INDEX OF SHEETS

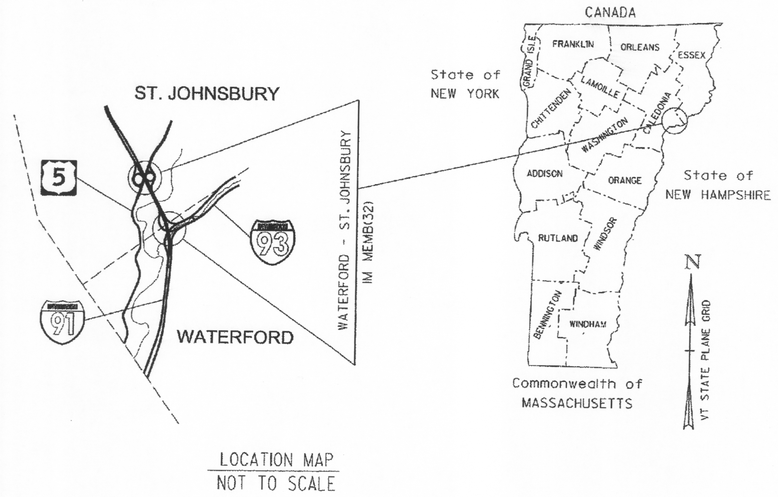
SEE SHEET 2

RECORD PLANS

R.E. NATHAN COVEY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PROPOSED IMPROVEMENT
BRIDGE PROJECT
TOWNS OF WATERFORD & ST. JOHNSBURY
COUNTY OF CALEDONIA
PROJECT IM MEMB(32)



LOCATION MAP
NOT TO SCALE

ROUTE NO.: INTERSTATE I-91
INTERSTATE I-91 RAMP "B"

BRIDGE NO.: 81N&S, 81B, 83N

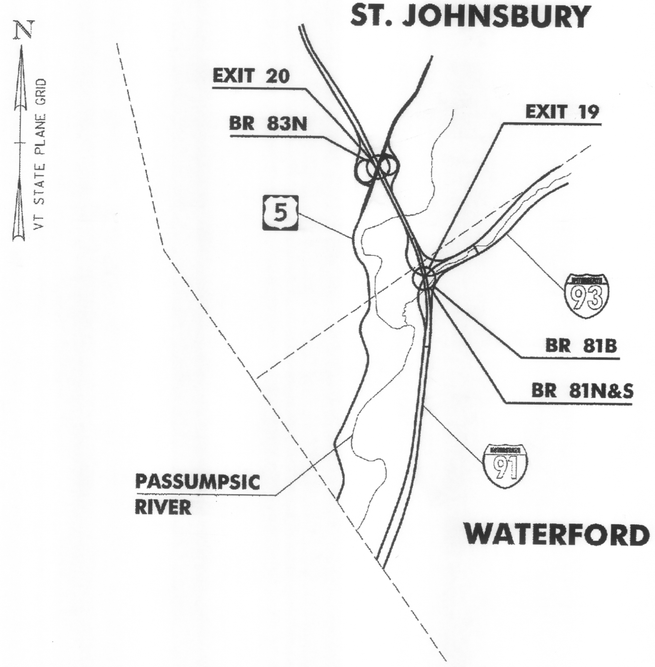
PROJECT LOCATION: WATERFORD - BR 81N&S OVER RAMP "D" (MM 128.25)
WATERFORD - BR 81B OVER I-91 N&S AND RAMP "D" (EXIT 19)
ST. JOHNSBURY - BR 83N OVER US 5 (MM 128.889) (EXIT 20)

PROJECT DESCRIPTION: THIS PROJECT INVOLVES REMOVING AND REPLACING THE SHEET MEMBRANE WATERPROOFING AND BITUMINOUS CONCRETE PAVEMENT ON THE BRIDGE AND ITS APPROACHES ALONG WITH MINOR RELATED WORK.

LENGTH OF STRUCTURES:

BR 81N	112.11'
BR 81S	124.64'
BR 81B	417.92'
BR 83N	216.38'

TOTAL LENGTH OF STRUCTURES: 871.05'



QUALITY ASSURANCE PROGRAM: LEVEL I

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

DATUM
VERTICAL N/A
HORIZONTAL N/A

CONVENTIONAL SYMBOLS

COUNTY LINE
TOWN LINE
LIMITS OF ACCESS
POINT OF ACCESS
FENCE LINE
STONE WALL
TRAVELED WAY
GUARD RAIL
RAILROAD
SURVEY LINE
CULVERT
POWER POLE
TELEPHONE POLE
TREES
CONTROL OF ACCESS
PROPERTY LINE
R.O.W. TAKING LINE
SLOPE RIGHTS SR SR SR
TOP OF CUT
TOE OF SLOPE

RECORD PLANS

CONTRACTOR: COLD RIVER BRIDGES, LLC- KEENE, NH
RESIDENT ENGINEER: NATE COVEY
CONSTRUCTION BEGAN: JULY 2, 2012
CONSTRUCTION COMPLETE: OCTOBER 10, 2012
RECORD PLANS BY: NATE COVEY & C. PEIRCE

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

BY Donald A. Way for Nate Covey RESIDENT ENGINEER
DATE 5/13/13

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

STATE OF VERMONT JOHN P. BYRNE NO. 077 LICENSED PROFESSIONAL ENGINEER 3/19/12

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 2006, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JUNE 15, 2006 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

PLANS PREPARED BY:

CLD CONSULTING ENGINEERS Inc.
540 Commercial Street Manchester, NH 03101
(603) 668-8223 • Fax: (603) 668-8902
email: cld@cldengineers.com • www.cldengineers.com
Maine • New Hampshire • Vermont

DIRECTOR OF PROGRAM DEVELOPMENT
APPROVED Peter Tetreault DATE 3/19/12

PROJECT MANAGER : DOUGLAS BONNEAU

PROJECT NAME : **WATERFORD - ST. JOHNSBURY**
PROJECT NUMBER : IM MEMB(32)

SHEET 1 OF 43 SHEETS

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9.-11. BITUMINOUS CONCRETE DETAILS SHEETS 1-3
12. MISCELLANEOUS BRIDGE DETAILS
13. BARRIER RAIL DETAILS
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05/30/03	E-101	CONSTRUCTION SIGN DETAILS
06/30/03	E-102	CONSTRUCTION SIGN DETAILS
05/01/04	E-102A	CONSTRUCTION SIGN DETAILS
03/01/04	E-103	MAINLINE TRAFFIC CONTROL DIVIDED HIGHWAY ONE LANE CLOSED
03/01/04	E-106	TRAFFIC CONTROL MISCELLANEOUS DETAILS
06/30/03	E-107	DELINEATION, BARRICADES AND DETOURS FOR CONSTRUCTION AREAS
06/08/09	E-107A	BREAKAWAY BARRICADE DETAILS
06/08/09	E-108A	CONSTRUCTION ZONE LONGITUDINAL DROP OFFS FOR PAVING
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08/08/95	E-120	STANDARD SIGN PLACEMENT EXPRESSWAY AND FREEWAY
08/08/95	E-121	STANDARD SIGN PLACEMENT CONVENTIONAL ROAD

PROJECT NOTES

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO STATE OF VERMONT, AGENCY OF TRANSPORTATION, 2006 STANDARD SPECIFICATIONS FOR CONSTRUCTION, AND ITS LATEST REVISIONS, AND THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, DATED 2010, AND ITS LATEST REVISIONS.

2. ALL WORK AND ANY ASSOCIATED ACTIVITY ON THIS PROJECT SHALL BE PERFORMED WITHIN THE EXISTING RIGHT-OF-WAY LIMITS.

3. ALL COSTS ASSOCIATED WITH PROTECTION OF TRAFFIC DURING REMOVAL OF THE BRIDGE PAVEMENT WILL BE INCIDENTAL TO ITEM 529.10, "REMOVAL OF BRIDGE PAVEMENT".

4. WATER REPELLENT, SILANE SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES EXCEPT THE PIERS AND THE UNDERSIDE OF THE DECK. THIS WORK WILL BE PAID FOR UNDER ITEM 514.10, "WATER REPELLENT, SILANE".

5. FOLLOWING THE COMPLETION OF ALL OTHER CONSTRUCTION ACTIVITIES, ALL FABRIC DRAIN TROUGHS, DOWNSPOUTS AND SCUPPERS WITHIN THE LIMITS OF CONSTRUCTION AS SHOWN ON THE BITUMINOUS CONCRETE REMOVAL PLAN, SHALL BE THOROUGHLY FLUSHED BY THE CONTRACTOR. THE COST FOR FLUSHING THE FABRIC DRAIN TROUGHS, DOWNSPOUTS AND SCUPPERS WILL BE INCIDENTAL TO ALL OTHER ITEMS IN THE CONTRACT.

TRAFFIC CONTROL

6. THE TRAFFIC CONTROL PLANS SHOWN ON TRAFFIC CONTROL SHEETS 1, 2, AND 3 ARE SCHEMATICS ONLY AND SHOULD BE USED AS REFERENCES. THE CONTRACTOR SHALL SUBMIT TRAFFIC CONTROL PLANS DEPICTING EACH PHASE OF THE PLANNED WORK. PLANS SHALL BE SUBMITTED IN ACCORDANCE WITH SUBSECTION 105.03 AND SHALL BE STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN AN APPROPRIATE DISCIPLINE IN THE STATE OF VERMONT. PAYMENT FOR PREPARING AND SUBMITTING THE TRAFFIC CONTROL PLAN AND MAKING ANY NECESSARY REVISIONS TO THE PLAN WILL BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 641.10, "TRAFFIC CONTROL". THE CONTRACTOR SHALL ALLOW TWO WEEKS FOR APPROVAL OF THE TRAFFIC CONTROL PLAN. NO WORK SHALL COMMENCE UNTIL THE CONTRACTOR HAS AN APPROVED TRAFFIC CONTROL PLAN.

7. UNLESS COVERED UNDER INDIVIDUAL PAY ITEMS OR NOTED OTHERWISE, ALL COSTS FOR WORK SHOWN ON TRAFFIC CONTROL SHEETS AND FOR TEMPORARY TRAFFIC CONTROL DEVICES INCLUDING RETROREFLECTIVE DRUMS, SIGNS, AND SIGN POSTS WILL BE CONSIDERED TO BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR ITEM 641.10, "TRAFFIC CONTROL". THE QUANTITY FOR ITEM 630.15, "FLAGGERS" AS SHOWN ON THE QUANTITY SUMMARY SHEETS WAS ESTIMATED FOR TRAFFIC CONTROL ON ROADS UNDERNEATH THE BRIDGES DURING APPLICATION OF ITEM 514.10, "WATER REPELLENT, SILANE". ANY ADDITIONAL TRAFFIC CONTROL NECESSARY FOR ROADS UNDERNEATH BRIDGES UNDER CONSTRUCTION SHALL BE INCIDENTAL TO ITEM 641.10, "TRAFFIC CONTROL".

8. TRAFFIC WILL BE ALLOWED TO DRIVE ON THE BARE CONCRETE BRIDGE DECK AFTER THE REMOVAL OF THE BARRIER MEMBRANE, BUT PRIOR TO THE DECK BEING CLEANED AND PREPARED FOR THE NEW SHEET MEMBRANE. ONCE THE CONCRETE BRIDGE DECK IS PREPARED FOR THE NEW SHEET MEMBRANE, NO TRAFFIC WILL BE ALLOWED ON THE NEW MEMBRANE UNTIL THE SECOND LIFT OF BITUMINOUS CONCRETE PAVEMENT IS IN PLACE.

CONCRETE STRUCTURE, JOINT, AND DRAIN TUBE REPAIR

9. A TOTAL OF SIX DRAIN TUBES IN SPAN NO. 4 AT THE SOUTH END OF BRIDGE NO. 81B SHALL BE CLEANED AND EXTENDED BELOW THE BOTTOM FLANGE OF THE GIRDER PER THE "DRAIN TUBE EXTENSION DETAIL" ON SHEET 12. THIS WORK WILL INCIDENTAL TO ITEM 635.11, "MOBILIZATION/DEMOBILIZATION".

10. REPAIRS SHALL BE MADE TO DETERIORATED AREAS OF THE BEARING SEATS AT THE EAST BRIDGE BEARING OF BOTH BRIDGE NO. 81B ABUTMENTS. THESE REPAIRS WILL REQUIRE SHORING THE BEARING. REPAIRS TO THE SUBSTRUCTURE SURFACES SHALL BE PAID FOR UNDER ITEM 580.15, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS III". THE QUANTITY FOR THIS ITEM AS SHOWN ON THE QUANTITY SHEET IS ESTIMATED. THE COST TO SHORE EACH BEARING SHALL BE PAID FOR UNDER ITEM 502.11, "SHORING SUPERSTRUCTURE BEARINGS".

    THE DESIGN LOADS ON THE BEARINGS ARE AS SHOWN IN THE TABLE BELOW PER THE BEARING DEVICE ASSEMBLY REFERENCE PLAN SHEET ON SHEET 34 OF THIS PLAN SET.

DESIGN LOADS		
	VERT. LOAD	LAT. LOAD
ABUTMENT 1	140 KIPS	15 KIPS
ABUTMENT 2	100 KIPS	8 KIPS

11. REPAIRS SHALL BE MADE TO DETERIORATED AREAS OF THE BEARING SEATS ON BRIDGE NO. 81N, ABUTMENT NO. 4, AND BRIDGE NO. 81S, ABUTMENT NO. 1. REPAIRS TO THE SUBSTRUCTURE SURFACES SHALL BE PAID FOR UNDER ITEM 580.15, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS III". THE QUANTITY FOR THIS ITEM AS SHOWN ON THE QUANTITY SHEET IS ESTIMATED.

12. REPAIRS TO DETERIORATED CONCRETE CURBS ON BRIDGE NO. 81S SHALL BE PAID FOR UNDER ITEM 580.12, "REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS III". THE QUANTITY FOR THIS ITEM AS SHOWN ON THE QUANTITY SHEET IS ESTIMATED.

13. REPAIRS TO THE CONCRETE ALONG THE FULL LENGTH OF THE FINGER JOINT ON BRIDGE 81B AT ABUTMENT NO. 2 SHALL BE PAID FOR UNDER ITEM 580.12, "REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS III". THE QUANTITY FOR THIS ITEM AS SHOWN ON THE QUANTITY SHEET IS ESTIMATED.

PAVEMENT REMOVAL

14. THE FINAL ONE HALF INCH OF PAVEMENT ON THE CONCRETE BRIDGE DECK AND APPROACH SLABS SHALL BE REMOVED BY LOADER, GRADER OR EQUIPMENT APPROVED BY THE ENGINEER. COLD PLANING TO REMOVE BRIDGE PAVEMENT WILL BE INCIDENTAL TO ITEM 529.10, "REMOVAL OF BRIDGE PAVEMENT".

15. DURING BRIDGE AND APPROACH SLAB PAVEMENT REMOVAL, THE CONTRACTOR SHALL EXERCISE CARE TO INSURE THAT NO DAMAGE OCCURS TO THE EXISTING CONCRETE BRIDGE DECK AND THE EXISTING APPROACH SLABS. ANY DAMAGE TO THE CONCRETE BRIDGE DECK OR APPROACH SLABS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. REPAIRS SHALL BE MADE IN ACCORDANCE WITH SECTION 580.

16. CARE SHALL BE TAKEN TO PROTECT ANY SCUPPERS OR DROP INLETS AT ALL STAGES OF CONSTRUCTION. ANY DAMAGE TO THESE STRUCTURES SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AND AT THE CONTRACTOR'S EXPENSE.

17. AFTER THE REMOVAL OF THE BRIDGE PAVEMENT, THE BARRIER MEMBRANE SHALL BE REMOVED AND THE CONCRETE BRIDGE DECK (AND APPROACH SLABS IF APPLICABLE) SHALL BE CLEANED IN ACCORDANCE WITH SUBSECTION 580.04 AND TO THE SATISFACTION OF THE ENGINEER. REMOVAL OF THE BARRIER MEMBRANE AND THE CLEANING OF THE CONCRETE BRIDGE DECK (AND APPROACH SLABS IF APPLICABLE) WILL BE PAID FOR UNDER ITEM 580.16, "SURFACE PREPARATION FOR MEMBRANE".

18. ONCE THE BARRIER MEMBRANE IS REMOVED, ANY AREAS ON THE CONCRETE BRIDGE DECK (AND APPROACH SLABS IF APPLICABLE) THAT ARE FOUND TO BE UNSOUND SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER. THE METHOD FOR DETERMINING AREAS OF UNSOUND CONCRETE SHALL BE APPROVED BY THE ENGINEER. THE ENGINEER SHALL MAKE A DETERMINATION AS TO HOW TO REPAIR THE DETERIORATED PORTION OF THE CONCRETE BRIDGE DECK AND APPROACH SLABS AND THE LIMITS OF THE REPAIR. THE REPAIRS SHALL BE PAID FOR UNDER ITEM 580.10, "REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS I", ITEM 580.11, "REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS II", OR ITEM 580.12, "REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS III". QUANTITIES FOR ITEMS 580.10, 580.11, AND 580.12 AS SHOWN ON THE QUANTITY SHEET ARE ESTIMATED.

19. ANY REPAIR WORK REQUIRING THE USE OF ITEM 580.20, "RAPID SETTING CONCRETE REPAIR MATERIAL WITH COURSE AGGREGATE" SHALL BE APPROVED BY THE ENGINEER.

20. UPON THE ENGINEER'S APPROVAL OF THE CONCRETE BRIDGE DECK'S CONDITION, ITEM 519.20, "SHEET MEMBRANE WATERPROOFING, TORCH APPLIED" SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 519. THE CONTRACTOR SHALL NOT INSTALL ITEM 519.20, "SHEET MEMBRANE WATERPROOFING, TORCH APPLIED" WHEN THE DECK CONCRETE AND/OR DECK PATCH AREAS' MOISTURE CONTENT IS ABOVE SECTION 519 SPECIFICATIONS OR MANUFACTURER'S SPECIFICATIONS, WHICHEVER IS LESS.

PAVEMENT

21. FOLLOWING THE INSTALLATION OF THE NEW SHEET MEMBRANE WATERPROOFING ON THE CONCRETE BRIDGE DECK, THE CONCRETE BRIDGE DECK (AND THE AT-GRADE APPROACH SLABS IF APPLICABLE) SHALL BE PAVED CURB TO CURB WITH ITEM 406.27, "MEDIUM DUTY BITUMINOUS CONCRETE PAVEMENT" IN TWO 1¼" LIFTS. THE PAVEMENT SHALL BE TYPE IV FOR BOTH LIFTS, NO EXCEPTIONS.

22. CARE SHALL BE EXERCISED TO SMOOTHLY TRANSITION THE NEW BRIDGE PAVEMENT INTO THE EXISTING PAVEMENT. ANY COLD PLANING NECESSARY FOR SHAPING BRIDGE APPROACHES SHALL BE PAID FOR UNDER ITEM 210.10, "COLD PLANING, BITUMINOUS PAVEMENT".

23. TESTING FOR PAVEMENT DENSITY WILL REQUIRE CORES OF THE PAVEMENT ON THE BRIDGE. THE COST FOR THIS WORK WILL BE INCIDENTAL TO ITEM 406.27, "MEDIUM DUTY BITUMINOUS CONCRETE PAVEMENT". ANY DAMAGE TO THE NEW SHEET MEMBRANE CAUSED BY CORING THE PAVEMENT SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AND AT THE CONTRACTOR'S EXPENSE.

24. FOR PG BINDER GRADE SEE SECTION 406 OF THE GENERAL SPECIAL PROVISIONS AND SPECIAL PROVISIONS.

25. EMULSIFIED ASPHALT SHALL BE APPLIED AT A RATE OF 0.08 GAL/SY TO ALL COLD PLANED SURFACES AND AT A RATE OF 0.03 TO 0.04 GAL/SY BETWEEN PAVEMENT LIFTS. PAYMENT SHALL BE UNDER ITEM 404.65, "EMULSIFIED ASPHALT".

26. THE CONTRACTOR SHALL INSTALL TEMPORARY PAVEMENT MARKINGS ON ALL PAVED SURFACES THAT WILL NOT HAVE THE PERMANENT MARKINGS APPLIED WITHIN 14 CALENDAR DAYS OF THE FINAL PAVING OPERATIONS AS DIRECTED BY THE ENGINEER.

PROJECT NAME: WATERFORD - ST. JOHNSBURY
PROJECT NUMBER: IM MEMB(32)

FILE NAME: sllo298notes.dgn
PROJECT LEADER: JPB
DESIGNED BY: SRB
PLOT DATE: 3/15/2012
DRAWN BY: MWS
CHECKED BY: JF

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES									TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
				ROADWAY	BRIDGE NO. 81N	BRIDGE NO. 83N	FULL C.E. ITEMS	BRIDGE NO. 81S	BRIDGE NO. 81B	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
				1						1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22				
					815	1008		815	504	3142		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10				
					12.2	20.1		12.7	14.9	59.9		CWT	EMULSIFIED ASPHALT	404.65				
					237	329		244	236	1046		TON	MEDIUM DUTY BITUMINOUS CONCRETE PAVEMENT	406.27				
					1	1		1	1	4		LU	MAT DENSITY PAY ADJUSTMENT (N.A.B.I.)	406.29				
				1						1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50				
									2	2		EACH	SHORING SUPERSTRUCTURE BEARINGS	502.11				
					27	22		25	37	111		GAL	WATER REPELLENT, SILANE	514.10				
					76	130		84	23	313		LF	BRIDGE EXPANSION JOINT, ASPHALTIC PLUG	516.10				
					457	1090		508	1053	3108		SY	SHEET MEMBRANE WATERPROOFING, TORCH APPLIED	519.20				
					457	1090		508	1053	3108		SY	REMOVAL OF BRIDGE PAVEMENT	529.10				
					23	55		26	53	157		SY	REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS I	580.10				
					69	164		77	158	468		SY	REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS II	580.11				
					3	6		7	16	32		CY	REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS III	580.12				
					3			3	6	12		CY	REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS III	580.15				
					4111	9810		4571	9473	27965		SF	SURFACE PREPARATION FOR MEMBRANE	580.16				
					10	10		10	10	40		CF	RAPID SETTING CONCRETE REPAIR MATERIAL WITH COARSE AGGREGATE	580.20				
					5			5		10		HR	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	608.25				
					5			5		10		HR	TRUCK RENTAL	608.37				
					265	631		294	610	1800		HR	TRUCK-MOUNTED ATTENUATOR	608.45				
					1	1		1	2	5		EACH	ENERGY ABSORPTION ATTENUATOR	621.56				
					640	1415		652	152	2859		LF	TEMPORARY TRAFFIC BARRIER	621.90				
					614	1415		627	152	2808		LF	REMOVE AND RESET TEMPORARY TRAFFIC BARRIER	621.95				
					529	1263		588	1220	3600		HR	UNIFORMED TRAFFIC OFFICERS	630.10				
					300	150		300	300	1050		HR	FLAGGERS	630.15				
							1			1		LS	FIELD OFFICE, ENGINEERS	631.10				
							1			1		LS	TESTING EQUIPMENT, CONCRETE	631.16				
							1			1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
							3000			3000		DL	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.26				
				1						1		LS	MOBILIZATION/DEMOBILIZATION	635.11				
									1	1		LS	TRAFFIC CONTROL (I-91 - BRIDGE NO. 81B)	641.10				
					1					1		LS	TRAFFIC CONTROL (I-91 - BRIDGE NO. 81N)	641.10				
								1		1		LS	TRAFFIC CONTROL (I-91 - BRIDGE NO. 81S)	641.10				
						1				1		LS	TRAFFIC CONTROL (I-91 - BRIDGE NO. 83N)	641.10				
					1	1		1	1	4		EACH	PORTABLE CHANGEABLE MESSAGE SIGN	641.15				
					1	1		1	1	4		EACH	PORTABLE ARROW BOARD	641.16				
					391	937		406	773	2507		LF	6 INCH WHITE LINE	646.214				
					313	417		325	618	1673		LF	6 INCH YELLOW LINE	646.215				
					3281	8770		3306	1131	16488		LF	TEMPORARY 6 INCH WHITE LINE, TYPE II TAPE	646.621				
					3281	4080		3306	1708	12375		LF	TEMPORARY 6 INCH YELLOW LINE, TYPE II TAPE	646.631				
									27	27		LF	BRIDGE EXPANSION JOINT, FINGER PLATE CHANGE OF DESIGN #2 SEE SHEET 35 OF PLANS.	516.12				

PROJECT NAME: Waterford - St. Johnsbury
PROJECT NUMBER: IM MEMB(32)

FILE NAME: s11A298qss.dgn
PROJECT LEADER: JPB
DESIGNED BY: SRB
QUANTITY SHEET #1

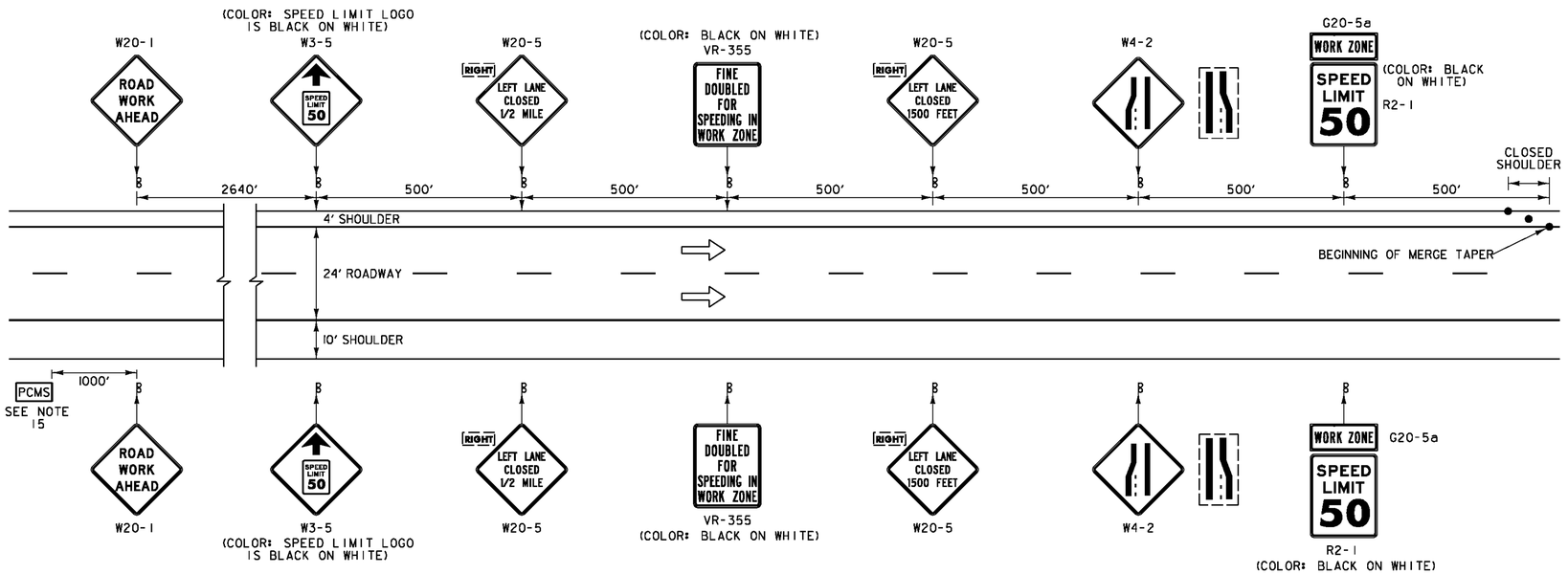
PLOT DATE: 03/15/2012
DRAWN BY: SRB
CHECKED BY: JPB
SHEET 3 OF 43

STATE OF VERMONT
AGENCY OF TRANSPORTATION

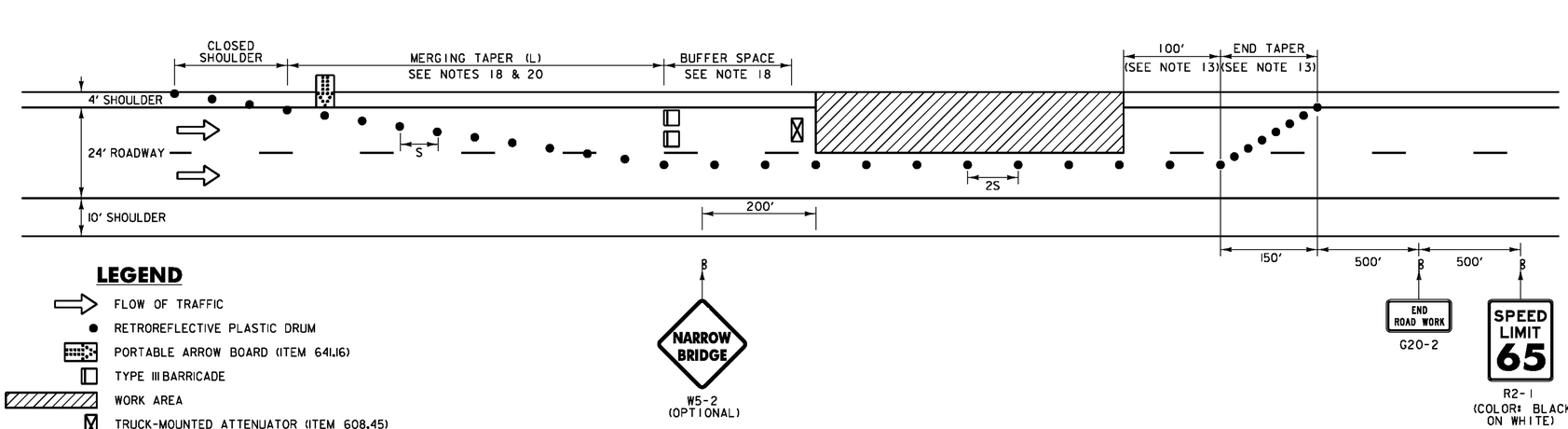
QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
					ROADWAY	BRIDGE NO. 81N	BRIDGE NO. 83N	FULL C.E. ITEMS	BRIDGE NO. 81S	BRIDGE NO. 81B	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
							1683				1683		LF	TEMPORARY 12 INCH WHITE LINE, TYPE II TAPE	646.661				
						165	364		166	71	766		EACH	RAISED PAVEMENT MARKERS, TYPE II	646.75				
						1297	1582		1303	1070	5252		SF	PAVEMENT MARKING MASK	646.86				
					1						1		LU	PRICE ADJUSTMENT, FUEL (N.A.B.I.)	690.50				
						9	18		10	34	71		GAL	SPECIAL PROVISION (REPOINTING GRANITE CURB)	900.625				

PROJECT NAME:	Waterford - St. Johnsbury
PROJECT NUMBER:	IM MEMB(32)
FILE NAME: s11A298qss.dgn	PLOT DATE: 03/15/2012
PROJECT LEADER: JPB	DRAWN BY: SRB
DESIGNED BY: SRB	CHECKED BY: JPB
QUANTITY SHEET #2	SHEET 4 OF 43



CONSTRUCTION APPROACH SIGNING ON INTERSTATE 91 LEFT LANE CLOSED



LEGEND

- FLOW OF TRAFFIC
- RETROREFLECTIVE PLASTIC DRUM
- PORTABLE ARROW BOARD (ITEM 641.16)
- TYPE III BARRICADE
- WORK AREA
- TRUCK-MOUNTED ATTENUATOR (ITEM 608.45)
- PCMS — PORTABLE CHANGEABLE MESSAGE SIGN (ITEM 641.15) (SEE NOTE 15)

TRAFFIC CONTROL ON INTERSTATE 91 LEFT LANE CLOSED

CHANNELIZING DEVICES

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

L = MINIMUM LENGTH OF TAPER
W = WIDTH OF OFFSET IN FEET. (TYPICAL)
S = POSTED SPEED IN MPH

POSTED SPEED (MPH)	TAPER LENGTHS (FT)		TANGENT W=12 FT (L/2)	BARRIER FLARE RATE (MINIMUM)	MINIMUM BUFFER SPACE LENGTH (FT)	MAXIMUM CHANNELIZING DEVICE SPACING (FT)	
	SHOULDER W=10 FT (L/3)	MERGING 12 FT LANE• (L)				TAPER (S)	TANGENT (2S)
≤40	90	320	160	1:9	305	40	80
45	150	540	270	1:9	360	45	90
50	170	600	300	1:11	425	50	100
55	185	660	330	1:13	495	55	110
60	200	720	360	1:13	570	60	120
65	215	780	390	1:13	645	65	130

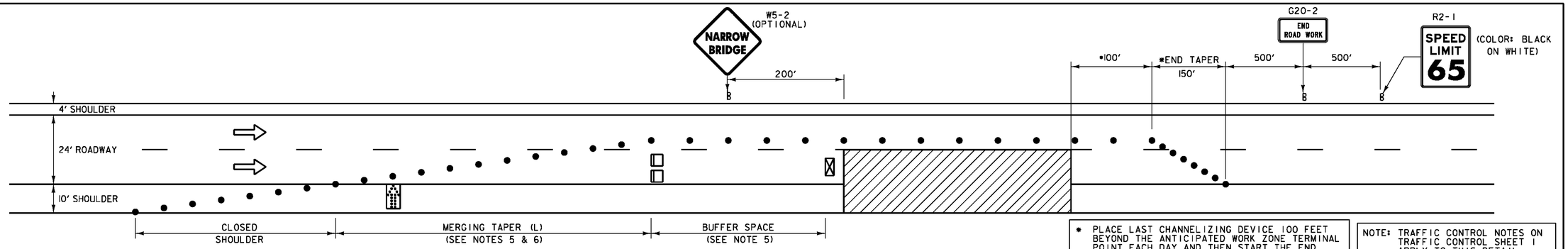
• SEE NOTE 20.

TRAFFIC CONTROL NOTES:

1. THE LEFT LANE CLOSURE IS SHOWN. THE RIGHT LANE APPROACH SIGNING IS SIMILAR. THE RIGHT LANE CLOSURE IS SHOWN ON TRAFFIC CONTROL SHEET 2.
2. THE EXISTING SPEED LIMIT ON THE MAINLINE IS 65 MPH. THE SPEED LIMIT WILL BE REDUCED TO 50 MPH IN THE WORK ZONE FOR THIS PROJECT EXCEPT AS NOTED. ANY EXISTING SPEED LIMIT SIGNS WITHIN THE SPEED REDUCTION AREA SHALL BE COMPLETELY COVERED.
3. CONSTRUCTION SIGNS SHALL BE INSTALLED SO AS NOT TO OBSTRUCT EXISTING SIGNS.
4. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND THE "STANDARD HIGHWAY SIGNS AND MARKINGS" BOOK (SHSM) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION (FHWA).
5. SOLID SUBSTRATE CONSTRUCTION SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING "AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) TYPE VII, VIII OR IX REQUIREMENTS, UNLESS OTHERWISE NOTED. BLACK AND WHITE REGULATORY SIGNS SHALL BE A MINIMUM OF TYPE III, UNLESS OTHERWISE NOTED.
6. ROLL UP SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING ASTM TYPE VI.
7. CONSTRUCTION SIGNS SHALL BE ERECTED BEFORE THE START OF ANY WORK AND SHALL BE COVERED UNTIL WORK COMMENCES, DURING PERIODS OF INACTIVITY, OR UPON COMPLETION OF THE WORK. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMANLIKE MANNER. SIGNS SHALL BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER.
8. FIXED SIGNS SHALL BE SET SECURELY IN THE GROUND. THE BOTTOM OF A SIGN SHALL BE AT LEAST SEVEN FEET ABOVE THE EDGE OF PAVEMENT. THE NEAREST EDGE OF A SIGN SHALL BE AT LEAST SIX FEET OUTSIDE THE SHOULDER POINT OR FOUR FEET OUTSIDE GUARDRAIL.
9. PORTABLE SIGNS SHALL BE PLACED ON THE EDGE OF ROADWAY AND ONE FOOT MINIMUM ABOVE TRAVELED WAY. ALL VEGETATION THAT INTERFERES WITH VISIBILITY OF THE SIGNS SHALL BE REMOVED AT THE CONTRACTOR'S EXPENSE. WHEN PLACED BEHIND GUARDRAIL, THE BOTTOM OF THE SIGN FACE SHALL BE ABOVE THE TOP OF THE GUARDRAIL.
10. WHERE SIGN INSTALLATIONS ARE NOT PROTECTED BY GUARDRAIL OR OTHER APPROVED TRAFFIC BARRIERS, ALL SIGN STANDS AND POST INSTALLATIONS SHALL BE "NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM" (NCHRP) REPORT 350 COMPLIANT. NO SIGN POSTS SHALL EXTEND OVER THE TOP OF THE SIGN INSTALLED ON SAID POST(S). WHEN ANCHORS ARE INSTALLED, STUB SHALL NOT BE GREATER THAN FOUR INCHES ABOVE EXISTING GROUND.
11. THE CONTRACTOR SHALL HAVE SIGNS FOR CLOSURE OF RIGHT AND LEFT LANES ON PROJECT BEFORE WORK COMMENCES.
12. THE NUMBER OF CHANNELIZING DEVICES, TYPE THREE BARRICADE AND OTHER TRAFFIC CONTROL DEVICES SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL NUMBER REQUIRED ARE TO BE DETERMINED BASED ON INDIVIDUAL DETOUR CONDITIONS (TAPERS, SPEED LIMITS, LENGTH OF DETOUR, CURVE, ETC.). WARNING LIGHTS SHALL NOT BE USED ON CHANNELIZING DEVICES.
13. PLACE LAST CHANNELIZING DEVICE 100 FEET BEYOND THE ANTICIPATED WORK ZONE TERMINAL POINT EACH DAY AND THEN START THE END TAPER. THE END TAPER SHALL BE CONSTRUCTED OF 8 ADDITIONAL RETROREFLECTIVE DRUMS SPACED AT 20 FEET MAX. ON CENTER.
14. THE ARROW BOARD SHALL BE PLACED ON THE SHOULDER OF THE ROADWAY, OR, IF PRACTICAL, FURTHER FROM THE TRAVELED LANE AT THE END OF THE SHOULDER TAPER.
15. THE PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE USED AT THE DISCRETION OF THE ENGINEER, THE PCMS SHALL BE USED IN ACCORDANCE WITH SECTION 6F.60 OF THE MUTCD. THE PCMS SHALL READ 'LEFT (OR RIGHT) LANE CLOSED AHEAD, PLEASE MERGE EARLY'.
16. TRAVEL LANE SHALL BE A MINIMUM OF 12 FEET WIDE EXCEPT FOR BRIDGE NO. 81B WITH A MINIMUM OF 11 FEET WIDE.
17. THE CONTRACTOR SHALL REDUCE TRAFFIC TO ONE LANE DURING WORKING HOURS IN ACCORDANCE WITH THIS SHEET. ALL EQUIPMENT SHALL BE MOVED TO A LOCATION OFF PAVED SHOULDERS AND OUTSIDE THE CLEAR ZONE (MINIMUM 30 FEET) DURING NON-WORK PERIODS AND PROTECTED BY BARRELS OR CONES, UNLESS PROTECTED BY TRAFFIC BARRIER OR GUARDRAIL.
18. AT THE DISCRETION OF THE ENGINEER, MERGING TAPER AND BUFFER SPACE LENGTHS MAY BE EXTENDED BEYOND MINIMUM VALUES, ESPECIALLY IN CLOSE PROXIMITY TO INTERCHANGE RAMPS, CURVES, OR OTHER INFLUENCING FACTORS. THIS WORK SHALL BE INCIDENTAL TO ITEM 641.10, 'TRAFFIC CONTROL'.
19. FOR BRIDGE 83N, TRAFFIC CONTROL SHALL BE INSTALLED IN ACCORDANCE WITH STANDARDS E-106, 'MAINLINE LANE CLOSURE AT AN ENTRANCE RAMP'. ALL TAPER LENGTHS SHALL BE ADJUSTED FOR AN ADDITIONAL LANE. PHASING SHALL OCCUR PER THE APPROPRIATE MEMBRANE SPLICE DETAILS ON THE BITUMINOUS CONCRETE DETAILS SHEET 3.
20. EXTEND MERGING TAPER TO ACCOUNT FOR REQUIRED LANE SHIFT OFFSET.

PROJECT NAME: WATERFORD - ST. JOHNSBURY
PROJECT NUMBER: IM MEMB(32)

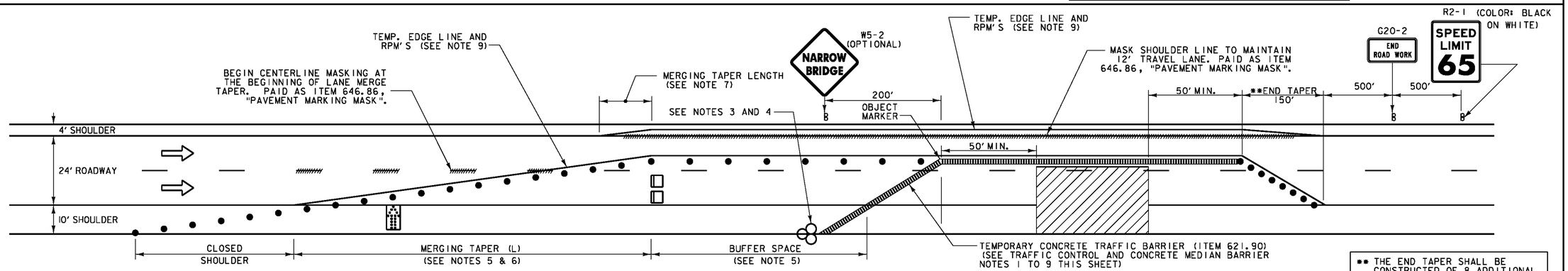
FILE NAME: sllo298ts.dgn
PROJECT LEADER: JPB
DESIGNED BY: SRB
PLOT DATE: 3/15/2012
DRAWN BY: MWS
CHECKED BY: JF
TRAFFIC CONTROL SHEET 1
SHEET 5 OF 43



* PLACE LAST CHANNELIZING DEVICE 100 FEET BEYOND THE ANTICIPATED WORK ZONE TERMINAL POINT EACH DAY AND THEN START THE END TAPER. THE END TAPER SHALL BE CONSTRUCTED OF 8 ADDITIONAL RETROREFLECTIVE DRUMS SPACED AT 20 FEET MAX. ON CENTER.

NOTE: TRAFFIC CONTROL NOTES ON TRAFFIC CONTROL SHEET 1 APPLY TO THIS DETAIL.

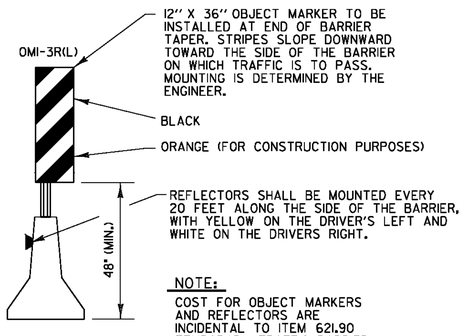
TRAFFIC CONTROL ON INTERSTATE 91 RIGHT LANE CLOSED



** THE END TAPER SHALL BE CONSTRUCTED OF 8 ADDITIONAL RETROREFLECTIVE DRUMS SPACED AT 20 FEET MAX. ON CENTER.

TRAFFIC CONTROL ON INTERSTATE 91 RIGHT LANE CLOSED WITH TEMPORARY BARRIER PROTECTION (SEE NOTE 2)

(RIGHT LANE CLOSURE SHOWN, LEFT LANE CLOSURE MIRRORED)



NOTE:
COST FOR OBJECT MARKERS AND REFLECTORS ARE INCIDENTAL TO ITEM 621.90 TEMPORARY TRAFFIC BARRIER.

