

STATE OF VERMONT AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT BRIDGE PROJECT

TOWN OF RICHFORD

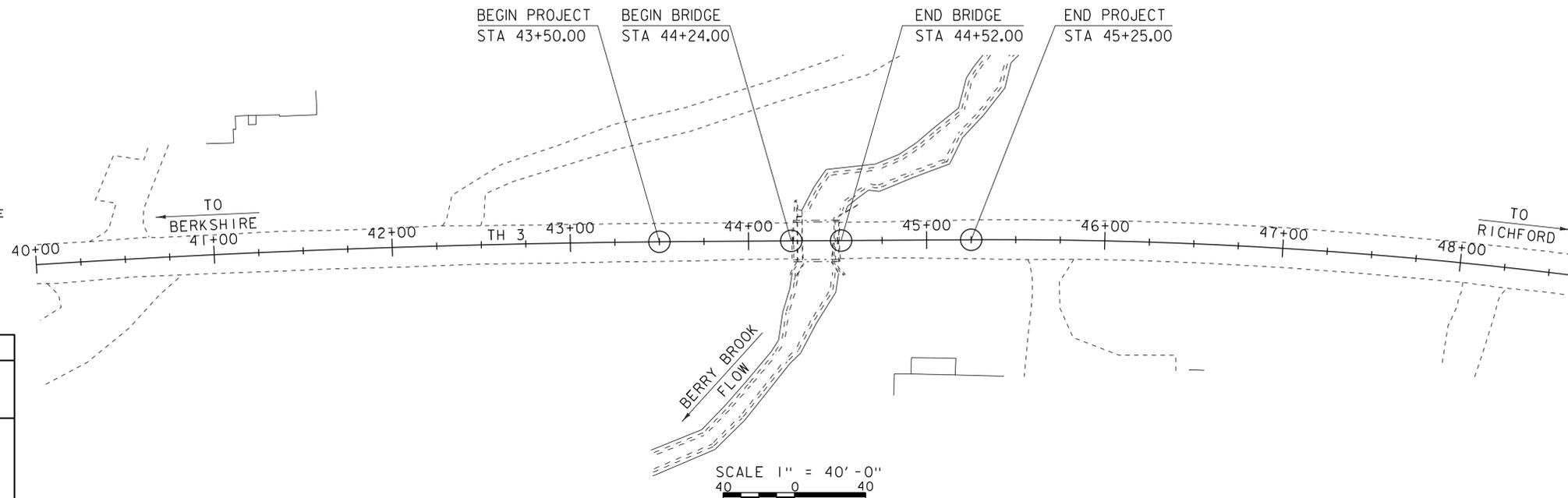
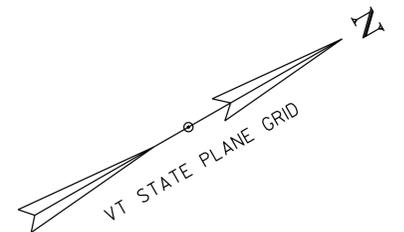
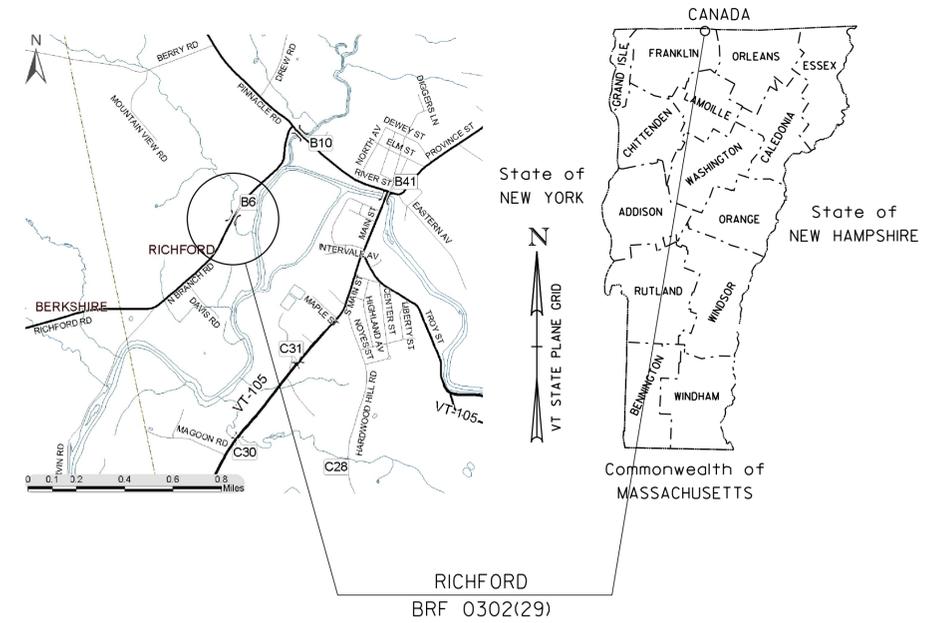
COUNTY OF FRANKLIN

ROUTE NO : TH 3 (FAS 0302)(RURAL MAJOR COLLECTOR) BRIDGE NO : 6

PROJECT LOCATION : BEGINNING AT A POINT ON TH 3, APPROXIMATELY 1.2 MILES WEST OF THE JUNCTION
WITH TH 1 AND TH 3

PROJECT DESCRIPTION : REPLACEMENT OF BRIDGE WITH RELATED ROADWAY AND CHANNEL WORK.

LENGTH OF STRUCTURE :	28.00 FEET.
LENGTH OF ROADWAY :	147.00 FEET.
LENGTH OF PROJECT :	175.00 FEET.



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

QUALITY ASSURANCE PROGRAM : LEVEL 2	
SURVEYED BY :	L. ORVIS
SURVEYED DATE :	4/9/2012
DATUM	
VERTICAL	NAVD88
HORIZONTAL	NAD (83) 2007

**FINAL PLANS
21-AUG-2014**

DIRECTOR OF PROJECT DELIVERY	
APPROVED _____	DATE _____
PROJECT MANAGER : CAROLYN CARLSON, P. E.	
PROJECT NAME :	RICHFORD
PROJECT NUMBER :	BRF 0302 (29)
SHEET 1 OF 36 SHEETS	

INDEX OF SHEETS

PLAN SHEETS

1	TITLE
2	PRELIMINARY INFORMATION
3	TYPICAL SECTIONS
4	PROJECT NOTES
5 - 6	QUANTITY 1 & 2
7	BRIDGE QUANTITY
8	CONVENTIONAL SYMBOLOLOGY LEGEND
9	TIE
10	LAYOUT
11	TH 3 PROFILE
12	UTILITY LAYOUT
13	SIGNS & PAVEMENT MARKING LAYOUT
14	BORING INFORMATION
15 - 21	BORING LOGS 1 - 7
22	PLAN AND ELEVATION
23	PEDESTAL WALL LAYOUT
24	RIGID FRAME ELEVATION
25 - 28	MAINLINE CROSS SECTIONS
29 - 30	CHANNEL CROSS SECTIONS
31	EPSC NARRATIVE
32	EPSC EXISTING CONDITIONS
33	EPSC DURING CONSTRUCTION
34	EPSC FINAL CONDITIONS
35 - 36	EPSC DETAILS

STANDARDS LIST

E-193	PAVEMENT MARKING DETAILS	08-18-1995
G-1	STEEL BEAM GUARDRAIL DETAILS (POST, DELINEATOR, TYPICALS)	02-10-2014
G-1D	STEEL BEAM GUARDRAIL DETAILS (END TERMINAL, ANCHOR, MEDIAN)	02-10-2014
S-360A	BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM	04-23-2012
S-360B	GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM	04-23-2012
S-363	THRIE BEAM TO STANDARD STEEL BEAM TRANSITION SECTION	04-23-2012
G-19	GENERIC GRADING PLANS FOR GUARDRAIL END TERMINALS	11-15-2002
T-1	TRAFFIC CONTROL GENERAL NOTES	08-06-2012
T-10	CONVENTIONAL ROADS CONSTRUCTION APPROACH SIGNING	08-06-2012
T-17	TRAFFIC CONTROL MISCELLANEOUS DETAILS	08-06-2012
T-28	CONSTRUCTION SIGN DETAILS	08-06-2012
T-30	CONSTRUCTION SIGN DETAILS	08-06-2012
T-31	CONSTRUCTION SIGN DETAILS	08-06-2012
T-42	BRIDGE NUMBER PLAQUE	04-09-2014
T-45	SQUARE TUBE SIGN POST AND ANCHOR	01-02-2013

STRUCTURES DETAIL SHEETS

SD-501.00	CONCRETE DETAILS AND NOTES	5/7/2010
SD-502.00	CONCRETE DETAILS AND NOTES	5/7/2010

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: February 2014

DRAINAGE AREA : 4.7 sq. mi.
 CHARACTER OF TERRAIN : Hilly, mixture of open and forested land cover
 STREAM CHARACTERISTICS : Sinuous, alluvial with low banks to floodplain relief
 NATURE OF STREAMBED : Mostly sand, gravel and silt with some cobbles

PEAK FLOW DATA

Q 2.33 =	250 cfs	Q 50 =	800 cfs
Q 10 =	500 cfs	Q 100 =	950 cfs
Q 25 =	650 cfs	Q 500 =	1330 cfs

DATE OF FLOOD OF RECORD : Unknown
 ESTIMATED DISCHARGE : Unknown
 WATER SURFACE ELEV. : Unknown
 NATURAL STREAM VELOCITY : @ Q50 = 8.0 fps
 ICE CONDITIONS : Light to moderate
 DEBRIS : Light to moderate
 DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? No
 IS ORDINARY RISE RAPID? No
 IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? Yes
 IF YES, DESCRIBE : Flood flows on the Missisquoi River may back up through this site.
 That was not considered in this final hydraulics. Water elevations may be higher than shown.

WATERSHED STORAGE : < 1% HEADWATERS :
 UNIFORM : X
 IMMEDIATELY ABOVE SITE :

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE : Single span concrete T-beam bridge
 YEAR BUILT : 1900
 CLEAR SPAN(NORMAL TO STREAM) : 21'
 VERTICAL CLEARANCE ABOVE STREAMBED : 5'
 WATERWAY OF FULL OPENING : 125 sq. ft.
 DISPOSITION OF STRUCTURE : Remove and replace with new structure
 TYPE OF MATERIAL UNDER SUBSTRUCTURE : See boring logs

WATER SURFACE ELEVATIONS AT:

Q2.33 =	429.9'	VELOCITY =	5.9 fps
Q10 =	431.3'	"	7.5 fps
Q25 =	431.9'	"	7.6 fps
Q50 =	433.4'	"	8.0 fps
Q100 =	433.9'	"	9.1 fps

LONG TERM STREAMBED CHANGES : Scour through bridge area.

IS THE ROADWAY OVERTOPPED BELOW Q100 : No
 FREQUENCY : Above Q100
 RELIEF ELEVATION : 436.2'
 DISCHARGE OVER ROAD @Q100 : 0 cfs

UPSTREAM STRUCTURE

TOWN : Richford DISTANCE : 4,500'
 HIGHWAY # : TH 8 STRUCTURE # : 26
 CLEAR SPAN : Not available CLEAR HEIGHT : NA
 YEAR BUILT : Not available FULL WATERWAY : NA
 STRUCTURE TYPE : Not available

DOWNSTREAM STRUCTURE

TOWN : Richford DISTANCE : 800'
 HIGHWAY # : Confluence Missisquoi River STRUCTURE # :
 CLEAR SPAN : CLEAR HEIGHT :
 YEAR BUILT : FULL WATERWAY :
 STRUCTURE TYPE :

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A STR	4A STR	5A SEMI
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY							
POSTING							
OPERATING							
COMMENTS:							

AS BUILT "REBAR" DETAIL

LEVEL I			LEVEL II			LEVEL III		
TYPE:			TYPE:			TYPE:		
GRADE:			GRADE:			GRADE:		

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT	20 year ESAL for flexible pavement from 2015 to 2035	40 year ESAL for flexible pavement from 2015 to 2055	Design Speed
2015	830	120	56	13.9	120	882,000	1,946,000	50 mph
2035	880	120	56	17.5	160			

PROPOSED STRUCTURE

STRUCTURE TYPE : Single span precast concrete structure
 CLEAR SPAN(NORMAL TO STREAM) : 26'
 VERTICAL CLEARANCE ABOVE STREAMBED : 6'
 WATERWAY OF FULL OPENING : 175 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 =	429.8'	VELOCITY=	5.9 fps
Q10 =	431.0'	"	7.5 fps
Q25 =	431.4'	"	7.6 fps
Q50 =	431.7'	"	8.0 fps
Q100 =	431.9'	"	8.4 fps

IS THE ROADWAY OVERTOPPED BELOW Q100 : No
 FREQUENCY : Above Q100
 RELIEF ELEVATION : 436.6'
 DISCHARGE OVER ROAD @Q100 : 0 cfs

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE : 433.6'
 VERTICAL CLEARANCE : @ Q50 = 1.9'

SCOUR : Contraction scour = 3' at Q100 and 4' at Q200.

REQUIRED CHANNEL PROTECTION : Stone Fill, Type II

PERMIT INFORMATION

AVERAGE DAILY FLOW : 10 cfs DEPTH OR ELEVATION :
 ORDINARY LOW WATER : 5 cfs Depth = 0.5'
 ORDINARY HIGH WATER : 110 cfs Depth = 2.0'

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE : No temporary bridge required.
 CLEAR SPAN (NORMAL TO STREAM) :
 VERTICAL CLEARANCE ABOVE STREAMBED :
 WATERWAY AREA OF FULL OPENING :

ADDITIONAL INFORMATION

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TRAFFIC ON AN OFF SITE DETOUR.
2. TRAFFIC SIGNALS ARE NOT NECESSARY.
3. SIDEWALKS ARE NOT NECESSARY

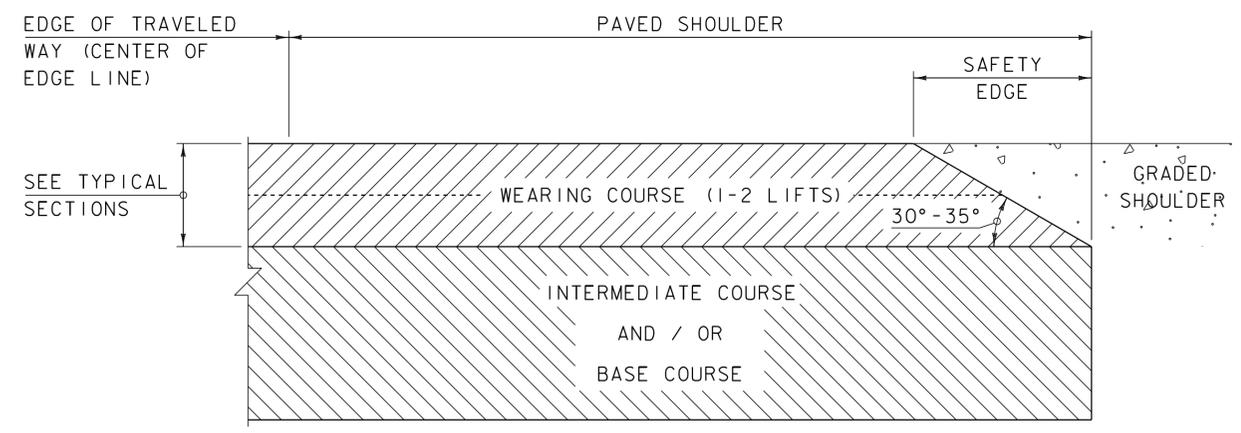
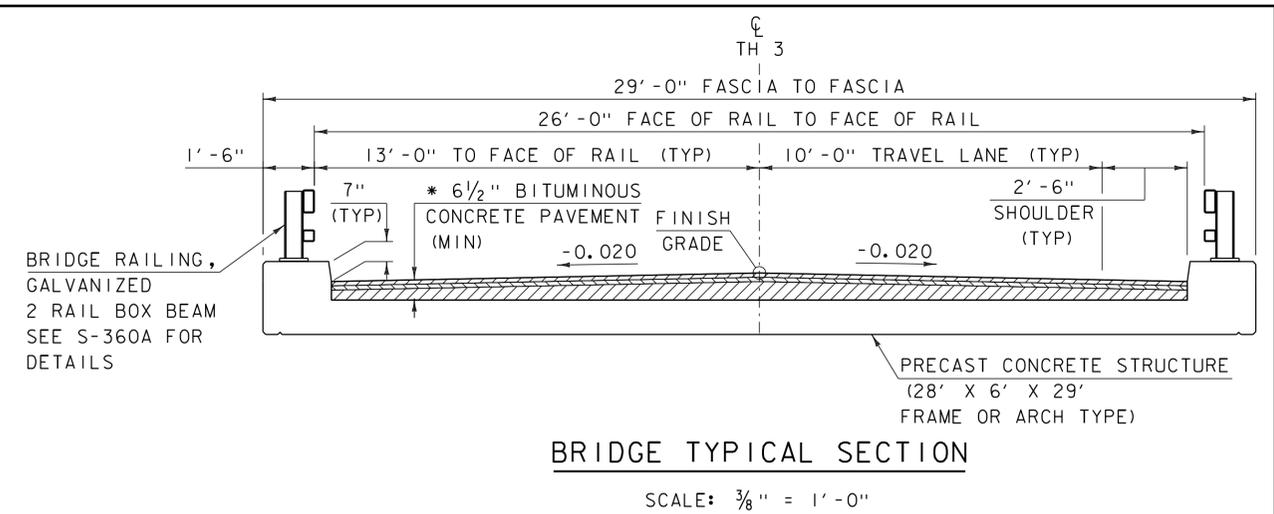
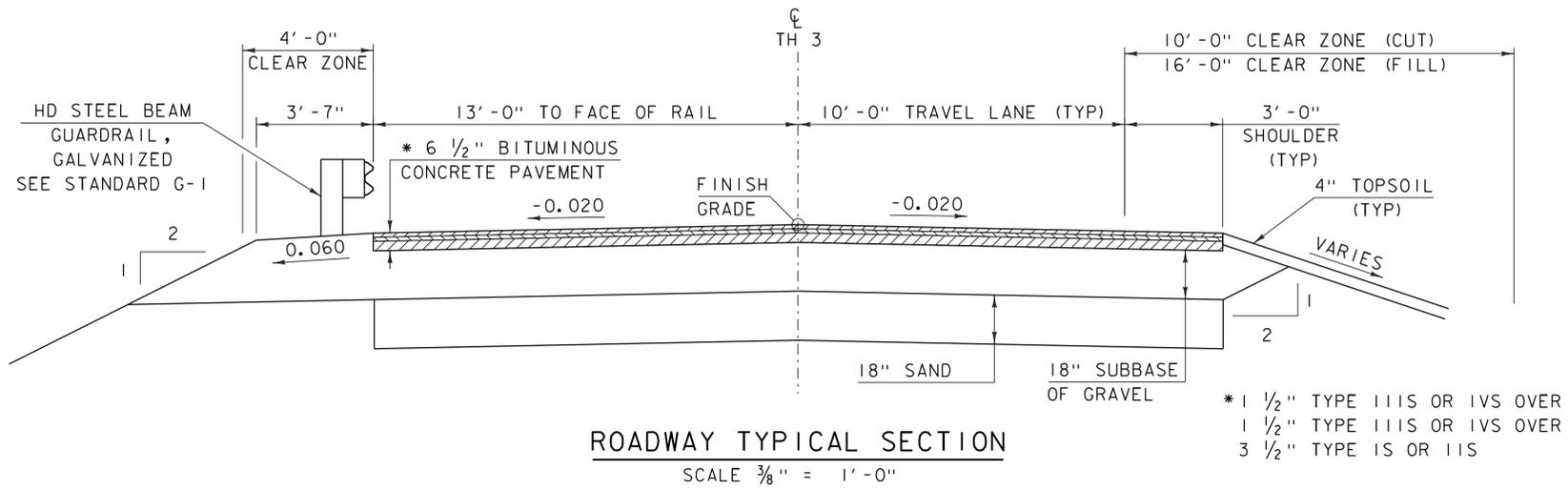
DESIGN VALUES

1. DESIGN LIVE LOAD	HL-93
2. FUTURE PAVEMENT	dp: 0.0 INCH
3. DESIGN SPAN	L: 26.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ: ---
5. PRESTRESSING STRAND	fy: ---
6. PRESTRESSED CONCRETE STRENGTH	f'c: ---
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'cr: ---
8. CONCRETE, HIGH PERFORMANCE CLASS AA	f'c: 4.0 KSI
9. CONCRETE, HIGH PERFORMANCE CLASS A	f'c: 4.0 KSI
10. CONCRETE, HIGH PERFORMANCE CLASS B	f'c: 3.5 KSI
11. CONCRETE, CLASS C	f'c: 3.0 KSI
12. REINFORCING STEEL	fy: 60 KSI
13. STRUCTURAL STEEL AASHTO M270	fy: ---
SEE PROJECT NOTES SHEET FOR INFORMATION -- 0.14 KCF	
14. NOMINAL BEARING RESISTANCE OF SOIL	qn: ---
15. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	φ: ---
16. NOMINAL BEARING RESISTANCE OF ROCK	qn: ---
17. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	φ: ---
18. PILE RESISTANCE FACTOR	φ: ---
19. LATERAL PILE DEFLECTION	Δ: ---
20. BASIC WIND SPEED	V3s: ---
21. MINIMUM GROUND SNOW LOAD	ps: ---
22. SEISMIC DATA	PGA: 0 Ss: --- S1: ---
23.	---
24.	---
25.	---
26.	---

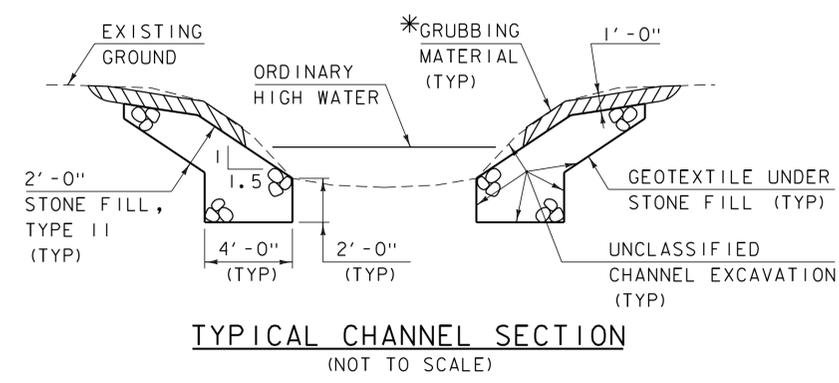
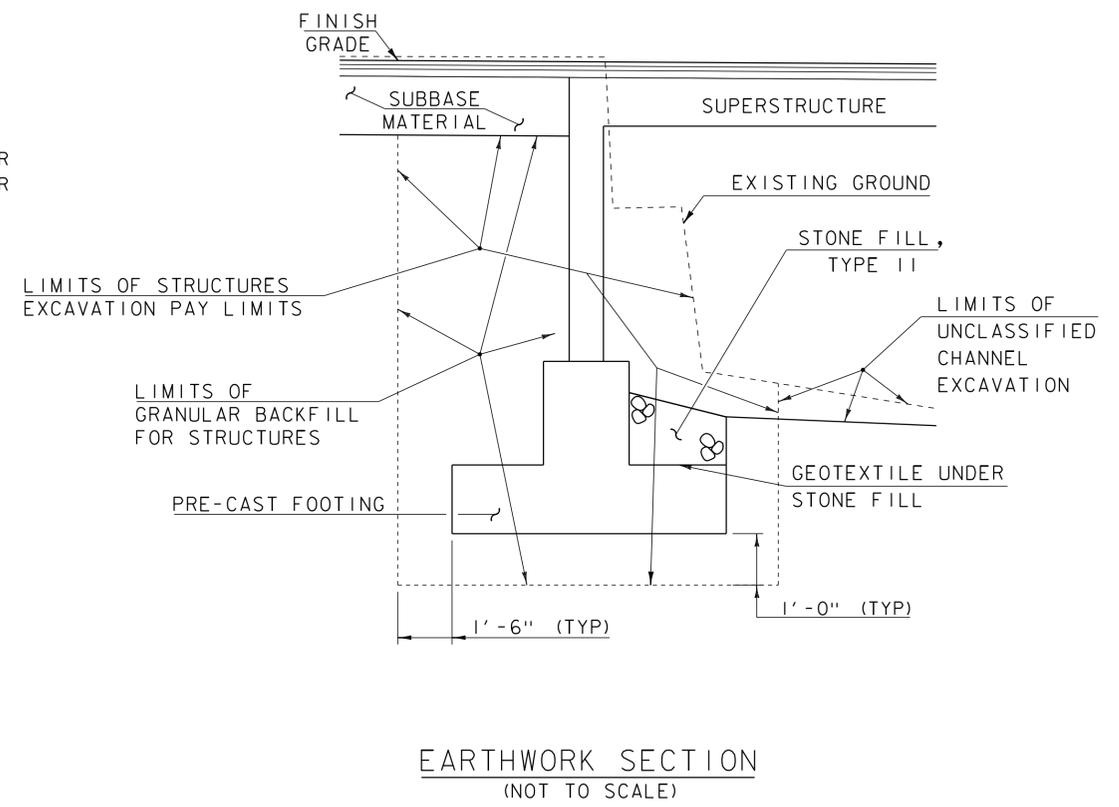
PROJECT NAME : RICHFORD

PROJECT NUMBER : BRF 0302(29)

FILE NAME : s12j158pi.xls PLOT DATE : 8/20/2014
 PROJECT LEADER : C. CARLSON DRAWN BY : R. PELLETT
 DESIGNED BY : H. SALLS CHECKED BY : H. SALLS
PRELIMINARY INFORMATION SHEET 2 OF 36



1. LEVELING COURSE MAY INCLUDE THE "SAFETY EDGE" AT THE CONTRACTOR'S CHOICE.
2. THE EDGE OF PAVEMENT SHALL BE FORMED IN SUCH A WAY THAT THE BITUMINOUS CONCRETE PAVEMENT IS EXTRUDED OR COMPRESSED TO FORM THE 30 TO 35 DEGREE ANGLE. DEVICES THAT SIMPLY STRIKE-OFF THE MIX WITHOUT PROVIDING ANY COMPACTIVE EFFORT WILL NOT BE ALLOWED.
3. THE PAVED SHOULDER EXTENDS FROM THE EDGE OF TRAVELED WAY TO THE EDGE OF THE WEARING COURSE, INCLUDING THE "SAFETY EDGE".



*GRUBBING MATERIAL SHALL NOT BE PLACED ON THE STONE FILL IN THE AREA UNDER THE BRIDGE. WHENEVER CHANNEL SLOPE INTERSECTS ROADWAY SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF SUBBASE.

MATERIAL TOLERANCES (IF USED ON PROJECT)	
SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- 1/4"
- AGGREGATE SURFACE COURSE	+/- 1/2"
SUBBASE	+/- 1"
SAND BORROWS	+/- 1"

PROJECT NAME:	RICHFORD	PLOT DATE:	21-AUG-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	R. PELLETT
FILE NAME:	sl2j58typ.dgn	DESIGNED BY:	H. SALLS
PROJECT LEADER:	C. CARLSON	TYPICAL SECTIONS	
CHECKED BY:	H. SALLS		
			SHEET 3 OF 36

GENERAL

1. THE CONTRACTOR WILL BE ALLOWED TO CLOSE THE ROAD TO TRAFFIC FOR A MAXIMUM OF 28 CONSECUTIVE DAYS FOR INSTALLATION OF THE NEW STRUCTURE.
2. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2011, AND ITS LATEST REVISIONS, THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 2012, AND ITS LATEST REVISIONS, AND THE VTRANS STRUCTURES DESIGN MANUAL.
3. ALL PRECAST CONCRETE COMPONENTS INCLUDING THE FOOTINGS, PEDESTAL WALLS, RIGID FRAME OR ARCH, HEADWALLS, WINGWALLS AND ALL CONNECTIONS BETWEEN THESE COMPONENTS SHALL BE DESIGNED BY THE PRECAST FABRICATOR. THE SOIL PROPERTIES AND DESIGN PARAMETERS USED FOR THIS PROJECT ARE AS INDICATED BELOW.

4. DESIGN CRITERIA:

DESIGN LIVE LOAD: HL - 93
FILL OVER THE STRUCTURE: 6 INCHES MINIMUM

FOUNDATION SOIL PARAMETERS
UNIT WEIGHT: 125 PCF
FRICTION ANGLE: 36 DEGREES

COEFFICIENT OF FRICTION
FORMED CONCRETE AGAINST SOIL: 0.35

RETAINED SOIL PARAMETERS
UNIT WEIGHT: 140 PCF
FRICTION ANGLE: 35 DEGREES

COEFFICIENT OF FRICTION
CONCRETE CAST AGAINST SOIL: 0.55
FORMED AGAINST SOIL: 0.45

NOMINAL BEARING RESISTANCE: 10 KSF FOR FOOTING WIDTHS > 6 FT

5. ALL DIMENSIONS SHOWN IN THE PLANS ARE HORIZONTAL OR VERTICAL AND ARE GIVEN AT 68 DEGREES FAHRENHEIT, UNLESS NOTED OTHERWISE.
6. ITEM 529.15 "REMOVAL OF STRUCTURE" SHALL BE USED FOR REMOVAL OF THE EXISTING BRIDGE SUPERSTRUCTURE, THE ABUTMENTS AND WINGWALLS.
7. THE DESIGN SHALL INCLUDE THE EFFECTS OF ALL LOADS, NOT LIMITED TO LIVE LOAD, EARTH SURCHARGE AND HYDROSTATIC PRESSURE.
8. THE FABRICATOR SHALL BE RESPONSIBLE FOR SUPPLYING THE STATE WITH THE LRFR LOAD RATING FACTORS TO COMPLETE THE CHART SHOWN ON THE PRELIMINARY INFORMATION SHEET.

CONCRETE

9. THE RIGID FRAME OR ARCH, HEADWALLS AND WINGWALLS SHALL BE PRECAST CONCRETE CONFORMING TO SECTION 540 OF THE SPECIFICATIONS AND SHALL MEET THE DIMENSIONS INDICATED IN THE PLANS. ALL PRECAST COMPONENTS OF THE STRUCTURE WILL BE PAID FOR UNDER ITEM 541.10 "PRECAST CONCRETE STRUCTURE (28' X 6' X29' FRAME OR ARCH TYPE).
10. ALL ELEMENTS OF THE PRECAST STRUCTURE(S) SHALL BE DESIGNED BY THE PRECAST SUPPLIER, INCLUDING THE ANCHORAGE AND CONNECTIONS BETWEEN ELEMENTS. ALL ELEMENTS SHALL BE INSTALLED IN ACCORDANCE WITH THE FABRICATORS RECOMMENDATIONS. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS FOR THE PRECAST RIGID FRAME OR ARCH IN ACCORDANCE WITH SECTION 105. IN ADDITION TO FABRICATION DRAWINGS, THE FABRICATOR SHALL PROVIDE A LOAD RATING AND SUPPORTING CALCULATIONS IN ACCORDANCE WITH THE AASHTO SPECIFICATIONS REFERENCED IN GENERAL NOTE 1 AND THE VTRANS STRUCTURES DESIGN MANUAL, 2010 WHICH PROVIDES SPECIFIC LOAD RATING INSTRUCTIONS. THE RATING AND SUPPORTING CALCULATIONS SHALL BE SIGNED, STAMPED AND DATED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE ENGINEERING IN THE STATE OF VERMONT. NOTE THAT THE FABRICATOR ASSUMES ALL LIABILITY FOR THE ADEQUACY AND ACCURACY OF THE RIGID FRAME OR ARCH DESIGN AND LOAD RATING.
11. WATER REPELLENT, SILANE SHALL BE FURNISHED IN ACCORDANCE WITH SECTION 514 AND SHALL BE SHOP APPLIED TO ALL EXPOSED CONCRETE SURFACES, EXCEPT THE UNDERSIDE OF THE STRUCTURE BETWEEN THE DRIP NOTCHES. ALL WORK IS INCIDENTAL TO THE BID ITEM 540.10 "PRECAST CONCRETE STRUCTURE (28'-0' x 6'-0" x 29'-0" FRAME OR ARCH TYPE).
12. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" x 1".
13. REINFORCING STEEL PLACEMENT TOLERANCES SHALL BE:
SPACING: +/- 1 INCH
CLEARANCE: +/- 1/4 INCH
14. PRECAST TOLERANCES:
HEIGHT/WIDTH: +/- 1/4 INCH
LENGTH: +/- 1/2 INCH
15. ALL REINFORCING STEEL IN THE PRECAST PEDESTAL WALLS AND FOOTINGS SHALL BE LEVEL I.
16. ALL REINFORCING STEEL IN THE PRECAST RIGID FRAME OR ARCH, WINGWALLS AND HEADWALLS SHALL BE LEVEL II.

