/8"	1 3/4"	1 3/4"	1 7/8"	1 7/8"	1 7/8"	1 9/16"	1 3/16"	0 5/8"	0"
S3	0"	1 11/16"	3 3/16"	4 1/2"	5 9/16"	6 1/8"	6 1/4"	6 1/16"	5 11/16"	5 5/16"	5 5/16"	5 5/8"	6 5/16"	7 1/16"	7 3/4"	8 3/16"	8 5/16"	8 3/16"	7 13/16"	7 1/2"	7 3/8"	7 1/2"	7 7/8"	8 3/16"	8 3/8"	8 5/16"	8 1/16"	7 5/8"	6 15/16"	6 7/16"	6 3/16"	6 3/8"	6 15/16"	7 9/16"	7 13/16"	7 11/16"	7 1/16"	6"	4 9/16"	3 1/4"	2 3/16"	1 15/16"	1 3/4"	1 13/16"	1 7/8"	1 15/16"	1 13/16"	1 5/8"	1 3/16"	0 11/16"	0"
S4	0"	1 11/16"	3 3/16"	4 1/2"	5 7/16"	6"	6 3/16"	5 15/16"	5 5/8"	5 1/4"	5 1/4"	5 9/16"	6 1/4"	7 1/16"	7 3/4"	8 3/16"	8 5/16"	8 3/16"	7 3/4"	7 7/16"	7 1/4"	7 5/16"	7 5/8"	7 7/8"	8"	8"	7 3/4"	7 5/16"	6 7/8"	6 3/8"	6 3/16"	6 7/16"	7"	7 5/8"	7 15/16"	7 7/8"	7 3/16"	6 1/16"	4 11/16"	3 1/4"	2 1/4"	1 15/16"	1 13/16"	1 13/16"	1 7/8"	1 15/16"	1 13/16"	1 5/8"	1 3/16"	0 11/16"	0"
S5	0"	1 5/8"	3 1/8"	4 3/8"	5 7/16"	6"	6 1/8"	5 15/16"	5 1/2"	5 3/16"	5 1/8"	5 9/16"	6 1/4"	7"	7 3/4"	8 1/4"	8 5/16"	8 3/16"	7 3/4"	7 3/8"	7 1/16"	7 1/16"	7 1/4"	7 9/16"	7 11/16"	7 11/16"	7 7/16"	7 1/16"	6 11/16"	6 5/16"	6 1/4"	6 1/2"	7 1/16"	7 11/16"	8 1/8"	8"	7 5/16"	6 1/4"	4 13/16"	3 5/16"	2 1/4"	2"	1 13/16"	1 13/16"	1 15/16"	1 15/16"	1 7/8"	1 9/16"	1 3/16"	0 11/16"	0"

TVGA ENGINEERING, SURVEYING, P.C.

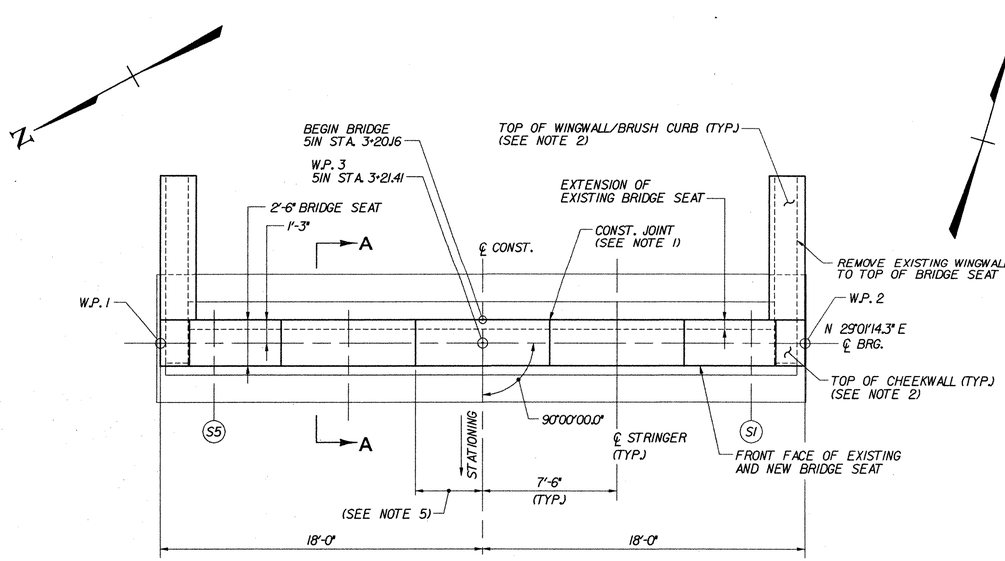
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51S
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 SB OVER U.S. ROUTE 2 AND JOINER BROOK

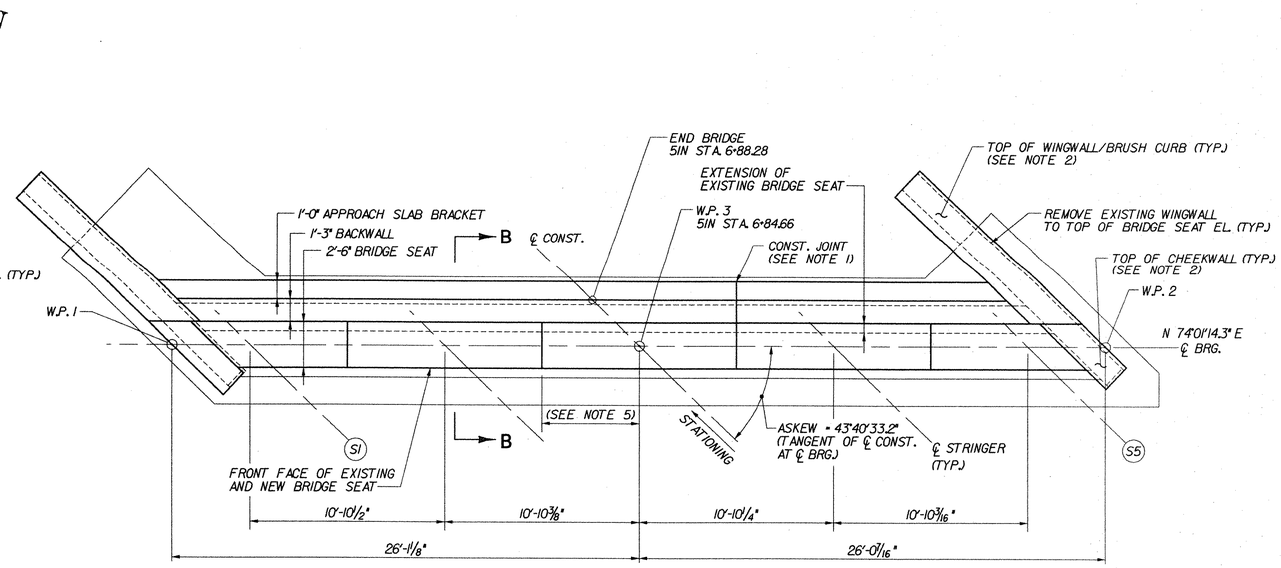
STRINGER ELEVATION (51S) (2 OF 2)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51sstrel	Date 10/99
Bridge Sheet No. BR51-19	Sheet 117 of 307



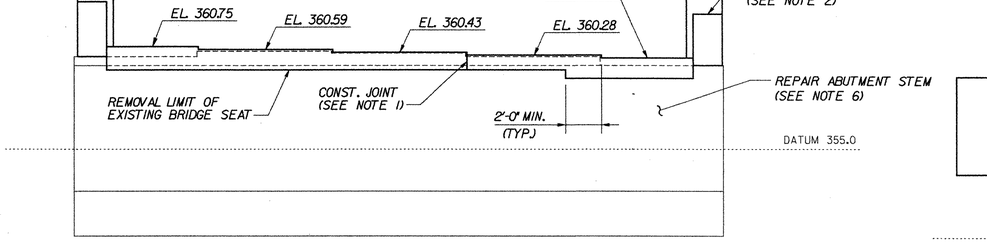
ABUTMENT 1 PLAN (FIXED)

SCALE: 1/4"=1'-0"



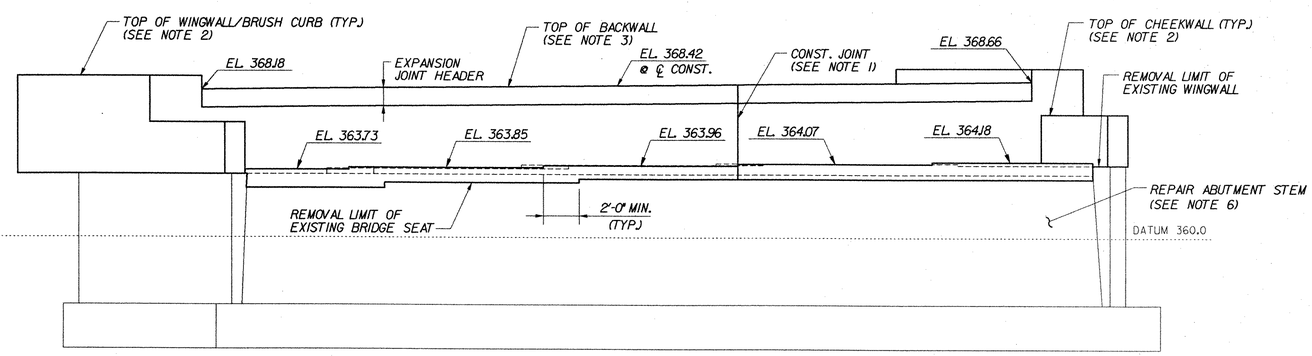
ABUTMENT 2 PLAN (EXP.)

SCALE: 1/4"=1'-0"



ABUTMENT 1 ELEVATION

SCALE: 1/4"=1'-0"



ABUTMENT 2 ELEVATION

SCALE: 1/4"=1'-0"

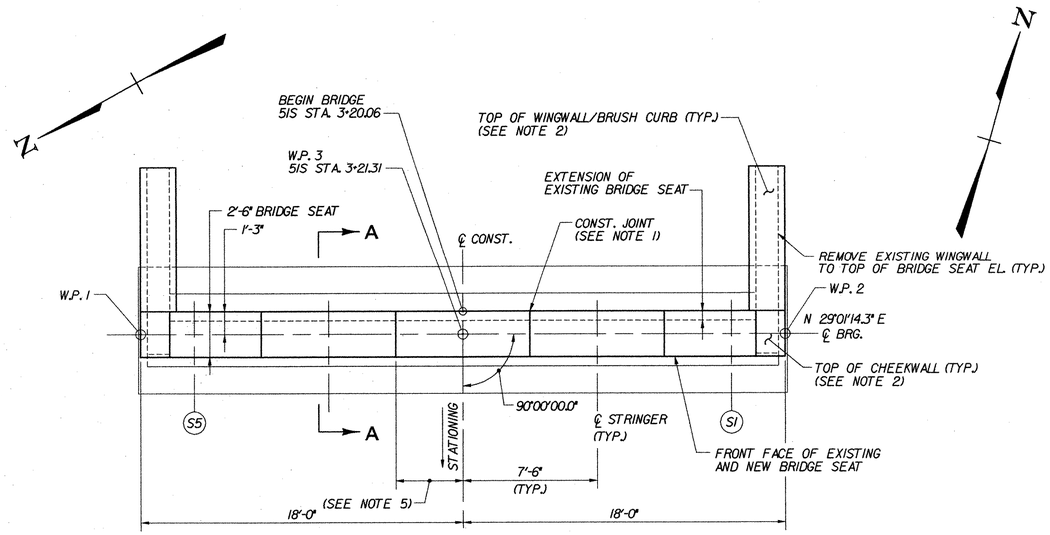
NOTE: FOR SECTIONS A-A AND B-B, SEE ABUTMENT MASONRY (51S), BRIDGE SHEET BR51-21.

NOTES:

1. CONSTRUCTION JOINT LOCATED AT STEP IN BRIDGE SEAT. LOCATION SHALL BE REVISED AS DIRECTED BY THE RESIDENT ENGINEER AS REQUIRED TO MATCH ANY CONSTRUCTION JOINT IN THE EXISTING ABUTMENT STEM.
2. FOR WINGWALL AND CHEEKWALL DIMENSIONS, DETAILS AND ELEVATIONS, SEE TYPICAL WINGWALL DETAILS, BRIDGE SHEETS C-43 AND C-44.
3. BACKWALL ELEVATIONS SHOWN AT FRONT FACE OF BACKWALL.
4. FOR ABUTMENT REINFORCEMENT DETAILS, SEE TYPICAL EXPANSION ABUTMENT REINFORCEMENT, BRIDGE SHEET C-40, AND TYPICAL FIXED ABUTMENT REINFORCEMENT, BRIDGE SHEET C-41.
5. STEPS IN BRIDGE SEATS SHALL BE EQUIDISTANT BETWEEN STRINGERS.
6. REPAIR ALL EXISTING SPALLED AND DELAMINATED AREAS ON ABUTMENT. SEE EXISTING SUBSTRUCTURE CONDITION, BRIDGE SHEETS SC-17 THROUGH SC-23 FOR APPROXIMATE CONDITION OF EXISTING SUBSTRUCTURES. FOR CONCRETE REPAIR DETAILS, SEE SUBSTRUCTURE REPAIR DETAILS AND NOTES, BRIDGE SHEET C-45.

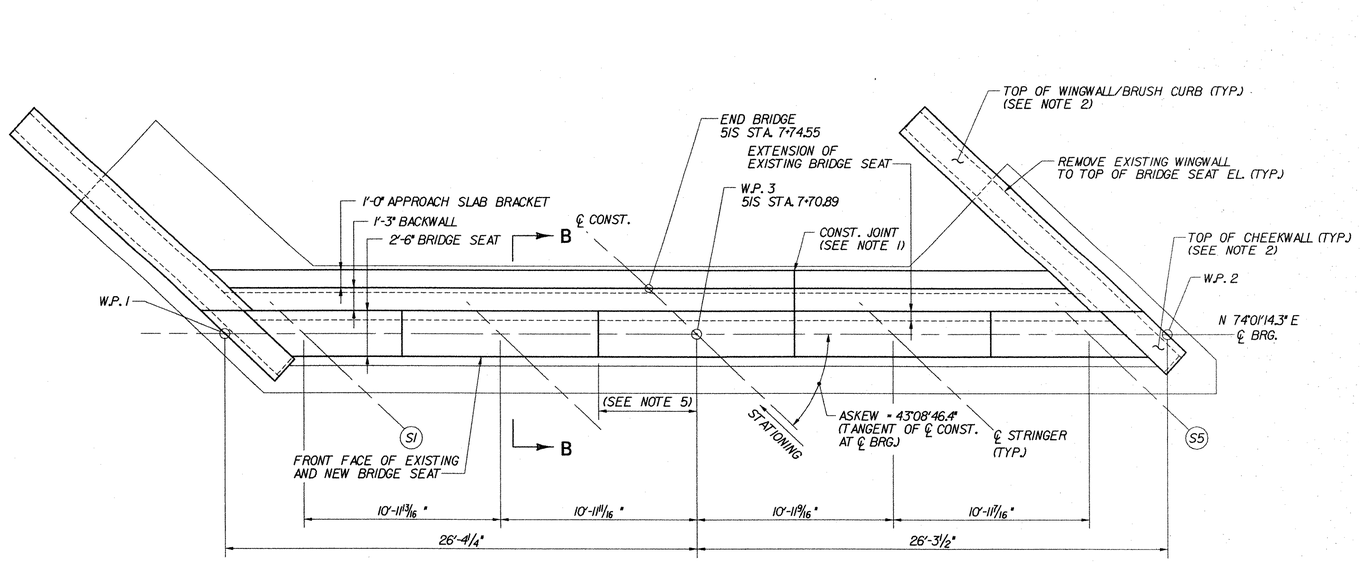
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. **51N**
Highway No. I-89	Log Sta. / Surv. Sta.
I-89 NB OVER U.S. ROUTE 2 AND JOINER BROOK	
ABUTMENT MASONRY (51N)	
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA ENGINEERING, SURVEYING, P.C. — TVGA CAD Drawing No. 51abmas	Date 10/99
Bridge Sheet No. **BR51-20**	Sheet 118 of 307



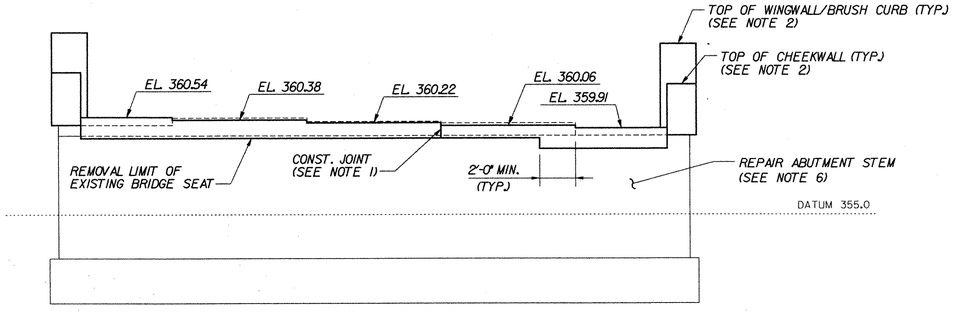
ABUTMENT 1 PLAN (FIXED)

SCALE: 1/4"=1'-0"



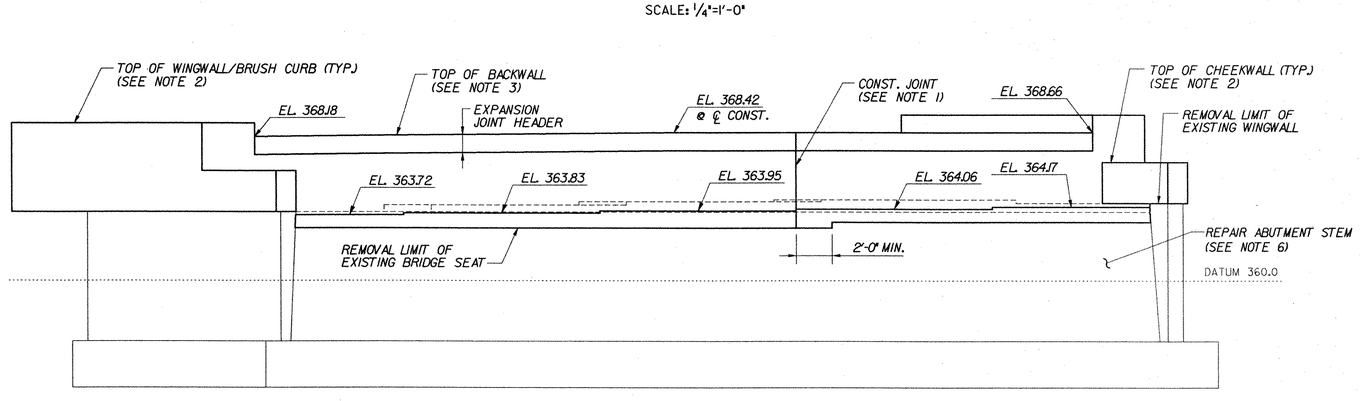
ABUTMENT 2 PLAN (EXP.)

SCALE: 1/4"=1'-0"



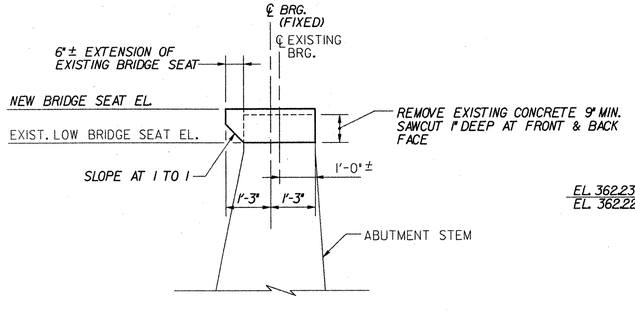
ABUTMENT 1 ELEVATION

SCALE: 1/4"=1'-0"



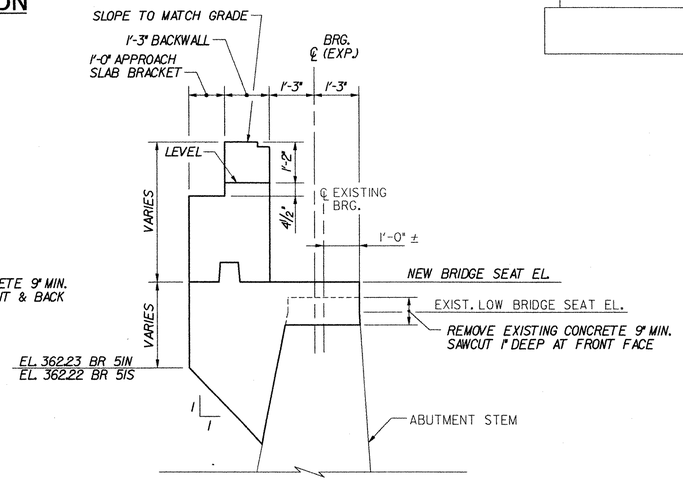
ABUTMENT 2 ELEVATION

SCALE: 1/4"=1'-0"



SECTION A–A

SCALE: 1/2"=1'-0"



SECTION B–B

SCALE: 1/2"=1'-0"

NOTES:

1. CONSTRUCTION JOINT LOCATED AT STEP IN BRIDGE SEAT. LOCATION SHALL BE REVISED AS DIRECTED BY THE RESIDENT ENGINEER AS REQUIRED TO MATCH ANY CONSTRUCTION JOINT IN THE EXISTING ABUTMENT STEM.
2. FOR WINGWALL AND CHEEKWALL DIMENSIONS, DETAILS AND ELEVATIONS, SEE TYPICAL WINGWALL DETAILS, BRIDGE SHEETS C-43 AND C-44.
3. BACKWALL ELEVATIONS SHOWN AT FRONT FACE OF BACKWALL.
4. FOR ABUTMENT REINFORCEMENT DETAILS, SEE TYPICAL EXPANSION ABUTMENT REINFORCEMENT, BRIDGE SHEET C-40, AND TYPICAL FIXED ABUTMENT REINFORCEMENT, BRIDGE SHEET C-41.
5. STEPS IN BRIDGE SEATS SHALL BE EQUIDISTANT BETWEEN STRINGERS.
6. REPAIR ALL EXISTING SPALLED AND DELAMINATED AREAS ON ABUTMENT. SEE EXISTING SUBSTRUCTURE CONDITION, BRIDGE SHEETS SC-17 THROUGH SC-23 FOR APPROXIMATE CONDITION OF EXISTING SUBSTRUCTURES. FOR CONCRETE REPAIR DETAILS, SEE SUBSTRUCTURE REPAIR DETAILS AND NOTES, BRIDGE SHEET C-45.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

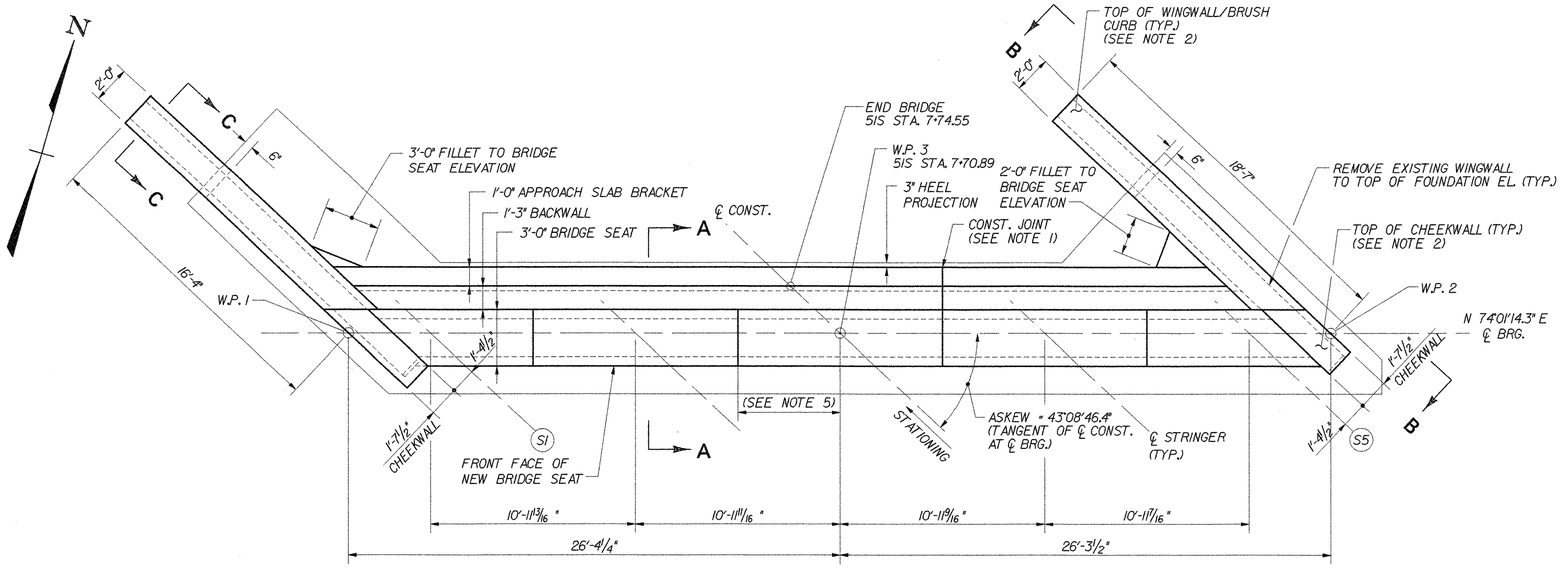
Town Of BOLTON	Bridge No. 51S
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 SB OVER U.S. ROUTE 2 AND JOINER BROOK

ABUTMENT MASONRY (51S)

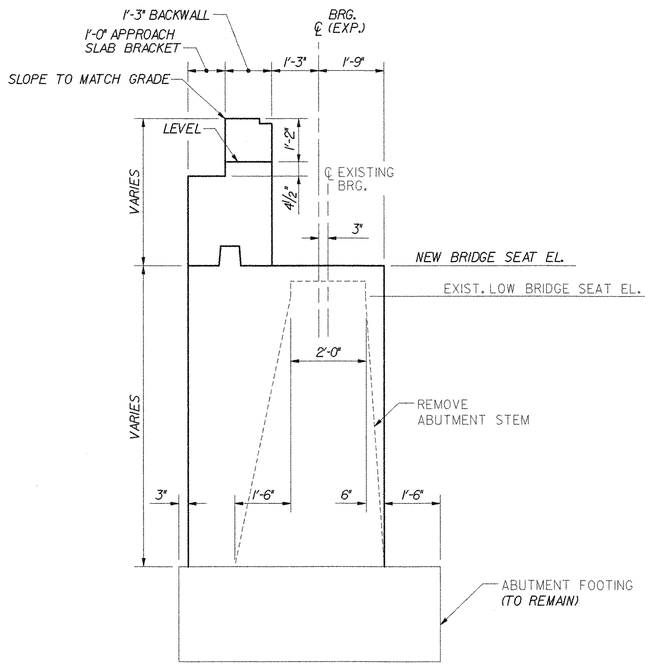
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51abmas	Date 10/99
Bridge Sheet No. BR51-21	Sheet 119 of 307

TVGA ENGINEERING, SURVEYING, P.C.



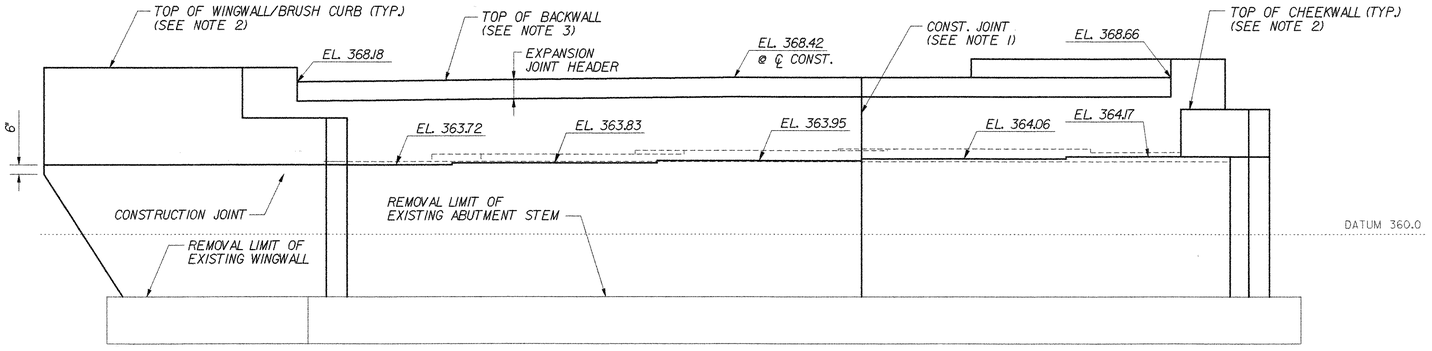
ABUTMENT 2 PLAN (EXP.)

SCALE: ¼"=1'-0"



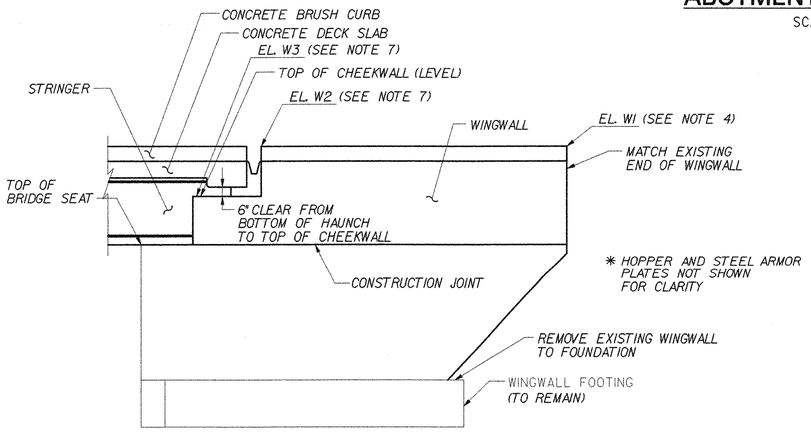
SECTION A–A

SCALE: ½"=1'-0"



ABUTMENT 2 ELEVATION

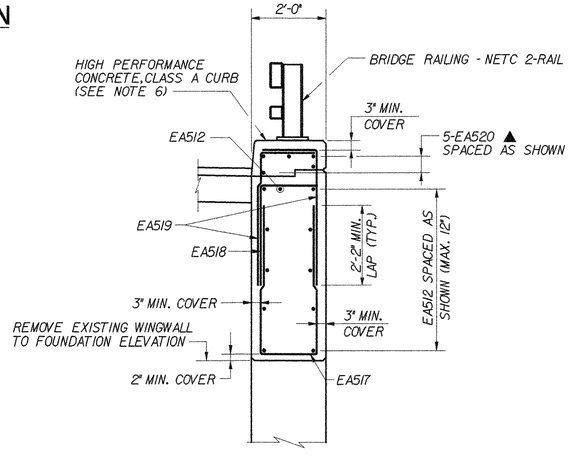
SCALE: ¼"=1'-0"



ELEVATION B–B (EXP. ABUTMENTS)

(ACUTE CORNER SIMILAR)

SCALE: ¼"=1'-0"



SECTION C–C

(ALL WINGWALLS SIMILAR)

SCALE: ½"=1'-0"

NOTES:

1. CONSTRUCTION JOINT LOCATED AT STEP IN BRIDGE SEAT. LOCATION SHALL BE REVISED AS DIRECTED BY THE RESIDENT ENGINEER AS REQUIRED TO MATCH ANY CONSTRUCTION JOINTS IN THE EXISTING ABUTMENT FOOTING.
2. WORKING POINT (W.P.) 1 AND 2 LOCATIONS ARE SHOWN ON ABUTMENT MASONRY PLANS FOR EACH BRIDGE. FROM THE WORKING POINTS, THE CONTRACTOR MAY CONSTRUCT WINGWALLS CONCENTRIC TO THE CENTERLINE OF CONSTRUCTION, OR ON AN APPROXIMATE TANGENT LINE, AS APPROVED BY THE ENGINEER.
3. BACKWALL ELEVATIONS SHOWN AT FRONT FACE OF BACKWALL.
4. FOR ABUTMENT REINFORCEMENT DETAILS, SEE TYPICAL EXPANSION ABUTMENT REINFORCEMENT, BRIDGE SHEET BR51-21BR.
5. STEPS IN BRIDGE SEATS SHALL BE EQUIDISTANT BETWEEN STRINGERS.
6. FOR DIMENSIONS OF CONCRETE CURB, SEE FASCIA DETAIL ON THE TRANSVERSE SECTION.
7. FOR TABLE OF WINGWALL AND BRUSH CURB ELEVATIONS, SEE TYPICAL WINGWALL DETAILS (2 OF 2), BRIDGE SHEET C-44.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

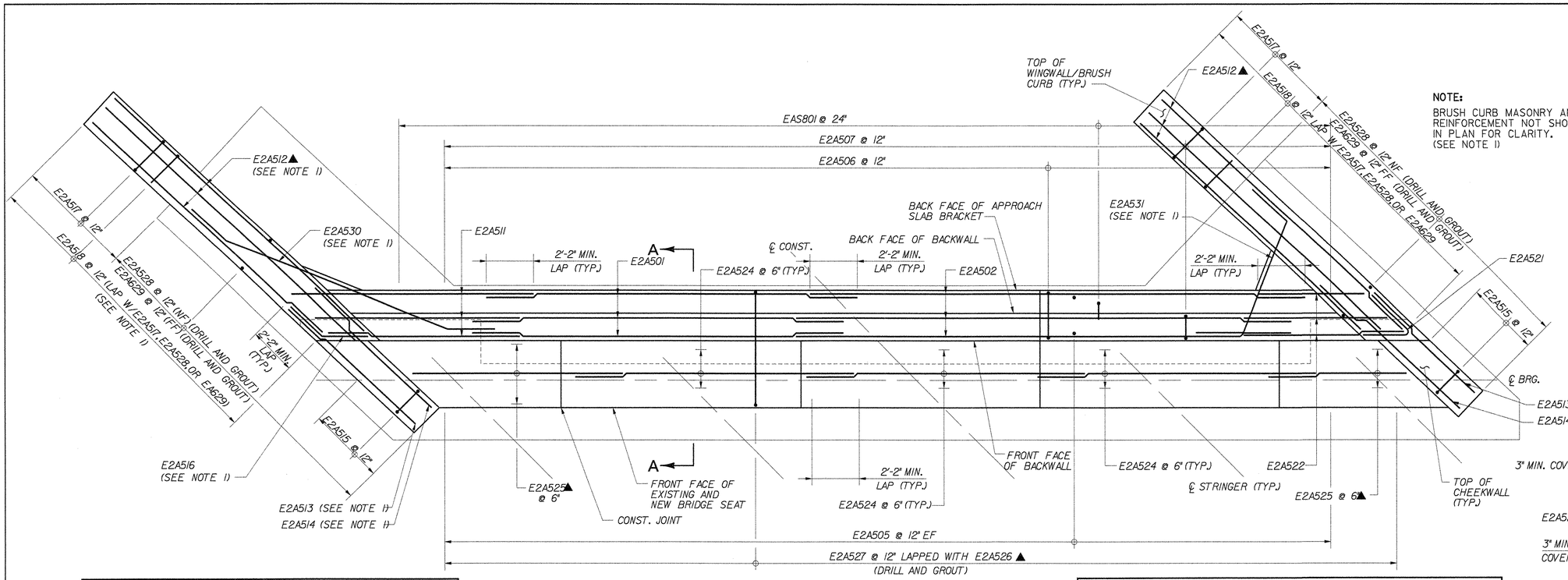
Town Of BOLTON	Bridge No. 515
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 SB OVER U.S. ROUTE 2 AND JOINER BROOK

ABUTMENT MASONRY (515)

Designed By J.T. DEPLANCHE	Drawn By D.S. URBINO
Checked By Date B.J. CARLSON 12/05	Bridge Design Supervisor K.M. WOJTKOWSKI Date 12/05
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 5labmas	Date 11/2005
Bridge Sheet No. BR51-21AR	Sheet 119A of 307

TVGA ENGINEERING, SURVEYING, P.C.



PLAN

N.T.S.

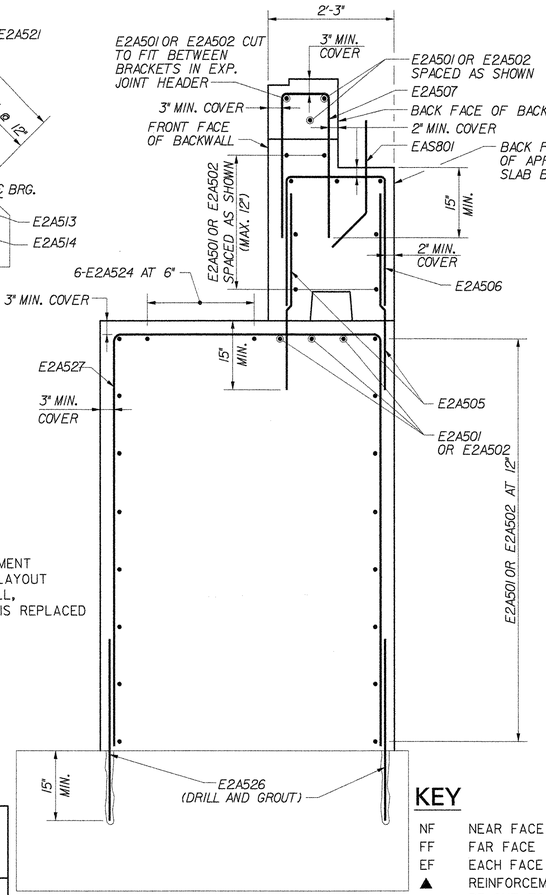
NOTE:
BRUSH CURB MASONRY AND REINFORCEMENT NOT SHOWN IN PLAN FOR CLARITY. (SEE NOTE 1)

NOTES:

1. FOR ADDITIONAL WINGWALL AND BRUSH CURB DETAILS, SEE TYPICAL WINGWALL DETAILS, BRIDGE SHEET 119A, C-43, AND C-44.

REINFORCEMENT LAYOUT SHOWN IS INTENDED AS GUIDANCE ONLY. CONTRACTOR MUST MAKE ADJUSTMENTS IN ORDER TO FIT ACTUAL FIELD CONDITIONS, AS APPROVED BY THE ENGINEER, AT NO ADDITIONAL EXPENSE TO THE CONTRACT.

CONSTRUCTION JOINT LOCATED AT STEP IN BRIDGE SEAT. LOCATION SHALL BE REVISED AS DIRECTED BY THE RESIDENT ENGINEER AS REQUIRED TO MATCH ANY CONSTRUCTION JOINT IN THE EXISTING ABUTMENT FOOTING. REQUIRED REVISIONS TO REINFORCING STEEL LENGTHS WILL BE MADE BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE CONTRACT.

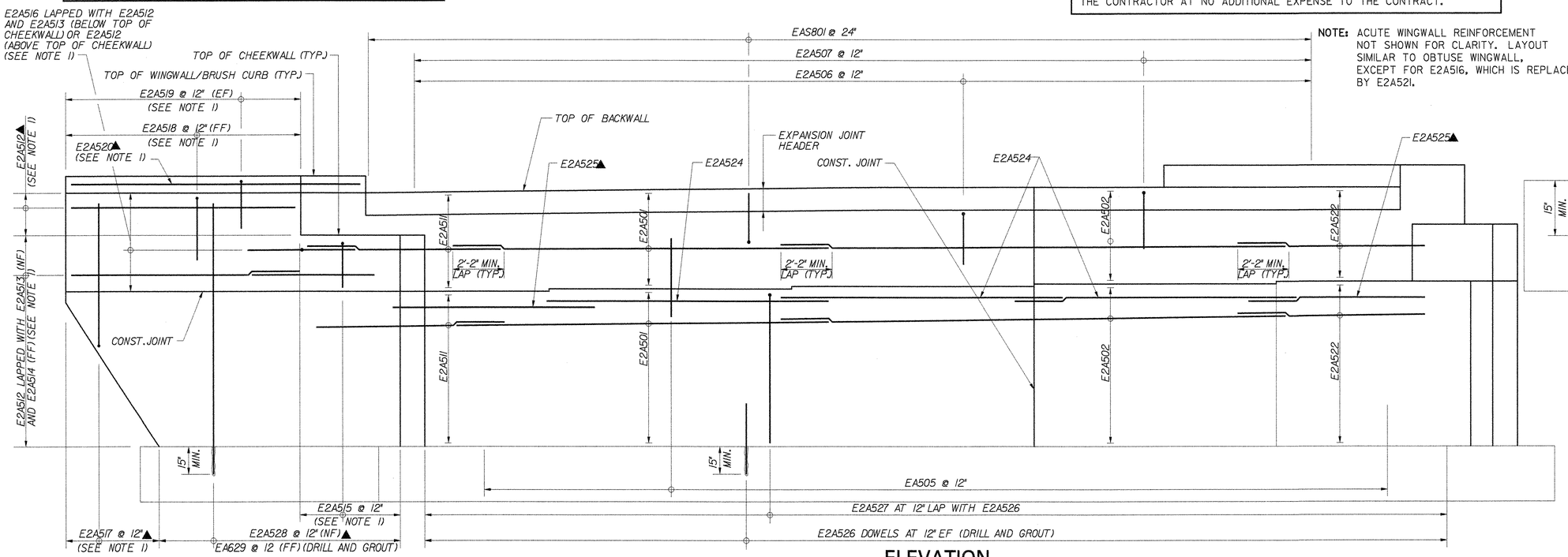


KEY

NF	NEAR FACE
FF	FAR FACE
EF	EACH FACE
▲	REINFORCEMENT T BE CUT TO FIT IN THE FIELD

SECTION A–A

N.T.S.



ELEVATION

N.T.S.

NOTE: ACUTE WINGWALL REINFORCEMENT NOT SHOWN FOR CLARITY. LAYOUT SIMILAR TO OBTUSE WINGWALL, EXCEPT FOR E2A516, WHICH IS REPLACED BY E2A521.

TVGA ENGINEERING, SURVEYING, P.C.

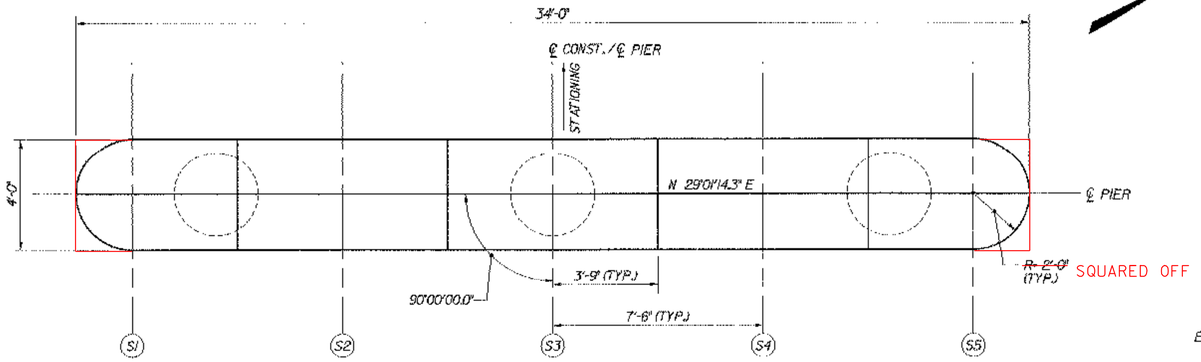
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 515
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 SB OVER U.S. ROUTE 2 AND JOINER BROOK

EXPANSION ABUTMENT REINFORCEMENT (515

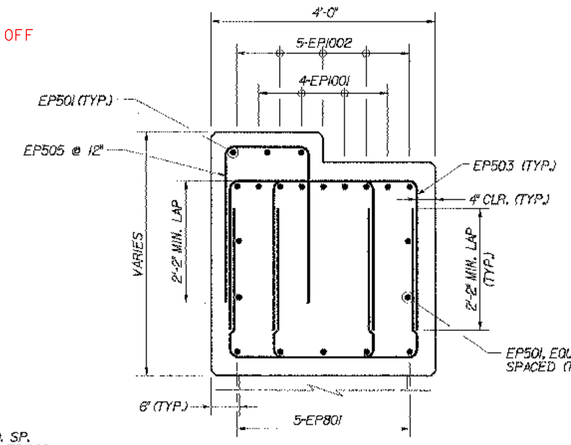
Designed By J.T. DEPLANCHE	Drawn By D.S. URBINO
Checked By B.J. CARLSON Date 12/05	Bridge Design Supervisor K.M. WOJTKOWSKI Date 12/0
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. abrinf_e	Date 12/05
Bridge Sheet No. **BR51-21BR**	Sheet 119B of 307



TYPICAL RADIAL PIER CAP PLAN

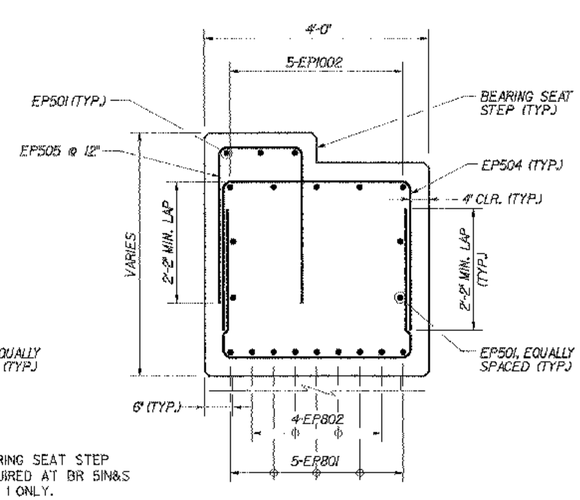
SCALE: 3/8"=1'-0"

BRIDGE	PIER	CL BRG. STATION	SIDE	PIER SEAT ELEVATIONS S1	S2	S3	S4	S5	BOTTOM OF PIER CAP ELEVATION C1
51N	1	3+58.56	SPAN 1	360.63	360.79	360.95	361.11	361.26	356.32
		3+60.56	SPAN 2	360.24	360.39	360.55	360.71	360.87	
51S	1	3+58.68	SPAN 1	360.38	360.53	360.69	360.85	361.01	356.45
		3+60.68	SPAN 2	359.99	360.15	360.30	360.46	360.62	
	2	4+48.57	-	361.12	361.28	361.44	361.59	361.75	357.87



SECTION A-A

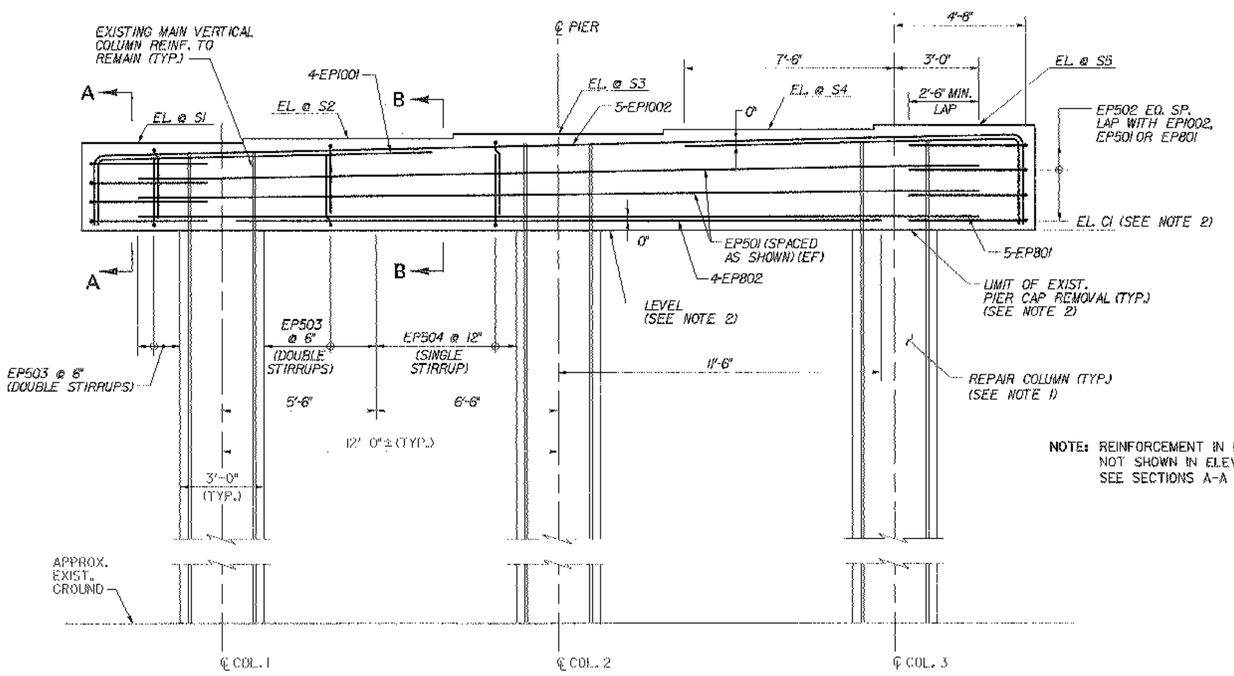
SCALE: 3/4"=1'-0"



NOTE: BEARING SEAT STEP REQUIRED AT BR 51N&S PIER 1 ONLY.

SECTION B-B

SCALE: 3/4"=1'-0"



(REINFORCEMENT SYMMETRICAL ABOUT ℄ PIER)

TYPICAL RADIAL PIER ELEVATION

SCALE: 3/8"=1'-0"

NOTE: REINFORCEMENT IN BEARING SEAT STEP NOT SHOWN IN ELEVATION FOR CLARITY. SEE SECTIONS A-A AND B-B FOR DETAILS.

NOTES:

1. REPAIR EXISTING SPALLED AND DELAMINATED AREAS AND APPLY FIBER-REINFORCED POLYMER WRAP, IN ACCORDANCE WITH THE DETAILS SHOWN ON SUBSTRUCTURE REPAIR DETAILS AND NOTES, BRIDGE SHEET C-45. FOR APPROXIMATE CONDITION OF EXISTING PIERS, SEE EXISTING SUBSTRUCTURE CONDITION, BRIDGE SHEETS SC-17 THROUGH SC-23.
2. BOTTOM OF PIER CAP ELEVATIONS SHOWN ARE APPROXIMATE, BASED ON MATCHING THE EXISTING TOP OF COLUMN ELEVATIONS. HOWEVER, SOME MINOR REMOVAL OF EXISTING COLUMN CONCRETE MAY BE REQUIRED TO ACHIEVE LEVEL PIER CAP. LIMIT OF REMOVAL TO BE SAWCUT AS ORDERED BY THE ENGINEER. COSTS TO BE INCIDENTAL TO ITEM 528.20, "PARTIAL REMOVAL OF STRUCTURE (AT SIXX)"

KEY

NF	NEAR FACE
FF	FAR FACE
EF	EACH FACE
▲	REINFORCEMENT TO BE CUT TO FIT IN THE FIELD

STATE OF VERMONT
AGENCY OF TRANSPORTATION

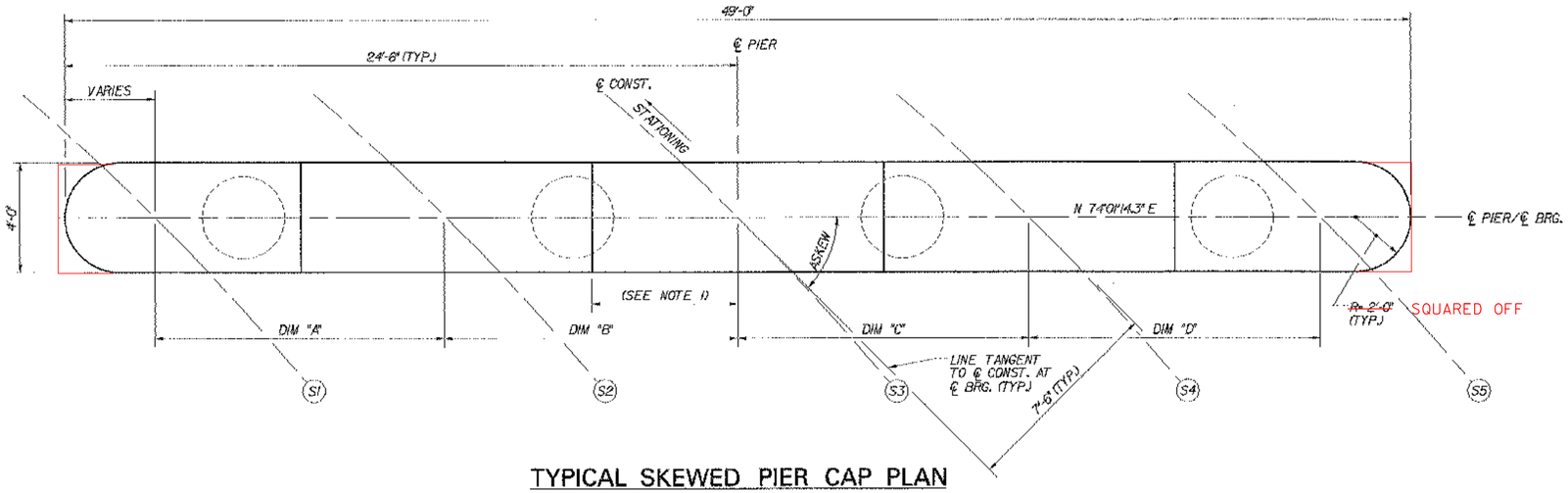
Town Of BOLTON	Bridge No. 51N&S
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 OVER U.S. ROUTE 2 AND JOINER BROOK

PIER CAP MASONRY AND REINF. (RADIAL)

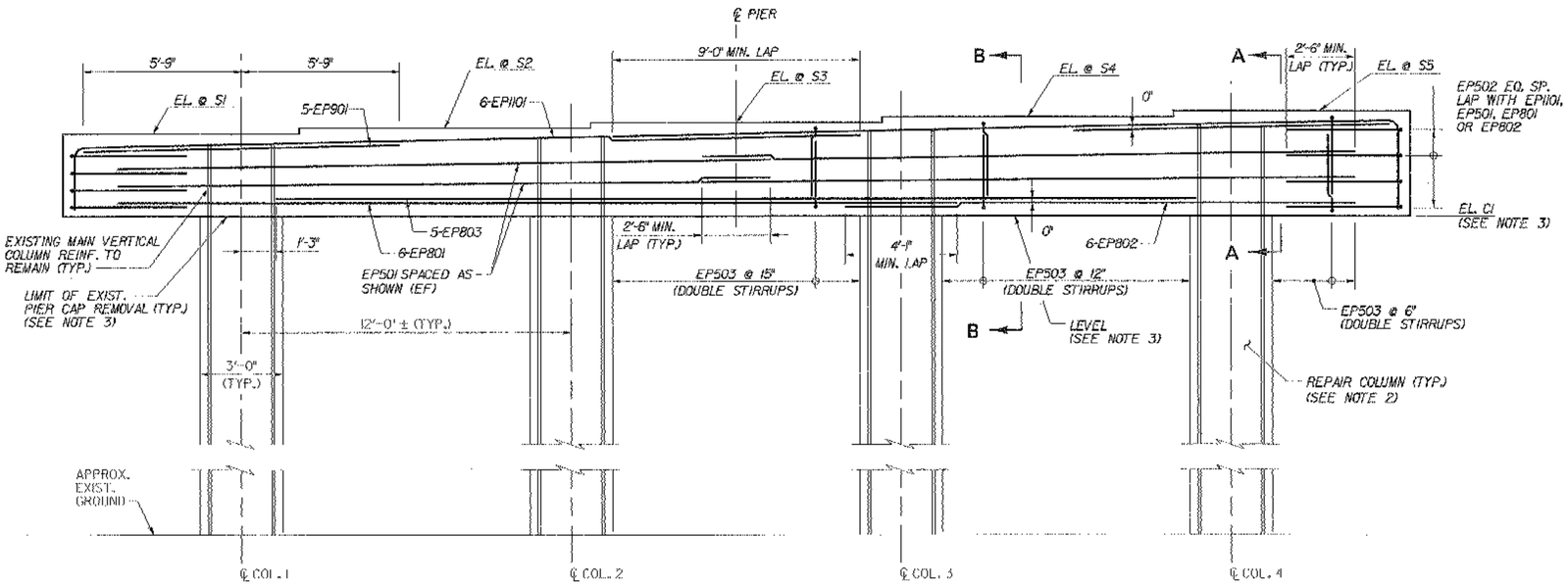
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51pmas	Date 10/99
Bridge Sheet No. BR51-22	Sheet 120 of 307

TVGA ENGINEERING, SURVEYING, P.C.



TYPICAL SKEWED PIER CAP PLAN

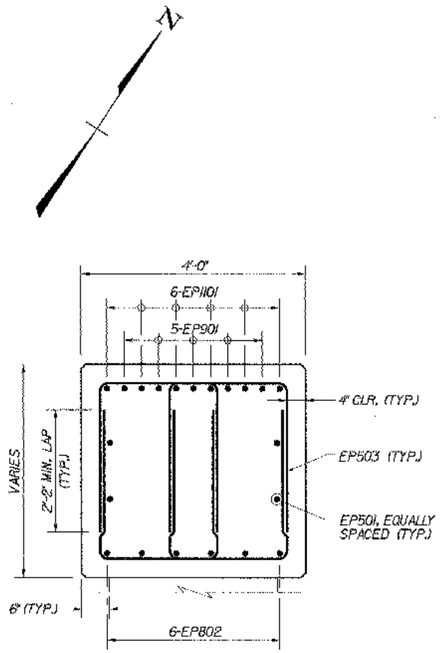
SCALE: 3/8"=1'-0"



(REINFORCEMENT SYMMETRICAL ABOUT ℄ PIER EXCEPT EP801 AND EP802)

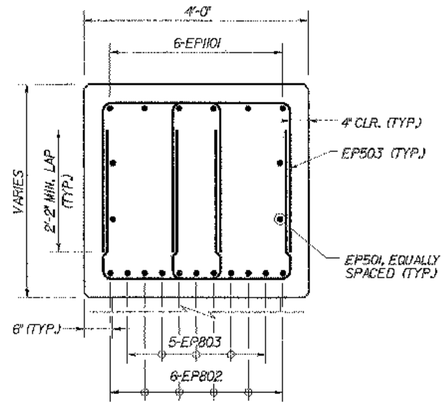
TYPICAL SKEWED PIER ELEVATION

SCALE: 3/8"=1'-0"



SECTION A–A

SCALE: 3/4"=1'-0"



SECTION B–B

SCALE: 3/4"=1'-0"

BRIDGE	PIER	CL BRG. STATION	ASKEW ANGLE	DIM. "A"	DIM. "B"	DIM. "C"	DIM. "D"	PIER SEAT ELEVATIONS					BOTTOM OF PIER CAP ELEVATION
								S1	S2	S3	S4	S5	C1
51N	3	6+32.86	44°34'59.4"	10'-8 3/8"	10'-8 1/4"	10'-8 3/16"	10'-8 1/16"	362.53	362.61	362.69	362.77	362.84	359.09
	4	6+31.57	43°59'35.5"	10'-9 3/4"	10'-9 5/8"	10'-9 1/2"	10'-9 7/16"	363.17	363.28	363.38	363.48	363.58	359.42
51S	4	6+19.85	44°03'21.5"	10'-9 9/16"	10'-9 1/2"	10'-9 3/8"	10'-9 1/4"	362.62	362.73	362.84	362.95	363.06	359.73
	5	7+18.03	43°27'52.6"	10'-11"	10'-10 7/8"	10'-10 3/4"	10'-10 11/16"	363.19	363.30	363.42	363.53	363.65	360.36

KEY

NF	NEAR FACE
FF	FAR FACE
EF	EACH FACE
▲	REINFORCEMENT TO BE CUT TO FIT IN THE FIELD

NOTES:

1. STEPS IN BRIDGE SEATS SHALL BE EQUIDISTANT BETWEEN STRINGERS.
2. REPAIR EXISTING SPALLED AND DELAMINATED AREAS AND APPLY FIBER REINFORCED POLYMER WRAP, IN ACCORDANCE WITH THE DETAILS SHOWN ON SUBSTRUCTURE REPAIR DETAILS AND NOTES, BRIDGE SHEET C-45. FOR APPROXIMATE CONDITION OF EXISTING PIERS, SEE EXISTING SUBSTRUCTURE CONDITION, BRIDGE SHEETS SC-17 THROUGH SC-23.
3. BOTTOM OF PIER CAP ELEVATIONS SHOWN ARE APPROXIMATE, BASED ON MATCHING THE EXISTING TOP OF COLUMN ELEVATIONS. HOWEVER, SOME MINOR REMOVAL OF EXISTING COLUMN CONCRETE MAY BE REQUIRED TO ACHIEVE LEVEL PIER CAP. LIMIT OF REMOVAL TO BE SAWCUT AS ORDERED BY THE ENGINEER. COSTS TO BE INCIDENTAL TO ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE (AT SIXX)".

STATE OF VERMONT
AGENCY OF TRANSPORTATION

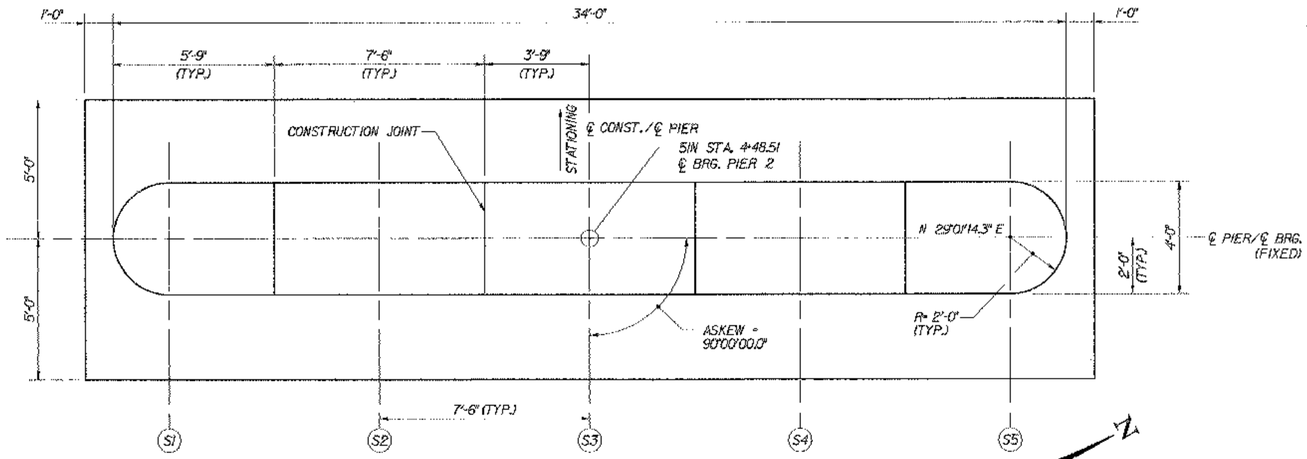
Town Of BOLTON	Bridge No. 51N&S
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 OVER U.S. ROUTE 2 AND JOINER BROOK

PIER CAP MASONRY AND REINF. (SKEWED)

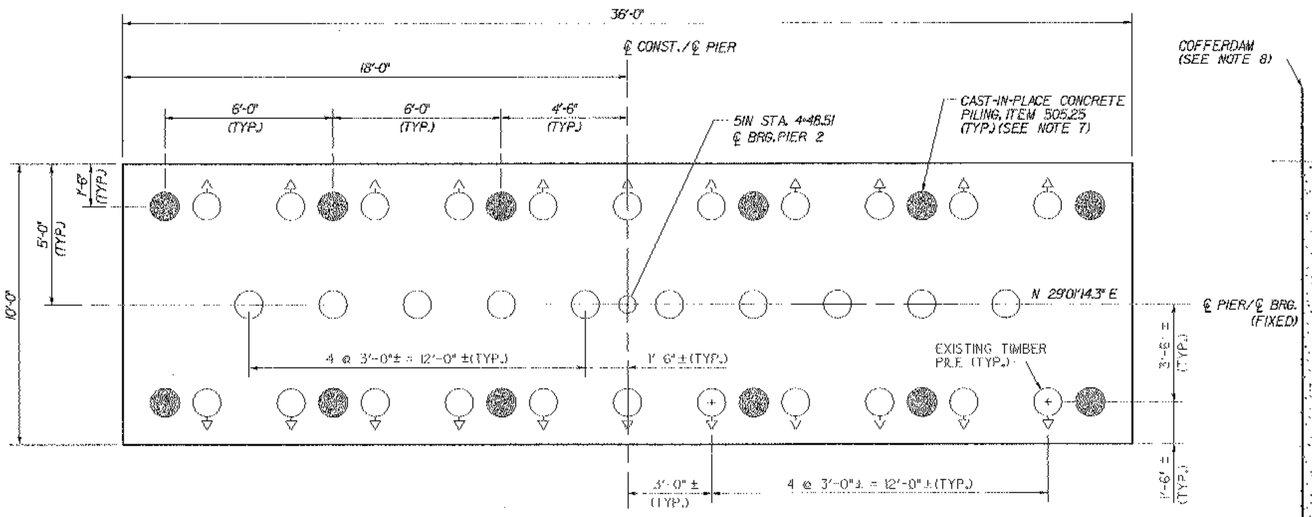
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. Slpmas	Date 10/99
Bridge Sheet No. BR51-23	Sheet 121 of 307

TVGA ENGINEERING, SURVEYING, P.C.



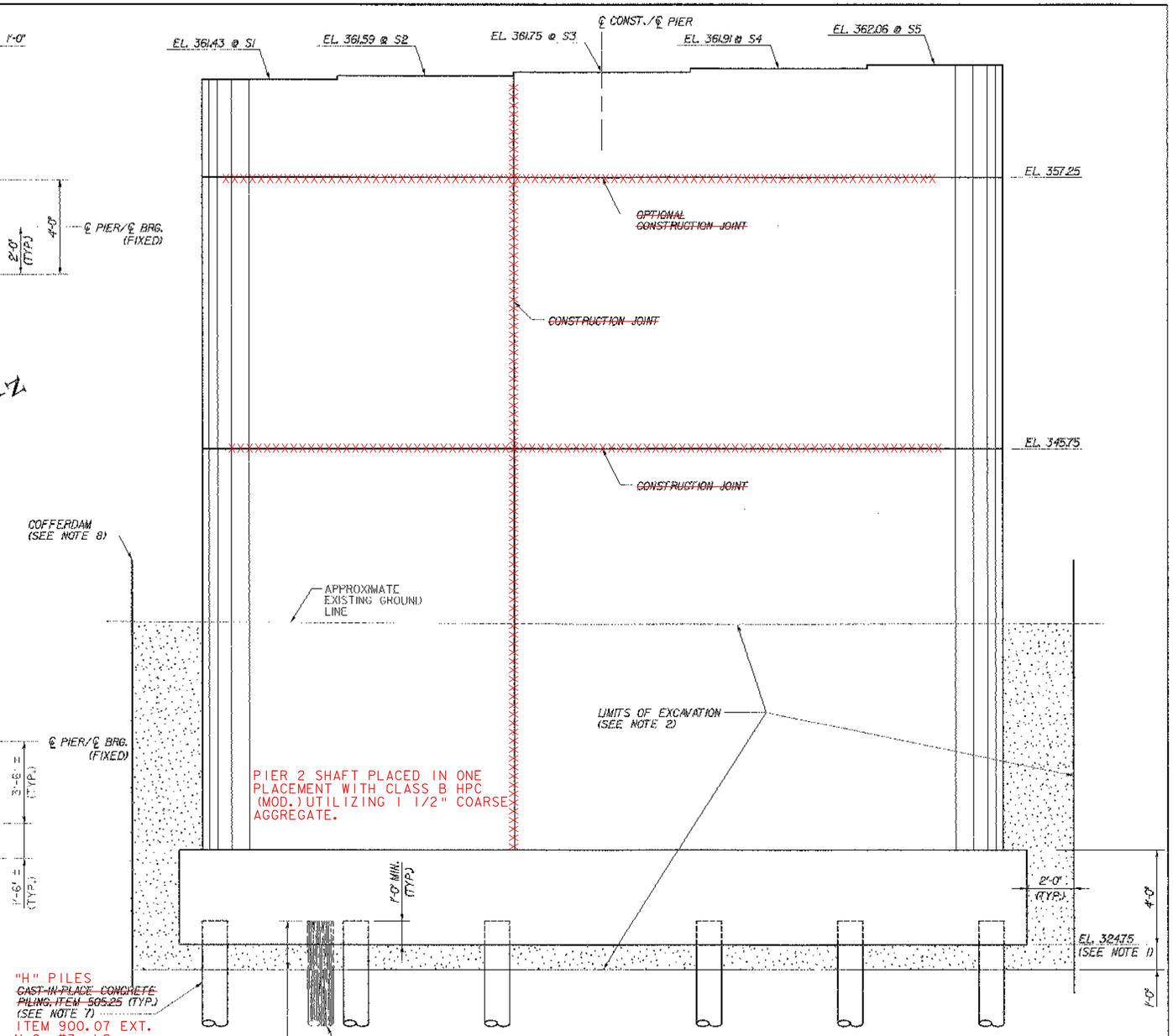
PLAN

SCALE: 3/8"=1'-0"



FOOTING PLAN

SCALE: 3/8"=1'-0"



ELEVATION

SCALE: 3/8"=1'-0"

NOTES:

1. THE NEW BOTTOM OF FOOTING ELEVATION SHOWN IS APPROXIMATE. THE NEW BOTTOM OF FOOTING SHALL BE CONSTRUCTED AT THE SAME ELEVATION AS THE EXISTING FOOTING. THE CONTRACTOR SHALL VERIFY THE EXISTING BOTTOM OF FOOTING LOCATION PRIOR TO ORDERING REINFORCING STEEL.
2. REMOVAL OF THE EXISTING PIER TO EXISTING GROUND ELEVATION SHALL BE INCLUDED UNDER ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE (AT BR 51N)". THE COST OF ALL EARTH AND MASONRY EXCAVATION WITH LIMITS TWO FEET OUTSIDE AND ONE FOOT UNDER THE NEW PIER FOOTING SHALL BE INCLUDED UNDER ITEM 208.30, "COFFERDAM EXCAVATION, EARTH", AND ITEM 208.35 "COFFERDAM EXCAVATION, ROCK"
3. PAYMENT FOR ALL BACKFILL REQUIRED WITHIN THE NEAT LINES AS SHOWN SHALL BE MADE UNDER ITEM 204.30, "GRANULAR BACKFILL FOR STRUCTURES."
4. EXISTING TIMBER PILES SHALL BE REMOVED ONE FOOT MINIMUM BELOW THE NEW BOTTOM OF FOOTING (COSTS TO BE INCLUDED IN ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE (AT BR 51N).
5. IF THE LOCATION OF EXISTING TIMBER PILES CONFLICTS WITH DRIVING NEW PILES, THE CONTRACTOR SHALL DRIVE NEW PILES IN DIFFERENT LOCATIONS, AS ORDERED BY THE STRUCTURES ENGINEER, AT NO ADDITIONAL EXPENSE TO THE CONTRACT. SHOULD EXHUMATION OF EXISTING TIMBER PILES BE REQUIRED, THIS WORK SHALL BE PAID FOR IN ACCORDANCE WITH SECTION 109.06, EXTRA AND FORCE ACCOUNT WORK.
6. THE SIZE AND LENGTH OF EXISTING PILES IS BASED ON EXISTING PLAN INFORMATION, AND IS PROVIDED FOR INFORMATION ONLY.
7. FOR DETAILS OF CAST-IN-PLACE CONCRETE PILING, SEE TYPICAL BRIDGE DETAILS, BRIDGE SHEET C-46.
8. A COFFERDAM IS REQUIRED FOR THE EXCAVATION OF THE EXISTING PIER AND THE CONSTRUCTION OF THE NEW PIER. THE CONTRACTOR SHALL PREPARE DETAILED PLANS IN ACCORDANCE WITH SUBSECTION 208 OF THE SPECIFICATIONS FOR APPROVAL BY THE STRUCTURES ENGINEER. PAYMENT FOR THE COFFERDAM SHALL BE MADE UNDER ITEM 208.40, "COFFERDAM."

KEY

- EXISTING 12" DIA. TIMBER PILE (APPROX. 33' LONG - SEE NOTE 6)
- INDICATES BATTERED PILE 4:4 (SEE NOTE 6)
- NEW 12 3/4" DIA. CLOSED END CAST-IN-PLACE CONCRETE PILE
- GRANULAR BACKFILL FOR STRUCTURES

TVGA ENGINEERING, SURVEYING, P.C.

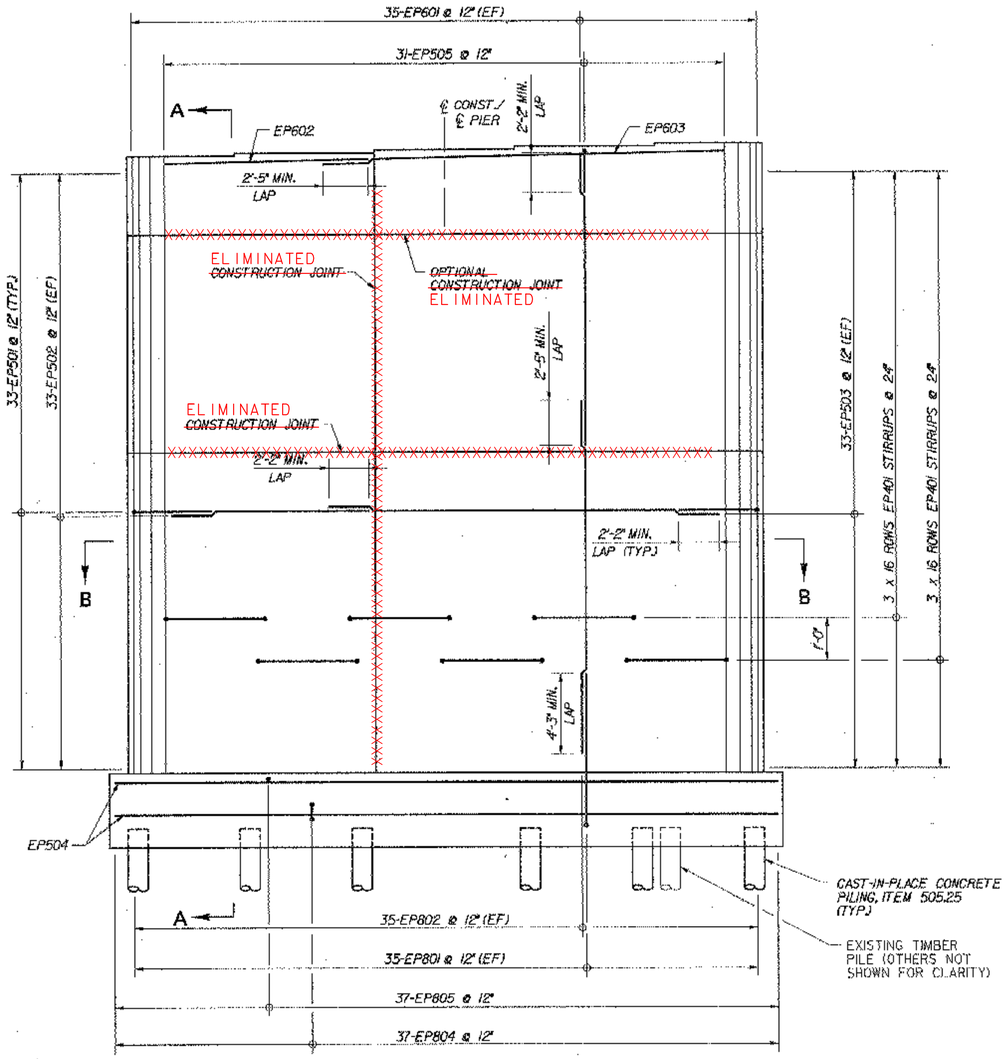
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of	BOLTON	Bridge No.	51N
Highway No.	I-89	Log Sta.	
		Surv. Sta.	

I-89 OVER US ROUTE 2 AND JOINER BROOK

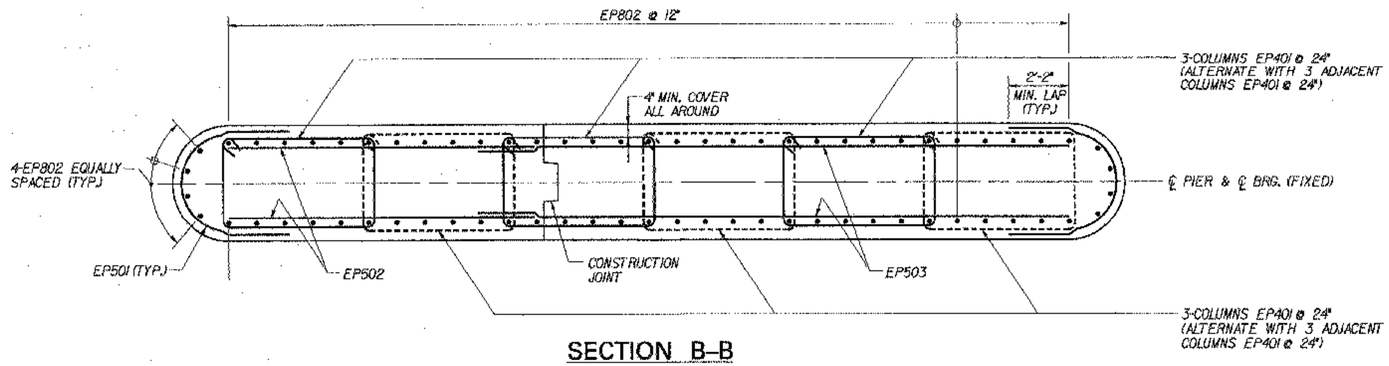
PIER NO. 2 MASONRY (51N)

Designed By	M.J. MOZER	Drawn By	R.A. BOTZENHART
Checked By	P.W. SZUSTAK Date 10/99	Bridge Design Supervisor	J.P. HALSTEAD Date 10/99
PROJECT	BOLTON	PROJECT NO.	IM-089-2(29)
TVGA CAD Drawing No.	Sinp2mab	Date	10/99
Bridge Sheet No.	BR51-24	Sheet	122 of 307



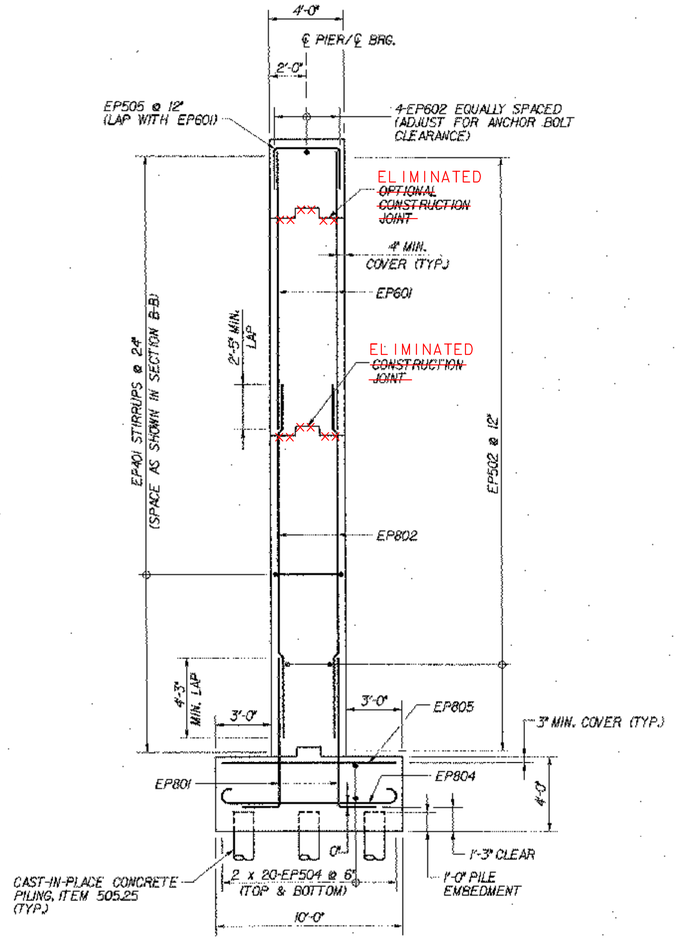
ELEVATION

SCALE: 1/4"=1'-0"



SECTION B–B

SCALE: 3/8"=1'-0"



SECTION A–A

SCALE: 1/4"=1'-0"

KEY

NF	NEAR FACE
FF	FAR FACE
EF	EACH FACE
▲	REINFORCEMENT TO BE CUT TO FIT IN THE FIELD

STATE OF VERMONT
AGENCY OF TRANSPORTATION

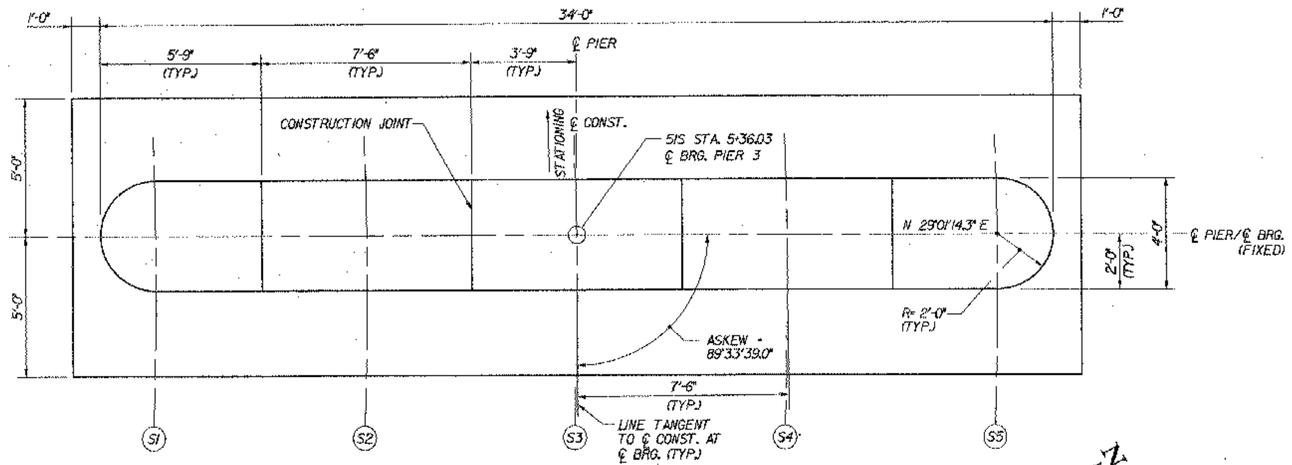
Town Of	BOLTON	Bridge No.	51N
Highway No.	I-89	Log Sta.	
		Surv. Sta.	

I-89 OVER US ROUTE 2 AND JOINER BROOK

PIER NO. 2 REINFORCEMENT (51N)

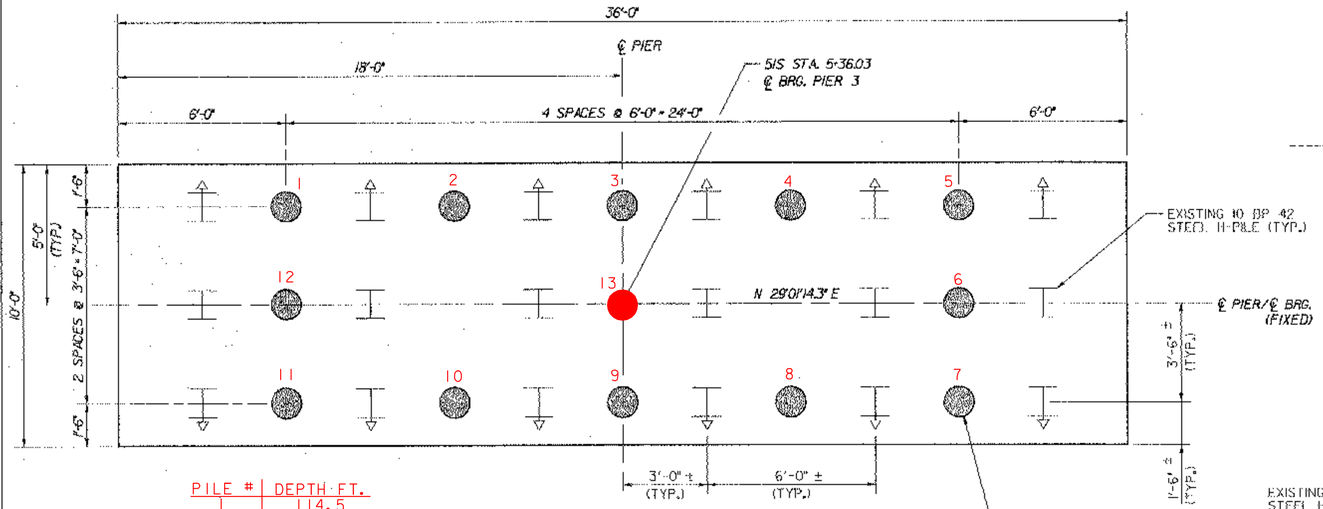
Designed By	M.J. MOZER	Drawn By	R.A. BOTZENHART
Checked By	Date	Bridge Design Supervisor	
P.W. SZUSTAK	10/99	J.P. HALSTEAD	Date 10/99
PROJECT	BOLTON	PROJECT NO.	IM-089-2(29)
TVGA CAD Drawing No.	Sinp2rel	Date	10/99
Bridge Sheet No.	BR51-25	Sheet	123 of 307

TVGA ENGINEERING, SURVEYING, P.C.



PLAN

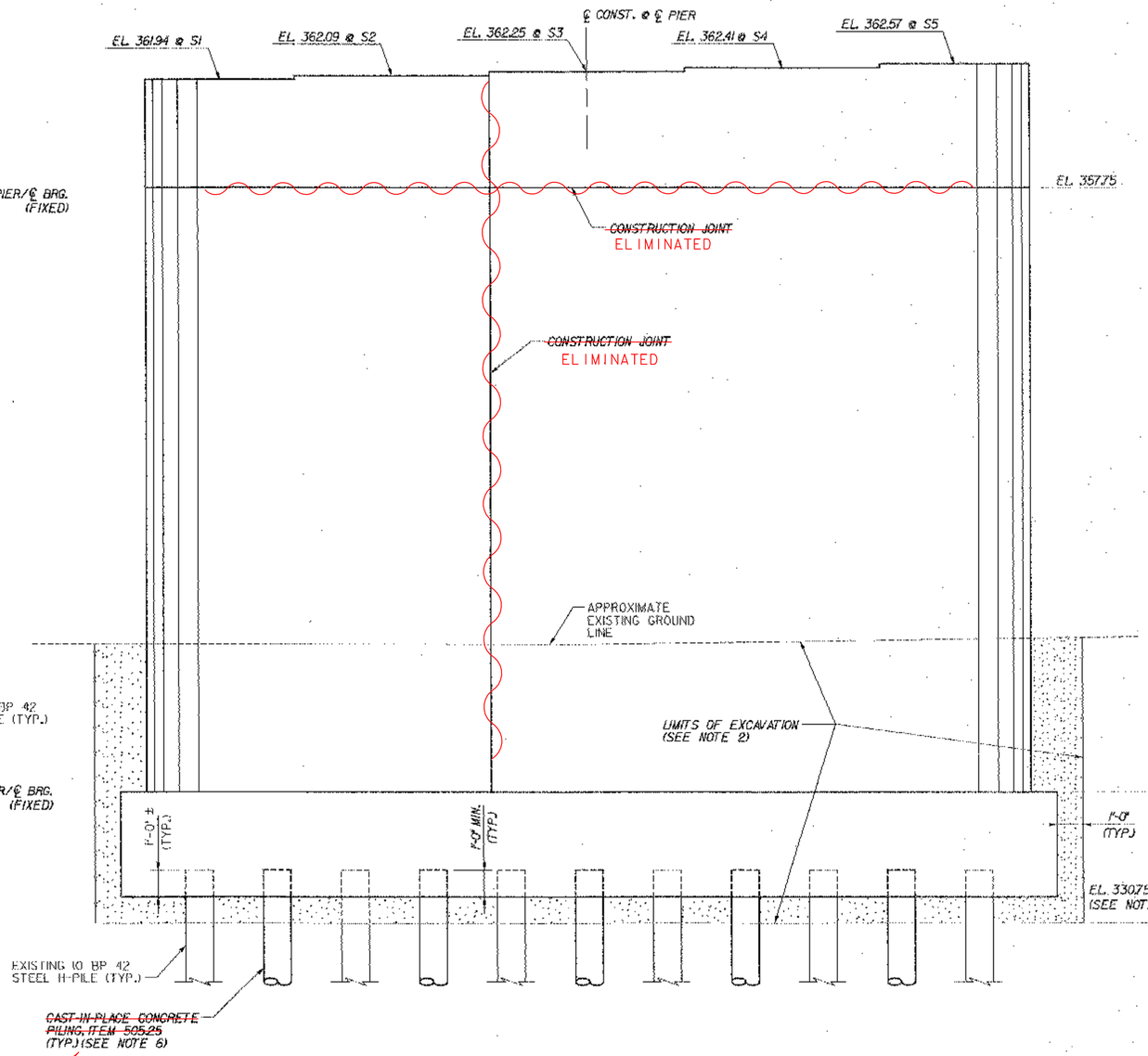
SCALE: 3/8"=1'-0"



FOOTING PLAN

SCALE: 3/8"=1'-0"

PILE #	DEPTH FT.
1	114.5
2	117.5
3	117
4	117
5	113
6	120
7	118.5
8	139
9	118.5
10	118.5
11	104
12	100
13	112.5



ELEVATION

SCALE: 3/8"=1'-0"

NOTES:

1. THE NEW BOTTOM OF FOOTING ELEVATION SHOWN IS APPROXIMATE. THE NEW BOTTOM OF FOOTING SHALL BE CONSTRUCTED AT THE SAME ELEVATION AS THE EXISTING FOOTING. THE CONTRACTOR SHALL VERIFY THE EXISTING BOTTOM OF FOOTING LOCATION PRIOR TO ORDERING REINFORCING STEEL.
2. THE COST OF ALL EARTH EXCAVATION WITH LIMITS ONE FOOT OUTSIDE AND UNDER THE NEW PIER FOOTING SHALL BE PAID UNDER ITEM 204.25, "STRUCTURE EXCAVATION". REMOVAL OF THE EXISTING PIER SHALL BE INCLUDED UNDER ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE (AT BR 51S)".
3. PAYMENT FOR ALL BACKFILL REQUIRED WITHIN THE NEAT LINES AS SHOWN SHALL BE MADE UNDER ITEM 204.30, "GRANULAR BACKFILL FOR STRUCTURES".
4. IF THE LOCATION OF EXISTING STEEL PILES CONFLICTS WITH DRIVING NEW PILES, THE CONTRACTOR SHALL DRIVE NEW PILES IN DIFFERENT LOCATIONS, AS ORDERED BY THE STRUCTURES ENGINEER, AT NO ADDITIONAL EXPENSE TO THE CONTRACT. SHOULD EXHUMATION OF EXISTING STEEL PILES BE REQUIRED, THIS WORK SHALL BE PAID FOR IN ACCORDANCE WITH SECTION 109.06, EXTRA AND FORCE ACCOUNT WORK.
5. THE SIZE AND LENGTH OF EXISTING PILES IS BASED ON EXISTING PLAN INFORMATION, AND IS PROVIDED FOR INFORMATION ONLY.
6. FOR DETAILS OF CAST-IN-PLACE CONCRETE PILING, SEE TYPICAL BRIDGE DETAILS, BRIDGE SHEET C-46.