LEGEND

- FLOW OF TRAFFIC
- RETROREFLECTIVE PLASTIC DRUM
- PORTABLE ARROW BOARD (ITEM 641.16)
- TYPE III BARRICADE
- WORK AREA
- TRUCK-MOUNTED ATTENUATOR (ITEM 608.45)
- PCMS — PORTABLE CHANGEABLE MESSAGE SIGN (ITEM 641.15) (SEE NOTE 15 ON TRAFFIC CONTROL SHEET 1)
- ENERGY ABSORPTION ATTENUATOR (ITEM 621.56)
- TEMPORARY TRAFFIC BARRIER (ITEM 621.90)

CHANNELIZING DEVICES

POSTED SPEED (MPH)	TAPER LENGTHS (FT)		TANGENT W=12 FT (L/2)	BARRIER FLARE RATE (MINIMUM)	MINIMUM BUFFER SPACE LENGTH (FT)	MAXIMUM CHANNELIZING DEVICE SPACING (FT)	
	SHOULDER W=10 FT (L/3)	MERGING 12 FT LANE• (L)				TAPER (S)	TANGENT (2S)
≤40	90	320	160	1:9	305	40	80
45	150	540	270	1:9	360	45	90
50	170	600	300	1:11	425	50	100
55	185	660	330	1:13	495	55	110
60	200	720	360	1:13	570	60	120
65	215	780	390	1:13	645	65	130

• SEE NOTE 6.

TAPER RATES ARE DETERMINED USING THE FOLLOWING EQUATION:
L = WS FOR POSTED SPEEDS OF 45 MPH OR GREATER
L = WS²/60 FOR POSTED SPEEDS OF 40 MPH OR LESS

L = MINIMUM LENGTH OF TAPER
W = WIDTH OF OFFSET IN FEET. (TYPICAL)
S = POSTED SPEED IN MPH

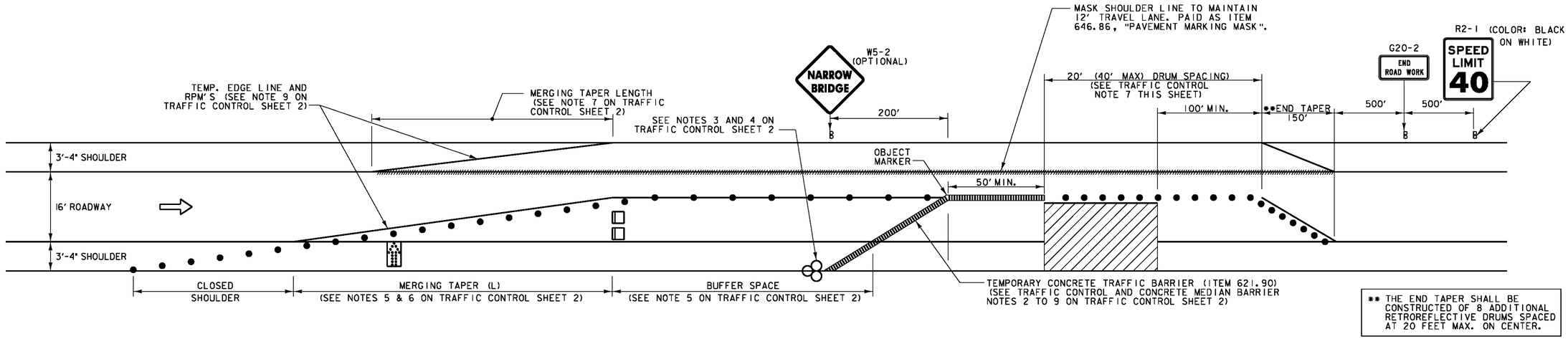
TRAFFIC CONTROL AND CONCRETE MEDIAN BARRIER NOTES:

1. SEE THE TRAFFIC CONTROL NOTES ON THE PREVIOUS SHEET (TRAFFIC CONTROL SHEET 1) FOR ADDITIONAL NOTES AND APPROACH SIGNING FOR THE RIGHT LANE CLOSURE.
2. IF THE LANE CLOSURE IS TO LAST LONGER THAN 3 DAYS, THE CONTRACTOR SHALL USE TEMPORARY TRAFFIC BARRIER AS SHOWN ON THIS SHEET AND PAID FOR AS ITEM 621.90, "TEMPORARY TRAFFIC BARRIER". TEMPORARY TRAFFIC BARRIER SHALL BE A CONCRETE MEDIAN BARRIER (CMB) TYPE. STEEL BEAM GUARDRAIL WILL NOT BE ALLOWED FOR USE AS A TEMPORARY TRAFFIC BARRIER. WHEN ONE SIDE OF THE BRIDGE IS COMPLETE, MOVING THE BARRIER TO CLOSE THE OTHER SIDE TO TRAFFIC WILL BE PAID FOR AS ITEM 621.95, "REMOVE AND RESET TEMPORARY TRAFFIC BARRIER".
3. THE END OF THE BARRIER FACING APPROACHING TRAFFIC SHALL MEET THE FOLLOWING REQUIREMENTS.
   A. WHEN NO GUARDRAIL IS PRESENT, A 30' OFFSET SHALL BE USED FROM THE EDGE OF TRAVELLED WAY. IF A 30' OFFSET IS NOT ATTAINABLE, THEN AN ENERGY ABSORPTION ATTENUATOR SHALL BE LOCATED AT THE END OF THE BARRIER.
   B. IF GUARDRAIL IS PRESENT, THEN TEMPORARY CONCRETE TRAFFIC BARRIER SHALL BE CONNECTED TO EXISTING GUARDRAIL (COST INCIDENTAL TO ITEM 621.90, "TEMPORARY TRAFFIC BARRIER".) (COSTS FOR DISMANTLING BARRIER CONNECTION AND RESTORING EXISTING BARRIER TO ORIGINAL CONFIGURATION SHALL BE INCIDENTAL TO ITEM 621.90, "TEMPORARY TRAFFIC BARRIER".) SEE BARRIER RAIL DETAILS ON SHEET 13. AN ENERGY ABSPORTION ATTENUATOR SHALL BE LOCATED AT THE END OF THE BARRIER.
4. THE QUANTITIES INCLUDE ONE ENERGY ABSORPTION ATTENUATOR PER BRIDGE AND ONE BACKUP ATTENUATOR FOR THE PROJECT (INCLUDED IN QUANTITY FOR BRIDGE NO. 81B) TO BE USED IN THE EVENT AN IN-SERVICE ATTENUATOR IS DAMAGED AND NEEDS TO BE REPLACED. THE COST FOR THE ATTENUATORS AND TO MOVE ATTENUATORS FOR SHIFTING LANE CLOSURES SHALL BE PAID FOR AS ITEM 621.56, "ENERGY ABSORPTION ATTENUATOR". THE COST FOR ENERGY ABSORPTION ATTENUATORS USED FOR ANY OTHER TRAFFIC CONTROL SETUP SHALL BE INCIDENTAL TO ITEM 641.10, "TRAFFIC CONTROL".
5. AT THE DISCRETION OF THE ENGINEER, MERGING TAPER AND BUFFER SPACE LENGTHS MAY BE EXTENDED BEYOND MINIMUM VALUES, ESPECIALLY IN CLOSE PROXIMITY TO INTERCHANGE RAMPS, CURVES, OR OTHER INFLUENCING FACTORS. THIS WORK SHALL BE INCIDENTAL TO ITEM 641.10, "TRAFFIC CONTROL".
6. EXTEND MERGING TAPER TO ACCOUNT FOR REQUIRED LANE SHIFT OFFSET.
7. PROVIDE MERGING TAPER LENGTH AS REQUIRED FOR LANE SHIFT.
8. TEMPORARY TAPE EDGELINES SHALL BE APPLIED AND SHALL MAINTAIN A ONE FOOT MINIMUM DISTANCE FROM THE BARRIER WITH TWO FEET BEING DESIRABLE.
9. THE RAISED PAVEMENT MARKERS (RPM'S), TYPE II SHALL BE PLACED TO THE OUTSIDE OF THE TEMPORARY TAPE PAVEMENT MARKINGS. THE RPM'S SHALL BE SPACED AT 20 FEET AND SHALL BE PAID FOR UNDER ITEM 646.75, "RAISED PAVEMENT MARKERS, TYPE II".

PROJECT NAME: WATERFORD - ST. JOHNSBURY
PROJECT NUMBER: IM MEMB(32)

FILE NAME: sllo298ts.dgn
PROJECT LEADER: JPB
DESIGNED BY: SRB
TRAFFIC CONTROL SHEET 2

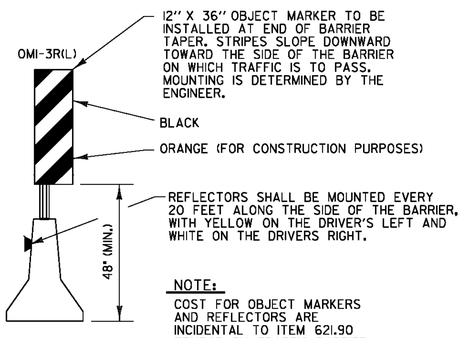
PLOT DATE: 3/15/2012
DRAWN BY: MWS
CHECKED BY: JF
SHEET 6 OF 43



** THE END TAPER SHALL BE CONSTRUCTED OF 8 ADDITIONAL RETROREFLECTIVE DRUMS SPACED AT 20 FEET MAX. ON CENTER.

TRAFFIC CONTROL ON INTERSTATE 91 RAMP "B", BRIDGE NO. 81B, RIGHT LANE CLOSED WITH TEMPORARY BARRIER PROTECTION (SEE NOTE 2 ON TRAFFIC CONTROL SHEET 2)

(RIGHT LANE CLOSURE SHOWN, LEFT LANE CLOSURE MIRRORED)



NOTE:
COST FOR OBJECT MARKERS AND REFLECTORS ARE INCIDENTAL TO ITEM 621.90 TEMPORARY TRAFFIC BARRIER.

LEGEND

- FLOW OF TRAFFIC
- RETROREFLECTIVE PLASTIC DRUM
- PORTABLE ARROW BOARD (ITEM 641.16)
- TYPE III BARRICADE
- WORK AREA
- ENERGY ABSORPTION ATTENUATOR (ITEM 621.56)
- TEMPORARY TRAFFIC BARRIER (ITEM 621.90)

CHANNELIZING DEVICES

TAPER RATES ARE DETERMINED USING THE FOLLOWING EQUATION:
L = WS FOR POSTED SPEEDS OF 45 MPH OR GREATER
L = WS²/60 FOR POSTED SPEEDS OF 40 MPH OR LESS

L = MINIMUM LENGTH OF TAPER
W = WIDTH OF OFFSET IN FEET. (TYPICAL)
S = POSTED SPEED IN MPH

POSTED SPEED (MPH)	TAPER LENGTHS (FT)		TANGENT W=12 FT (L/2)	BARRIER FLARE RATE (MINIMUM)	MINIMUM BUFFER SPACE LENGTH (FT)	MAXIMUM CHANNELIZING DEVICE SPACING (FT)	
	SHOULDER W=10 FT (L/3)	MERGING 12 FT LANE* (L)				TAPER (S)	TANGENT (2S)
≤40	90	320	160	1:9	305	40	80
45	150	540	270	1:9	360	45	90
50	170	600	300	1:11	425	50	100
55	185	660	330	1:13	495	55	110
60	200	720	360	1:13	570	60	120
65	215	780	390	1:13	645	65	130

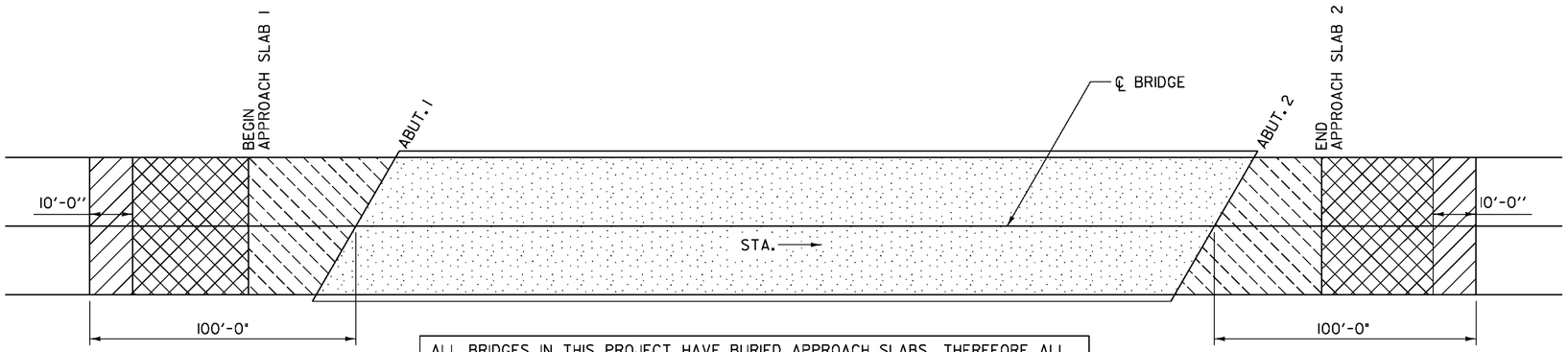
* SEE NOTE 6 ON TRAFFIC CONTROL SHEET 2.

TRAFFIC CONTROL NOTES:

1. THE EXISTING SPEED LIMIT IS 40 MPH. THE SPEED LIMIT WILL REMAIN 40 MPH IN THE WORK ZONE FOR THIS PROJECT.
2. THE APPROACH SIGNING SHALL BE SIMILAR TO THAT SHOWN ON TRAFFIC CONTROL SHEETS 1 AND 2 EXCEPT THAT THE SPEED REDUCTION SIGNS SHALL NOT BE REQUIRED.
3. SEE TRAFFIC CONTROL NOTES 3 THROUGH 10, 12 THROUGH 14, 16 THROUGH 18, AND 20 ON TRAFFIC CONTROL SHEET 1 FOR ADDITIONAL NOTES.
4. THE CONTRACTOR SHALL ERECT SIGNS FOR NARROWING OF BRIDGE RAMP ON PROJECT BEFORE WORK COMMENCES.
5. THE PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE USED AT THE DISCRETION OF THE ENGINEER. THE PCMS SHALL BE USED IN ACCORDANCE WITH SECTION 6F.60 OF THE MUTCD. THE PCMS SHALL READ "CAUTION, BRIDGE WORK AHEAD".
6. SEE THE TRAFFIC CONTROL AND CONCRETE MEDIAN BARRIER NOTES 2 THROUGH 7 AND NOTE 9 ON TRAFFIC CONTROL SHEET 2 FOR ADDITIONAL NOTES.
7. DUE TO THE NARROW TRAVELWAY AND SHOULDERS ON BRIDGE NO. 81B, CHANNELIZING DEVICES SHALL BE USED IN LIEU OF CONCRETE BARRIER WITHIN THE WORK ZONE. CONCRETE BARRIER, AS SHOWN THIS SHEET, SHALL BE LOCATED IN AN AREA PRIOR TO THE WORKZONE THAT WILL PROVIDE THE SAFE PASSAGE OF OVERSIZED VEHICLES.

PROJECT NAME: WATERFORD - ST. JOHNSBURY
PROJECT NUMBER: IM MEMB(32)

FILE NAME: sllo298ts.dgn
PROJECT LEADER: JPB
DESIGNED BY: SRB
PLOT DATE: 3/15/2012
DRAWN BY: MWS
CHECKED BY: JF
TRAFFIC CONTROL SHEET 3
SHEET 7 OF 43



ALL BRIDGES IN THIS PROJECT HAVE BURIED APPROACH SLABS. THEREFORE, ALL PAVEMENT REMOVAL BEHIND ABUTMENTS SHALL BE PAID FOR UNDER ITEM 210.10, "COLD PLANING, BITUMINOUS PAVEMENT".

COLD PLANE - 1¼"

COLD PLANE - 2½"

REMOVE BIT. CONC. PAV'T - TO THE TOP OF THE CONCRETE BRIDGE DECK AND REMOVE THE BARRIER MEMBRANE.

NOTE:

1. COLD PLANING WILL BE PAID FOR UNDER ITEM 210.10 EXCEPT AS OTHERWISE SPECIFIED IN NOTE 14 ON SHEET 2.
2. REMOVAL OF THE BIT. CONC. PAV'T. WILL BE PAID FOR UNDER ITEM 529.10.
3. REMOVAL OF THE BARRIER MEMBRANE WILL BE PAID FOR UNDER ITEM 580.16.
4. IN THE EVENT THAT COLD PLANING OF THE RIGHT ROADWAY SHOULDERS ALONG BRIDGE APPROACHES EXPOSES GRAVEL SUBBASE, THE CONTRACTOR SHALL REMOVE 2" OF GRAVEL SUBBASE, PREPARE THE AREA AS DIRECTED BY THE ENGINEER, AND PROVIDE 2" BASE PAVEMENT. IN ADDITION TO THE 2½" PAVEMENT TO BE PLACED IN TWO EQUAL LIFTS OF TYPE IV MIX IN ALL OTHER LOCATIONS PER TYPICAL APPROACH SECTION ON BITUMINOUS CONCRETE DETAILS SHEET 1. FOR BRIDGES 8IN&S, 61 ADDITIONAL TONS HAVE BEEN INCLUDED IN THE ESTIMATED QUANTITY FOR ITEM 406.27 TO ADDRESS THIS WORK. WHERE DIRECTED BY THE ENGINEER, PAYMENT FOR BASE PREPARATION WILL BE PAID FOR UNDER EQUIPMENT RENTAL ITEMS.

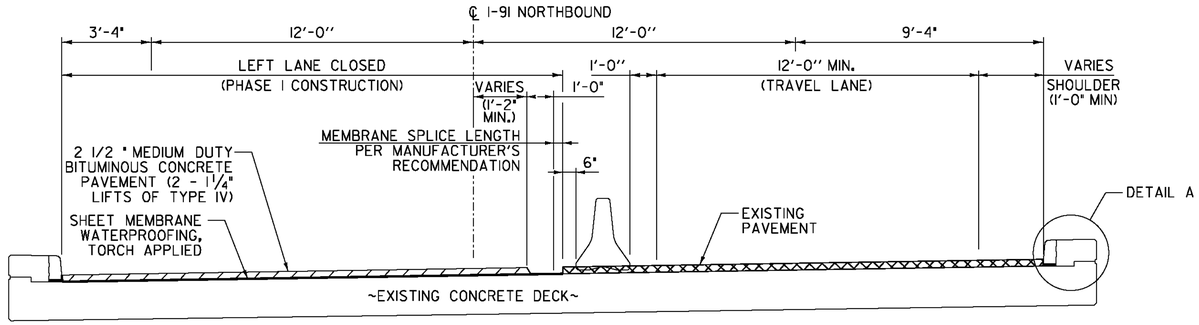
BITUMINOUS CONCRETE REMOVAL & REPLACEMENT PLAN

NOT TO SCALE

PROJECT NAME: WATERFORD - ST. JOHNSBURY
PROJECT NUMBER: IM MEMB(32)

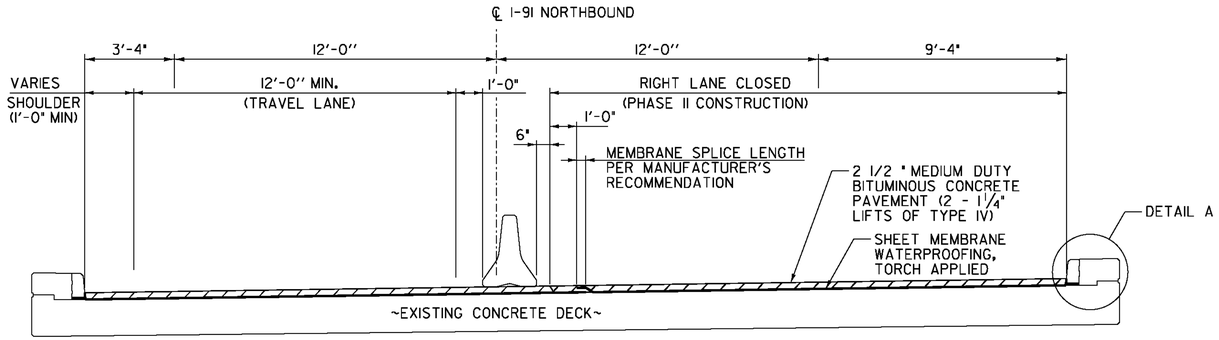
FILE NAME: sllo298removal.dgn
PROJECT LEADER: JPB
DESIGNED BY: SRB
PLOT DATE: 3/15/2012
DRAWN BY: MWS
CHECKED BY: JF

BITUMINOUS CONCRETE REMOVAL PLAN SHEET 8 OF 43



TYPICAL SECTION – PHASE I CONSTRUCTION – BRIDGE NO. 81N

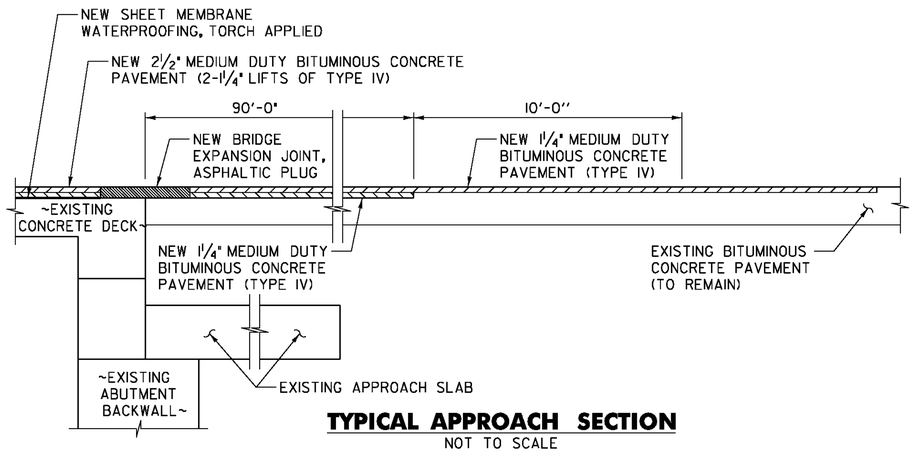
NOT TO SCALE



TYPICAL SECTION – PHASE II CONSTRUCTION – BRIDGE NO. 81N

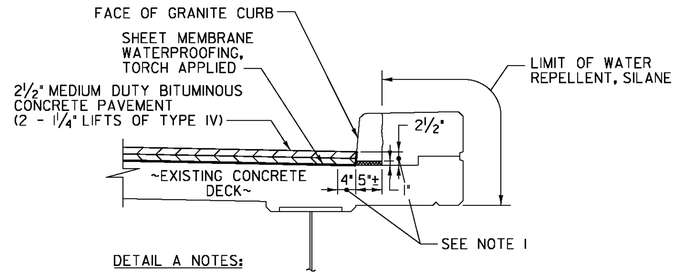
NOT TO SCALE

NOTE: PLACEMENT OF THE MEMBRANE SHALL START AT THE LOW SIDE OF THE BRIDGE. THE SPLICE SHALL BE AS SHOWN ABOVE, WITH THE HIGH SIDE OVERLAPPING THE LOW SIDE.



TYPICAL APPROACH SECTION

NOT TO SCALE



DETAIL A NOTES:

1. INDICATES AREA ALONG DECK AND UP FACE OF CURB FOR PLACEMENT OF TWO COATS OF POLYURETHANE MEMBRANE.
2. POLYURETHANE MEMBRANE AND BLAST CLEANING SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SHEET MEMBRANE WATERPROOFING, TORCH APPLIED.
3. SHEET MEMBRANE WATERPROOFING SHALL EXTEND TO FACE OF CURB AS SHOWN.
4. IN ADDITION TO THE REQUIREMENTS OF SUBSECTION 519.04, BLAST CLEAN 2½" UP THE FACE OF CURB PRIOR TO PLACING THE MEMBRANE.
5. REPOINTING OF THE GRANITE CURB SHALL BE REQUIRED AND PAID FOR UNDER ITEM 900.625, "SPECIAL PROVISION (REPOINTING GRANITE CURB). THE QUANTITY FOR THIS ITEM AS SHOWN ON THE QUANTITY SHEET IS ESTIMATED.

DETAIL A

NOT TO SCALE

BRIDGE LENGTH AND WIDTH (CURB TO CURB)

BRIDGE NO.	WIDTH (CURB TO CURB) (FEET)	LENGTH (FEET)
81B	22.67	417.92
81N	36.67	112.11
81S	36.67	124.64
83N	45.33	216.38

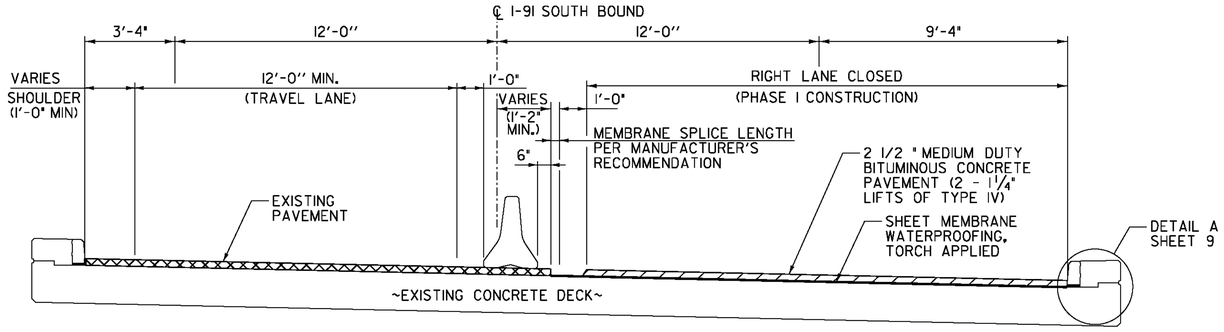
ASPHALTIC PLUG JOINT REPLACEMENT SCHEDULE

BRIDGE NO.	ABUT. 1	PIER 1	PIER 2	PIER 3	ABUT. 2
81B	23 LF	-	-	-	-
81N	38 LF	-	-	-	38 LF
81S	42 LF	-	-	-	42 LF
83N	65 LF	-	-	-	65 LF

PROJECT NAME: WATERFORD - ST. JOHNSBURY
PROJECT NUMBER: IM MEMB(32)

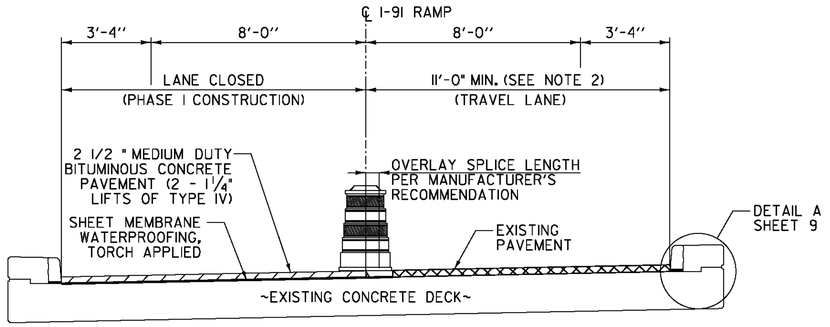
FILE NAME: sllo298conc_details.dgn
PROJECT LEADER: JPB
DESIGNED BY: SRB
PLOT DATE: 3/15/2012
DRAWN BY: MWS
CHECKED BY: JF

BITUMINOUS CONCRETE DETAILS SHEET 1



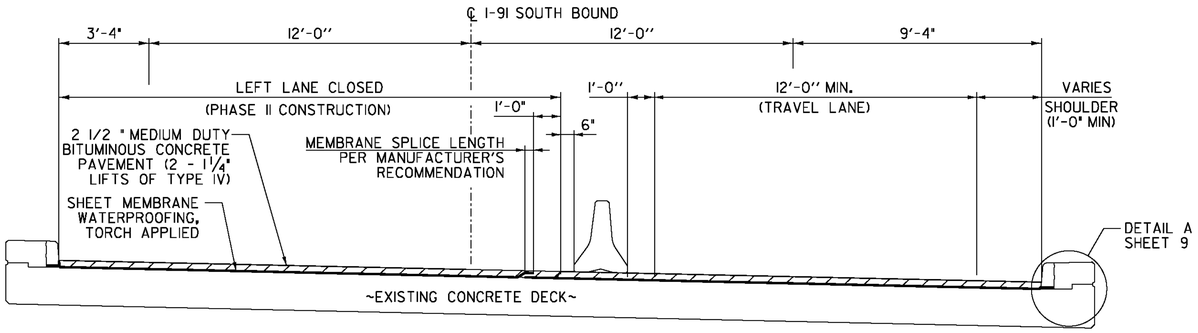
TYPICAL SECTION - PHASE I CONSTRUCTION - BRIDGE NO. 81S

NOT TO SCALE



TYPICAL SECTION - PHASE I CONSTRUCTION - BRIDGE NO. 81B

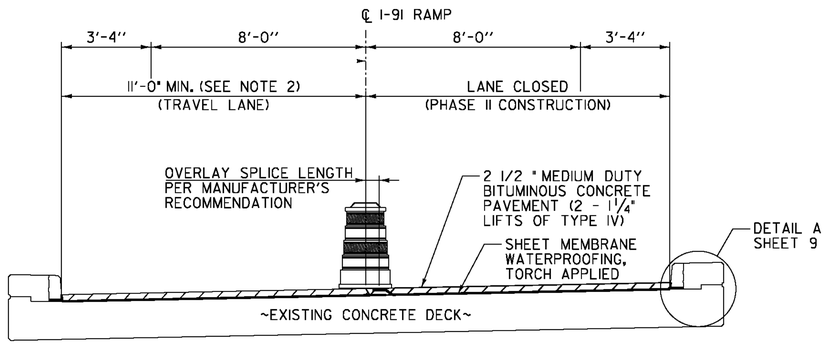
NOT TO SCALE



TYPICAL SECTION - PHASE II CONSTRUCTION - BRIDGE NO. 81S

NOT TO SCALE

NOTE: PLACEMENT OF THE MEMBRANE SHALL START AT THE LOW SIDE OF THE BRIDGE. THE SPLICE SHALL BE AS SHOWN ABOVE, WITH THE HIGH SIDE OVERLAPPING THE LOW SIDE.



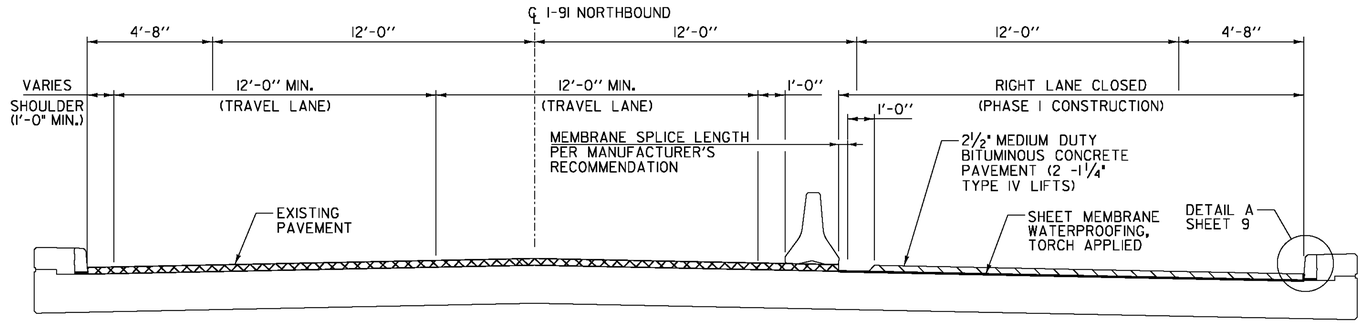
TYPICAL SECTION - PHASE II CONSTRUCTION - BRIDGE NO. 81B

NOT TO SCALE

NOTES:

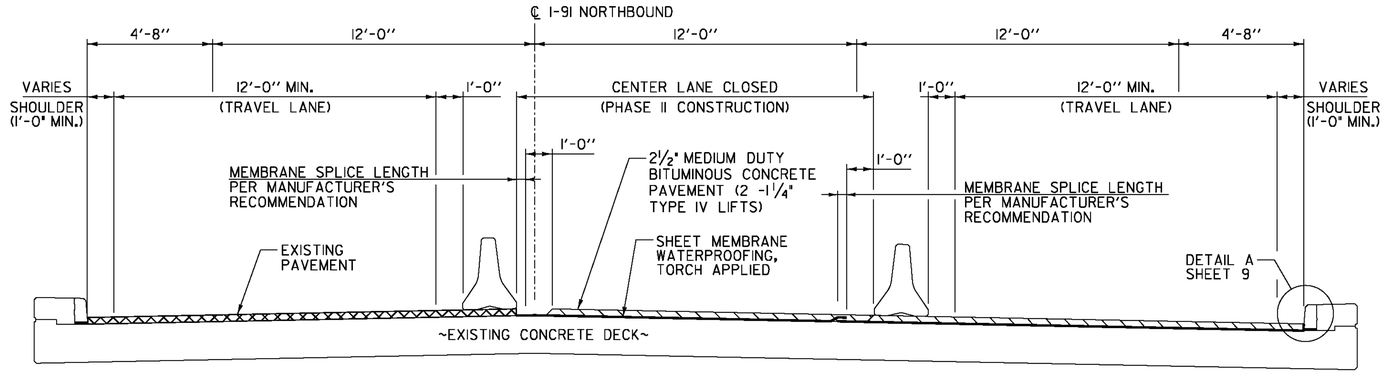
1. PLACEMENT OF THE MEMBRANE SHALL START AT THE LOW SIDE OF THE BRIDGE. THE SPLICE SHALL BE AS SHOWN ABOVE, WITH THE HIGH SIDE OVERLAPPING THE LOW SIDE.
2. TEMPORARY BARRELS SHALL BE MOVED AND REPLACED AS NECESSARY TO ACCOMMODATE OVERSIZED VEHICLES AND CONSTRUCTION ACTIVITIES. PAYMENT SHALL BE INCIDENTAL TO ITEM 641.10.

PROJECT NAME: WATERFORD - ST. JOHNSBURY	
PROJECT NUMBER: IM MEMB(32)	
FILE NAME: sllo298conc_details.dgn	PLOT DATE: 3/15/2012
PROJECT LEADER: JPB	DRAWN BY: MWS
DESIGNED BY: SRB	CHECKED BY: JF
BITUMINOUS CONCRETE DETAILS SHEET 2	SHEET 10 OF 43



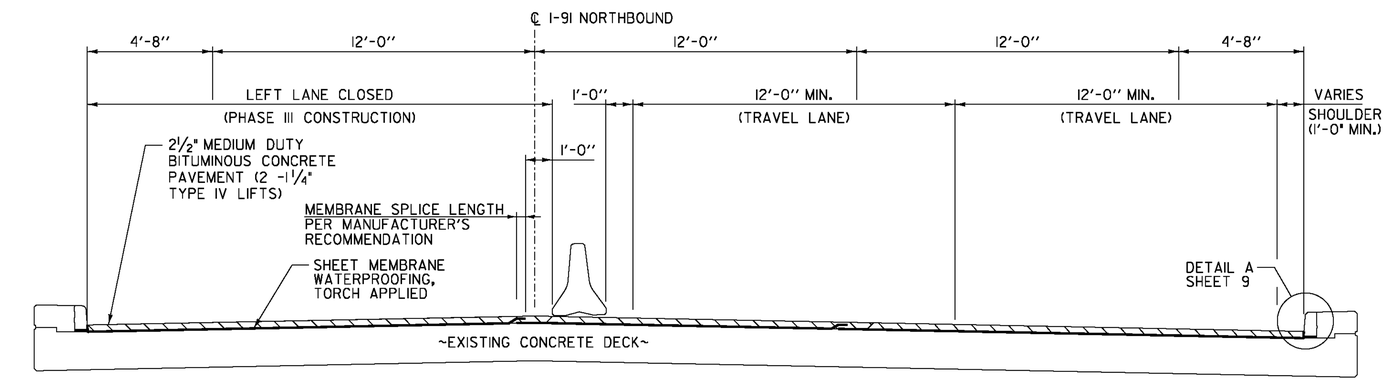
TYPICAL SECTION - PHASE I CONSTRUCTION - BRIDGE NO. 83N

NOT TO SCALE



TYPICAL SECTION - PHASE II CONSTRUCTION - BRIDGE NO. 83N

NOT TO SCALE



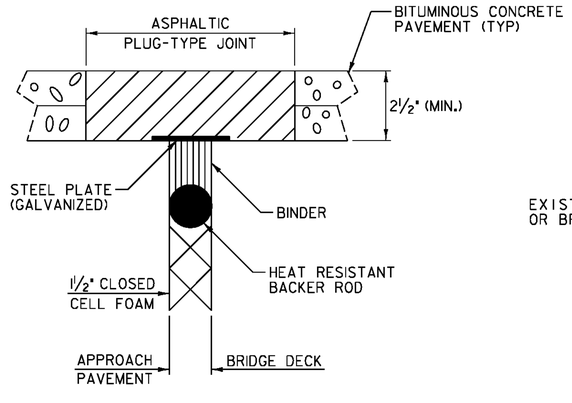
TYPICAL SECTION - PHASE III CONSTRUCTION - BRIDGE NO. 83N

NOT TO SCALE

NOTES:

1. PLACEMENT OF THE MEMBRANE SHALL START AT THE LOW SIDE OF THE BRIDGE. THE SPLICE SHALL BE AS SHOWN, WITH THE HIGH SIDE OVERLAPPING THE LOW SIDE.

PROJECT NAME: WATERFORD - ST. JOHNSBURY	
PROJECT NUMBER: IM MEMB(32)	
FILE NAME: sllo298conc_details.dgn	PLOT DATE: 3/15/2012
PROJECT LEADER: JPB	DRAWN BY: MWS
DESIGNED BY: SRB	CHECKED BY: JF
BITUMINOUS CONCRETE DETAILS SHEET 3	SHEET 11 OF 43



ASPHALTIC PLUG-TYPE JOINT DETAIL
(NOT TO SCALE)

NOTES:

1. THE JOINT SHALL BE LOCATED CENTRALLY OVER THE DECK EXPANSION GAP OR FIXED JOINT MARKED OUT TO THE MANUFACTURER'S RECOMMENDED WIDTH.
2. THE JOINT SHALL BE EXCAVATED AS SHOWN ON THE PLANS BY USE OF SAWS AND PNEUMATIC HAMMER OR A HAMMER AND CHISEL.
3. THE JOINT AREA SHALL BE BLAST CLEANED OF DEBRIS AND ASPHALT. THE JOINT AREA SHALL BE THOROUGHLY DRIED USING HOT COMPRESSED AIR PRIOR TO APPLYING BINDER MATERIAL.
4. SPALLED AND DEFECTIVE CONCRETE SHALL BE REPAIRED WITH AN APPROVED MATERIAL AS AGREED UPON BY THE ENGINEER.
5. PROPERLY SIZED HEAT RESISTANT BACKER ROD SHALL BE PLACED IN THE MOVEMENT GAP ALLOWING FOR 1INCH +/- OF BINDER ABOVE THE ROD.
6. THE BINDER MATERIAL SHALL BE HEATED AND PLACED AS RECOMMENDED BY THE MANUFACTURER.
7. PLACE ¼ INCH THICK BY 8 INCH WIDE SECTIONS OF STEEL PLATE OVER THE CENTER OF THE MOVEMENT GAP. SECURE PLATES FROM MOVING BY INSERTING LOCATING PINS THROUGH THE PRESTAMPED HOLES INTO BACKER ROD AND COVER WITH HOT BINDER.
   A. THE STEEL PLATES MAY BE OMITTED WHERE THE APPROACH SLAB IS COVERED WITH A STONE BASE OR BITUMINOUS PAVEMENT AND VERTICAL MOVEMENT OF THE PLATES MIGHT OCCUR.
   B. FOR ALL EXPANSION LENGTHS OVER 100 FEET, THE CONTRACTOR SHALL BE REQUIRED TO USE STEEL PLATE. ADJACENT SURFACES SHALL BE GROUND DOWN TO ENSURE FULL CONTACT WITH THE STEEL PLATE.
8. THE BINDER MATERIAL AND AGGREGATE SHALL BE HEATED AND MIXED AS RECOMMENDED BY THE MANUFACTURER.
9. THE INSTALLATION OF MATERIAL, COMPACTION, AND TOPCOATING SHALL BE AS RECOMMENDED BY THE MANUFACTURER.
10. IMMEDIATELY AFTER TOPCOATING, AN ANTI-SKID MATERIAL SHALL BE CAST OVER THE JOINT TO REDUCE THE RISK OF TRACKING.
11. JOINT SHALL BE PROTECTED FROM TRAFFIC UNTIL THE MATERIAL HAS COOLED TO 125°F±.

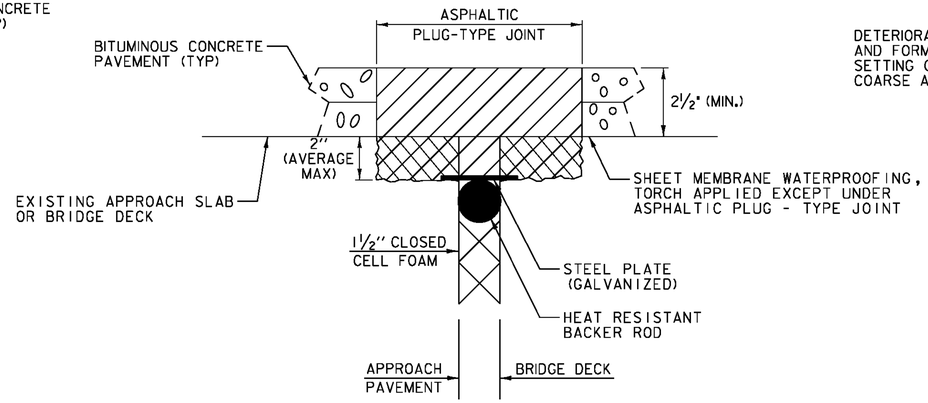
WEATHER LIMITATIONS

BINDER MATERIAL SHALL BE APPLIED ONLY WHEN THE FOLLOWING CONDITIONS PREVAIL:

A. THE AMBIENT AIR TEMPERATURE IS AT LEAST 50° F AND RISING.

B. THE ROAD SURFACE IS SUFFICIENTLY DRY.

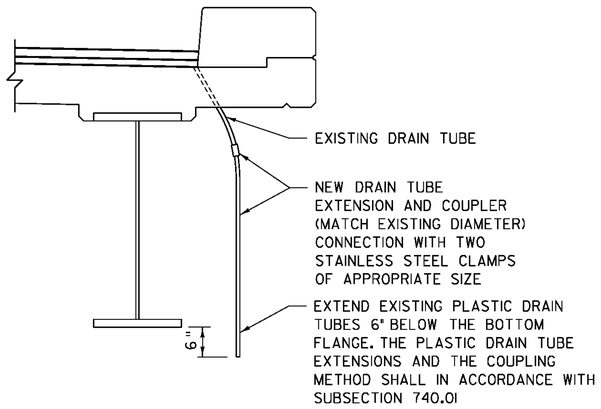
C. WEATHER CONDITIONS OR OTHER CONDITIONS ARE FAVORABLE AND ARE EXPECTED TO REMAIN SO FOR THE PERFORMANCE OF SATISFACTORY WORK.



