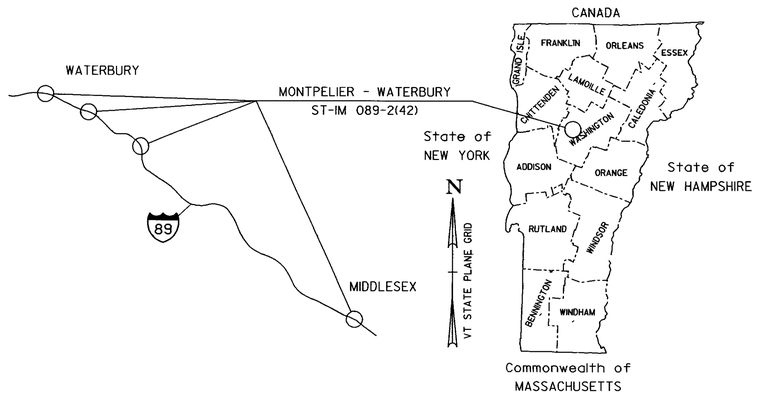
STATE OF VERMONT
AGENCY OF TRANSPORTATION

INDEX OF SHEETS

1.	TITLE SHEET
2.	QUANTITY SHEET
3.-4.	TRAFFIC CONTROL SHEETS
5.	BITUMINOUS CONCRETE REMOVAL PLAN
6.	BITUMINOUS CONCRETE DETAILS AND NOTES
7.	PAVEMENT JOINT DETAILS
8.-10.	REFERENCE PLANS - BRIDGE 43N&S
11.-12.	REFERENCE PLANS - BRIDGE 45N&S
13.-16.	REFERENCE PLANS - BRIDGE 46N&S AND 46A
17.-19.	REFERENCE PLANS - BRIDGE 48N&S
20.-22.	REFERENCE PLANS - BRIDGE 49N&S
23.-25.	REFERENCE PLANS - BRIDGE 50N&S

VAOT STANDARD SHEETS

E-100	01/02/04
E-100A	01/02/04
E-101	05/30/03
E-102	06/30/03
E-102A	05/01/04
E-106	03/01/04
E-107	06/30/03
E-107A	08/08/95
SB-R4A-82	09/19/89



LOCATION MAP
NOT TO SCALE

PROPOSED IMPROVEMENT
BRIDGE PROJECT

TOWNS OF MIDDLESEX & WATERBURY
COUNTY OF WASHINGTON

BRIDGES NO. 43 N&S ON I-89 (MIDDLESEX), NO. 45S ON I-89 (MIDDLESEX), NO. 46 N&S ON I-89 (WATERBURY), NO. 46A ON I-89 (WATERBURY), NO. 48S ON I-89 (WATERBURY), NO. 49S ON I-89 (WATERBURY), & 50 N&S ON I-89 (WATERBURY)

PROJECT LOCATIONS: BRIDGE NO. 43 N&S ARE LOCATED ON I-89 (MM 54.8) IN THE TOWN OF MIDDLESEX
BRIDGE NO. 45S IS LOCATED ON I-89 (MM 58.7) IN THE TOWN OF MIDDLESEX
BRIDGE NO. 46 N&S AND NO. 46A ARE LOCATED ON I-89 (MM63.5) IN THE TOWN OF WATERBURY
BRIDGE NO. 48S IS LOCATED ON I-89 (MM 65.2) IN THE TOWN OF WATERBURY
BRIDGE NO. 49S IS LOCATED ON I-89 (MM 65.4) IN THE TOWN OF WATERBURY
BRIDGE NO. 50 N&S ARE LOCATED ON I-89 (MM 66.6) IN THE TOWN OF WATERBURY

PROJECT DESCRIPTION: THIS PROJECT INVOLVES REMOVING AND REPLACING THE BITUMINOUS CONCRETE WEARING SURFACE ON THE BRIDGE AND ITS APPROACHES AND MINOR ASSOCIATED WORK.

LENGTH OF BRIDGES: 43N 175.11 FEET, 43S 205.29 FEET, 45S 115.88 FEET, 46N 356.67 FEET, 46S 356.67 FEET, 46A 434.00 FEET, 48S 300.70 FEET, 49S 100.73 FEET, 50N 237.87 FEET, 50S 224.73 FEET

TOTAL LENGTH OF BRIDGES: 2,507.65 FEET

RECORD PLANS

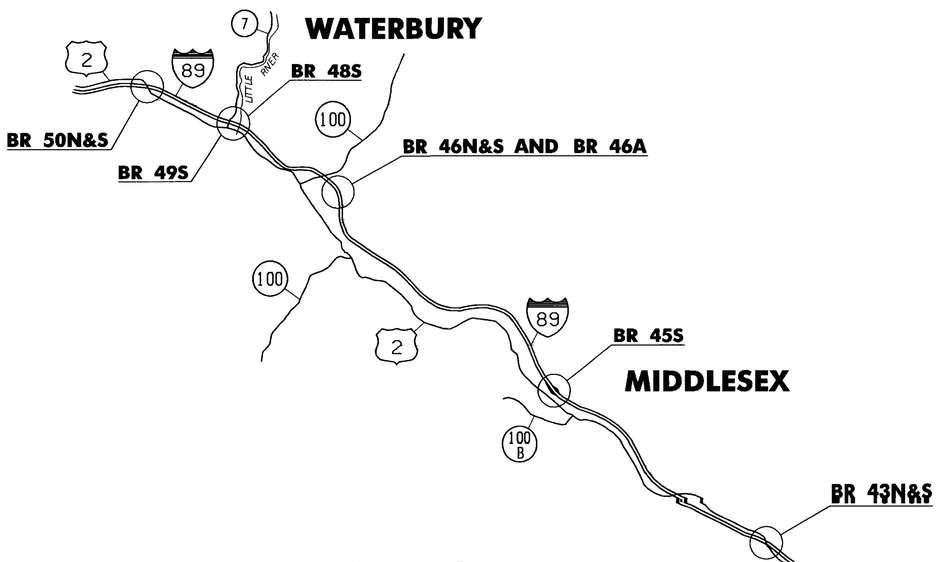
CONTRACTOR PIKE INDUSTRIES, INC - BERLIN, VT
RESIDENT ENGINEER TOM MANCINI
CONSTRUCTION BEGAN APRIL 28, 2009
CONSTRUCTION COMPLETE JUNE 6, 2009
RECORD PLANS BY TOM MANCINI & N. GARBACIK

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

BY _____ RESIDENT ENGINEER

DATE 6/7/10

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



NOT TO SCALE

CONVENTIONAL SYMBOLS

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

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

DATUM
VERTICAL N/A
HORIZONTAL N/A

N
VT STATE PLANE GRID

STATE OF VERMONT
GEORGE A BOGUE NO 5136
REGISTERED PROFESSIONAL ENGINEER

7/2/08

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.

Stantec
Stantec Consulting Services Inc
55 Green Mountain Drive
South Burlington VT U.S.A.
05403
Tel. 802.864.0223
Fax 802.864.0165
www.stantec.com

DIRECTOR OF PROGRAM DEVELOPMENT
APPROVED _____ DATE 7-3-2008

PROJECT MANAGER : SHERWARD FARNSWORTH

PROJECT NAME : **MIDDLESEX - WATERBURY**
PROJECT NUMBER : ST-IM 089-2(42)

SHEET 1 OF 25 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES

I89-BR. NO. 43N	I89-BR. NO. 43S	I89-BR. NO. 45S	I89-BR. NO. 46N	I89-BR. NO. 46S	I89-BR. NO. 46A	I89-BR. NO. 48S	I89-BR. NO. 49S	I89-BR. NO. 50N	I89-BR. NO. 50S	GRAND TOTAL	FINAL
	260					200	196		260	916	
0.1	2					2.1	1.5		2	7.7	
18	18	20	22	22	22	25	16	25	25	213	
	46	24	31	195	22	37	44		45	444	
	91					72	88		92	343	
			120							120	
			120							120	
41	908		3			1212	688	1	977	3830	
			1					1		2	
			1					1		2	
			27					9		36	
24	40	8	24	40	16	48	40	4	48	292	
				40						40	
0.2	0.2					0.2	0.2		0.2	1	
0.05	0.15	0.04	0.11	0.09	0.05	0.17	0.13	0.05	0.16	1	
1										1	
	1									1	
		1								1	
					1					1	
			1							1	
				1						1	
						1				1	
								1		1	
									1	1	
1	1	1	1	1	1	1	1	1	1	10	
1	1	1	1	1	1	1	1	1	1	10	
50	411	5	15	20	5	496	226	3	435	1666	
	329		5	10	5	397	181		348	1275	
50	411					496	226		435	1618	
	329					397	181		348	1255	
2	27					30	15		27	101	
			50							50	
1	1					1	1		1	5	
1	1					1	1		1	5	
			3					1		4	
4	121					132	93		126	476	

TOTALS

DESCRIPTIONS

UNIT	ITEMS	ITEM NUMBER	ROUND
SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10	
CWT	EMULSIFIED ASPHALT	404.65	
GAL	WATER REPELLENT, SILANE	514.10	
LF	BRIDGE EXPANSION JOINT, ASPHALTIC PLUG	516.10	
LF	JOINT SEALER, HOT POURED	524.11	
LF	REMOVAL OF EXISTING RAILING	525.10	
LF	RESETTING RAILING	525.11	
SY	REMOVAL OF BRIDGE PAVEMENT	529.10	
SY	REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS I	580.10	
SY	REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS II	580.11	
SF	SURFACE PREPARATION FOR MEMBRANE	580.16	
HR	TRUCK-MOUNTED ATTENUATOR	608.45	
HR	UNIFORMED TRAFFIC OFFICERS	630.10	
LS	TESTING EQUIPMENT, BITUMINOUS	631.17	
LS	MOBILIZATION/DEMOBILIZATION	635.11	
LS	TRAFFIC CONTROL (I89-BR. NO. 43N)	641.10	
LS	TRAFFIC CONTROL (I89-BR. NO. 43S)	641.10	
LS	TRAFFIC CONTROL (I89-BR. NO. 45S)	641.10	
LS	TRAFFIC CONTROL (I89-BR. NO. 46A)	641.10	
LS	TRAFFIC CONTROL (I89-BR. NO. 46N)	641.10	
LS	TRAFFIC CONTROL (I89-BR. NO. 46S)	641.10	
LS	TRAFFIC CONTROL (I89-BR. NO. 48S)	641.10	
LS	TRAFFIC CONTROL (I89-BR. NO. 49S)	641.10	
LS	TRAFFIC CONTROL (I89-BR. NO. 50N)	641.10	
LS	TRAFFIC CONTROL (I89-BR. NO. 50S)	641.10	
EACH	PORTABLE CHANGEABLE MESSAGE SIGN	641.15	
EACH	PORTABLE ARROW BOARD	641.16	
LF	6 INCH WHITE LINE	646.214	
LF	6 INCH YELLOW LINE	646.215	
LF	TEMPORARY 6 INCH WHITE LINE	646.620	
LF	TEMPORARY 6 INCH YELLOW LINE	646.630	
EACH	LINE STRIPING TARGETS	646.76	
LF	SPECIAL PROVISION (BRIDGE RAILING REPAIR,TYPE IV)	900.640	
LU	SPECIAL PROVISION (MAT DENSITY PAY ADJUSTMENT, SMALL QUANTITY) (N.A.B.I.)	900.650	⚠1
LU	SPECIAL PROVISION (MIXTURE PAY ADJUSTMENT) (N.A.B.I.)	900.650	
SY	SPECIAL PROVISION (BRIDGE POTHOLE REPAIR)	900.675	
TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680	

DETAILED SUMMARY OF QUANTITIES

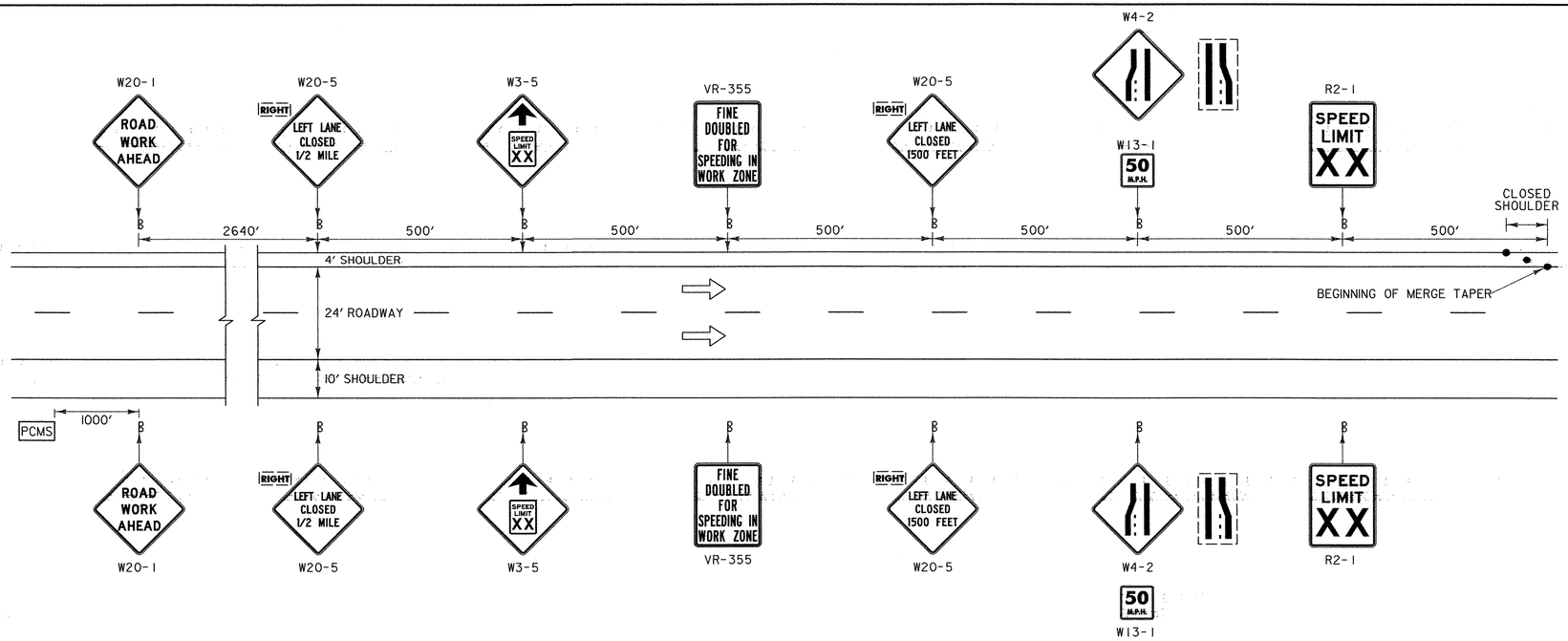
QUANTITIES	UNIT	ITEMS

REVISION	DATE	BY	DESCRIPTION
⚠1	08/07/2008	VAOT	ADDED PAY ITEM.

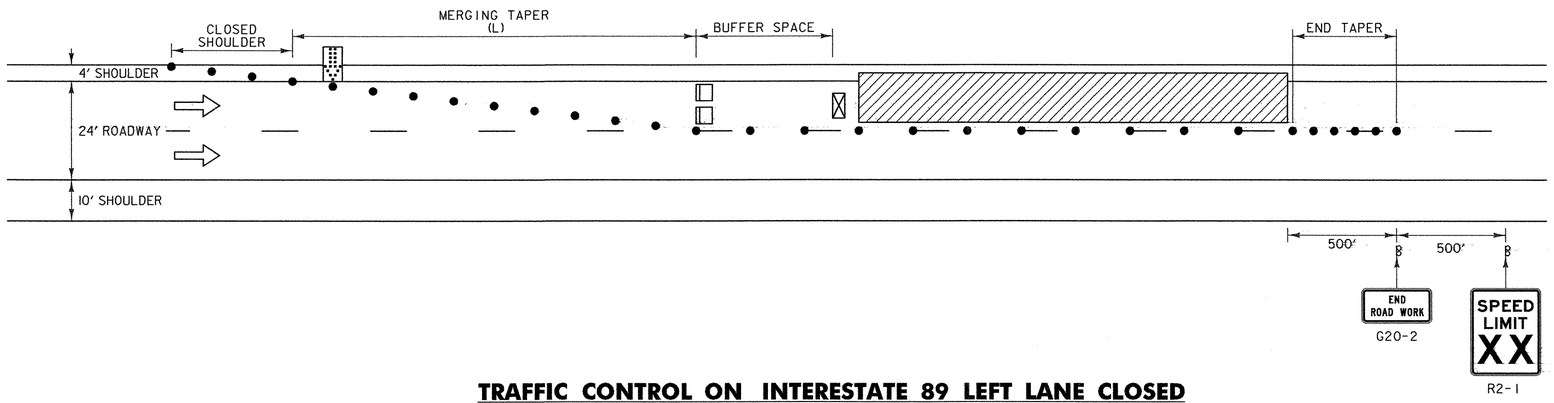
PROJECT NAME: MIDDLESEX - WATERBURY
PROJECT NUMBER: ST-IM 089-2(42)

FILE NAME: Quantity Sheet.xls
PROJECT MANAGER: G. BOGUE
DESIGNED BY: S. BURBANK
QUANTITY SHEET #1

PLOT DATE: 07/02/2008
DRAWN BY: J. SOTER
CHECKED BY: G. BOGUE
SHEET 2 OF 25



CONSTRUCTION APPROACH SIGNING ON INTERSTATE 89 LEFT LANE CLOSED



TRAFFIC CONTROL ON INTERESTATE 89 LEFT LANE CLOSED

LEGEND

- FLOW OF TRAFFIC
- RETROREFLECTIVE PLASTIC DRUM
- PORTABLE ARROW BOARD
- TYPE III BARRICADE
- WORK AREA
- TRUCK/TRAILOR MOUNTED ATTENUATOR
- PCMS — PORTABLE CHANGEABLE MESSAGE SIGN

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

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

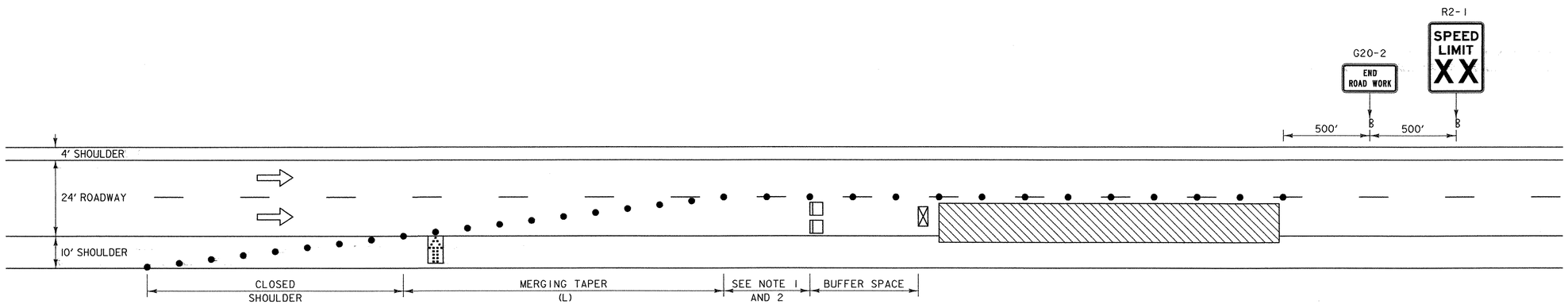
TRAFFIC CONTROL NOTES:

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 IS 65 MPH. THE SPEED LIMIT WILL BE REDUCED TO 50 MPH IN THE WORK ZONE FOR THIS PROJECT. ANY EXISTING SPEED LIMIT SIGNS WITHIN THE SPEED REDUCTION AREA SHALL BE COMPLETELY COVERED.
3. SIGNS SHALL BE INSTALLED SO AS NOT TO OBSTRUCT EXISTING SIGNS.
4. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND THE "STANDARD HIGHWAY SIGNS" BOOK (SHS) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION (FHWA).
5. 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.
6. ROLL UP SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING ASTM TYPE VI.
7. 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 A ONE FOOT MINIMUM ABOVE TRAVELED WAY. ALL VEGETATION THAT INTERFERES WITH VISIBILITY OF THE SIGNS SHALL BE REMOVED. 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 5 RETROREFLECTIVE DRUMS SPACED AT 10 FEET ON CENTER.
14. THE ARROW BOARD SHALL BE PLACED ON THE SHOULDER OF THE ROADWAY, OR IF PRACTICAL FURTHER FROM THE TRAVELED LANE AT THE END OF THE SHOULDER TAPER.
15. THE PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE USED AT THE DISCRETION OF THE ENGINEER, THE PCMS SHALL BE USED IN ACCORDANCE WITH SECTION 6F.55 OF THE MUTCD. THE PCMS SHALL READ "LEFT (OR RIGHT) LANE CLOSED AHEAD, PLEASE MERGE EARLY".
16. TRAVEL LANE SHALL BE 12 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 DURING NON-WORK PERIODS, AND PROTECTED BY BARRELS OR CONES. NORMAL TRAFFIC LANES SHALL BE RESTORED DURING NON-WORK PERIODS AND TEMPORARY TRAFFIC SIGNS REMOVED OR COVERED.