KEY

- EXISTING 10 BP 42 STEEL H-PILE (APPROX. 47' LONG - SEE NOTE 5)
- INDICATES BATTERED PILE 1:4 (SEE NOTE 5)
- NEW 12¾" DIA. CLOSED END CAST-IN-PLACE CONCRETE PILE
- GRANULAR BACKFILL FOR STRUCTURES

STATE OF VERMONT
AGENCY OF TRANSPORTATION

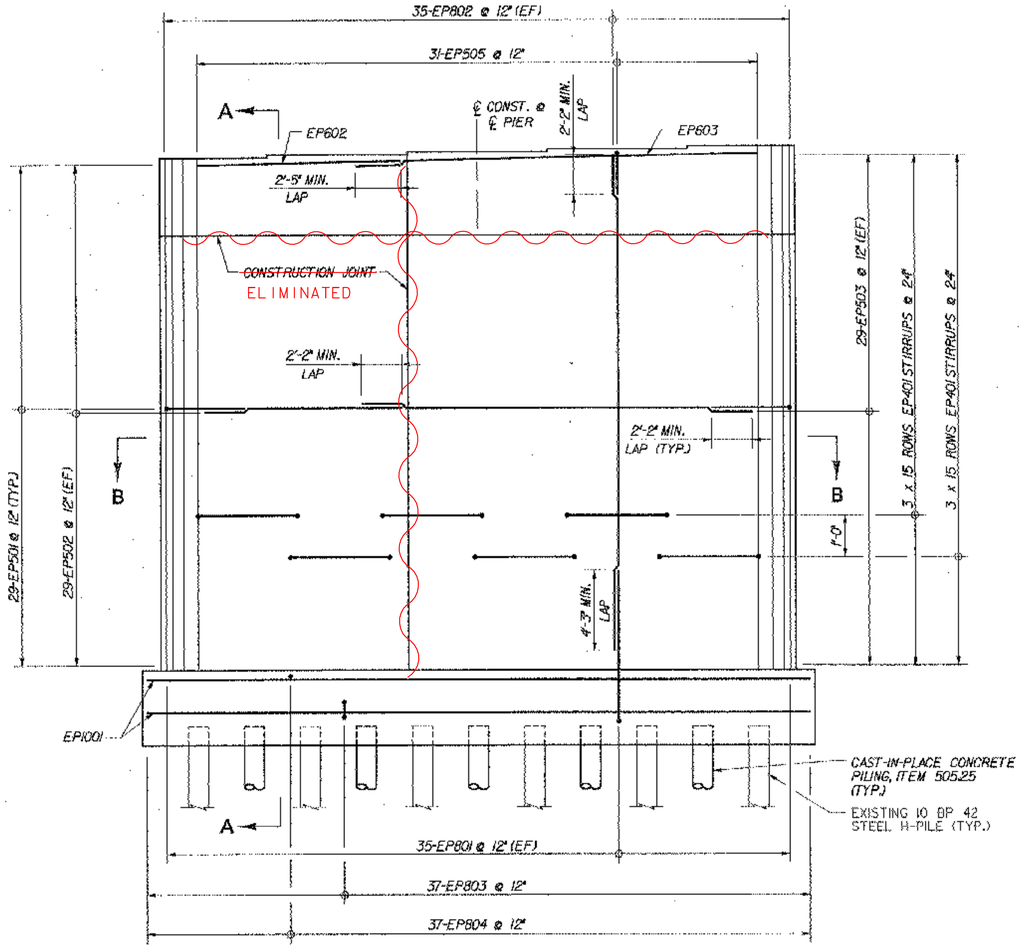
Town Of BOLTON	Bridge No. 515
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 OVER US ROUTE 2 AND JOINER BROOK

PIER NO. 3 MASONRY (515)

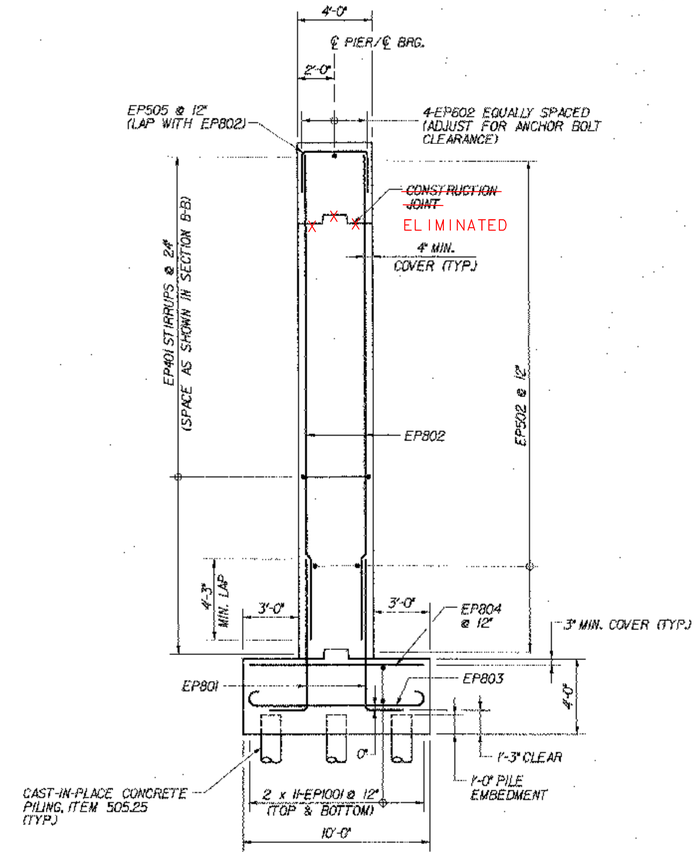
Designed By M.J. MOZER	Drawn By R.A. BOTZENHART
Checked By P.W. SZUSTAK Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51sp3mos	Date 10/99
Bridge Sheet No. BR51-26	Sheet 124 of 307

TVGA ENGINEERING, SURVEYING, P.C.



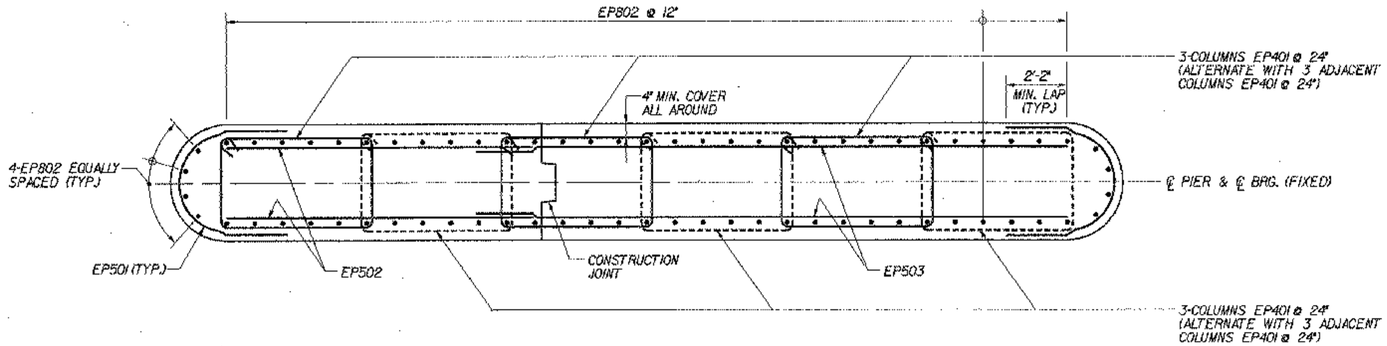
ELEVATION

SCALE: 1/4"=1'-0"



SECTION A-A

SCALE: 1/4"=1'-0"



SECTION B-B

SCALE: 3/8"=1'-0"

KEY

NF	NEAR FACE
FF	FAR FACE
EF	EACH FACE
▲	REINFORCEMENT TO BE CUT TO FIT IN THE FIELD

TVGA ENGINEERING, SURVEYING, P.C.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51S
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 OVER US ROUTE 2 AND JOINER BROOK

PIER NO. 3 REINFORCEMENT (51S)

Designed By M.J. MOZER	Drawn By R.A. BOTZENHART
Checked By Date P.W. SZUSTAK 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51sp3rel	Date 10/99
Bridge Sheet No. BR51-27	Sheet 125 of 307

BRIDGE 51 NORTH

	ITEM	NO. OF PIECES	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
	1	APPROACH SLAB 1 (51N)																
△	2	23	5	31' - 6"	E1AS501	STR.												
	3	17	8	2' - 6"	E1AS801	19		0' - 10"	1' - 8"	0' - 0"								2' - 3"
△	4	41	9	20' - 9"	E1AS901	1	1' - 3"	19' - 6"					0' - 0"		1' - 0"			
	5	APPROACH SLAB 2 (51N)																
✳	6	27	5	19' - 0"	E2AS502	STR.												
✳	7	27	5	30' - 0"	E2AS503	STR.												
	8	24	8	2' - 6"	E2AS801	19		0' - 10"	1' - 8"	0' - 0"								2' - 3"
△	9	45	9	25' - 9"	E2AS901	1	1' - 3"	24' - 6"					0' - 0"		1' - 0"			
	10	SUPERSTRUCTURE (51N)																
✳	11	107	5	38' - 8 1/2"	ES501	STR.												
▲	12	1390	5	35' - 6"	ES502	STR.												
	13	1023	5	4' - 11"	ES503	S5	0' - 6"	1' - 3"	1' - 5"	1' - 3"			0' - 6"					
✳	14	5	5	35' - 6"	ES511	STR.												
	15	68	5	5' - 2 1/2"	ES513	16	0' - 8"	1' - 6"	0' - 10 1/2"	2' - 2"				0' - 0"		2' - 2"		
	16	24	5	7' - 0"	ES514	STR.												
	17	12	5	2' - 6"	ES515	STR.												
✳	18	521	5	36' - 4"	ES521	STR.												
	19	486	5	38' - 4"	ES522	STR.												
	20	34	5	6' - 0 1/2"	ES523	16	0' - 8"	2' - 4"	0' - 10 1/2"	2' - 2"				0' - 0"		2' - 2"		
	21	2	5	33' - 0"	ES524	STR.												
✳	22	3	5	21' - 4"	ES525	STR.												
	23	12	5	10' - 4"	ES526	STR.												
	24	6	5	3' - 10"	ES527	STR.												
	25	2	5	2' - 0"	ES530	STR.												
	26	↓	↓	↓	↓	↓	VARY IN 68 EQUAL INCREMENTS											
	27	2	5	35' - 6"	ES598	STR.												
✳	28	106	6	25' - 10"	ES601	STR.												
✳	29	91	6	27' - 3"	ES602	STR.												
	30	60	6	35' - 4"	ES603	STR.												
	31	CURTAIN WALL (51N)																
✳▲	32	5	5	21' - 4"	ECW504	STR.												
	33	24	5	12' - 6"	ECW505	S5	2' - 2"	3' - 10"	0' - 10"	3' - 6"			2' - 2"					
	34	32	5	2' - 11"	ECW506	1	0' - 7"	1' - 9"					0' - 7"					
	35	12	5	3' - 11"	ECW507	STR.												
✳	36	17	5	18' - 9"	ECW508	STR.												
	37	2	5	4' - 7"	ECW509	S5	1' - 3"	0' - 10"	0' - 9"	0' - 6"			1' - 3"					
	38	2	5	10' - 7"	ECW510	S5	2' - 2"	3' - 0"	0' - 10"	2' - 5"			2' - 2"					
	39	2	5	4' - 7"	ECW511	S5	1' - 3"	0' - 10"	0' - 9"	0' - 6"			1' - 3"					
▲	40	4	5	14' - 2"	ECW512	STR.												
	41	ABUTMENT 1 (51N)																
	42	33	5	4' - 7"	E1A501	21	0' - 7"	2' - 0"	2' - 0"									
✳▲	43	33	5	3' - 6"	E1A502	17		1' - 6"	2' - 0"	0' - 0"								
	44	26	5	9' - 9"	E1A503	STR.												
	45	11	5	9' - 6"	E1A512	STR.												
✳	46	11	5	8' - 9"	E1A513	STR.												
	47	13	5	4' - 9"	E1A514	STR.												
	48	8	5	5' - 1"	E1A515	17		2' - 0"	1' - 1"	2' - 0"								
	49	20	5	7' - 6"	E1A517	17		3' - 0"	1' - 6"	3' - 0"								
	50	20	5	4' - 6"	E1A518	17		1' - 6"	3' - 0"	0' - 0"								
	51	64	5	5' - 6"	E1A519	17		1' - 6"	4' - 0"	0' - 0"								
	52	10	5	7' - 6"	E1A520	STR.												
	53	ABUTMENT 2 (51N)																
	54	19	5	9' - 0"	E2A501	STR.												
	55	19	5	21' - 6"	E2A502	STR.												
✳	56	43	5	6' - 1"	E2A503	21	0' - 7"	4' - 4"	1' - 3"						0' - 5"			
	57	34	5	9' - 9"	E2A504	19		4' - 0"	5' - 9"	0' - 0"								7' - 1"
▲	58	43	5	3' - 9"	E2A505	STR.												
	59	43	5	6' - 10"	E2A506	S10		2' - 6"	1' - 10"	2' - 6"								
▲	60	43	5	5' - 10"	E2A507	17		2' - 6"	0' - 10"	2' - 6"								
	61	86	5	3' - 7"	E2A508	17		1' - 6"	2' - 1"	0' - 0"								
	62	8	5	7' - 9"	E2A509	19		4' - 0"	3' - 9"	0' - 0"								6' - 0"
▲	63	2	5	8' - 3"	E2A510	19		4' - 0"	4' - 3"	0' - 0"								6' - 0"
▲	64	17	5	15' - 6"	E2A511	STR.												
▲	65	22	5	16' - 3"	E2A512	STR.												
▲	66	6	5	8' - 0"	E2A513	STR.												
	67	6	5	6' - 0"	E2A514	STR.												
	68	9	5	4' - 7"	E2A515	17		1' - 9"	1' - 1"	1' - 9"								
✳	69	6	5	4' - 6"	E2A516	19		2' - 3"	2' - 3"	0' - 0"								
	70	33	5	8' - 0"	E2A517	17		3' - 3"	1' - 6"	3' - 3"								
	71	32	5	4' - 6"	E2A518	17		1' - 6"	3' - 0"	0' - 0"								
▲	72	88	5	5' - 6"	E2A519	17		1' - 6"	4' - 0"	0' - 0"								
	73	10	5	16' - 3"	E2A520	STR.												
▲	74	6	5	4' - 6"	E2A521	27		2' - 3"	2' - 3"	0' - 0"								
	75	17	5	13' - 6"	E2A522	STR.												
	76	15	5	13' - 3"	E2A524	STR.												
	77	10	5	8' - 6"	E2A525	STR.												

BRIDGE 51 NORTH

	ITEM	NO. OF PIECES	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
	78	PIER CAP 1 (51N)																
✳	79	8	5	30' - 0"	E1P501	STR.												
✳	80	9	5	10' - 3"	E1P502	10		2' - 6"	5' - 3"	2' - 6"							1' - 8"	3' - 4"
	81	104	5	8' - 6"	E1P503	S10		3' - 0"	2' - 6"	3' - 0"								
	82	48	5	9' - 4"	E1P504	S10		3' - 0"	3' - 4"	3' - 0"								
	83	30	5	6' - 6"	E1P505	S10		2' - 7"	1' - 4"	2' - 7"								
✳	84	6	8	33' - 4"	E1P801	STR.												
✳	85	5	8	23' - 0"	E1P802	STR.												
✳	86	9	10	14' - 1"	E1P1001	2	1' - 10"	12' - 3"										
✳	87	6	10	37' - 0"	E1P1002	2	1' - 10"	33' - 4"										
	88	PIER 2 (51N)																
△	89	98	4	17' - 8"	E2P401	T1	0' - 5 1/2"	5' - 0"	3' - 4"	5' - 0"	3' - 4"			0' - 5 1/2"				
✳	90	67	5	9' - 3"	E2P501	10		2' - 0"	5' - 3"	2' - 0"							1' - 8"	3' - 4"
	91	66	5	10' - 6"	E2P502	STR.												
	92	66	5	21' - 0"	E2P503	STR.												
	93	40	5	35' - 6"	E2P504	STR.												
✳	94	32	5	9' - 1"	E2P505	17		3' - 0"	3' - 1"	3' - 0"								
✳	95	71	6	14' - 10"	E2P601	STR.												
✳	96	5	6	11' - 0"	E2P602	STR.												
	97	4	6	21' - 6"	E2P603	STR.												
	98	70	8	10' - 3"	E2P801	20		2' - 0"	8' - 3"	0' - 0"								
✳	99	71	8	19' - 0"	E2P802	STR.												
	100	37	8	10' - 3"	E2P804	1	0' - 11"	8' - 6"						0' - 11"		0' - 8"		
	101	37	8	9' - 6"	E2P805	STR.												
	102	PIER CAP 3 (51N)																
✳	103	9	5	23' - 9"	E3P501	STR.												
	104	8	5	10' - 3"	E3P502	10		2' - 6"	5' - 3"	2' - 6"							1' - 8"	3' - 4"
✳	105	181	5	7' - 7"	E3P503	S10		2' - 9"	2' - 2"	2' - 9"								
✳	106	7	8	30' - 6"	E3P801	STR.												
✳	107	7	8	18' - 9"	E3P802	STR.												
	108	5	8	33' - 6"	E3P803	STR.												
△	109	12	9	11' - 6"	E3P901	STR.												
△	110	14	11	30' - 6"	E3P1101	2	2' - 0"	28' - 6"						0' - 0"				
	111	PIER CAP 4 (51N)																
	112	8	5	23' - 9"	E4P501	STR.												
✳	113	9	5	10' - 3"	E4P502	10		2' - 6"	5' - 3"	2' - 6"							1' - 8"	3' - 4"
✳	114	181	5	7' - 10"	E4P503	S10		2' - 10"	2' - 2"	2' - 10"								
✳	115	7	8	30' - 6"	E4P801	STR.												
	116	6	8	18' - 9"	E4P802	STR.												
✳	117	6	8	33' - 6"	E4P803	STR.												
△	118	12	9	11' - 6"	E4P901	STR.												
△	119	14	11	30' - 6"	E4P1101	2	2' - 0"	28' - 6"						0' - 0"				
	120																	
	121																	
	122																	
	123																	
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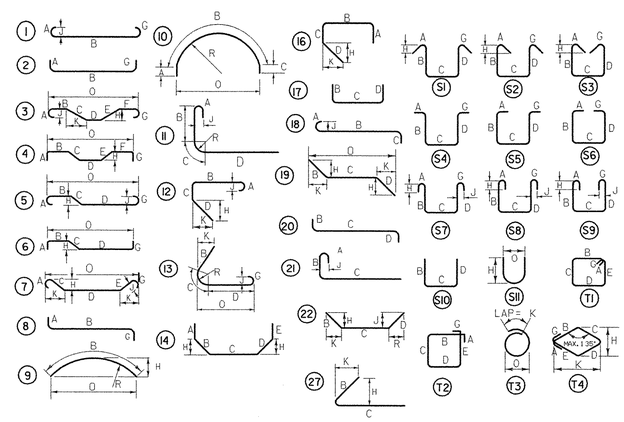

NOTES:

1. UNLESS OTHERWISE DESIGNATED, ALL BAR REINFORCEMENT FOR CONCRETE IN SIZES UP TO AND INCLUDING NO. 18 SHALL CONFORM TO THE REQUIREMENTS OF THE "SPECIFICATIONS FOR DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT", AASHTO M 31(ASTM A 615-91). ALL BARS SHALL BE GRADE 60, UNLESS OTHERWISE DESIGNATED.
2. FOR TYPICAL BENDING DETAILS, RECOMMENDED PIN DIAMETER "D" OF BENDS AND HOOKS, AND OTHER STANDARD PRACTICE, SEE CURRENT CONCRETE REINFORCING STEEL INSTITUTE "MANUAL OF STANDARD PRACTICE".
3. BARS WHICH REQUIRE MORE ACCURATE BENDING THAN STANDARD PRACTICES SHOULD HAVE LIMITS INDICATED.
4. ALL DIMENSIONS ARE OUT TO OUT OF BAR EXCEPT "A" AND "G" ON STANDARD 180 DEGREE AND 135 DEGREE HOOKS.
5. "J" DIMENSION ON 180 DEGREE HOOKS TO BE SHOWN ONLY WHEN NECESSARY TO MAINTAIN CLEARANCES.
6. "H" DIMENSION ON STIRRUPS TO BE SHOWN ONLY WHEN NECESSARY TO MAINTAIN CLEARANCES.
7. WHERE SLOPE DIFFERS FROM 45 DEGREES, DIMENSIONS "H" AND "K" MUST BE SHOWN.

LEGEND

▲ DENOTES BARS TO BE CUT IN THE FIELD.

✳ DENOTES ONE EXTRA BAR ADDED FOR TESTING PURPOSES.

△ DENOTES TWO EXTRA BARS ADDED FOR TESTING PURPOSES.

"E" IN PREFIX DENOTES EPOXY COATED REINFORCING STEEL.

ASTM STANDARD REINFORCING BARS

BAR SIZE DESIGNATION	WEIGHT (POUNDS PER FOOT)	NOMINAL DIMENSIONS ROUND SECTION: DIAMETER (INCHES)	CROSS SECTIONAL AREA (SQ. INCHES)	PERIMETER (INCHES)
#3	0.376	0.375	0.11	1.178
#4	0.668	0.500	0.20	1.571
#5	1.043	0.625	0.31	1.963
#6	1.502	0.750	0.44	2.356
#7	2.044	0.875	0.60	2.749
#8	2.670	1.000	0.79	3.142
#9	3.400	1.128	1.00	3.544
#10	4.303	1.270	1.27	3.990
#11	5.313	1.410	1.56	4.430
#14	7.65	1.693	2.25	5.32
#18	13.60	2.257	4.00	7.09

ALL REBAR IN ABUTMENTS 1 AND 2, ALONG WITH PIER AND PIER CAPS, ARE TO BE ITEM 507.15 - REINFORCING STEEL AND NOT ITEM 507.17 - EPOXY COATED REINFORCING STEEL.

TVGA ENGINEERING, SURVEYING, P.C.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51N
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 OVER U.S. ROUTE 2 AND JOINER BROOK

REINFORCING STEEL SCHEDULE (51N)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. reinf51	Date 10/99
Bridge Sheet No. BR51-28	Sheet 126 of 307

BRIDGE 51 SOUTH

	ITEM	NO. OF PIECES	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
	1	APPROACH SLAB 1 (51S)																
△	2	23	5	31' - 6"	E1AS501	STR.												
	3	17	8	2' - 6"	E1AS801	19		0' - 10"	1' - 8"	0' - 0"								2' - 3"
△	4	41	9	20' - 9"	E1AS901	1	1' - 3"	19' - 6"					0' - 0"		1' - 0"			
	5	APPROACH SLAB 2 (51S)																
✳	6	27	5	19' - 0"	E2AS502	STR.												
✳	7	27	5	30' - 0"	E2AS503	STR.												
	8	24	8	2' - 6"	E2AS801	19		0' - 10"	1' - 8"	0' - 0"								2' - 3"
△	9	45	9	25' - 9"	E2AS901	1	1' - 3"	24' - 6"					0' - 0"		1' - 0"			
	10	SUPERSTRUCTURE (51S)																
	11	106	5	38' - 11"	ES501	STR.												
✳▲	12	1811	5	35' - 6"	ES502	STR.												
	13	1269	5	4' - 11"	ES503	S5	0' - 6"	1' - 3"	1' - 5"	1' - 3"			0' - 6"					
	14	4	5	35' - 6"	ES511	STR.												
	15	68	5	5' - 2 1/2"	ES513	16	0' - 8"	1' - 6"	0' - 10 1/2"	2' - 2"				0' - 0"		2' - 2"		
✳	16	25	5	7' - 0"	ES514	STR.												
	17	12	5	2' - 6"	ES515	STR.												
	18	676	5	35' - 2"	ES521	STR.												
	19	594	5	39' - 4"	ES522	STR.												
	20	34	5	6' - 2 1/2"	ES523	16	0' - 10"	2' - 4"	0' - 10 1/2"	2' - 2"				0' - 0"		2' - 2"		
✳	21	3	5	33' - 0"	ES524	STR.												
	22	2	5	21' - 6"	ES525	STR.												
✳	23	13	5	10' - 5"	ES526	STR.												
	24	6	5	3' - 10 1/2"	ES527	STR.												
	25	2	5	2' - 0"	ES530	STR.												
	26	↓	↓	↓	↓	↓	VARY IN 68 EQUAL INCREMENTS											
	27	2	5	35' - 6"	ES598	STR.												
	28	90	6	25' - 9"	ES601	STR.												
✳	29	106	6	26' - 5"	ES602	STR.												
	30	90	6	27' - 10"	ES603	STR.												
✳	31	61	6	34' - 4"	ES604	STR.												
	32	CURTAIN WALL (51S)																
▲	33	4	5	21' - 4"	ECW504	STR.												
✳	34	25	5	12' - 6"	ECW505	S5	2' - 2"	3' - 10"	0' - 10"	3' - 6"			2' - 2"					
	35	32	5	2' - 11"	ECW506	1	0' - 7"	1' - 9"					0' - 7"					
	36	12	5	3' - 11"	ECW507	STR.												
✳	37	17	5	18' - 9"	ECW508	STR.												
	38	2	5	4' - 7"	ECW509	S5	1' - 3"	0' - 10"	0' - 9"	0' - 6"			1' - 3"					
	39	2	5	10' - 7"	ECW510	S5	2' - 2"	3' - 0"	0' - 10"	2' - 5"			2' - 2"					
	40	2	5	4' - 7"	ECW511	S5	1' - 3"	0' - 10"	0' - 9"	0' - 6"			1' - 3"					
▲	41	4	5	14' - 2"	ECW512	STR.												
	42	ABUTMENT 1 (51S)																
	43	33	5	4' - 7"	E1A501	21	0' - 7"	2' - 0"	2' - 0"									
	44	33	5	3' - 6"	E1A502	17		1' - 6"	2' - 0"	0' - 0"								
▲	45	25	5	9' - 9"	E1A503	STR.												
✳	46	12	5	9' - 6"	E1A512	STR.												
✳	47	12	5	8' - 9"	E1A513	STR.												
	48	12	5	4' - 9"	E1A514	STR.												
	49	8	5	5' - 1"	E1A515	17		2' - 0"	1' - 1"	2' - 0"								
	50	20	5	7' - 6"	E1A517	17		3' - 0"	1' - 6"	3' - 0"								
	51	20	5	4' - 6"	E1A518	17		1' - 6"	3' - 0"	0' - 0"								
	52	64	5	5' - 6"	E1A519	17		1' - 6"	4' - 0"	0' - 0"								
	53	10	5	7' - 6"	E1A520	STR.												
	54	ABUTMENT 2 (51S)																
	55	19	5	9' - 0"	E2A501	STR.												
	56	19	5	21' - 6"	E2A502	STR.												
	57	43	5	6' - 1"	E2A503	21	0' - 7"	4' - 4"	1' - 3"						0' - 5"			
	58	33	5	9' - 9"	E2A504	19		4' - 0"	5' - 9"	0' - 0"								7' - 1"
	59	43	5	3' - 9"	E2A505	STR.												
▲	60	43	5	6' - 10"	E2A506	S10		2' - 6"	1' - 10"	2' - 6"								
	61	43	5	5' - 10"	E2A507	17		2' - 6"	0' - 10"	2' - 6"								
▲	62	86	5	3' - 7"	E2A508	17		1' - 6"	2' - 1"	0' - 0"								
	63	8	5	7' - 9"	E2A509	19		4' - 0"	3' - 9"	0' - 0"								6' - 0"
	64	2	5	8' - 3"	E2A510	19		4' - 0"	4' - 3"	0' - 0"								6' - 0"
▲	65	17	5	15' - 6"	E2A511	STR.												
▲	66	22	5	16' - 3"	E2A512	STR.												
▲	67	6	5	8' - 0"	E2A513	STR.												
✳▲	68	7	5	6' - 3"	E2A514	STR.												
	69	9	5	4' - 7"	E2A515	17		1' - 9"	1' - 1"	1' - 9"								
	70	6	5	4' - 6"	E2A516	19		2' - 3"	2' - 3"	0' - 0"								
	71	32	5	8' - 0"	E2A517	17		3' - 3"	1' - 6"	3' - 3"								
	72	32	5	4' - 6"	E2A518	17		1' - 6"	3' - 0"	0' - 0"								
	73	100	5	5' - 6"	E2A519	17		1' - 6"	4' - 0"	0' - 0"								
▲	74	10	5	16' - 3"	E2A520	STR.												
	75	6	5	4' - 6"	E2A521	27		2' - 3"	2' - 3"	0' - 0"								
✳▲	76	18	5	13' - 6"	E2A522	STR.												
	77	15	5	13' - 3"	E2A524	STR.												
	78	10	5	8' - 6"	E2A525	STR.												

BRIDGE 51 SOUTH

	ITEM	NO. OF PIECES	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
	79	PIER CAP 1 (51S)																
✳	80	8	5	30' - 0"	E1P501	STR.												
	81	8	5	10' - 3"	E1P502	10		2' - 6"	5' - 3"	2' - 6"							1' - 8"	3' - 4"
	82	104	5	8' - 2"	E1P503	S10		2' - 10"	2' - 6"	2' - 10"								
✳	83	49	5	9' - 0"	E1P504	S10		2' - 10"	3' - 4"	2' - 10"								
	84	30	5	6' - 6"	E1P505	S10		2' - 7"	1' - 4"	2' - 7"								
✳	85	6	8	30' - 0"	E1P801	STR.												
✳	86	5	8	23' - 0"	E1P802	STR.												
✳	87	9	10	14' - 1"	E1P1001	2	1' - 10"	12' - 3"										
✳	88	6	10	37' - 0"	E1P1002	2	1' - 10"	33' - 4"					1' - 10"					
	89	PIER CAP 2 (51S)																
✳	90	5	5	30' - 0"	E2P501	STR.												
✳	91	9	5	10' - 3"	E2P502	10		2' - 6"	5' - 3"	2' - 6"							1' - 8"	3' - 4"
	92	104	5	7' - 8"	E2P503	S10		2' - 7"	2' - 6"	2' - 7"								
	93	48	5	8' - 6"	E2P504	S10		2' - 7"	3' - 4"	2' - 7"								
✳	94	6	8	33' - 4"	E2P801	STR.												
✳	95	5	8	23' - 0"	E2P802	STR.												
✳	96	9	10	14' - 1"	E2P1001	2	1' - 10"	12' - 3"										
✳	97	6	10	37' - 0"	E2P1002	2	1' - 10"	33' - 4"					1' - 10"					
	98	PIER 3 (51S)																
△	99	92	4	17' - 8"	E3P401	T1	0' - 5 1/2"	5' - 0"	3' - 4"	5' - 0"	3' - 4"		0' - 5 1/2"					
✳	00	59	5	9' - 3"	E3P501	10		2' - 0"	5' - 3"	2' - 0"							1' - 8"	3' - 4"
✳	101	59	5	10' - 6"	E3P502	STR.												
	102	58	5	21' - 0"	E3P503	STR.												
	103	31	5	8' - 0"	E3P505	17		2' - 6"	3' - 0"	2' - 6"								
✳	104	5	6	11' - 0"	E3P602	STR.												
✳	105	5	6	21' - 6"	E3P603	STR.												
✳	106	71	8	10' - 3"	E3P801	20		2' - 0"	8' - 3"	0' - 0"								
	107	70	8	20' - 9"	E3P802	STR.												
✳	108	38	8	15' - 6"	E3P803	STR.												
	109	37	8	10' - 3"	E3P804	1	0' - 11"	8' - 6"					0' - 11"		0' - 8"			
	110	37	8	9' - 6"	E3P805	STR.												
△	111	22	10	35' - 6"	E3P1001	STR.												
	112	PIER CAP 4 (51S)																
	113	8	5	23' - 9"	E4P501	STR.												
✳	114	9	5	10' - 3"	E4P502	10		2' - 6"	5' - 3"	2' - 6"							1' - 8"	3' - 4"
✳	115	181	5	6' - 6"	E4P503	S10		2' - 2"	2' - 2"	2' - 2"								
	116	6	8	30' - 6"	E4P801	STR.												
✳	117	7	8	18' - 9"	E4P802	STR.												
✳	118	6	8	33' - 6"	E4P803	STR.												
△	119	12	9	11' - 6"	E4P901	STR.												
△	120	14	11	30' - 6"	E4P1101	2	2' - 0"	28' - 6"					0' - 0"					
	121	PIER CAP 5 (51S)																
✳	122	9	5	23' - 9"	E5P501	STR.												
✳	123	9	5	10' - 3"	E5P502	10		2' - 6"	5' - 3"	2' - 6"							1' - 8"	3' - 4"
	124	180	5	6' - 6"	E5P503	S10		2' - 2"	2' - 2"	2' - 2"								
✳	125	7	8	30' - 6"	E5P801	STR.												
✳	126	7	8	18' - 9"	E5P802	STR.												
	127	5	8	33' - 6"	E5P803	STR.												
△	128	12	9	11' - 6"	E5P901	STR.												
△	129	14	11	30' - 6"	E5P1101	2	2' - 0"	28' - 6"					0' - 0"					
	130																	
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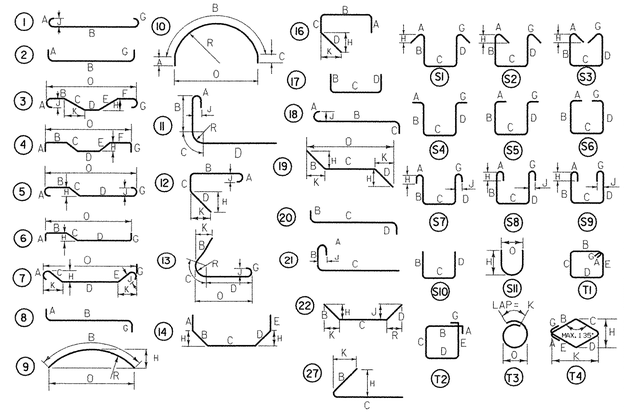


NOTES:

1. UNLESS OTHERWISE DESIGNATED, ALL BAR REINFORCEMENT FOR CONCRETE IN SIZES UP TO AND INCLUDING NO. 18 SHALL CONFORM TO THE REQUIREMENTS OF THE "SPECIFICATIONS FOR DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT", AASHTO M 31(ASTM A 615-91). ALL BARS SHALL BE GRADE 60, UNLESS OTHERWISE DESIGNATED.
2. FOR TYPICAL BENDING DETAILS, RECOMMENDED PIN DIAMETER "D" OF BENDS AND HOOKS, AND OTHER STANDARD PRACTICE, SEE CURRENT CONCRETE REINFORCING STEEL INSTITUTE "MANUAL OF STANDARD PRACTICE".
3. BARS WHICH REQUIRE MORE ACCURATE BENDING THAN STANDARD PRACTICES SHOULD HAVE LIMITS INDICATED.
4. ALL DIMENSIONS ARE OUT TO OUT OF BAR EXCEPT "A" AND "G" ON STANDARD 180 DEGREE AND 135 DEGREE HOOKS.
5. "J" DIMENSION ON 180 DEGREE HOOKS TO BE SHOWN ONLY WHEN NECESSARY TO MAINTAIN CLEARANCES.
6. "H" DIMENSION ON STIRRUPS TO BE SHOWN ONLY WHEN NECESSARY TO MAINTAIN CLEARANCES.
7. WHERE SLOPE DIFFERS FROM 45 DEGREES, DIMENSIONS "H" AND "K" MUST BE SHOWN.

LEGEND

▲ DENOTES BARS TO BE CUT IN THE FIELD.

✳ DENOTES ONE EXTRA BAR ADDED FOR TESTING PURPOSES.

△ DENOTES TWO EXTRA BARS ADDED FOR TESTING PURPOSES.

"E" IN PREFIX DENOTES EPOXY COATED REINFORCING STEEL.

ASTM STANDARD REINFORCING BARS

BAR SIZE DESIGNATION	WEIGHT (POUNDS PER FOOT)	NOMINAL DIMENSIONS ROUND SECTION: DIAMETER (INCHES)	CROSS SECTIONAL AREA (SQ. INCHES)	PERIMETER (INCHES)
#3	0.376	0.375	0.11	1.178
#4	0.668	0.500	0.20	1.571
#5	1.043	0.625	0.31	1.963
#6	1.502	0.750	0.44	2.356
#7	2.044	0.875	0.60	2.749
#8	2.670	1.000	0.79	3.142
#9	3.400	1.128	1.00	3.544
#10	4.303	1.270	1.27	3.990
#11	5.313	1.410	1.56	4.430
#14	7.65	1.693	2.25	5.32
#18	13.60	2.257	4.00	7.09

ALL REBAR IN ABUTMENTS 1 AND 2, ALONG WITH PIER AND PIER CAPS, ARE TO BE ITEM 507.15 - REINFORCING STEEL AND NOT ITEM 507.17 - EPOXY COATED REINFORCING STEEL.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

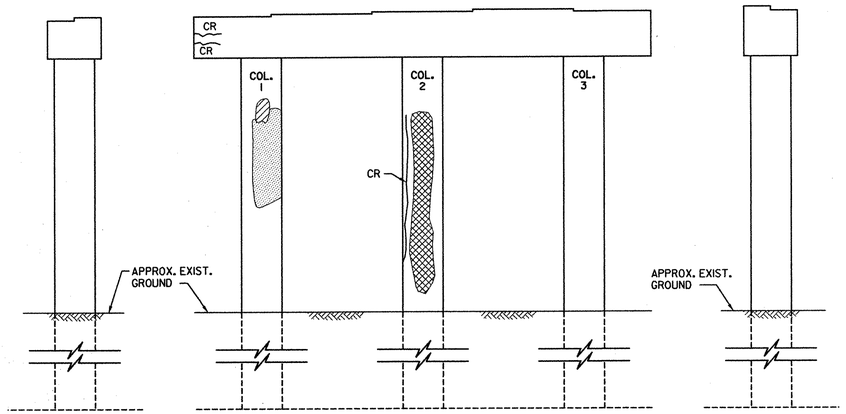
Town Of BOLTON	Bridge No. 51S
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 OVER U.S. ROUTE 2 AND JOINER BROOK

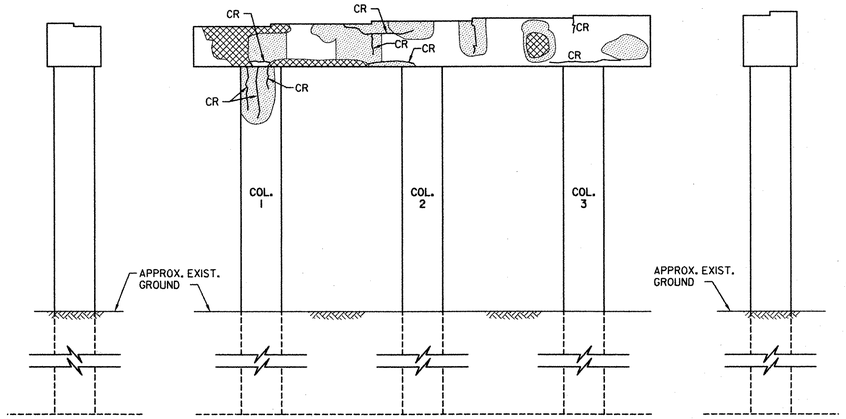
REINFORCING STEEL SCHEDULE (51S)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. reinf51	Date 10/99
Bridge Sheet No. BR51-29	Sheet 127 of 307

TVGA ENGINEERING, SURVEYING, P.C.



(ABUT. 1 SIDE)



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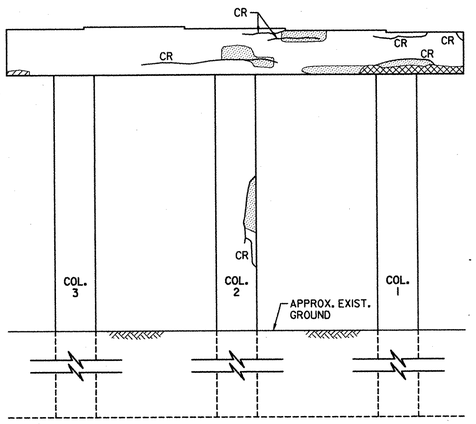
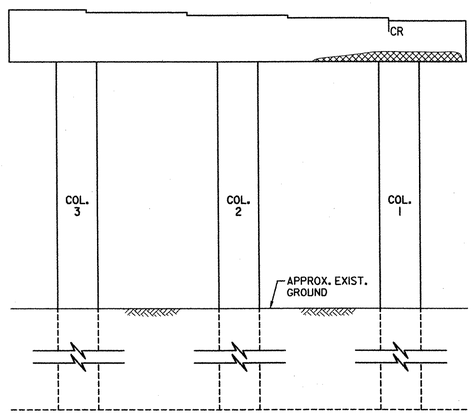


(PIER 2 SIDE)

PIER 1 ELEVATIONS

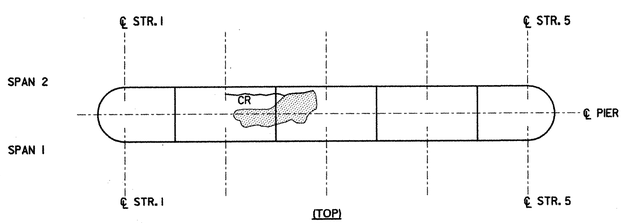
SCALE: 3/16"=1'-0"



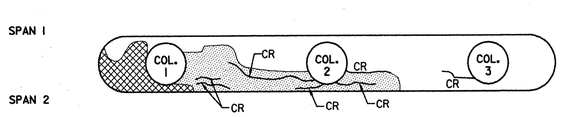
(PIER 3 SIDE)

PIER 2 ELEVATIONS

SCALE: 3/16"=1'-0"



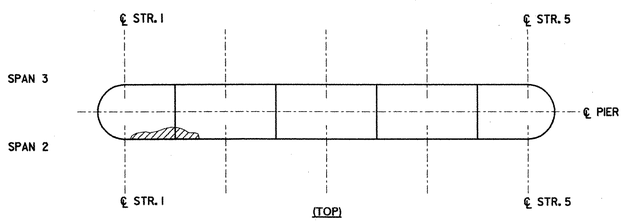
(TOP)



(BOTTOM)

PIER 1 CAP

SCALE: 3/16"=1'-0"



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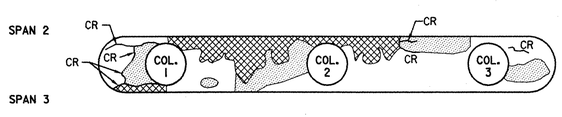


(BOTTOM)

PIER 2 CAP

SCALE: 3/16"=1'-0"

ABBREVIATIONS

CR	CRACK
PA	PREVIOUSLY PATCHED AREA

LEGEND

- CRACK
- DELAMINATED AREA
- SPALLED AREA
- DEEPLY SPALLED WITH EXPOSED REBAR
- EXISTING GROUND

STATE OF VERMONT
AGENCY OF TRANSPORTATION

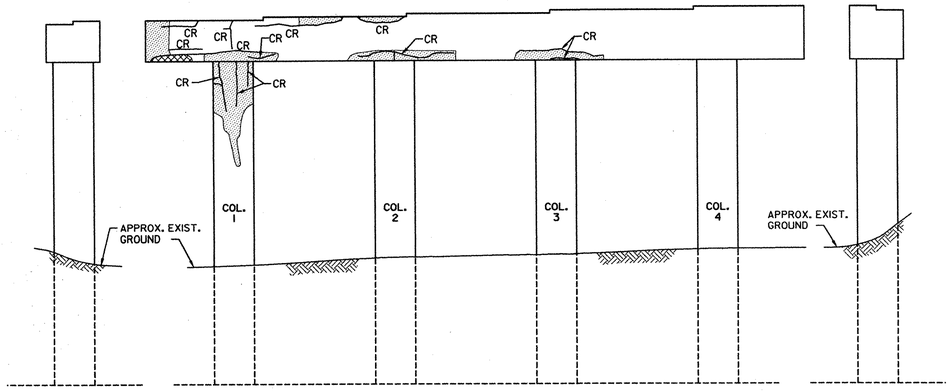
Town Of BOLTON	Bridge No. **51N**
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 NB OVER U.S. ROUTE 2 & JOINER BROOK

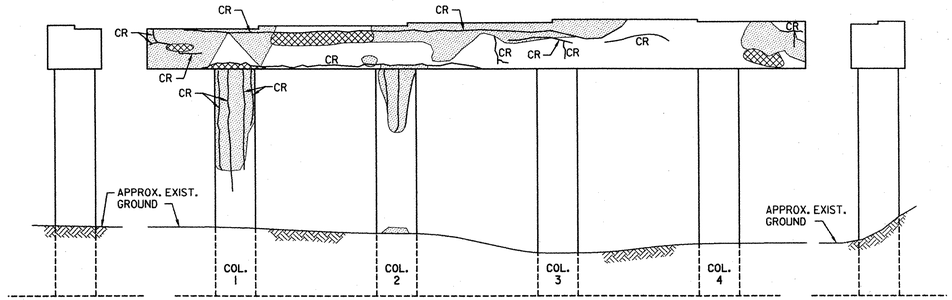
EXIST. SUBSTR. CONDITION (51N) (1 OF 3)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51nplers	Date 10/99
Bridge Sheet No. **SC-17**	Sheet 151 of 307

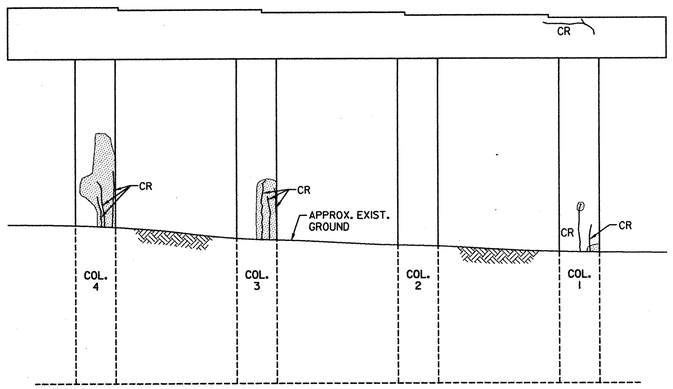
TVGA ENGINEERING, SURVEYING, P.C.



(PIER 2 SIDE)



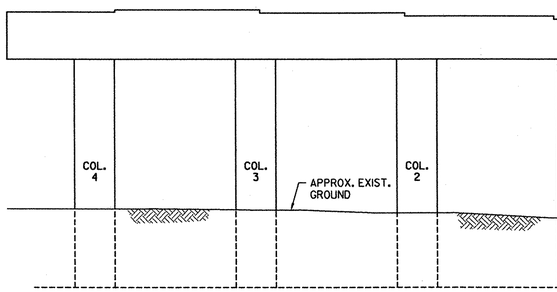
(PIER 3 SIDE)



(PIER 4 SIDE)

PIER 3 ELEVATIONS

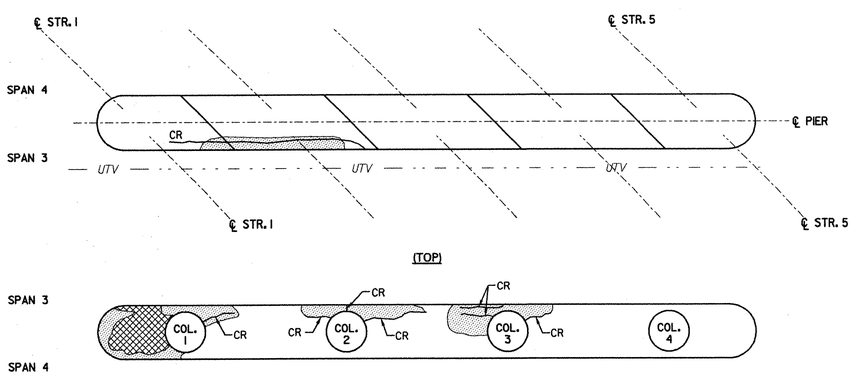
SCALE: 3/16"=1'-0"



(ABUT. 2 SIDE)

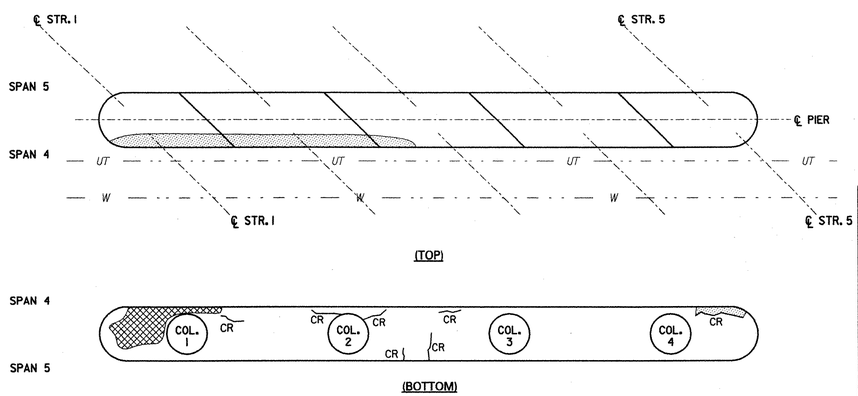
PIER 4 ELEVATIONS

SCALE: 3/16"=1'-0"



PIER 3 CAP

SCALE: 3/16"=1'-0"



PIER 4 CAP

SCALE: 3/16"=1'-0"

ABBREVIATIONS

CR	CRACK
PA	PREVIOUSLY PATCHED AREA

LEGEND

- CRACK
- DELAMINATED AREA
- SPALLED AREA
- DEEPLY SPALLED WITH EXPOSED REBAR
- UNDERGROUND TELEPHONE — UT —
- UNDERGROUND CABLE TV — UTV —
- WATERLINE — W —
- EXISTING GROUND

STATE OF VERMONT
AGENCY OF TRANSPORTATION

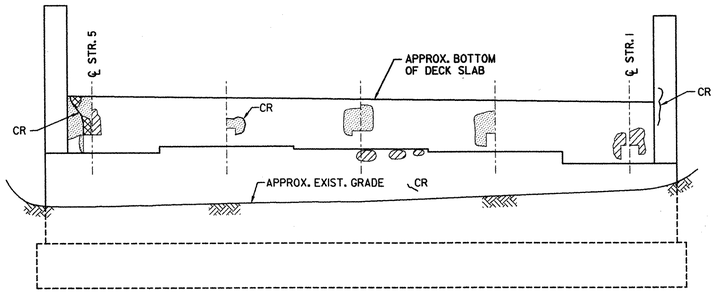
Town Of BOLTON	Bridge No. **51N**
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 NB OVER U.S. ROUTE 2 & JOINER BROOK

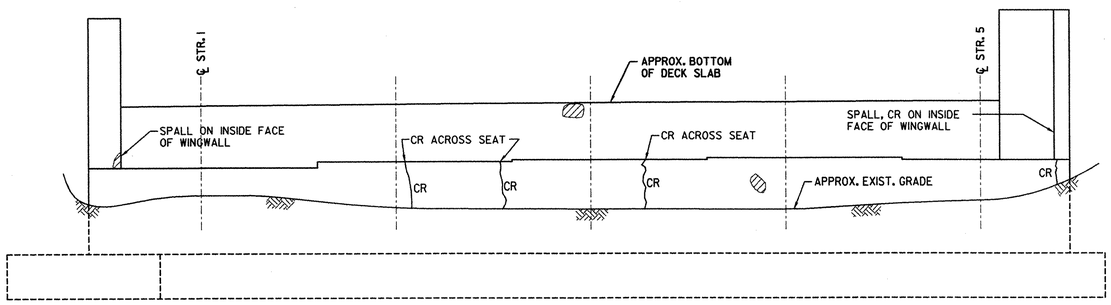
EXIST. SUBSTR. CONDITION (51N) (2 OF 3)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51nplers	Date 10/99
Bridge Sheet No. **SC-18**	Sheet 152 of 307

TVGA ENGINEERING, SURVEYING, P.C.



ABUT. 1 ELEVATION
SCALE: 1/4"=1'-0"



ABUT. 2 ELEVATION
SCALE: 1/4"=1'-0"

ABBREVIATIONS

CR	CRACK
PA	PREVIOUSLY PATCHED AREA

LEGEND

CRACK
DELAMINATED AREA
SPALLED AREA
DEEPLY SPALLED WITH EXPOSED REBAR
EXISTING GROUND

STATE OF VERMONT
AGENCY OF TRANSPORTATION

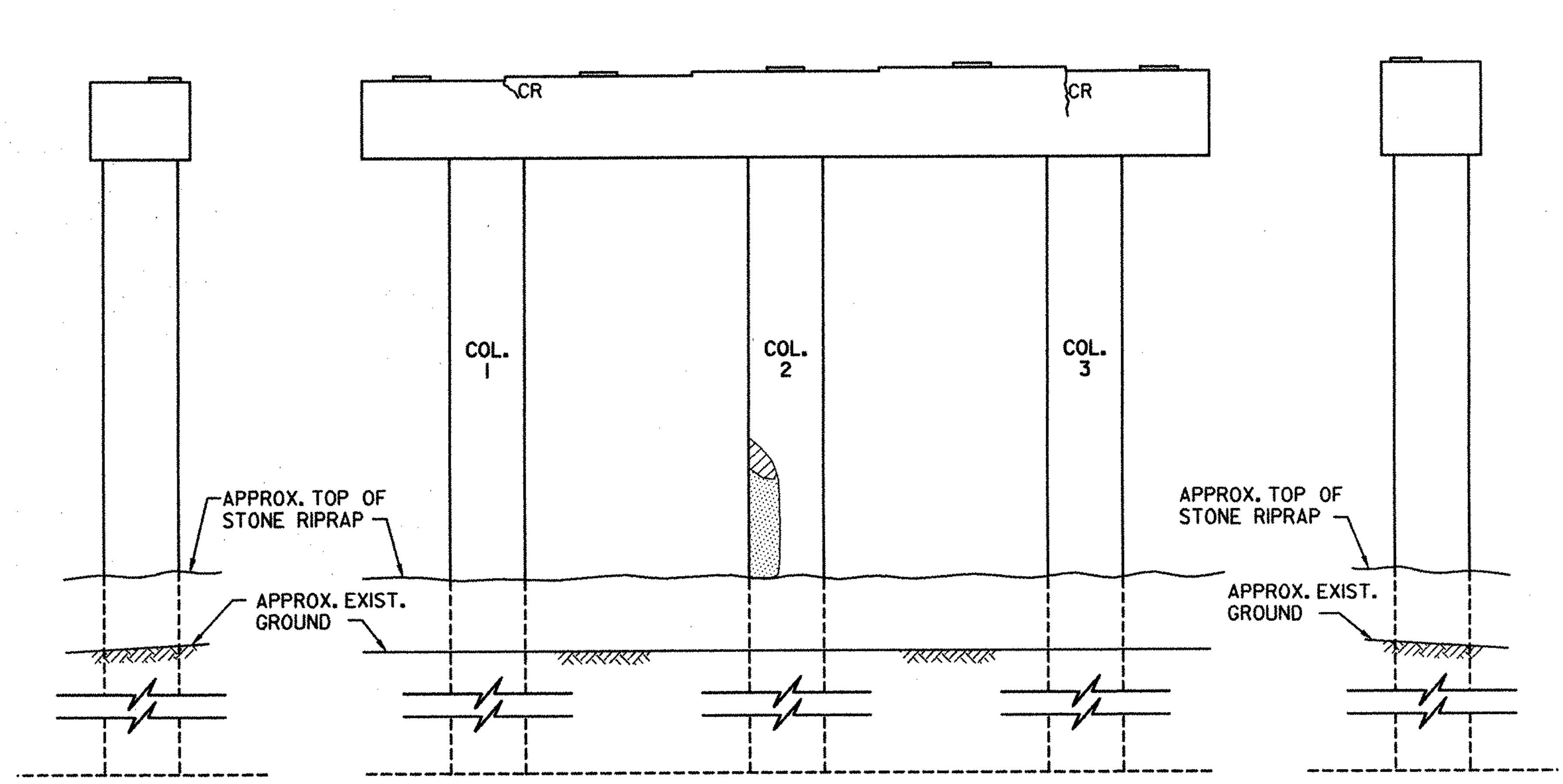
Town Of BOLTON	Bridge No. **51N**
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 NB OVER U.S. ROUTE 2 & JOINER BROOK

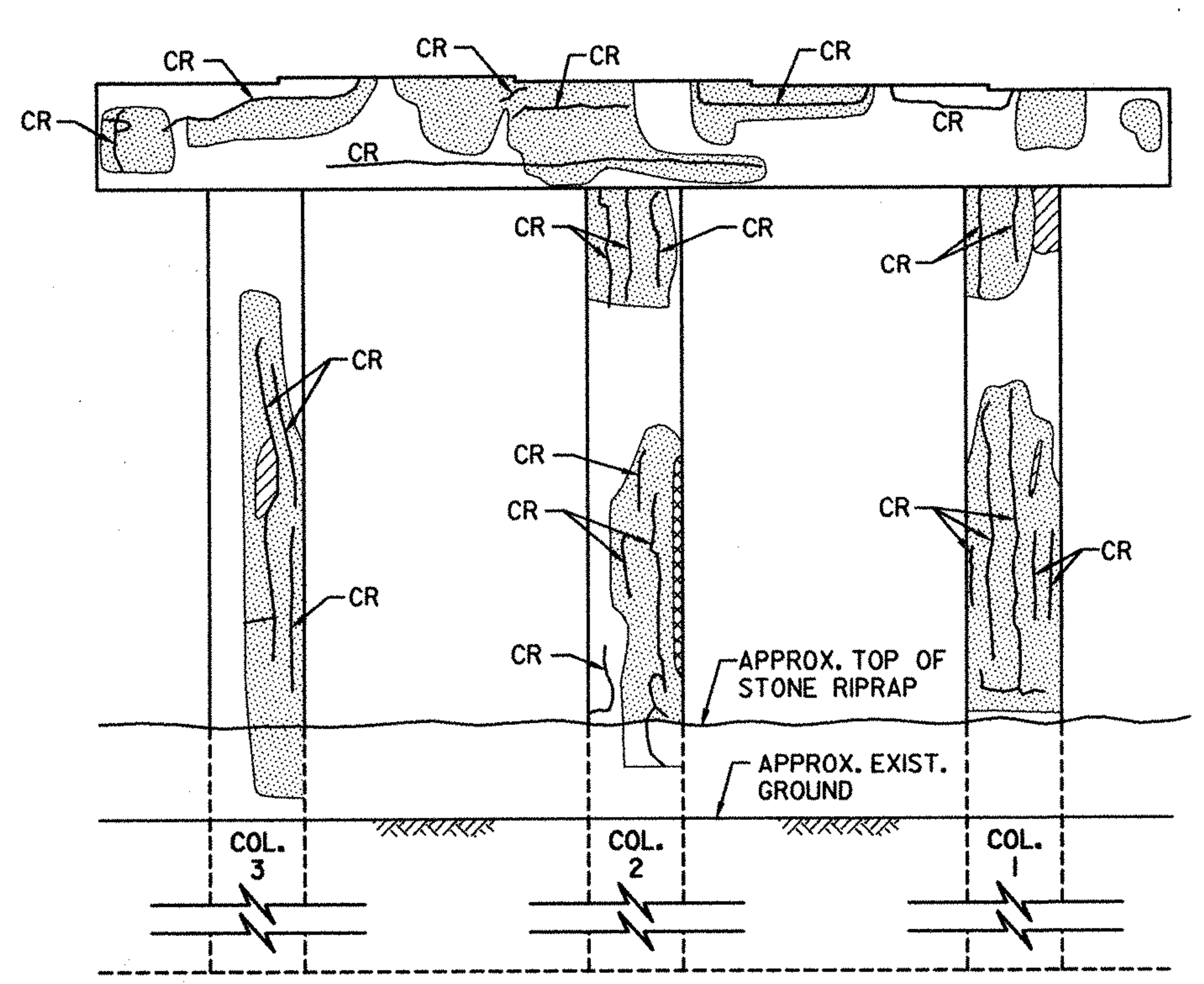
EXIST. SUBSTR. CONDITION (51N) (3 OF 3)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51abut	Date 10/99
Bridge Sheet No. **SC-19**	Sheet 153 of 307

TVGA ENGINEERING, SURVEYING, P.C.



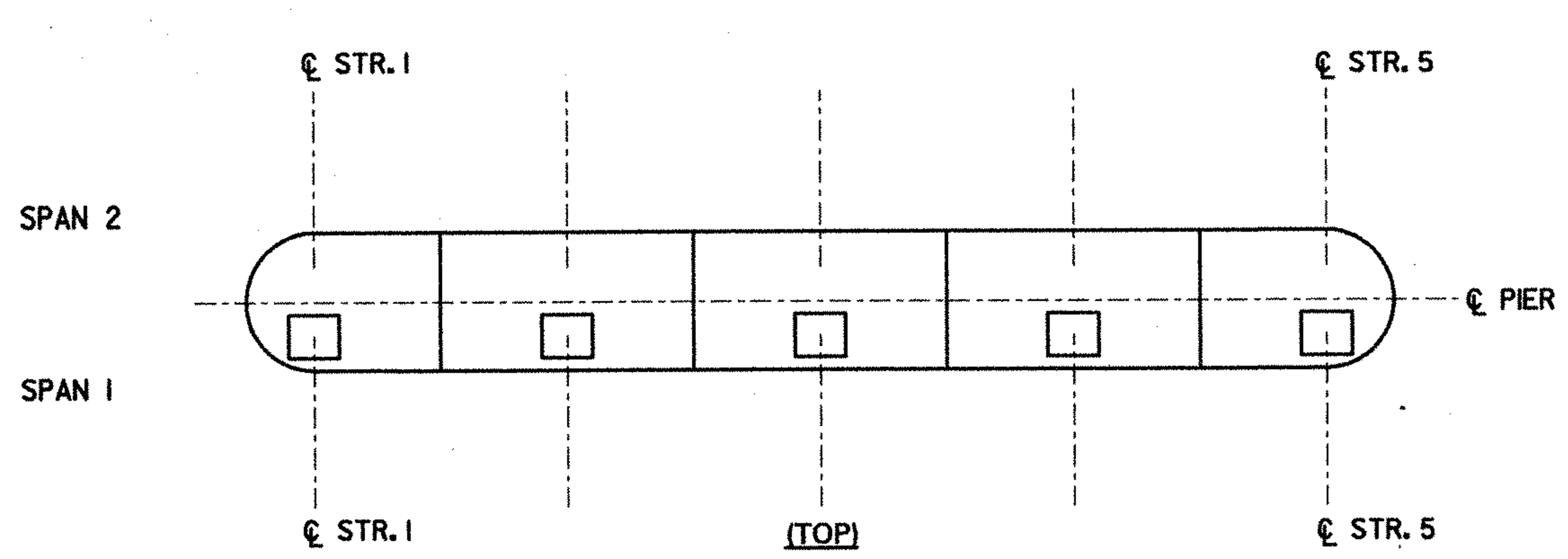
(ABUT. 1 SIDE)



(PIER 2 SIDE)

PIER 1 ELEVATIONS

SCALE: 3/16"=1'-0"



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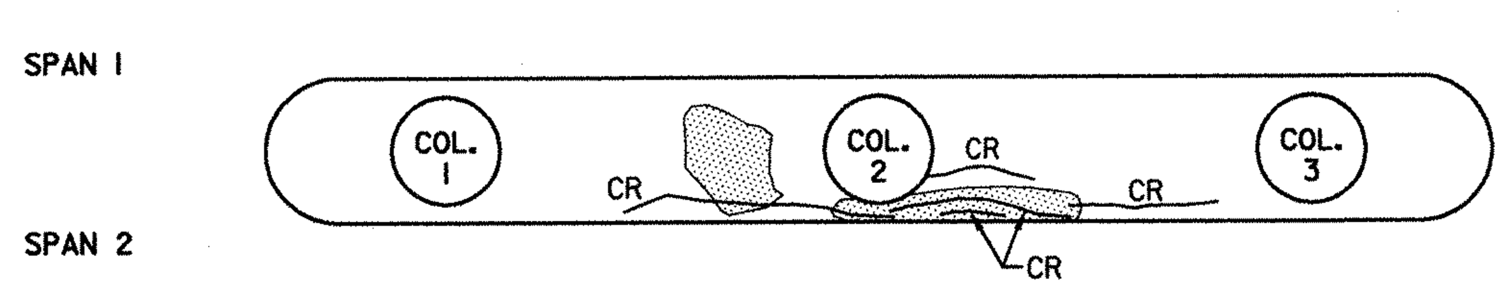
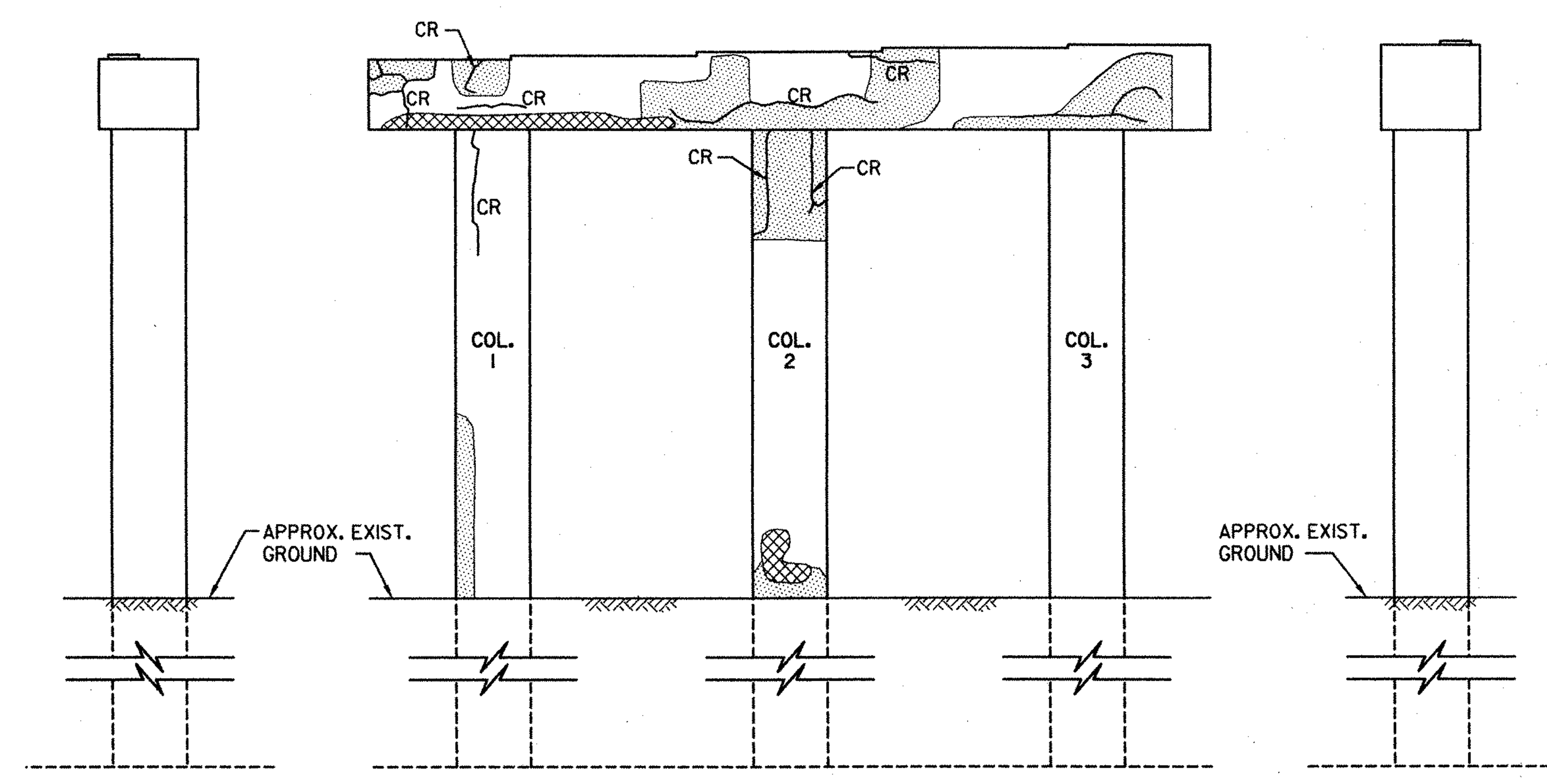


(BOTTOM)

PIER 1 CAP

SCALE: 3/16"=1'-0"



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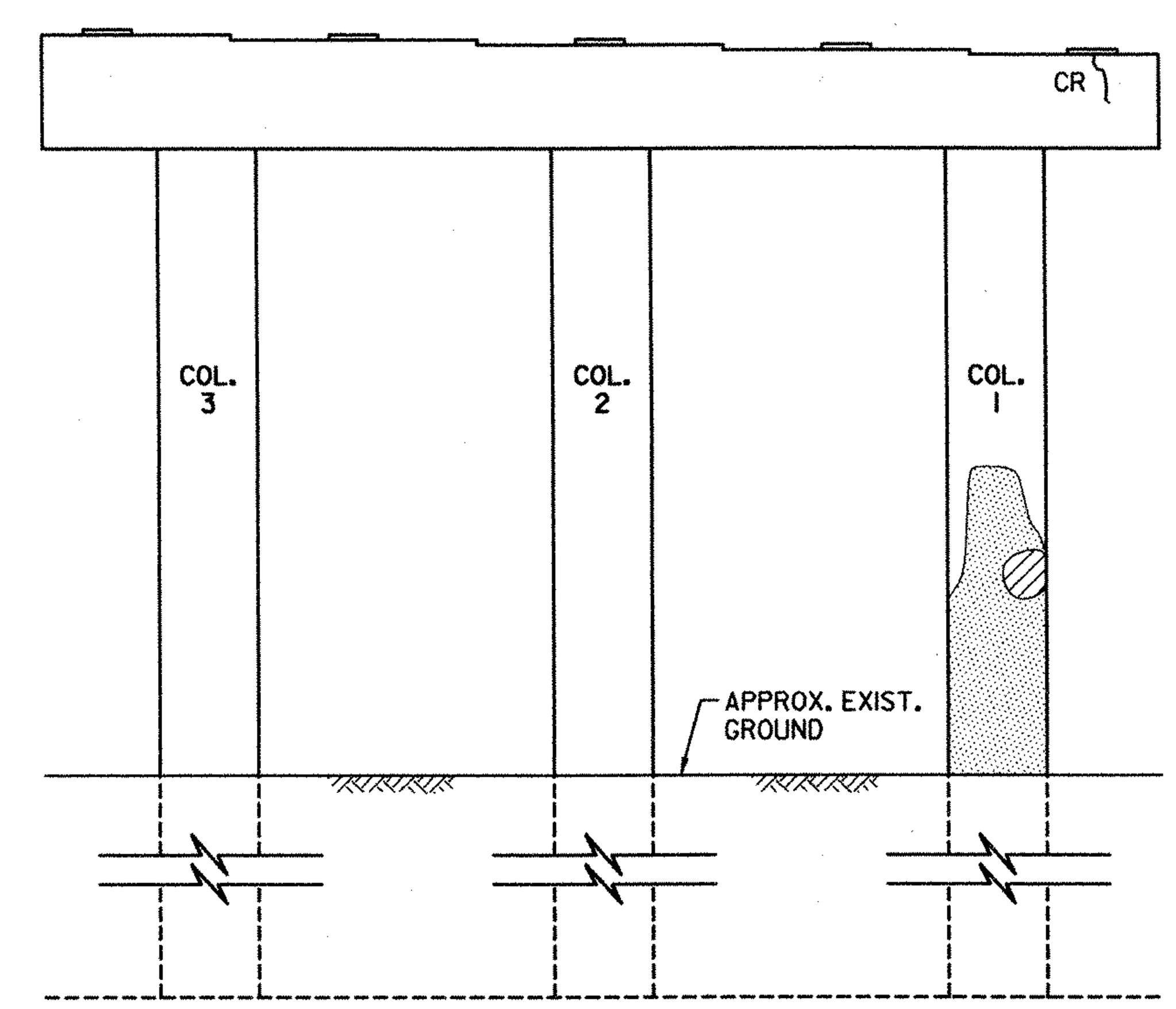


(PIER 3 SIDE)

PIER 2 ELEVATIONS

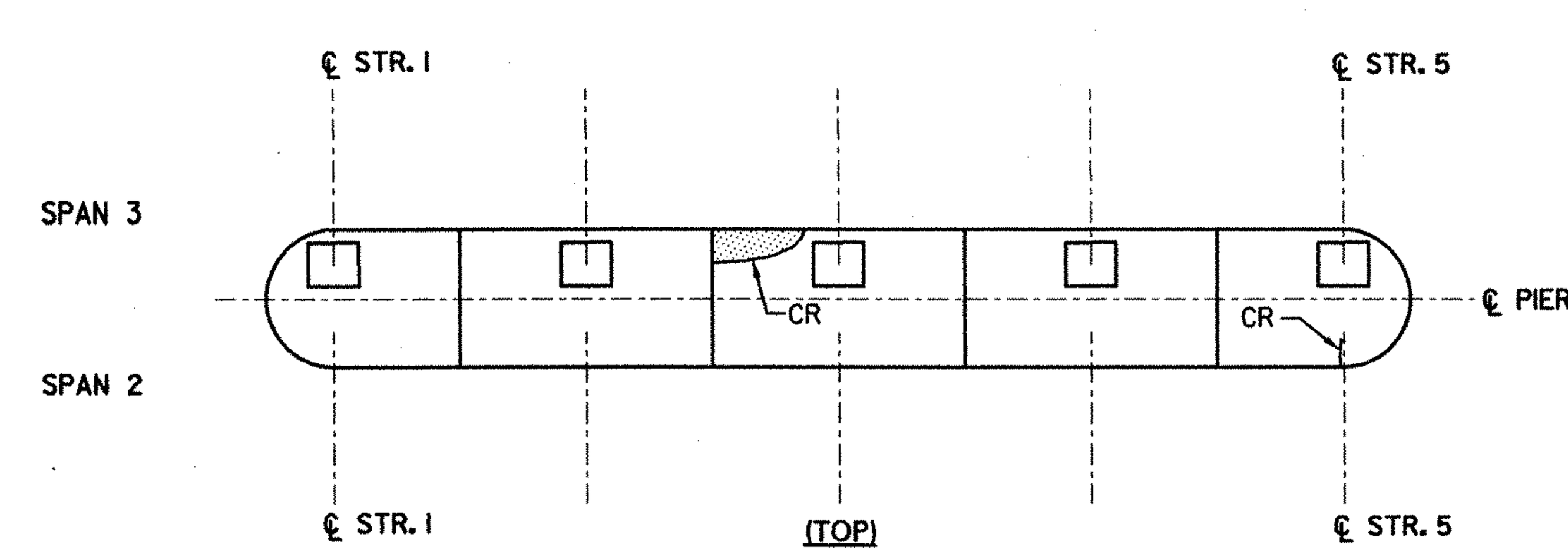
SCALE: 3/16"=1'-0"

ABBREVIATIONS

CR	CRACK
PA	PREVIOUSLY PATCHED AREA

LEGEND

- CRACK
- DELAMINATED AREA
- SPALLED AREA
- DEEPLY SPALLED WITH EXPOSED REBAR
- EXISTING GROUND



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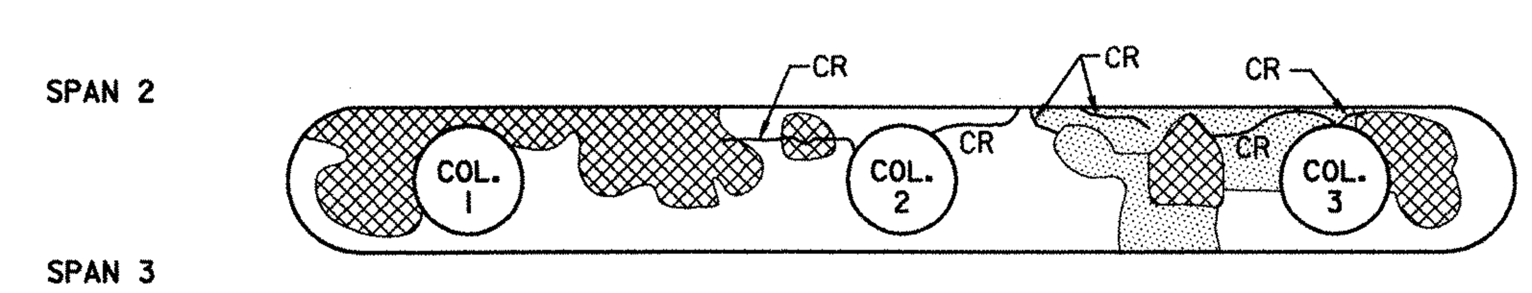


(BOTTOM)

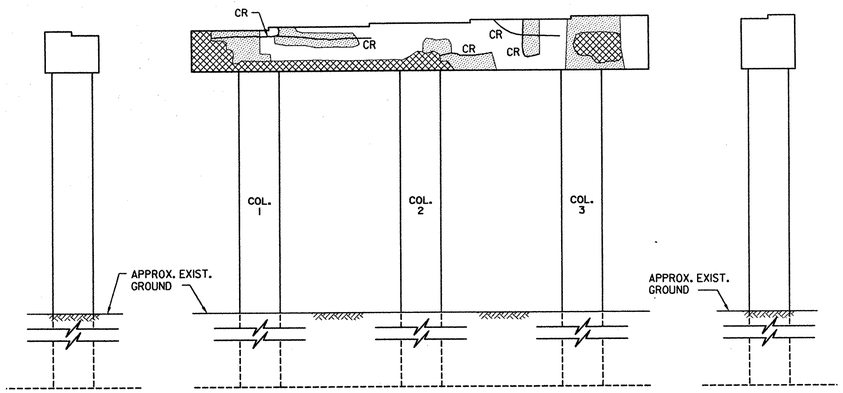
PIER 2 CAP

SCALE: 3/16"=1'-0"

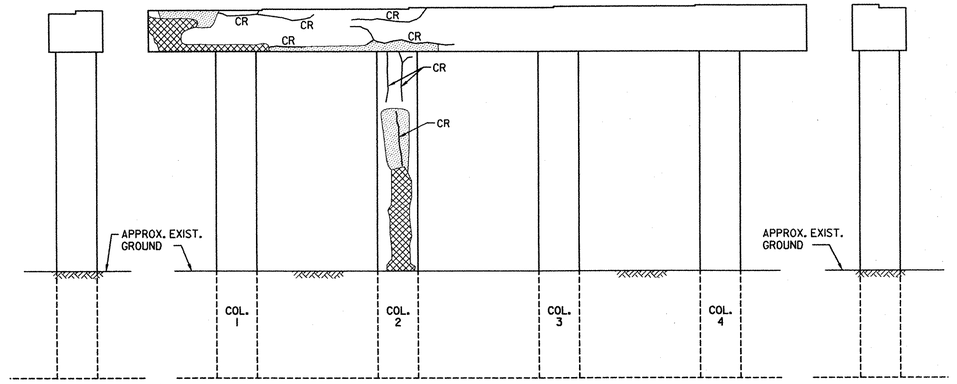
TVGA ENGINEERING, SURVEYING, P.C.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

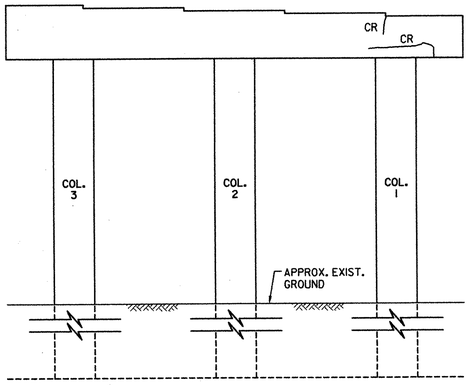
Town Of BOLTON	Bridge No. 51S
Highway No. I-89	Log Sta. / Surv. Sta.
I-89 SB OVER U.S. ROUTE 2 & JOINER BROOK	
EXIST. SUBSTR. CONDITION (51S) (1 OF 4)	
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51spiers	Date 10/99
Bridge Sheet No. **SC-20**	Sheet 154 of 307



(PIER 2 SIDE)



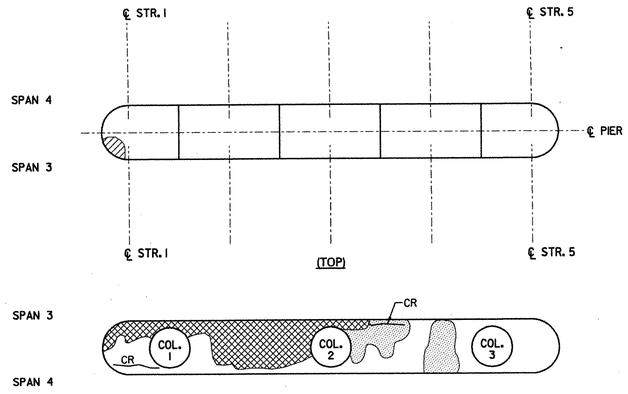
(PIER 3 SIDE)



(PIER 4 SIDE)

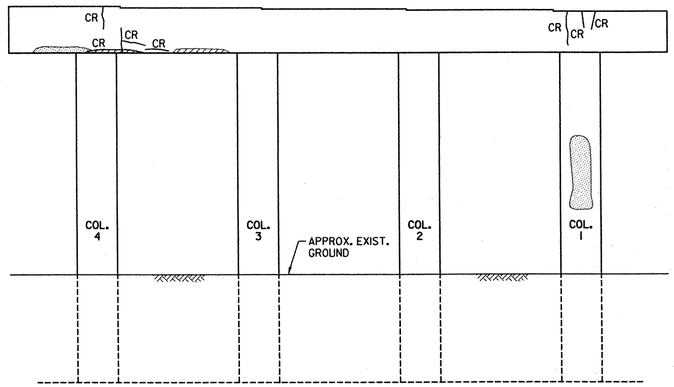
PIER 3 ELEVATIONS

SCALE: 3/16"=1'-0"



PIER 3 CAP

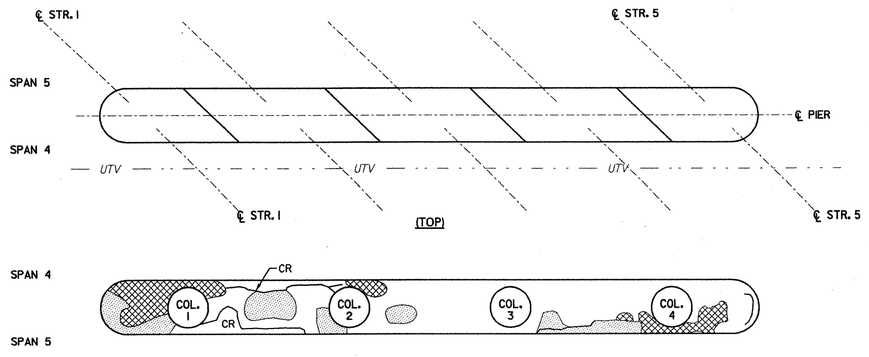
SCALE: 3/16"=1'-0"



(PIER 5 SIDE)

PIER 4 ELEVATIONS

SCALE: 3/16"=1'-0"



PIER 4 CAP

SCALE: 3/16"=1'-0"

ABBREVIATIONS

CR	CRACK
PA	PREVIOUSLY PATCHED AREA

LEGEND

- CRACK
- DELAMINATED AREA
- SPALLED AREA
- DEEPLY SPALLED WITH EXPOSED REBAR
- UNDERGROUND CABLE TV — UTV — · · —
- EXISTING GROUND

STATE OF VERMONT
AGENCY OF TRANSPORTATION

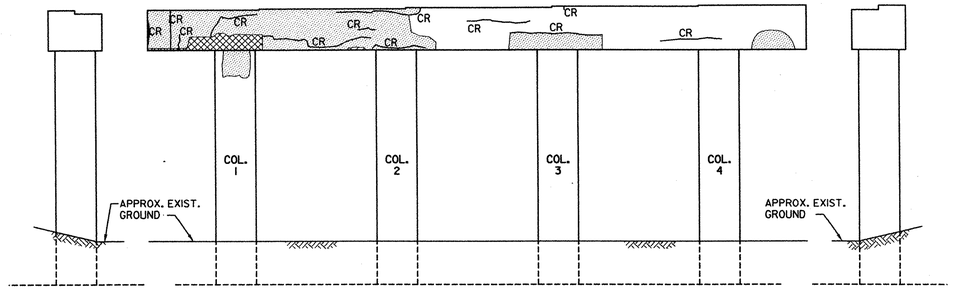
Town Of BOLTON	Bridge No. 51S
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 SB OVER U.S. ROUTE 2 & JOINER BROOK

EXIST. SUBSTR. CONDITION (51S) (2 OF 4)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51splers	Date 10/99
Bridge Sheet No. SC-21	Sheet 155 of 307

TVGA ENGINEERING, SURVEYING, P.C.