ASPHALTIC PLUG-TYPE JOINT DETAIL
REMOVAL OF UP TO
2" DETERIORATED CONCRETE
(NOT TO SCALE)

NOTES:

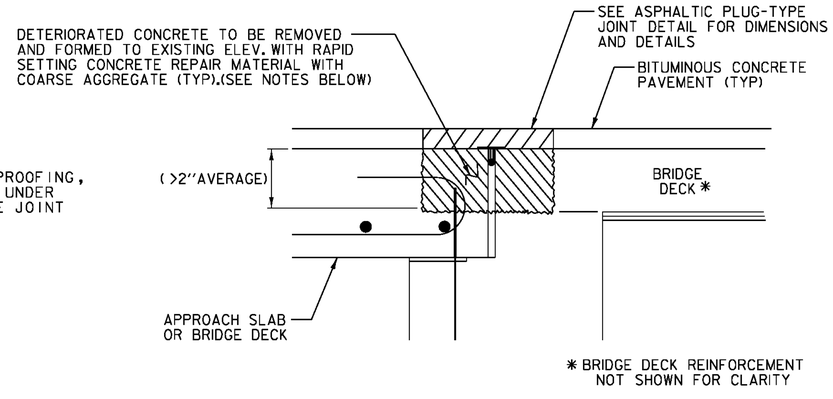
1. UPON ENCOUNTERING UP TO 2" AVERAGE OF DETERIORATED CONCRETE, THE CONTRACTOR SHALL REMOVE THE DETERIORATED MATERIAL AND REPLACE IT WITH THE ASPHALTIC PLUG JOINT MATERIAL AS DIRECTED BY THE ENGINEER.
2. REMOVAL OF THE DETERIORATED CONCRETE WILL NOT BE PAID SEPARATELY BUT WILL BE CONSIDERED INCIDENTAL TO THE UNIT BID PRICE FOR ITEM 516.10. THE ADDITIONAL PLUG JOINT MATERIAL BELOW THE DESIGN DEPTH REQUIRED TO REPLACE THE DETERIORATED CONCRETE WILL BE CONSIDERED INCIDENTAL TO THE UNIT BID PRICE FOR THE ITEM 516.10.
3. THE STEEL PLATE IN THE ASPHALTIC PLUG JOINT MAY BE OMITTED ONLY IF THE REPAIRED SURFACE IS SO IRREGULAR IT WILL CAUSE VERTICAL MOVEMENT AND IT IS DIRECTED BY THE ENGINEER.



NOTES:

1. DRAIN TUBE EXTENSION DETAIL TO BE USED WHERE THE END OF EXISTING TUBES ARE LESS THAN 6" BELOW ADJACENT BEAM OR AS DIRECTED BY THE ENGINEER. THE COST TO CLEAN AND EXTEND BRIDGE DRAIN TUBES SHALL BE INCIDENTAL TO ITEM 635.11, "MOBILIZATION/DEMOBILIZATION".
2. IF EXISTING DRAIN TUBE IS TOO SHORT TO PROVIDE AN ADEQUATE CONNECTION TO EXTEND THE TUBE, THE CONTRACTOR SHALL COMPLETELY FILL THE TUBE WITH POLYURETHANE SEALANT CONFORMING TO SUBSECTION 707.05. TUBES TO BE FILLED WITH POLYURETHANE SEALANT SHALL BE APPROVED BY THE ENGINEER PRIOR TO BEING FILLED. COST SHALL BE INCIDENTAL TO ITEM 635.11, "MOBILIZATION/DEMOBILIZATION".

DRAIN TUBE EXTENSION DETAIL
(NOT TO SCALE)



ASPHALTIC PLUG-TYPE JOINT DETAIL
REMOVAL OF >2"
DETERIORATED CONCRETE
(NOT TO SCALE)

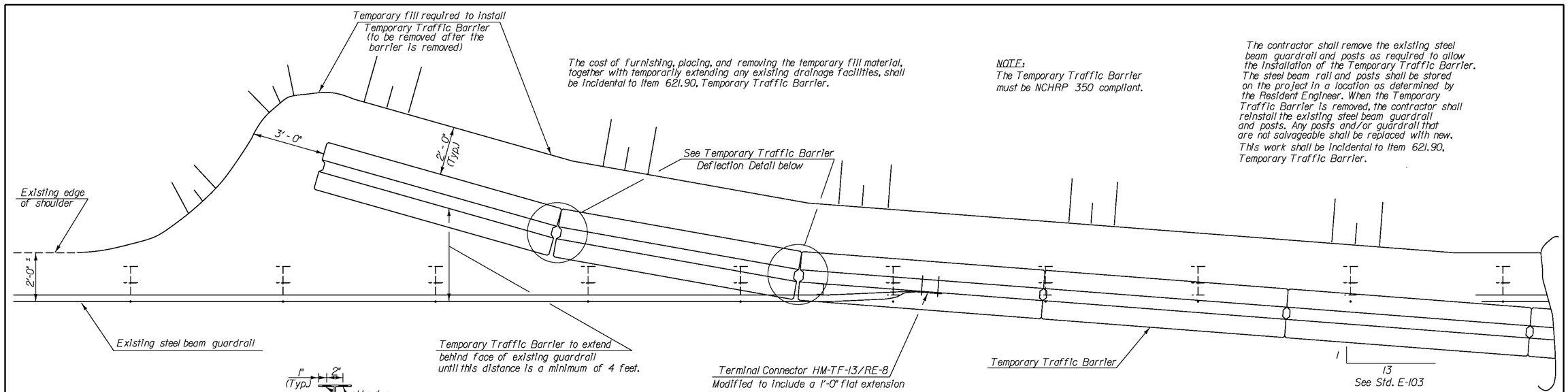
NOTES:

1. UPON ENCOUNTERING GREATER THAN 2" AVERAGE OF DETERIORATED CONCRETE, THE CONTRACTOR SHALL REMOVE THE DETERIORATED MATERIAL AND REPLACE IT WITH RAPID SETTING CONCRETE REPAIR MATERIAL WITH COARSE AGGREGATE.
2. REMOVAL OF THE DETERIORATED CONCRETE WILL BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 580.20 "RAPID SETTING CONCRETE REPAIR MATERIAL WITH COARSE AGGREGATE".
3. THE STEEL PLATE IN THE ASPHALTIC PLUG JOINT MAY BE OMITTED ONLY IF THE REPAIRED SURFACE IS SO IRREGULAR IT WILL CAUSE VERTICAL MOVEMENT AND IT IS DIRECTED BY THE ENGINEER.

PROJECT NAME: WATERFORD - ST. JOHNSBURY
PROJECT NUMBER: IM MEMB(32)

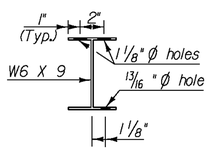
FILE NAME: sllo298jnt_detail.dgn
PROJECT LEADER: JPB
DESIGNED BY: SRB
MISCELLANEOUS BRIDGE DETAILS

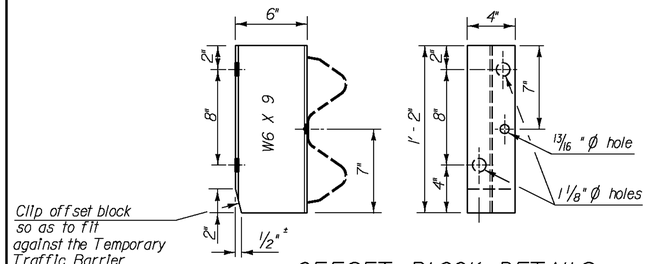
PLOT DATE: 3/15/2012
DRAWN BY: MWS
CHECKED BY: JF
SHEET 12 OF 43



PLAN VIEW SHOWING POSITIVE CONNECTION BETWEEN TEMPORARY TRAFFIC BARRIER AND EXISTING GUARDRAIL

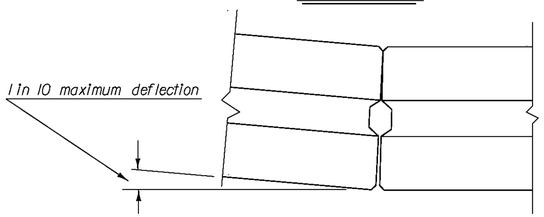
1/2" = 1'-0"





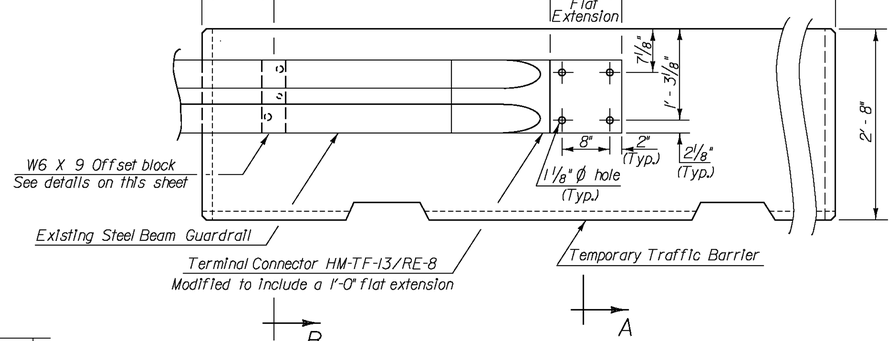
OFFSET BLOCK DETAILS

1" = 6"



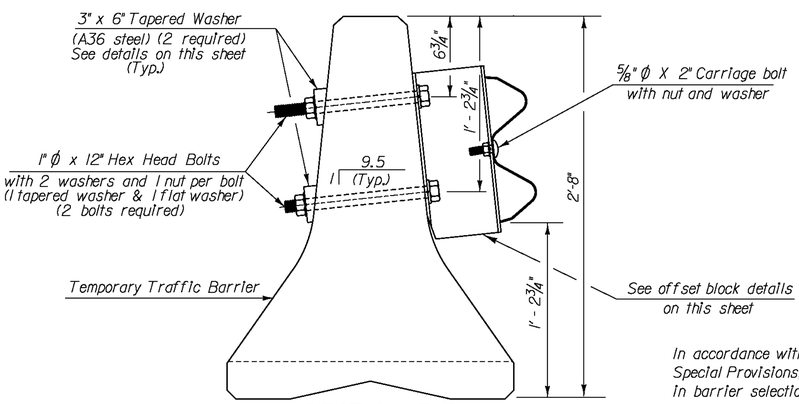
TEMPORARY TRAFFIC BARRIER DEFLECTION DETAIL

NTS

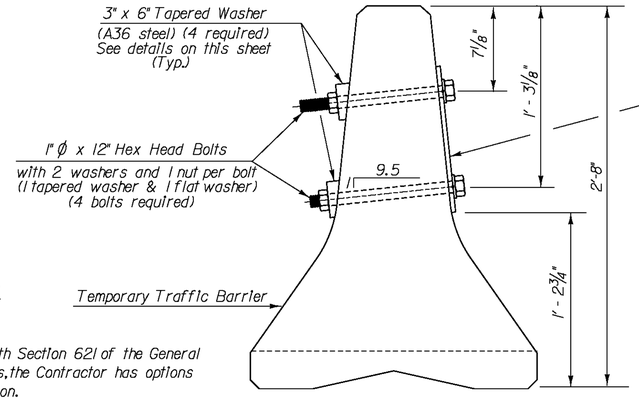


ELEVATION VIEW SHOWING POSITIVE CONNECTION BETWEEN TEMPORARY TRAFFIC BARRIER AND EXISTING GUARDRAIL

1" = 1'-0"



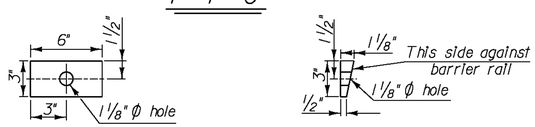
SECTION B-B



SECTION A-A

In accordance with Section 621 of the General Special Provisions, the Contractor has options in barrier selection.

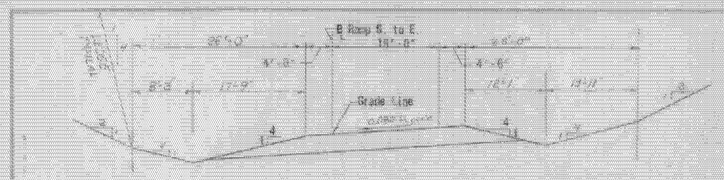
1" = 6"



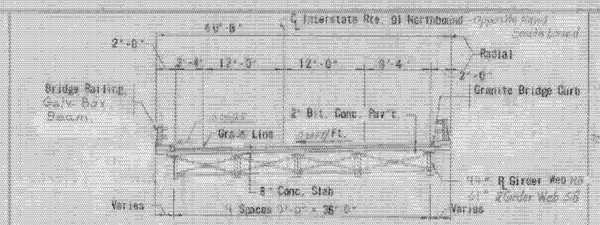
TAPERED WASHER DETAILS

1" = 6"

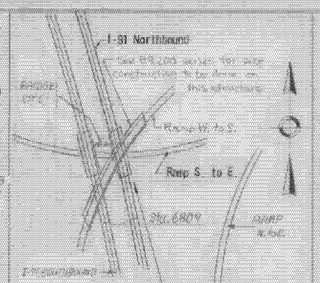
PROJECT NAME: WATERFORD - ST. JOHNSBURY	
PROJECT NUMBER: IM MEMB(32)	
FILE NAME: sl1a298rail.dgn	PLOT DATE: 3/15/2012
PROJECT LEADER: JPB	DRAWN BY: VTRANS
DESIGNED BY: VTRANS	CHECKED BY: VTRANS
BARRIER RAIL DETAILS	SHEET 13 OF 43



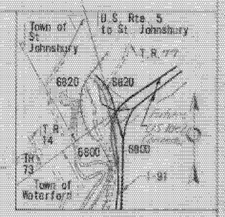
APPROACH SECTION RAMP SOUTH TO EAST
Scale: 1"=10'-0"



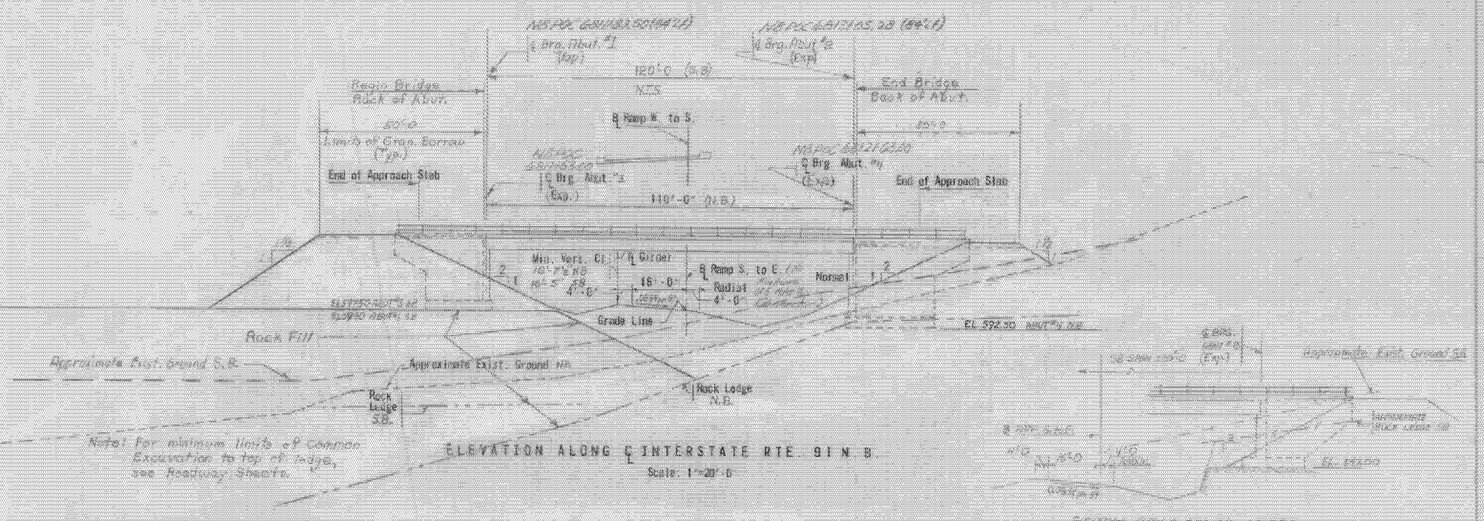
TYPICAL BRIDGE SECTION
Scale: 1"=10'-0"



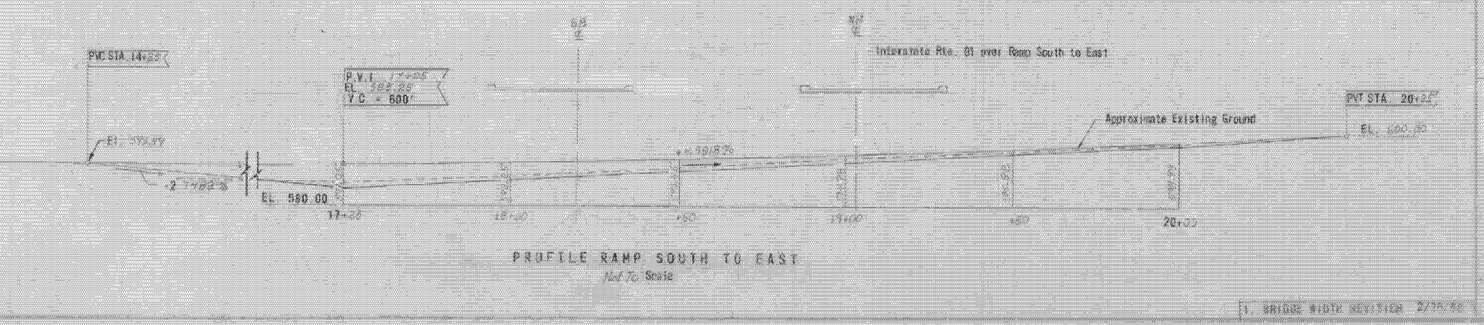
Scale: 1"=200'



STA. 6818+50
P.V.I. EL. 618.10
V.C. = 1000'
-0.300%
+.98295%



ELEVATION ALONG ℄ INTERSTATE RTE. 91 N.B.
Scale: 1"=20'-0"



PROFILE RAMP SOUTH TO EAST
Not To Scale

1. BRIDGE WIDTH REVISED 2/25/82

HIGHWAY NO. I-91 NAME OF ROADWAY INTERSTATE ROUTE 91 NORTHBOUND & SOUTHBOUND
STRUCTURE NO. 4 COUNTY CALEDONIA TOWN WATERFORD
PROJECT NO. EACI 91-2(59) LOCATION 1 MILE SOUTH OF ST. JOHNSBURY

EXISTING STRUCTURE

1 RATED LOADING OF EXISTING STRUCTURE
2 TYPE OF EXISTING STRUCTURE
3 UNDERCLEARANCE ELEVATION OF EXISTING STRUCTURE
4 WHAT DISPOSITION SHOULD BE MADE OF EXISTING STRUCTURE ? REMOVE REMARKS
5 SHOULD EXISTING STRUCTURE BE USED TO CARRY TRAFFIC DURING CONSTRUCTION OF NEW STRUCTURE ?
6 SHOULD RED TEMPORARY STRUCTURE BE SUPPLIED
7 ORDINARY HIGH WATER SURFACE ELEV. AT EXISTING STRUCTURE WATERWAY TO ORDINARY H.W.
8 EXTREME HIGH WATER AT EXISTING STRUCTURE WATERWAY TO EXTREME H.W.
9 SPAN OF EXISTING BRIDGE UPSTREAM WATERWAY TO EXTREME H.W.
SPAN OF EXISTING BRIDGE DOWNSTREAM 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, WHAT ELEVATION IS RELIEF AFFORDED ?
ADDITIONAL WATERWAY AREA PROVIDED

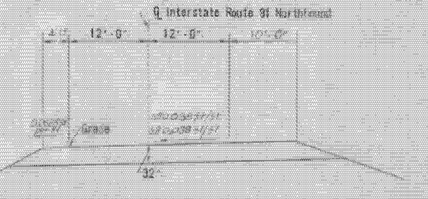
NEW STRUCTURE

1 RECOMMENDED TYPE OF STRUCTURE 2- SIMPLE SPAN COMPOSITE ♂ GIRDER
2 RECOMMENDED CLEAR SPAN OR SPANS 110'-0" N.B. 120'-0" S.B.
MEASURED PARALLEL TO ℄ NEW HIGHWAY 110'-0" N.B. 120'-0" S.B.
MEASURED AT RIGHT ANGLES TO ℄ ROAD 107'-2 3/8" N.B. 116'-7 3/8" S.B.
3 ARE THERE OBJECTIONS TO A PIER IN THE STREAM? ANSWER YES OR NO
4 ORDINARY WATER ELEVATION AT NEW STRUCTURE SOURCE OF INFORMATION
5 EXTREME HIGH WATER ELEVATION AT NEW STRUCTURE SOURCE OF INFORMATION
6 IS ALL WATER INTENDED TO PASS THROUGH NEW STRUCTURE ?
7 DOES STREAM REACH ITS MAXIMUM HIGH WATER ELEVATION RAPIDLY ? IS ORDINARY RISE RAPID?
8 LOW WATER ELEVATION AT NEW STRUCTURE
9 DRAINAGE AREA IN ACRES ABOVE STRUCTURE CHARACTER OF TERRAIN
10 IS STREAM EVER DRY
11 VELOCITY OF STREAM AT ORDINARY WATER STAGE ESTIMATED DISCHARGE
12 AREA, FULL OPENING AREA BELOW ORDINARY H.W.
13 CHARACTER OF SOIL CLAY? SAND? ROCK? YES
14 ESTIMATED DRAINAGE AREA ABOVE NATURAL OR ARTIFICIAL STORAGE
15 VERTICAL CLEARANCE ABOVE ROADWAY ELEVATION 16'-7" N.B. ; 16'-5" S.B.
16 ARE SIDEWALKS REQUIRED? IF SO ON WHAT SIDE? N/A WIDTH N/A
17 RECOMMENDED TYPE OF PAVEMENT 8" REINF. CONC. SLAB, 2" BITUMINOUS PAVEMENT
18 TRAFFIC TO BE MAINTAINED UNDER ITEM NO. N/A ONE OR TWO WAYS N/A
19 PROBABLE COST OF CLEARING AND GRUBBING STREAM CHANNEL AT STRUCTURE SITE N/A
20 SHOULD PROVISIONS BE MADE FOR PUBLIC UTILITIES ? NO
21 ESTIMATED ALLOWABLE LOAD ON FOUNDATIONS ? SHOULD PILES BE USED ? NO EST. LGTH. N/A

FOUNDATION INFORMATION

OBTAINED FOR DESIGN PURPOSES ONLY, AND THE STATE ASSUMES NO RESPONSIBILITY WHATSOEVER FOR THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN. BOULDERS MAY BE ENCOUNTERED AT ANY PIER OR ABUTMENT LOCATION.

N 5.75P on Indpa
2.75K on Face N.E.



APPROACH SECTION INTERSTATE RTE 91 NORTHBOUND
OPPOSITE HAND SOUTHBOUND
Scale: 1"=10'-0"

I-91 BRIDGES 81N&S
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 14 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

INT. RTE. 91 IN THE TOWNS OF WATERFORD & NHS
ROUTE NO. I-91 STA. 6812+00
INT. ROUTE 91 NB & SB OVER RAMP S. TO E

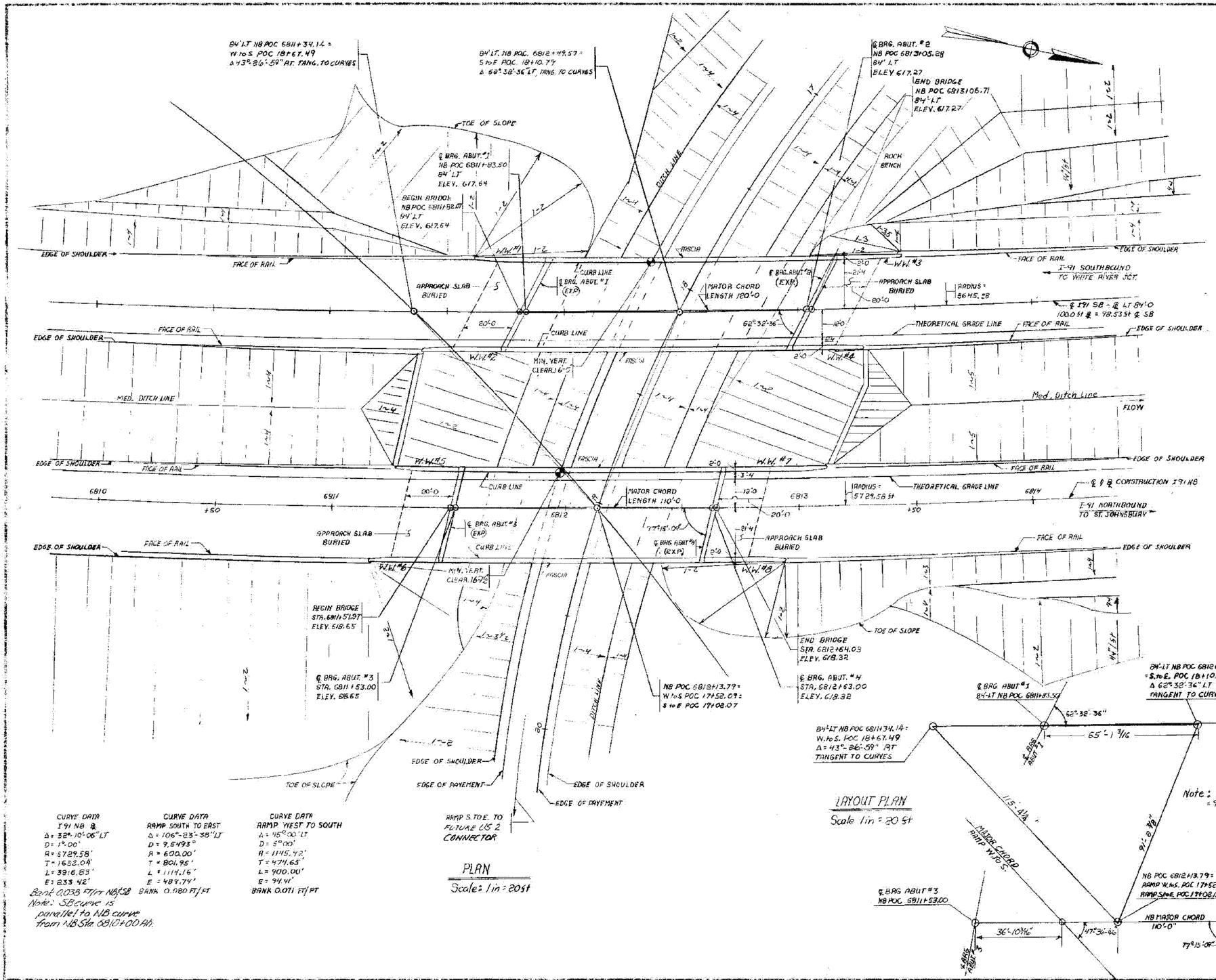
PRELIMINARY INFORMATION

DESIGNED BY K.S. DRAWN BY S.P. CHECKED BY L.S. AS SHOWN
PROJECT NO. BACI 91-2(59) SHEET NO. 119 OF 358

PROJECT BARNET - ST. JOHNSBURY
BR 400

RECOMMENDED FOR APPROVAL: [illegible] DATE
BRIDGE ENGINEER
RECOMMENDED FOR APPROVAL: [illegible] DATE
ASST. CHIEF ENGINEER
APPROVED BY: [illegible] DATE
CHIEF ENGINEER

CLARKESON, CLOUGH AND YOKEL
Consulting Engineers
ALBANY NEW YORK



CURVE DATA
I 91 NB ℄
Δ = 32°-10'-06" LT
D = 1°-00'
R = 5729.58'
T = 1652.04'
L = 3216.83'
E = 233.42'
Bank 0.038 FT/FT NB & SB

CURVE DATA
RAMP SOUTH TO EAST
Δ = 106°-23'-38" LT
D = 9.5493°
R = 600.00'
T = 801.95'
L = 1114.16'
E = 484.74'
BANK 0.080 FT/FT

CURVE DATA
RAMP WEST TO SOUTH
Δ = 45°00' LT
D = 5°00'
R = 1145.92'
T = 474.65'
L = 900.00'
E = 94.41'
BANK 0.071 FT/FT

Note: SB curve is parallel to NB curve from NB Sta. 6810+00 Ah.

PLAN
Scale: 1 in = 20 ft

LAYOUT PLAN
Scale 1 in = 20 ft

INDEX OF SHEETS

BR 400	Preliminary Information
BR 401	Quantity Sheet
BR 402-403	Borings
BR 404	Plan & General Notes
BR 405	Elevation - NB & SB
BR 406	NB Typical Section, Camber Dets. & Rail Layout
BR 407	SB Typical Section, Bearing Device Details
BR 408	NB Framing Plan
BR 409	SB Framing Plan
BR 410	Abutment No. 1
BR 411	Wingwall No. 1 & 2
BR 412	Abutment No. 2
BR 413	Wingwall No. 3 & 4
BR 414	Abutment No. 3
BR 415	Wingwall No. 5, 6, 7, & 8
BR 416	Abutment No. 4
BR 417	Approach Slab Details
BR 418-420	Reinforcing Schedule

REFERANCE SHEETS

NB & SB Roadway Plan, Profile, & X-Sections
Ramp W to S Profile
Ramp S. to E. Profile

STANDARD DRAWINGS

SCB-D1-75	4-23-75 (R)
SCB-D2-71	12-29-75 (R)
SCB-D4-76	1-8-76
SCB-D6-73	12-29-75 (R)
SCB-D7-71	1-22-73 (R)
SB-R4-73	1-28-74 (R)
G-1b	5-22-74 (R)

GENERAL NOTES

1. The General Notes pertaining to Specifications, Materials & Construction shown on Standard Dwg. SCB-D1-75 all apply except #12.

2. Expansion bearings, including anchor bolts, shall be paid for at the unit price bid per pound for Item 506.91, Structural Steel (Plate Girder).

3. All surfaces of structural steel shall be blast cleaned as specified under section 506.47(b)2. Protection of concrete and field cleaning of structural steel shall be as specified under Section 506.50.

4. For curb layout and curb joint details not shown see Std. Dwg.'s SCB-D4-76 and SCB-D6-76, Detail Ⓔ.

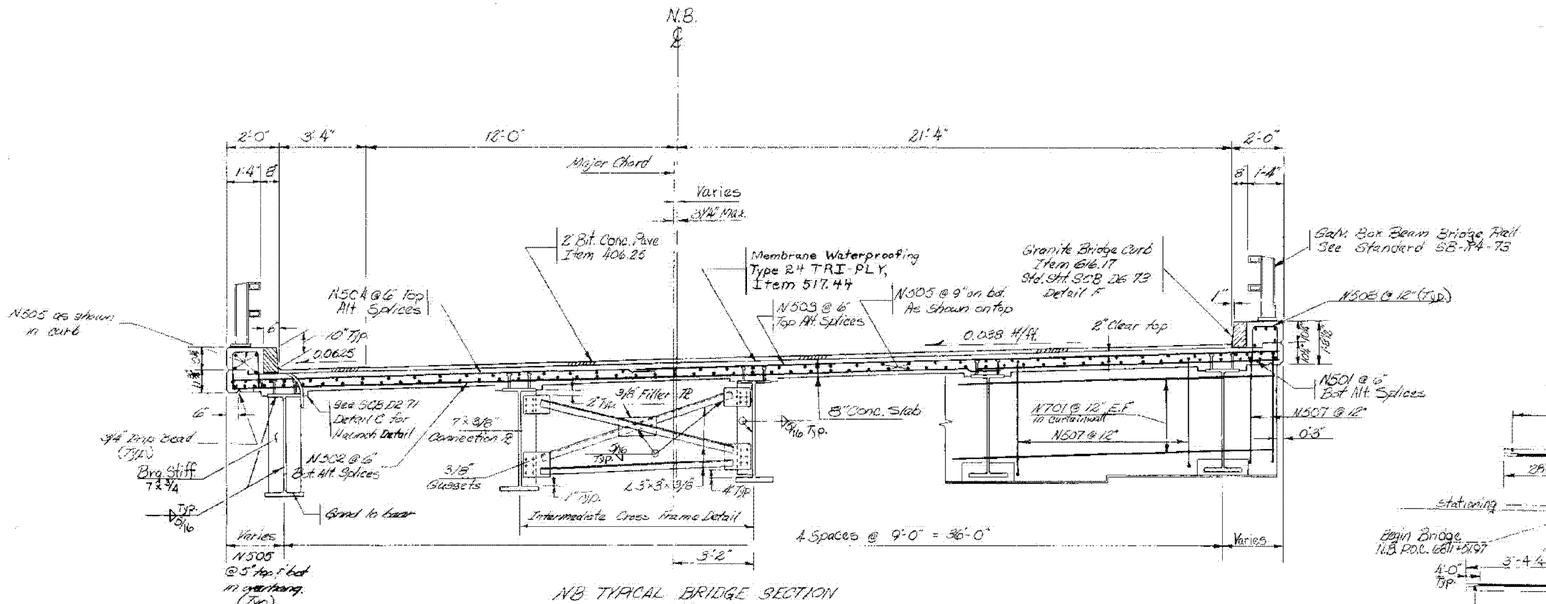
5. The abutment bridge seats and back of curtain walls shall be coated with Water Repellent.

(cont'd on BR405)

I-91 BRIDGES 81N&S
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 15 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

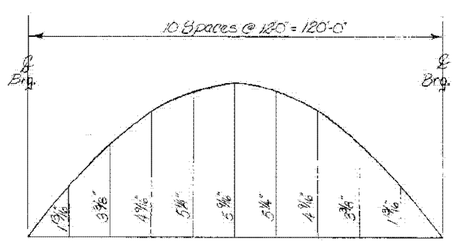
TOWN OF: WATERFORD — Bridge No. 4 & 81 N&S
HIGHWAY NO.: I-91 — Proj. No.: 6812(400)
INT. RTE. 91 NB & SB. OVER RAMP S TO E
PLAN & GENERAL NOTES
Designed by: Mittell — Drawn by: Mittell
Checked by: A. Elwood Date 3/1974 — Bridge Design Supervisor: R.S. Haupt Date 3-76
PROJECT: BARNET - ST. JOHNSBURY — PROJECT NO.: EACI 91-2(39) (28)
Bridge Sheet No. BR 404 — Sheet 190 of 358



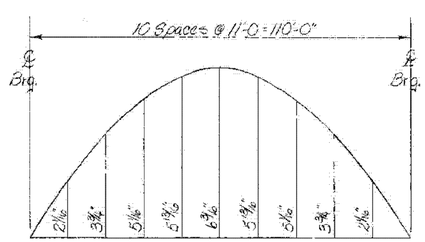
N.B. TYPICAL BRIDGE SECTION
Scale 3/8" = 1'-0"

Due to weight of Girder, Bracing, Slab, Curb, Railing and Pavement
S.B. Dead Load Deflection Diagram

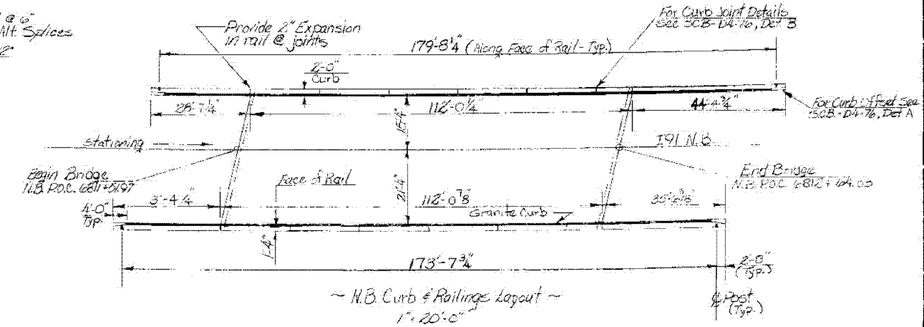
Due to weight of Girder, Bracing, Slab, Curb, Railing and Pavement
N.B. Dead Load Deflection Diagram



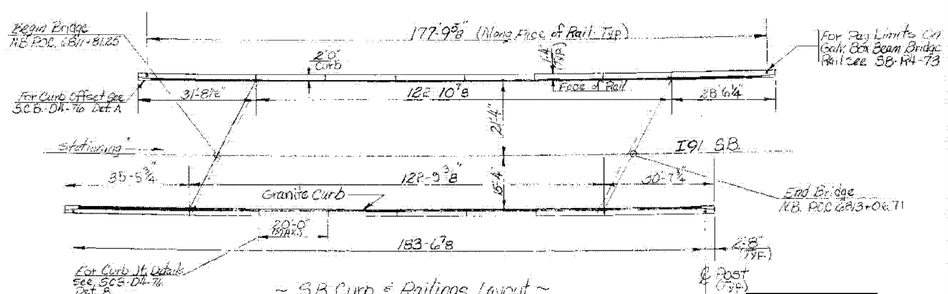
S.B. Camber Diagram
(Required Camber After Fabrication; Measured ⊥ Girder in Horiz. Position)



N.B. Camber Diagram
(Required Camber After Fabrication; Measured ⊥ Girder in Horiz. Position)



~ N.B. Curb & Railings Layout ~
1" = 20'-0"



~ S.B. Curb & Railings Layout ~
1" = 20'-0"

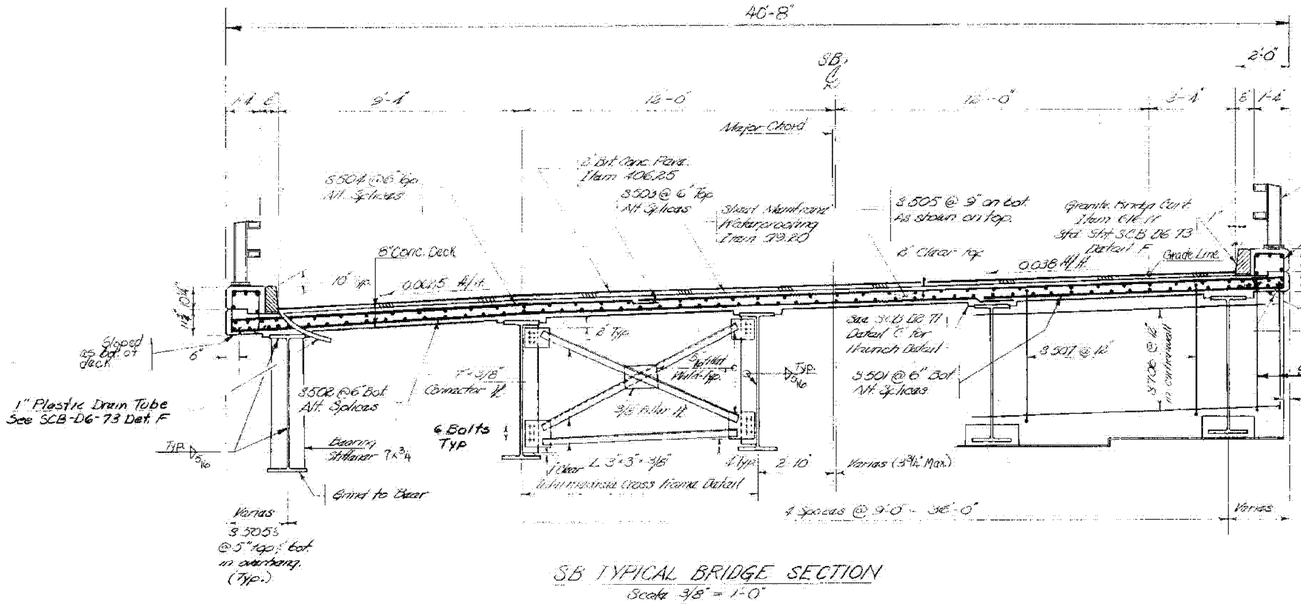
I-91 BRIDGES 81N&S
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 16 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

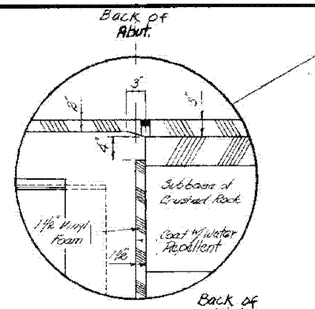
TOWN OF Waterford	Bridge No. 81
HIGHWAY NO. I91	Log Sta.
	Surv. Sta.
Int. Rte. 91 N.B. & S.B. Over Ramps S. to E.	
N.B. Typ. Section, Curb & Railing Layouts	
Designed by N. Danforth	Drawn by R. Lunt/Feamb.
Checked by J.R.B. & N.R.D. date 3-15-76	Bridge Design Supervisor R. Haupt date 3-76
PROJECT Barnet - St. Johnsbury	PROJECT No. EAC.I 91-2(59)(28)
Bridge Sheet No. BR 406	Sheet 119 of 556

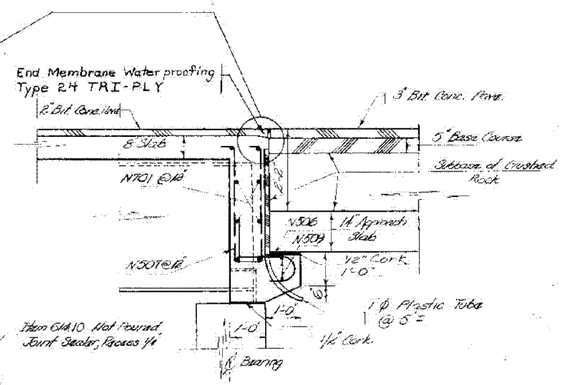
CURB & RAILING DIMENSION REVISION 12/8/76

SRM

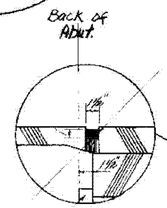


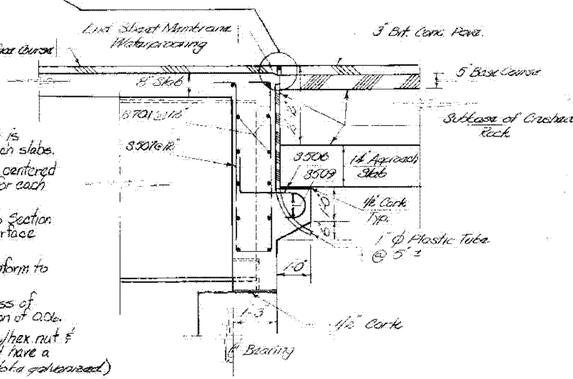
SB TYPICAL BRIDGE SECTION
Scale 3/8" = 1'-0"





NB CURTIAN WALL DETAIL
Scale 1/2" = 1'-0"

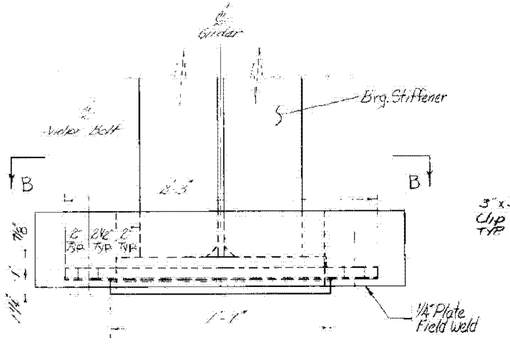




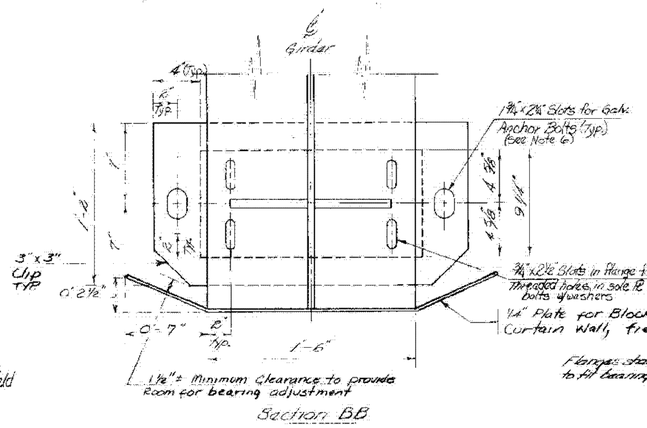
SB CURTIAN WALL DETAIL
Scale 1/2" = 1'-0"

- NOTES -

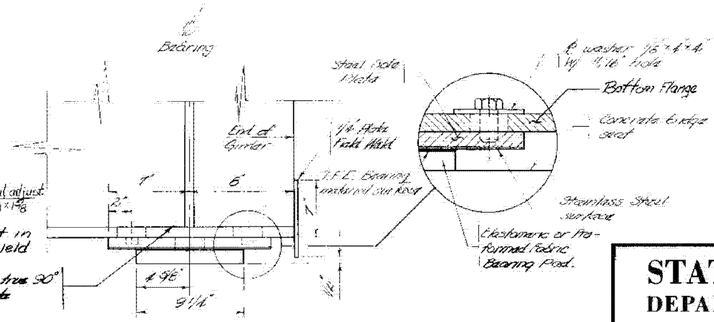
1. The movement @ each bearing due to Dead Load Elongation is expected to be approx. 3/8 towards the respective approach slabs.
2. Expansion device bearing pad & anchor bolts shall be centered @ 45° F and shall be offset 1/8" toward approach slab for each 15° change in temp. above 45° F.
3. Details of the T.F.E. expansion bearings shall conform to Section 731.05 of Std. Specifications except that the T.F.E. surface may be untilled in lieu of the tilled as specified.
4. Structural Steel in expansion bearing devices shall conform to A.A.S.H.O. M222 (A.S.T.M. A588)
5. Expansion bearing device is designed for a working stress of 1000 p.s.i. and shall have a maximum coefficient of friction of 0.06.
6. Anchor bolts shall be 1 1/2" ϕ x 1'-8" long sweedge bolts w/hex nut & 3/8" washer. The sweedge bolts shall be threaded 9" and have a projection of 6" above bridge seat elevations. (Bolts to be galvanized)
7. Expansion bearings, including anchor bolts, shall be paid for at the unit price bid per pound for Item 506.21, Structural Steel, Plate Girder.