17. THE PROPOSED STRUCTURE SHALL BE A THREE-SIDED RIGID FRAME OR ARCH WITH A MINIMUM CLEAR SPAN OF 26'. THE LUMP SUM COST FOR ITEM 540.10 "PRECAST CONCRETE STRUCTURE (28'-0" x 6'-0" x 29'-0" FRAME OR ARCH TYPE) SHALL INCLUDE THE PRECAST RIGID FRAME OR ARCH, WINGWALLS AND MECHANICAL CONNECTIONS.
18. THE PRECAST STRUCTURE DETAILS ARE SHOWN FOR REFERENCE ONLY. THE ACTUAL DIMENSIONS AND CONFIGURATION WILL BE DEPENDENT ON THE FABRICATOR. THE INSIDE CLEAR DIMENSION SHALL BE 26' - 0" AND THE RISE SHALL BE 6' - 0".
19. NO HOLES SHALL BE DRILLED IN THE RIGID FRAME OR ARCH WITH OUT THE APPROVAL OF THE FABRICATOR AND THE AGENCY.
20. THE USE OF EQUIPMENT AND THE METHOD OF BACKFILLING AROUND THE BURIED STRUCTURE SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION. CARE SHALL BE TAKEN WHEN BACKFILLING AGAINST JOINT SEALING MATERIALS.
21. JOINTS BETWEEN ALL ABUTTING PRECAST UNITS SHALL BE WATERTIGHT AND MECHANICALLY CONNECTED.

TRAFFIC CONTROL

22. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF A SITE SPECIFIC TRAFFIC CONTROL PLAN FOR ALL STAGES OF CONSTRUCTION. THE PLAN SHALL CLEARLY DETAIL HOW TRAFFIC WILL BE MAINTAINED PRIOR TO, DURING AND AFTER THE CLOSURE PERIOD AND SHALL INCLUDE ALTERNATING ONE-WAY TRAFFIC THROUGH THE PROJECT WITH APPROPRIATE SIGNAGE. THE CONTRACTOR SHALL SUBMIT DETAILED TRAFFIC CONTROL PLANS TO THE RESIDENT ENGINEER FOR APPROVAL PER SUBSECTION 105.03. ALL COSTS SHALL BE INCLUDED IN ITEM 900.645 SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE).
23. THE TOWN SHALL BE RESPONSIBLE FOR SIGNING THE DETOUR; THE CONTRACTOR SHALL GIVE THE TOWN 21 DAYS NOTICE PRIOR TO ANY ROAD CLOSURE.

PROJECT NAME: RICHFORD
PROJECT NUMBER: BRF 0302(29)

FILE NAME: sl2j58pnote.dgn PLOT DATE: 21-AUG-2014
PROJECT LEADER: C. CARLSON DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS CHECKED BY: H. SALLS
PROJECT NOTES SHEET 4 OF 36

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
							ROADWAY	EROSION CONTROL	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
							1				1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10				
							670				670		CY	COMMON EXCAVATION	203.15				
							50				50		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27				
							160				160		CY	SAND BORROW	203.31				
							80				80		CY	GRANULAR BORROW	203.32				
							1				1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22				
									760		760		CY	STRUCTURE EXCAVATION	204.25				
									280		280		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30				
							242				242		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10				
							450				450		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35				
							7				7		CWT	EMULSIFIED ASPHALT	404.65				
							1				1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50				
									10		10		GAL	WATER REPELLENT, SILANE	514.10				
							56				56		LF	JOINT SEALER, HOT POURED	524.11				
									56		56		LF	BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM	525.33				
									1		1		EACH	REMOVAL OF STRUCTURE	529.15				
									1		1		LS	PRECAST CONCRETE STRUCTURE (28' X 6' X 29' FRAME OR ARCH TYPE)	540.10				
									1		1		LS	PRECAST CONCRETE STRUCTURE (PEDESTAL WALL ABUTMENT #1)	540.10				
									1		1		LS	PRECAST CONCRETE STRUCTURE (PEDESTAL WALL ABUTMENT #2)	540.10				
									1		1		LS	PRECAST CONCRETE STRUCTURE (WINGWALL #1)	540.10				
									1		1		LS	PRECAST CONCRETE STRUCTURE (WINGWALL #2)	540.10				
									1		1		LS	PRECAST CONCRETE STRUCTURE (WINGWALL #3)	540.10				
									1		1		LS	PRECAST CONCRETE STRUCTURE (WINGWALL #4)	540.10				
							90				90		CY	STONE FILL, TYPE II	613.11				
							160				160		LF	CAST-IN-PLACE CONCRETE CURB, TYPE B	616.28				
							555				555		LF	REMOVING AND RESETTING FENCE	620.50				
							208				208		LF	HD STEEL BEAM GUARDRAIL, GALVANIZED	621.21				
							4				4		EACH	ANCHOR FOR STEEL BEAM RAIL	621.60				
							4				4		EACH	GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM	621.72				
							109				109		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
							25				25		HR	UNIFORMED TRAFFIC OFFICERS	630.10				
							400				400		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				
							750				750		LF	4 INCH YELLOW LINE	646.21				
							170				170		SY	GEOTEXTILE UNDER STONE FILL	649.31				
								55			55		SY	GEOTEXTILE FOR SILT FENCE, WOVEN WIRE REINFORCED	649.515				

PROJECT NAME: RICHFORD
PROJECT NUMBER: BRF 0302(29)
FILE NAME: sl2j58qs.dgn PLOT DATE: 21-AUG-2014
PROJECT LEADER: C. CARLSON DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS CHECKED BY: H. SALLS
QUANTITY 1 SHEET 5 OF 36

QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
							ROADWAY	EROSION CONTROL	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
								55			55		SY	GEOTEXTILE FOR FILTER CURTAIN	649.61				
								10			10		LB	SEED	651.15				
								10			10		LB	SEED, WINTER RYE	651.17				
								100			100		LB	FERTILIZER	651.18				
								0.25			0.25		TON	AGRICULTURAL LIMESTONE	651.20				
								0.25			0.25		TON	HAY MULCH	651.25				
							30				30		CY	TOPSOIL	651.35				
								240			240		SY	GRUBBING MATERIAL	651.40				
								1			1		LS	EPSC PLAN	652.10				
								10			10		HR	MONITORING EPSC PLAN	652.20				
								1			1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.)	652.30				
								470			470		SY	TEMPORARY EROSION MATTING	653.20				
								30			30		CY	VEHICLE TRACKING PAD	653.35				
								64			64		LF	BARRIER FENCE	653.50				
								160			160		LF	PROJECT DEMARCATION FENCE	653.55				
							6				6		EACH	REMOVING SIGNS	675.50				
							1				1		LU	PRICE ADJUSTMENT, FUEL (N.A.B.I.)	690.50				
							5				5		EACH	SPECIAL PROVISION (CMP SCHEDULING)	900.620				
							1				1		LS	SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM)	900.645				
							1				1		LS	SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)	900.645				
							1				1		LU	SPECIAL PROVISION (INCENTIVE/DISINCENTIVE)(N.A.B.I.)	900.650				
							1				1		LU	SPECIAL PROVISION (MAT DENSITY PAY ADJUSTMENT, SMALL QUANTITY)(N.A.B.I.)	900.650				
							1				1		LU	SPECIAL PROVISION (MIXTURE PAY ADJUSTMENT)(N.A.B.I.)	900.650				
							270				270		TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT)	900.680				

PROJECT NAME:	RICHFORD	PLOT DATE:	21-AUG-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	R. PELLETT
FILE NAME:	sl2j58qs.dgn	CHECKED BY:	H. SALLS
PROJECT LEADER:	C. CARLSON	DESIGNED BY:	H. SALLS
QUANTITY 2		SHEET	6 OF 36

BRIDGE QUANTITY SHEET 1

SUMMARY OF BRIDGE QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
					DECK	APPROACH SLAB 1	APPROACH SLAB 2	ABUTMENT 1	ABUTMENT 2	CHANNEL	BRIDGE TOTAL		UNIT	ITEMS	ITEM NUMBER		QUANTITIES	UNIT	ITEMS
								373	387		760		CY	STRUCTURE EXCAVATION	204.25				
								141	139		280		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30				
					4			3	3		10		GAL	WATER REPELLENT, SILANE	514.10				
					56						56		LF	BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM	525.33				
					1						1		EACH	REMOVAL OF STRUCTURE	529.15				
					1						1		LS	PRECAST CONCRETE STRUCTURE (28' X 6' X 29' FRAME OR ARCH TYPE)	540.10				
								1			1		LS	PRECAST CONCRETE STRUCTURE (PEDESTAL WALL ABUTMENT #1)	540.10				
									1		1		LS	PRECAST CONCRETE STRUCTURE (PEDESTAL WALL ABUTMENT #2)	540.10				
								1			1		LS	PRECAST CONCRETE STRUCTURE (WINGWALL #1)	540.10				
								1			1		LS	PRECAST CONCRETE STRUCTURE (WINGWALL #2)	540.10				
									1		1		LS	PRECAST CONCRETE STRUCTURE (WINGWALL #3)	540.10				
									1		1		LS	PRECAST CONCRETE STRUCTURE (WINGWALL #4)	540.10				

PROJECT NAME:	RICHFORD	PLOT DATE:	21-AUG-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	R. PELLETT
FILE NAME:	sl2j58qs.dgn	DESIGNED BY:	H. SALLS
PROJECT LEADER:	C. CARLSON	CHECKED BY:	H. SALLS
BRIDGE QUANTITY		SHEET	7 OF 36

GENERAL INFORMATION

SYMBOLGY LEGEND NOTE

THE SYMBOLGY ON THIS SHEET IS INTENDED TO COVER STANDARD CONVENTIONAL SYMBOLGY. THE SYMBOLGY IS USED FOR EXISTING & PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROJECT ANNOTATION, AS NOTED ON PROJECT PLAN SHEETS. THIS LEGEND SHEET COVERS THE BASICS. SYMBOLGY ON PLANS MAY VARY, PLAN ANNOTATIONS AND NOTES SHOULD BE USED TO CLARIFY AS NEEDED.

R. O. W. ABBREVIATIONS (CODES) & SYMBOLS

POINT CODE	DESCRIPTION
CH	CHANNEL EASEMENT
CONST	CONSTRUCTION EASEMENT
CUL	CULVERT EASEMENT
D&C	DISCONNECT & CONNECT
DIT	DITCH EASEMENT
DR	DRAINAGE EASEMENT
DRIVE	DRIVEWAY EASEMENT
EC	EROSION CONTROL
HWY	HIGHWAY EASEMENT
I&M	INSTALL & MAINTAIN EASEMENT
LAND	LANDSCAPE EASEMENT
R&RES	REMOVE & RESET
R&REP	REMOVE & REPLACE
SR	SLOPE RIGHT
UE	UTILITY EASEMENT
(P)	PERMANENT EASEMENT
(T)	TEMPORARY EASEMENT
■	BNDNS BOUND SET
□	BNDNS BOUND TO BE SET
●	IPNS IRON PIN SET
⊙	IPNS IRON PIN TO BE SET
⊠	CALC EXISTING ROW POINT
○	PROW PROPOSED ROW POINT
[LENGTH]	LENGTH CARRIED ON NEXT SHEET

COMMON TOPOGRAPHIC POINT SYMBOLS

POINT CODE	DESCRIPTION
⊕	APL BOUND APPARENT LOCATION
◻	BM BENCHMARK
◻	BND BOUND
⊔	CB CATCH BASIN
⊕	COMB COMBINATION POLE
⊔	DITHR DROP INLET THROATED DNC
⊕	EL ELECTRIC POWER POLE
◊	FPOLE FLAGPOLE
○	GASFIL GAS FILLER
○	GP GUIDE POST
×	GSO GAS SHUT OFF
◊	GUY GUY POLE
◊	GUYW GUY WIRE
×	GV GATE VALUE
⊗	H TREE HARDWOOD
△	HCTRL CONTROL HORIZONTAL
▲	HVCTRL CONTROL HORIZ. & VERTICAL
◇	HYD HYDRANT
◊	IP IRON PIN
●	IPIPE IRON PIPE
⊕	LI LIGHT - STREET OR YARD
⊕	MB MAILBOX
○	MH MANHOLE (MH)
◻	MM MILE MARKER
●	PM PARKING METER
◻	PMK PROJECT MARKER
◊	POST POST STONE/WOOD
⊕	RRSIG RAILROAD SIGNAL
⊕	RRSL RAILROAD SWITCH LEVER
⊗	S TREE SOFTWOOD
⊕	SAT SATELLITE DISH
⊗	SHRUB SHRUB
⊕	SIGN SIGN
⊕	STUMP STUMP
⊕	TEL TELEPHONE POLE
◊	TIE TIE
⊕	TSIGN SIGN W/DOUBLE POST
⊕	VCTRL CONTROL VERTICAL
◊	WELL WELL
×	WSO WATER SHUT OFF

THESE ARE COMMON VAOT SURVEY POINT SYMBOLS FOR EXISTING FEATURES, ALSO USED FOR PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROPOSED ANNOTATION.

PROPOSED GEOMETRY CODES

CODE	DESCRIPTION
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
CC	CENTER OF CURVE
PT	POINT OF TANGENCY
PCC	POINT OF COMPOUND CURVE
PRC	POINT OF REVERSE CURVE
POB	POINT OF BEGINNING
POE	POINT OF ENDING
STA	STATION PREFIX
AH	AHEAD STATION SUFFIX
BK	BACK STATION SUFFIX
D	CURVE DEGREE OF (100FT)
R	CURVE RADUIS OF
T	CURVE TANGENT LENGTH
L	CURVE LENGTH OF
E	CURVE EXTERNAL DISTANCE

UTILITY SYMBOLGY

UNDERGROUND UTILITIES

— UGU —	UTILITY (GENERIC-UNKNOWN)
— UT —	TELEPHONE
— UE —	ELECTRIC
— UC —	CABLE (TV)
— UEC —	ELECTRIC+CABLE
— UET —	ELECTRIC+TELEPHONE
— UCT —	CABLE+TELEPHONE
— UECT —	ELECTRIC+CABLE+TELEP.
— G —	GAS LINE
— W —	WATER LINE
— S —	SANITARY SEWER (SEPTIC)

ABOVE GROUND UTILITIES (AERIAL)

— AGU —	UTILITY (GENERIC-UNKNOWN)
— T —	TELEPHONE
— E —	ELECTRIC
— C —	CABLE (TV)
— EC —	ELECTRIC+CABLE
— ET —	ELECTRIC+TELEPHONE
— AER E&T —	ELECTRIC+TELEPHONE
— CT —	CABLE+TELEPHONE
— ECT —	ELECTRIC+CABLE+TELEP.
—	UTILITY POLE GUY WIRE

PROJECT CONSTRUCTION SYMBOLGY

PROJECT DESIGN & LAYOUT SYMBOLGY

— CZ —	CLEAR ZONE
—	PLAN LAYOUT MATCHLINE

PROJECT CONSTRUCTION FEATURES

—	TOP OF CUT SLOPE
—	TOE OF FILL SLOPE
—	STONE FILL
—	BOTTOM OF DITCH
—	CULVERT PROPOSED
—	STRUCTURE SUBSURFACE
PDF	PROJECT DEMARCATION FENCE
BF	BARRIER FENCE
—	TREE PROTECTION ZONE (TPZ)
—	STRIPING LINE REMOVAL
—	SHEET PILES

CONVENTIONAL BOUNDARY SYMBOLGY

BOUNDARY LINES

—	TOWN BOUNDARY LINE
—	COUNTY BOUNDARY LINE
—	STATE BOUNDARY LINE
—	PROPOSED STATE R.O.W. (LIMITED ACCESS)
—	PROPOSED STATE R.O.W.
—	STATE ROW (LIMITED ACCESS)
—	STATE ROW
—	TOWN ROW
—	PERMANENT EASEMENT LINE (P)
—	TEMPORARY EASEMENT LINE (T)
—	SURVEY LINE
P	PROPERTY LINE (P/L)
SR	SLOPE RIGHTS
6f	6F PROPERTY BOUNDARY
4f	4F PROPERTY BOUNDARY
HAZ	HAZARDOUS WASTE

EPSC LAYOUT PLAN SYMBOLGY

EPSC MEASURES

—	FILTER CURTAIN
—	SILT FENCE
—	SILT FENCE WOVEN WIRE
—	CHECK DAM
—	DISTURBED AREAS REQUIRING RE-VEGETATION
—	EROSION MATTING

ENVIRONMENTAL RESOURCES

—	WETLAND BOUNDARY
—	RIPARIAN BUFFER ZONE
—	WETLAND BUFFER ZONE
—	SOIL TYPE BOUNDARY
T&E	THREATENED & ENDANGERED SPECIES
HAZ	HAZARDOUS WASTE AREA
AG	AGRICULTURAL LAND
HABITAT	FISH & WILDLIFE HABITAT
FLOOD PLAIN	FLOOD PLAIN
OHW	ORDINARY HIGH WATER (OHW)
—	STORM WATER
—	USDA FOREST SERVICE LANDS
—	WILDLIFE HABITAT SUIT/CONN

ARCHEOLOGICAL & HISTORIC

— ARCH —	ARCHEOLOGICAL BOUNDARY
— HISTORIC DIST —	HISTORIC DISTRICT BOUNDARY
— HISTORIC —	HISTORIC AREA
Ⓜ	HISTORIC STRUCTURE

CONVENTIONAL TOPOGRAPHIC SYMBOLGY

EXISTING FEATURES

—	ROAD EDGE PAVEMENT
—	ROAD EDGE GRAVEL
—	DRIVEWAY EDGE
—	DITCH
—	FOUNDATION
—	FENCE (EXISTING)
—	FENCE WOOD POST
—	FENCE STEEL POST
—	GARDEN
—	ROAD GUARDRAIL
—	RAILROAD TRACKS
—	CULVERT (EXISTING)
—	STONE WALL
—	WALL
—	WOOD LINE
—	BRUSH LINE
—	HEDGE
—	BODY OF WATER EDGE
—	LEDGE EXPOSED

PROJECT NAME: RICHFORD
PROJECT NUMBER: BRF 0302(29)

FILE NAME: sl2j58legend.dgn PLOT DATE: 21-AUG-2014
PROJECT LEADER: C. CARLSON DRAWN BY: M.LONGSTREET
DESIGNED BY: AOT CHECKED BY: H. SALLS
CONVENTIONAL SYMBOLGY LEGEND SHEET 8 OF 36

GPS CONTROL POINTS

--- HVCTRL #1 ---

5600 VOLTS

NORTH = 905682.149
EAST = 1595379.726
ELEV. = 485.449

STATION MARK IS A VERTICAL CONTROL DISK WITH SETTING: STAINLESS STEEL ROD W/O SLEEVE (10 FT.+) DISK FROM: NGS THE MARK IS STAMPED: U 49 1978 SATELLITE; THE SITE IS SUITABLE FOR GPS OBSERVATIONS PGI387' RECOVERED IN GOOD CONDITION. IT IS 0.8 M (2.6 FT) NORTHWEST OF A PGI387' STEEL WITNESS POST.

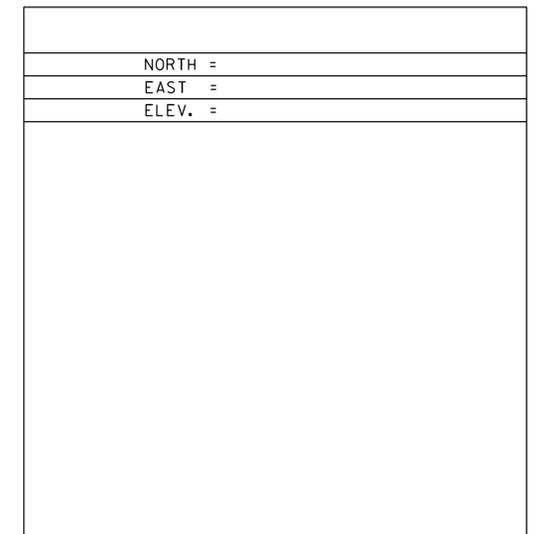
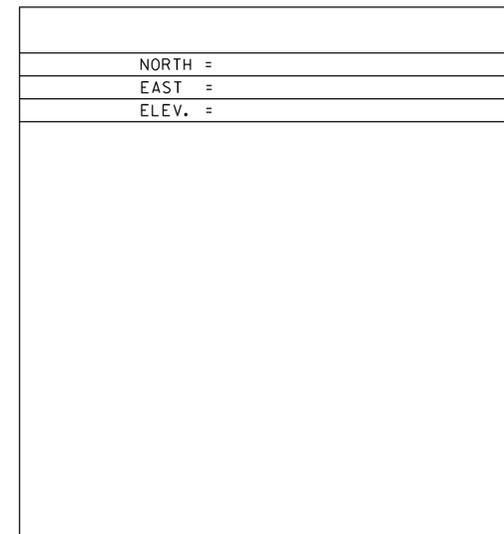
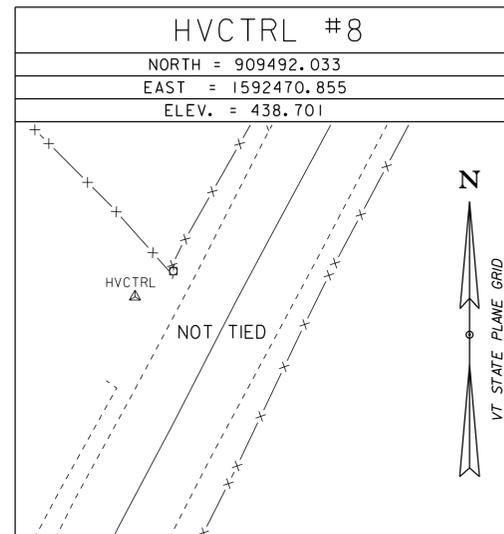
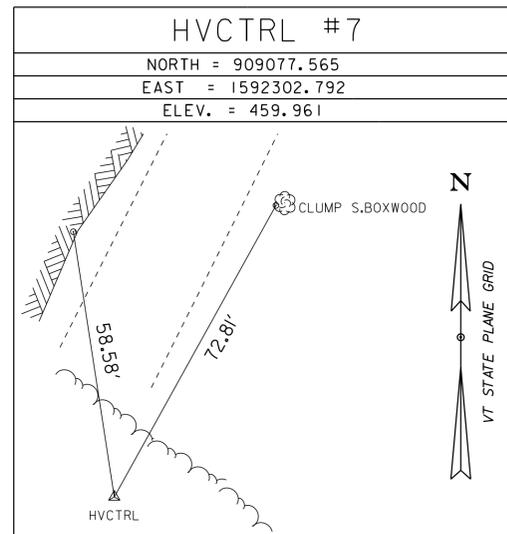
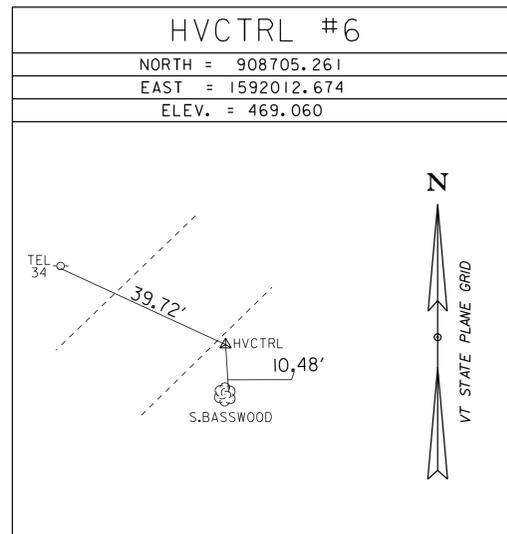
--- HVCTRL #2 ---

U 49

NORTH = 906242.748
EAST = 1593803.722
ELEV. = 446.210

GENERAL LOCATION, RICHFORD, VT. TO REACH FROM THE INTERSECTION OF VT ROUTE 105 AND VT ROUTE 139 IN RICHFORD VILLAGE GO SOUTHEAST ALONG VT ROUTE 105 FOR 0.2 MI (0.3 KM) TO THE INTERSECTION OF NOYES STREET LEFT. TURN LEFT AND GO SOUTH ALONG NOYES STREET FOR 0.4 MI (0.6 KM) TO THE INTERSECTION OF A PAVED DRIVE LEFT LEADING TO STAIRS UNLIMITED INC. CONTINUE STRAIGHT AHEAD AND GO SOUTHWEST ALONG NOYES STREET FOR ABOUT 20 M (65.6 FT) TO THE SITE OF THE MARK ON THE RIGHT. THE MARK IS SET FLUSH WITH GROUND SURFACE IN THE TOP OF A 30 CM DIAMETER CONCRETE MONUMENT POURED 1.3 M (4.3 FT) DEEP. THE MARK IS 6.9 M (22.6 FT) NORTHWEST OF AND ABOUT 1.0 M (3.3 FT) LOWER THAN THE CENTERLINE OF NOYES STREET, 15.2 M (49.9 FT) WEST NORTHWEST OF AN UNNUMBERED POLE, 18.1 M (59.4 FT) WEST OF A CAST IRON GATE POST WITH AN ATTACHED MAILBOX, 46.3 M (151.9 FT) WEST SOUTHWEST OF THE WEST CORNER OF AN ELL ON THE STAIRS UNLIMITED INC. BUILDING, AND 1.2 M (3.9 FT) SOUTHEAST OF A 5600 VOLT ELECTRIC FENCE AND A FIBERGLASS WITNESS POST.

TRAVERSE TIES



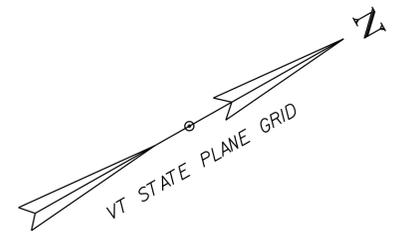
* Main Traverse Completed 4/17/09 by R. Bullock P.C. & R. Bockus

ALIGNMENT TIES

TOWN HIGHWAY 3			
	STATION	NORTHING	EASTING
PC	40+00.00	909322.5958	1592404.8065
PI	41+86.52	909490.0381	1592486.9783
	Radius:	6500.00	
	Delta:	3°17'14.35" Right	
	Degree of Curvature(Arc):	0°52'53.30"	
	Length:	372.93	
	Tangent:	186.52	
	Chord:	372.88	
	Middle Ordinate:	2.67	
	External:	2.68	
PT	43+72.93		
PC	45+24.77		
PI	47+35.93		
	Radius:	2600.00	
	Delta:	9°17'10.58" Right	
	Degree of Curvature(Arc):	2°12'13.26"	
	Length:	421.40	
	Tangent:	211.16	
	Chord:	420.94	
	Middle Ordinate:	8.53	
	External:	8.56	
PT	49+35.62		
POE	49+46.16		

DATUM	
VERTICAL	NAVD 88
HORIZONTAL	NAD 83 (1996)
ADJUSTMENT	TRAVERSE

PROJECT NAME:	RICHFORD
PROJECT NUMBER:	BRF 0302(29)
FILE NAME:	sl2j58tie.dgn
PROJECT LEADER:	C. CARLSON
DESIGNED BY:	H. SALLS
TIE	
PLOT DATE:	21-AUG-2014
DRAWN BY:	S. DONOVAN
CHECKED BY:	H. SALLS
SHEET	9 OF 36



HD STEEL BEAM GUARDRAIL, GALVANIZED

STA 43+44.92 LT - STA 43+88.67 LT
 STA 43+44.92 RT - STA 43+88.67 RT
 STA 44+87.33 LT - STA 45+31.08 LT
 STA 44+87.33 RT - STA 45+31.08 RT

REMOVING AND RESETTING FENCE *

STA 42+50.00 LT - STA 44+17.00 LT
 STA 42+50.00 RT - STA 44+23.00 RT
 STA 44+51.00 RT - STA 44+75.00 RT
 STA 44+52.00 LT - STA 46+25.00 LT

REMOVAL AND DISPOSAL OF GUARDRAIL

STA 43+98.79 LT - STA 44+78.62 LT
 STA 43+98.45 RT - STA 44+77.92 RT

GUARDRAIL APPROACH SECTION,
 GALVANIZED 2 RAIL BOX BEAM

STA 43+88.67 LT - STA 44+24.00 LT
 STA 43+88.67 RT - STA 44+24.00 RT
 STA 44+52.00 LT - STA 44+87.33 LT
 STA 44+52.00 RT - STA 44+87.33 RT

* FENCING WILL BE RESET AT A LOCATION
 AGREED UPON W/ THE PROPERTY OWNER
 AND ENGINEER IN THE FIELD

CONSTRUCT 5' PAVED APRON

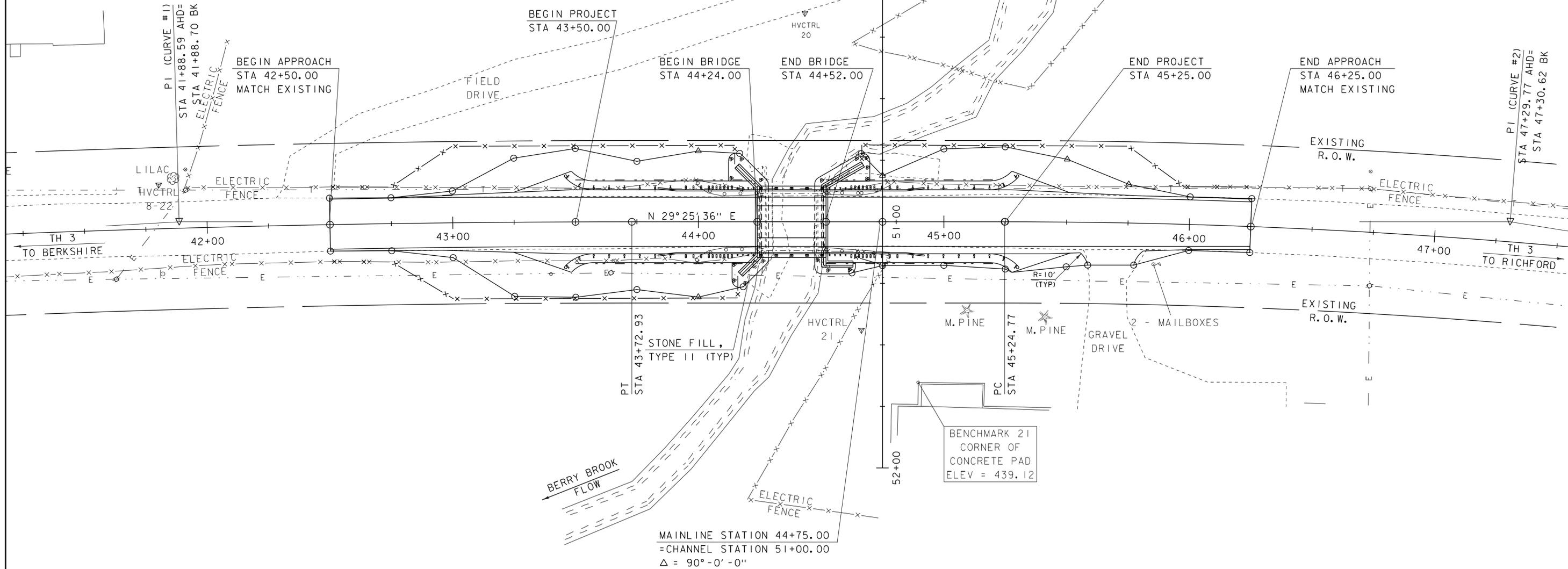
STA 45+59.00 RT - STA 45+77.00 RT

BRIDGE RAILING, GALVANIZED
 2 RAIL BOX BEAM

STA 44+24.00 LT - STA 44+52.00 LT
 STA 44+24.00 RT - STA 44+52.00 RT

CURVE (1)
 DELTA = 3° 14' 56"
 D = 0° 52' 53"
 R = 6500.00'
 T = 184.34'
 L = 368.57'
 E = 2.61'

CURVE (2)
 DELTA = 9° 03' 14"
 D = 2° 12' 13"
 R = 2600.00'
 T = 205.85'
 L = 410.85'
 E = 8.14'



