

STATE OF VERMONT AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT BRIDGE PROJECT

TOWN OF RICHFORD

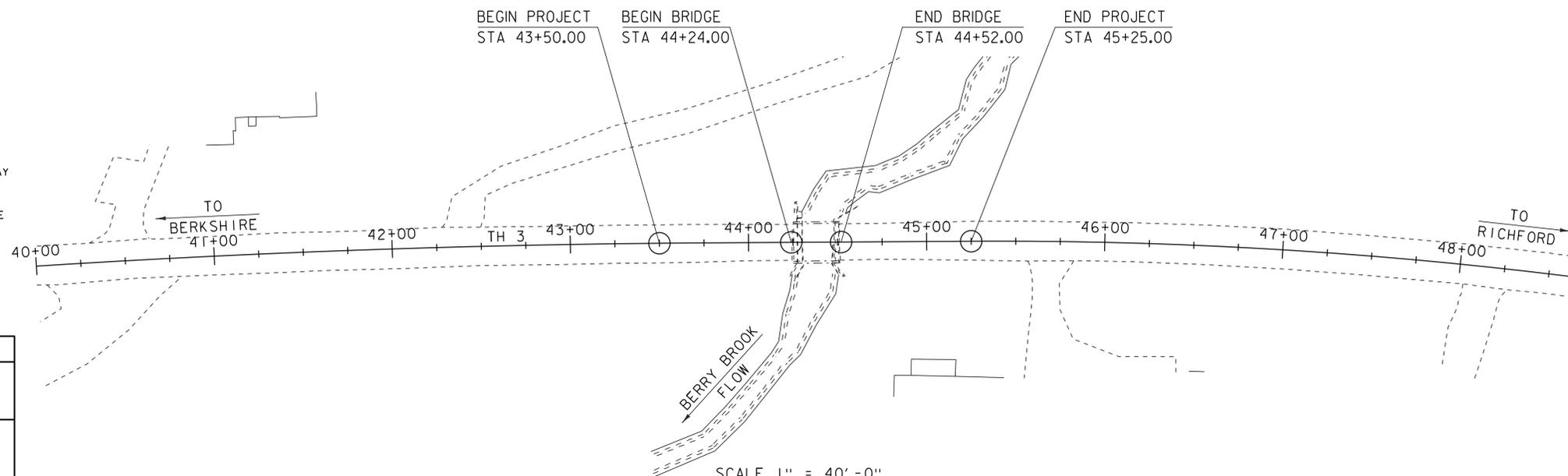
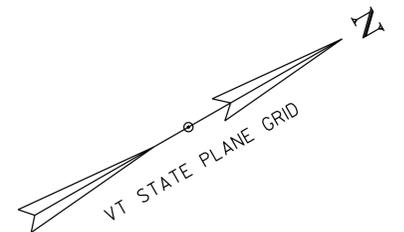
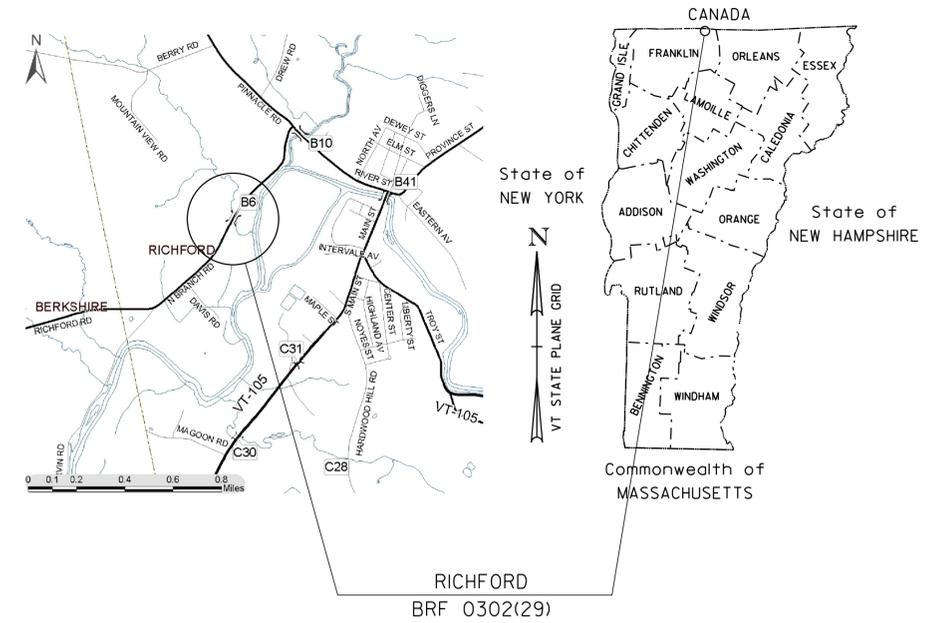
COUNTY OF FRANKLIN

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.



THESE PLANS ARE SUBJECT TO SUCH ENGINEERING CHANGES AS MAY BE REQUIRED BY THE FEDERAL HIGHWAY ADMINISTRATION OR THE DIRECTOR OF PROGRAM DEVELOPMENT.

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 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

PRELIMINARY PLANS 14-MAR-2014

DIRECTOR OF PROGRAM DEVELOPMENT	
APPROVED _____	DATE _____
PROJECT MANAGER : CAROLYN CARLSON, P.E.	
PROJECT NAME :	RICHFORD
PROJECT NUMBER :	BRF 0302 (29)
SHEET 1 OF 30 SHEETS	

PRELIMINARY INFORMATION SHEET (BRIDGE)

INDEX OF SHEETS

PLAN SHEETS

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STANDARDS LIST

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, aluvial 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	
2015	830	120	56	13.9	120	20 year ESAL for flexible pavement from 2015 to 2035 : 882000
2035	880	120	56	17.5	160	40 year ESAL for flexible pavement from 2015 to 2055 : 1946000
						Design Speed : 50 mph

PROPOSED STRUCTURE

STRUCTURE TYPE : Single span precast concrete structure
 CLEAR SPAN(NORMAL TO STREAM): 25'
 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

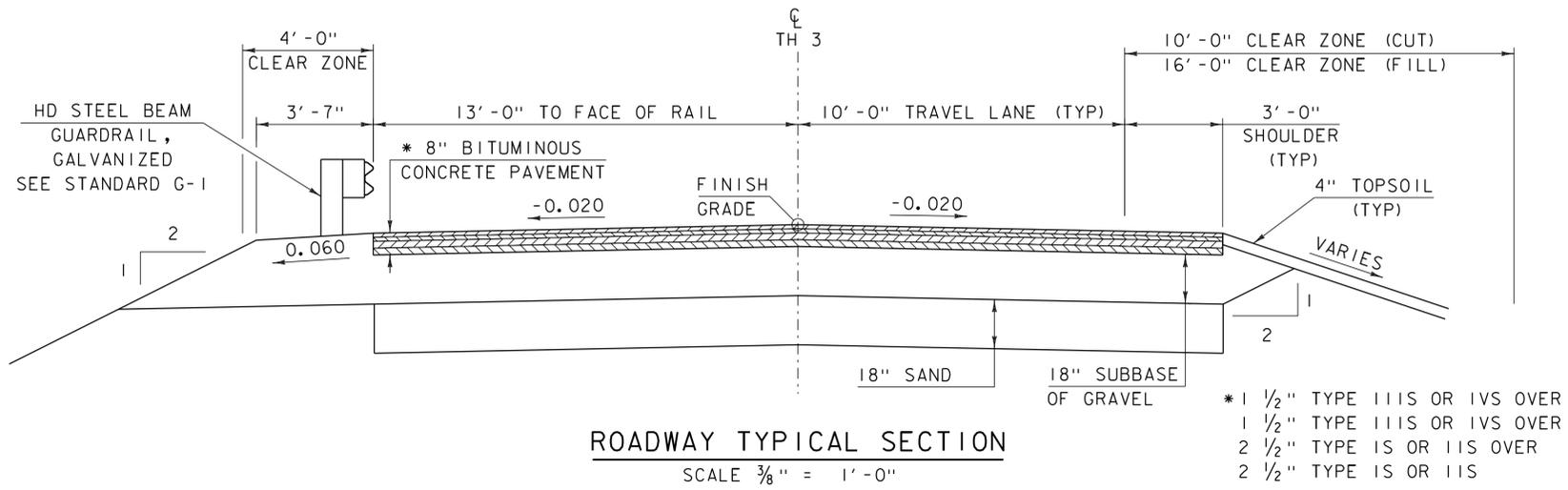
1. MAINTAIN TRAFFIC ON AN OFF SITE DETOUR.
2. TRAFFIC SIGNALS ARE NOT NECESSARY.
3. SIDEWALKS ARE NOT NECESSARY

DESIGN VALUES

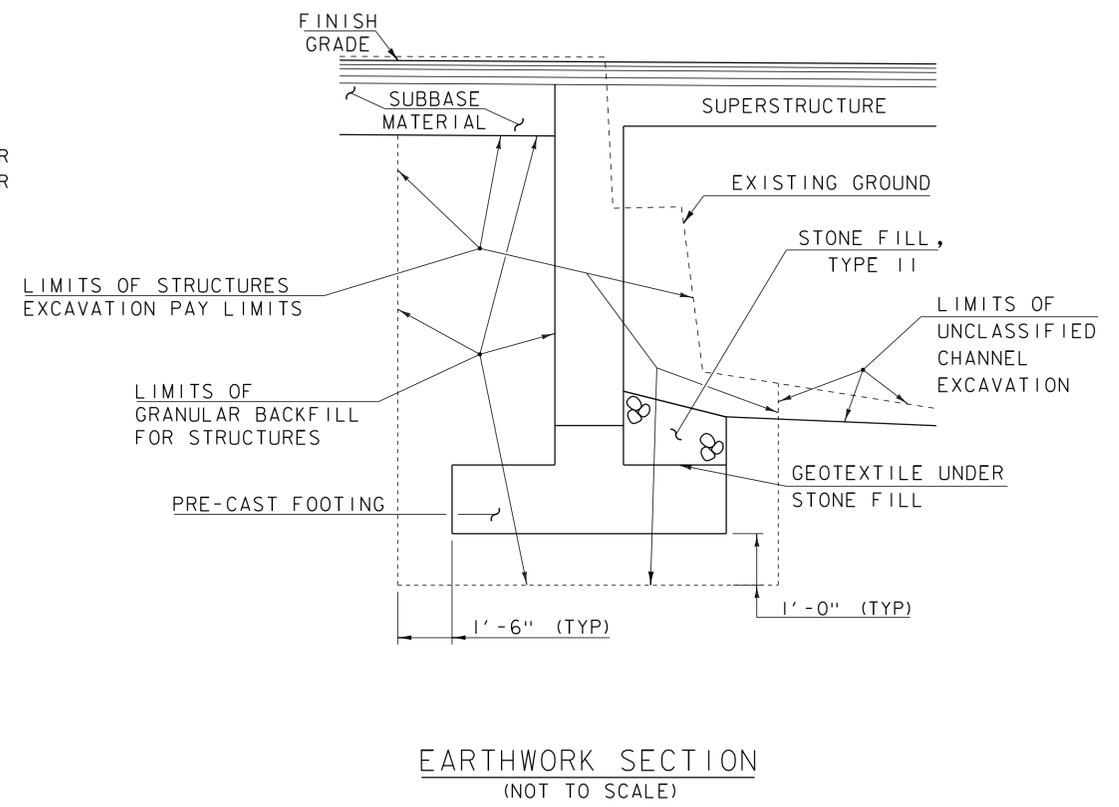
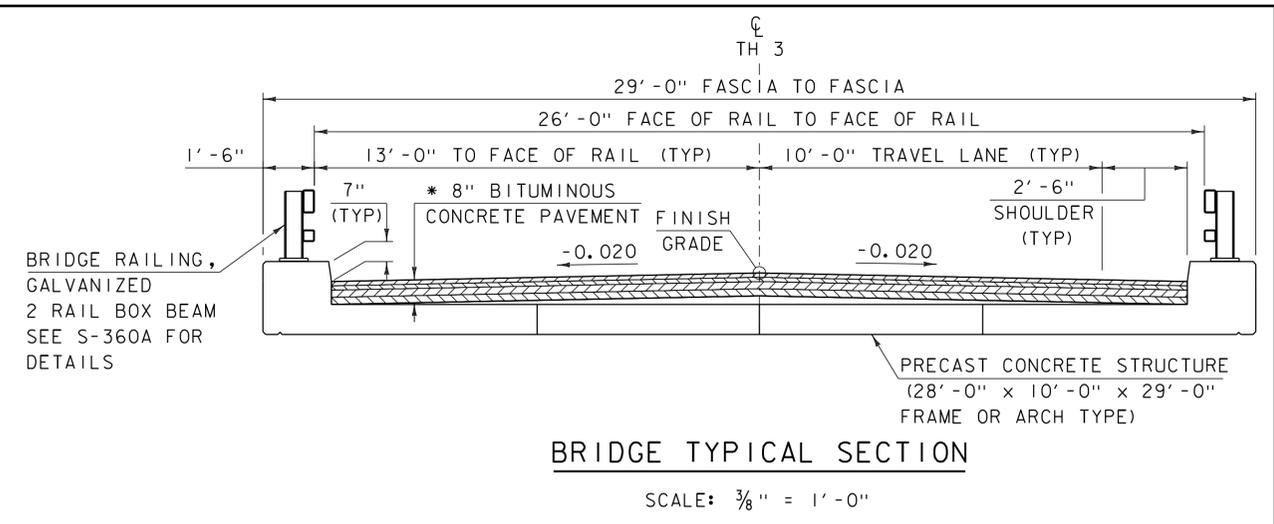
1. DESIGN LIVE LOAD	HL-93
2. FUTURE PAVEMENT	dp: 3.0 INCH
3. DESIGN SPAN	L: 26.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ: ---
5. PRESTRESSING STRAND	fy: ---
6. PRESTRESSED CONCRETE STRENGTH	f'c: ---
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'cr: ---
8. CONCRETE, HIGH PERFORMANCE 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: ---
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	pg: ---
22. SEISMIC DATA	PGA: 0 S: --- Sf: ---
23.	---
24.	---
25.	---
26.	---