Front Elevation



Section BB



Side Elevation

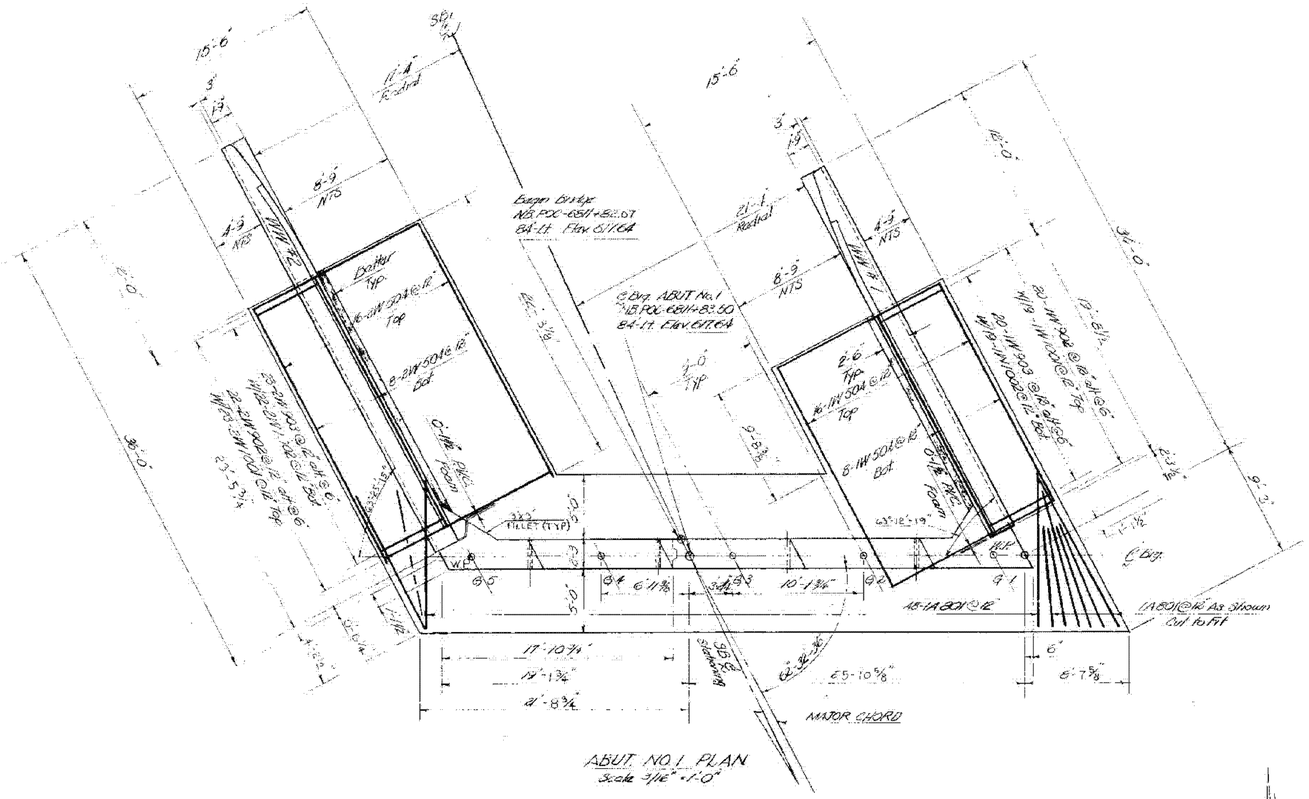
EXPANSION BEARING DEVICE
Typ. all brgs. NB and SB - NTS

I-91 BRIDGES 81N&S
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 17 OF 43
FOR REFERENCE ONLY

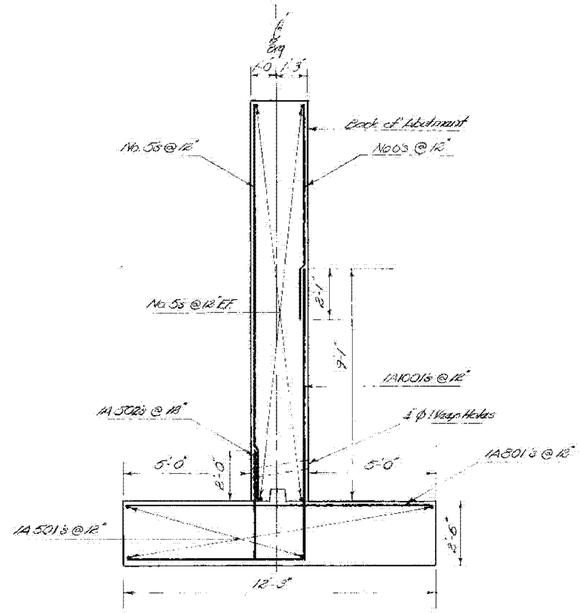
STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

TOWN OF WATERFORD	Bridge No. 9
	Log Sta.
HIGHWAY NO. I 91	Surv. Sta. 6812+C
INT. ATE 91 NB & SB Over Ramps S to E.	
SB Typical Sect., Bearing Device Details	
Designed by N. Danforth	Drawn by C. Witham
Checked by JRB & NRD. date 3-15-76	Bridge Design Supervisor R. Haupt date 3-76
PROJECT Barnet - St Johnsbury	PROJECT NO. (88) E.A.C.I. 91-2(59)
Bridge Sheet No. BR407	Sheet 119h of 358

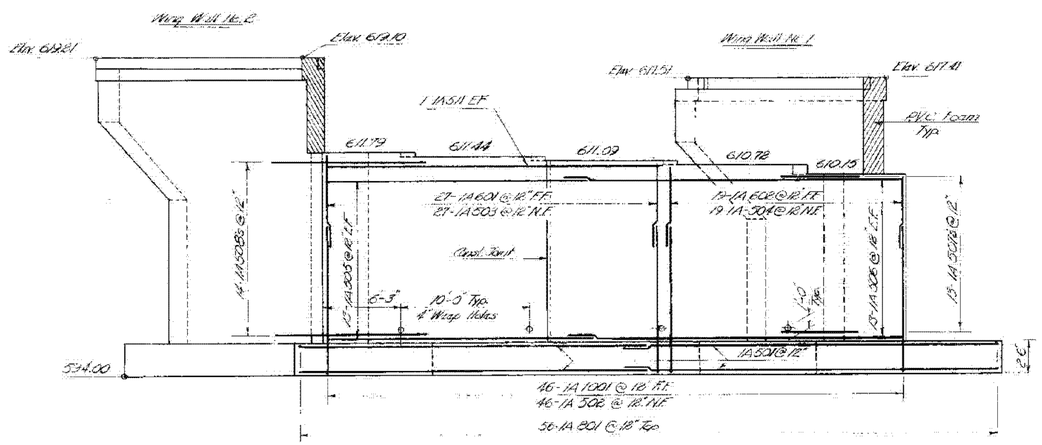
ER-9



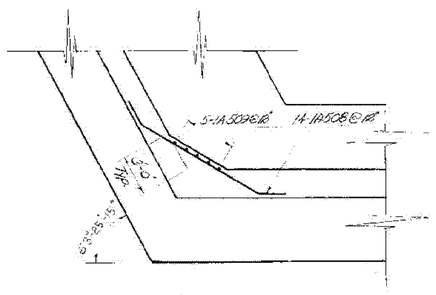
ABUT NO. 1 PLAN
Scale 3/16" = 1'-0"



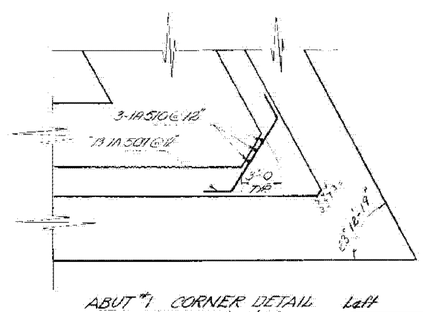
TYPICAL SECTION - ABUT #1
Scale 3/8" = 1'-0"



ABUT NO. 1 ELEVATION
Scale 3/16" = 1'-0"



ABUT #1 CORNER DETAIL Right
Scale 3/16" = 1'-0"



ABUT #1 CORNER DETAIL Left
Scale 3/16" = 1'-0"

NOTES
1. For quantity limit typical see BR. A14

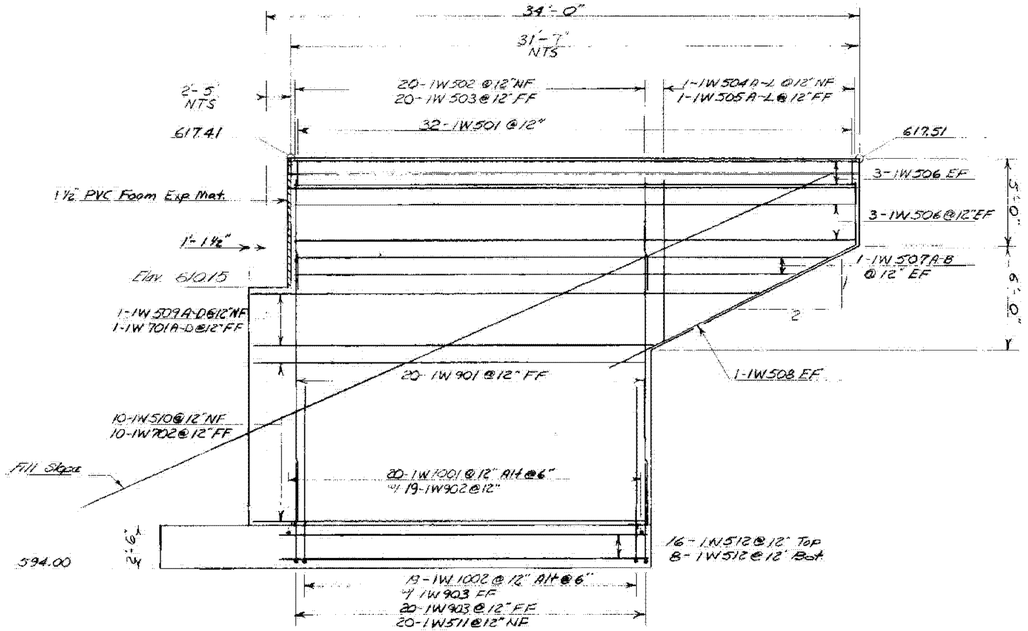
ABUTMENT DIMENSIONS & CORNER DETAIL ANGLES REVISION 12/8/76 RSL

I-91 BRIDGES 81N&S
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 18 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

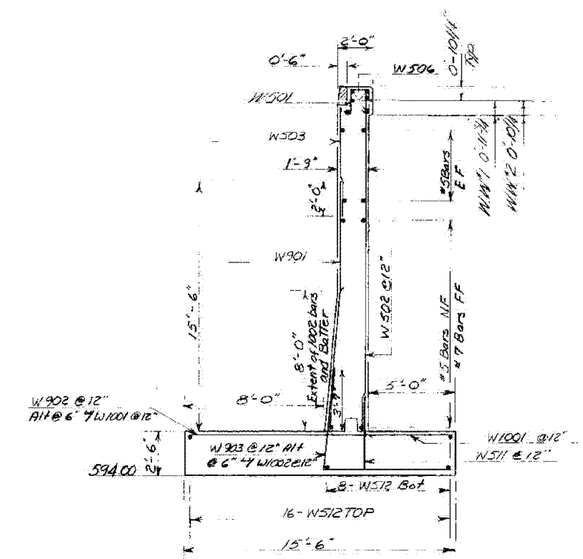
TOWN OF WATERFORD	Bridge No. 4
	Log Sta.
HIGHWAY NO. 191	Surv. Sta. 68+12+0
INT. RTE. 91 NB & SB Over Ramps S to E	
ABUT #1 PLAN & ELEVATION	
Designed by Danforth	Drawn by Witham
Checked by J.R. Burnett date 3-10-76	Bridge Design Supervisor R. Haupt date 3-76
PROJECT Barnet - St Johnsbury	PROJECT NO. EACI 91-2(59)
Bridge Sheet No. BR A10	Sheet 119 k of 358

BR-9



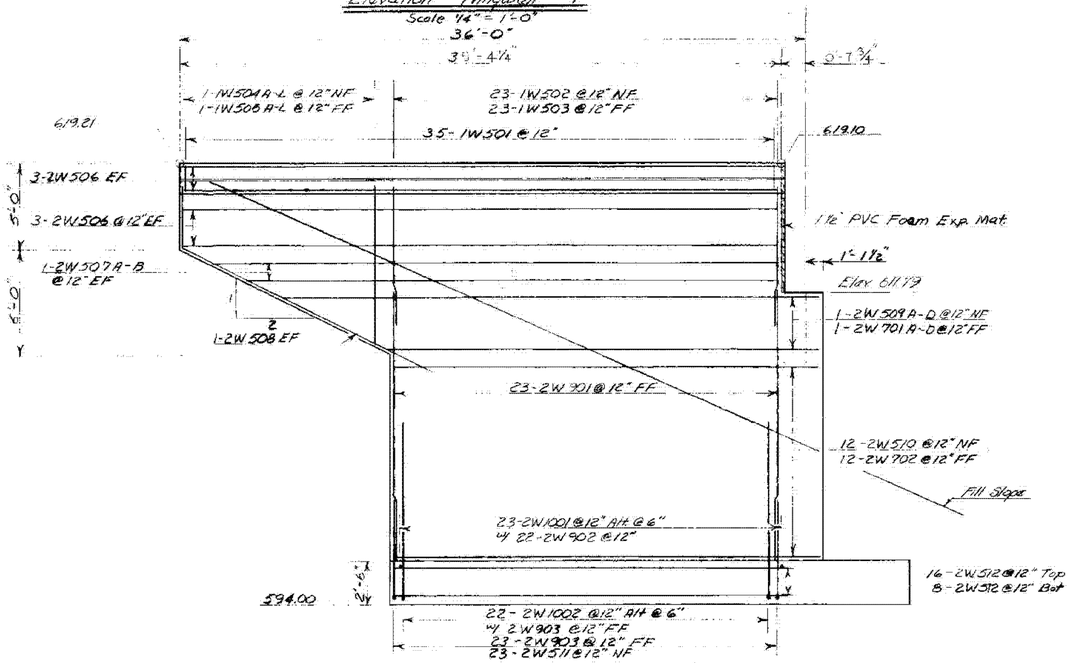
Elevation Wingwall # 1

Scale 1/4" = 1'-0"



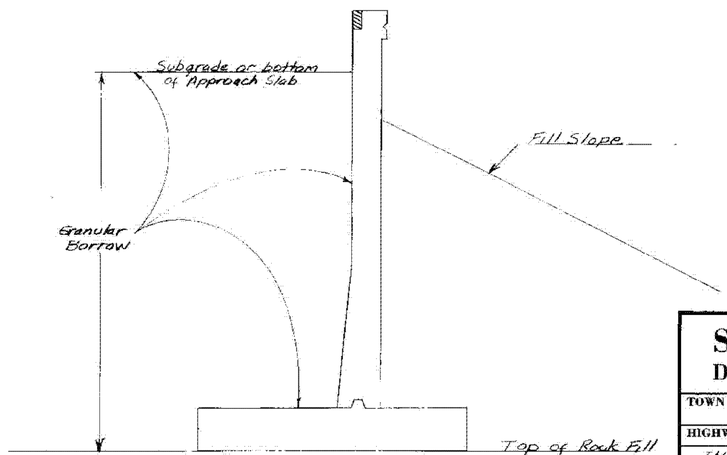
Typical Section Wingwall # 1 & #2

Scale 1/4" = 1'-0"



Elevation Wingwall # 2

Scale 1/4" = 1'-0"



Typical Backfill Wingwalls # 1 & 2

Wingwalls 3 & 6 Similar

Scale 1/4" = 1'-0"

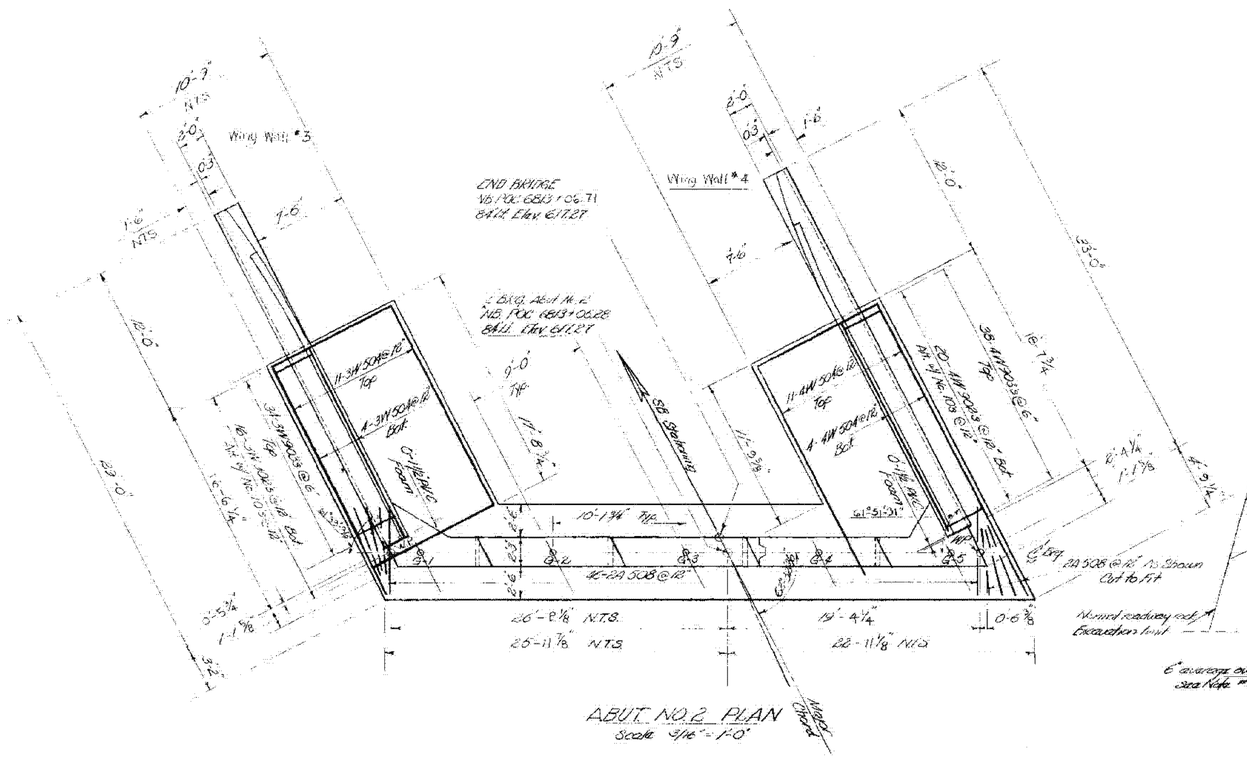
I-91 BRIDGES 81N&S
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 19 OF 43
FOR REFERENCE ONLY

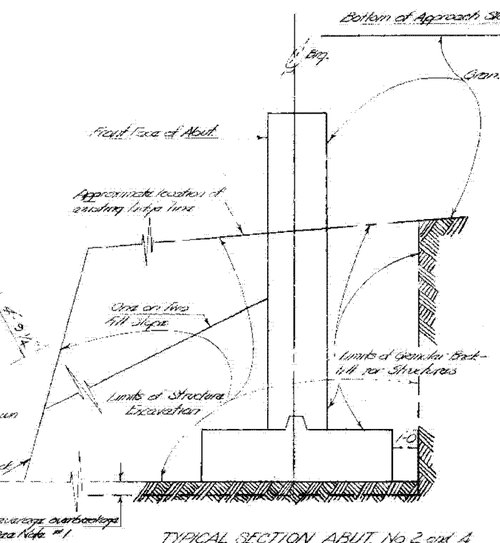
STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

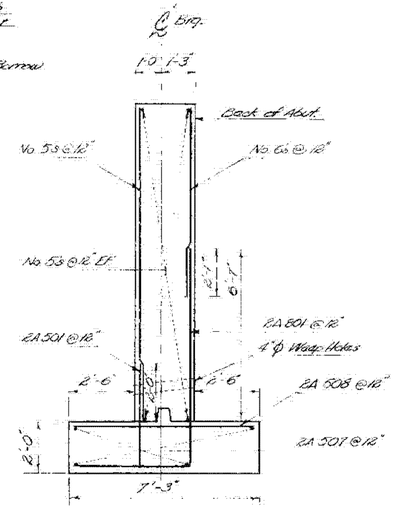
TOWN OF WATERFORD	Bridge No. 4 / Log Sta.
HIGHWAY NO. I 91	Surv. Sta. 681.2+0
INT. RTE. 91 NB & SB Over Ramps S to E	
Wingwall 1 & 2 Details	
Designed by J.R. Burnett	Drawn by W. Stoddard
Checked by J. Burnett date 3/18/167	Bridge Design Supervisor R. Haupt date 3/76
PROJECT Barnett - St. Johnsbury	PROJECT NO. EACI 91-2(59)C #3
Bridge Sheet No. BR 4/1	Sheet 1191 of 558

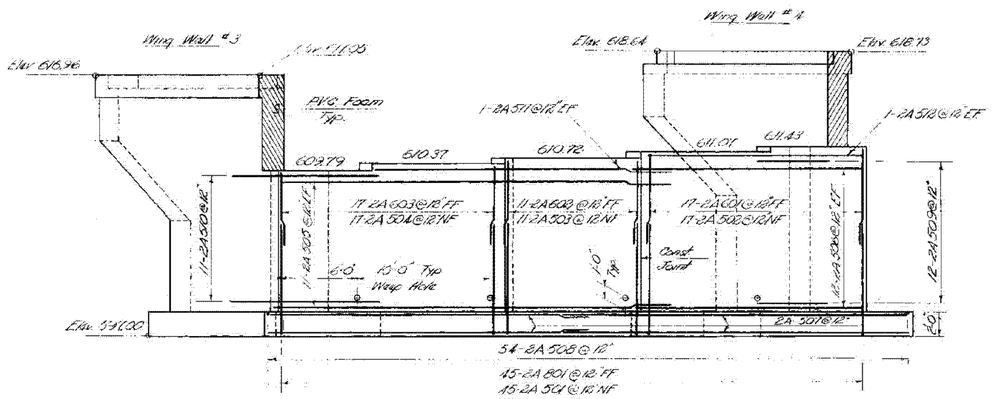
WINGWALL DIMENSIONS REVISION 12/8/76

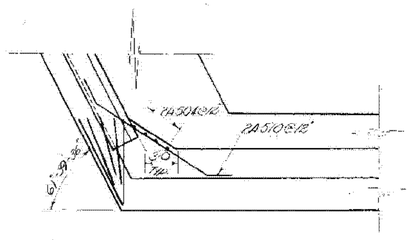
BR-9

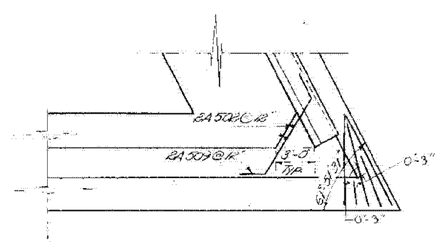












NOTES

1. No ledge should project above indicated bottom of footings or wingwalls. All overbreakage below indicated bottom of footing or wingwalls shall be replaced with concrete Class B. A maximum of 6" average overbreakage depth shall be paid for as Concrete Class B, Item 504.15; any additional concrete required shall be placed at no cost to the State of Vermont.

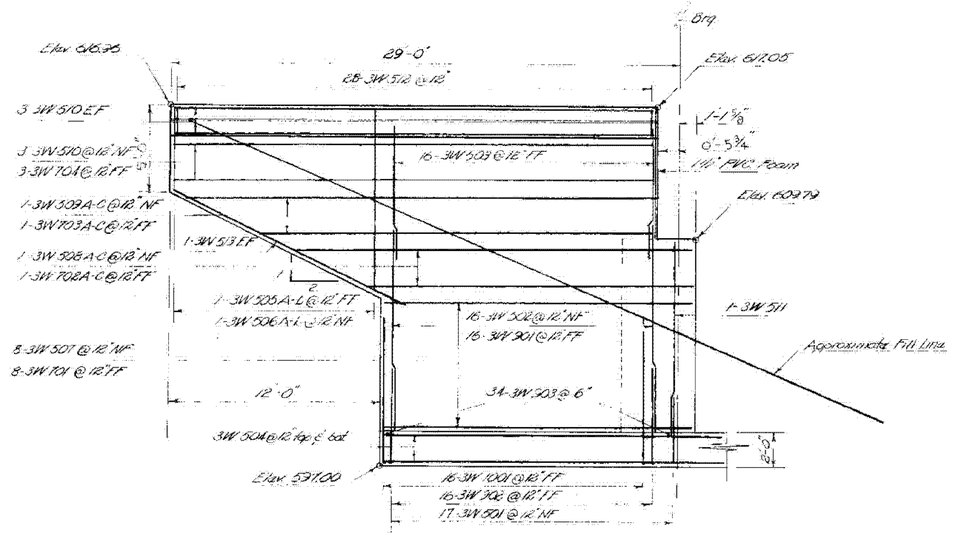
ABUTMENT DIMENSIONS & CORNER DETAIL ANGLES REVISION 12/8/76

I-91 BRIDGES 81N&S
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 20 OF 43
FOR REFERENCE ONLY

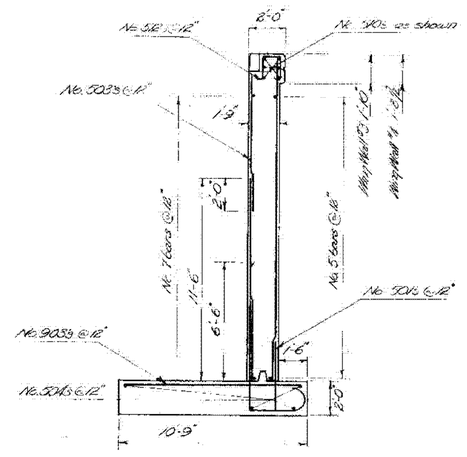
STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

TOWN OF Waterford	Bridge No. 4
HIGHWAY NO. I 91	Log Sta.
	Surv. Sta. 6812+0
INT. RTE. 91 NB & SB Over Ramp S to E	
SB ABUT # 2	
Designed by N. Danforth	Drawn by C. Witham
Checked by T. Burnett date 3-11-76	Bridge Design Supervisor R. Haupt date 3-76
PROJECT Barnet - St. Johnsbury	PROJECT NO. EACI-91-2(59)
Bridge Sheet No. BR 412	Sheet 119 of 358

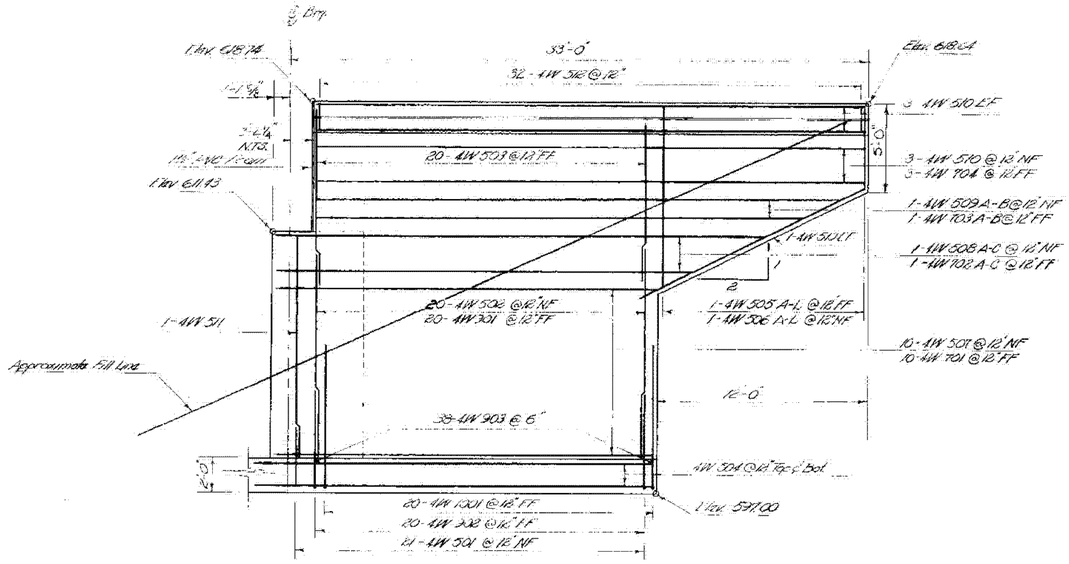
BR-9



Elevation Wingwall No. 3
Scale 1/4" = 1'-0"



Wingwall Typical Section
Scale 1/4" = 1'-0"



Elevation Wingwall No. 4
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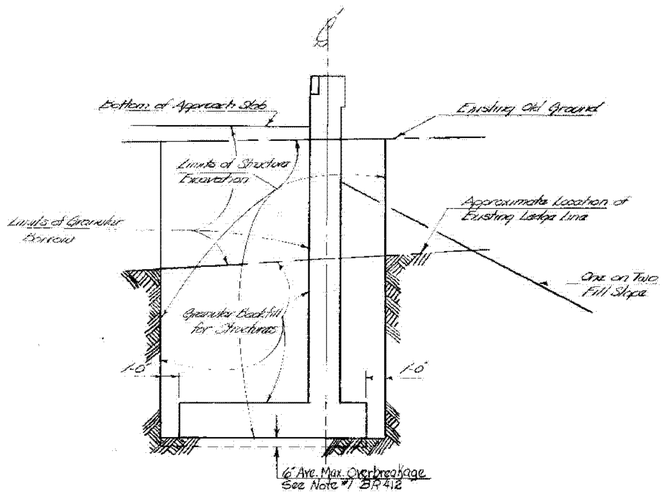


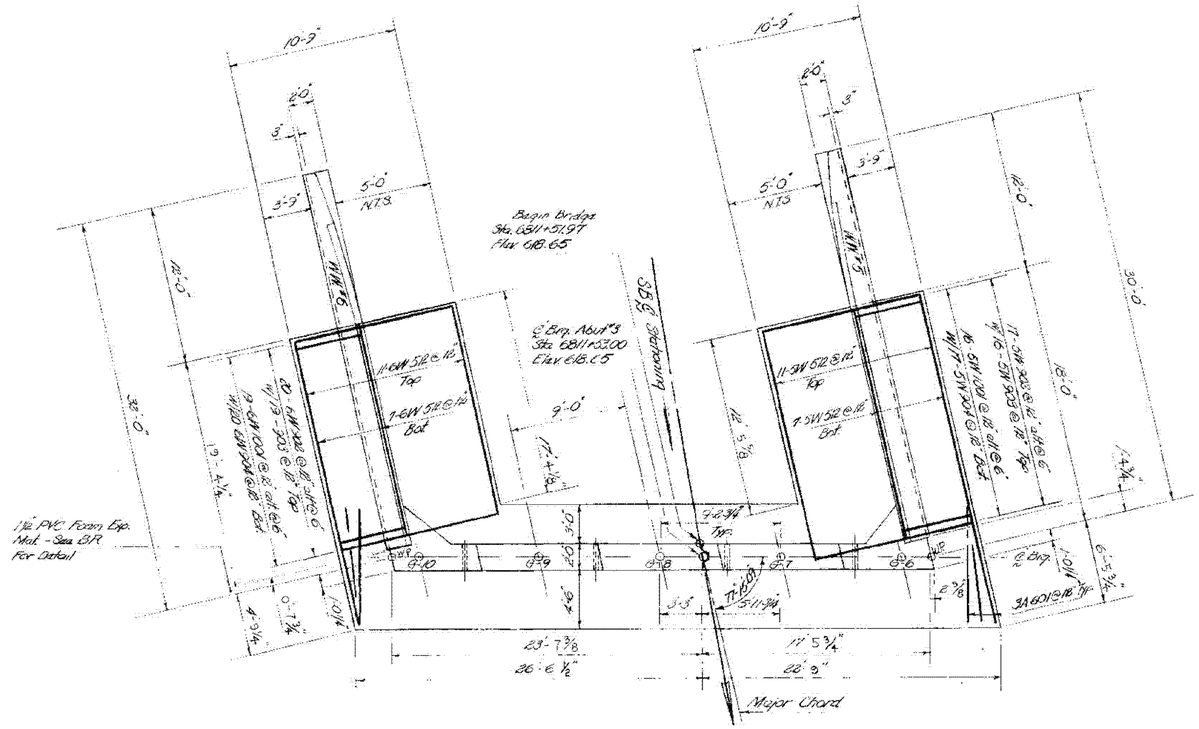
Wingwall Typical Section
Scale 1/4" = 1'-0"

I-91 BRIDGES 81N&S
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 21 OF 43
FOR REFERENCE ONLY

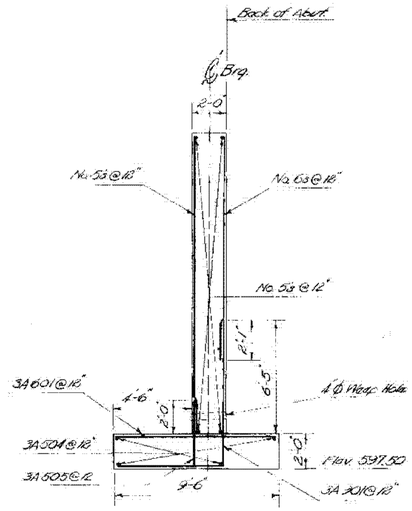
STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

TOWN OF WATERFORD	Bridge No. 4
HIGHWAY NO. I 91	Log Sta.
	Surv. Sta. 681.2+0
INT. RTE. 91 NB & SB Over Ramps 3 to L	
Wing Walls 3 & 4	
Designed by N. Lenforth	Drawn by C. Withham
Checked by J. Bernatt date 3-10-76	Bridge Design Supervisor R. Hoyt date 3-76
PROJECT Bernat - St. Johnsbury	PROJECT NO. BAC.I91-2(39)
Bridge Sheet No. BR 4.13	Sheet 119 n of 556

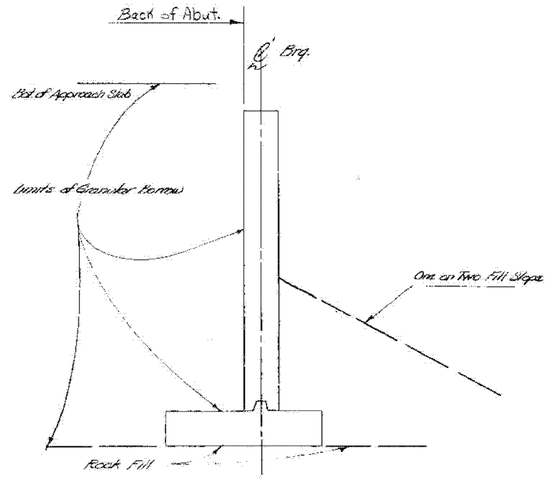
WINGWALL DIMENSIONS REVISION 12/15/76



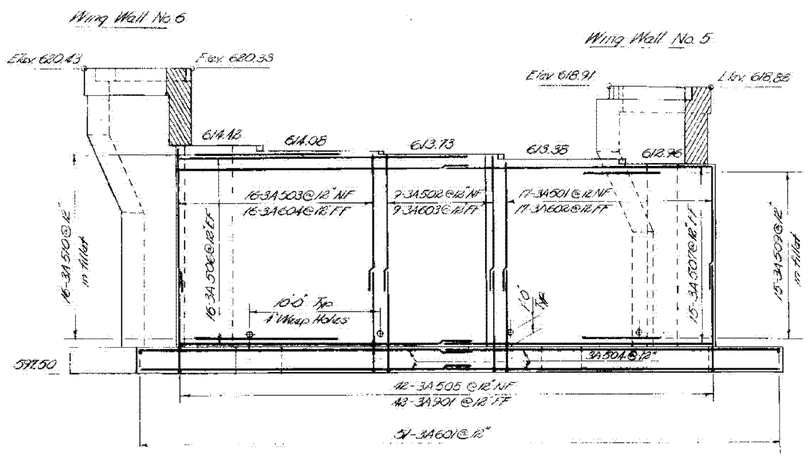
ABUTMENT NO. 3 PLAN
Scale 3/16" = 1'-0"



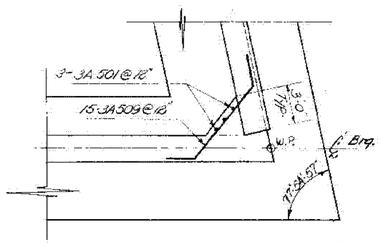
TYPICAL SECTION ABUT. No. 3
Scale 1/4" = 1'-0"



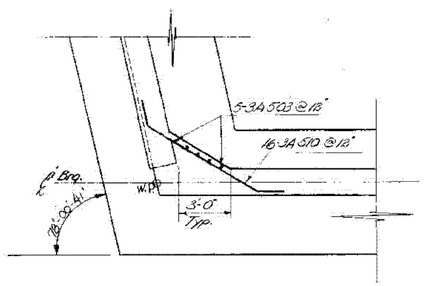
TYPICAL SECTION ABUTS. No. 1 and 3
Scale NTS



ABUTMENT NO. 3 ELEV.
SCALE 3/16"-1'-0"



ABUT. NO. 3 Corner Detail - left
Scale 3/16" = 1'-0"



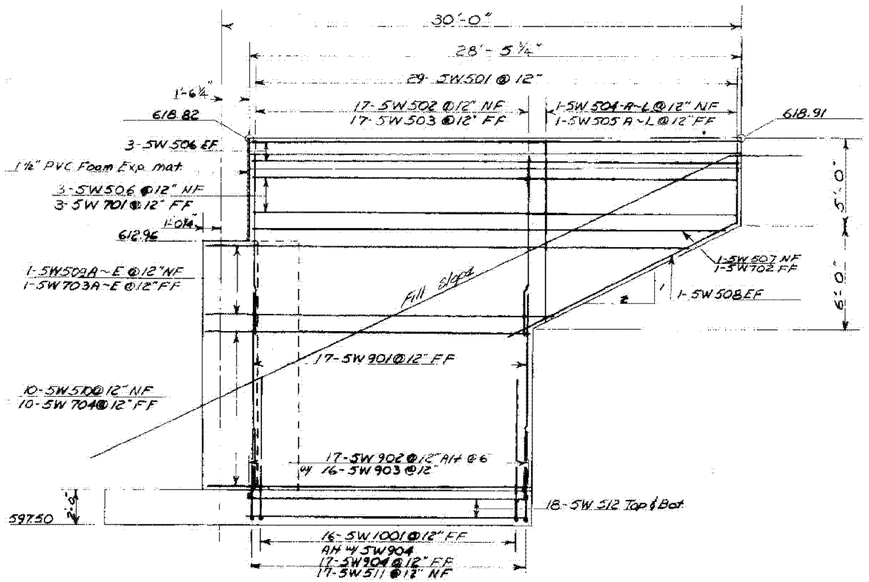
ABUT. NO. 3 Corner Detail - right
Scale 3/16" = 1'-0"

I-91 BRIDGES 81N&S
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 22 OF 43
FOR REFERENCE ONLY

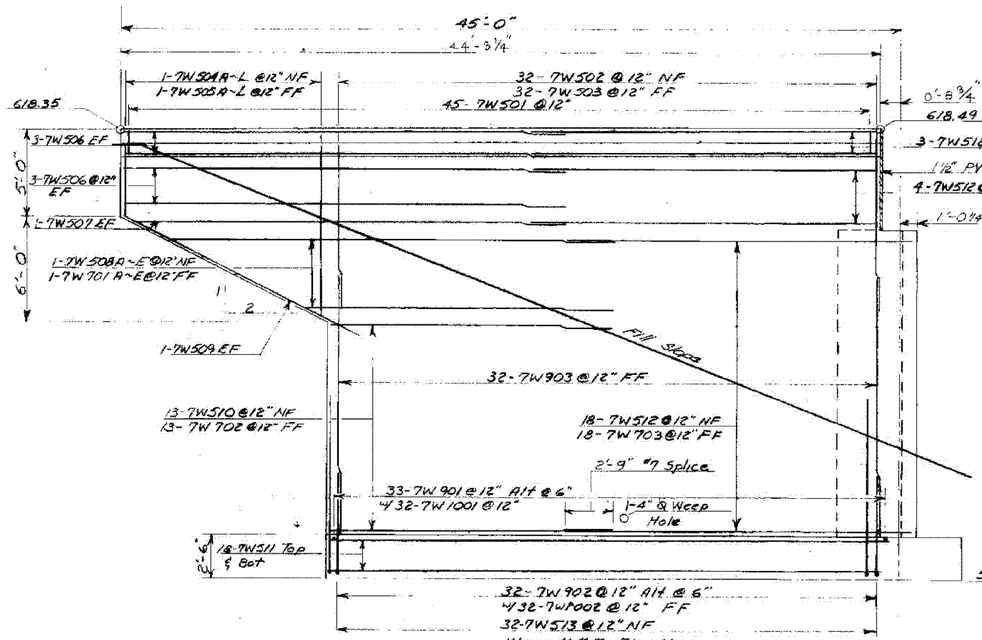
STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