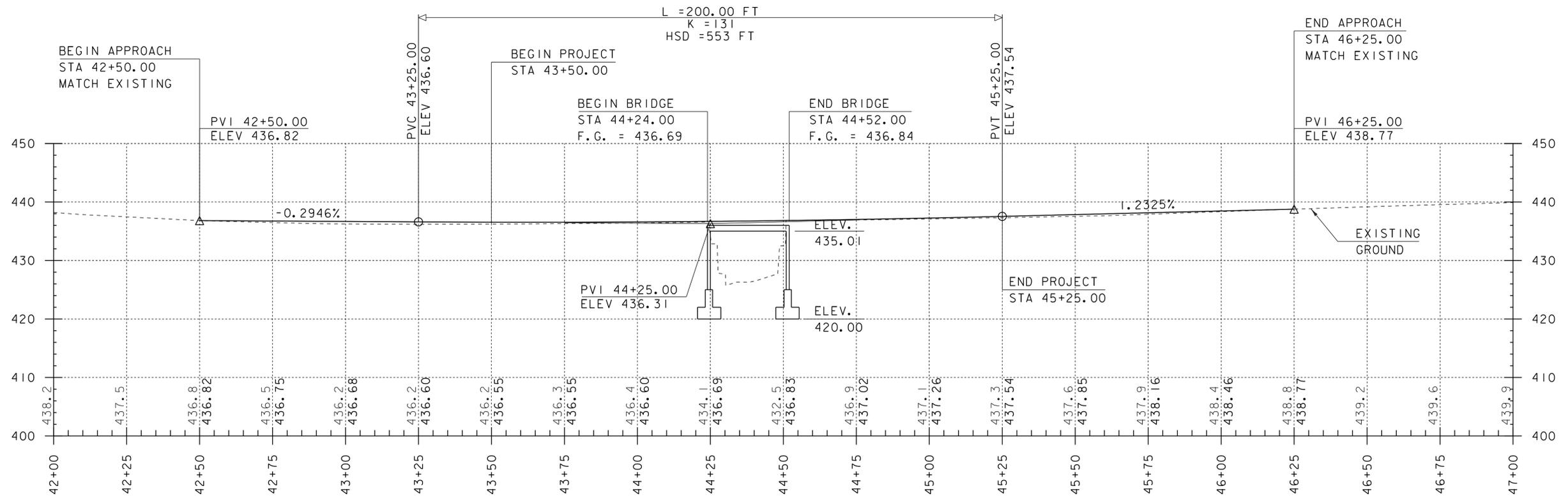
EXISTING BRIDGE DATA
 CONCRETE T-BEAM
 BRIDGE BUILT IN 1900
 BRIDGE LENGTH = 24 FT.
 WATERWAY AREA = xx SF

SCALE 1" = 20'-0"
 20 0 20

PROJECT NAME: RICHFORD
 PROJECT NUMBER: BRF 0302(29)

FILE NAME: sl2j58bdr.dgn
 PROJECT LEADER: C. CARLSON
 DESIGNED BY: H. SALLS
 LAYOUT

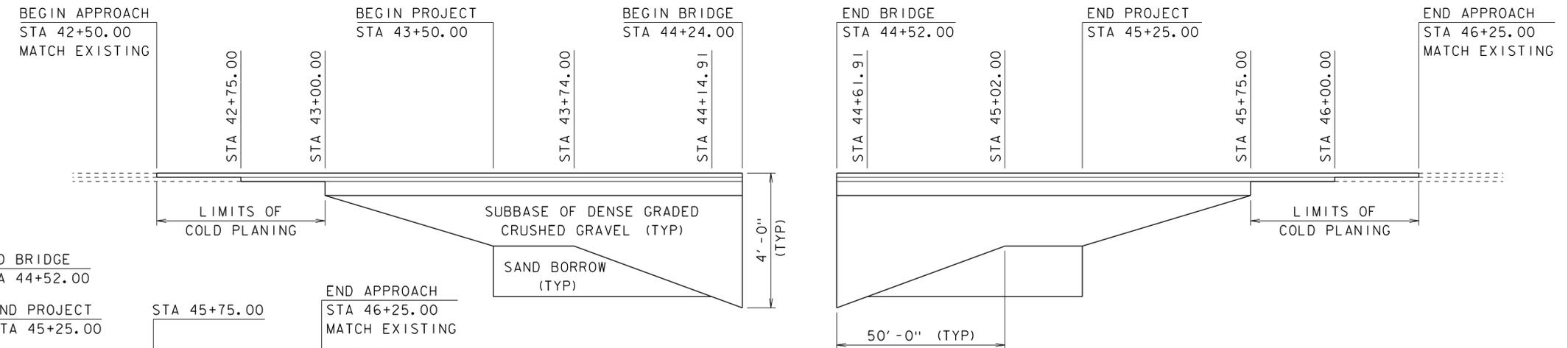
PLOT DATE: 21-AUG-2014
 DRAWN BY: R. PELLETT
 CHECKED BY: H. SALLS
 SHEET 10 OF 36



TH3 PROFILE

SCALE: HORIZONTAL 1" = 20' - 0"
VERTICAL 1" = 10' - 0"

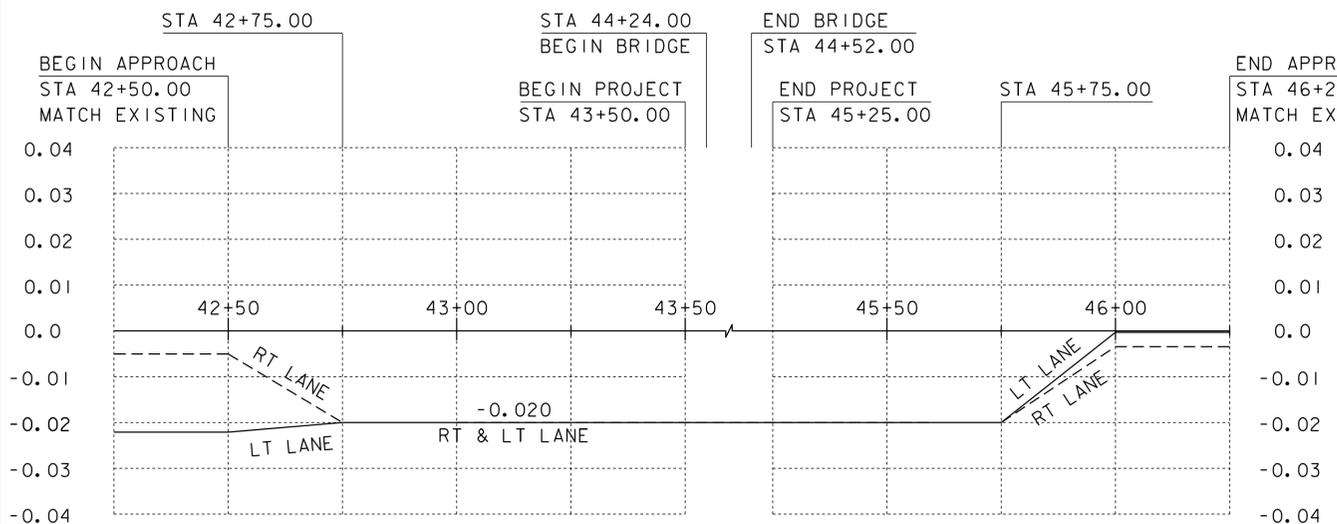
NOTE:
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ϕ
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG \square



MATERIAL TRANSITION DIAGRAM

HOR. SCALE 1" = 20' - 0"
NO VERT. SCALE

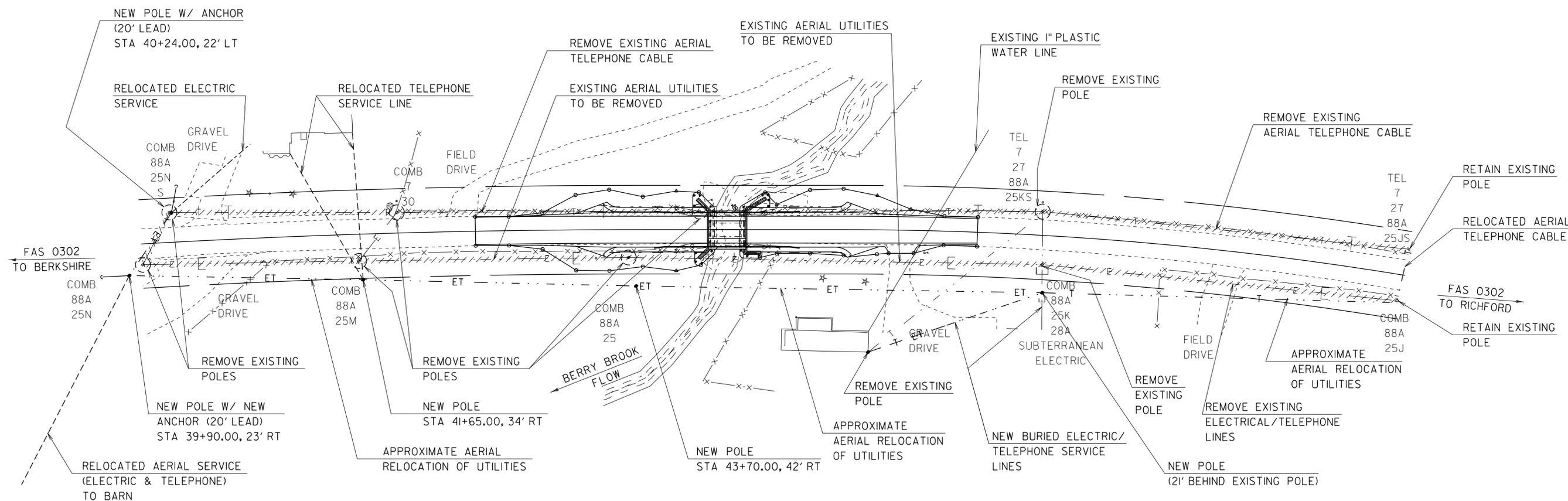
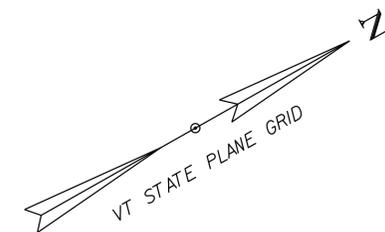
NOTE:
SEE ROADWAY TYPICAL SECTION FOR THICKNESSES OF:
BITUMINOUS CONCRETE PAVEMENT,
SUBBASE OF DENSE GRADED CRUSHED GRAVEL
& SAND BORROW



BANKING DIAGRAM

HOR. SCALE 1" = 20' - 0"
NO VERT. SCALE

PROJECT NAME:	RICHFORD	PLOT DATE:	21-AUG-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	R. PELLETT
FILE NAME:	sl2j58pro.dgn	DESIGNED BY:	H. SALLS
PROJECT LEADER:	C. CARLSON	CHECKED BY:	H. SALLS
TH 3 PROFILE			SHEET II OF 36

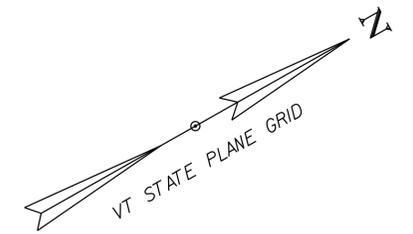


NOTE:

- I. ALL UTILITY RELOCATION, REMOVAL AND NEW LINES AND POLES, SHALL BE DONE BY THE UTILITY COMPANY OR A CONTRACTOR, CONTRACTED BY THE UTILITY TO PERFORM THE REQUIRED WORK.

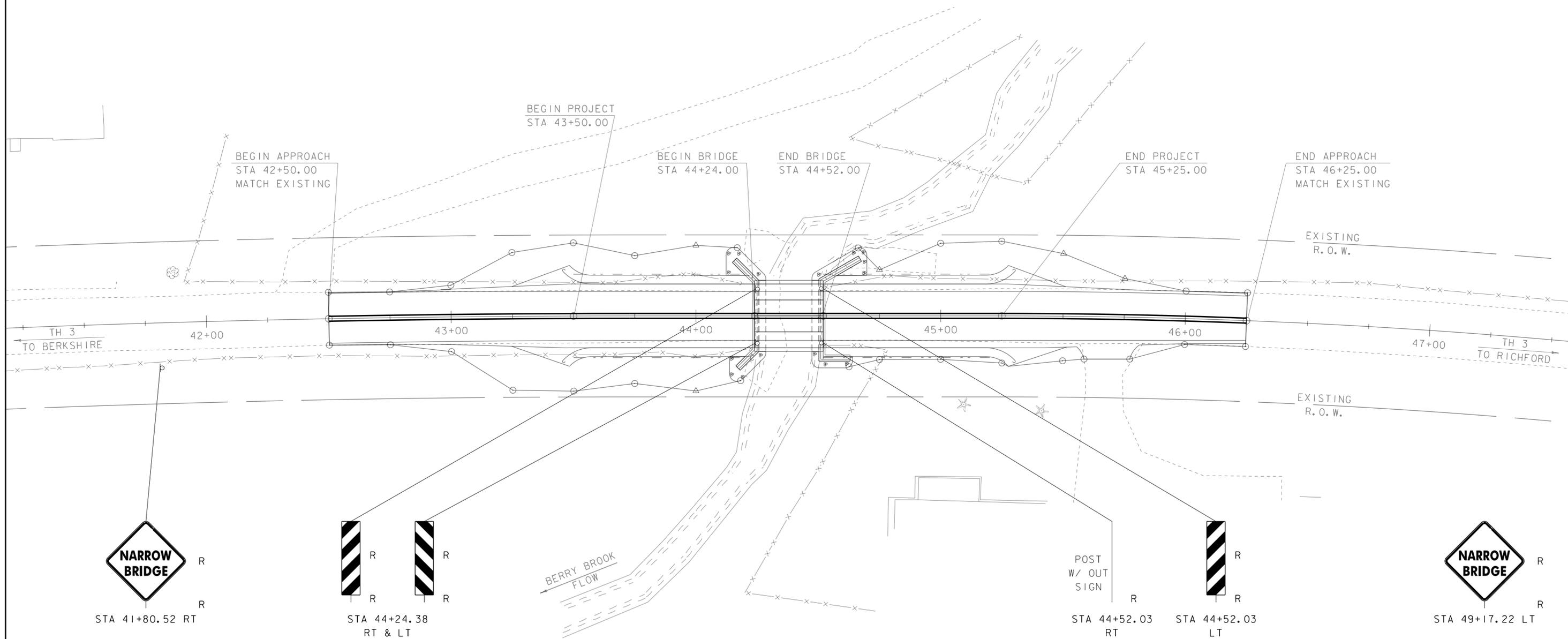
SCALE 1" = 40' - 0"
 40 0 40

PROJECT NAME:	RICHFORD	PLOT DATE:	10-SEP-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	M. LONGSTREET
FILE NAME:	sl2j58bdrutil.dgn	CHECKED BY:	L. WHEELER
PROJECT LEADER:	C. CARLSON	UTILITY LAYOUT	SHEET 12 OF 36
DESIGNED BY:	H. SALLS		



REMOVING SIGNS
 STA 41+80.52 RT
 STA 44+24.38 RT & LT
 STA 44+52.03 LT
 STA 49+17.22 LT

PAINT PAVEMENT MARKING, 6 INCH YELLOW LINE
 STA 42+50.00 - 46+25.00 CL



**NARROW
BRIDGE**
 STA 41+80.52 RT

R
R
R
R
 STA 44+24.38
 RT & LT

BERRY BROOK
 FLOW

POST
 W/ OUT
 SIGN
 STA 44+52.03
 RT

R
R
 STA 44+52.03
 LT

**NARROW
BRIDGE**
 STA 49+17.22 LT

LEGEND
 R - REMOVE

SCALE 1" = 20'-0"
 20 0 20

PROJECT NAME: RICHFORD	PLOT DATE: 21-AUG-2014
PROJECT NUMBER: BRF 0302(29)	DRAWN BY: R. PELLETT
FILE NAME: sl2j58bdr-sign.dgn	CHECKED BY: H. SALLS
PROJECT LEADER: C. CARLSON	SHEET 13 OF 36
DESIGNED BY: H. SALLS	
SIGNS & PAVEMENT MARKING LAYOUT	

SOIL CLASSIFICATION

AASHTO

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

ROCK QUALITY DESIGNATION

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

SHEAR STRENGTH

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

CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

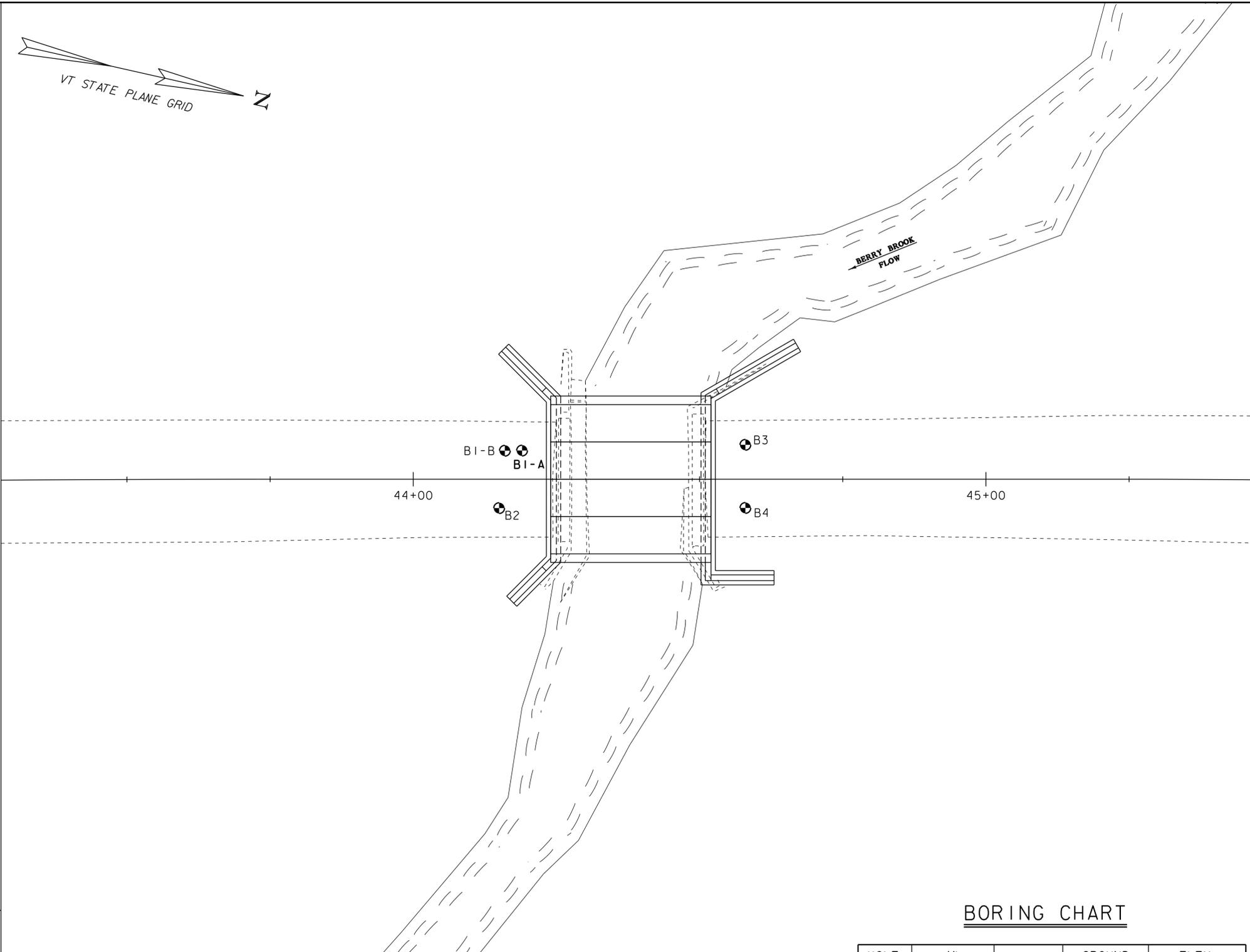
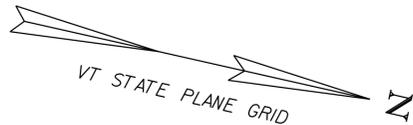
DENSITY (GRANULAR SOILS)		CONSISTENCY (COHESIVE SOILS)	
N	DESCRIPTIVE TERM	N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

COMMONLY USED SYMBOLS

- ▼ Water Elevation
- ⊕ Standard Penetration Boring
- ⊕ Auger Boring
- ⊕ Rod Sounding
- ⊕ Sample
- N Standard Penetration Test Blow Count Per Foot For: 2" O.D. Sampler 1 3/8" I.D. Sampler Hammer Weight Of 140 Lbs. Hammer Fall Of 30"
- VS Field Vane Shear Test
- US Undisturbed Soil Sample
- B Blast
- DC Diamond Core
- MD Mud Drill
- WA Wash Ahead
- HSA Hollow Stem Auger
- AX Core Size 1 1/8"
- BX Core Size 1 7/8"
- NX Core Size 2 1/8"
- M Double Tube Core Barrel Used
- LL Liquid Limit
- PL Plastic Limit
- PI Plasticity Index
- NP Non Plastic
- w Moisture Content (Dry Wgt. Basis)
- D Dry
- M Moist
- MTW Moist To Wet
- W Wet
- Sat Saturated
- Bo Boulder
- Gr Gravel
- Sa Sand
- Si Silt
- Cl Clay
- HP Hardpan
- Le Ledge
- NLTD No Ledge To Depth
- CNPF Can Not Penetrate Further
- TLOB Top of Ledge Or Boulder
- NR No Recovery
- Rec. Recovery
- 1/2 Rec. Percent Recovery
- ROD Rock Quality Designation
- CBR California Bearing Ratio
- < Less Than
- > Greater Than
- R Refusal (N > 100)
- VTSPG NAD83 - See Note 7

COLOR

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



BORING CHART

HOLE NO.	ML STATION	OFFSET	GROUND ELEV.	ELEV. TLOB
B1-A	44+19.00	5' LT	436.50	395.50
B1-B	44+16.00	5' LT	436.50	395.50
B2	44+15.00	5' RT	436.50	396.50
B3	44+58.00	6' LT	437.00	392.00
B4	44+58.00	5' RT	437.00	388.00

PROJECT NAME: RICHFORD
PROJECT NUMBER: BRF 0302(29)

FILE NAME: si2j58bor.dgn PLOT DATE: 21-AUG-2014
PROJECT LEADER: C. CARLSON DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS CHECKED BY: H. SALLS
BORING INFORMATION SHEET 14 OF 36

DEFINITIONS (AASHTO)

- BEDROCK (LEDGE) - Rock in its native location of indefinite thickness.
- BOULDER - A rock fragment with an average dimension > 12 inches.
- COBBLE - Rock fragments with an average dimension between 3 and 12 inches.
- GRAVEL - Rounded particles of rock < 3" and > 0.075" (#10 sieve).
- SAND - Particles of rock < 0.075" (#10 sieve) and > 0.0025" (#200 sieve).
- SLT - Soil < 0.0025" (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.
- CLAY - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.
- VARVED - Alternate layers of silt and clay.
- HARDPAN - Extremely dense soil, cemented layer, not softened when wet.
- MUCK - Soft organic soil (containing > 10% organic material).
- MOISTURE CONTENT - Weight of water divided by dry weight of soil.
- FLOWING SAND - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.
- STRIKE - Angle from magnetic north to line of intersection of bed with a horizontal plane.
- DIP - Inclination of bed with a horizontal plane.

GENERAL NOTES

- The subsurface explorations shown herein were made between 09/04/2013 and 09/09/2013 by the Agency.
- Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by the Agency and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.
- Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.
- Engineering judgment was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgment by the Contractor.
- Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.
- Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.
- Northing and Easting coordinates are shown in Vermont State Plane Grid North American Datum 1983 in meters and survey feet.



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

BORING LOG

Richford BRF 0302(29)
Richford, VT
GeoDesign # 750-09.13

Boring No.: **B-1A/B**

Page No.: **1 of 3**

Pin No.: **12j158**

Checked By: **JFW**

Boring Crew: **J. Leonhardt (TransTech), A. Baribault (GeoDesign)**

Date Started: **9/04/13** Date Finished: **9/05/13**

VTSPG NAD83: **N 909695.07 ft E 1592596.89 ft**

Station: **44+19** Offset: **5' L**

Ground Elevation: **436.5 ft**

Type: **FJ** Sampler: **SS**
I.D.: **4 in** **2 in**
Hammer Wt: **140 lb.** **140 lb.**
Hammer Fall: **30 in.** **30 in.**
Hammer/Rod Type: **Auto/NWJ**
Rig: **CME 550X ATV** $C_e = -1.5$

Groundwater Observations ⁽³⁾

Date	Depth (ft)	Notes
09/04/13		See Note 3.

Depth (ft)	Strata ⁽¹⁾	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value) ⁽²⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
0	XXXX	6" Asphalt										
0.5	XXXX	S1 (0.5' to 2'): Medium dense, brown-gray fine to coarse SAND, little fine Gravel, little Silt, slightly moist. (Fill) Rec. = 1.0 ft (AASHTO M145 Classification: A-1-b.)				16-9-8 (17)	4.2	35.4	49.5	15.1	NP	NP
2	XXXX	S2 (2' to 4'): Medium dense, brown-gray fine to coarse SAND, some fine to coarse Gravel, little Silt, slightly moist. (Fill) Rec. = 1.42 ft (AASHTO M145 Classification: A-1-b.)				4-6-11-11 (17)	7.1	41.4	43.3	15.3	NP	NP
4	XXXX	S3 (4' to 6'): Medium dense, brown fine to coarse SAND and fine to coarse GRAVEL, little Silt, very moist to wet. (Fill) Rec. = 1.17 ft (AASHTO M145 Classification: A-1-b.)				10-9-6-5 (15)	10.2	49.5	35.6	14.9	NP	NP
6	XXXX	S4 (6' to 8'): Loose, brown fine to coarse SAND, some Silt, little fine Gravel, very moist. (Possible Fill) Rec. = 0.83 ft (AASHTO M145 Classification: A-2-4.)				4-5-4-5 (9)	15.7	21.6	49.9	28.5	NP	NP
9	XXXX	S5 (9' to 11'): Loose, no recovery. Rec. = 0.0 ft				7-4-5-7 (9)						
11	XXXX	S6 (11' to 13'): Medium dense; S6A (Upper 5"): Brown fine to coarse SAND and SILT, trace fine Gravel (concentrated at top of sample), wet. S6B (Lower 3"): Gray SILT, trace fine Sand, wet. (Sand/Silt) Rec. = 0.67 ft (AASHTO M145 Classification: A-4.)				7-6-6-6 (12)	28.7	2.3	97.7		NP	NP
13	C1	C1 (13' to 13.7'): Hard, slightly weathered, gray with white QUARTZITE BOULDER.				16-18-20-24 (38)	10.5	48.1	17.5	34.4	NP	NP
14		S7 (14' to 16'): Dense, greenish-gray fine to coarse GRAVEL and SILT, some fine to coarse Sand, moist. (Glacial Till) Rec. = 0.5 ft (AASHTO M145 Classification: A-2-4.)				9-19-19-16 (38)	10.4	39.0	31.5	29.5	NP	NP
16		S8 (16' to 18'): Dense, gray fine to coarse SAND, some Silt, some fine Gravel, moist to wet. (Glacial Till) Rec. = 1.17 ft (AASHTO M145 Classification: A-2-4.)				80/3" (R)	8.5	38.4	23.4	38.2	NP	NP
19		S9 (19' to 19.3'): Refusal, gray SILT, some fine to coarse Sand, some fine to coarse Gravel (fractured), wet. (Glacial Till) Rec. = 0.25 ft (AASHTO M145 Classification: A-4.)				80/2" (R)	7.5	63.1	20.0	16.9	NP	NP
21		S10 (21' to 21.2'): Refusal, gray fine to coarse GRAVEL, some fine to coarse Sand, little Silt, wet. (Glacial Till) Rec. = 0.17 ft (AASHTO M145 Classification: A-1-b.)				100/6" (R)	8.5	14.9	31.7	53.4	NP	NP
24		S11 (24' to 24.5'): Refusal, gray SILT and fine to coarse SAND, trace fine Gravel, moist. (Glacial Till) Rec. = 0.5 ft (AASHTO M145 Classification: A-4.)				100/6" (R)	9.0	18.1	29.9	52.0	NP	NP
29		S12 (29' to 29.5'): Refusal, gray SILT and fine to coarse SAND, little fine Gravel, moist. (Glacial Till) Rec. = 0.5 ft										

Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_e is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BOTTOM OF FOOTING
ELEV 420.00

GEODESIGN BORING LOG 750-09.13 RICHFORD VTSPG NAD83 10/9/13



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

BORING LOG

Richford BRF 0302(29)
Richford, VT
GeoDesign # 750-09.13

Boring No.: **B-1A/B**

Page No.: **2 of 3**

Pin No.: **12j158**

Checked By: **JFW**

Boring Crew: **J. Leonhardt (TransTech), A. Baribault (GeoDesign)**

Date Started: **9/04/13** Date Finished: **9/05/13**

VTSPG NAD83: **N 909695.07 ft E 1592596.89 ft**

Station: **44+19** Offset: **5' L**

Ground Elevation: **436.5 ft**

Type: **FJ** Sampler: **SS**
I.D.: **4 in** **2 in**
Hammer Wt: **140 lb.** **140 lb.**
Hammer Fall: **30 in.** **30 in.**
Hammer/Rod Type: **Auto/NWJ**
Rig: **CME 550X ATV** $C_e = -1.5$

Groundwater Observations ⁽³⁾

Date	Depth (ft)	Notes
09/04/13		See Note 3.

Depth (ft)	Strata ⁽¹⁾	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value) ⁽²⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
0		(AASHTO M145 Classification: A-4.)										
35		S13 (34' to 35'): Refusal, gray fine to coarse SAND and SILT, little fine Gravel, wet. (Glacial Till) Rec. = 0.83 ft (AASHTO M145 Classification: A-4.)				58-100/5.5" (R)	12.2	18.0	46.3	35.7	NP	NP
40		S14 (39' to 39.4'): Refusal, gray and greenish gray fine to coarse SAND and SILT, some fine Gravel, wet. Approximately 2" in spoon shoe of possible weathered bedrock. (Glacial Till) Rec. = 0.42 ft (AASHTO M145 Classification: A-2-4.) Inferred Weathered Bedrock				100/5" (R)	11.8	35.2	30.4	34.4	NP	NP
41	C2	C2 (41' to 46'): Poor quality, gray-greenish gray, moderately hard, fine grained, moderately weathered PHYLLITE interbedded with Quartz, fracture angle approximately 45 to 90 degrees.		93 (48)	3.5							
46		C3 (46' to 51'): Poor quality, greenish gray, moderately hard, fine grained, moderately weathered PHYLLITE, fracture angle approximately 60 to 80 degrees.		87 (47)	4							
51		Hole stopped @ 51.0 ft B-1A abandoned; B-1B end of Core										
55		Remarks: 1) Hammer efficiency correction factor is assumed. Elevation, station and offset are estimated by GeoDesign from site plans provided by VTrans and taped measurements from existing features made in the field by GeoDesign personnel. They should be considered accurate only to the degree implied by the method of location used. 2) Sample S2 not performed in accordance with ASTM D1586, (sampled immediately after sample S1 without clearing the borehole with the roller bit). 3) Soil moisture descriptions may not accurately depict actual conditions due to wash and drive drilling methods. Wash water observed to be brown in color to approximately 11' deep, then turning gray by 13' deep. 4) Cored through a boulder from 13' to 13.7' deep. Lost water upon breaking through. Casing became out of alignment while attempting to drive through boulder. Abandoned location and moved to B-1B, offset 3.5' south/west, (approximate STA 44+16, 5' L)										

Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_e is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

PROJECT NAME:	RICHFORD	PLOT DATE:	21-AUG-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	R. PELLETT
FILE NAME:	sl2j58bor.dgn	CHECKED BY:	H. SALLS
PROJECT LEADER:	C. CARLSON	SHEET	15 OF 36
DESIGNED BY:	H. SALLS		
BORING LOGS 1			



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

BORING LOG

Richford BRF 0302(29)
Richford, VT
GeoDesign # 750-09.13

Boring No.: B-1A/B
Page No.: 3 of 3
Pin No.: 12j158
Checked By: JFW

Boring Crew: J. Leonhardt (TransTech), A. Baribault (GeoDesign)
Date Started: 9/04/13 Date Finished: 9/05/13
VTSPG NAD83: N 909695.07 ft E 1592596.89 ft
Station: 44+19 Offset: 5' L
Ground Elevation: 436.5 ft

Casing		Sampler		Groundwater Observations ⁽³⁾		
Type:	FJ	SS	Date	Depth (ft)	Notes	
I.D.:	4 in	2 in	09/04/13		See Note 3.	
Hammer Wt:	140 lb.	140 lb.				
Hammer Fall:	30 in.	30 in.				
Hammer/Rod Type:	Auto/NWJ					
Rig:	CME 550X ATV	C _E = -1.5				

Depth (ft)	Strata ⁽¹⁾	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value) ⁽²⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
65		5) Advanced casing in B-1B to 14' deep prior to continuing with soil sampling. 6) Noted occasional roller bit grinding/chatter below 18' deep, on inferred gravel. 7) Encountered inferred weathered bedrock at approximately 39.2' deep based on split spoon resistance. Roller bit penetration slowed to approximately 1 inch in 5 minutes at approximately 41' deep on inferred top of competent rock. Began rock core at 41' deep. 8) Used reduced drilling RPM and pressure for entire rock core. Encountered oscillations of drill string below 48' deep, most pronounced from 50' to 51' deep, where driller had to pause every 10 to 30 seconds to correct. 9) Grouted borehole with 1 bag portland cement, 1/2 bag bentonite powder, and 40 gallons water. Topped off borehole with approximately 3 inches of cold patch asphalt at the ground surface. 10) All visual descriptions are per the Burmister classification system. All lab gradations are per the AASHTO M 145 classification system.										
70												
75												
80												
85												

Notes:
 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
 2. N Values have not been corrected for hammer energy. C_e is the hammer energy correction factor.
 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

GEODESIGN BORING LOG: 750-09.13 RICHFORD VTRANS.GPJ VERMONT AOT.GDT 10/09/13

PROJECT NAME:	RICHFORD	PLOT DATE:	21-AUG-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	R. PELLETT
FILE NAME:	sl2j158bor.dgn	CHECKED BY:	H. SALLS
PROJECT LEADER:	C. CARLSON	SHEET	16 OF 36
DESIGNED BY:	H. SALLS		
BORING LOGS	2		

VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <u>B-2</u>						
				Richford BRF 0302(29) Richford, VT GeoDesign # 750-09.13		Page No.: <u>1 of 2</u>						
						Pin No.: <u>12j158</u>						
						Checked By: <u>JFW</u>						
Boring Crew: J. Leonhardt (TransTech), A. Baribault (GeoDesign)		Type: Casing FJ, Sampler SS		Groundwater Observations (3)								
Date Started: 9/09/13 Date Finished: 9/09/13		I.D.: 4 in, 2 in		Date	Depth (ft)	Notes						
VTSPG NAD83: N 909686.67 ft E 1592603.64 ft		Hammer Wt: 140 lb., 140 lb.		09/09/13		Not recorded.						
Station: 44+15 Offset: 5' R		Hammer/Rod Type: Auto/NWJ										
Ground Elevation: 436.5 ft		Rig: CME 550X ATV, C _E = ~1.5										
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
5	X X X	6" Asphalt Inferred Fill										
10	X X X	Inferred Boulder / Cobble Inferred Fill				4-9-16-14	11.3	50.1	32.3	17.6	NP	NP
	X X X	S1 (9' to 11'); Medium dense, brown fine to coarse SAND and fine to coarse GRAVEL, little Silt, wet. Rec. = 0.83 ft (AASHTO M145 Classification: A-1-b.)										
	X X X	Inferred Possible Fill										
15	X X X	Inferred Silt / Sand										
20	X X X	Inferred Glacial Till										
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C _E is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.												

VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <u>B-2</u>						
				Richford BRF 0302(29) Richford, VT GeoDesign # 750-09.13		Page No.: <u>2 of 2</u>						
						Pin No.: <u>12j158</u>						
						Checked By: <u>JFW</u>						
Boring Crew: J. Leonhardt (TransTech), A. Baribault (GeoDesign)		Type: Casing FJ, Sampler SS		Groundwater Observations (3)								
Date Started: 9/09/13 Date Finished: 9/09/13		I.D.: 4 in, 2 in		Date	Depth (ft)	Notes						
VTSPG NAD83: N 909686.67 ft E 1592603.64 ft		Hammer Wt: 140 lb., 140 lb.		09/09/13		Not recorded.						
Station: 44+15 Offset: 5' R		Hammer/Rod Type: Auto/NWJ										
Ground Elevation: 436.5 ft		Rig: CME 550X ATV, C _E = ~1.5										
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
35	X X X											
40	X X X	C1 (40' to 43.5'): Poor quality, moderately hard, silvery-gray-green PHYLLITE. Fractures at approximately 60 to 90 degrees.		C1	67 (33)	2.3						
	X X X					1.5						
	X X X					1.5						
	X X X					2.8						
45		Hole stopped @ 43.5 ft										
50		Remarks: 1) Hammer efficiency correction factor is assumed. Strata breaks and composition are inferred from roller bit and casing resistance observed during borehole advance and soil samples collected in nearby Borings B-1 and B-4. Elevation, station and offset are estimated by GeoDesign from site plans provided by VTtrans and taped measurements from existing features made in the field by GeoDesign personnel. They should be considered accurate only to the degree implied by the method of location used. 2) Drove casing to near refusal at approximately 7' deep and cleaned out with roller bit. Return water brown, except gray/greenish-gray from 7' to 7.5' deep. Casing drove at approximately 100 to 200 blows per inch from 7' to 7.3' deep. 3) Inferred gravel fill to 5' deep. Infer elevated gravel content from 5' to 9' deep based on roller bit grinding. Inferred cobble/boulder at 7' to 7.5' deep. 4) Infer strata change between 13' and 15' deep due to decrease in resistance and grinding during casing and roller bit advance from 13' to 14' deep and a change in wash water color to gray between 14' and 15' deep. 5) Infer strata change to glacial till at 17' deep based on increased roller bit resistance. Note quartz gravel in the return water. 6) Encountered inferred gravel within the soil matrix based on roller bit resistance at 26', 27.5', 28.5', 30', 33', 34', 35', and 37.5' deep. Encountered roller bit refusal at 40' deep on inferred competent bedrock. 7) Lowered drilling RPM while coring at 42.5' deep due to rig oscillations. Water hose burst while advancing core barrel at 43.5' deep. Terminated boring at 43.5' deep. 8) Borehole backfilled with winter sand mix and topped with approximately 3 inches of cold patch asphalt at the ground surface. 9) All visual descriptions are per the Burmister classification system. All lab gradations are per the AASHTO M 145 classification system.										
55												
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C _E is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.												

BOTTOM OF FOOTING
ELEV 420.00

GEODESIGN BORING LOG 750-09.13 RICHFORD VTRANS.GPJ VERMONT AOT.GDT 10/9/13

GEODESIGN BORING LOG 750-09.13 RICHFORD VTRANS.GPJ VERMONT AOT.GDT 10/9/13

PROJECT NAME:	RICHFORD
PROJECT NUMBER:	BRF 0302(29)
FILE NAME:	sl2j58bor.dgn
PROJECT LEADER:	C. CARLSON
DESIGNED BY:	H. SALLS
BORING LOGS	3
PLOT DATE:	21-AUG-2014
DRAWN BY:	R. PELLETT
CHECKED BY:	H. SALLS
SHEET	17 OF 36

 STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <u>B-3</u>						
		Richford BRF 0302(29) Richford, VT GeoDesign # 750-09.13		Page No.: <u>1 of 3</u> Pin No.: <u>12j158</u> Checked By: <u>JFW</u>						
Boring Crew: J. Leonhardt (TransTech), A. Baribault (GeoDesign) Date Started: <u>9/05/13</u> Date Finished: <u>9/06/13</u> VTSPG NAD83: <u>N 909729.53 ft E 1592615.18 ft</u> Station: <u>44+58</u> Offset: <u>6' L</u> Ground Elevation: <u>437 ft</u>		Casing Type: <u>FJ</u> Sampler: <u>N.A.</u> I.D.: <u>4 in</u> <u>2 in</u> Hammer Wt: <u>140 lb.</u> <u>N.A.</u> Hammer Fall: <u>30 in.</u> <u>N.A.</u> Hammer/Rod Type: <u>Auto/NWJ</u> Rig: <u>CME 550X ATV</u> $C_e = \sim 1.5$		Groundwater Observations ⁽³⁾ Date: <u>09/06/13</u> Depth: <u>9.7</u> Notes: <u>In casing (15 hrs.)</u>						
Depth (ft)	Strata ⁽¹⁾	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value) ⁽²⁾	Moisture Content %	Gravel %	Sand %	Fines %
5	X X X X X X	6" Asphalt Inferred Fill								
10		Inferred Silt/Sand								
15										
20		Inferred Glacial Till								
25										
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C_e is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.										

BOTTOM OF FOOTING
ELEV 420.00

GEODESIGN BORING LOG 750-09.13 RICHFORD VTRANS.GPJ VERMONT AOT.GDT 10/9/13

 STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <u>B-3</u>						
		Richford BRF 0302(29) Richford, VT GeoDesign # 750-09.13		Page No.: <u>2 of 3</u> Pin No.: <u>12j158</u> Checked By: <u>JFW</u>						
Boring Crew: J. Leonhardt (TransTech), A. Baribault (GeoDesign) Date Started: <u>9/05/13</u> Date Finished: <u>9/06/13</u> VTSPG NAD83: <u>N 909729.53 ft E 1592615.18 ft</u> Station: <u>44+58</u> Offset: <u>6' L</u> Ground Elevation: <u>437 ft</u>		Casing Type: <u>FJ</u> Sampler: <u>N.A.</u> I.D.: <u>4 in</u> <u>2 in</u> Hammer Wt: <u>140 lb.</u> <u>N.A.</u> Hammer Fall: <u>30 in.</u> <u>N.A.</u> Hammer/Rod Type: <u>Auto/NWJ</u> Rig: <u>CME 550X ATV</u> $C_e = \sim 1.5$		Groundwater Observations ⁽³⁾ Date: <u>09/06/13</u> Depth: <u>9.7</u> Notes: <u>In casing (15 hrs.)</u>						
Depth (ft)	Strata ⁽¹⁾	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value) ⁽²⁾	Moisture Content %	Gravel %	Sand %	Fines %
35										
40										
45		C1 (45' to 50'): Poor quality, moderately hard, fine grained, silvery gray-green with white GNEISS. With occasional Quartz bedding. Fractures between 30 and 70 degrees from horizontal.	C1	72 (38)	2.25					
50		Hole stopped @ 50.0 ft								
55		Remarks: 1) Hammer efficiency correction factor is assumed. Strata breaks and composition are inferred from roller bit and casing resistance observed during borehole advance and soil samples collected in nearby Borings B-1 and B-4. Elevation, station and offset are estimated by GeoDesign from site plans provided by VTTrans and taped measurements from existing features made in the field by GeoDesign personnel. They should be considered accurate only to the degree implied by the method of location used. 2) Casing driven to 8' deep. Note advancement rate slowed considerably at approximately 7.7' deep. 3) Wash water observed to be grayish-brown in color from surface to 12' deep before turning gray below 12' deep. 4) Noted grinding of roller bit from approximately 7.5' to 8.5' deep on inferred gravel. 5) Infer strata change to Silt / Sand at 8.5' deep due to significant increase in bit advancement rate. 6) Infer strata change to glacial till due to decrease in advancement rate at 17' deep. 7) Note decrease in advancement rate at 22' deep through inferred dense glacial till soils. Consistent, slow rate from 22' to 41.5' deep, with an increase from 41.5' to 43.5' deep.								
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C_e is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.										

GEODESIGN BORING LOG 750-09.13 RICHFORD VTRANS.GPJ VERMONT AOT.GDT 10/9/13

PROJECT NAME:	RICHFORD
PROJECT NUMBER:	BRF 0302(29)
FILE NAME:	sl2j158bor.dgn
PROJECT LEADER:	C. CARLSON
DESIGNED BY:	H. SALLS
BORING LOGS	4
PLOT DATE:	21-AUG-2014
DRAWN BY:	R. PELLETT
CHECKED BY:	H. SALLS
SHEET	18 OF 36



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

BORING LOG

Richford BRF 0302(29)
Richford, VT
GeoDesign # 750-09.13

Boring No.: B-3
 Page No.: 3 of 3
 Pin No.: 12j158
 Checked By: JFW

Boring Crew: J. Leonhardt (TransTech), A. Baribault (GeoDesign)		Casing	Sampler	Groundwater Observations ⁽³⁾		
Date Started: <u>9/05/13</u>	Date Finished: <u>9/06/13</u>	Type: <u>FJ</u>	<u>N.A.</u>	Date	Depth (ft)	Notes
VTSPG NAD83: <u>N 909729.53 ft E 1592615.18 ft</u>		I.D.: <u>4 in</u>	<u>2 in</u>	<u>09/06/13</u>	<u>9.7</u>	<u>In casing (15 hrs.)</u>
Station: <u>44+58</u>	Offset: <u>6' L</u>	Hammer Wt: <u>140 lb.</u>	<u>N.A.</u>			
Ground Elevation: <u>437 ft</u>		Hammer Fall: <u>30 in.</u>	<u>N.A.</u>			
		Hammer/Rod Type: <u>Auto/NWJ</u>				
		Rig: <u>CME 550X ATV</u>	<u>C_E = -1.5</u>			

Depth (ft)	Strata ⁽¹⁾	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value) ⁽²⁾	Moisture Content %	Gravel %	Sand %	Fines %
65		8) Inferred gravelly zones within the glacial till matrix based on drilling resistance / behavior from 31' to 31.5' deep, 38' to 38.5' deep, and 43.5' to 44' deep. 9) Borehole backfilled with winter sand mix and topped with approximately 3 inches of cold patch asphalt at the ground surface. 10) All visual descriptions are per the Burmister classification system.								
70										
75										
80										
85										

Notes:
 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
 2. N Values have not been corrected for hammer energy. C_e is the hammer energy correction factor.
 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

GEODESIGN BORING LOG: 750-09.13 RICHFORD VTRANS.GPJ VERMONT AOT.GDT 10/9/13

PROJECT NAME: RICHFORD	PLOT DATE: 21-AUG-2014
PROJECT NUMBER: BRF 0302(29)	DRAWN BY: R. PELLETT
FILE NAME: si2j58bor.dgn	CHECKED BY: H. SALLS
PROJECT LEADER: C. CARLSON	SHEET 19 OF 36
DESIGNED BY: H. SALLS	
BORING LOGS 5	

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: B-4								
Richford BRF 0302(29) Richford, VT GeoDesign # 750-09.13		Type: Casing Sampler		Page No.: 1 of 3								
Boring Crew: J. Leonhardt (TransTech), A. Baribault (GeoDesign)		I.D.: 4 in 2 in		Pin No.: 12j158								
Date Started: 9/03/13 Date Finished: 9/04/13		Hammer Wt: 140 lb. 140 lb.		Checked By: JFW								
VTSPG NAD83: N 909724.13 ft E 1592624.76 ft		Hammer Fall: 30 in. 30 in.		Groundwater Observations (3)								
Station: 44+58 Offset: 5' R		Hammer/Rod Type: Auto/NWJ		Date	Depth (ft)							
Ground Elevation: 437 ft		Rig: CME 550X ATV C _E = -1.5		09/03/13	10.0	Wet sample						
				09/04/13	9.5	In Casing						
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value) ⁽²⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
0		6" Asphalt										
0.5		S1 (0.5' to 2'): Medium dense, tan fine to coarse SAND, little fine Gravel, little Silt, slightly moist. (Roadbase Fill) Rec. = 1.08 ft (AASHTO M145 Classification: A-1-b.)				8-15-14 (29)	4.7	29.3	51.9	18.8	NP	NP
2		S2 (2' to 4'): Medium dense, brown fine to coarse SAND, some fine to coarse Gravel, some Silt, moist. (Subbase Fill) Rec. = 1.0 ft (AASHTO M145 Classification: A-1-b.)				11-9-7-6 (16)	8.0	42.5	35.7	21.8	NP	NP
4		S3 (4' to 6'): Loose, brown fine to coarse SAND, some Silt, little fine Gravel, moist. (Possible Fill) Rec. = 0.67 ft (AASHTO M145 Classification: A-2-4.)				3-2-3-2 (5)	16.0	26.1	52.5	21.4	NP	NP
6		S4 (6' to 8'): Loose, brown and gray fine to coarse SAND, some Silt, trace fine Gravel, very moist. (Possible Fill) Rec. = 1.08 ft (AASHTO M145 Classification: A-2-4.)				4-3-1-3 (4)	23.2	8.5	59.4	32.1	NP	NP
9		S5 (9' to 11'): Loose, gray SILT, little fine to coarse Sand, trace fine Gravel (concentrated in top of sample), wet. (Silt / Sand) Rec. = 1.17 ft (AASHTO M145 Classification: A-4.)				3-3-2-4 (5)	25.1	9.6	4.2	86.2	22	1
11		S6 (11' to 13'): Medium dense, gray SILT, some Clayey Silt, trace fine Sand, wet. (Silt / Sand) Rec. = 1.67 ft (AASHTO M145 Classification: A-4.)				4-6-5-6 (11)	27.9	1.3	98.7	25	6	
14		S7 (14' to 16'): Loose, gray SILT and Clayey SILT (laminated), trace fine Sand, wet. (Silt / Sand) Rec. = 1.67 ft (AASHTO M145 Classification: A-4.)				3-4-3-3 (7)	28.9	1.0	99.0	24	5	
16		S8A (16' to 17') - Upper 8" of S8: Medium dense, gray SILT, trace Clayey Silt, trace fine Sand, wet. (Silt / Sand) Rec. = 1.0 ft (AASHTO M145 Classification: A-4.)				3-2-8-10 (10)	27.4	2.7	97.3	22	2	
17		S8B (17' to 18') - Lower 4" of S8: Medium dense, gray fine to coarse SAND, some Silt, some fine Gravel, wet. (Glacial Till) (AASHTO M145 Classification: A-2-4.)				9-9	41.0	30.6	28.4	NP	NP	
19		S9 (19' to 21'): Dense, gray fine to coarse SAND, some fine to coarse Gravel, some Silt, moist to wet. (Glacial Till) Rec. = 1.33 ft (AASHTO M145 Classification: A-2-4.)				9-16-20-26 (36)	9.3	35.3	34.2	30.5	NP	NP
21		S10 (21' to 23'): Very dense, gray/green fine to coarse SAND and SILT, some fine Gravel, moist to wet. (Glacial Till) Rec. = 1.25 ft (AASHTO M145 Classification: A-2-4.)				24-29-27-28 (56)	10.0	32.7	32.0	35.3	NP	NP
24		S11 (24' to 24.4'): Refusal, gray SILT and fine to coarse SAND, some fine to coarse Gravel, moist to wet. (Glacial Till) Rec. = 0.42 ft (AASHTO M145 Classification: A-4.)				80/5.5" (R)	9.1	29.7	32.5	37.8	NP	NP
29		S12 (29' to 29.4'): Refusal, gray SILT and fine to coarse Sand, trace fine Gravel, moist. (Glacial Till) Rec. = 0.42 ft				80/5.5" (R)	9.7	14.4	33.8	51.8	NP	NP

Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_e is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: B-4								
Richford BRF 0302(29) Richford, VT GeoDesign # 750-09.13		Type: Casing Sampler		Page No.: 2 of 3								
Boring Crew: J. Leonhardt (TransTech), A. Baribault (GeoDesign)		I.D.: 4 in 2 in		Pin No.: 12j158								
Date Started: 9/03/13 Date Finished: 9/04/13		Hammer Wt: 140 lb. 140 lb.		Checked By: JFW								
VTSPG NAD83: N 909724.13 ft E 1592624.76 ft		Hammer Fall: 30 in. 30 in.		Groundwater Observations								
Station: 44+58 Offset: 5' R		Hammer/Rod Type: Auto/NWJ		Date	Depth (ft)							
Ground Elevation: 437.0 ft		Rig: CME 550X ATV C _e = -1.5		09/03/13	10.0	Wet sample						
				09/04/13	9.5	In Casing						
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
0		(AASHTO M145 Classification: A-4.)										
34		S13 (34' to 34.3'): Refusal, gray SILT, some fine to coarse Sand, some fine to coarse Gravel (fractured, platelike), moist. (Glacial Till) Rec. = 0.33 ft (AASHTO M145 Classification: A-4.)				80/4" (R)	9.3	29.0	26.9	44.1	NP	NP
39		S14 (39' to 39.2'): Refusal, gray and white SILT, some fine to coarse Gravel, some fine to coarse Sand, moist. (Glacial Till) Rec. = 0.25 ft (AASHTO M145 Classification: A-4.)				100/3" (R)	8.9	36.5	24.0	39.5	NP	NP
44		S15 (44' to 44.2'): Refusal, gray WEATHERED PHYLLITE. C1 (44' to 49'): Very poor quality, gray to greenish-gray, fine-grained weathered to extremely weathered (majority of core washed away) PHYLLITE, fracture angle estimated at 70 to 90 degrees.	C1	25 (0)	2.5	100/2" (R)						
49		S16 (49' to 49.1'): Refusal, gray WEATHERED PHYLLITE with highly weathered zones. C2 (49' to 54'): Fair quality, greenish-gray fine grained, slightly to moderately weathered PHYLLITE, fracture angle approximately 45 to 70 degrees.	C2	78 (50)	3.5	100/1" (R)						
54		C3 (54' to 59'): Poor quality, greenish-gray fine grained, moderately weathered PHYLLITE, fracturing approximately 70 to 90 degrees.	C3	80 (25)	3							
59		Hole stopped @ 59.0 ft										

Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_e is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

PROJECT NAME: RICHFORD
PROJECT NUMBER: BRF 0302(29)

FILE NAME: sl2j58bor.dgn PLOT DATE: 21-AUG-2014
PROJECT LEADER: C. CARLSON DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS CHECKED BY: H. SALLS
BORING LOGS 6 SHEET 20 OF 36



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

BORING LOG

Richford BRF 0302(29)
Richford, VT
GeoDesign # 750-09.13

Boring No.: B-4
 Page No.: 3 of 3
 Pin No.: 12j158
 Checked By: JFW

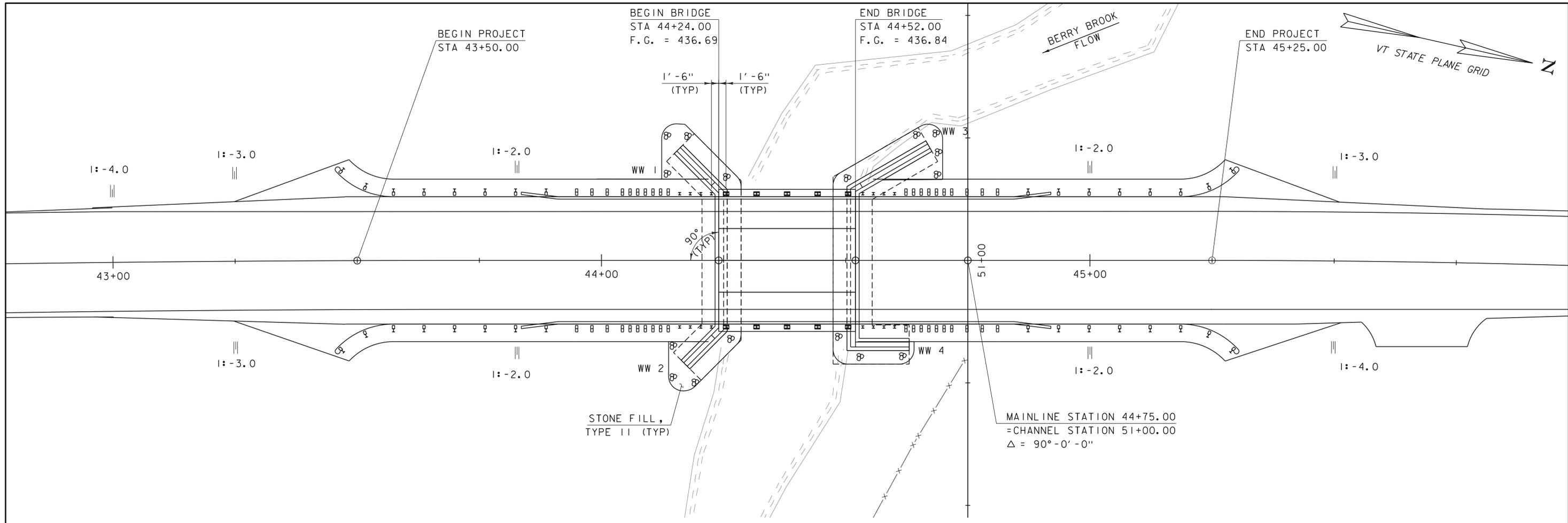
Boring Crew: J. Leonhardt (TransTech), A. Baribault (GeoDesign)		Casing	Sampler	Groundwater Observations ⁽³⁾		
Date Started: <u>9/03/13</u>	Date Finished: <u>9/04/13</u>	Type: <u>FJ</u>	<u>SS</u>	Date	Depth (ft)	Notes
VTSPG NAD83: <u>N 909724.13 ft E 1592624.76 ft</u>		I.D.: <u>4 in</u>	<u>2 in</u>	<u>09/03/13</u>	<u>10.0</u>	<u>Wet sample</u>
Station: <u>44+58</u>	Offset: <u>5' R</u>	Hammer Wt: <u>140 lb.</u>	<u>140 lb.</u>	<u>09/04/13</u>	<u>9.5</u>	<u>In Casing</u>
Ground Elevation: <u>437 ft</u>		Hammer Fall: <u>30 in.</u>	<u>30 in.</u>			
		Hammer/Rod Type: <u>Auto/NWJ</u>				
		Rig: <u>CME 550X ATV</u>	<u>C_E = -1.5</u>			

Depth (ft)	Strata ⁽¹⁾	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value) ⁽²⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %	
65		Remarks: 1) Hammer efficiency correction factor is assumed. Elevation, station and offset are estimated by GeoDesign from site plans provided by VTrans and taped measurements from existing features made in the field by GeoDesign personnel. They should be considered accurate only to the degree implied by the method of location used. 2) Samples S2 and S4 were not performed in accordance with ASTM D1586, (samples taken immediately after preceding split spoon sample without first clearing the borehole with the roller bit). 3) Soil moisture descriptions may not accurately depict actual conditions due to wash and drive drilling methods. Observe brown return water to approximately 10' deep, then turning gray. 4) Drove casing to 10' deep prior to advancing borehole open hole with the roller bit to 17' deep. At 17' deep encountered gravelly soils resulting in loss of water. Drive casing to 21 feet deep (prior to sampling S10) and advance the remainder of the borehole open hole with the roller bit until beginning coring at 44' deep. 5) Encountered weathered rock in sample S15 at 44' deep. Attempted core from 44' to 49' deep with low recovery / RQD sample obtained. Cleaned hole with roller bit to 49 feet and attempted split spoon. 6) Return water light gray during rock core. Coring times inflated due to drill string oscillation leading to driller using a lower RPM drilling speed and having stop approximately 1 to 4 times per minute to correct, particularly for C2 and C3. 7) Borehole grouted with 1 bag portland cement, 1/2 bag bentonite powder, and 40 gallons water. Topped off borehole with approximately 3 inches of cold patch asphalt at the ground surface. 8) All visual descriptions are per the Burmister classification system. All lab gradations are per the AASHTO M 145 classification system.											
70													
75													
80													
85													

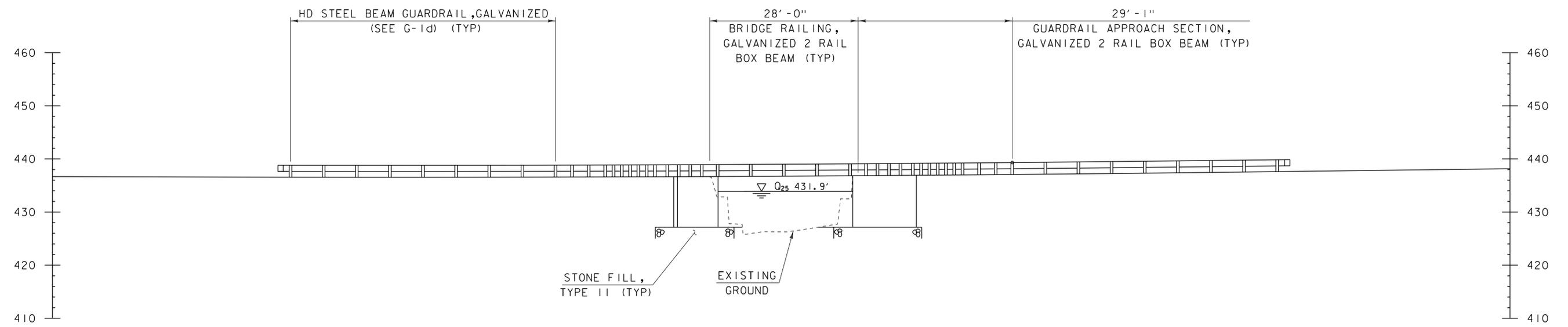
Notes:
 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
 2. N Values have not been corrected for hammer energy. C_e is the hammer energy correction factor.
 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

GEODESIGN BORING LOG: 750-09.13 RICHFORD VTRANS.GPJ VERMONT AOT.GDT 10/9/13

PROJECT NAME:	RICHFORD
PROJECT NUMBER:	BRF 0302(29)
FILE NAME:	sl2j158bor.dgn
PROJECT LEADER:	C. CARLSON
DESIGNED BY:	H. SALLS
BORING LOGS	7
PLOT DATE:	21-AUG-2014
DRAWN BY:	R. PELLETT
CHECKED BY:	H. SALLS
SHEET	21 OF 36



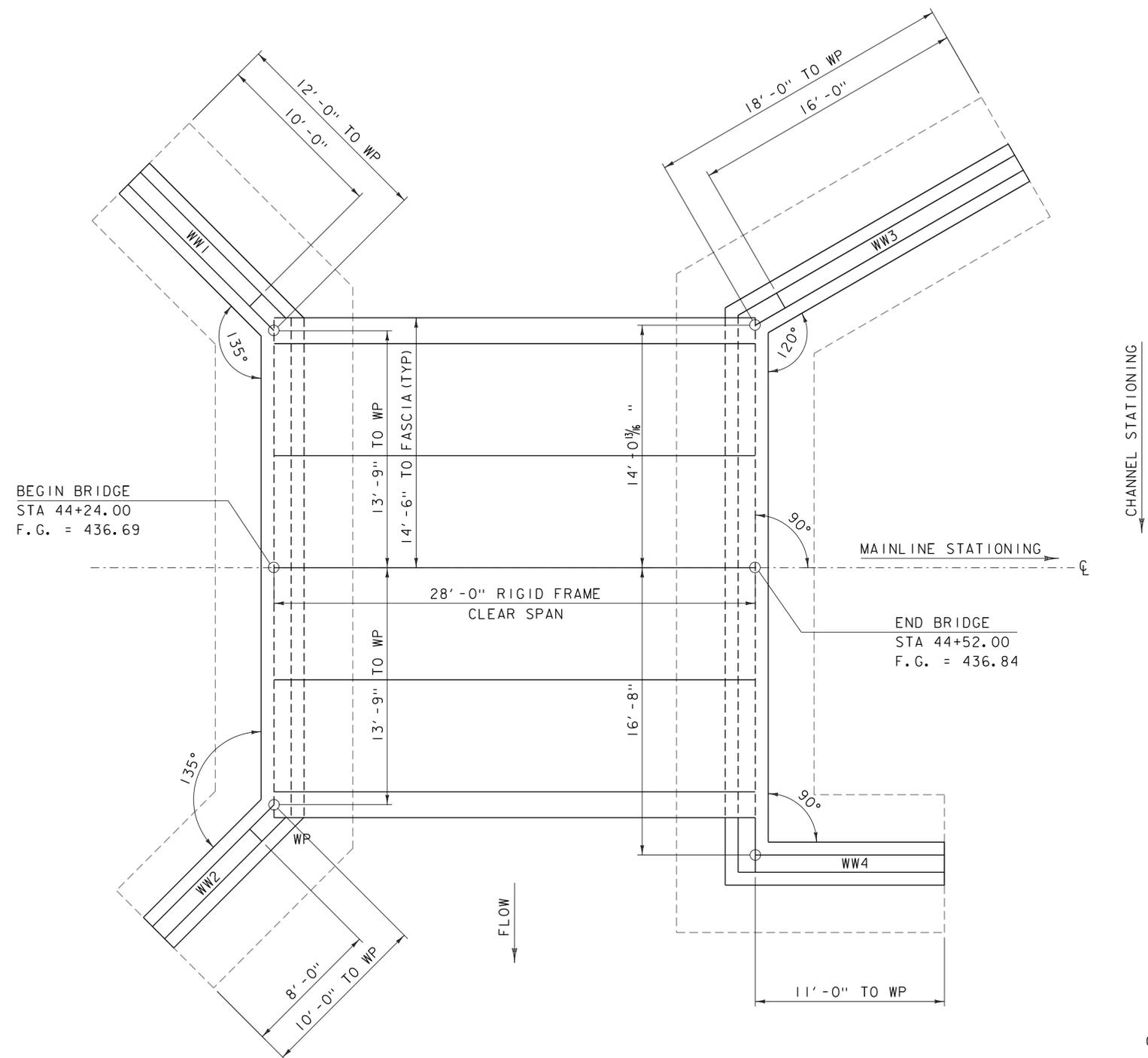
PLAN



ELEVATION

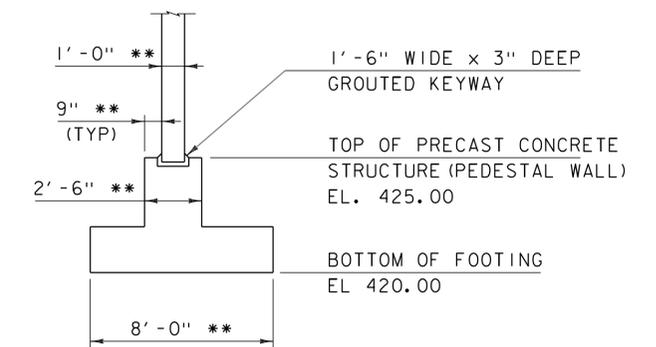
PROJECT NAME: RICHFORD	
PROJECT NUMBER: BRF 0302(29)	
FILE NAME: sl2j58pe.dgn	PLOT DATE: 21-AUG-2014
PROJECT LEADER: C. CARLSON	DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS	CHECKED BY: H. SALLS
PLAN AND ELEVATION	SHEET 22 OF 36