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

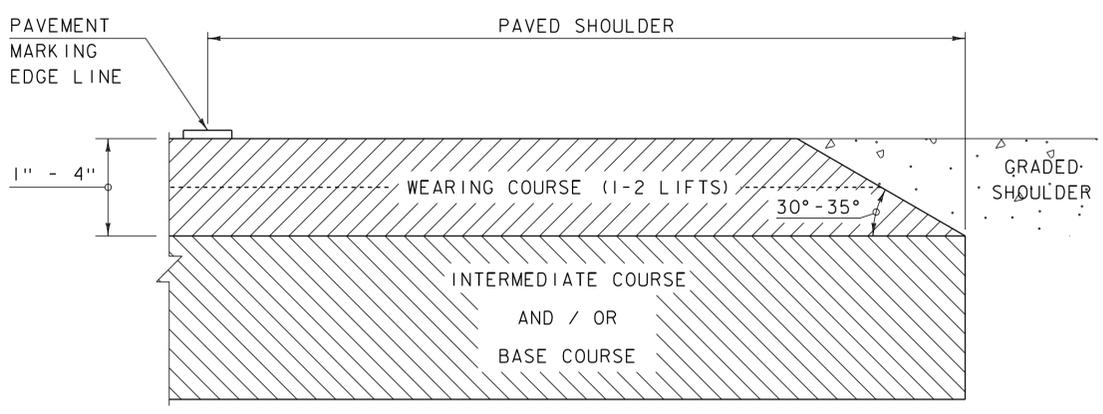
FILE NAME: s12j158pi.xls PLOT DATE: 3/5/2014
 PROJECT LEADER: C. CARLSON DRAWN BY: R. PELLETT
 DESIGNED BY: H. SALLS CHECKED BY: H. SALLS
PRELIMINARY INFORMATION SHEET 2 OF 30



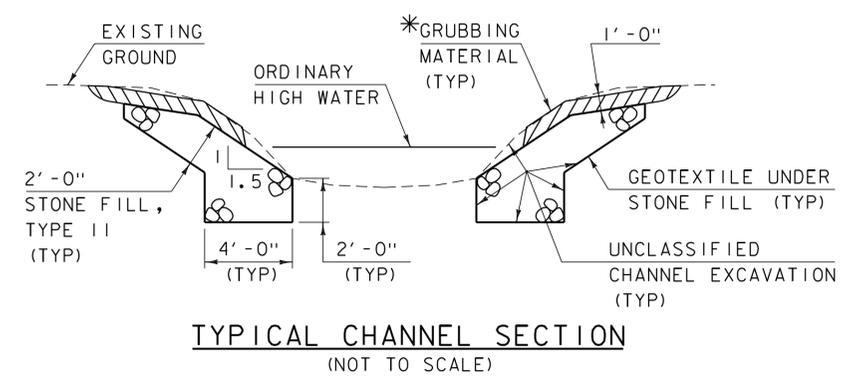
- * 1 1/2" TYPE IIIS OR IVS OVER
- 1 1/2" TYPE IIIS OR IVS OVER
- 2 1/2" TYPE IS OR IIS OVER
- 2 1/2" TYPE IS OR IIS



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



- NOTES:
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.



*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.

PROJECT NAME:	RICHFORD	PLOT DATE:	14-MAR-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 30

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 BENCH MARK
◻	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

— 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)