Stantec

PROJECT NAME: MIDDLESEX - WATERBURY
PROJECT NUMBER: ST-IM 089-2(42)

FILE NAME: ...\structural\drawing\TCP 1.dgn PLOT DATE: 7/2/2008
PROJECT LEADER: G. BOGUE DRAWN BY: J. SOTER
DESIGNED BY: S. BURBANK CHECKED BY: G. BOGUE
TRAFFIC CONTROL SHEET 1 SHEET 3 OF 25



TRAFFIC CONTROL ON INTERESTATE 89 RIGHT LANE CLOSED

LEGEND

- FLOW OF TRAFFIC
- RETROREFLECTIVE PLASTIC DRUM
- PORTABLE ARROW BOARD
- TYPE III BARRICADE
- WORK AREA
- TRUCK/TRAILOR MOUNTED ATTENUATOR
- PCMS — PORTABLE CHANGEABLE MESSAGE SIGN

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

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 NOTES:

1. FOR BRIDGE 45S AND 46N TRAFFIC CONTROL SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD E-106, 'MAINLINE LANE CLOSURE AT AN EXIT RAMP'. FOR BRIDGE 46S TRAFFIC CONTROL SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD E-106, 'MAINLINE CLOSURE AT AN ENTRANCE RAMP'.
2. FOR BRIDGES 43N&S, 48S, 49S AND 50N&S THE RIGHT LANE CLOSURE SHALL BE AS SHOWN ABOVE WITH ZERO FEET BETWEEN THE MERGING TAPER (L) AND THE BUFFER SPACE.
3. A UNIFORM TRAFFIC OFFICER SHALL BE PRESENT ANYTIME BRIDGE 46S IS REDUCED TO ONE LANE.
4. SEE THE TRAFFIC CONTROL NOTES ON THE PREVIOUS SHEET (TRAFFIC CONTROL SHEET 1) FOR ADDITIONAL INFORMATION AND APPROACH SIGNING FOR THE RIGHT LANE CLOSURE.

Stantec

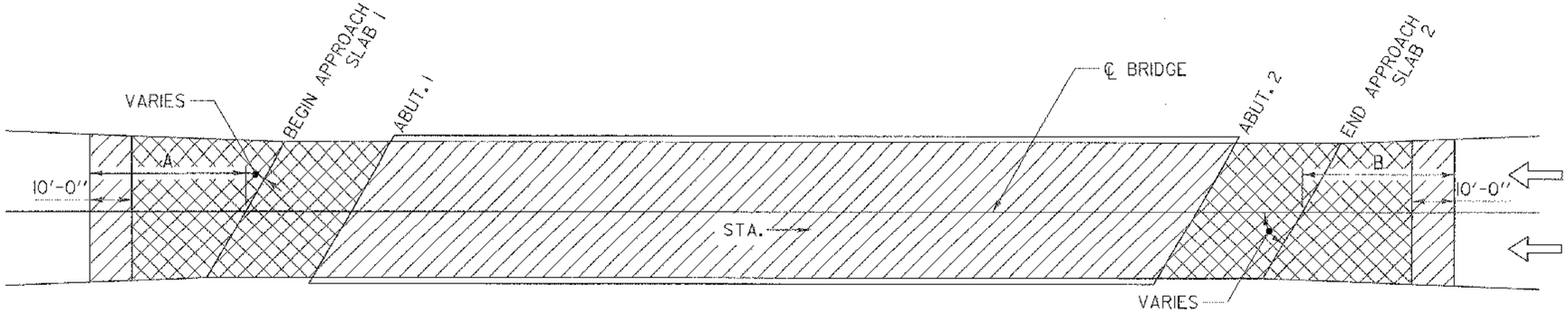
PROJECT NAME: MIDDLESEX - WATERBURY
PROJECT NUMBER: ST-IM 089-2(42)

FILE NAME: ...\structural\drawing\TCP 2.dgn PLOT DATE: 7/2/2008
PROJECT LEADER: G. BOGUE DRAWN BY: J. SOTER
DESIGNED BY: S. BURBANK CHECKED BY: G. BOGUE
TRAFFIC CONTROL SHEET 2 SHEET 4 OF 25

BRIDGE NO.	A(FT)	B(FT)	
43 SOUTH 57'	~~37.0~~	~~36.0~~	40'
48 SOUTH	27.0	29.0	
49 SOUTH	20.0	20.0	
50 SOUTH	37.0	36.0	
43 NORTH	43.0	16.0	(DRIVING LANE ONLY)

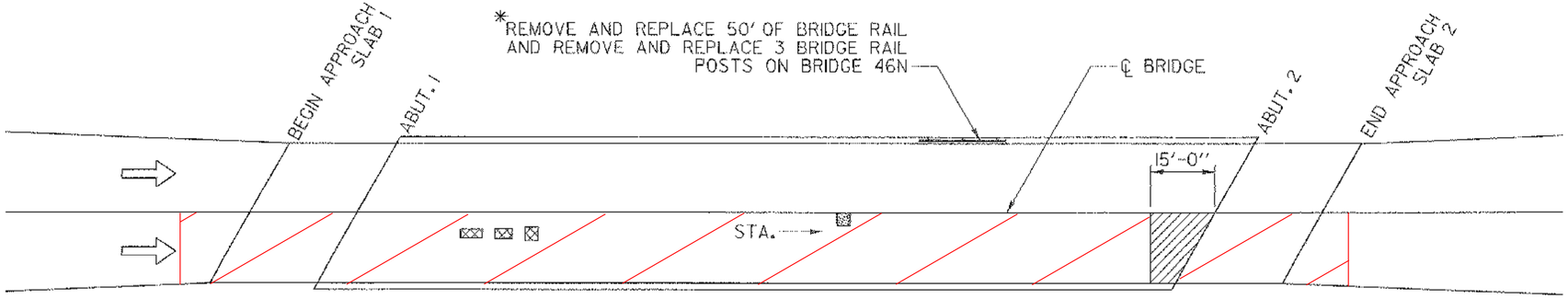
BRIDGE LENGTH AND WIDTH (CURB TO CURB)

BRIDGE NO.	WIDTH (CURB TO CURB) (FEET)	LENGTH (FEET)
43 NORTH	32.00	175.11
43 SOUTH	32.00	205.29
45 SOUTH	42.00	115.88
46 NORTH	30.00	356.67
46 SOUTH	30.00	356.67
46A	22.00	434.00
48 SOUTH	32.00	300.70
49 SOUTH	44.00	100.73
50 NORTH	32.00	237.87
50 SOUTH	32.00	224.73



BRIDGES 43S, 48S, 49S & 50S BITUMINOUS CONCRETE REMOVAL & REPLACEMENT PLAN

NOT TO SCALE



BRIDGES 43N, 46N & 50N BITUMINOUS CONCRETE REMOVAL & REPLACEMENT PLAN

NOT TO SCALE

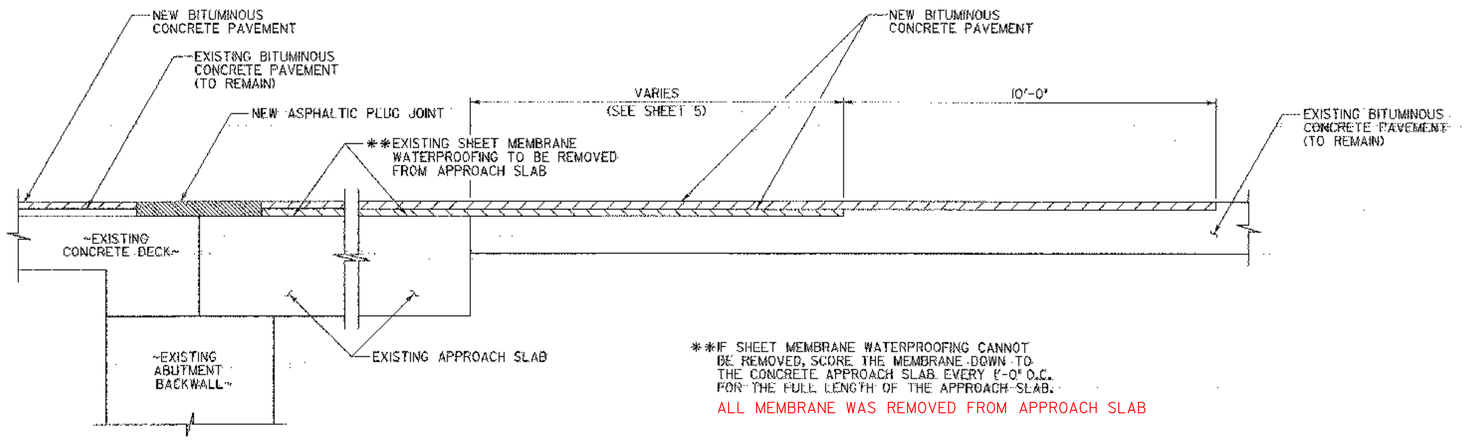
ASPHALTIC PLUG JOINT REPLACEMENT SCHEDULE

BRIDGE NO.	ABUT. 1	PIER 1	PIER 2	PIER 3	PIER 4	ABUT. 2
43 SOUTH	--	--	--	--	--	45.25 ~~46~~ FT
45 SOUTH	--	42 ~~24~~ FT	--	--	--	--
46 NORTH	19 FT --	38.08 --	3.5 --	--	31.08 ~~31~~ FT	--
46 SOUTH	36.75 37 FT	38 FT	38.34 ~~39~~ FT	40.67 ~~40~~ FT	41.16 ~~41~~ FT	45.25 --
46A	--	22 FT	6.58 --	--	--	--
48 SOUTH	--	--	--	--	--	36 ~~37~~ FT
49 SOUTH	44.16 44 FT	--	--	--	--	--
50 SOUTH	--	--	--	--	--	45.25 ~~45~~ FT
43 NORTH	45.42 FT	--	--	--	--	--

Stantec

PROJECT NAME: MIDDLESEX - WATERBURY
PROJECT NUMBER: ST-IM 089-2(42)

FILE NAME: ...\drawing\Conc Remov Plan.dgn PLOT DATE: 7/2/2008
PROJECT LEADER: G. BOGUE DRAWN BY: J. SOTER
DESIGNED BY: S. BURBANK CHECKED BY: G. BOGUE
BITUMINOUS CONCRETE REMOVAL PLAN SHEET 5 OF 25

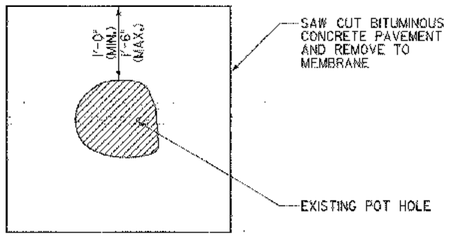


**IF SHEET MEMBRANE WATERPROOFING CANNOT BE REMOVED, SCORE THE MEMBRANE DOWN TO THE CONCRETE APPROACH SLAB EVERY 5'-0" O.C. FOR THE FULL LENGTH OF THE APPROACH SLAB.

ALL MEMBRANE WAS REMOVED FROM APPROACH SLAB

TYPICAL APPROACH SECTION

NOT TO SCALE



LIMITS OF SPECIAL PROVISION (BRIDGE POT HOLE REPAIR)

NOT TO SCALE

NOTES:

1. SAW CUTTING OF THE BITUMINOUS CONCRETE PAVEMENT SHALL BE INCIDENTAL TO ITEM 529.10 "REMOVAL OF BRIDGE PAVEMENT".
2. SEE SECTION 900 OF THE PROJECT SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS FOR BRIDGE POTHOLE REPAIR.

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 STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DATED 2002, 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. WATER REPELLENT, SILANE SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES, EXCEPT THE PIERS AND THE UNDERSIDE OF THE DECK.
4. REMOVAL AND REPLACEMENT OF THE TWO RAIL BOX BEAM BRIDGE RAIL AND THE THREE POSTS ON BRIDGE 46N WILL BE PAID FOR UNDER ITEM 900.640, "SPECIAL PROVISION (BRIDGE RAILING REPAIR, TYPE IV). SEE STANDARD SB-R4A-82 AND SPECIAL PROVISION FOR ADDITIONAL INFORMATION. IF IT IS NECESSARY TO REMOVE ADDITIONAL UNDAMAGED BOX BEAM BRIDGE RAIL TO REPAIR THE DAMAGED RAIL, THEN THE COSTS OF REMOVING AND RESETTING THE UNDAMAGED RAIL WILL BE PAID FOR UNDER ITEMS 525.10 AND 525.11.

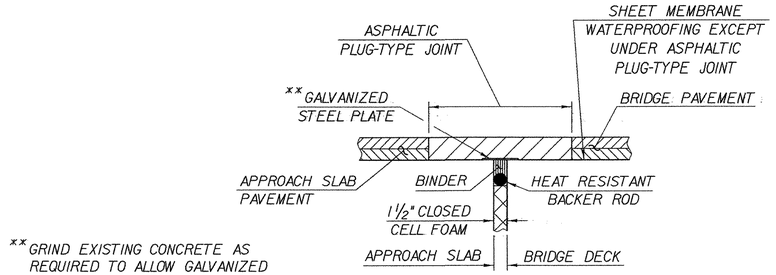
TRAFFIC CONTROL

5. UNLESS COVERED UNDER INDIVIDUAL PAY ITEMS, ALL COSTS FOR WORK SHOWN ON SHEETS 3 AND 4 AND FOR TEMPORARY TRAFFIC CONTROL DEVICES INCLUDING TRAFFIC BARRIERS, SIGNS, AND SIGN POSTS WILL BE CONSIDERED TO BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR TRAFFIC CONTROL, ITEM 641.10.
6. THE CONTRACTOR WILL NOT BE ALLOWED TO REDUCE THE NUMBER OF TRAVEL LANES OR PERFORM ANY WORK ON BRIDGE 46N WHILE WORKING ON BRIDGE 46A (RAMP BRIDGE).

Stantec

PROJECT NAME: MIDDLESEX - WATERBURY
PROJECT NUMBER: ST-IM 089-2(42)

FILE NAME: ...\drawing\Details and Notes.dgn PLOT DATE: 7/2/2008
PROJECT LEADER: G. BOGUE DRAWN BY: J. SOTER
DESIGNED BY: S. BURBANK CHECKED BY: G. BOGUE
BIT. CONCRETE DETAILS & NOTES SHEET 6 OF 25



** GRIND EXISTING CONCRETE AS REQUIRED TO ALLOW GALVANIZED PLATE TO BE INSTALLED LEVEL. GALVANIZED PLATE IS REQUIRED ON ALL ASPHALTIC PLUG JOINTS.

ASPHALTIC PLUG-TYPE JOINT DETAIL

NTS

ASPHALTIC PLUG JOINT NOTES

1. INSTALLATION

A. LOCATE THE JOINT CENTRALLY OVER THE DECK OVERLAY EXPANSION GAP OR FIXED JOINT MARKED OUT TO THE MANUFACTURER'S RECOMMENDED WIDTH.

B. EXCAVATE THE JOINT AS SHOWN ON THE PLANS WITH SAWS AND PNEUMATIC HAMMER OR A HAMMER AND CHISEL.

C. BLAST CLEAN THE JOINT AREA OF DEBRIS AND ASPHALT. THOROUGHLY DRY THE JOINT AREA WITH HOT COMPRESSED AIR PRIOR TO APPLYING BINDER MATERIAL.

D. REPAIR SPALLED AND DEFECTIVE CONCRETE WITH AN APPROVED MATERIAL AS AGREED UPON BY THE ENGINEER.

E. PLACE PROPERLY SIZED HEAT RESISTANT BACKER ROD IN THE MOVEMENT GAP ALLOWING FOR 1" +/- OF BINDER ABOVE THE ROD.

F. HEAT AND PLACE THE BINDER MATERIAL AS RECOMMENDED BY THE MANUFACTURER.

G. PLACE ¼" THICK BY 8" WIDE SECTIONS OF STEEL PLATE OVER THE CENTER OF THE MOVEMENT GAP. SECURE THE PLATES FROM MOVING BY INSERTING LOCATING PINS THROUGH THE PRESTAMPED HOLES INTO BACKER ROD AND COVER WITH HOT BINDER. 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.

H. HEAT AND MIX THE BINDER MATERIAL AND AGGREGATE AS RECOMMENDED BY THE MANUFACTURER.

I. INSTALLATION OF MATERIAL, COMPACTION, AND TOP COATING SHALL BE AS RECOMMENDED BY THE MANUFACTURER.

J. IMMEDIATELY AFTER TOP COATING, CAST AN ANTI-SKID MATERIAL OVER THE JOINT TO REDUCE THE RISK OF TRACKING.

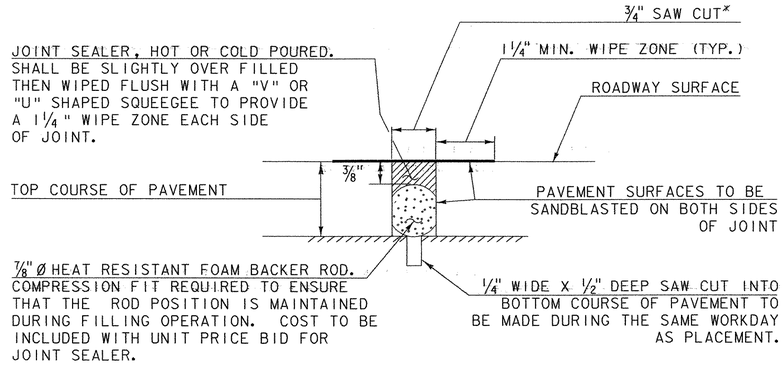
K. PROTECTED JOINT FROM TRAFFIC UNTIL THE MATERIAL HAS COOLED TO 51 DEG C (125 DEG F) +/-.

2. WEATHER LIMITATIONS. (APPLY BINDER MATERIAL ONLY WHEN THE FOLLOWING CONDITIONS PREVAIL):

A. THE AMBIENT AIR TEMPERATURE IS AT LEAST 10 DEG C (50 DEG 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.



NOTE: PLACE JOINT SEALER, HOT POURED AT THE BEGINNING OF APPROACH SLAB NO. 1 AND AT THE END OF APPROACH SLAB NO. 2 ON BRIDGES 43S, 48S, 49S AND 50S.