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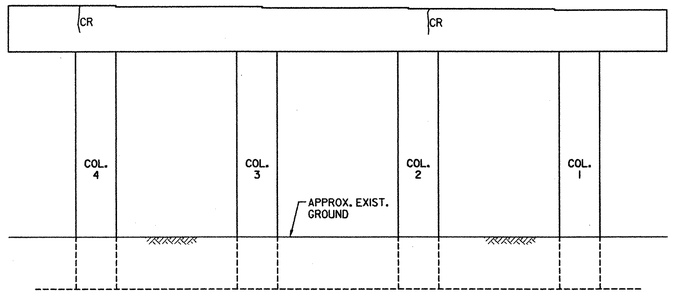
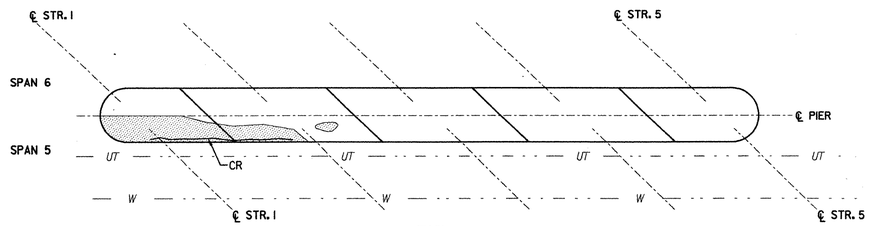


(ABUT. 2 SIDE)

PIER 5 ELEVATIONS

SCALE: 3/16"=1'-0"



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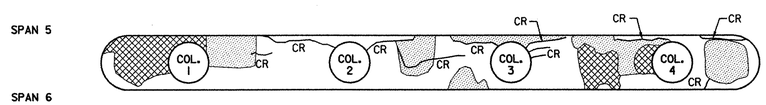


(BOTTOM)

PIER 5 CAP

SCALE: 3/16"=1'-0"

ABBREVIATIONS

CR	CRACK
PA	PREVIOUSLY PATCHED AREA

LEGEND

- CRACK
- DELAMINATED AREA
- SPALLED AREA
- DEEPLY SPALLED WITH EXPOSED REBAR
- UNDERGROUND TELEPHONE — UT —
- WATERLINE — W —
- EXISTING GROUND

STATE OF VERMONT
AGENCY OF TRANSPORTATION

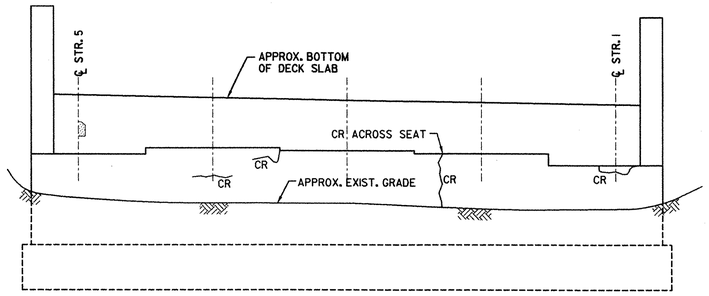
Town Of BOLTON	Bridge No. 51S
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 SB OVER U.S. ROUTE 2 & JOINER BROOK

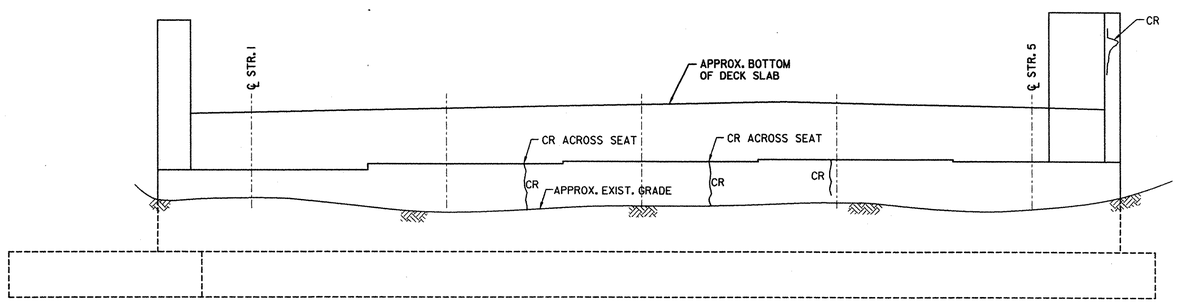
EXIST. SUBSTR. CONDITION (51S) (3 OF 4)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51spiers	Date 10/99
Bridge Sheet No. SC-22	Sheet 156 of 307

TVGA ENGINEERING, SURVEYING, P.C.



ABUT. 1 ELEVATION
SCALE: 1/4"=1'-0"



ABUT. 2 ELEVATION
SCALE: 1/4"=1'-0"

ABBREVIATIONS

CR	CRACK
PA	PREVIOUSLY PATCHED AREA

LEGEND

CRACK
DELAMINATED AREA
SPALLED AREA
DEEPLY SPALLED WITH EXPOSED REBAR
EXISTING GROUND

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. **51S**
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 SB OVER U.S. ROUTE 2 & JOINER BROOK

EXIST. SUBSTR. CONDITION (51S) (4 OF 4)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. 51abut	Date 10/99
Bridge Sheet No. **SC-23**	Sheet 157 of 307

TVGA ENGINEERING, SURVEYING, P.C.

TRAFFIC CONTROL NOTES

1. ALL TRAFFIC CONTROL DEVICES AND PLANS SHALL CONFORM TO THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) "GREEN BOOK", THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND VERMONT AGENCY OF TRANSPORTATION (VAOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION 2001. THE RESIDENT ENGINEER SHALL HAVE THE AUTHORITY TO ALTER ALL TRAFFIC CONTROL PLANS IN THE FIELD AS NECESSARY.

2. THE CONTRACTOR IS NOTIFIED THAT AN EMERGENCY ACCESS GATE IS LOCATED AT APPROXIMATELY STATION 1132+50 (MM 70.25) NORTHBOUND. THE CONTRACTOR SHALL NOT AT ANY TIME THROUGHOUT THE CONSTRUCTION PERIOD USE OR BLOCK THE EXISTING EMERGENCY ACCESS GATE. A NEW PERMANENT U-TURN IS TO BE CONSTRUCTED DIRECTLY ACROSS FROM THE EMERGENCY ACCESS PRIOR TO ANY CONSTRUCTION ACTIVITY. ONCE CONSTRUCTED, THE NEW U-TURN AND THE EMERGENCY ACCESS GATE SHALL NOT BE OBSTRUCTED AT ANY TIME. THE CONTRACTOR SHALL NOTIFY AND COORDINATE ALL CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE EMERGENCY ACCESS GATE AND U-TURN WITH ALL ASSOCIATED EMERGENCY SERVICES PRIOR TO ANY CONSTRUCTION ACTIVITY.

3. THE NEW PERMANENT U-TURN SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD B-17. THE EXISTING SLOPES SHALL BE STRIPPED OF ALL EXISTING TOPSOIL PRIOR TO PLACEMENT OF ITEM 301.15 "SUBBASE OF GRAVEL". SUBBASE OF GRAVEL SHALL BE PLACED TO A MINIMUM DEPTH OF 24 INCHES AND THE FINISH SURFACE SHALL BE 6 INCHES OF ITEM 406.25 "BITUMINOUS CONCRETE PAVEMENT". A NEW 18 INCH CPEP SHALL BE PLACED IN THE NEW U-TURN TO MAINTAIN POSITIVE DRAINAGE TO EXISTING DRAINAGE STRUCTURES. PAYMENT FOR THE NEW PIPE SHALL BE UNDER ITEM 601.0915 "18 INCH CPEP". ANY WORK NECESSARY TO REMOVE THE EXISTING TOPSOIL AND LOAM AND SEED THE FINISHED SLOPES SHALL BE CONSIDERED INCIDENTAL TO ITEM 641.10 "TRAFFIC CONTROL". THE EXISTING U-TURN SIGNS SHALL BE REMOVED AND SALVAGED TO NEW POSTS IN THE NEW PERMANENT U-TURN. PAYMENT FOR THIS WORK SHALL BE UNDER ITEMS 675.50 "REMOVING SIGNS", 675.60 "ERECTING SALVAGED SIGNS", AND 675.341 "SQUARE TUBE STEEL SIGN POSTS & ANCHOR", RESPECTIVELY.

4. TRAFFIC SHALL BE CONTROLLED AND MAINTAINED AT ALL TIMES THROUGHOUT ALL PHASES OF THIS PROJECT IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS OR AS DIRECTED BY THE RESIDENT ENGINEER.

5. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING TRAFFIC CONTROL FOR ALL SIDELINES WHICH WILL REQUIRE LANE CLOSURES ASSOCIATED WITH THIS PROJECT IN ACCORDANCE WITH APPLICABLE STANDARDS. THE CONTRACTOR SHALL DEVELOP A PLAN TO CONTROL TRAFFIC FOR EACH SIDELINE WHICH WILL REQUIRE A LANE CLOSURE AND SUBMIT THIS PLAN TO THE RESIDENT ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL RE-ESTABLISH TWO WAY TRAFFIC ON SIDELINE ROADS PRIOR TO LEAVING THE SITE ON A DAILY BASIS. LANE CLOSURES WILL NOT BE ALLOWED AT NIGHT OR ON WEEKENDS UNLESS APPROVED BY THE RESIDENT ENGINEER. ALL WORK ASSOCIATED WITH SIDELINE TRAFFIC CONTROL SHALL BE INCIDENTAL TO ITEM 641.10, "TRAFFIC CONTROL".

6. TRAFFIC CONTROL MEASURES WILL NOT BE PERMITTED BETWEEN THE DATES OF NOVEMBER 15 AND APRIL 15 UNLESS OTHERWISE APPROVED BY THE RESIDENT ENGINEER. IN ADDITION, ONCE TRAFFIC CONTROL DEVICES HAVE BEEN INSTALLED, THE CONTRACTOR SHALL BEGIN ASSOCIATED BRIDGE WORK IMMEDIATELY AND PROCEED IN A TIMELY MANNER THROUGH COMPLETION IN ORDER TO MINIMIZE INCONVENIENCE TO THE TRAVELING PUBLIC.

7. THE CONTRACTOR SHALL SUBMIT TRAFFIC CONTROL PLANS AND SCHEDULES FOR ALL WORK ASSOCIATED WITH THIS PROJECT TO THE RESIDENT ENGINEER FOR APPROVAL PRIOR TO ANY CONSTRUCTION ACTIVITY.

8. THE NUMBER AND LOCATION OF REFLECTORIZED PLASTIC DRUMS, TYPE III BARRICADES AND DELINEATORS SHOWN ON THESE PLANS ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL LOCATIONS IN ACCORDANCE WITH THE APPLICABLE STANDARDS PRIOR TO PLACEMENT.

9. MILE MARKERS REFERENCED IN THE DRAWINGS SHALL NOT BE USED FOR LAYOUT PURPOSES; THEY ARE INTENDED FOR REFERENCE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL MILE MARKERS AND STATIONING NECESSARY TO DESIGN AND CONSTRUCT ALL TRAFFIC CONTROL RELATED ITEMS.

10. NO PRIVATE VEHICLES BELONGING TO THE CONTRACTOR'S EMPLOYEES SHALL BE PARKED ON THE INTERSTATE RIGHT-OF-WAY AND/OR THE TRAVELED WAY OF ANY PUBLIC THOROUGHFARE AT ANY TIME THROUGHOUT THE CONSTRUCTION PERIOD.

11. ANY CLEARING AND GRUBBING DEEMED NECESSARY TO CONSTRUCT CROSSOVERS SHALL BE INCIDENTAL TO ITEM 635.10, "MOBILIZATION".

12. ALL EXISTING PAVEMENT MARKINGS IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS AS SHOWN IN THE STANDARD E-103, E-104 AND E-104A, SHALL BE COVERED WITH ITEM 646.86 "BLACK PAVEMENT MARKING MASKING TAPE." WHEN APPLIED, THE BLACK PAVEMENT MARKING MASKING TAPE SHALL BE CUT AT 100' INTERVALS TO PREVENT UNRAVELING.

13. TEMPORARY PAVEMENT MARKINGS ON THE CROSSOVERS IN THE MEDIAN SHALL BE PAID AS ITEMS 646.60 "TEMPORARY 4" WHITE LINE" AND 646.61 "TEMPORARY 4" YELLOW LINE". TEMPORARY PAVEMENT MARKINGS THROUGHOUT THE REST OF THE TRAFFIC CONTROL PACKAGE SHALL BE PAID AS ITEMS 646.60 "TEMPORARY 4" WHITE LINE (TAPE, TYPE II) AND 646.61 "TEMPORARY 4" YELLOW LINE (TAPE, TYPE II).

14. IN ACCORDANCE WITH STD E-103, ITEM 646.81 "RAISED PAVEMENT MARKERS, TYPE II" SHALL BE PLACED AT 20 FOOT INTERVALS.

15. PAYMENT FOR PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE UNDER ITEM 641.15 "PORTABLE CHANGEABLE MESSAGE SIGN" AND PAYMENT FOR FLASHING ARROW PANELS SHALL BE UNDER ITEM 641.16 "PORTABLE ARROW BOARD." PAYMENT FOR TRAFFIC CONTROL SIGNS, PLASTIC DRUMS, DELINEATORS, FLEXIBLE TUBULAR MARKERS, TYPE III BARRICADES AND TYPE III (MOD.) BARRICADES SHALL BE UNDER ITEM 641.10 "TRAFFIC CONTROL". PAYMENT SHALL INCLUDE ALL NECESSARY MAINTENANCE AND REPAIRS TO THESE TRAFFIC CONTROL DEVICES ON A DAILY BASIS. THE ENGINEER MAY ADD TRAFFIC CONTROL SIGNS AS NECESSARY. ADDITIONAL SIGNS, INCLUDING POSTS AND FOUNDATIONS, SHALL BE PAID FOR AS ITEM 675.20, "TRAFFIC SIGNS, TYPE A (MOD.)" IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

16. THE CONTRACTOR SHALL KEEP AN EXTRA PORTABLE CHANGEABLE MESSAGE BOARD AND A PORTABLE ARROW BOARD ON SITE TO BE USE AS A "BACK-UP" IN THE EVENT THAT A PORTABLE CHANGEABLE MESSAGE BOARD OR A PORTABLE ARROW BOARD IS RENDERED INOPERATIVE. PAYMENT FOR ADDITIONAL PORTABLE CHANGEABLE MESSAGE BOARD AND PORTABLE ARROW BOARD SHALL BE PAID FOR UNDER ITEMS 641.15 AND 641.16 RESPECTIVELY.

17. FOR CLARITY, NOT ALL EXISTING SIGNS ARE SHOWN ON THE PLANS. CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING SIGNS IN THE FIELD. PLACEMENT OF CONSTRUCTION SIGNS SHALL BE DIRECTED BY THE RESIDENT ENGINEER WHERE CONFLICTS WITH EXISTING SIGNS OCCUR.

18. THE CONTRACTOR SHALL COVER OR REMOVE ANY SIGNS THAT CONTRADICT TEMPORARY TRAFFIC CONTROL SIGNS. ALL SIGNS REMOVED OR COVERED BY THE CONTRACTOR SHALL BE REPLACED OR UNCOVERED BY THE CONTRACTOR WHEN THE TRAFFIC CONTROL PLAN IS DISASSEMBLED. PAYMENT FOR REMOVAL AND REPLACEMENT, COVERING AND UNCOVERING OF SIGNS AND PLACEMENT AND REMOVAL OF TEMPORARY OVERLAYS SHALL BE INCIDENTAL TO ITEM 641.10, "TRAFFIC CONTROL". ANY DAMAGE TO EXISTING SIGNS BY THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR WITH NO EXTRA COMPENSATION.

19. DURING BRIDGE REHABILITATION OPERATIONS, TRAVEL LANES UNDER THE BRIDGE SHALL BE PROTECTED BY ENCLOSING THE AREA BELOW THE DECK (WITHOUT REDUCING OVERHEAD CLEARANCE). THE CONTRACTOR SHALL SUBMIT DETAILS OF PROTECTIVE ENCLOSURES TO THE RESIDENT ENGINEER FOR APPROVAL. COSTS FOR PROVIDING PROTECTIVE ENCLOSURES SHALL BE PAID FOR UNDER ITEM 527.11 "TRAFFIC PROTECTION FOR BRIDGE PROJECT".

20. WHERE CROSSOVERS ARE TO BE PLACED, EXISTING SLOPES SHALL BE STRIPPED OF TOPSOIL AND BENCHED AS DIRECTED BY THE ENGINEER. FILL MATERIAL SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT AND SHALL BE FREE OF EXCESSIVE AMOUNTS OF MOISTURE, ORGANICS, AND SILTS. SUBBASE MATERIAL SHALL BE APPROVED BY THE RESIDENT ENGINEER PRIOR TO PLACEMENT AND SHALL BE PLACED TO A MAXIMUM DEPTH OF 12 INCHES. PAVING OF CROSSOVER DETOURS SHALL BE PAID FOR AS ITEM 406.25, "BITUMINOUS PAVEMENT, TYPE III". THE PAVEMENT SHALL BE PLACED IN A SINGLE COURSE OF 3 INCHES OF DEPTH. THE COST OF ALL OTHER WORK REQUIRED FOR THE DESIGN, CONSTRUCTION AND REMOVAL OF CROSSOVERS SHALL BE INCIDENTAL TO ITEM 641.10 "TRAFFIC CONTROL".

21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING, MAINTAINING AND REMOVING TEMPORARY DRAINAGE STRUCTURES AS NECESSARY TO MAINTAIN POSITIVE DRAINAGE TO EXISTING DRAINAGE STRUCTURES (IE: CATCH BASINS, CULVERTS) WHICH COULD BECOME BLOCKED FROM INSTALLATION OF THE CROSSOVERS. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING DRAINAGE STRUCTURES AND SUBMIT A TEMPORARY DRAINAGE PLAN FOR EACH CROSS OVER TO THE RESIDENT ENGINEER FOR APPROVAL. PAYMENT FOR DEVELOPMENT OF THIS PLAN AND ALL CONSTRUCTION ACTIVITIES ASSOCIATED WITH TEMPORARY DRAINAGE SHALL BE CONSIDERED INCIDENTAL TO ITEM 641.10, "TRAFFIC CONTROL".

NOTE: THESE PLANS WERE ORIGINALLY PART OF THE MIDDLESEX-BOLTON IM 089-2(26) PROJECT, WHICH INCLUDED BRIDGES 43N&S, 48N&S, 49N&S, 50N&S, AND 51N&S. THESE PLANS HAVE BEEN SEPARATED FROM THAT PROJECT TO FORM A NEW CONSTRUCTION CONTRACT FOR BRIDGES 51N&S ONLY. ANY REFERENCE IN THESE PLANS OR IN THE SPECIFICATIONS TO BRIDGES 43N&S, 48N&S, 49N&S, OR 50N&S SHALL BE IGNORED.

DuBois & King inc.
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STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. -
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 PHASE I & PHASE II CONSTRUCTION

TRAFFIC CONTROL NOTES

Designed By J.M.SMYRSKI/K.S.MARSHIA	Drawn By S. E. SCHMITT
Checked By J. W. TUCKER Date 06/04	Bridge Design Supervisor J. P. HALSTEAD Date 06/04
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
Drawing No. TRAFFICO.DGN	Date 06/04
Bridge Sheet No. TC-1A	Sheet 160 of 307

TRAFFIC CONTROL NOTES (CONT.)

22. NOT USED

23. WHERE CROSSOVERS TRAVERSE AN EXISTING U-TURN, THE CONTRACTOR SHALL MAINTAIN A SMOOTH TRANSITION THROUGHOUT THE CROSSOVER. ANY EXCAVATION OR FILL NECESSARY TO PROVIDE A SMOOTH TRANSITION DURING CONSTRUCTION AND RETURN THE U-TURN TO ORIGINAL CONDITION AS DIRECTED BY THE RESIDENT ENGINEER SHALL BE INCIDENTAL TO ITEM 641.10 'TRAFFIC CONTROL'.

24. ALL GUARDRAIL, BRIDGE APPROACH RAIL OR BRIDGE RAIL THAT IS LAPPED IN THE OPPOSITE DIRECTION OF TRAVEL SHALL BE TEMPORARILY RESET TO PROVIDE LAPS IN THE DIRECTION OF TRAVEL. ANY WORK REQUIRED TO CHANGE DIRECTION OF THE LAPS DURING CONSTRUCTION AND RESTORE TO ORIGINAL CONDITION AFTER CONSTRUCTION OR RESET RAILING SHALL BE INCIDENTAL TO ITEM 641.10 'TRAFFIC CONTROL'.

25. WHERE END TERMINALS DO NOT MEET APPLICABLE STANDARDS FOR APPROACHING TRAFFIC WITHIN THE CROSSOVERS, THE EXISTING END TERMINALS WILL BE REMOVED AND A MANUFACTURED TERMINAL SECTION (MTS) SHALL BE INSTALLED AND PAID AS ITEM 621.505 'MANUFACTURED TERMINAL SECTION'. UPON REMOVAL OF THE CROSSOVER, THE MANUFACTURED TERMINAL SECTION SHALL BE REMOVED, DELIVERED TO THE VAOT MIDDLESEX MAINTENANCE FACILITY AND THE ORIGINAL END TERMINAL INSTALLED. PAYMENT FOR REMOVAL OF THE MANUFACTURED TERMINAL SECTION AND INSTALLATION OF THE EXISTING END TERMINAL SHALL BE INCIDENTAL TO ITEM 641.10 'TRAFFIC CONTROL'.

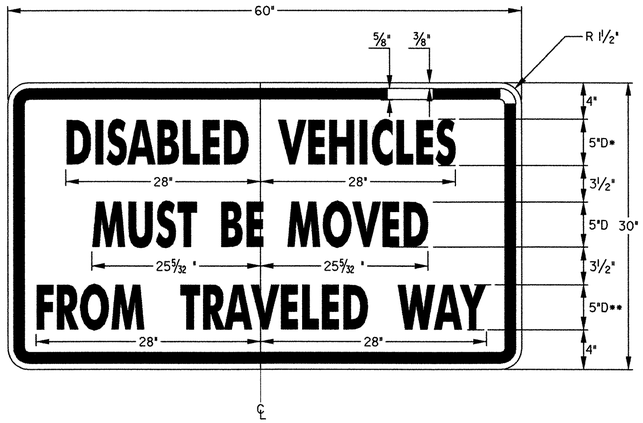
26. THE CONTRACTOR SHALL REPLACE ALL DELINEATOR POSTS, DELINEATORS, GUARDRAIL, APPROACH RAIL AND BRIDGE RAIL THAT IS DAMAGED OR DESTROYED BY THE CONTRACTOR WITH NO ADDITIONAL COMPENSATION.

27. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF THE CROSSOVERS AND RE-ESTABLISHMENT OF TURF AND VEGETATION ON ALL PORTIONS OF THE SITE THAT HAVE BEEN DISTURBED DURING CONSTRUCTION. ALL COSTS FOR THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 641.10, 'TRAFFIC CONTROL.'

28. THE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE FOR ALL EXISTING DRAINAGE STRUCTURES AND SYSTEMS. NO STAGNATION OF OR EROSION FROM STORMWATER SHALL BE PERMITTED ON ACCOUNT OF TEMPORARILY CONSTRUCTED TRAFFIC CONTROL STRUCTURES OR DEVICES. PAYMENT FOR THIS WORK WILL BE CONSIDERED INCIDENTAL TO ITEM 641.10, 'TRAFFIC CONTROL.'

29. NOT USED

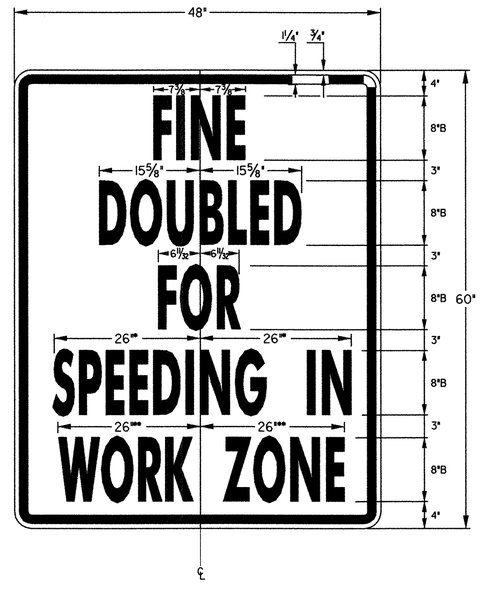
30. ALL EXISTING 65 MILE PER HOUR SPEED LIMIT SIGNS LOCATED WITHIN THE LIMITS OF THE TRAFFIC CONTROL SHOWN ON THESE SHEETS SHALL BE COVERED DURING CONSTRUCTION. PAYMENT FOR COVERING AND UNCOVERING OF SIGN SHALL BE INCIDENTAL TO ITEM 641.10 'TRAFFIC CONTROL'.



VC-838

* REDUCE SPACING BY 5%
** REDUCE SPACING BY 13%

COLORS: BLACK TEXT AND BORDER
WITH REFLECTORIZED ORANGE BACKGROUND



VR-355

EXPWY FWY 26"* REDUCE SPACING BY 12%
EXPWY FWY 26"** REDUCE SPACING BY 7.7%

COLORS: BLACK TEXT AND BORDER
WITH WHITE REFLECTORIZED BACKGROUND

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STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. -
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 PHASE I & PHASE II CONSTRUCTION

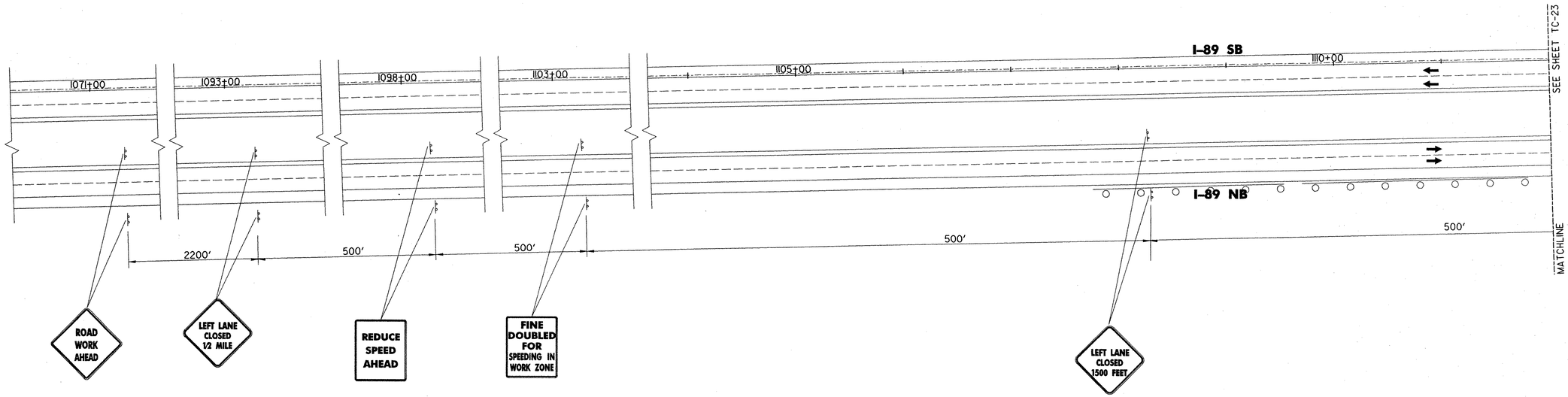
TRAFFIC CONTROL NOTES

Designed By J.M.SMYRSKI/K.S.MARSHIA	Drawn By S. E. SCHMITT
Checked By J. W. TUCKER Date 06/04	Bridge Design Supervisor J. P. HALSTEAD Date 06/04
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
Drawing No. TRAFFICO.DGN	Date 06/04
Bridge Sheet No. TC-18	Sheet 161 of 307

LEGEND

- CONCRETE BARRIER
- DIRECTION OF TRAFFIC FLOW WITH DETOUR IN PLACE
- CROSSOVER ALIGNMENT
- BRIDGE WORK AREA
- LEDGE OUTCROPPING
- GUARDRAIL
- EXISTING DROP INLET
- PORTABLE ARROW BOARD
- TYPE I DELINEATOR (YELLOW)
- TYPE I DELINEATOR (WHITE)
- REFLECTORIZED PLASTIC DRUM
- 4" TEMPORARY PAVEMENT MARKINGS
- TYPE III BARRICADE
- TYPE III (MOD) BARRICADE
- APPROXIMATE CULVERT LOCATION

N



50 0 25 50 100 200

SCALE IN FEET

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51
Highway No. I-89	Log Sta. / Surv. Sta.

PHASE II CONSTRUCTION I-89 SOUTHBOUND CROSSOVER

BRIDGE 51

Designed By J.M.SMYRSKI/K.S.MARSHIA	Drawn By S. E. SCHMITT
Checked By J. W. TUCKER Date 10/99	Bridge Design Supervisor J. P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
Drawing No. ...\51-SB.DGN	Date OCT 1999
Bridge Sheet No. TC-22	Sheet 182 of 307

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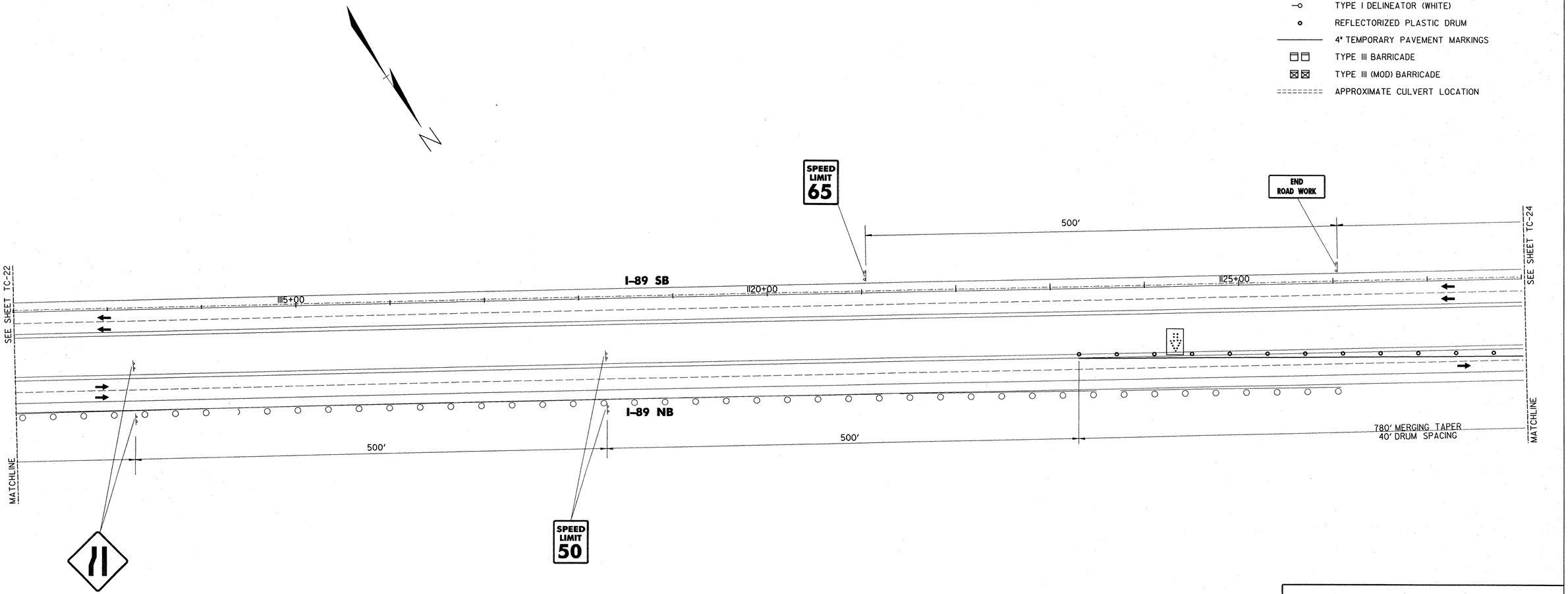
LEGEND

- CONCRETE BARRIER
- DIRECTION OF TRAFFIC FLOW WITH DETOUR IN PLACE
- CROSSOVER ALIGNMENT
- BRIDGE WORK AREA
- LEDGE OUTCROPPING
- GUARDRAIL
- EXISTING DROP INLET
- PORTABLE ARROW BOARD
- TYPE I DELINEATOR (YELLOW)
- TYPE I DELINEATOR (WHITE)
- REFLECTORIZED PLASTIC DRUM
- 4" TEMPORARY PAVEMENT MARKINGS
- TYPE III BARRICADE
- TYPE III (MOD) BARRICADE
- APPROXIMATE CULVERT LOCATION



STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51
Highway No. I-89	Log Sta. / Surv. Sta.

PHASE II CONSTRUCTION I-89 SOUTHBOUND CROSSOVER

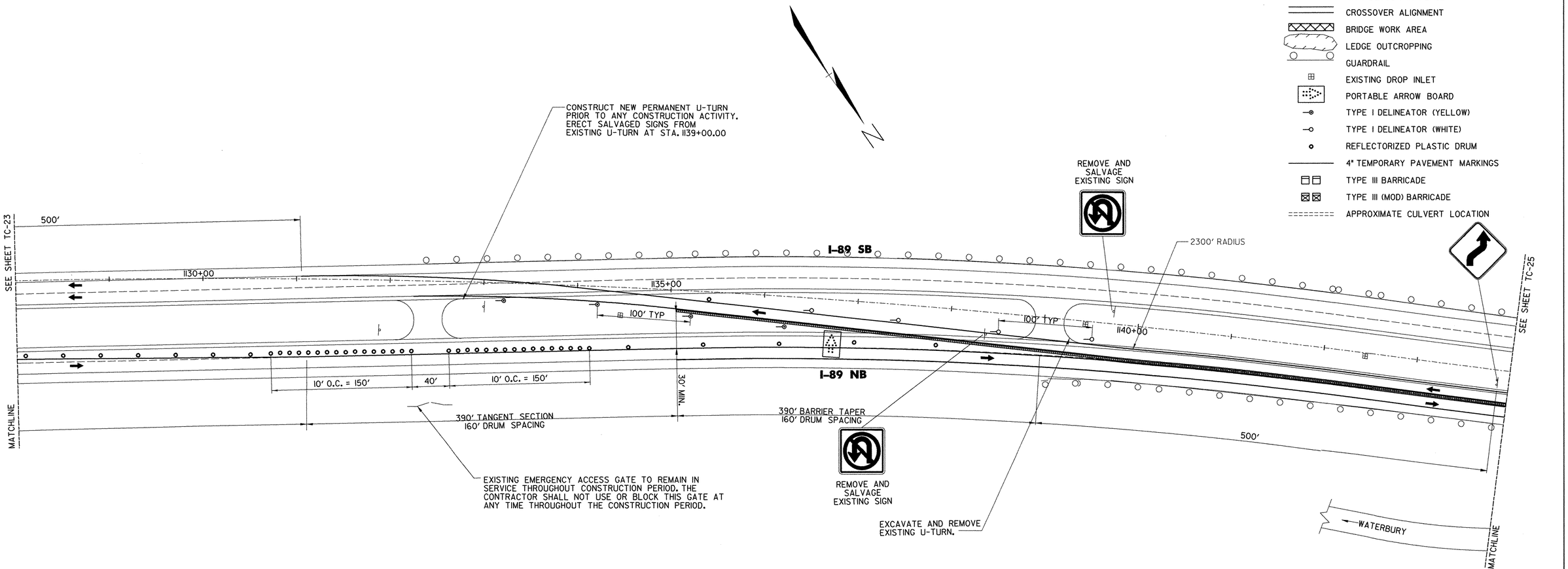
BRIDGE 51

Designed By J.M.SMYRSKI/K.S.MARSHIA	Drawn By S. E. SCHMITT
Checked By J. W. TUCKER Date 10/99	Bridge Design Supervisor J. P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
Drawing No. ...\SI-SB.DGN	Date OCT 1999
Bridge Sheet No. TC-23	Sheet 183 of 307

DuBois & King inc.
engineering planning management development

LEGEND

- CONCRETE BARRIER
- DIRECTION OF TRAFFIC FLOW WITH DETOUR IN PLACE
- CROSSOVER ALIGNMENT
- BRIDGE WORK AREA
- LEDGE OUTCROPPING
- GUARDRAIL
- EXISTING DROP INLET
- PORTABLE ARROW BOARD
- TYPE I DELINEATOR (YELLOW)
- TYPE I DELINEATOR (WHITE)
- REFLECTORIZED PLASTIC DRUM
- 4" TEMPORARY PAVEMENT MARKINGS
- TYPE III BARRICADE
- TYPE III (MOD) BARRICADE
- APPROXIMATE CULVERT LOCATION



50 0 25 50 100 200

SCALE IN FEET

DuBois & King inc.
engineering planning management development

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. **51**
Highway No. I-89	Log Sta.
	Surv. Sta.

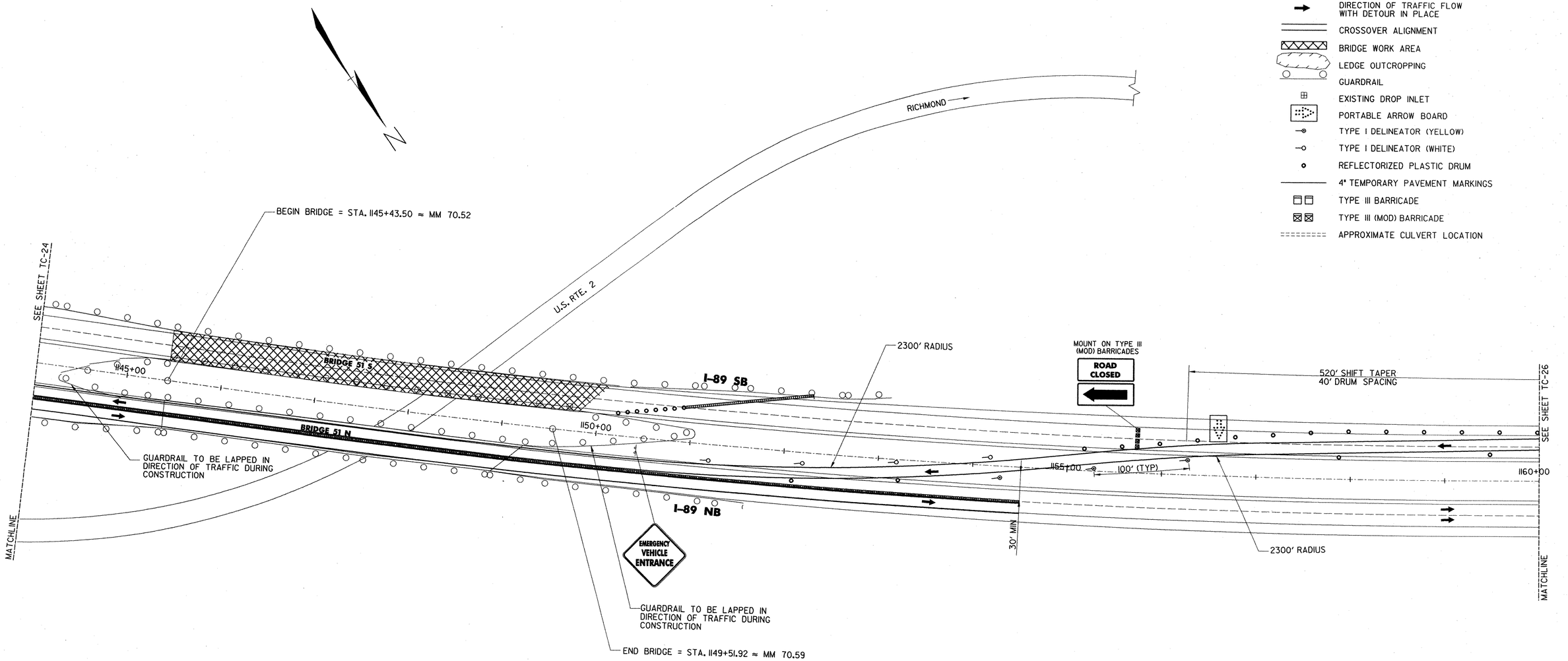
PHASE II CONSTRUCTION I-89 SOUTHBOUND CROSSOVER

BRIDGE 51

Designed By J.M.SMYRSKI/K.S.MARSHIA	Drawn By S. E. SCHMITT
Checked By J. W. TUCKER Date D	Bridge Design Supervisor J. P. HALSTEAD Date D
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
Drawing No. DGN$SPEC$	Date $$$$DATE$$$
Bridge Sheet No. TC-24	Sheet 184 of S

LEGEND

- CONCRETE BARRIER
- DIRECTION OF TRAFFIC FLOW WITH DETOUR IN PLACE
- CROSSOVER ALIGNMENT
- BRIDGE WORK AREA
- LEDGE OUTCROPPING
- GUARDRAIL
- EXISTING DROP INLET
- PORTABLE ARROW BOARD
- TYPE I DELINEATOR (YELLOW)
- TYPE I DELINEATOR (WHITE)
- REFLECTORIZED PLASTIC DRUM
- 4" TEMPORARY PAVEMENT MARKINGS
- TYPE III BARRICADE
- TYPE III (MOD) BARRICADE
- APPROXIMATE CULVERT LOCATION



50 0 25 50 100 200
SCALE IN FEET

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51
Highway No. I-89	Log Sta. / Surv. Sta.

PHASE II CONSTRUCTION I-89 SOUTHBOUND CROSSOVER

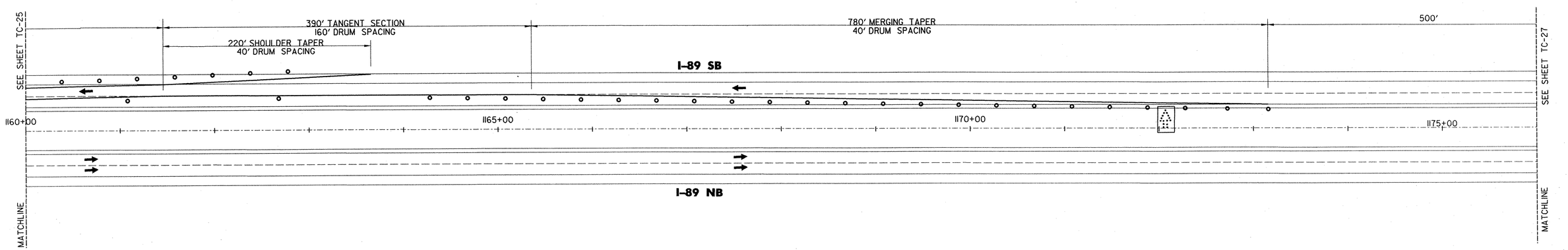
BRIDGE 51

Designed By J.M.SMYRSKI/K.S.MARSHIA	Drawn By S. E. SCHMITT
Checked By J. W. TUCKER Date 10/99	Bridge Design Supervisor J. P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
Drawing No. ...\51-SB.DGN	Date OCT 1999
Bridge Sheet No. TC-25	Sheet 185 of 307

DuBois & King inc.
engineering planning management development

LEGEND

- CONCRETE BARRIER
- DIRECTION OF TRAFFIC FLOW WITH DETOUR IN PLACE
- CROSSOVER ALIGNMENT
- BRIDGE WORK AREA
- LEDGE OUTCROPPING
- GUARDRAIL
- EXISTING DROP INLET
- PORTABLE ARROW BOARD
- TYPE I DELINEATOR (YELLOW)
- TYPE I DELINEATOR (WHITE)
- REFLECTORIZED PLASTIC DRUM
- 4" TEMPORARY PAVEMENT MARKINGS
- TYPE III BARRICADE
- TYPE III (MOD) BARRICADE
- APPROXIMATE CULVERT LOCATION



50 0 25 50 100 200

SCALE IN FEET

DuBois & King inc.
engineering planning management development

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51
Highway No. I-89	Log Sta. / Surv. Sta.

PHASE II CONSTRUCTION I-89 SOUTHBOUND CROSSOVER

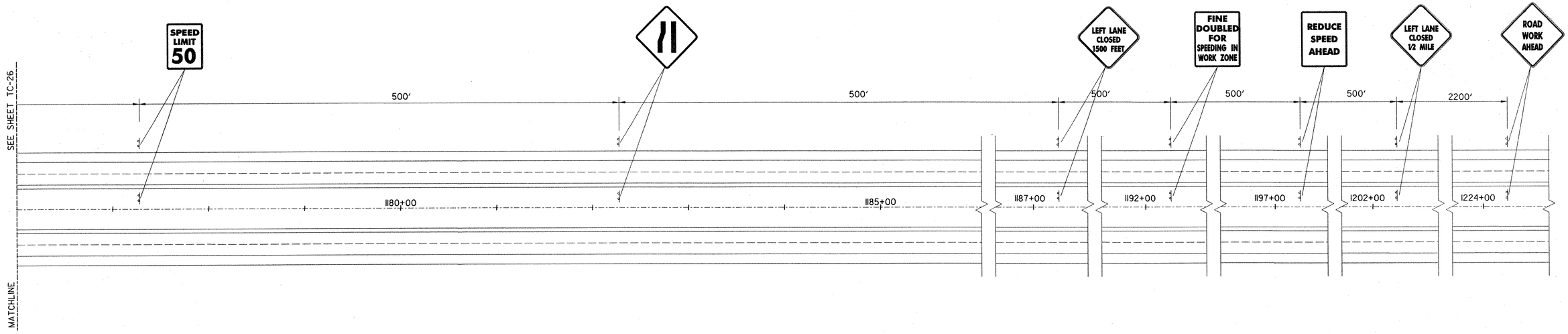
BRIDGE 51

Designed By J.M.SMYRSKI/K.S.MARSHIA	Drawn By S. E. SCHMITT
Checked By J. W. TUCKER Date 10/99	Bridge Design Supervisor J. P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
Drawing No. ...\51-SB.DGN	Date OCT 1999
Bridge Sheet No. TC-26	Sheet 186 of 307

LEGEND

- CONCRETE BARRIER
- DIRECTION OF TRAFFIC FLOW WITH DETOUR IN PLACE
- CROSSOVER ALIGNMENT
- BRIDGE WORK AREA
- LEDGE OUTCROPPING
- GUARDRAIL
- EXISTING DROP INLET
- PORTABLE ARROW BOARD
- TYPE I DELINEATOR (YELLOW)
- TYPE I DELINEATOR (WHITE)
- REFLECTORIZED PLASTIC DRUM
- 4" TEMPORARY PAVEMENT MARKINGS
- TYPE III BARRICADE
- TYPE III (MOD) BARRICADE
- APPROXIMATE CULVERT LOCATION

N



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SCALE IN FEET

DuBois & King inc.
engineering planning management development

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51
Highway No. I-89	Log Sta. / Surv. Sta.

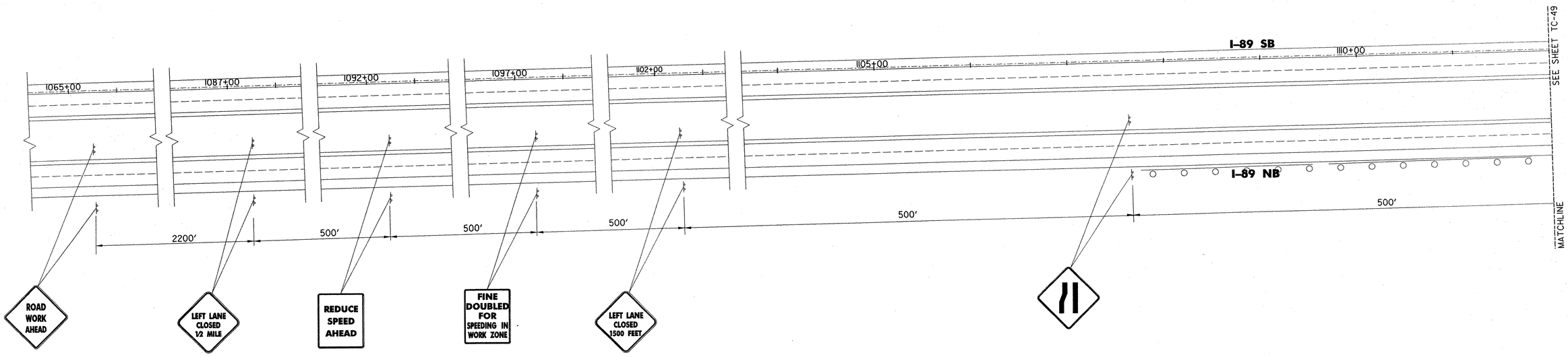
PHASE II CONSTRUCTION I-89 SOUTHBOUND CROSSOVER

BRIDGE 51

Designed By J.M.SMYRSKI/K.S.MARSHIA	Drawn By S. E. SCHMITT
Checked By J. W. TUCKER Date 10/99	Bridge Design Supervisor J. P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
Drawing No. ...\51-SB.DGN	Date OCT 1999
Bridge Sheet No. TC-27	Sheet 187 of 307

LEGEND

- CONCRETE BARRIER
- DIRECTION OF TRAFFIC FLOW WITH DETOUR IN PLACE
- CROSSOVER ALIGNMENT
- BRIDGE WORK AREA
- LEDGE OUTCROPPING
- GUARDRAIL
- EXISTING DROP INLET
- PORTABLE ARROW BOARD
- TYPE I DELINEATOR (YELLOW)
- TYPE I DELINEATOR (WHITE)
- REFLECTORIZED PLASTIC DRUM
- 4" TEMPORARY PAVEMENT MARKINGS
- TYPE III BARRICADE
- TYPE III (MOD) BARRICADE
- APPROXIMATE CULVERT LOCATION



50 0 25 50 100 200

SCALE IN FEET

DuBois & King INC.
engineering planning management development

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51
Highway No. I-89	Log Sta. / Surv. Sta.

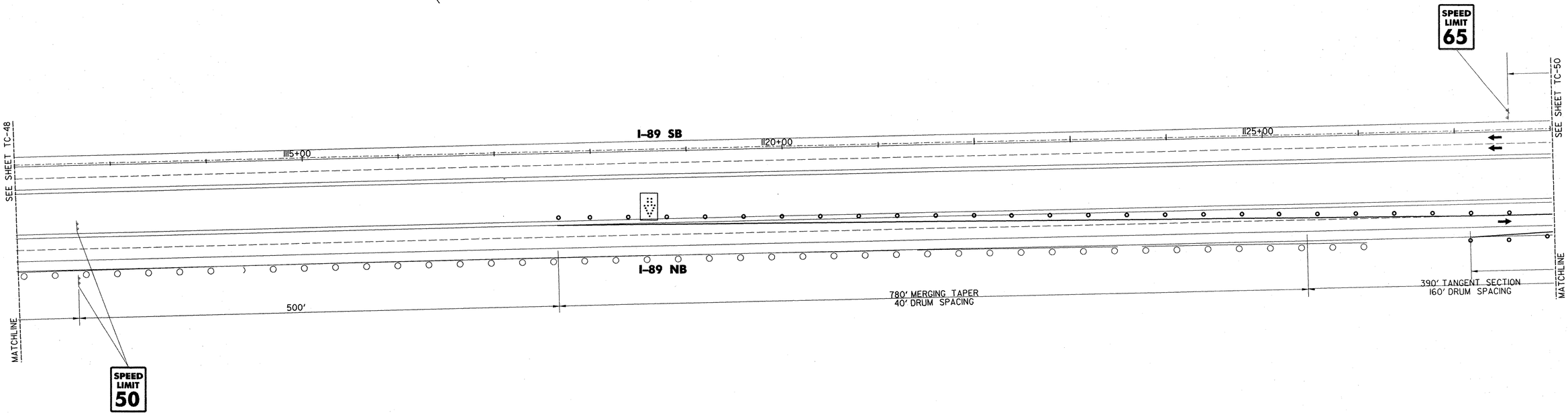
PHASE I CONSTRUCTION I-89 NORTHBOUND CROSSOVER

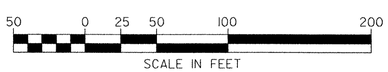
BRIDGE 51

Designed By J.M.SMYRSKI/K.S.MARSHIA	Drawn By S. E. SCHMITT
Checked By J. W. TUCKER Date 10/99	Bridge Design Supervisor J. P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
Drawing No. ...\51-NB.DGN	Date OCT 1999
Bridge Sheet No. TC-48	Sheet 208 of 307

LEGEND

- CONCRETE BARRIER
- DIRECTION OF TRAFFIC FLOW WITH DETOUR IN PLACE
- CROSSOVER ALIGNMENT
- BRIDGE WORK AREA
- LEDGE OUTCROPPING
- GUARDRAIL
- EXISTING DROP INLET
- PORTABLE ARROW BOARD
- TYPE I DELINEATOR (YELLOW)
- TYPE I DELINEATOR (WHITE)
- REFLECTORIZED PLASTIC DRUM
- 4" TEMPORARY PAVEMENT MARKINGS
- TYPE III BARRICADE
- TYPE III (MOD) BARRICADE
- APPROXIMATE CULVERT LOCATION





DuBois & King inc.
engineering planning management development

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51
Highway No. I-89	Log Sta. / Surv. Sta.

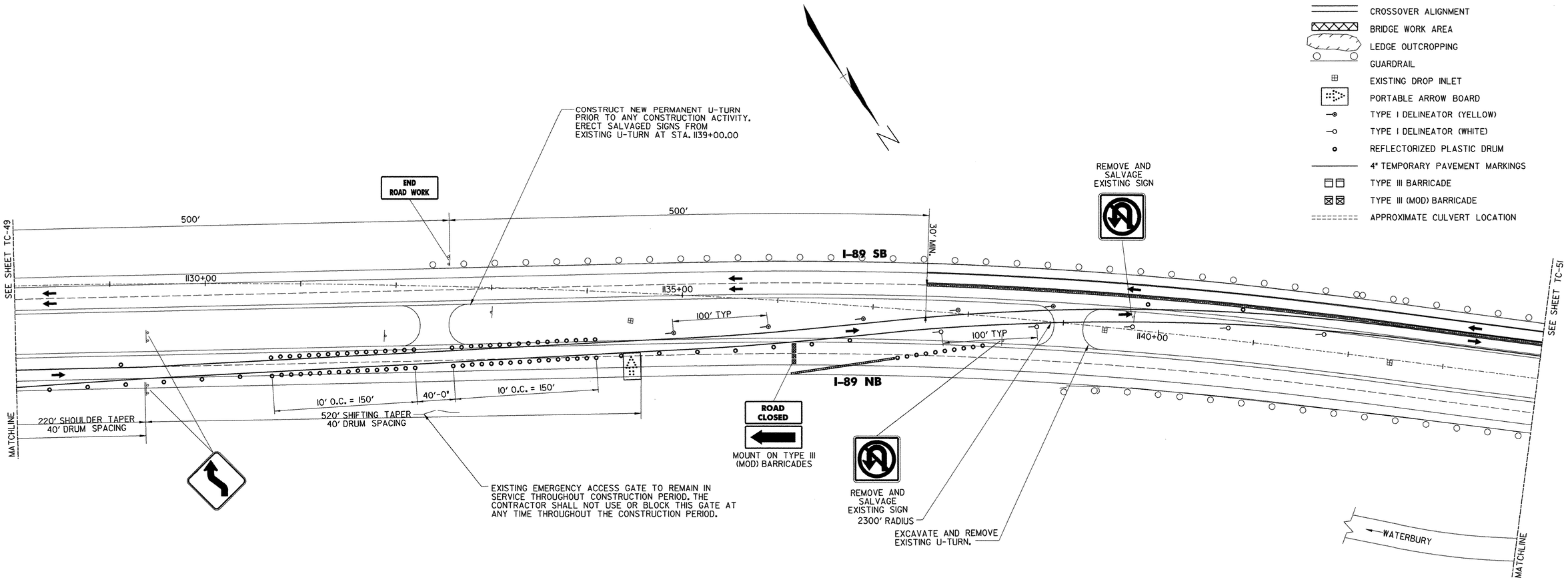
PHASE I CONSTRUCTION I-89 NORTHBOUND CROSSOVER

BRIDGE 51

Designed By J.M.SMYRSKI/K.S.MARSHIA	Drawn By S. E. SCHMITT
Checked By J. W. TUCKER Date 10/99	Bridge Design Supervisor J. P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
Drawing No. ...\51-NB.DGN	Date OCT 1999
Bridge Sheet No. TC-49	Sheet 209 of 307

LEGEND

- CONCRETE BARRIER
- DIRECTION OF TRAFFIC FLOW WITH DETOUR IN PLACE
- CROSSOVER ALIGNMENT
- BRIDGE WORK AREA
- LEDGE OUTCROPPING
- GUARDRAIL
- EXISTING DROP INLET
- PORTABLE ARROW BOARD
- TYPE I DELINEATOR (YELLOW)
- TYPE I DELINEATOR (WHITE)
- REFLECTORIZED PLASTIC DRUM
- 4" TEMPORARY PAVEMENT MARKINGS
- TYPE III BARRICADE
- TYPE III (MOD) BARRICADE
- APPROXIMATE CULVERT LOCATION



50 0 25 50 100 200

SCALE IN FEET

DuBois & King inc.
engineering planning management development

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51
Highway No. I-89	Log Sta. / Surv. Sta.

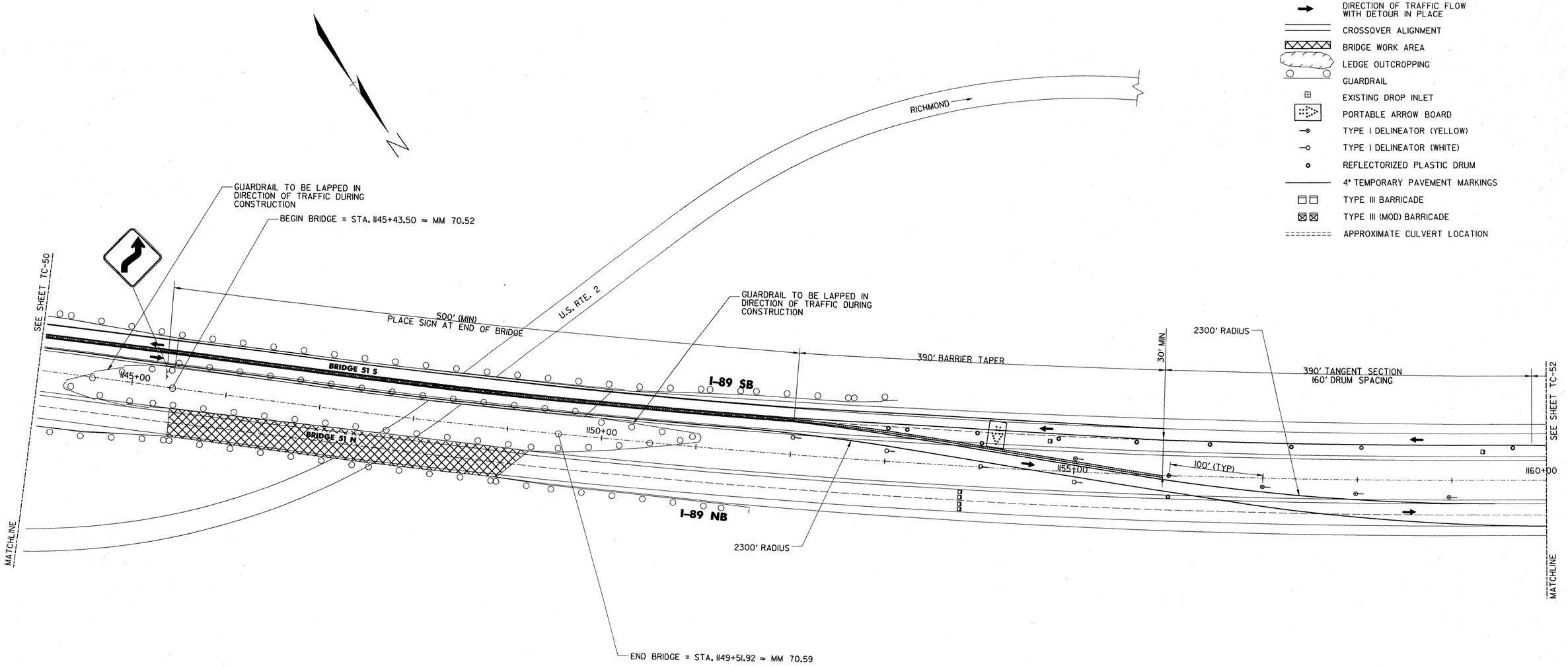
PHASE I CONSTRUCTION I-89 NORTHBOUND CROSSOVER

BRIDGE 51

Designed By J.M.SMYRSKI/K.S.MARSHIA	Drawn By S. E. SCHMITT
Checked By J. W. TUCKER Date 06/04	Bridge Design Supervisor J. P. HALSTEAD Date 06/04
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
Drawing No. 51-NB.DGN	Date 06/04
Bridge Sheet No. TC-50	Sheet 210 of 307

LEGEND

- CONCRETE BARRIER
- DIRECTION OF TRAFFIC FLOW WITH DETOUR IN PLACE
- CROSSOVER ALIGNMENT
- BRIDGE WORK AREA
- LEDGE OUTCROPPING
- GUARDRAIL
- EXISTING DROP INLET
- PORTABLE ARROW BOARD
- TYPE I DELINEATOR (YELLOW)
- TYPE I DELINEATOR (WHITE)
- REFLECTORIZED PLASTIC DRUM
- 4" TEMPORARY PAVEMENT MARKINGS
- TYPE III BARRICADE
- TYPE III (MOD) BARRICADE
- APPROXIMATE CULVERT LOCATION



50 0 25 50 100 200

SCALE IN FEET

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51
Highway No. I-89	Log Sta. / Surv. Sta.

PHASE I CONSTRUCTION I-89 NORTHBOUND CROSSOVER

BRIDGE 51

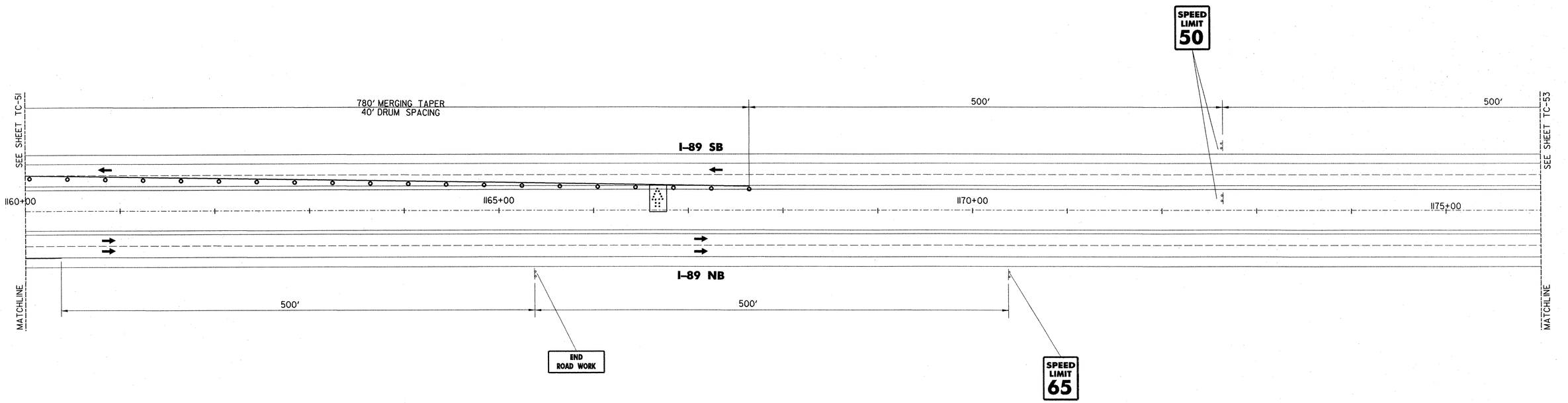
Designed By J.M.SMYRSKI/K.S.MARSHIA	Drawn By S. E. SCHMITT
Checked By J. W. TUCKER Date 10/99	Bridge Design Supervisor J. P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
Drawing No. ...\51-NB.DGN	Date OCT 1999
Bridge Sheet No. TC-51	Sheet 211 of 307

DuBois & King INC.
engineering planning management development

LEGEND

- CONCRETE BARRIER
- DIRECTION OF TRAFFIC FLOW WITH DETOUR IN PLACE
- CROSSOVER ALIGNMENT
- BRIDGE WORK AREA
- LEDGE OUTCROPPING
- GUARDRAIL
- EXISTING DROP INLET
- PORTABLE ARROW BOARD
- TYPE I DELINEATOR (YELLOW)
- TYPE I DELINEATOR (WHITE)
- REFLECTORIZED PLASTIC DRUM
- 4" TEMPORARY PAVEMENT MARKINGS
- TYPE III BARRICADE
- TYPE III (MOD) BARRICADE
- APPROXIMATE CULVERT LOCATION

N



50 0 25 50 100 200

SCALE IN FEET

DuBois & King inc.
engineering planning management development

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No. 51
Highway No. I-89	Log Sta. / Surv. Sta.

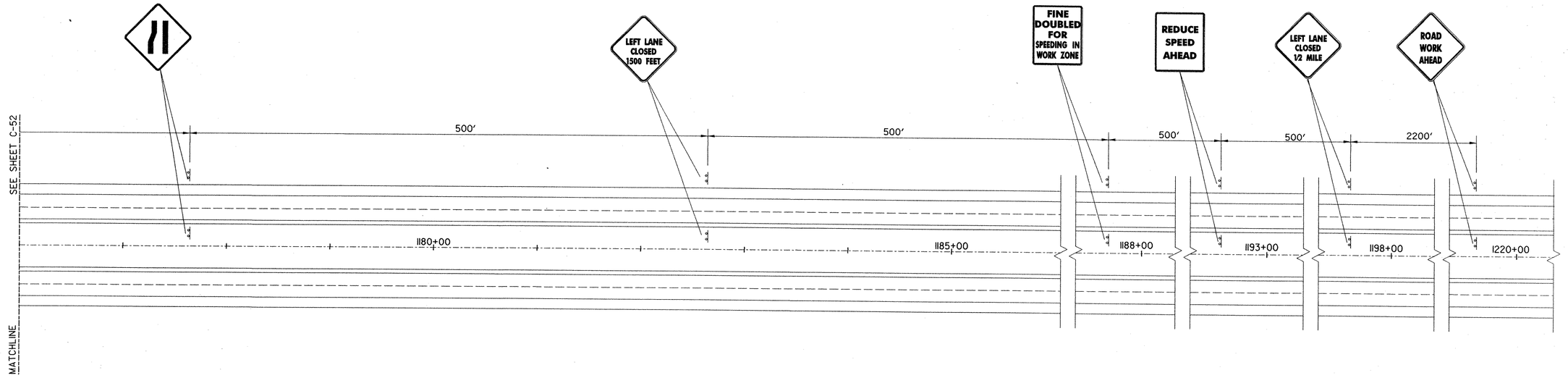
PHASE I CONSTRUCTION I-89 NORTHBOUND CROSSOVER

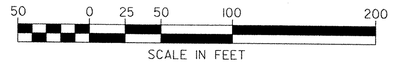
BRIDGE 51

Designed By J.M.SMYRSKI/K.S.MARSHIA	Drawn By S. E. SCHMITT
Checked By J. W. TUCKER Date 10/99	Bridge Design Supervisor J. P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
Drawing No. ...\51-NB.DGN	Date OCT 1999
Bridge Sheet No. TC-52	Sheet 212 of 307

LEGEND

- CONCRETE BARRIER
- DIRECTION OF TRAFFIC FLOW WITH DETOUR IN PLACE
- CROSSOVER ALIGNMENT
- BRIDGE WORK AREA
- LEDGE OUTCROPPING
- GUARDRAIL
- EXISTING DROP INLET
- PORTABLE ARROW BOARD
- TYPE I DELINEATOR (YELLOW)
- TYPE I DELINEATOR (WHITE)
- REFLECTORIZED PLASTIC DRUM
- 4" TEMPORARY PAVEMENT MARKINGS
- TYPE III BARRICADE
- TYPE III (MOD) BARRICADE
- APPROXIMATE CULVERT LOCATION





STATE OF VERMONT
AGENCY OF TRANSPORTATION

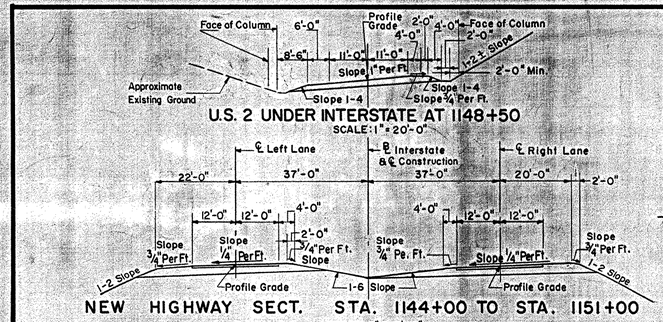
Town Of BOLTON	Bridge No. **51**
Highway No. I-89	Log Sta. / Surv. Sta.

PHASE I CONSTRUCTION I-89 NORTHBOUND CROSSOVER

BRIDGE 51

Designed By J.M.SMYRSKI/K.S.MARSHA	Drawn By S. E. SCHMITT
Checked By J. W. TUCKER Date 10/99	Bridge Design Supervisor J. P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
Drawing No. ...\51-NB.DGN	Date OCT 1999
Bridge Sheet No. TC-53	Sheet 213 of 307

DuBois & King inc.
engineering planning management development

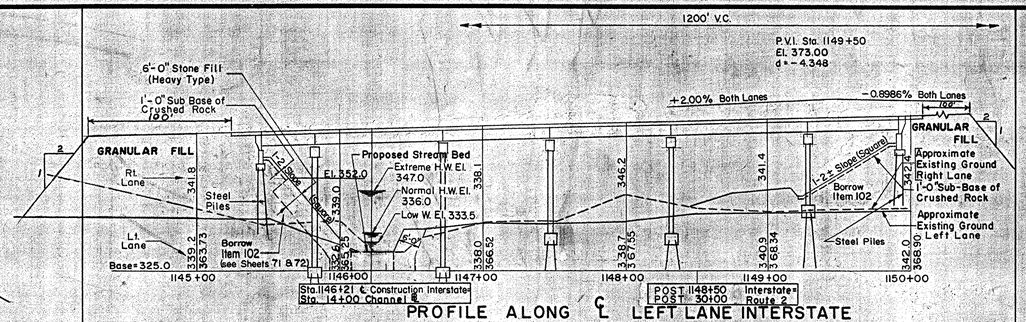


U.S. 2 UNDER INTERSTATE AT 1148+50

SCALE: 1"=20'-0"

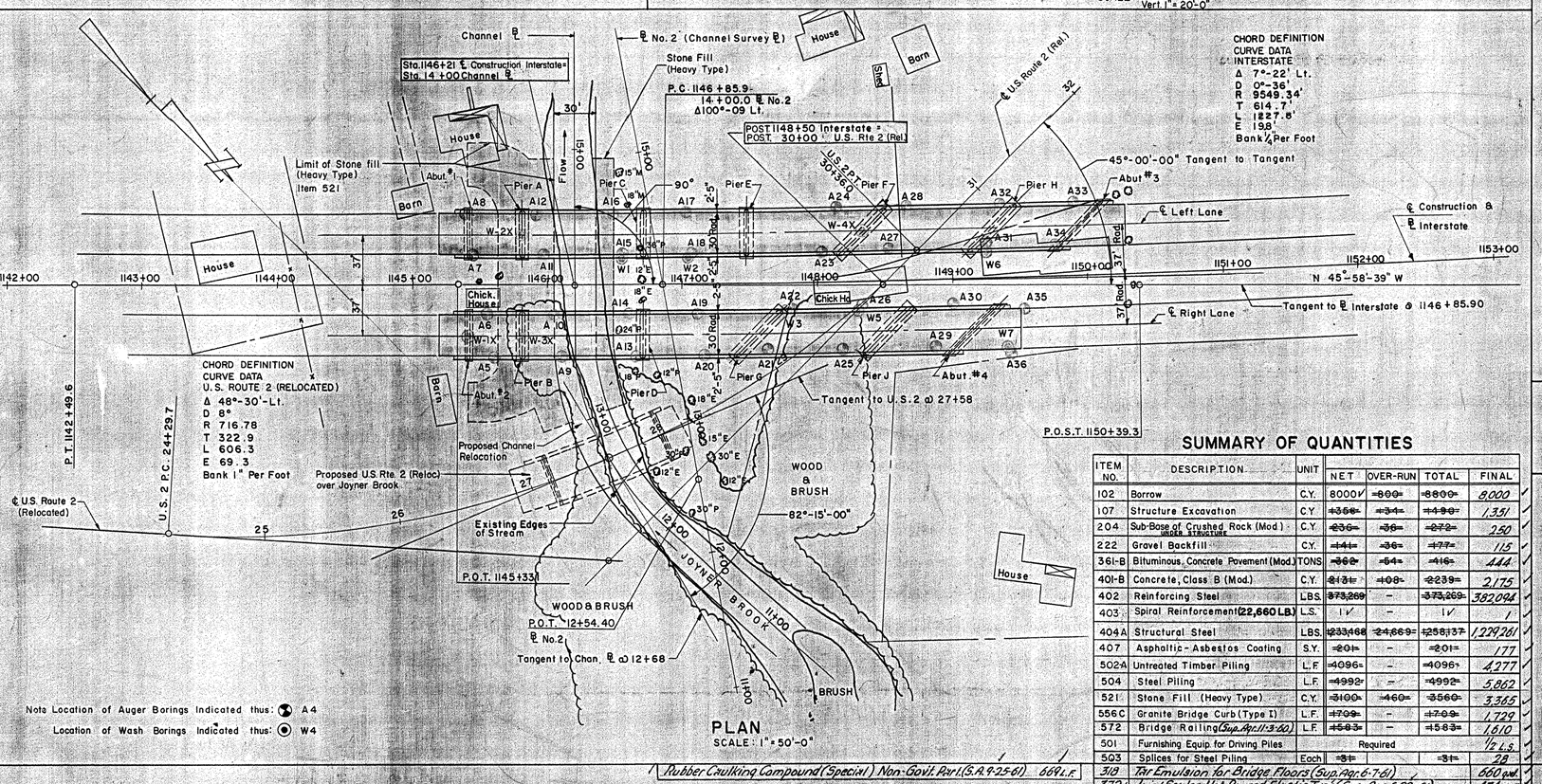
NEW HIGHWAY SECT. STA. 1144+00 TO STA. 1151+00

SCALE: 1"=20'-0"



PROFILE ALONG ℄ LEFT LANE INTERSTATE

SCALE: Hor. 1"=50'-0" Vert 1"=20'-0"



Note Location of Auger Borings Indicated thus: A4

Location of Wash Borings Indicated thus: W4

PLAN

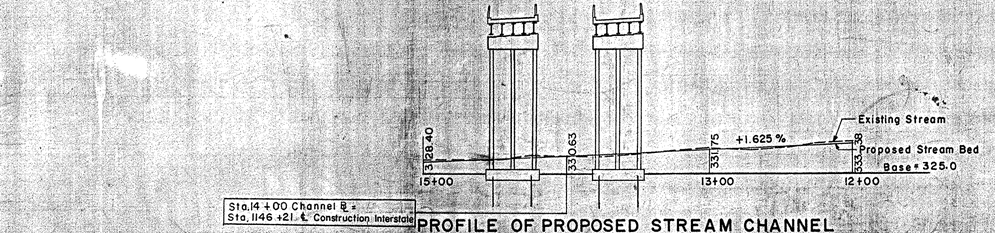
SCALE: 1"=50'-0"

CHORD DEFINITION
CURVE DATA
U.S. ROUTE 2 (RELOCATED)
Δ 48°-30'-Lt.
D 8°
R 716.78
T 322.9
L 606.3
E 69.3
Bank 1" Per Foot

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	NET	OVER-RUN	TOTAL	FINAL
102	Borrow	C.Y.	8000 V	~~800~~	~~8800~~	8,000
107	Structure Excavation	C.Y.	~~1356~~	~~34~~	~~1390~~	1,351
204	Sub-Base of Crushed Rock (Mod.)	C.Y.	~~236~~	~~36~~	~~272~~	250
222	Gravel Backfill	C.Y.	~~141~~	~~26~~	~~177~~	115
361-B	Bituminous Concrete Pavement (Mod.)	TONS	~~360~~	~~54~~	~~416~~	444
401-B	Concrete, Class B (Mod.)	C.Y.	~~2131~~	~~108~~	~~2239~~	2,175
402	Reinforcing Steel	LBS.	~~373,269~~	–	~~373,269~~	382094
403	Spiral Reinforcement (22,660 LB)	L.S.	1 V	–	1 V	1
404A	Structural Steel	LBS.	~~233468~~	~~24,669~~	~~258,137~~	1,279,261
407	Asphaltic-Asbestos Coating	S.Y.	~~201~~	–	~~201~~	177
502-A	Untreated Timber Piling	L.F.	~~4096~~	–	~~4096~~	4,277
504	Steel Piling	L.F.	~~4992~~	–	~~4992~~	5,862
521	Stone Fill (Heavy Type)	C.Y.	~~3100~~	~~460~~	~~3560~~	3,365
556C	Granite Bridge Curb (Type I)	L.F.	~~1709~~	–	~~1709~~	1,729
572	Bridge Railing (Sup. Agr. 11-3-60)	L.F.	~~1583~~	–	~~1583~~	1,610
501	Furnishing Equip. for Driving Piles		Required			½ L.S.
503	Splices for Steel Piling	Each	~~31~~		~~31~~	28
318	Tar Emulsion for Bridge Floors (Sup. Agr. 6-7-61)					660 gal.
372	Joint Sealer, Hot Poured Elastic Type (Sup. Agr. 6-22-61)					474 L.F.
106-A	Channel Excav. of Earth	C.Y.	0	0	0	1,790

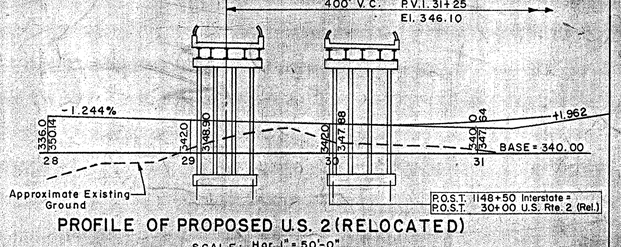
Rubber Caulking Compound (Special) Non-Govt. Agr. (S.A. 9-25-61) 669 L.F.



Sta. 14+00 Channel ℄ = Sta. 1146+21 ℄ Construction Interstate

PROFILE OF PROPOSED STREAM CHANNEL

SCALE: Hor. 1"=50'-0" Vert. 1"=20'-0"



PROFILE OF PROPOSED U.S. 2 (RELOCATED)

SCALE: Hor. 1"=50'-0" Vert. 1"=20'-0"

HIGHWAY NO. I 89	NAME OF HIGHWAY Interstate	B.P.R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
STRUCTURE NO. 20	COUNTY CHITTENDEN TOWN Bolton	1	VT.	I-89-2(7)	68	137

PROJECT NO. I-89-2(7) LOCATION Sta 1148+50

EXISTING STRUCTURE

1. RATED LOADING OF EXISTING STRUCTURE None
2. TYPE OF EXISTING STRUCTURE None
3. UNDERCLEARANCE ELEVATION OF EXISTING STRUCTURE None
4. WHAT DISPOSITION SHOULD BE MADE OF EXISTING STRUCTURE COST OF REMOVAL None
5. SHOULD EXISTING STRUCTURE BE USED TO MAINTAIN TRAFFIC DURING CONSTRUCTION OF NEW STRUCTURE No
6. SHOULD NEW TEMPORARY STRUCTURE BE BUILT
7. ORDINARY HIGH WATER SURFACE ELEV. AT EXISTING STRUCTURE WATERWAY TO ORDINARY H.W.
8. EXTREME HIGH WATER AT EXISTING STRUCTURE
9. SPAN OF EXISTING BRIDGE UPSTREAM WATERWAY TO EXTREME H.W.
   SPAN OF EXISTING BRIDGE DOWNSTREAM 35' WATERWAY TO EXTREME H.W.
10. TYPE OF FOUNDATION UNDER EXISTING ABUTMENTS
11. DOES ALL WATER AT FLOOD ELEVATION PASS THROUGH EXISTING STRUCTURE
12. IF NOT AT WHAT ELEVATION IS RELIEF AFFORDED
13. ADDITIONAL WATERWAY AREA PROVIDED

NEW STRUCTURE

1. RECOMMENDED TYPE OF STRUCTURE 5 and 6 Span Composite Steel Stringer Bridge
2. RECOMMENDED CLEAR SPAN OR SPANS Left lane 37-87-85.5 96-95-51 / 97-96-51 Right lane 37-87-66 / 67
   MEASURED PARALLEL TO ℄ NEW HIGHWAY
   MEASURED AT RIGHT ANGLES TO ℄ STREAM
3. ARE THERE OBJECTIONS TO A PIER IN THE STREAM ANSWER YES OR NO YES
4. ORDINARY HIGH WATER ELEVATION AT NEW STRUCTURE 336.0
5. EXTREME HIGH WATER ELEVATION AT NEW STRUCTURE 347.0 SOURCE OF INFORMATION U.S. Corps of Engineers Profile 1927 Flood from
6. IS ALL WATER INTENDED TO PASS THROUGH NEW STRUCTURE Yes
7. DOES STREAM REACH ITS MAXIMUM HIGHWATER ELEVATION RAPIDLY Yes IS ORDINARY RISE RAPID
8. LOW WATER ELEVATION AT NEW STRUCTURE 333.5
9. DRAINAGE AREA IN ACRES ABOVE STRUCTURE 6100 CHARACTER OF TERRAIN Mountainous
10. IS STREAM EVER DRY No
11. VELOCITY OF STREAM AT HIGH WATER STAGE 13 Ft. Per Second ESTIMATED DISCHARGE 1900 C.F.S
12. AREA FULL OPENING AREA BELOW ORDINARY H.W. 88 S.F.
13. CHARACTER OF SCOUR DRIFT ICE
14. ESTIMATED DRAINAGE AREA ABOVE NATURAL OR ARTIFICIAL STORAGE None
15. VERTICAL CLEARANCE ABOVE FLOOD ELEVATION
16. ARE SIDEWALKS REQUIRED, IF SO ON WHAT SIDE NO BOTH SIDES
17. RECOMMENDED TYPE OF PAVEMENT 2" Bituminous Concrete Pavement
18. TRAFFIC TO BE MAINTAINED UNDER ITEM NO. NONE ONE OR TWO WAYS PROBABLE COST
19. PROBABLE COST OF CLEARING AND GRUBBING STREAM CHANNEL AT STRUCTURE SITE
20. SHOULD PROVISIONS BE MADE FOR PUBLIC UTILITIES
21. ESTIMATED ALLOWABLE LOAD ON FOUNDATIONS SHOULD PILES BE USED YES EST. LGTH

FOUNDATION INFORMATION

OBTAINED FOR DESIGN PURPOSES ONLY, THE STATE ASSUMES NO RESPONSIBILITY WHATSOEVER FOR THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN. BOULDERS MAY BE ENCOUNTERED AT ANY PIER OR ABUTMENT LOCATION. FOR BORING LOGS, SEE SHEETS 68 & 69 OF 137

GENERAL NOTES

DESIGN SPECIFICATIONS:
AASHO 1957 Edition, and as modified by Vermont Dept. of Highways.

LIVE LOAD:
H20-S16-44 and Military Loading

DESIGN STRESSES:
Structural steel fs = 18,000 psi
Reinforcing steel fs = 20,000 psi
Concrete fc = 1,200 psi f'c = 3,000 psi.

CLEARANCES:
Horizontal: as shown on drawings.
Vertical: 14'-3" Clear U.S. Route 2 (Relocated)

SUPERSTRUCTURES:
Separate Structure for Each Lane
30' Roadway, 1'-6" Safety Walks, as per SCB-30-56
6 Spans (Simple) Left Lane, 5 Spans (Simple) Right Lane, rolled beams, composite design, as per SB-30-56
Aluminum bridge railing, or galvanized bridge railing, and granite bridge curb as per SB-56-57 (1 & 2).
Bearing and diaphragm connections as per SB-20-56
Approach Slabs as per SB-AS-45° Skew 57
SB-AS-Square 57
SUBSTRUCTURE
Open piers, round columns spaced 12'-0" o.c.± continuous footing.
Stub abutments.

FOUNDATION:
Stub Abutments, Steel Piles, 35 Ton Design Load.
Piers, A, B, C, & D, Untreated Timber Piles 20 Ton Capacity
Piers, E, F, G, H & J, Steel Piles 35 Ton Design Load.

LIST OF SHEETS

SHEET NO.	DESCRIPTION
68	GENERAL PLAN
69	BORING LOGS
70	BORING LOGS
71	PLAN AND ELEVATION
72	PLAN AND ELEVATION
73	ABUTMENTS #1 AND #2
74	ABUTMENT #3
75	ABUTMENT #4
76	APPROACH SLABS
77	PIERS A, B, C, D AND E
78	PIERS F, G, H AND J
79	STRUCTURAL STEEL PLAN
80	STRUCTURAL STEEL PLAN
81	STRUCTURAL DETAILS
82	REINFORCING SCHEDULE
83	REINFORCING SCHEDULE
84	REINFORCING SCHEDULE
85	REINFORCING SCHEDULE
16-18	HIGHWAYS PLAN AND PROFILES
50-51	SCB-30-56 (1 & 2)
54-55	SB-56-57 (1 & 2)
59	SB-20-56
60	SB-22-58
56	SB-AS-Square-57
58	SB-AS-45° Skew-57

BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

CONTRACT NO. 3

GENERAL PLAN

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

INTERSTATE PROJECT in the towns of
WATERBURY - BOLTON
INTERSTATE STA. 1148+50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00

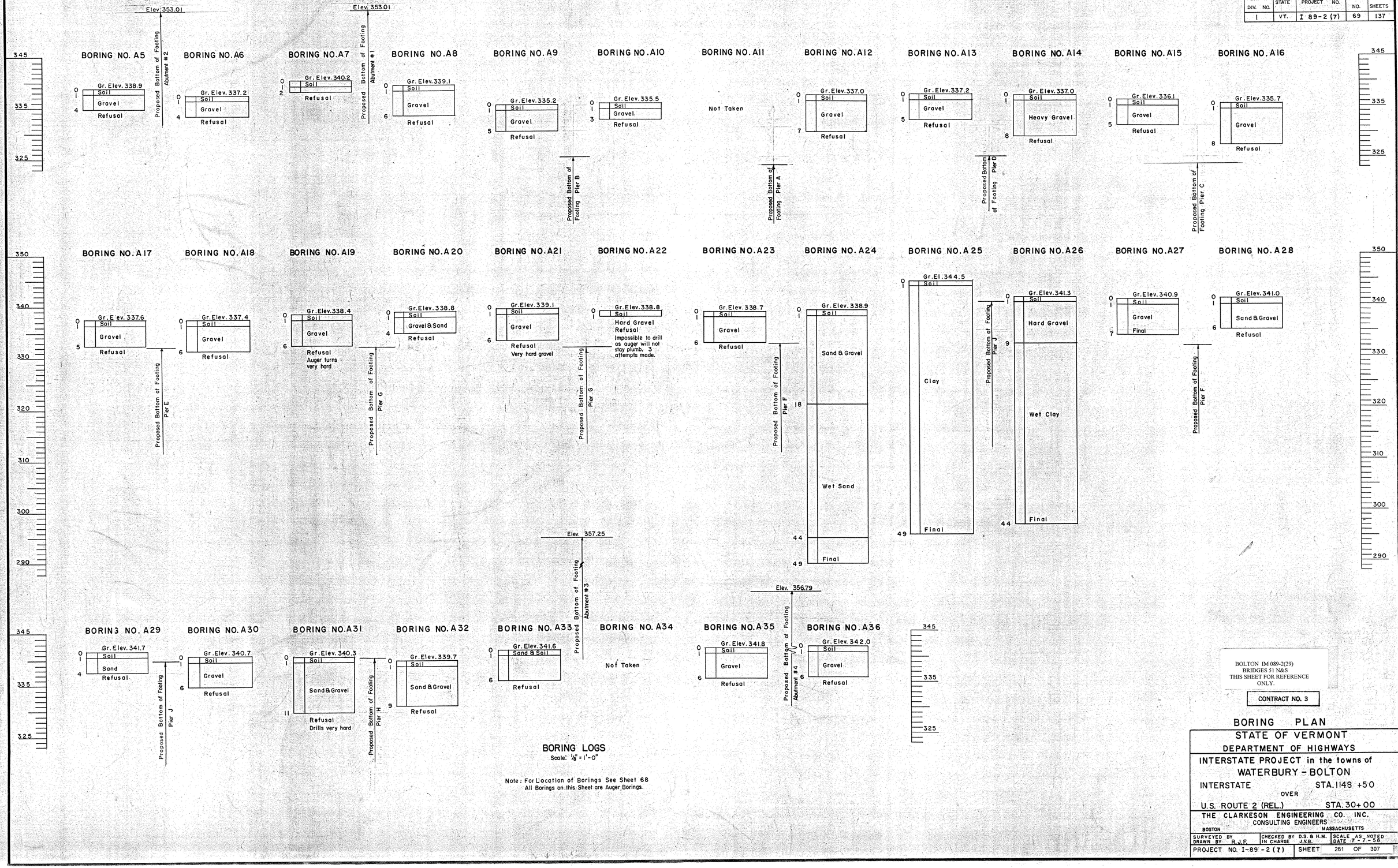
APPROVED BY Wm. A. Henderson DATE 12-16-58

THE CLARKESON ENGINEERING CO. INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SURVEYED BY	CHECKED BY OS & H.M.	SCALE AS NOTED
DRAWN BY R.J.F.	IN CHARGE J.V.B.	DATE 7-7-58

PROJECT NO. I-89-2(7) SHEET 260 OF 307

B. P. R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	VT.	I 89-2 (7)	69	137



BORING LOGS

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

Note: For Location of Borings See Sheet 68
All Borings on this Sheet are Auger Borings.

BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

CONTRACT NO. 3

BORING PLAN

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

INTERSTATE PROJECT in the towns of
WATERBURY - BOLTON

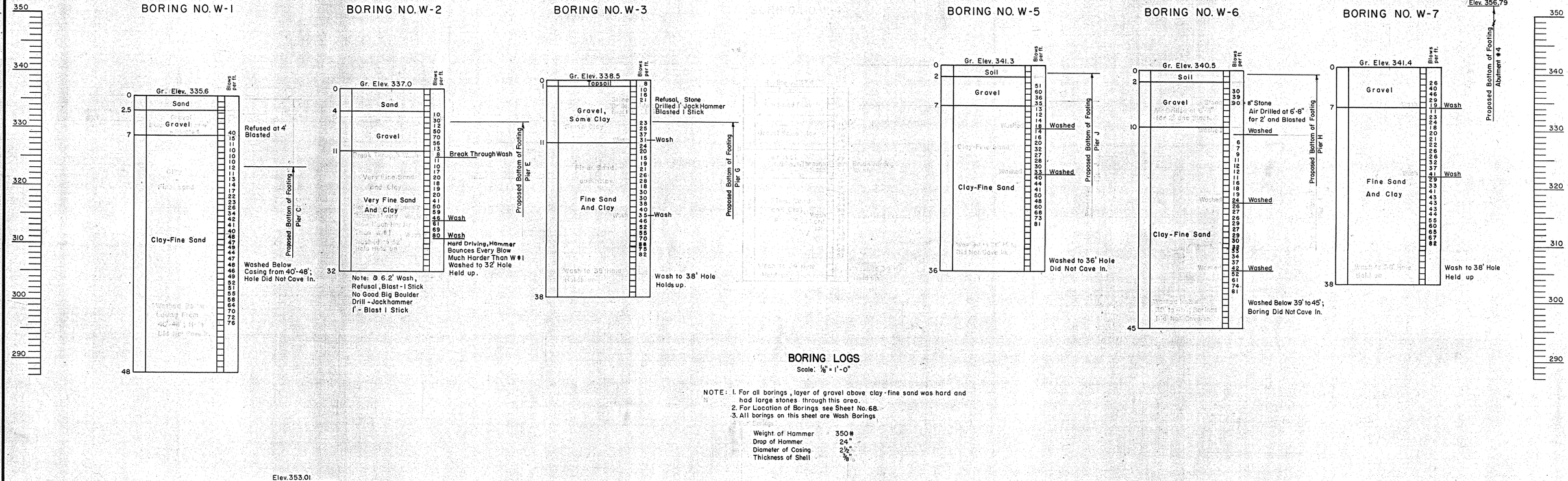
INTERSTATE STA. 1148 +50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00

THE CLARKESON ENGINEERING CO. INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SURVEYED BY DRAWN BY R.J.F.	CHECKED BY D.S. & H.M. IN CHARGE J.V.B.	SCALE AS NOTED DATE 7-7-58

PROJECT NO. I-89-2(7) SHEET 261 OF 307

B.R.R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	VT.	I-89-2 (7)	70	137



BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

CONTRACT NO. 3

BORING PLAN

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

INTERSTATE PROJECT in the towns of
WATERBURY - BOLTON

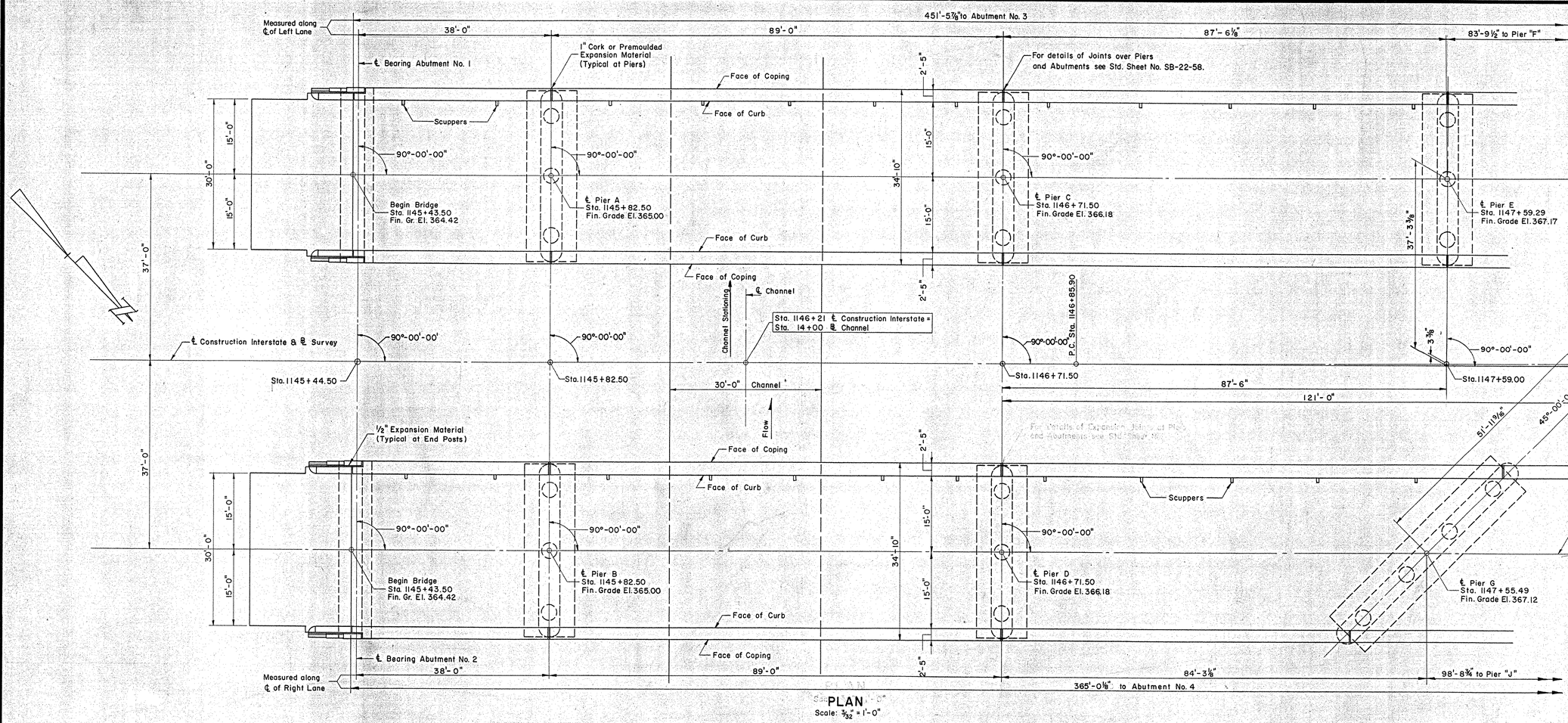
INTERSTATE STA. 1148+50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00

THE CLARKESON ENGINEERING CO. INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SURVEYED BY		CHECKED BY	D.S. & H.M.
DRAWN BY	E.K.	IN CHARGE	J.V.B.
SCALE	AS NOTED	DATE	7-7-58

PROJECT NO. I-89-2 (7) SHEET 262 OF 307

B. P. R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	VT.	I-89-2(7)	71	137

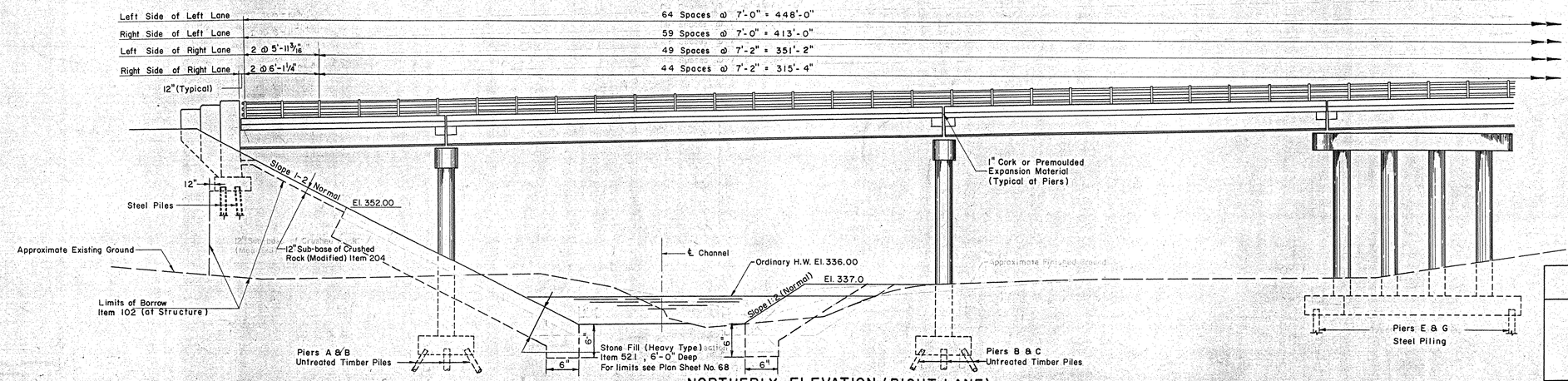


PLAN
Scale: 3/32" = 1'-0"

CHORD DEFINITION
CURVE DATA (INTERSTATE)

Δ = 7°-22'-00" Lt.
D = 0°-36'-00"
R = 9549.34'
T = 614.7'
L = 1227.8'
E = 19.8'
Bank = ¼" Per Ft.

1. Railing posts to be set normal to grade.
2. Omit set screws at upgrade end of Railing panels at expansion joints over piers.
3. All Stations refer to ℄ Construction Interstate
4. All dimensions are horizontal dimensions.
5. For Scupper layout see Framing Plan, Sheets 79 & 80
6. For Quantity Estimate see Sheet No. 72
7. For Bridge Marker see Std. Sheet SB-20-56 (Detail "A")



NORTHERLY ELEVATION (RIGHT LANE)
Scale: 3/32" = 1'-0"

BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

CONTRACT NO. 3

PLAN AND ELEVATION
STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
INTERSTATE PROJECT In the towns of
WATERBURY - BOLTON
INTERSTATE STA. 1148+50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00

THE CLARKESON ENGINEERING CO., INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SURVEYED BY	CHECKED BY D.S. & H.M.	SCALE AS NOTED
DRAWN BY A.L.	IN CHARGE J.V.B.	DATE 7-7-58

PROJECT NO. I-89-2(7) SHEET 263 OF 307

B.P.R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	VT.	I-89-2(7)	72	137

451'-5⅞" to Abut 1

87'-6⅛" to pier C | 83'-9½" | 98'-1¾" | 52'-6⅞"

1" Cork or Premolded Expansion material (Typical at Piers)

Measured along ℄ of Left lane

℄ Bearing Abutment No. 3

For details of Joints over Piers and Abutments see Std. Sheet No. SB-22-58.

Face of Coping

Face of Curb

℄ Pier "E" Sta. 1147+59.29 Fin. Grade El. 367.17

℄ Pier "F" Sta. 1148+43.41 Fin. Grade El. 367.93

℄ Pier "H" Sta. 1149+41.94 Fin. Grade El. 368.61

End of Bridge Sta. 1149+96.19 Fin. Grade El. 368.88

℄ Left Lane

PT. Sta. 30+36.00 ℄ Relocated U.S. Rte. 2

P.O.S.T. 1148+50 Interstate
P.O.S.T. 30+00 U.S. Route 2

22'-0" Roadway

Sta. 1147+59.00

Sta 1147+93.10

Sta. 1148+05.25

Sta 1149+02.99

Sta. 1149+45.05

Sta. 1149+85.34

℄ Construction Interstate & ℄ Survey

Tangent to ℄ Interstate at Sta. 1146+85.90

37'-0" Radial

34'-10" Radial

15'-0"

30'-0" Radial

CHORD DEFINITION
CURVE DATA (INTERSTATE)

Δ 7°-22'-00" Left
D 0°-36'-00"
R 9549.34'
T 614.7'
L 1227.8
E 19.8'
Bank ¼" Per FT.

87'-6" to ℄ Pier C

33'-6" | 12'-0" | 85'-6" | 10'-6" | 41'-0" | 10'-0"

45°-00'-00"

Face of Coping

Face of Curb

Tangent to U.S. Rte. 2 (Rel.) Sta 30+36.00

℄ Pier "G" Sta. 1147+55.49 Fin. Grade El. 367.12

℄ Pier "J" Sta. 1148+53.84 Fin. Grade El. 368.01

End of Bridge Sta. 1149+07.66 Fin. Grade El. 368.39

Point of Minimum Vertical Clearance

½" Expansion Material (Typical at end Posts)

℄ Right Lane

84'-3⅜" to Pier D | 98'-8¾" | 52'-7" | 365'-0⅛" to Abut 2

℄ Bearing Abutment No. 4

Measured along ℄ of Right lane

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

64 Spaces @ 7'-0" = 448'-0"	2 @ 6'-9"	Left Side of Left Lane
59 Spaces @ 7'-0" = 413'-0"	2 @ 6'-7 15/16"	Right Side of Left Lane
49 Spaces @ 7'-2" = 351'-2"	2 @ 5'-11 3/16"	Left Side of Right Lane
44 Spaces @ 7'-2" = 315'-4"	2 @ 6'-3 3/16"	Right Side of Right Lane

12" (Typical)

1" Cork or Premolded Expansion material Typical at Piers

14'-3" Min. Vert. Clearance

Slope 1:2 (Normal)

12" Steel Piles

12" Sub-base of Crushed Rock (Modified). Item No. 204

Approximate Existing Ground

Piers E & G Steel Piling

Piers F, J, & H Steel Piling

Limits of Borrow Item 102 (at Structure)

NORTHERLY ELEVATION (RIGHT LANE)
Scale: 3/32" = 1'-0"

NOTE: For Notes & References see Sheet No. 71

ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	NET	OVER-RUN	TOTAL	FINAL
102	Borrow	C.Y.	8000 ✓	~~880~~	~~8800~~	8,000 ✓
521	Stone Fill (Heavy Type)	C.Y.	~~3100~~	~~460~~	~~3560~~	3,365 ✓
556-C	Granite Bridge Curb Type I ✓	L.F.	~~1709~~	—	~~1709~~	1,729 ✓
572	Bridge Railing (Sup. Agr. 11-3-60)	L.F.	~~1583~~	—	~~1583~~	1,610 ✓

BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

CONTRACT NO. 3

PLAN AND ELEVATION
STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

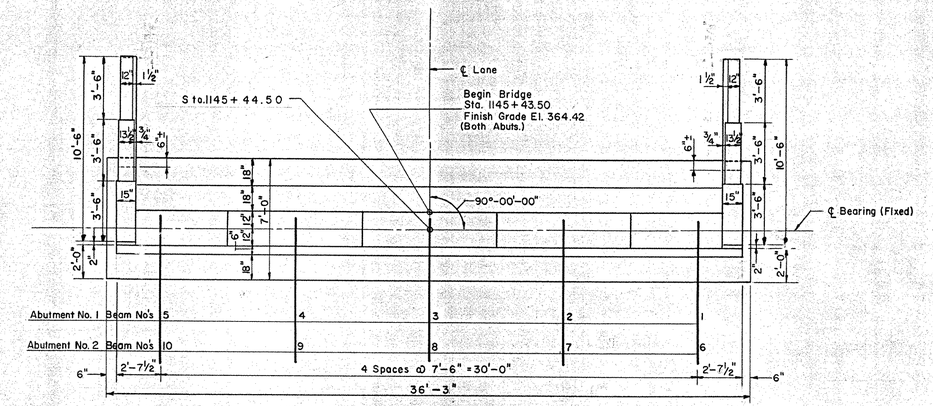
INTERSTATE PROJECT in the towns of
WATERBURY BOLTON
INTERSTATE STA. 1148+50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00

THE CLARKESON ENGINEERING CO. INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SURVEYED BY	DRAWN BY H.B.C.	CHECKED BY D.S. & H.M. IN CHARGE J.V.B.	SCALE AS NOTED DATE 7-7-58

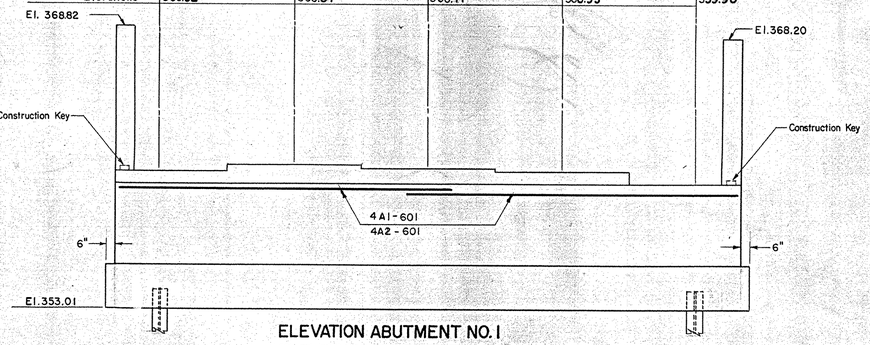
PROJECT NO. I-89-2(7) SHEET 264 OF 307

B. P. R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	VT.	I-89-2(7)	73	137

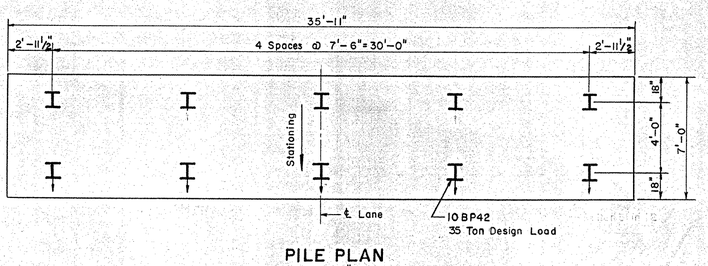


PLAN ABUTMENT NO.1
PLAN ABUTMENT NO.2 (SIMILAR)
Scale: 1/4" = 1'-0"

Abutment No. 1 Beam No's	5	4	3	2	1
Abutment No. 2 Beam No's	10	9	8	7	6
Elevations	360.52	360.87	360.71	360.55	359.90

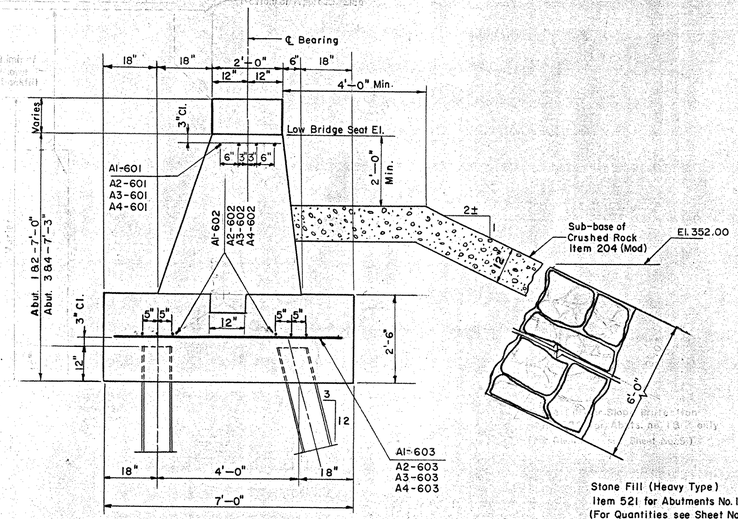


ELEVATION ABUTMENT NO.1
ELEVATION ABUTMENT NO.2 (SIMILAR)
Scale: 1/4" = 1'-0"



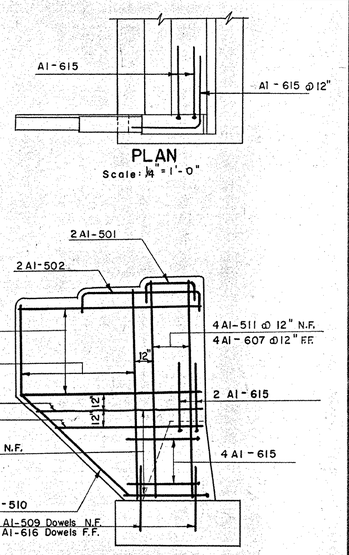
PILE PLAN
Scale: 1/4" = 1'-0"

NOTE: 1. Battered piles indicated thus: I; Vertical Piles indicated thus: I.
2. For estimating purposes, the length of piles is assumed to be 34'-0"
3. Piles must be driven to at least El. 320.0 unless otherwise directed in writing by the Engineer.



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

Stone Fill (Heavy Type) Item 521 for Abutments No. 1 & 2 only. (For Quantities see Sheet No. 72)



PLAN
Scale: 1/4" = 1'-0"

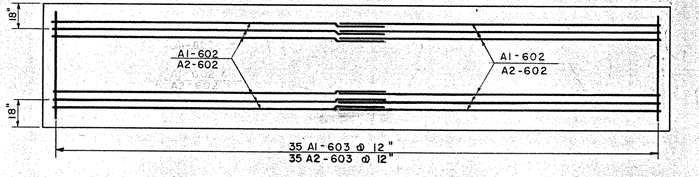
WINGWALL REINFORCING
ABUTMENT No. 1 & 2
Scale: 1/4" = 1'-0"

Note: Reinforcing as shown is for Abut No.1 prefixed A1. Reinforcing for Abut. No. 2 identical except prefixed A2.

ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	ABUTMENT NUMBER 1 NET	OVER-RUN	TOTAL	FINAL	ABUTMENT NUMBER 2 NET	OVER-RUN	TOTAL	FINAL	ABUTMENT NUMBER 3 NET	OVER-RUN	TOTAL	FINAL	ABUTMENT NUMBER 4 NET	OVER-RUN	TOTAL	FINAL
107	Structure Excavation	C.Y.	~~12~~	~~1~~	13 ✓	13 ✓	~~12~~	~~1~~	13 ✓	13 ✓	~~26~~	~~2~~	~~27~~	31 ✓	~~22~~	~~2~~	~~24~~	30 ✓
204	Sub-base of Crushed Rock (Mod)	C.Y.	~~27~~	~~4~~	~~31~~	25 ✓	~~27~~	~~4~~	~~31~~	25 ✓	~~91~~	~~14~~	~~105~~	95 ✓	~~91~~	~~14~~	~~105~~	104 ✓
222	Gravel Backfill	C.Y.	23 ✓	~~6~~	~~29~~	23 ✓	23 ✓	~~6~~	~~29~~	23 ✓	~~49~~	~~12~~	~~61~~	35 ✓	~~46~~	~~12~~	~~58~~	34 ✓
401-B	Concrete Class B (Mod.)	C.Y.	51 ✓	~~3~~	~~54~~	51 ✓	51 ✓	~~3~~	~~54~~	51 ✓	~~87~~	~~4~~	91 ✓	91 ✓	~~80~~	~~4~~	~~84~~	83 ✓
402	Reinforcing Steel	LBS.	See Reinforcing Steel Schedule Sheet No. 82															
407	Asphaltic-Asbestos Coating	S.Y.	~~8~~	None	~~8~~	4 ✓	~~8~~	None	~~8~~	4 ✓	~~11~~	None	~~11~~	5 ✓	~~11~~	None	~~11~~	5 ✓
504	Steel Piling	L.F.	~~340~~	None	~~340~~	368 ✓	~~340~~	None	~~340~~	355 ✓	~~476~~	None	~~476~~	483 ✓	~~476~~	None	~~476~~	497 ✓

NOTES
1. Prior to driving the piles, rock free fill shall be placed under the abutment area to approximately the pile cutoff elevation, and with a surface area at least two feet outside the abutment
2. After piles are driven, the fill is to be excavated to the elevation of the footing
3. Slope all bridge seats ½" per foot
4. The entire exposed top surface of Bridge Seats to be covered with ½" of Asphaltic-Asbestos coating after superstructure is in place.
5. A layer of Sub-Base of Crushed Rock (Mod). Item 204 shall be placed in front of the Abutments; one (1) foot thick, 19 feet long on the slopes of Abutments #1 and #2, and 70 feet long on the slopes of Abutments #3 and #4. A layer of Stone Fill (Heavy Type) Item 521, six (6) feet thick, 53 feet long shall be placed on the slopes in front of Abutments #1 and #2 to the limits shown on the Plan Sheet No.68. Stone Fill (Heavy Type) 6'-0" deep shall be placed on the Westerly bank to El 337.0 For limits see Sheet No.68.
6. For additional wingwall details see Sheet No. 76.
7. For Limits of Gravel Backfill see Sheet No. 75.



STEEL REINFORCING PLAN
ABUTMENT No. 1 & 2
Scale: 1/4" = 1'-0"

Note: Bars prefixed A2 to be used in Abutment No. 2.

CONTRACT NO. 3

ABUTMENTS #1 AND #2

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

INTERSTATE PROJECT in the towns of
WATERBURY-BOLTON

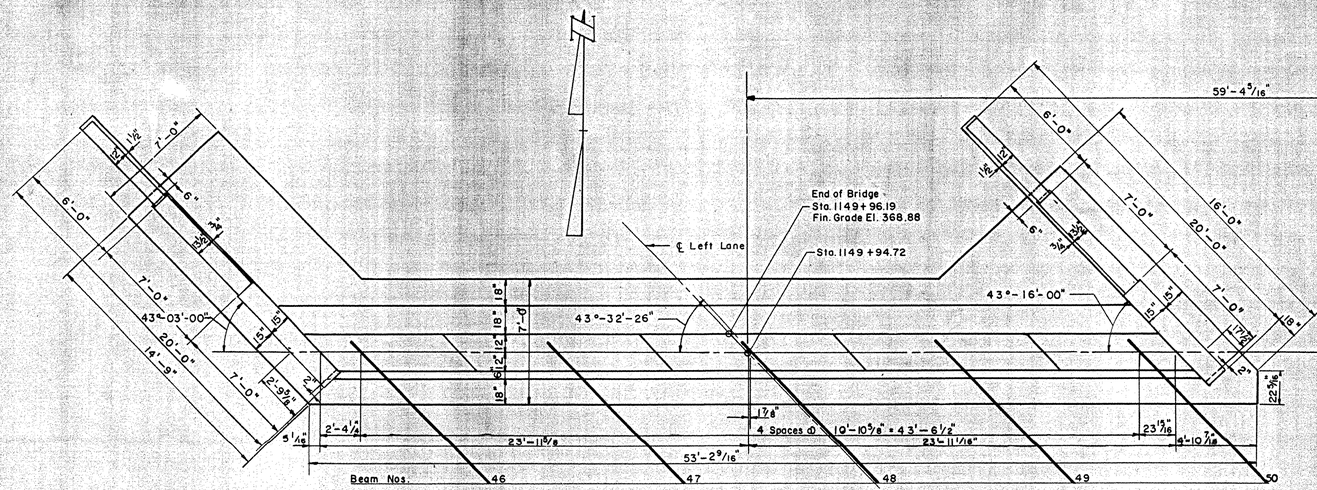
INTERSTATE STA. 1148+50
OVER
U.S. ROUTE 2 (REL.) STA 30+00

THE CLARKESON ENGINEERING CO., INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

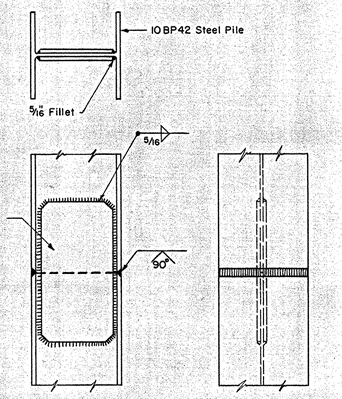
SURVEYED BY	CHECKED BY D.S.& H.M.	SCALE AS NOTED
DRAWN BY A.L.	IN CHARGE J.V.B.	DATE 7-7-58

PROJECT NO. I-89-2(7) SHEET 265 OF 307

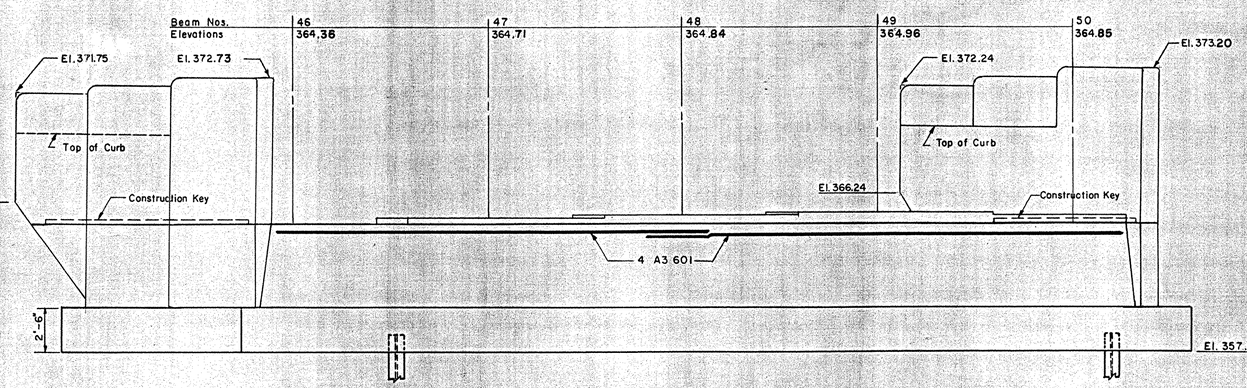
B. P. R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	VT.	I-89-2 (7)	74	137



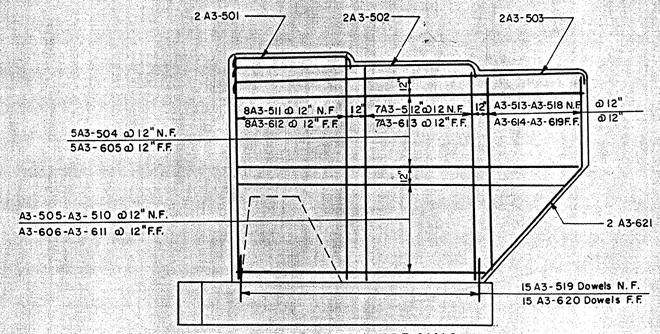
PLAN ABUTMENT NO. 3
Scale: 1/4" = 1'-0"



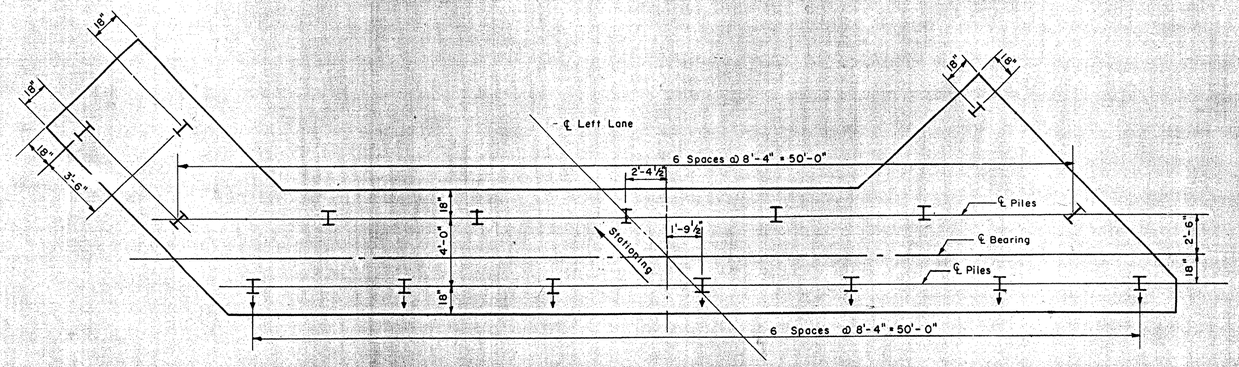
PILE SPLICE DETAILS
Scale: 1 1/2" = 1'-0"



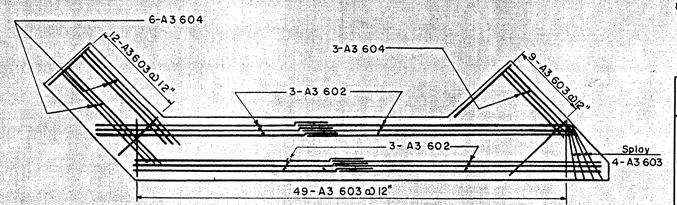
ELEVATION ABUTMENT NO. 3
Scale: 1/4" = 1'-0"



WING WALL REINFORCING
Scale: 1/4" = 1'-0"



PILE PLAN
Scale: 1/4" = 1'-0"



STEEL REINFORCING PLAN ABUTMENT NO. 3
Scale: 1/8" = 1'-0"

BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

NOTE: 1. For general notes see Sheet 73
2. For typical Abutment section see Sheet 73
3. All piles 10 BP 42 (35ton design load)
4. Battered piles indicated thus ⊥
Vertical piles indicated thus I
5. For estimating purposes, the length of Piles is assumed to be 28'.
6. For estimated quantities see Sheet 73
7. For additional Wing Wall details see Sheet No. 76
8. Piles must be driven to at least El. 330 unless otherwise directed in writing by the Engineer.

CONTRACT NO. 3

ABUTMENT #3

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

INTERSTATE PROJECT in the towns of
WATERBURY-BOLTON

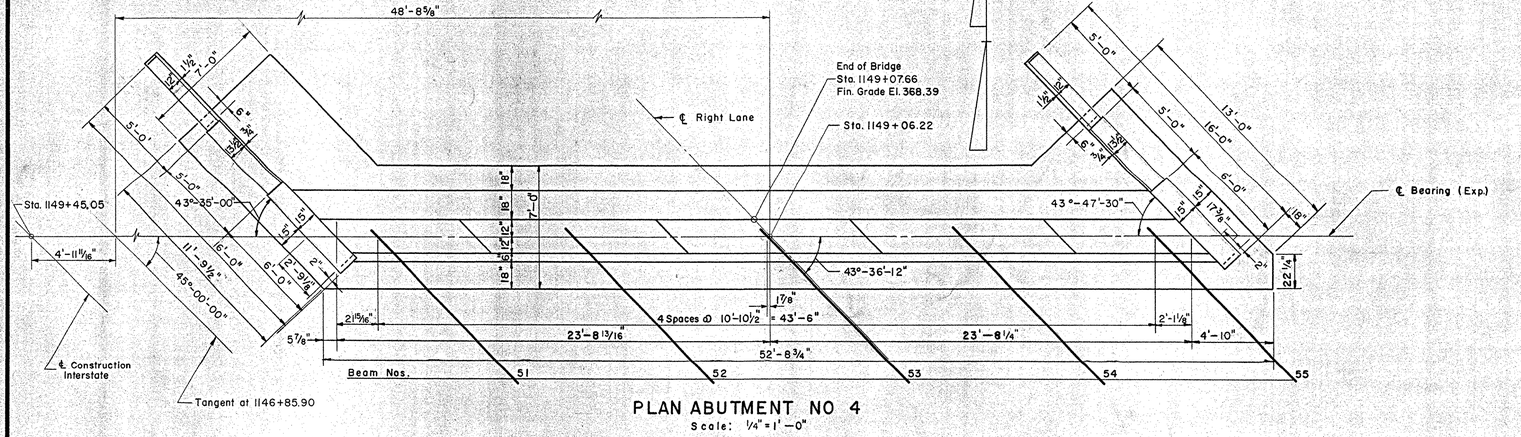
INTERSTATE STA. 1148+50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00

THE CLARKESON ENGINEERING CO., INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

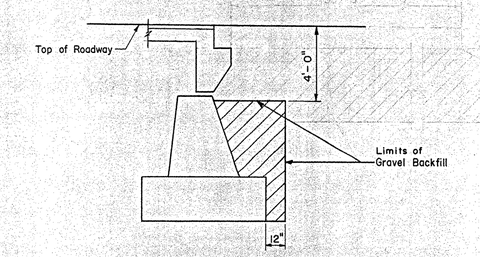
SURVEYED BY	CHECKED BY D.S. & H.W.	SCALE AS NOTED
DRAWN BY R.F.	IN CHARGE J.V.B.	DATE 7-7-58

PROJECT NO. I-89-2(7) SHEET 266 OF 307

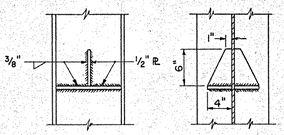
B. P. R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	VT.	I-89-2(7)	75	137



PLAN ABUTMENT NO 4
Scale: 1/4" = 1'-0"



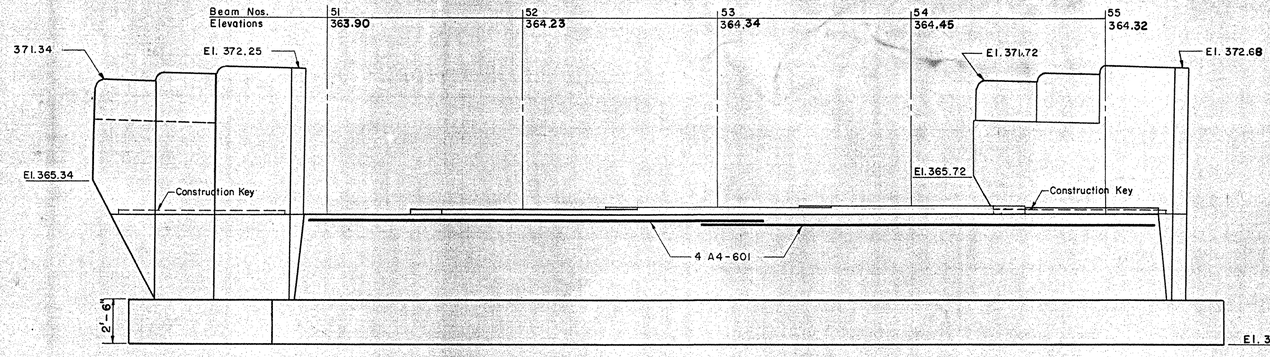
LIMITS OF GRAVEL BACKFILL
Scale: 1/4" = 1'-0"



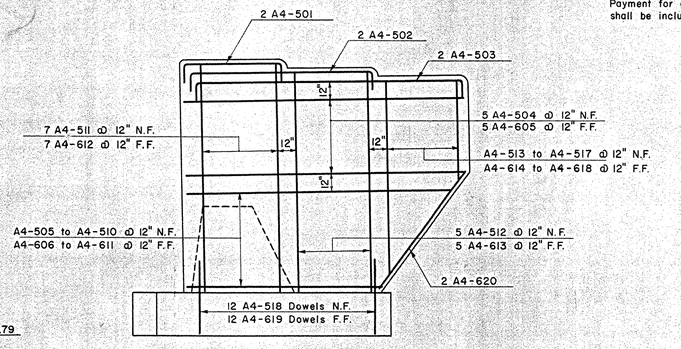
ELEVATION SECTION

DETAIL OF CORE STOPPER FOR PILING
Scale: 1" = 1'-0"

NOTE: Core stoppers to be used if so designated by the Engineer at the time of driving the piling. Payment for core stoppers, if used, shall be included under Item No. 504, "Steel Piling."



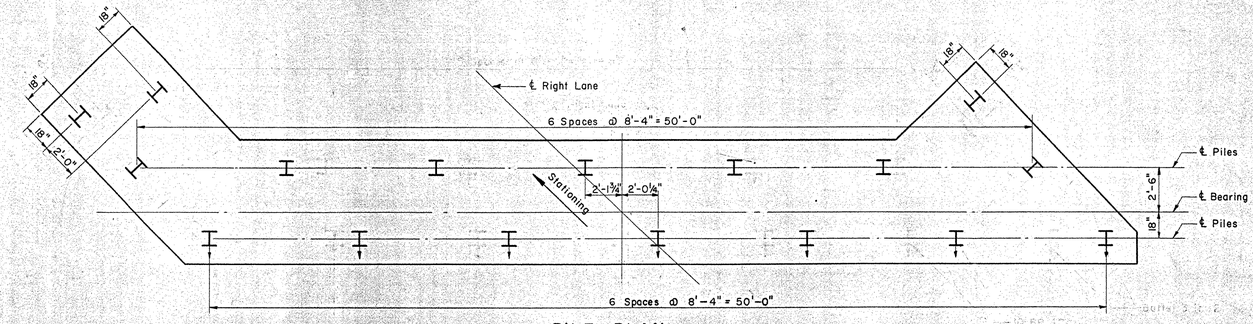
ELEVATION ABUTMENT NO 4
Scale: 1/4" = 1'-0"



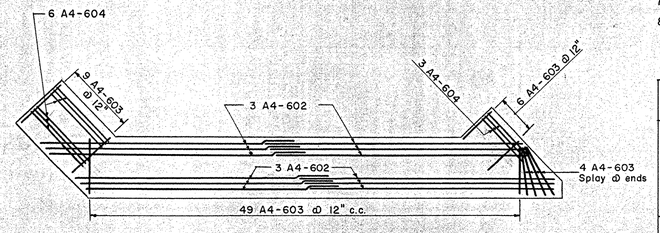
WINGWALL REINFORCING
Scale: 1/4" = 1'-0"

BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

NOTES:
1. For typical abutment section see Sheet No. 73
2. All piles to be 10 BP 42 (35 Ton Design Load)
3. Battered piles indicated thus: ⊤
   Vertical piles indicated thus: ⊥
4. For estimating purposes, the length of Piles is assumed to be 28'
5. For estimated quantities see Sheet No. 73
6. For General Notes see Sheet No. 73
7. For Additional Wing Wall Details see Sheet No. 76
8. Piles must be driven to at least El. 330 unless otherwise directed in writing by the Engineer.



PILE PLAN
Scale: 1/4" = 1'-0"



STEEL REINFORCING PLAN ABUTMENT NO. 4
Scale: 1/8" = 1'-0"

CONTRACT NO. 3

ABUTMENT #4

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

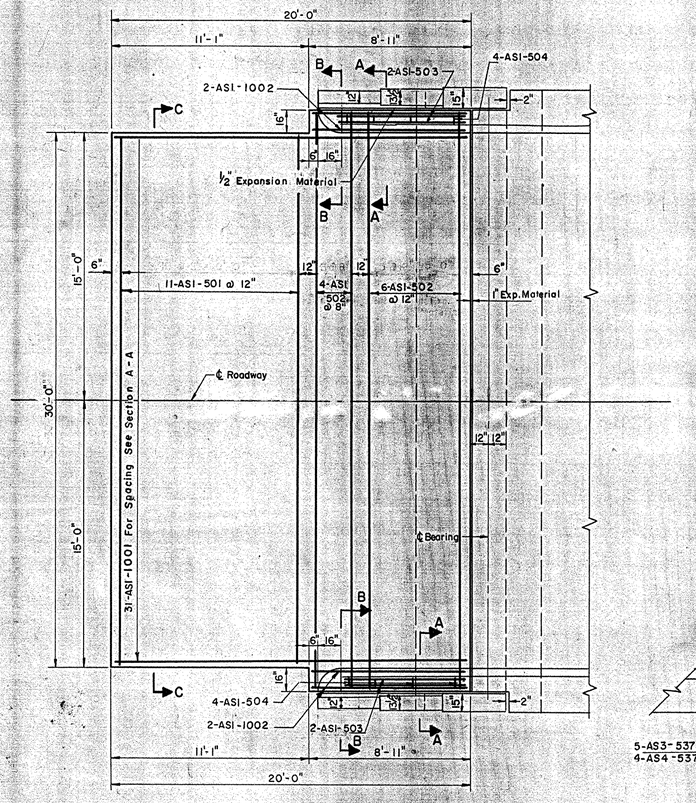
INTERSTATE PROJECT in the towns of
WATERBURY - BOLTON
INTERSTATE STA. 1148+50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00

THE CLARKESON ENGINEERING CO., INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SURVEYED BY		CHECKED BY:	D.S. & H.M.	SCALE: AS NOTED
DRAWN BY:	H.S.R., A.L.	IN CHARGE	J.V.B.	DATE 7-7-58

PROJECT NO. I-89-2(7) SHEET 267 OF 307

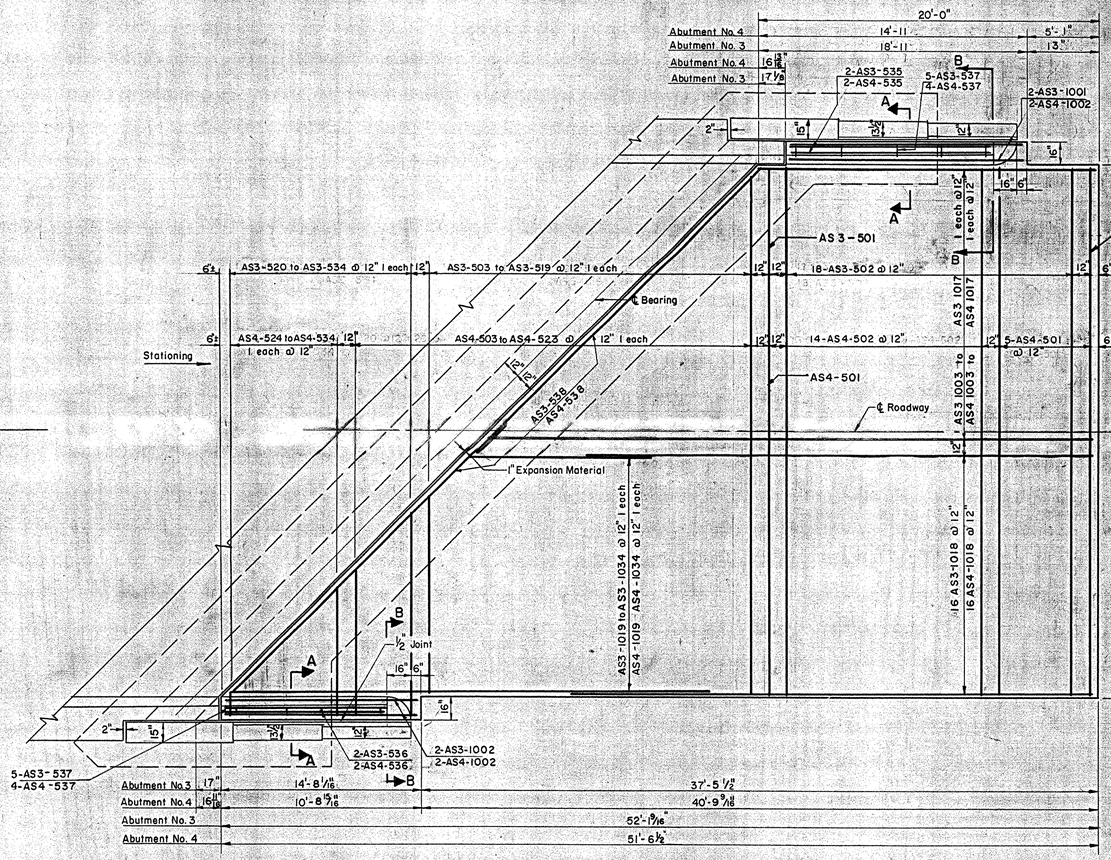
B. R. R. Div. No.	State	Project No.	Sheet no	Total Sheets
1	VT	I-89-2(7)	76	137



APPROACH SLAB ABUTMENTS NO. 1 & 2

Scale: ¼" = 1'-0"

NOTE: For Sections A-A & B-B (Abut. 1 & 2) see Std. Detail Sheet SB-AS-Square-57



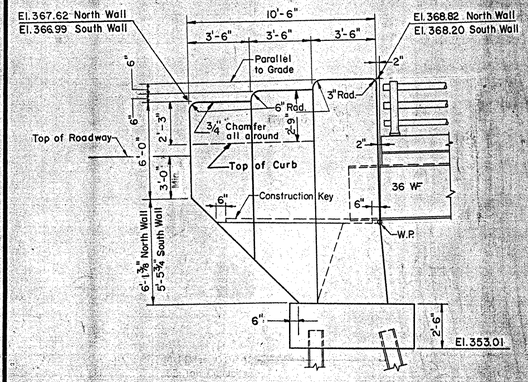
APPROACH SLAB ABUTMENTS NO. 3 & 4

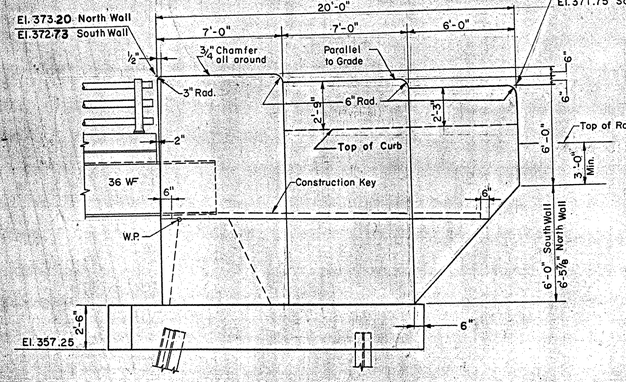
Scale: ¼" = 1'-0"

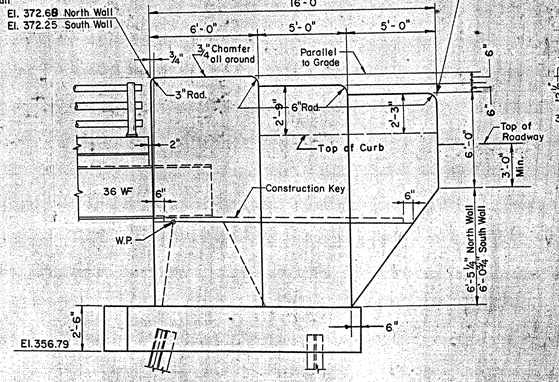
NOTE: For Sections A-A & B-B (Abut. 3 & 4) see Std. Detail Sheet SB-AS-45° Skew-57

ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	APPROACH SLABS NET	OVER RUN	TOTAL	FINAL
361-B	Bituminous Concrete Pavement (Mod.)	TONS	~~48~~	~~7~~	~~56~~	See Total
401-B	Conc. Class B (Mod.)	CY	137	~~7~~	~~144~~	137
402	Reinforcing Steel	LBS.	See Reinforcing Schedule Sh. 84			
556-C	Granite Curb Type I	LF	See General Plan & Elev. Sheet No. 72			







NORTHWALL & SOUTHWALL ABUTMENT NO. 1
NORTHWALL & SOUTHWALL ABUTMENT NO. 2

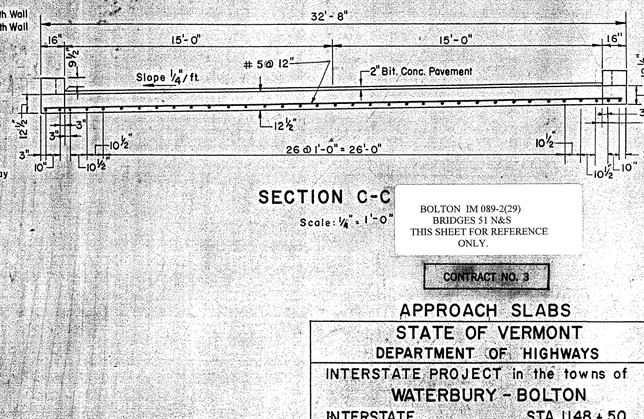
Scale: ¼" = 1'-0"

NORTHWALL & SOUTHWALL ABUTMENT NO. 3

Scale: ¼" = 1'-0"

NORTHWALL & SOUTHWALL ABUTMENT NO. 4

Scale: ¼" = 1'-0"



SECTION C-C

Scale: ¼" = 1'-0"

BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

CONTRACT NO. 3

APPROACH SLABS

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

INTERSTATE PROJECT in the towns of
WATERBURY - BOLTON

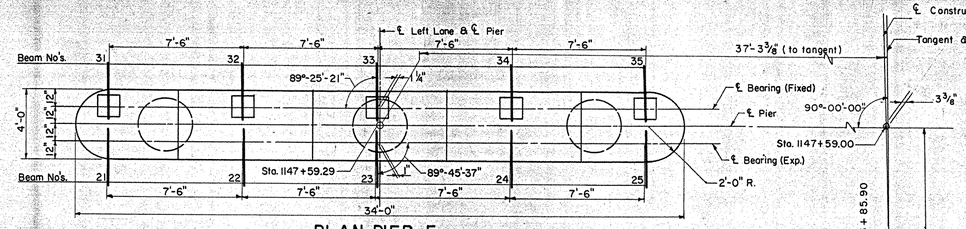
INTERSTATE STA. 1148 + 50
OVER
U.S. ROUTE 2 (REL.) STA. 30 + 00

THE CLARKESON ENGINEERING CO., INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

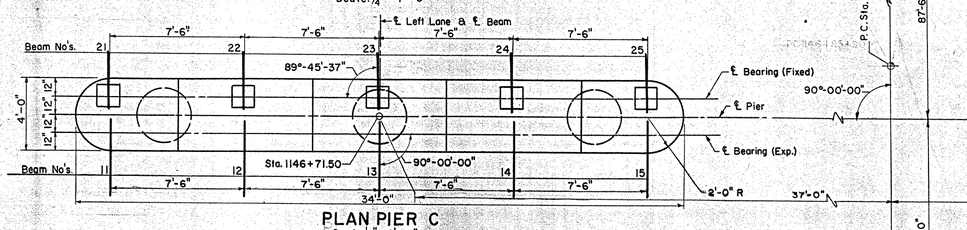
SURVEYED BY	CHECKED BY OS & HM	SCALE: AS NOTED
DRAWN BY H.B.C.	IN CHARGE J.V.B.	DATE 7-7-56

PROJECT NO I-89-2(7) SHEET 268 OF 307

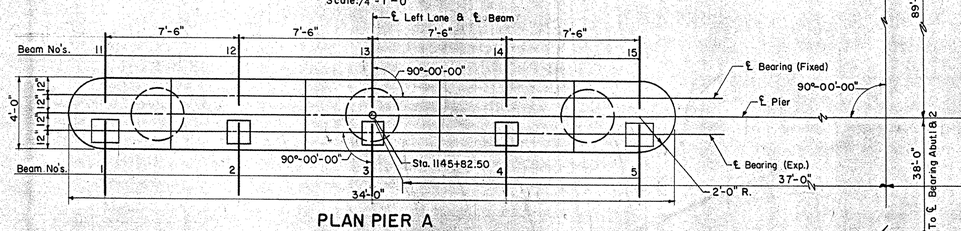
B. P. R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
I	VT.	I-89-2 (7)	77	137



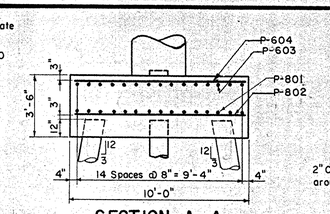
PLAN PIER E
Scale: 1/4" = 1'-0"



PLAN PIER C
Scale: 1/4" = 1'-0"

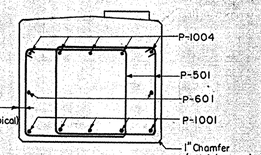


PLAN PIER A
Scale: 1/4" = 1'-0"

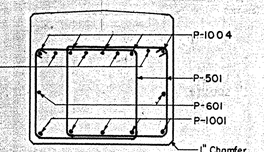


SECTION A-A
Scale: 1/4" = 1'-0"

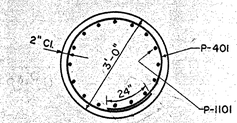
Bridge seats to be sloped 1/4" per ft. from ℄ of Pier.
Bridge seats to be covered with 1/2" asphaltic-asbestos coating after Superstructure is in place and paid for under Item 407.



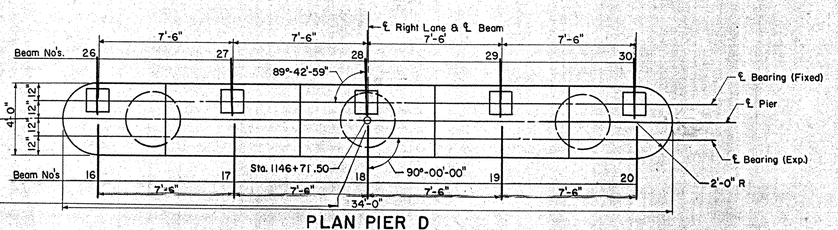
SECTION B-B
Scale: 1/2" = 1'-0"



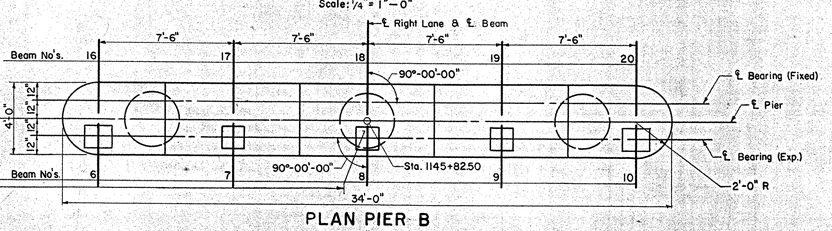
SECTION C-C
Scale: 1/2" = 1'-0"



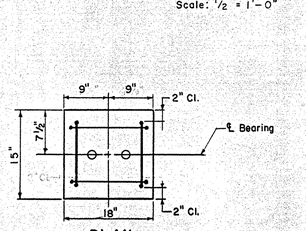
SECTION D-D
Scale: 1/2" = 1'-0"



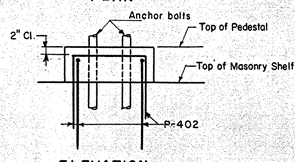
PLAN PIER D
Scale: 1/4" = 1'-0"



PLAN PIER B
Scale: 1/4" = 1'-0"



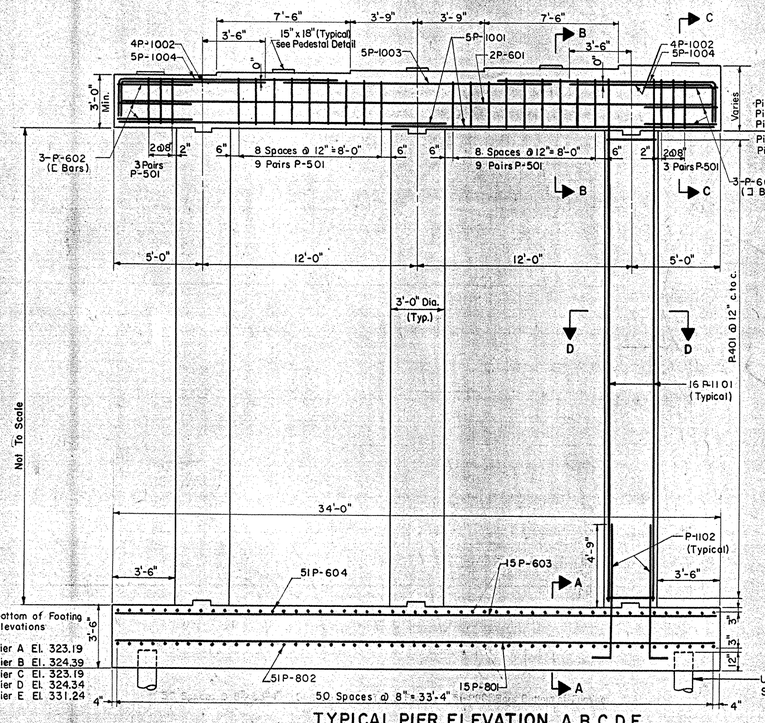
PLAN



ELEVATION

DETAIL OF PEDESTAL
Scale: 1" = 1'-0"

Note: Pedestal reinforcing to be omitted if depth of pedestal is less than 3".



TYPICAL PIER ELEVATION A,B,C,D,E
Scale: 1/4" = 1'-0"

NOTE:
Bar prefixed "PA" "PB" "PC" "PD" & "PE" are to be used in Piers A,B,C,D & E. respectively

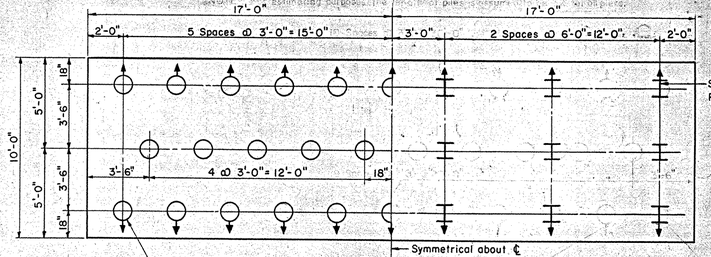
SCHEDULE OF BEAM SEAT ELEVATIONS

Beam No.	Pier A		Beam No.	Pier C		Beam No.	Pier E		Beam No.	Pier B		Beam No.	Pier D		Beam No.
1	360.45	360.23	11	361.27	361.43	21	362.27	362.32	31	6	360.45	360.23	16	361.27	361.34	26
2	361.10	360.38	12	361.40	361.58	22	362.42	362.55	32	7	361.10	360.38	17	361.40	361.56	27
3	361.26	360.54	13	361.58	361.74	23	362.58	362.74	33	8	361.26	360.54	18	361.58	361.76	28
4	361.42	360.70	14	361.74	361.90	24	362.74	362.95	34	9	361.42	360.70	19	361.74	361.96	29
5	361.07	360.85	15	361.89	362.05	25	362.89	363.17	35	10	361.07	360.85	20	361.89	362.19	30

ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	PIER A NET	PIER A OVER-RUN	PIER A TOTAL	PIER A FINAL	PIER B NET	PIER B OVER-RUN	PIER B TOTAL	PIER B FINAL	PIER C NET	PIER C OVER-RUN	PIER C TOTAL	PIER C FINAL	PIER D NET	PIER D OVER-RUN	PIER D TOTAL	PIER D FINAL
107	Structure Excavation	C.Y.	~~218~~	~~22~~	~~240~~	178	~~173~~	~~17~~	~~190~~	181	~~200~~	~~20~~	~~220~~	217	~~200~~	~~20~~	~~220~~	198
401-B	Concrete Class B (Mod.)	C.Y.	86	~~4~~	~~90~~	86	85	~~4~~	~~89~~	85	~~87~~	~~4~~	~~91~~	86	~~86~~	~~4~~	~~90~~	85
402	Reinforcing Steel	L.B.S.	See Reinforcing Steel Schedule Sh. 83.				See Reinforcing Steel Schedule Sh.83				See Reinforcing Steel Schedule Sh.83				See Reinforcing Steel Schedule Sh.83			
407	Asphaltic-Asbestos Coating	S.Y.	15	None	15	15	15	None	15	15	15	None	15	15	15	None	15	15
502-A	Untreated Timber Piling	L.F.	~~1024~~	None	~~1024~~	1095	~~1024~~	None	~~1024~~	1103	~~1024~~	None	~~1024~~	1032	~~1024~~	None	~~1024~~	1046

ITEM NO.	DESCRIPTION	UNIT	PIER F NET	PIER F OVER-RUN	PIER F TOTAL	PIER F FINAL	PIER G NET	PIER G OVER-RUN	PIER G TOTAL	PIER G FINAL	PIER H NET	PIER H OVER-RUN	PIER H TOTAL	PIER H FINAL	PIER J NET	PIER J OVER-RUN	PIER J TOTAL	PIER J FINAL	PIER E NET	PIER E OVER-RUN	PIER E TOTAL	PIER E FINAL
107	Structure Excavation	C.Y.	~~157~~	~~16~~	~~173~~	131	~~152~~	~~15~~	~~167~~	144	~~21~~	~~2~~	~~23~~	17	~~64~~	~~6~~	~~70~~	52	~~100~~	~~10~~	~~110~~	107
401-B	Concrete Class B (Mod.)	C.Y.	~~106~~	~~6~~	~~112~~	108	~~106~~	~~6~~	~~112~~	107	~~100~~	~~5~~	~~105~~	102	~~89~~	~~5~~	~~104~~	101	~~81~~	~~4~~	~~85~~	80
402	Reinforcing Steel	L.B.S.	See Reinforcing Steel Schedule Sh.83				See Reinforcing Steel Schedule Sh.83				See Reinforcing Steel Schedule Sh.83				See Reinforcing Steel Schedule Sh.83				See Reinforcing Steel Schedule Sh.83			
407	Asphaltic-Asbestos Coating	S.Y.	~~22~~	None	~~22~~	21	~~22~~	None	~~22~~	21	~~22~~	None	~~22~~	21	22	None	22	21	15	None	15	15
504	Steel Piling	L.F.	~~672~~	None	~~672~~	822	~~672~~	None	~~672~~	828	~~672~~	None	~~672~~	815	~~672~~	None	~~672~~	840	~~672~~	None	~~672~~	852



PILE PLAN
Scale: 1/4" = 1'-0"

NOTE: 1. Battered Piles indicated thus ○ timber, I steel.
Vertical Piles indicated thus ○ timber, I steel.
2. For estimating purposes the length of piles is assumed to be 32' for all piers

BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

CONTRACT NO. 3

PIERS, A, B, C, D AND E

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

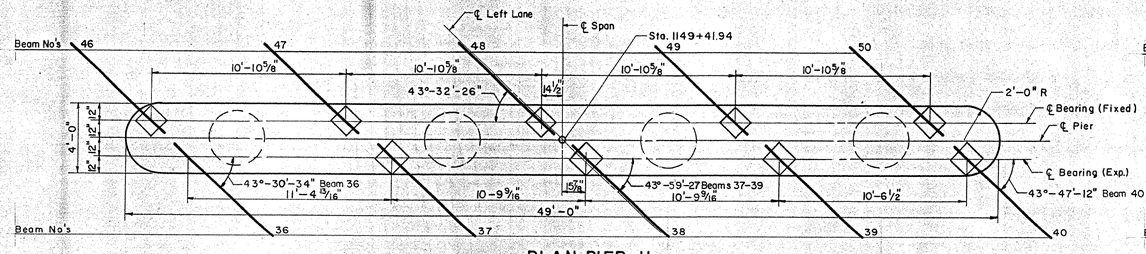
INTERSTATE PROJECT in the town of
WATERBURY-BOLTON
INTERSTATE STA. 1148+50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00

THE CLARKESON ENGINEERING CO., INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

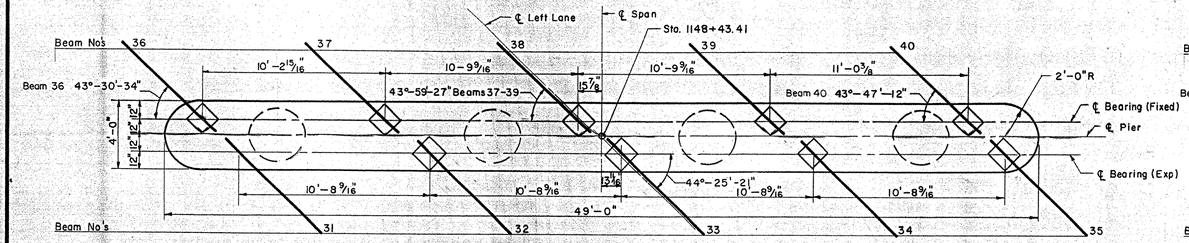
SURVEYED BY	CHECKED BY D.S.B.H.M.	SCALE AS NOTED
DRAWN BY R.N.F.	IN CHARGE J.V.B.	DATE 12-7-59

PROJECT NO. I-89-2(7) SHEET 269 OF 307

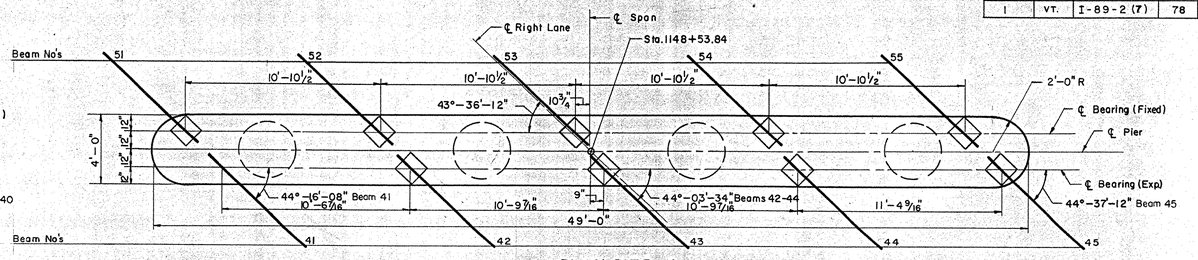
B.P.R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	VT.	I-89-2 (7)	78	137



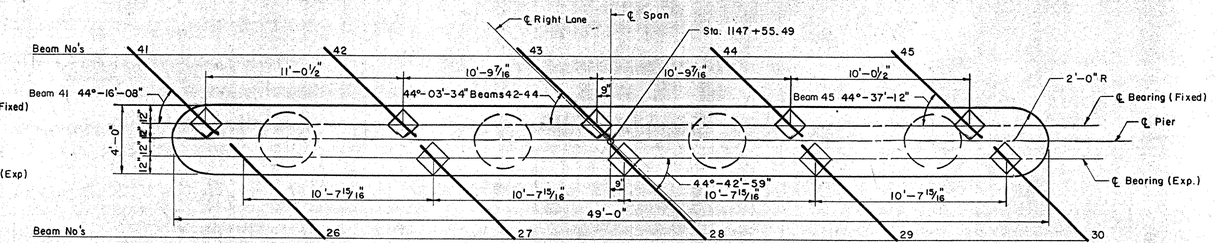
PLAN PIER H
Scale: ¼" = 1'-0"



PLAN PIER F
Scale: ¼" = 1'-0"

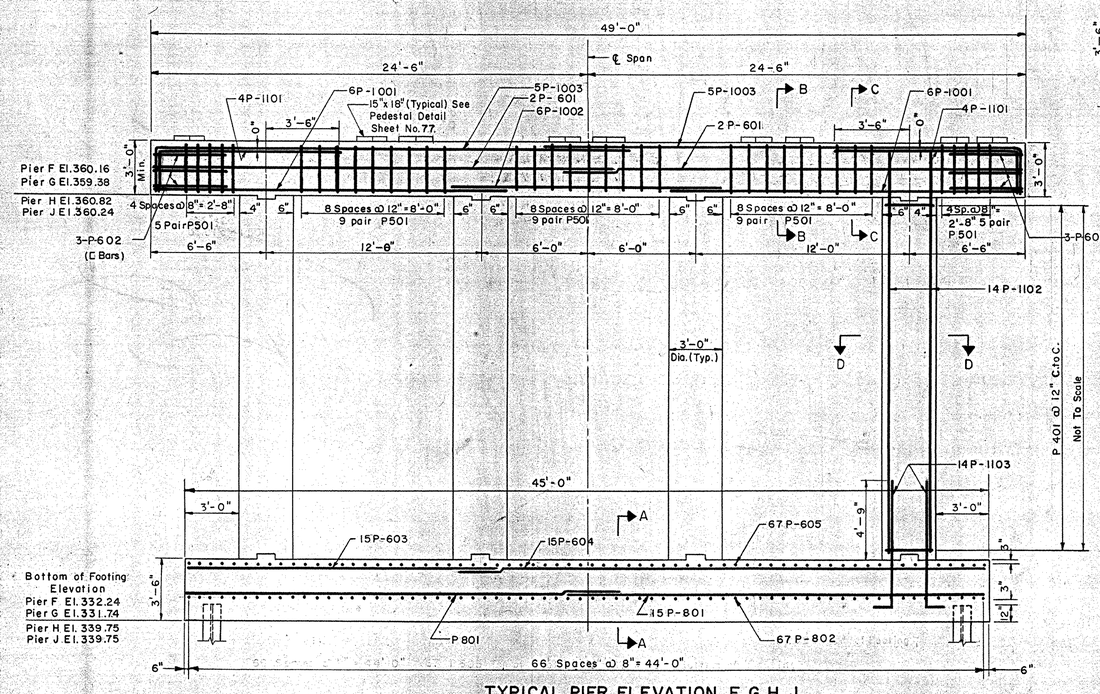


PLAN PIER J
Scale: ¼" = 1'-0"

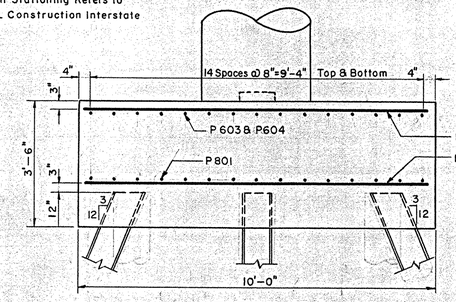


PLAN PIER G
Scale: ¼" = 1'-0"

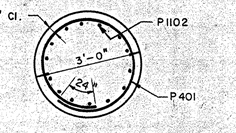
Note: All Stationing Refers to ℄ Construction Interstate



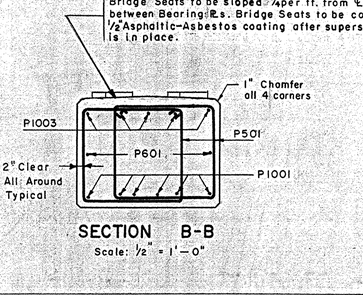
TYPICAL PIER ELEVATION F,G,H,J.
Scale: ¼" = 1'-0"



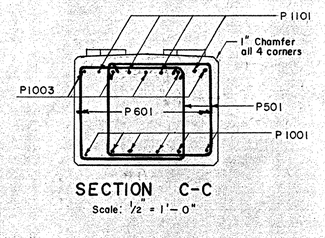
SECTION A-A
Scale: ½" = 1'-0"



SECTION D-D
Scale: ½" = 1'-0"



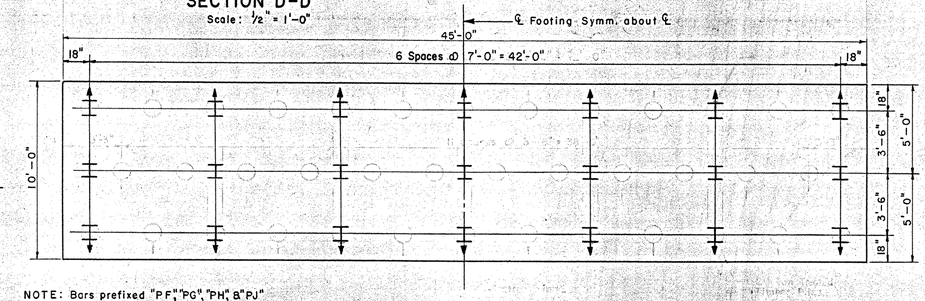
SECTION B-B
Scale: ½" = 1'-0"



SECTION C-C
Scale: ½" = 1'-0"

Bridge Seats to be sloped ¼" per ft. from ℄ of Pier, between Bearings & Bridge Seats to be covered with ½" Asphaltic-Asbestos coating after superstructure is in place.

SCHEDULE OF BEAM SEAT ELEVATIONS												
Beam No.	Pier F		Beam No.	Pier H		Beam No.	Beam No.	Pier G		Beam No.	Pier J		Beam No.
31	363.05	363.22	36	363.69	364.12	46	26	362.28	362.43	41	363.17	363.53	51
32	363.24	363.30	37	363.83	364.46	47	27	362.43	362.53	42	363.25	363.88	52
33	363.37	363.40	38	363.94	364.56	48	28	362.56	362.61	43	363.33	363.98	53
34	363.51	363.51	39	364.05	364.69	49	29	362.68	362.69	44	363.45	364.09	54
35	363.79	363.59	40	364.16	364.56	50	30	362.95	362.75	45	363.55	363.93	55



PILE PLAN
Scale: ¼" = 1'-0"

NOTE: Bars prefixed "PF" "PG" "PH" & "PJ" to be used in Piers F, G, H, & J respectively.

BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

CONTRACT NO. 3

Note: 1. For Quantity Estimates See Sheet No. 77
2. All Piles to be Steel Piling 10 BP 42 (35 Ton Design Load)
3. Battered Piles Indicated thus ⫽
4. Vertical Piles Indicated thus ⫿
5. For Estimating Purposes the Length of Piles is Assumed to be 32' for all Piers.

PIERS F, G, H, AND J

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

INTERSTATE PROJECT in the towns of
WATERBURY - BOLTON

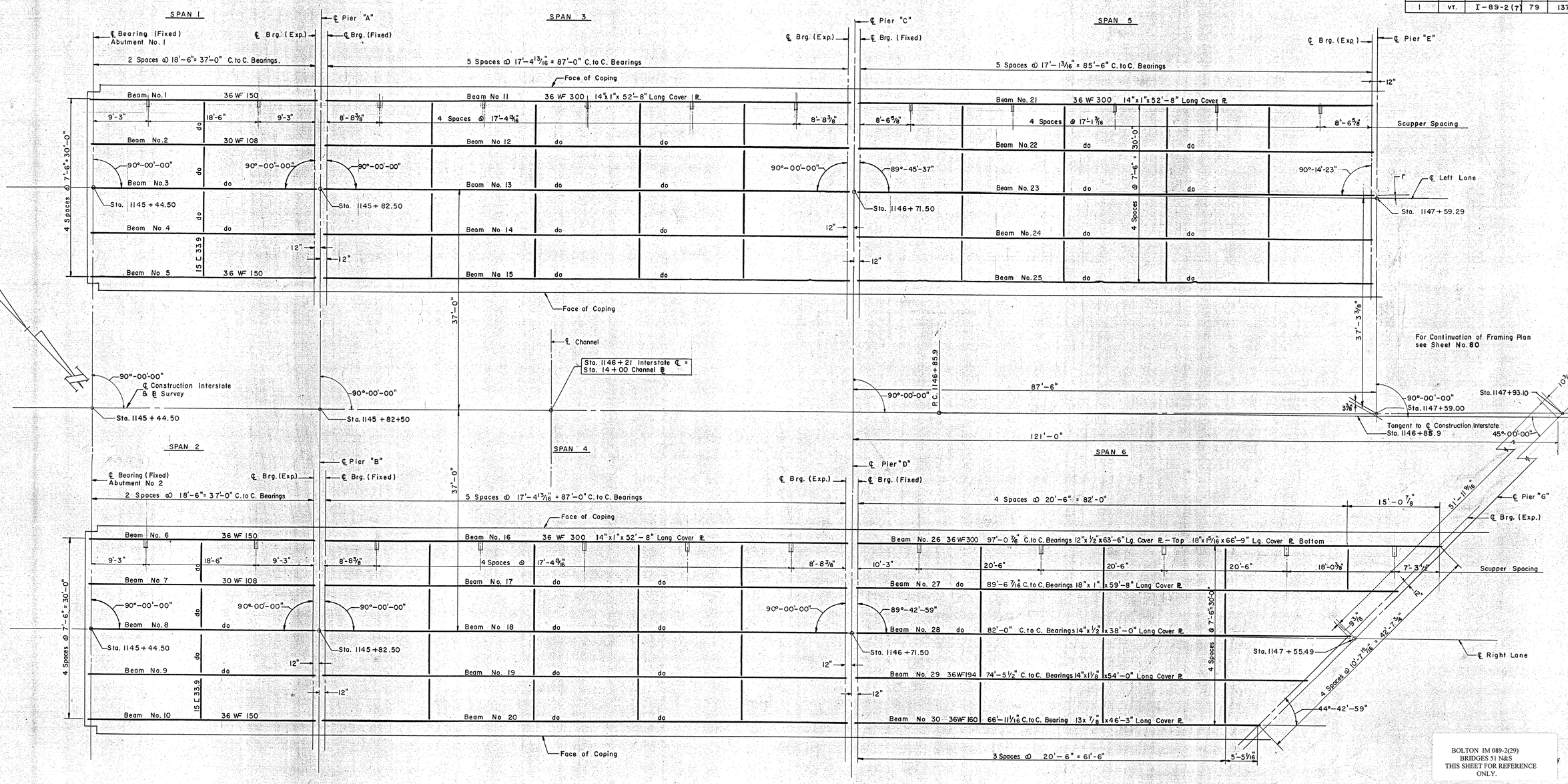
INTERSTATE STA. 1148+50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00

THE CLARKESON ENGINEERING CO. INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SURVEYED BY	CHECKED BY H.M & D.S	SCALE AS NOTED
DRAWN BY R. J. F.	IN CHARGE J.V.B.	DATE 7-7-58

PROJECT NO. I-89-2(7) SHEET 270 OF 307

B. P. R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	VT.	I-89-2(7)	79	137



BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	RIGHT LANE NET	RIGHT LANE OVER-RUN	RIGHT LANE TOTAL	RIGHT LANE FINAL	LEFT LANE NET	LEFT LANE OVER-RUN	LEFT LANE TOTAL	LEFT LANE FINAL
401-B	Concrete Class B (Mod.)	C.Y.	~~398~~	~~20~~	~~418~~	418 ✓	~~491~~	~~25~~	~~516~~	509 ✓
402	Reinforcing Steel	LBS.	See Reinforcing Schedule Sheet 85.				See Reinforcing Schedule			
403-e	Spiral Reinforcment (22,660 LB.)	L.S.	1 ✓		1 ✓	1 ✓	1 ✓		1 ✓	1 ✓
404-A	Structural Steel	LBS.	~~545638~~	~~10912~~	~~556550~~	See Total ✓	~~687830~~	~~13757~~	~~701587~~	See Total ✓
361-B	Bituminous Concrete Pavement (Mod.)	TONS	~~140~~	~~21~~	~~161~~	See Total ✓	~~174~~	~~26~~	~~200~~	See Total ✓

FRAMING PLAN

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

NOTE:

1. All diaphragms to be 18 E 42.7 except as noted
2. All beams shall be rolled to true circular camber with the middle ordinate as shown on Sheet No. 81
3. All dimensions are horizontal dimensions.
4. For Steel Details, see Sheet No. 81.
5. The steel for all beams and cover plates shall conform to A.S.T.M. Designation A373. All other structural steel shall conform to either A 7 or A373.

CONTRACT NO. 3

STRUCTURAL STEEL PLAN

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

INTERSTATE PROJECT in the towns of
WATERBURY - BOLTON

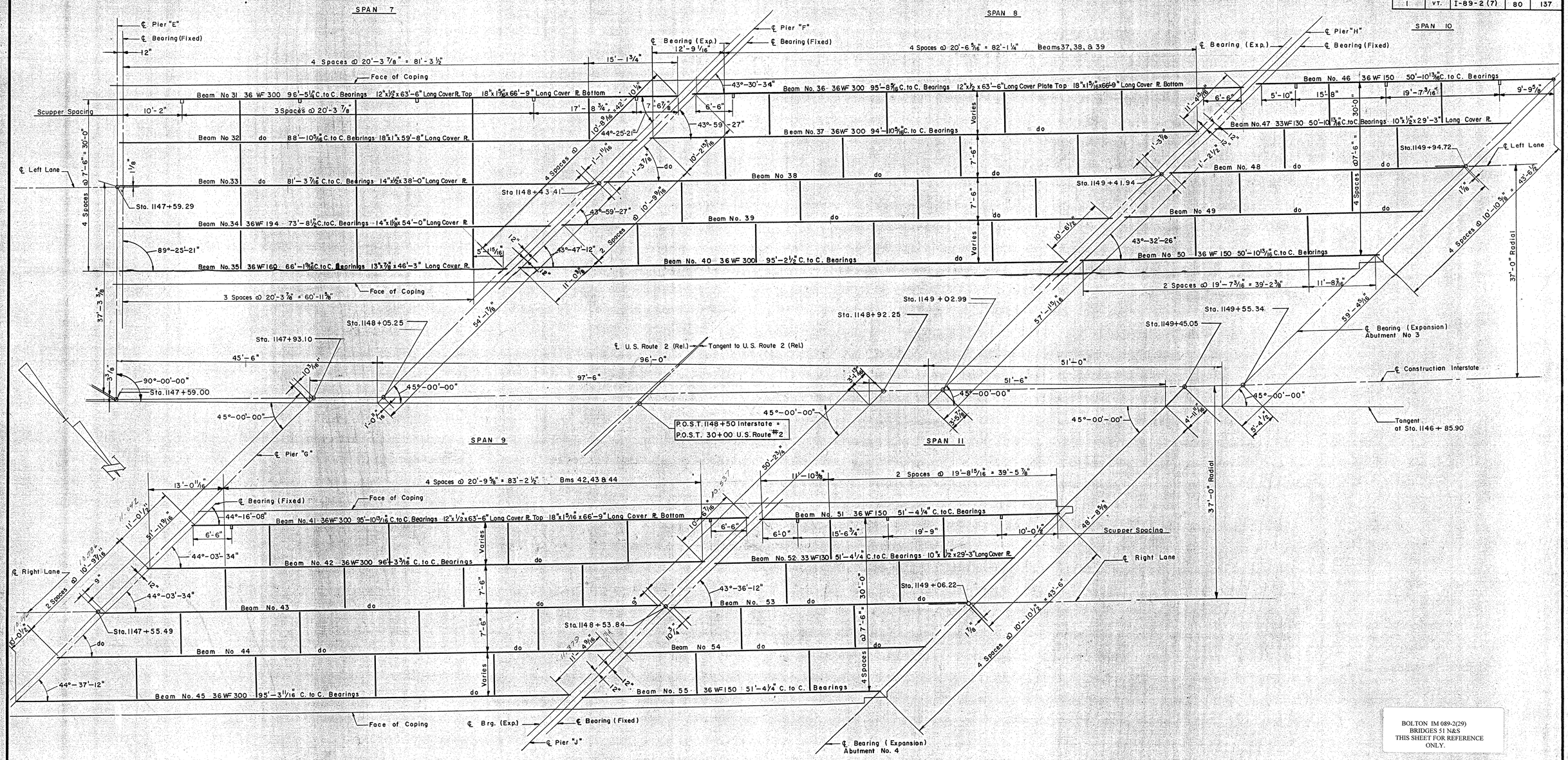
INTERSTATE STA. 1148 + 50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00

THE CLARKESON ENGINEERING CO., INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SURVEYED BY / DRAWN BY	CHECKED BY	SCALE AS NOTED
AL	HM & DS / JVB	DATE 7-7-58

PROJECT NO. I-89-2-(7) | SHEET 271 OF 307

B. P. R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	VT.	I-89-2(7)	80	137



FRAMING PLAN

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

NOTE:

1. All diaphragms to be 18 C 42.7
2. All beams shall be rolled to true circular camber with the middle ordinate as shown on Sheet No. 81.
3. All dimensions are horizontal dimensions.
4. For Steel Details, see Sheet No. 81.
5. The steel for all beams and cover plates shall conform to A.S.T.M. Designation A373. All other structural steel shall conform to either A 7 or A373.

BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

CONTRACT NO. 3

STRUCTURAL STEEL PLAN

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

INTERSTATE PROJECT in the towns of
WATERBURY - BOLTON

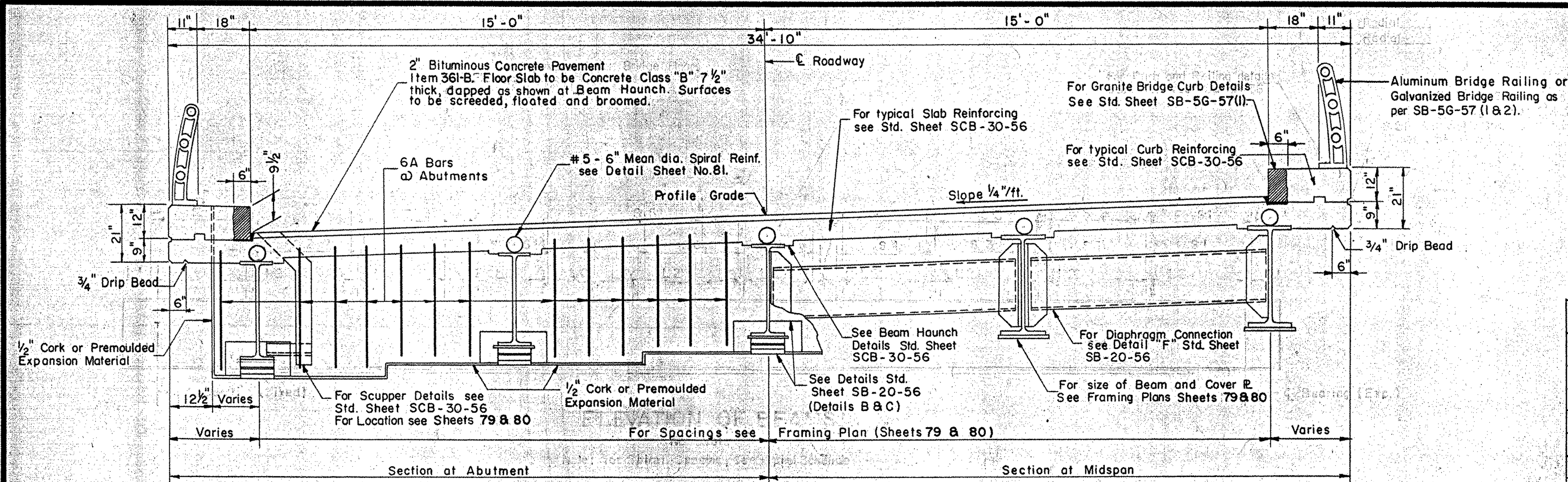
INTERSTATE STA. 1148+50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00

THE CLARKESON ENGINEERING CO. INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SURVEYED BY	CHECKED BY O.S. & H.M.	SCALE 1/8"=1'-0"
DRAWN BY H.B.C.	IN CHARGE J.V.S.	DATE 7-7-58

PROJECT NO. I-89-2(7) SHEET 272 OF 307

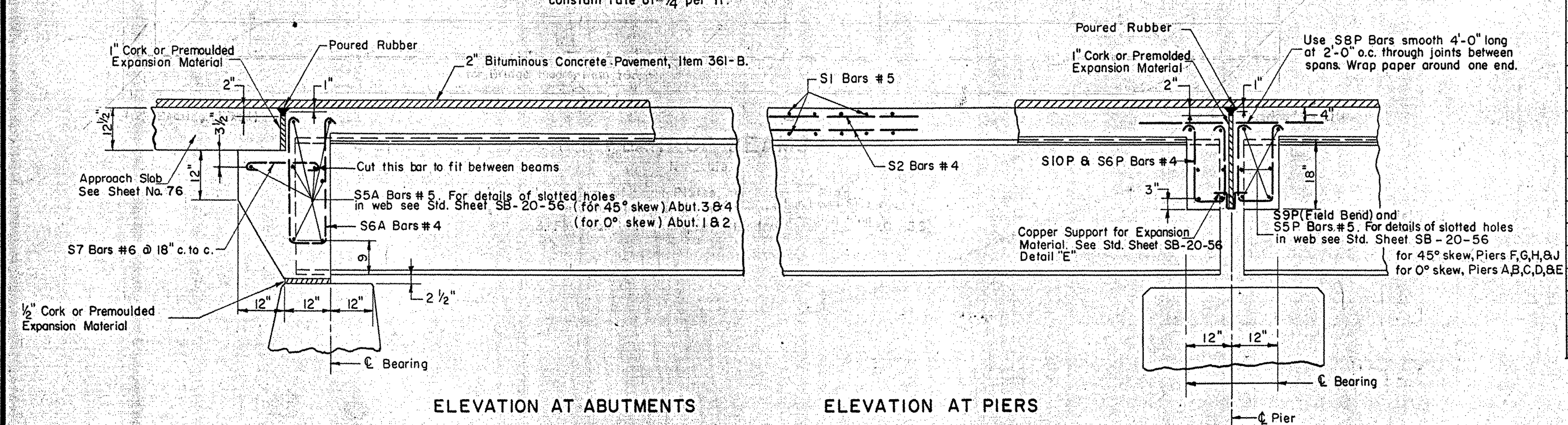
B. P. R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	VT.	I-89-2 (7)	81	137



TYPICAL CROSS SECTION

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

Note: The entire Bridge and Approach Slabs are to be superelevated at constant rate of 1/4" per ft.