— 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
XXXXXXXXXXXXXXXXXXXX	TREE PROTECTION ZONE (TPZ)
////	STRIPING LINE REMOVAL
~~~~	SHEET PILES

**CONVENTIONAL BOUNDARY SYMBOLGY**

**BOUNDARY LINES**

— TOWN LINE —	TOWN BOUNDARY LINE
— COUNTY LINE —	COUNTY BOUNDARY LINE
— STATE 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: 14-MAR-2014  
PROJECT LEADER: C. CARLSON DRAWN BY: M.LONGSTREET  
DESIGNED BY: AOT CHECKED BY: H. SALLS  
CONVENTIONAL SYMBOLGY LEGEND SHEET 4 OF 30

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.

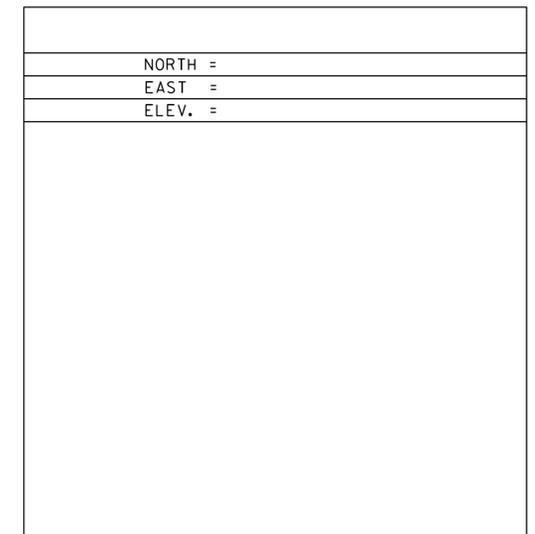
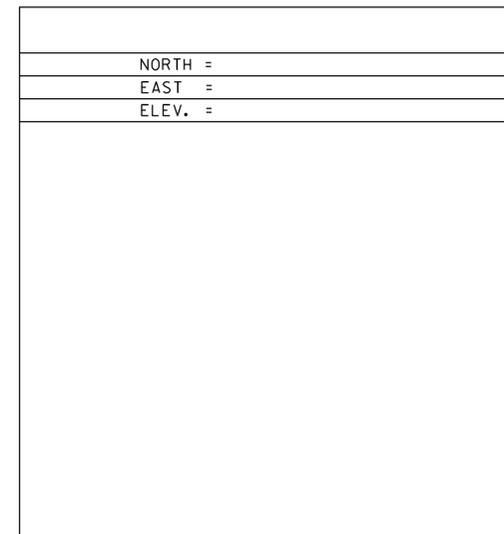
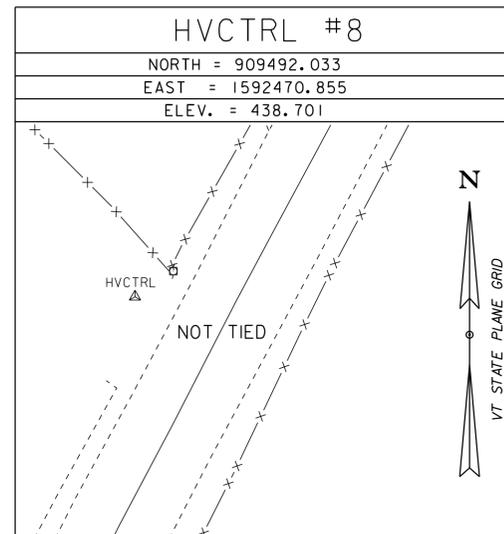
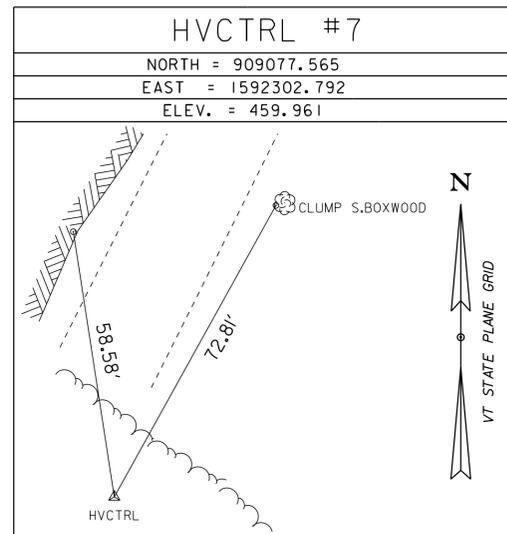
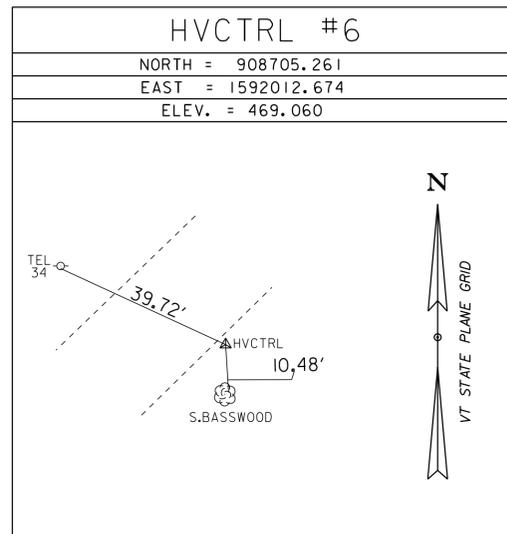
--- HVCTRL #2 ---

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



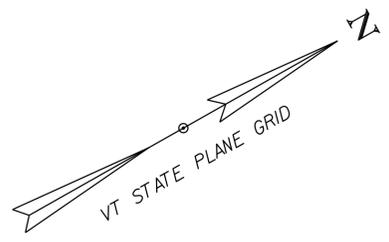
* Main Traverse Completed 4/17/09 by R. Bullock P.C. & R. Bockus

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:	14-MAR-2014
DRAWN BY:	S. DONOVAN
CHECKED BY:	H. SALLS
SHEET	5 OF 30



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

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

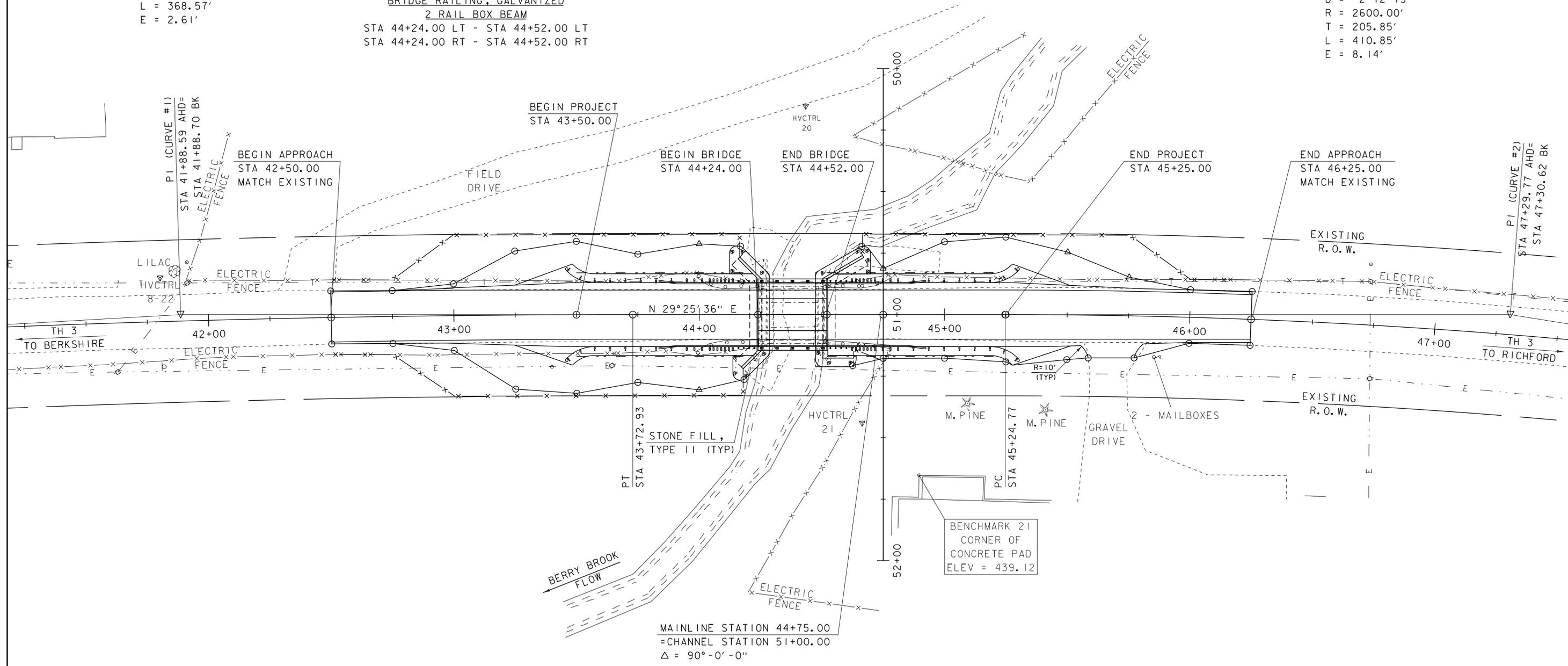
* FENCING WILL BE RESET AT A LOCATION AGREED UPON W/ THE PROPERTY OWNER AND ENGINEER IN THE FIELD

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

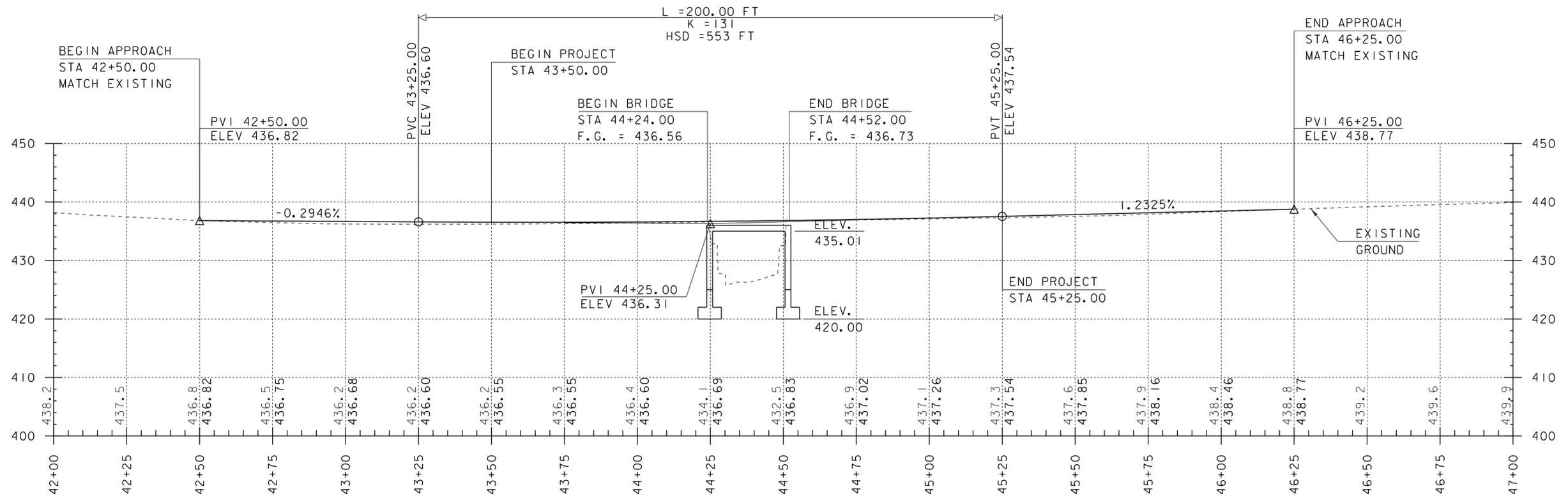
CURVE (1)  
 DELTA = 3°14'56"  
 D = 0°52'53"  
 R = 6500.00'  
 T = 184.34'  
 L = 368.57'  
 E = 2.61'



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