SAWED PAVEMENT JOINT DETAIL

N. T. S.

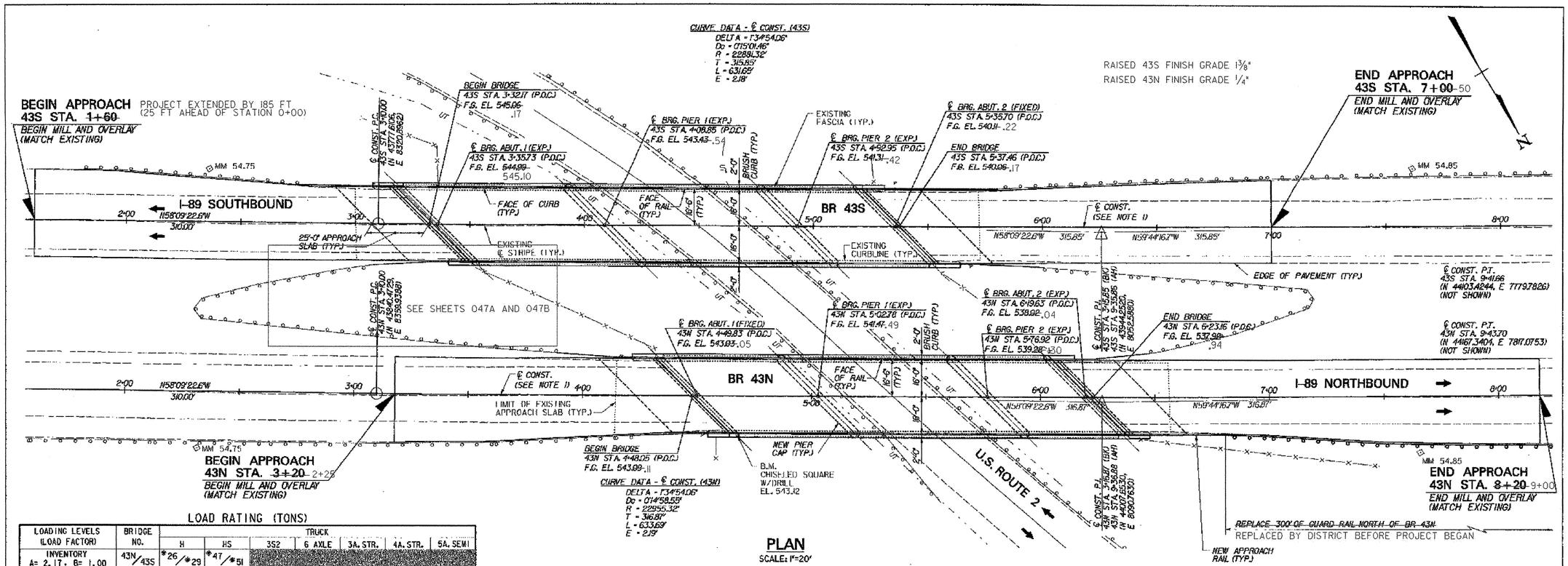
*JOINT IS TO BE LOCATED ACCURATELY BY STRING LINING, OR OTHER MEANS, PRIOR TO PAVING, SO THAT THE SAW CUTS WILL BE MADE DIRECTLY OVER THE END OF CONCRETE DECK. JOINT SHALL BE CUT DRY IN A SINGLE PASS AND BE SEALED WITHIN 24 HOURS OR PRIOR TO EXPOSURE TO TRAFFIC. JOINT SHALL BE CLEANED PRIOR TO APPLYING THE JOINT SEALER.

Stantec

PROJECT NAME: MIDDLESEX - WATERBURY
PROJECT NUMBER: ST-IM 089-2(42)

FILE NAME: ...\drawing\Pvmt Jt Dets.dgn
PROJECT LEADER: G. BOGUE
DESIGNED BY: S. BURBANK
PAVEMENT JOINT DETAILS

PLOT DATE: 7/2/2008
DRAWN BY: J. SOTER
CHECKED BY: G. BOGUE
SHEET 7 OF 25



PLAN
SCALE: 1"=20'

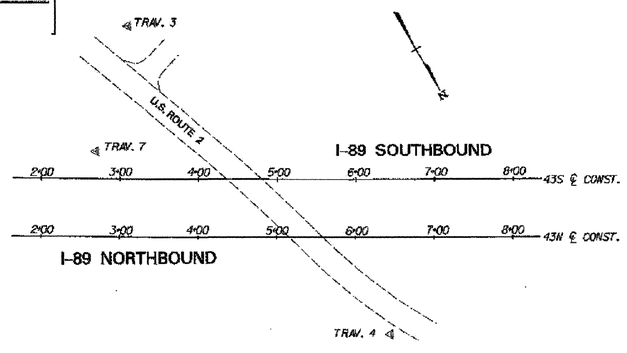
LOAD RATING (TONS)

LOADING LEVELS (LOAD FACTOR)	BRIDGE NO.	TRUCK H	HS	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
INVENTORY A= 2.17; B= 1.00	43N/43S	*26/*29	*47/*51					
POSTED A= 1.55; B= 1.40	43N/43S	*36/*41	*66/*72	*86/*89		*61/*65	*63/*66	*79/*80
OPERATING A= 1.30; B= 1.67	43N/43S		*78/*85	*101/*105	*96/*115	*73/*77	*75/*78	

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

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

BRIDGE	CL CONST. @	STATION	NORTHING	EASTING
43N	BEGIN BRIDGE	4+48.05	43912.8528	8242.4533
	CL BRG. ABUT. 1	4+49.83	43913.8830	8240.9347
	CL BRG. PIER 1	5+02.78	43941.4931	8195.7530
	CL BRG. PIER 2	5+76.92	43979.9770	8132.3833
	CL BRG. ABUT. 2	6+19.63	44002.0536	8096.8215
	END BRIDGE	6+23.16	44003.8739	8092.7999
43S	BEGIN BRIDGE	3+32.17	43789.2952	8302.0627
	CL BRG. ABUT. 1	3+35.73	43791.1710	8299.0352
	CL BRG. PIER 1	4+08.85	43829.5802	8236.8157
	CL BRG. PIER 2	4+62.95	43873.5109	8165.1017
	CL BRG. ABUT. 2	5+35.70	43895.7408	8128.5881
	END BRIDGE	5+37.46	43896.6558	8127.0793



CONTROL POINT LOCATION MAP
N.T.S.
(SEE NOTE 2)

BR 43N&S SPECIFIC CONSTRUCTION NOTES:

1. THE PROPOSED CONSTRUCTION CENTERLINE FOR EACH BRIDGE WAS ESTABLISHED BASED ON BEST FIT BETWEEN EXISTING CURB LINES. IT DOES NOT EXACTLY MATCH THE ORIGINAL CONSTRUCTION CENTERLINE.
2. FOR CONTROL POINT TIE SKETCHES, SEE CONTROL POINT TIES (43N&S), BRIDGE SHEET C-10.
3. REPLACE PIER CAPS, SUPERSTRUCTURE STEEL, BEARINGS, DECK SLABS, APPROACH SLABS, BRIDGE RAIL AND APPROACH RAIL. RESET GUARD RAIL.
4. NEW SCUPPERS ARE REQUIRED ON BRIDGE 43N. FOR LOCATIONS OF NEW SCUPPERS, SEE FRAMING PLAN (43N), BRIDGE SHEET BR43-8.
5. CONSTRUCT NEW BACKWALLS AT EXPANSION ABUTMENTS AND NEW CURTAINWALLS AT FIXED ABUTMENTS. REBUILD ABUTMENT BRIDGE SEATS AND MODIFY WINGWALLS AS SHOWN IN THE PLANS.
6. REPAIR ALL PIER COLUMNS AND APPLY FIBER REINFORCED POLYMER (FRP) COLUMN WRAP.
7. REPAIR ABUTMENT DELAMINATED AND SPALLED AREAS.
8. ~~REPLACE DAMAGED GUARD RAIL IMMEDIATELY NORTHEAST OF BR 43N.~~ REPLACED BY DISTRICT BEFORE THE PROJECT BEGAN.
9. RE-STRIPE BRIDGE AND APPROACH ROADWAY.

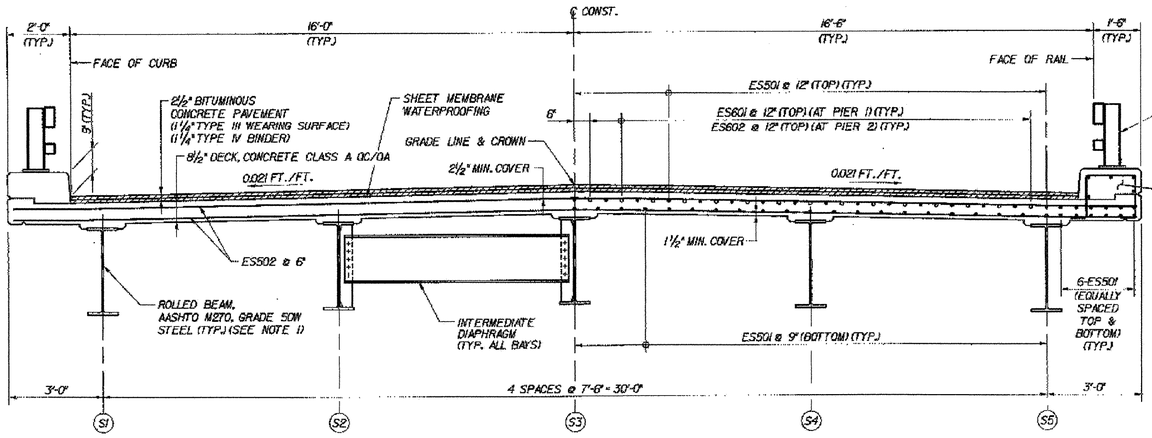
20 0 20
SCALE IN FEET

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 8 OF 25
BRIDGES 43 N & S
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

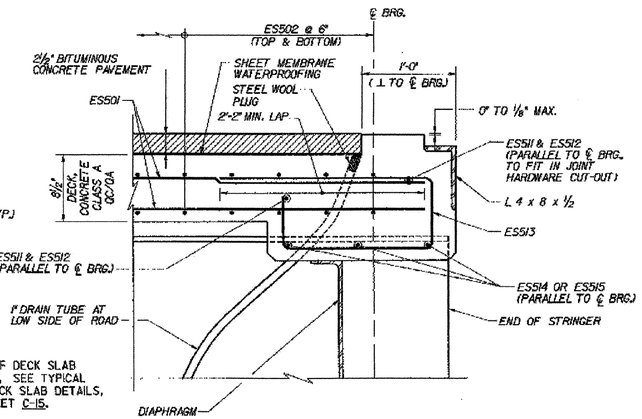
Town Of MIDDLESEX-BOLTON	Bridge No. 43N&S
Highway No. I-89	Leg Sta. / Surv. Sta.
I-89 OVER U.S. ROUTE 2	
GENERAL PLAN (43N&S)	
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT MIDDLESEX-BOLTON	PROJECT NO. IM-089-2(26)
TVGA CAD Drawing No. 43gen_pl	Date 10/99
Bridge Sheet No. BR43-1	Sheet 47 of 307

TVGA ENGINEERING, SURVEYING, P.C.



TRANSVERSE SECTION

SCALE: ½" = 1'-0"

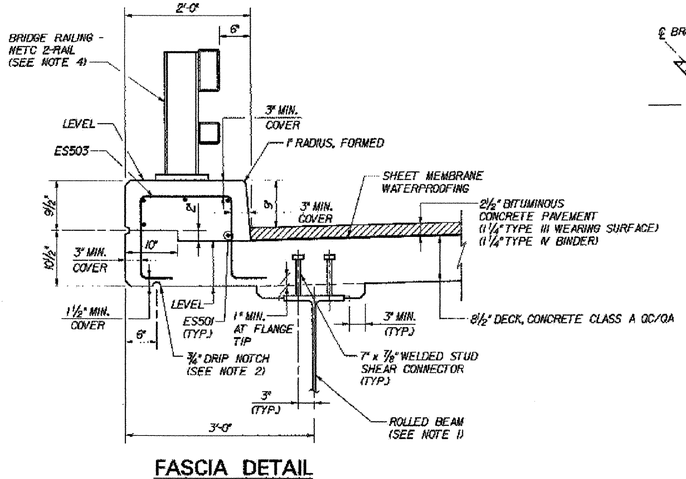


NOTE: FOR END OF DECK SLAB DIMENSIONS, SEE TYPICAL END OF DECK SLAB DETAILS, BRIDGE SHEET C-15.

END OF DECK SLAB REINFORCEMENT DETAIL

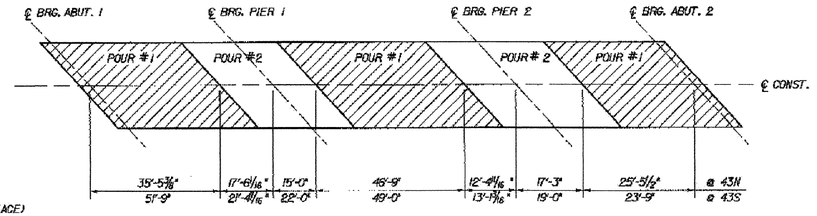
(EXP. END)

SCALE: 1½" = 1'-0"



FASCIA DETAIL

SCALE: 1"=1'-0"



DECK POUR SEQUENCE

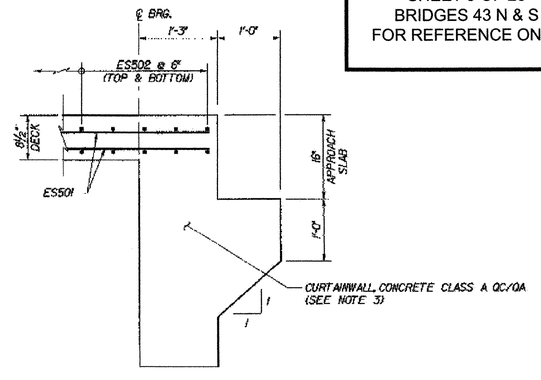
N.T.S.

BRIDGE 43N AND S WERE DONE IN A SINGLE POUR WITH NO CONSTRUCTION JOINTS

DECK SLAB PLACEMENT NOTES

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

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



END OF DECK SLAB REINFORCEMENT DETAIL

(FIXED END)

SCALE: 1" = 1'-0"

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 9 OF 25
BRIDGES 43 N & S
FOR REFERENCE ONLY

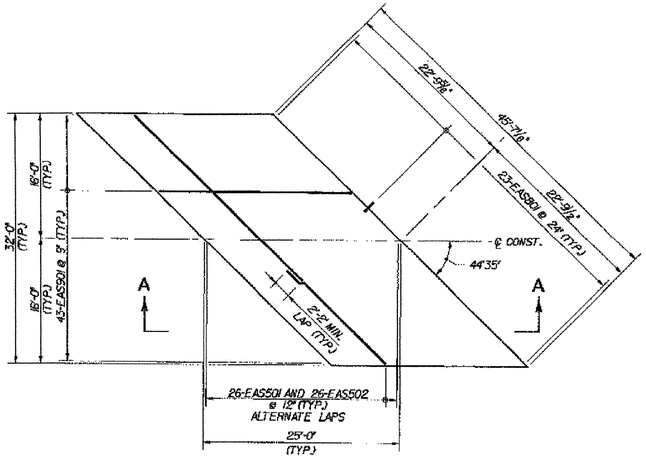
NOTES:

1. FOR ROLLED BEAM SIZES, SEE STRINGER ELEVATION (43N&S), BRIDGE SHEET BR43-10.
2. END DRIP NOTCH 5 FEET BEFORE END OF SLAB AT "DOWNHILL" ABUTMENTS AT 45°.
3. FOR CURTAINWALL DETAILS AND REINFORCEMENT LAYOUT, SEE TYPICAL CURTAINWALL DETAILS, BRIDGE SHEET C-42.
4. FOR DETAILS OF NETC BRIDGE RAIL AND APPROACH SECTION, SEE STANDARD SHEETS BRI-97 AND BR3-97, AND GUARD RAIL APPROACH SECTION, NETC 2 RAIL, BRIDGE SHEETS C-46A AND C-46B.

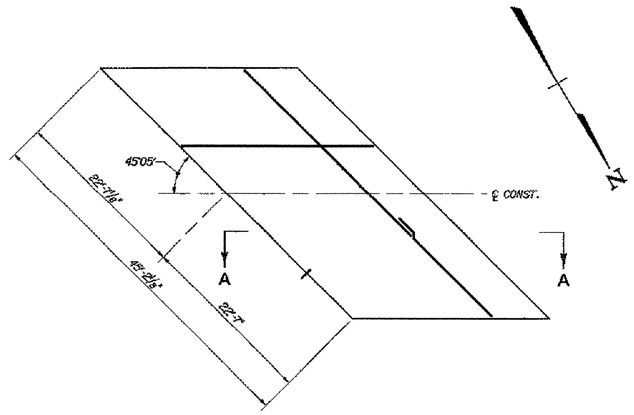
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of MIDDLESEX-BOLTON	Bridge No. 43N&S
Highway No. I-89	Log Sta. / Surv. Sta.
I-89 OVER U.S. ROUTE 2	
TRANSVERSE SECTION (43N&S)	
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT MIDDLESEX-BOLTON	PROJECT NO. IM-089-2(26)
TVGA CAD Drawing No. 43tsect	Date 10/99
Bridge Sheet No. BR43-4	Sheet 50 of 307

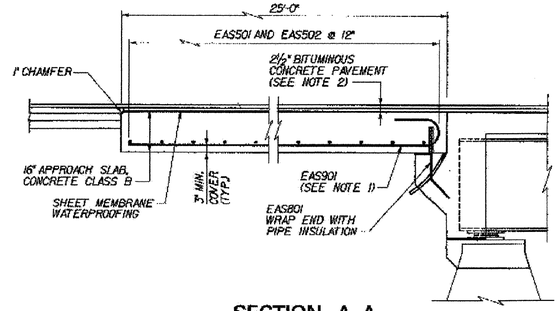
TVGA ENGINEERING, SURVEYING, P.C.