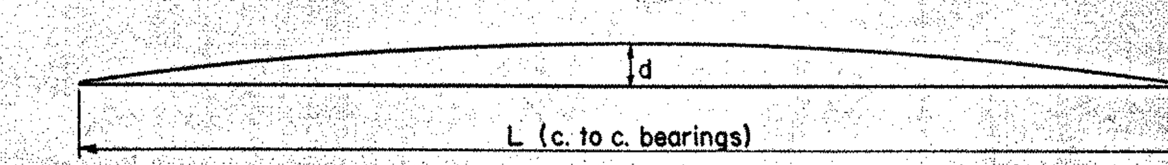


ELEVATION AT ABUTMENTS — ELEVATION AT PIERS

TYPICAL ELEVATION OF BEAM (SQUARE)

Scale: 1/2" = 1'-0"

NOTE: WHERE A DOUBLE SPIRAL IS CALLED FOR IN THE SCHEDULE (4) FOUR 6 1/2" LONG STUDS ARE REQUIRED PER PITCH.



Beam	L	d
1, 5, 6, 10	37'	5/8"
2-4, 7-9	37'	7/8"
11-25, 42-44	87'±	4"
26, 31	97'±	5"
27, 32	89'±	4 1/4"
28, 33	82'±	3 1/2"
29, 34	74'±	2 7/8"
30, 35	66'±	2 3/8"
36-41, 45	95'±	4 3/4"
46, 50, 51, 58	51'±	1 1/4"
47-49, 52-54	51'±	1 1/2"

CAMBER DIAGRAM

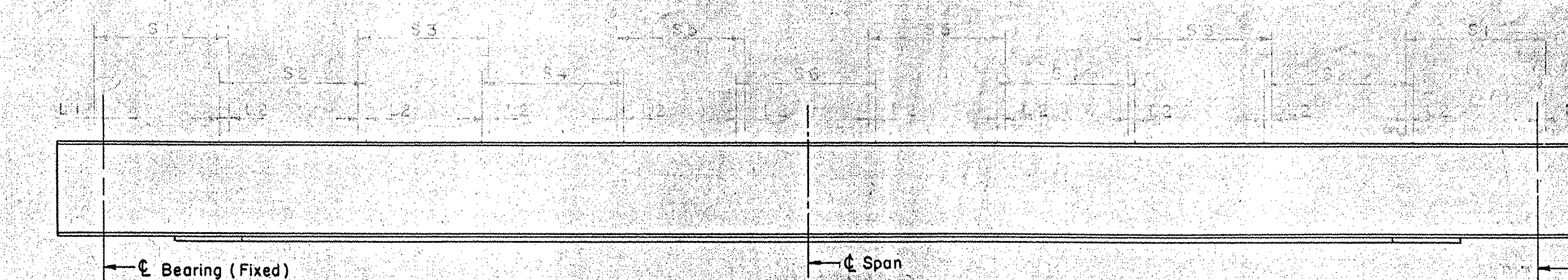
No Scale

BEAM SCHEDULE

Beam No.	A	B	C	D
1, 5, 6, 10	6"	11"	37'-0"	38'-5"
2-4, 7-9	6"	9"	37'-0"	38'-3"
11, 15, 16, 20	11"	11"	87'-0"	88'-10"
12-14, 17-19	9"	9"	87'-0"	88'-6"
21; 25	11"	11"	85'-6"	87'-4"
22-24	9"	9"	85'-6"	87-0"
26	11"	14 1/8"	97-0 7/8"	99'-2"
27	9"	9"	89'-6 7/16"	91'-0 7/16"
28	9"	9"	82'-0"	83'-6"
29	9"	9"	74'-5 1/2"	75'-11 1/2"
30	11"	15 5/8"	66'-11 1/16"	69'-1 11/16"
31	11"	15 11/16"	96'-5 1/4"	98'-7 15/16"
32	9"	9"	88'-10 5/16"	90'-4 5/16"
33	9"	9"	81'-3 7/16"	82'-9 7/16"
34	9"	9"	73'-8 1/2"	75'-2 1/2"
35	11"	15 11/16"	66'-1 9/16"	68'-4 1/4"
36	16"	15"	95'-8 5/16"	98'-3 5/16"
37-39	9"	9"	94'-10 5/16"	96'-4 5/16"
40	15 7/8"	15 7/8"	95'-2 1/2"	97'-10 1/4"
41	17 1/4"	15 3/4"	95'-10 13/16"	98'-7 13/16"
42-44	9"	9"	96'-3 3/16"	97'-9 3/16"
45	15 11/16"	18 11/16"	95'-3 11/16"	98'-2 1/16"
46; 50	17"	9"	50'-10 13/16"	53'-0 13/16"
47-49	9"	9"	50'-10 13/16"	52'-4 13/16"
51; 55	12 15/16"	9"	51'-4 1/4"	53'-2 3/16"
52-54	9"	9"	51'-4 1/4"	52'-10 1/4"

SPIRAL SCHEDULE

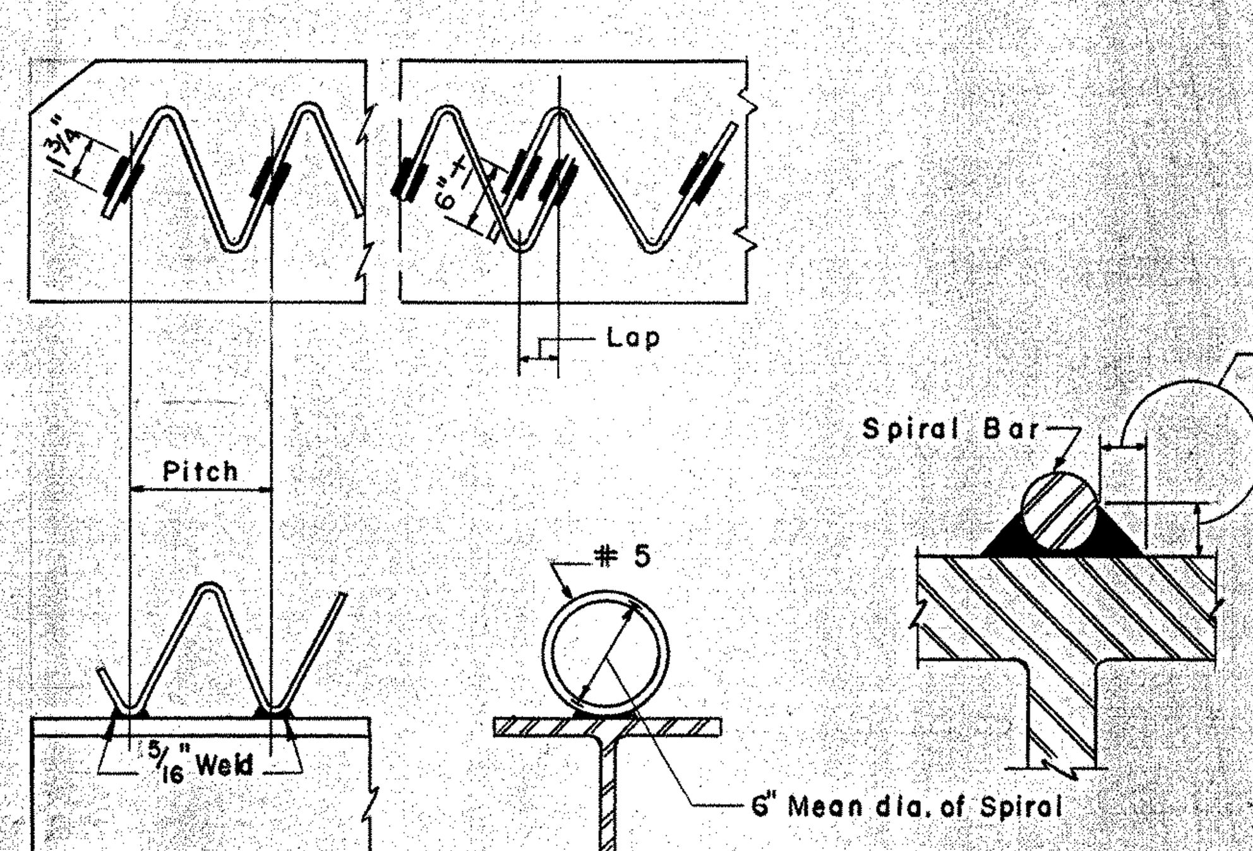
LENGTH OF SPAN	39'	54'	84'	89'	99'
SPIRAL PITCH 0'-10' FROM BRNG.	DOUBLE @ 5"	DOUBLE @ 5"	DOUBLE @ 5 1/2"	DOUBLE @ 6"	DOUBLE @ 5 1/2"
" " 10'-20' OR ℄ SPAN	4"	DOUBLE @ 7"	DOUBLE @ 6 1/2"	DOUBLE @ 7"	DOUBLE @ 6 1/2"
" " 20'-30' OR ℄ SPAN	—	5 1/2"	4"	4 1/2"	4 1/2"
" " 30'-40' OR ℄ SPAN	—	—	5 1/2"	5 1/2"	5 1/2"
" " 40'-℄ SPAN	—	—	8"	8"	7"



ELEVATION OF BEAMS

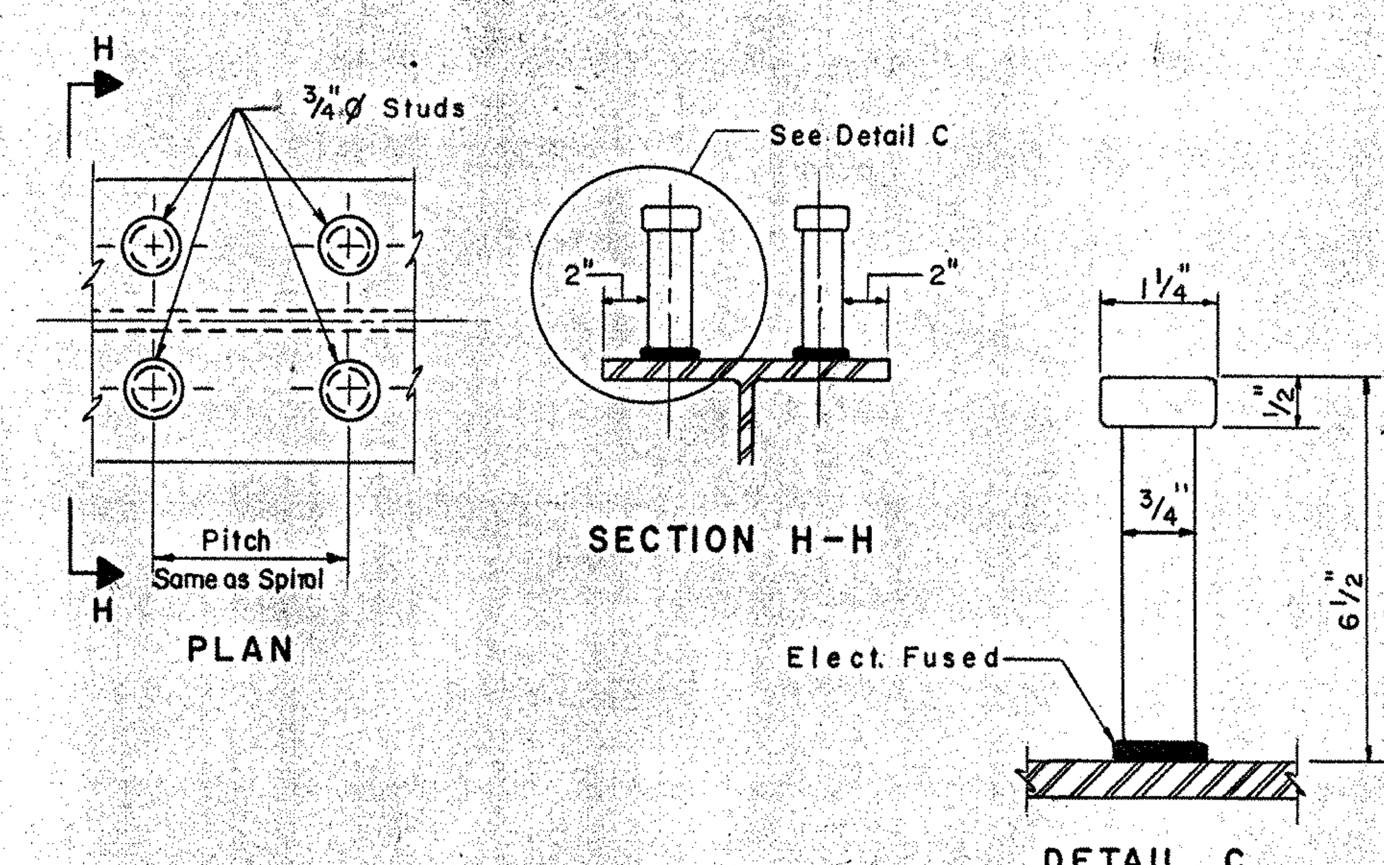
No Scale

Note: For Spiral Spacing, see Spiral Schedule



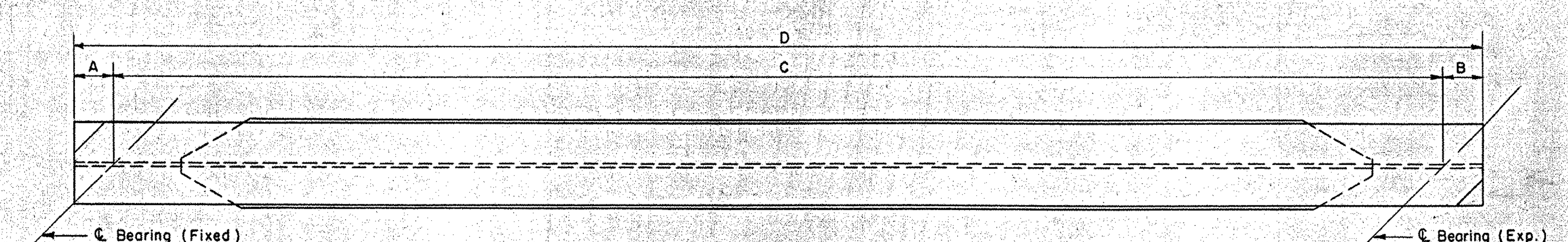
SPIRAL WELDING DETAILS

No Scale



ALTERNATE SHEAR CONNECTOR

No Scale



PLAN OF BEAMS

No Scale

Notes: 1. For Cover Plate Details, see Standard Sheet SCB-30-56
2. For Estimated Quantities, see Sheet No. 79
3. Cut flange ends as per Standard Sheet No. SB-22-58.

BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

CONTRACT NO. 3

STRUCTURAL DETAILS

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

INTERSTATE PROJECT in the towns of
WATERBURY-BOLTON
INTERSTATE STA. 1148+50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00

THE CLARKESON ENGINEERING CO., INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SURVEYED BY — CHECKED BY H.M.& D.S. — SCALE AS NOTED

Item	No. Pieces	Size	Length	Mark	Type	A	B	C	D	E	F	G	H	J	K	R	O
							ABUTMENT NO. 1										
1	4	5	5'-0"	A1-501	17		1'-0"	3'-0"	1'-0"								
2	4	↓	8'-6"	A1-502	17		1'-0"	6'-6"	1'-0"								
3	12		10'-10"	A1-503	Str.												
4	2		9'-9"	A1-504	↓												
5	2		8'-8"	A1-505													
6	2		7'-7"	A1-506													
7	2		6'-6"	A1-507													
8	2		5'-5"	A1-508													
9	12		4'-4"	A1-509													
10	4		8'-4"	A1-510													
11	8		12'-2"	A1-511													
12	2		11'-8"	A1-512													
13	2		10'-10"	A1-513													
14	2		9'-11"	A1-514													
15	2		8'-6"	A1-515													
16	2		7'-6"	A1-516													
17	2	↓	6'-7"	A1-517													
18	2	5	5'-8"	A1-518													
19	8	6	18'-6"	A1-601													
20	12	↓	18'-11"	A1-602													
21	35		6'-6"	A1-603													
22	12		10'-0"	A1-604													
23	12		9'-9"	A1-605													
24	2		8'-8"	A1-606													
25	8		12'-3"	A1-607													
26	2		11'-8"	A1-608													
27	2		10'-10"	A1-609													
28	2		9'-11"	A1-610													
29	2		8'-6"	A1-611													
30	2		7'-6"	A1-612													
31	2		6'-7"	A1-613	↓												
32	2	↓	5'-8"	A1-614	Str.												
33	12	6	8'-0	A1-615	17		4'-0	4'-0"									
34	10	6	4'-3"	A1-616	Str.												
35							ABUTMENT NO. 2										
36																	
37	Same	Reinforcing as in	Abutment	No.1	Except	Bars to be Prefixed	A2										
38																	
39																	
40																	
41							ABUTMENT NO. 3										
42	4	5	8'-8"	A3-501	17		1'-0"	6'-8"	1'-0"								
43	4	↓	15'-8"	A3-502	17		1'-0"	13'-8"	1'-0"								
44	4		21'-8"	A3-503	17		1'-0	19'-8"	1'-0"								
45	10		19'-8"	A3-504	Str.												
46	2		19'-2"	A3-505	↓												
47	↑		18'-1"	A3-506													
48			17'-0"	A3-507													
49			15'-11"	A3-508													
50	↓		14'-10"	A3-509													
51	2		13'-9"	A3-510													
52	16		12'-6"	A3-511													
53	14		12'-0"	A3-512													
54	2		10'-9"	A3-513													
55	↑		9'-7"	A3-514													
56			8'-5"	A3-515													
57			7'-6"	A3-516													
58			6'-4"	A3-517													
59	2	↓	5'-7"	A3-518													
60	*311	5	4'-2"	A3-519													
61	8	6	26'8"	A3-601													
62	12	↓	28'-3"	A3-602													
63	74		6'-6"	A3-603													
64	9		11'-0"	A3-604													
65	10		19'-3"	A3-605													
66	2		19'-2"	A3-606													
67	↑		18'-1"	A3-607													
68			17'-0"	A3-608													
69			15'-11"	A3-609													
70	↓		14'-10"	A3-610													
71	2		13'-9"	A3-611													
72	16		12'-6"	A3-612													
73	14		12'-0"	A3-613													
74	2		10'-9"	A3-614													
75	↑		9'-7"	A3-615													
76			8'-5"	A3-616													
77			7'-6"	A3-617													
78			6'-4"	A3-618													
79	2		5'-7"	A3-619													
80	30		5'-0"	A3-620													
81	4	6	8'-6"	A3-621	Str.												

Item	No. Pieces	Size	Length	Mark	Type	A	B	C	D	E	F	G	H	J	K	R	O
82							ABUTMENT NO. 4										
83	4	5	7'-8"	A4-501	17		1'-0"	5'-8"	1'-0"								
84	4	↓	12'-8"	A4-502	17		1'-0"	10'-8"	1'-0"								
85	4		17'-8"	A4-503	17		1'-0"	15'-8"	1'-0"								
86	10		15'-6"	A4-504	Str.												
87	2		15'-2"	A4-505	↓												
88	↓		14'-4"	A4-506													
89			13'-6"	A4-507													
90			12'-7"	A4-508													
91	↓		11'-10"	A4-509													
92	2		11'- 0"	A4-510													
93	14		12'- 6"	A4-511													
94	10		12'- 0"	A4-512													
95	2		10'-7"	A4-513													
96	↓		9'-10"	A4-514													
97			8'-3"	A4-515													
98	↓		6'- 10"	A4-516													
99	2	↓	5'- 7"	A4-517													
100	24	5	4'- 2"	A4-518													
101	8	6	26'-6"	A4- 601													
102	12	↓	28'-9"	A4-602													
103	68		6'- 6"	A4-603													
104	9		8'- 0'	A4-604													
105	10		15'- 6"	A4-605													
106	2		18'-2"	A4-606													
107	↓		14'-4"	A4-607													
108			13'-6"	A4-608													
109			12'-7"	A4-609													
110	↓		11'-10"	A4- 610													
111	2		11'- 0"	A4-611													
112	14		12'- 6"	A4-612													
113	10		12'- 0"	A4-613													
114	2		10'-7"	A4-614													
115	↓		9'-10"	A4-615													
116			8'-3"	A4-616													
117	↓		6'-10"	A4-617													
118	2		5'-7"	A4-618													
119	24	↓	5'-0"	A4-619	↓												
120	4	6	7'-11"	A4-620	Str.												
121																	
122																	
123																	
124																	
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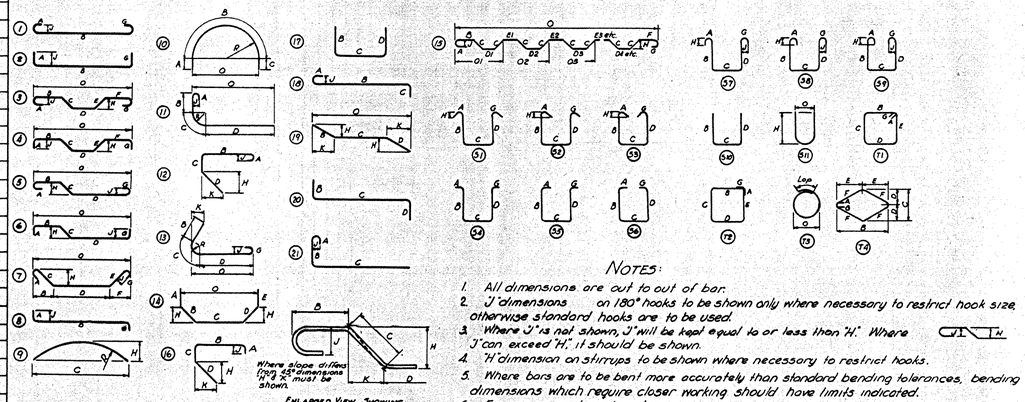
TYPICAL BAR BENDS



NOTES:

1. All dimensions are out to out of bar.
2. "J" dimensions on 180° hooks to be shown only where necessary to restrict hook size, otherwise standard hooks are to be used.
3. Where "J" is not shown, "J" will be kept equal to or less than "H." Where "J" can exceed "H," it should be shown.
4. "H" dimension on stirrups to be shown where necessary to restrict hooks.
5. Where bars are to be bent more accurately than standard bending tolerances, bending dimensions which require closer working should have limits indicated.
6. Figures in circles show types.
7. No allowance for bend curvature is to be made except for standard hook & radii in excess of same.

Item	No. Pieces	Size	Length	Mark	Type	A	B	C	D	E	F	G	H	J	K	R	O
163																	
164																	
165																	
166																	
167																	
168																	
169																	
170																	
171																	
172																	
173																	
174																	
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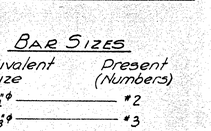
190																	



STANDARD HOOK DETAIL

BAR SIZES

Equivalent Size	Present (Numbers)
¼"ϕ	#2
⅜"ϕ	#3
½"ϕ	#4
⅝"ϕ	#5
¾"ϕ	#6
⅞"ϕ	#7
1"ϕ	#8
1 1/8"□	#9
1 ¼"□	#10
1 ⅜"□	#11

BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

8. Bar reinforcement metal shall conform to the requirements of the Standard Specifications for new Billet-Steel Concrete Reinforcement Bars (Intermediate Grade) Serial Designation A.A.S.H.O. M31-48 or its latest revision. All bars shall be deformed to conform with A.S.T.M. Specifications A305-49.

* Denotes one additional bar for testing purposes

ESTIMATED QUANTITIES

FINAL	Location	Pounds
2,412 ✓	Abutment No. 1	~~2121~~
2,412 ✓	Abutment No. 2	~~2121~~
4,482 ✓	Abutment No. 3	~~4334~~
3,853 ✓	Abutment No. 4	~~3730~~
13,159 ✓	TOTAL	~~12,306~~

B.P.R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	V T	I-89-2 (7)	82	137

CONTRACT NO. 3

REINFORCING SCHEDULE

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
INTERSTATE PROJECT in the towns of
WATERBURY - BOLTON
INTERSTATE STA. 1148+50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00
THE CLARKESON ENGINEERING CO. INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SURVEYED BY	CHECKED BY	SCALE
DRAWN BY F.P.D.	IN CHARGE J.V.B.	DATE 7-7-58

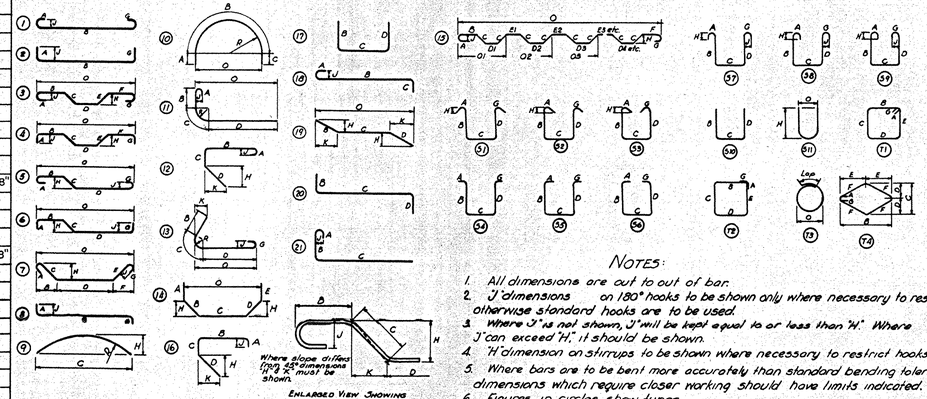
PROJECT NO. I-89-2(7) SHEET 274 OF 307

PRINTED BY SPAULDING-MOSS CO., BOSTON, MASS., EX-ORDER NO. D- 855

Item	No. Pieces	Size	Length	Mark	Type	A	B	C	D	E	F	G	H	J	K	R	O
				PIER A													
1	94 *	4	10'-4"	PA401	T3											2'-8"	
2	12	4	5'-11"	PA402	S10		2'-6"	0'-11"	2'-6"								
3	48	5	11'-4"	PA501	T1	0'-4"	2'-8"	2'-8"	2'-8"	2'-8"		0'-4"					
4	2	6	30'-0"	PA601	STR.												
5	6	6	9'-10"	PA602	S11								3'-10"			3'-8"	
6	15	6	33'-6"	PA603	STR.												
7	52 *	6	9'-6"	PA604	STR.												
8	15	8	33'-6"	PA801	STR.												
9	51	8	9'-6"	PA802	STR.												
10	10	10	19'-0"	PA1001	STR.												
11	8	10	11'-0"	PA1002	20			8'-4"	2'-8"								
12	6 *	10	16'-3"	PA1003	STR.												
13	10	10	15'-8"	PA1004	20			13'-0"	2'-8"								
14	49 *	11	33'-5"	PA1101	STR.												
15	48	11	9'-0"	PA1102	20			8'-0	1'-0"								
16																	
17																	
18																	
19				PIER B													
20	90	4	10'-4"	PB401	T3											2'-8"	
21	12	4	5'-11"	PB402	S10		2'-6"	0'-11"	2'-6"								
22	48	5	11'-4"	PB501	T1	0'-4"	2'-8"	2'-8"	2'-8"	2'-8"		0'-4"					
23	2	6	30'-0"	PB601	STR.												
24	6	6	9'-10"	PB602	S11								3'-10"			3'-8"	
25	15	6	33'-6"	PB603	STR.												
26	51	6	9'-6"	PB604	STR.												
27	15	8	33'-6"	PB801	STR.												
28	51	8	9'-6"	PB802	STR.												
29	10	10	19'-0"	PB1001	STR.												
30	18	10	11'-0"	PB1002	20			8'-4"	2'-8"								
31	5	10	16'-3"	PB1003	STR.												
32	10	10	15'-8"	PB1004	20			13'-0"	2'-8"								
33	48	11	32'-2"	PB1101	STR.												
34	48	11	9'-0"	PB1102	20			8'-0"	1'-0"								
35																	
36																	
37																	
38																	
39				PIER C													
40	96	4	10'-4"	PC401	T3											2'-8"	
41	48	5	11'-4"	PC501	T1	0'-4"	2'-8"	2'-8"	2'-8"	2'-8"		0'-4"					
42	2	6	30'-0"	PC601	STR.												
43	6	6	9'-10"	PC602	S11								3'-10"			3'-8"	
44	15	6	33'-6"	PC603	STR.												
45	51	6	9'-6"	PC304	STR.												
46	15	8	33'-6"	PC801	STR.												
47	51	8	9'-6"	PC802	STR.												
48	10	10	19'-0"	PC1001	STR.												
49	8	10	11'-0"	PC1002	20			8'-4"	2'-8"								
50	5	10	16'-3"	PC1003	STR.												
51	10	10	15'-8"	PC1004	20			13'-0"	2'-8"								
52	48	11	34'-3"	PC1101	STR.												
53	48	11	9'-0"	PC1102	20			8'-0"	1'-0"								
54																	
55																	
56																	
57																	
58				PIER D													
59	93	4	10'-4"	PD401	T3											2'-8"	
60	48	5	11'-4"	PD501	T1	0'-4"	2'-8"	2'-8"	2'-8"		0'-4"						
61	2	6	30'-0"	PD601	STR.												
62	6	6	9'-10"	PD602	S11								3'-10"			3'-8"	
63	15	6	33'-6"	PD603	STR.												
64	51	6	9'-6"	PD604	STR.												
65	15	8	33'-6"	PD801	STR.												
66	51	8	9'-6"	PD802	STR.												
67	10	10	19'-0"	PD1001	STR.												
68	8	10	11'-0"	PD1002	20			8'-4"	2'-8"								
69	5	10	16'-3"	PD1003	STR.												
70	10	10	15'-8"	PD1004	20			13'-0"	2'-8"								
71	48	11	33'-1"	PD1101	STR.												
72	48	11	9'-0"	PD1102	20			8'-0"	1'-0"								
73	4	4	5'-11"	PD402	S10		2'-6"	0'-11"	2'-6"								
74																	
75																	
76																	
77																	
78				PIER E													
79	75	4	10'-4"	PE401	T3											2'-8"	
80	48	5	11'-4"	PE501	T1	0'-4"	2'-8"	2'-8"	2'-8	2'-8"		0'-4"					
81	2	6	30'-0"	PE601	STR.												
82	6	6	9'-10"	PE602	S11								3'-10"				3'-8"
83	15	6	33'-6"	PE603	STR.												
84	51	6	9'-6"	PE604	STR.												
85	15	8	33'-6"	PE801	STR.												
86	51	8	9'-6"	PE802	STR.												
87	10	10	19'-0"	PE1001	STR.												
88	8	10	11'-0"	PE1002	20			8'-4"	2'-8"								
89	5	10	16'-3"	PE1003	STR.												
90	10	10	15'-8"	PE1004	20			13'-0"	2'-8"								
91	48	11	27'-3"	PE1101	STR.												
92	48	11	9'-0"	PE1102	20			8'-0"	1'-0"								
93	4	4	5'-11"	PE402	S10		2'-6"	0'-11"	2'-6"								
94																	
95																	
96																	
97				PIER F													
98	100	4	10-4"	PF401	T3												2'-8"
99	24	4	5'-11"	PF402	S10		2'-6"	0'-11"	2'-6"								
100	74	5	11'-4"	PF501	T1	0'-4"	2'-8"	2'-8"	2'-8"	2'-8"	0'-4"						
101	4	6	23'-9"	PF601	STR.												
102	6	6	9'-10"	PF602	S11								3'-10"				3'-8"
103	15	6	17'-6"	PF603	STR.												
104	15	6	29'-6"	PF604	STR.												
105	67	6	9'-6"	PF605	STR.												
106	30	8	24'-0"	PF801	STR.												
107	67	8	9'-6"	PF802	STR.												
108	12	10	20'-6"	PF1001	STR.												
109	6	10	16'-3"	PF1002	STR.												
110	10	10	29'-2"	PF1003	20			26'-6"	2'-8"								
111	8	11	12'-6"	PF1101	20			9'-10"	2'-8"								
112	56	11	27'-3"	PF1102	STR.												
113	56	11	9'-0"	PF1103	20			8'-0	1'-0"								
114																	
115																	
116																	
117																	
118																	
119				PIER G													
120	100	4	10'-4"	PG401	T3											2'-8"	
121	24	4	5'-11"	PG402	S10		2'-6"	0'-11"	2'-6"								
122	74	5	11'-4"	PG501	T1	0'-4"	2'-8"	2'-8"	2'-8"	2'-8"	0'-4"						
123	4	6	23'-9"	PG601	STR.												
124	6	6	9'-10"	PG602	S11								3'-10"				3'-8"
125	15	6	17'-6"	PG603	STR.												
126	15	6	29'-6"	PG604	STR.												
127	67	6	9'-6"	PG605	STR.												
128	30	8	24'-0"	PG801	STR.												
129	67	8	9'-6"	PG802	STR.												
130	12	10	20'-6"	PG1001	STR.												
131	6	10	16'-3"	PG1002	STR.												
132	10	10	29'-2"	PG1003	20			26'-6"	2'-8"								
133	8	11	12'-6"	PG1101	20			9'-10"	2'-8"								
134	56	11	26'-11"	PG1102	STR.												
135	56	11	9'-0"	PG1103	20			8'-0"	1'-0"								
136																	
137																	
138																	
139																	
140				PIER H													
141	72	4	10'-4"	PH401	T3											2'-8"	
142	28	4	5'-11"	PH402	S10		2'-6"	0'-11"	2'-6"								
143	74	5	11'-4"	PH501	T1	0'-4"	2'-8"	2'-8"	2'-8"	2'-8"	0'-4"						
144	4	6	23'-9"	PH601	STR.												
145	6	6	9'-10"	PH602	S11								3'-10"				3'-8"
146	15	6	17'-6"	PH603	STR.												
147	15	6	29'-6"	PH604	STR.												
148	67	6	9'-6"	PH605	STR.												
149	30	8	24'-0"	PH801	STR.												
150	67	8	9'-6"	PH802	STR.												
151	12	10	20'-6"	PH1001	STR.												
152	6	10	16'-3"	PH1002	STR.												
153	10	10	29'-2"	PH1003	20			26'-6"	2'-8"								
154	8	11	12'-6"	PH1101	20			9'-10"	2'-8"								
155	56	11	20'-5"	PH1102	STR.												
156	56	11	9'-0"	PH1103	20			8'-0"	1'-0"								
157																	
158																	
159																	
160																	
161																	
162																	

B.P.R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
I	VT.	I-89-2(7)	83	137

TYPICAL BAR BENDS

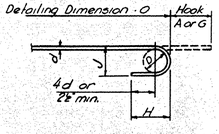


NOTES:

1. All dimensions are out to out of bar.
2. 'J' dimensions on 180° hooks to be shown only where necessary to restrict hook size, otherwise standard hooks are to be used.
3. Where 'J' is not shown, 'J' will be kept equal to or less than 'H'. Where J can exceed 'H,' it should be shown.
4. 'H' dimension on stirrups to be shown where necessary to restrict hooks.
5. Where bars are to be bent more accurately than standard bending tolerances, bending dimensions which require closer working should have limits indicated.
6. Figures in circles show types.
7. No allowance for bend curvature is to be made except for standard hook & radii in excess of same.

Item	No. Pieces	Size	Length	Mark	Type	A	B	C	D	E	F	G	H	J	K	R	O
163				PIER J													
164	72	4	10'-4"	PJ401	T3												2'-8"
165	28	4	5'-11"	PJ402	S10		2'-6"	0'-11"	2'-6"								
166	74	5	11'-4"	PJ501	T1	0'-4"	2'-8"	2'-8"	2'-8"	2'-8"	0'-4"						
167	4	6	23'-9"	PJ601	STR.												
168	6	6	9'-10"	PJ602	S11								3'-10"				3'-8"
169	15	6	17'-6"	PJ603	STR.												
170	15	6	29'-6"	PJ604	STR.												
171	67	6	9'-6"	PJ605	STR.												
172	30	8	24'-0"	PJ801	STR.												
173	67	8	9'-6"	PJ802	STR.												
174	12	10	20'-6"	PJ1001	STR.												
175	6	10	16'-3"	PJ1002	STR.												
176	10	10	29'-2"	PJ1003	20			26'-6"	2'-8"								
177	8	11	12'-6"	PJ1101	20			9'-10"	2'-8"								
178	56	11	19'-9"	PJ1102	STR.												
179	56	11	8'-0"	PJ1103	STR.												
180																	
181																	
182																	
183																	
184																	
185																	
186																	
187																	
188																	
189																	
190																	

Detailing Dimension : O



STANDARD HOOK DETAIL

BAR SIZES

Equivalent Size	Present (Numbers)
1/4"ϕ	#2
3/8"ϕ	#3
1/2"ϕ	#4
5/8"ϕ	#5
3/4"ϕ	#6
7/8"ϕ	#7
1"ϕ	#8
1 1/8"ϕ	#9
1 1/4"ϕ	#10
1 3/8"ϕ	#11

BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY

8. Bar reinforcement metal shall conform to the requirements of the Standard Specifications for new Billet-Steel Concrete Reinforcement Bars (Intermediate Grade) Serial Designation A.A.S.H.O. M31-48 or its latest revision. All bars shall be deformed to conform with A.S.T.M. Specifications A 305-49.
9. * Denotes one additional bar for testing purposes.

ESTIMATED QUANTITIES

FINAL	Location	Pounds
~~18,858~~ ✓	PIER A	~~=18,302~~
~~18,251~~ ✓	PIER B	~~=17,932~~
~~18,776~~ ✓	PIER C	~~=18,457~~
~~18,474~~ ✓	PIER D	~~=18,156~~
~~16,853~~ ✓	PIER E	~~=16,553~~
~~21,570~~ ✓	PIER F	~~=21,205~~
~~21,478~~ ✓	PIER G	~~=21,108~~
~~19,369~~ ✓	PIER H	~~=19,002~~
~~21,928~~ ✓	PIER J	~~=18,825~~
175,572 ✓	TOTAL	~~=169,540~~

CONTRACT NO. 3

REINFORCING SCHEDULE

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
INTERSTATE PROJECT in the towns of
WATERBURY--BOLTON
INTERSTATE STA. 1148+50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00

THE CLARKESON ENGINEERING CO. INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SURVEYED BY:	CHECKED BY D.S.& H.M.	SCALE NONE
DRAWN BY R.J.F.	IN CHARGE J.V.B.	DATE 7-7-58

PROJECT NO I-89-2(7)[illegible] SHEET 275 OF 307

PRINTED BY STADLEY-MOSS CO., BOSTON, MASS., RE-ORDER NO. D-833

Item	No. Pieces	Size	Length	Mark	Type	A	B	C	D	E	F	G	H	J	K	R	O
			APPROACH SLAB 1														
1	22	5	15'-9"	AS1-501	Str.												
2	20	5	17'-1"	AS1-502	Str.												
3	4	5	7'-0"	AS1-503	Str.												
4	8	5	4'-4"	AS1-504	S3	0'-5"	1'-6"	0'-6"	1'-6"			0'-5"	0'-2 3/4"				
5	31	10	21'-4"	AS1-1001	1	0'-11"	19'-6"					0'-11"		0'-8"			
6	4	10	10'-3"	AS1-1002	1	0'-11"	8'-5"					0'-11"		0'-8"			
7																	
8			APPROACH SLAB 2														
9			Same as slab 1, except bars to be prefixed														
10				"AS2"													
11																	
12																	
13			APPROACH SLAB 3														
14	2	5	29'-6"	AS3-501	Str.												
15	18	↑	30'-10"	AS3-502	↑												
16	1		14'-0"	AS3-503													
17	↑		15'-0"	AS3-504													
18			16'-0"	AS3-505													
19			17'-0"	AS3-506													
20			18'-0"	AS3-507													
21			19'-0"	AS3-508													
22			20'-0"	AS3-509													
23			20'-9"	AS3-510													
24			21'-9"	AS3-511													
25			22'-9"	AS3-512													
26			23'-9"	AS3-513													
27			24'-6"	AS3-514													
28			25'-6"	AS3-515													
29			26'-6"	AS3-516													
30			27'-6"	AS3-517													
31			28'-3"	AS3-518													
32			29'-0"	AS3-519													
33			14'-6"	AS3-520													
34			13'-6"	AS3-521													
35			12'-6"	AS3-522													
36			11'-6"	AS3-523													
37			10'-6"	AS3-524													
38			9'-6"	AS3-525													
39			8'-6"	AS3-526													
40			7'-6"	AS3-527													
41			6'-6"	AS3-528													
42			5'-6"	AS3-529													
43			4'-6"	AS3-530													
44	↓		3'-6"	AS3-531													
45	1		5'-0"	AS3-532		Field Bend											
46	*2		4'-0"	AS3-533		Field Bend											
47	1		3'-0"	AS3-534		Field Bend											
48	2		15'-0"	AS3-535	↓												
49	2		12'-6"	AS3-536	Str.												
50	10	↓	4'-4"	AS3-537	S3	0'-5"	1'-6"	0'-6"	1'-6"			0'-5"	0'-2 3/4"				
51	2	5	23'-0"	AS3-538	Str.												
52	2	10	18'-10"	AS3-1001	1	0'-11"	17'-0"					0'-11"		0'-8"			
53	2	10	16'-1"	AS3-1002	↑	↑	14'-3"										
54	1	10	21'-4"	AS3-1003			19'-6"										
55	↑	↑	22'-4"	AS3-1004			20'-6"										
56			23'-4"	AS3-1005			21'-6"										
57			24'-4"	AS3-1006			22'-6"										
58			25'-4"	AS3-1007			23'-6"										
59			26'-7"	AS3-1008			24'-9"										
60			27'-7"	AS3-1009			25'-9"										
61			28'-10"	AS3-1010			27'-0"										
62			29'-10"	AS3-1011			28'-0"										
63			30'-10"	AS3-1012			29'-0"										
64			32'-1"	AS3-1013			30'-3"										
65			33'-1"	AS3-1014			31'-3"										
66			34'-1"	AS3-1015			32'-3"										
67	↓		35'-4"	AS3-1016	↓	↓	33'-6"										
68	1	↓	36'-4"	AS3-1017	1	0'-11"	34'-6"					0'-11"		0'-8"			
69	16	10	30'-0"	AS3-1018	1	0'-11"	29'-1"							0'-8"			
70	*2	10	11'-5"	AS3-1019	↑	↑	10'-6"							↑			
71	1	↑	12'-5"	AS3-1020			11'-6"										
72	↑		13'-8"	AS3-1021			12'-9"										
73			14'-9"	AS3-1022			13'-10"										
74			15'-11"	AS3-1023			15'-0"										
75			16'-11"	AS3-1024			16'-0"										
76			17'-11"	AS3-1025			17'-0"										
77			18'-11"	AS3-1026			18'-0"										
78			20'-0"	AS3-1027			19'-1"										
79			21'-2"	AS3-1028			20'-3"										
80	↓	↓	22'-2"	AS3-1029	↓	↓	21'-3"							↓			
81	1	10	23'-3"	AS3-1030	1	0'-11"	22'-4"							0'-8"			

Item	No. Pieces	Size	Length	Mark	Type	A	B	C	D	E	F	G	H	J	K	R	O
82	1	10	24'-5"	AS3-1031	1	0'-11"	23'-6"							0'-8"			
83	1	10	25'-5"	AS3-1032	1	↑	24'-6"							↑			
84	1	10	26'-5"	AS3-1033	1	↓	25'-6"										
85	1	10	27'-5"	AS3-1034	1	0'-11"	26'-6"							0'-8"			
86																	
87																	
88																	
89			APPROACH SLAB 4														
90	6	5	29'-6"	AS4-501	Str.												
91	14	5	30'-10"	AS4-502	↑												
92	1	↑	10'-0"	AS4-503													
93	↑		11'-0"	AS4-504													
94			12'-0"	AS4-505													
95			13'-0"	AS4-506													
96			14'-0"	AS4-507													
97			15'-0"	AS4-508													
98			16'-0"	AS4-509													
99			17'-0"	AS4-510													
100			18'-0"	AS4-511													
101			19'-0"	AS4-512													
102			20'-0"	AS4-513													
103			20'-9"	AS4-514													
104			21'-9"	AS4-515													
105			22'-9"	AS4-516													
106			23'-9"	AS4-517													
107			24'-6"	AS4-518													
108			25'-6"	AS4-519													
109			26'-6"	AS4-520													
110			27'-6"	AS4-521													
111			28'-3"	AS4-522													
112			29'-0"	AS4-523													
113			10'-6"	AS4-524													
114			9'-6"	AS4-525													
115			8'-6"	AS4-526													
116			7'-6"	AS4-527													
117			6'-6"	AS4-528													
118			5'-6"	AS4-529													
119			4'-6"	AS4-530													
120			3'-6"	AS4-531													
121			5'-0"	AS4-532		Field Bend											
122	↓		4'-0"	AS4-533		Field Bend											
123	1		3'-0"	AS4-534		Field Bend											
124	2		11'-0"	AS4-535	↓												
125	2	↓	9'-0"	AS4-536	Str.												
126	8	5	4'-4"	AS4-537	S3	0'-5"	1'-6"	0'-6"	1'-6"			0'-5"	0'-2 3/4"				
127	2	5	23'-0"	AS4-538	Str.												
128	2	10	14'-10"	AS4-1001	1	0'-11"	13'-0"					0'-11"		0'-8"			
129	2	10	12'-3"	AS4-1002	↑	↑	10'-5"										
130	1	10	21'-4"	AS4-1003			19'-6"										
131	↑	↑	22'-4"	AS4-1004			20'-6"										
132			23'-4"	AS4-1005			21'-6"										
133			24'-4"	AS4-1006			22'-6"										
134			25'-4"	AS4-1007			23'-6"										
135			26'-7"	AS4-1008			24'-9"										
136			27'-7"	AS4-1009			25'-9"										
137			28'-10"	AS4-1010			27'-0"										
138			29'-10"	AS4-1011			28'-0"										
139			30'-10"	AS4-1012			29'-0"										
140			32'-1"	AS4-1013			30'-3"										
141			33'-1"	AS4-1014			31'-3"										
142			34'-1"	AS4-1015			32'-3"										
143	↓	↓	35'-4"	AS4-1016	↓	↓	33'-6"							↓			
144	1	10	36'-4"	AS4-1017	1	0'-11"	34'-6"					0'-11"		0'-8"			
145	16	10	30'-0"	AS4-1018	1	0'-11"	29'-1"							0'-8"			
146	1	10	11'-5"	AS4-1019	↑	↑	10'-6"							↑			
147	↑	↑	12'-5"	AS4-1020			11'-6"										
148			13'-8"	AS4-1021			12'-9"										
149			14'-9"	AS4-1022			13'-10"										
150			15'-11"	AS4-1023			15'-0"										
151			16'-11"	AS4-1024			16'-0"										
152			17'-11"	AS4-1025			17'-0"										
153			18'-11"	AS4-1026			18'-0"										
154			20'-0"	AS4-1027			19'-1"										
155			21'-2"	AS4-1028			20'-3"										
156			22'-2"	AS4-1029			21'-3"										
157			23'-3"	AS4-1030			22'-4"										
158			24'-5"	AS4-1031			23'-6"										
159			25'-5"	AS4-1032			24'-6"										
160	↓	↓	26'-5"	AS4-1033	↓	↓	25'-6"							↓			
161	1	10	27'-5"	AS4-1034	1	0'-11"	26'-6"							0'-8"			
162																	

Item	No. Pieces	Size	Length	Mark	Type	A	B	C	D	E	F	G	H	J	K	R	O
163																	
164																	
165																	
166																	
167																	
168																	
169																	
170																	
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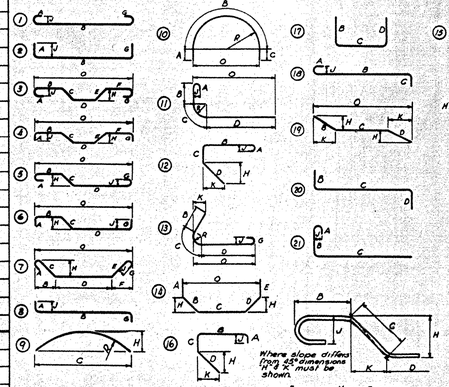
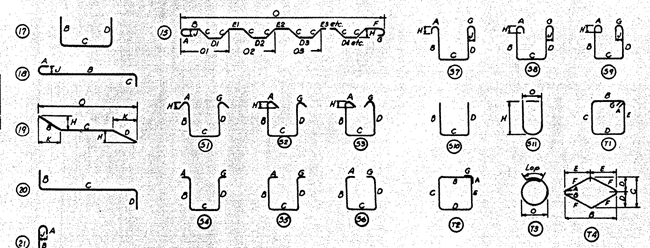
189																	
190																	

B.P.R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	VT.	I-89-2(7)	84	137

TYPICAL BAR BENDS

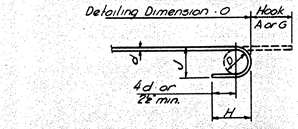


ENLARGED VIEW SHOWING BAR BENDING DETAILS



NOTES:

1. All dimensions are out to out of bar.
2. "J" dimensions on 180° hooks to be shown only where necessary to restrict hook size, otherwise standard hooks are to be used.
3. Where "J" is not shown, "J" will be kept equal to or less than "H." Where J can exceed "H," it should be shown.
4. "H" dimension on stirrups to be shown where necessary to restrict hooks.
5. Where bars are to be bent more accurately than standard bending tolerances, bending dimensions which require closer working should have limits indicated.
6. Figures in circles show types.
7. No allowance for bend curvature is to be made except for standard hook & radii in excess of same.



STANDARD HOOK DETAIL

BAR SIZES

Equivalent Size	Present (Numbers)
1/4" ϕ	#2
3/8" ϕ	#3
1/2" ϕ	#4
5/8" ϕ	#5
3/4" ϕ	#6
7/8" ϕ	#7
1" ϕ	#8
1" □	#9
1 1/8" □	#10
1 1/4" □	#11

8. Bar reinforcement metal shall conform to the requirements of the Standard Specifications for new Billet-Steel Concrete Reinforcement Bars (Intermediate Grade) Serial Designation A.A.S.H.O. M31-48 or its latest revision. All bars shall be deformed to conform with A.S.T.M. Specifications A305-49.

* Denotes one additional bar for testing purposes

ESTIMATED QUANTITIES

FINAL	Location	Pounds
3,805 ✓	Approach Slab # 1	~~3787~~
3,805 ✓	" " # 2	~~3787~~
6,919 ✓	" " # 3	~~6932~~
6,762 ✓	" " # 4	~~6848~~
21,241 ✓	TOTAL	~~21,354~~

CONTRACT NO. 3

REINFORCING SCHEDULE

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
INTERSTATE PROJECT in the towns of
WATERBURY - BOLTON
INTERSTATE STA. 1148 + 50
OVER
U.S. ROUTE 2 (REL.) STA. 30 + 00

THE CLARKESON ENGINEERING CO. INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SURVEYED BY		CHECKED BY	D.S. & H.M.	SCALE:	NONE
DRAWN BY	J.H., R.W.G.	IN CHARGE	J.V.B.	DATE	7-7-58

PROJECT NO. I-89-2(7) SHEET 276 OF 307

PRINTED BY KRAUSLUND-MORE CO., BOSTON, MASS. PO-ORDER NO. P-533

B.R.R. DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	VT.	I-89-2 (7)	85	137

Item	No. Pieces	Size	Length	Mark	Type	A	B	C	D	E	F	G	H	J	K	R	O
						SPAN 1 (LEFT LANE)											
1	144	5	34'-4"	S1-501	Str.												
2	129 *	4	20'-3"	S2-401	Str.												
3	21 *	6	20'-6"	S3-601	Str.												
4	50	4	4'-10"	S4-402	S3	0'-4½"	1'-4"	1'-5"	1'-4"			0'-4½"	0'-2½"				
5	8	5	32'-2"	S5A-502	Str.												
6	6	5	29'-6"	S5P-503	Str.												
7	26	4	6'-0"	S6A-403	S2	0'-4½"	2'-3"	0'-9"	2'-3"			0'-4½"	0'-2½"				
8	28	4	4'-10"	S6P-404	S2	0'-4½"	1'-8"	0'-9"	1'-8"			0'-4½"	0'-2½"				
9	22	6	3'-0"	S7-602	1	0'-8"	1'-8"					0'-8"		0'-6"			
10	12	5	3'-3"	S9P-507	Str.												
11																	
12						SPAN 2 (RIGHT LANE)											
13	SAME AS SPAN 1 LEFT LANE																
14																	
15						SPAN 3 (LEFT LANE)											
16	328	5	34'-4"	S1-501	Str.												
17	192	4	31'-0"	S2-405	Str.												
18	30	6	31'-3"	S3-603	Str.												
19	120	4	4'-10"	S4-402	S3	0'-4½"	1'-4"	1'-5"	1'-4½"			0'-4½"	0'-2½"				
20	12	5	29'-6"	S5P-503	Str.												
21	56	4	4'-10"	S6P-404	S2	0'-4½"	1'-8"	0'-9"	1'-8"			0'-4½"	0'-2½"				
22	24	5	3'-3"	S9P-507	Str.												
23																	
24						SPAN 4 (RIGHT LANE)											
25	SAME AS SPAN 3 LEFT LANE																
26																	
27						SPAN 5 (LEFT LANE)											
28	324	5	34'-4"	S1-501	Str.												
29	192	4	30'-6"	S2-406	Str.												
30	30	6	30'-9"	S3-604	Str.												
31	116	4	4'-10"	S4-402	S3	0'-4½"	1'-4"	1'-5"	1'-4"			0'-4½"	0'-2½"				
32	12	5	29'-6"	S5P-503	Str.												
33	56	4	4'-10"	S6P-404	S2	0'-4½"	1'-8"	0'-9"	1'-8"			0'-4½"	0'-2½"				
34	24	5	3'-3"	S9P-507	Str.												
35																	
36						SPAN 6 (RIGHT LANE)											
37	310	5	34'-4"	S1-501	Str.												
38	192	4	29'-3"	S2-407	Str.												
39	30	6	29'-6"	S3-605	Str.												
40	112	4	4'-10"	S4-402	S3	0'-4½"	1'-4"	1'-5"	1'-4"			0'-4½"	0'-2½"				
41	6	5	29'-6"	S5P-503	Str.												
42	12	5	22'-2"	S5P-504	Str.												
43	68	4	4'-10"	S6P-404	S2	0'-4½"	1'-8"	0'-9"	1'-8"			0'-4½"	0'-2½"				
44	17 *	8	4'-0"	S8P-801	Str.	(Smooth)											
45	4	4	5'-1"	S10P411	S2	0'-4½"	1'-8"	1'-0"	1'-8"			0'-4½"	0'-2½"				
46	24	5	3'-3"	S9P507	Str.	SPAN 7 (LEFT LANE)											
47	SAME AS SPAN 6 RIGHT LANE																
48																	
49						SPAN 8 (LEFT LANE)											
50	SAME AS SPAN 9 RIGHT LANE																
51																	
52						SPAN 9 (RIGHT LANE)											
53	362	5	34'-4"	S1-501	Str.												
54	192	4	34'-1"	S2-408	Str.												
55	30	6	34'-4"	S3-606	Str.												
56	132	4	4'-10"	S4-402	S3	0'-4½"	1'-4"	1'-5"	1'-4"			0'-4½"	0'-2½"				
57	24	5	22'-6"	S5P-505	Str.												
58	80	4	4'-10"	S6P-404	S2	0'-4½"	1'-8"	0'-9"	1'-8"			0'-4½"	0'-2½"				
59	16	8	4'-0"	S8P-801	Str.	(Smooth)											
60	24	5	3'-3	S9P-507	Str.												
61	8	4	5'-1"	S10P-411	S2	0'-4½"	1'-8"	1'-0"	1'-8"			0'-4½"	0'-2½"				
62						SPAN 10 (LEFT LANE)											
63	SAME AS SPAN 11 RIGHT LANE																
64																	
65						SPAN 11 (RIGHT LANE)											
66	196	5	34'-4"	S1-501	Str.												
67	128	4	27'-8	S2-409	Str.												
68	20	6	27'-11"	S3-607	Str.												
69	66	4	4'-10"	S4-402	S3	0'-4½"	1'-4"	1'-5"	1'-4"			0'-4½"	0'-2½"				
70	16	5	22'-8"	S5A-506	Str.												
71	12	5	22'-6"	S5P-505	Str.												
72	42	4	6'-6"	S6A-410	S2	0'-4½"	2'-6"	0'-9"	2'-6"			0'-4½"	0'-2½"				
73	40	4	4'-1"	S6P-404	S2	0'-4½"	1'-8"	0'-9"	1'-8"			0'-4½"	0'-2½"				
74	29	6	3'-0"	S7-602	1	0'-8"	1'-8"					0'-8"		0'-6"			
75	12	5	3'-3"	S9P-507	Str.												
76	4	4	5'-1"	S10P-411	S2	0'-4½"	1'-8"	1'-0"	1'-8"			0'-4½"	0'-2½"				
77																	
78																	
79																	
80																	
81																	

Item	No. Pieces	Size	Length	Mark	Type	A	B	C	D	E	F	G	H	J	K	R	O
82																	
83																	
84																	
85																	
86																	
87																	
88																	
89																	
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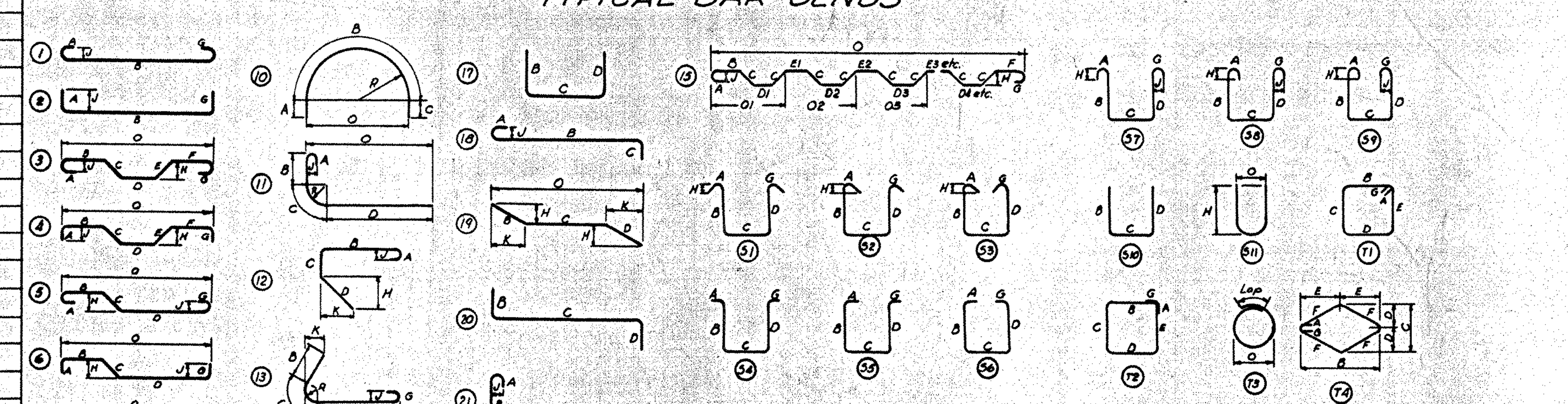
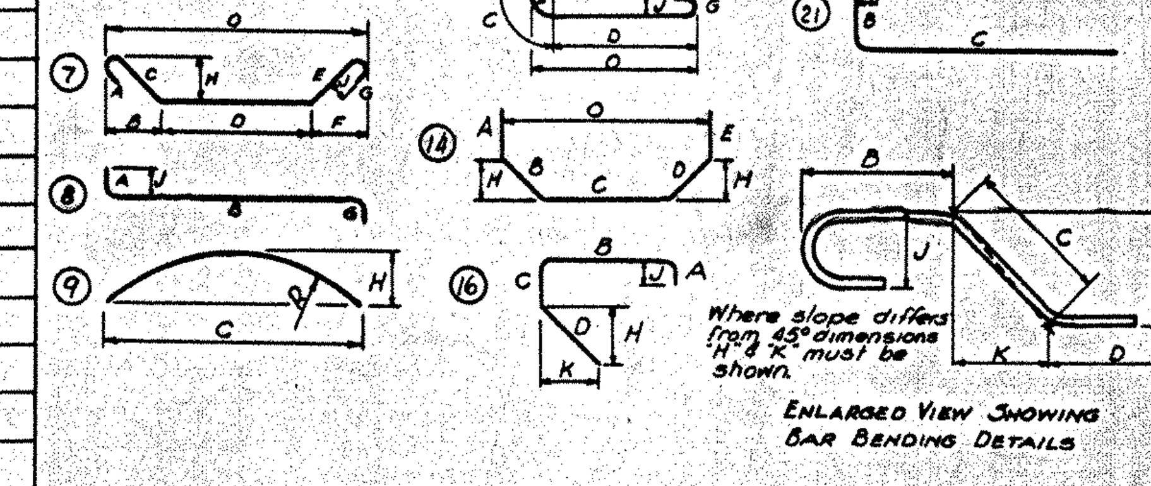
TYPICAL BAR BENDS

NOTES:

1. All dimensions are out to out of bar.
2. "J" dimensions on 180° hooks to be shown only where necessary to restrict hook size, otherwise standard hooks are to be used.
3. Where "J" is not shown, "J" will be kept equal to or less than "H". Where "J" can exceed "H", it should be shown.
4. "H" dimension on stirrups to be shown where necessary to restrict hooks.
5. Where bars are to be bent more accurately than standard bending tolerances, bending dimensions which require closer working should have limits indicated.
6. Figures in circles show types.
7. No allowance for bend curvature is to be made except for standard hook & radii in excess of same.

Item	No. Pieces	Size	Length	Mark	Type	A	B	C	D	E	F	G	H	J	K	R	O
163																	
164																	
165																	
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167																	
168																	
169																	
170																	
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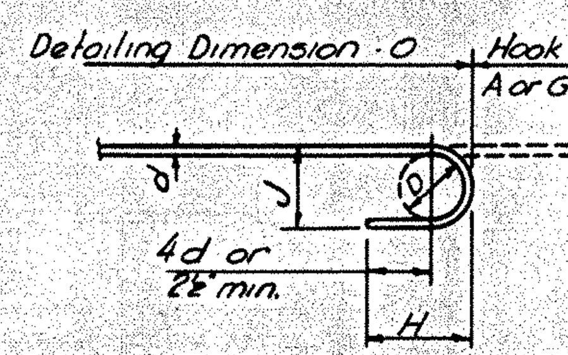

STANDARD HOOK DETAIL

BAR SIZES

Equivalent Size	Present (Numbers)
¼"φ	#2
⅜"φ	#3
½"φ	#4
⅝"φ	#5
¾"φ	#6
⅞"φ	#7
1"φ	#8
1"□	#9
1⅛"□	#10
1¼"□	#11

BOLTON IM 089-2(29)
BRIDGES 51 N&S
THIS SHEET FOR REFERENCE ONLY.

8. Bar reinforcement metal shall conform to the requirements of the Standard Specifications for new Billet-Steel Concrete Reinforcement Bars (Intermediate Grade) Serial Designation A.A.S.H.O. M31-48 or its latest revision. All bars shall be deformed to conform with A.S.T.M. Specifications A305-49.
9. * Denotes one additional bar for testing purposes

ESTIMATED QUANTITIES

Final	Location	Pounds
9,030 ✓	Span 1	~~8,448~~
9,030 ✓	" 2	~~8,448~~
18,148 ✓	" 3	18,148 ✓
18,148 ✓	" 4	18,148 ✓
17,906 ✓	" 5	~~17,905~~
17,501 ✓	" 6	~~17,489~~
17,502 ✓	" 7	~~17,489~~
20,410 ✓	" 8	~~20,406~~
20,410 ✓	" 9	~~20,406~~
11,573 ✓	" 10	~~11,591~~
11,573 ✓	" 11	~~11,591~~
841 ✓	Dowels ✓	
172,072 ✓	TOTAL	~~170,069~~

CONTRACT NO. 3

REINFORCING SCHEDULE

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
INTERSTATE PROJECT in the towns of
WATERBURY - BOLTON
INTERSTATE STA. 1148+50
OVER
U.S. ROUTE 2 (REL.) STA. 30+00

THE CLARKESON ENGINEERING CO. INC.
CONSULTING ENGINEERS
BOSTON MASSACHUSETTS

SURVEYED BY
DRAWN BY F.P.D.
CHECKED BY D.S. & H.M.
IN CHARGE J.V.B.
SCALE NONE
DATE 7-7-58
PROJECT NO. I-89-2 (7) SHEET 277 OF 307

APPROVED

TVGA
CONSULTANTS

2001.9693.01
April 12, 2005

COSMEC, Inc.
70 South Street
Walpole, MA 02081

VTrans - PDD
APR 14 2005
Structures Design Section

Attn: Rob Connolly

Re: Middlesex-Bolton IM 089-2(29)
Item 531.10 Bearing Device

Dear Mr. Connolly:

The following details (Item 531.10 Bearing Device – Revision #1 and welding and bonding procedures) for the above project, transmitted with your letters dated February 2005, and April 7, 2005, have been reviewed and are being returned herewith.

Sheets: 4361R1, 4362R1, 4363R1, 4364R1, 4365R1, 4367R1, 4368R1, 4369R1, Welding and Bonding Procedures
are approved [x] approved "as noted" [ ] reviewed [ ]

Sheets: 4360R1, 4366R1
are approved [ ] approved "as noted" [x] reviewed [ ]

Upon receipt of these "as noted" or "approved" plans, please make appropriate changes and submit white prints for our use in the record plans for this project.

You must provide written notice to Vermont Agency of Transportation (VTrans) Structures Section office as to the date fabrication represented by these drawings will begin. **That notice must be received at least seven days prior to that date, as per Specifications 506.03. Any material fabricated prior to the notification date is subject to rejection without further cause.**

Very truly yours,

TVGA Consultants

Kenneth M. Wojtkowski, P.E.
Senior Project Manager

Attachments: One set of prints

cc: [x] VTrans Resident Engineer (Rick Hale) w/prints
[x] Contractor: Winterset w/prints
[ ] Subcontractor -_____ letter only (if railing details then include prints)
[x] VTrans Const Sec. - letter only (To: Const. Eng. Nat Danforth, Attn: Reg. Eng. Alan Campo)
[x] VTrans Consultant Project Manager - Sherward G. Farnsworth w/prints
[x] VTrans Materials & Research Section (C&IA Unit)- Letter only
[x] VTrans Structures Section - Shop Inspector Jeff Clark w/prints
2001.9693.01.2D

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GLOBAL SOLUTIONS FOR THE BUILT ENVIRONMENT
One Thousand Maple Road • P.O. Box H • Elma, NY 14059 • PH.716.655.8842 • FX.716.655.0937
www.tvga.com

bb.308

TVGA
CONSULTANTS

2001.9693.01
March 28, 2005

COSMEC, Inc.
70 South Street
Walpole, MA 02081

Attn: Rob Connolly

Re: Middlesex-Bolton IM 089-2(29)
Item 531.10 Bearing Device

Dear Mr. Connolly:

The following details (Item 531.10 Bearing Device) for the above project, transmitted with your letter dated February 2005, have been reviewed and are being returned herewith.

Sheets: **4358, 4359, 4370, 4371**
are approved [x] approved "as noted" [ ] reviewed [ ] ALL ASSUMPTIONS & COMMENTS BY TVGA 4-12-05 LETTER

Sheets: **4363, 4364, 4365, 4366, 4367, 4368, 4369,**
are approved [ ] approved "as noted" [x] reviewed [ ]

Sheets: **4360, 4361, 4362**
are to be reconsidered (note comments in red) and resubmitted for final approval. MAW SUIT 4-14-05

Please note that the welding and bonding procedures have been approved, and are being retained pending resubmission of the shop drawing sheets 4360, 4361, and 4362. They will be returned as a complete package, in conjunction with the "approved" shop drawings.

There shall be no fabrication done until all drawings and welding procedures are approved or approved as noted. You must provide written notice to Vermont Agency of Transportation (VTrans) Structures Section office as to the date fabrication represented by these drawings will begin. **That notice must be received at least seven days prior to that date, as per Specifications 506.03. Any material fabricated prior to the notification date is subject to rejection without further cause.**

Very truly yours,

TVGA Consultants

Kenneth M. Wojtkowski, P.E.
Senior Project Manager

Attachments: One set of prints

cc: [x] VTrans Resident Engineer (Rick Hale) w/prints
[x] Contractor: Winterset w/prints
[ ] Subcontractor -_____ letter only (if railing details then include prints)
[x] VTrans Const Sec. - letter only (To: Const. Eng. Nat Danforth, Attn: Reg. Eng. Alan Campo)
[x] VTrans Consultant Project Manager - Sherward G. Farnsworth w/prints
[x] VTrans Materials & Research Section (C&IA Unit)- Letter only
[x] VTrans Structures Section - Shop Inspector Jeff Clark w/prints
2001.9693.01.2D

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GLOBAL SOLUTIONS FOR THE BUILT ENVIRONMENT
One Thousand Maple Road • P.O. Box H • Elma, NY 14059 • PH.716.655.8842 • FX.716.655.0937

b6309

VT A.O.T.
PROJECT: IM-089-2(29)
TOWN OF BOLTON

COSMEC INC.

WELDING PROCEDURE SPECIFICATION

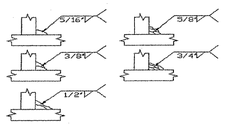
SPECIFICATIONS AND CODE: AASHTO--AWS D1.5
MATERIAL SPECIFICATION ASTM A709 GR 50W, GR 50, GR 36
WELDING PROCESS---------- FCAW-G
MANUAL OR MACHINE------- SEMI-AUTOMATIC
POSITION OF WELDING----- 1F & 2F
FILLER METAL SPECIFICATION AWS 5.20 CLASSIFICATION: E71M
MANUFACTURER: LINCOLN ELECTRIC TRADENAME: E71M OUTERSHIELD
FLUX------- INTERNAL
SHIELDING GAS---------- CO2 FLOW RATE 45 CFH
SINGLE OR MULTIPLE PAS S MULTIPLE
SINGLE OR MULTIPLE ARC SINGLE
WELDING CURRENT--------- DC
POLARITY: REVERSE (EP)
WELDING PROGRESSION----------
ROOT TREATMENT---------- CLEANED & PREPARED BRIGHT METAL
PREHEAT AND INTERPASS TEMPERATURE---------- SEE BELOW
POSTHEAT TEMPERATURE N/A
HEAT IMPUT MIN.---------- MAX.----

WELDING PROCEDURE

PASS NO.	ELECTRODE SIZE	WELDING CURRENT AMPERES	VOLTS	TRAVEL SPEED	JOINT DETAIL
ALL	0.045	193.5--236.5	29.76--34.24	9.45--11.55	

PREHEAT TEMPS.

THICKNESS	TEMP.
UP TO 3/4"	50 DEG. F
OVER 3/4" TO 1 1/2"	70 DEG. F
OVER 1 1/2" TO 2 1/2"	150 DEG. F
OVER 2 1/2"	225 DEG. F
INTERPASS TEMP:	400 DEG. F



THIS PROCEURE MAY VARY DUE TO FABRICATION SEQUENCE, FIT-UP, PASS SIZE, ETC. WITHIN THE LIMITATION OF VARIABLES GIVEN IN SECTION 5.

PROCEDURE NO. FCAW-F-MN-VT.
SUPPORTING PQR: FCAW-F-MN
REVISION NO.

CONTRACTOR: COSMEC INC.
AUTHORIZED BY:DONALD VOSE

AWS QC 1 DONALD E VOSE 01100651 CWI

DATE:--- 1/31/2005

VTRANS RECEIVED
OK'D BY _____ OK'D BY JWC
MAR 09 2005
RESUBMIT _____ APPROVED _____
BY DATE 3-16-05

b6310

VT A.O.T.

PROJECT: IM-089-2(29)

TOWN OF BOLTON

COSMEC INC.

WELDING PROCEDURE SPECIFICATION

SPECIFICATIONS AND CODE: D1.6 (D1.3)
MATERIAL SPECIFICATION ASTM A240 TYPE 304 TO ASTM A709 GR 50W
WELDING PROCESS---------- GTAW
MANUAL OR MACHINE-------- MANUAL
POSITION OF WELDING------ 1F & 2F
FILLER METAL SPECIFICATION ER309L — CLASSIFICATION: A5.9
MANUFACTURER: HARRIS WELCO — TRADENAME:
FLUX------- INTERNAL
SHIELDING GAS----------- ARGON — FLOW RATE 45 CFH
SINGLE OR MULTIPLE PAS S SINGLE
SINGLE OR MULTIPLE ARC SINGLE
WELDING CURRENT---------- DC
POLARITY : REVERSE (EN)
WELDING PROGRESSION----------
ROOT TREATMENT----------- CLEANED & PREPARED BRIGHT METAL
PREHEAT AND INTERPASS TEMPERATURE---------- SEE BELOW
POSTHEAT TEMPERATURE N/A
HEAT IMPUT MIN.---------- MAX.----

WELDING PROCEDURE

PASS NO.	ELECTRODE SIZE	WELDING CURRENT AMPERES	VOLTS	TRAVEL SPEED	JOINT DETAIL
ALL	3/32"	130--155	23--27	6.75--8.5	LAP JOINT
		16 GA THRU 10 GA BM THICKNESS			

PREHEAT TEMPS. ***PREHEAT UNTIL NO MOSITURE PRESENT

THICKNESS	TEMP.
UP TO 3/4"	100 DEG.
OVER 3/4" TO 1 1/2"	100 DEG.
OVER 1 1/2" TO 2 1/2"	100 DEG.
OVER 2 1/2"	100 DEG.

THIS PROCEURE MAY VARY DUE TO FABRICATION SEQUENCE, FIT-UP, PASS SIZE, ETC.
WITHIN THE LIMITATION OF VARIABLES GIVEN IN SECTION 5.
SUPPORTING PQR: GTAW-WF-05
PROCEDURE NO. GTAW-WF — CONTRACTOR: PA. D.O.T.
AUTHORIZED BY: DONALD VOSE
REVISION NO. — CWI#:01100651

DATE:--- 2/1/2005

AWS QC 1 DONALD E VOSE 01100651 CWI

VTRANS RECEIVED
OK'D BY_____ OK'D BY JWC
MAR 09 2005
RESUBMIT_____ APPROVED_____
BY DATE 3-16-05

6631

VT A.O.T.
PROJECT: IM-089-2(29)
TOWN OF BOLTON

EMS-QC-110

VTRANS
RECEIVED
MAR 09 2005

COSMEC, INC.
70 SOUTH STREET
WALPOLE, MA 02081
PH# 508-668-6600
FAX# 508-660-1022

OK'D BY _____ OK'D BY JJC
RESUBMIT _____ APPROVED ✓
BY DATE 3-16-05

ENGINEERING AND MANUFACTURING STANDARD
PTFE FACING AND STEEL
OR PREFORMED FABRIC SUBSTRATE
SURFACE PREPARATION AND ADHESIVE PROCEDURE

The PTFE facing shall be prepared for bonding to a substrate material by chemically etching the face to be bonded using the sodium ammonia process.

The mating surface of the substrate shall be prepared for bonding using a three-step process as follows:

1. preliminary degrease using methyl ethyl ketone.
2. mechanically roughen to approx. 125 RMS and thoroughly brush and clean for final degreasing.
3. final degrease using methyl ethyl ketone

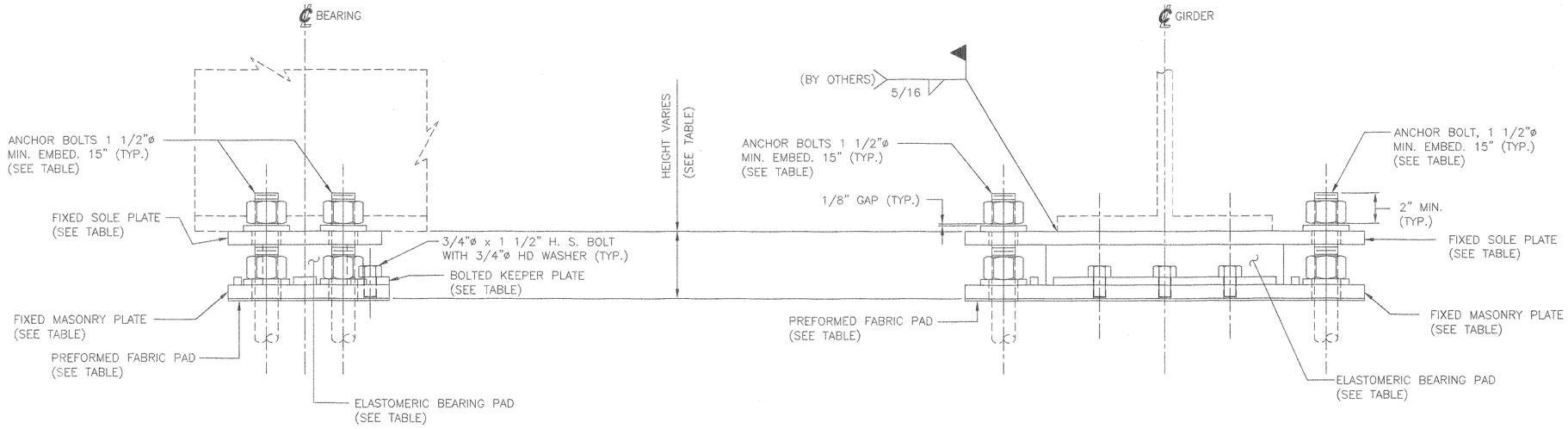
The PTFE and substrate mating surfaces shall be clean and dry with final degreasing performed within 30 minutes of bonding. Adhesive shall consist of a two-part epoxy adhesive system conforming to Military Specification MMM-A-134

The adhesive shall be applied to the full area of the contact surface in an even manner so as to establish a glue line not less than .002 inch nor more than .010 inch thick. Surfaces being bonded are to be assembled immediately with open assembly time not to exceed 20 minutes.

The PTFE material shall be greater in width and length than the substrate material by at least ½ inch when bonded. The PTFE shall be applied with contact starting at one edge and with contact progressing across entire bonded surface to eliminate air entrapment. The PTFE is to be in full contact with the steel or preformed fabric substrate. Curing of the bond shall be done under pressure of approx. 2-100 psi for 10-12 hours at approx. 70°F or other schedules as established by the manufacturer of the adhesive.

The PTFE shall be carefully trimmed to the same size as the substrate after bond curing and all bonds shall be visually inspected for bond retention.

66312



TYPICAL FIXED BEARING ASSEMBLY

FIXED BEARING ASSEMBLY TABLE

BEARING ASSEMBLY DESIGNATION	BRIDGE NO.	BEARING LOCATION	QUANTITY	SOLE PLATE	ELASTOMERIC BEARING	MASONRY PLATE	KEEPER PLATE	ANCHOR BOLT	ANCHOR BOLT LENGTH	PREFORMED PAD	OVERALL ASSEMBLY HEIGHT @ ℄ ±1/8"
FBA–1	51N	ABUT. 1	5	SP1	EB1	MP1	kpa4	AB1	23"	BP1	4 5/8"
FBA–2	51S	ABUT. 1	5	SP2	EB1	MP1	kpa4	AB1	23"	BP1	4 5/8"
FBA–3	51N	PIER 2	5	SP3	EB2	MP2	kpd4	AB1	23"	BP2	5"
FBA–4	51S	PIER 3	5	SP4	EB3	MP3	kpf4	AB2	25"	BP3	7 3/16"

*ASSEMBLY HEIGHT DIMENSION EXCLUDES 1/8" BEARING PAD.

TVGA CONSULTANTS

☑ NO EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

ENGINEER has reviewed Shop Drawings and Samples and other data which Contractor is required to submit, only for conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such review does not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

BY: PJC
DATE: 3/28/05

ASSEMBLY AND INSTALLATION NOTES:

1. ALL COMPONENTS SHALL BE SHOP ASSEMBLED (EXCEPT FOR MASONRY PADS AND SHIMS) AND SHIPPED AS AN ASSEMBLY AS MUCH AS PRACTICAL.
2. CONTRACTOR TO BE SOLELY RESPONSIBLE FOR THE CORRECT ORIENTATION, ALIGNMENT AND MATCHING OF COMPONENTS SHOULD HE ELECT TO DISASSEMBLE THE BEARING ASSEMBLIES FOR ANY REASON.
3. CONTRACTOR TO BE SOLEY RESPONSIBLE FOR THE PROPER PLACEMENT AND SETTING OF THE ANCHOR BOLTS AS REQUIRED BY THE CONTRACT PLANS.
4. WELDING OF SOLE PLATES TO GIRDERS (BY OTHERS).

SEE SHEET 1 FOR SHOP NOTES.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TOWN OF BOLTON
PROJECT NO.:IM–089–2 (29)

BRIDGE NO.'S 51N AND 51S
ON INTERSTATE 89

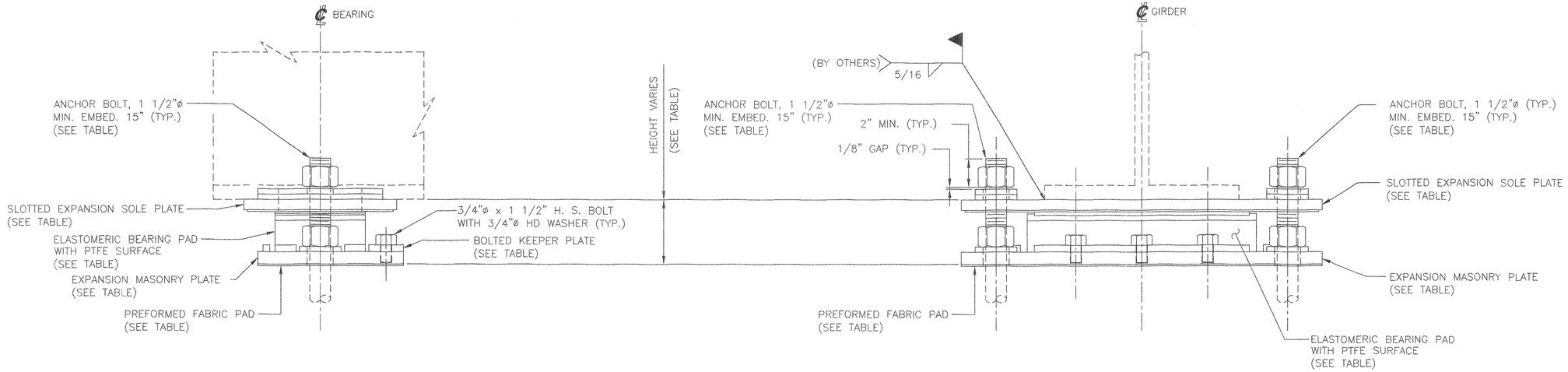
COSMEC, INC.
70 SOUTH STREET
WALPOLE, MA. 02081

SCALE: 1/4"=1"	DRAWN BY: JEP	CHECKED BY: PJM
SHT AS1 OF 2	DATE: 01/05	DATE 02/05

COSMEC BEARING bb 313

CUSTOMER	S.O. NUMBER	DRAWING NUMBER	REV.
WINTERSET	60233	4358	0

REV.		BY:	DATE	CK'D BY:	DATE
–					



TYPICAL EXPANSION BEARING ASSEMBLY

EXPANSION BEARING ASSEMBLY TABLE

BEARING ASSEMBLY DESIGNATION	BRIDGE NO.	BEARING LOCATION	QUANTITY	SOLE PLATE	ELASTOMERIC BEARING	MASONRY PLATE	KEEPER PLATE	ANCHOR BOLT	ANCHOR BOLT LENGTH	PREFORMED PAD	OVERALL ASSEMBLY HEIGHT*
EBA–1	51N	ABUT. 2	5	SP5	EB4	MP4	kpa5	AB3	23"	BP4	4 5/8"
EBA–1	51S	ABUT. 2	5	SP5	EB4	MP4	kpa5	AB3	23"	BP4	4 5/8"
EBA–2	51N	PIER 1(S1)	5	SP6	EB5	MP5	kpd5	AB4	24"	BP5	4 7/8"
EBA–3	51N	PIER 1(S2)	5	SP7	EB6	MP6	kpf5	AB3	23"	BP6	4 9/16"
EBA–4	51N	PIER 3	5	SP9	EB7	MP7	kpa6	AB4	24"	BP7	5 3/16"
EBA–5	51N	PIER 4	5	SP11	EB8	MP8	kpd6	AB5	26"	BP8	7 1/2"
EBA–6	51S	PIER 1(S1)	5	SP6	EB5	MP5	kpd5	AB4	24"	BP5	4 7/8"
EBA–7	51S	PIER 1(S2)	5	SP8	EB6	MP6	kpf5	AB3	23"	BP6	4 9/16"
EBA–8	51S	PIER 2	5	SP10	EB7	MP7	kpa6	AB4	24"	BP7	5 3/16"
EBA–9	51S	PIER 4	5	SP12	EB8	MP8	kpd6	AB5	26"	BP8	7 1/2"
EBA–10	51S	PIER 5	5	SP11	EB8	MP8	kpd6	AB5	26"	BP8	7 1/2"

*ASSEMBLY HEIGHT DIMENSION EXCLUDES 1/8" BEARING PAD.

TVGA CONSULTANTS

~~X~~ NO EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

ENGINEER has reviewed Shop Drawings and Samples and other data which Contractor is required to submit, only for conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such reviews do not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

BY: BJC
DATE: 3/28/05

SEE SHEET AS1 FOR ASSEMBLY NOTES.
SEE SHEET 1 FOR SHOP NOTES.