SCALE 1" = 10'-0"



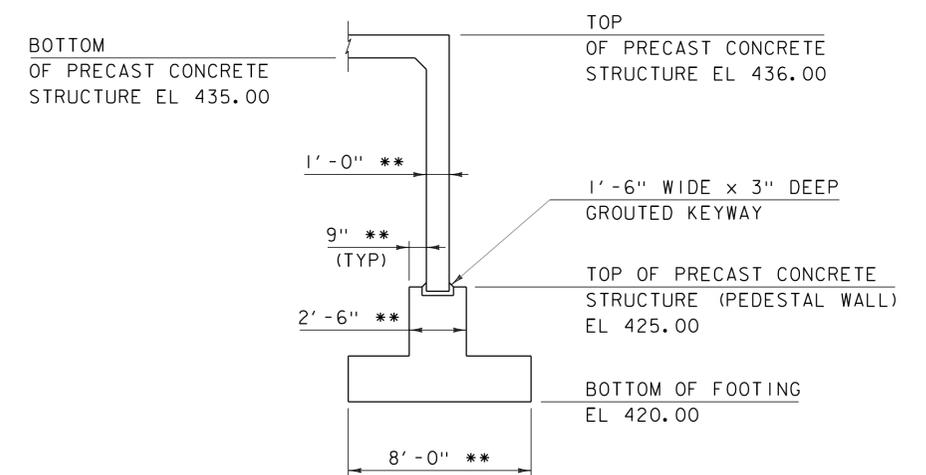
PEDESTAL WALL LAYOUT

SCALE 1/4" = 1'-0"



WINGWALL SECTION

SCALE 1/4" = 1'-0"

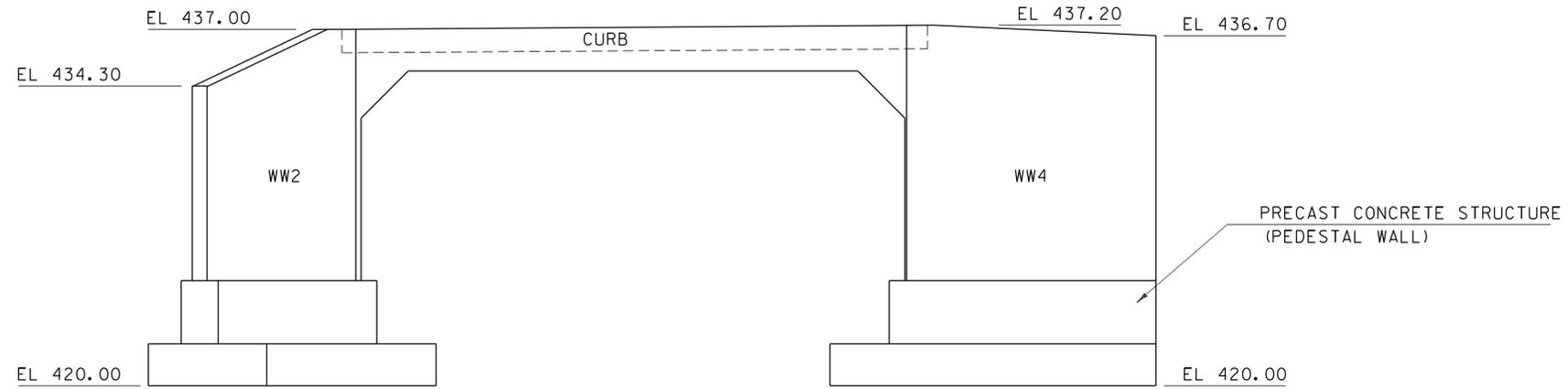


PEDESTAL WALL SECTION

SCALE 1/4" = 1'-0"

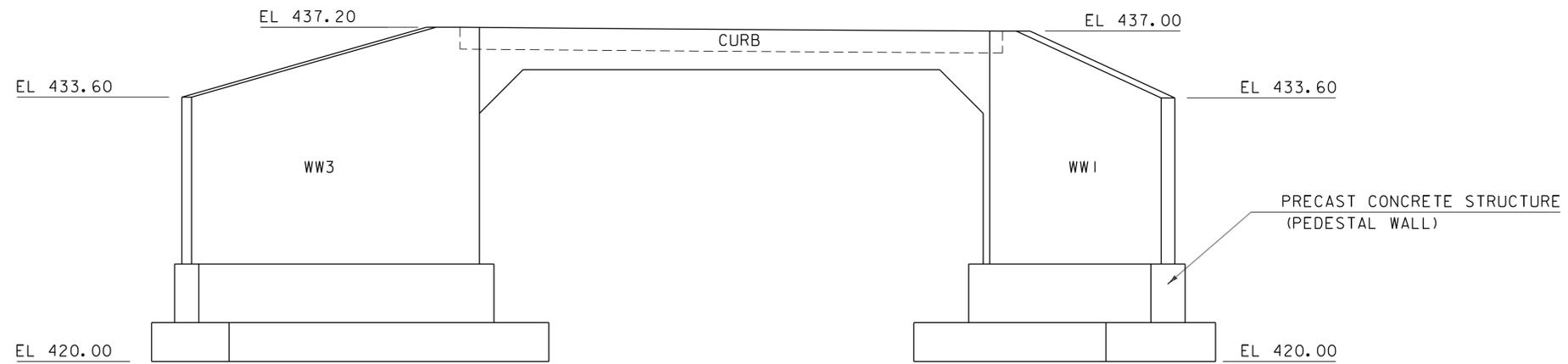
** DIMENSION SHOWN FOR ESTIMATING PURPOSES ONLY. ACTUAL DIMENSIONS TO BE DETERMINED BY THE FABRICATOR.

PROJECT NAME: RICHFORD	
PROJECT NUMBER: BRF 0302(29)	
FILE NAME: sl2j58sub.dgn	PLOT DATE: 21-AUG-2014
PROJECT LEADER: C. CARLSON	DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS	CHECKED BY: H. SALLS
PEDESTAL WALL LAYOUT	SHEET 23 OF 36



DOWNSTREAM ELEVATION LOOKING UPSTREAM

SCALE 1/4" = 1'-0"

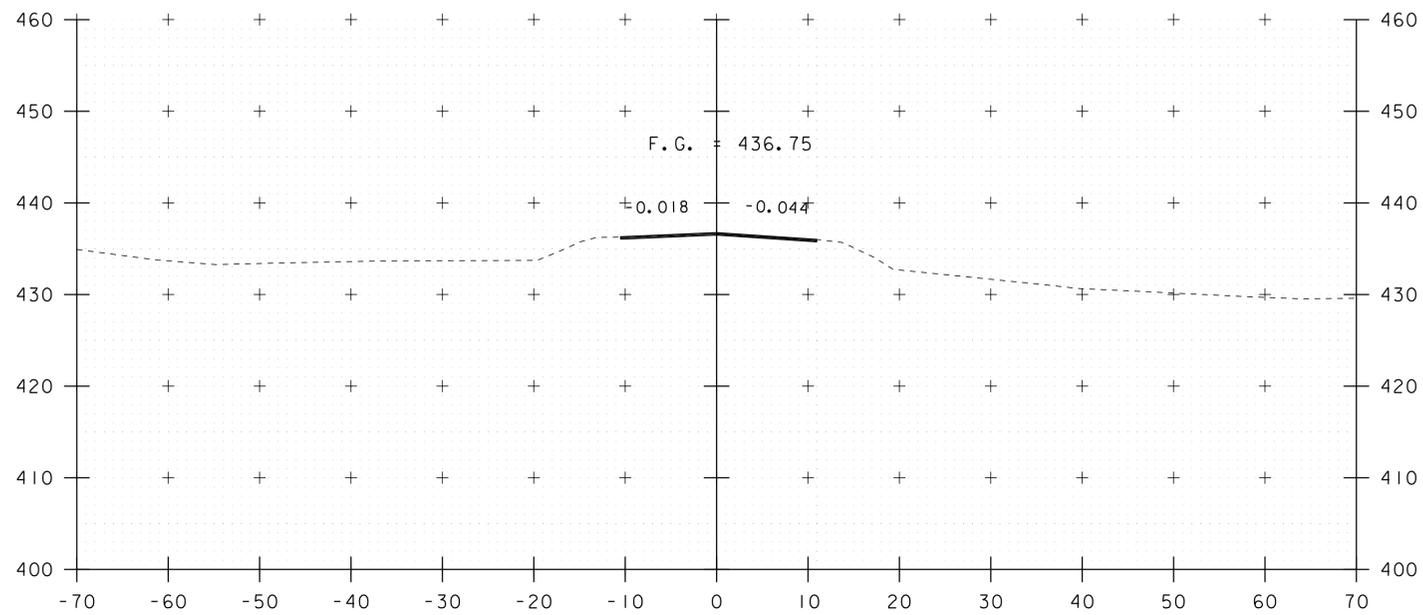


UPSTREAM ELEVATION LOOKING DOWNSTREAM

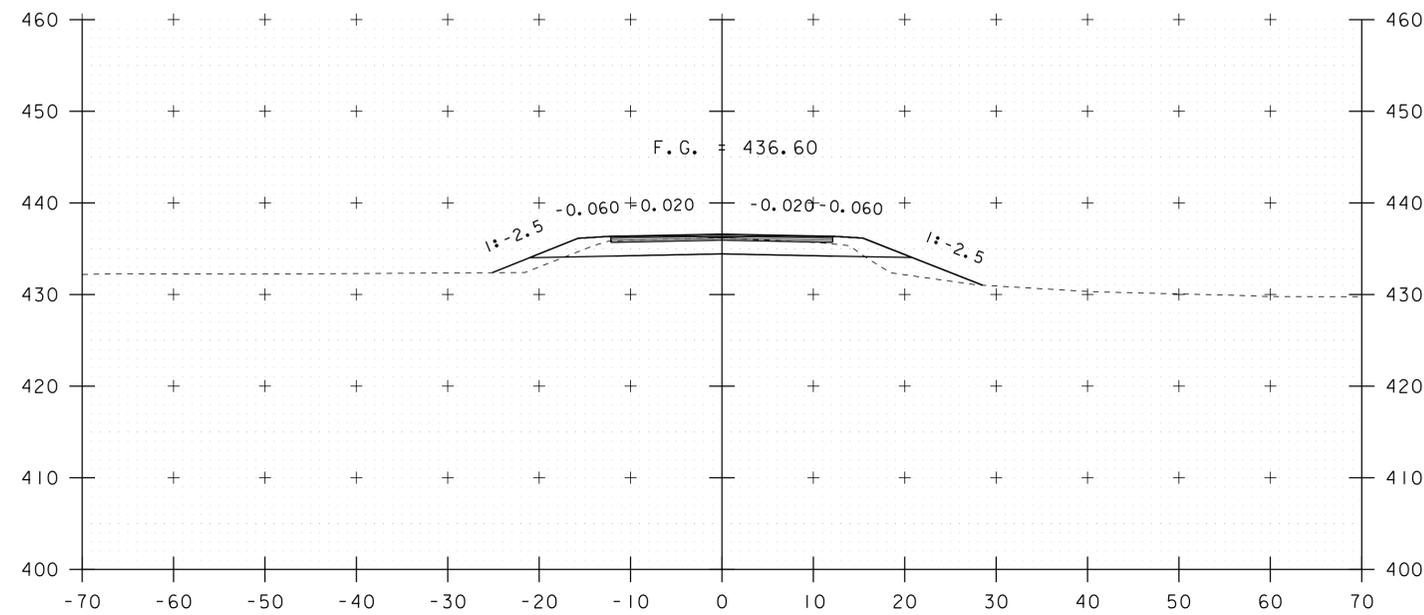
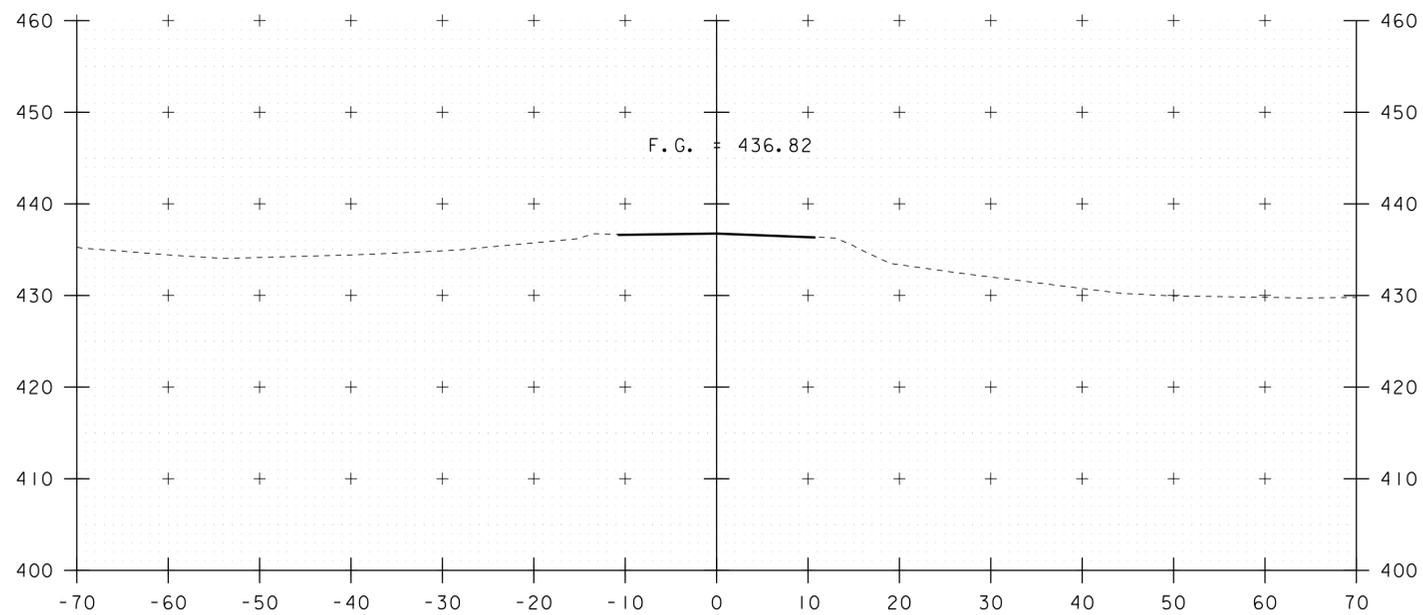
SCALE 1/4" = 1'-0"

PROJECT NAME: RICHFORD
PROJECT NUMBER: BRF 0302(29)

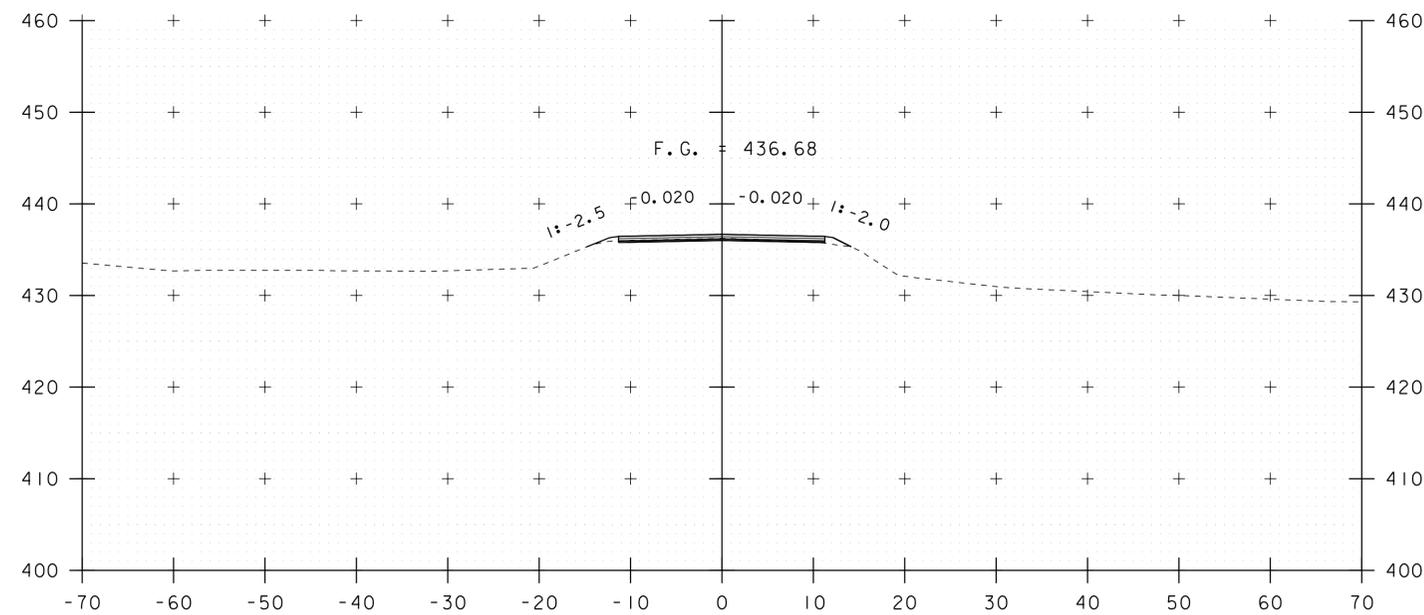
FILE NAME: sl2j158sub.dgn	PLOT DATE: 21-AUG-2014
PROJECT LEADER: C. CARLSON	DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS	CHECKED BY: H. SALLS
RIGID FRAME ELEVATION	SHEET 24 OF 36



42+75



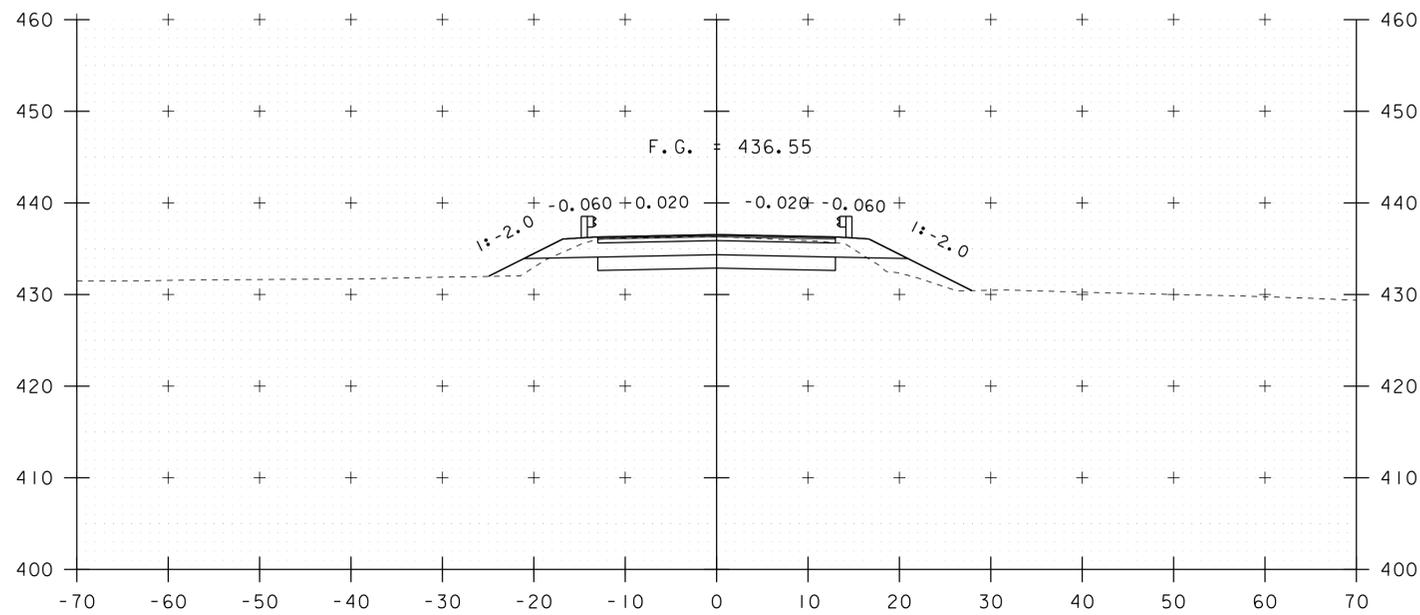
43+25



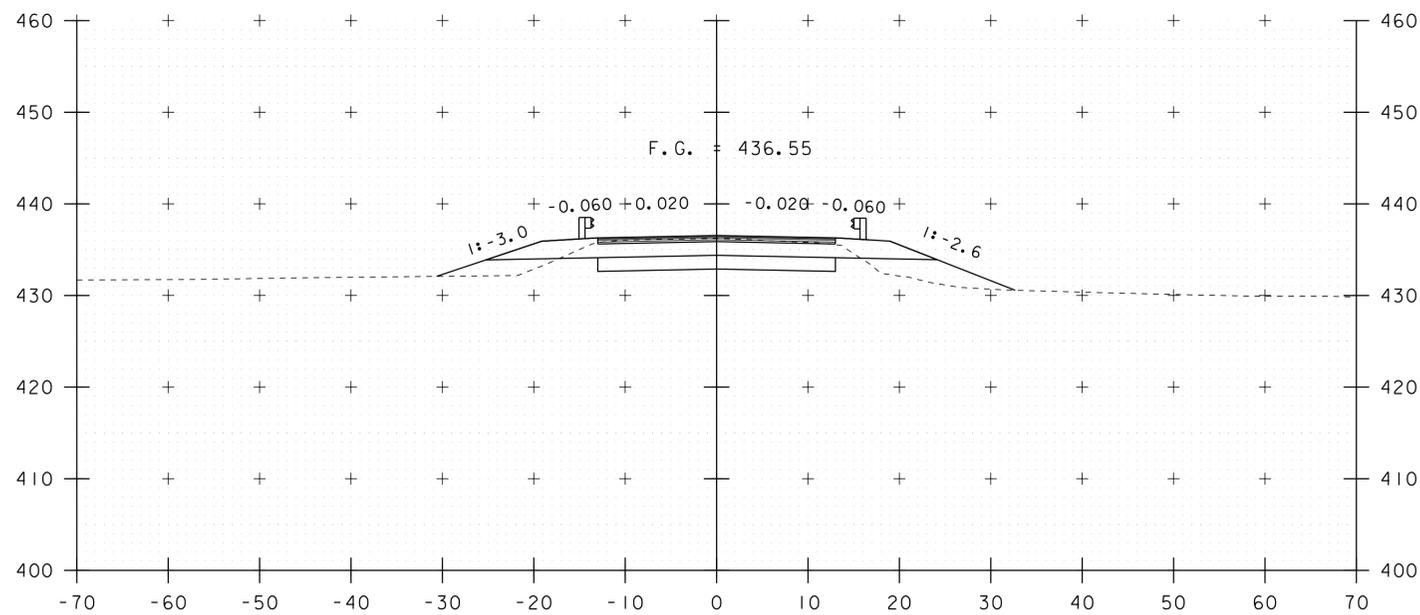
43+00

STA. 42+50 TO STA. 43+25

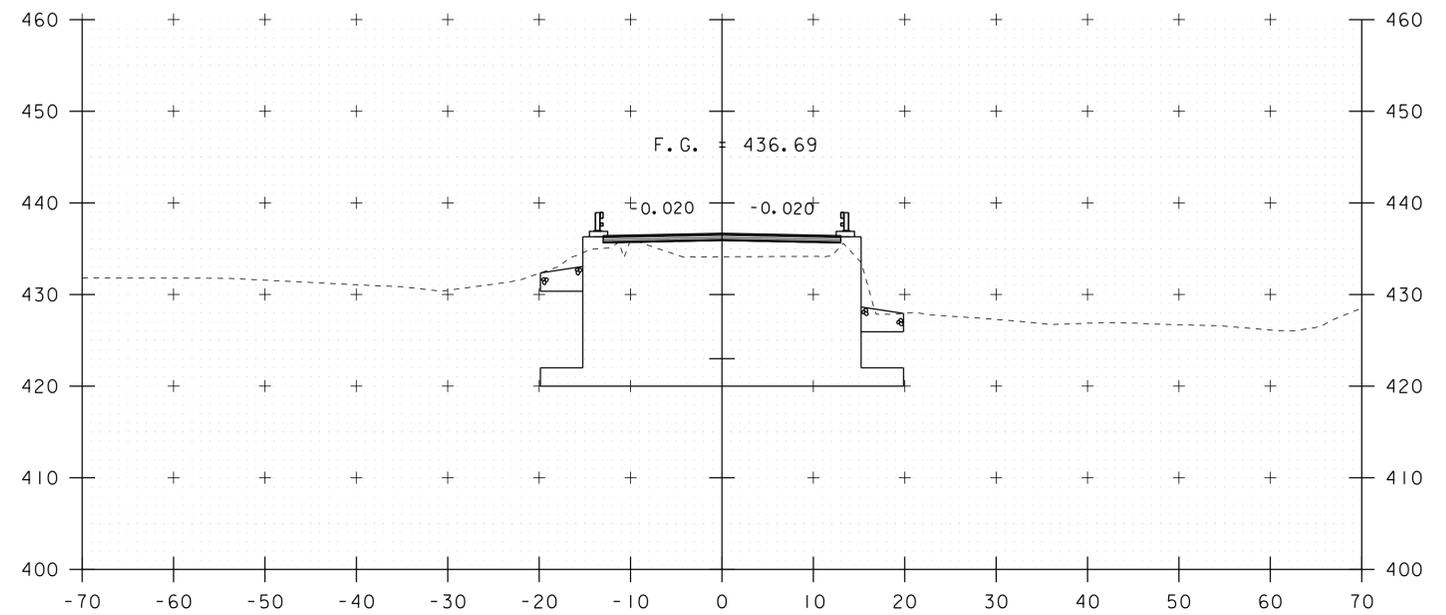
PROJECT NAME: RICHFORD	PLOT DATE: 21-AUG-2014
PROJECT NUMBER: BRF 0302(29)	DRAWN BY: R. PELLETT
FILE NAME: sl2j58xs.dgn	DESIGNED BY: H. SALLS
PROJECT LEADER: C. CARLSON	CHECKED BY: H. SALLS
DESIGNED BY: H. SALLS	SHEET 25 OF 36
MAINLINE CROSS SECTIONS	