43S ABUTMENT 1

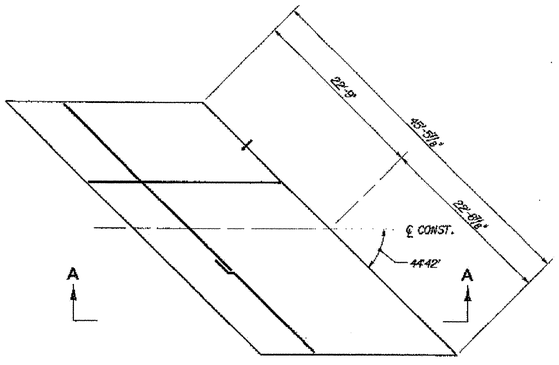


43S ABUTMENT 2

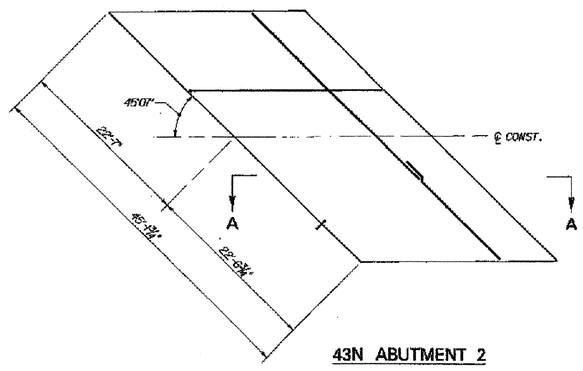


SECTION A–A

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



43N ABUTMENT 1



43N ABUTMENT 2

TOP OF APPROACH SLAB ELEVATIONS					
BR 43N			BR 43S		
LOCATION	STATION	ELEVATION	LOCATION	STATION	ELEVATION
A	4+31.87	543.82-.04	A	3+15.91	544.82-.93
B	4+48.05	542.88-.90	B	3+32.17	544.85-.96
C	4+64.21	542.06-.08	C	3+48.39	544.19-.30
D	4+08.83	543.72-.74	D	2+90.90	545.27-.38
E	4+23.05	543.62-.64	E	3+07.17	545.32-.43
F	4+39.24	542.80-.82	F	3+23.43	544.88-.79
G	6+07.22	537.84-.86	G	5+21.50	539.27-.08
H	6+23.16	537.74-.73	H	5+37.46	539.85-.96
J	6+39.07	536.80-.92	J	5+53.40	539.04-.15
K	6+32.25	537.10-.12	K	5+46.53	539.24-.35
L	6+48.16	536.97-.99	L	5+62.46	539.10-.21
M	6+64.03	536.15-.17	M	5+78.36	538.27-.38

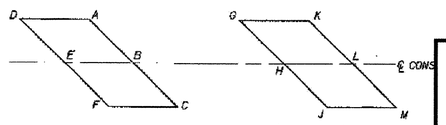
RAISED FIN. GRADE OF 43N - ¼" RAISED FIN. GRADE OF 43S - 0.11'

NOTES:

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

APPROACH SLAB PLANS

SCALE: ⅛" = 1'-0"



ABUTMENT 1 ABUTMENT 2

APPROACH SLAB ELEVATION KEY

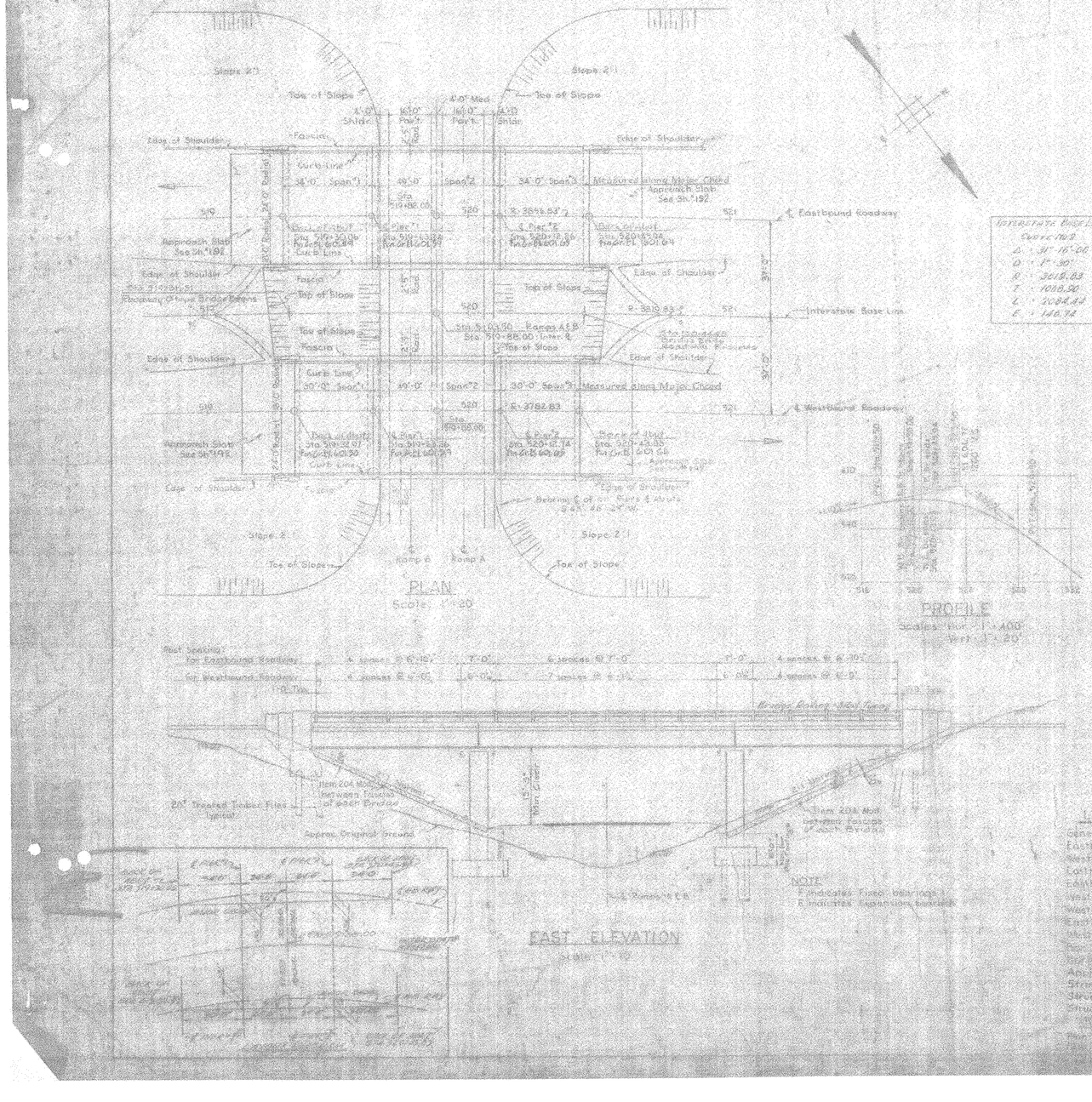
N.T.S.

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 10 OF 25
BRIDGES 43 N & S
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of MIDDLESEX-BOLTON	Bridge No. 43N&S
Highway No. I-89	Log Sta. / Surv. Sta.
I-89 OVER U.S. ROUTE 2	
APPROACH SLAB DETAILS (43N&S)	
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT MIDDLESEX-BOLTON	PROJECT NO. IM-089-2(26)
TVGA CAD Drawing No. 43apslab	Date 10/99
Bridge Sheet No. BR43-6	Sheet 52 of 307

TVGA ENGINEERING, SURVEYING, P.C.



ESTIMATE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY EASTBOUND NET	EASTBOUND ROUND	WESTBOUND NET	WESTBOUND ROUND
107	STRUCTURE EXCAVATION	C.Y.	349	420	431	512
204A	SUB BASE OF CRUSHED ROCK-MOD	C.Y.	1122	134	112	118
401B	BIT. CONCRETE PAV'T (Incl. Approach Slab)	Sq. Yard	85	14	78	80
401B	CLASS B CONCRETE (Incl. Approach Slab) MOD	C.Y.	525	552	361	534
602	REINFORCING STEEL (Incl. Approach Slab)	LB.	61,591	—	84,085	—
603	SPIRAL REINFORCEMENT (5222 lbs.)	L.S.	—	—	—	—
604A	STRUCTURAL STEEL	LB.	161,350	177,485	161,350	177,485
502B	TREATED TIMBER PILING	L.F.	2,552	—	3,220	—
556C	GRANITE BRIDGE CURB (Incl. Approach Slab)	L.F.	252	—	240	—
572	BRIDGE RAILING	L.F.	91	—	110	—
407	ASPHALTIC RUBBERIZED COATING	SY.	68	—	60	—
F	Fencing Equip. for Existing Pier	L.F.	—	—	—	—
E16	Protecting Existing Pier for Slow Weaning Surface	S.F.	—	1170	—	1260

GENERAL NOTES

1. All materials and construction shall conform to the State of Vermont Dept. of Highways Standard Specifications for Road and Bridge Construction dated Jan 1956 and the AASHO Std. Specifications dated 1953, designed for H-20-Sta#4 loading modified to National System of Interstate Highways applied in accordance with the provisions of the AASHO Standard Specifications, Art. 3.2.5.
2. Where rock is encountered, no footings shall be poured until blasting in the adjacent area has been completed.
3. All bearing elevations, of abutments and piers, have been lowered ½" to compensate for excessive camber noted in beams at the mill.
4. All beams shall be noted as a true circular camber, full length, and the middle ordinate to be as shown on Contract plans.
5. Final coat of Piers paint shall be black unless otherwise directed by the Engineer.
6. All stations referred to Interstate Base Line between the two Roadways.
7. All dimensions given are measured horizontally or vertically unless noted.
8. All reinforcing to have a clear cover of 2" unless noted.
9. All exposed edges of concrete shall be chamfered 1"x1" unless noted.
10. Borings indicated on the drawings have been made for design purposes only and are not warranted to show actual subsurface conditions.
11. Elevation Datum Sea Level based on Bench Line U.S.C.&S. Survey Level Line, Vermont 25 (Second Order).
12. Where Piles are driven in fill, the material shall be such as to have no stones large enough to interfere with the driving of Piles.
13. Grass slope of approach slab to conform with cross slope of roadway.
14. Piles shall not be spliced without written approval of the engineer.
15. The top surfaces of all piers and abuts. shall be sloped ¼" per ft. from the back edge of seats or the ℄ of pier except for bearing seats requiring more above the general area, which surface shall be level. These sloping surfaces shall be coated with asphaltic emulsion coating, which shall consist of Specs. and rounded as required at the ends.

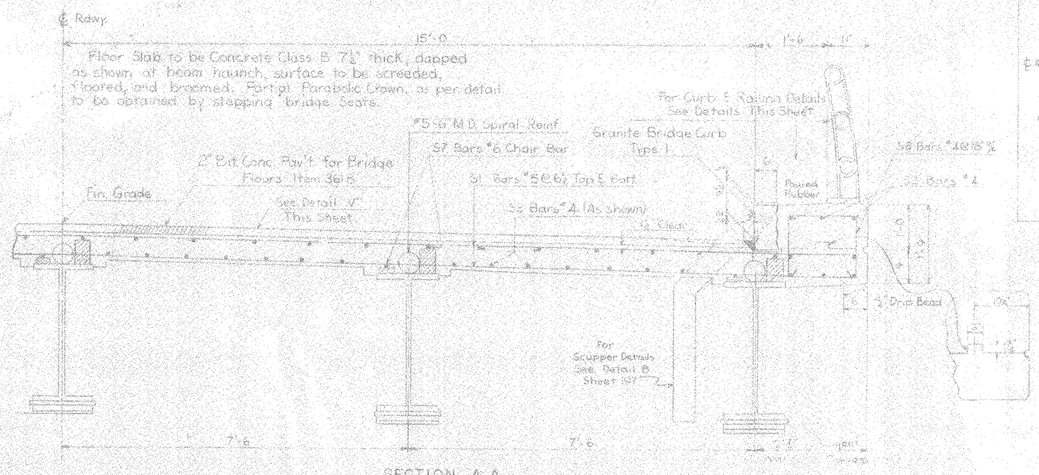
LIST OF DRAWINGS

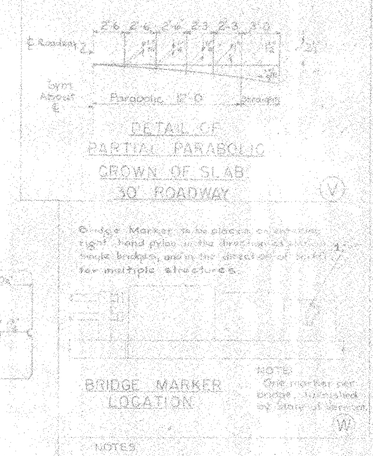
General Plan & Elevation — Sh. "176"
Eastbound Frames & Reinforcing Plan — Sh. "176"
Westbound Frames & Reinforcing Plan — Sh. "177"
Eastbound Pier "1" Details — Sh. "178"
Eastbound Pier "2" Details — Sh. "179"
Westbound Pier "1" Details — Sh. "180"
Westbound Pier "2" Details — Sh. "181"
Eastbound Abutment Details — Sh. "182"
Westbound Abutment Details — Sh. "183"
Box Culvert — Sh. "184"
Box Culvert — Sh. "185"
Approach Slabs — Sh. "192"
Structure Details "A" — Sh. "193"
Structure Details "B" — Sh. "194"
Structure Details "C" — Sh. "195"

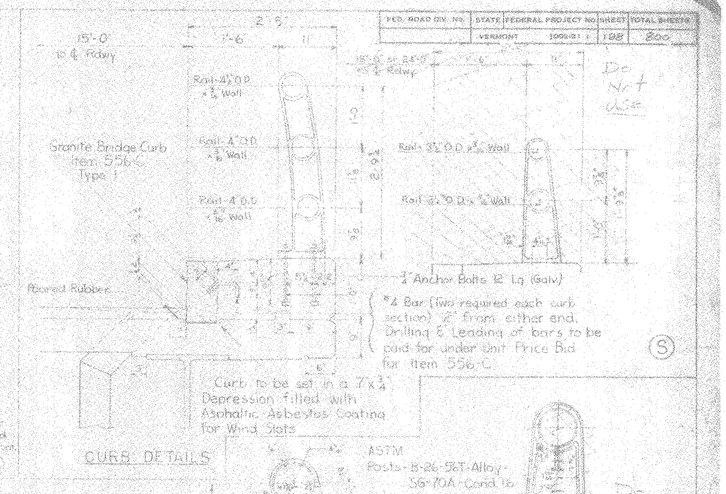
IR DECK (17)
I-89, BR #45 N & S
THIS SHEET FOR INFORMATION ONLY

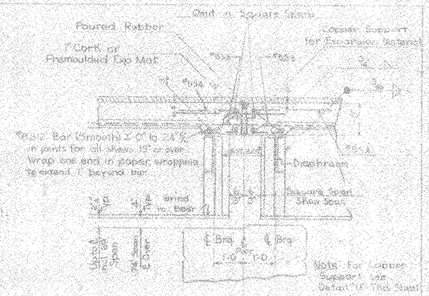
STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
INTERSTATE PROJECT IN THE TOWNS OF BERLIN & MONTPELIER & MIDDLESEX

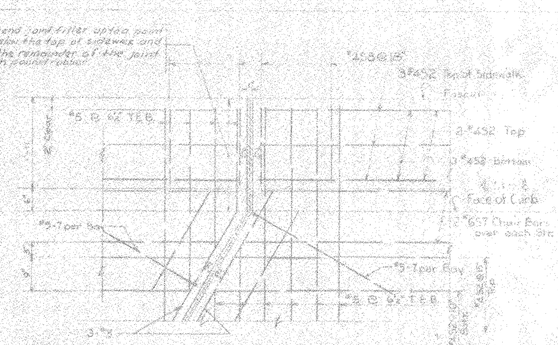
MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 11 OF 25
BRIDGES 45 N & S
FOR REFERENCE ONLY

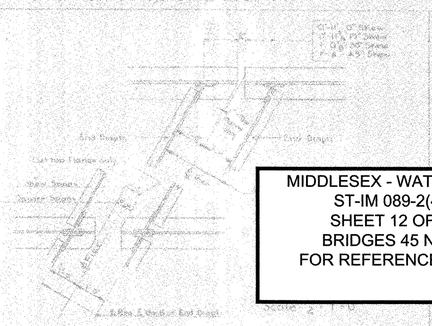




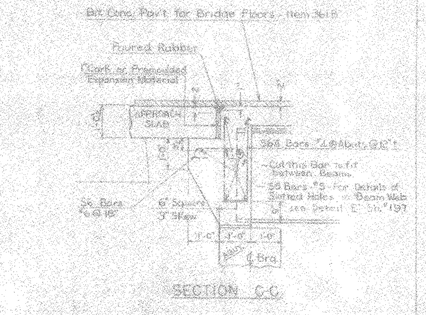


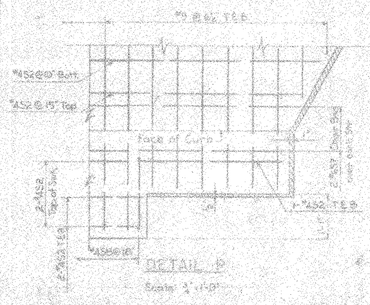


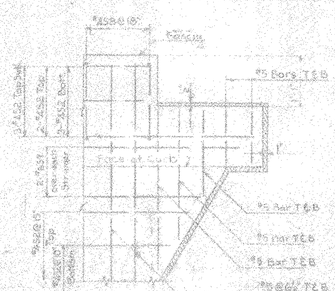


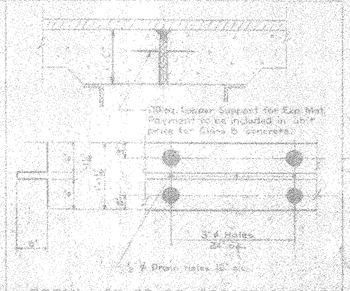


MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 12 OF 25
BRIDGES 45 N & S
FOR REFERENCE ONLY









NOTE:
Details on this sheet not to be used for Structure

FED. ROAD DIV. NO.	STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
	VERMONT	1999(18)	128	800

Do Not Use

ZR-DECK(17)
T-81, BR. #45 N&S
FOR SHEET FOR INFORMATION ONLY

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
INTERSTATE PROJECT in the towns of BERLIN - MONTPELIER - MIDDLESEX
STRUCTURE DETAIL 'B'
BOSWELL ENGINEERING CO.
CONSULTING ENGINEERS
RUTLAND, VERMONT

Existing Route 100
Curve Data

Δ = 36°-24'
D = 26°-00'
R = 220.4'
T = 118.2
L = 216.9
E = 29.7

Winter Rye and Mulch on all slopes outside fascias. Not included in Bridge Estimate.

Taper at Speed Change Lane

℄ Interstate Southbound

℄ Interstate

℄ Interstate Northbound

Approach Slab

Existing Manhole

Existing Wall

Existing 9'-3" x 6'-3" Concrete Box Culvert

Existing 24" Tile Pipe

Existing House to be removed

For slope in this area see General Plan & Elevation Sheet, Rump A Bridge.

Existing Route 100 Curve Data

Spiral Curve Data

PI = 770+50.4 Bk=
769+44.67 Ah
Δ = 48°-25' Lt
D = 3°-00'
Rc = 1909.86'
Lc = 1263.59'
Ls = 350'
θs = 5°-15'
Ts = 1054.01
LT = 233.44
S.T = 116.76
P = 10.67
K = 174.95
Es = 187.07
S.E = 15.7 Ft

PLAN
Scale: 1"=20'

ELEVATION
Scale: 1"=20'

Span 1 69'-0" | Span 2 74'-0" | Span 3 69'-0" Southbound, 79'-0" Northbound | Span 4 79'-0" | Span 5 3'-0"

Begin Bridge | ℄ Pier #1 | ℄ Pier #2 | ℄ Pier #3 | ℄ Pier #4 | End Bridge

S.W. Abut. Elev. 455.0
S.E. Abut. Elev. 444.0
Elev. N.W. Abut 454.5
Elev. N.E. Abut. 458.0

Extreme High Water Elev. 426

6'± Item 521 Stone Fill Heavy Type

1'-0" Item 204 Mod. Sub-base of Crushed Rock between fascias

Approx. existing ground at East fascia.

Limits of Bar for 2 Fsh. 102

Note: For General Notes see Sheet 2.