STATE OF VERMONT
AGENCY OF TRANSPORTATION
TOWN OF BOLTON
PROJECT NO.:IM–089–2 (29)
BRIDGE NO.'S 51N AND 51S
ON INTERSTATE 89

COSMEC, INC. — 70 SOUTH STREET, WALPOLE, MA. 02081

SCALE: 1/4"=1"	DRAWN BY: JEP	CHECKED BY: PJM
SHT AS2 OF 2	DATE: 01/05	DATE 02/05

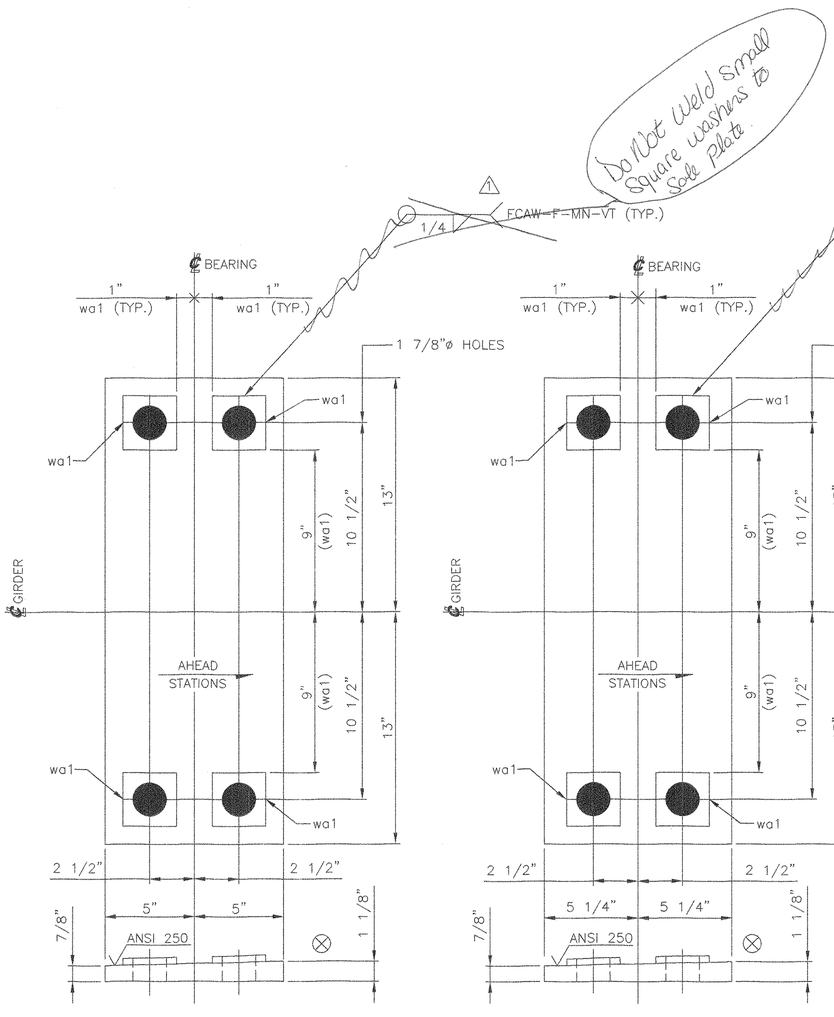
COSMEC BEARING 06314

CUSTOMER	S.O. NUMBER	DRAWING NUMBER	REV.
WINTERSET	60233	4359	0

REV.		BY:	DATE	CK'D BY:	DATE
–		---	---	---	---

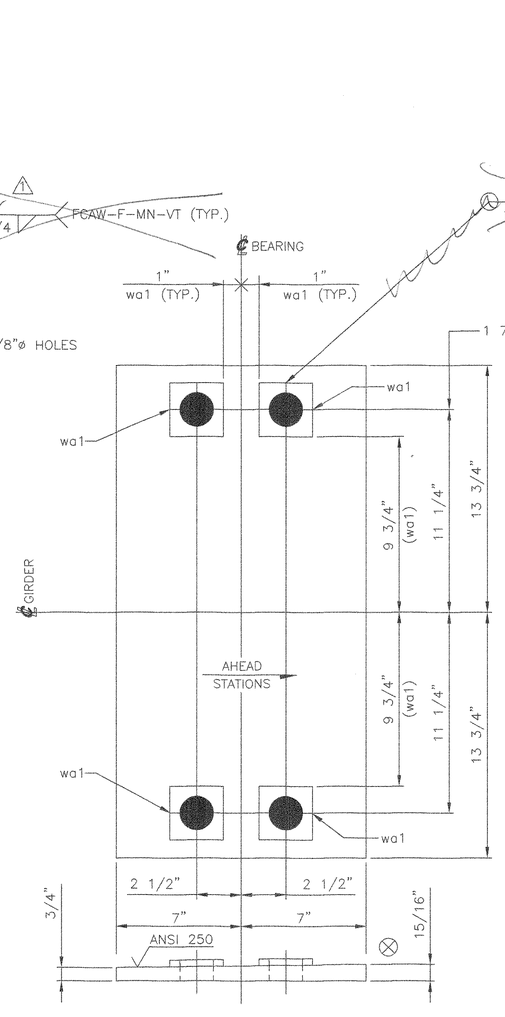
MARK	QTY	DESCRIPTION	FT	IN	16ths	FAB MARK	MILL MARK	WEIGHT
SP1	5	PL 1 1/8" x 10"	·	26	0	·	METALLIZED	435
·	20	PL 3/8" x 3"	·	3	0	wa1	METALLIZED	19
SP2	5	PL 1 1/8" x 10 1/2"	·	26	0	·	METALLIZED	435
·	20	PL 3/8" x 3"	·	3	0	wa1	METALLIZED	19
SP3	5	PL 15/16" x 14"	·	27	8	·	METALLIZED	512
·	20	PL 3/8" x 3"	·	3	0	wa1	METALLIZED	19
SP4	5	PL 1" x 13"	·	29	8	·	METALLIZED	544
·	20	PL 3/8" x 3"	·	3	0	wa1	METALLIZED	19

TOTAL GROSS WT = 2002

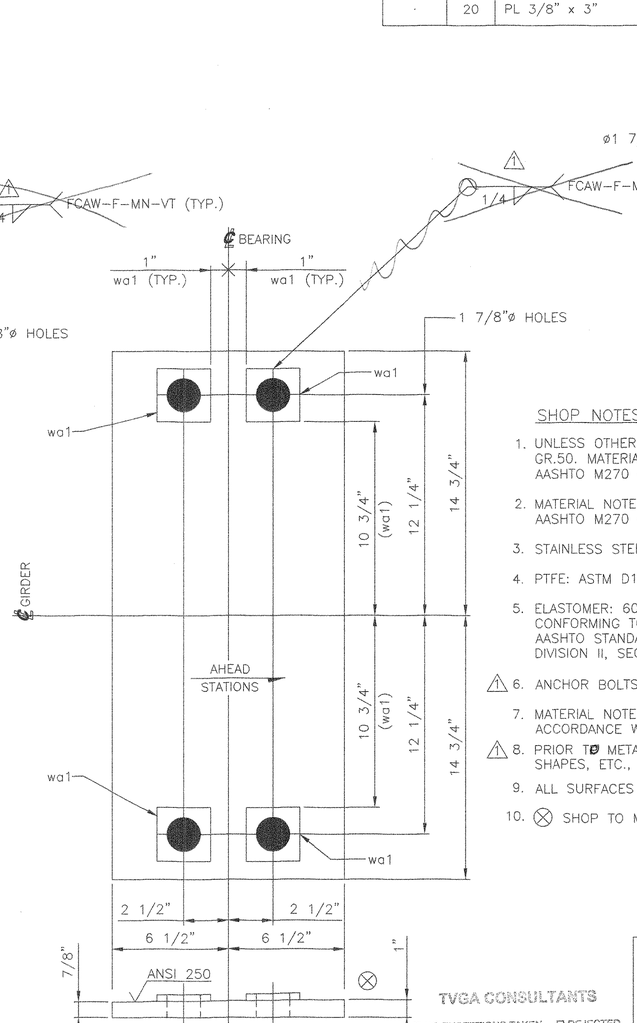


5 FIXED SOLE PLATES, SP1
PL 1 1/8" x 10" x 26"
METALLIZED AS NOTED
LOCATE AT
BRIDGE NO. 51N, ABUTMENT 1

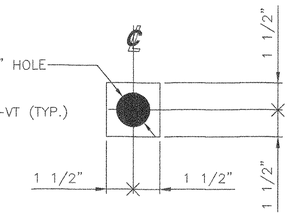
5 FIXED SOLE PLATE, SP2
PL 1 1/8" x 10 1/2" x 26"
METALLIZED AS NOTED
LOCATE AT
BRIDGE NO. 51S, ABUTMENT 1



5 FIXED SOLE PLATE, SP3
PL 15/16" x 14" x 27 1/2"
METALLIZED AS NOTED
LOCATE AT
BRIDGE NO. 51N, PIER 2



5 FIXED SOLE PLATE, SP4
PL 1" x 13" x 29 1/2"
METALLIZED AS NOTED
LOCATE AT
BRIDGE NO. 51S, PIER 3



80 PLATE WASHERS, wa1
PL 3/8" x 3" x 3"
METALLIZED
USE WITH
FIXED SOLE PLATES SP1 THRU SP4

SHOP NOTES:

1. UNLESS OTHER WISE NOTED ALL STEEL SHALL BE ASTM A.709 GR.50. MATERIAL NOTED AS ASTM A.709 GR.50 MAY BE EITHER AASHTO M270 GR.50, A709 GR.50 OR A572 GR.50.
2. MATERIAL NOTED AS AASHTO M270 GR.36 MAY BE EITHER AASHTO M270 GR.36, A709 GR.36 OR A36.
3. STAINLESS STEEL: ASTM A240 TYPE 304, MIRROR FINISH.
4. PTFE: ASTM D1457 VIRGIN UNFILLED.
5. ELASTOMER: 60 DUROMETER, GRADE 4, NATURAL RUBBER CONFORMING TO AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DIVISION II, SECTION 18.
6. ⚠1 ANCHOR BOLTS: ASTM F1554 GR.55 (AASHTO M183) GALVANIZED.
7. MATERIAL NOTED SHALL BE METALLIZED OR GALVANIZED IN ACCORDANCE WITH SUBSECTION 506.15 OF THE SPECIFICATIONS.
8. ⚠1 PRIOR TO METALIZING, ALL CORNERS AND EDGES OF STEEL PLATES, SHAPES, ETC., SHALL BE GROUND TO 1/16" RADIUS (TYP.).
9. ALL SURFACES OF SOLE PLATES SHALL BE SMOOTH AND STRAIGHT.
10. ⊗ SHOP TO MARK HIGH SIDE OF PLATE.

TVGA CONSULTANTS

☐ NO EXCEPTIONS TAKEN ☐ REJECTED
☒ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

ENGINEER has reviewed Shop Drawings and Samples and other data which Contractor is required to submit, only for conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such review does not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

BY: BJC
DATE: 4/14/05

SEE SHEET AS1 FOR ASSEMBLY NOTES.

REV.	REVISED NOTES 6 & 8, REVISED WELDS ON WASHERS AND REVISED METALIZING ON SOLE PLATES	BY:	DATE	CK'D BY:	DATE
⚠1		MM	4/05		

STATE OF VERMONT
AGENCY OF TRANSPORTATION
TOWN OF BOLTON
PROJECT NO.: IM-089-2 (29)
BRIDGE NO.'S 51N AND 51S
ON INTERSTATE 89

COSMEC, INC. 70 SOUTH STREET WALPOLE, MA. 02081

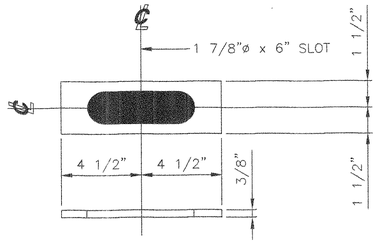
SCALE: 1/4"=1"	DRAWN BY: JEP	CHECKED BY: PJM
SHT 1 OF 12	DATE: 01/05	DATE: 02/05

COSMEC BEARING bb315

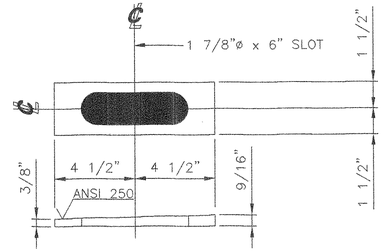
CUSTOMER	S.O. NUMBER	DRAWING NUMBER	REV.
WINTERSET	60233	4360	1

MARK	QTY	DESCRIPTION	FT	IN	16ths	FAB MARK	MILL MARK	WEIGHT
SP5	10	PL 3/4" x 11"	·	26	0	·	METALLIZED	608
·	10	STAINLESS PL. (11ga) 1/8" x 10 1/2"	·	16	8	ssa2	A240 TYPE 304 MIRROR FIN.	68
·	20	PL 3/8" x 3"	·	9	0	wa2	METALLIZED	57
SP6	10	PL 3/4" x 9"	·	26	0	·	METALLIZED	498
·	10	STAINLESS PL. (11ga) 1/8" x 8 1/2"	·	16	0	ssb2	A240 TYPE 304 MIRROR FIN.	53
·	20	PL 3/8" x 3"	·	9	0	wa2	METALLIZED	57
SP7	5	PL 15/16" x 9 1/2"	·	29	0	·	METALLIZED	328
·	5	STAINLESS PL. (11ga) 1/8" x 9"	·	20	0	ssc2	A240 TYPE 304 MIRROR FIN.	35
·	10	PL 9/16" x 3"	·	9	0	wb2	METALLIZED	43
SP8	5	PL 15/16" x 10 1/2"	·	29	0	·	METALLIZED	363
·	5	STAINLESS PL. (11ga) 1/8" x 10"	·	20	0	ssd2	A240 TYPE 304 MIRROR FIN.	39
·	10	PL 9/16" x 3"	·	9	0	wb2	METALLIZED	43

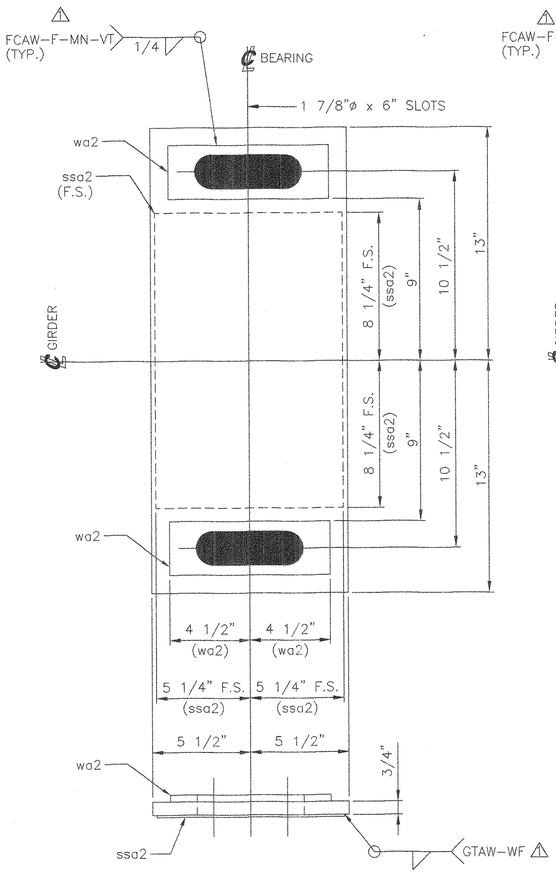
TOTAL GROSS WT= 2192



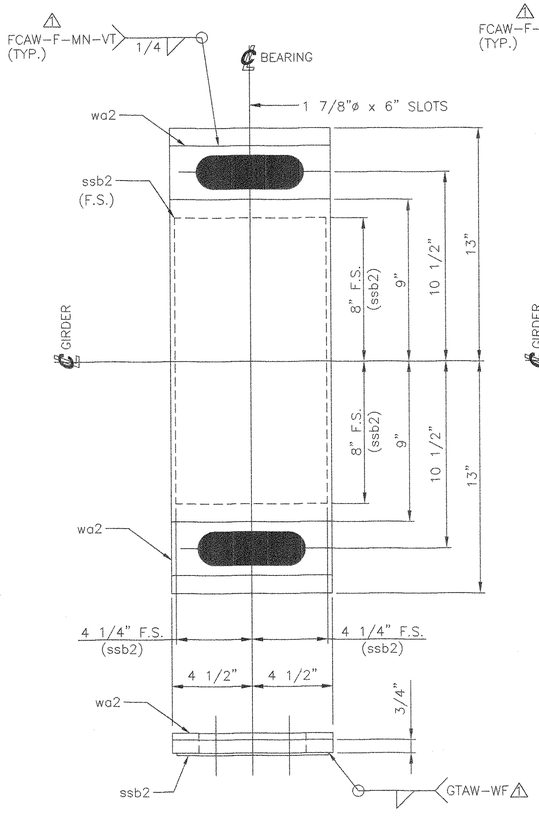
40 WASHERS, wa2
PL 3/8" x 3" x 9"
USE WITH
EXPANSION SOLE PLATES SP5 & SP6



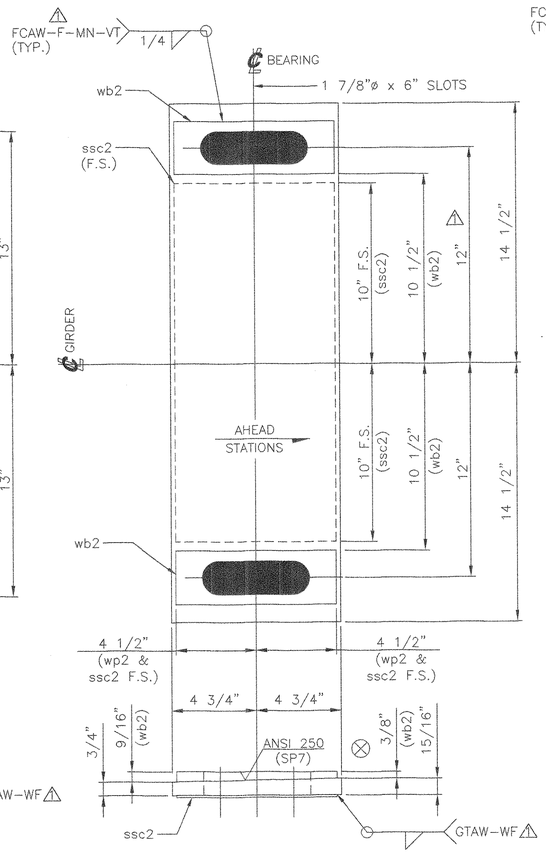
20 BEVELED WASHERS, wb2
PL 9/16" x 3" x 9"
USE WITH
EXPANSION SOLE PLATE SP7 & SP8



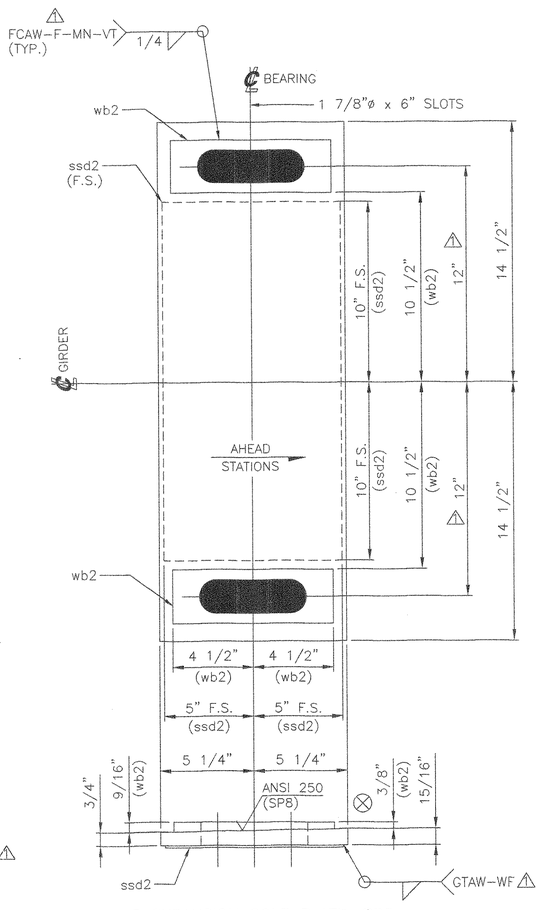
10 EXPANSION SOLE PLATES, SP5
PL 3/4" x 11" x 26"
METALLIZED AS NOTED
LOCATE AT
BRIDGE 51N, ABUTMENT 2
AND
BRIDGE 51S, ABUTMENT 2



10 EXPANSION SOLE PLATES, SP6
PL 3/4" x 9" x 26"
METALLIZED AS NOTED
LOCATE AT
BRIDGE 51N, PIER 1(S1)
AND
BRIDGE 51S, PIER1(S1)



5 EXPANSION SOLE PLATE, SP7
PL 15/16" x 9 1/2" x 29"
METALLIZED AS NOTED
LOCATE AT
BRIDGE 51N, PIER 1(S2)



5 EXPANSION SOLE PLATE, SP8
PL 15/16" x 10 1/2" x 29"
METALLIZED AS NOTED
LOCATE AT
BRIDGE 51S, PIER 1(S2)

TVGA CONSULTANTS

☒ EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

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BY: BJC
DATE: 5/16/05

SEE SHEET AS1 FOR ASSEMBLY NOTES.
SEE SHEET 1 FOR SHOP NOTES.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TOWN OF BOLTON
PROJECT NO.: IM-089-2 (29)

BRIDGE NO.'S 51N AND 51S
ON INTERSTATE 89

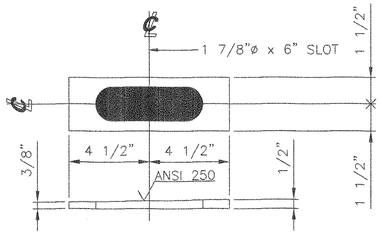
REV.		BY:	DATE	CK'D BY:	DATE
1	REVISED WELD DETAILS, REVISED SOLE PLATE METALIZING, REVISED HOLE SPACING ON SP7 & SP8	MM	4/05		

COSMEC, INC.
70 SOUTH STREET
WALPOLE, MA. 02081

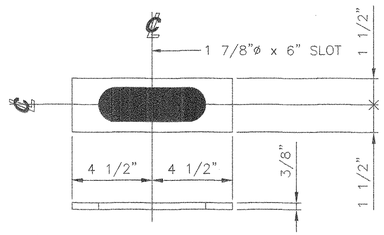
SCALE: 1/4"=1"	DRAWN BY: JEP	CHECKED BY: PJM
SHT 2 OF 12	DATE: 01/05	DATE: 02/05

COSMEC BEARING bb 316

CUSTOMER	S.O. NUMBER	DRAWING NUMBER	REV.
WINTERSET	60233	4361	1



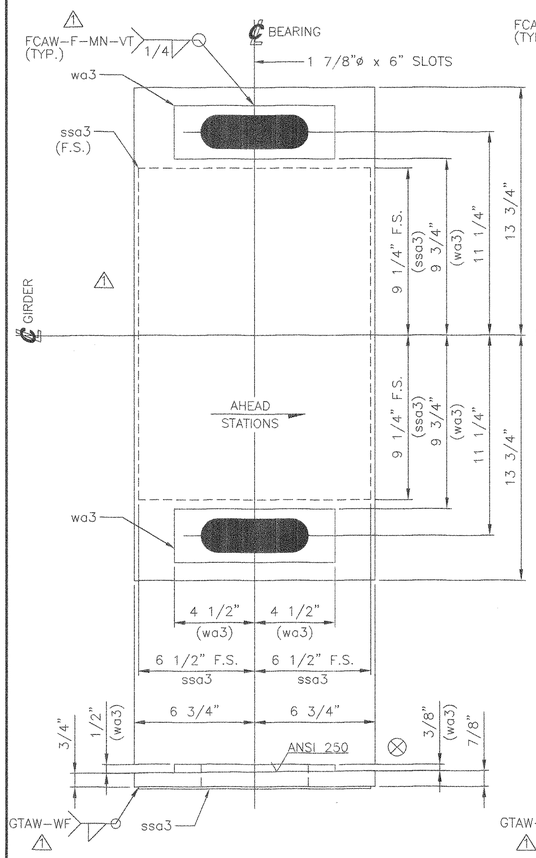
20 BEVELED WASHERS, wa3
PL 1/2" x 3" x 9"
USE WITH
EXPANSION SOLE PLATES SP9 & SP10



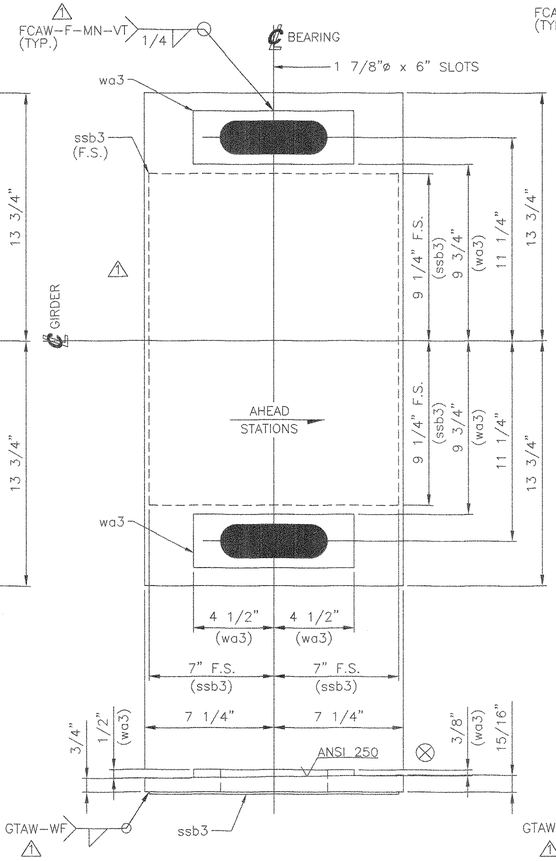
⚠ 30 WASHERS, wb3
PL 3/8" x 3" x 9"
USE WITH
EXPANSION SOLE PLATES SP11 & SP12

	MARK	QTY	DESCRIPTION	FT	IN	16ths	FAB MARK	MILL MARK	WEIGHT
	SP9	5	PL 7/8" x 13 1/2"	·	27	8	·	METALLIZED	461
	·	5	PL 11 GA (1/8") x 13"	·	18	8	ssa3	A240 TYPE 304 MIRROR FIN.	43
	·	10	PL 1/2" x 3 "	·	9	0	wa3	·	38
	SP10	5	PL 15/16" x 14 1/2"	·	27	8	·	METALLIZED	530
	·	5	PL 11 GA (1/8") x 14"	·	18	8	ssb3	A240 TYPE 304 MIRROR FIN.	47
	·	10	PL 1/2 x 3"	·	9	0	wa3	·	38
	SP11	10	PL 7/8" x 14"	·	29	8	·	METALLIZED	1025
	·	10	PL 11 GA (1/8") x 13 1/2"	·	20	8	ssc3	A240 TYPE 304 MIRROR FIN.	98
	·	20	PL 3/8" x 3"	·	9	0	wb3	·	57
	SP12	5	PL 7/8" x 13"	·	29	8	·	METALLIZED	476
⚠	·	5	PL 11 GA (1/8") x 12 1/2"	·	20	8	ssd3	A240 TYPE 304 MIRROR FIN.	45
	·	10	PL 3/8" x 3"	·	9	0	wb3	·	29

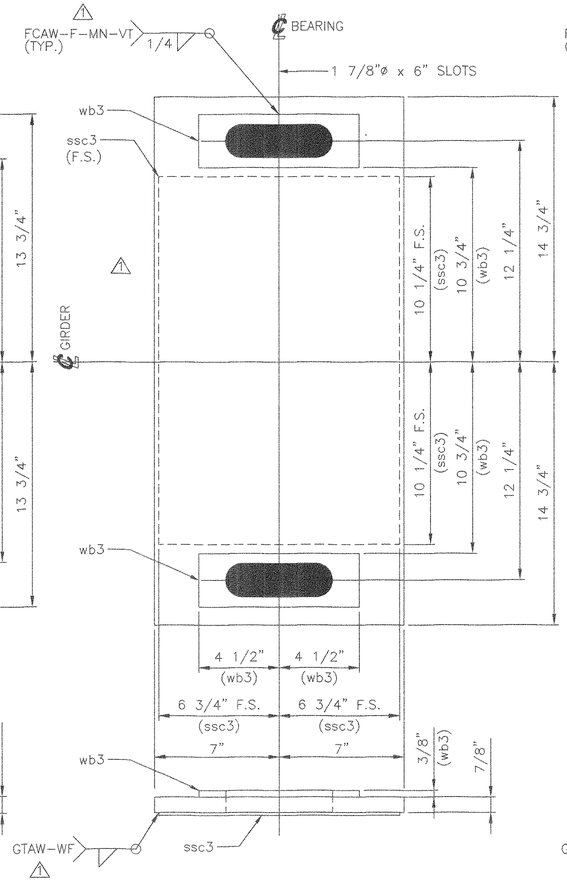
TOTAL GROSS WT = 2887



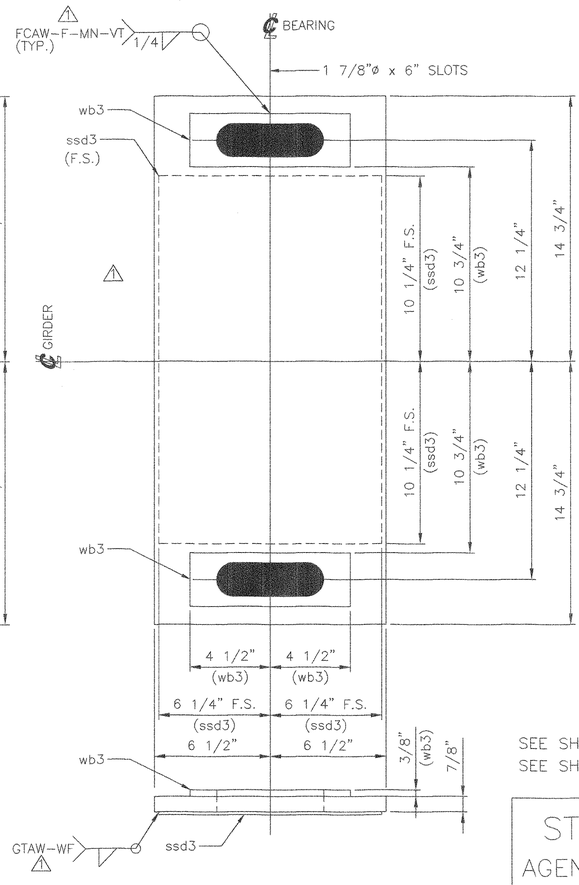
5 EXPANSION SOLE PLATES, SP9
PL 7/8" x 13 1/2" x 27 1/2"
METALLIZED AS NOTED
LOCATE AT
BRIDGE 51N, PIER 3



5 EXPANSION SOLE PLATES, SP10
PL 15/16" x 14 1/2" x 27 1/2"
METALLIZED AS NOTED
LOCATE AT
BRIDGE 51S, PIER 2



10 EXPANSION SOLE PLATES, SP11
PL 7/8" x 14" x 29 1/2"
METALLIZED AS NOTED
LOCATE AT
BRIDGE 51N, PIER 4
AND
BRIDGE 51S, PIER 5



5 EXPANSION SOLE PLATES, SP12
PL 7/8" x 13" x 29 1/2"
METALLIZED AS NOTED
LOCATE AT
BRIDGE 51S, PIER 4

TVGA CONSULTANTS

☒ NO EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

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BY: BJC
DATE: 4/12/05

SEE SHEET AS1 FOR ASSEMBLY NOTES.
SEE SHEET 1 FOR SHOP NOTES.

STATE OF VERMONT
AGENCY OF TRANSPORTATION
TOWN OF BOLTON
PROJECT NO.: IM-089-2 (29)
BRIDGE NO.'S 51N AND 51S
ON INTERSTATE 89

COSMEC, INC.
70 SOUTH STREET
WALPOLE, MA. 02081

SCALE: 1/4"=1"	DRAWN BY: JEP	CHECKED BY: PJM
SHT 3 OF 12	DATE: 01/05	DATE: 02/05

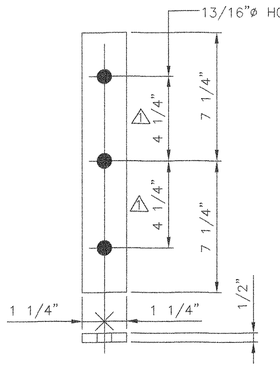
COSMEC BEARING 66317

REV.	DESCRIPTION	BY:	DATE	CK'D BY:	DATE
⚠	REVISED WELD DETAILS, INCREASED wa3 WASHER QTY. REVISED SOLE PLATE METALIZING AND AS NOTED	MM	4/05		

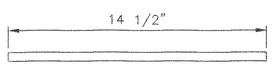
CUSTOMER	S.O. NUMBER	DRAWING NUMBER	REV.
WINTERSET	60233	4362	1

MARK	QTY	DESCRIPTION	FT	IN	16ths	FAB MARK	MILL MARK	WEIGHT
MP1	10	PL 1" x 10 1/2"	·	26	0	·	METALLIZED	774
·	10	BAR 1/2" x 2 1/2"	·	14	8	kpa4	METALLIZED	51
·	10	BAR 1/2" x 1/2"	·	14	8	kpb4	·	10
·	20	BAR 1/2" x 1/2"	·	1	8	kpc4	·	2
MP2	5	PL 1 1/8" x 15"	·	27	8	·	METALLIZED	658
·	5	BAR 1/2" x 2 1/2"	·	17	8	kpd4	METALLIZED	26
·	5	BAR 1/2" x 1/2"	·	17	8	kpe4	·	6
·	10	BAR 1/2" x 1/2"	·	1	8	kpc4	·	1
MP3	5	PL 1 1/8"x 14"	·	29	8	·	METALLIZED	659
·	5	BAR 1/2" x 2 1/2"	·	19	8	kpf4	METALLIZED	35
·	5	BAR1/2" x 1/2"	·	19	8	kpg4	·	7
·	10	BAR 1/2" x 1/2"	·	1	8	kpc4	·	1
·	60	3/4"ø H.S. BOLTS	·	1	8	GALV.	A325 TYPE 1	32
·	60	3/4"ø H.D. WASHERS	·	·	·	GALV.	F-436	3

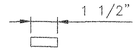
TOTAL GROSS WT = 2265



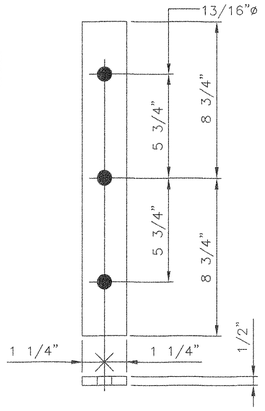
10 KEEPER PLATES, kpa4
BAR 1/2" x 2 1/2" x 14 1/2"
METALLIZED
USE WITH MP1



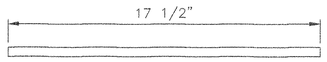
10 KEEPER PLATES, kpb4
BAR 1/2" x 1/2" x 14 1/2"
USE WITH MP1



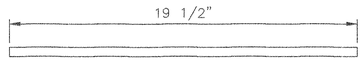
40 KEEPER PLATES, kpc4
BAR 1/2" x 1/2" x 1 1/2"
USE WITH MP1 THRU MP3



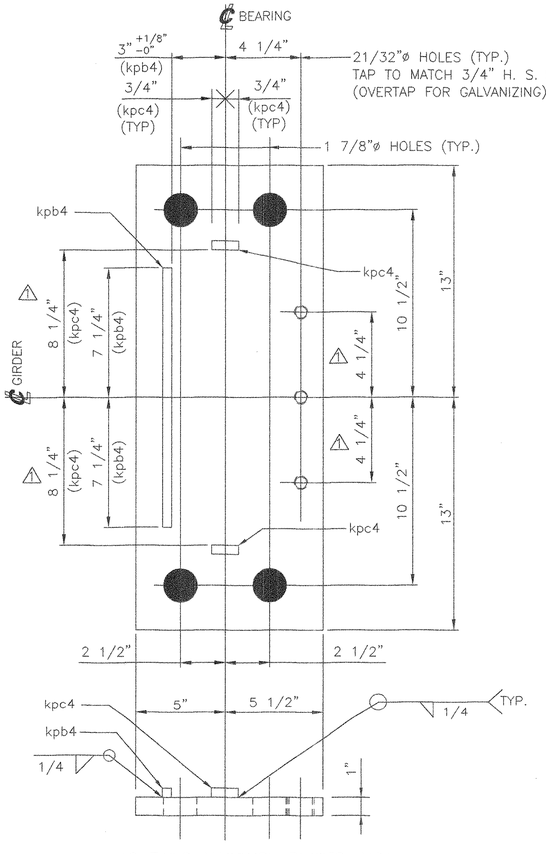
5 KEEPER PLATE, kpd4
BAR 1/2" x 2 1/2" x 17 1/2"
METALLIZED
USE WITH MP2



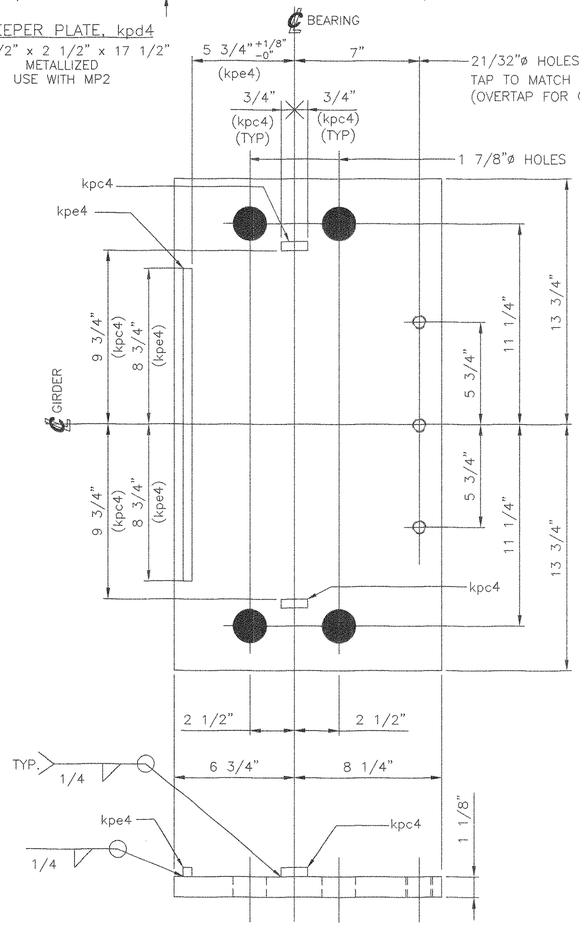
5 KEEPER PLATE, kpe4
BAR 1/2" x 1/2" x 17 1/2"
USE WITH MP2



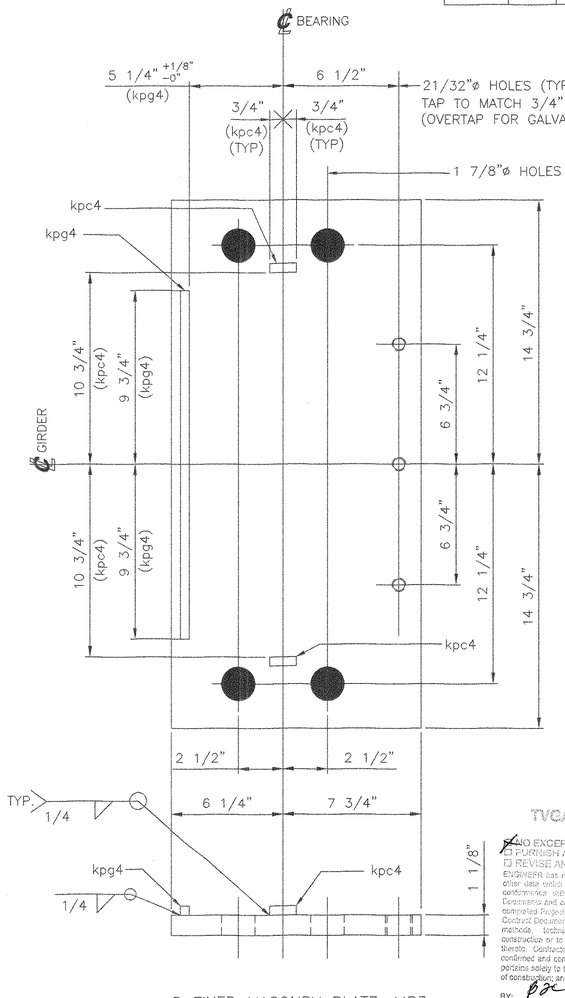
5 KEEPER PLATE, kpg4
BAR 1/2" x 1/2" x 19 1/2"
USE WITH MP3



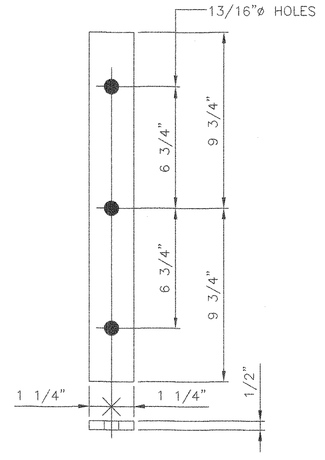
10 FIXED MASONRY PLATES, MP1
PL 1" x 10 1/2" x 26"
METALLIZED
LOCATE AT
BRIDGE NO. 51N, ABUT. 1
AND
BRIDGE NO. 51S, ABUT. 1



5 FIXED MASONRY PLATE, MP2
PL 1 1/8" x 15" x 27 1/2"
METALLIZED
LOCATE AT
BRIDGE NO. 51N, PIER 2



5 FIXED MASONRY PLATE, MP3
PL 1 1/8" x 14" x 29 1/2"
METALLIZED
LOCATE AT
BRIDGE NO. 51S, PIER 3



5 KEEPER PLATE, kpf4
BAR 1/2" x 2 1/2" x 19 1/2"
METALLIZED
USE WITH MP3

SEE SHEET AS1 FOR ASSEMBLY NOTES.
SEE SHEET 1 FOR SHOP NOTES.

TVGA CONSULTANTS

☒ NO EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

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BY: PJC
DATE: 4/18/05

REV.		BY:	DATE	CK'D BY:	DATE
1	REVISED HOLE SPACING ON kpg4 REVISED HOLE SPACING ON MP1 REVISED BAR SPACING ON MP1	MM	4/05		

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TOWN OF BOLTON
PROJECT NO.: IM-089-2 (29)

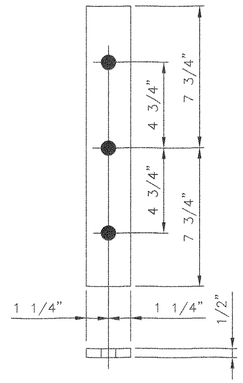
BRIDGE NO.'S 51N AND 51S
ON INTERSTATE 89

COSMEC, INC.
70 SOUTH STREET
WALPOLE, MA. 02081

SCALE:	DRAWN BY:	CHECKED BY:
1/4"=1"	JEP	PJM
SHT 4 OF 12	DATE: 01/05	DATE 02/05

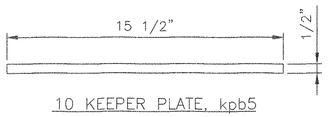
COSMEC BEARING 66318

CUSTOMER	S.O. NUMBER	DRAWING NUMBER	REV.
WINTERSET	60233	4363	1



10 KEEPER PLATE, kpa5

BAR 1/2" x 2 1/2" x 15 1/2"
METALLIZED
USE WITH MP4

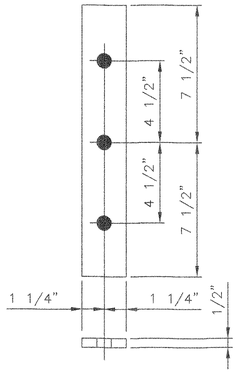


10 KEEPER PLATE, kpb5

BAR 1/2" x 1/2" x 15 1/2"
USE WITH MP4

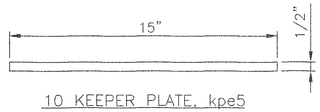
80 KEEPER PLATES, kpc5

BAR 1/2" x 1/2" x 1 1/2"
USE WITH MP4 AND MP5



10 KEEPER PLATES, kpd5

BAR 1/2" x 2 1/2" x 15"
METALLIZED
USE WITH MP5

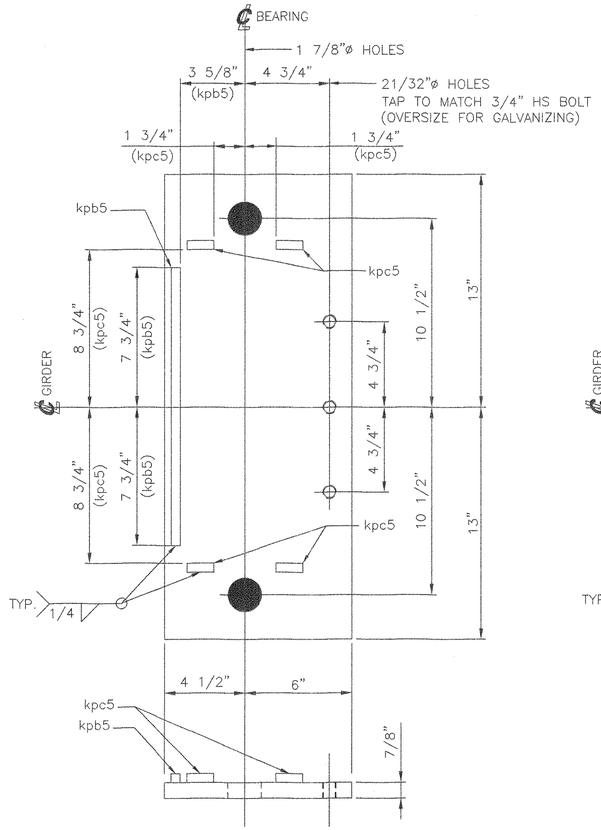


10 KEEPER PLATE, kpe5

BAR 1/2" x1/2" x 15"
USE WITH MP5

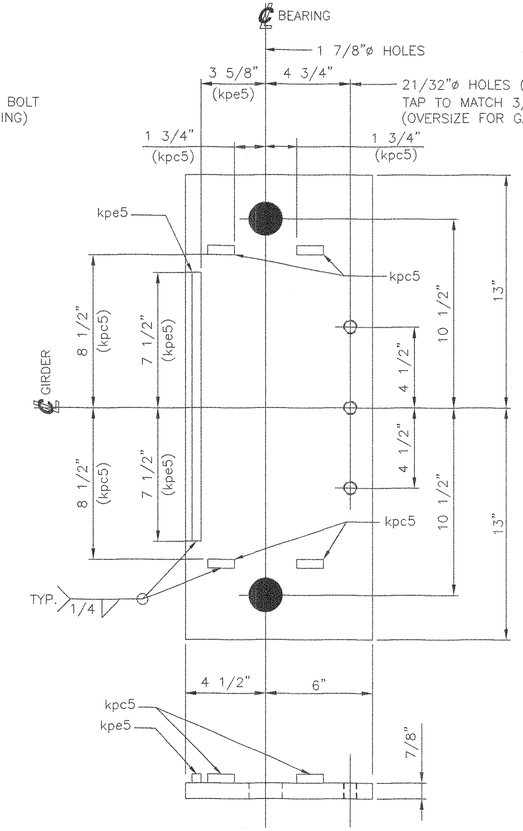
MARK	QTY	DESCRIPTION	FT	IN	16ths	FAB MARK	MILL MARK	WEIGHT
MP4	10	PL 7/8" x 10 1/2"	·	26	0	·	METALLIZED	690
·	10	BAR 1/2" x 2 1/2"	·	15	8	kpa5	METALLIZED	55
·	10	BAR 1/2" x 1/2"	·	15	8	kpb5	·	11
·	40	BAR 1/2" x 1/2"	·	1	8	kpc5	·	4
MP5	10	PL 7/8" x 10 1/2"	·	26	0	·	METALLIZED	690
·	10	BAR 1/2" x 2 1/2"	·	15	0	kpd5	METALLIZED	53
·	10	BAR 1/2" x 1/2"	·	15	0	kpe5	·	11
·	40	BAR 1/2" x 1/2"	·	1	8	kpc5	·	4
⚠ MP6	10	PL 7/8" x 11"	·	29	0	·	METALLIZED	792
·	10	BAR 1/2" x 2 1/2"	·	19	0	kpf5	METALLIZED	67
·	10	BAR 1/2" x 1/2"	·	19	0	kpg5	·	13
·	40	BAR 1/2" x 1/2"	·	1	12	kph5	·	5
·	90	3/4"ø H.S. BOLTS	·	1	8	GALV.	A325 TYPE 1	48
·	90	3/4"ø H.D. WASHERS	·	·	·	GALV.	F-436	4

TOTAL = 2447



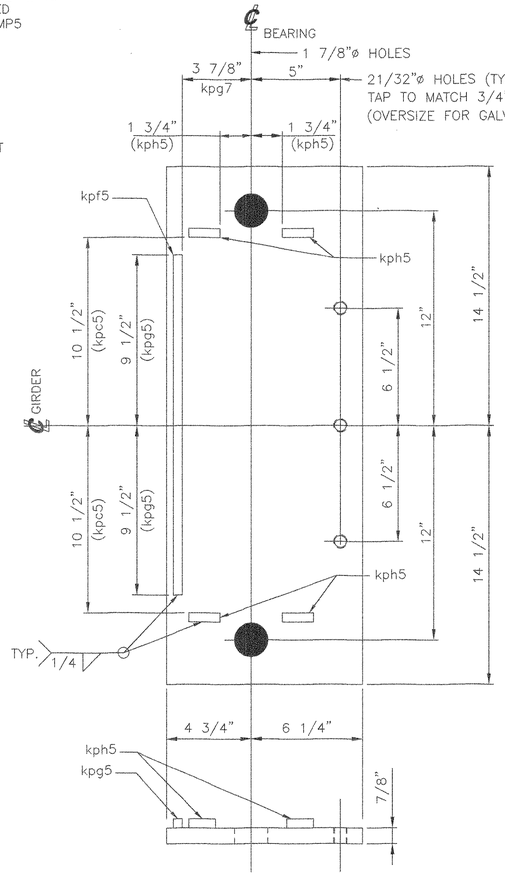
10 EXPANSION MASONRY PLATES, MP4

PL 7/8" x 10 1/2" x 26"
METALLIZED
LOCATE AT
BRIDGE NO. 51N, ABUTMENT 2
AND
BRIDGE NO. 51S, ABUTMENT 2



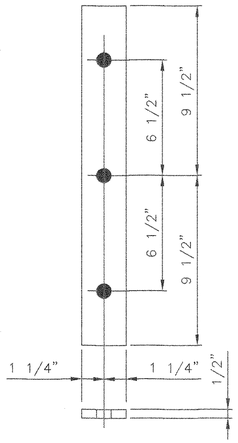
10 EXPANSION MASONRY PLATES, MP5

PL 7/8" x 10 1/2" x 26"
METALLIZED
LOCATE AT
BRIDGE NO. 51N, PIER 1(S1)
AND
BRIDGE NO. 51S, PIER 1(S1)



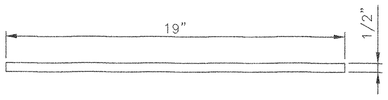
10 EXPANSION MASONRY PLATE, MP6

PL 7/8" x 11" x 29"
METALLIZED
LOCATE AT
BRIDGE NO. 51N, PIER 1(S2)
AND
BRIDGE NO. 51S, PIER 1(S2)



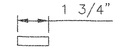
10 KEEPER PLATES, kpf5

BAR 1/2" x 2 1/2" x 19"
METALLIZED
USE WITH MP6



10 KEEPER PLATES, kpg5

BAR 1/2" x 1/2" x 19"
USE WITH MP6



40 KEEPER PLATES, kph5

BAR 1/2" x 1/2" x 1 3/4"
USE WITH MP6

SEE SHEET AS1 FOR ASSEMBLY NOTES.
SEE SHEET 1 FOR SHOP NOTES.

TVGA CONSULTANTS

☒ NO EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

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BY: [signature]
DATE: 4/12/05

REV.		BY:	DATE	CK'D BY:	DATE
⚠	REVISED BILL OF MATERIALS	MM	4/05		

STATE OF VERMONT
AGENCY OF TRANSPORTATION
TOWN OF BOLTON
PROJECT NO.: IM-089-2 (29)
BRIDGE NO.'S 51N AND 51S
ON INTERSTATE 89

COSMEC, INC. 70 SOUTH STREET WALPOLE, MA. 02081

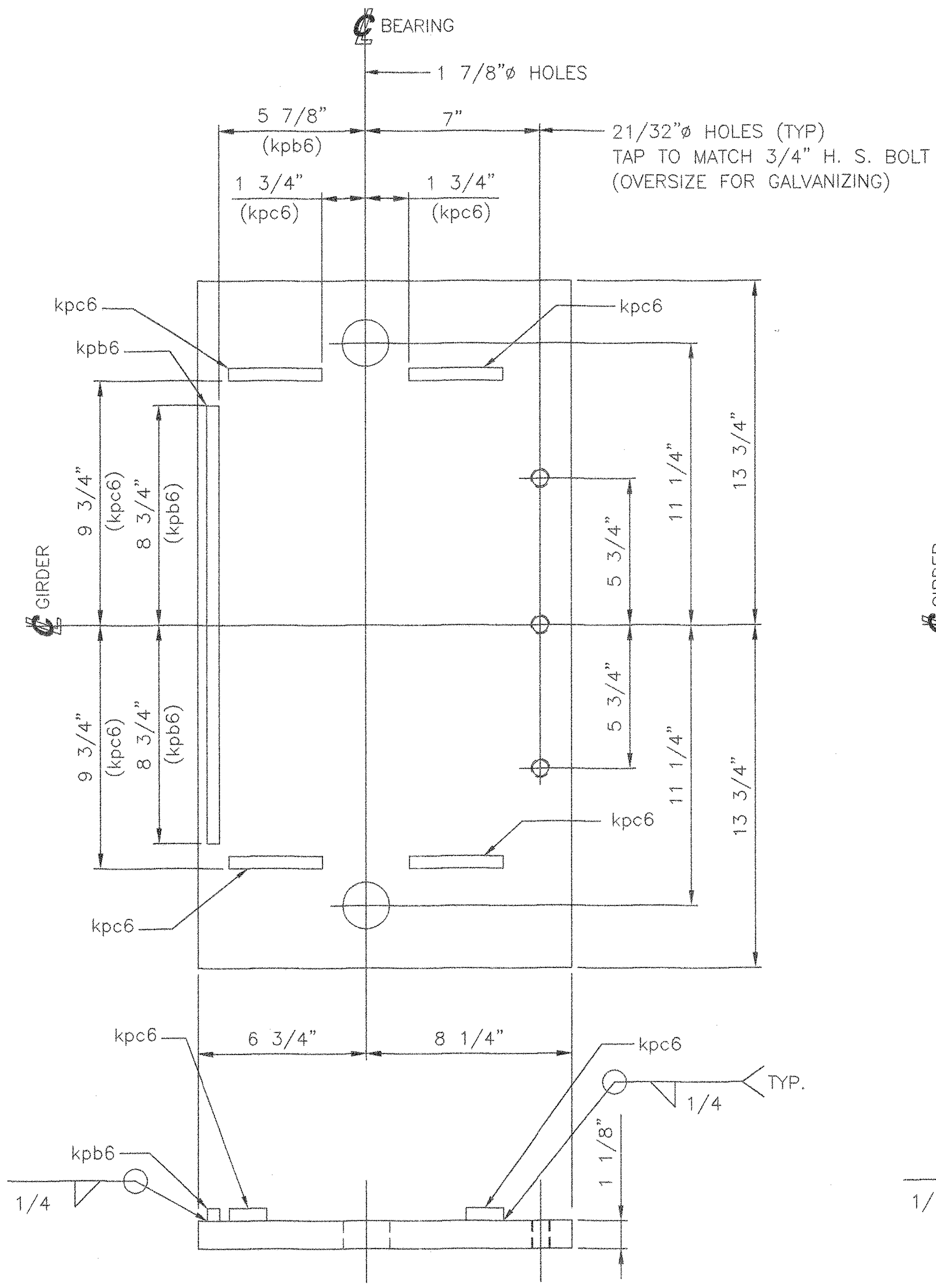
SCALE: 1/4"=1"	DRAWN BY: JEP	CHECKED BY: PJM
SHT 5 OF 12	DATE: 01/05	DATE 02/05

COSMEC BEARING 66319

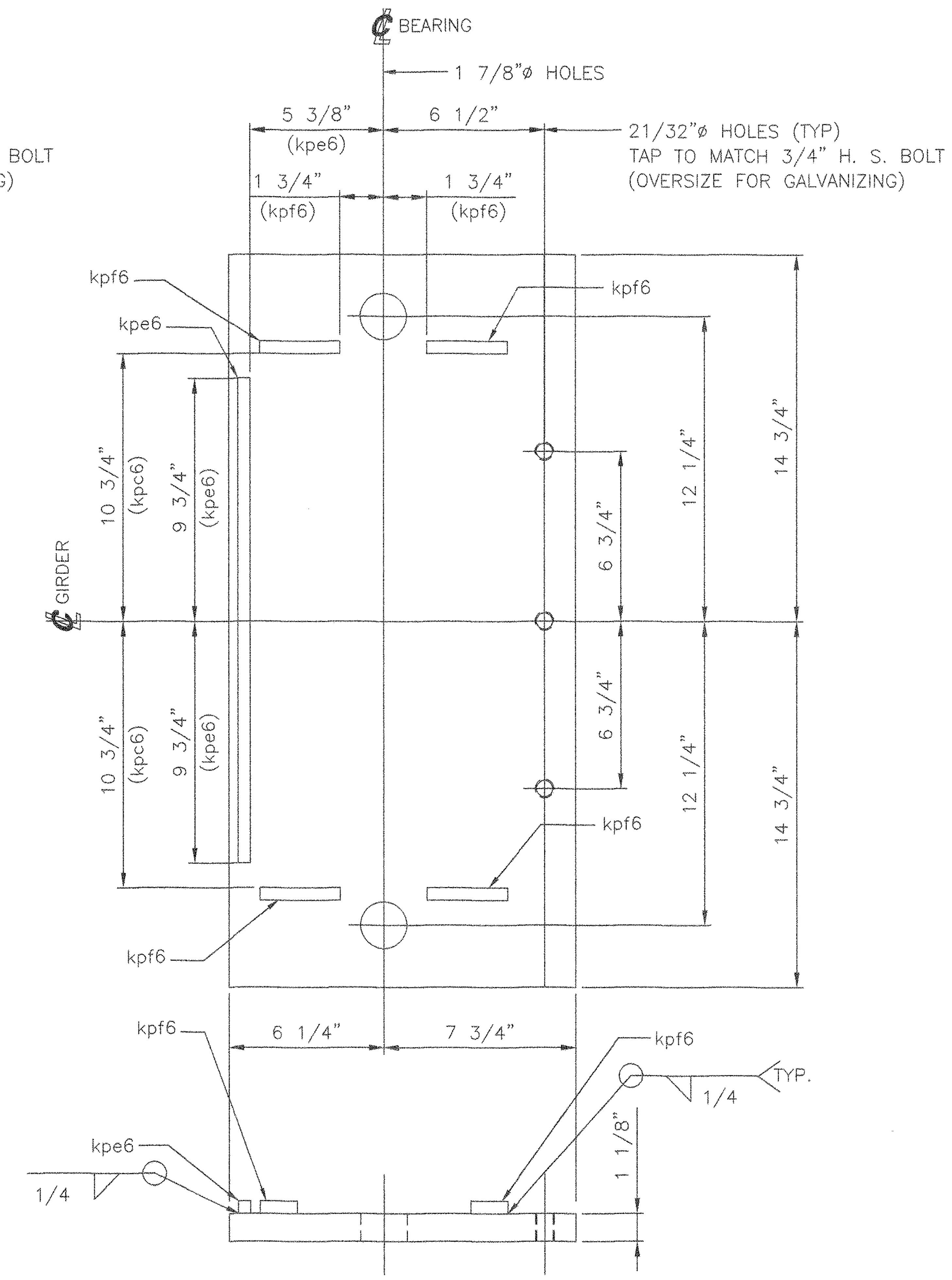
CUSTOMER	S.O. NUMBER	DRAWING NUMBER	REV.
WINTERSET	60233	4364	1

MARK	QTY	DESCRIPTION	FT	IN	16ths	FAB MARK	MILL MARK	WEIGHT
MP7	10	PL 1 1/8" x 15"	·	27	8	·	METALLIZED	1316
·	10	BAR 1/2" x 2 1/2"	·	17	8	kpa6	METALLIZED	62
·	10	BAR 1/2" x 1/2"	·	17	8	kpb6	·	12
·	40	BAR 1/2" x 1/2"	·	3	12	kpc6	·	11
MP8	15	PL 1 1/8" x 14"	·	29	8	·	METALLIZED	1412
·	15	BAR 1/2" x 2 1/2"	·	19	8	kpd6	METALLIZED	69
·	15	BAR 1/2" x 1/2"	·	19	8	kpe6	·	14
·	60	BAR 1/2" x 1/2"	·	3	4	kpf6	·	14
·	75	3/4"ø H.S. BOLTS	·	1	8	GALV.	A325 TYPE 1	40
·	75	3/4"ø H.D. WASHERS	·	·	·	GALV.	F-436	4

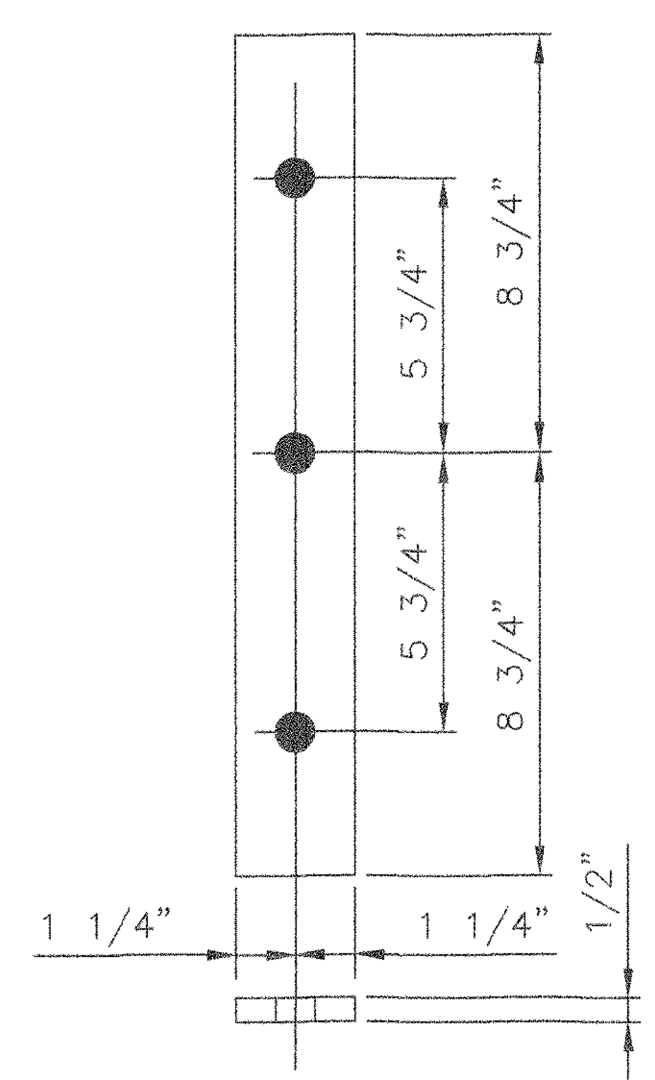
TOTAL GROSS WT = 2954



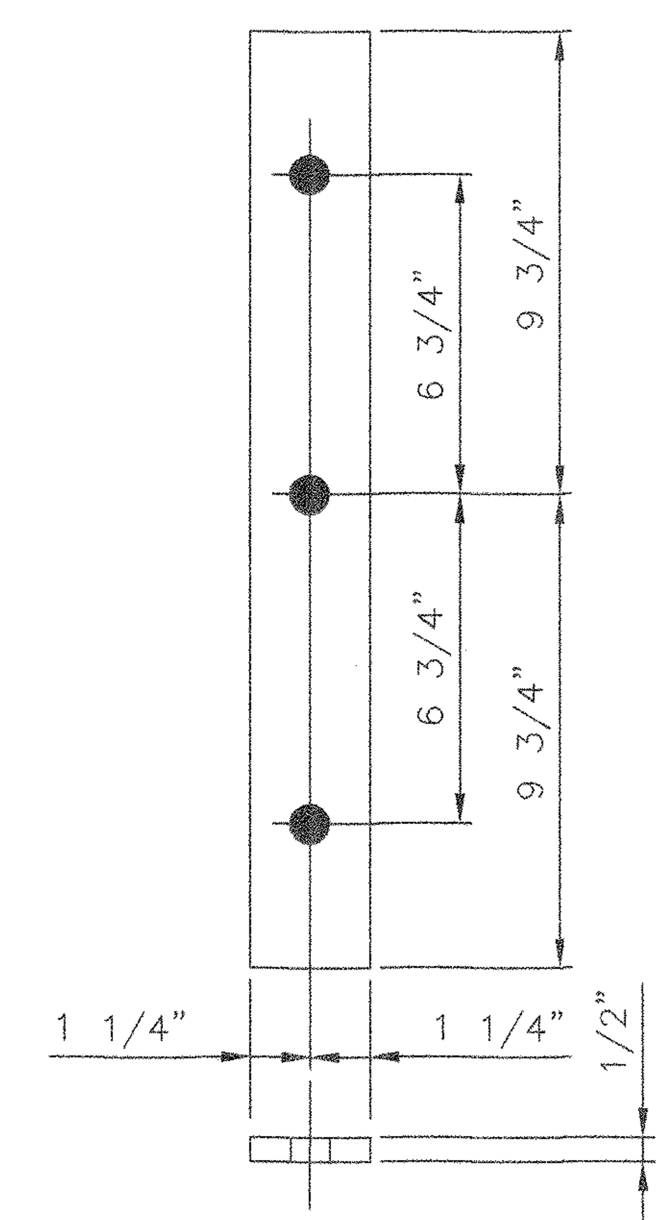
10 EXPANSION MASONRY PLATES, MP7
PL 1 1/8" x 15" x 27 1/2"
METALIZED
LOCATE AT
BRIDGE NO. 51N, PIER 3
AND
BRIDGE NO. 51S, PIER 2



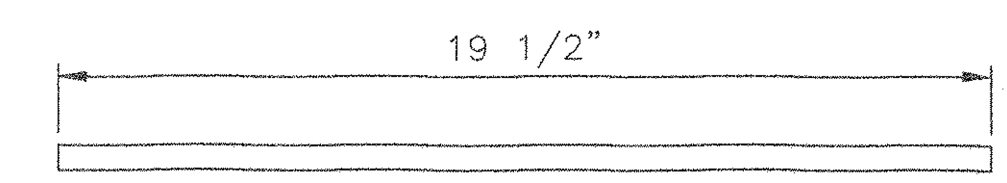
15 EXPANSION MASONRY PLATES, MP8
PL 1 1/8" x 14" x 29 1/2"
METALIZED
LOCATE AT
BRIDGE NO. 51N, PIER 4,
BRIDGE NO. 51S, PIER 5
AND
BRIDGE NO. 51S, PIER 4



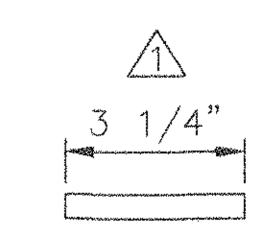
10 KEEPER PLATES, kpa6
PL 1/2" x 2 1/2" x 17 1/2"
METALLIZED
USE WITH MP7



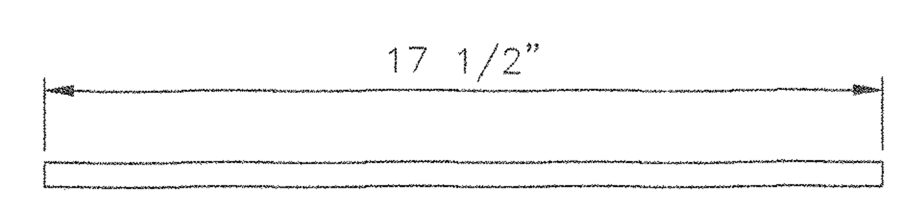
15 KEEPER PLATES, kpd6
PL 1/2" x 2 1/2" x 19 1/2"
METALLIZED
USE WITH MP8



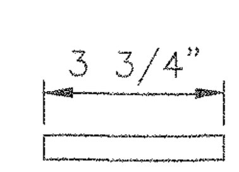
15 KEEPER PLATES, kpe6
PL 1/2" x1/2" x 19 1/2"
USE WITH MP8



60 KEEPER PLATES, kpf6
PL 1/2" x 1/2" x 3 1/4"
USE WITH MP8



10 KEEPER PLATES, kpb6
PL 1/2" x 1/2" x 17 1/2"
USE WITH MP7



40 KEEPER PLATES, kpc6
PL 1/2" x 1/2" x 3 3/4"
USE WITH MP7

SEE SHEET AS1 FOR ASSEMBLY NOTES.
SEE SHEET 1 FOR SHOP NOTES.

☐ FURNISH AS CO...
☐ REVISE AND RESU...
ENGINEER has reviewed ... and other data which Contractor is required to submit, ... conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such reviews do not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.
BY: BJC
DATE: 7/12/05

REV.		BY:	DATE	CK'D BY:	DATE
1	REVISED kpf6 BAR LENGTH	MM	4/05		

STATE OF VERMONT
AGENCY OF TRANSPORTATION
TOWN OF BOLTON
PROJECT NO.: IM-089-2 (29)
BRIDGE NO.'S 51N AND 51S
ON INTERSTATE 89

COSMEC, INC. 70 SOUTH STREET WALPOLE, MA. 02081

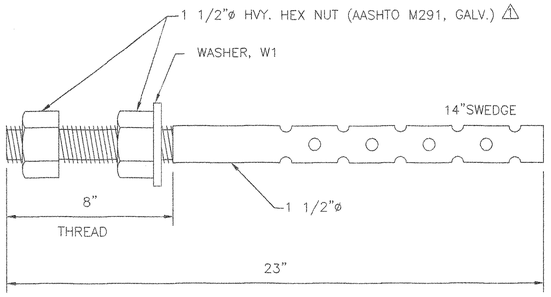
SCALE: 1/4"=1"	DRAWN BY: JEP	CHECKED BY: PJM
SHT 6 OF 12	DATE: 01/05	DATE: 02/05

COSMEC BEARING 66320

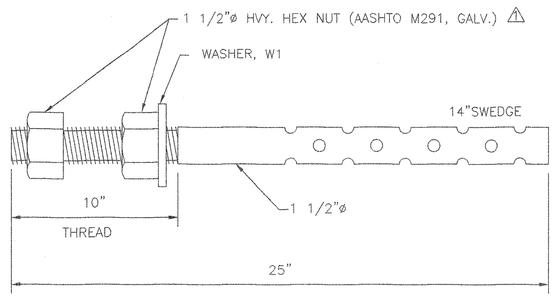
CUSTOMER	S.O. NUMBER	DRAWING NUMBER	REV.
WINTERSET	60233	4365	1

MARK	QTY	DESCRIPTION	FT	IN	16ths	FAB MARK	MILL MARK	WEIGHT
AB1	60	RD 1 1/2"ø	·	23	0	·	GALV.	692
AB2	20	RD 1 1/2"ø	·	25	0	·	GALV.	722
AB3	40	RD 1 1/2"ø	·	23	0	·	GALV.	461
AB4	40	RD 1 1/2"ø	·	24	0	·	GALV.	251
AB5	30	RD 1 1/2"ø	·	26	0	·	GALV.	391
W1	190	PL 3/8" x 3"	·	3	0	GALV.	A36	182
W2	110	PL 3/8" x 3"	·	9	0	GALV.	A36	316
·	380	1 1/2"ø HVY HEX NUTS	·	·	·	·	AASHTO M291 GALV. ⚠1	358

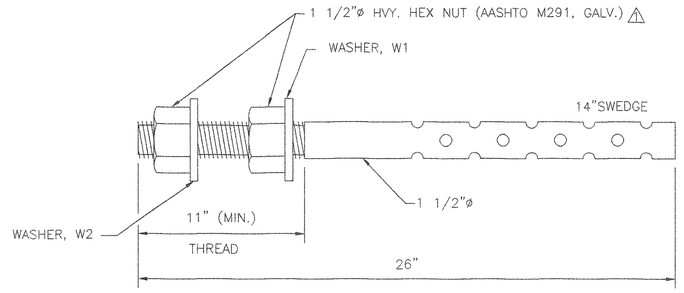
TOTAL GROSS WT = 3373



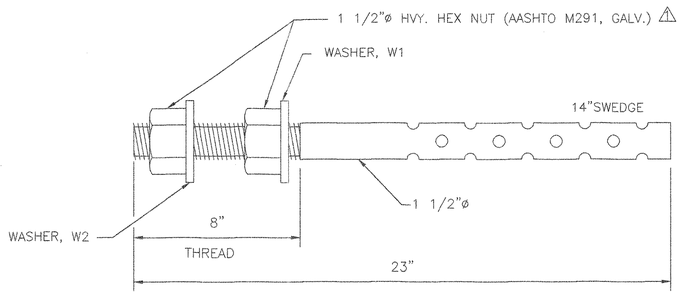
60 ANCHOR BOLTS, AB1
RD 1 1/2"ø x 23"
AASHTO M183 OR EQUIVALENT (GALV.) ⚠1
EMBED. = 15" MIN.
USE AT
BRIDGE NO. 51N, ABUT. 1
BRIDGE NO. 51S, ABUT. 1
BRIDGE NO. 51N, PIER 2



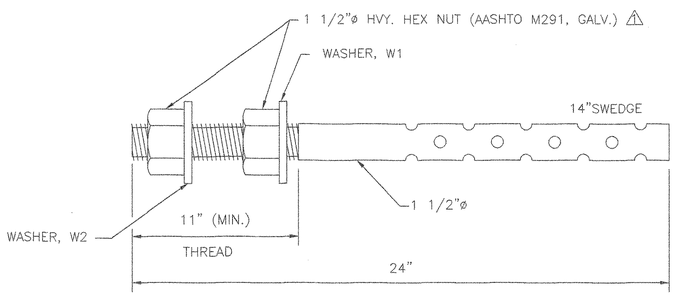
20 ANCHOR BOLTS, AB2
RD 1 1/2"ø x 25"
AASHTO M183 OR EQUIVALENT (GALV.) ⚠1
EMBED. = 15" MIN.
USE AT
BRIDGE NO. 51S, PIER 3



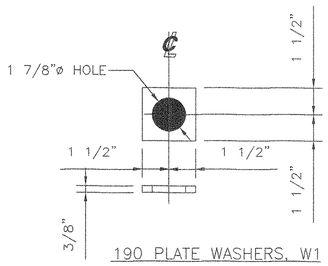
30 ANCHOR BOLTS, AB5
RD 1 1/2"ø x 26"
⚠1 AASHTO M183 OR EQUIVALENT (GALV.)
EMBED. = 15" MIN.
USE AT
BRIDGE NO. 51N, PIER 4
BRIDGE NO. 51S, PIER 4
BRIDGE NO. 51S, PIER 5



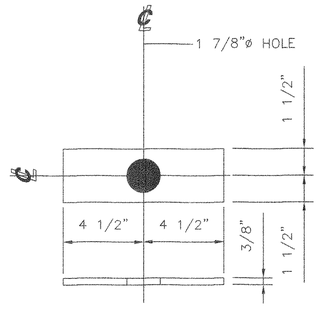
40 ANCHOR BOLTS, AB3
RD 1 1/2"ø x 23"
AASHTO M183 OR EQUIVALENT (GALV.) ⚠1
EMBED. = 15" MIN.
USE AT
BRIDGE NO. 51N, ABUT. 2
BRIDGE NO. 51S, ABUT. 2
BRIDGE NO. 51N, PIER 1(S2)
BRIDGE NO. 51S, PIER 1(S2)



40 ANCHOR BOLTS, AB4
RD 1 1/2"ø x 24"
AASHTO M183 OR EQUIVALENT (GALV.) ⚠1
EMBED. = 15" MIN.
USE AT
BRIDGE NO. 51N, PIER 1(S1)
BRIDGE NO. 51S, PIER 1(S1)
BRIDGE NO. 51N, PIER 3
BRIDGE NO. 51S, PIER 2



190 PLATE WASHERS, W1
PL 3/8" x 3" x 3"
ASTM A.709 GR.36 (GALV.)
USE WITH
ANCHOR BOLTS AB1 THRU AB5



110 PLATE WASHERS, W2
PL 3/8" x 3" x 9"
ASTM A.709 GR. 36 (GALV.)
USE WITH
ANCHOR BOLTS ~~AB2, AB3~~ AB3, AB4 AND AB5

SEE SHEET AS1 FOR ASSEMBLY NOTES.
SEE SHEET 1 FOR SHOP NOTES.

TVGA CONSULTANTS

☐ NO EXCEPTIONS TAKEN ☐ REJECTED
☒ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT
ENGINEER has reviewed Shop Drawings and Samples and other data which Contractor is required to submit, only for conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such reviews do not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

BY: BJC
DATE: 4/12/05

REV.		BY:	DATE	CK'D BY:	DATE
⚠1	REVISED ANCHOR BOLT MATERIAL AND WASHER MATERIAL AS NOTED	MM	4/05		

STATE OF VERMONT
AGENCY OF TRANSPORTATION
TOWN OF BOLTON
PROJECT NO.: IM-089-2 (29)
BRIDGE NO.'S 51N AND 51S
ON INTERSTATE 89

COSMEC, INC. — 70 SOUTH STREET, WALPOLE, MA. 02081

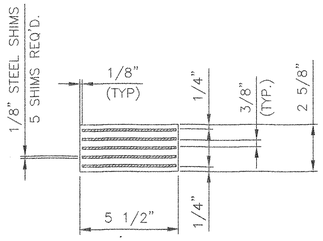
SCALE: 1/4"=1"	DRAWN BY: JEP	CHECKED BY: PJM
SHT 7 OF 12	DATE: 01/05	DATE 02/05

COSMEC BEARING bb321

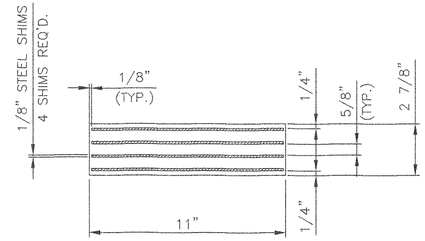
CUSTOMER	S.O. NUMBER	DRAWING NUMBER	REV.
WINTERSET	60233	4366	1

	MARK	QTY	DESCRIPTION	FT	IN	16ths	FAB MARK	MILL MARK	WEIGHT
1	EB1	10	LAM. ELAST. PAD 2 5/8" x 5 1/2"	·	15	8	·	60 DURO. GR.4 NAT. RUBBER	227
1	EB2	5	LAM. ELAST. PAD 2 7/8" x 11"	·	18	8	·	60 DURO. GR.4 NAT. RUBBER	260
1	EB3	5	LAM. ELAST. PAD 5 1/8" x 10"	·	20	8	·	60 DURO. GR.4 NAT. RUBBER	482

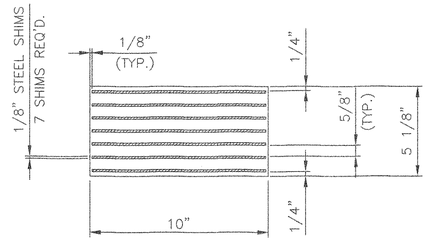
TOTAL GROSS WT = 969



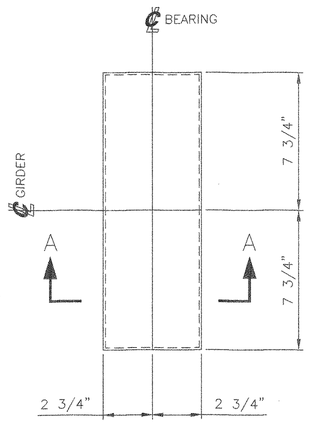
SECTION A–A



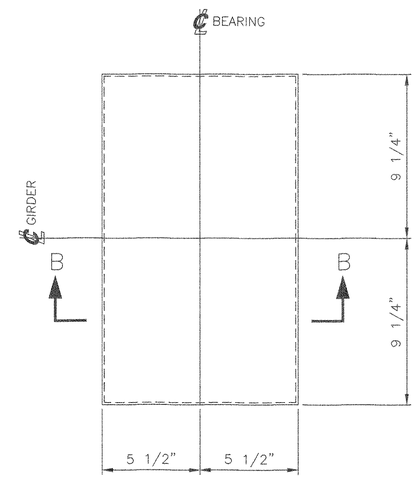
SECTION B–B



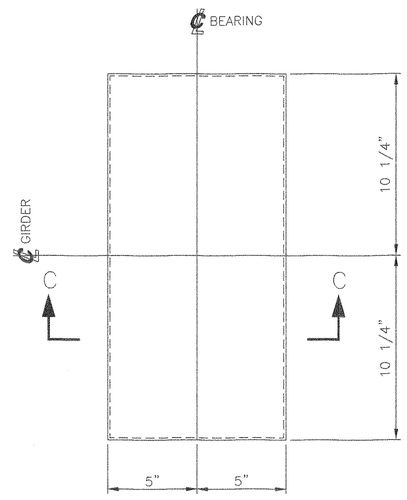
SECTION C–C



10 ELASTOMERIC BEARINGS, EB1
LAMINATED ELASTOMERIC BEARINGS CONFORMING TO
VTDOT STANDARD SPECIFICATIONS
ELASTOMERIC BEARING 2 5/8" X 5 1/2" X 15 1/2"
ELASTOMER – 60 DUROMETER, GRADE 4 NATURAL RUBBER 1
SHIM PLATES – M270 GR.36 (PLAIN)
LOCATE AT
BRIDGE NO. 51N, ABUT. 1
BRIDGE NO. 51S, ABUT. 1



5 ELASTOMERIC BEARING, EB2
LAMINATED ELASTOMERIC BEARINGS CONFORMING TO
VTDOT STANDARD SPECIFICATIONS
ELASTOMERIC BEARING 2 7/8" X 11" X 18 1/2"
ELASTOMER – 60 DUROMETER, GRADE 4 NATURAL RUBBER 1
SHIM PLATES – M270 GR.36 (PLAIN)
LOCATE AT
BRIDGE 51N, PIER 2



5 ELASTOMERIC BEARING, EB3
LAMINATED ELASTOMERIC BEARINGS CONFORMING TO
VTDOT STANDARD SPECIFICATIONS
ELASTOMERIC BEARING 5 1/8" X 10" X 20 1/2"
ELASTOMER – 60 DUROMETER, GRADE 4 NATURAL RUBBER 1
SHIM PLATES – M270 GR.36 (PLAIN)
LOCATE AT
BRIDGE 51S, PIER 3

SEE SHEET AS1 FOR ASSEMBLY NOTES.
SEE SHEET 1 FOR SHOP NOTES.

TVGA CONSULTANTS

~~X~~ NO EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

ENGINEER has reviewed Shop Drawings and Samples and other data which Contractor is required to submit, only for conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such reviews do not extend to means, methods, techniques, sequences or procedures of construction, or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

BY: BJC
DATE: 4/12/05

REV.		BY:	DATE	CK'D BY:	DATE
1	NATURAL RUBBER WAS NEOPRENE	MM	4/05		

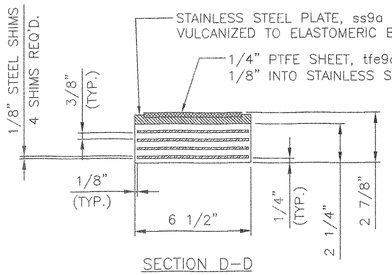
STATE OF VERMONT
AGENCY OF TRANSPORTATION
TOWN OF BOLTON
PROJECT NO.: IM–089–2 (29)
BRIDGE NO.'S 51N AND 51S
ON INTERSTATE 89

COSMEC, INC. 70 SOUTH STREET WALPOLE, MA. 02081

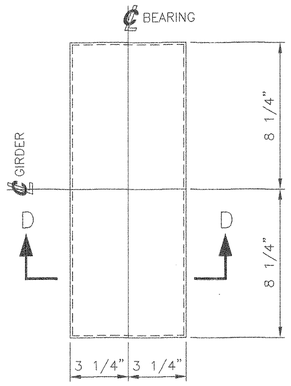
SCALE: 1/4"=1"	DRAWN BY: JEP	CHECKED BY: PJM
SHT 8 OF 12	DATE: 01/05	DATE: 02/05

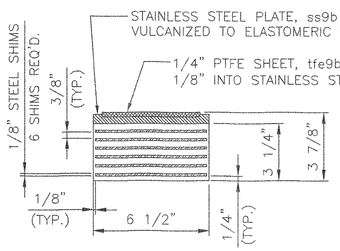
COSMEC BEARING bb322

CUSTOMER	S.O. NUMBER	DRAWING NUMBER	REV.
WINTERSET	60233	4367	1

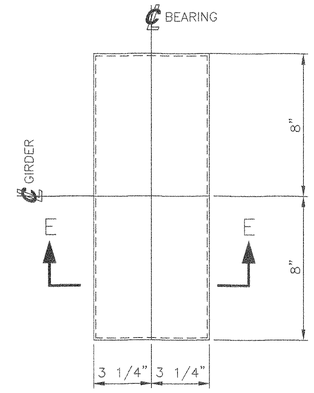


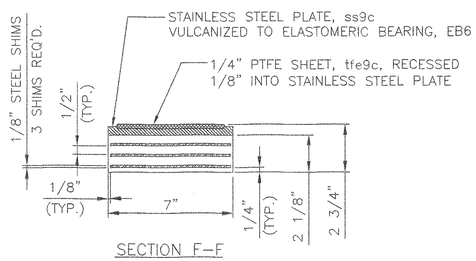
SECTION D–D



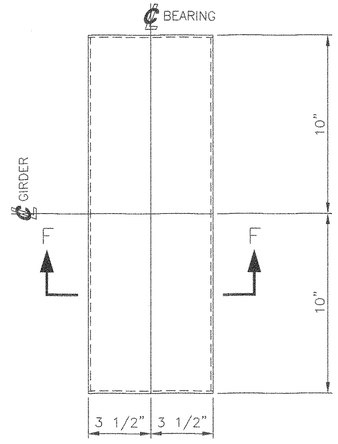


SECTION E–E



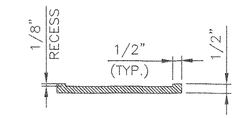


SECTION F–F

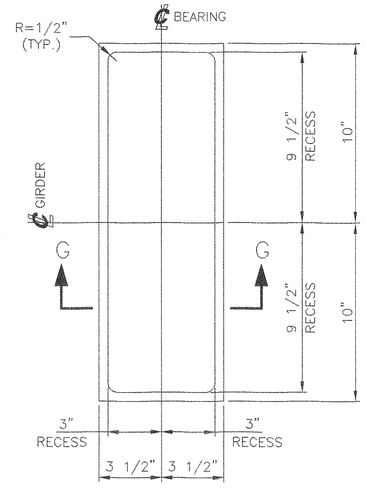


MARK	QTY	DESCRIPTION	FT	IN	16ths	FAB MARK	MILL MARK	WEIGHT
EB4	10	LAM. ELAST. PAD 2 1/4" x 6 1/2"	·	16	8	·	60 DURO. GR.4 NAT. RUBBER	⚠1 238
·	10	STAINLESS PL 1/2" x 6 1/2"	·	16	8	ss9a	A240 TYPE 304	167
·	10	PTFE 1/4" x 5 1/2"	·	15	8	tfe9a	D1457	60
EB5	10	LAM. ELAST. PAD 3 1/4" x 6 1/2"	·	16	0	·	60 DURO. GR.4 NAT. RUBBER	⚠1 339
·	10	STAINLESS PL 1/2" x 6 1/2"	·	16	0	ss9b	A240 TYPE 304	162
·	10	PTFE 1/4" x 5 1/2"	·	15	0	tfe9b	D1457	58
EB6	10	LAM. ELAST. PAD 2 1/8" x 7"	·	20	0	·	60 DURO. GR.4 NAT. RUBBER	⚠1 264
·	10	STAINLESS PL 1/2" x 7"	·	20	0	ss9c	A240 TYPE 304	219
·	10	PTFE 1/4" x 6"	·	19	0	tfe9c	D1457	81

TOTAL GROSS WT = 1588

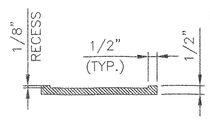


SECTION G–G

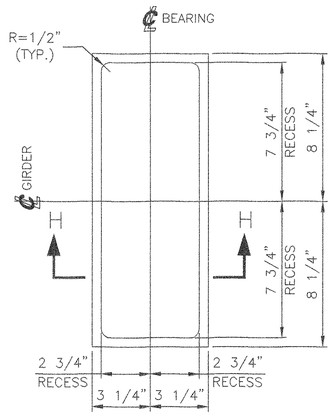


10 ELASTOMERIC BEARINGS, EB4

LAMINATED ELASTOMERIC BEARINGS CONFORMING TO VTDOT STANDARD SPECIFICATIONS
ELASTOMERIC BEARING 2 1/4" X 6 1/2" X 16 1/2"
ELASTOMER – 60 DUROMETER, GRADE 4 NATURAL RUBBER
SHIM PLATES – M270 GR.36 (PLAIN) ⚠1
LOCATE AT
BRIDGE 51N, ABUT. 2
BRIDGE 51S, ABUT. 2



SECTION H–H

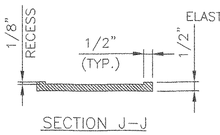


10 STAINLESS STEEL PLATES, SS9a

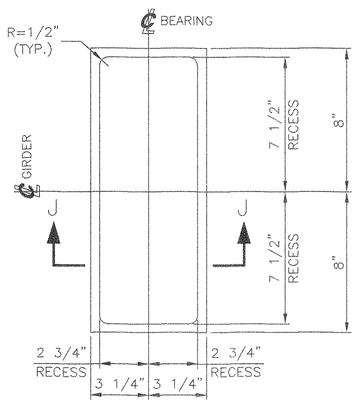
PL 1/2" x 6 1/2" x 16 1/2"
ASTM A240 TYPE 304
USE WITH EB4

10 ELASTOMERIC BEARINGS, EB5

LAMINATED ELASTOMERIC BEARINGS CONFORMING TO VTDOT STANDARD SPECIFICATIONS
ELASTOMERIC BEARING 3 1/4" X 6 1/2" X 16"
ELASTOMER – 60 DUROMETER, GRADE 4 NATURAL RUBBER ⚠1
SHIM PLATES – M270 GR.36 (PLAIN)
LOCATE AT
BRIDGE 51N, PIER 1(S1)
BRIDGE 51S, PIER 1(S1)



SECTION J–J



10 STAINLESS STEEL PLATES, SS9b

PL 1/2" x 6 1/2" x 16"
ASTM A240 TYPE 304
USE WITH EB5

10 ELASTOMERIC BEARING, EB6

LAMINATED ELASTOMERIC BEARINGS CONFORMING TO VTDOT STANDARD SPECIFICATIONS
ELASTOMERIC BEARING 2 1/8" X 7" X 20"
ELASTOMER – 60 DUROMETER, GRADE 4 NATURAL RUBBER ⚠1
SHIM PLATES – M270 GR.36 (PLAIN)
LOCATE AT
BRIDGE 51N, PIER 1(S2)
BRIDGE 51S, PIER 1(S2)

10 STAINLESS STEEL PLATES, SS9c

PL 1/2" x 7" x 20"
ASTM A240 TYPE 304
USE WITH EB6

SEE SHEET AS1 FOR ASSEMBLY NOTES.
SEE SHEET 1 FOR SHOP NOTES.