TOWN OF WATERFORD	Bridge No. 4
	Log Sta.
HIGHWAY NO. 191	Surv. Sta. 6812+0
INT. RTE. 91 NB & SB over Ramps S to E	
NB Abutment # 3	
Designed by N. Danforth	Drawn by C. Witham
Checked by J.R. DUENET date 3-17-76	Bridge Design Supervisor R. Haupt date 3-76
PROJECT Barnet - St. Johnsbury	PROJECT NO. EAI91-2(59)
Bridge Sheet No. BR 414	Sheet 1190 of 358

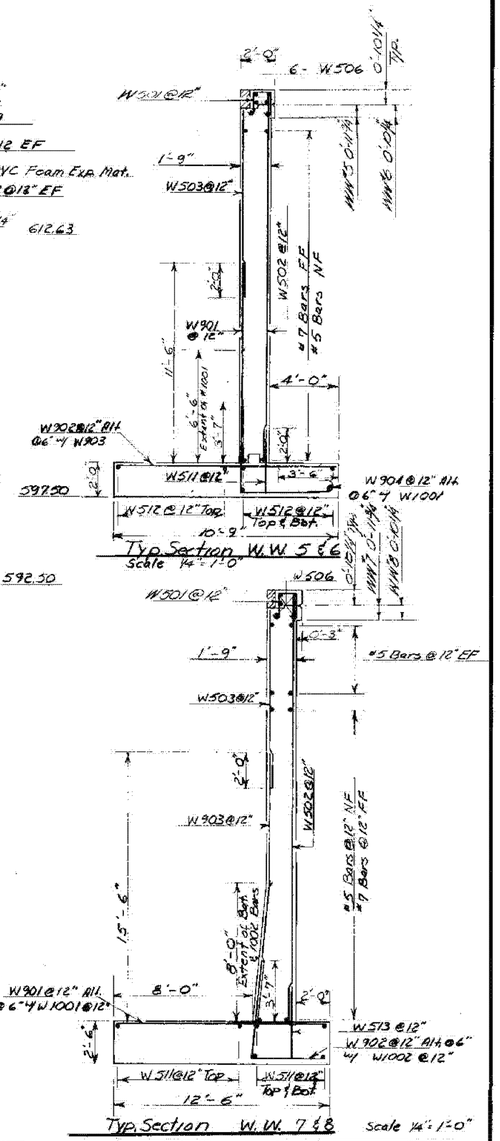
ABUTMENT DIMENSIONS
REVISION 12/8/76

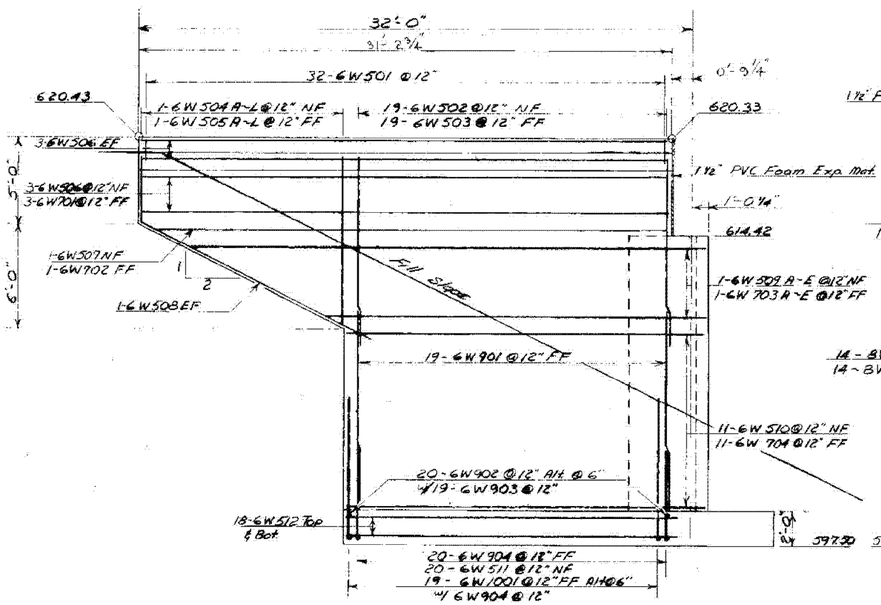


Wingwall # 5 Elev. View
Scale 1/4" = 1'-0"

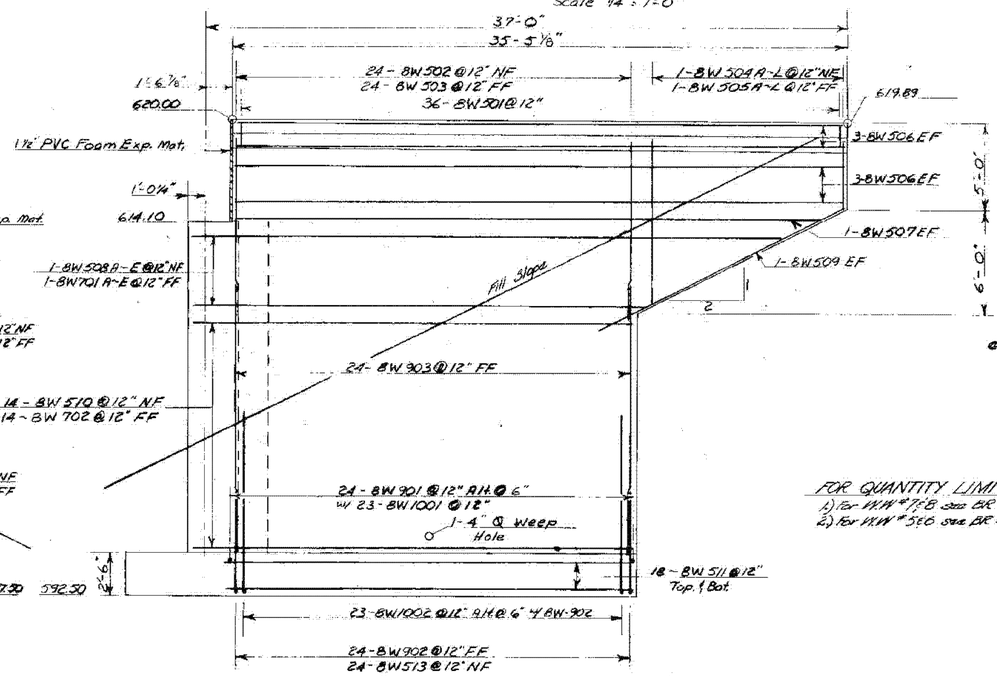


Wingwall # 7 Elev. View
Scale 1/4" = 1'-0"





Wingwall # 6 Elev. View
Scale 1/4" = 1'-0"



Wingwall # 8 Elev. View
Scale 1/2" = 1'-0"

FOR QUANTITY LIMITS
1.) for W.W. # 7 & 8 see BR 413
2.) for W.W. # 5 & 6 see BR 411

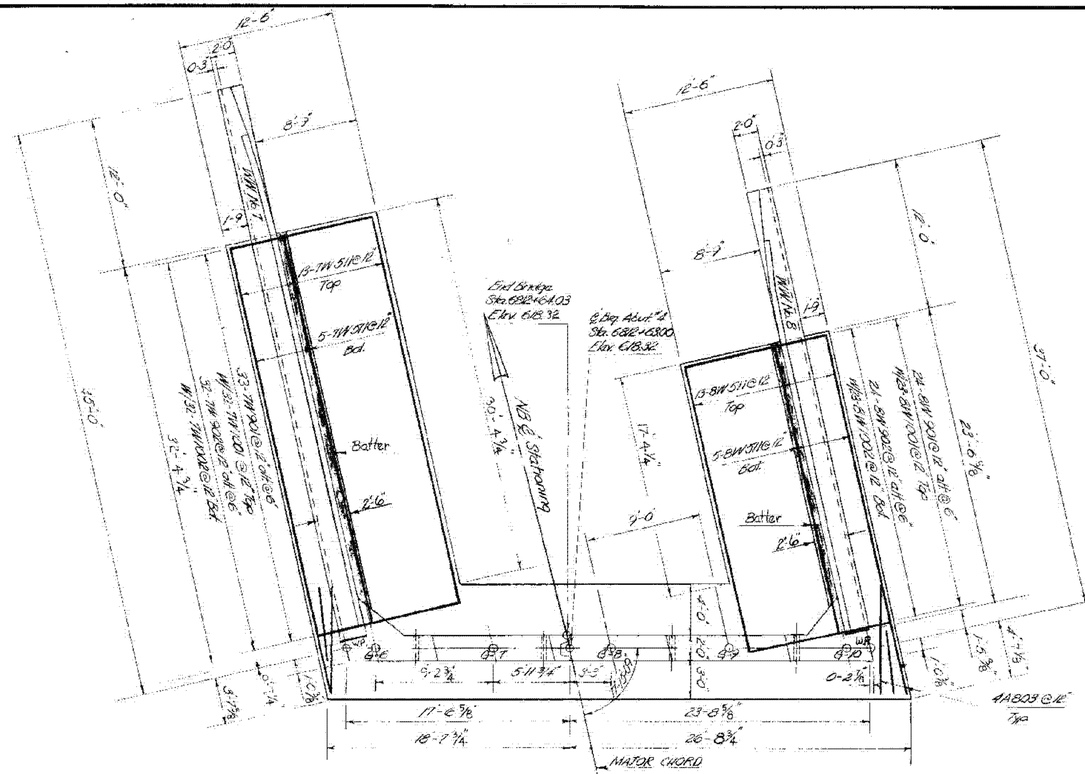
WINGWALL DIMENSIONS
REVISION 12/8/76

I-91 BRIDGES 81N&S
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 23 OF 43
FOR REFERENCE ONLY

STATE OF
DEPARTMENT

TOWN OF WATERFORD	Bridge No. 4
	Log Sta.
HIGHWAY NO. I 91	Surv. Sta. 681+2+0
INT. RTE 91 NB & SB OVER RAMPS S. TO E.	
WINGWALL 5, 6, 7 & 8 DETAILS	
Designed by J. BURNETT	Drawn by W. STODDARD
Checked by J. BURNETT date 3/19/76	Bridge Design Supervisor R. HAUPT date 3/76
PROJECT BARNET - ST. JOHNSBURY	PROJECT NO. EACI 91-2(59)
Bridge Sheet No. BR 415	Sheet 119 p of 358

BR-9



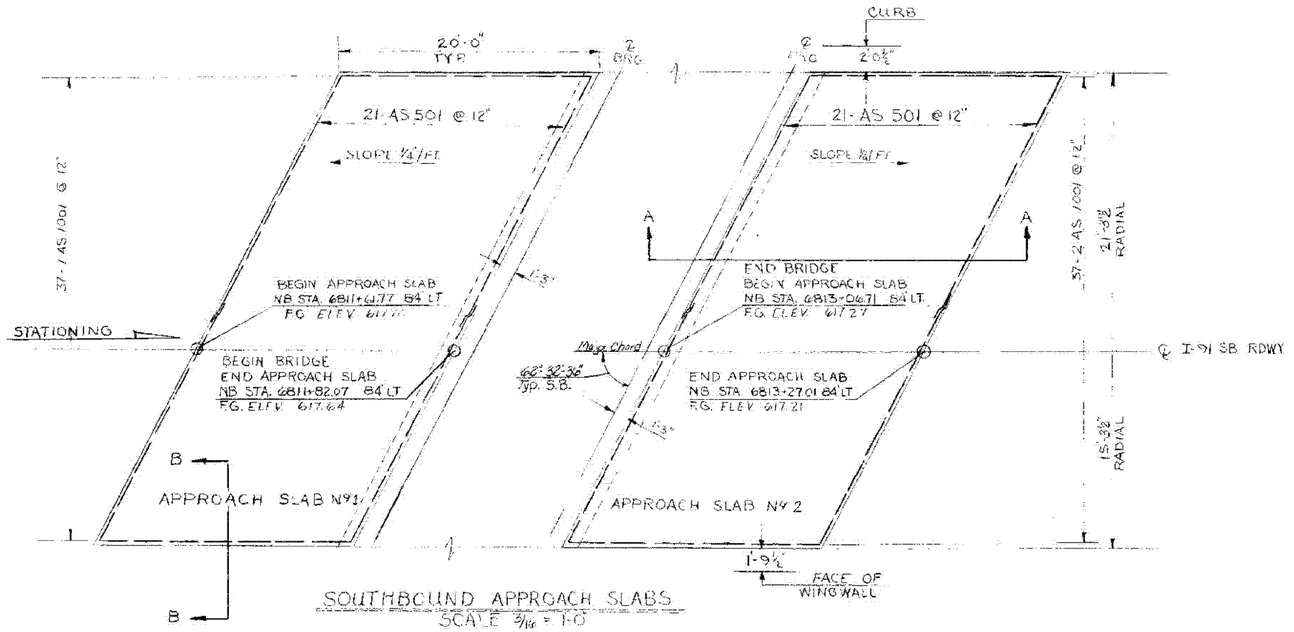
Note:
1. For quantity limit typical see BR412.

I-91 BRIDGES 81N&S
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 24 OF 43
FOR REFERENCE ONLY

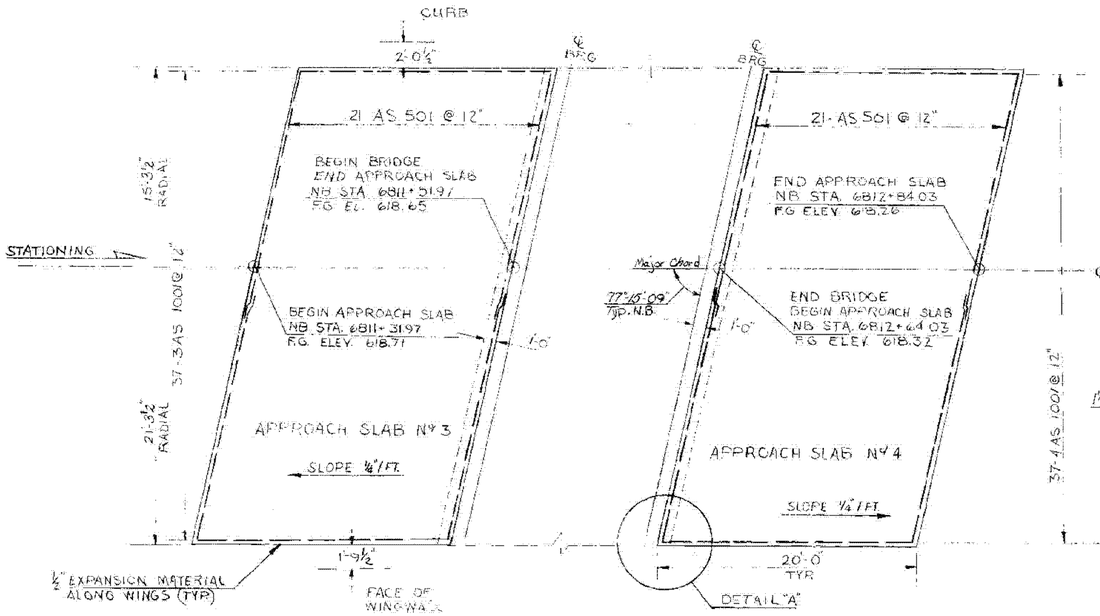
STATE OF
DEPARTMENT OF HIGHWAYS

TOWN OF Waterford	Bridge No. 4
HIGHWAY NO. I 91	Log Sta.
	Surv. Sta.
Int. Rte. I91 NB over Ramp S to E	
NB Abutment 4	
Designed by N. Danforth	Drawn by W. Stoddard
Checked by J. Burnett date 3-19-76	Bridge Design Supervisor R. Haupt date 3-19-76
PROJECT Barnet - St. Johnsbury	PROJECT NO. EAC I91-2(59)
Bridge Sheet No. BR 416	Sheet 119a of 558

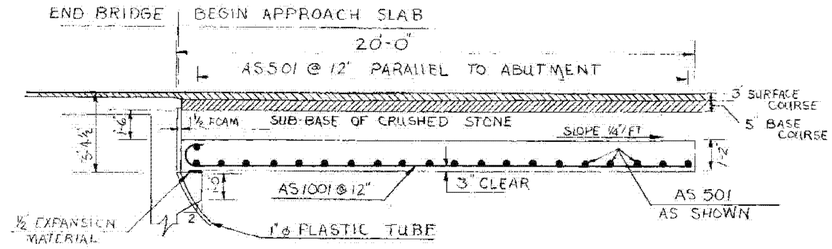
ABUTMENT DIMENSIONS REVISION 12/8/76



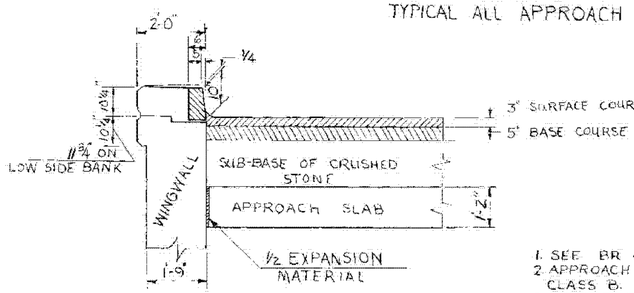
SOUTHBOUND APPROACH SLABS
SCALE 3/16" = 1'-0"



NORTHBOUND APPROACH SLABS
SCALE 3/16" = 1'-0"



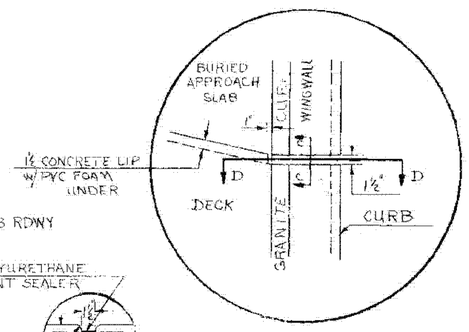
SECTION "AA"
SCALE 3/8" = 1'-0"
TYPICAL ALL APPROACH SLABS



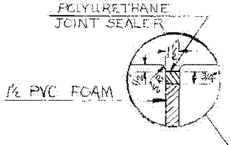
SECTION "BB"
SCALE ½" = 1'-0"

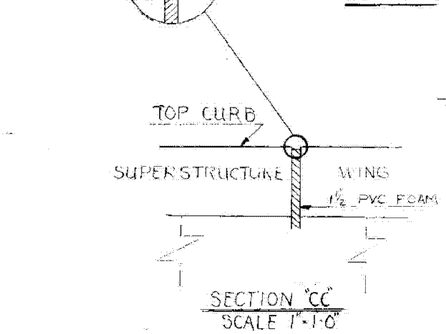
NOTES:

1. SEE BR 404 FOR GENERAL NOTES.
2. APPROACH SLAB CONCRETE TO BE CONCRETE CLASS B.
3. THE POLYVINYLCHLORIDE (PVC) FOAM USED SHALL BE A CLOSED CELL SEMI-RIDID, NON-EXTRUDING PVC FOAM AND SHALL MEET OR EXCEED THE REQUIREMENTS OF ASTM-D-1752-67, TYPE I. IT SHALL BE INSTALLED IN SHEETS AS LARGE AS PRACTICAL AND SHALL BE SUPPLIED IN A NOMINAL 1½ INCH THICKNESS. 20d GALVANIZED NAILS SHALL BE DRIVEN THRU THE FOAM AND LEFT PROTRUDING INTO THE CONCRETE POUR TO HELP HOLD THE PVC FOAM IN PLACE AFTER CONSTRUCTION. PAYMENT FOR PVC FOAM SHALL BE INCLUDED IN THE UNIT BID PRICE FOR CONCRETE CLASS A.
4. PAYMENT FOR POLYURETHANE JOINT SEALER SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE CLASS A.

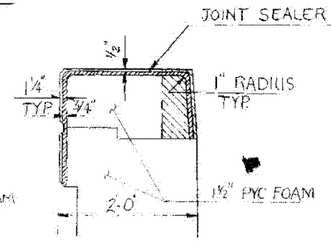


DETAIL "A"





SECTION "CC"
SCALE 1"=1'-0"



SECTION DD
SCALE 1"=1'-0"

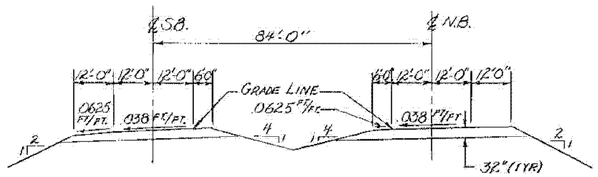
I-91 BRIDGES 81N&S
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 25 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

TOWN OF WATERFORD	Bridge No. 4
HIGHWAY NO. I-91	Loc. Sta. Surv. Sta. 6812+00
APPROACH SLAB DETAILS	
I-91 NB & SB OVER RAMP S. TO E.	
Designed by N. DANFORTH	Drawn by DAVID A. ROSS
Checked by J. BURNETT date 3-19-76	Bridge Design Supervisor R. HAUPT date 3-19-76
PROJECT BARNET - ST. JOHNSBURY	PROJECT NO. EACI91-2(59)(28)
Bridge Sheet No. 417	Sheet 119r of 358

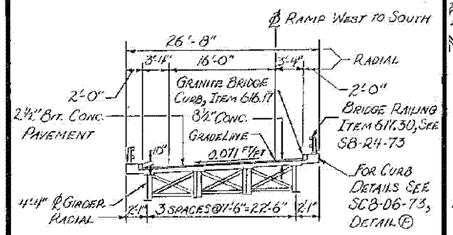
172 8300

BR-9

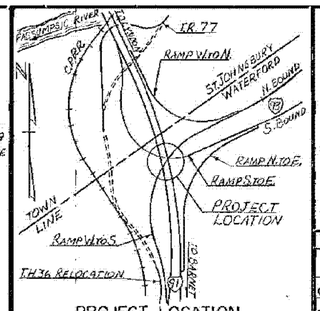


EXISTING
INTERSTATE RTE. 91

NEW HIGHWAY SECTION — BRIDGE APPROACHES
SCALE: 1" = 20'-0"



BRIDGE TYPICAL SECTION
SCALE: 1" = 10'-0"



PROJECT LOCATION
SCALE: 1" = 750'-0"

NEW STRUCTURE

1. RECOMMENDED TYPE OF STRUCTURE FOUR SPAN CONTINUOUS CURVED PLATE GIRDER
2. RECOMMENDED OVERALL STRUCTURE LENGTH 417'-1"
   SPAN LENGTH(S) CENTER TO CENTER OF BEARINGS 112'-0" ; 120'-0" ; 120'-0" ; 60'-0"
3. ESTIMATED ALLOWABLE LOAD FOR SPREAD FOOTINGS 4 K.S.F. @ ABUTMENTS (ON ROCK FILL)
   10 K.S.F. @ PIERS (ON LEDGE)
4. DESIGN SPECIFICATIONS
   DESIGN LOAD A.A.S.H.T.O. 1925 - 44
   ALLOWABLE STRESSES
   STRUCTURAL STEEL (A588) TENSION 24,000 P.S.I.
   REINFORCING STEEL (GRADE 60) TENSION 24,000 P.S.I.
   CONCRETE f'_c 3500 P.S.I.
   COMPRESSION 24,000 P.S.I. COMPRESSION 20,000 P.S.I. f_c 1400 P.S.I.

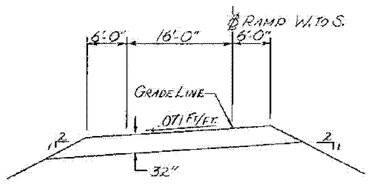
STRESS LEVELS	LOAD RATING (TONS) H	HS	332	TRUCK 6 AXLE	3A. STR.	4A. STR.	5A. SEMI
INVENTORY 0.55 F_y =							
POSTED 0.67 F_y =							
OPERATING 0.75 F_y =							

LIST OF STANDARDS

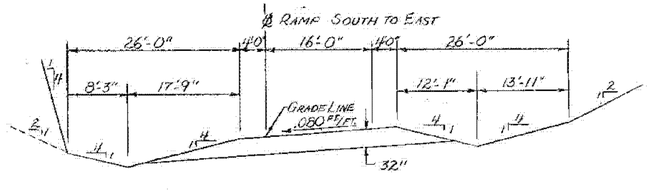
SB - R4 - 73	R 11-21-79
SCB - D1 - 75	R 4 - 3 - 78
SCB - D4 - 76	A 1 - 8 75
SCB - D6 - 73	R 1 - 3 - 77
SCB D7 - 71	R 12-15-76

LIST OF SHEETS

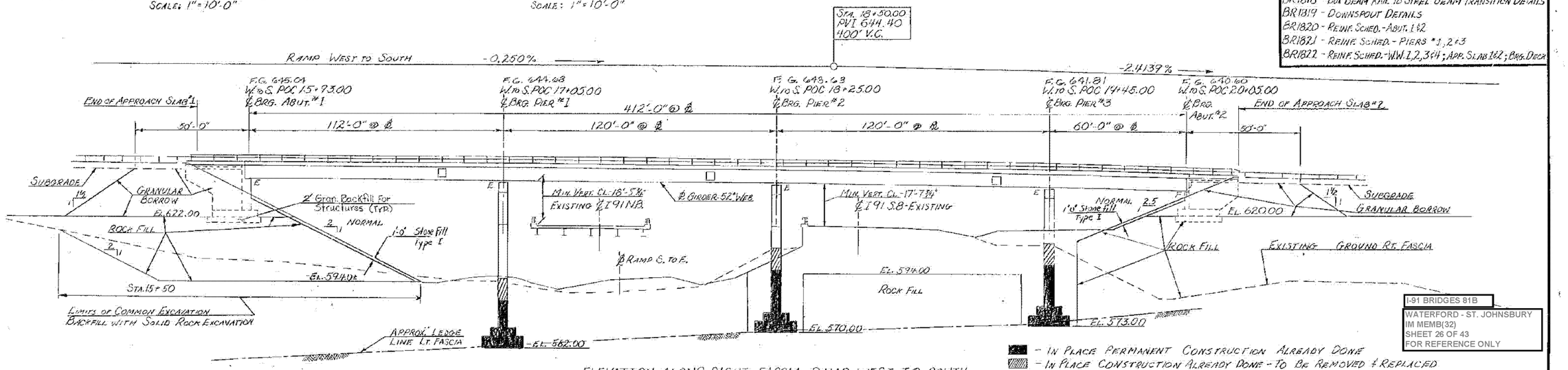
BR1800 - PRELIMINARY INFORMATION
BR1801 - PLAN
BR1802 - QUANTITY SHEET
BR1803 - BORING SHEET
BR1804 - BORING SHEET & GENERAL NOTES
BR1805 - FRAMING PLAN
BR1806 - CURB & RAILING
BR1807 - TYPICAL SECTION
BR1808 - GIRDER ELEVATION; CAMBER & DEFLECTION
BR1809 - ABUTMENT #1
BR1810 - WINGWALLS 1, 2, 3 & 4
BR1811 - ABUTMENT #2
BR1812 - PIER ELEVATIONS
BR1813 - FOOTING DETAILS, TYPICAL PIER 1, 2 & 3
BR1814 - TYPICAL PIER CAP & COFFERDAM DETAILS
BR1815 - DECK & APPROACH SLABS REINFORCING
BR1816 - BEARING DEVICES
BR1817 - EXPANSION JOINT DETAILS
BR1818 - BOX BEAM RAIL TO STEEL BEAM TRANSITION DETAILS
BR1819 - DOWNSPOUT DETAILS
BR1820 - REINF. SCHED. - ABUT. 1 & 2
BR1821 - REINF. SCHED. - PIERS #1, 2 & 3
BR1822 - REINF. SCHED. - W.W. 1, 2, 3 & 4; APP. SLAB 1 & 2; BRG. DECK



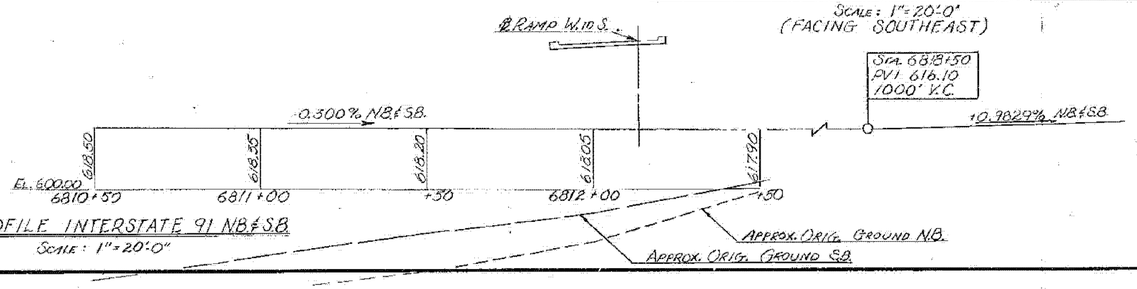
APPROACH SECTION RAMP WEST TO SOUTH
SCALE: 1" = 10'-0"



APPROACH SECTION RAMP SOUTH TO EAST
SCALE: 1" = 10'-0"



ELEVATION ALONG RIGHT FASCIA RAMP WEST TO SOUTH
SCALE: 1" = 20'-0"
(FACING SOUTHEAST)



PROFILE INTERSTATE 91 N.B. & S.B.
SCALE: 1" = 20'-0"

▬ - IN PLACE PERMANENT CONSTRUCTION ALREADY DONE
▨ - IN PLACE CONSTRUCTION ALREADY DONE - TO BE REMOVED & REPLACED

RECOMMENDED FOR APPROVAL		DATE
	W. M. Smith STRUCTURES ENGINEER	7/10/80
RECOMMENDED FOR APPROVAL	Arthur Vinal CHIEF OF DESIGN	7/10/80
APPROVED BY	S. J. Gear DIRECTOR OF ENGINEERING & CONSTRUCTION	7/16/80

REVISIONS NO:	DESCRIPTION	BY & DATE

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TOWN OF WATERFORD	Bridge No. 18
	Log Sta.
HIGHWAY NO. I 93	Surv. Sta. RAMP W. S. 16+00

PRELIMINARY INFORMATION
RAMP W. TO S. OVER I 91 N.B. & S.B. & RAMP S. TO E.

Designed by A. Elwood	Drawn by A. Elwood
Checked by G. SPILAR date 7-8-80	Bridge Design Supervisor R. S. HAUPT date 7-80
PROJECT CONTRACT 3 WATERFORD	PROJECT NO. I 93-1(3)
Bridge Sheet No. BR 1800	Sheet 159 of 550

I-91 BRIDGES 81B
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 26 OF 43
FOR REFERENCE ONLY

175 of 290 159

SKRKNG 44-131-40151
BR-6

CURVE DATA I91 NB ℄	CURVE DATA RAMP SOUTH TO EAST	CURVE DATE RAMP WEST TO SOUTH
Δ 32°10'06" Lt.	Δ 106°23'58" Lt	Δ 45°00'-00" Lt
D 1°-00'	D 9.5493°	D 5°-00'
R 5729.58'	R 600.00'	R 1145.92'
T 1652.04'	T 801.95'	T 474.65'
L 3216.83'	L 1119.16'	L 900.00'
E 233.42'	E 489.74'	E 94.41'
BANK 0.058 Ft/Ft	BANK 0.080 Ft/Ft	BANK 0.071 Ft/Ft
SB BANK 0.038 Ft/Ft		

N

May 1972

EDGE OF SHOULDER
END BRIDGE W. to S. POC 20+07.50 EL. 640.55
℄ BRG. ABUT. #2 W. to S. POC 20+05.00 EL. 640.60
EDGE OF PAVEMENT
STONE FILL TYPE I
℄ BRG PIER #3 W. to S. POC 19+45.00 EL. 641.81
EDGE OF SHOULDER
MAJOR CHORD 57'-11 3/16"
℄ BRG ABUT #2 (RADIAL) (FIX.)
DITCH LINE
℄ BRG PIER #3 (RADIAL) (EXP.)
TOE OF SLOPE
84' LT N.B. POC 6812+49.57 = RAMP S. to E. POC 18+10.79 Δ 62°52'-36", TANG TO CURVES
RAMP SOUTH TO EAST
ROCK BENCH
DITCH LINE
EDGE OF SHOULDER
I91 SOUTHBOUND To WHITE RIVER JCT.
℄ BRG. ABUT #2 84' LT N.B. POC 6813+05.28
℄ S.B.
EDGE OF SHOULDER
MAJOR CHORD 120'-0"
℄ BRG ABUT #1 84' LT N.B. POC 6811+83.50
MAJOR CHORD 119'-11 9/16"
84' LT N.B. POC 6811+34.11 = W. to S. POC 18+67.99 Δ 43°26'-59" Rt. TANGS TO CURVES
MAJ. DITCH LINE FLOW
T.O. BERM (TYP.)
EDGE OF SHOULDER
EDGE OF SHOULDER
MIN. VERT. CL. 17'-7 1/4"
℄ BRG PIER #2 (RADIAL) (EXP.)
MAJOR CHORD 120'-0"
℄ BRG. PIER #4 W. to S. POC 17+05.00 EL. 644.68
℄ BRG ABUT #4 N.B. POC 6812+63.00
℄ N.B.
I91 NORTHBOUND To ST. JOHNSBURY
EDGE OF SHOULDER
EDGE OF SHOULDER
℄ BRG. ABUT #3 N.B. POC 6811+53.00
MIN. VERT. CL. 18'-5 3/16"
Stone Fill, Type I
CURB LINE
PARAPET
℄ BRG. ABUT #4 W. to S. POC 15+95.00 EL. 645.04
℄ BRG ABUT #1 (RADIAL) (EXP.)
MAJOR CHORD 117'-11 3/16"
PENN BRIDGE W. to S. POC 15+89.58 EL. 645.05
N.B. POC 6812+13.79 = W. to S. POC 17+52.09 = S. to E. POC 19+05.07
RAMP SOUTH TO EAST I-93 TO
EDGE OF PAVEMENT
EDGE OF SHOULDER
DITCH LINE
APPROACH SLAB
EL. 647.17 F.
RAMP WEST TO SOUTH

PLAN
SCALE: 1" = 20'-0"

℄ BRG ABUT #2 STA. 20+05.00
8°-48'
MINOR CHORD 57'-11 3/16"
℄ BRG PIER #3 STA. 19+45.00
MINOR CHORD 119'-11 3/16"
℄ BRG PIER #2 STA. 18+25.00
MINOR CHORD 119'-11 3/16"
℄ BRG ABUT #4 N.B. POC 6812+63.00
℄ BRG. ABUT #3 N.B. POC 6811+53.00
℄ BRG. PIER #1 STA. 17+05.00
MINOR CHORD 111'-11 3/16"
℄ BRG ABUT #1 STA. 15+93.00
GRADE LINE ℄ RAMP W. to S.
RADIAL
BEGIN 6°-32'
END 7°-30'

LAYOUT INFORMATION
SCALE: 1" = 40'-0"

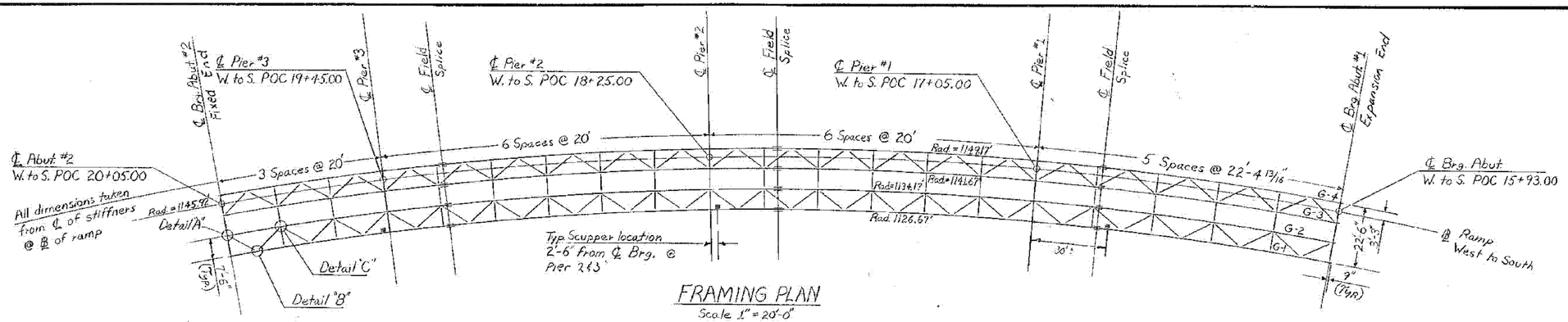
I-91 BRIDGES 81B
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 27 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TOWN OF WATERFORD	Bridge No. 18
HIGHWAY NO. I-93	Log Sta.
	Surv. Sta. RAMP W-S. 16+00
PLAN	
RAMP W. TO S. OVER I91 N.B. & S.B. & RAMP S. TO E.	
Designed by A. Elwood	Drawn by A. Elwood
Checked by G. SPEAR date 7-8-80	Bridge Design Supervisor R.S. HALDT date 7-80
PROJECT CONTRACT 3 WATERFORD	PROJECT NO. I 93-1(3)
Bridge Sheet No. BR 1801	Sheet 160 of 550

BRUNING 44-191-40151

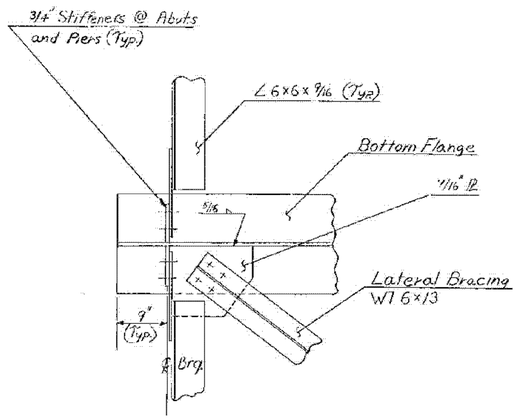
BR-6



FRAMING PLAN

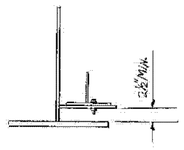
Scale 1" = 20'-0"

Note: See girder dimension table BR 1808 for individual girder dimensions and location of crossframes.



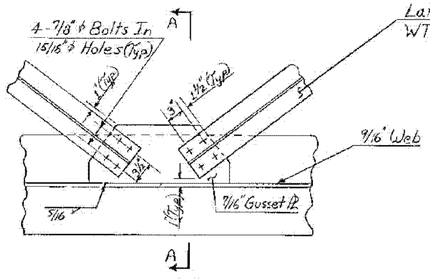
DETAIL 'A'

Scale 1"=1'-0"



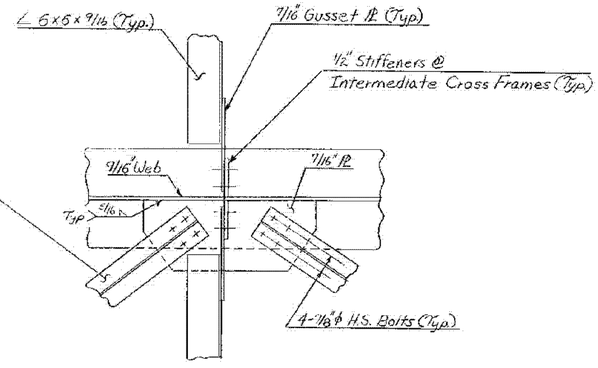
SECTION A-A

Scale 1"=1'-0"



DETAIL 'B'

Scale 1"=1'-0"



DETAIL 'C'

Scale 1"=1'-0"

I-91 BRIDGES 81B
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 28 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TOWN OF WATERFORD	Bridge No. 18
HIGHWAY NO. I 93	Log Sta.
	Surv. Sta. Ramp W. to S. 1646
FRAMING PLAN	
Ramp W. to S. over I 91 N.B. & S.B.	
Designed by D. BURLEY	Drawn by R. RANALDO
Checked by A. Elwood date 7-80	Bridge Design Supervisor R.S. HAUPT date 7-80
PROJECT CONTRACT 3 WATERFORD	PROJECT NO. I 93-1(3)
Bridge Sheet No. BR 1805 Sheet 164 of 550	

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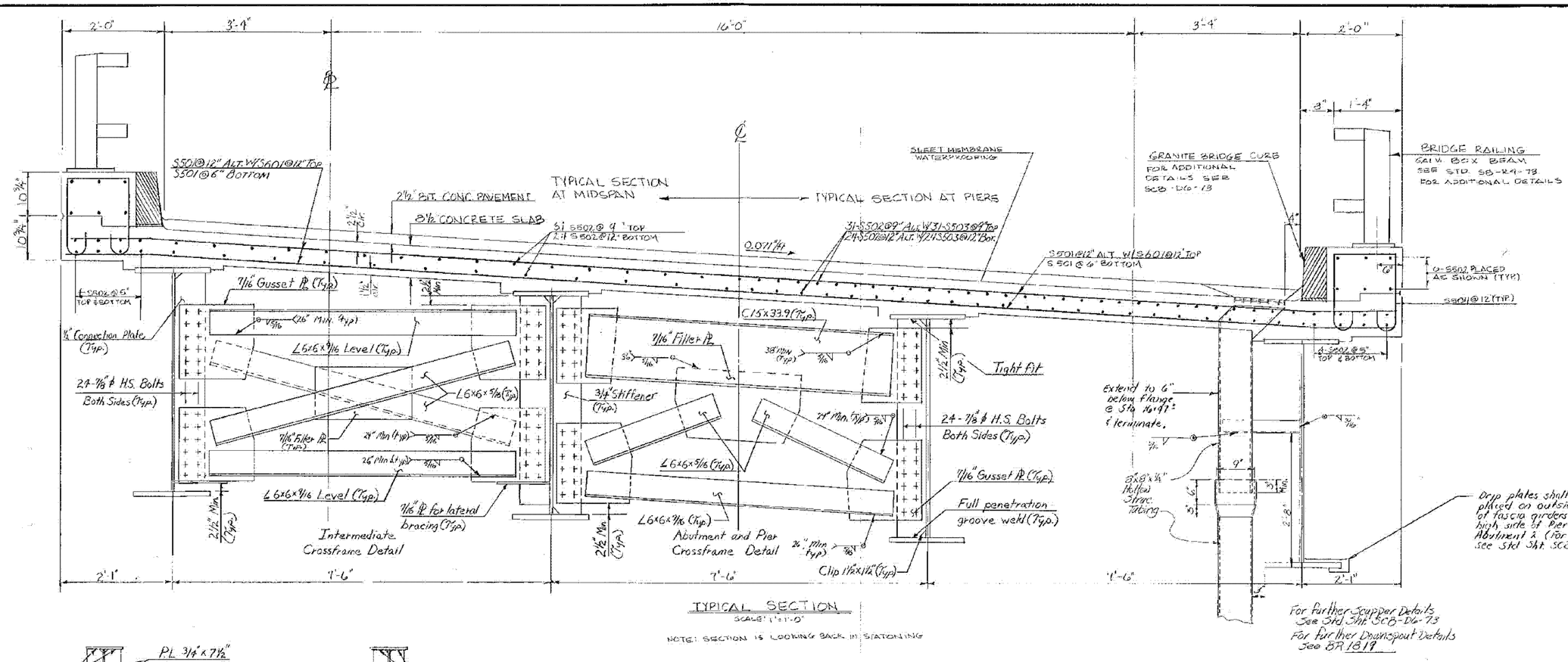
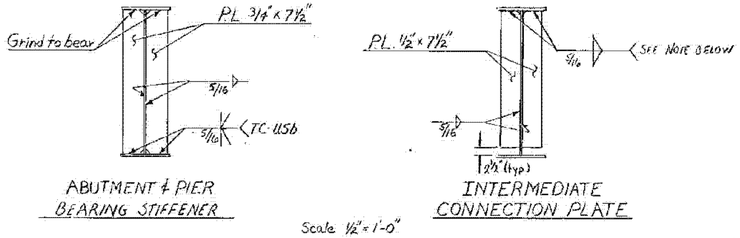
BRUNING 44-131-40161

BR-6



TYPICAL SECTION
SCALE: 1"=1'-0"

NOTE: SECTION IS LOOKING BACK IN STATIONING



ABUTMENT & PIER
BEARING STIFFENER

INTERMEDIATE
CONNECTION PLATE

Scale ½"=1'-0"

For Deck End Details see detail A on Br 1809 & Br1811.