INDEX TO DRAWINGS

Sheet No.	Title
1	General Plan and Elevation
2	Boring Logs and Profiles
3	Framing Plan Spans 1 & 3
4	Framing Plan Spans 4 & 5
5	Details of Channel Improvement
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 13 OF 25
BRIDGES 45 N & S
FOR REFERENCE ONLY

REFERENCE DRAWINGS

Superstructure Std. Drwg.	308-30 Sh. 6 & 12
Handrail " "	88-26-37 Sh. 1
Bearings & Steel " "	88-20-56
Miscellaneous " "	
Approach Slabs " "	60-46-67 30° Skew
Expansion Jt. Details " "	58-22-56

VERMONT
STATE HIGHWAY DEPARTMENT
TOWNS OF MIDDLESEX - WATERBURY
INTERSTATE PROJECT

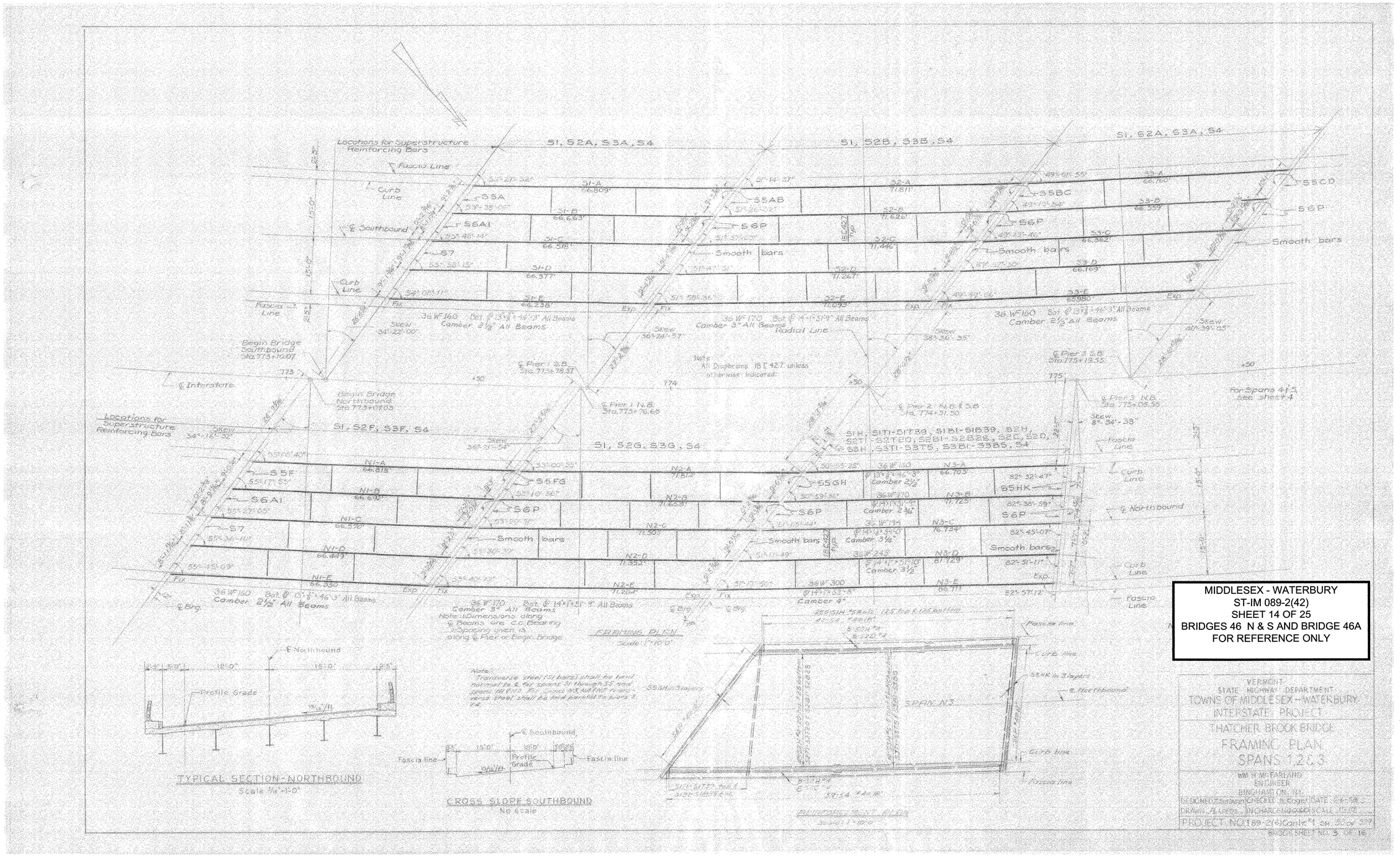
THATCHER BROOK BRIDGE

GENERAL PLAN AND ELEVATION

WM. H. MC FARLAND
ENGINEER
BINGHAMTON, N.Y.

DESIGNED H.W.C. | CHECKED H.W.C. | DATE 5/6/53
DRAWN J. Wiesko | IN CHARGE H.W.C. | SCALE as shown
PROJECT NO. 35926 Cont. | SH. 13 OF 321

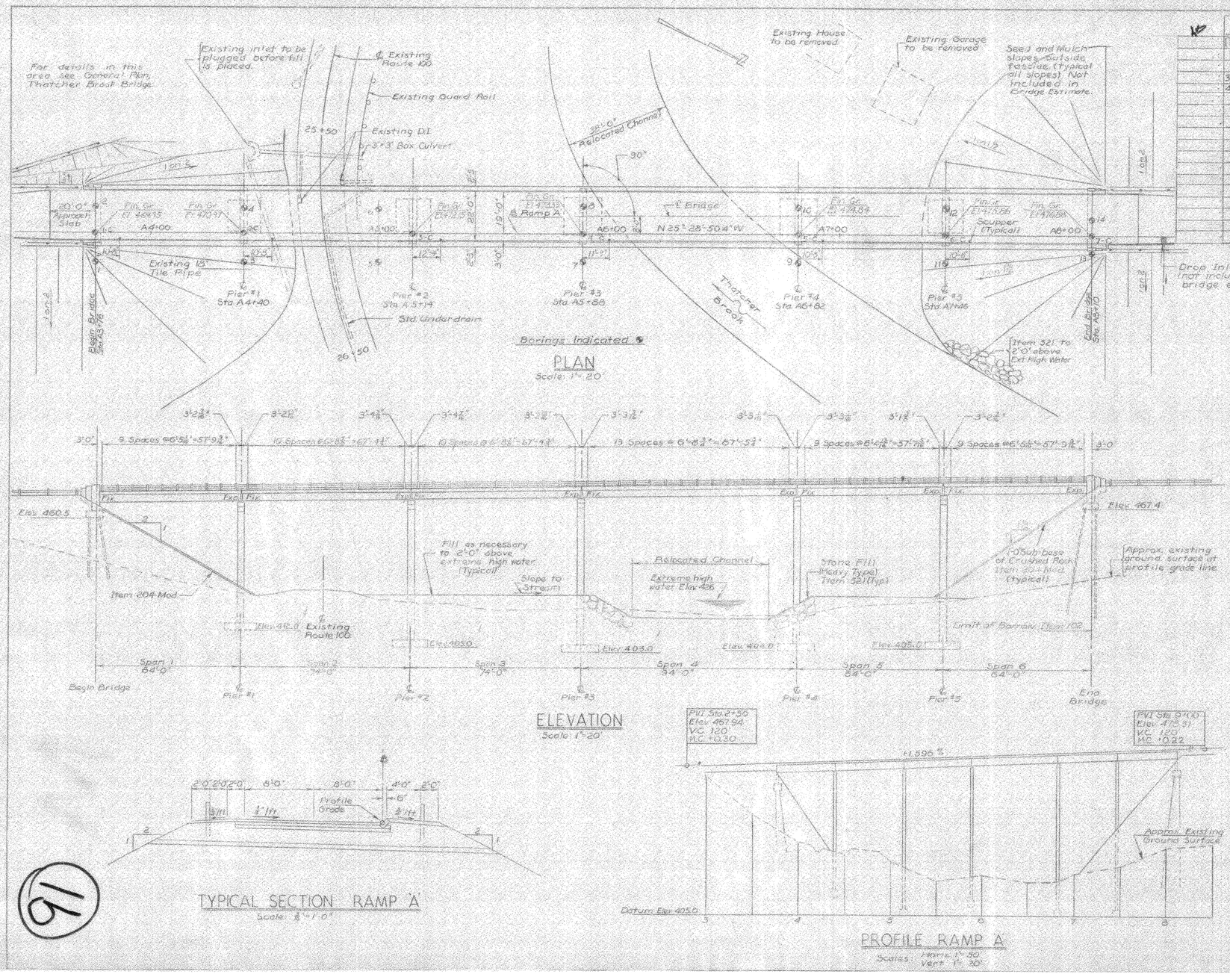
BRIDGE SHEET NO. 1 OF 2



MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 14 OF 25
BRIDGES 46 N & S AND BRIDGE 46A
FOR REFERENCE ONLY

VERMONT
STATE HIGHWAY DEPARTMENT
TOWNS OF MIDDLESEX - WATERBURY
INTERSTATE PROJECT
THATCHER BROOK BRIDGE
FRAMING PLAN
SPANS 1, 2 & 3

WM. H. McFARLAND
ENGINEER
BINGHAMTON, VT.
DESIGNED S. Sullivan CHECKED S. Eagle DATE 5-6-58
DRAWN R. Lewis IN CHARGE W. McF. SCALE 1"=10'
PROJECT NO. I 89-2(42) Contr. # SH. 3 of 27
BRIDGE SHEET NO. 3 OF 16



ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
102	Borrow	c.y.	7500
204 Mod.	Sub-Base Crushed Rock	c.y.	190
361-B Mod.	Bituminous Concrete Pavt.	ton	148
401-B Mod.	Concrete Class "B"	c.y.	615
402	Reinforcing Steel	lb.	165,241
403	Spiral Reinforcement (6000 lb.)	l.s.	Nec.
404-A	Structural Steel	lb.	411,909
407	Asphaltic-Asbestos Coating	sq.y.	66
501	Furnish Equip. for Driving Piles	l.s.	Nec.
504	Steel Piling	l.f.	820
556-C	Granite Bridge Curb	l.f.	892
572	Bridge Railing	l.f.	863
107	Structure Excavation	c.y.	1,140
105	Time Emt. for Underwater Work	hr.	2,772

REFERENCE DRAWINGS

Superstructure	Std. Dwg.	SB-30-56 Sh. 1&2
Hand rail	" "	SB-56-57 Sh. 1
Bearings	" "	SB-20-56
Steel Diaphragms	" "	SB-20-56

INDEX TO DRAWINGS

Sheet No.	Title
1	General Plan and Elevation
2	Framing Plan, Section and Boring Logs
3	Abutment Details
4	Pier Details
5	Approach Slabs
6	Reinforcing Bar Schedule

GENERAL NOTES

1. Material and construction shall conform to State of Vermont Standard Specifications for Highway Bridge Construction, dated 1956.
2. All design in accordance with AASHO Standard Specifications for Highway Bridges, dated 1953. Loading E-H20-S16-44 as modified for National System of Interstate Highways.
3. Concrete shall attain a minimum strength of 2000 p.s.i. prior to addition of any superimposed load.
4. All concrete to be Class B throughout.
5. All welding to conform with the American Welding Society Standard Specifications for Welded Highway and Railway Bridges.
6. All piles to be 10BP42 and driven to a minimum bearing capacity of 37 tons.
7. Chord of Excavation Item 106-A and Structure Fill (Heavy Type) Item 521 are incidental to Highway Excavation.
8. Reinforcing steel shall be placed in accordance with the Recommended Practice for Placing Reinforcing Steel as adopted by the Concrete Reinforcing Steel Institute.
9. All exposed corners of concrete shall be chamfered 1".
10. Bridge seat reinforcing steel shall be placed before concrete is placed in the backwall.
11. Where concrete is placed against earth, it shall be poured against undisturbed earth.

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 15 OF 25
BRIDGES 46 N & S AND BRIDGE 46A
FOR REFERENCE ONLY

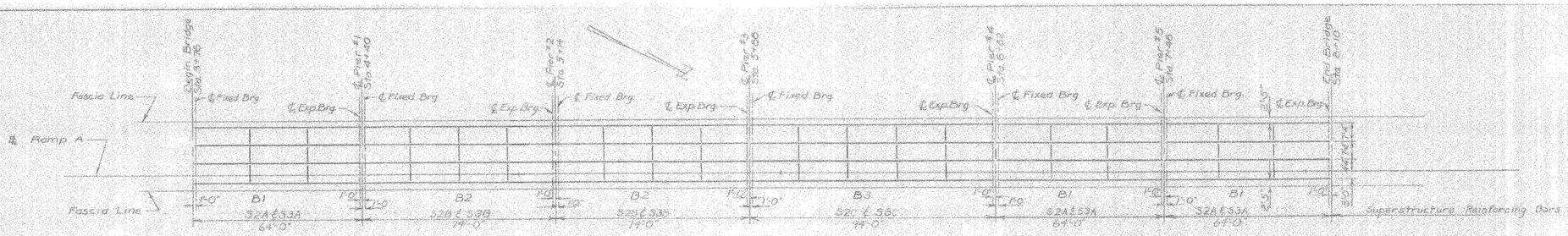
VERMONT
STATE HIGHWAY DEPARTMENT
TOWNS OF MIDDLESEX - WATERBURY
INTERSTATE PROJECT

RAMP A BRIDGE
GENERAL PLAN AND ELEVATION

WM. H. McEARLAND
ENGINEER
BINGHAMTON, N.Y.

DESIGNED F.W.C. CHECKED F.W.C. DATE 5-1956
DRAWN V. Kiesle IN CHARGE McCole SCALE As shown
PROJECT NO. I-89-2(42)CONST. 1 SHEET NO. 15

61

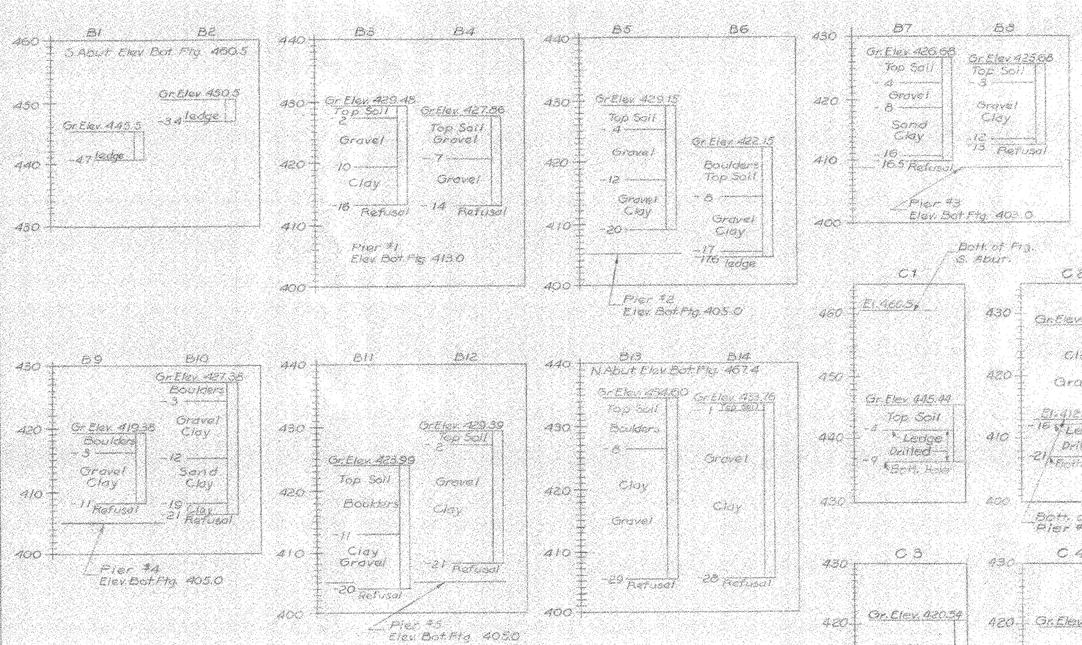


BEAM SCHEDULE

MARK	SIZE	BOTTOM COVER PL	C. C. BRG.	LENGTH	NO.	CAMBER
B1	36 WF150	10"x⅝"x39'-6"	62'-0"	63'-0"	12	2¼"
B2	36 WF170	14"x1"x51'-9"	72'-0"	73'-0"	8	3"
B3	36 WF300	18"x1"x59'-8"	92'-0"	93'-0"	4	4⅝"

FRAMING PLAN

Scale: 1"=20'



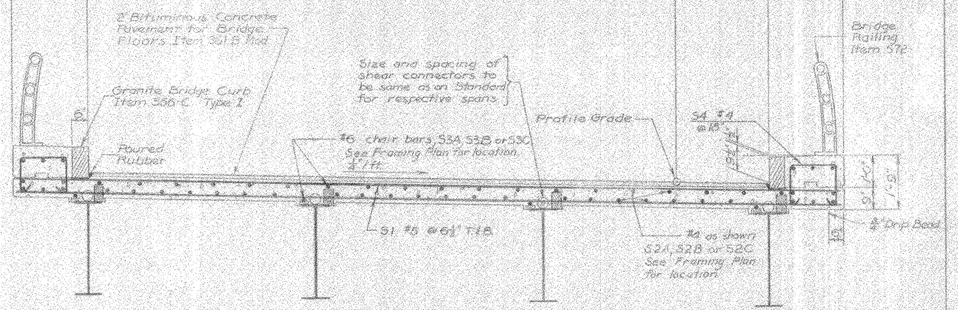
BORING LOGS

No Scale

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. For location of borings see General Plan sheet.

TYPICAL SECTION

Scale: ½"=1'-0"



NOTES

1. Superstructure details not shown will be same as shown on Standard Sheets SCB-50-59, sheets 1 & 2 for respective spans.
2. Handrail details will be same as shown

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 16 OF 25
BRIDGES 46 N & S AND BRIDGE 46A
FOR REFERENCE ONLY

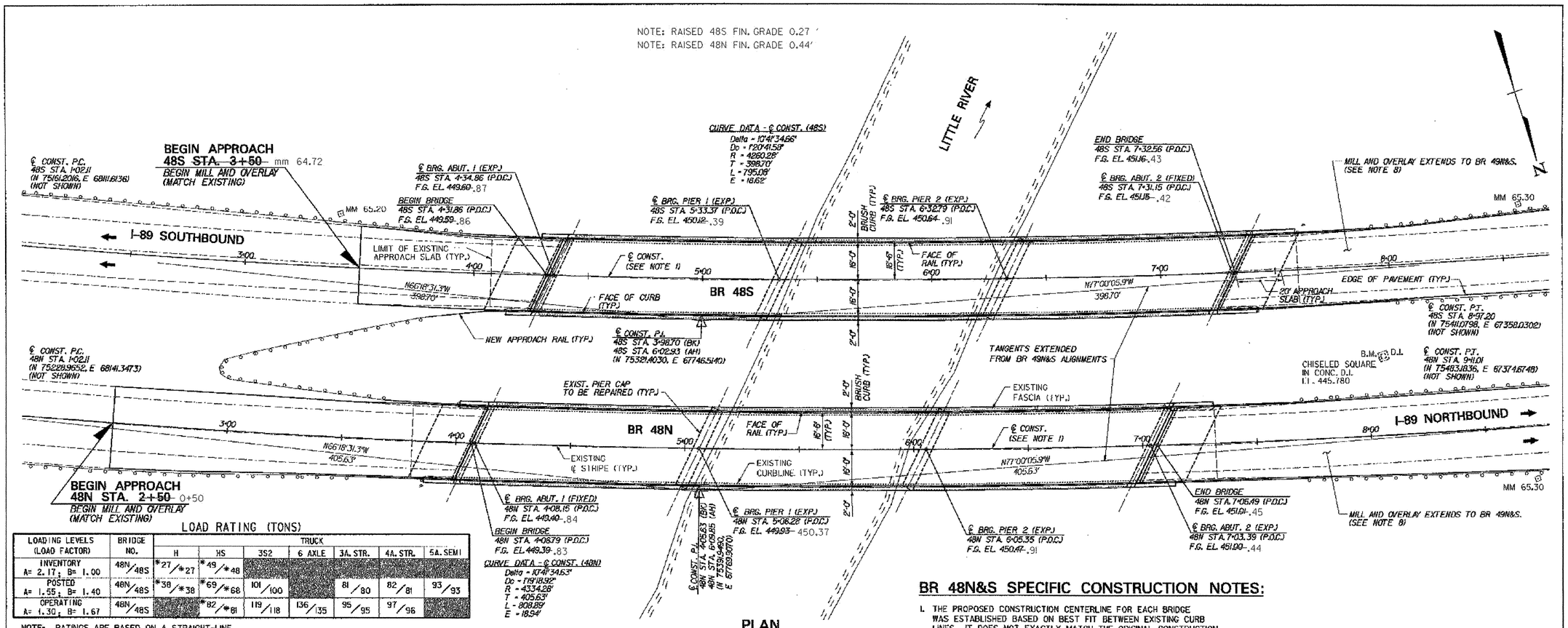
VERMONT
STATE HIGHWAY DEPARTMENT
TOWNS OF MIDDLESEX-WATERBURY
INTERSTATE PROJECT

RAMP A BRIDGE
FRAMING PLAN
SECTION & BORING LOGS

WM. H. McFARLAND
ENGINEER
BINGHAMTON, N.Y.