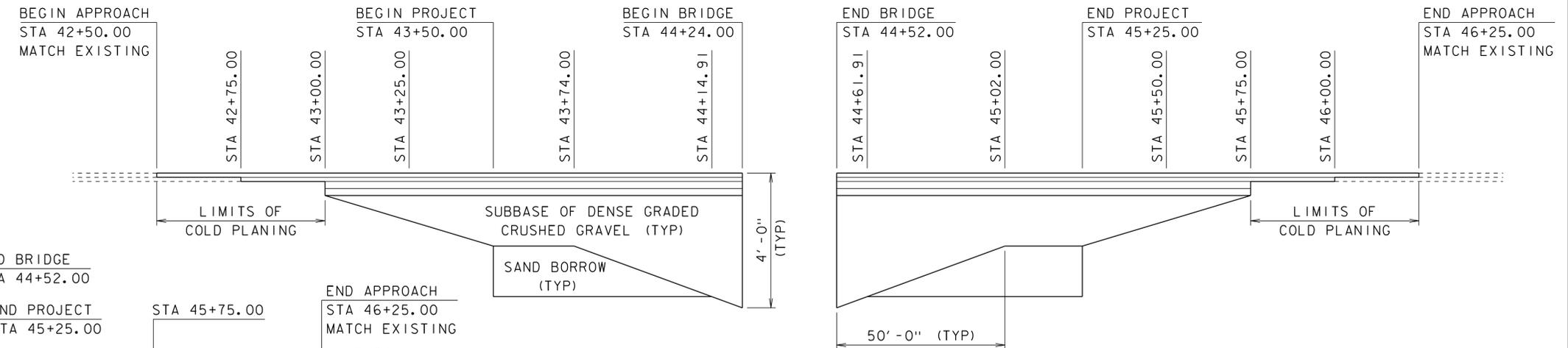
PROJECT NAME:	RICHFORD	PLOT DATE:	14-MAR-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	R. PELLETT
FILE NAME:	sl2j58bdr.dgn	CHECKED BY:	H. SALLS
PROJECT LEADER:	C. CARLSON	DESIGNED BY:	H. SALLS
DESIGNED BY:	H. SALLS	LAYOUT	
		SHEET	6 OF 30



**TH3 PROFILE**

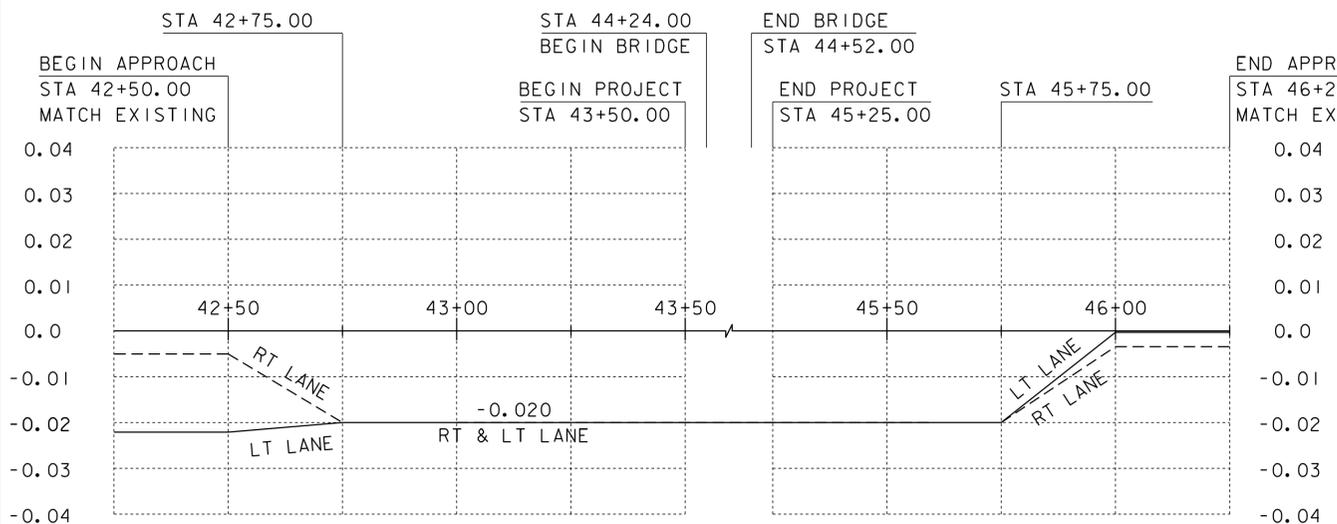
SCALE: HORIZONTAL 1" = 20' - 0"  
VERTICAL 1" = 10' - 0"

NOTE:  
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG  $\phi$   
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG  $\text{—}$



**MATERIAL TRANSITION DIAGRAM**

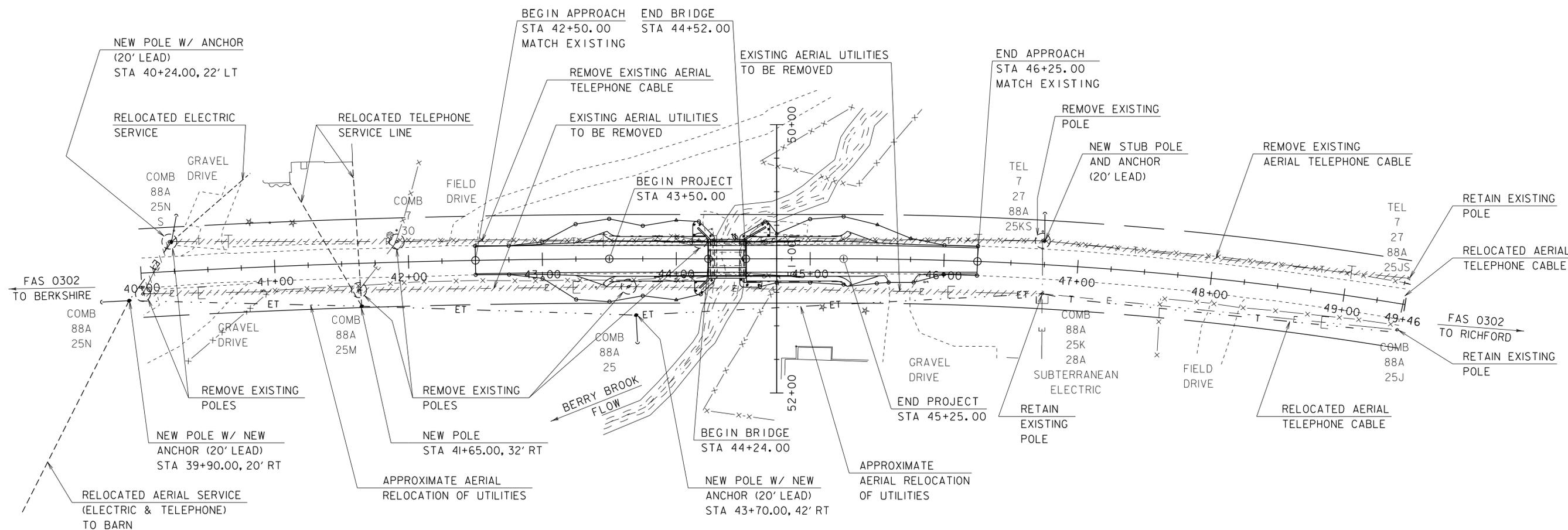
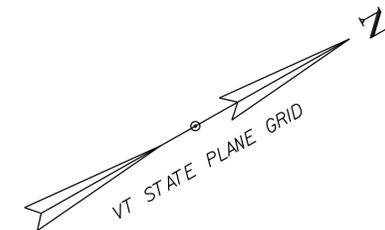
HOR. SCALE 1" = 20' - 0"  
NO VERT. SCALE



**BANKING DIAGRAM**

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

PROJECT NAME:	RICHFORD	PLOT DATE:	14-MAR-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 7 OF 30

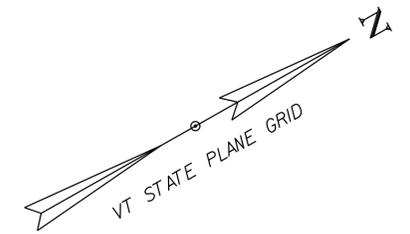


**NOTE:**

- 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.

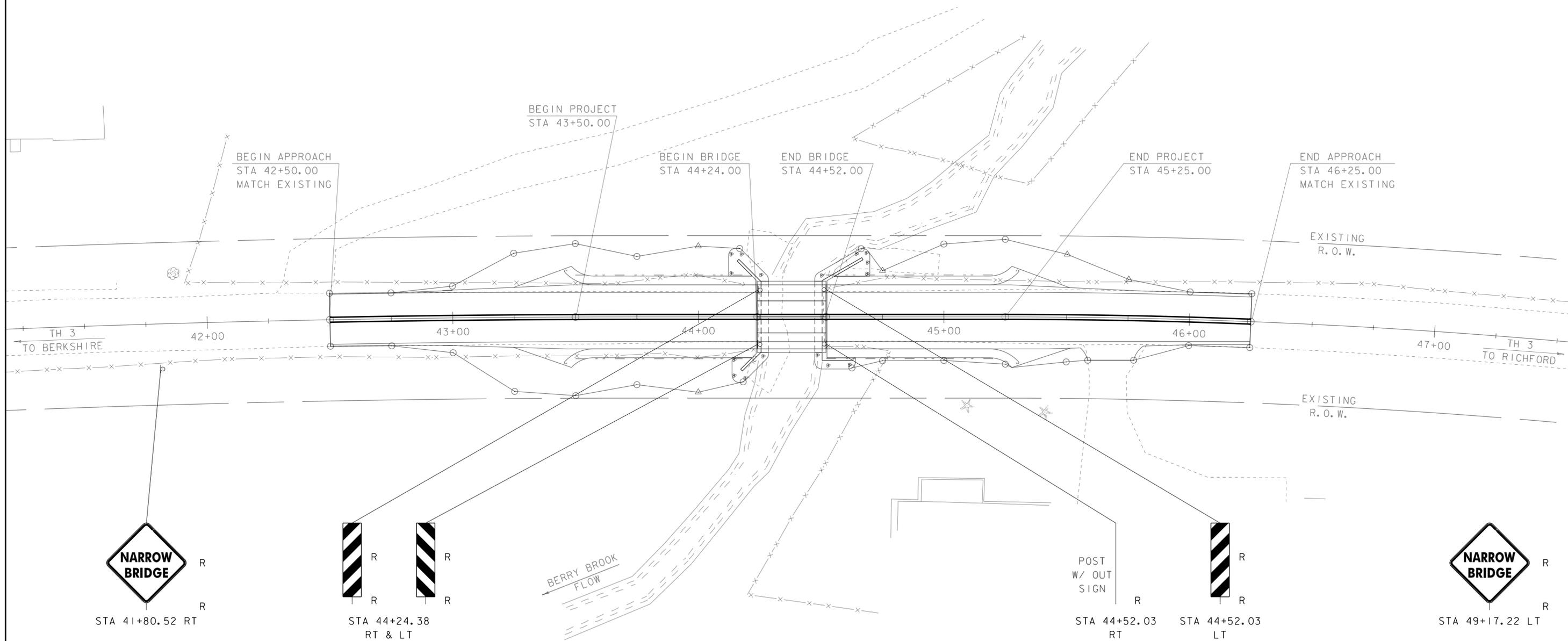
SCALE 1" = 40'-0"  
 20 0 20

PROJECT NAME: RICHFORD	
PROJECT NUMBER: BRF 0302(29)	
FILE NAME: sl2j58bdrutil.dgn	PLOT DATE: 14-MAR-2014
PROJECT LEADER: C. CARLSON	DRAWN BY: M. LONGSTREET
DESIGNED BY: H. SALLS	CHECKED BY: L. WHEELER
UTILITY LAYOUT	SHEET 8 OF 30



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  
**R**  
 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: 14-MAR-2014
PROJECT NUMBER: BRF 0302(29)	DRAWN BY: R. PELLETT
FILE NAME: sl2j58bdr-sign.dgn	CHECKED BY: H. SALLS
PROJECT LEADER: C. CARLSON	SHEET 9 OF 30