VTRANS CONSULTANTS

☑ NO EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT
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BY: BJC
DATE: 11.10.05

REV.		BY:	DATE	CK'D BY:	DATE
⚠1	NATURAL RUBBER WAS NEOPRENE	MM	4/05		

STATE OF VERMONT
AGENCY OF TRANSPORTATION
TOWN OF BOLTON
PROJECT NO.: IM-089-2 (29)
BRIDGE NO.'S 51N AND 51S
ON INTERSTATE 89

COSMEC, INC. — 70 SOUTH STREET, WALPOLE, MA. 02081

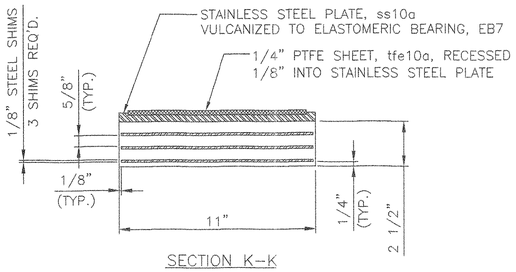
SCALE:	DRAWN BY:	CHECKED BY:
1/4"=1"	JEP	PJM
SHT 9 OF 12	DATE: 01/05	DATE: 02/05

COSMEC BEARING bb323

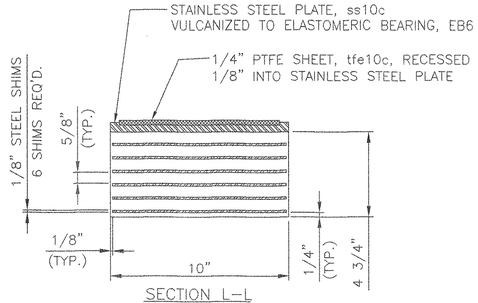
CUSTOMER	S.O. NUMBER	DRAWING NUMBER	REV.
WINTERSET	60233	4368	1

MARK	QTY	DESCRIPTION	FT	IN	16ths	FAB MARK	MILL MARK	WEIGHT
EB7	10	LAM. ELAST. PAD 2 1/2" x 11"	·	18	8	·	60 DURO, GR.4 NAT. RUBBER ⚠	425
·	10	PL 1/2" x 11"	·	18	8	ss10a	A240 TYPE 304	318
·	10	PTFE 1/4" x 10"	·	17	8	tfe10a	D1457	124
EB8	15	LAM. ELAST. PAD 4 3/4" x 10"	·	20	8	·	60 DURO, GR.4 NAT. RUBBER ⚠	1245
·	15	PL 1/2" x 10"	·	20	8	ss10b	A240 TYPE 304	480
·	15	PTFE 1/4" x 9"	·	19	8	tfe10b	D1457	187

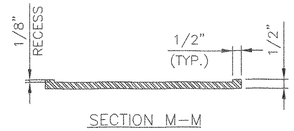
TOTAL GROSS WT = 2779



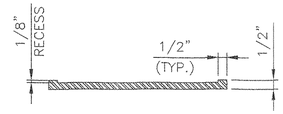
SECTION K–K



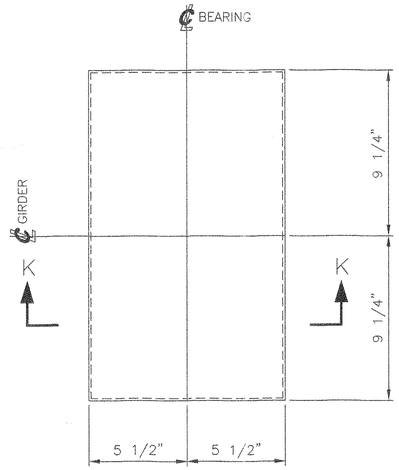
SECTION L–L



SECTION M–M

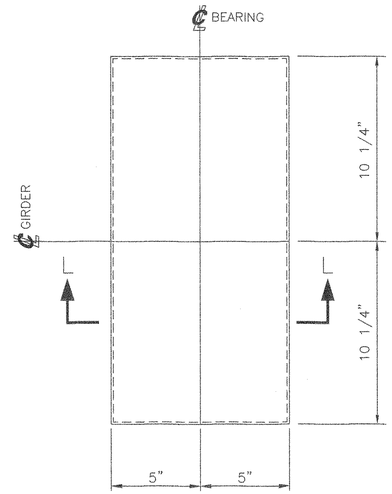


SECTION N–N



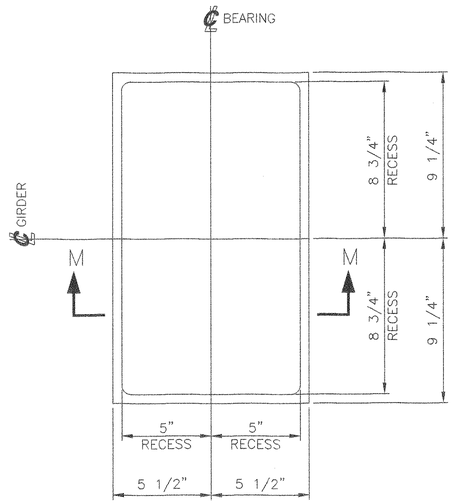
10 ELASTOMERIC BEARINGS, EB7

LAMINATED ELASTOMERIC BEARINGS CONFORMING TO
VTDOT STANDARD SPECIFICATIONS
ELASTOMERIC BEARING 2 1/2" X 11" X 18 1/2"
ELASTOMER – 60 DUROMETER, GRADE 4 NATURAL RUBBER ⚠
SHIM PLATES – M270 GR.36 (PLAIN)
LOCATE AT
BRIDGE 51N, PIER 3
BRIDGE 51S, PIER 2



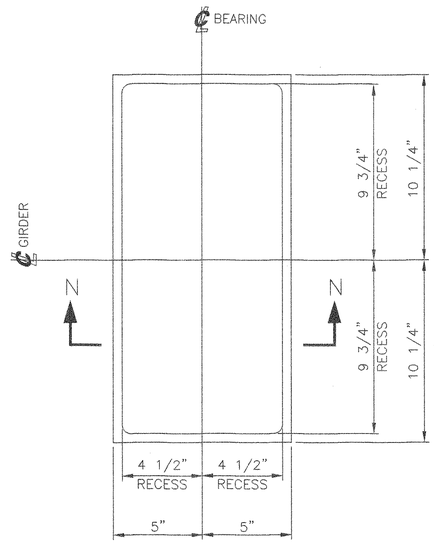
15 ELASTOMERIC BEARING, EB8

LAMINATED ELASTOMERIC BEARINGS CONFORMING TO
VTDOT STANDARD SPECIFICATIONS
ELASTOMERIC BEARING 4 3/4" X 10" X 20 1/2"
ELASTOMER – 60 DUROMETER, GRADE 4 NATURAL RUBBER ⚠
SHIM PLATES – M270 GR.36 (PLAIN)
LOCATE AT
BRIDGE 51N, PIER 4
BRIDGE 51S, PIER 4
BRIDGE 51S, PIER 5



10 STAINLESS STEEL PLATES, SS10a

PL 1/2" x 11" x 18 1/2"
ASTM A240 TYPE 304
USE WITH EB7



15 STAINLESS STEEL PLATES, SS10b

PL 1/2" x 10" x 20 1/2"
ASTM A240 TYPE 304
USE WITH EB8

SEE SHEET AS1 FOR ASSEMBLY NOTES.
SEE SHEET 1 FOR SHOP NOTES.

TVGA CONSULTANTS

☑ NO EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

ENGINEER has reviewed Shop Drawings and Samples and other data which Contractor is required to submit, only for conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such review does not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

BY: DJC
DATE: 4/14/05

REV.		BY:	DATE	CK'D BY:	DATE
⚠	NATURAL RUBBER WAS NEOPRENE	MM	4/05		

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TOWN OF BOLTON
PROJECT NO.: IM–089–2 (29)

BRIDGE NO.'S 51N AND 51S
ON INTERSTATE 89

COSMEC, INC. — 70 SOUTH STREET, WALPOLE, MA. 02081

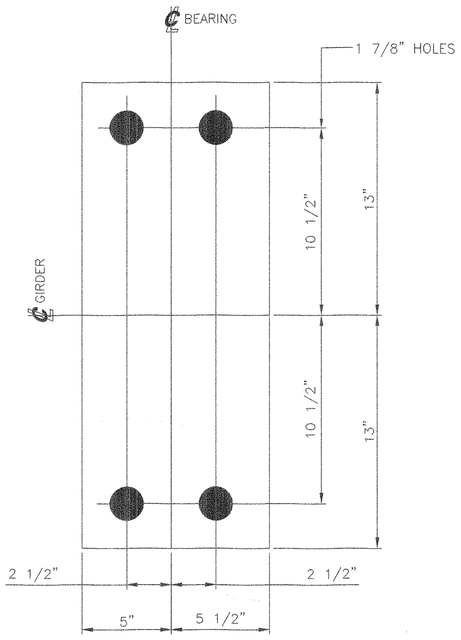
SCALE: 1/4"=1"	DRAWN BY: JEP	CHECKED BY: PJM
SHT 10 OF 12	DATE: 01/05	DATE 02/05

COSMEC BEARING 66324

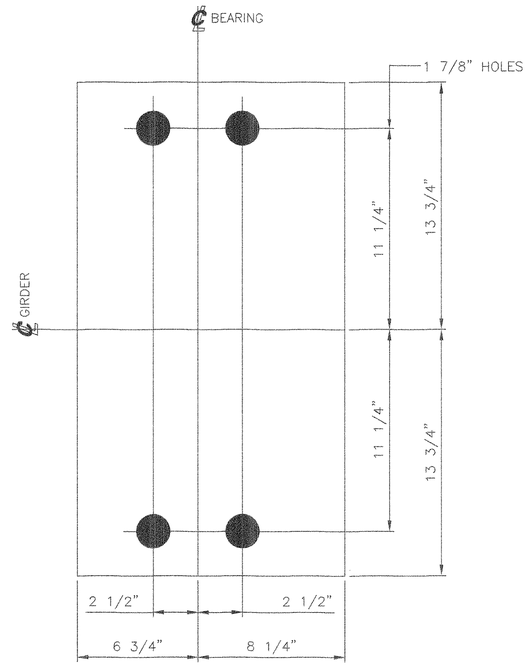
CUSTOMER	S.O. NUMBER	DRAWING NUMBER	REV.
WINTERSET	60233	4369	1

MARK	QTY	DESCRIPTION	FT	IN	16ths	FAB MARK	MILL MARK	WEIGHT
BP1	10	PREFORMED PAD 1/8"x 10 1/2"	·	26	0	·	·	53
BP2	5	PREFORMED PAD 1/8"x 15"	·	27	8	·	·	13
BP3	5	PREFORMED PAD 1/8"x 14"	·	29	8	·	·	13

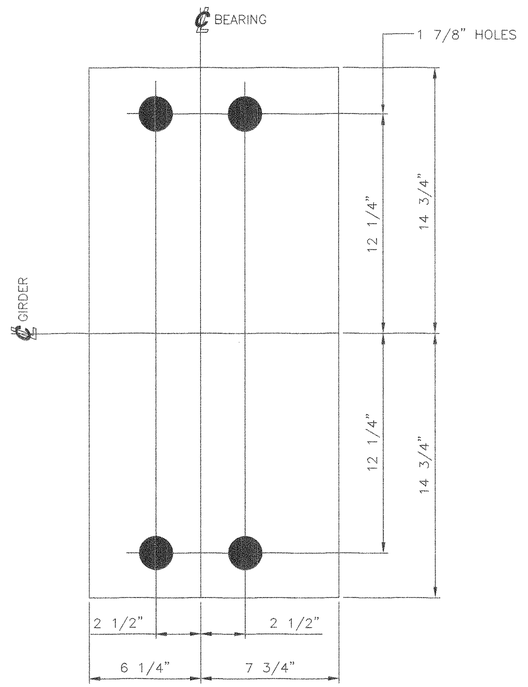
TOTAL GROSS WT = 79



10 PREFORMED BEARING PADS, BP1
1/8" x 10 1/2" x 26"
MATERIAL SHALL BE IN ACCORDANCE WITH AASHTO 18.4.9.1, DIV. 2
LOCATE AT
BRIDGE NO. 51N, ABUT. 1
BRIDGE NO. 51S, ABUT. 1



5 PREFORMED BEARING PAD, BP2
1/8" x 15" x 27 1/2"
MATERIAL SHALL BE IN ACCORDANCE WITH AASHTO 18.4.9.1, DIV. 2
LOCATE AT
BRIDGE NO. 51N, PIER 2



5 PREFORMED BEARING PAD, BP3
1/8" x 14" x 29 1/2"
MATERIAL SHALL BE IN ACCORDANCE WITH AASHTO 18.4.9.1, DIV. 2
LOCATE AT
BRIDGE NO. 51S, PIER 3

TVGA CONSULTANTS

☒ NO EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

ENGINEER has reviewed Shop Drawings and Samples and other data which Contractor is required to submit, only for conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such reviews do not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

BY: BJK
DATE: 3/24/06

SEE SHEET AS1 FOR ASSEMBLY NOTES.
SEE SHEET 1 FOR SHOP NOTES.

STATE OF VERMONT
AGENCY OF TRANSPORTATION
TOWN OF BOLTON
PROJECT NO.: IM-089-2 (29)
BRIDGE NO.'S 51N AND 51S
ON INTERSTATE 89

COSMEC, INC. 70 SOUTH STREET WALPOLE, MA. 02081

SCALE: 1/4"=1"	DRAWN BY: JEP	CHECKED BY: PJM
SHT 11 OF 12	DATE: 01/05	DATE 02/05

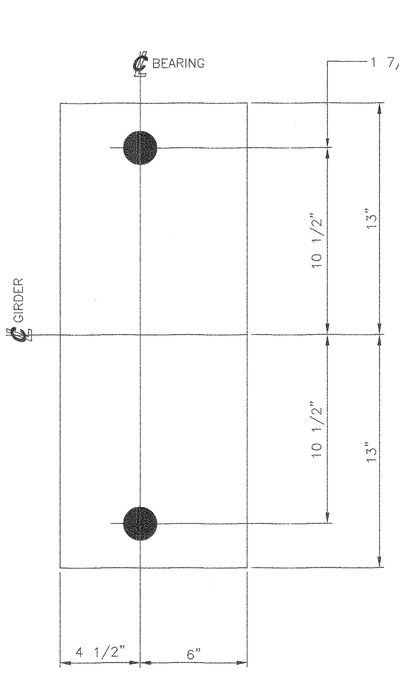
COSMEC BEARING bb325

CUSTOMER	S.O. NUMBER	DRAWING NUMBER	REV.
WINTERSET	60233	4370	0

REV.		BY:	DATE	CK'D BY:	DATE
–					

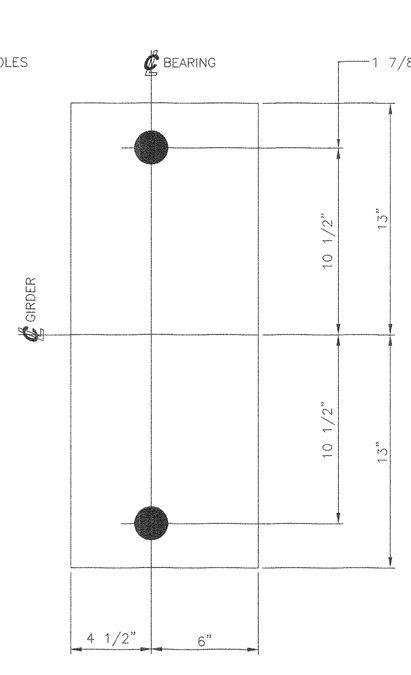
MARK	QTY	DESCRIPTION	FT	IN	16ths	FAB MARK	MILL MARK	WEIGHT
BP4	10	PREFORMED PAD 1/8"x 10 1/2"	·	26	0	·	·	18
BP5	10	PREFORMED PAD 1/8"x 10 1/2"	·	26	0	·	·	18
BP6	10	PREFORMED PAD 1/8"x 11"	·	29	0	·	·	21
BP7	10	PREFORMED PAD 1/8"x 15"	·	27	8	·	·	27
BP8	15	PREFORMED PAD 1/8"x 14"	·	29	8	·	·	39

TOTAL GROSS WT = 123



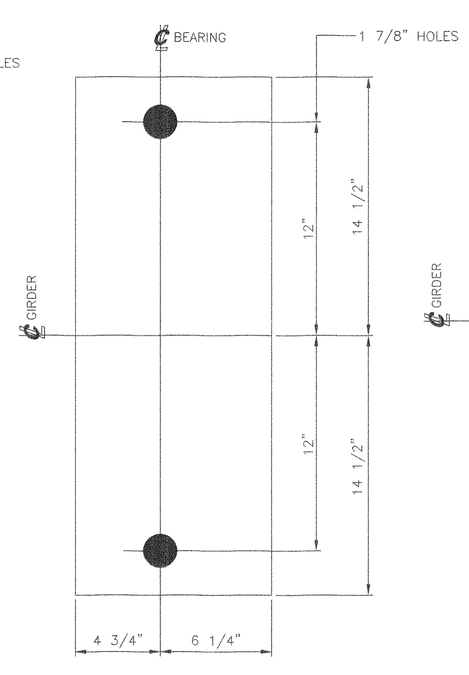
10 PREFORMED BEARING PADS, BP4

1/8" x 10 1/2" x 26"
MATERIAL SHALL BE IN ACCORDANCE WITH
AASHTO 18.4.9.1, DIV. 2
LOCATE AT
BRIDGE NO. 51N, ABUT. 2
BRIDGE NO. 51S, ABUT. 2



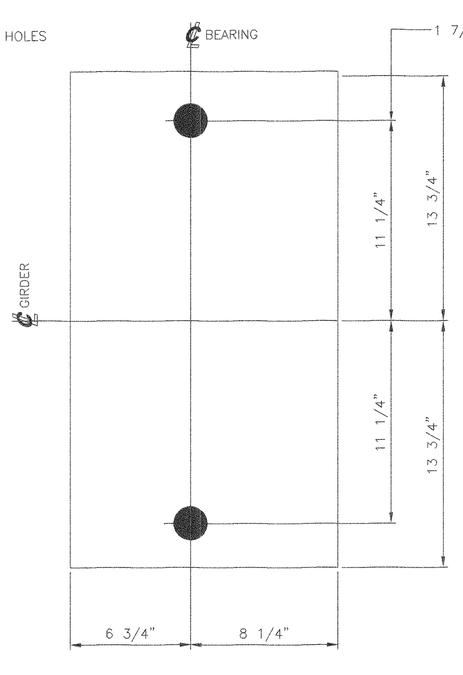
10 PREFORMED BEARING PADS, BP5

1/8" x 10 1/2" x 26"
MATERIAL SHALL BE IN ACCORDANCE WITH
AASHTO 18.4.9.1, DIV. 2
LOCATE AT
BRIDGE NO. 51N, PIER 1(S1)
BRIDGE NO. 51S, PIER 1(S1)



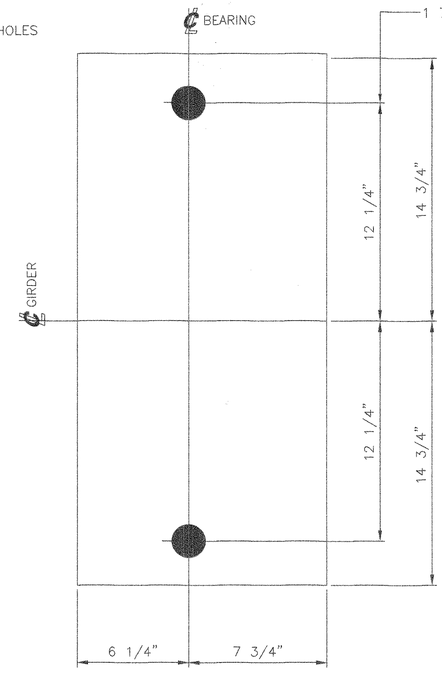
10 PREFORMED BEARING PADS, BP6

1/8" x 11" x 29"
MATERIAL SHALL BE IN ACCORDANCE WITH
AASHTO 18.4.9.1, DIV. 2
LOCATE AT
BRIDGE NO. 51N, PIER 1(S2)
BRIDGE NO. 51S, PIER 1(S2)



10 PREFORMED BEARING PADS, BP7

1/8" x 15" x 27 1/2"
SHALL BE IN ACCORDANCE WITH
AASHTO18.4.9.1, DIV. 2
LOCATE AT
BRIDGE NO. 51N, PIER 3
BRIDGE NO. 51S, PIER 2



15 PREFORMED BEARING PADS, BP8

1/8" x 14" x 29 1/2"
SHALL BE IN ACCORDANCE WITH
AASHTO18.4.9.1, DIV. 2
LOCATE AT
BRIDGE NO. 51N, PIER 4
BRIDGE NO. 51S, PIER 4
BRIDGE NO. 51S, PIER 5

SEE SHEET AS1 FOR ASSEMBLY NOTES.
SEE SHEET 1 FOR SHOP NOTES.

TVGA CONSULTANTS

~~NO EXCEPTIONS TAKEN~~ ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

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BY: BJC
DATE: 5/18/06

REV.		BY:	DATE	CK'D BY:	DATE
–		---	---	---	---

STATE OF VERMONT
AGENCY OF TRANSPORTATION
TOWN OF BOLTON
PROJECT NO.: IM-089-2 (29)
BRIDGE NO.'S 51N AND 51S
ON INTERSTATE 89

COSMEC, INC. 70 SOUTH STREET WALPOLE, MA. 02081

SCALE: 1/4"=1"	DRAWN BY: JEP	CHECKED BY: PJM
SHT 12 OF 12	DATE: 01/05	DATE 02/05

COSMEC BEARING 66326

CUSTOMER	S.O. NUMBER	DRAWING NUMBER	REV.
WINTERSET	60233	4371	0

TVGA
CONSULTANTS

2001.9693.01
July 20, 2005

Casco Bay Steel Structures, Inc.
75 Spring Hill Road
Saco, ME 04072

Attn: Mr. Bryon Tait

Re: Middlesex-Bolton IM 089-2(29)
Bridge 51N&S Expansion Joints, Downspouts and Scupper Drawings

Dear Mr. Tait:

The following details (Item 516.10 Bridge Expansion Joint) for the above project, transmitted with your letter dated 06/16/05, have been reviewed and are being returned herewith.

Sheets: **Bridge 51 N (Sheet J2), Bridge 51 S (Sheet J3), Bridge 51 N and 51 S (Sheets J1A, DS2, and SC1)**
are approved [X] approved "as noted" [ ] reviewed [ ]

Sheets: **Bridge 51 N (Sheet J2A), Bridge 51 S (Sheet J3A), Bridge 51 N and 51 S (Sheets J1, and DS1)**
are approved [ ] approved "as noted" [**X**] reviewed [ ]

The welding procedures were reviewed by Jeff Clark of the Vermont Agency of Transportation and returned separately

You must provide written notice to Vermont Agency of Transportation (VTrans) Structures Section office as to the date fabrication represented by these drawings will begin. **That notice must be received at least seven days prior to that date, as per Specifications 506.03. Any material fabricated prior to the notification date is subject to rejection without further cause.**

Very truly yours,

TVGA Consultants

Kenneth M. Wojtkowski, P.E.
Senior Project Manager

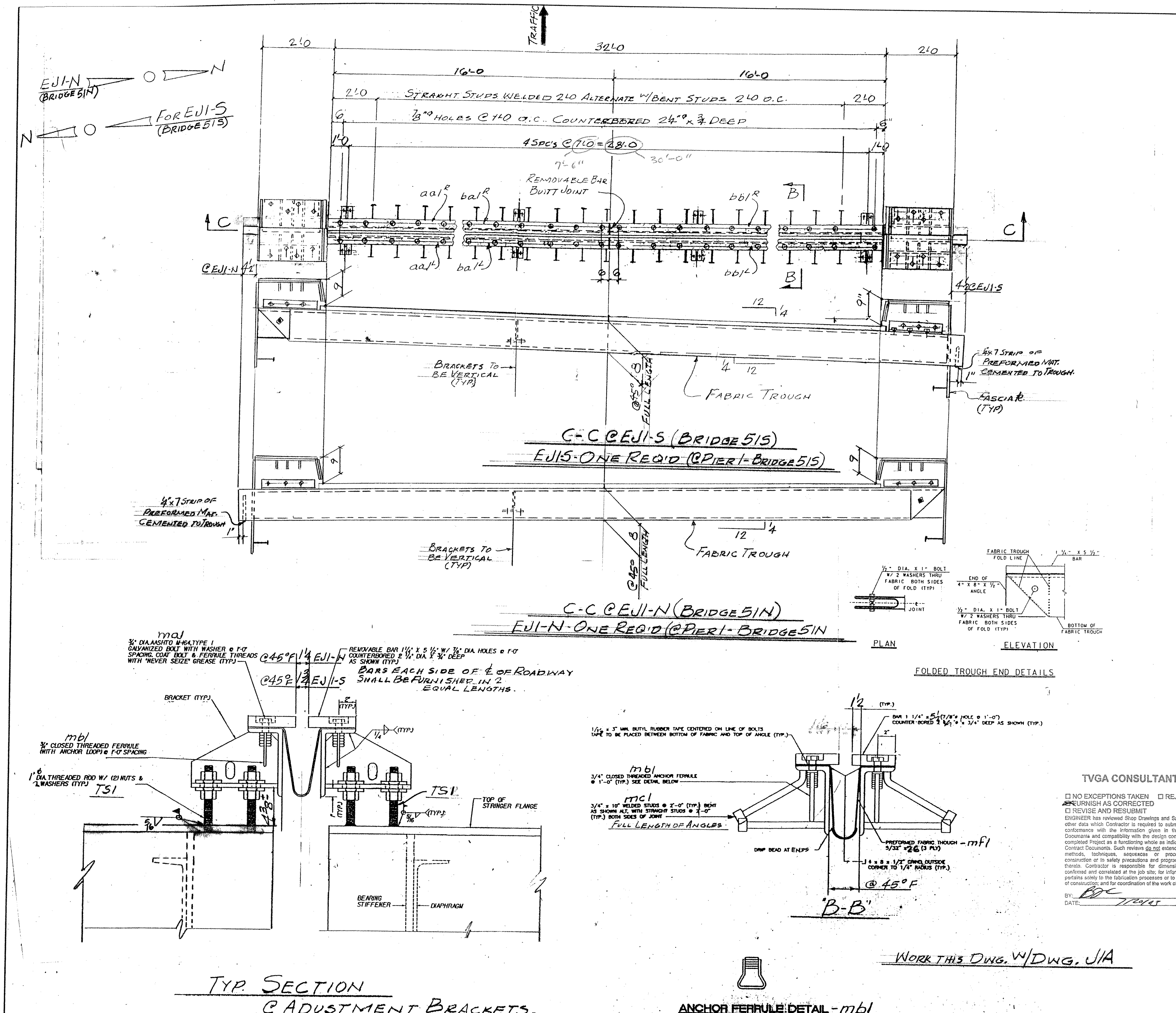
Attachments: One set of prints

cc: [x] VTrans Resident Engineer (Rick Hale) w/prints
[x] Contractor: Winterset w/prints
[ ] Subcontractor -_____ letter only (if railing details then include prints)
[x] VTrans Const Sec. - letter only (To: Const. Eng. Nat Danforth, Attn: Reg. Eng. Alan Campo)
[x] VTrans Consultant Project Manager - Sherward G. Farnsworth w/prints
[x] VTrans Materials & Research Section (C&IA Unit)- Letter only
[x] VTrans Structures Section - Shop Inspector Jeff Clark w/prints
2001.9693.01.2D

BJT 7/12

ELMA
NEW YORK
ALBANY
NEW YORK
BUFFALO
NEW YORK
JAMESTOWN
NEW YORK
NIAGARA FALLS
NEW YORK
ROCHESTER
NEW YORK
STONY BROOK
NEW YORK
SYRACUSE
NEW YORK
STRATHAM
NEW HAMPSHIRE
ATLANTA
GEORGIA
TAMPA
FLORIDA

1000 MAPLE ROAD
ELMA, NY 14059
P.716.655.8842
F.716.655.0937
WWW.TVGA.COM



TVGA CONSULTANTS

☐ NO EXCEPTIONS TAKEN ☐ REJECTED
☒ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

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BY: [illegible]
DATE: 7/26/05

SHOP BILL

JOB NO. 253 DRG. NO. J1

NO.	DESCRIPTION	FT	IN	SHIPPING MARK	REMARKS	WEIGHT
1	EXP. JNT. ASSY			EJ1-S		—
1	EXP. JNT. ASSY	36	0	EJ1-N		—
4	L 8x4x1/2	36	0	aa 1/2		
4	BAR 5 1/2 x 1 1/4	16	1	ba1 1/2		
4	DO	16	1	bb1 1/2		
20	PL 1/2 x 8		10	bc1		
20	PL 1/2 x 6		10	bd1		
128	3/4" H.S. BOLTS		2 1/4	ma1		
128	3/4" CLOSED THREADED ANC. FERRULES			mb1		
144	3/4" ANC STUDS		10	mc1		
2	PREFORMED FABR. ...	37	0	mf1	SPEC PER SUBSECT 707.07 AASHTO ... TYPE II	
4	BUTYL RUBBER TAPE ...	37	0			
80	1" THREADED RODS		9	TS1		
				TS2		
180	1" HEX NUTS					
180	BAR 3 x 3/8		3	W1	WASHER	
4	3/4" GALV. BOLTS		1	SHOP	... WASH.	
14	L 4x4x3/8	1	0	sa1		
28	3/4" H.S. BOLTS		3		W/ WASH	
	CURBS					
4	PL 3/8 x 13 1/2	1	10 1/4	cp1		
4	DO		6 5/8	cp1a		
4	DO	1	7 3/8	cp1b		
4	PL 3/8 x 12 1/2	1	9 1/2	cp2		
4	DO		6 1/4	cp2a		
4	DO	1	7 1/4	cp2b		
4	PL 3/8 x 9 3/4	1	9 1/8	cp3		
4	DO		6 1/4	cp3a		
4	PL 3/8 x 9 3/4	1	9 1/8	cp4		
4	DO		5 1/8	cp4a		
4	PL 3/8 x 9 1/2	1	10 3/8	cp5		
4	PL 3/8 x 8 3/4	1	10 1/8	cp6		
64	3/4" H.S. BOLTS		2 1/4	ma1		
64	3/4" CLOSED THREADED ANC. FERRULES			mb1		
24	3/4" ANC STUDS		10	mc1		
16	3/4" H.S. BOLTS		2 1/4	md1	W/ NEW.	
48	3/4" ANC. STUDS		7	me1		
8	L 4x4x3/8	1	8 1/4	ac1 1/2		
24	PL 3/8 x 5 3/8		5 1/4	sp1		
24	PL 3/8 x 4		4 1/2	sp2		

PAY ITEM 516.10

OUT FOR APPROVAL	2/6/05	
OUT FOR APPROVAL	6/15/05	
ISSUED TO SHOP		
FIELD & OFFICE		

REV.	REMARKS	DATE	DWN	CHK	APP	Q.A.	NO.	DIA.	LGT	TYPE	WASHER

PROJECT NO. IM-089-2(29) STATE BRIDGE NO.

MATERIAL: AASHTO M270-GR36 ELECTRODES: PER PROC. HOLES: AS NOTED SHOP BOLTS: 3/4" H.S.

SURFACE PREP. & PAINT: GALVANIZED AFTER FAB

DESCRIPTION: EXP. JOINT PIER 1

JOB: BRIDGE 51S & 51N

I89 OVER U.S. ROUTE 2 BOLTON, VT.

DRAWN BY: JPF DATE: 1-05
CHKD BY: EJ.
APPROV BY:
Q.A.

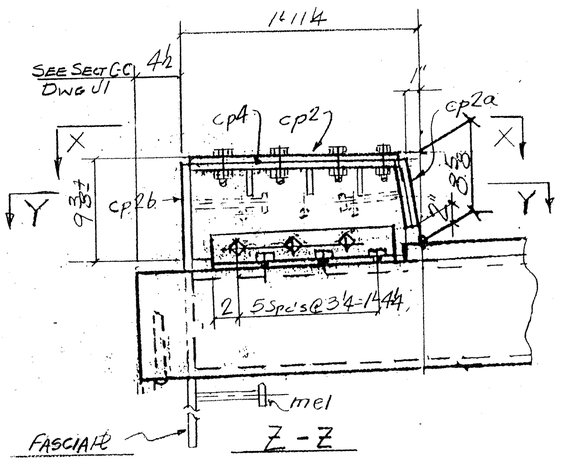
CUSTOMER: WINTERSET INC.

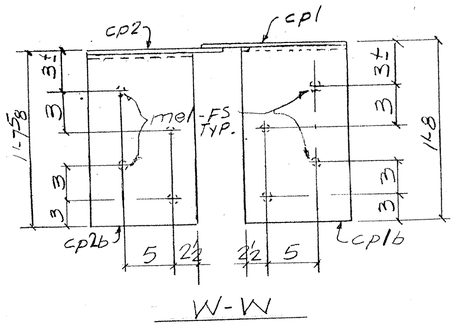
CASCO BAY STEEL STRUCTURES, INC.
75 SPRING HILL ROAD SACO, MAINE 04072
PHONE (207) 282-7360 FAX (207) 282-1179

JOB NO. 253 DRG. NO. J1 REV. △

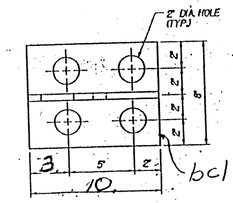
BJ 413

JOB NO. 253 | DRG. NO. J1A

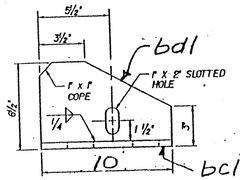




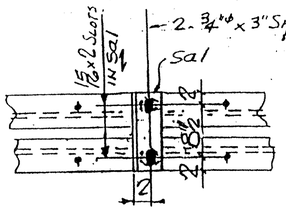
W - W



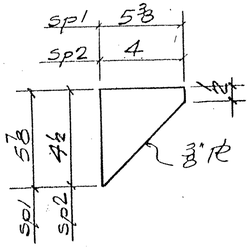
BRACKET PLAN



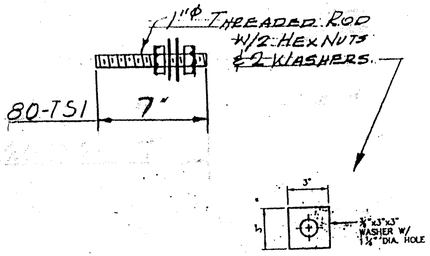
BRACKET ELEVATION



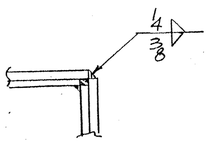
SHIPPING DEVICE
SPACED 5'-0" O.C. MAX. (9 REQ'D EA UNT.)



STIFF. DETAILS

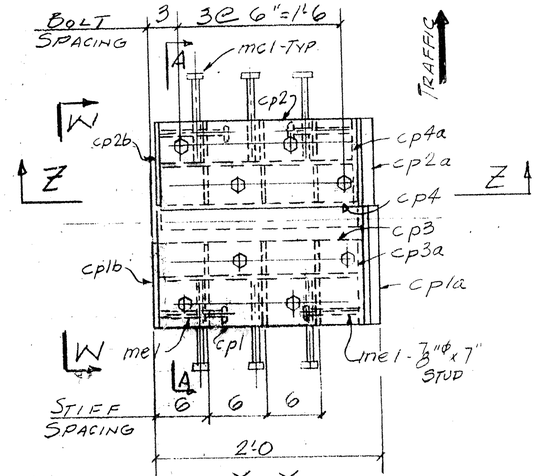


WASHER FOR BRACKET
W1

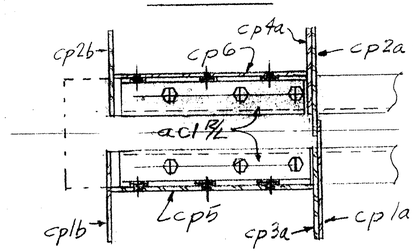


TYP. CORNER DET.

WORK THIS DWG. W/ DWG. J1

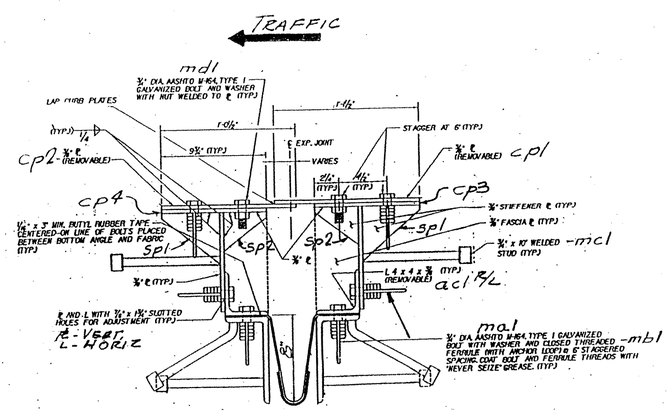


X - X



Y - Y

LEFT END BRUSH CURB SHOWN
RIGHT END - OPP HAND



A - A

TVGA CONSULTANTS

☒ NO EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

ENGINEER has reviewed Shop Drawings and Samples and other data which Contractor is required to submit, only for conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such reviews do not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

BY BJC
DATE 1/20/05

REV.	REMARKS	DATE	DWN	CHK	APP	Q.A.	NO.	DIA.	LGT	TYPE	WASHER
	OUT FOR APPROVAL	2/16/05									
	OUT FOR APPROVAL	6/15/05									
	ISSUED TO SHOP										
	FIELD & OFFICE										

PROJECT NO. IM-089-2(29) STATE BRIDGE NO.
MATERIAL AASHTO M270 GR 36 ELECTRODES: E 70 PROC HOLES: AS NOTED SHOP BOLTS: 3/4"ϕ GALV.
SURFACE PREP. & PAINT:
GALVANIZED AFTER FAB

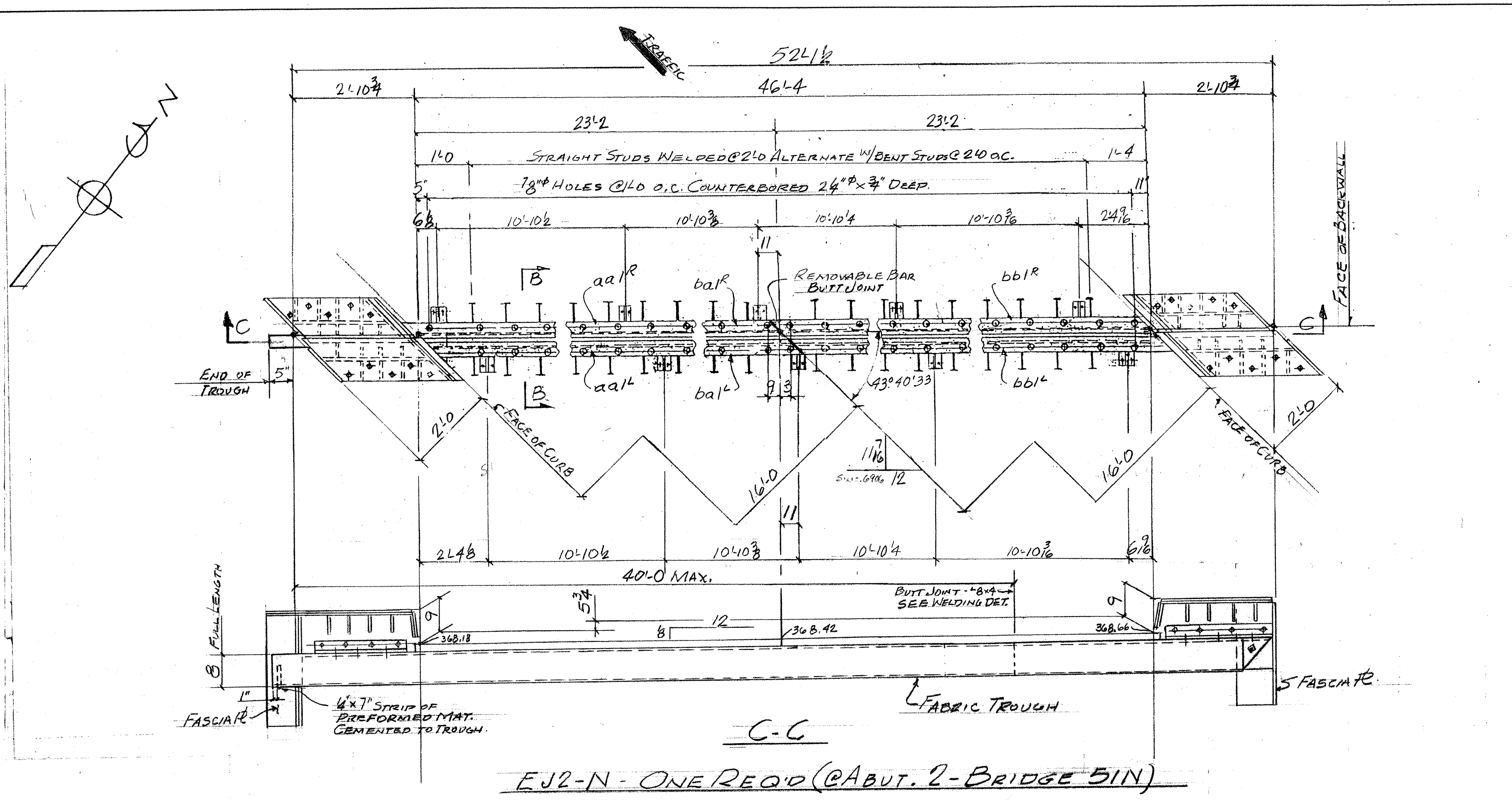
DESCRIPTION: EXP. JOINT - PIER 1
JOB: BRIDGE 515 & 516
I 89 OVER U.S. ROUTE 2
BOLTON, VT.
CUSTOMER: WINTERSET INC.

	DRAWN BY	DATE
	JPF	1-05
CHKD BY	Ed	
APPROV BY		
Q.A.		

CASCO BAY STEEL STRUCTURES, INC.
75 SPRING HILL ROAD SACO, MAINE 04072
PHONE (207) 282-7360 FAX. (207) 282-1179

JOB NO. 253 | DRG. NO. J1A | REV. △

BT-414



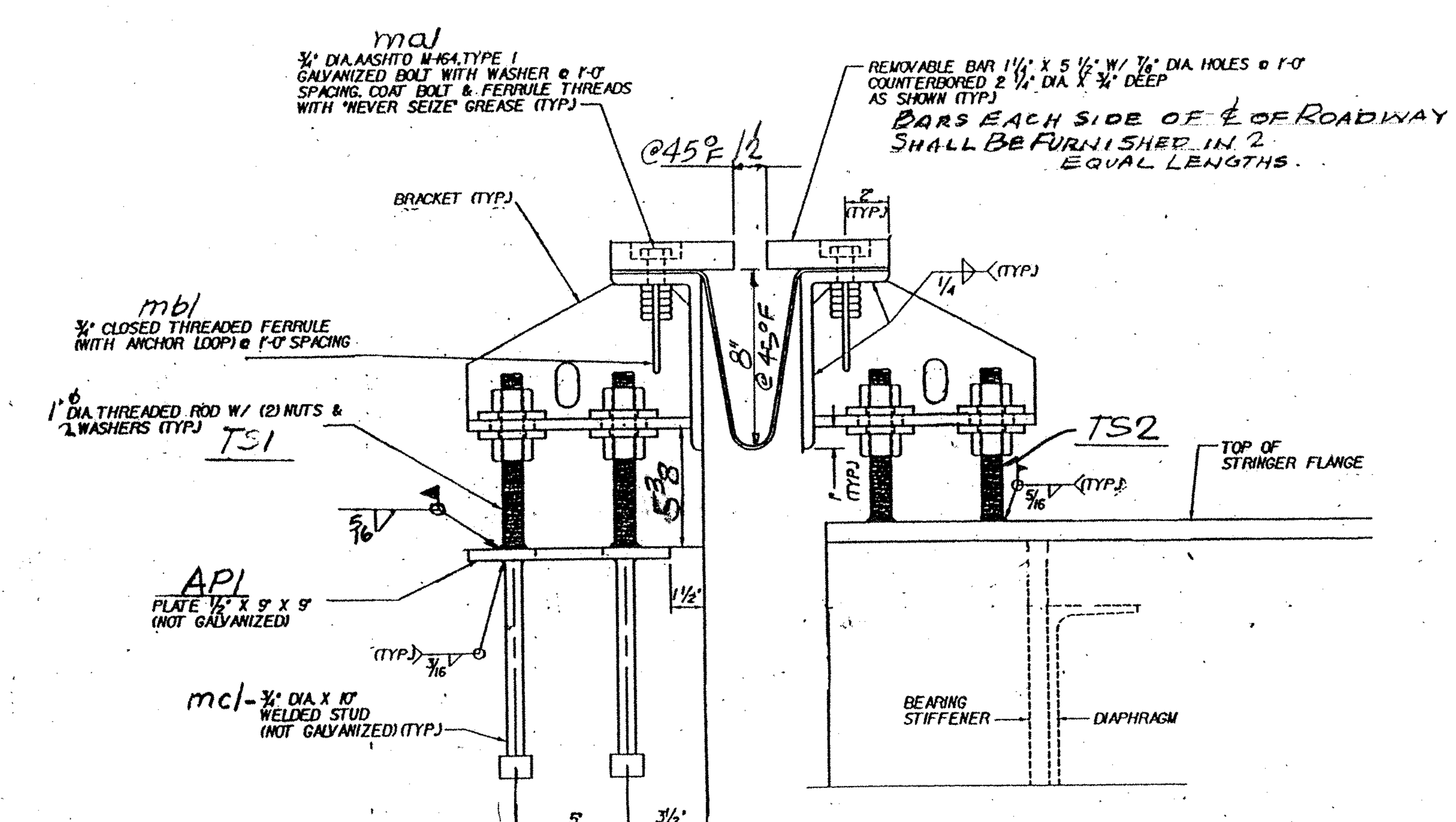
EJ2-N - ONE REQ'D (@ ABUT. 2 - BRIDGE 51N)

WORK THIS DWG. W/ DWG. J2A

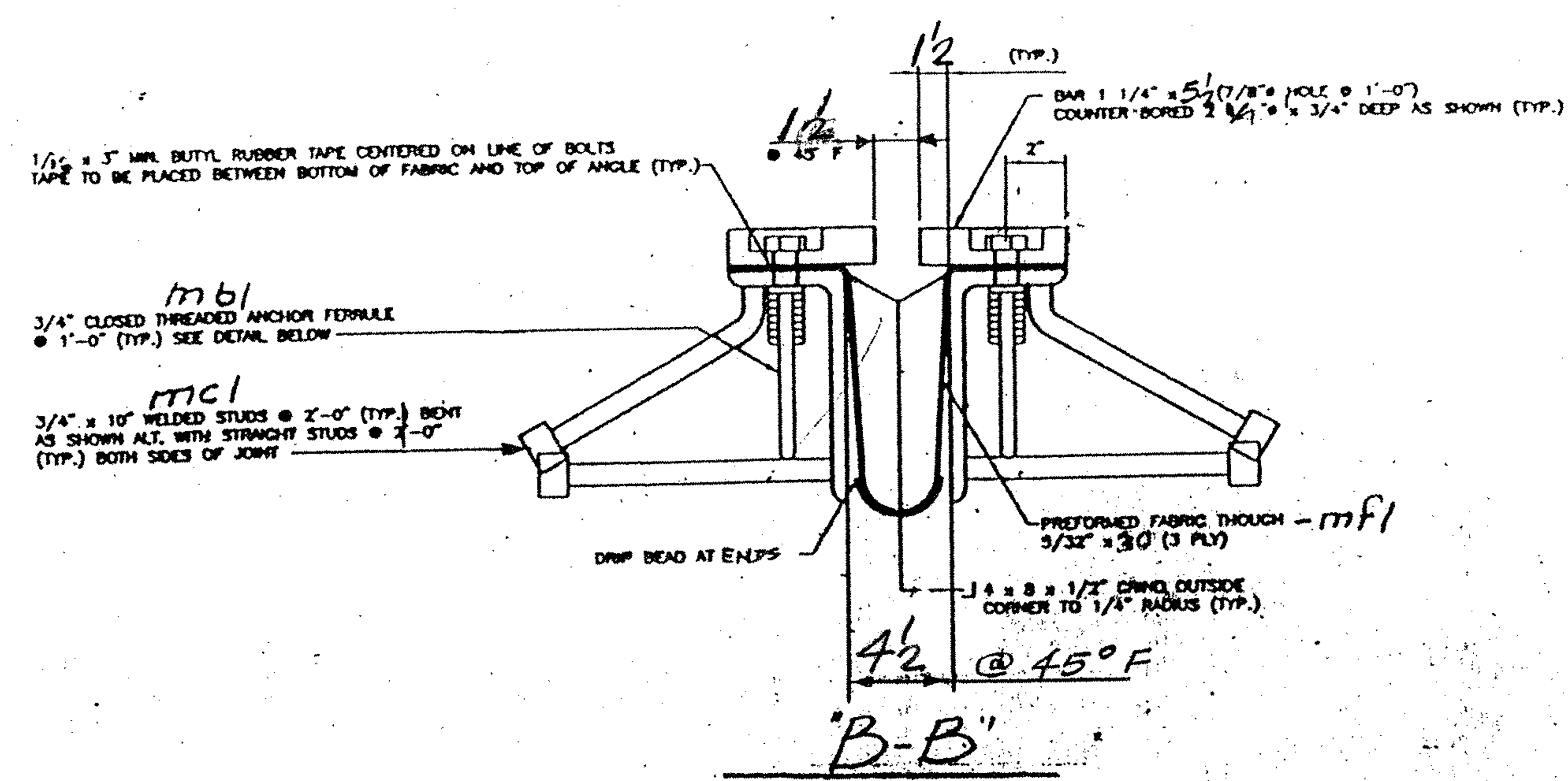
PAGE	LINE	NO.		DESCRIPTION	FT	IN	ASSEM. MARK	SHIPPING MARK	REMARKS	WEIGHT
		1		EXP. JNT. ASS'Y	53	0±		EJ2N		—
			2	L 8x4x½	52	6±	aa1 R/L			
			2	DO						
			2	BAR 5½x1¼	23	10±	ba1 R/L			
			2	DO	23	10±	bb1 R/L			
			10	PL ½x8		10	bc1			
			10	PL ½x6		10	bd1			
			94	¾"Φ H.S. BOLTS		2¼	ma1			
			94	¾"Φ CLOSED THREADED ANC. FERRULES			mb1			
			104	¾"Φ ANC STUDS		10	mc1			
			1	PREFORMED FABR. 5/32 x 30	53	0±	mf1		3 PLY PER SUBSECT 707.07	
			2	BUTYL RUBBER TAPE ⅛ x 3	53	0±			AASHTO SPEC M118-TYPE II	
			2	½"Φ GALV BOLT		1			W/ NUT-2 WASH.	
		20		1"Φ THREADED RODS		9		TS1		
		20		DO		7		TS2		
			80	1"Φ HEX NUTS						
			80	BAR 3 x ⅜		3	W1		WASHER	
		5		PL ½ x 9		9		AP1	NOT GALV.	
			20	¾"Φ ANC STUDS		10	mc1			
			9	L 4x4x⅜	1	0½	sa1			
			9	¾"Φ H.S. BOLTS		3			W/ 1 WASH.	
	CURBS									
			2	PL ⅜ x 13½	3	10½	cp1			
			2	PL ⅜ x 19½		6⅝	cp1a			
			2	DO	2	2⅜	cp1b			
			2	PL ⅜ x 12½	3	9½	cp2			
			2	PL ⅜ x 18		6¼	cp2a			
			2	DO	2	7¾	cp2b			
			2	PL ⅜ x 9¾	3	6¼	cp3			
			2	PL ⅜ x 14		6¼	cp3a			
			2	PL ⅜ x 9¾	3	5¼	cp4			
			2	PL ⅜ x 14		5⅜	cp4a			
			2	PL ⅜ x 9±	2	9¼	cp5			
			2	PL ⅜ x 8⅝±	2	8¼	cp6			
			28	¾"Φ H.S. BOLTS		2¼	ma1			
			28	¾"Φ CLOSE THREADED ANC. FERRULES			mb1			
			12	¾"Φ ANC STUDS		10	mc1			
			24	⅝"Φ H.S. BOLTS		2¼	md1		W/ N.E.W.	
			24	⅝"Φ ANC. STUDS		7	me1			
			4	L 4x4x⅜	1	10	ac1 R/L			
			16	PL ⅜ x 5⅜		5⅜	sp1			
			16	PL ⅜ x 4		4½	sp2			

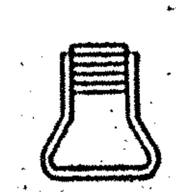
JOB NO. 253 — DRG. NO. J2

PAY ITEM 516.10

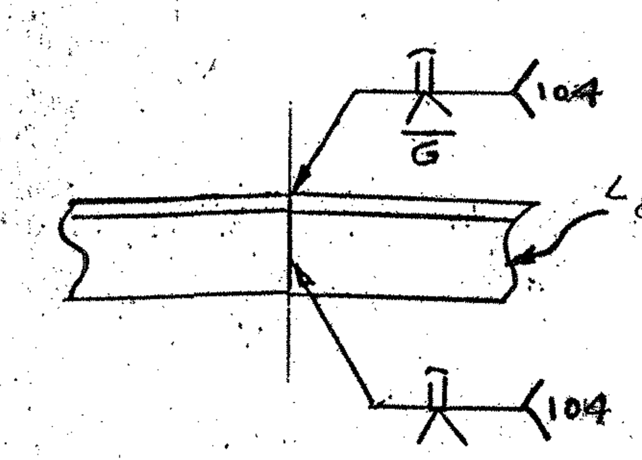


TYP. SECTION @ ADUSTMENT BRACKETS.





ANCHOR FERRULE DETAIL - mb1



WELDING DETAIL

TVGA CONSULTANTS

☒ NO EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

ENGINEER has reviewed Shop Drawings and Samples and other data which Contractor is required to submit, only for conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such reviews do not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

BY: BDC DATE: 7/20/05

OUT FOR APPROVAL	2-16-05											
OUT FOR APPROVAL	6-15-05											
ISSUED TO SHOP												
FIELD & OFFICE												
1	ADDED WELD DET.	6-15	JPF									
REV.	REMARKS	DATE	DWN	CHK	APP.	Q.A.	NO.	DIA.	LGT	TYPE	WASHER	

PROJECT NO. IM-089-2(24) STATE NO.

MATERIAL: AASHTO M270 GR 36 ELECTRODES: E70 HOLES: AS NOTED SHOP BOLTS: ¾"Φ A325

SURFACE PREP. & PAINT: GALVANIZED AFTER FAB

DESCRIPTION: EXP. JOINT ABUT. 2 — DRAWN BY: JPF — DATE: 1-05

JOB: BRIDGE 51N — CHKD BY: EJ

I89 OVER U.S. ROUTE 2 MIDDLESEX, VT. — APPROV BY

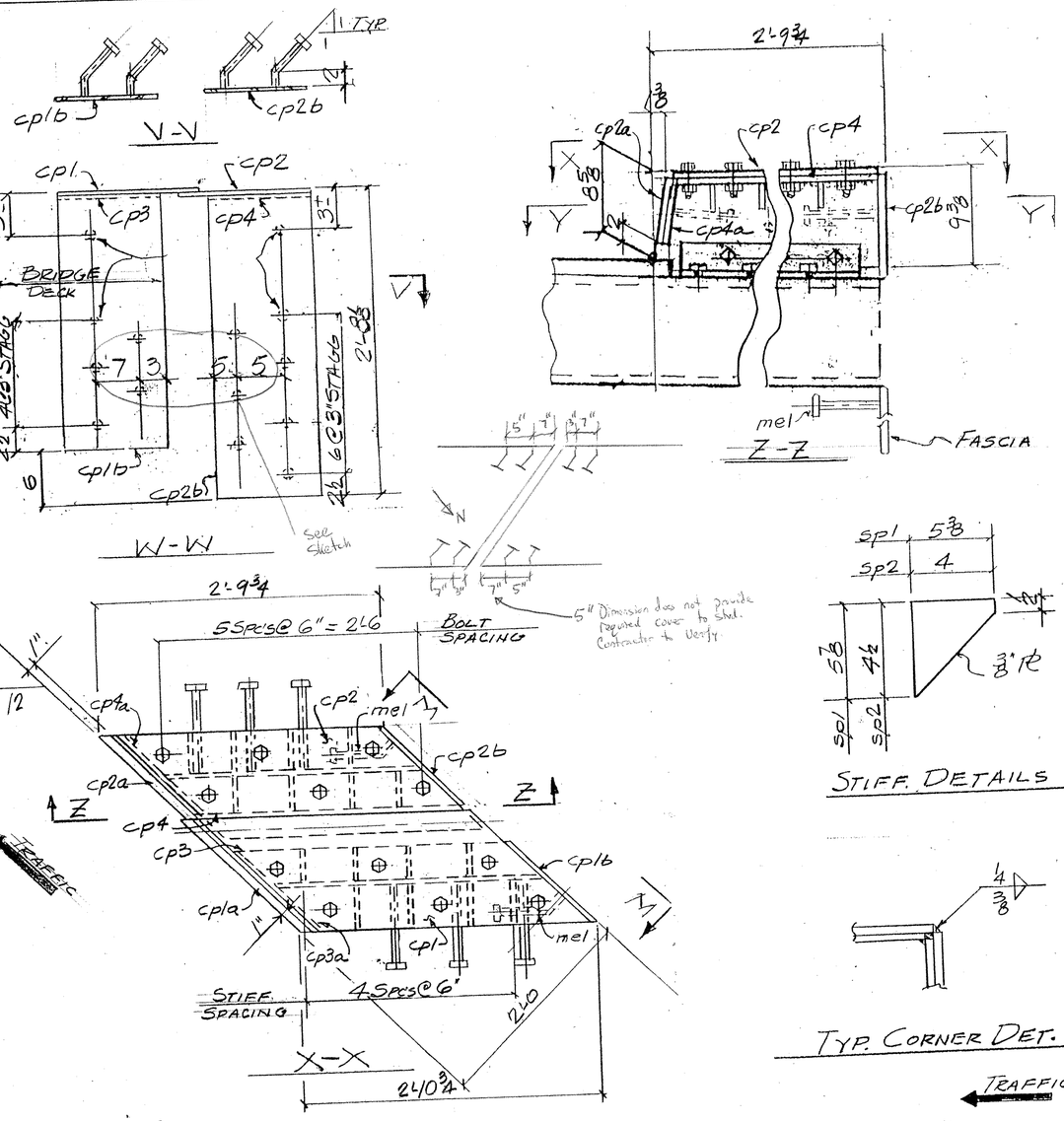
Q.A.

CUSTOMER: WINTERSET INC.

CASCO BAY STEEL STRUCTURES, INC.
75 SPRING HILL ROAD SACO, MAINE 04072
PHONE (207) 282-7360 FAX (207) 282-1179

JOB NO. 253 — DRG. NO. J2 — REV. △

JOB NO. 253 | DRG. NO. J2A



WORK THIS DWG. W/ DWG. J2

REV.	REMARKS	DATE	DWN	CHK	APP	Q.A.	NO.	DIA.	LGT	TYPE	WASHER
	OUT FOR APPROVAL	2-16-05									
	OUT FOR APPROVAL	3-5-05									
	ISSUED TO SHOP										
	FIELD & OFFICE										

PROJECT NO. IM-089-2(29) STATE BRIDGE NO.

MATERIAL ~~ASSTO~~ M270GR36 ELECTRODES: E70 PROC HOLES: As Noted SHOP BOLTS:

SURFACE PREP. & PAINT:

GALVANIZED AFTER FAB.

DESCRIPTION: EXP. JOINT-ABUT. 2

JOB: BRIDGE 5 IN I 89 OVER U.S. ROUTE 2 BOLTON, VT.

CUSTOMER: WINTERSET INC.

	DRAWN BY	DATE
	JPF	1-05
CHKD. BY	EJ	
APPROV BY		
Q.A.		

CASCO BAY STEEL STRUCTURES, INC.
75 SPRING HILL ROAD SACO, MAINE 04072
PHONE (207) 282-7360 FAX. (207) 282-1179

JOB NO.	DRG. NO.
253	J2A
83-416	REV.

TVGA CONSULTANTS

☐ NO EXCEPTIONS TAKEN ☐ REJECTED
☒ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

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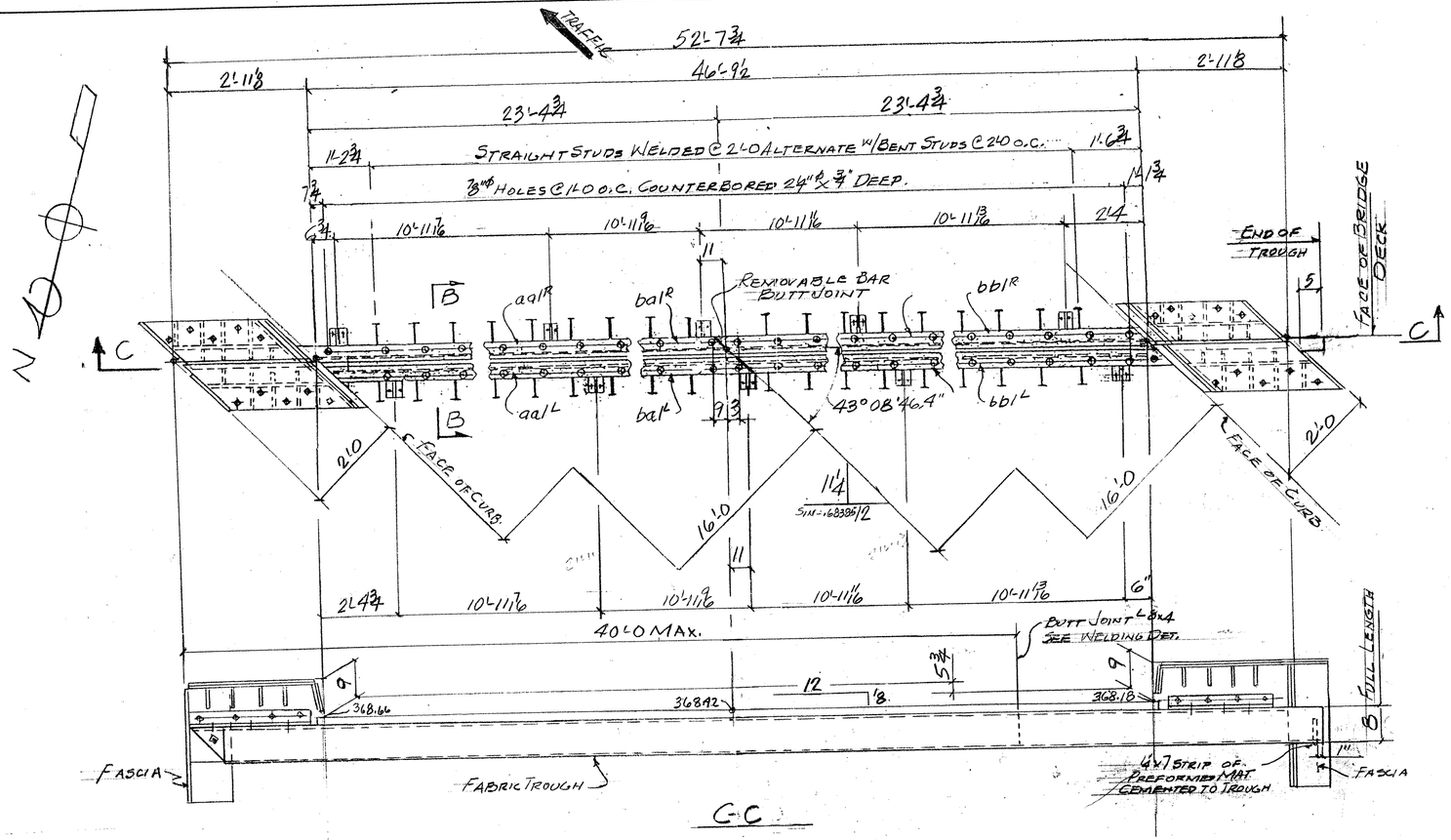
BY: EJC
DATE: 3/24/05



C-C

EJ2-5 - ONE REQ'D. (@ ABUT. 2 - BRIDGE 515)

WORK THIS DWG W/ DWG J3A

ABM INFO PAGE	LINE	NO.	DESCRIPTION	FT	IN	ASSEM. MARK	SHIPPING MARK	REMARKS	WEIGHT
		1	EXP. JNT. ASS'Y	53	0±		EJ2-5		—
			2 L 8x4x½	53	0±	ba/5			
			2 BAR 5½x14	24	0±	bc/8			
			2 DO	24	0±	bb/8			
			10 PL ½x8		10	bc1			
			10 PL ½x6		10	bd1			
			94 ¾" H.S. BOLTS		24	ma1			
			94 ¾" RUBBER THREADED ANC. FERRULES			mb1			
			104 ¾" ANC. STUDS		10	mc1			
			PREFORMED FABR. 8 WAY x 30	54	0±	mf1		SPLY PER SUGGEST 707.07 MSHTO SPECIFICATION TYPE II	
			2 BURLAP SUB BASE REPAIR x 3	54	0±				
			2 ½" GALV. BOLTS		1			W/ NUT - 2 WASH.	
		80	⅞" THREADED RODS		9		751		
		20	DO		7		752		
			80 ⅞" HEX NUTS					WASHER	
			80 BAR 3x⅜		3	W1			
		5	PL ½ x 9		9		API	NOT GALV.	
			20 ¾" ANC. STUDS		10	mc1			
			9 L 4x4x⅜	1	0	sa1			
			9 ¾" H.S. BOLTS		3			W/ 1 WASH	
		CURBS							
			2 PL ⅜x13½	3	11	cp1			
			2 PL ⅜x19¾		68	cp1a			
			2 DO	2	88	cp1b			
			2 PL ⅜x12½	3	10	cp2			
			2 PL ⅜x18¼		64	cp2a			
			2 DO	2	13¾	cp2b			
			2 PL ⅜x9¾	3	63⅜	cp3			
			2 PL ⅜x.144		64	cp3a			
			2 PL ⅜x9¾	3	54	cp4			
			2 PL ⅜x144		58⅜	cp4a			
			2 PL ⅜x9 ±	2	9	cp5			
			2 PL ⅜x8⅝ ±	2	8	cp6			
			28 ¾" H.S. BOLTS		24	ma1			
			28 ¾" RUBBER THREADED ANC. FERRULES			mb1			
			12 ¾" ANC. STUDS		10	mc1			
			24 ¾" H.S. BOLTS		24	md1		W/ NEW.	
			24 ¾" ANC. STUDS		7	me1			
			4 L 4x4x⅜	1	10	bc1/8			
			16 PL ⅜x5⅜		5⅞	sp1			
			16 PL ⅜x4		4½	sp2			

PAY ITEM 516.10

REV.	REMARKS	DATE	DWN	CHK	APP	Q.A.	NO.	DIA.	LGT	TYPE	WASHER
	OUT FOR APPROVAL	2-16-05									
	OUT FOR APPROVAL	6-15-05									
	ISSUED TO SHOP										
	FIELD & OFFICE										
1	ADDED L WELD DET.	6-15	JPF								

PROJECT NO. INT-089-2(29) STATE BRIDGE NO.

MATERIAL: AASHTO M270-50S W ELECTRODES: E70XX HOLES: AS NOTED SHOP BOLTS: ¾" H.S.

SURFACE PREP. & PAINT:

GALVANIZED AFTER FAB

TVGA CONSULTANTS

☒ NO EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

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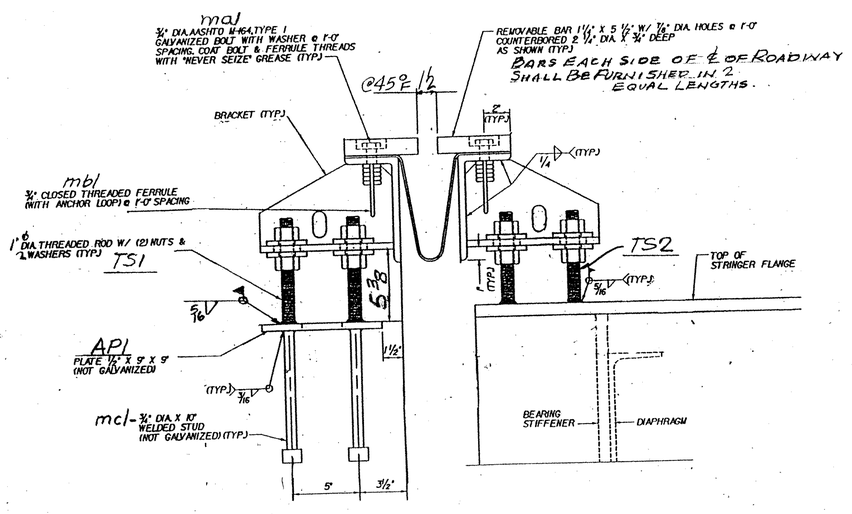
BY: BDC
DATE: 7/20/05

DESCRIPTION: EXP. JOINT - ABUT. 2
JOB: BRIDGE 515
I89 OVER U.S. ROUTE 2
BOLTON, VT.
CUSTOMER: WINTERSET INC.

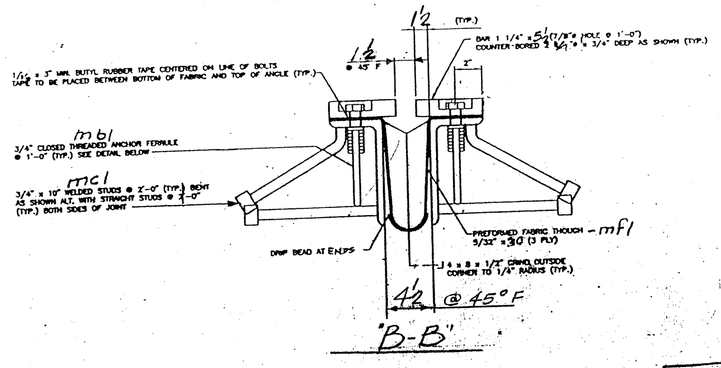
DRAWN BY: JPF | DATE: 1-06
CHKD BY: EJ
APPROV BY:
Q.A.
JOB NO.: 253 | DRG. NO.: J3
REV.: △

CASCO BAY STEEL STRUCTURES, INC.
75 SPRING HILL ROAD SACO, MAINE 04072
PHONE (207) 282-7360 FAX # (207) 282-1179

1" = 1'-0

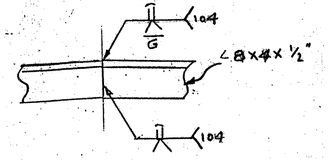


TYP. SECTION @ ADJUSTMENT BRACKETS.



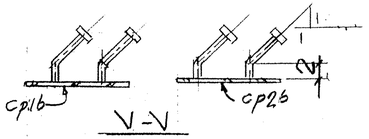
"B-B"

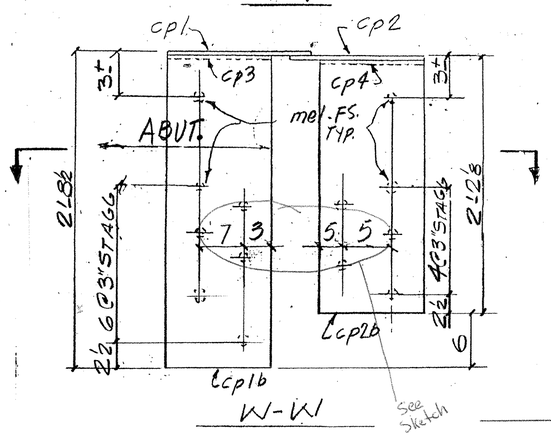
ANCHOR FERRULE DETAIL - mbl

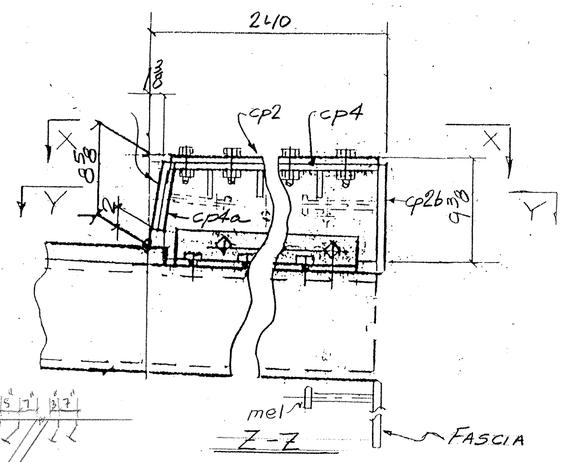


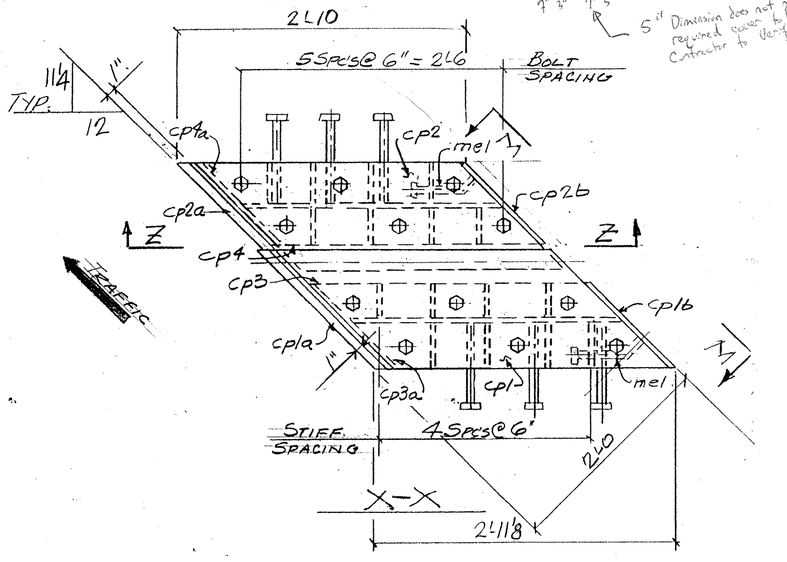
WELDING DETAIL

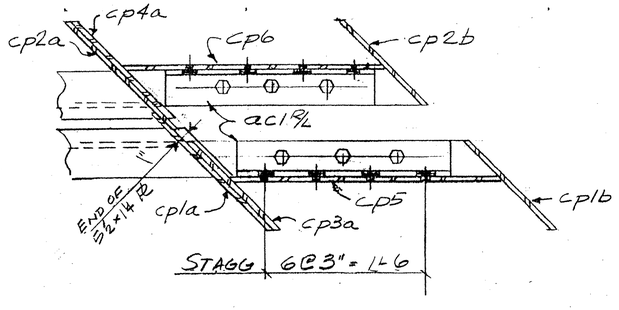
JOB NO. 253 | DRG. NO. J3A



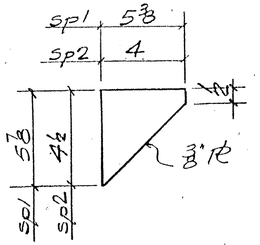




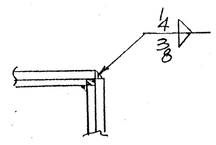




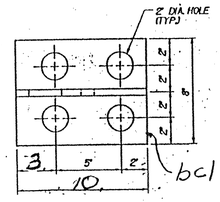
LEFT END BRUSH CURB SHOWN
RIGHT END - OPP HAND



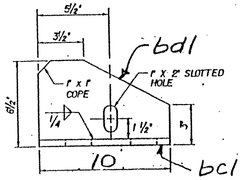
STIFF. DETAILS



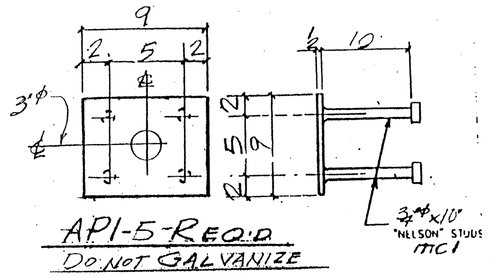
TYP. CORNER DET.



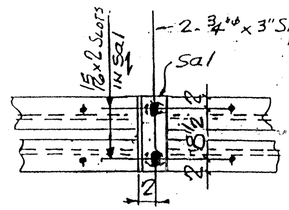
BRACKET PLAN



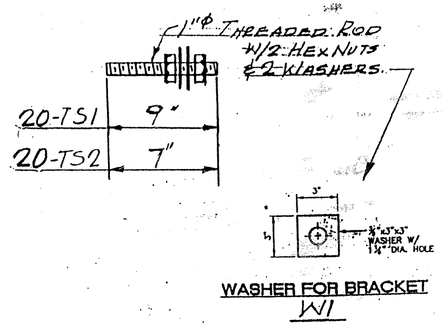
BRACKET ELEVATION



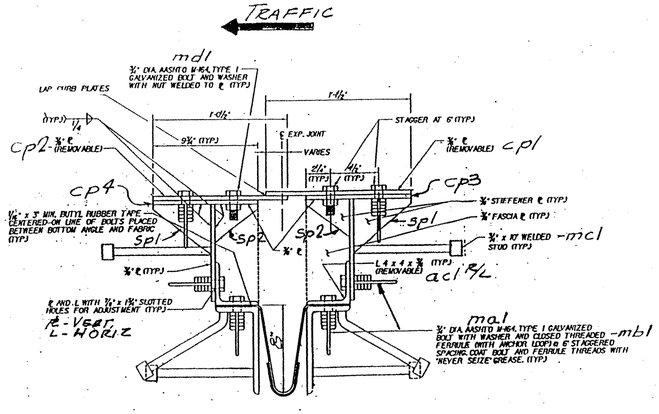
API-5-REQ'D
DO NOT GALVANIZE



SHIPPING DEVICE
SPACED 5'-0" O.C. MAX. (9 REQ'D) (4 UNIT)



WASHER FOR BRACKET
W1



A-A

TVGA CONSULTANTS

☐ NO EXCEPTIONS TAKEN ☐ REJECTED
☒ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

ENGINEER has reviewed Shop Drawings and Samples and other data which Contractor is required to submit, only for conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such reviews do not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for the determination of the work of all trades.

BY: BDC
DATE: 7/20/05

WORK THIS DWG. W/ DWG. J.

REV.	REMARKS	DATE	DWN	CHK	APP	Q.A.	NO.	DIA.	LGT	TYPE	WASHER
	OUT FOR APPROVAL	2/16/05									
	OUT FOR APPROVAL	6/15/05									
	ISSUED TO SHOP										
	FIELD & OFFICE										

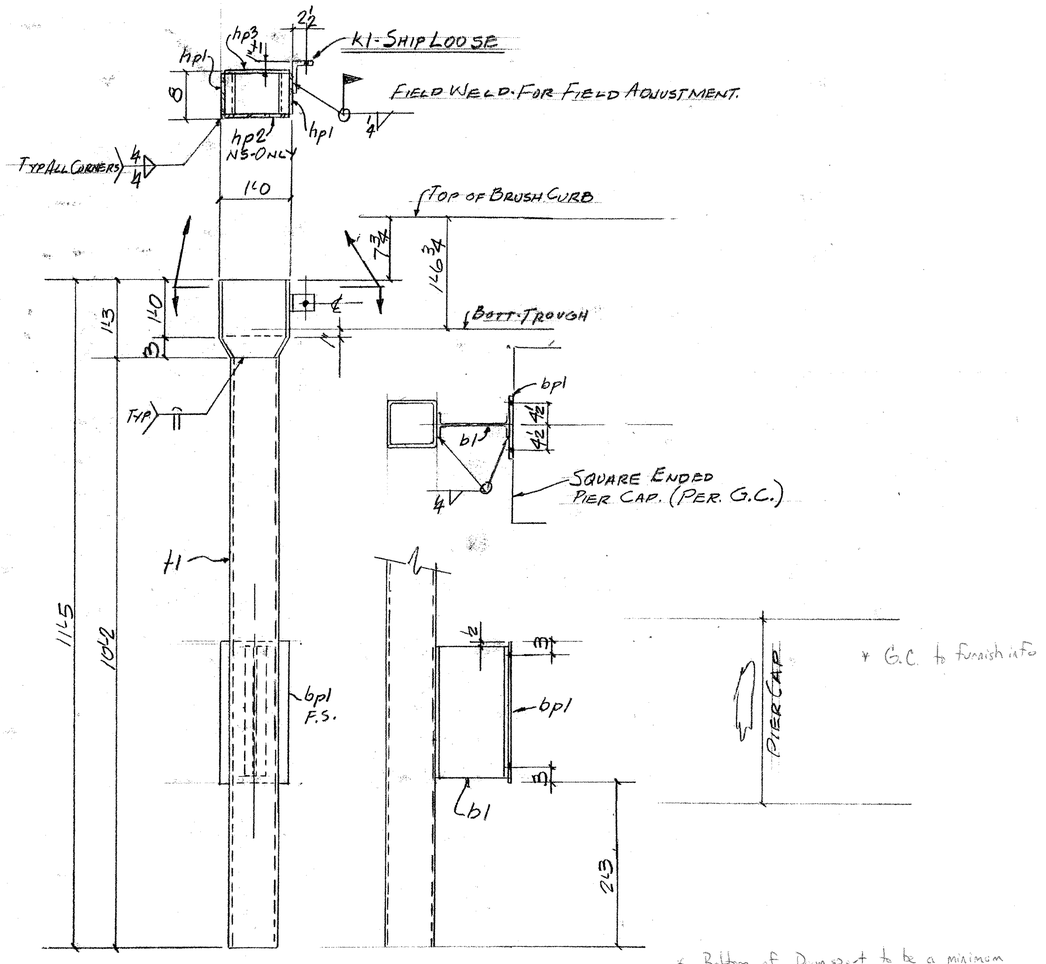
PROJECT NO. IM-089-2(29) STATE BRIDGE NO.
MATERIAL AASHTO M270GR36 ELECTRODES: E70 FROC HOLES: AS NOTED SHOP BOLTS:
SURFACE PREP. & PAINT:
GALVANIZED AFTER FAB

DESCRIPTION: EXP. JOINT-ABUT. 2
JOB: BRIDGE 5/S
I89 OVER U.S. ROUTE 2
BOLTON, VT.
CUSTOMER: WINTERSET INC.

	DRAWN BY	DATE
	JPF	1-05
CHKD BY	E.J.	
APPROV BY		
Q.A.		

CASCO BAY STEEL STRUCTURES, INC.
75 SPRING HILL ROAD SACO, MAINE 04072
PHONE (207) 282-7360 FAX. (207) 282-1179

JOB NO.	DRG. NO.
253	J3A
BS-418	REV. △



DS1-S - ONE REQ'D. (@ BRIDGE-S1S)

DS1-N - ONE REQ'D (@ BRIDGE S1N)

ABM INFO PAGE	LINE	NO.	DESCRIPTION	FT	IN	ASSEM. MARK	SHIPPING MARK	REMARKS	WEIGHT
		1	DOWNSPOUT	11	5		DS1-S		—
		1	DO	11	5		DS1-N		—
		2	TS8x8x3/8	10	2	H1		ASTM A500 OR A501	
		4	R3/8 x 7/4	1	3 3/8	hp1		BEND.	
		2	R3/8x 11/4	1	3	hp2			
		2	R3/8x 3		11/4	hp3			
		2	L6x4x1/2		6		K1		
		2	W12x14	1	11	b1			
		2	R3/8 x 12	2	0	bp1			
		10	3/8" ANC. BOLTS HILTI, INC. HIT HY-150 SYSTEM OR EQUAL	1	0		FIELD	PER SUBSECT. 914.08	

PAY ITEM 506.60

REV.	REMARKS	DATE	DWN	CHK	APP	Q.A.	NO.	DIA.	LGT	TYPE	WASHER
	OUT FOR APPROVAL	2 Kopy									
	OUT FOR APPROVAL	6/15/05									
	ISSUED TO SHOP										
	FIELD & OFFICE										
1	FIELD DIM'S.	6-15	JPF								

PROJECT NO. IM-089-2(29) STATE PROJECT NO.

MATERIAL: ~~AASHTO~~ M270-GR36 ELECTRODES: PER PROC. HOLES: 13/16" ø SHOP BOLTS:

SURFACE PREP. & PAINT:

GALANIZED AFTER FAB (ASTM. A123)

DESCRIPTION: DOWNSPOUTS - PIER 1

JOB: BRIDGE S1S & S1N

I89 OVER U.S. ROUTE 2

BOLTON, VT.

CUSTOMER: WINTERSET INC.