DESIGNED J.R.C. CHECKED J.W.T. DATE 5-4-59
DRAWN J. Kleshe IN CHARGE H.G.Cole SCALE as shown
PROJECT NO. I-89-2(6) CONTR. 1 SH. 16 OF 329

BRIDGE SHEET NO. 2 OF 6



PLAN

SCALE: 1"=20'

LOAD RATING (TONS)

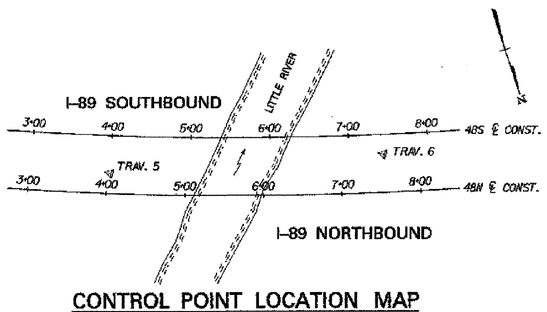
LOADING LEVELS (LOAD FACTOR)	BRIDGE NO.	TRUCK H	HS	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
INVENTORY A= 2.17 ; B= 1.00	48N/48S	*27/*27	*49/*48					
POSTED A= 1.55 ; B= 1.40	48N/48S	*38/*38	*69/*68	101/100		81/80	82/81	93/93
OPERATING A= 1.30 ; B= 1.67	48N/48S		*82/*81	119/118	136/135	95/95	97/96	

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

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

TABLE OF BRIDGE COORDINATES

BRIDGE	CL CONST. @	STATION	NORTHING	EASTING
48N	BEGIN BRIDGE	4+06.79	75341.4836	67856.2782
	CL BRG. ABUT. 1	4+08.15	75341.9417	67858.9955
	CL BRG. PIER 1	5+06.28	75373.8843	67764.2122
	CL BRG. PIER 2	6+05.35	75403.9939	67669.8307
	CL BRG. ABUT. 2	7+03.39	75431.5592	67575.7772
	END BRIDGE	7+06.49	75432.4982	67572.7971
48S	BEGIN BRIDGE	4+31.86	75281.8840	67804.8348
	CL BRG. ABUT. 1	4+34.86	75282.8731	67802.0004
	CL BRG. PIER 1	5+33.37	75314.2178	67708.6125
	CL BRG. PIER 2	6+32.79	75343.6544	67613.6526
	CL BRG. ABUT. 2	7+31.15	75370.6887	67519.0546
	END BRIDGE	7+32.56	75370.9593	67517.6927



CONTROL POINT LOCATION MAP

N.T.S.
(SEE NOTE 2)

BR 48N&S SPECIFIC CONSTRUCTION NOTES:

1. THE PROPOSED CONSTRUCTION CENTERLINE FOR EACH BRIDGE WAS ESTABLISHED BASED ON BEST FIT BETWEEN EXISTING CURB LINES. IT DOES NOT EXACTLY MATCH THE ORIGINAL CONSTRUCTION CENTERLINE.
2. FOR CONTROL POINT TIE SKETCHES, SEE CONTROL POINT TIES (48N&S AND 49N&S), BRIDGE SHEET C-11.
3. REPLACE SUPERSTRUCTURE STEEL, BEARINGS, DECK SLABS, APPROACH SLABS, BRIDGE RAIL AND APPROACH RAIL. RESET GUARD RAIL.
4. NEW SCUPPERS ARE REQUIRED ON BRIDGE 48S. FOR LOCATION OF NEW SCUPPERS, SEE FRAMING PLAN (48S), BRIDGE SHEET BR48-9.
5. CONSTRUCT NEW BACKWALLS AT EXPANSION ABUTMENTS AND NEW CURTAINWALLS AT FIXED ABUTMENTS. REBUILD ABUTMENT BRIDGE SEATS AND MODIFY WINGWALLS AS SHOWN IN THE PLANS.
6. REPAIR PIER STEM AND PIER CAP DELAMINATED AND SPALLED AREAS. REBUILD PIER SEAT TO PROPOSED ELEVATIONS.
7. REPAIR ABUTMENT DELAMINATED AND SPALLED AREAS.
8. MILL AND OVERLAY EXTENDS TO BR 49N&S. FOR END LIMITS OF MILL AND OVERLAY, SEE GENERAL PLAN (49N&S), BRIDGE SHEET BR49-1.
9. RE-STRIPE BRIDGE AND APPROACH ROADWAY.

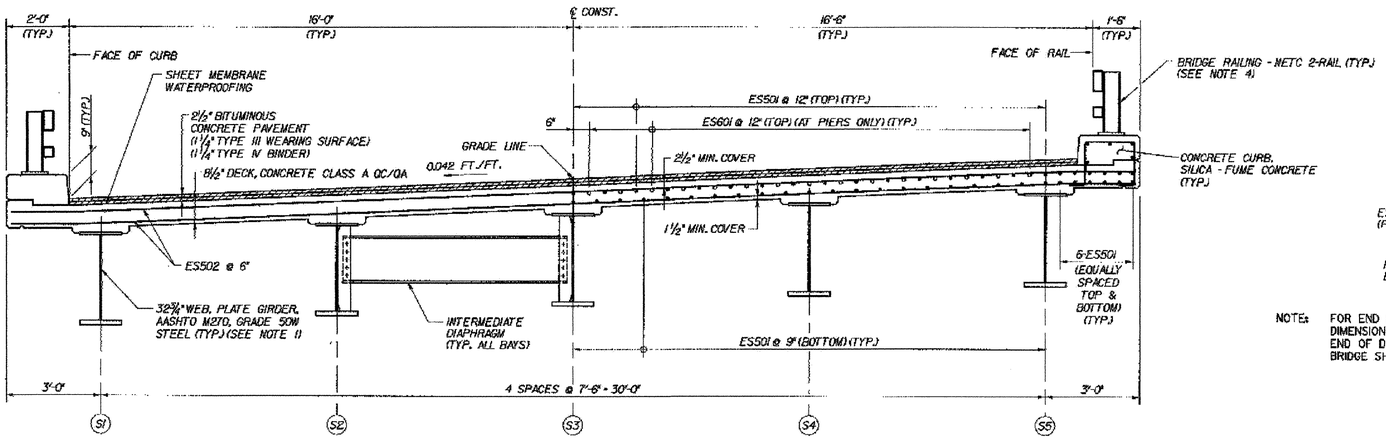
20 0 20
SCALE IN FEET

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 17 OF 25
BRIDGES 48 N & S
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

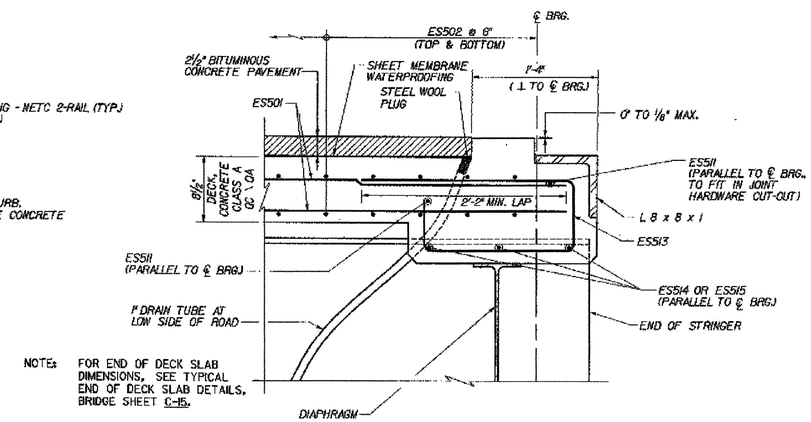
Town Of MIDDLESEX-BOLTON	Bridge No. 48N&S
Highway No. I-89	Leg Sta. / Surv. Sta.
I-89 OVER LITTLE RIVER	
GENERAL PLAN (48N&S)	
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT MIDDLESEX-BOLTON	PROJECT NO. IM-089-2(26)
TVGA CAD Drawing No. 48gen.pl	Date 10/99
Bridge Sheet No. BR48-1	Sheet 61 of 307

TVGA ENGINEERING, SURVEYING, P.C.



TRANSVERSE SECTION

SCALE: ½" = 1'-0"

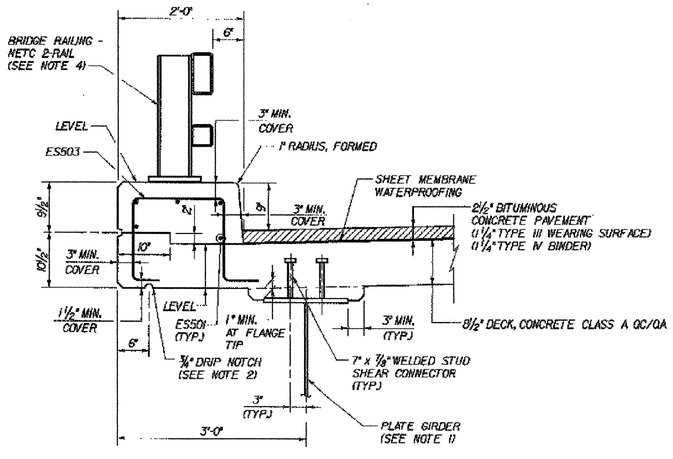


NOTE: FOR END OF DECK SLAB DIMENSIONS, SEE TYPICAL END OF DECK SLAB DETAILS, BRIDGE SHEET C-15.

END OF DECK SLAB REINFORCEMENT DETAIL

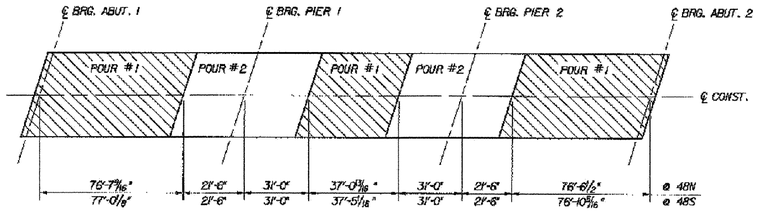
(EXP. END)

SCALE: 1½" = 1'-0"



FASCIA DETAIL

SCALE: 1"=1'-0"



DECK POUR SEQUENCE

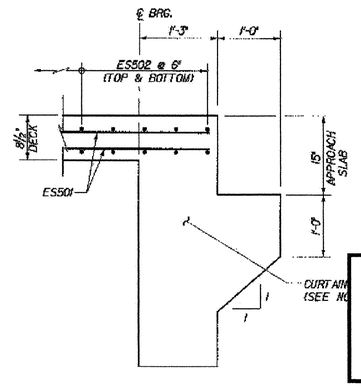
N.T.S.

BRIDGE 48N AND 48S WAS DONE IN A SINGLE POUR WITH NO CONSTRUCTION JOINT.

DECK SLAB PLACEMENT NOTES

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

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



END OF DECK SLAB REINFORCEMENT DETAIL

(FIXED END)

SCALE: 1" = 1'-0"

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 18 OF 25
BRIDGES 48 N & S
FOR REFERENCE ONLY

NOTES:

1. FOR PLATE GIRDER SIZES SEE STRINGER ELEVATION (48N&S), BRIDGE SHEET BR48-10.
2. END DRIP NOTCH 5 FEET BEFORE END OF SLAB AT "DOWNHILL" ABUTMENTS AT 45°.
3. FOR CURTAINWALL DETAILS AND REINFORCEMENT LAYOUT, SEE TYPICAL CURTAINWALL DETAILS, BRIDGE SHEET C-42.
4. FOR DETAILS OF NETC BRIDGE RAIL AND APPROACH SECTION, SEE STANDARD SHEETS BRI-97 AND BR3-97, AND GUARD RAIL APPROACH SECTION, NETC 2 RAIL, BRIDGE SHEETS C-46A AND C-46B.

TVGA ENGINEERING, SURVEYING, P.C.

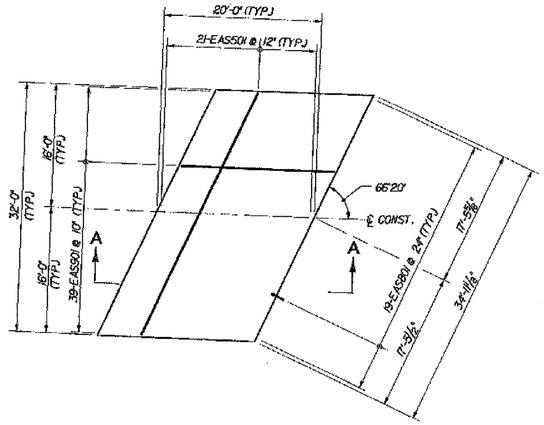
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of MIDDLESEX-BOLTON	Bridge No. 48N&S
Highway No. I-89	Log Sta. / Surv. Sta.

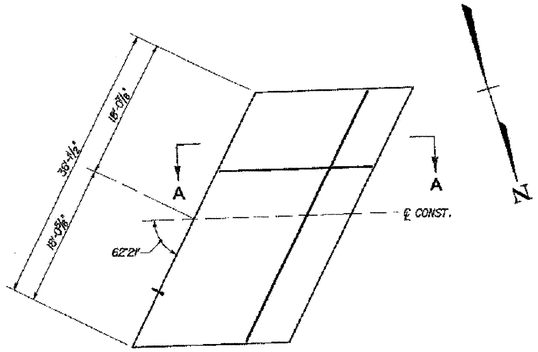
I-89 OVER LITTLE RIVER

TRANSVERSE SECTION (48N&S)

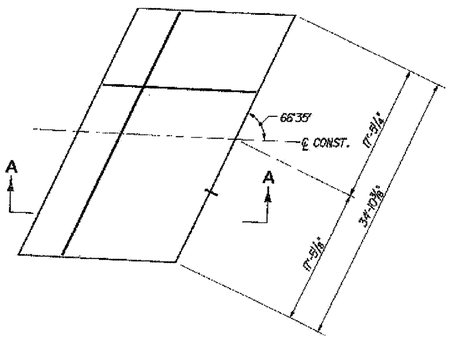
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT MIDDLESEX-BOLTON	PROJECT NO. IM-089-2(26)
TVGA CAD Drawing No. 48tsect	Date 10/99
Bridge Sheet No. BR48-4	Sheet 64 of 307



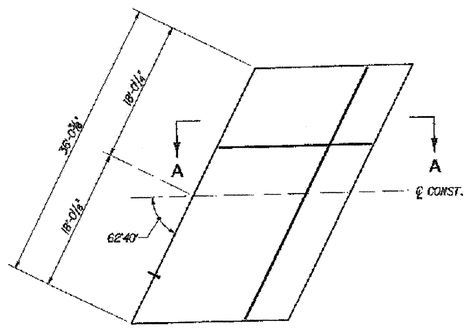
48S ABUTMENT 1



48S ABUTMENT 2



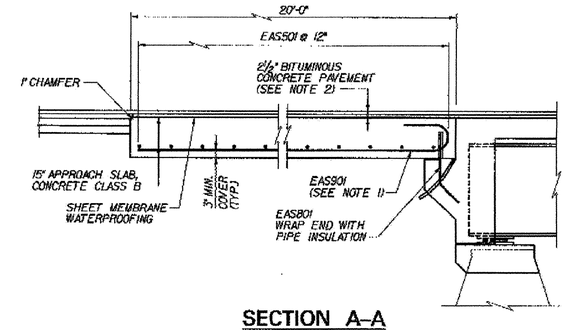
48N ABUTMENT 1



48N ABUTMENT 2

APPROACH SLAB PLANS

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



SECTION A–A

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

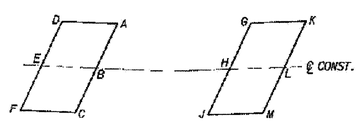
N.T.S.

RAISED FINISHED GRADE 5¼" — RAISED FINISHED GRADE 3¼"

TOP OF APPROACH SLAB ELEVATIONS						
BR 48N			BR 48S			
LOCATION	STATION	ELEVATION	LOCATION	STATION	ELEVATION	
A	4+13.74	448.55 .99	A	4+38.89	448.74	449.01
B	4+06.79	449.18 .62	B	4+31.86	449.38	449.65
C	3+99.89	449.81 .25	C	4+24.89	450.01	450.28
D	3+93.66	448.44 .88	D	4+18.80	448.04	448.91
E	3+86.79	449.07 .51	E	4+11.86	449.27	449.54
F	3+79.98	449.71 .15	F	4+04.98	449.91	450.18
G	7+14.80	450.17 .61	G	7+40.99	450.32	450.59
H	7+08.49	450.80 .24	H	7+32.56	450.95	451.22
J	6+98.24	451.43 .87	J	7+24.21	451.58	451.85
K	7+34.88	450.28 .72	K	7+61.08	450.43	450.70
L	7+26.49	450.91 .35	L	7+52.56	451.06	451.32
M	7+18.14	451.54 .98	M	7+44.11	451.88	451.95

NOTES:

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



ABUTMENT 1 — ABUTMENT 2

APPROACH SLAB ELEVATION KEY

N.T.S.

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 19 OF 25
BRIDGES 48 N & S
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

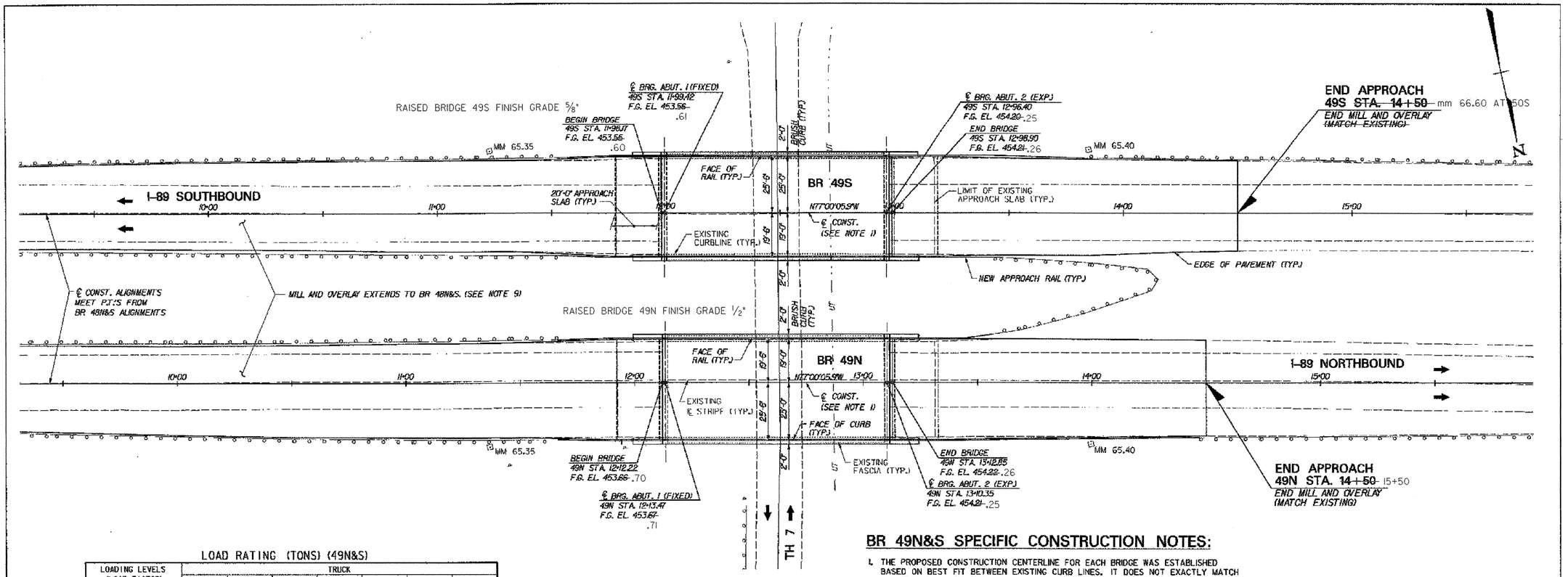
Town Of MIDDLESEX-BOLTON	Bridge No. 48N&S
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 OVER LITTLE RIVER

APPROACH SLAB DETAILS (48N&S)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT MIDDLESEX-BOLTON	PROJECT NO. IM-089-2(26)
TVGA CAD Drawing No. 48apslab	Date 10/99
Bridge Sheet No. BR48-6	Sheet 66 of 307

TVGA ENGINEERING, SURVEYING, P.C.