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**

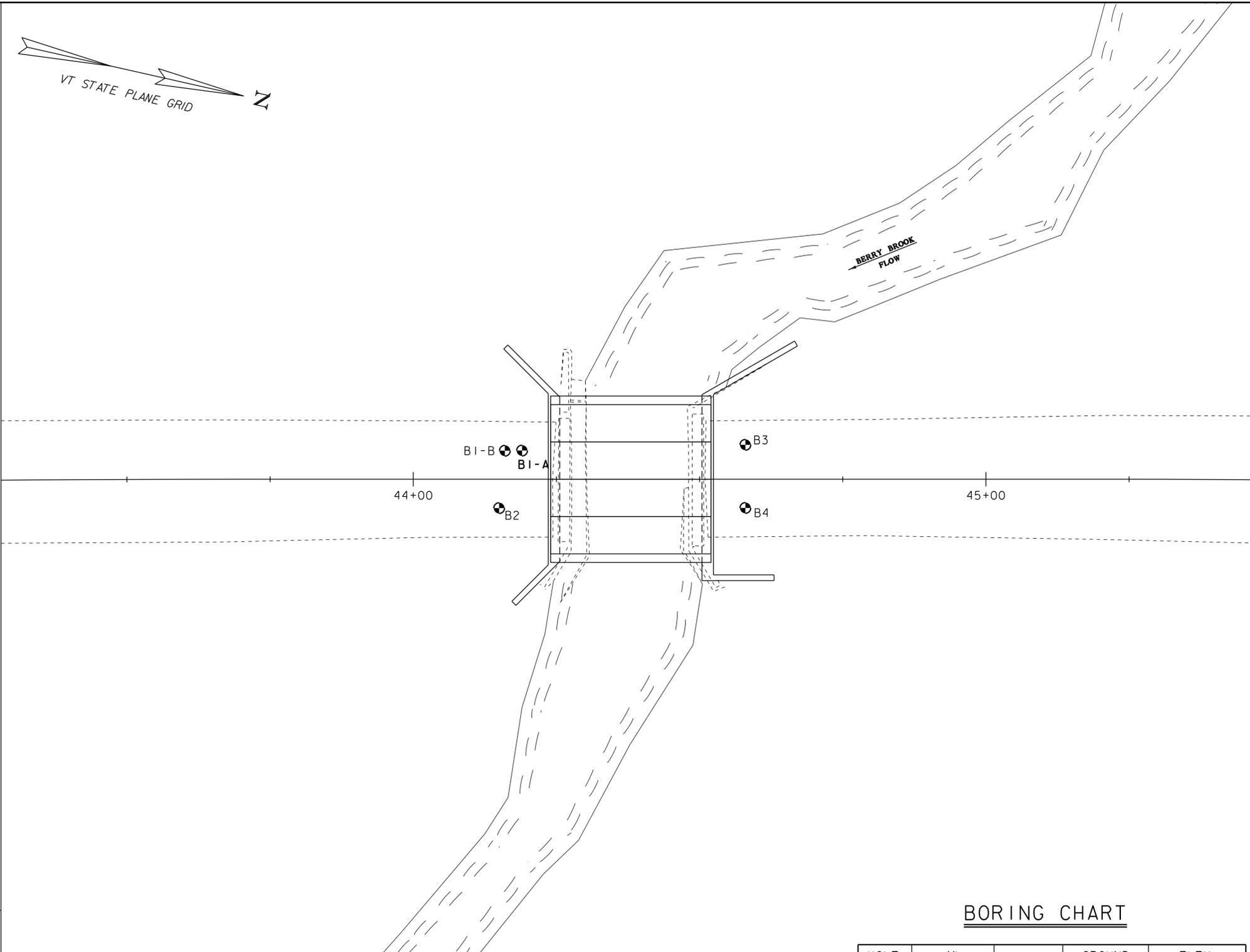
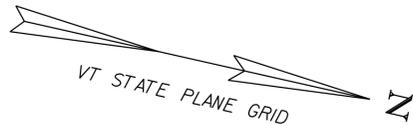
DENSITY (GRANULAR SOILS)		CONSISTENCY (COHESIVE SOILS)	
N	DESCRIPTIVE TERM	N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

**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: 14-MAR-2014  
PROJECT LEADER: C. CARLSON DRAWN BY: R. PELLETT  
DESIGNED BY: H. SALLS CHECKED BY: H. SALLS  
BORING INFORMATION SHEET 10 OF 30

**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**

1. The subsurface explorations shown herein were made between 09/04/2013 and 09/09/2013 by the Agency.
2. Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by the Agency and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.
3. Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.
4. 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.
5. Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.
6. Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.
7. Northing and Easting coordinates are shown in Vermont State Plane Grid North American Datum 1983 in meters and survey feet.

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: Casing 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: 09/04/13 Depth (ft): Notes: 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 (13' to 13.7'): Hard, slightly weathered, gray with white QUARTZITE BOULDER.	C1			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 (AASHTO M145 Classification: A-4.)										

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