Note:
Use 5/16 fillet weld for compression flange on intermediate crossframe connections. The compression flange is the bottom flange for the first set of connection plates on each side of piers 1 and 2; and on Abut 2 side of pier 3. The compression flange is the top flange for the remaining connection plates.

I-91 BRIDGES 81B
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 29 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TOWN OF WATERFORD	Bridge No. 18
HIGHWAY NO. I-93	Log Sta.
	Surv. Sta. RAMP W-S 16+10
TYPICAL SECTION	
RAMP W. to S. over I91 N.B. & S.B. & RAMP S. to E.	
Designed by D. BURLEY	Drawn by M. HEALD
Checked by A. ELWOOD date 7-80	Bridge Design Supervisor R.S. HAUPT date 7/80
PROJECT CONTRACT 3 WATERFORD	PROJECT NO. I-93-1(3)
Bridge Sheet No. BR1807	Sheet 168 of 550

198 of 290

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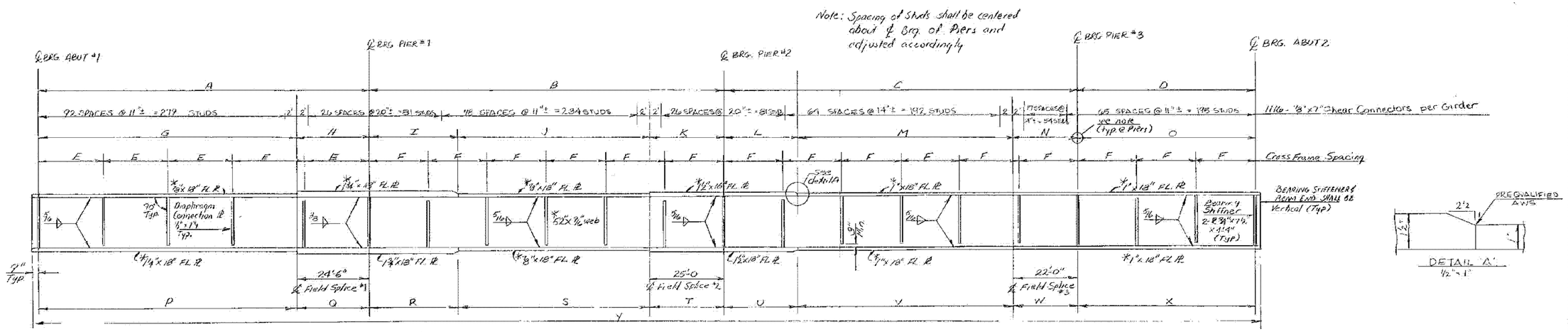
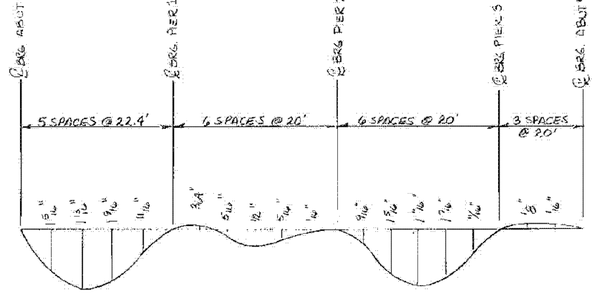
BR-6

Note: Spacing of Studs shall be centered about ℄ Brg. of Piers and adjusted accordingly

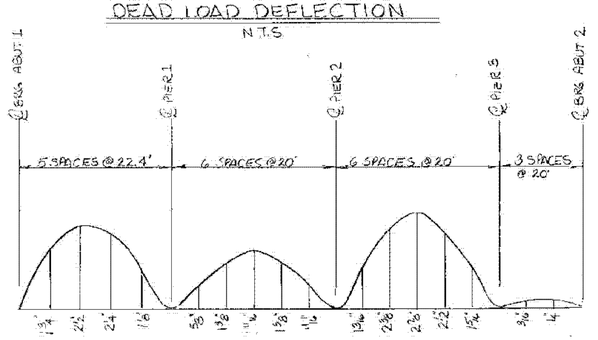


GIRDER ELEVATION
N.T.S.

*denote PL's requiring Charpy V-Notch test



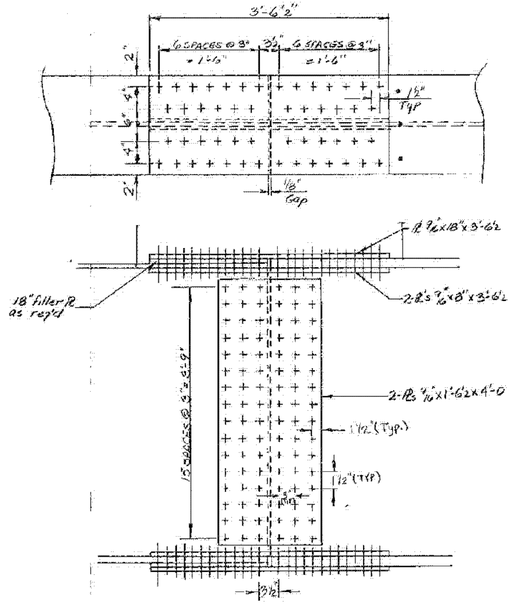
DEAD LOAD DEFLECTION
N.T.S



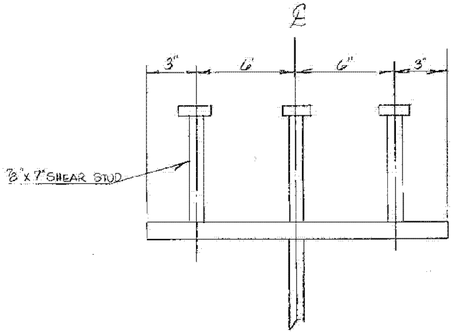
CAMBER DIAGRAM
N.T.S.

Note: 1) All distances are arc lengths along the base line
2) Camber tolerance shall be ± 1/8"/10' of distance from nearest support

		Girder Number			
		1	2	3	4
℄ BRG.	A	110'-1 7/16"	110'-10 3/16"	111'-7	112'-3 13/16"
	B	117'-11 1/16"	118'-9 1/4"	119'-6 7/16"	120'-4 1/16"
C. C.	C	117'-11 1/16"	118'-9 1/4"	119'-6 7/16"	120'-4 1/16"
	D	58'-11 3/8"	59'-4 5/8"	59'-9 7/16"	60'-2 1/16"
FASCIA	E	22'-0 3/16"	22'-2 3/4"	22'-3 7/16"	22'-5 7/16"
	F	19'-7 25/32"	19'-9 3/32"	19'-11 3/8"	20'-0 11/16"
TOP FLANGE PLATES	G	86'-7 7/16"	86'-9 13/16"	87'-1	87'-3 1/16"
	H	24'-6	24'-6	24'-6	24'-6
	I	30'-0	30'-0	30'-0	30'-0
	J	62'-11 3/16"	63'-3 1/4"	64'-6 7/16"	65'-4 1/16"
	K	25'-0	25'-0	25'-0	25'-0
	L	25'-0	25'-0	25'-0	25'-0
	M	70'-11 3/16"	71'-3 1/4"	72'-6 7/16"	73'-4 1/16"
	N	22'-0	22'-0	22'-0	22'-0
	O	58'-11 3/8"	59'-4 5/8"	59'-9 7/16"	60'-2 1/16"
BOTTOM FLANGE PLATES	P	85'-7 7/16"	86'-4 3/16"	87'-1	87'-7 13/16"
	Q	24'-6	24'-6	24'-6	24'-6
	R	30'-0	30'-0	30'-0	30'-0
	S	62'-11 3/16"	63'-7 1/4"	64'-6 7/16"	65'-4 1/16"
	T	25'-0	25'-0	25'-0	25'-0
	U	25'-0	25'-0	25'-0	25'-0
	V	70'-11 3/16"	71'-7 1/4"	72'-6 7/16"	73'-4 1/16"
	W	22'-0	22'-0	22'-0	22'-0
	X	58'-11 3/8"	59'-4 5/8"	59'-9 7/16"	60'-2 1/16"
RADIUS		1126'-8 3/8"	1134'-2 3/8"	1141'-8 3/8"	1149'-2 3/8"
Y		406'-6 3/8"	409'-3 5/8"	411'-11 13/16"	414'-8 1/16"



FIELD SPLICE DETAILS
SCALE: 1" = 1'-0"



SHEAR STUD PLAN
3" = 1'-0"

I-91 BRIDGES 81B
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 30 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TOWN OF WATERFORD	Bridge No. 18
HIGHWAY NO. I 93	Log Sta.
	Surv. Sta. RAMP W. to S. over I91 N.B. & SB & RAMP S. to E.
GIRDER ELEVATION, CAMBER & DEFLECTION DIAG. RAMP W. to S. over I91 N.B. & S.B. & RAMP S. to E.	
Designed by R.E. LUKAT & D. BURLEY	Drawn by M. HEALD
Checked by G.V. SPILAR date 7-12-80	Bridge Design Supervisor R.S. HAUPT date 7-80
PROJECT CONTRACT 3 WATERFORD	PROJECT NO. I 93-1(3)
Bridge Sheet No. BR 1808	Sheet 167 of 550

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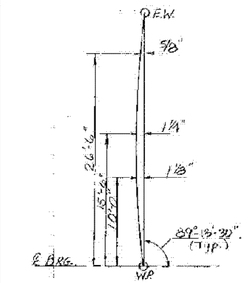
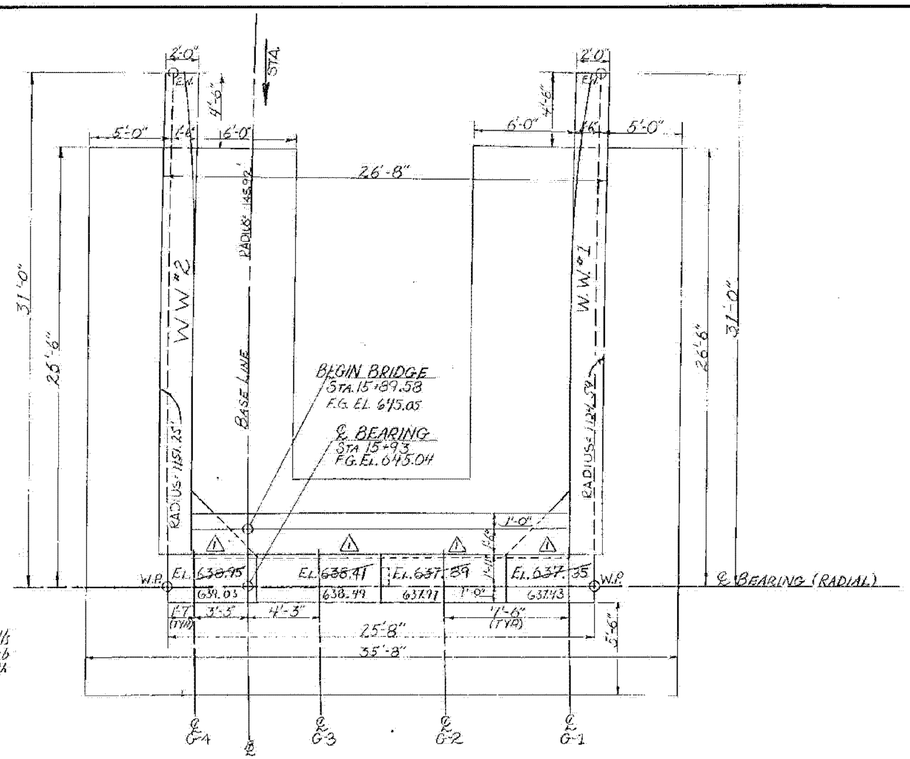
BRUNING 44-151 40151

BR-6

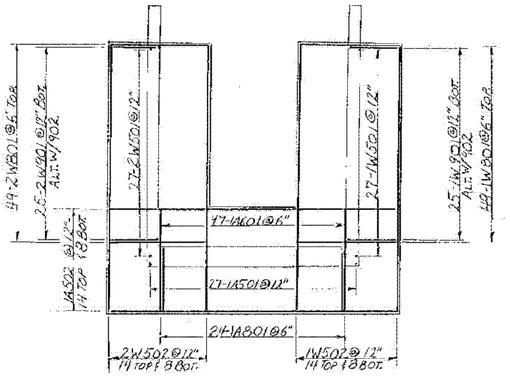


CURB LAYOUT
N.T.S.

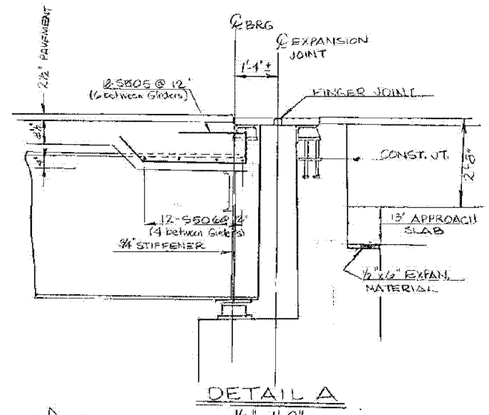


PLAN VIEW
SCALE: 1/4"=1'-0"

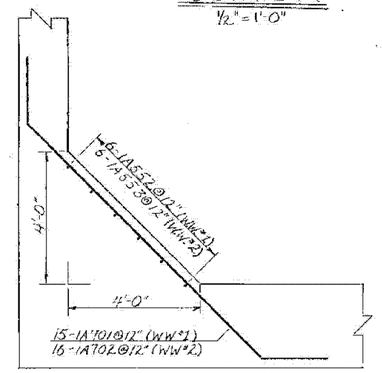
NOTE: FOOTINGS and WINGWALLS are straight, with curb overhang to vary with radius



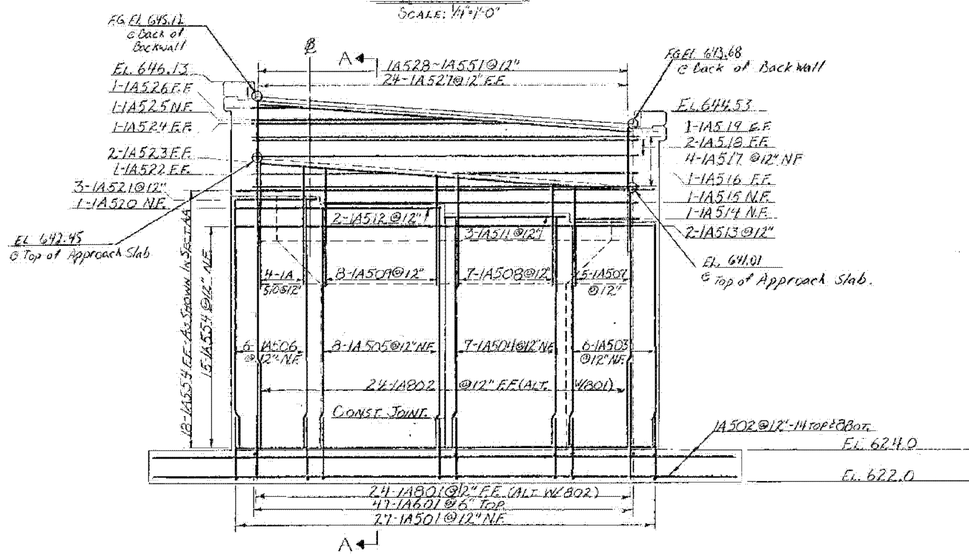
FOOTING REINFORCING PLAN
SCALE: 1/8" = 1'-0"



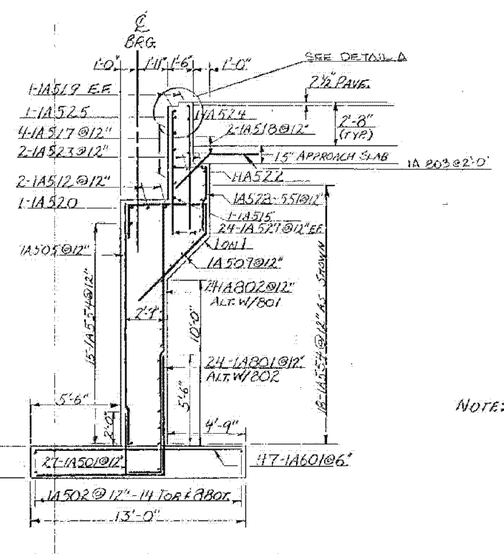
DETAIL A
1/2" = 1'-0"



TYPICAL FILLET DETAIL
SCALE: 1/2" = 1'-0"



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



TYPICAL SECTION A-A
SCALE: 1/4"=1'-0"

NOTE: N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE

REV	DESCRIPTION	DATE	APP'D
1	REVISED BEAM SEAT EL'S. AT ℄	3/14/86	

I-91 BRIDGES 81B
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 31 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TOWN OF WATERFORD	Bridge No. 18
HIGHWAY NO. I-93	Log Sta.
	Surv. Sta. RAMP W.-S. 160

ABUTMENT #1 DETAILS

RAMP W. TO S. OVER I-91 NB & SB & RAMP S. TO E

Designed by D. BURLEY	Drawn by S. BASCOM
Checked by A.E. Elwood date 7-15-80	Bridge Design Supervisor R.S. HAUPT date 7-80
PROJECT CONTRACT 3 WATERFORD	PROJECT NO. I 93-1(3)
Bridge Sheet No. 1809	Sheet 168 of 550

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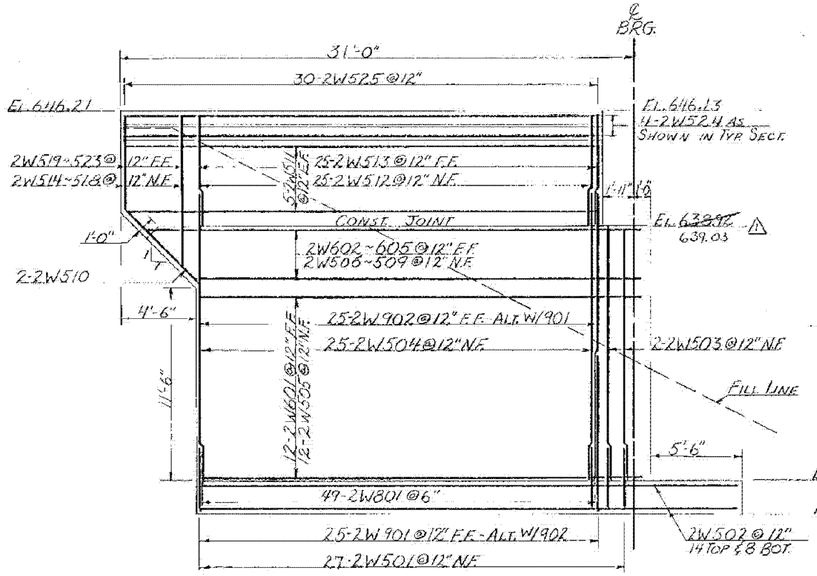
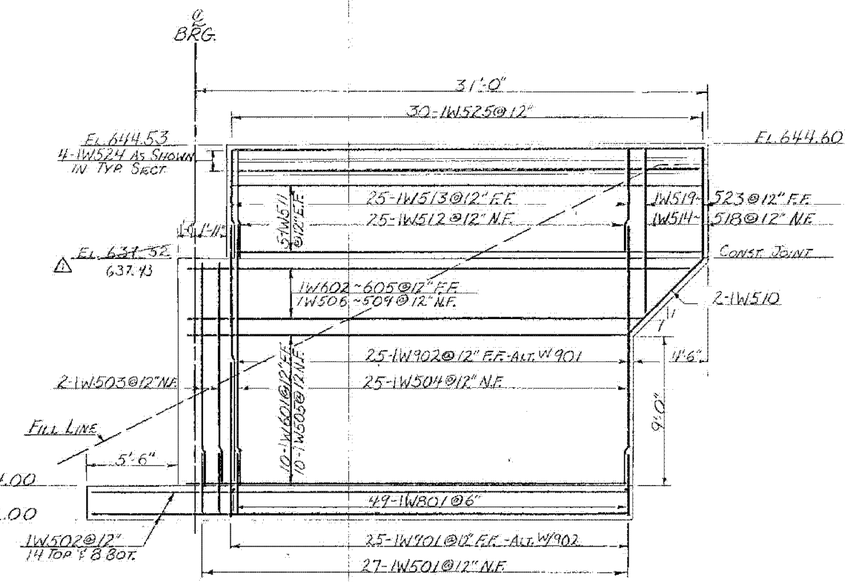
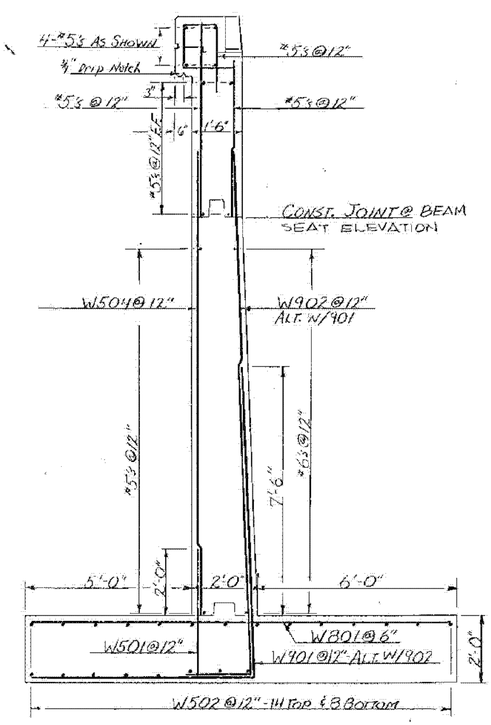
DRUNING 44-131-40151
BR-6



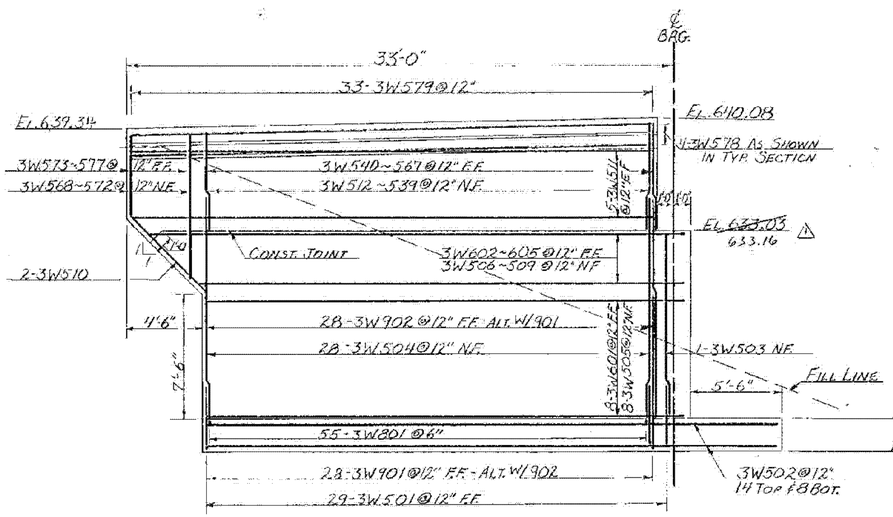
W.W.#2 ELEVATION
SCALE: 1/4" = 1'-0"



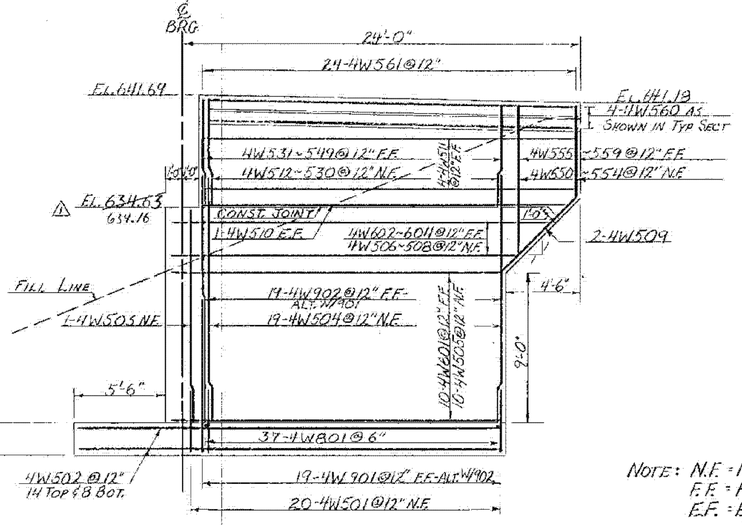
W.W.#1 ELEVATION
SCALE: 1/4" = 1'-0"



TYPICAL SECTION
SCALE 1/2" = 1'-0"



W.W.#3 ELEVATION
SCALE: 1/4" = 1'-0"



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

NOTE: N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE

REV.	DESCRIPTION	DATE	APP'D
1	REVISED BEAM SEAT ELS AS SHOWN.	4/6/84	DB

I-91 BRIDGES 81B
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 32 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TOWN OF WATERFORD	Bridge No. 18
HIGHWAY NO. I93	Log Sta. / Surv. Sta. RAMP W.S. 16+00
WINGWALL 1,2,3 & 4 DETAILS	
RAMP W. to S. OVER I91 N.B. & RAMP S. to E.	
Designed by D. BURLEY	Drawn by S. BASCOM
Checked by A. ELWOOD date 7-80	Bridge Design Supervisor R.S. HAUPT date 7-80
PROJECT CONTRACT 3 WATERFORD	PROJECT NO. I93-1(3)
Bridge Sheet No. BR 1810	Sheet 169 of 550

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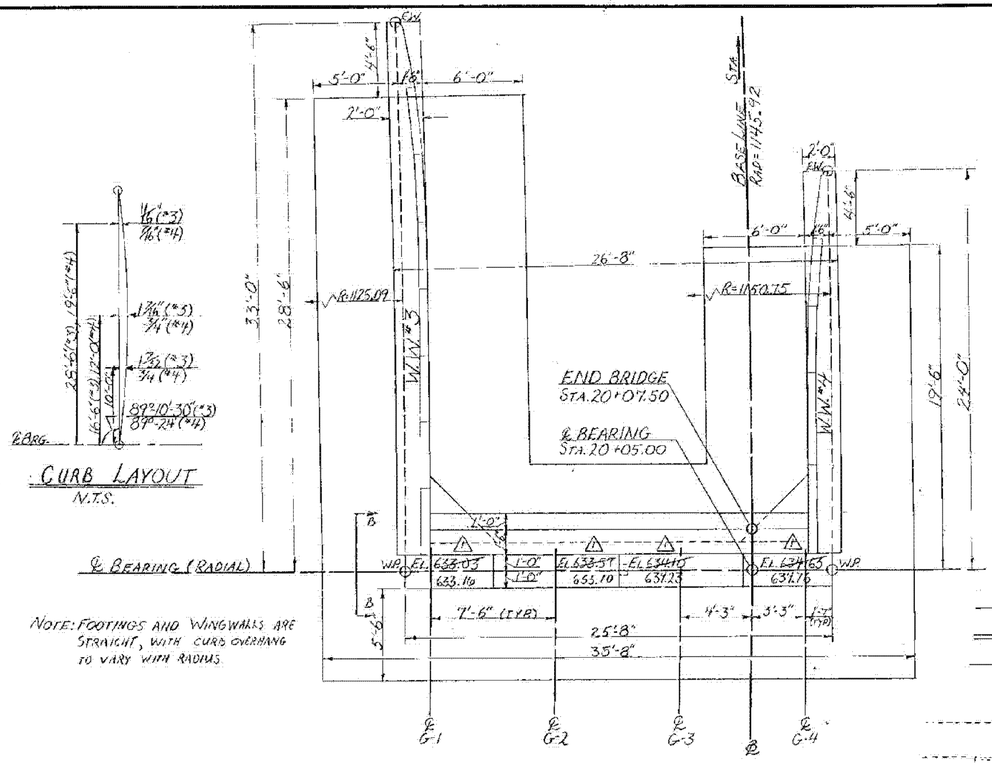
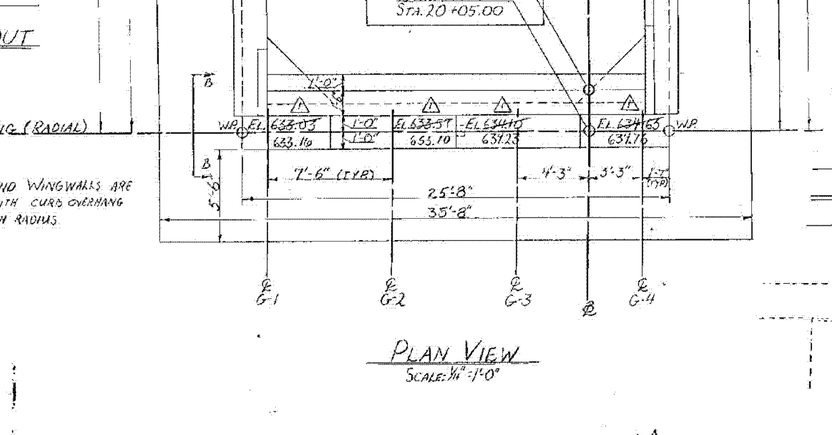
BR-5



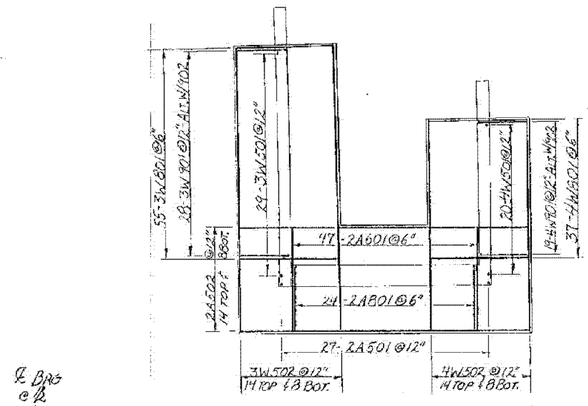
PLAN VIEW
SCALE: 1/4" = 1'-0"

CURB LAYOUT
N.T.S.

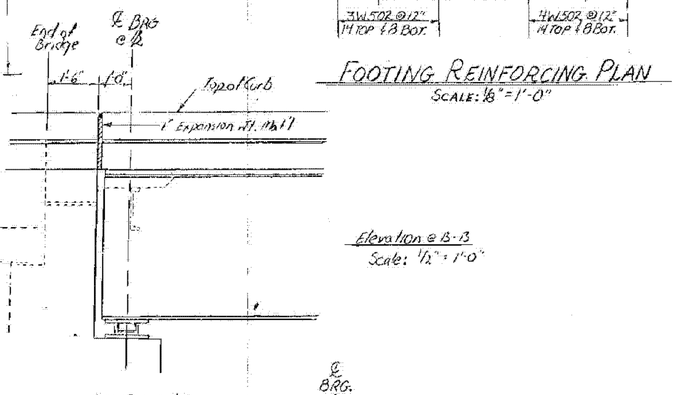
NOTE: FOOTINGS AND WINGWALLS ARE STRAIGHT, WITH CURB OVERHANG TO VARY WITH RADIUS.



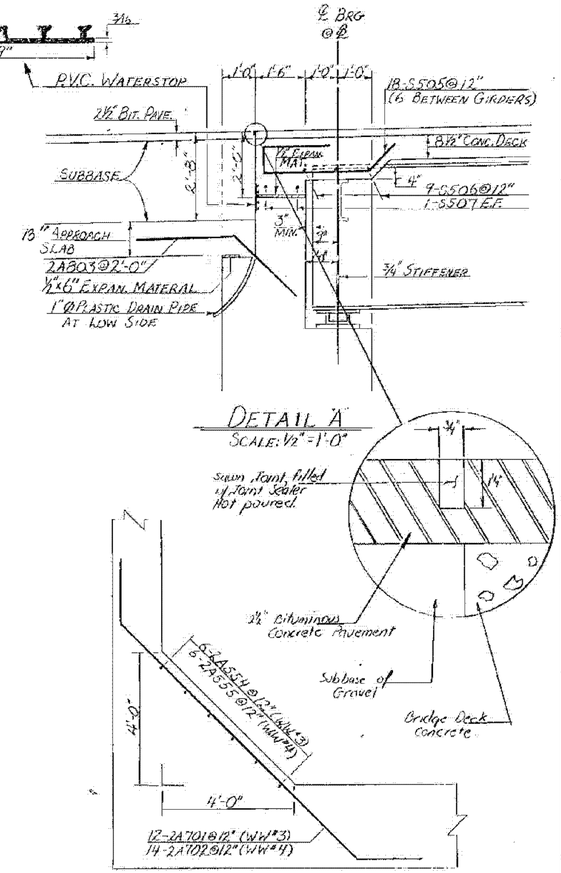
ELEVATION
SCALE: 1/4" = 1'-0"



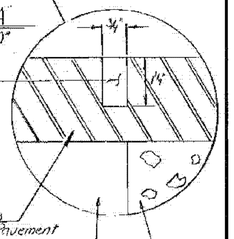
FOOTING REINFORCING PLAN
SCALE: 1/8" = 1'-0"



TYPICAL SECTION A-A
SCALE: 1/4" = 1'-0"



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



TYPICAL FILLET DETAIL
SCALE: 1/2" = 1'-0"

NOTE: N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE

REV	DESCRIPTION	DATE	INIT.
1	REVISED BEAM SEAT ELEV. AS INDICATED BY △	3/15/82	RB

I-91 BRIDGES 81B
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 33 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TOWN OF WATERFORD	Bridge No. 18
HIGHWAY NO. I-93	Log Sta.
	Surv. Sta. RAMP W. to S. 16+00

ABUTMENT 2 DETAILS
RAMP W. to S. OVER I-91 N.B. & S.B. & RAMP S. to E.

Designed by D. BURLEY	Drawn by S. BASCOM
Checked by A. Elwood date 7-80	Bridge Design Supervisor R.S. HAUPT date 7-80
PROJECT CONTRACT 3 WATERFORD	PROJECT NO. I 93-1(3)
Bridge Sheet No. BR1811	Sheet 170 of 550

199 OF 290

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BR-6

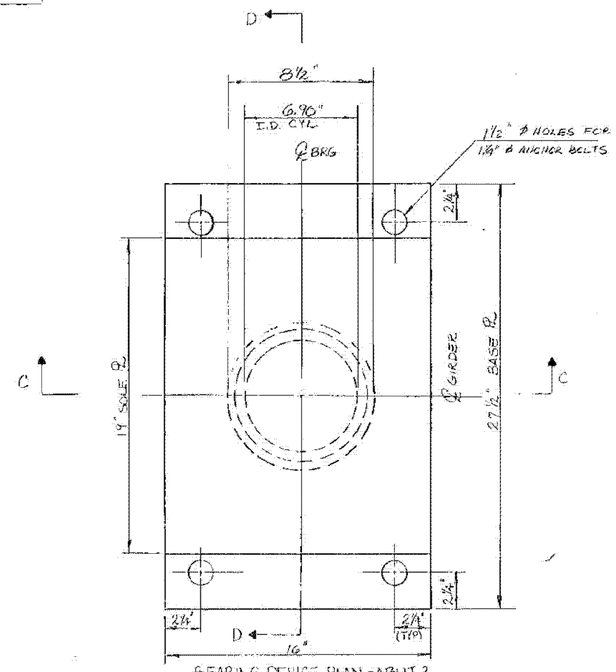
DESIGN LOADS		
	Vert Load	Lat. Load
Abut 1	140^K	15^K
Pier 1	310^K	32^K
Pier 2	280^K	33^K
Pier 3	260^K	25^K
Abut 2	100^K	8^K

Location	TEMPERATURE						
	0°	15°	45°	60°	75°	90°	105°
Abut 1	-1"	-1/2"	0	+1/2"	+1	+1 1/2	+2
Pier 1	-3/4	-3/8	0	+3/8	+3/4	+1 1/8	+1 1/2
Pier 2	-7/16	-7/16	0	+11/32	+7/16	+21/32	+7/8
Pier 3	-1/8	1/16	0	+1 1/16	+1/8	+3/16	+1/4

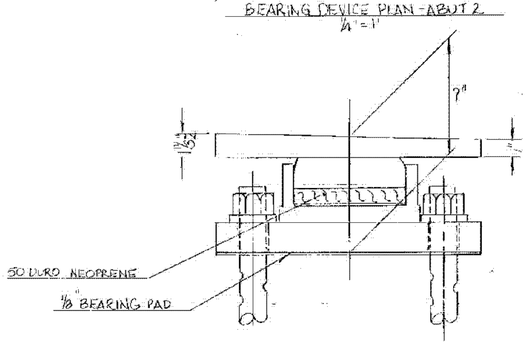
OFFSET FROM ℄ BEARING TO ℄ SOLE PL.

( ) TOWARD ABUTMENT 2.

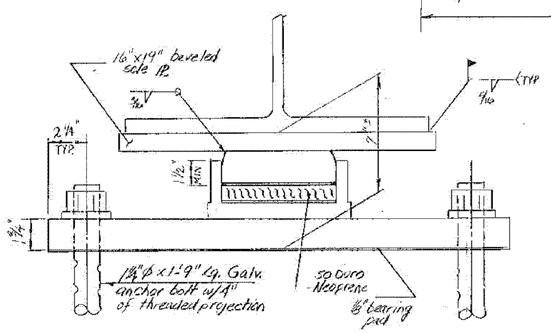
(+) AWAY FROM ABUTMENT 2.



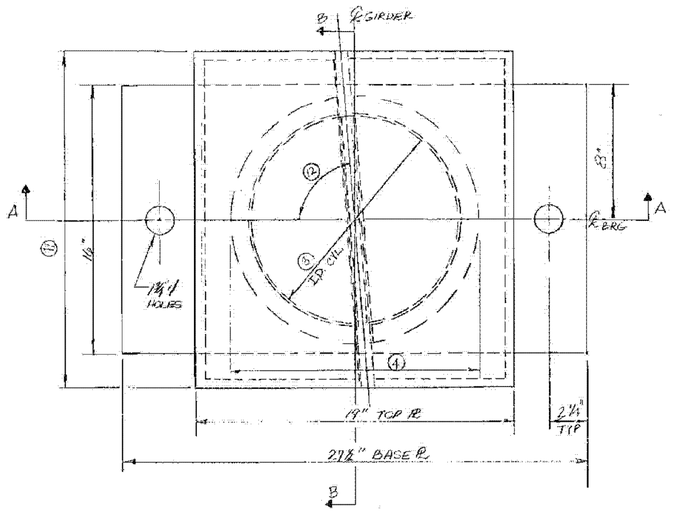
BEARING DEVICE PLAN - ABUT 2.
1/4" = 1"



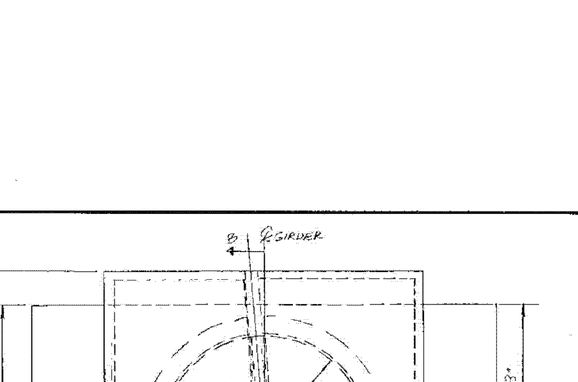
SECTION C-C
SCALE: 1/4" = 1"



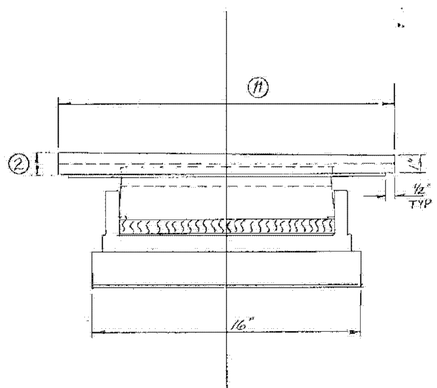
SECTION D-D
SCALE: 1/4" = 1"



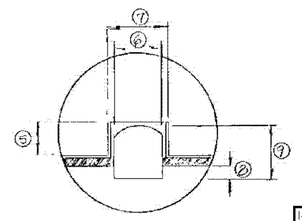
EXPANSION BEARING DEVICE PLAN
SCALE: 1/4" = 1"



SECTION A-A
SCALE 1/4" = 1"



SECTION B-B
SCALE 1/4" = 1"



SHEAR KEY DETAIL
N. T. S.

GENERAL NOTES

1. DESIGN CRITERIA
   A. VERTICAL LOAD (SEE DESIGN LOADS)
   B. TRANSVERSE LOAD (SEE DESIGN LOADS)
   C. TFE BEARING SURFACE PRESSURE ~3500 MAXIMUM, 600 PSI MINIMUM
   D. BASE PL. TO CONCRETE BEAM SEAT BEARING PRESSURE ~1400 PSI MAXIMUM
   E. MATING SURFACE STAINLESS STEEL ASTM A240, TYPE 304 W/MIRROR FINISH
   F. MINIMUM ROTATION CAPACITY ~0.01 RADIANS
2. BEARING BASE PLATE SHALL BE PLACED ON A 1/8" FABRIC PAD AS SPECIFIED IN SECTION 731.01.
3. BEARING DEVICES SHALL BE PAID FOR AT THE UNIT BID PRICE EACH OF ITEM 506.99, BEARING DEVICE ASSEMBLY.
4. ALL STEEL IN BEARING DEVICE ASSEMBLY SHALL BE ASTM A36 GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. THE CONTRACTOR WILL CERTIFY THAT THE BEARING DEVICE ASSEMBLY WILL MEET THE DESIGN CRITERIA STATED IN 1 ABOVE.
6. ALTERNATIVE BEARING ASSEMBLY CONFIGURATIONS MEETING AASHTO SPECIFICATIONS MAY BE SUBMITTED FOR APPROVAL PROVIDED DESIGN CRITERIA ARE SATISFIED AND THE ANCHOR BOLT SYSTEM AND PLACEMENT IS MAINTAINED.

⚠ 7. ALTERNATE BEARING DEVICE HAS BEEN APPROVED, SEE MANUFACTURERS DRAWING FOR DETAILS. THIS DRAWING IS "FOR REFERENCE ONLY."

REV.	DESCRIPTION	DATE	APP'D
⚠	ADDED NOTE 7.	11/16	DB

	ABUT 1	PIER 1	PIER 2	PIER 3
(1)	2"	2"	2"	2"
(2)	1"	1"	1 1/4"	1 9/16"
(3)	8.35"	12.25"	12.25"	11.43"
(4)	10 1/8"	14 3/4"	14 3/4"	13 5/8"
(5)	0.44"	0.56"	0.56"	0.44"
(6)	1/2"	1/2"	1/2"	1/2"
(7)	0.81"	0.81"	0.81"	0.81"
(8)	0.27"	0.31	0.37	0.27"
(9)	3/4"	1"	1"	3/4"
(10)	7 5/8"	7 5/8"	7 3/4"	7 5/8"
(11)	20"	20"	20"	16"
(12)	79°32'	82°30'	85°30'	85°30'

I-91 BRIDGES 81B
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 34 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TOWN OF WATERFORD	Bridge No. 18
	Log Sta.
HIGHWAY NO. I 93	Surv. Sta. RAMP W. to S. 16+0

BEARING DEVICE ASSEMBLY

RAMP W. to S. over I 91 N.B. & S.B. & RAMP S. to E.