PLAN
SCALE: 1"=20'

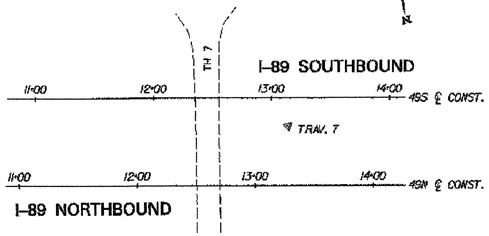
LOAD RATING (TONS) (49N&S)

LOADING LEVELS (LOAD FACTOR)	TRUCK						
	H	HS	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
INVENTORY A= 2.17; B= 1.00	52	76					
POSTED A= 1.55; B= 1.40	73	107	124		100	102	115
OPERATING A= 1.30; B= 1.67		127	147	171	118	121	

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

TABLE OF BRIDGE COORDINATES

BRIDGE	CL CONST. @	STATION	NORTHING	EASTING
49N	BEGIN BRIDGE	12+12.22	75550.9332	67081.1808
	CL BRG. ABUT. 1	12+13.47	75551.2144	67079.9628
	CL BRG. ABUT. 2	13+10.36	75573.0049	66985.5653
	END BRIDGE	13+12.85	75573.5672	66983.1293
49S	BEGIN BRIDGE	11+98.17	75478.7754	67064.7699
	CL BRG. ABUT. 1	11+98.42	75479.0566	67063.5519
	CL BRG. ABUT. 2	12+96.40	75590.8698	66989.0569
	END BRIDGE	12+98.90	75591.4320	66986.8209



CONTROL POINT LAYOUT MAP
N.T.S.
(SEE NOTE 2)

BR 49N&S SPECIFIC CONSTRUCTION NOTES:

1. THE PROPOSED CONSTRUCTION CENTERLINE FOR EACH BRIDGE WAS ESTABLISHED BASED ON BEST FIT BETWEEN EXISTING CURB LINES. IT DOES NOT EXACTLY MATCH THE ORIGINAL CONSTRUCTION CENTERLINE.
2. ADDITIONAL CONTROL POINTS ARE LOCATED ADJACENT TO BR 48N&S, AS SHOWN ON GENERAL PLAN (48N&S), BRIDGE SHEET BR48-1. FOR CONTROL POINT TIE SKETCHES, SEE CONTROL POINT TIES (48N&S AND 49N&S), BRIDGE SHEET C-11.
3. REMOVE SCUPPERS. REPLACE DECK SLABS, SHEAR CONNECTORS, APPROACH SLABS, BRIDGE RAIL AND APPROACH RAIL. RESET GUARD RAIL.
4. NEW SCUPPERS ARE NOT REQUIRED ON THESE BRIDGES.
5. AT EXPANSION ABUTMENTS, CONSTRUCT NEW BACKWALLS, REBUILD BRIDGE SEATS AND MODIFY WINGWALLS AS SHOWN IN THE PLANS. INSTALL NEW ELASTOMERIC BEARINGS. INSTALL NEW BEARING STIFFENERS AND DIAPHRAGMS.
6. AT FIXED ABUTMENTS, CONSTRUCT NEW CURTAINWALLS AND MODIFY WINGWALLS AS SHOWN IN THE PLANS. AT FASCIA STRINGERS, REPLACE BEARINGS IN KIND. AT INTERIOR STRINGERS, JACK, CLEAN, PAINT AND GREASE EXISTING BEARINGS.
7. REPAIR ABUTMENT DELAMINATED AND SPALLED AREAS.
8. REMOVE 100% OF EXISTING PAINT COATING FROM EXISTING STRUCTURAL STEEL. PAINT EXISTING AND NEW STRUCTURAL STEEL.
9. MILL AND OVERLAY EXTENDS TO BR 48N&S. FOR BEGIN LIMITS OF MILL AND OVERLAY, SEE GENERAL PLAN (48N&S), BRIDGE SHEET BR48-1.
10. RE-STRIPE BRIDGE AND APPROACH ROADWAY.
11. THE CONTRACTOR SHALL MAINTAIN A MINIMUM 12' WIDE TRAFFIC LANE AT ALL TIMES ON TH 7. FOR ADDITIONAL TRAFFIC CONTROL REQUIREMENTS, SEE TRAFFIC CONTROL NOTES, BRIDGE SHEETS TC-1A AND TC-1B.

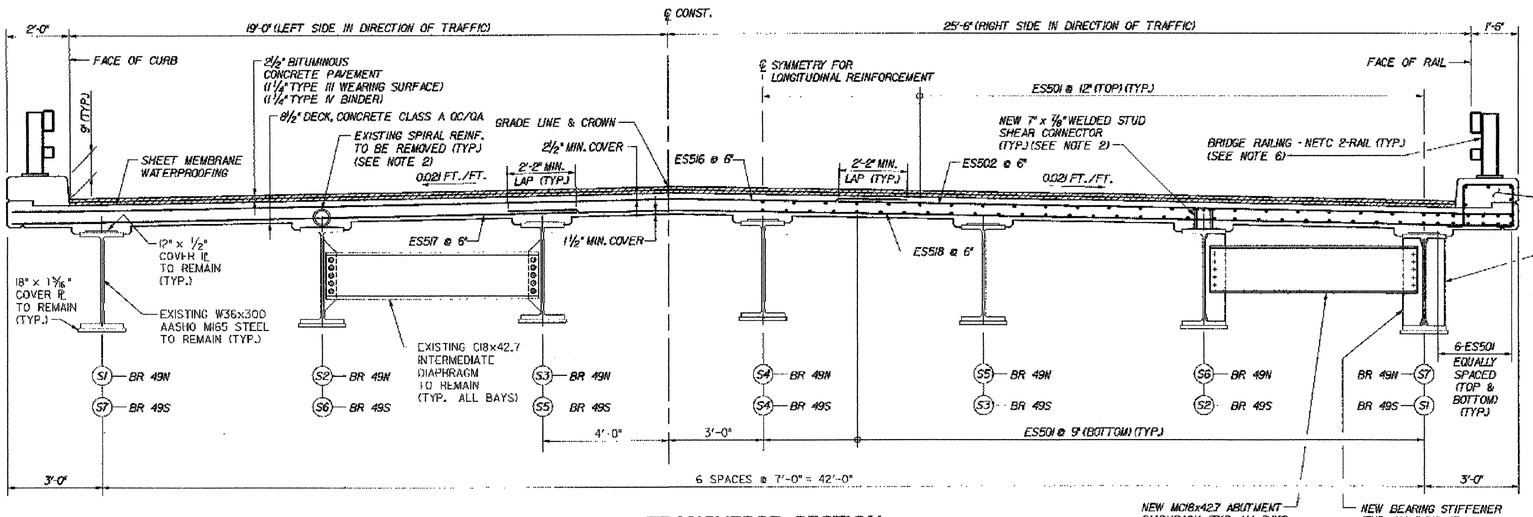
20 0 20
SCALE IN FEET

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 20 OF 25
BRIDGES 49 N & S
FOR REFERENCE ONLY

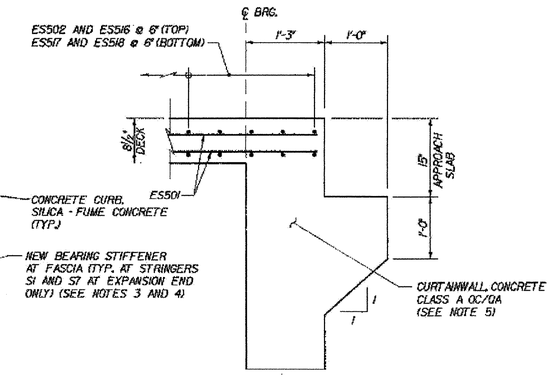
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of MIDDLESEX-BOLTON	Bridge No. 49N&S
Highway No. I-89	Log Sta. / Surv. Sta.
I-89 OVER TH 7	
GENERAL PLAN (49N&S)	
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT MIDDLESEX-BOLTON	PROJECT NO. IM-089-2(26)
TVGA CAD Drawing No. 49gen pl	Date 10/99
Bridge Sheet No. BR49-1	Sheet 75 of 307

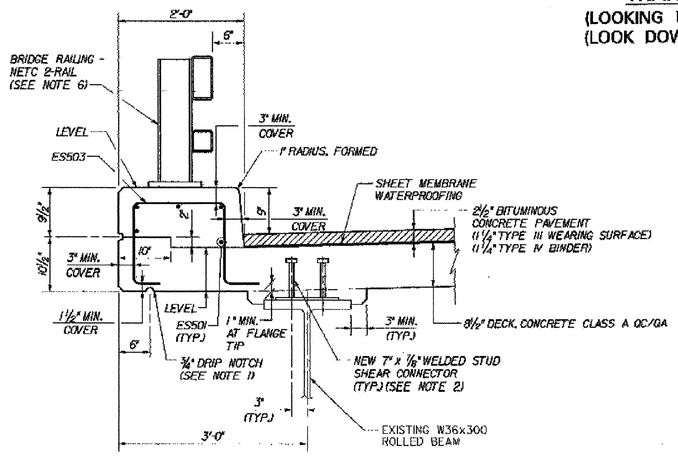
TVGA ENGINEERING, SURVEYING, P.C.



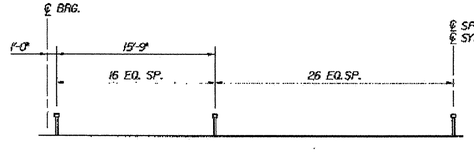
TRANSVERSE SECTION
(LOOKING UP STATION FOR BR 49N)
(LOOK DOWN STATION FOR BR 49S)
SCALE: ½" = 1'-0"



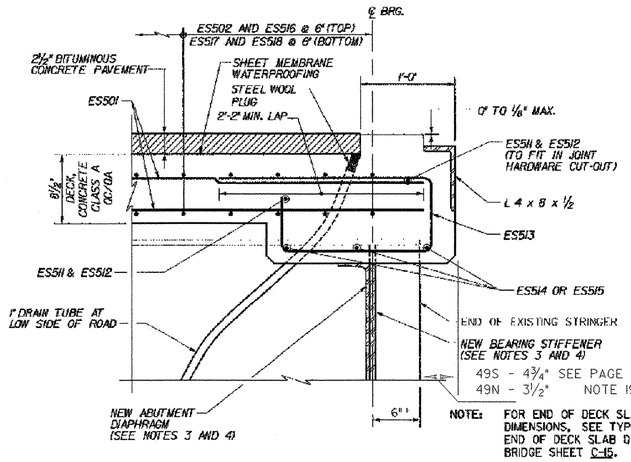
END OF DECK SLAB REINFORCEMENT DETAIL
(FIXED END)
SCALE: 1" = 1'-0"



FASCIA DETAIL
SCALE: 1"=1'-0"



SHEAR CONNECTOR LAYOUT
N.T.S.
(SEE NOTE 2)



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

END OF DECK SLAB REINFORCEMENT DETAIL
(EXP. END)
SCALE: 1½" = 1'-0"

NOTES:

1. END DRIP NOTCH 5 FEET BEFORE END OF SLAB AT "DOWNHILL" ABUTMENTS AT 45°.
2. EXISTING SPIRAL REINFORCEMENT (IF ENCOUNTERED) SHALL BE REMOVED AND REPLACED WITH WELDED STUD SHEAR CONNECTORS, ITEM 508.15, AS SHOWN. EXISTING SHEAR STUDS (IF ENCOUNTERED) SHALL BE REMOVED AND REPLACED WITH WELDED SHEAR STUDS AT THE DISCRETION OF THE RESIDENT ENGINEER. THESE ATTACHMENTS SHALL BE CUT OFF SLIGHTLY ABOVE THE FLANGE, THEN REMAINING MATERIAL SHALL BE GROUND FLUSH WITH THE FLANGE. GRINDING SHALL BE DONE IN THE LONGITUDINAL DIRECTION SO THAT NO TRANSVERSE MARKS ARE LEFT. REMOVAL OF EXISTING SPIRAL REINFORCEMENT OR STUDS SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE."
3. FOR DETAILS OF NEW BEARING STIFFENERS AND ABUTMENT DIAPHRAGMS, SEE TYPICAL ROLLED BEAM DETAILS, BRIDGE SHEET C-16.
4. ALL NEW STRUCTURAL STEEL SHALL BE AASHTO M270, GRADE 50W STEEL. BOLTS SHALL BE ⅞" DIAMETER AASHTO M-164 TYPE 3 BOLTS IN 15/16" DIAMETER HOLES.
5. FOR CURTAINWALL DETAILS AND REINFORCEMENT LAYOUT, SEE TYPICAL CURTAINWALL REINFORCEMENT, BRIDGE SHEET C-42.
6. FOR DETAILS OF NETC BRIDGE RAIL AND APPROACH SECTION, SEE STANDARD SHEETS BRI-97 AND BR3-97, AND GUARD RAIL APPROACH SECTION, NETC 2 RAIL, BRIDGE SHEETS C-46A AND C-46B.
7. REMOVE 100% OF EXISTING PAINT COATING FROM EXISTING STRUCTURAL STEEL. PAINT ALL NEW AND EXISTING STRUCTURAL STEEL, USING ITEMS 513.30, 513.36 AND 513.41. FINAL COAT TO BE DARK BROWN (COLOR CHIP #20059).
8. EXISTING SCUPPER DOWNSPOUTS SHALL BE REMOVED PRIOR TO REMOVAL OF DECK CONCRETE. REMOVAL OF WELDS SHALL BE PERFORMED BY GRINDING, IN ACCORDANCE WITH THE PROCEDURES SHOWN IN NOTE 2, THIS SHEET. ALL COSTS FOR THIS WORK SHALL BE SUBSIDIARY TO ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE".

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 21 OF 25
BRIDGES 49 N & S
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

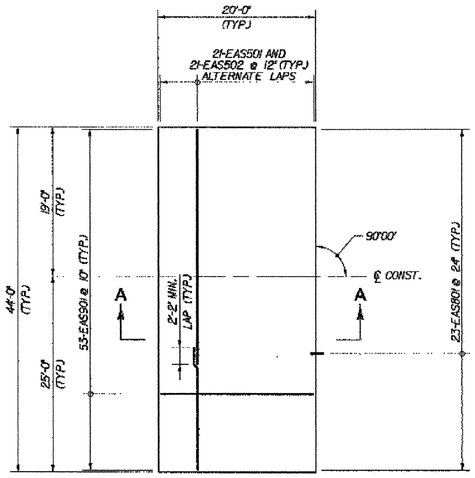
Town Of MIDDLESEX-BOLTON	Bridge No. 49N&S
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 OVER TH 7

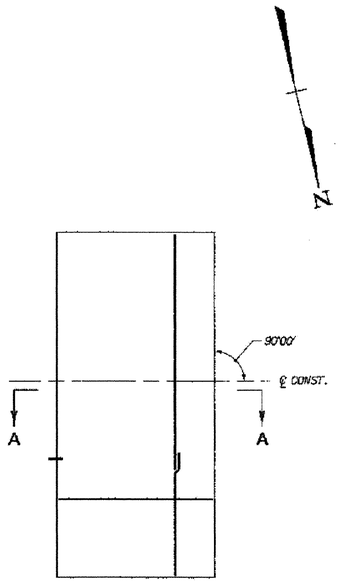
TRANSVERSE SECTION (49N&S)

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT MIDDLESEX-BOLTON	PROJECT NO. IM-089-2(26)
TVGA CAD Drawing No. 49tsect	Date 10/99
Bridge Sheet No. BR49-4	Sheet 78 of 307

TVGA ENGINEERING, SURVEYING, P.C.

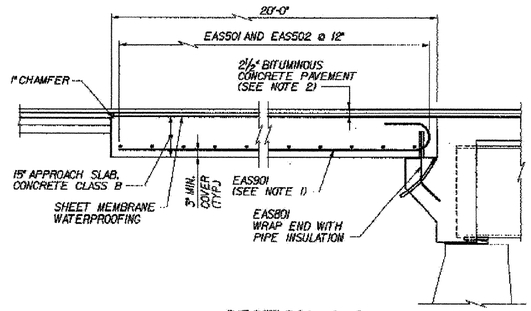


49N ABUTMENT 1



49N ABUTMENT 2

APPROACH SLAB PLANS
(49N SHOWN; 49S SIMILAR)
SCALE: 1/8" = 1'-0"



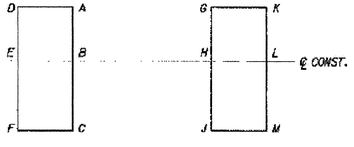
SECTION A–A
(APPROACH SLAB AT FIXED ABUT. SHOWN; SLAB AT EXPANSION ABUT. SIMILAR)
N.T.S.

RAISED BRIDGE 49S FINISHED GR. 5/8"

RAISED BRIDGE 49N FINISH GR. 1/2"

TOP OF APPROACH SLAB ELEVATIONS						
BR 49N			BR 49S			
LOCATION	STATION	ELEVATION	LOCATION	STATION	ELEVATION	
A	12+12.22	453.05	A	11+98.17	452.82	452.87
B	12+12.22	453.45	B	11+98.17	453.34	453.39
C	12+12.22	452.93	C	11+98.17	452.84	453.99
D	11+92.22	452.94	D	11+78.17	452.68	452.73
E	11+92.22	453.34	E	11+78.17	453.21	453.26
F	11+92.22	452.82	F	11+78.17	452.81	452.86
G	13+12.85	453.61	G	12+98.80	453.48	453.53
H	13+12.85	454.01	H	12+98.80	454.00	454.05
J	13+12.85	453.49	J	12+98.80	453.60	453.65
K	13+32.85	453.73	K	13+18.80	453.61	453.66
L	13+32.85	454.12	L	13+18.80	454.13	454.18
M	13+32.85	453.88	M	13+18.80	453.73	453.78

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



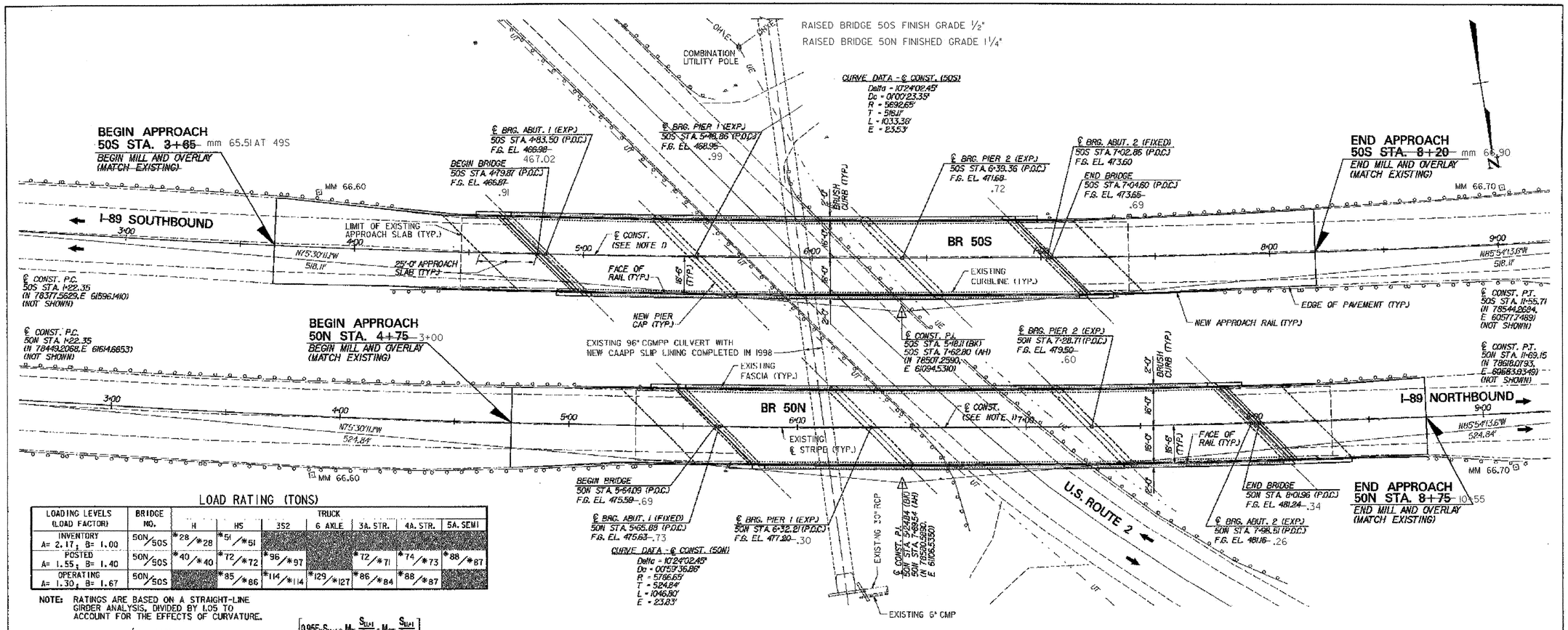
ABUTMENT 1 ABUTMENT 2

APPROACH SLAB ELEVATION KEY
N.T.S.