DRAWN BY	DATE
JPF	1-05
CHKD BY	
EJ	
APPROV BY	
Q.A.	
JOB NO.	DRG. NO.
253	DS1
8/5/19	REV. △

TVGA CONSULTANTS

☐ NO EXCEPTIONS TAKEN ☐ REJECTED
☒ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

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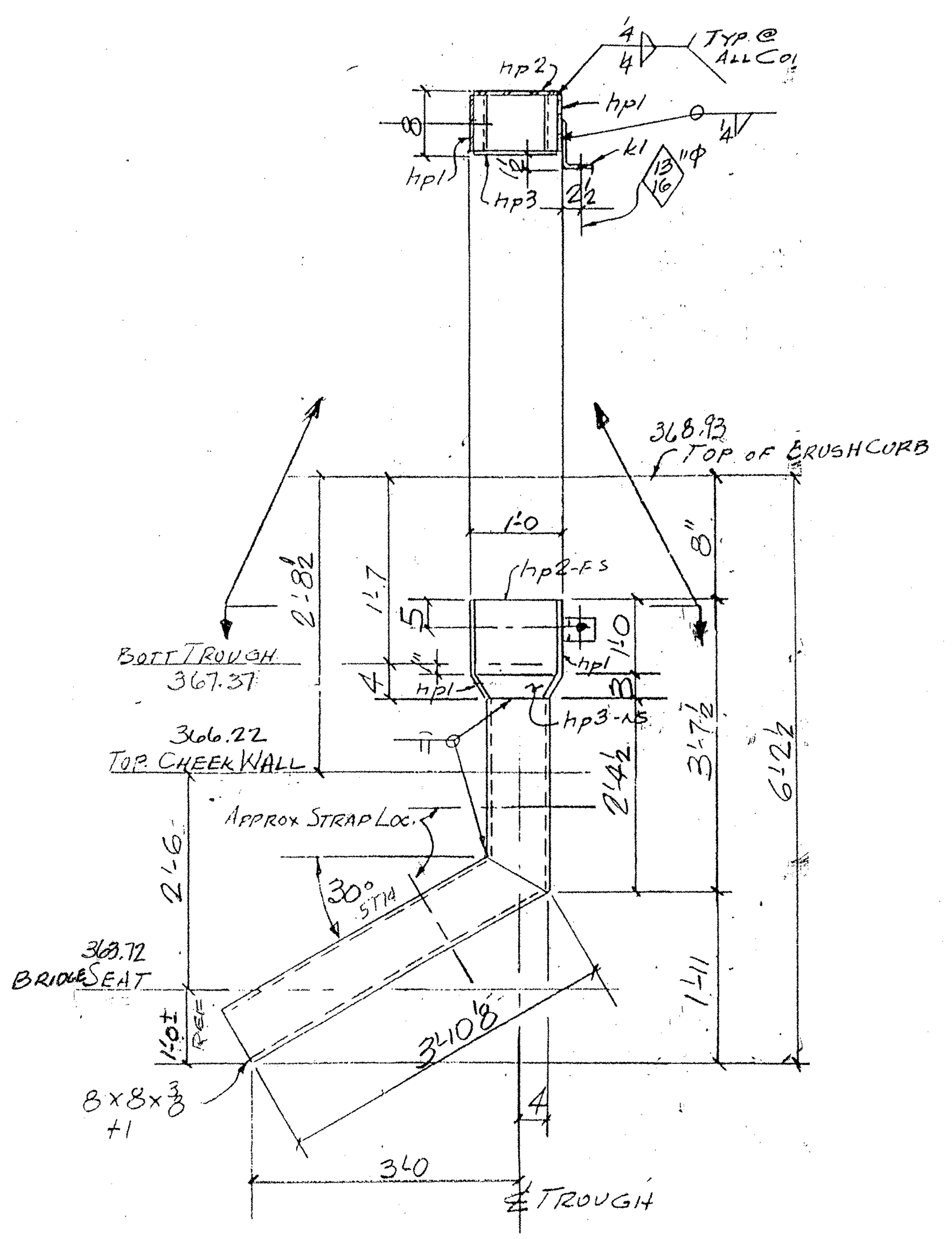
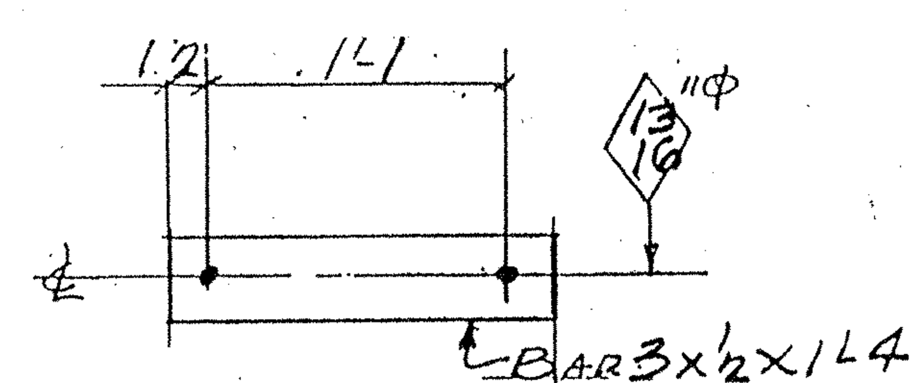
BY: [signature]
DATE: 7/20/05

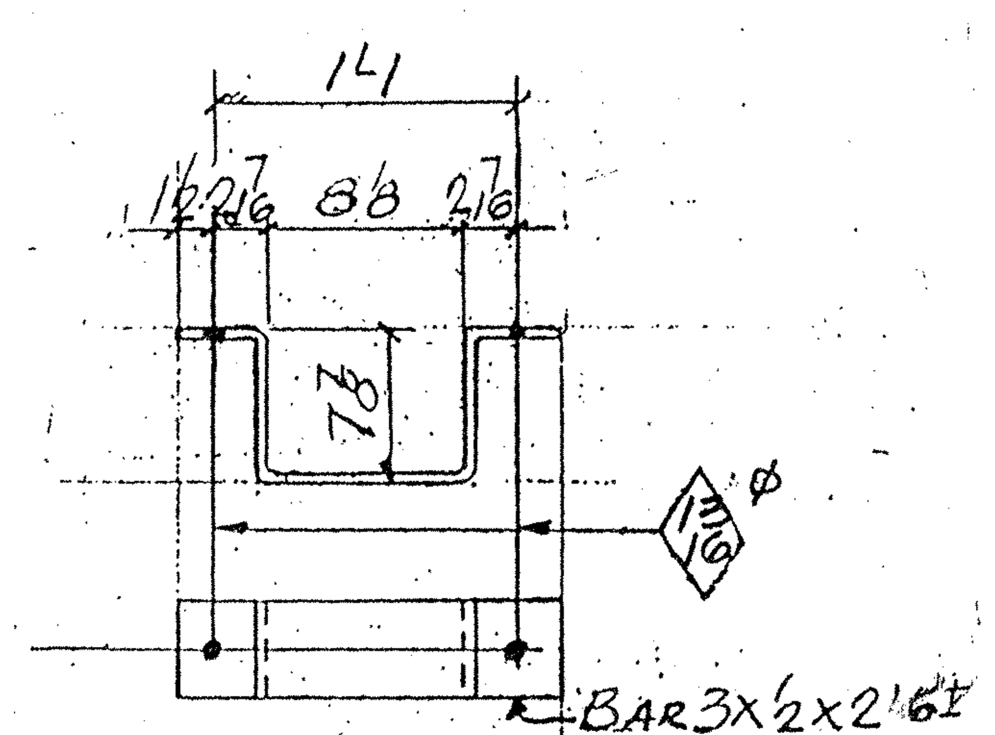
CASCO BAY STEEL STRUCTURES, INC.
75 SPRING HILL ROAD SACO, MAINE 04072
PHONE (207) 282-7360 FAX. (207) 282-1179



D51-S - ONE REQ'D (@ BRIDGE 51S)
D51-N - ONE REQ'D. (@ BRIDGE 51N)



SB1 - 4 - REQ'D.



SA1 - 4 - REQ'D

SHOP BILL

JOB NO. 253 — DRG. NO. D52

PAGE	LINE	NO.		DESCRIPTION	FT	IN	ASSEM. MARK	SHIPPING MARK	REMARKS	WEIGHT
		1		DOWNSPOUT	5	6±		D51-S		—
		1		DO	5	6±		D51-N		—
			2	TS 8×8×3/8	6	0±	+1		ASTM A500 OR A501	
			4	℞ 3/8×7 1/4	1	3 3/8	hp1		BEND	
			2	℞ 3/8×11 1/4	1	3	hp2			
			2	℞ 3/8×3		11 1/4	hp3			
			2	∟6×4×1/2		3	k1			
		4		BAR 3×1/2	2	6±		SA1	BEND	
		4		DO	1	4		SB1		
		8		5/8" φ ANC BOLTS				FIELD	W/ 2 NUTS - 2 WASH PER SUBSEC 714.08	
				HILTI, INC. HIT HY-150 SYSTEM OR EQUAL						

PAY ITEM 506.60

REV.	REMARKS	DATE	DWN	CHK	APP	Q.A.	NO.	DIA.	LGT	TYPE	WASHER
OUT FOR APPROVAL		2-16-05									
OUT FOR APPROVAL		6-15-05									
ISSUED TO SHOP											
FIELD & OFFICE											

PROJECT NO. IM-089-2(29) STATE PROJECT NO.

MATERIAL: AASHTO M270 GR36 — ELECTRODES: PER PROC — HOLES: 13/16" φ — SHOP BOLTS:

SURFACE PREP. & PAINT: GALVANIZED AFTER FAB. (ASTM-123)

DESCRIPTION: DOWNSPOUTS - ABUT. 2

JOB: BRIDGE 51S & 51N

I 89 OVER U.S. ROUTE 2

BOLTON, VT.

CUSTOMER: WINTERSET INC.

DRAWN BY	DATE
JPF	2-05
CHKD BY	
EJ.	
APPROV BY	
Q.A.	

CASCO BAY STEEL STRUCTURES, INC.

75 SPRING HILL ROAD SACO, MAINE 04072
PHONE (207) 282-7360 FAX. (207) 282-1179

JOB NO. 253 — DRG. NO. D52 — B3420 — REV. △

1" = 1'-0

TVGA CONSULTANTS

☒ NO EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

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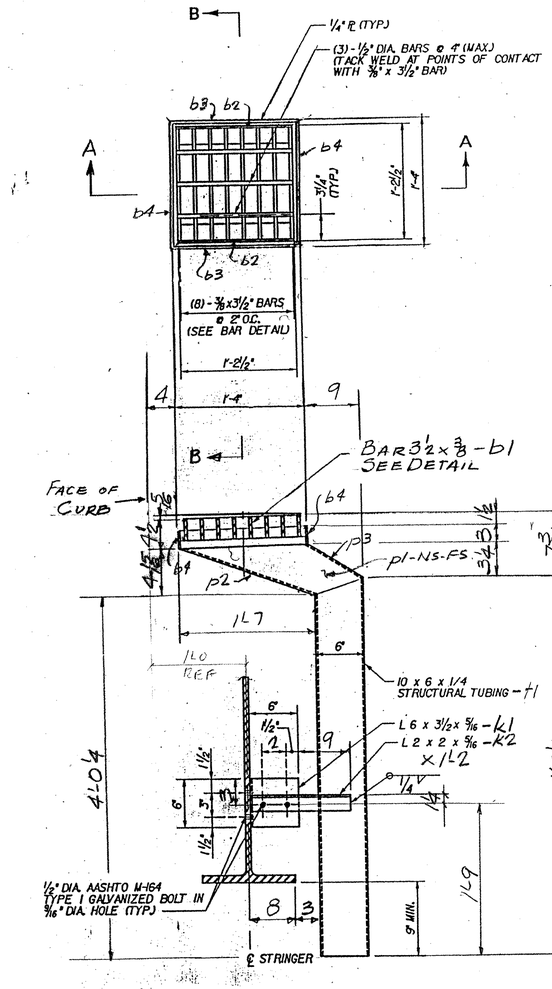
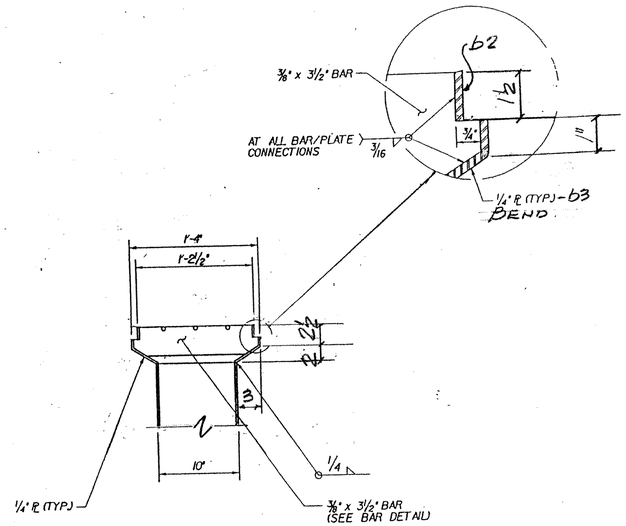
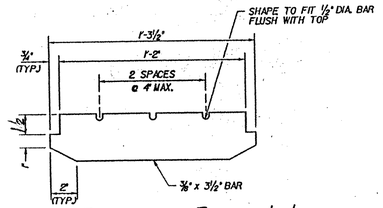
BY: [signature]
DATE: 7/20/05



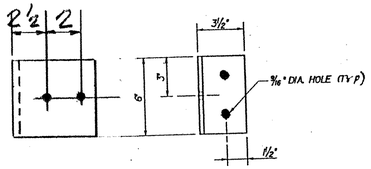
S51-S - 2 - REQ'D (@ BRIDGE 51S)
S51-N - 2 - REQ'D (@ BRIDGE 51N)



SECTION B–B



DETAIL - BAR b1



DETAIL - k1

SHOP BOLT TO k2 FOR SHIPPING

ABM INFO		SHOP BILL						JOB NO. 253	DRG. NO. 5C1
PAGE	LINE	NO.	DESCRIPTION	FT	IN	ASSEM. MARK	SHIPPING MARK	REMARKS	WEIGHT
		2	SCUPPERS	4	10		S51-S		—
		2	DO	4	10		S51-N		—
		4	TS10X6X4	4	24	+1			
		32	BAR 3 1/2 x 3/8	1	3 1/2	b1			
		8	BAR 1 1/2 x 4	1	4	b2			
		8	BAR 4 1/2 x 4	1	4	b3		BEND	
		8	BAR 3 x 4	1	3 1/2	b4			
		12	1/2" BAR	1	2 1/2	r1			
		8	PL 4 x 5 4	2	1	p1			
		4	PL 4 x 9 1/2	1	7 3/8	p2			
		4	DO		9 1/2	p3			
		4	L 6 x 3 1/2 x 4		6	k1			
		4	L 2 x 2 x 5/16	1	2	k2			
		8	1/2" H.S. BOLTS		1/2	SHOP		HN & W GALV. M164	

PAY ITEM 506.55

OUT FOR APPROVAL	2-16-05									
OUT FOR APPROVAL	1-15-05									
ISSUED TO SHOP										
FIELD & OFFICE										
REV.	REMARKS	DATE	DWN	CHK	APP	Q.A.	NO.	DIA.	LGT	TYPE	WASHER

PROJECT NO. IM-089-2 (29) STATE PROJECT NO.

MATERIAL: ~~AASHTO~~ M270 Gr 36 ELECTRODES: For Proc. HOLES: As Noted SHOP BOLTS: 1" HS.

SURFACE PREP. & PAINT:

GALVANIZED AFTER FAB.

TVGA CONSULTANTS

☑ NO EXCEPTIONS TAKEN ☐ REJECTED
☐ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

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BY: BJC Trares
DATE:

DESCRIPTION: SCUPPER DETAILS
JOB: BRIDGE 51S & 51N
I89 OVER U.S. ROUTE 2
BOLTON, VT.
CUSTOMER: WINTERSET INC.

	DRAWN BY	DATE
	JPF	2-05
	CHKD BY	
	EJ	
	APPROV BY	
	Q.A.	
	JOB NO.	DRG. NO.
	253	5C1
		REV. △

CASCO BAY STEEL STRUCTURES, INC.
75 SPRING HILL ROAD SACO, MAINE 04072
PHONE (207) 282-7360 FAX. (207) 282-1179

1'-1-0

TVGA
CONSULTANTS

2001.9693.01
May 11, 2005

F.R. Lafayette, Inc.
52 Kellogg Road
Essex Jct., VT 05452-2898

Attn: Ms. Pam Lafayette

Re: Middlesex-Bolton AC IM 089-2(29)
Bridge Railing NETC 2 Rail and Shop Drawings for Guardrail Approach Section NETC 2 Rail

Dear Ms. Lafayette:

The following details (Items 525.33 – Bridge Railing – NETC 2 Rail and 621.72 – Guard Rail Approach Section, NETC 2 Rail) for the above project, transmitted with Highway Safety Corp's letter dated May 3, 2005 and May 9, 2005, have been reviewed and are being returned herewith.

Sheets: **Welding Procedures**
are approved [X] approved "as noted" [ ] reviewed [ ].

Sheets: **Bridge Railing – NETC 2 Rail (Sheets 1, 2, 3, 4, and 4 of 5),**
Guard Rail Approach Section, NETC 2 rail (Sheets 1, and 2 of 2)
are approved [ ] approved "as noted" [X] reviewed [ ].

Upon receipt of these "as noted" or "approved" plans, please make appropriate changes and submit white prints for our use in the record plans for this project.

You must provide written notice to Vermont Agency of Transportation (VTrans) Structures Section office as to the date fabrication represented by these drawings will begin. **That notice must be received at least seven days prior to that date, as per Specifications 506.03. Any material fabricated prior to the notification date is subject to rejection without further cause.**

Very truly yours,

TVGA Consultants

Kenneth M. Wojtkowski, P.E.
Project Manager

Attachments: One set of prints

cc: [x] VTrans Resident Engineer (Rick Hale) w/prints
[x] Contractor Winterset Letter only
[x] Subcontractor – Highway Safety Corp w/prints
[x] VTrans Const Sec. - letter only (To: Const. Eng. Nat Danforth, Att: Reg. Eng. Alan Campo)
[x] VTrans Consultant Project Manager - Sherward G. Farnsworth ~~Letter only~~ w/prints
[x] VTrans Materials & Researth Section (C&IA Unit)- Letter only
[x] VTrans Structures Section - Shop Inspector Jeff Clark w/prints
2001.9693.01.2D
S:\DEPT\01\960009\LETTERS\fr_lafayette07 5-11-05.doc

BR 422

F. R. LAFAYETTE, INC.

F. R. LAFAYETTE, INC.
62 KELLOGG RD
ESSEX JCT.
VERMONT 05452

Phone: 802 878-5341
Fax: 802 878 2041

Vermont Agency of Transportation
Structures Division

Re: Bldg AC IM 089-2(29)

Gentlemen:

The enclosed shop drawings are being submitted for approval. Please return approved shop drawings to us **as soon as possible.** Thank you.

Very truly yours,

Pamela A. Lafayette

President

BR423

Highway Safety Corporation

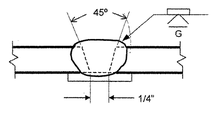
Glastonbury, CT

Welding Procedure Specification

Material specification **ASTM A500 Gr B**
Welding process **Shielded Metal Arc Welding (SMAW)**
Manual, semi-automatic, or automatic **Manual**
Position of welding **Flat (1G)**
Filler metal specification **AWS A5.1**
Filler metal classification **ER7018**
Electrode and manufacturer **Lincoln Electric Jet LH 78 MR**
Flux and manufacturer **N/A**
Shielding gas **N/A** Flow rate **N/A**
Single or multiple pass **Multiple**
Single or multiple arc **Single**
Welding current **AC**
Polarity **N/A**
Welding progression **Stringers**
Root treatment **None**
Preheat and interpass temperature **50°F (min)**
Postheat treatment **None**
Electrode extension **N/A**

V.A.O.T.
RECEIVED
JAN 21 2005
CK'D BY JWC DR'D BY
RESUBMIT APPROVED
BY DATE 01-19-05

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters Amperes	Welding parameters Volts	Travel speed	Joint detail
	ALL	**5/32"**	**150 A to 220 A**		**VARIES**	B-U2a 

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

AWS QC 1 PAUL A. RADICE 98070221 CWI

WPS no. **W-1482-A**
Revision no. **0**
Supporting PQR no. **Pre-Qualified**
Project Name **Bolton, VT**

Fabricator **Highway Safety Corporation**
Authorized by **Paul Radice**
Date **12/30/04**
Project Number **IM-089-2(29)**

BR424

Highway Safety Corporation

Glastonbury, CT

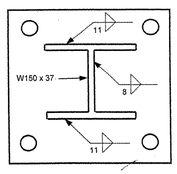
Welding Procedure Specification

V.A.O.T. RECEIVED
BY JWC
JAN 04 2005
RESUBMIT APPROVED
BY DATE 01-19-05

Material specification **A572 gr 50, A709 Gr 50**
Welding process **Gas Metal Arc Welding (GMAW)**
Manual, semi-automatic, or automatic **Semi-Automatic**
Position of welding **Flat (1F) or 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 or Multiple**
Single or multiple arc **Single or Multiple**
Welding current **DCEP**
Polarity **Reverse - electrode positive**
Welding progression **Stringers**
Root treatment **None**
Preheat and interpass temperature **base metal up to 3/4" (50°F) ; over 3/4 thru 1-1/2" (150°F) : over 1-1/2" thru 2-1/2" (225°F)**
Postheat treatment **None**
Electrode extension **3/4" ± 1/4"**

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters Amperes	Welding parameters Volts	Travel speed	Joint detail
8mm	**1**	**2 mm**	**275 A ± 25**	**25 V ± 2**	**200-250 mm / min**	
5/16"	**1**	**0.062"**	↓	↓	**8-10 ipm**	
11 mm	**1 & 2**	**2 mm**	↓	↓	**200-250 mm / min**	
7/16"	**1 & 2**	**0.062"**	↓	↓	**8-10 ipm**	



AWS QC 1 PAUL A. RADICE 99070221 CWI

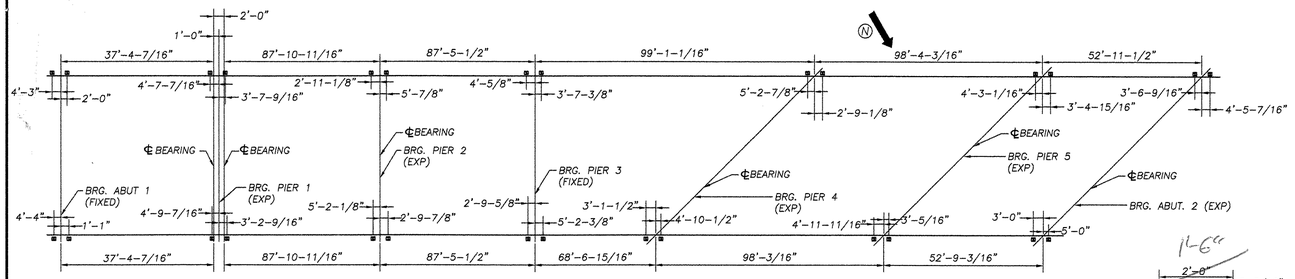
This procedure may vary due to fabrication sequence, fit-up, pass size, etc. within the limitation of variables given in section 5 of latest edition AWS D1.5

WPS no. **W-1479-A**
Revision no. **0**
Supporting PQR no. **Pre-Qualified**
Project Name **Bolton, VT**

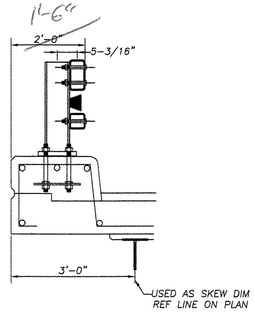
Fabricator **Highway Safety Corporation**
Authorized by **Paul Radice**
Date **12/30/04**
Project Number **IM-089-2(29)**

BR425

525.33



PARTIAL PLAN VIEW



BILL OF MATERIAL (ITEM 563.22)

Mk.	Qty.	Description	Size/Shape	length/qty. per unit	Material
	66	BRIDGE RAIL PED POST 680mm OAH W/ BASE PLATE			
	66	*POST UPRIGHT*	*W6 x 25*	*2'-03/8"*	*A709 Gr. 50*
	66	*POST BASE PLATE*	*1" x 10"*	*1'-2"*	*A709 Gr. 50*
	23	UPPER SPLICE TUBE FOR 8 x 4 RAIL			
	23	*TUBE*	*TS 7x3x3/8*	*1'-8"*	*A500 Gr. B*
	46	*LOCK NUTS*	*5/8"*	*2 pcs.*	*A563 Gr. DH*
	23	LOWER SPLICE TUBE FOR 4 x 4 RAIL			
	23	*TUBE*	*TS 3x3x5/16*	*1'-8"*	*A500 Gr. B*
	46	*LOCK NUTS*	*5/8"*	*2 pcs.*	*A563 Gr. DH*
	13	UPPER RAIL	*TS 8x4x5/16*	*24'-0"*	*A500 Gr. B*
	13	LOWER RAIL	*TS 4x4x1/4*	*24'-0"*	*A500 Gr. B*
	1	UPPER RAIL	*TS 8x4x5/16*	*24'-7-3/16"*	*A500 Gr. B*
	1	LOWER RAIL	*TS 4x4x1/4*	*24'-7-3/16"*	*A500 Gr. B*
	2	UPPER RAIL	*TS 8x4x5/16*	*21'-0-3/8"*	*A500 Gr. B*
	2	LOWER RAIL	*TS 4x4x1/4*	*21'-0-3/8"*	*A500 Gr. B*
	2	UPPER RAIL	*TS 8x4x5/16*	*12'-0"*	*A500 Gr. B*
	2	LOWER RAIL	*TS 4x4x1/4*	*12'-0"*	*A500 Gr. B*
	1	UPPER RAIL	*TS 8x4x5/16*	*18'-0"*	*A500 Gr. B*
	1	LOWER RAIL	*TS 4x4x1/4*	*18'-0"*	*A500 Gr. B*
	1	UPPER RAIL	*TS 8x4x5/16*	*20'-8-7/16"*	*A500 Gr. B*
	1	LOWER RAIL	*TS 4x4x1/4*	*20'-8-7/16"*	*A500 Gr. B*
	1	UPPER RAIL	*TS 8x4x5/16*	*14'-0"*	*A500 Gr. B*
	1	LOWER RAIL	*TS 4x4x1/4*	*14'-0"*	*A500 Gr. B*
	1	UPPER RAIL	*TS 8x4x5/16*	*16'-3-1/2"*	*A500 Gr. B*
	1	LOWER RAIL	*TS 4x4x1/4*	*16'-3-1/2"*	*A500 Gr. B*
	1	UPPER RAIL	*TS 8x4x5/16*	*16'-2-3/4"*	*A500 Gr. B*
	1	LOWER RAIL	*TS 4x4x1/4*	*16'-2-3/4"*	*A500 Gr. B*
	1	UPPER RAIL	*TS 8x4x5/16*	*15'-10-5/8"*	*A500 Gr. B*
	1	LOWER RAIL	*TS 4x4x1/4*	*15'-10-5/8"*	*A500 Gr. B*

*ANCHORS NOT PROVIDED BY HIGHWAY SAFETY CORP. – SHOWN FOR REFERENCE ONLY.

525.33

BILL OF MATERIAL (ITEM 563.22)

Mk.	Qty.	Description	Size/Shape	per unit	Material
		HARDWARE			
*	66	ANCHOR PLATE			*A709 Gr. 36*
*	264	ANCHOR STUD	*1" DIA.*	*12"*	*A449*
*	528	HEX NUT	*1" DIA.*	*– – –*	*A563*
*	264	JAMB NUT	*1" DIA.*	*– – –*	*A563*
*	264	WASHER	*1" DIA.*	*– – –*	*F436*
	264	ROUND HEAD BOLT	*3/4" DIA.*	*6"*	*M164 TYPE I*
	264	LOCK NUT	*3/4" DIA.*	*– – –*	*A563*
	264	WASHER	*3/4" DIA.*	*– – –*	*F436*
	184	SPLICE BOLT	*5/8" DIA.*	*1 3/4"*	*M164 TYPE I*
	184	WASHER	*5/8" DIA.*	*– – –*	*F436*
	40	PIPE SPACER (SCH. 40)	*3/4" DIA.*	*1/2"*	*A53*
	66	BEARING PAD	*1/8 x 10*	*1'-2"*	*M251*

PAY LIMITS

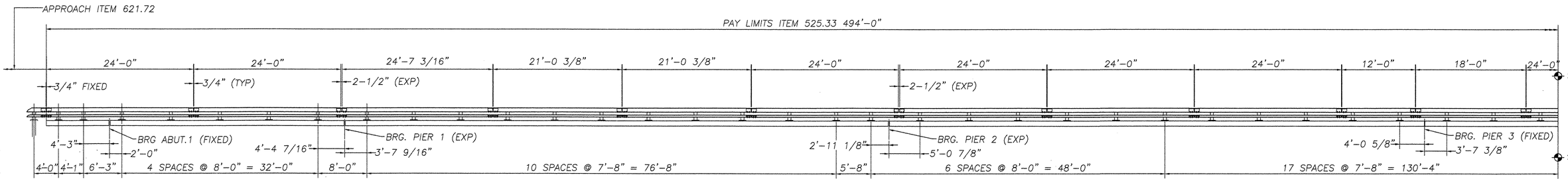
SHEET 1: 493'-11-1/4"

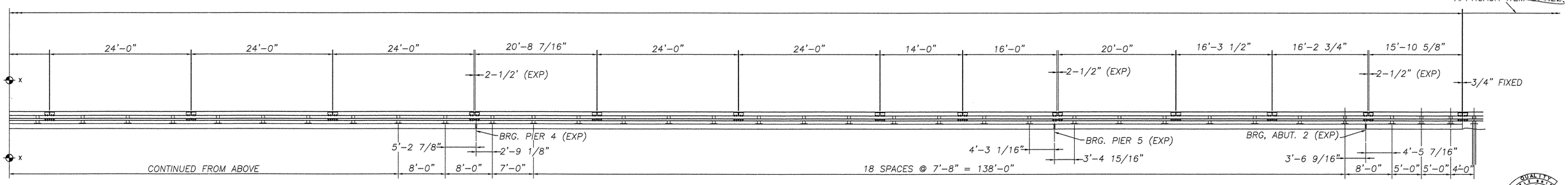
SHEET 2: 458-10-1/4"

SHEET 3: 403-1-1/4"

SHEET 4: 368'-7-1/4"

TOTAL _____ *1724'-6"*





I-89 SOUTH BOUND
SOUTHWEST ELEVATION
LOOKING AT FACE OF RAIL
FROM ℄ OF ROAD.

END OF WINGWALLS HAVE BEEN LOCATED APPROXIMATELY BY VAOT SURVEY. CONTRACTOR SHALL VERIFY REQUIRED DIMENSIONS AND RAIL LENGTHS PRIOR TO FABRICATION

REVISIONS

No.	Remarks	Date
0	Initial submittal	28-JAN-05
0	Re-submittal	09-MAR-05
0	Re-submittal	02-MAY-05

TVGA CONSULTANTS

☐ NO EXCEPTIONS TAKEN ☐ REJECTED
☒ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

ENGINEER has reviewed Shop Drawings and Samples and other data which Contractor is required to submit, only for conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such reviews do not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

BY: BJC
DATE: 5/11/05

HIGHWAY SAFETY CORP.

GLASTONBURY, CT

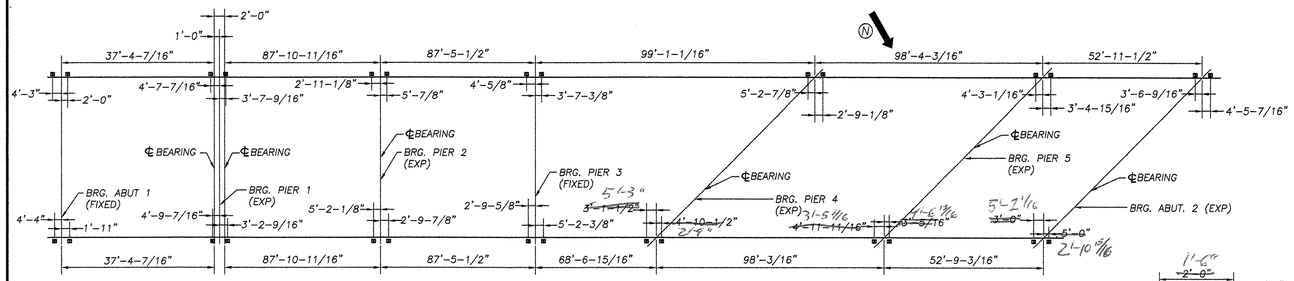
ITEM 525.33 BRIDGE RAILING-NETC 2 RAIL
TOWN OF BOLTON
COUNTY OF CHETTENDEN
PROJECT AC IM 089-2(29)
BR 51N&S OVER U.S. ROUTE 2

GENERAL CONTRACTOR

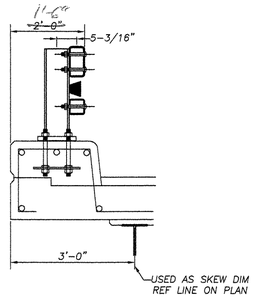
SUB CONTRACTOR
F.R. LAFAYETTE, INC.

DRAWN C CRAMER
CHECKED
DATE 11-31-04
SCALE 1/8=12
HSC REFERENCE NO. 1479
SIZE D REVISION 0
SHEET NO. 1 of 5

BR426



PARTIAL PLAN VIEW



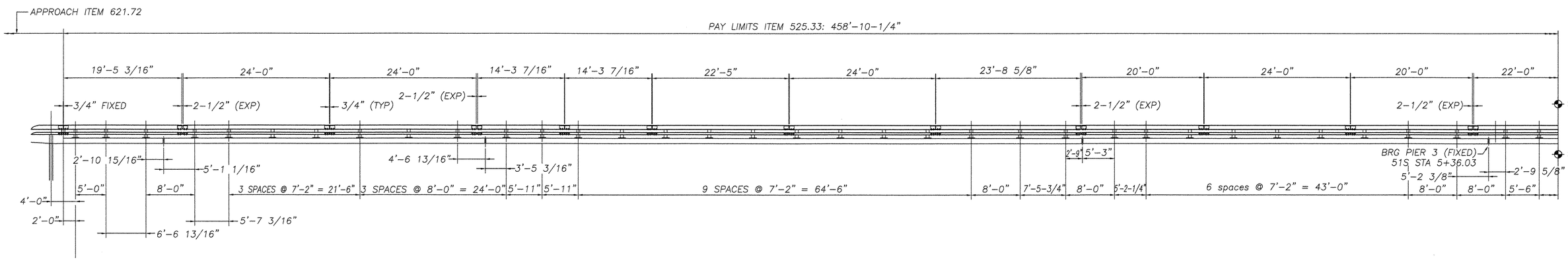
BILL OF MATERIAL (ITEM 525.33)

Mk.	Qty.	Description	Size/Shape	length/qty. per unit	Material
	65	BRIDGE RAIL PED POST 680mm OAH W/ BASE PLATE			
	65	*POST UPRIGHT*	*W6 x 25*	*2'-03/8"*	*A709 Gr. 50*
	65	*POST BASE PLATE*	*1" x 10"*	*1'-2"*	*A709 Gr. 50*
	22	UPPER SPLICE TUBE FOR 8 x 4 RAIL			
	22	*TUBE*	*TS 7x3x3/8*	*1'-8"*	*A500 Gr. B*
	44	*LOCK NUTS*	*5/8"*	*2 pcs.*	*A563 Gr. DH*
	22	LOWER SPLICE TUBE FOR 4 x 4 RAIL			
	22	*TUBE*	*TS 3x3x5/16*	*1'-8"*	*A500 Gr. B*
	44	*LOCK NUTS*	*5/8"*	*2 pcs.*	*A563 Gr. DH*
	1	UPPER RAIL	*TS 8x4x5/16*	*19'-5-3/16"*	*A500 Gr. B*
	1	LOWER RAIL	*TS 4x4x1/4*	*19'-5-3/16"*	*A500 Gr. B*
	8	UPPER RAIL	*TS 8x4x5/16*	*24'-0"*	*A500 Gr. B*
	8	LOWER RAIL	*TS 4x4x1/4*	*24'-0"*	*A500 Gr. B*
	2	UPPER RAIL	*TS 8x4x5/16*	*14'-3-7/16"*	*A500 Gr. B*
	2	LOWER RAIL	*TS 4x4x1/4*	*14'-3-7/16"*	*A500 Gr. B*
	1	UPPER RAIL	*TS 8x4x5/16*	*22'-5"*	*A500 Gr. B*
	1	LOWER RAIL	*TS 4x4x1/4*	*22'-5"*	*A500 Gr. B*
	1	UPPER RAIL	*TS 8x4x5/16*	*23'-8-5/8"*	*A500 Gr. B*
	1	LOWER RAIL	*TS 4x4x1/4*	*23'-8-5/8"*	*A500 Gr. B*
	4	UPPER RAIL	*TS 8x4x5/16*	*20'-0"*	*A500 Gr. B*
	4	LOWER RAIL	*TS 4x4x1/4*	*20'-0"*	*A500 Gr. B*
	1	UPPER RAIL	*TS 8x4x5/16*	*22'-0"*	*A500 Gr. B*
	1	LOWER RAIL	*TS 4x4x1/4*	*22'-0"*	*A500 Gr. B*
	1	UPPER RAIL	*TS 8x4x5/16*	*23'-0"*	*A500 Gr. B*
	1	LOWER RAIL	*TS 4x4x1/4*	*23'-0"*	*A500 Gr. B*
	1	UPPER RAIL	*TS 8x4x5/16*	*23'-6"*	*A500 Gr. B*
	1	LOWER RAIL	*TS 4x4x1/4*	*23'-6"*	*A500 Gr. B*
	1	UPPER RAIL	*TS 8x4x5/16*	*22'-1-1/8"*	*A500 Gr. B*
	1	LOWER RAIL	*TS 4x4x1/4*	*22'-1-1/8"*	*A500 Gr. B*

BILL OF MATERIAL (ITEM 525.33)

Mk.	Qty.	Description	Size/Shape	per unit	Material
		HARDWARE			
*	65	ANCHOR PLATE			*A709 Gr. 36*
*	260	ANCHOR STUD	*1" DIA.*	*12"*	*A449*
*	520	HEX NUT	*1" DIA.*	– – –	*A563*
*	260	JAMB NUT	*1" DIA.*	– – –	*A563*
*	260	WASHER	*1" DIA.*	– – –	*F436*
	260	ROUND HEAD BOLT	*3/4" DIA.*	*6"*	*M164 TYPE 1*
	260	LOCK NUT	*3/4" DIA.*	– – –	*A563*
	260	WASHER	*3/4" DIA.*	– – –	*F436*
	176	SPLICE BOLT	*5/8" DIA.*	*1 3/4"*	*M164 TYPE 1*
	176	WASHER	*5/8" DIA.*	– – –	*F436*
	40	PIPE SPACER (SCH. 40)	*3/4" DIA.*	*1/2"*	*A53*
	65	BEARING PAD	*1/8 x 10*	*1'-2"*	*M251*

*ANCHORS NOT PROVIDED BY HIGHWAY SAFETY CORP. – SHOWN FOR REFERENCE ONLY.



I–89 SOUTH BOUND
NORTHEAST ELEVATION
LOOKING AT FACE OF RAIL
FROM ℄ OF ROAD.

END OF WINGWALLS HAVE BEEN LOCATED APPROXIMATELY BY VAOT SURVEY. CONTRACTOR SHALL VERIFY REQUIRED DIMENSIONS AND RAIL LENGTHS PRIOR TO FABRICATION

REVISIONS		
No.	Remarks	Date
0	Initial submittal	28–JAN–05
0	Re–submittal	09–MAR–05
0	Re–submittal	02–MAY–05
0	Re–submittal	06–MAY–05

TVGA CONSULTANTS

☐ NO EXCEPTIONS TAKEN ☐ REJECTED
☒ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

ENGINEER has reviewed Shop Drawings and Samples and other data which Contractor is required to submit, only for conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such reviews do not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

BY: BJC
DATE: 7/11/05

HIGHWAY SAFETY CORP.
GLASTONBURY, CT

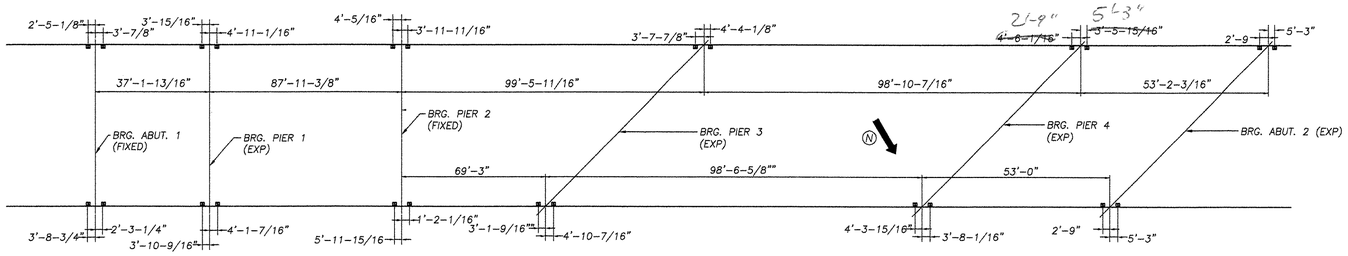
ITEM 525.33 BRIDGE RAILING–NETC 2 RAIL
TOWN OF BOLTON
COUNTY OF CHITTENDEN
PROJECT AC IM 089–2(29)
BRIDGE 51N&S OVER U.S. ROUTE 2

GENERAL CONTRACTOR

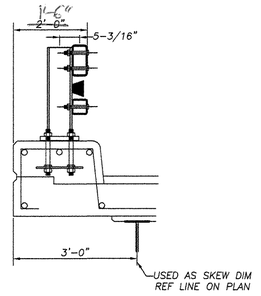
SUB CONTRACTOR
F.R. LAFAYETTE, INC.

DRAWN C CRAMER
CHECKED
DATE 11–31–04
SCALE N.T.S.
HSC REFERENCE NO. 1479
SIZE D REVISION 0
SHEET NO. 2 of 5

BR4127



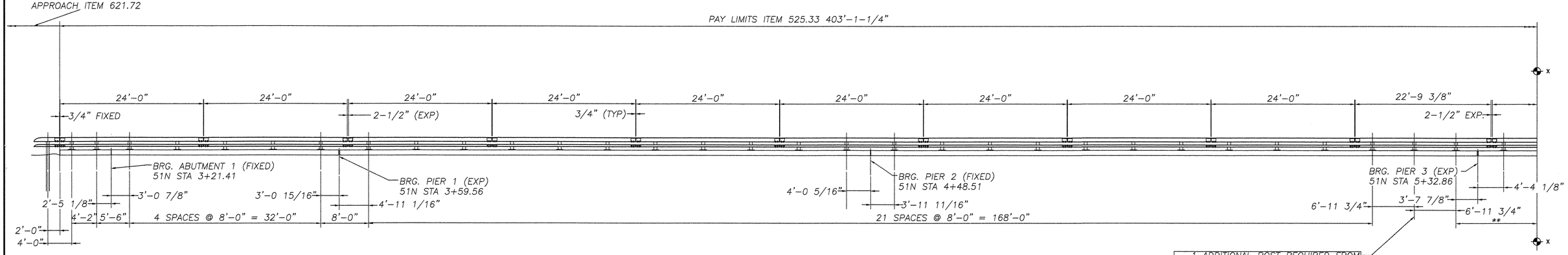
PARTIAL PLAN VIEW

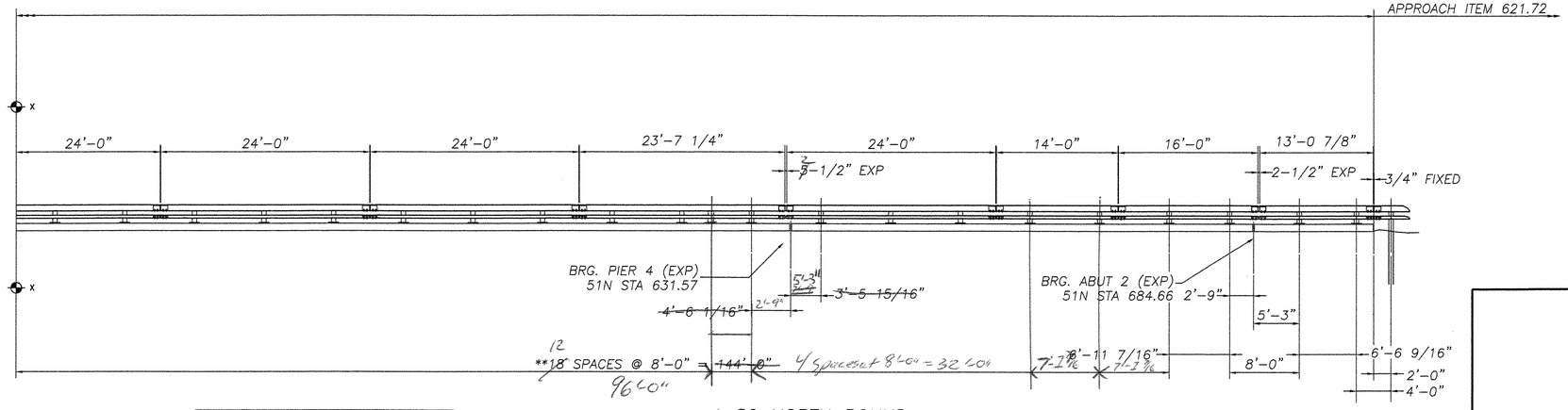


BILL OF MATERIAL (ITEM 525.33)

Mk.	Qty.	Description	Size/Shape	length/qty. per unit	Material
	52	BRIDGE RAIL PED POST 680mm OAH W/ BASE PLATE			
	52	POST UPRIGHT	W6 x 25	2'-03/8"	A709 Gr. 50
	52	POST BASE PLATE	1" x 10"	1'-2"	A709 Gr. 50
	17	UPPER SPLICE TUBE FOR 8 x 4 RAIL			
	17	TUBE	TS 7x3x3/8	1'-8"	A500 Gr. B
	34	LOCK NUTS	5/8"	2 pcs.	A563 Gr. DH
	17	LOWER SPLICE TUBE FOR 4 x 4 RAIL			
	17	TUBE	TS 3x3x5/16	1'-8"	A500 Gr. B
	34	LOCK NUTS	5/8"	2 pcs.	A563 Gr. DH
	13	UPPER RAIL	TS 8x4x5/16	24'-0"	A500 Gr. B
	13	LOWER RAIL	TS 4x4x1/4	24'-0"	A500 Gr. B
	1	UPPER RAIL	TS 8x4x5/16	14'-0"	A500 Gr. B
	1	LOWER RAIL	TS 4x4x1/4	14'-0"	A500 Gr. B
	1	UPPER RAIL	TS 8x4x5/16	16'-0"	A500 Gr. B
	1	LOWER RAIL	TS 4x4x1/4	16'-0"	A500 Gr. B
	1	UPPER RAIL	TS 8x4x5/16	13'-7/8"	A500 Gr. B
	1	LOWER RAIL	TS 4x4x1/4	13'-7/8"	A500 Gr. B
	1	UPPER RAIL	TS 8x4x5/16	22'-9-3/8"	A500 Gr. B
	1	LOWER RAIL	TS 4x4x1/4	22'-9-3/8"	A500 Gr. B
	1	UPPER RAIL	TS 8x4x5/16	23'-7-1/4"	A500 Gr. B
	1	LOWER RAIL	TS 4x4x1/4	23'-7-1/4"	A500 Gr. B
*	53	ANCHOR PLATE	3/8 x 9 3/8	1'-1"	A709 Gr. 36
*	212	ANCHOR STUD	1" DIA.	12"	A449
*	424	HEX NUT	1" DIA.	- - -	A563
*	212	JAMB NUT	1" DIA.	- - -	A563
*	212	WASHER	1" DIA.	- - -	F436
	212	ROUND HEAD BOLT	3/4" DIA.	6"	M164 TYPE I
	212	HEX NUT	3/4" DIA.	- - -	A563
	212	WASHER	3/4" DIA.	- - -	F436
	136	SPLICE BOLT	5/8" DIA.	1 3/4"	M164 TYPE I
	136	WASHER	5/8" DIA.	- - -	F436
	32	PIPE SPACER (SCH. 40)	3/4" DIA.	1/2"	A53
*	53	BEARING PAD	1/8 x 10	1'-2"	M251

* ANCHORS NOT PROVIDED BY HIGHWAY SAFETY CORP. - SHOWN FOR REFERENCE ONLY.





END OF WINGWALLS HAVE BEEN LOCATED APPROXIMATELY BY VAOT SURVEY. CONTRACTOR SHALL VERIFY REQUIRED DIMENSIONS AND RAIL LENGTHS PRIOR TO FABRICATION

I-89 NORTH BOUND
SOUTHWEST ELEVATION
LOOKING AT FACE OF RAIL
FROM ℄ OF ROAD.

REVISIONS		
No.	Remarks	Date
0	Initial submittal	28-JAN-05
0	Re-submittal	09-MAR-05
0	Re-submittal	02-MAY-05
0	Re-submittal	06-MAY-05

TVGA CONSULTANTS

☐ NO EXCEPTIONS TAKEN ☐ REJECTED
☑ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

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BY: BJC
DATE: 5/11/05

HIGHWAY SAFETY CORP.
GLASTONBURY, CT

ITEM 525.33 BRIDGE RAILING-NETC 2 RAIL
TOWN OF BOLTON
COUNTY OF CHITTENDEN
PROJECT AC IM 089-2(29)
BRIDGE 51N&S OVER US ROUTE 2

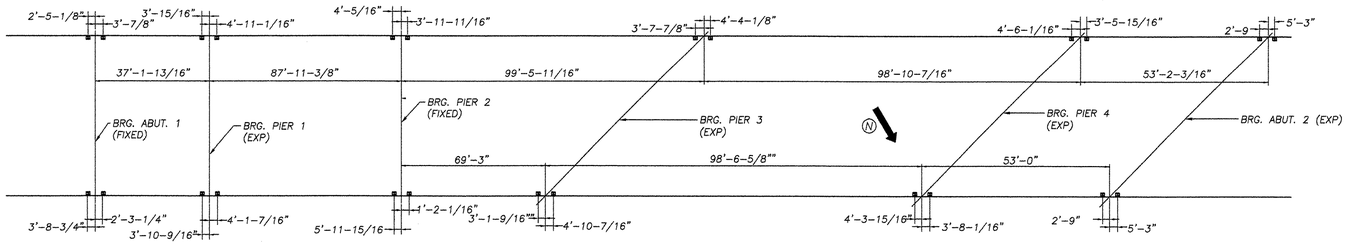
GENERAL CONTRACTOR

SUB CONTRACTOR
F.R. LAFAYETTE, INC.

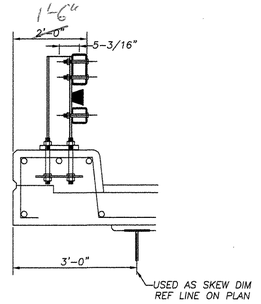
DRAWN C CRAMER
CHECKED
DATE 11-31-04
SCALE N.T.S.
HSC REFERENCE NO. 1479
SIZE D REVISION 0
SHEET NO. 3 of 5

BR428

525.33



PARTIAL PLAN VIEW



BILL OF MATERIAL (ITEM ~~563.22~~)

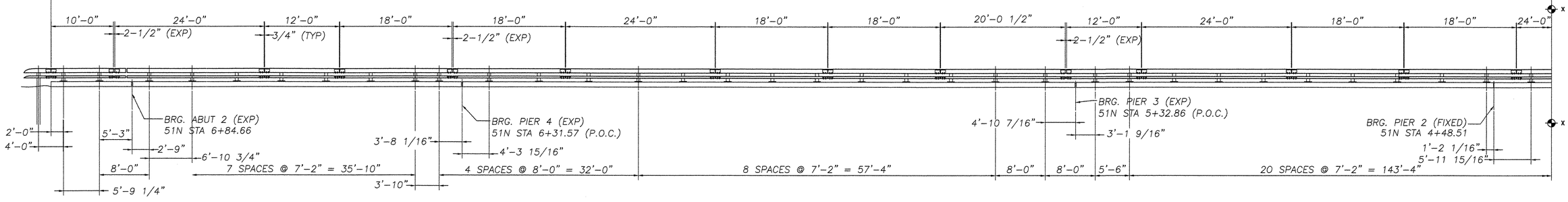
Mk.	Qty.	Description	Size/Shape	length/qty. per unit	Material
	52	BRIDGE RAIL PED POST 680mm OAH W/ BASE PLATE			
	52	POST UPRIGHT	W6 x 25	2'-03/8"	A709 Gr. 50
	52	POST BASE PLATE	1" x 10"	1'-2"	A709 Gr. 50
	18	UPPER SPLICE TUBE FOR 8 x 4 RAIL			
	18	TUBE	TS 7x3x3/8	1'-8"	A500 Gr. B
	36	LOCK NUTS	5/8"	2 pcs.	A563 Gr. DH
	18	LOWER SPLICE TUBE FOR 4 x 4 RAIL			
	18	TUBE	TS 3x3x5/16	1'-8"	A500 Gr. B
	36	LOCK NUTS	5/8"	2 pcs.	A563 Gr. DH
	1	UPPER RAIL	TS 8x4x5/16	10'-0"	A500 Gr. B
	1	LOWER RAIL	TS 4x4x1/4	10'-0"	A500 Gr. B
	6	UPPER RAIL	TS 8x4x5/16	24'-0"	A500 Gr. B
	6	LOWER RAIL	TS 4x4x1/4	24'-0"	A500 Gr. B
	2	UPPER RAIL	TS 8x4x5/16	12'-0"	A500 Gr. B
	2	LOWER RAIL	TS 4x4x1/4	12'-0"	A500 Gr. B
	1	UPPER RAIL	TS 8x4x5/16	20'-0"	A500 Gr. B
	1	LOWER RAIL	TS 4x4x1/4	20'-0"	A500 Gr. B
	2	UPPER RAIL	TS 8x4x5/16	21'-0-3/8"	A500 Gr. B
	2	LOWER RAIL	TS 4x4x1/4	21'-0- 3/8"	A500 Gr. B
	6	UPPER RAIL	TS 8x4x5/16	18'-0"	A500 Gr. B
	6	LOWER RAIL	TS 4x4x1/4	18'-0"	A500 Gr. B
	4	UPPER RAIL	TS 8x4x5/16	24'-9-1/2"	A500 Gr. B
	4	LOWER RAIL	TS 4x4x1/4	24'-9-1/2"	A500 Gr. B
*	52	ANCHOR PLATE	3/8 x 9 3/8	1'-1"	A709 Gr. 36
*	208	ANCHOR STUD	1" DIA.	12"	A449
*	416	HEX NUT	1" DIA.	- - -	A563
*	208	JAMB NUT	1" DIA.	- - -	A563
*	208	WASHER	1" DIA.	- - -	F436
	208	ROUND HEAD BOLT	3/4" DIA.	6"	M164 TYPE I
	208	HEX NUT	3/4" DIA.	- - -	A563
	208	WASHER	3/4" DIA.	- - -	F436
	144	SPLICE BOLT	5/8" DIA.	1 3/4"	M164 TYPE I
	144	WASHER	5/8" DIA.	- - -	F436
	32	PIPE SPACER (SCH. 40)	3/4" DIA.	1/2"	A53
*	52	BEARING PAD	1/8 x 10	1'-2"	M251

* ANCHORS NOT PROVIDED BY HIGHWAY SAFETY CORP. - SHOWN FOR REFERENCE ONLY.

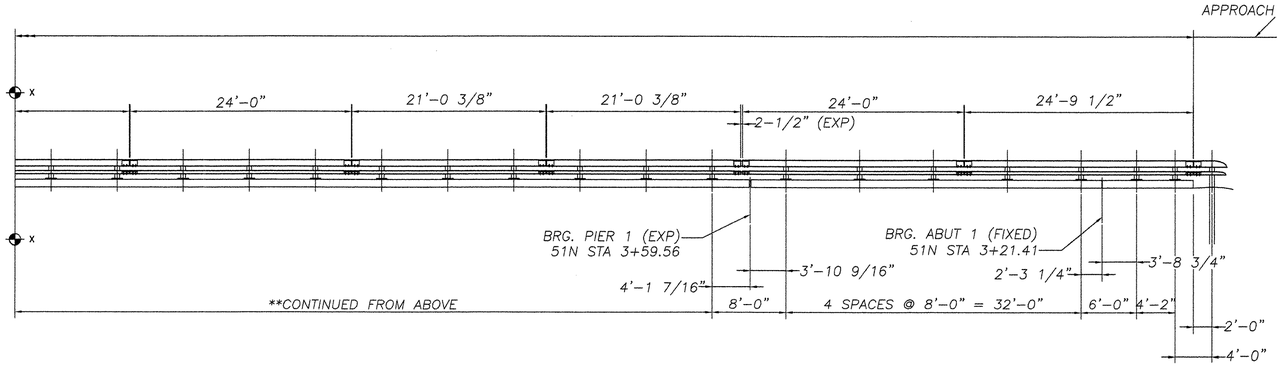
621.72

APPROACH ITEM ~~525.33~~

PAY LIMITS ITEM 525.33 368'-7-1/4"



APPROACH ITEM 621.72



END OF WINGWALLS HAVE BEEN LOCATED APPROXIMATELY BY VAOT SURVEY. CONTRACTOR SHALL VERIFY REQUIRED DIMENSIONS AND RAIL LENGTHS PRIOR TO FABRICATION

I-89 NORTH BOUND
NORTHEAST ELEVATION
LOOKING AT FACE OF RAIL
FROM ℄ OF ROAD.

REVISIONS		
No.	Remarks	Date
0	Initial submittal	28-JAN-05
0	Re-submittal	09-MAR-05
0	Re-submittal	02-MAY-05

TVGA CONSULTANTS

☐ NO EXCEPTIONS TAKEN ☐ REJECTED
☒ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

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BY: BJC
DATE: 5/11/05

HIGHWAY SAFETY CORP.
GLASTONBURY, CT

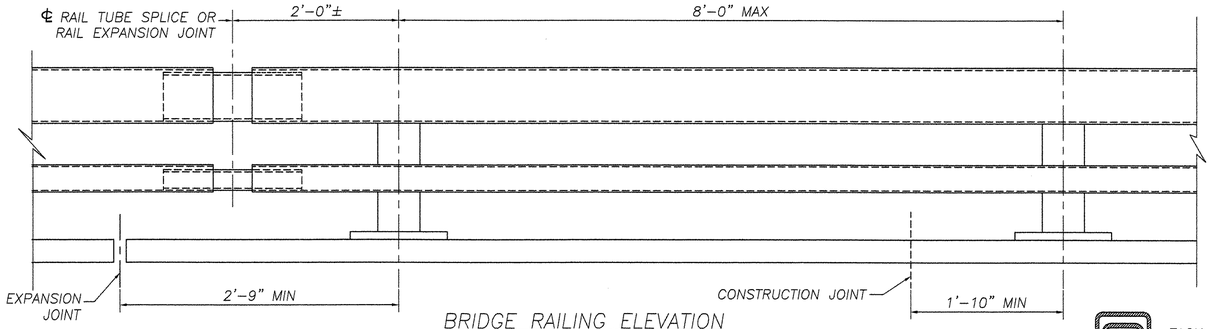
ITEM 525.33 BRIDGE RAILING NETC-2 RAIL
TOWN OF BOLTON
COUNTY OF CHITTENDEN
PROJECT AC IM 089-2(29)
BRIDGE 51N&S OVER U.S. ROUTE 2

GENERAL CONTRACTOR

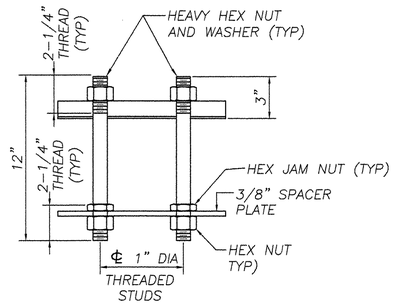
SUB CONTRACTOR
F.R. LAFAYETTE, INC.

DRAWN C CRAMER
CHECKED
DATE 11-31-04
SCALE 1/8=12
HSC REFERENCE NO. 1479
SIZE D REVISION 0
SHEET NO. 4 of 5

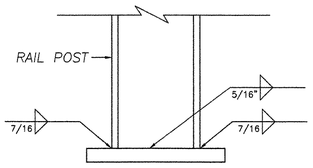
BR429



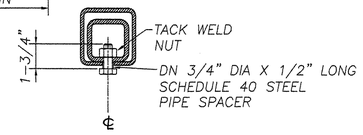
BRIDGE RAILING ELEVATION



RAIL POST ANCHORAGE



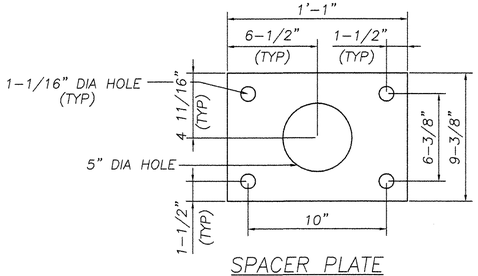
BASE WELD DETAIL



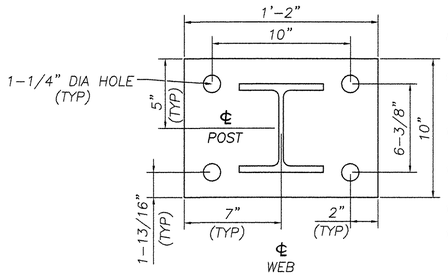
5/8" DIA TAPERED HOLE IN SPLICE TUBE AND 1 1/8" X 'C' SLOT IN RAIL TUBE FOR 5/8" DIA BOLT AND PLAIN HARDENED WASHER

EXPANSION JOINT SECTION

FOR DETAILS NOT SHOWN, SEE "RAIL TUBE SPLICE SECTION"



SPACER PLATE



POST AND BASE PLATE

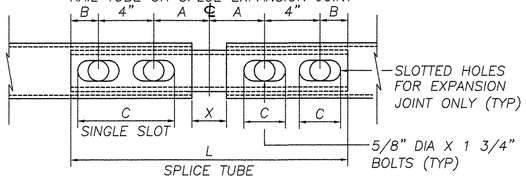
SPLICE TABLE

T	A	B	C	L	X
NA	4"	2"	--	20"	3/4"

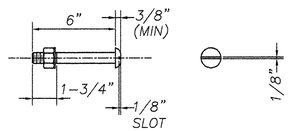
EXPANSION JOINT TABLE

	A	B	C	L	X
<4"	4"	2"	2 1/2"	20"	2 1/2"
>4" <6 1/2"	5 1/2"	2 3/8"	3 1/2"	23 3/4"	4"
>6 1/2" <9"	6 1/2"	3 3/8"	9" *	27 3/4"	5"
>9" <13"	8 1/2"	4 3/8"	11" *	33 3/4"	7"

RAIL TUBE OR SPLCE EXPANSION JOINT

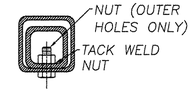


RAIL TUBE SPLICE AND RAIL EXPANSION JOINT DETAIL

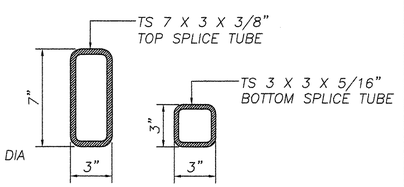


3/4" DIA M164 (TYPE 1) ROUND HEAD BOLT

(WITH WASHER AND PREVAILING TORQUE TYPE LOCK NUT) (SEE NOTE #9)
ONLY FULL DIAMETER BODY BOLTS WILL BE ALLOWED



5/8" DIA TAPPED HOLE IN SPLICE TUBE
3/4" DIA HOLE IN RAIL TUBE FOR 5/8" DIA BOLT AND PLAIN HARDENED WASHER



RAIL TUBE SPLICE SECTION

NOTES

1 ALL WORK AND MATERIALS SHALL CONFORM TO THE PROVISIONS OF SECTION 525 "RAILINGS OF THE STANDARD SPECIFICATION FOR CONSTRUCTION".

2 TUBING AND POSTS SHALL MEET THE REQUIREMENTS OF SECTION 732, "RAILING MATERIALS OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION" EXCEPT THE DROP WEIGHT TEAR TEST IN SECTION 732 SHALL NOT APPLY TO THE STRUCTURAL TUBING IN THIS STANDARD.

3 ALL EXPOSED CUT OR SHEARED EDGES SHALL BE ROUNDED TO A 1/16" RADIUS AND BE FREE OF BURRS.

4 RAIL POSTS SHALL BE SET ~~to~~ TO NORMAL GRADE.

5 SECTIONS OF RAIL TUBE SHALL BE ATTACHED TO A MINIMUM OF TWO (2) RAIL POSTS AND PREFERABLY TO AT LEAST FOUR (4) POSTS.

6 RAIL TUBE EXPANSION JOINTS SHALL BE PROVIDED IN ANY RAIL BAY SPANNING A SUPERSTRUCTURE EXPANSION JOINT. EXPANSION JOINT WIDTH SHALL BE "X" AT 45°F AND WILL BE ADJUSTED IN THE FIELD BY THE ENGINEER FOR OTHER TEMPERATURES.

7 ALL PARTS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111, EXCEPT THAT HARDWARE SHALL MEET THE REQUIREMENTS OF AASHTO M232.

8 RAIL POSTS ANCHORING NUTS SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ONE-EIGHTH TURN.

9 RAIL TUBES SHALL BE ATTACHED USING 3/4" FULL DIAMETER BODY AASHTO M164 (TYPE 1) ROUND HEAD BOLTS INSERTED THROUGH THE FACE OF THE TUBE. HOLES IN POSTS SHALL BE 1/16" LARGER THAN THE BOLT SIZE.

10 HOLES IN RAILS FOR RAIL TUBE ATTACHMENT MAY BE FIELD DRILLED. HOLES SHALL BE COATED WITH AN APPROVED ZINC RICH PAINT PRIOR TO ERECTION.

11 IF THERE IS A CONFLICT BETWEEN THESE STANDARD DETAILS AND THE DESIGN, THE REQUIREMENTS OF THE DESIGN DRAWING SHALL BE FOLLOWED.

12 ANY BENDING OF RAIL SHALL BE DONE BY SHOP PROCEDURE ONLY.

13 THE FABRICATOR SHALL SUBMIT SHOP DRAWINGS INCLUDING WELDING PROCEDURES TO THE STRUCTURES SECTION FOR APPROVAL IN ACCORDANCE WITH THE PROVISION OF 506.04, SHOP DRAWINGS. ALL WELDING SHALL CONFORM WITH SECTION 506.10.

14 RAIL POSTS AND BASE PLATES SHALL BE TESTED FOR IMPACT PROPERTIES IN ACCORDANCE WITH ASTM A-370 CHARPY IMPACT TESTING USING A SPECIMEN.
TYPE

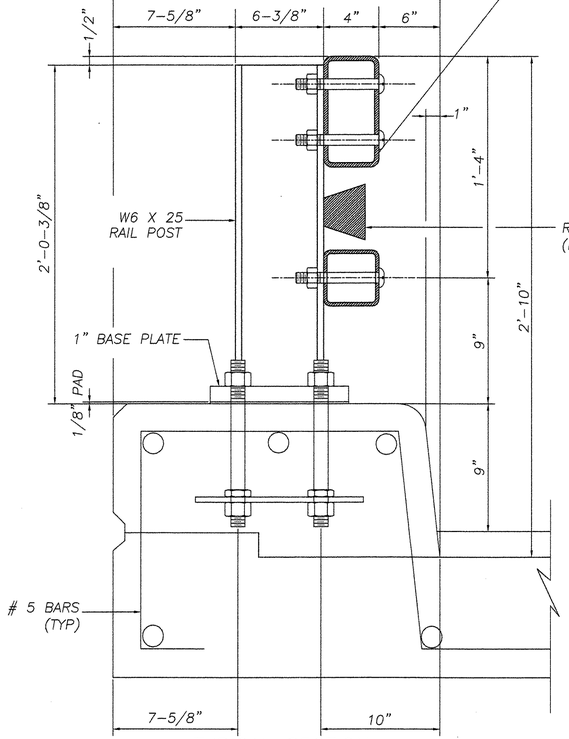
MATERIALS

RAIL TUBES.....ASTM A500, GRADE B OR ASTM A501
RAIL POSTS AND BASE PLATES.....ASTM A709A709M, GRADE 50
ALL OTHER SHAPES AND PLATES.....ASTM 1709/A709M, GRADE 36
ANCHOR STUDS.....ASTM A449
ALL OTHER BOLTS (UNLESS NOTED).....AASHTO M164, TYPE 1

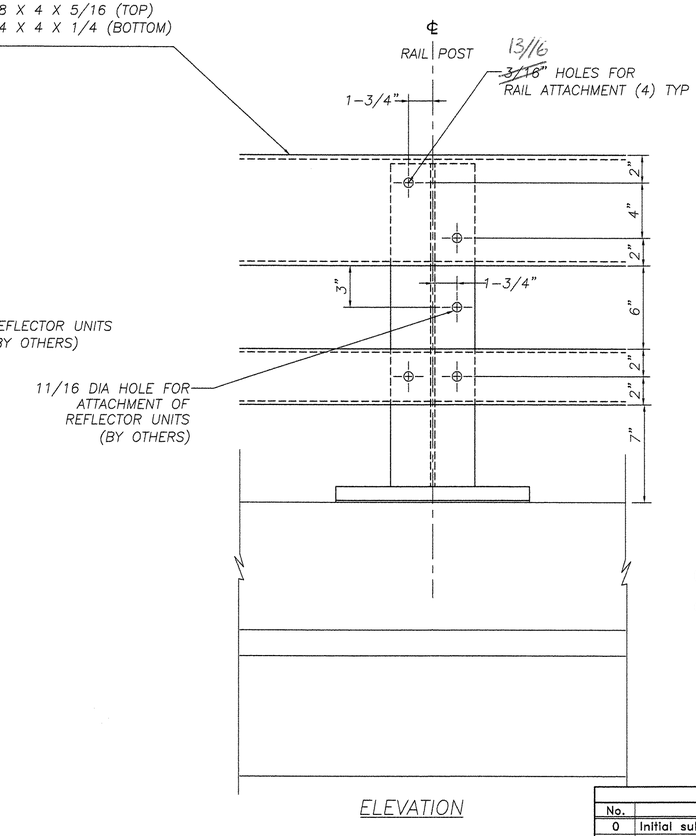
NUTS FOR AASHTO M164 (ASTM A325) BOLTS AND FOR ANCHOR STUDS SHALL COMPLY WITH AASHTO M291 (ASTM A563)

WASHERS SHALL COMPLY WITH AASHTO M293 (ASTM F436) SPECIFICATIONS

1/8" PAD SHALL COMPLY WITH STANDARD SPECIFICATION SUBSECTION 731.01 OR 731.02



TYPICAL SECTION



ELEVATION

REVISIONS		
No.	Remarks	Date
0	Initial submittal	28-JAN-05
0	Re-submittal	09-MAR-05
0	Re-submittal	02-MAY-05

TVGA CONSULTANTS

☐ NO EXCEPTIONS TAKEN ☐ REJECTED
☒ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

ENGINEER has reviewed Shop Drawings and Samples and other data which Contractor is required to submit, only for conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such reviews do not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

BY: BJC
DATE: 5/11/05

HIGHWAY SAFETY CORP.
GLASTONBURY, CT

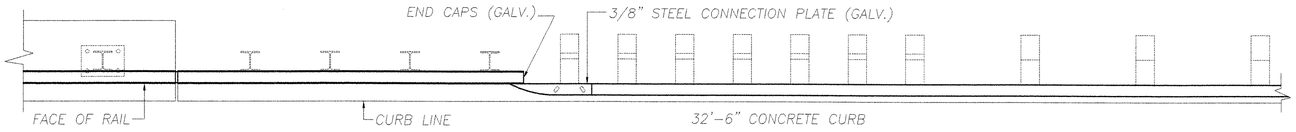
ITEM 525.33 BRIDGE RAILING - NETC 2 RAIL
TOWN OF BOLTON
COUNTY OF CHITTENDEN
PROJECT AC IM 089-2(29)
BR. 51N&S OVER U.S. ROUTE 2

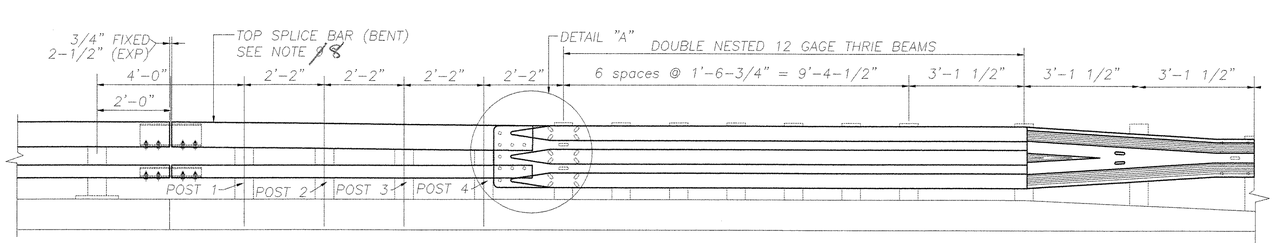
GENERAL CONTRACTOR

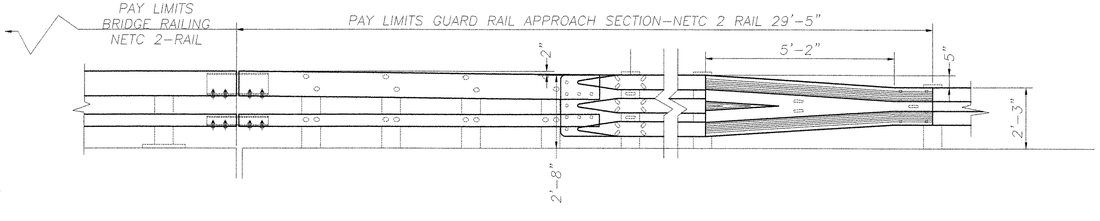
SUB CONTRACTOR
F.R. LAFAYETTE, INC.

DRAWN CJC
CHECKED
DATE 11/30/04
SCALE 3/16=12
HSC REFERENCE NO. 1479
SIZE D REVISION 0
SHEET NO. 5 of 5

BR 4730







BILL OF MATERIAL
BRIDGE No. 51S

Qty.	Description	Size/Shape	Length\Qty. Per unit	Material
2	APPROACH RAIL TUBE (UPPER)-EXP.	TS 8x4x5/16"	8'-3-1/8"	A500 Gr. B
2	APPROACH RAIL TUBE (LOWER)-EXP.	TS 4x4x1/4"	8'-3-1/8"	A500 Gr. B
2	APPROACH RAIL TUBE (UPPER)-FIXED	TS 8x4x5/16"	9'-9 5/8"	A500 Gr. B
2	APPROACH RAIL TUBE (LOWER)-FIXED	TS 4x4x1/4"	9'-9 5/8"	A500 Gr. B
16	STEEL POST	W6 x 25	8'-0"	A709 Gr. 50
40	WOOD POST	6x8	7'-0"	
40	WOOD OFFSET BLOCK	6x8	1'-6"	
4	BENT SPLICE TUBE FOR 8 x 4 RAIL TUBE	3/8"		
	TUBE	TS 7x3x5/16"	1'-8"	A500 Gr. B
	LOCK NUTS	5/8"	2 pcs.	A563
4	BENT SPLICE TUBE FOR 4 x 4 RAIL TUBE	3 5/16		
	TUBE	TS 7x3x1/4"	1'-8"	A500 Gr. B
	LOCK NUTS	5/8"	2 pcs.	A563
4	TERMINAL CONNECTOR	10 Ga.	2'-6"	M180 B2
4	CONNECTION PLATE	PL 3/8 x 1'-8"	2'-3"	A709 Gr. 36
4	DEFLECTOR PLATE	PL 3/8 x 4"	1'-8 1/2"	A709 Gr. 36
4	END CAP FOR 8 x 4 RAIL TUBE	3/16	Ø	
	PLATE	3/8 x 1" x1"	4 pcs.	A709 Gr. 36
	PLATE	PL 3/8 x 4"	8"	A709 Gr. 36
4	END CAP FOR 4 x 4 RAIL TUBE			
	PLATE	PL 3/16 x 1" x2"	4 pcs.	A709 Gr. 36
	PLATE	PL 3/8 x 4"	4"	A709 Gr. 36
4	THRIE TRANSITION PANEL	12 Ga.	7'-3 1/2"	M180 A2
8	DOUBLE NESTED 12 GAGE THRIE PANELS			M180 A2
92	3/4"ø x 6" SLOTTED HEAD BOLT W/LOCK NUT AND FW			A325
4	3/4" x 2" LG. ROUND HEAD BOLT W/NUT			A307
8	5/8" x 1'-8" LG. POST BOLT W/DBL RECESSED NUT, PLATE & ROUND WASHER			A307
68	5/8" x 1'-6" LG. POST BOLT W/DBL RECESSED NUT, PLATE & ROUND WASHER			A325
32	5/8" x 1 3/4" LG. HEX BOLT W/WASHER			A307
128	5/8" x 1 1/4" LG. PANEL SPLICE BOLT W/DBL RECESSED NUT			A307

BILL OF MATERIAL
BRIDGE No. 51S

Qty.	Description	Size/Shape	Length\Qty. Per unit	Material
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2	APPROACH RAIL TUBE (UPPER)-FIXED	TS 8x4x5/16"	9'-9 5/8"	A500 Gr. B
2	APPROACH RAIL TUBE (LOWER)-FIXED	TS 4x4x1/4"	9'-9 5/8"	A500 Gr. B
16	STEEL POST	W6 x 25	8'-0"	A709 Gr. 50
40	WOOD POST	6x8	7'-0"	
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4	BENT SPLICE TUBE FOR 4 x 4 RAIL TUBE	3 5/16		
	TUBE	TS 7x3x1/4"	1'-8"	A500 Gr. B
	LOCK NUTS	5/8"	2 pcs.	A563
4	TERMINAL CONNECTOR	10 Ga.	2'-6"	M180 B2
4	CONNECTION PLATE	PL 3/8 x 1'-8"	2'-3"	A709 Gr. 36
4	DEFLECTOR PLATE	PL 3/8 x 4"	1'-8 1/2"	A709 Gr. 36
4	END CAP FOR 8 x 4 RAIL TUBE	3/16	Ø	
	PLATE	3/8 x 1" x1"	4 pcs.	A709 Gr. 36
	PLATE	PL 3/8 x 4"	8"	A709 Gr. 36
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68	5/8" x 1'-6" LG. POST BOLT W/DBL RECESSED NUT, PLATE & ROUND WASHER			A325
32	5/8" x 1 3/4" LG. HEX BOLT W/WASHER			A307
128	5/8" x 1 1/4" LG. PANEL SPLICE BOLT W/DBL RECESSED NUT			A307

1. PAYMENT FOR GUARD RAIL APPROACH SECTION – NETC 2 RAIL SHALL INCLUDE THE TERMINAL CONNECTOR, THE CONNECTION PLATE, THE DEFLECTOR PLATE, RAIL, POSTS, BLOCKS, AND ATTACHMENT HARDWARE.

2. THE REFLECTORIZED ALUMINUM DELINIATION IS TO BE ERECTED EVER 30' (OR CLOSEST POST) WITH A 5/8" DIA BOLT. DELINIATORS SHALL MEET SPECIFICATION REQUIREMENTS FOR ASTM B209 ALLOY 5052-H32

3. REFLECTIVE MATERIAL SHALL MEET REQUIREMENTS OF SUBSECTION 750.08 AND SHALL BE OF ENCAPSULATED LENS SILVER OR AMBER. AMBER IS TO BE INSTALLED ON THE DRIVERS LEFT AND SILVER ON THEIR RIGHT

4. ON BRIDGES WITH A SIDEWALK, DELINEATORS ARE NOT TO BE INSTALLED ON THE SIDEWALK SIDE OF THE BRIDGE (I.E. DELINEATORS INSTALLED ONLY ON THE CURB SIDE AND ON THE APPROACH ON THE CURB SIDE). PAYMENT SHALL BE SUBSIDIARY TO ALL OTHER ITEMS.

5. ALL APPROACH RAIL SPLICES SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC FLOW.

6. ALL BRIDGE APPROACH MATERIALS, DIMENSION SIZES AND NOTES SHALL BE THE SAME AS THOSE OF THE BRIDGE RAIL UNLESS OTHERWISE NOTED.

7. APPROACH RAIL BOLTS SHALL BE ASTM A307 GRADE A AND NUTS SHALL AASHTO M291 (ASTM A563) GRADE A OR BETTER (GALVANIZED). WASHERS SHALL BE ASTM F844

8. WELD TOP SPLICE BAR TO FIT BEND. USE COMPLETE PENETRATION WELD (B-U2)

9. THE CONCRETE CURB WILL BE PAID FOR AS ITEM 616.28, "CAST-IN-PLACE CONCRETE CURB, TYPE B."

REVISIONS

No.	Remarks	Date
0	Initial submittal	28-JAN-05
0	Re-submittal	09-MAR-05
0	Re-submittal	02-MAY-05

TVGA CONSULTANTS

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☒ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

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BY: [signature]
DATE: 5/18/05

HIGHWAY SAFETY CORP.
GLASTONBURY, CT

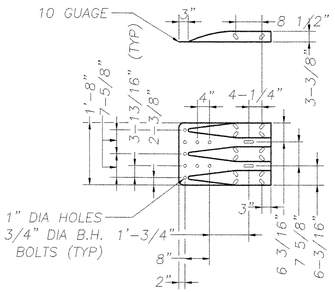
ITEM 621.72 GUARDRAIL APPROACH-NETC 2 RAIL
TOWN OF BOLTON
COUNTY OF CHITTENDEN
PROJECT AC IM 089-2(29)
BR 51 N&S OVER U.S. ROUTE 2

GENERAL CONTRACTOR

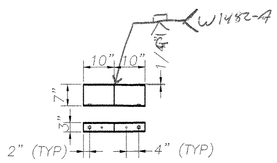
SUB CONTRACTOR
F.R. LAFAYETTE, INC.

DRAWN C CRAMER
CHECKED [signature]
DATE 12/07/04
SCALE 1/2=12
HSC REFERENCE NO. 1482
SIZE D REVISION 0
SHEET NO. 1 of 2

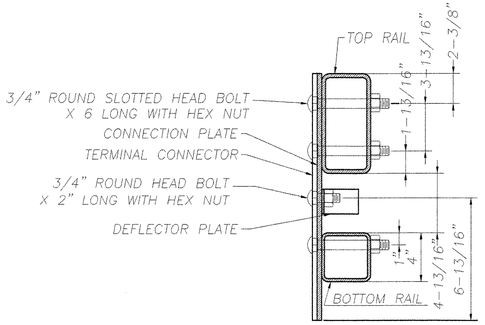
BR431



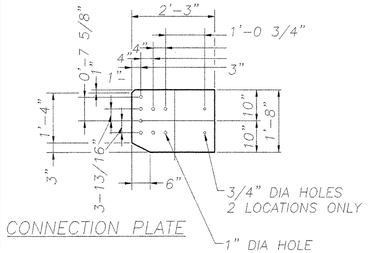
TERMINAL CONNECTOR



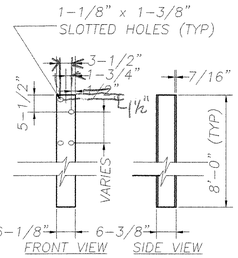
BENT SPLICE TUBE DETAIL



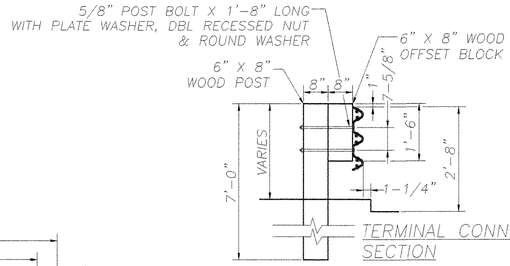
DETAIL B



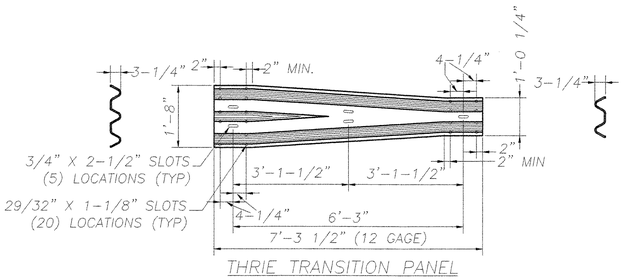
CONNECTION PLATE



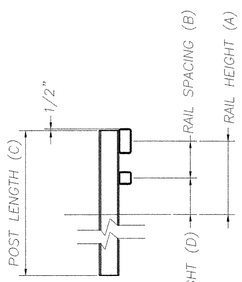
RAIL POST



TERMINAL CONNECTION SECTION



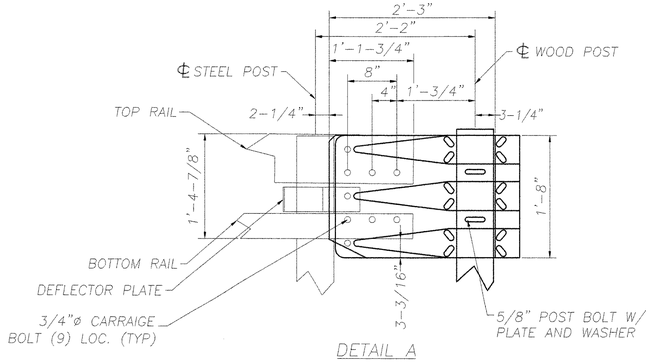
THRIE TRANSITION PANEL



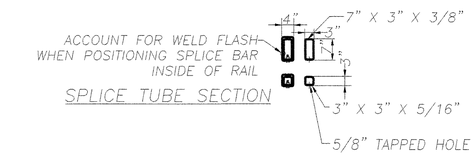
TYPICAL SECTION
(SEE CHART A)

POST NUMBER	RAIL HEIGHT A	RAIL SPACING B	POST LENGTH C	RAIL HEIGHT D
1	2'-9-1/2"	1'-3-3/4"	8'-0"	1'-5-3/4"
2	2'-9"	1'-3-1/2"	8'-0"	1'-5-1/2"
3	2'-8-1/2"	1'-3-3/16"	8'-0"	1'-5-5/16"
4	2'-8"	1'-2-7/8"	8'-0"	1'-5-1/8"

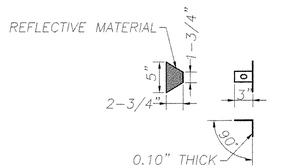
CHART A



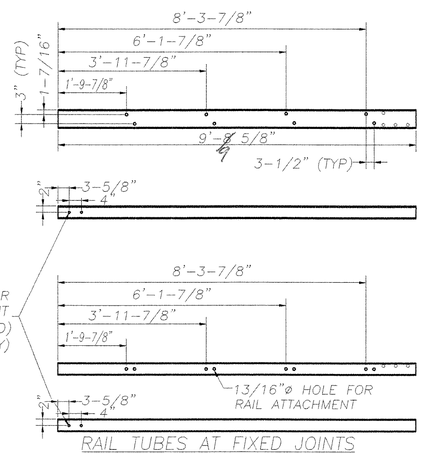
DETAIL A



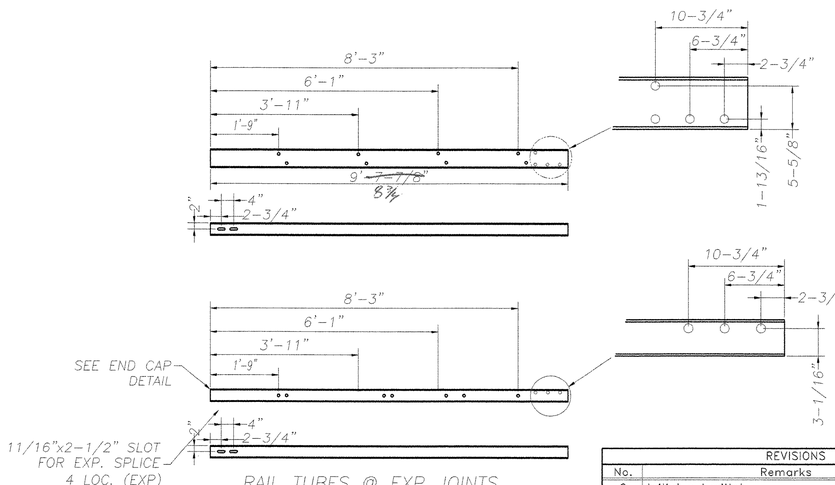
SPLICE TUBE SECTION



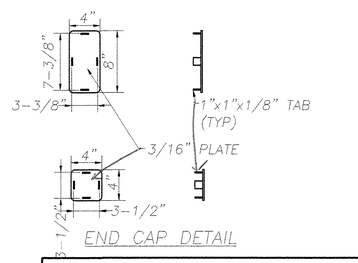
DELINIATION DEVICE DETAILS



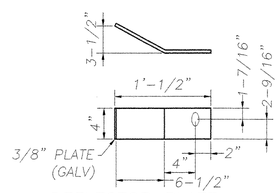
RAIL TUBES AT FIXED JOINTS



RAIL TUBES @ EXP JOINTS



END CAP DETAIL



DEFLECTOR PLATE

REVISIONS		
No.	Remarks	Date
0	Initial submittal	28-JAN-05
0	Re-submittal	09-MAR-05
		02-MAY-05

TVGA CONSULTANTS

☐ NO EXCEPTIONS TAKEN ☐ REJECTED
☒ FURNISH AS CORRECTED
☐ REVISE AND RESUBMIT

ENGINEER has reviewed Shop Drawings and Samples and other data which Contractor is required to submit, only for conformance with the information given in the Contract Documents and compatibility with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. Such review(s) do not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

BY: BDC 5/11/05
DATE:

HIGHWAY SAFETY CORP.
GLASTONBURY, CT

ITEM 621.72 GUARDRAIL APPROACH-NETC 2 RAIL
TOWN OF BOLTON
COUNTY OF CHITTENDEN
PROJECT AC IM 089-2(29)
BR 51 N&S OVER U.S. ROUTE 2

GENERAL CONTRACTOR

SUB CONTRACTOR
F.R. LAFAYETTE, INC.

DRAWN C CRAMER
CHECKED
DATE 12/07/04
SCALE 1/2=12
HSC REFERENCE NO. 1482
SIZE D REVISION 0
SHEET NO. 2 of 2

BR482