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: Casing 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: 09/04/13 Depth (ft): Notes: 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.)										
34		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
39		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.)				100/5" (R)	11.8	35.2	30.4	34.4	NP	NP
41		Inferred Weathered Bedrock										
41		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.	C2	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.	C3	87 (47)	4							
51		Hole stopped @ 51.0 ft B-1A abandoned; B-1B end of Core										

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.

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)

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**

**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				

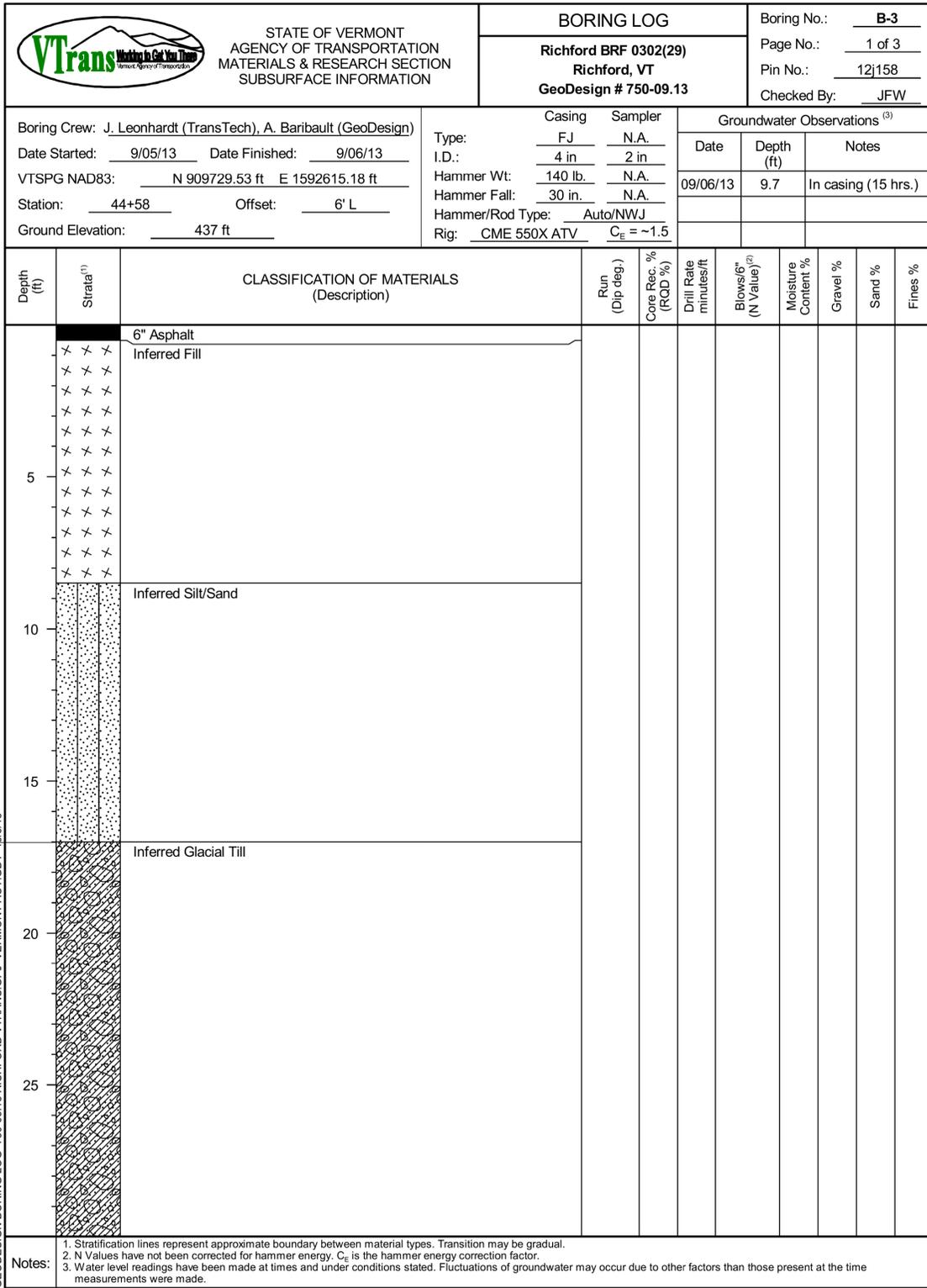
Depth (ft)	Strata ⁽¹⁾	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value) ⁽²⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
65		5) Advanced casing in B-1B to 14' deep prior to continuing with soil sampling. 6) Noted occasional roller 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 10/9/13

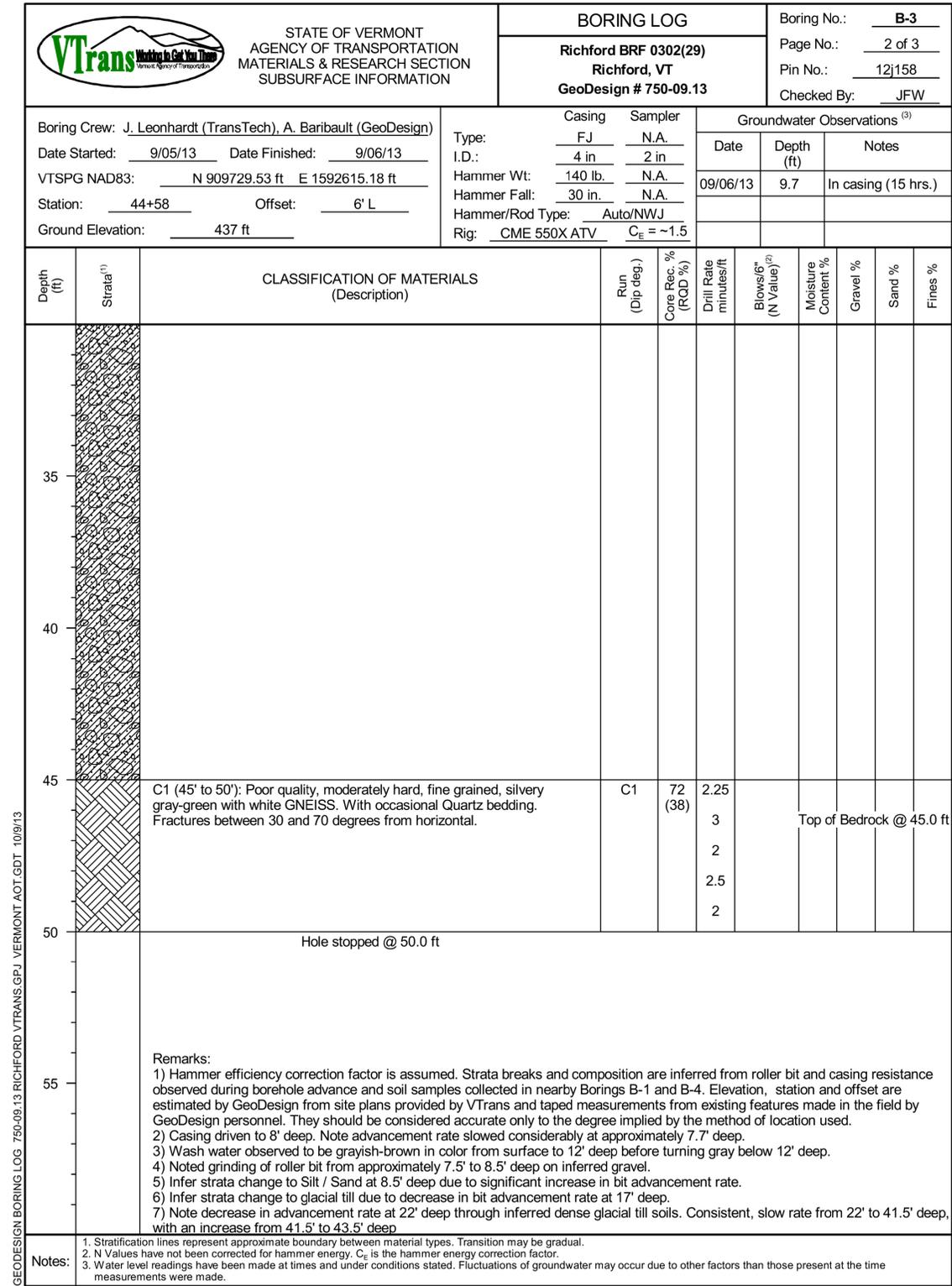
PROJECT NAME:	RICHFORD	PLOT DATE:	14-MAR-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	R. PELLETT
FILE NAME:	sl2j158bor.dgn	CHECKED BY:	H. SALLS
PROJECT LEADER:	C. CARLSON	SHEET	12 OF 30
DESIGNED BY:	H. SALLS		
BORING LOGS	2		





BOTTOM OF FOOTING  
ELEV 420.00

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



GEODESIGN BORING LOG 750-09.13 RICHFORD VTTRANS.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:	14-MAR-2014