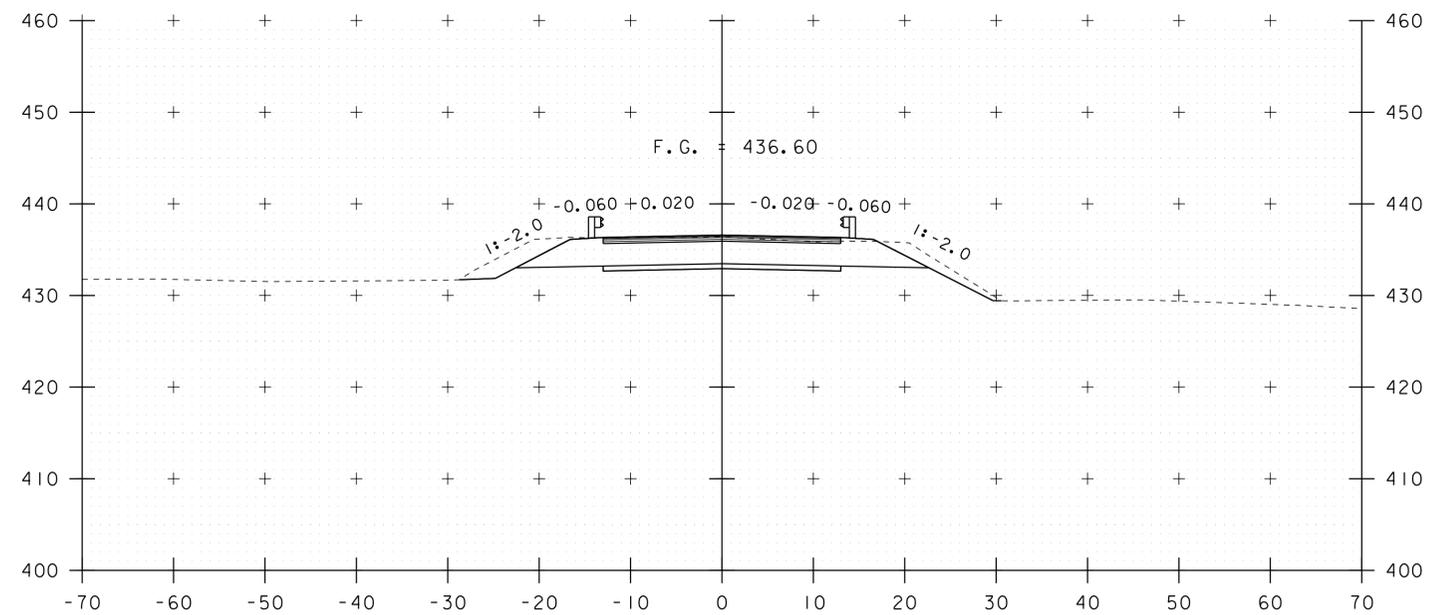
43+75



43+50
BEGIN PROJECT



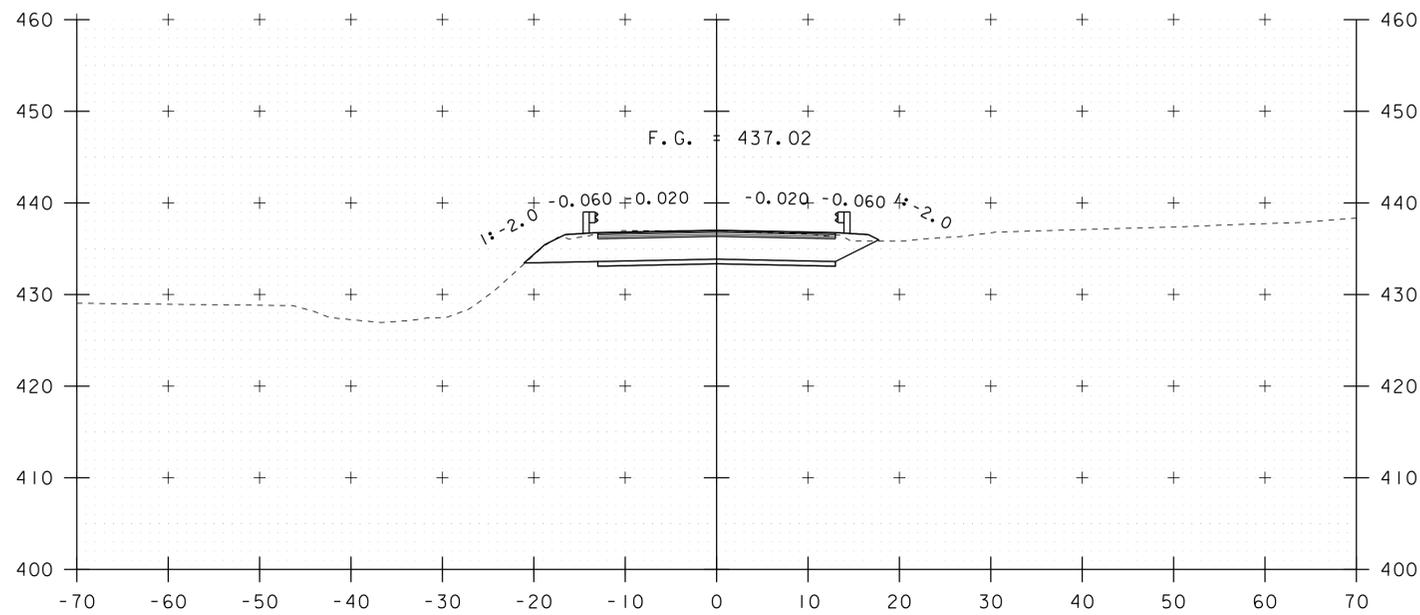
44+25
STA 44+24 BEGIN BRIDGE



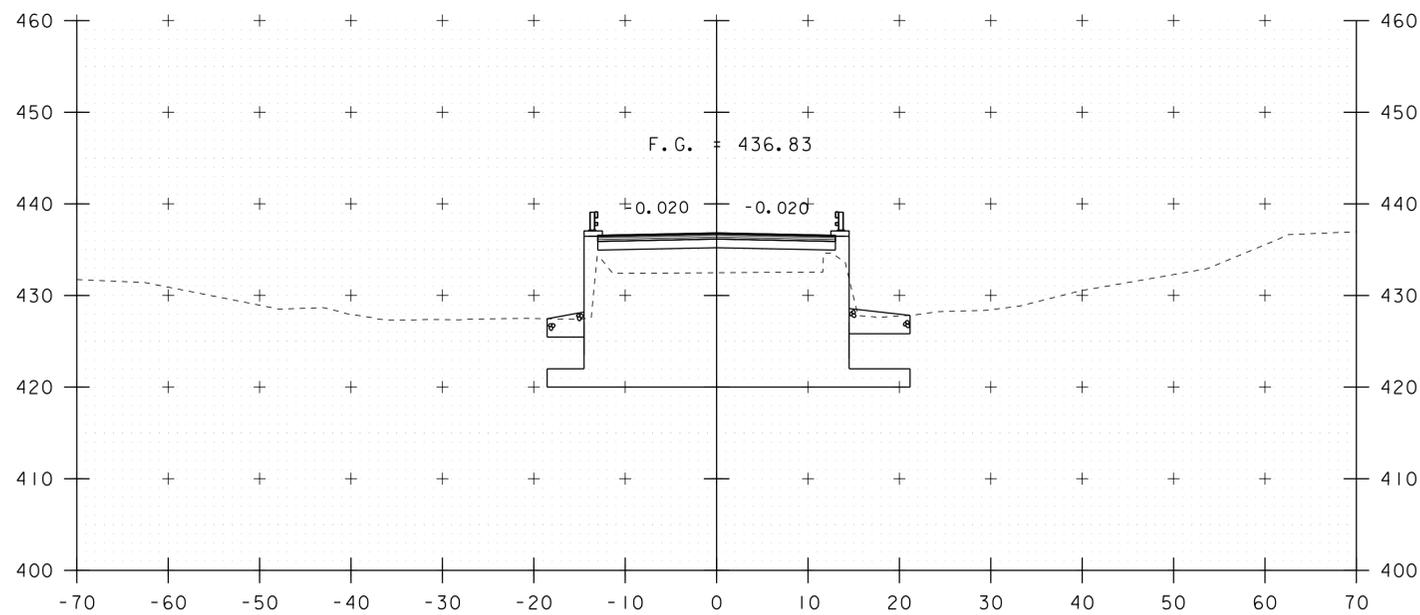
44+00

STA. 43+50 TO STA. 44+25

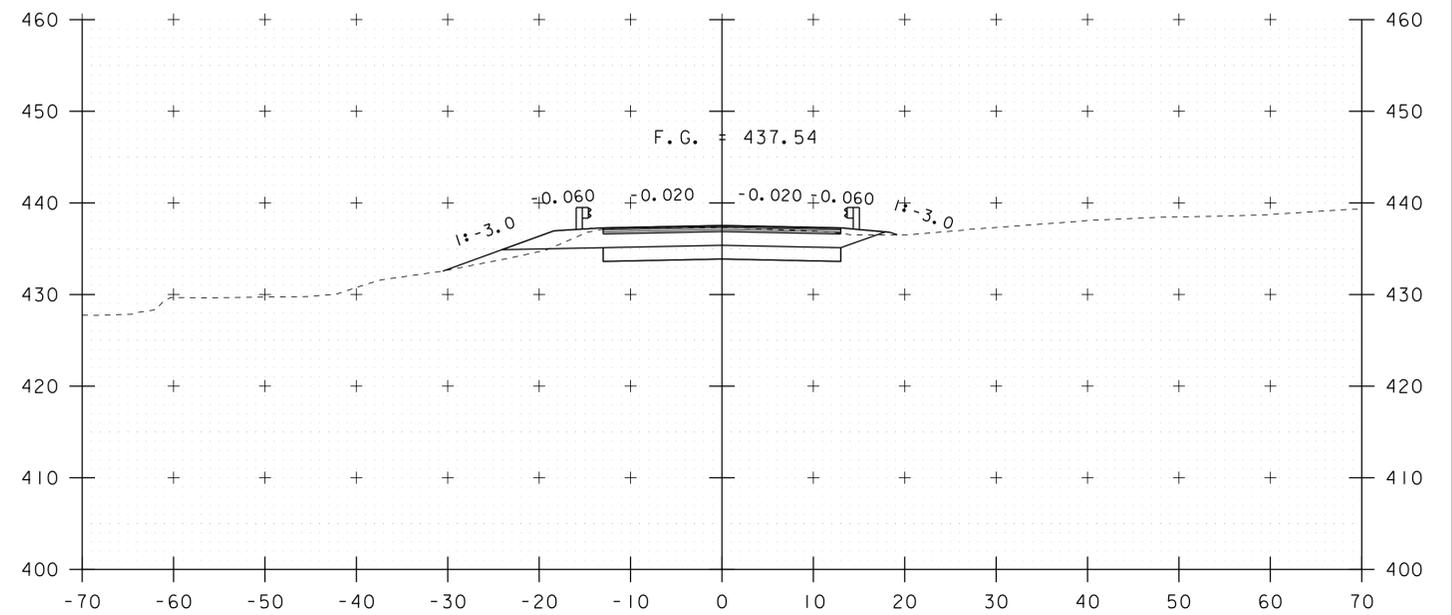
PROJECT NAME:	RICHFORD	PLOT DATE:	21-AUG-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	R. PELLETT
FILE NAME:	sl2j58xs.dgn	DESIGNED BY:	H. SALLS
PROJECT LEADER:	C. CARLSON	CHECKED BY:	H. SALLS
MAINLINE CROSS SECTIONS		SHEET	26 OF 36



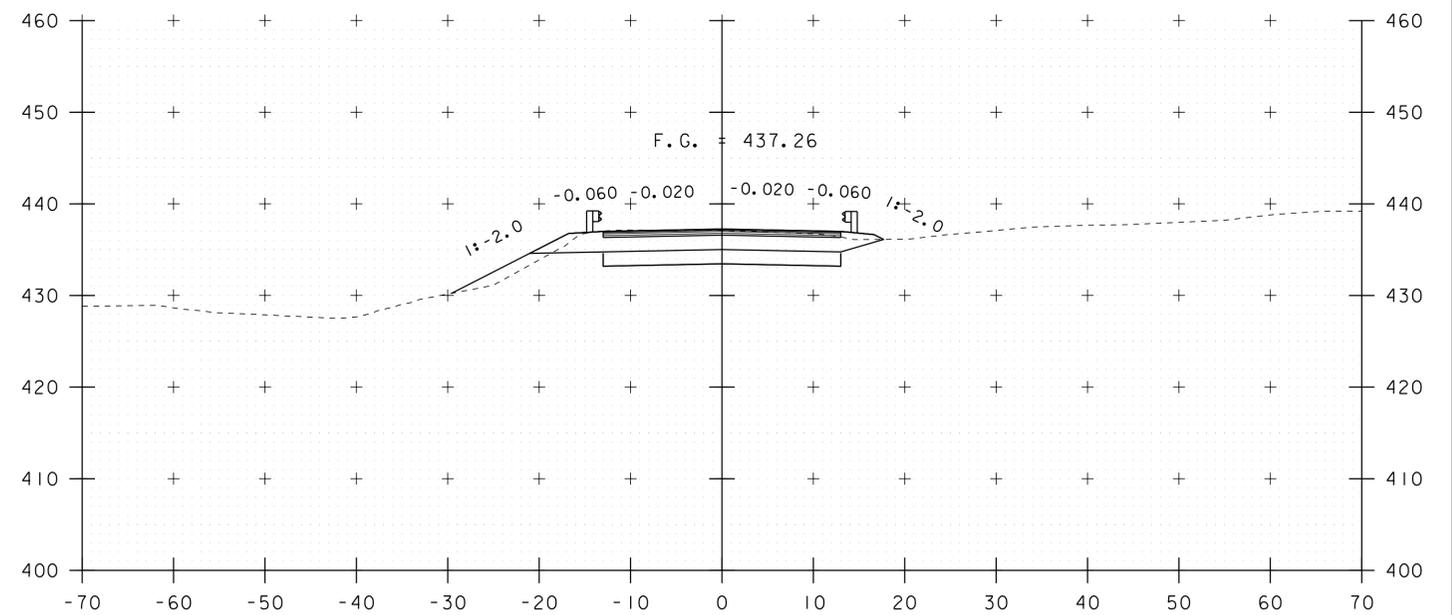
44+75



44+50
STA. 44+52 END BRIDGE



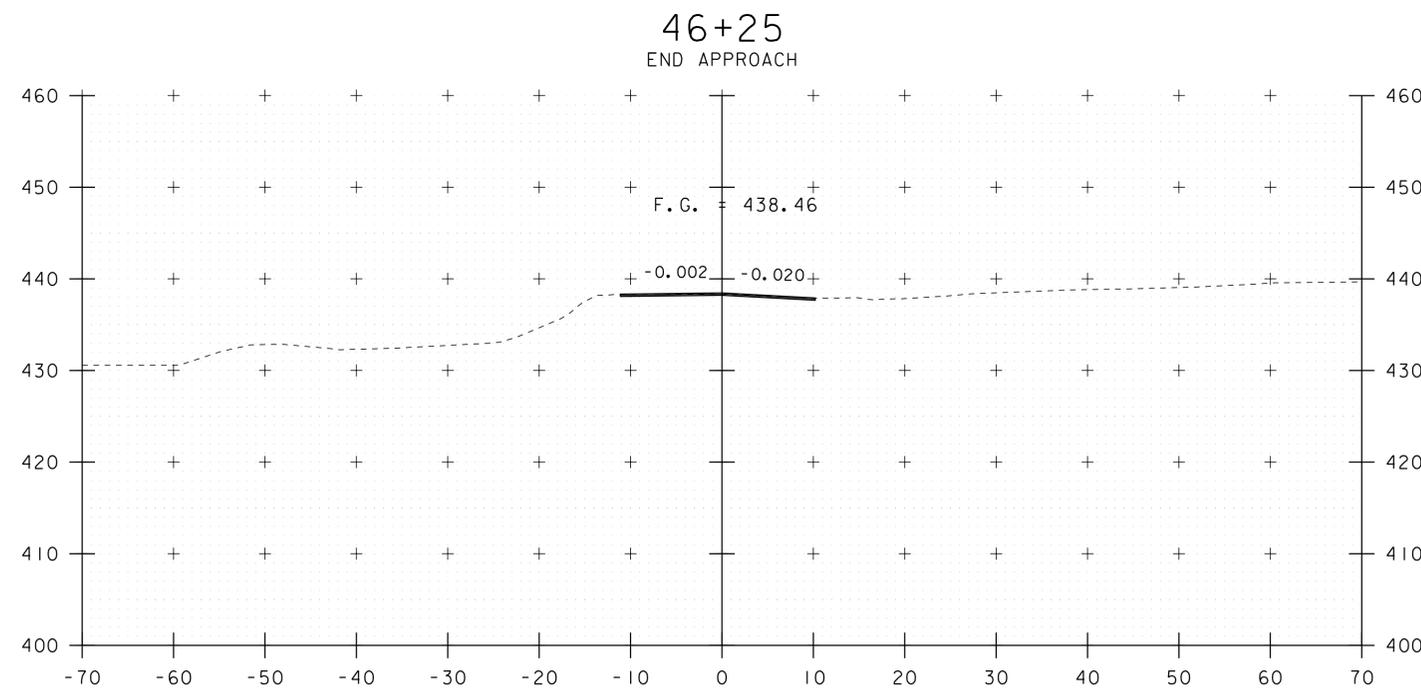
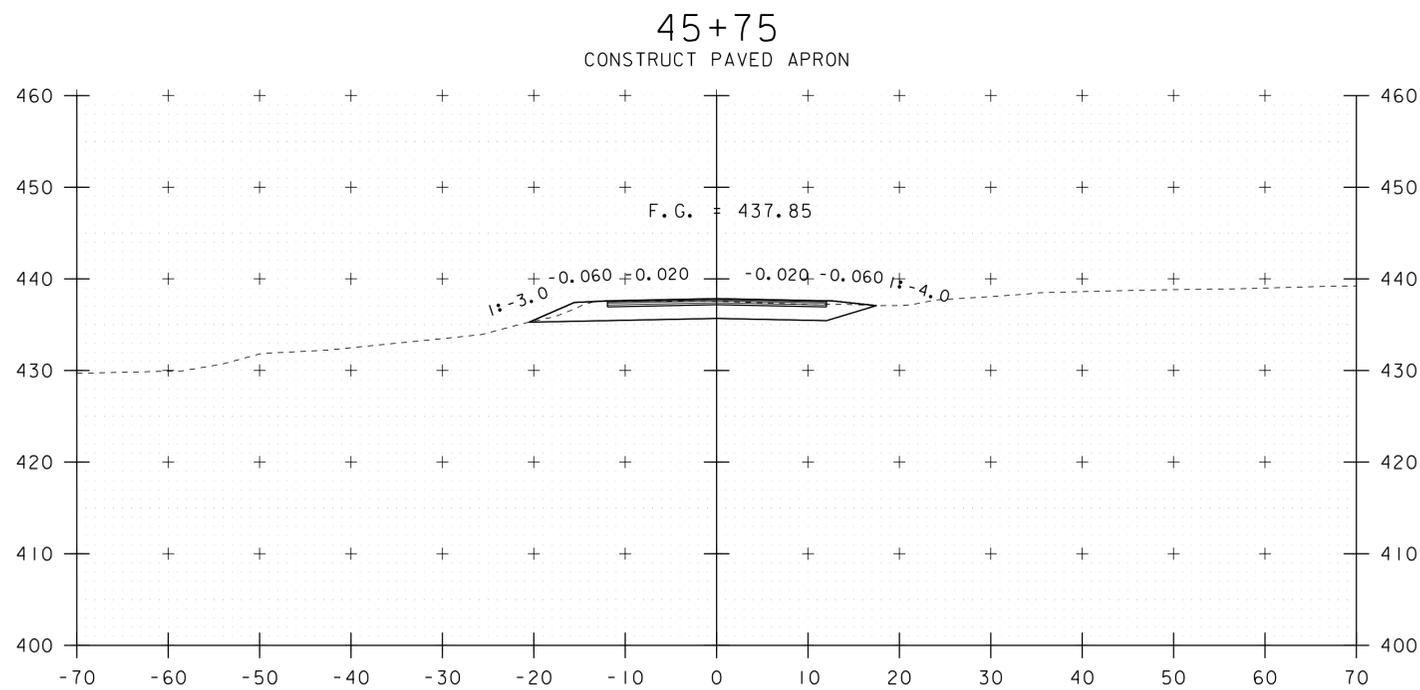
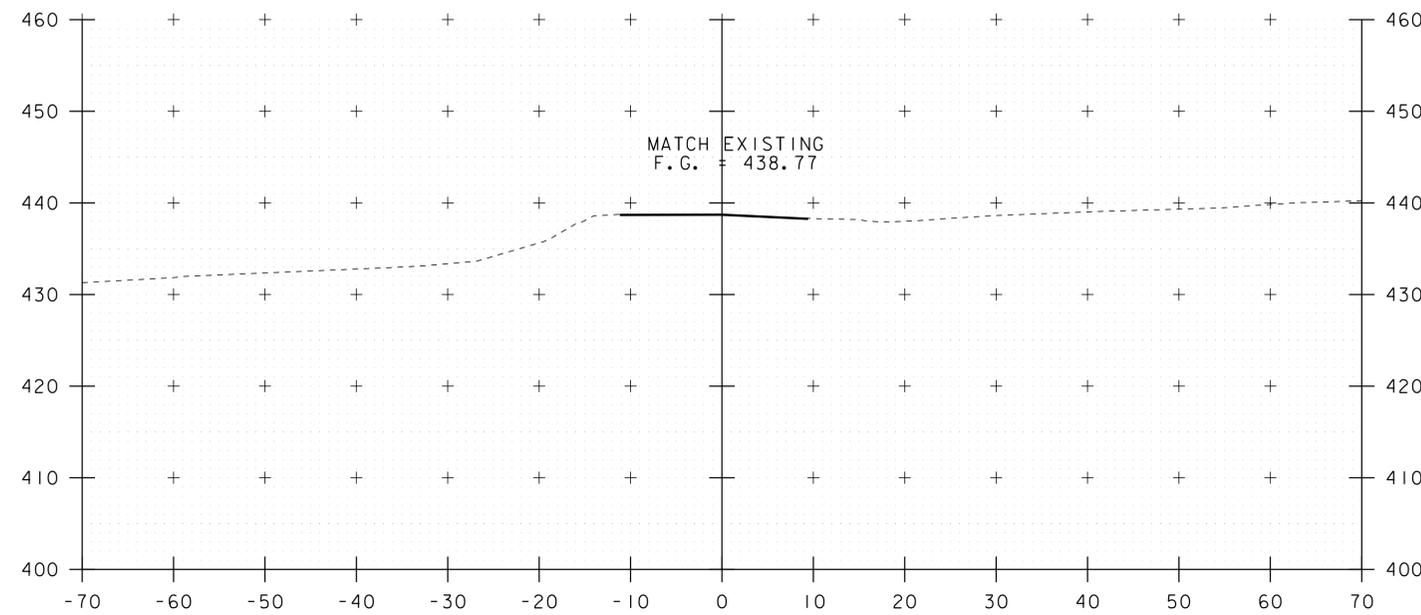
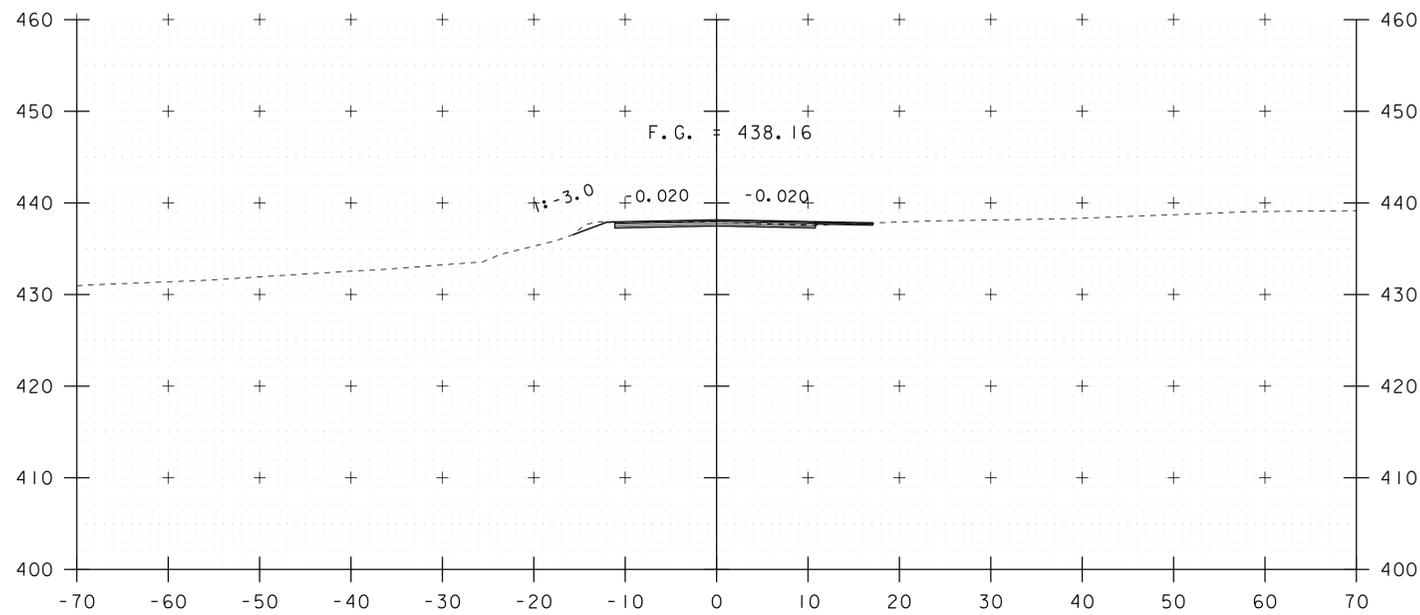
45+25
END PROJECT



45+00

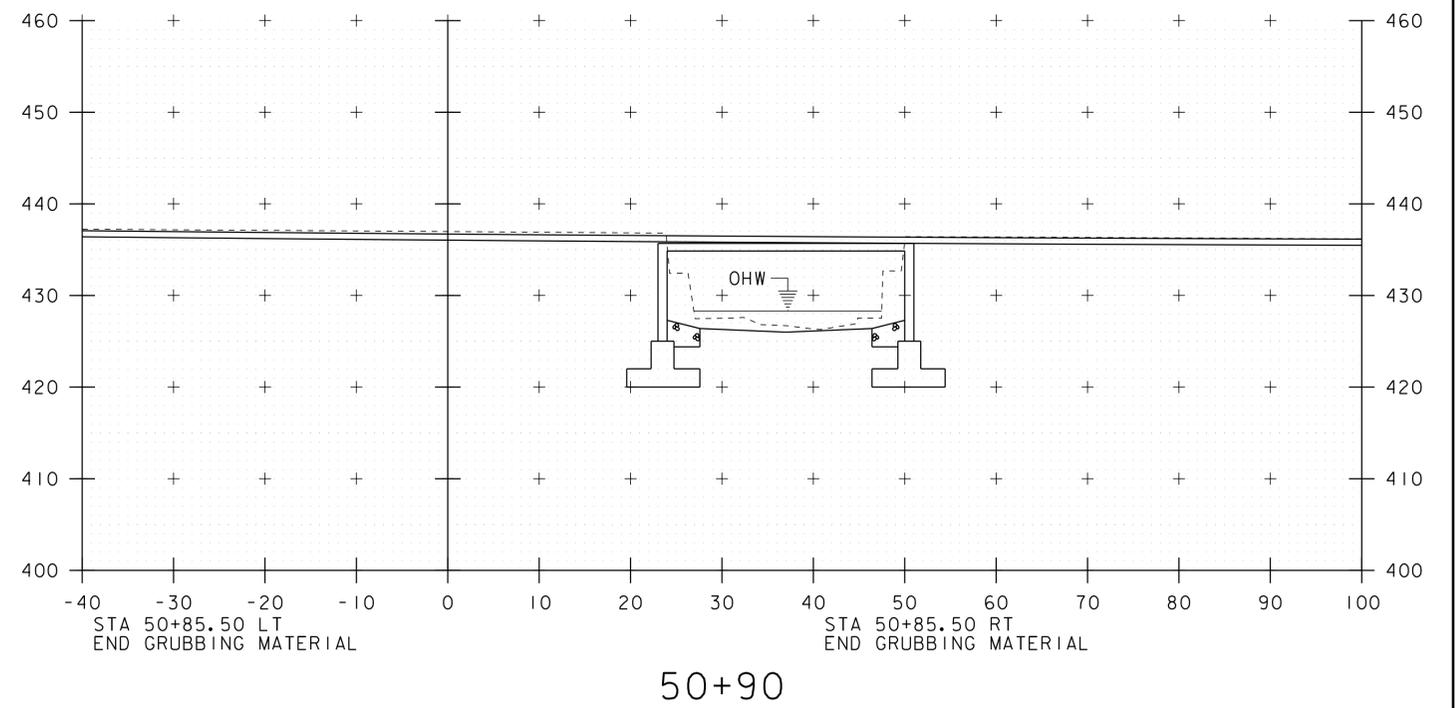
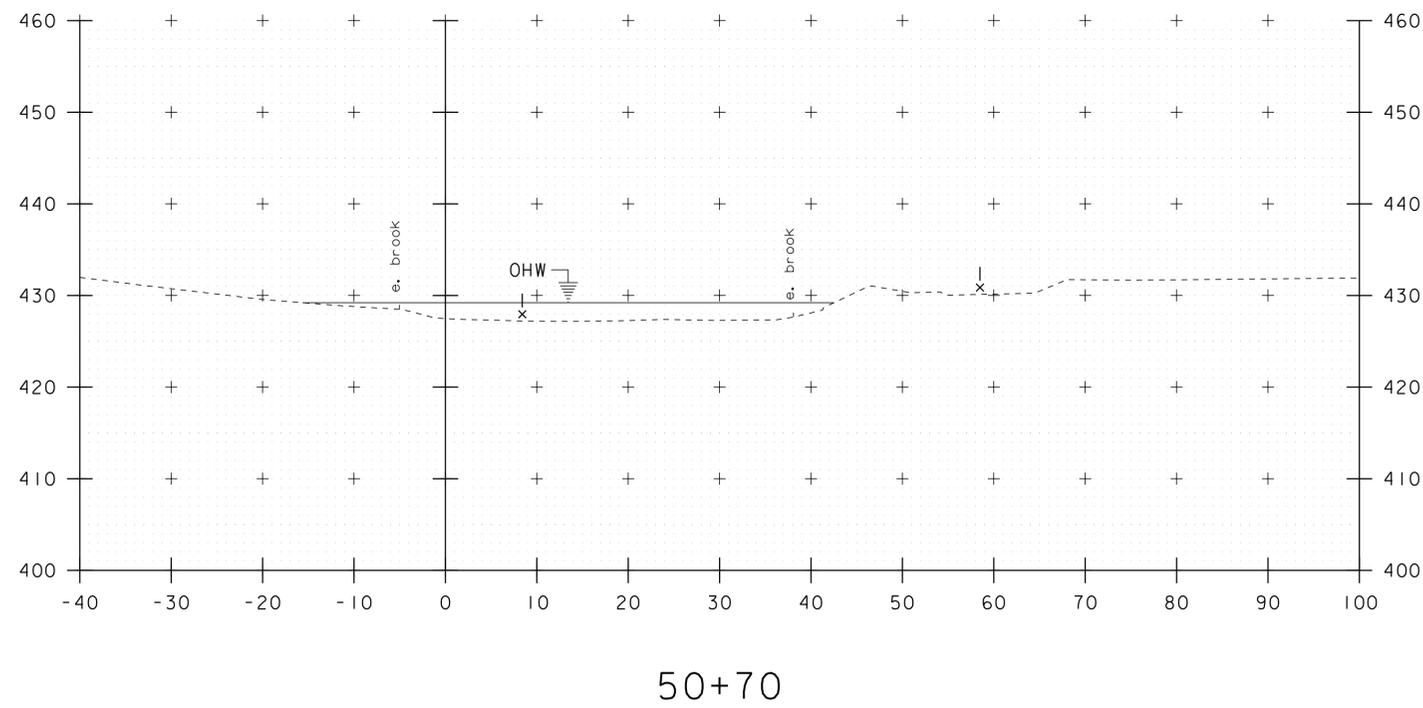
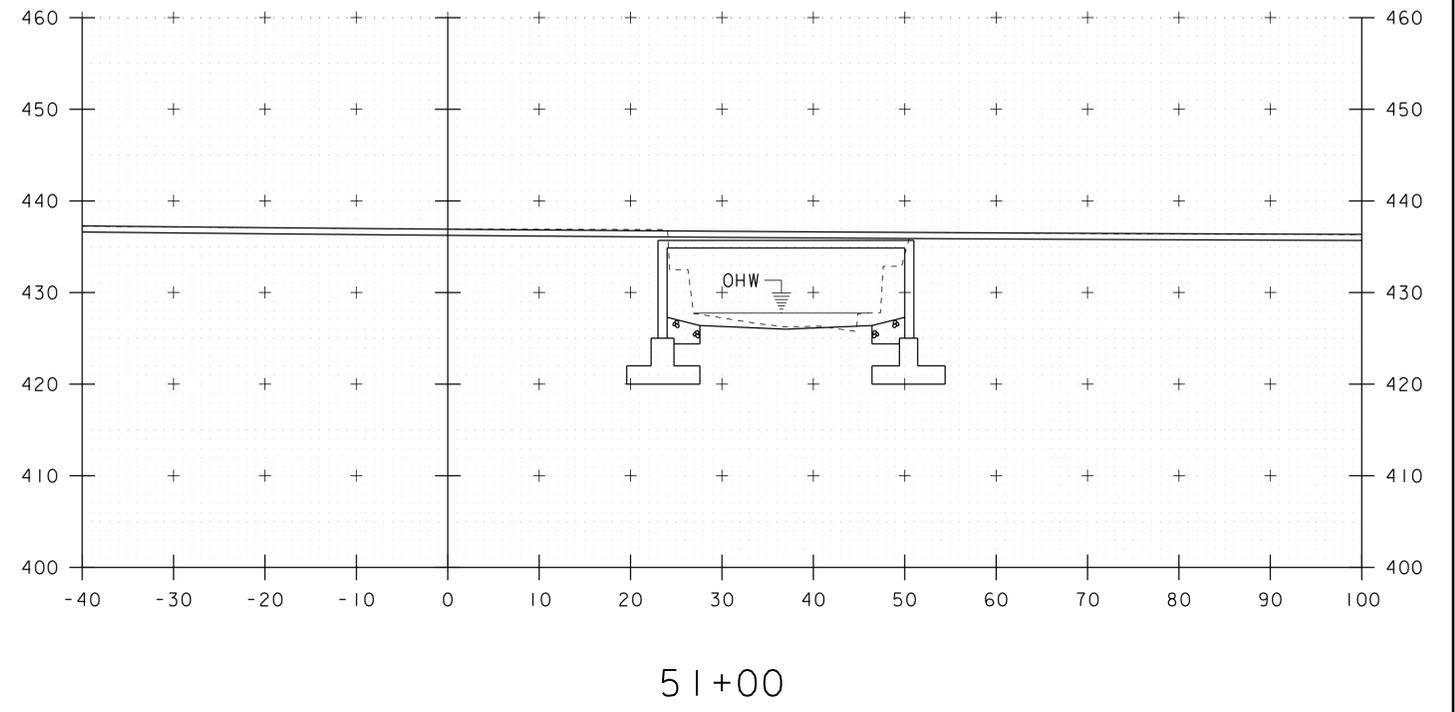
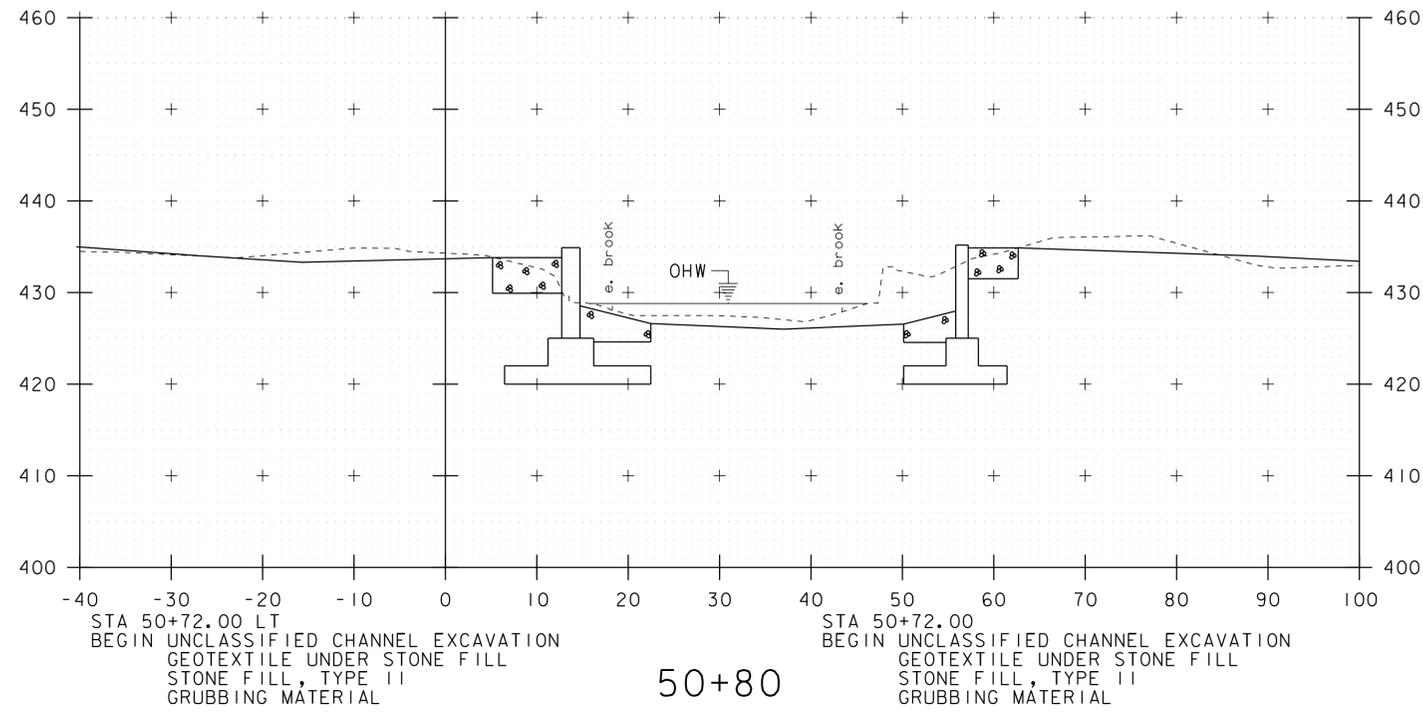
STA. 44+50 TO STA. 45+25