Designed by A. ELWOOD	Drawn by M. HEALD
Checked by D. Burley date 7/16/80	Bridge Design Supervisor R. S. HAUPT date 7/20
PROJECT CONTRACT 3 WATERFORD	PROJECT NO. I 93-1(13)
Bridge Sheet No. BR 18\6	Sheet 175 of 350

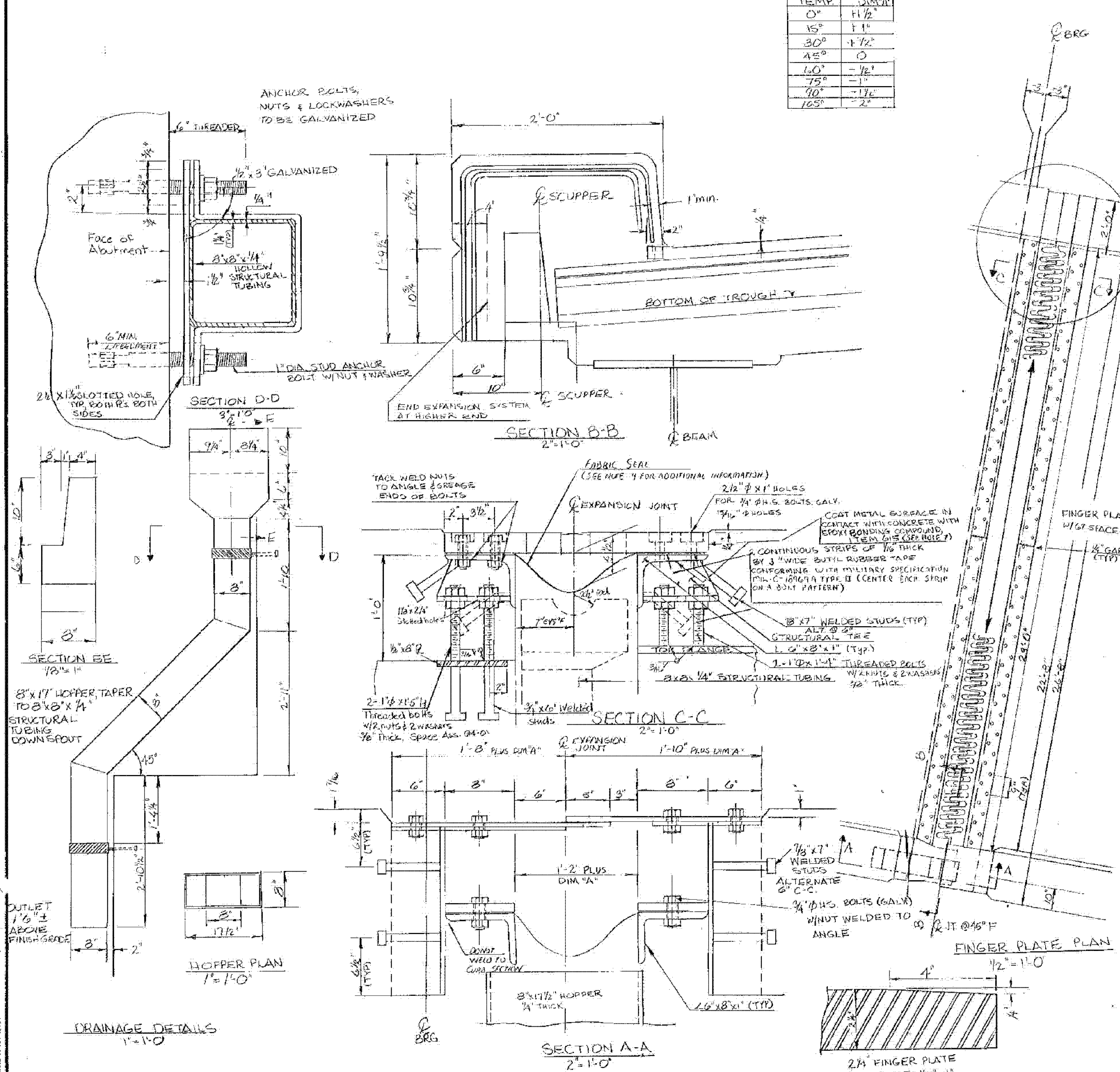
BRUNING 44-1131 4C1E1

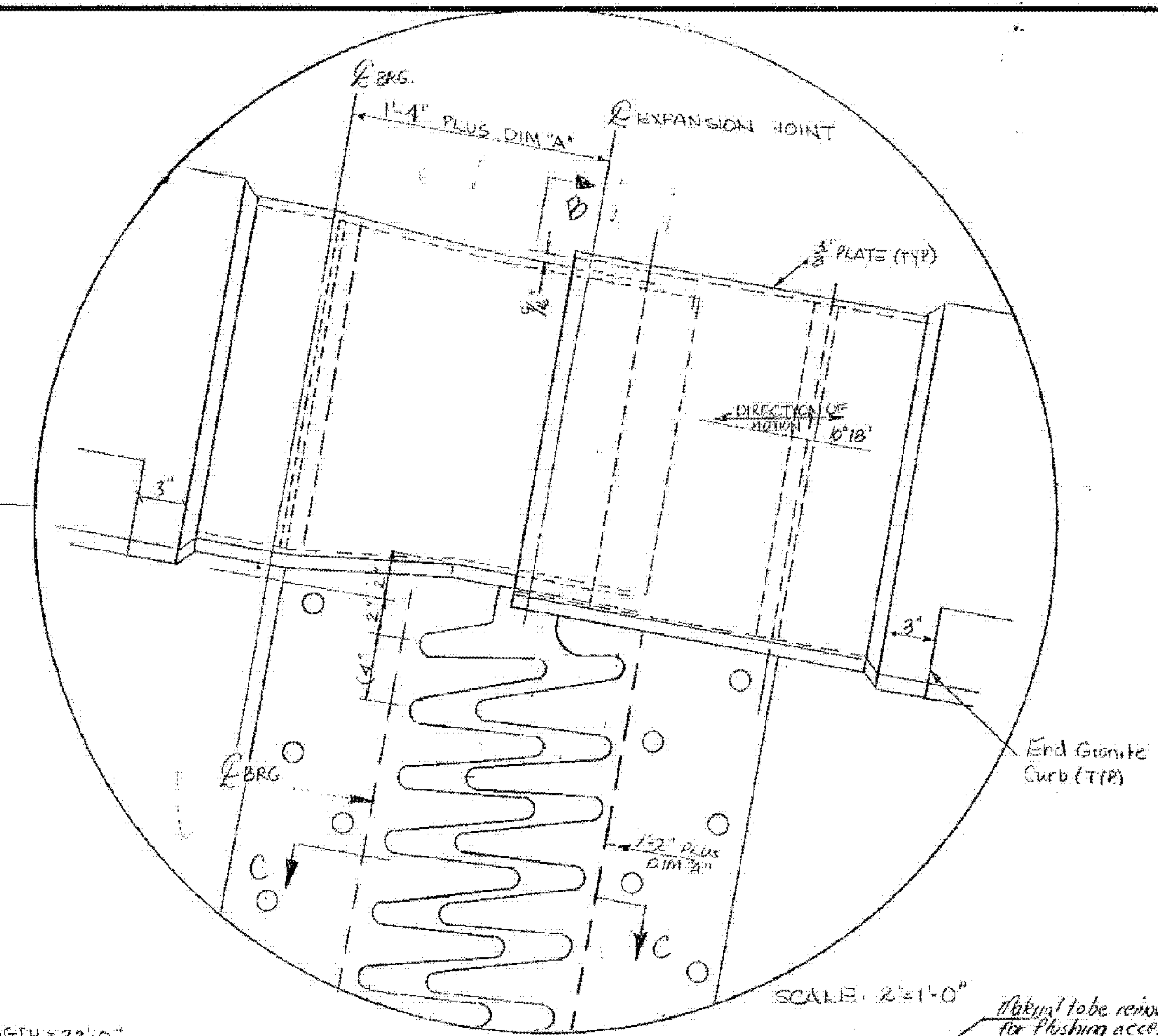
DR-5

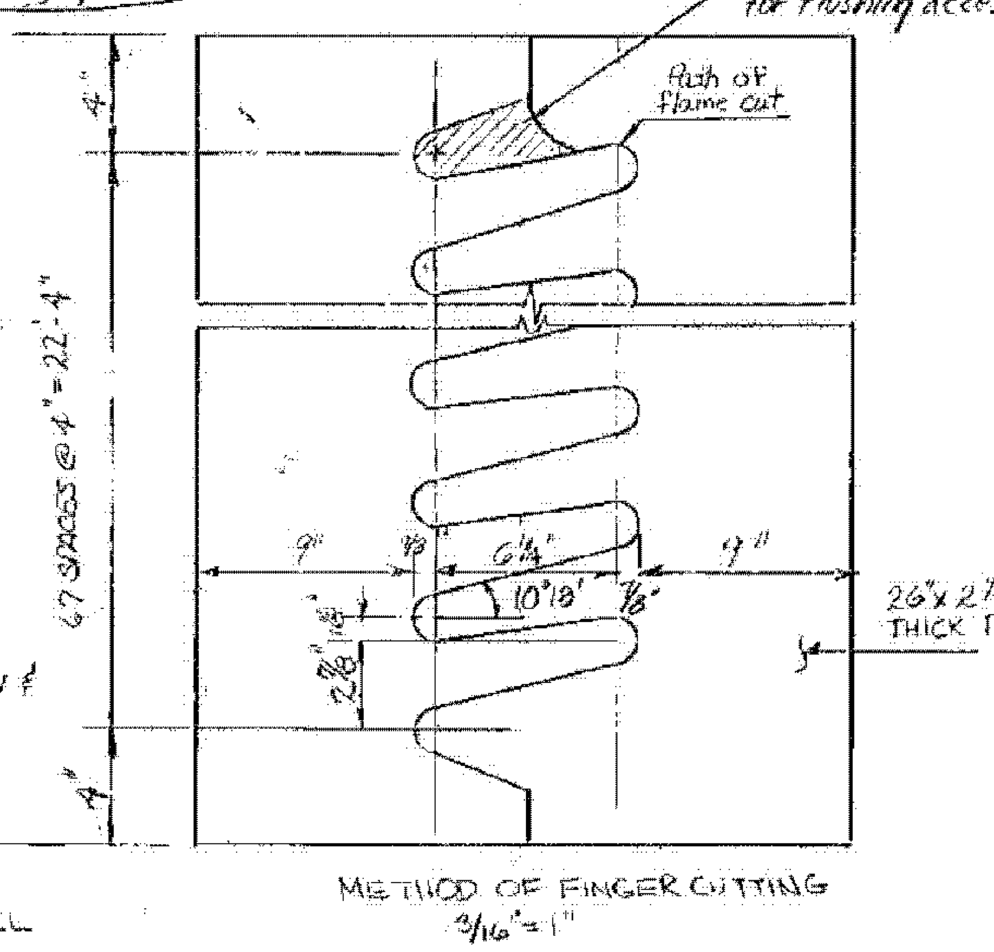
THIS FINGER JOINT REPLACED, SEE CHANGE OF DESIGN #2

EXPANSION

TEMP.	DIM "A"
0°	+1½"
15°	+1"
30°	+½"
45°	0
60°	-½"
75°	-1"
90°	-1½"
105°	-2"







NOTES

1. THE EXPANSION DAM IS TO BE SHOP ASSEMBLED AND TEMPORARILY FASTENED TOGETHER BY MEANS OF A BOLTED CONNECTION FOR TRANSPORTATION AS A UNIT TO THE FIELD.
2. THE FINAL FINISH SURFACE OF THE EXPANSION JOINT SHALL BE COVERED DURING THE PLACING OF THE BRIDGE DECK CONCRETE.
3. ALL STEEL COMPONENTS SHALL BE ASTM A588 UNLESS OTHERWISE NOTED.
4. ALL CURB PL's AND WELDED STUDS SHALL BE INCLUDED IN THE COST PER LINEAL FOOT BID FOR ITEM 516.36 ELASTOMERIC EXPANSION DAM (6" MOVEMENT). THE CURB PL's SHALL BE GALV & PAINTED GRAY IN COLOR (FEDERAL COLOR No. 26493) IN ACCORDANCE WITH THE SPECIAL PROVISION 708.09, PAINTING HOT DIP GALV. STEEL.
5. THE 2¼" THICK FINGER PLATES SHALL BE CUT FROM 2¼" x 26" PL AND FURNISHED IN 2 EQUAL LENGTHS. THE L'S 8"x6"x1" SHALL BE FURNISHED IN CONTINUOUS LENGTHS. THE FABRIC SEAL SHALL BE CONTINUOUS PREFORMED FABRIC MATERIAL CONFORMING WITH SECTION 707.13.
6. THREE COATS OF PAINT (IN ACCORDANCE WITH SECTION 513) SHALL BE APPLIED TO THE INTERIOR SURFACE OF THE EXPANSION JOINT.
7. THE HOPPER AND DOWN SPOUT SHALL BE A-36 GALV. AND PAINTED IN ACCORDANCE WITH THE SPECIAL PROVISION 708.09, "PAINTING OF HOT DIP GALVANIZED STEEL." PAYMENT FOR THE HOPPER AND DOWNSPOUT SHALL BE AT THE UNIT PRICE BID PER POUND FOR ITEM 506.91, STRUCTURAL STEEL. (COLOR: BRONZE 20040)
8. WHERE INDICATED EPOXY BONDING COMPOUND CONFORMING TO SECTION 615 SHALL BE APPLIED. PAYMENT TO BE INCLUDED IN THE UNIT PRICE FOR CONCRETE CLASS A, ITEM 501.20.
9. DRIP BEADS OF ¼" x 9" TWO PLY POLYESTER MATERIAL SHALL BE CEMENTED TO THE CENTER OF THE FABRIC TROUGH, AT EACH SIDE OF THE OUTLETS, WITH AN ADHESIVE APPROVED BY THE MANUFACTURER.

I-91 BRIDGES 81B

WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 35 OF 43
FOR REFERENCE ONLY

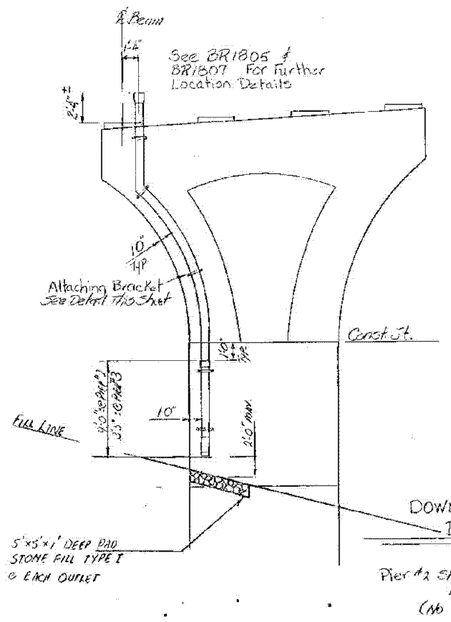
STATE OF
AGENCY OF TR

TOWN OF WATERFORD	Bridge No. 18
	Log Sta.
HIGHWAY NO. I 93	Surv. Sta. RAMP WAS 163
RAMP W. to S. over I 91 NB & SB & RAMP S to E.	
EXPANSION JOINT DETAILS	
Designed by D. BURLEY	Drawn by M. HEALD
Checked by G.V. SPILAK date 7.17.80	Bridge Design Supervisor R.S. HAUPT date 7-80
PROJECT CONTRACT 3 WATERFORD	PROJECT NO. I 93-1(3)
Bridge Sheet No. BR 1817	Sheet 176 of 550

176

BRUNING 44-131 40151

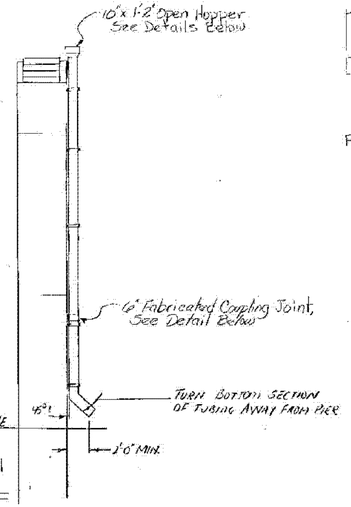
BR-6

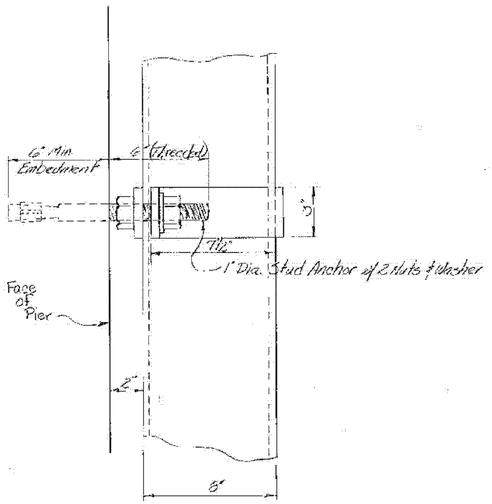


DOWNSPOUT LOCATION DETAILS

N.T.S.

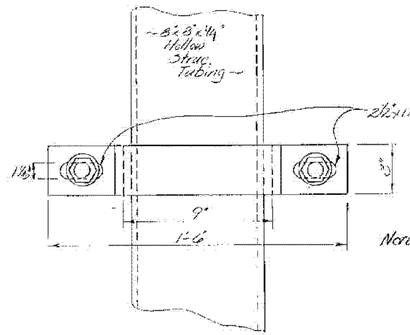
Pier #2 Shown - Pier #3 Similar Except Reverse (No Down Spout @ Pier #1)





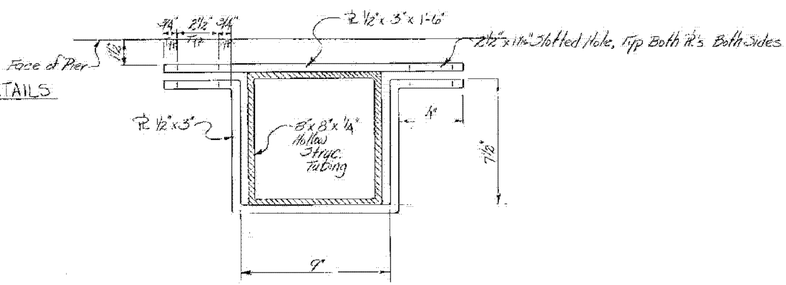
ATTACHING BRACKET DETAILS

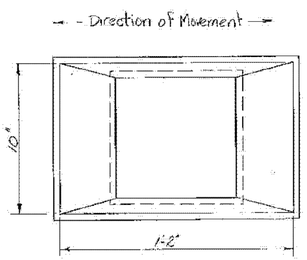
1/4" = 1"



STAINLESS STEEL ANCHOR BOLT ASSEMBLY

NOTES:
1) THE ANCHOR BOLT ASSEMBLY FURNISHED SHALL BE CAPABLE OF AN ULTIMATE PULLOUT OF AT LEAST 15,000 LBS, AND AN ULTIMATE SHEAR STRENGTH OF 21,000 LBS.
2) THE TYPE OF ANCHOR SHALL BE APPROVED BY THE STRUCTURES ENGINEER.
3) MATERIAL FOR THE STUD ANCHOR BOLTS SHALL CONFORM WITH ASTM A 582 TYPE 303
4) MATERIAL FOR THE WEDGE ANCHOR SHALL CONFORM WITH ASTM A 276 TYPE 304
5) MATERIAL FOR THE NUTS & WASHERS SHALL BE STAINLESS STEEL.

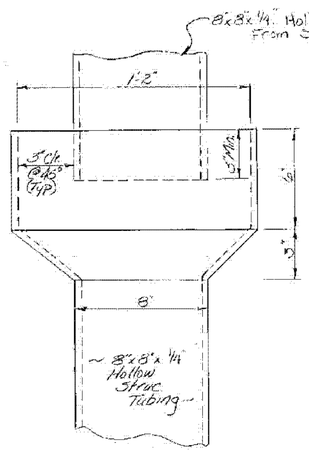


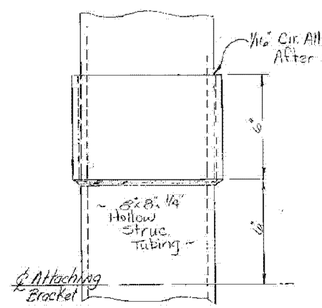


HOPPER DETAILS

1/4" = 1"

Construct Hopper of ¼" PL w/ Fillet weld all around





COUPLING JOINT DETAIL

1/4" = 1"

NOTE: SCUPPER MATERIALS:
The hollow structural tubing shall conform to ASTM A500 or A501. All plates, and bars shall conform to ASTM A36 All scuppers down spouts and brackets shall be galvanized according to ASTM A123. All shall be painted grey (Federal Color No. 26493) in accordance with Special Provision 708.09 "Painting of Hot Dipped Galvanized Steel." Payment for scuppers shall be at the unit price per pound for structural steel.

I-91 BRIDGES 81B
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 36 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TOWN OF WATERFORD	Bridge No. 18
HIGHWAY NO. I93	Log Sta.
	Surv. Sta. Ramp W-S, N-E

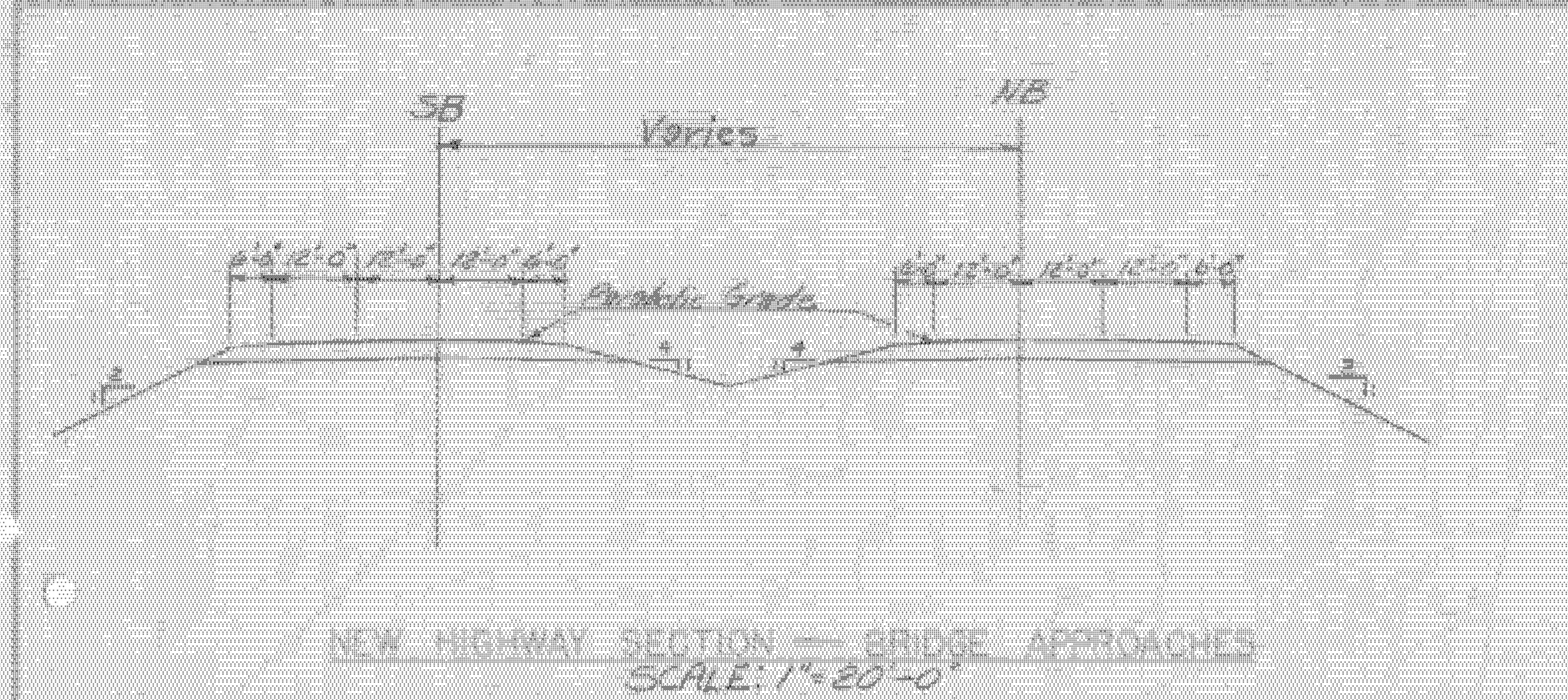
DOWNSPOUT DETAILS

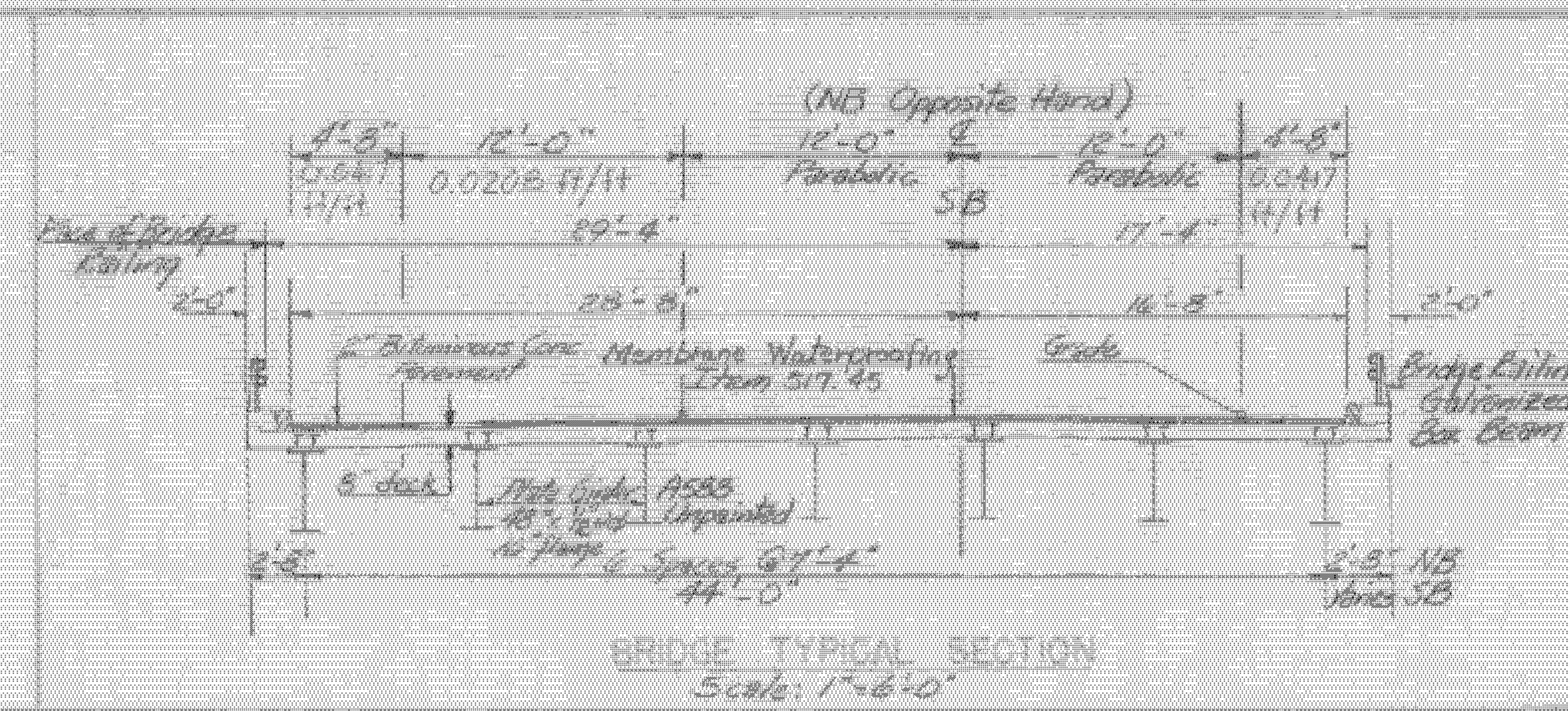
RAMP W to S OVER I91 N.B.F.S.B. & RAMP S to E.

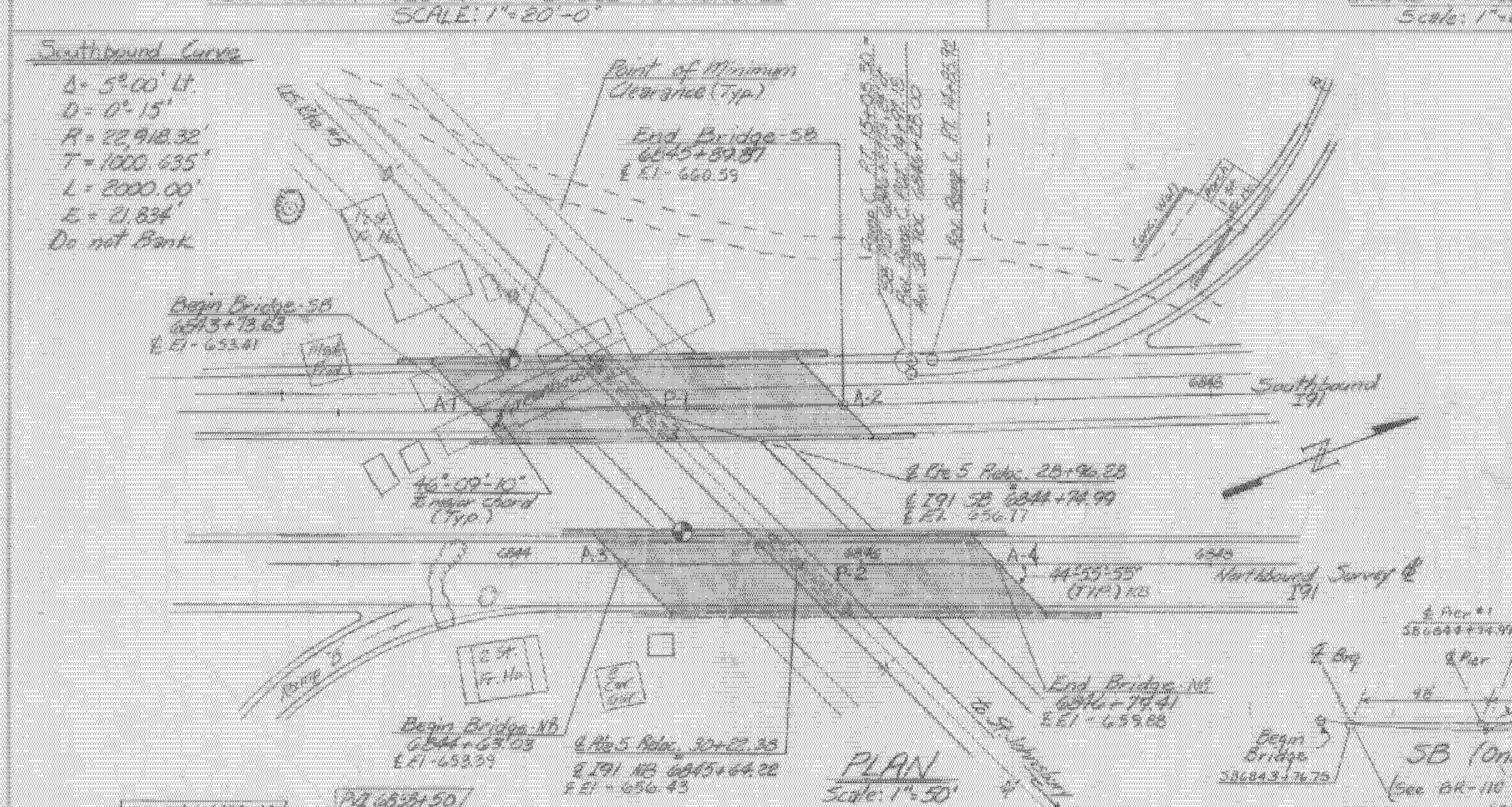
Designed by R. Whitcomb	Drawn by R. Whitcomb
Checked by A. ELWOOD date 7-24-80	Bridge Design Supervisor R.S. HAUPT date 7-80
PROJECT CONTRACT 3 WATERFORD	PROJECT NO. I93-1(3)
Bridge Sheet No. BR1819	Sheet 178 of 550

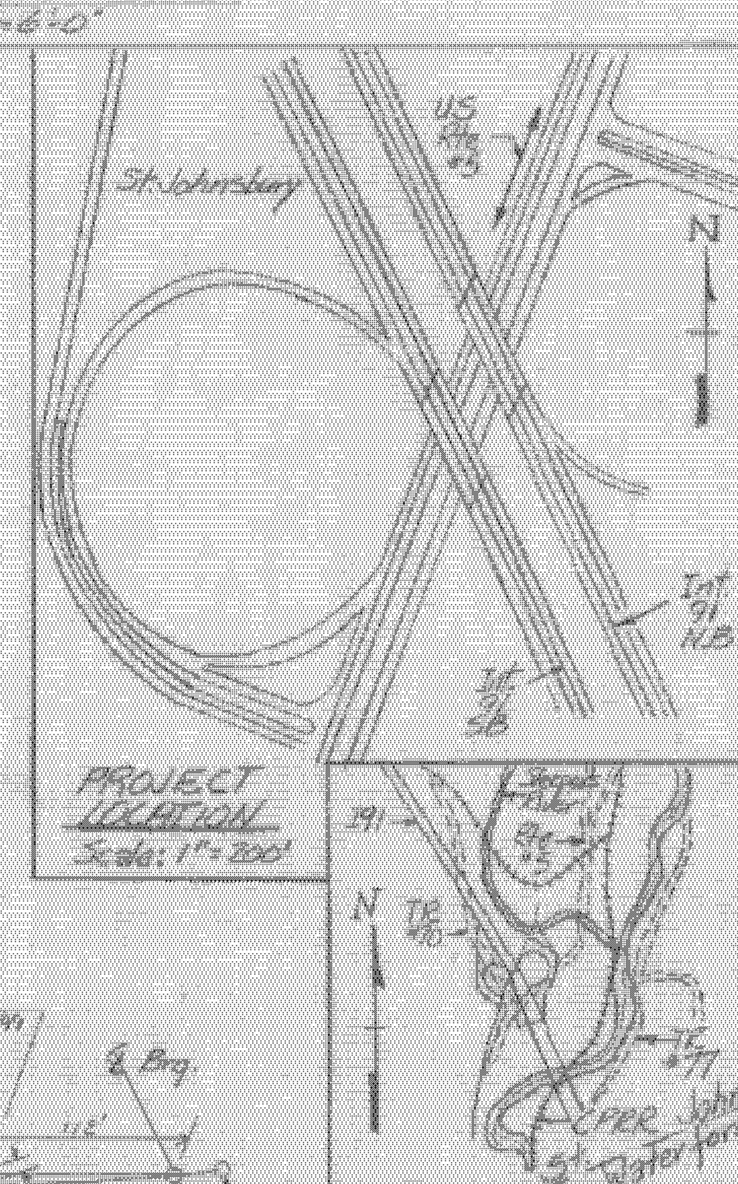
BRUNING 44-1351-40151

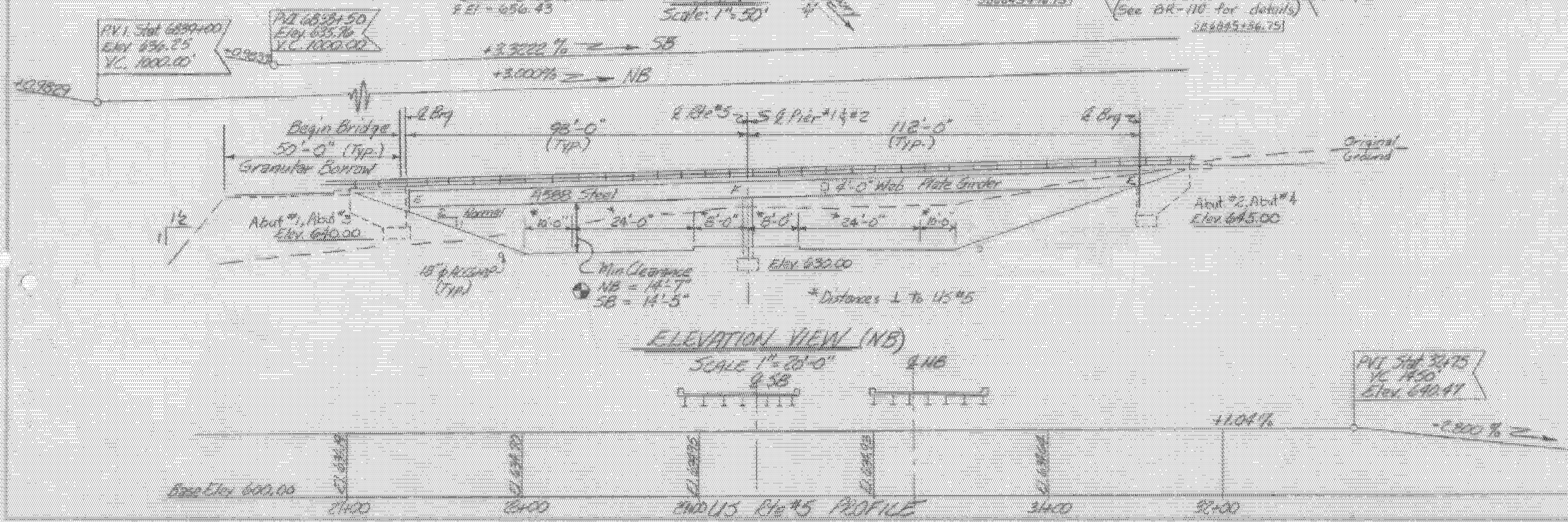
BR-6











EXISTING STRUCTURE

NONE

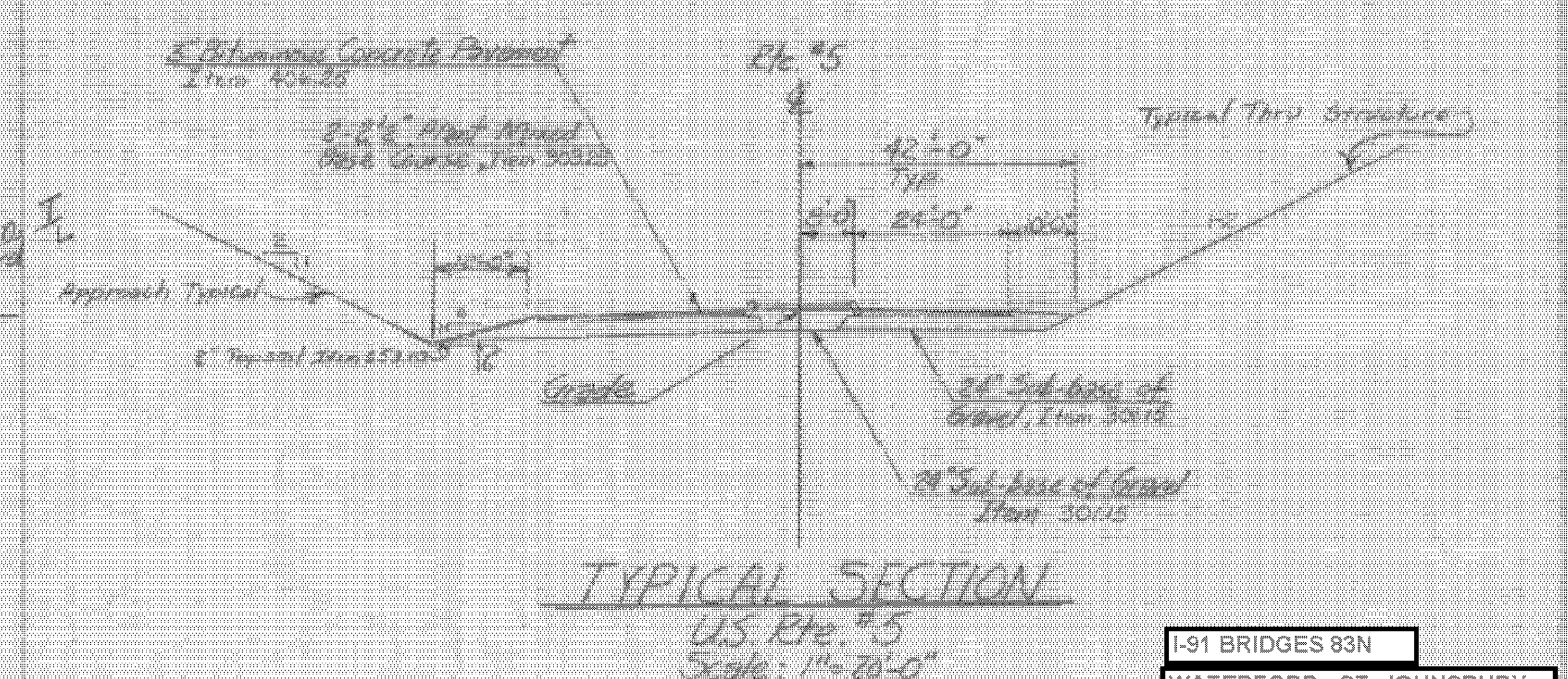
NEW STRUCTURE

1. RECOMMENDED TYPE OF STRUCTURE: Two Span Continuous Composite Plate Girder (A588 Steel)
2. RECOMMENDED OVERALL STRUCTURE LENGTH: NB 216'-4 3/16" SB 216'-2 7/8"
CLEAR SPAN LENGTHS NORMAL TO US #5: NB & SB ± 148'-0"
SPAN LENGTHS CENTER TO CENTER OF BEARINGS: NB & SB 98'-0" / 112'-0"

N.A.