DRAWN BY:	R. PELLETT
CHECKED BY:	H. SALLS
SHEET	14 OF 30



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
PROJECT NUMBER:	BRF 0302(29)
FILE NAME:	si2j58bor.dgn
PROJECT LEADER:	C. CARLSON
DESIGNED BY:	H. SALLS
BORING LOGS	5
PLOT DATE:	14-MAR-2014
DRAWN BY:	R. PELLETT
CHECKED BY:	H. SALLS
SHEET	15 OF 30





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)  
 Date Started: 9/03/13 Date Finished: 9/04/13  
 VTSPG NAD83: N 909724.13 ft E 1592624.76 ft  
 Station: 44+58 Offset: 5' R  
 Ground Elevation: 437 ft

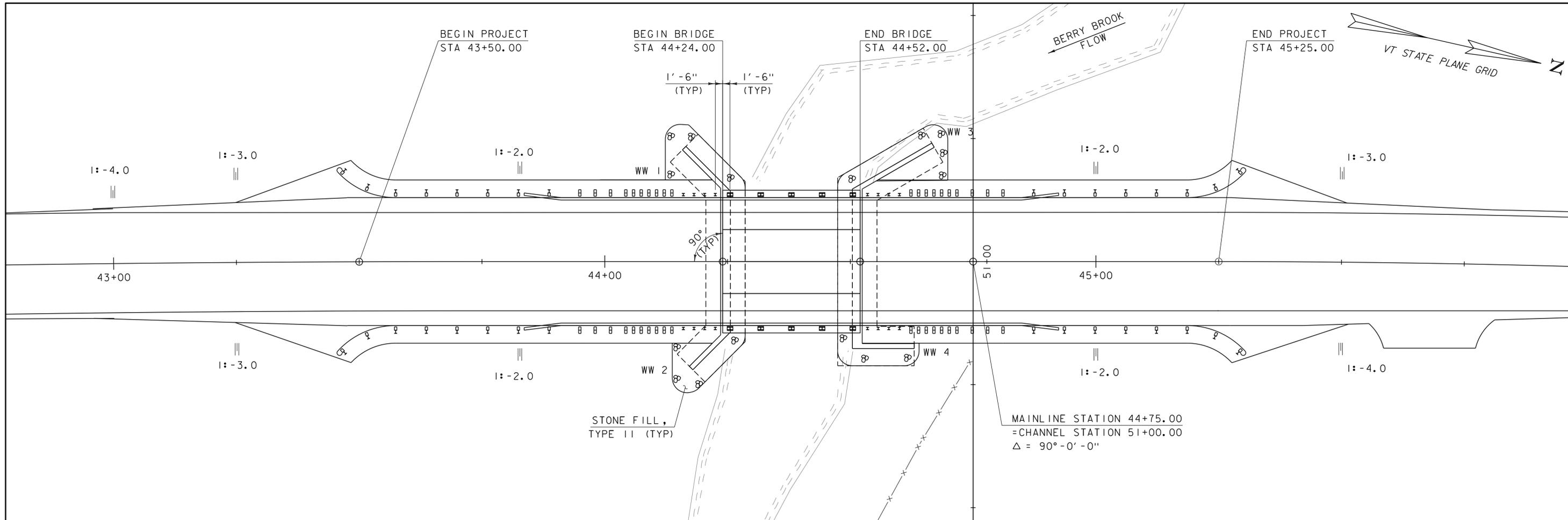
Casing		Sampler		Groundwater Observations ⁽³⁾		
Type:	I.D.:	Hammer Wt:	Hammer Fall:	Date	Depth (ft)	Notes
FJ	4 in	140 lb.	30 in.	09/03/13	10.0	Wet sample
SS	2 in	140 lb.	30 in.	09/04/13	9.5	In Casing
Rig: <u>CME 550X ATV</u>		C _E = <u>-1.5</u>				

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 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) 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												

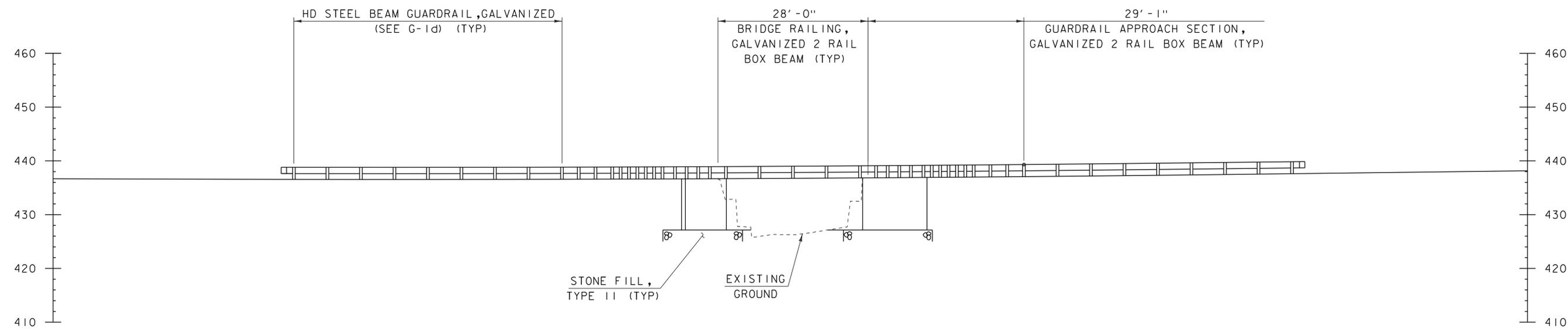
GEODESIGN BORING LOG 750-09.13 RICHFORD VTRANS.GPJ VERMONT AOT.GDT 10/9/13

**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: <b>RICHFORD</b>	PLOT DATE: 14-MAR-2014
PROJECT NUMBER: <b>BRF 0302(29)</b>	DRAWN BY: <b>R. PELLETT</b>
FILE NAME: <b>sl2j158bor.dgn</b>	CHECKED BY: <b>H. SALLS</b>
PROJECT LEADER: <b>C. CARLSON</b>	SHEET <b>17</b> OF <b>30</b>
DESIGNED BY: <b>H. SALLS</b>	
BORING LOGS <b>7</b>	

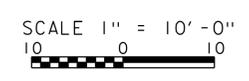


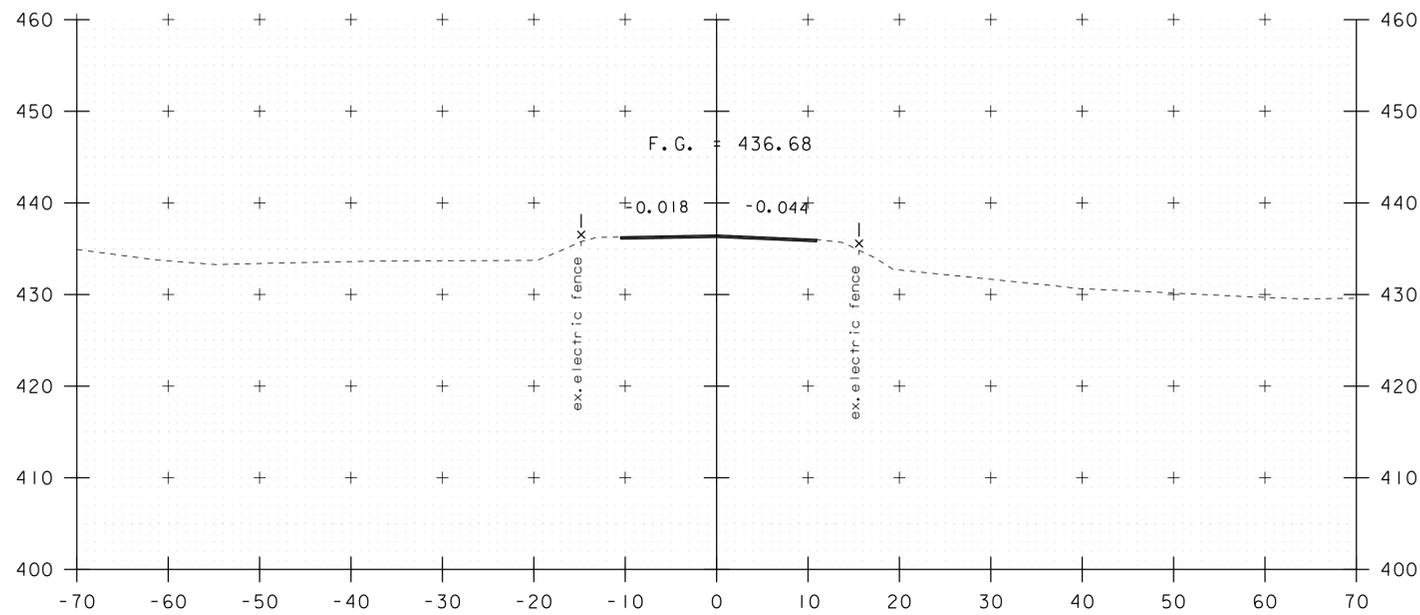