PROJECT NAME:	RICHFORD	PLOT DATE:	21-AUG-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	R. PELLETT
FILE NAME:	sl2j58xs.dgn	DESIGNED BY:	H. SALLS
PROJECT LEADER:	C. CARLSON	CHECKED BY:	H. SALLS
MAINLINE CROSS SECTIONS		SHEET	27 OF 36



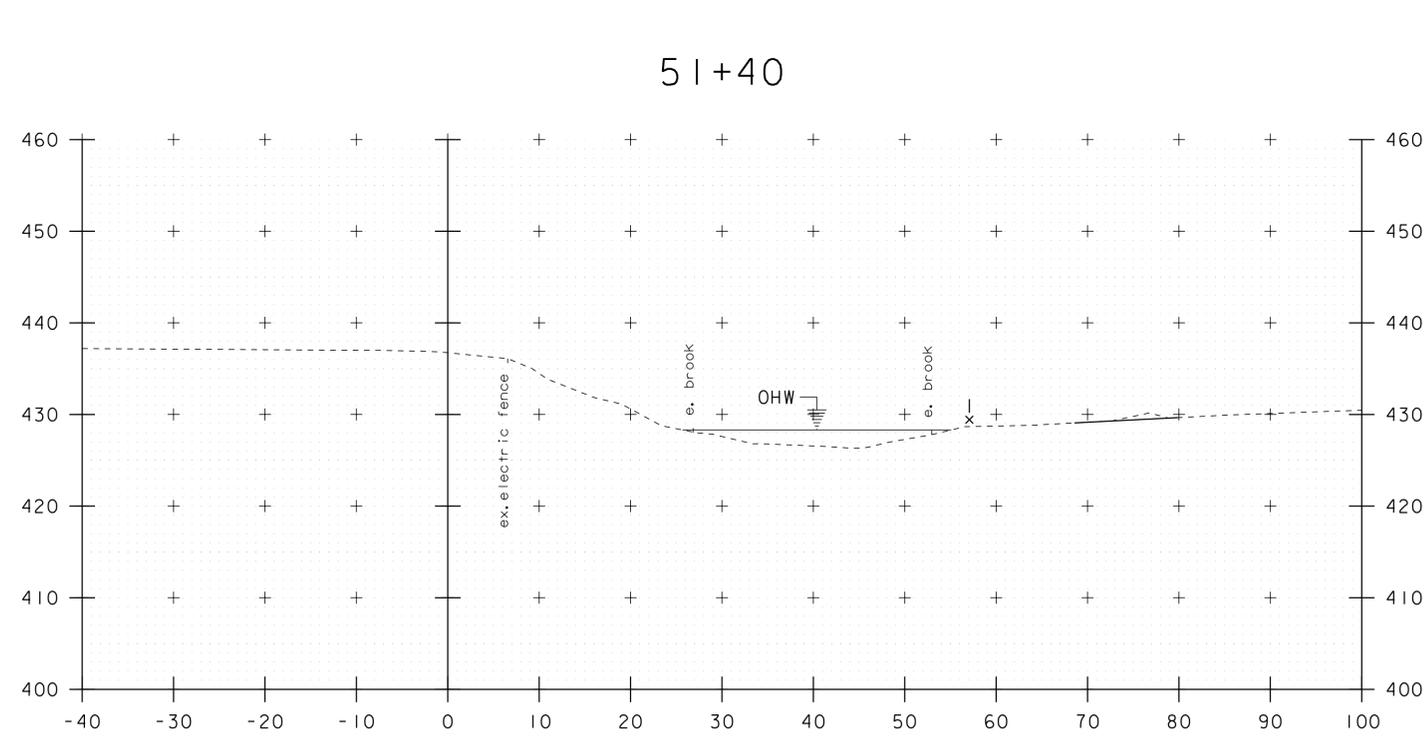
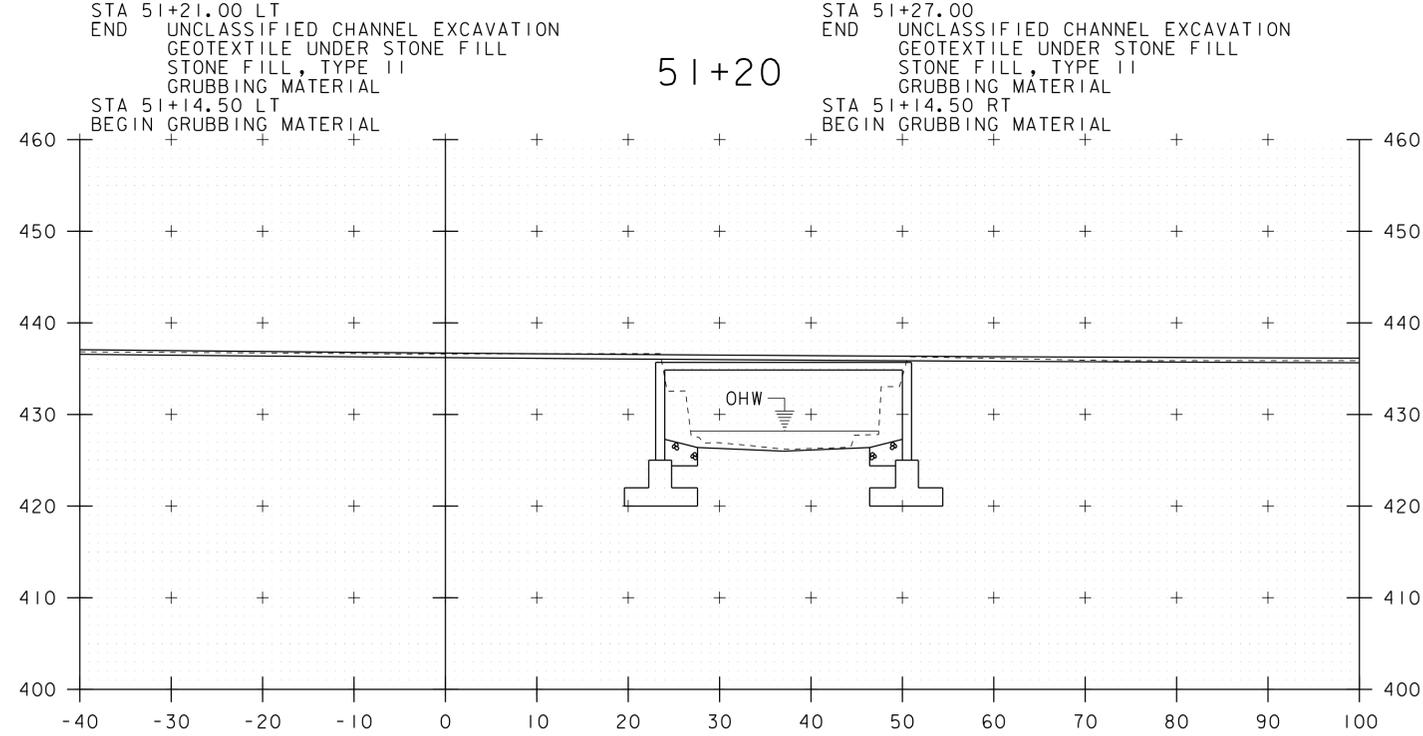
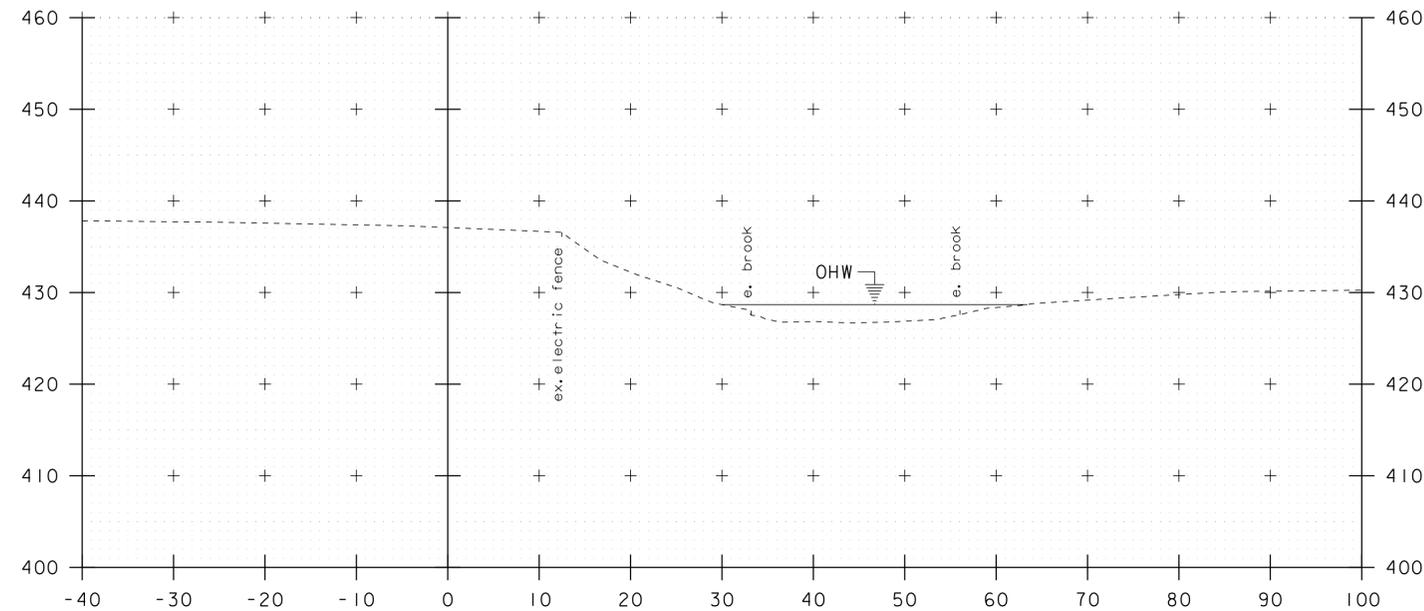
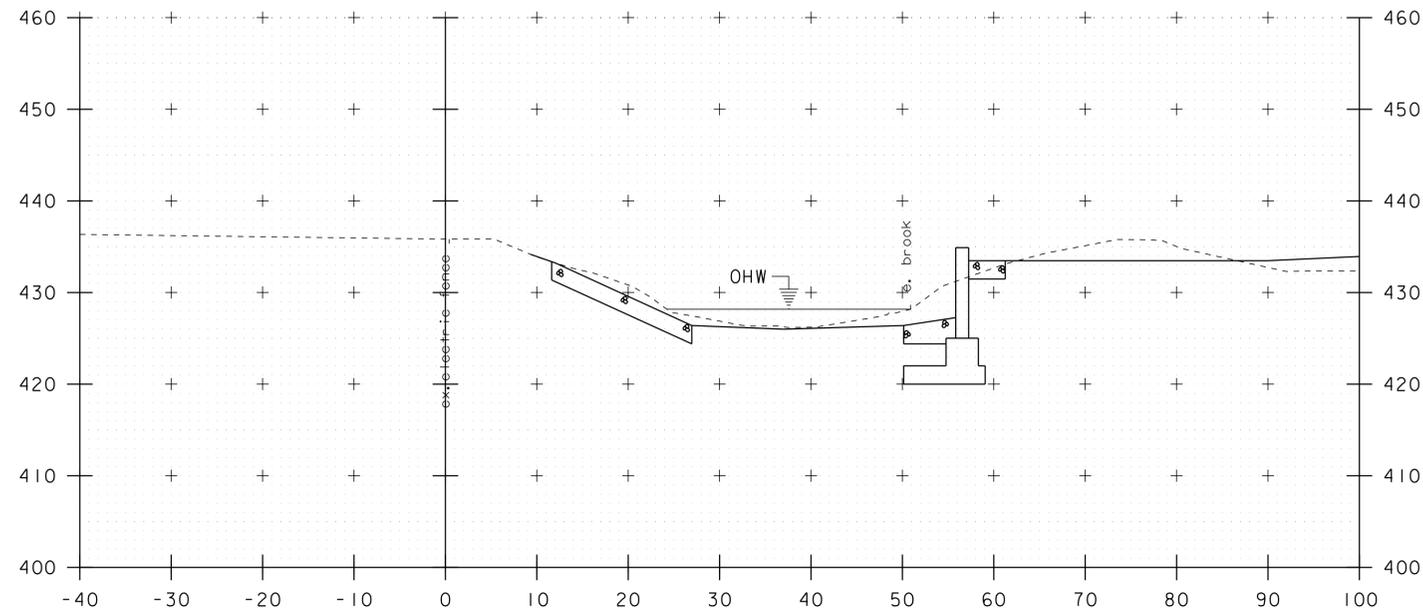
STA. 45+50 TO STA. 46+25

PROJECT NAME: RICHFORD	
PROJECT NUMBER: BRF 0302(29)	
FILE NAME: sl2j58xs.dgn	PLOT DATE: 21-AUG-2014
PROJECT LEADER: C. CARLSON	DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS	CHECKED BY: H. SALLS
MAINLINE CROSS SECTIONS	SHEET 28 OF 36



STA. 50+70 TO STA. 51+00

PROJECT NAME: RICHFORD	
PROJECT NUMBER: BRF 0302(29)	
FILE NAME: sl2j58xs.dgn	PLOT DATE: 21-AUG-2014
PROJECT LEADER: C. CARLSON	DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS	CHECKED BY: H. SALLS
CHANNEL CROSS SECTIONS	SHEET 29 OF 36



51+20

51+40

51+10

51+30

STA 51+21.00 LT
END UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE II
GRUBBING MATERIAL

STA 51+14.50 LT
BEGIN GRUBBING MATERIAL

STA 51+27.00
END UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE II
GRUBBING MATERIAL

STA 51+14.50 RT
BEGIN GRUBBING MATERIAL

PROJECT NAME:	RICHFORD	PLOT DATE:	21-AUG-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	R. PELLETT
FILE NAME:	sl2j158xs.dgn	DESIGNED BY:	H. SALLS
PROJECT LEADER:	C. CARLSON	CHECKED BY:	H. SALLS
CHANNEL CROSS SECTIONS		SHEET	30 OF 36

STA. 51+10 TO STA. 51+40

EPSC PLAN NARRATIVE

1.1 PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE REPLACEMENT OF BRIDGE 6 AND APPROACH WORK. EXISTING CONCRETE T-BEAM WILL BE REPLACED WITH A PRECAST CONCRETE 3-SIDED FRAME, SPANNING 28 FEET OVER BERRY BROOK. BRIDGE 6 IS LOCATED IN THE TOWN OF RICHFORD, ON TH 3 1.2 MILES WEST OF JUNCTION WITH TH 1.

NOTE: AREA OF DISTURBANCE INCLUDES LIMITS OF EARTH DISTURBANCE WITHIN THE PROJECT AREA, AS WELL AS WASTE, BORROW AND STAGING AREAS, AND OTHER EARTH DISTURBING ACTIVITIES WITHIN OR DIRECTLY ADJACENT TO THE PROJECT LIMITS AS SHOWN ON THE ATTACHED EPSC PLAN.

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN IS APPROXIMATELY 0.44 ACRES.

IT IS ANTICIPATED THAT THIS PROJECT WILL LAST ONE CONSTRUCTION SEASON.

1.2 SITE INVENTORY

1.2.1 TOPOGRAPHY

THE TOPOGRAPHY OF THE AREA IS HILLY, MIXTURE OF OPEN AND FORESTED LAND COVER. TOWN HIGHWAY 3, FIELD DRIVE AND GRAVEL DRIVEWAY ARE WITHIN THE PROJECT SITE. THERE IS A RESIDENCE ON THE EAST SIDE OF THE PROJECT.

1.2.2 DRAINAGE, WATERWAYS, BODIES OF WATER, AND PROXIMITY TO NATURAL OR MAN-MADE WATER FEATURES

THE BERRY BROOK IS THE ONLY WATER SOURCE ON THE PROJECT SITE. THE BROOK IS CLASSIFIED AS STEEP, SINUOUS, ALUVIAL WITH LOW BANKS TO FLOODPLAIN RELIEF. STREAM BED CONSISTS OF MOSTLY SAND, GRAVEL AND SILT WITH SOME COBBLES. DUE TO THE NATURE OF THE SURROUNDING TERRAIN THE PROJECT SITE COULD RECEIVE FLOOD FLOWS ON THE MISSISQUOI RIVER MAY BACK UP THROUGH THIS SITE.

1.2.3 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF PASTURE LAND. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS DIRECTLY AFFECTED BY REPLACEMENT OF THE EXISTING BRIDGE. UPON PROJECT COMPLETION, THE CHANNEL WILL BE ARMORED WITH STONE FILL TYPE II AS SPECIFIED ON THE PLANS. DISTURBED VEGETATION WILL BE REESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES.

1.2.4 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE FOR THE COUNTY OF FRANKLIN, VERMONT. SOIL ON THE PROJECT SITE IS PEACHAM STONY SOILS, <1%, "K FACTOR" = 0.28. THE SOIL IS CONSIDERED ERODIBLE DUE TO SLOPES.

NOTE: K-VALUES GENERALLY INDICATE THE FOLLOWING:

0.0-0.23 = LOW EROSION POTENTIAL
0.24-0.36 = MODERATE EROSION POTENTIAL
0.37 AND HIGHER = HIGH EROSION POTENTIAL

1.2.5 SENSITIVE RESOURCE AREAS

CRITICAL HABITATS: YES, FISH & WILD LIFE
HISTORICAL OR ARCHEOLOGICAL AREAS: YES
PRIME AGRICULTURAL LAND: NO
THREATENED AND ENDANGERED SPECIES: NO
WATER RESOURCE: BERRY BROOK
WETLANDS: YES

1.3 RISK EVALUATION

THIS PROJECT DOES NOT FALL UNDER THE JURISDICTION OF GENERAL PERMIT 3-9020 FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES. SHOULD CHANGES PRIOR TO OR DURING CONSTRUCTION RESULT IN ONE OR MORE ACRES OF EARTH DISTURBANCE OR SHOULD THE PROJECT BECOME PART OF A LARGER PLAN OF DEVELOPMENT, THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADDITIONAL PERMITTING.

1.4 EROSION PREVENTION AND SEDIMENT CONTROL

THE EROSION CONTROL PLANS ARE MEANT AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. THE PRINCIPLES OUTLINED IN THIS NARRATIVE CONSIST OF APPLYING MEASURES THROUGHOUT CONSTRUCTION OF THE PROJECT IN ORDER TO MINIMIZE SEDIMENT TRANSPORT TO THE RECEIVING WATERS. THE MEASURES INCLUDE STABILIZATION AND STRUCTURAL PRACTICES, STORM WATER CONTROLS AND OTHER POLLUTION PREVENTION PRACTICES. THEY HAVE BEEN PROPOSED BY THE DESIGNER AS A BASIS FOR PROTECTING RESOURCES AND WILL NEED TO BE BUILT UPON BASED ON THE SPECIFIC MEANS AND METHODS OF THE CONTRACTOR. REFER TO THE LOW RISK SITE HANDBOOK AND APPROPRIATE DETAIL SHEETS FOR SPECIFIC GUIDANCE AND CONSTRUCTION DETAILING.

ALL MEASURES SHALL BE REGULARLY MAINTAINED AND SHALL BE CHECKED FOR SEDIMENT BUILD-UP. SEDIMENT SHALL BE DISPOSED OF AT AN APPROVED SITE WHERE IT WILL NOT BE SUBJECT TO EROSION.

1.4.1 MARK SITE BOUNDARIES

SITE BOUNDARIES AND AREAS CONSTRUCTION EQUIPMENT CAN ACCESS SHALL BE DELINEATED.

PROJECT DEMARCATION FENCING (PDF) AND BARRIER FENCES SHALL BE USED TO PHYSICALLY MARK SITE BOUNDARIES.

1.4.2 LIMIT DISTURBANCE AREA

PREVENTING INITIAL SOIL EROSION BY MINIMIZING THE EXPOSED AREA IS MUCH MORE EFFECTIVE THAN TREATING ERODED SEDIMENT. EARTH DISTURBANCE CAN BE MINIMIZED THROUGH CONSTRUCTION PHASING BY ONLY OPENING UP EARTH AS NECESSARY. THIS CAN LIMIT THE AREA THAT WILL BE DISTURBED AND EXPOSED TO EROSION. EMPLOY TEMPORARY CONSTRUCTION STABILIZATION PRACTICES IN INCREMENTAL STAGES AS PHASES CHANGE. FOR PROJECTS WHICH FALL UNDER THE CONSTRUCTION GENERAL PERMIT, ONLY THE ACREAGE LISTED ON THE PERMIT AUTHORIZATION MAY BE EXPOSED AT ANY GIVEN TIME.

MAINTAINING VEGETATED BUFFERS ALONG STREAM BANKS, WETLANDS OR OTHER SENSITIVE AREAS IS A CRUCIAL EROSION AND SEDIMENT CONTROL MEASURE THAT SHOULD BE ESTABLISHED WHEREVER POSSIBLE.

1.4.3 SITE ENTRANCE/EXIT STABILIZATION

TRACKING OF SEDIMENT ONTO PUBLIC HIGHWAYS SHALL BE MINIMIZED TO REDUCE THE POTENTIAL FOR RUNOFF ENTERING RECEIVING WATERS. INSTALLATION SHALL COINCIDE WITH THE CONTRACTORS PROGRESS SCHEDULE.

STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AS PROPOSED ON THE EPSC PLAN AND ANYWHERE EQUIPMENT WILL BE GOING FROM AREAS OF EXPOSED SOILS TO PAVED SURFACES.

1.4.4 INSTALL SEDIMENT BARRIERS

SEDIMENT BARRIERS SHALL BE UTILIZED TO INTERCEPT RUNOFF AND ALLOW SUSPENDED SEDIMENT TO SETTLE OUT. THEY SHALL BE INSTALLED PRIOR TO ANY UP SLOPE WORK.

SILT FENCE AND TURBIDITY CURTAIN WILL BE INSTALLED AS PROPOSED ON THE EPSC PLAN.

1.4.5 DIVERT UPLAND RUNOFF

DIVERSIONARY MEASURES SHALL BE USED TO INTERCEPT RUNOFF FROM ABOVE THE CONSTRUCTION AND DIRECT IT AROUND THE DISTURBED AREA SO THAT CLEAN WATER DOES NOT BECOME MUDDIED WHILE TRAVELING OVER EXPOSED SOILS ON THE CONSTRUCTION SITE.

THE PROJECT AREA IS RELATIVELY FLAT. THEREFORE IT IS NOT ANTICIPATED THAT DIVERSION MEASURES WILL BE NECESSARY.

1.4.6 SLOW DOWN CHANNELIZED RUNOFF

CHECK STRUCTURES SHALL BE UTILIZED TO REDUCE THE VELOCITY, AND THUS THE EROSION POTENTIAL, OF CONCENTRATED FLOW IN CHANNELS.

1.4.7 CONSTRUCT PERMANENT CONTROLS

NONE NEEDED

1.4.8 STABILIZE EXPOSED SOILS DURING CONSTRUCTION

ALL AREAS OF DISTURBANCE MUST HAVE TEMPORARY STABILIZATION IN PLACE WITHIN 48 HOURS OF DISTURBANCE OR IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT 3-9020 AUTHORIZATION.

THE FORECAST OF RAINFALL EVENTS SHALL TRIGGER IMMEDIATE PROTECTION OF EXPOSED SOILS.

1.4.9 WINTER STABILIZATION

VARIOUS MEASURES SPECIFIC TO WINTER MAY BE NECESSARY SHOULD THE PROJECT EXTEND INTO WINTER (OCTOBER 15 THROUGH APRIL 15). REFER TO THE LOW RISK SITE HANDBOOK FOR GUIDANCE.

1.4.10 STABILIZE SOIL AT FINAL GRADE

EXPOSED SOIL MUST BE STABILIZED WITHIN 48 HOURS OF REACHING FINAL GRADE.

1.4.11 DE-WATERING ACTIVITIES

DISCHARGE FROM DEWATERING ACTIVITIES THAT FLOWS OFF OF THE CONSTRUCTION SITE MUST NOT CAUSE OR CONTRIBUTE TO A VIOLATION OF THE VERMONT WATER QUALITY STANDARDS.

1.4.12 INSPECT YOUR SITE

INSPECT THE PROJECT SITE BASED ON SPECIAL PROVISION REQUIREMENTS OR CONSTRUCTION GENERAL PERMIT AUTHORIZATION STIPULATIONS.

1.5 SEQUENCE AND STAGING

THIS SECTION WILL BE DEVELOPED BY THE CONTRACTOR USING THE GUIDANCE OUTLINED IN THE VTRANS EPSC PLAN CONTRACTOR CHECKLIST.

1.5.1 CONSTRUCTION SEQUENCE

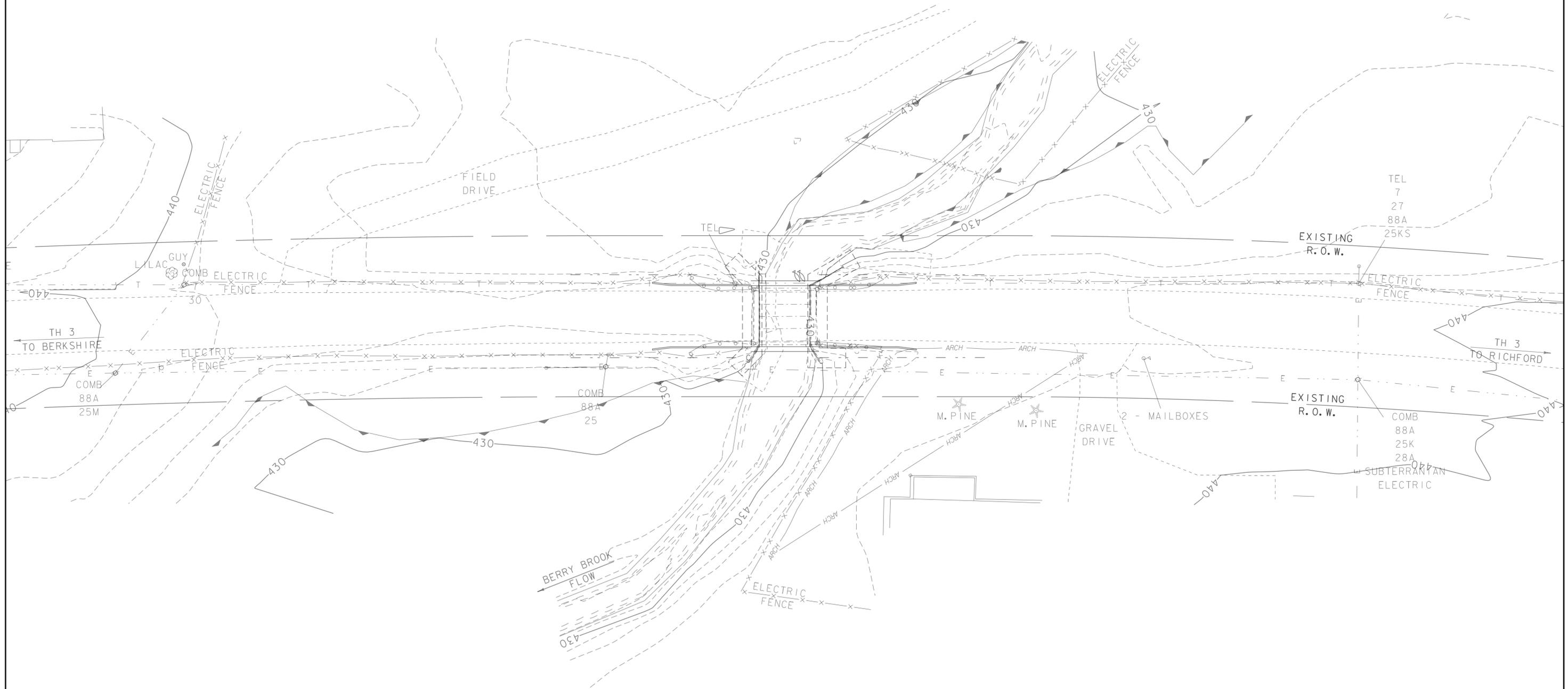
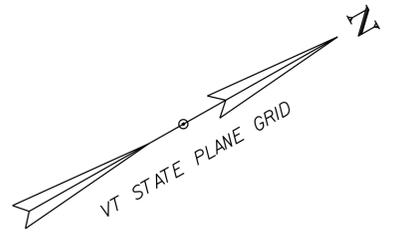
1.5.2 OFF-SITE ACTIVITIES

IN ADDITION TO THE CONTRACTOR CHECKLIST ANY ACTIVITIES OUTSIDE THE CONSTRUCTION LIMITS SHALL FOLLOW SPECIFICATION 105.25- 105.29 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

PROJECT NAME: RICHFORD
PROJECT NUMBER: BRF 0302(29)

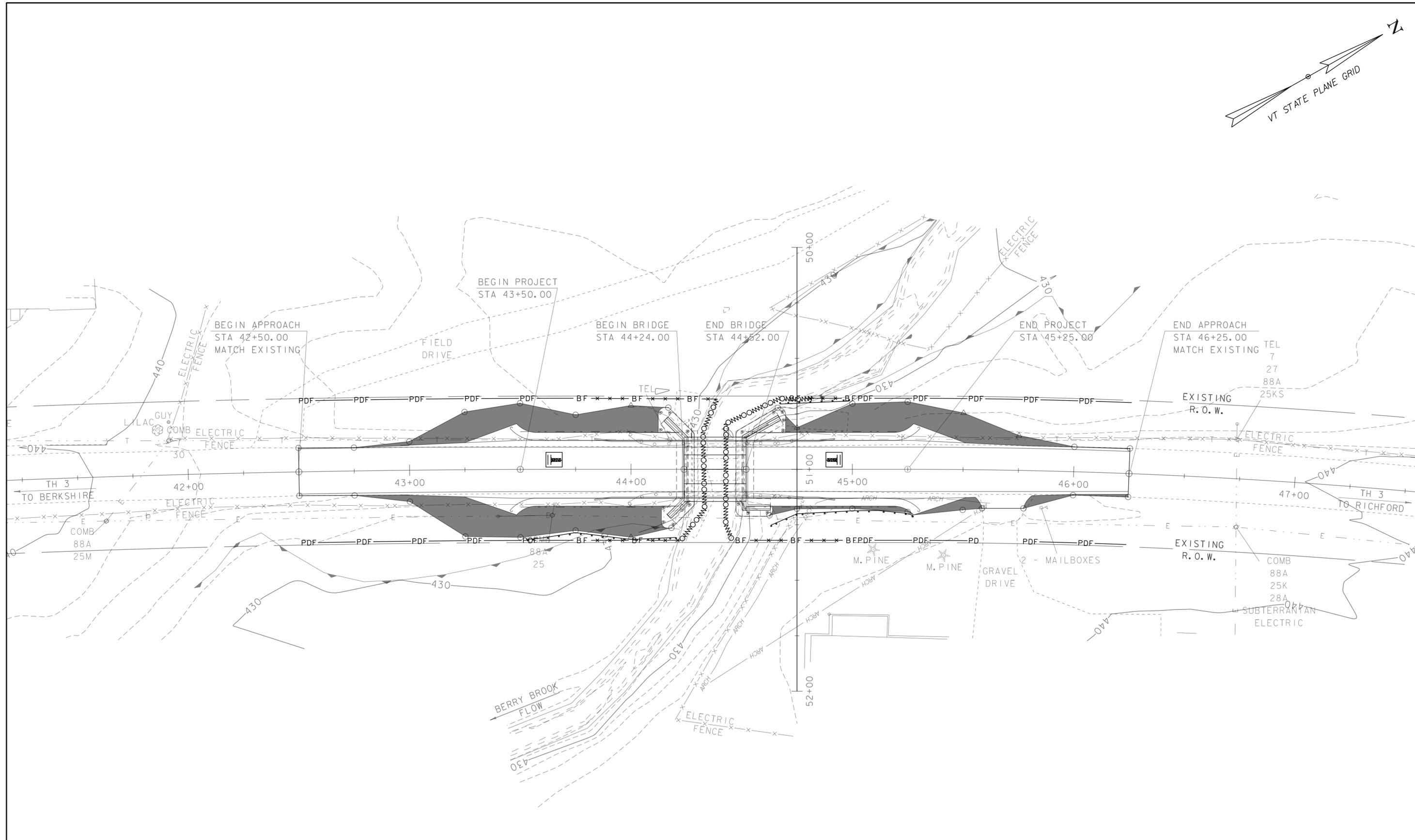
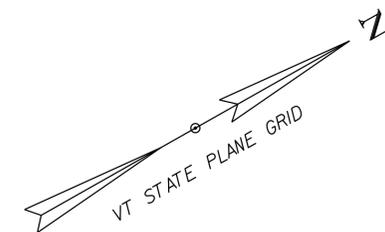
FILE NAME: s12j158epsc_narrative.dgn PLOT DATE: 21-AUG-2014
PROJECT LEADER: C. CARLSON DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS CHECKED BY: H. SALLS
EPSC NARRATIVE SHEET 31 OF 36