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 22 OF 25
BRIDGES 49 N & S
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of MIDDLESEX-BOLTON	Bridge No. 49N&S
Highway No. I-89	Log Sta. / Surv. Sta.
I-89 OVER TH 7	
APPROACH SLAB DETAILS (49N&S)	
Designed By P.W. SZLUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT MIDDLESEX-BOLTON	PROJECT NO. IM-089-2(26)
TVGA ENGINEERING, SURVEYING, P.C.	TVGA CAD Drawing No. 49apslab Date 10/99
	Bridge Sheet No. BR49-6 Sheet 80 of 307



LOAD RATING (TONS)

LOADING LEVELS (LOAD FACTOR)	BRIDGE NO.	H	HS	TRUCK 352	TRUCK 6 AXLE	TRUCK 3A. STR.	TRUCK 4A. STR.	TRUCK 5A. SEMI
INVENTORY A= 2.17; B= 1.00	50N/50S	*28/*28	*51/*51					
POSTED A= 1.55; B= 1.40	50N/50S	*40/*40	*72/*72	*96/*97		*72/*71	*74/*73	*88/*87
OPERATING A= 1.30; B= 1.67	50N/50S		*85/*86	*114/*114	*129/*127	*86/*84	*88/*87	

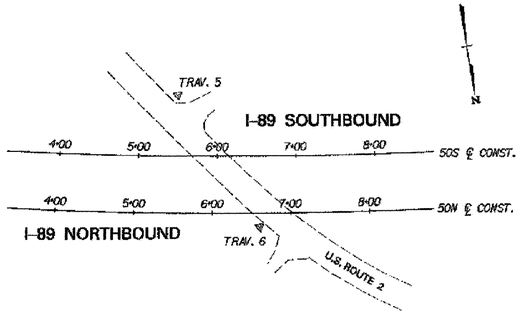
NOTE: RATINGS ARE BASED ON A STRAIGHT-LINE GIRDER ANALYSIS, DIVIDED BY 1.05 TO ACCOUNT FOR THE EFFECTS OF CURVATURE.

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

PLAN

SCALE: 1"=20'

TABLE OF BRIDGE COORDINATES				
BRIDGE	CL CONST. @	STATION	NORTHING	EASTING
50N	BEGIN BRIDGE	5+64.09	78543.3058	61183.1759
	CL BRG. ABUT. 1	5+65.88	78543.6203	61181.4100
	CL BRG. PIER 1	6+32.21	78554.8853	61116.0405
	CL BRG. PIER 2	7+28.71	78569.8806	61020.7170
	CL BRG. ABUT. 2	7+98.51	78579.7462	60951.8182
	END BRIDGE	8+01.96	78580.2116	60948.2039
50S	BEGIN BRIDGE	4+79.87	78456.1358	61247.4206
	CL BRG. ABUT. 1	4+83.50	78456.8211	61243.8550
	CL BRG. PIER 1	5+48.86	78468.7690	61179.5867
	CL BRG. PIER 2	6+39.36	78484.0829	61090.4046
	CL BRG. ABUT. 2	7+02.86	78493.9977	61027.6820
	END BRIDGE	7+04.60	78494.2590	61025.9573



CONTROL POINT LOCATION MAP

N.T.S.
(SEE NOTE 2)

BR 50N&S SPECIFIC CONSTRUCTION NOTES:

1. THE PROPOSED CONSTRUCTION CENTERLINE FOR EACH BRIDGE WAS ESTABLISHED BASED ON BEST FIT BETWEEN EXISTING CURB LINES. IT DOES NOT EXACTLY MATCH THE ORIGINAL CONSTRUCTION CENTERLINE.
2. FOR CONTROL POINT TIE SKETCHES, SEE CONTROL POINT TIES (50N&S), BRIDGE SHEET C-12.
3. REPLACE PIER CAPS, SUPERSTRUCTURE STEEL, BEARINGS, DECK SLABS, APPROACH SLABS, BRIDGE RAIL AND APPROACH RAIL. RESET GUARD RAIL.
4. NEW SCUPPERS ARE REQUIRED ON BRIDGE 50S. FOR LOCATION OF NEW SCUPPERS, SEE FRAMING PLAN (50S), BRIDGE SHEET BR50-9.
5. CONSTRUCT NEW BACKWALLS AT EXPANSION ABUTMENTS AND NEW CURTAINWALLS AT FIXED ABUTMENTS. REBUILD ABUTMENT BRIDGE SEATS AND MODIFY WINGWALLS AS SHOWN IN THE PLANS.
6. REPAIR PIER COLUMNS.
7. REPAIR ABUTMENT DELAMINATED AND SPALLED AREAS.
8. RE-STRIPE BRIDGE AND APPROACH ROADWAY.

20 0 20
SCALE IN FEET

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 23 OF 25
BRIDGES 50 N & S
FOR REFERENCE ONLY

STATE OF VERMONT
AGENCY OF TRANSPORTATION

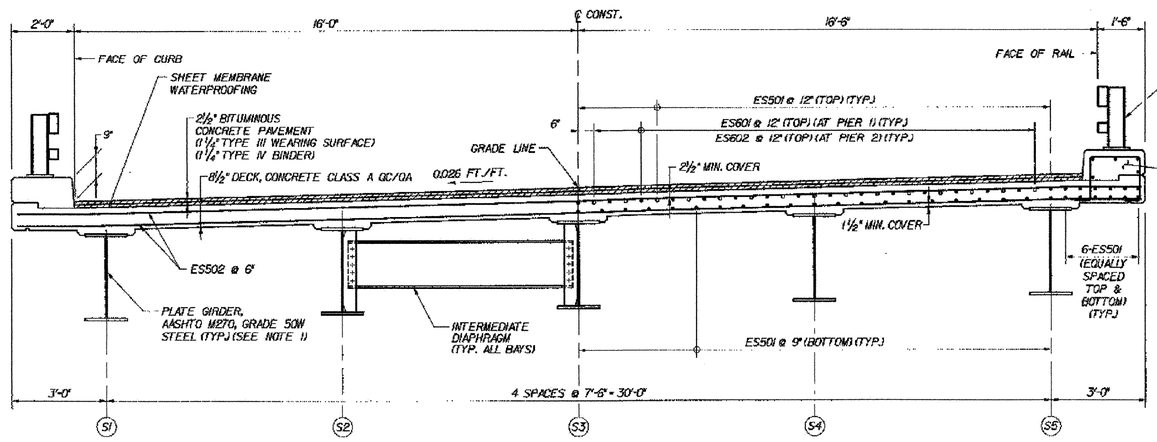
Town Of MIDDLESEX-BOLTON	Bridge No. 50N&S
Highway No. I-89	Log Sta. / Surv. Sta.

I-89 OVER U.S. ROUTE 2

GENERAL PLAN (50N&S)

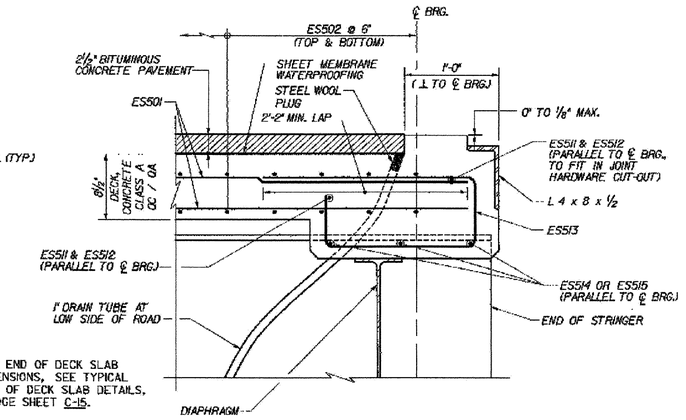
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By Date J.P. HALSTEAD 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT MIDDLESEX-BOLTON	PROJECT NO. IM-089-2(26)
TVGA CAD Drawing No. 50gen_p	Date 10/99
Bridge Sheet No. BR50-1	Sheet 85 of 307

TVGA ENGINEERING, SURVEYING, P.C.



TRANSVERSE SECTION

SCALE: ½" = 1'-0"



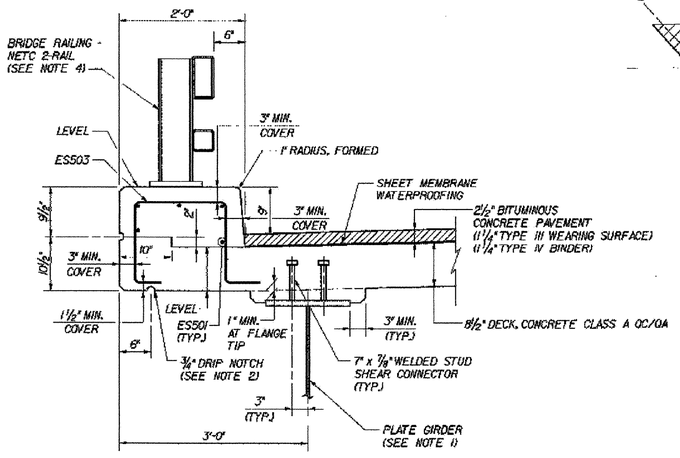
NOTE: FOR END OF DECK SLAB DIMENSIONS, SEE TYPICAL END OF DECK SLAB DETAILS, BRIDGE SHEET C-15.

END OF DECK SLAB REINFORCEMENT DETAIL

(EXP. END)

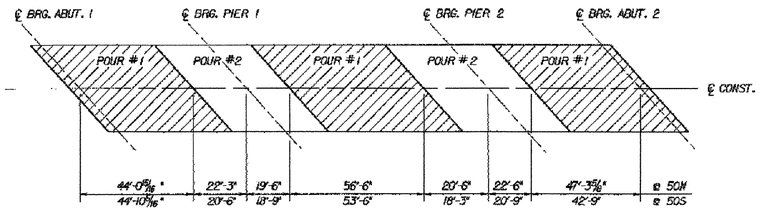
SCALE: 1½" = 1'-0"

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 24 OF 25
BRIDGES 50 N & S
FOR REFERENCE ONLY



FASCIA DETAIL

SCALE: 1"=1'-0"



DECK POUR SEQUENCE

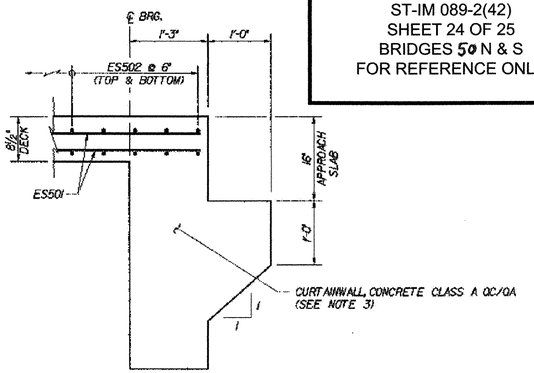
N.T.S.

BRIDGE 50N AND S WAS DONE IN A SINGLE POUR WITH NO CONSTRUCTION JOINTS.

DECK SLAB PLACEMENT NOTES

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

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



END OF DECK SLAB REINFORCEMENT DETAIL

(FIXED END)

SCALE: 1" = 1'-0"

NOTES:

1. FOR PLATE GIRDER SIZES SEE STRINGER ELEVATION (50N&S), BRIDGE SHEET BR50-10.
2. END DRIP NOTCH 5 FEET BEFORE END OF SLAB AT "DOWNHILL" ABUTMENTS AT 45°.
3. FOR CURTAINWALL DETAILS AND REINFORCEMENT LAYOUT, SEE TYPICAL CURTAINWALL DETAILS, BRIDGE SHEET C-42.
4. FOR DETAILS OF NETC BRIDGE RAIL AND APPROACH SECTION, SEE STANDARD SHEETS BRI-97 AND BR3-97, AND GUARD RAIL APPROACH SECTION, NETC 2 RAIL, BRIDGE SHEETS C-46A AND C-46B.

TVGA ENGINEERING, SURVEYING, P.C.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

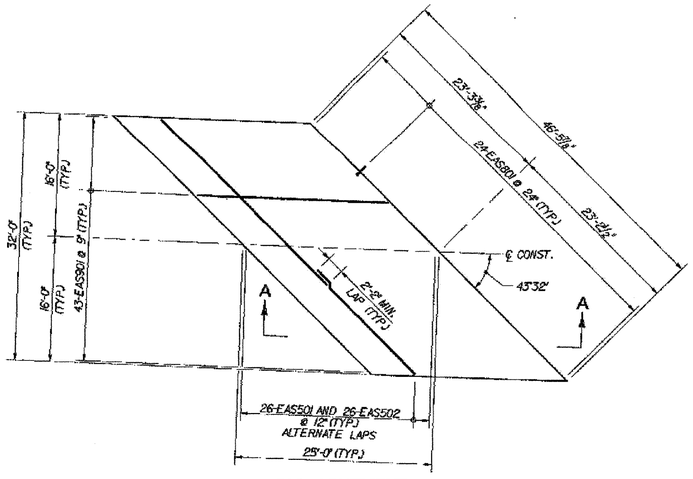
Town Of	MIDDLESEX-BOLTON	Bridge No.	50N&S
Highway No.	I-89	Log Sta.	
		Surv. Sta.	

I-89 OVER U.S. ROUTE 2

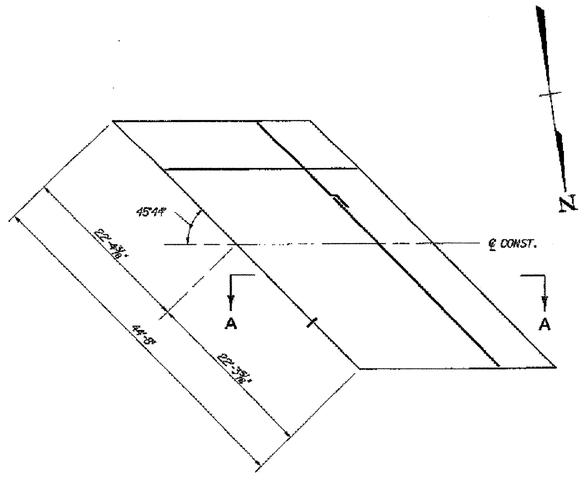
TRANSVERSE SECTION (50N&S)

Designed By	P.W. SZUSTAK	Drawn By	R.A. BOTZENHART
Checked By	Date	Bridge Design Supervisor	
J.P. HALSTEAD	10/99	J.P. HALSTEAD	Date 10/99

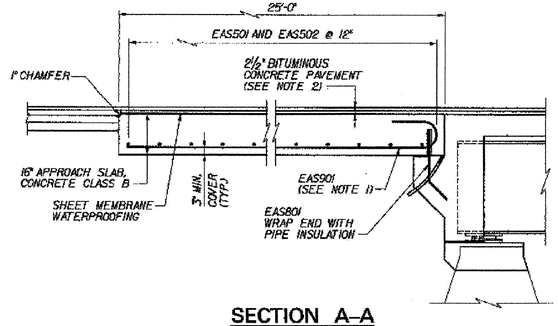
PROJECT MIDDLESEX-BOLTON	PROJECT NO. IM-089-2(26)
TVGA CAD Drawing No. 50tsect	Date 10/99
Bridge Sheet No. BR50-4	Sheet 88 of 307



50S ABUTMENT 1



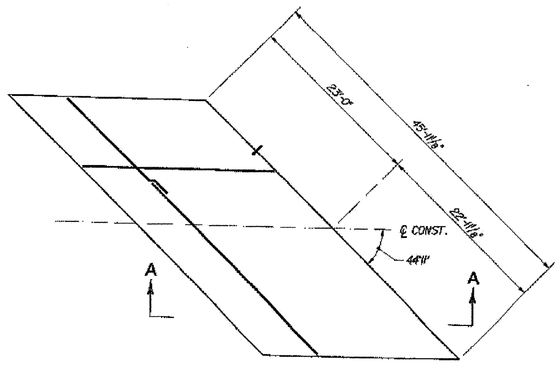
50S ABUTMENT 2



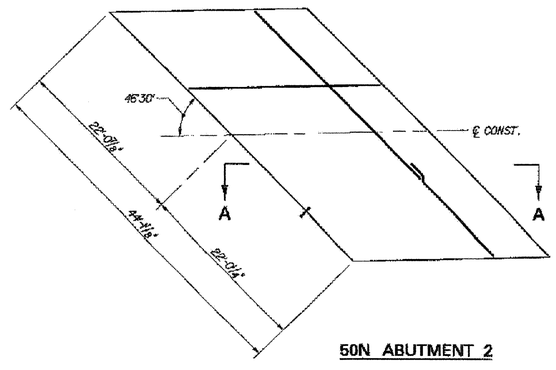
SECTION A–A

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

N.T.S.



50N ABUTMENT 1



50N ABUTMENT 2

RAISED FINISHED GRADE 1¼"

RAISED FINISHED GRADE ½"

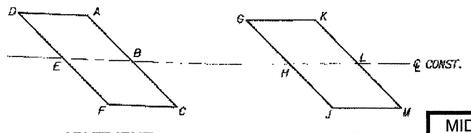
TOP OF APPROACH SLAB ELEVATIONS						
BR 50N			BR 50S			
LOCATION	STATION	ELEVATION	LOCATION	STATION	ELEVATION	
A	5+47.54	474.57-.67	A	4+62.93	~~465.73~~	465.77
B	5+84.06	475.38-.48	B	4+79.87	~~466.86~~	466.70
C	5+80.49	476.18-.28	C	4+98.65	~~467.56~~	467.62
D	5+22.40	473.97-.07	D	4+37.78	~~465.00~~	465.04
E	5+38.06	474.78-.88	E	4+54.87	~~466.91~~	465.95
F	5+55.63	475.59-.69	F	4+71.81	~~466.83~~	466.87
G	7+85.73	480.26-.35	G	6+68.96	~~472.55~~	472.59
H	8+01.96	481.03-.13	H	7+04.60	~~473.44~~	473.48
J	8+17.06	481.80-.90	J	7+20.13	~~474.33~~	474.38
K	8+11.86	490.85-.95	K	7+14.09	~~473.34~~	473.35
L	8+28.98	481.62-.72	L	7+29.60	~~474.20~~	474.25
M	8+41.94	482.39-.49	M	7+44.96	~~475.09~~	475.14

NOTES:

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

APPROACH SLAB PLANS

SCALE: ⅛" = 1'-0"



ABUTMENT 1 ABUTMENT 2

APPROACH SLAB ELEVATION KEY

N.T.S.

MIDDLESEX - WATERBURY
ST-IM 089-2(42)
SHEET 25 OF 25
BRIDGES 50 N & S
FOR REFERENCE ONLY

TVGA ENGINEERING, SURVEYING, P.C.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of MIDDLESEX-BOLTON	Bridge No. 50N&S
Highway No. I-89	Log Sta. / Surv. Sta.
I-89 OVER U.S. ROUTE 2	
APPROACH SLAB DETAILS (50N&S)	
Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT MIDDLESEX-BOLTON	PROJECT NO. IM-089-2(26)
TVGA CAD Drawing No. 50apslab	Date 10/99
Bridge Sheet No. BR50-6	Sheet 90 of 307