19. ESTIMATED ALLOWABLE LOAD FOR SPREAD FOOTINGS: 4 KSF DESIGN MAX FOOTING PRESSURE 4.0 KSF
20. PILING DESIGN LOAD: NA ESTIMATED LENGTH: NA TYPE: NA
21. DESIGN SPECIFICATIONS:
DESIGN LOAD: A.A.S.H.O. HS20-44
ALLOWABLE STRESSES:
STRUCTURAL STEEL: TENSION 27,000 psi, COMPRESSION 27,000 psi
REINFORCING STEEL: TENSION 24,000 psi, COMPRESSION 20,000 psi
CONCRETE: Class A, f'c 3000 PSI, fc 1400 PSI

ADDITIONAL DESIGN CONSIDERATIONS



I-91 BRIDGES 83N

WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 37 OF 43
FOR REFERENCE ONLY

RECOMMENDED FOR APPROVAL	K. M. Smith, BRIDGE ENGINEER	1/28/74
RECOMMENDED FOR APPROVAL	R O Mumm, ASSISTANT CHIEF ENGINEER	1/28/74
APPROVED BY	E. H. Stickney, CHIEF ENGINEER	1/28/74

REVISIONS

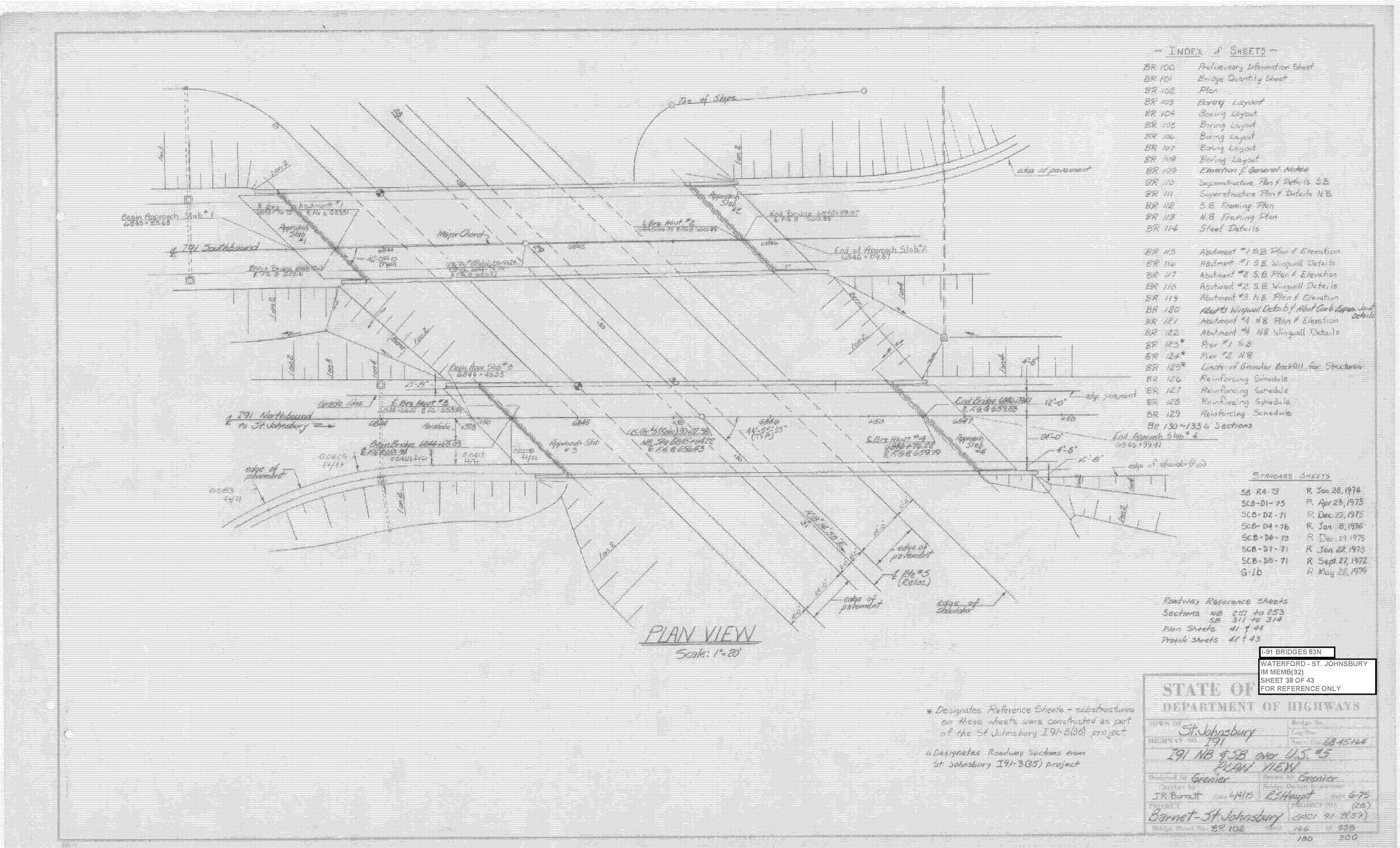
NO.	DESCRIPTION	BY & DATE

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

TOWN OF: St. Johnsbury
HIGHWAY NO.: I91
6845+64

I91 NB & SB over U.S. Rte #5 (Reloc.)
Preliminary Information

Designed by: Grenier
Drawn by: Grenier
Checked by: R. Ladd, Date 1-11-73
R. P. Gendron, Date 12-17-73
PROJECT: Barnet - St. Johnsbury
PROJECT NO.: (25) EAC I 91-2(33)
Bridge Sheet No. BR 100
Sheet 164 of 330
178 300



— INDEX of SHEETS —

BR 100	Preliminary Information Sheet
BR 101	Bridge Quantity Sheet
BR 102	Plan
BR 103	Boring Layout
BR 104	Boring Layout
BR 105	Boring Layout
BR 106	Boring Layout
BR 107	Boring Layout
BR 108	Boring Layout
BR 109	Elevation & General Notes
BR 110	Superstructure Plan & Details S.B.
BR 111	Superstructure Plan & Details N.B.
BR 112	S.B. Framing Plan
BR 113	N.B. Framing Plan
BR 114	Steel Details
BR 115	Abutment #1 S.B. Plan & Elevation
BR 116	Abutment #1 S.B. Wingwall Details
BR 117	Abutment #2 S.B. Plan & Elevation
BR 118	Abutment #2 S.B. Wingwall Details
BR 119	Abutment #3 N.B. Plan & Elevation
BR 120	Abut #3 Wingwall Details & Abut Curb & Span Joint Details
BR 121	Abutment #4 N.B. Plan & Elevation
BR 122	Abutment #4 N.B. Wingwall Details
BR 123*	Pier #1 S.B.
BR 124*	Pier #2 N.B.
BR 125*	Limits of Granular Backfill for Structures
BR 126	Reinforcing Schedule
BR 127	Reinforcing Schedule
BR 128	Reinforcing Schedule
BR 129	Reinforcing Schedule
BR 130 - 133	& Sections

STANDARD SHEETS

SB RA-73	R. Jan 28, 1974
SCB-D1-75	R. Apr 28, 1975
SCB-D2-71	R. Dec 23, 1975
SCB-D4-76	R. Jan 8, 1976
SCB-D6-73	R. Dec 23, 1975
SCB-D7-71	R. Jan 22, 1973
SCB-D8-71	R. Sept 27, 1972
G-16	R. May 28, 1974

Roadway Reference Sheets
Sections NB 251 to 253
SB 311 to 314
Plan Sheets 41 & 44
Profile Sheets 42 & 43

* Designates Reference Sheets - substructures on these sheets were constructed as part of the St Johnsbury I91-3(35) project

& Designates Roadway Sections from St Johnsbury I91-3(35) project

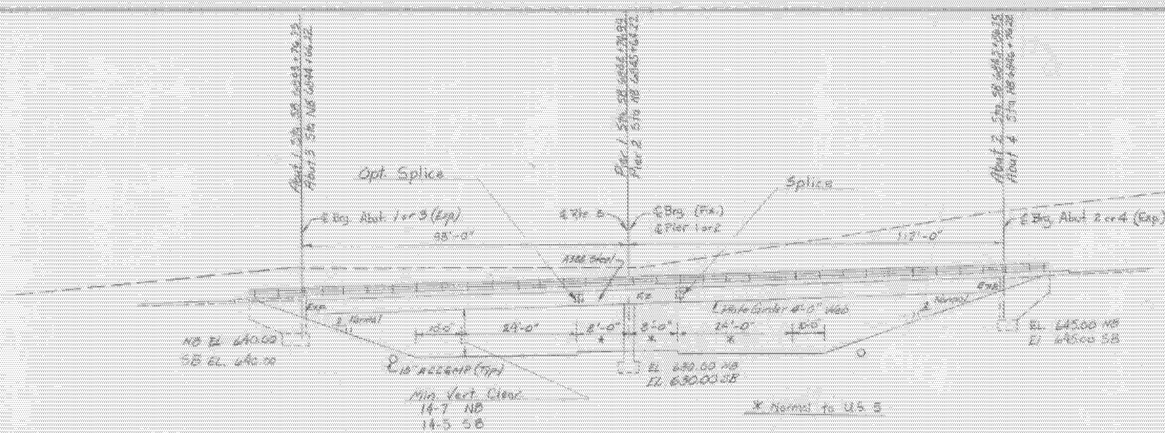
I-91 BRIDGES 83N
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 38 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

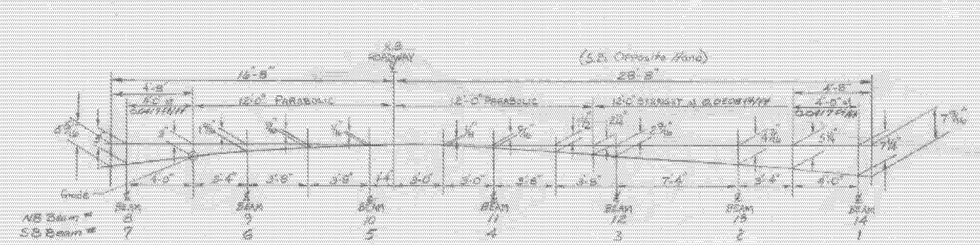
TOWN OR CITY	St. Johnsbury	Bridge No.	
HIGHWAY NO.	191	Project No.	BRM-1916(4)
		Town Code	68-15-164

I91 NB & SB over U.S. #5
PLAN VIEW

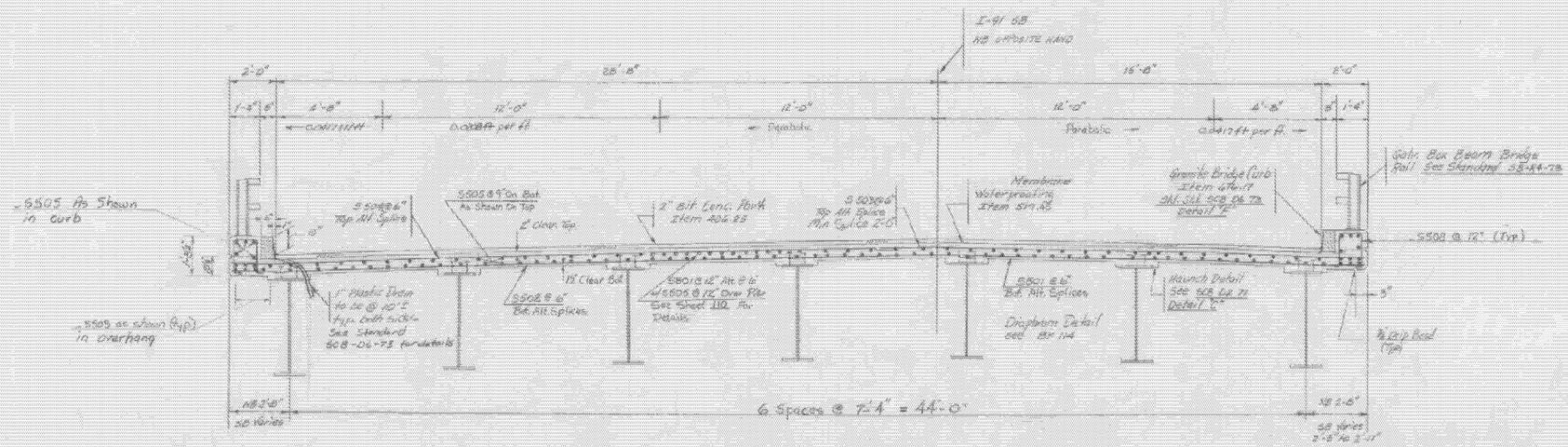
Designed by	Grenier	Drawn by	Grenier
Checked by	JR Burnett	Date 4/78	Approved by RJ Haupt
Date			6-75
Project	Barnet-St. Johnsbury	Project No.	BRM 91-3(59) (28)
Bridge No. on this Sht.	BR 102	Sheet	166 of 838
			180 300



ELEVATION NB & SB
Scale - 1"=20'



Detail of Partial Parabolic Crown of Slab
Scale ¼" = 1'-0"



TYPICAL SECTION (SB, NB opp HAND)
SCALE ⅜" = 1'

~ Deck Slab to be Concrete 2'-0" & 8" thick ~

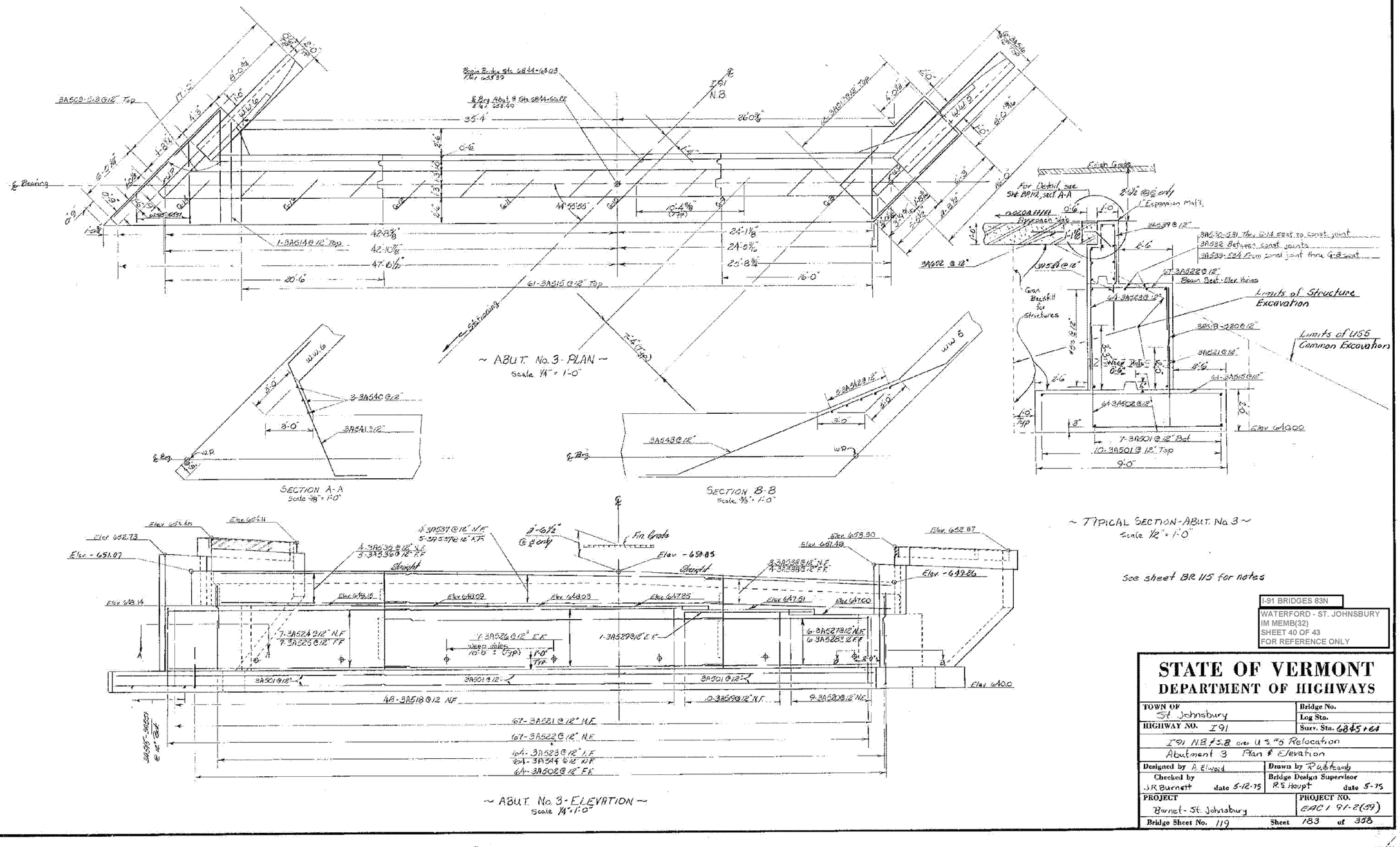
GENERAL NOTES

1. The General Notes pertaining to Specifications, Materials & Construction shown on Standard Dwg SCB-01.75 all apply except 2 & 12.
2. Superstructure concrete to be Class A. Substructure concrete to be Class B.
3. Water Repellent shall be applied to all exposed concrete surfaces on abutments, piers and superstructure except for the underside of the deck slab between fascia beams or areas otherwise treated.
4. All surfaces of structural steel shall be blast cleaned as specified under section 506.47(b)2. Protection of concrete and field cleaning of structural steel shall be as specified under section 506.60.
5. Piers 1 & 2 were constructed as part of the St Johnsbury I-91-3(35) project. The contractor shall be responsible for any injury or damage to these substructures incurred by his operation in performing the work covered by this contract in accordance with section 107.17 of the Specifications.
6. All ℄'s indicated C.V.N. shall meet the requirements for the Charpy V-notch test as specified in the Special Provisions Section 714.03.
7. The unit price bid for item 506.31 structural steel ℄ girder shall include compensation for drilling and grouting the anchor bolts for the fixed bearing devices on the piers.
8. Elevation datum is sea level based on nearest U.S. Government control.
9. The abutment and pier bridge seats shall be coated with Water Repellent.
10. Abbreviations used as follows: N.F. - Near Face; F.F. - Far Face; E.F. - Each Face.
11. Reinforcing Steel clearance to be 2" unless otherwise noted.
12. Drip Beads are to be discontinued 2'-0" from abuts & 1'-3" from pier ℄'s.

I-91 BRIDGES 83N
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 39 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

Town of St Johnsbury	Bridge No.
Highway No. I-91	Proj. No. BRM 6845(16)
NB & SB over US 5 & RR's etc.	
Profile, Typical Section & General Notes	
Designed by B. J. Greiner	Drawn by R. Tatum
Quantities by C. J. Greiner Date 12-76	Checked by & Approved by R. S. Haupt Date 3-78
Plotted by Durant - St. Johnsbury	Project No. (28) EMCI 91-2(39)
Bridge Sheet No. BR 100	Sheet 173 of 356
	181 300

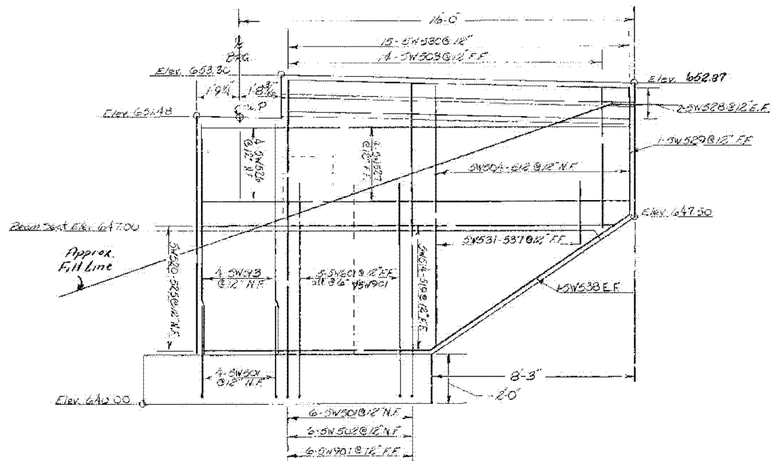


See sheet BR 115 for notes

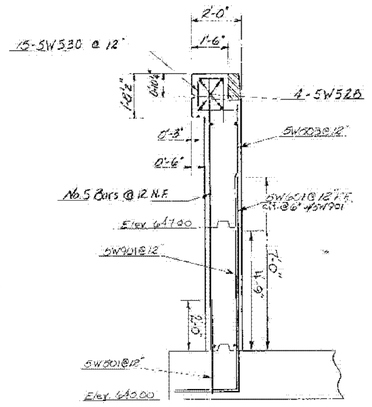
I-91 BRIDGES 83N
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 40 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

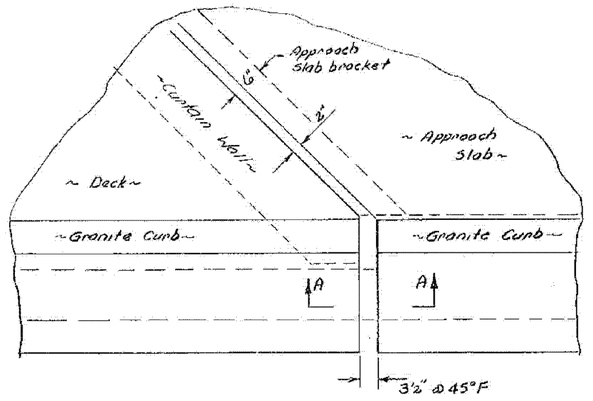
TOWN OF St Johnsbury	Bridge No.
HIGHWAY NO. I91	Log Sta. Surv. Sta. 685+61
I-91 NB #3.8 over U.S. #5 Relocation	
Abutment 3 Plan & Elevation	
Designed by A. Elwood	Drawn by Rubicomb
Checked by J.R. Burnett date 5-12-75	Bridge Design Supervisor R.S. Haupt date 5-75
PROJECT Barnet - St. Johnsbury	PROJECT NO. EAC I 91-2(59)
Bridge Sheet No. 119	Sheet 183 of 338



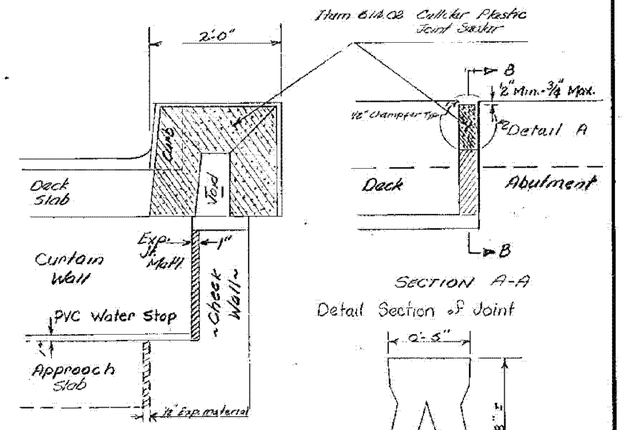
~ Elevation - Wingwall #5 ~
Scale 3/8" = 1'-0"



~ Typical Section ~
Wingwall #5 ~
Scale 3/8" = 1'-0"



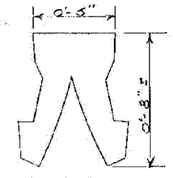
EXPANSION JOINT PLAN VIEW @ CURB



SECTION A-A

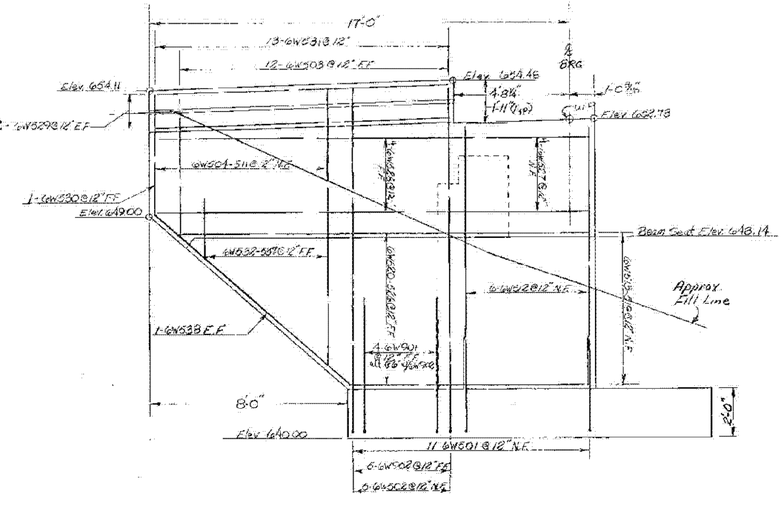
SECTION B-B

Detail Section of Joint

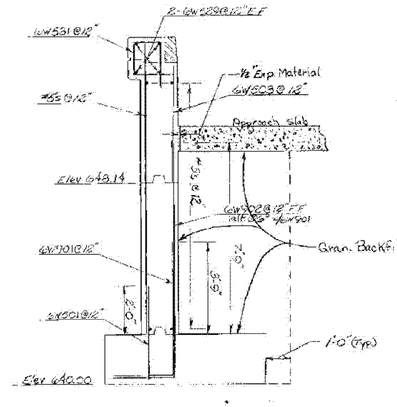


Detail A N.T.S.

ABUTMENT CURB EXPANSION JOINT
Scale: 1" = 1'-0"



~ Elevation - Wingwall #6 ~
Scale 3/8" = 1'-0"



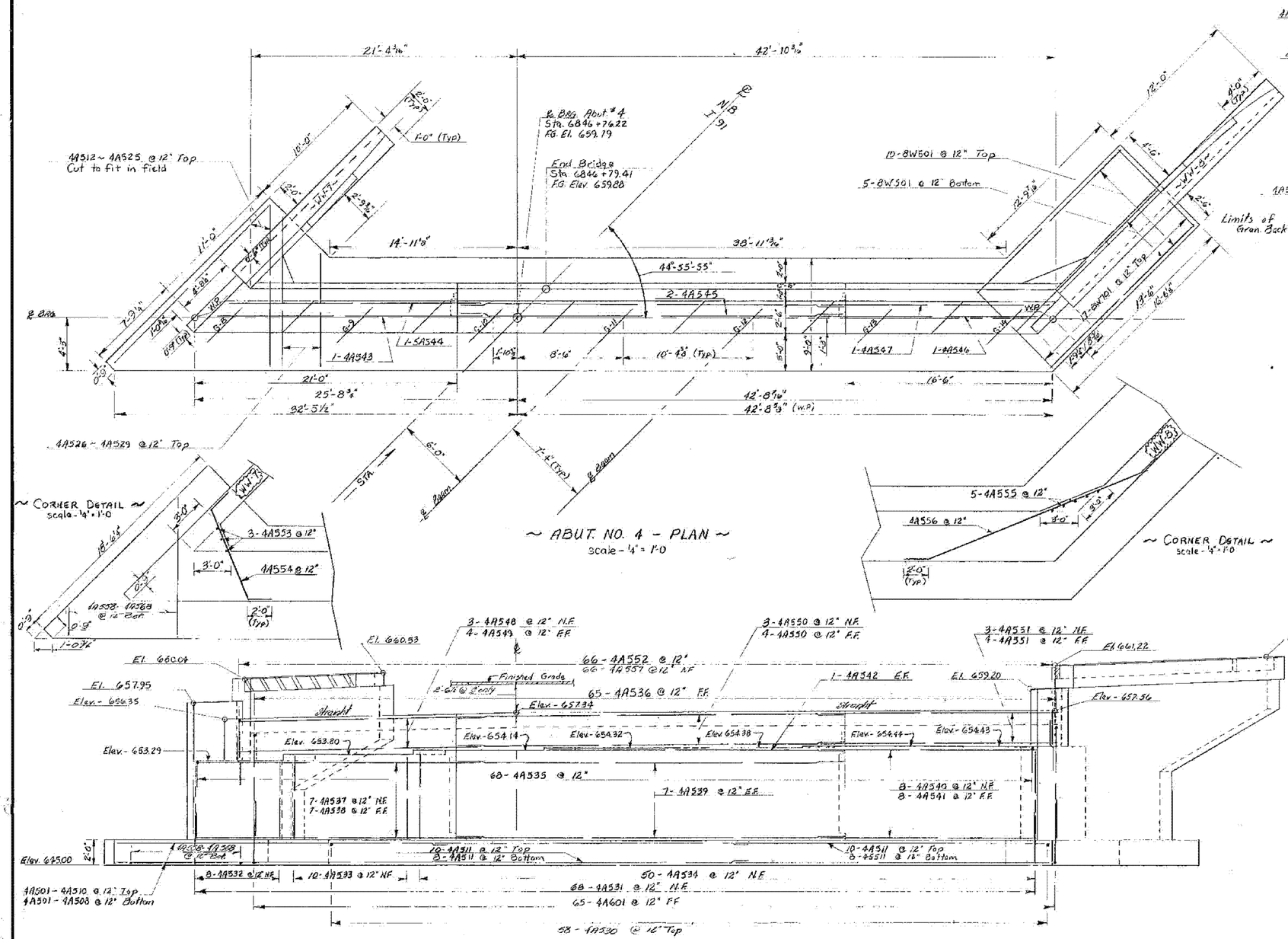
~ TYPICAL SECTION ~
Wingwall #6 ~
Scale 3/8" = 1'-0"

I-91 BRIDGES 83N
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 41 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

TOWN OF St Johnsbury	Bridge No.
HIGHWAY NO. I 91	Log Sta.
I 91 N.B. & S.B. over U.S.5 Relocation	Surv. Sta. 6845+64
Abut #3 Wingwall Details & Abut Curb Expan. Joint Details	
Designed by A. Elwood	Drawn by R. Whitcomb
Checked by J. Burnett date 1-30-75	Bridge Design Supervisor R.S. Haupt date 5-75
PROJECT Barnet - St Johnsbury	PROJECT NO. BAC 191-2(39)
Bridge Sheet No. 120	Sheet 184 of 338

BR-9



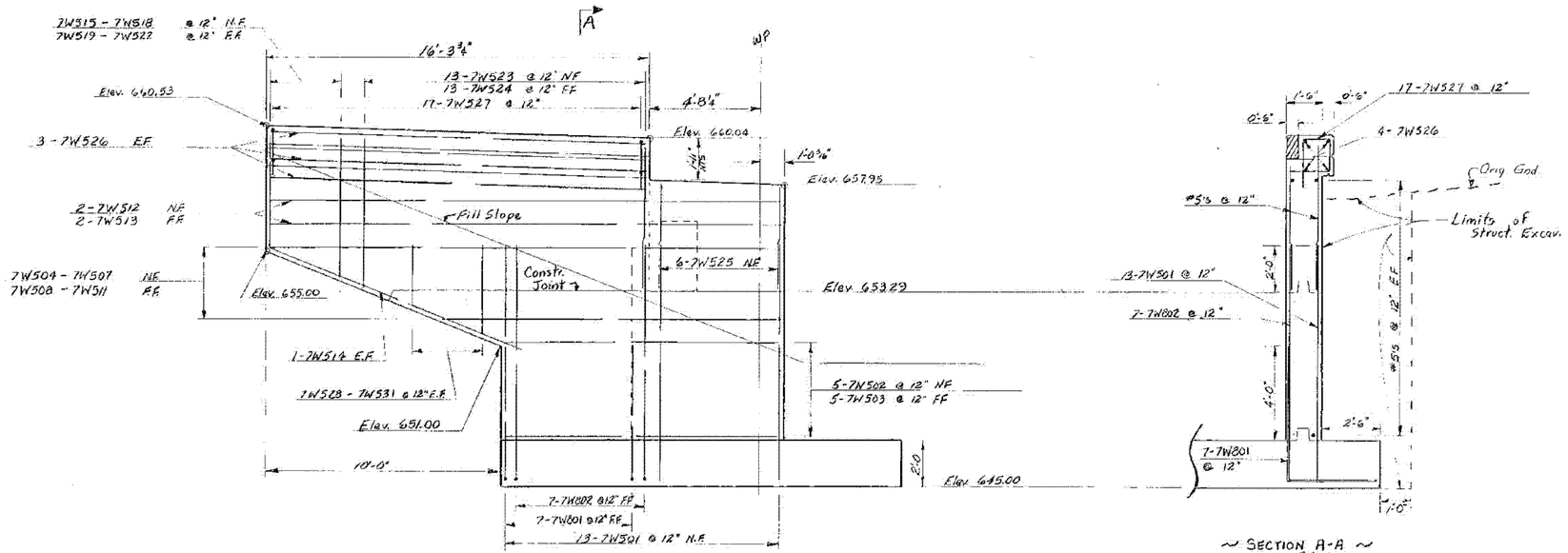
See sheet BR 115 for notes

I-91 BRIDGES 83N
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 42 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

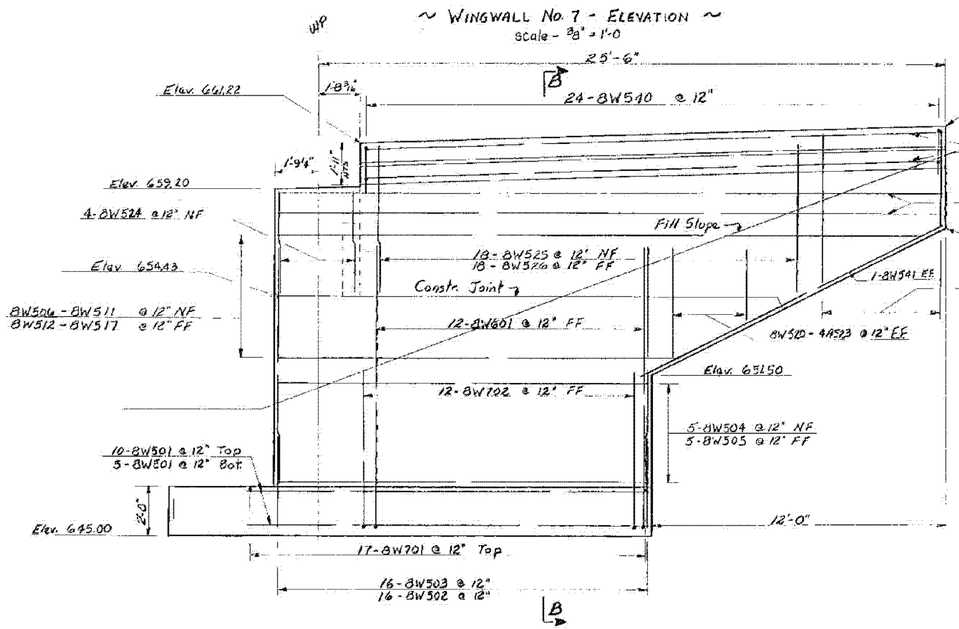
TOWN OF St. Johnsbury	Bridge No.
	Log Sta.
HIGHWAY NO. I91	Surv. Sta. 6845+64.
I91 over US Rte. 5 Relocation	
Abut. No. 4 - Plan & Elevation	
Designed by A Elwood	Drawn by L. Graham
Checked by JR Burnett date 5/14/15	Bridge Design Supervisor RS Houpt date 5/15
PROJECT Barnet - St. Johnsbury	PROJECT NO. EAGI 91-3(59)
Bridge Sheet No. BR 121.	Sheet 185 of 338

BR-9

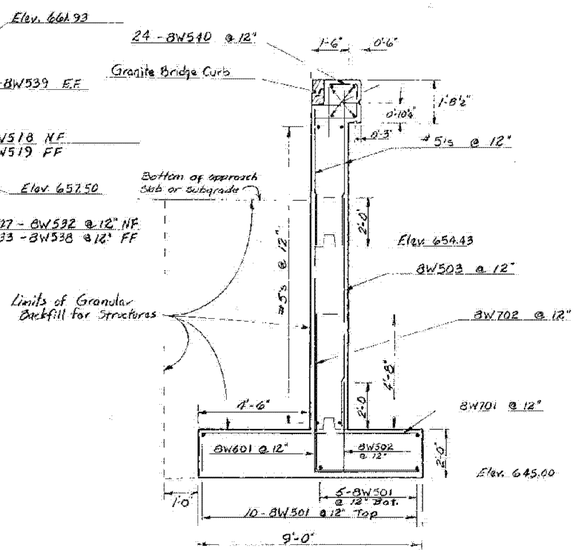


~ Wingwall No. 7 - Elevation ~
scale - ⅜" = 1'-0

~ Section A-A ~
scale - ⅜" = 1'-0



~ Wingwall No. 8 - Elevation ~
scale - ⅜" = 1'-0



~ Section B-B ~
scale - ⅜" = 1'-0

I-91 BRIDGES 83N
WATERFORD - ST. JOHNSBURY
IM MEMB(32)
SHEET 43 OF 43
FOR REFERENCE ONLY

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

TOWN OF St Johnsbury	Bridge No.
HIGHWAY NO. I91	Log Sta.
	Surv. Sta. 684+64
I91 over US. Rte 5 Relocation	
Wingwall Nos. 7 & 8 - Details	
Designed by A Elwood	Drawn by L. Graham
Checked by J.R. Burnett date 5/9/75	Bridge Design Supervisor R S Haupt date 5/75
PROJECT BARNET - ST. JOHNSBURY	PROJECT NO. EAC/ 91-2(39)
Bridge Sheet No. BR 122	Sheet 186 of 358

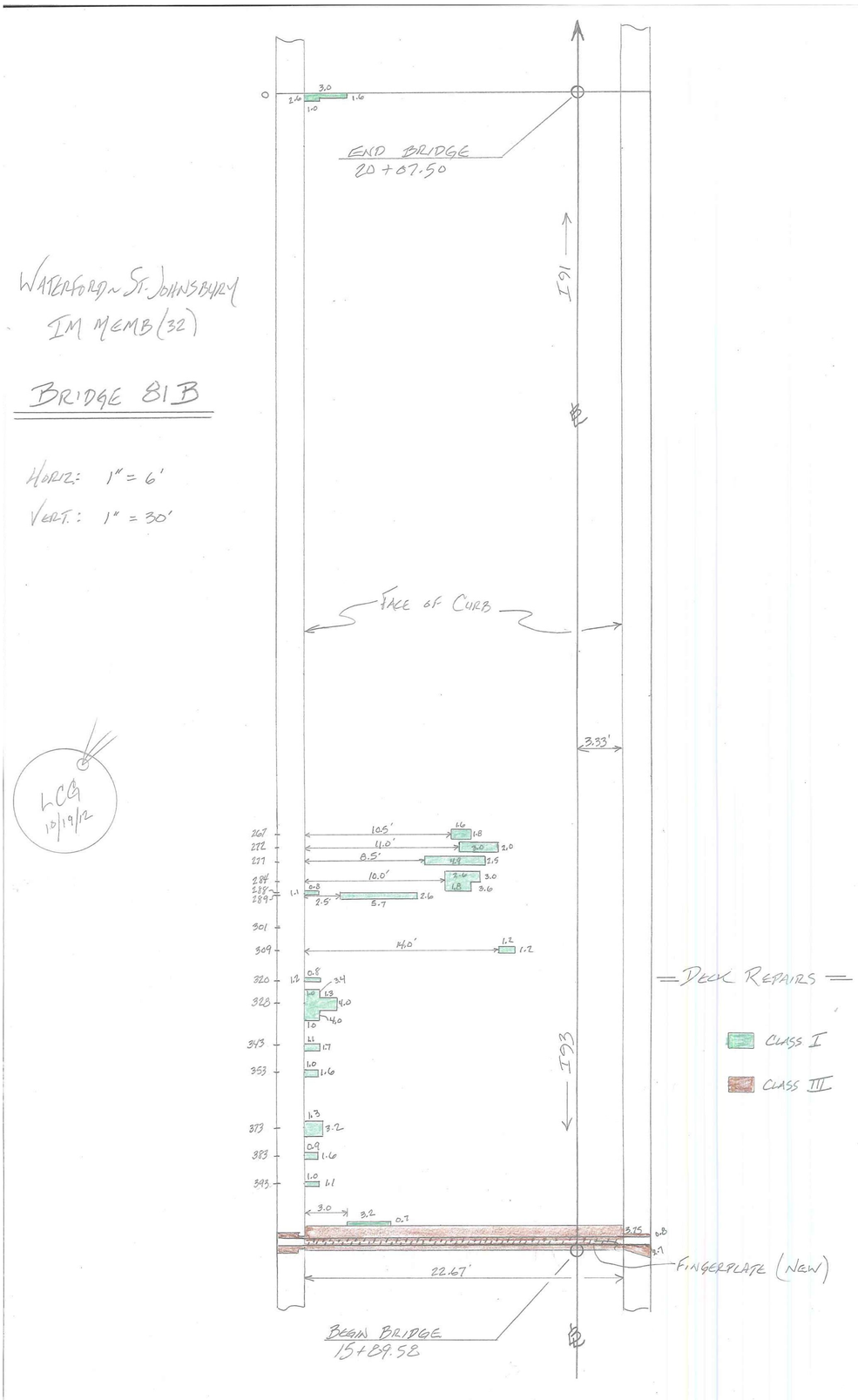
BR-9

WATERFORD ~ ST. JOHNSBURY
IM MEMB(32)

BRIDGE 81B

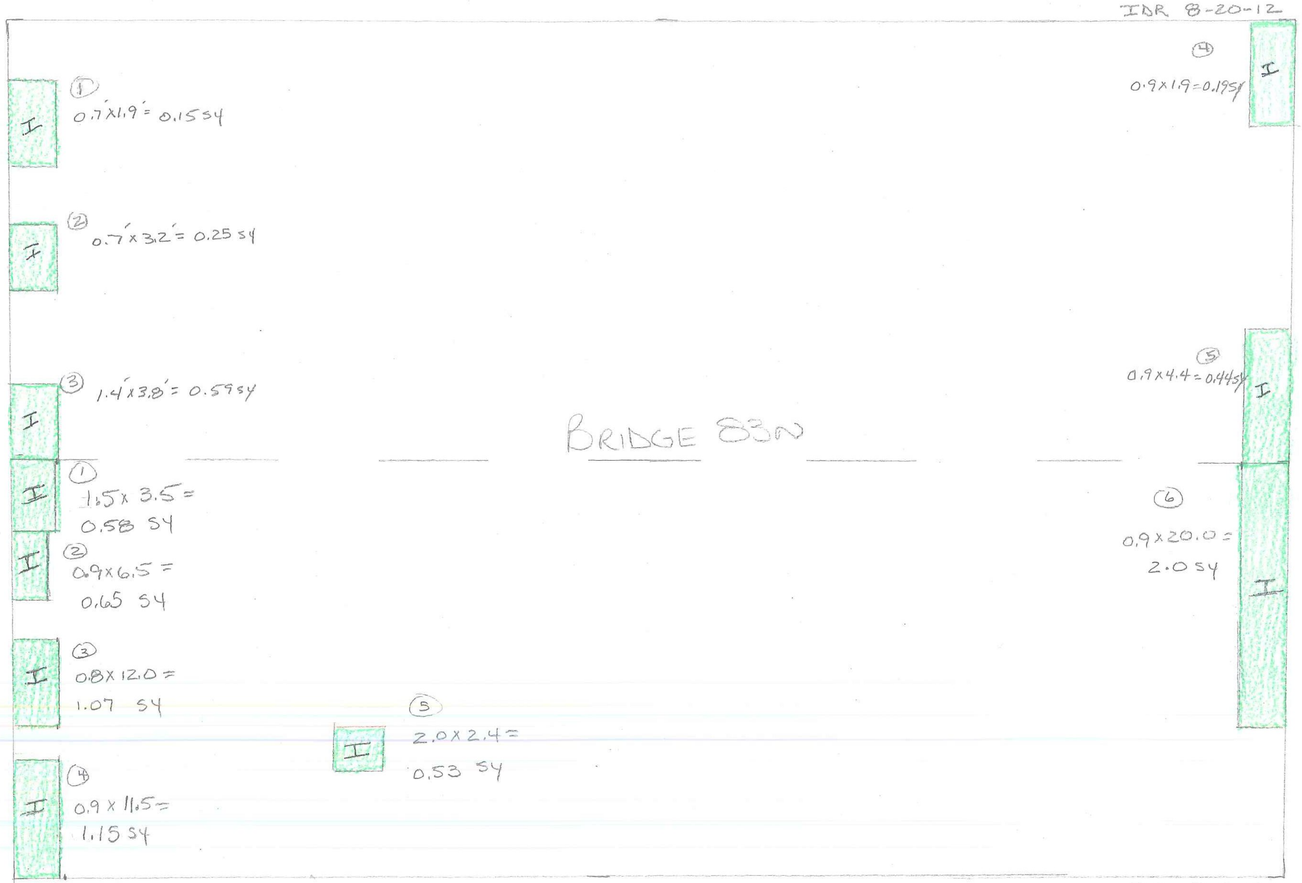
HORIZ: 1" = 6'
VERT.: 1" = 30'

LCG
10/19/12



WATERFORD - ST. JOHNSBURY IM MEMB(32)

IDR 8-20-12



IDR 7-13-12

Drawn By
Cindy Porter

WATERFORD - ST JOHNSBURY Im MEMB (32)

IDR 8-16-12

DRAWN BY
Cindy Porter

WATERFORD-ST JOHNSBURY IM MEMB (32)