SOIL INFORMATION
 PEACHAM STONY SOILS
 <1% SLOPES
 MODERATE EROSION POTENTIAL
 K=0.28



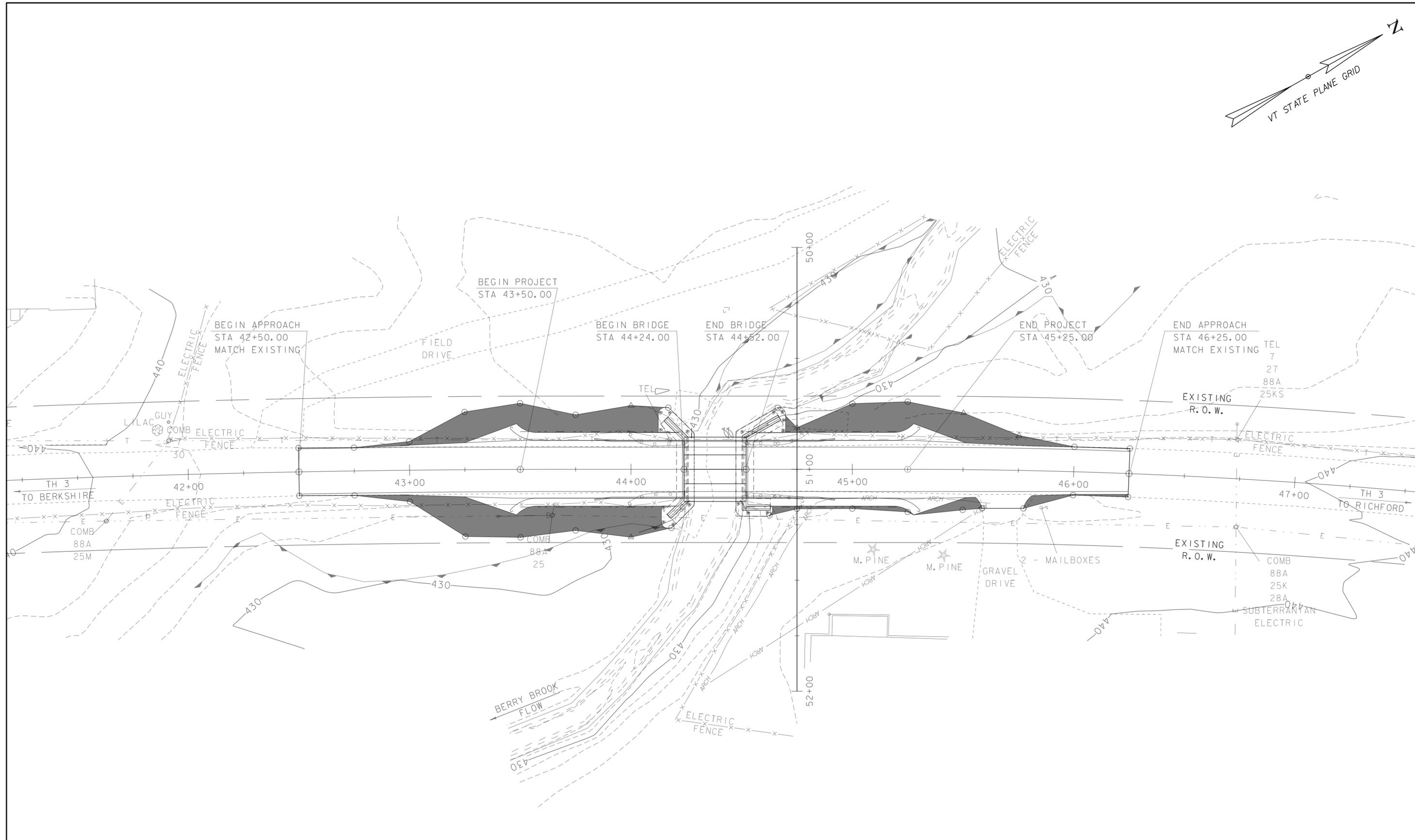
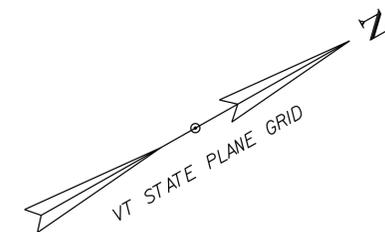
SCALE 1" = 20'-0"
 20 0 20

PROJECT NAME:	RICHFORD	PLOT DATE:	21-AUG-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	R. PELLETT
FILE NAME:	sl2j58bdrero.dgn	DESIGNED BY:	H. SALLS
PROJECT LEADER:	C. CARLSON	EPSC EXISTING CONDITIONS:	
CHECKED BY:	H. SALLS	SHEET	32 OF 36



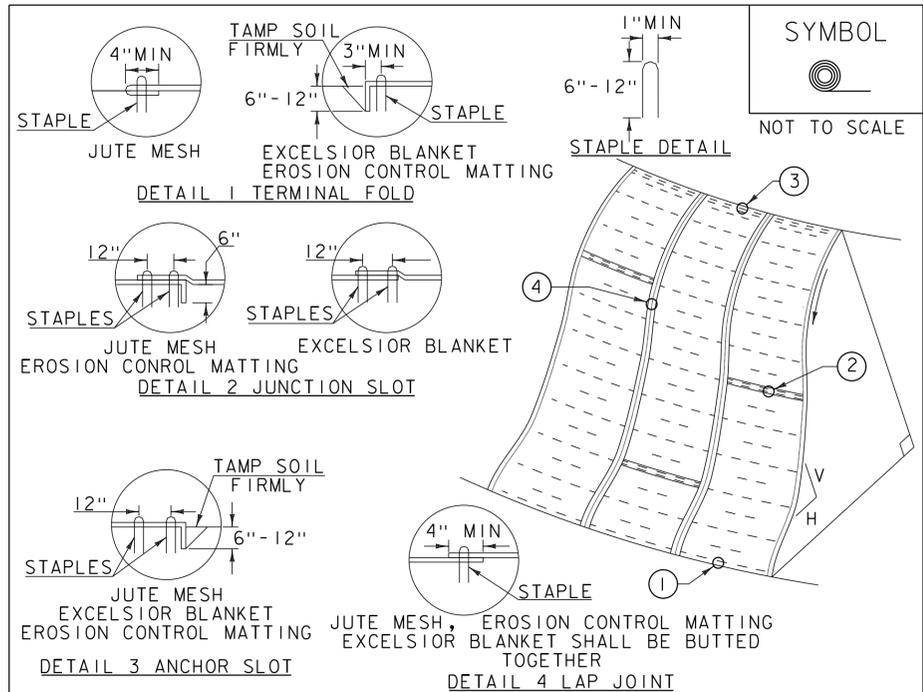
SCALE 1" = 20'-0"
 20 0 20

PROJECT NAME: RICHFORD	
PROJECT NUMBER: BRF 0302(29)	
FILE NAME: sl2j58bdrero.dgn	PLOT DATE: 21-AUG-2014
PROJECT LEADER: C. CARLSON	DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS	CHECKED BY: H. SALLS
EPSC DURING CONSTRUCTION	SHEET 33 OF 36



SCALE 1" = 20' - 0"
 20 0 20

PROJECT NAME: RICHFORD	
PROJECT NUMBER: BRF 0302(29)	
FILE NAME: sl2j58bdrero.dgn	PLOT DATE: 21-AUG-2014
PROJECT LEADER: C. CARLSON	DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS	CHECKED BY: H. SALLS
EPSC FINAL CONDITIONS	SHEET 34 OF 36



CONSTRUCTION SPECIFICATIONS

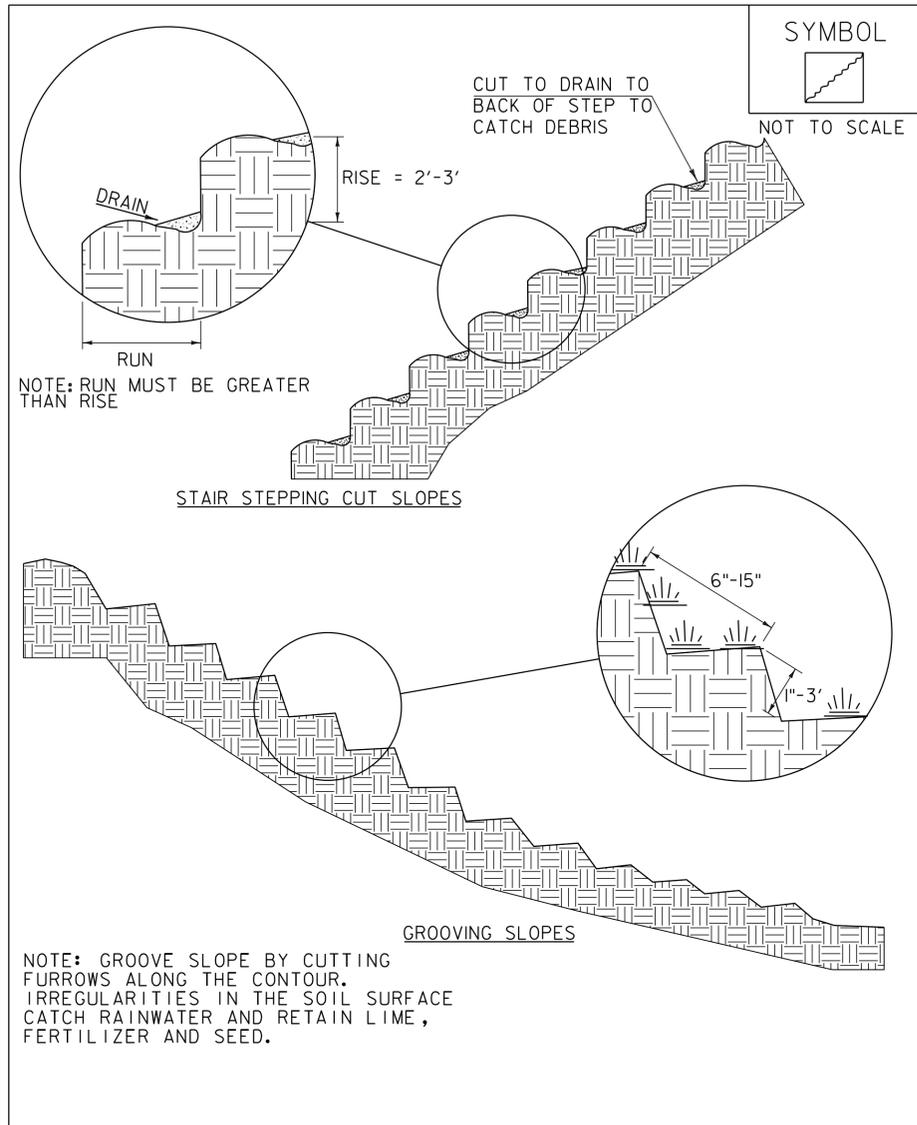
1. APPLY TO SLOPES GREATER THAN 3H:1V OR WHERE NECESSARY TO AID IN ESTABLISHING VEGETATION.
2. APPLY FERTILIZER, LIME SEED PRIOR TO PLACING MATTING.
3. STAPLES ARE TO BE PLACED ALTERNATELY, IN COLUMNS APPROXIMATELY 2' APART AND IN ROWS APPROXIMATELY 3' APART. APPROXIMATELY 175 STAPLES ARE REQUIRED PER 4' X 225' ROLL OF MATERIAL AND 125 STAPLES ARE REQUIRED PER 4' X 150' ROLL OF MATERIAL.
4. DISTURBED AREAS SHALL BE SMOOTHLY GRADED. EROSION CONTROL MATERIAL SHALL BE PLACED LOOSELY OVER GROUND SURFACE. DO NOT STRETCH.
5. ALL TERMINAL ENDS AND TRANSVERSE LAPS SHALL BE STAPLED AT APPROXIMATELY 12" INTERVALS.

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
ORIGINALLY DEVELOPED BY USDA-NRCS
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ROLLED EROSION CONTROL PRODUCT (RECP) SIDE SLOPE

NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 AND AS SHOWN IN THE PLANS FOR TEMPORARY EROSION MATTING (PAY ITEM 653.20) OR PERMANENT EROSION MATTING (PAY ITEM 653.21).

REVISIONS	
APRIL 16, 2007	JMF
JANUARY 13, 2009	WHF



ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
ORIGINALLY DEVELOPED BY USDA-NRCS
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SURFACE ROUGHENING

NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT

REVISIONS	
APRIL 1, 2008	WHF
JANUARY 13, 2009	WHF

VAOT RURAL AREA MIX					
% WEIGHT	LBS/AC		NAME	GERM %	PURITY %
	BROADCAST	HYDROSEED			
37.5%	22.5	45	CREeping RED FESCUE	85%	98%
37.5%	22.5	45	TALL FESCUE	90%	95%
5.0%	3	6	RED TOP	90%	95%
15.0%	9	18	BIRDSFOOT TREFOIL	85%	98%
5.0%	3	6	ANNUAL RYE GRASS	85%	95%
100%	60	120			

VAOT URBAN AREA MIX					
% WEIGHT	LBS/AC		NAME	GERM %	PURITY %
	BROADCAST	HYDROSEED			
42.5%	34	68	CREeping RED FESCUE	85%	98%
10.0%	8	16	PERENNIAL RYE GRASS	90%	95%
42.5%	34	68	KENTUCKY BLUE GRASS	85%	85%
5.0%	4	8	ANNUAL RYE GRASS	85%	95%
100%	80	160			

SOIL AMENDMENT GUIDANCE			
FERTILIZER		LIME	
BROADCAST	HYDROSEED	BROADCAST	HYDROSEED
10-20-10	FOLLOW	PELLETIZED	FOLLOW
500 LBS/AC	MANUFACTURER	2 TONS/AC	MANUFACTURER

CONSTRUCTION GUIDANCE

1. RURAL SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
2. URBAN SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED LAWN AREAS DISTURBED BY THE CONTRACTOR.
3. ALL SEED MIXTURES: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT AND SHALL BE FREE OF ALL NOXIOUS SEED.
4. FERTILIZER AND LIMESTONE: SHALL FOLLOW RATES SHOWN ON PLAN OR AS DIRECTED BY THE ENGINEER
5. HAY MULCH: TO BE PLACED ON EARTH SLOPES AT THE RATE OF 2 TONS/ACRE, ACHIEVE 90% GROUND COVER OR AS DIRECTED BY THE ENGINEER.
6. TOPSOIL: TO BE USED WITH SEED AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
7. HYDROSEEDING: ALTHOUGH GUIDANCE IS GIVEN ABOVE THE SITE CONDITIONS AND THE TYPE OF HYDROSEED WILL ULTIMATELY DICTATE THE AMOUNTS AND TYPES OF SOIL AMENDMENTS TO BE APPLIED
8. TURF ESTABLISHMENT: PLACING SEED, FERTILIZER, LIME AND MULCH PRIOR TO SEPTEMBER 15 AND AFTER APRIL 15 CAN BETTER ENSURE A VIGOROUS GROWTH OF GRASS.

ADAPTED FROM VTRANS TECHNICAL LANDSCAPE MANUAL FOR ROADWAYS AND TRANSPORTATION FACILITIES

TURF ESTABLISHMENT

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 651 FOR SEED (PAY ITEM 651.15)

REVISIONS	
JUNE 23, 2009	WHF
JANUARY 15, 2010	WHF
FEBRUARY 16, 2011	WHF

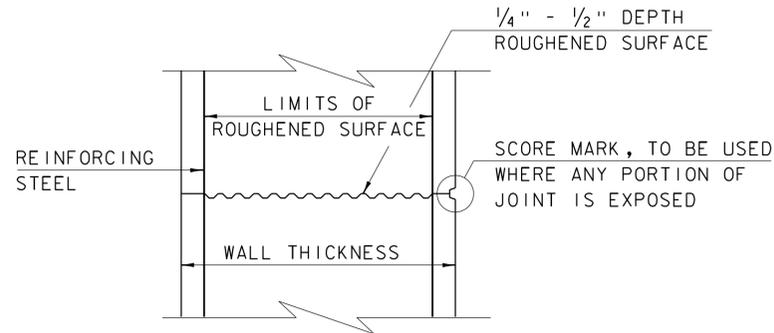
PROJECT NAME: RICHFORD
PROJECT NUMBER: BRF 0302(29)

FILE NAME: sl2j58erode+.dgn
PROJECT LEADER: C. CARLSON
DESIGNED BY: H. SALLS
EPSC DETAILS 2

PLOT DATE: 21-AUG-2014
DRAWN BY: R. PELLETT
CHECKED BY: H. SALLS
SHEET 36 OF 36

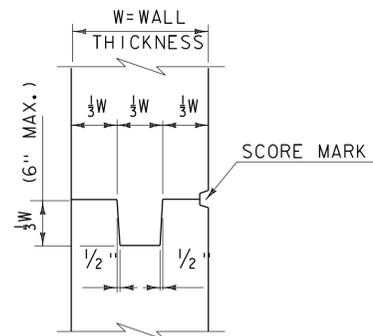
CONCRETE GENERAL NOTES

1. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" x 1"
2. REINFORCING STEEL SIZE AND SPACING SHOWN IN THE PLANS IS BASED ON 60 KSI STEEL, UNLESS NOTED OTHERWISE. WITH THE ENGINEER'S PERMISSION, BAR SIZE AND SPACING MAY BE MODIFIED ACCORDING TO THE LATEST AASHTO LRFD BRIDGE DESIGN SPECIFICATION AND STRUCTURES DESIGN MANUAL WHEN USING HIGHER STRENGTH STEEL.

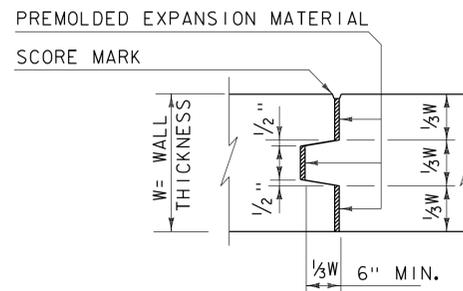
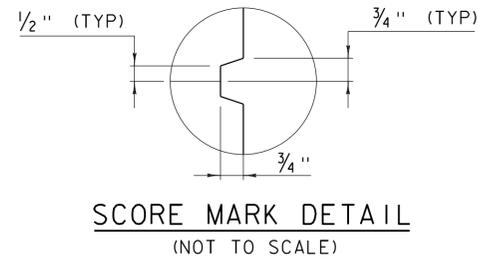


TYPICAL HORIZONTAL CONSTRUCTION JOINT
(NOT TO SCALE)

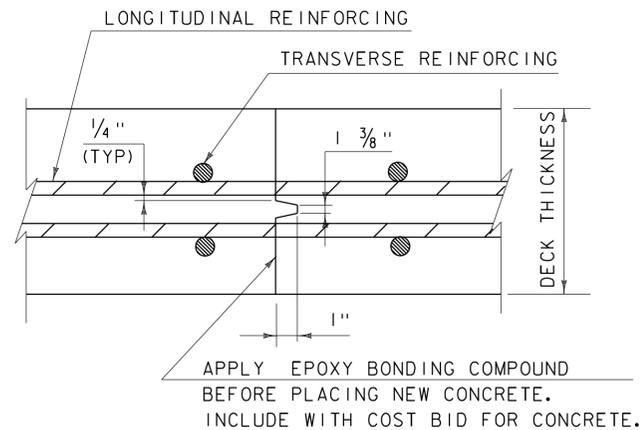
1. THE SURFACE OF THE CONCRETE CONSTRUCTION JOINTS SHALL BE CLEANED AND FREE OF LAITANCE.
2. IMMEDIATELY BEFORE NEW CONCRETE IS PLACED, ALL CONSTRUCTION JOINTS SHALL BE WETTED AND STANDING WATER REMOVED.



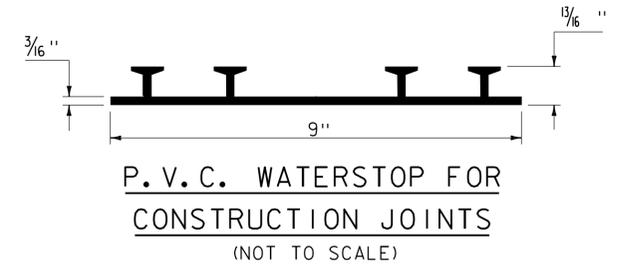
TYPICAL CONCRETE CONSTRUCTION JOINT
(NOT TO SCALE)



TYPICAL CONCRETE EXPANSION JOINT
(NOT TO SCALE)

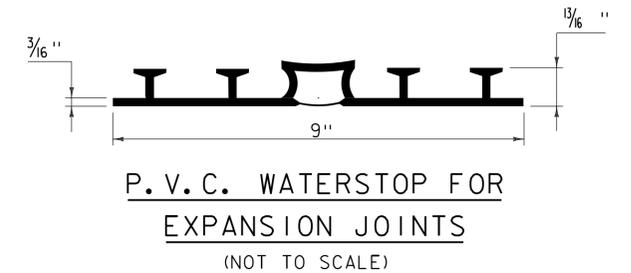


TRANSVERSE BRIDGE SLAB CONSTRUCTION JOINT DETAILS
(NOT TO SCALE)



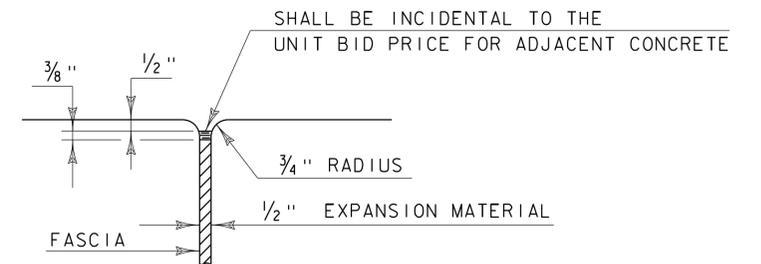
PAYMENT FOR THE P.V.C. WATERSTOP SHALL BE INCIDENTAL TO THE UNIT BID PRICE FOR THE ADJACENT CONCRETE.

OTHER CONFIGURATIONS OF WATERSTOP MAY BE USED UPON APPROVAL OF THE ENGINEER.



PAYMENT FOR THE P.V.C. WATERSTOP SHALL BE INCIDENTAL TO THE UNIT BID PRICE FOR THE ADJACENT CONCRETE.

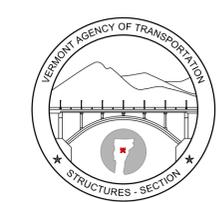
OTHER CONFIGURATIONS OF WATERSTOP MAY BE USED UPON APPROVAL OF THE ENGINEER.



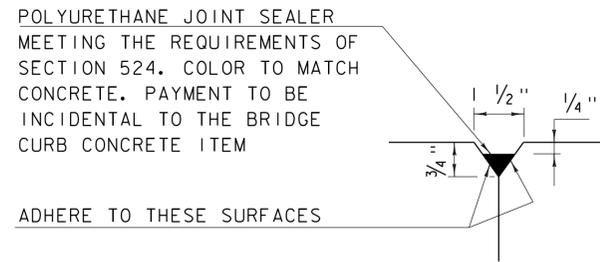
JOINT BETWEEN FASCIA AND WINGWALL
(NOT TO SCALE)

REVISIONS	
MAY 7, 2010	APPROVED FOR USE BY VAOT STRUCTURES SECTION
FEBRUARY 9, 2012	REBAR SUBSTITUTION ALLOWANCE ADDED TO CONCRETE GENERAL NOTES.

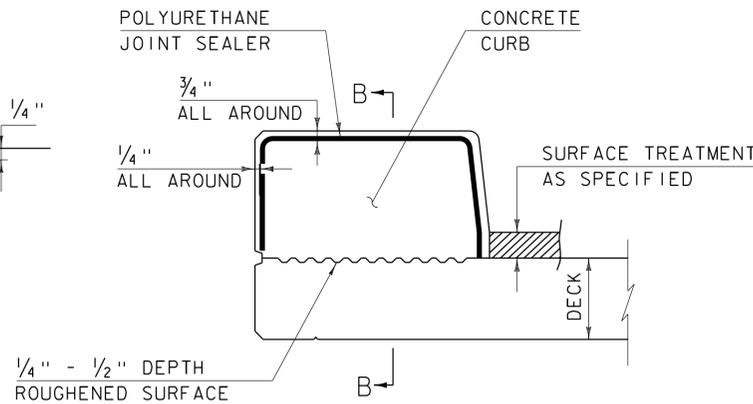
**CONCRETE
DETAILS AND NOTES**



**STRUCTURES
DETAIL
SD-501.00**

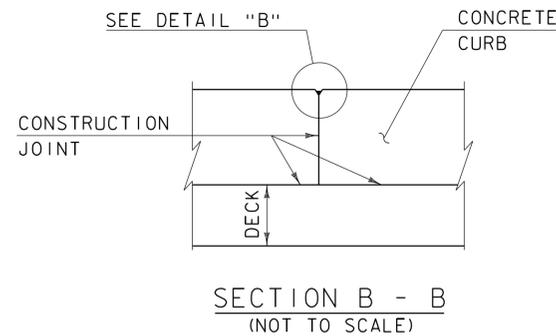


DETAIL "B"
(NOT TO SCALE)

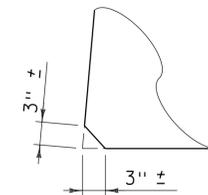


CONCRETE CURB JOINT SECTION
(NOT TO SCALE)

1. SEE TYPICAL HORIZONTAL CONSTRUCTION JOINT DETAIL FOR ADDITIONAL INFORMATION



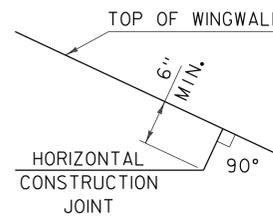
SECTION B - B
(NOT TO SCALE)



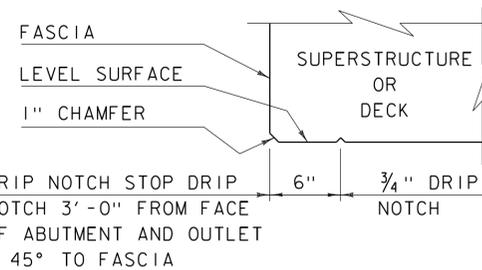
ACUTE ANGLE
CLIP DETAIL
(NOT TO SCALE)

CONCRETE CURB JOINT NOTES

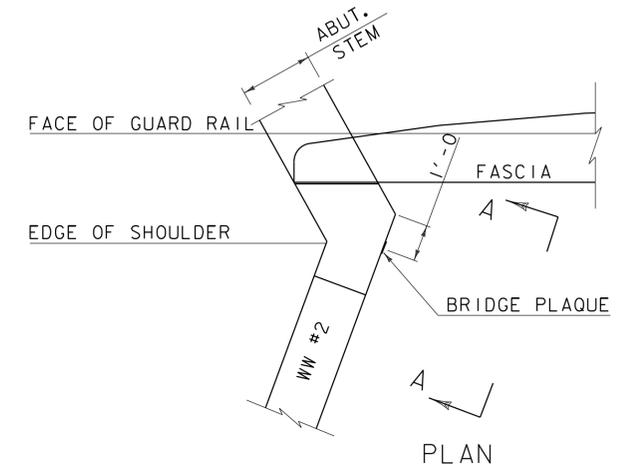
1. CONCRETE CURBS MAY BE PLACED IN ONE CONTINUOUS OPERATION IF AN APPROVED SHRINKAGE REDUCING ADMIXTURE LISTED IN THE SPECIAL PROVISIONS IS USED WITH THE CONCRETE MIX DESIGN. PAYMENT FOR THE SHRINKAGE REDUCING ADMIXTURE WILL BE INCIDENTAL TO THE BRIDGE CURB CONCRETE ITEM.
2. IF THE CONTRACTOR CHOOSES NOT TO USE AN APPROVED SHRINKAGE REDUCING ADMIXTURE, THE CURBS SHALL BE CONSTRUCTED WITH CONSTRUCTION JOINTS SPACED AT A MAXIMUM OF 15'-0" CENTER TO CENTER AND 2'-0" MINIMUM FROM THE CENTER OF NEAREST BRIDGE RAILING POST.
3. ON MULTI-SPAN CONTINUOUS SUPERSTRUCTURES, REGARDLESS OF WHETHER APPROVED SHRINKAGE REDUCING ADMIXTURE IS USED, CURB JOINTS SHALL BE LOCATED OVER THE CENTERLINE OF PIERS AND 7'-0" EACH SIDE OF THE CENTERLINE OF EACH PIER.
4. WHEN CURB JOINTS ARE USED THE CURBS SHALL BE PLACED IN ALTERNATE SECTIONS WITH A MINIMUM OF 48 HOUR DELAY BETWEEN ADJACENT PLACEMENTS.
5. LONGITUDINAL REINFORCING SHALL BE CONTINUOUS THROUGH CURB CONSTRUCTION JOINTS. CURB STIRRUP BARS SHALL BE TURNED AS NECESSARY TO MAINTAIN COVER IN THE FLARED CURB ENDS.
6. THE JOINT SPACING AND DETAILS SHOWN SHALL APPLY TO SIDEWALKS WHEN SHOWN IN THE PLANS.



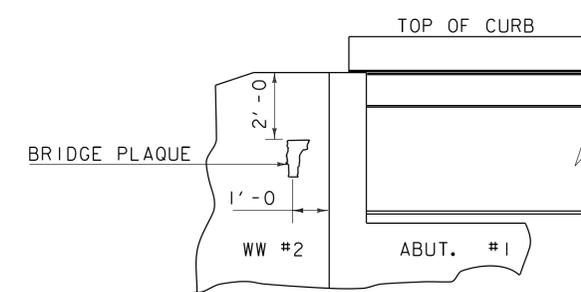
HORIZONTAL WINGWALL
CONSTRUCTION JOINT
(NOT TO SCALE)



DRIP NOTCH DETAIL
(NOT TO SCALE)



PLAN



VIEW "A - A"

BRIDGE PLAQUE
(NOT TO SCALE)

THE BRIDGE PLAQUE WILL BE SUPPLIED BY THE AGENCY OF TRANSPORTATION AND SHALL BE INSTALLED BY THE CONTRACTOR AT ABUTMENT #1 ON THE RIGHT SIDE AS SHOWN OR AS DIRECTED BY THE ENGINEER.

PAYMENT FOR INSTALLATION OF THE BRIDGE PLAQUE SHALL BE INCIDENTAL TO THE ADJACENT CONCRETE.

REVISIONS

MAY 7, 2010	APPROVED FOR USE BY VAOT STRUCTURES SECTION
JUNE 4, 2010	MODIFIED AND ADDED TWO DETAILS
OCTOBER 10, 2012	MODIFIED HORZ. JOINT WINGWALL ADD 6" MIN. DIMENSION

CONCRETE
DETAILS AND NOTES



STRUCTURES
DETAIL
SD-502.00