PLAN



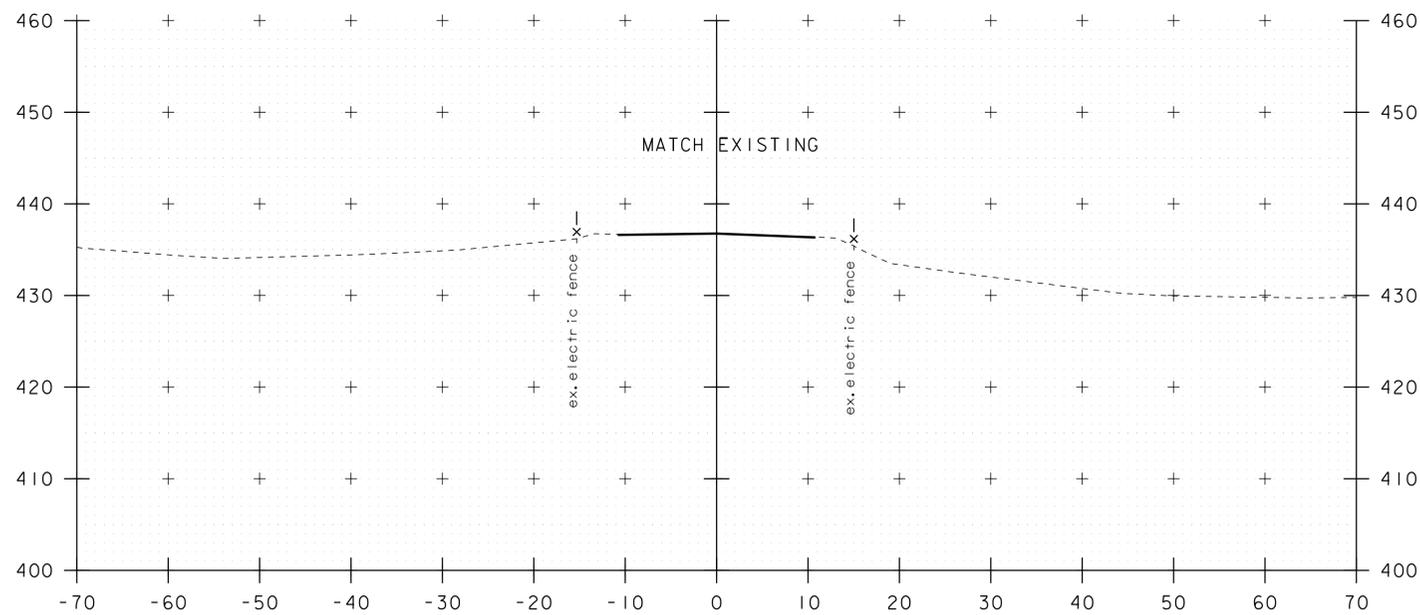
ELEVATION

PROJECT NAME: RICHFORD		PLOT DATE: 14-MAR-2014	
PROJECT NUMBER: BRF 0302(29)		DRAWN BY: R. PELLETT	
FILE NAME: sl2j58pe.dgn	DESIGNED BY: H. SALLS	CHECKED BY: H. SALLS	SHEET 18 OF 30
PROJECT LEADER: C. CARLSON		PLAN AND ELEVATION	

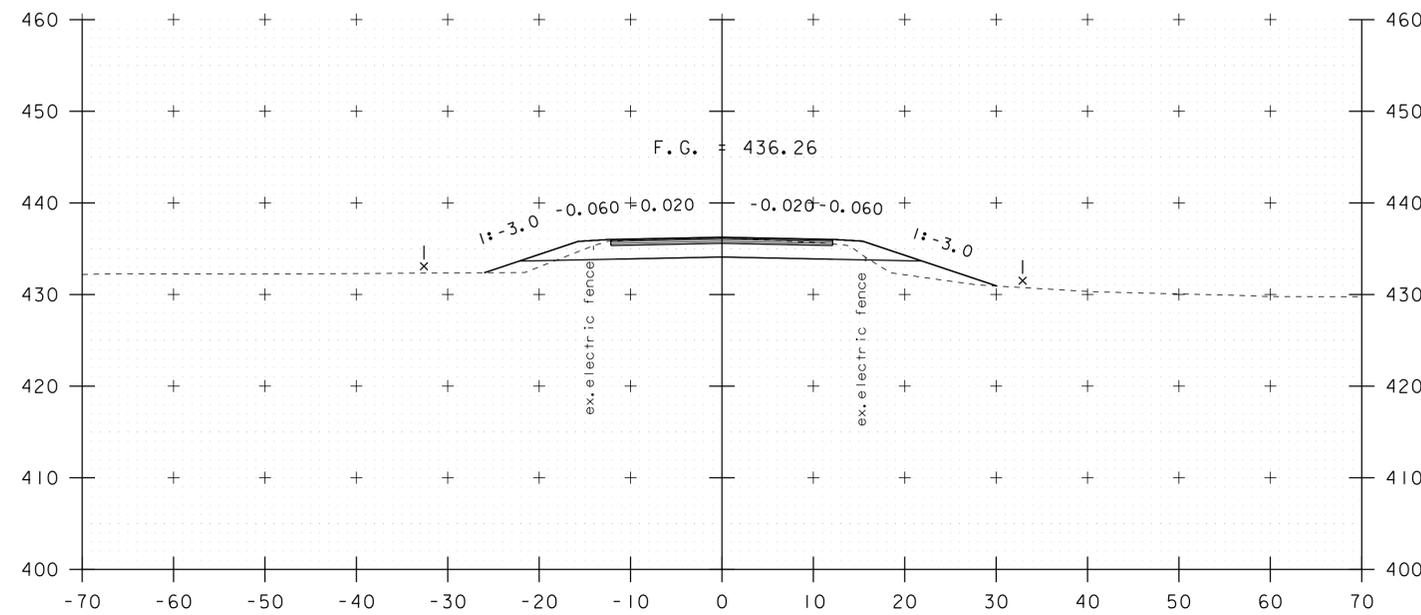




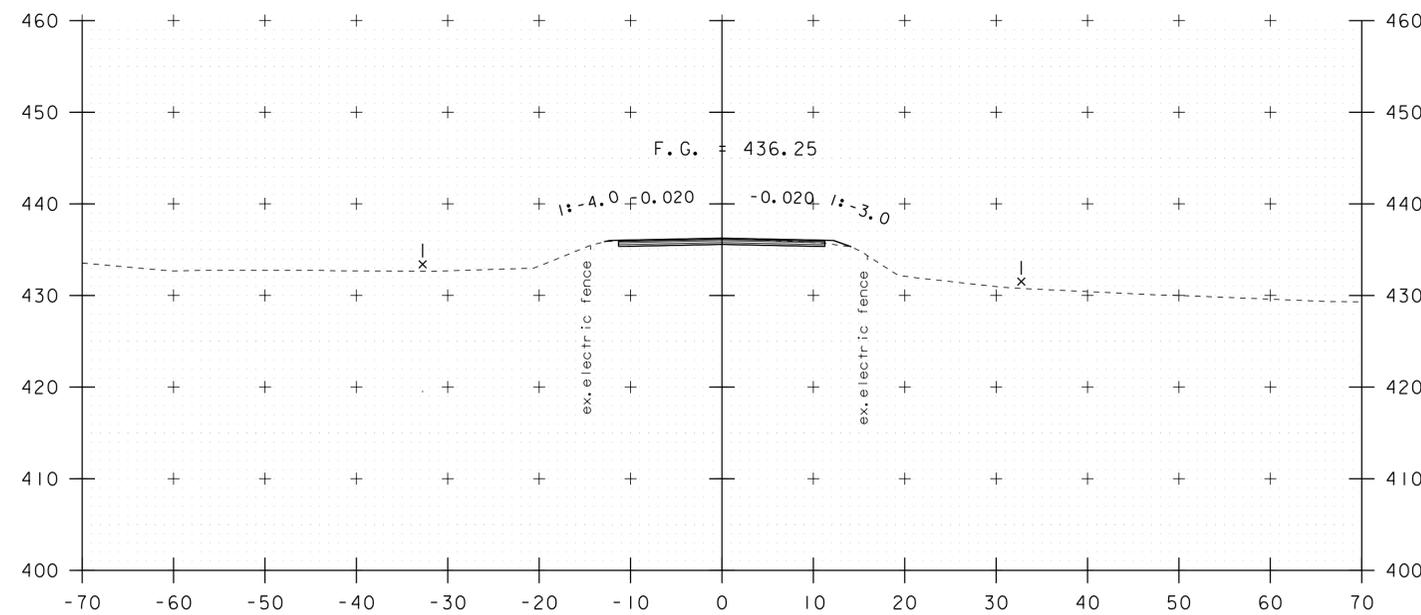
42+75



42+50  
BEGIN APPROACH



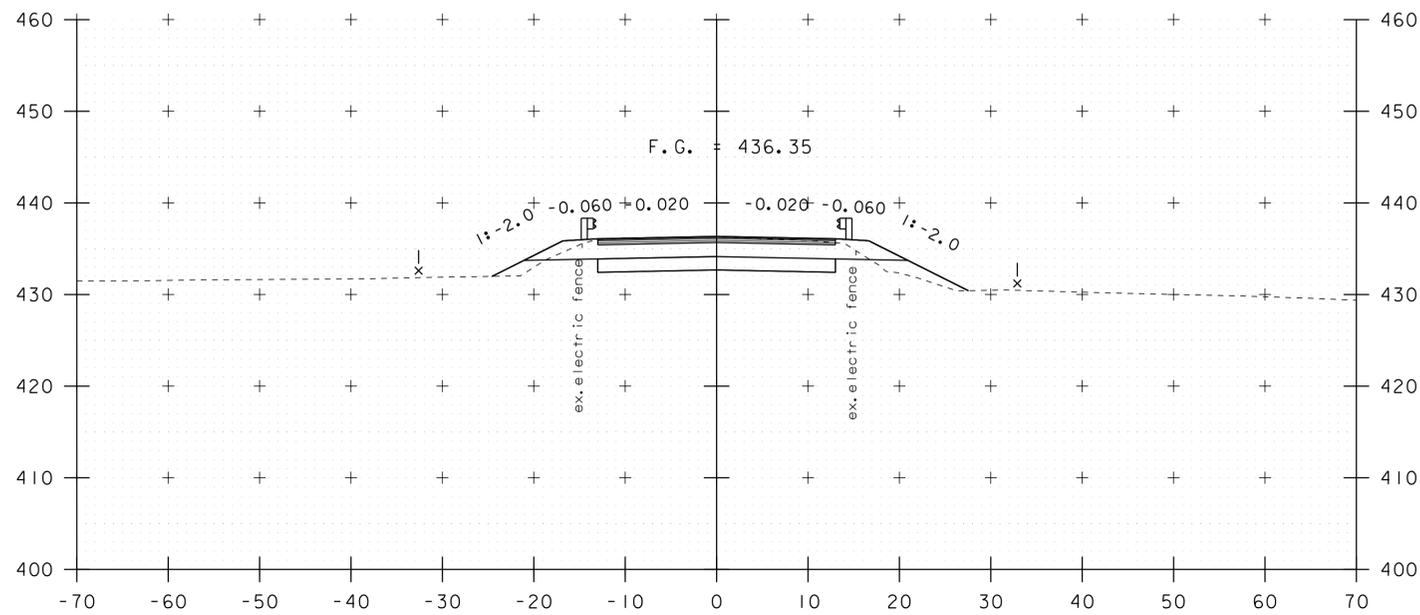
43+25



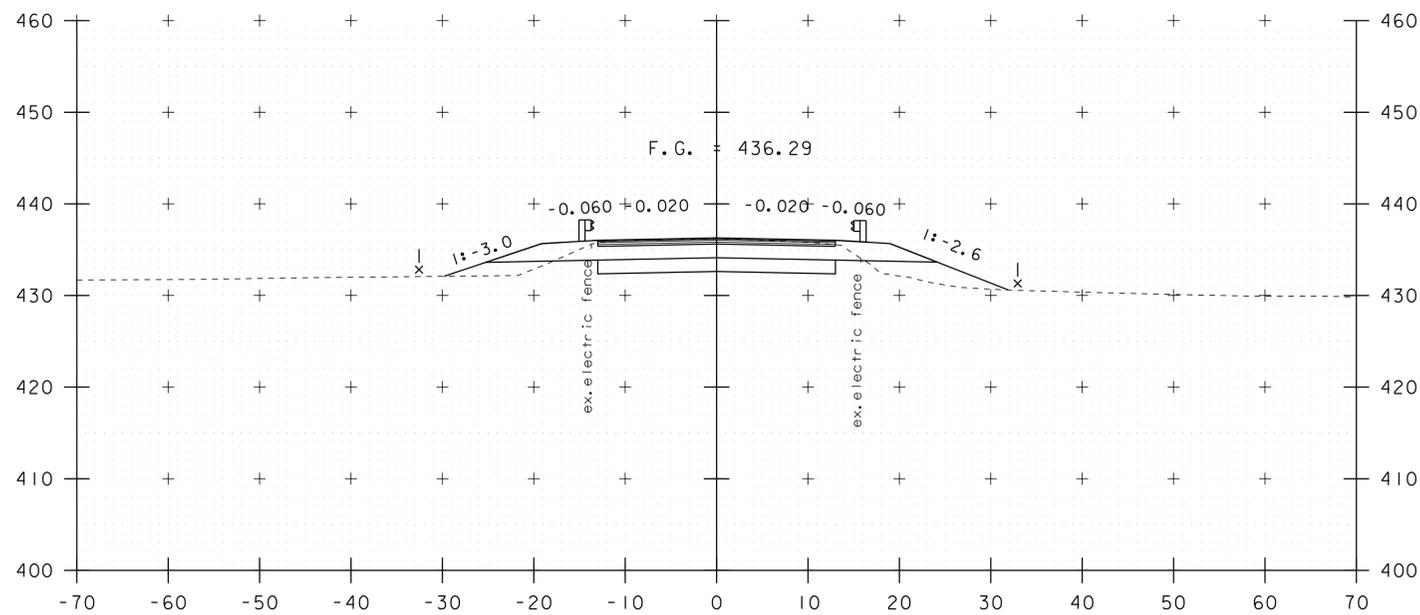
43+00

STA. 42+50 TO STA. 43+25

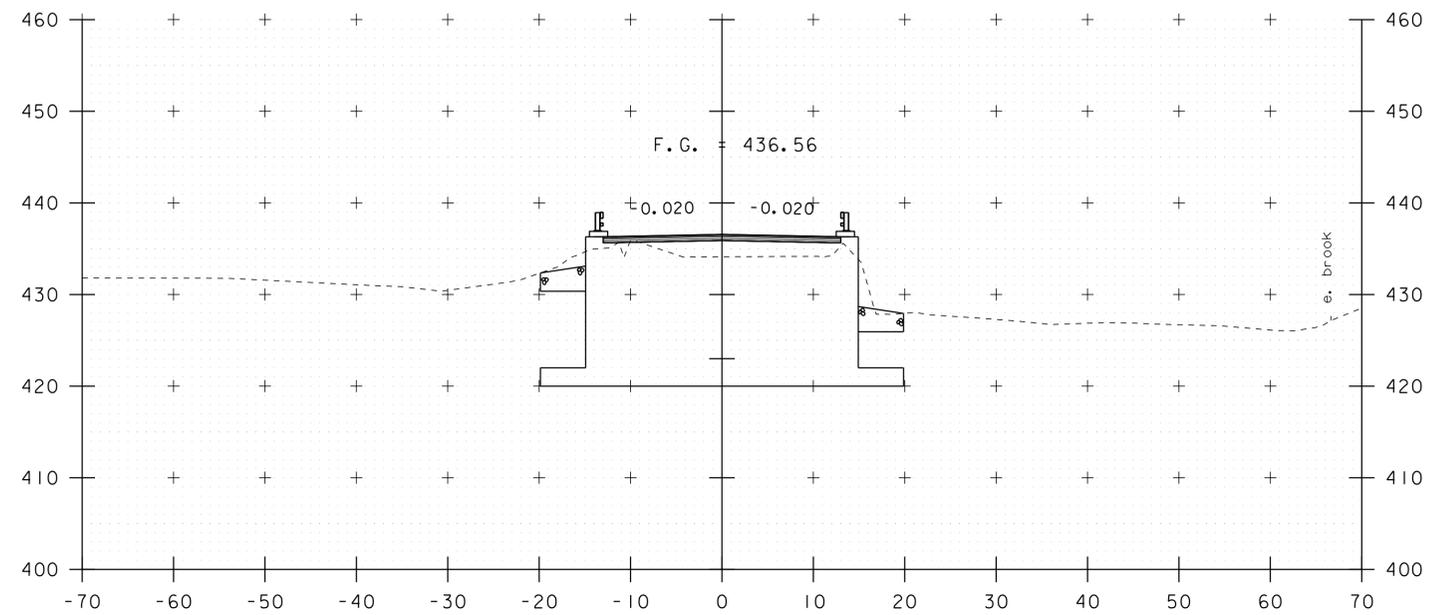
PROJECT NAME: RICHFORD	
PROJECT NUMBER: BRF 0302(29)	
FILE NAME: sl2j58xs.dgn	PLOT DATE: 14-MAR-2014
PROJECT LEADER: C. CARLSON	DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS	CHECKED BY: H. SALLS
MAINLINE CROSS SECTIONS 1	SHEET 19 OF 30



43+75

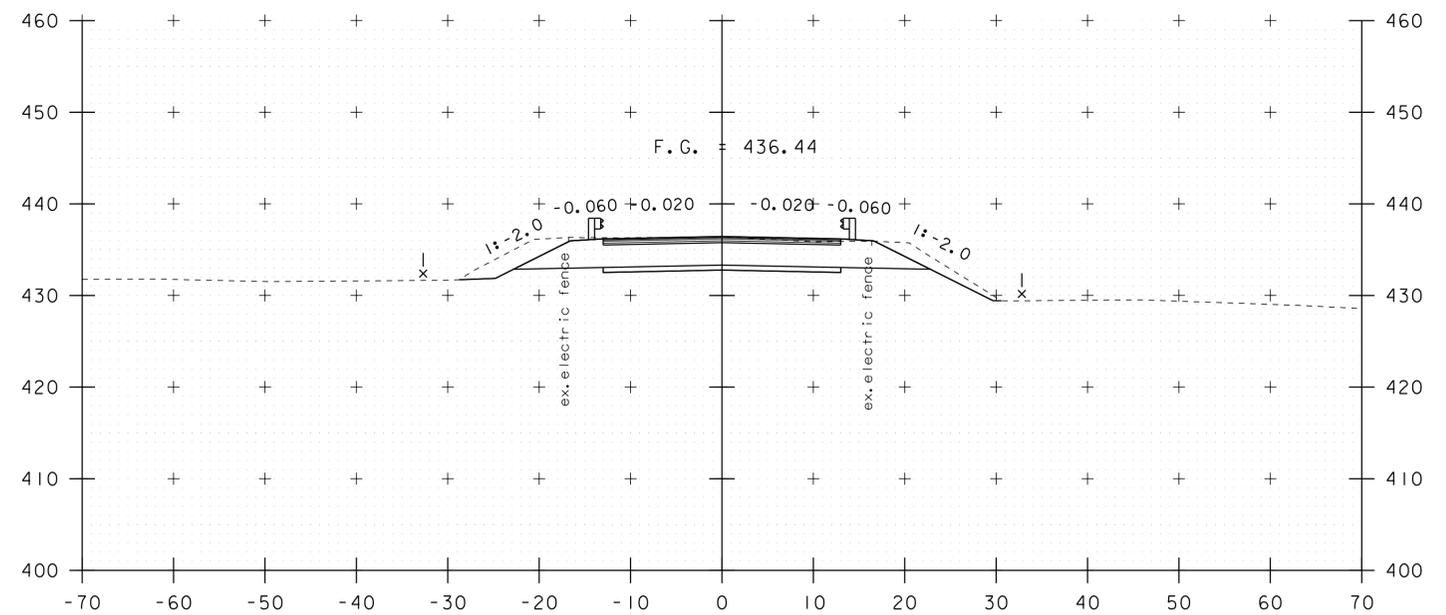


43+50  
BEGIN PROJECT



44+25

STA 44+24 BEGIN BRIDGE



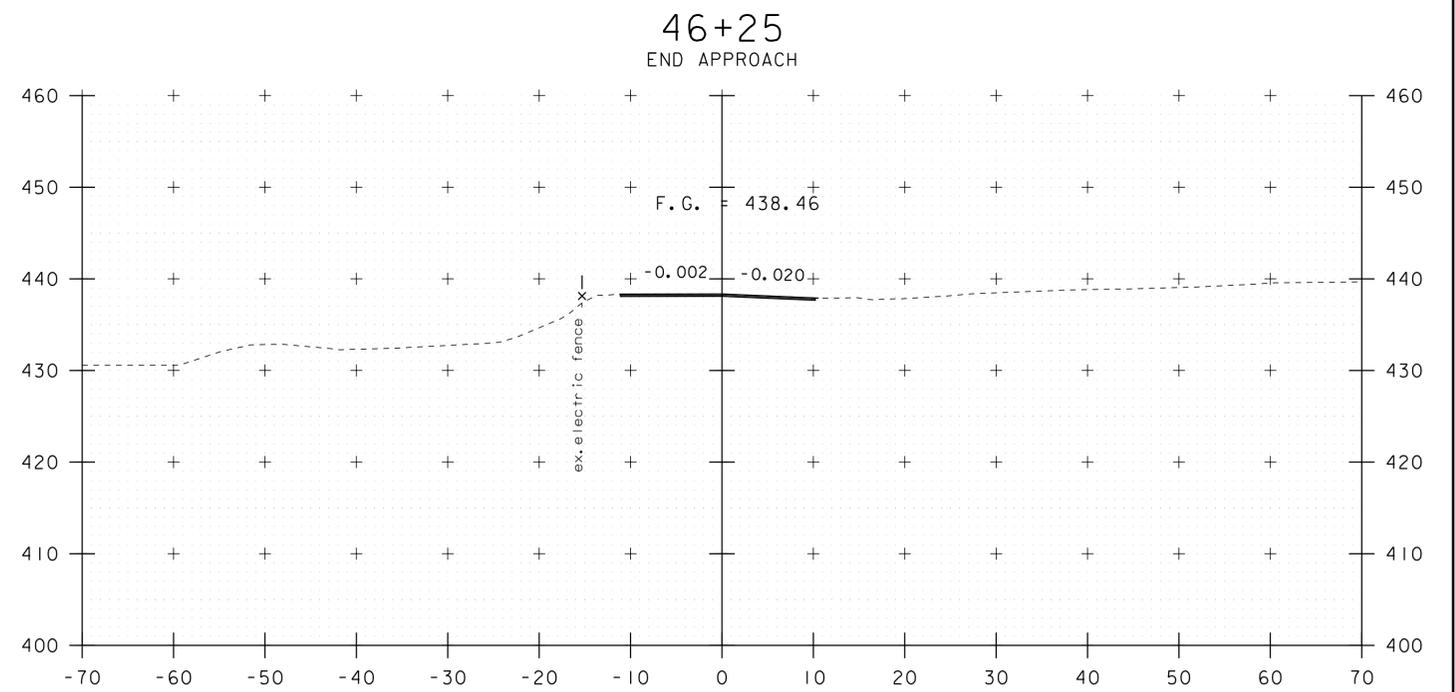
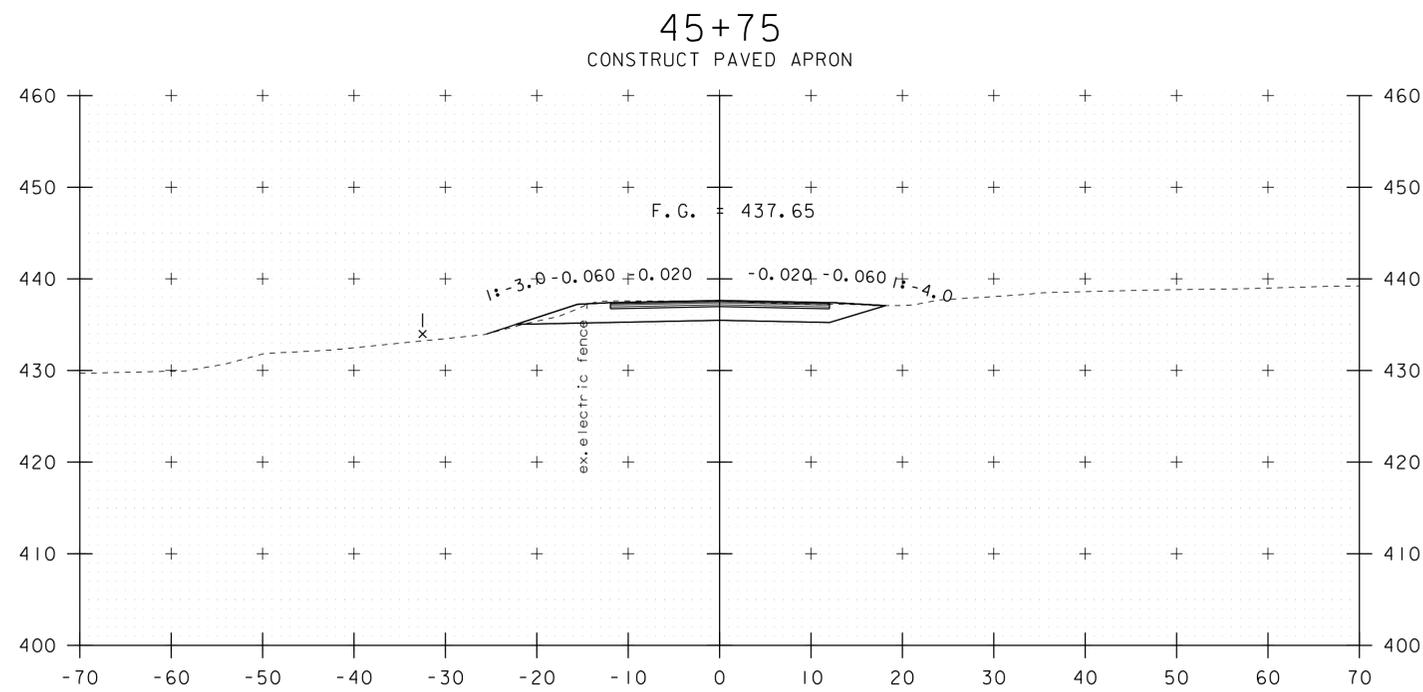
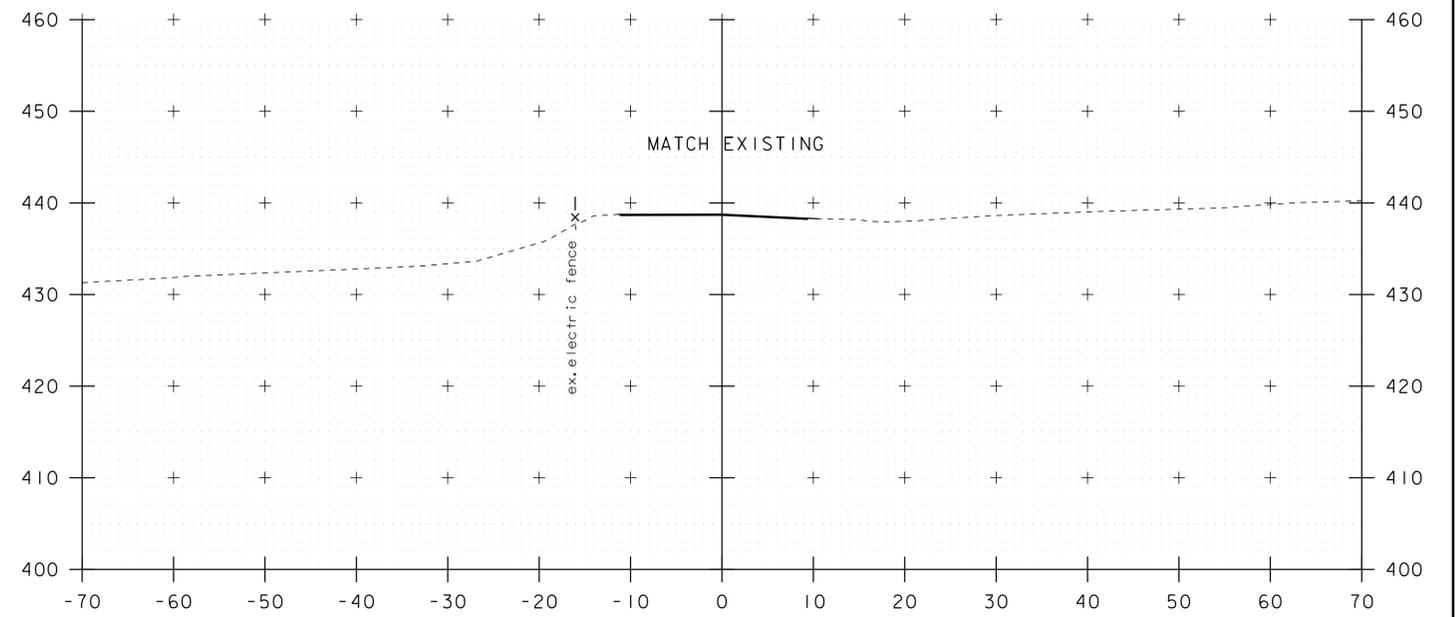
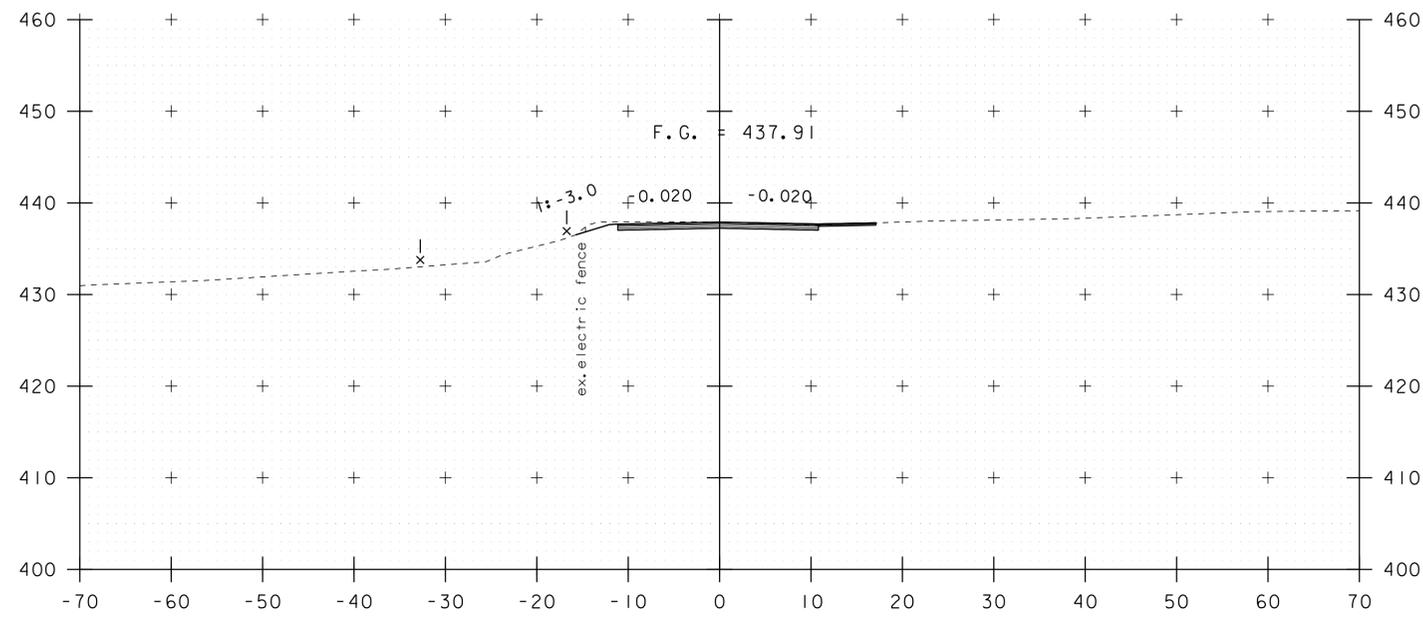
44+00

STA. 43+50 TO STA. 44+25

PROJECT NAME:	RICHFORD
PROJECT NUMBER:	BRF 0302(29)
FILE NAME:	sl2j58xs.dgn
PROJECT LEADER:	C. CARLSON
DESIGNED BY:	H. SALLS
MAINLINE CROSS SECTIONS 2	

PLOT DATE:	14-MAR-2014
DRAWN BY:	R. PELLETT
CHECKED BY:	H. SALLS
SHEET	20 OF 30



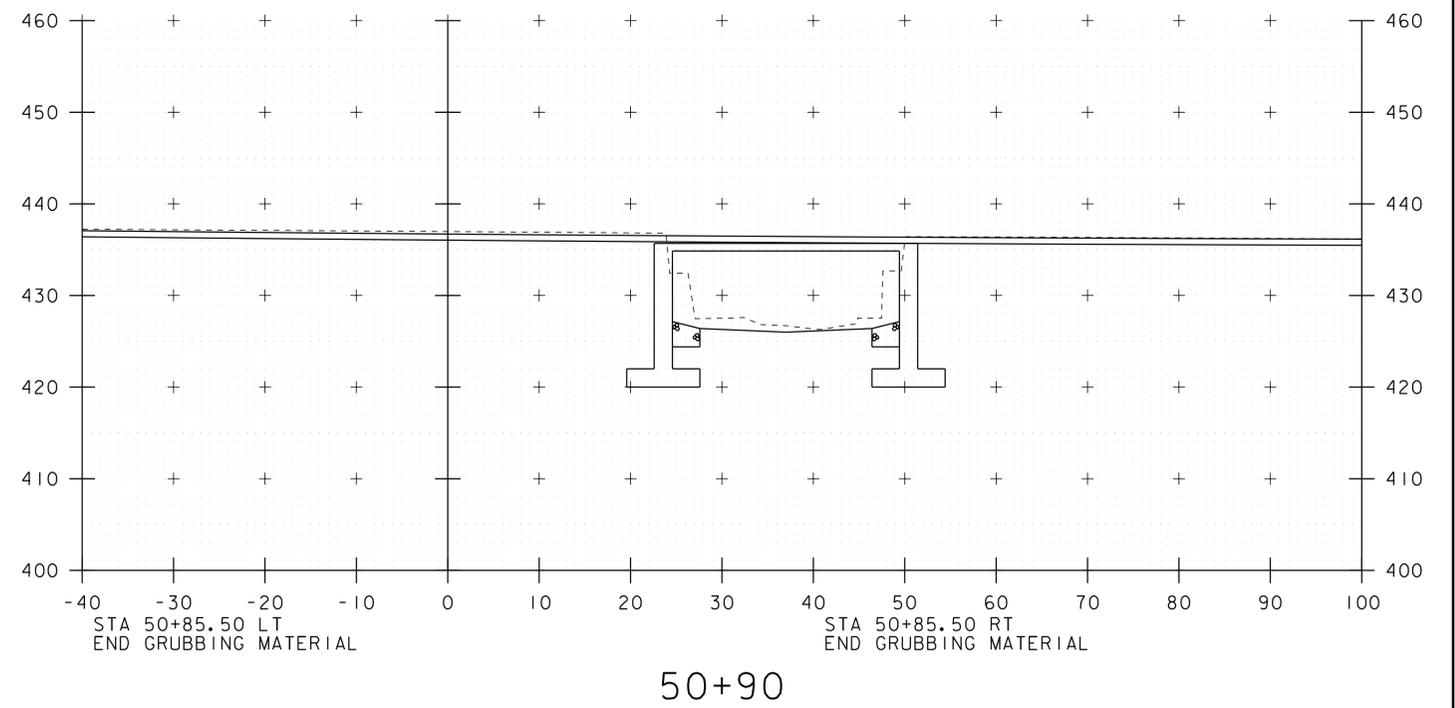
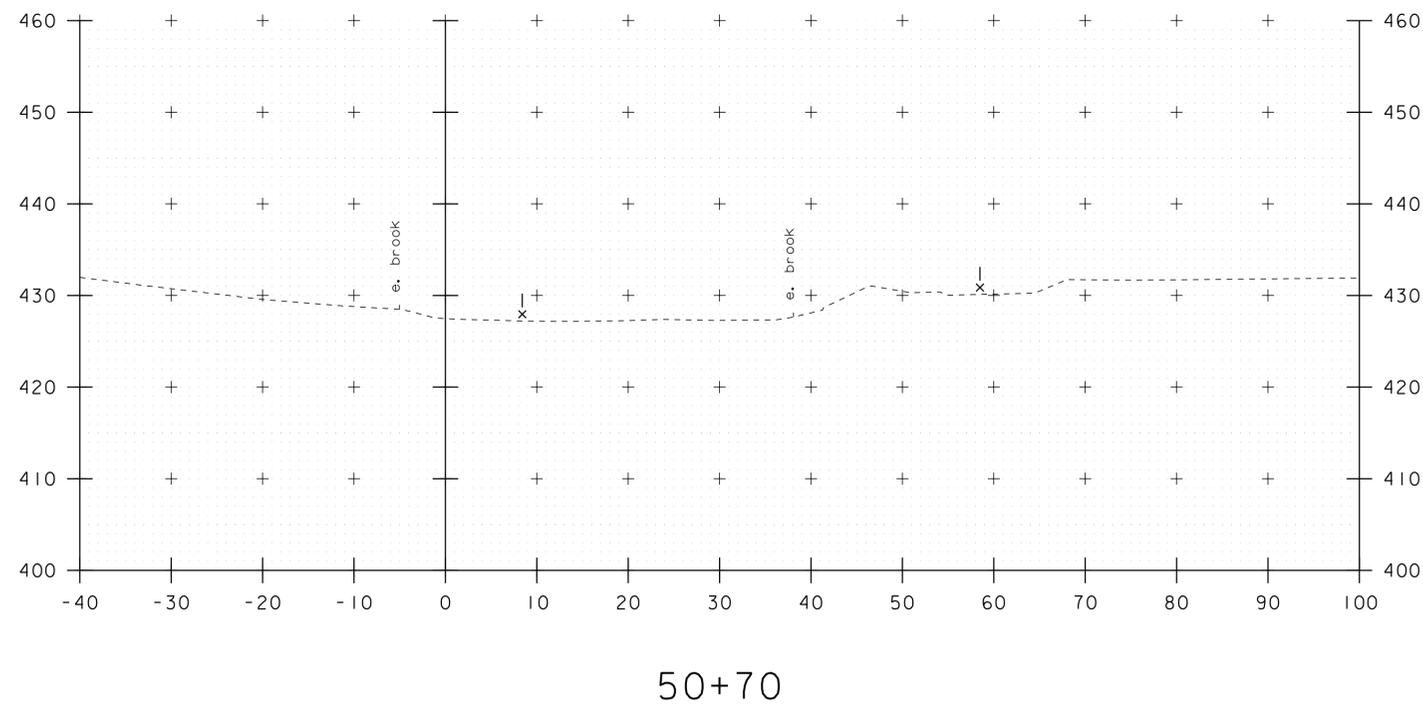
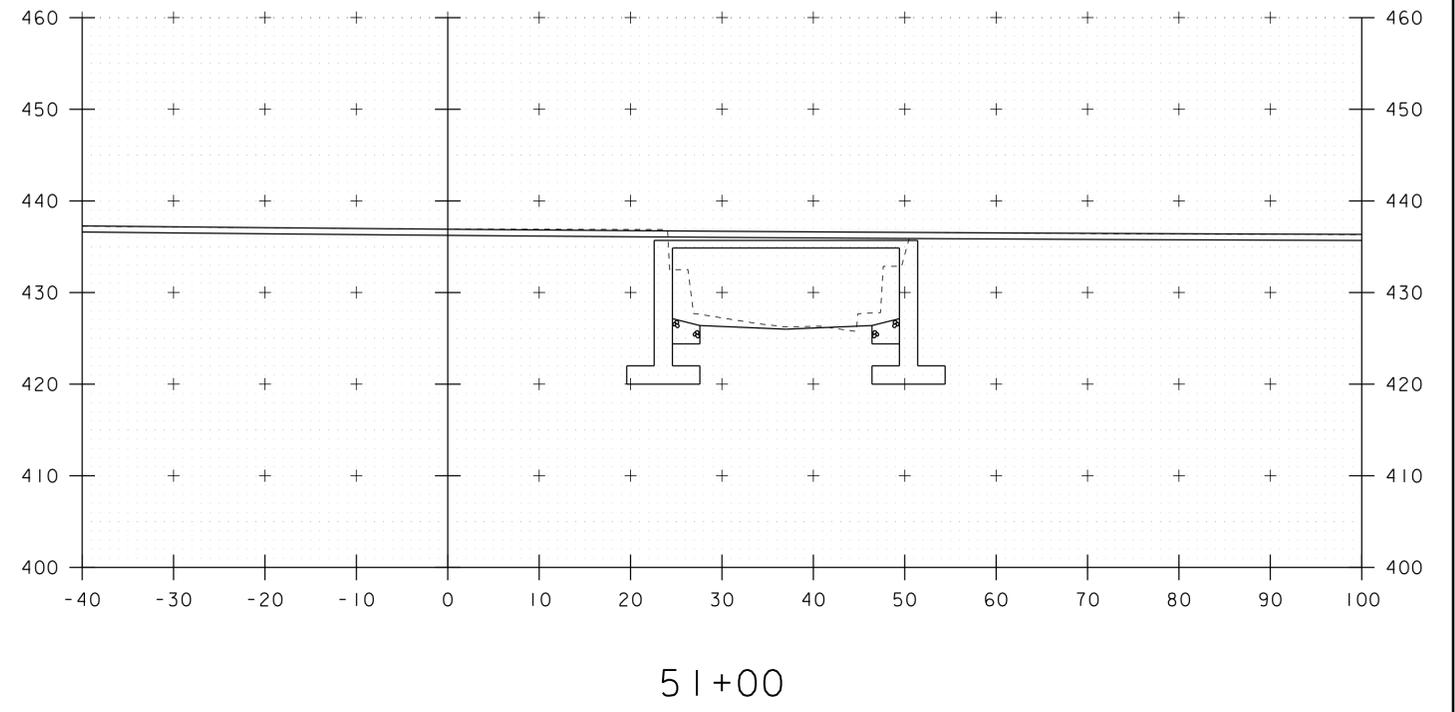
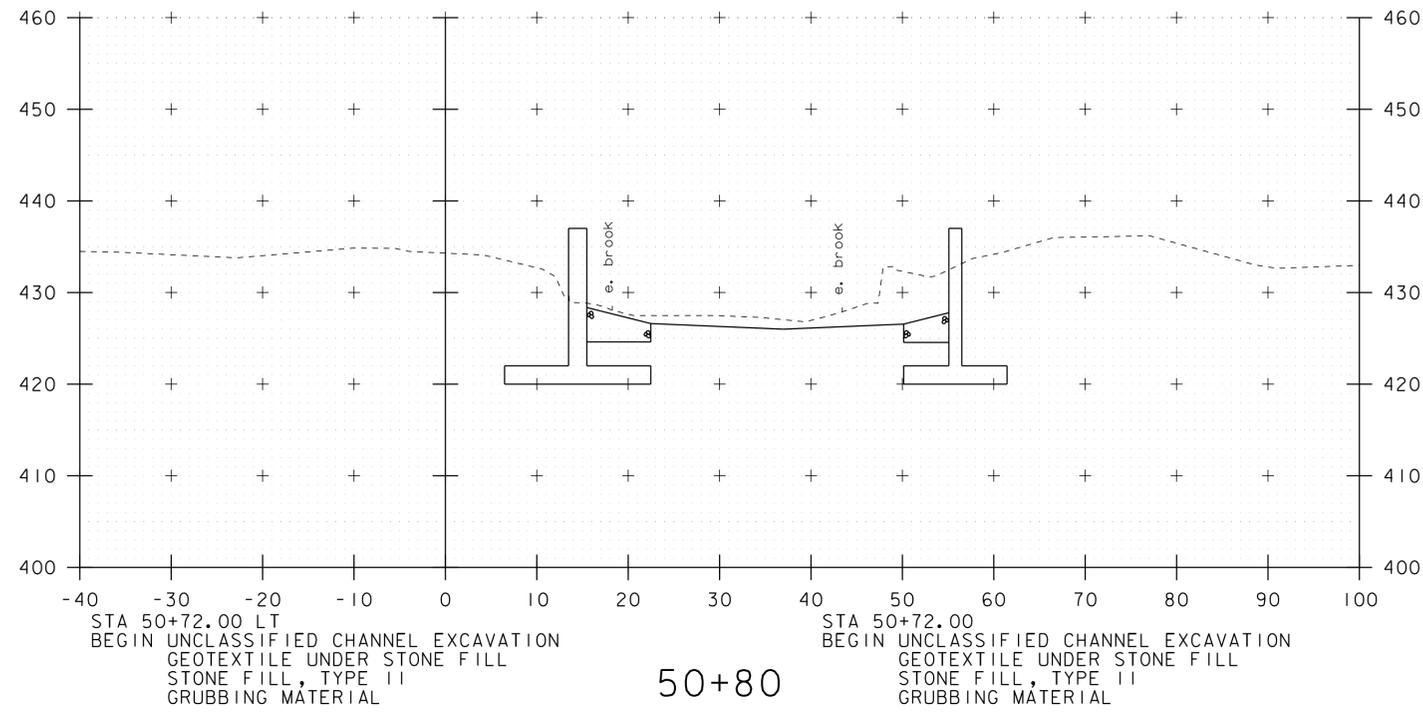


45+50

46+00

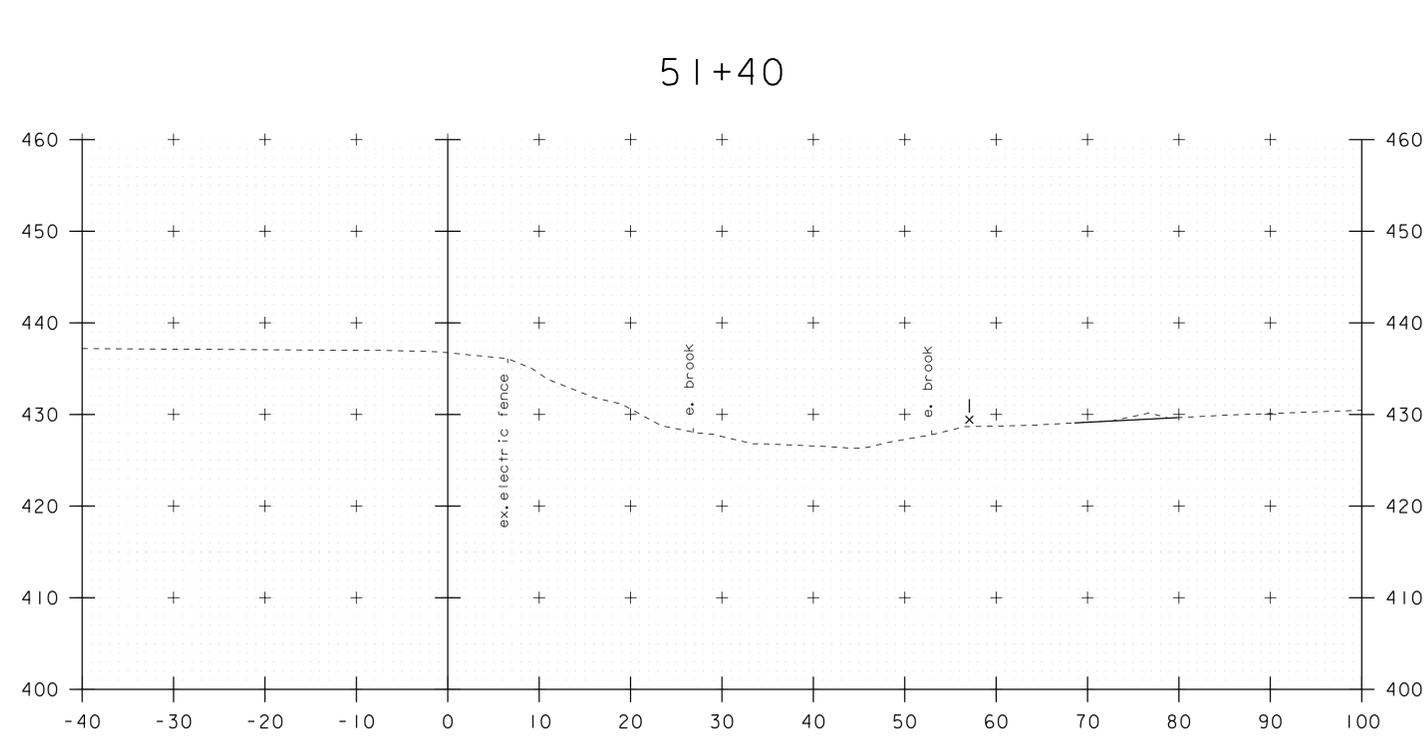
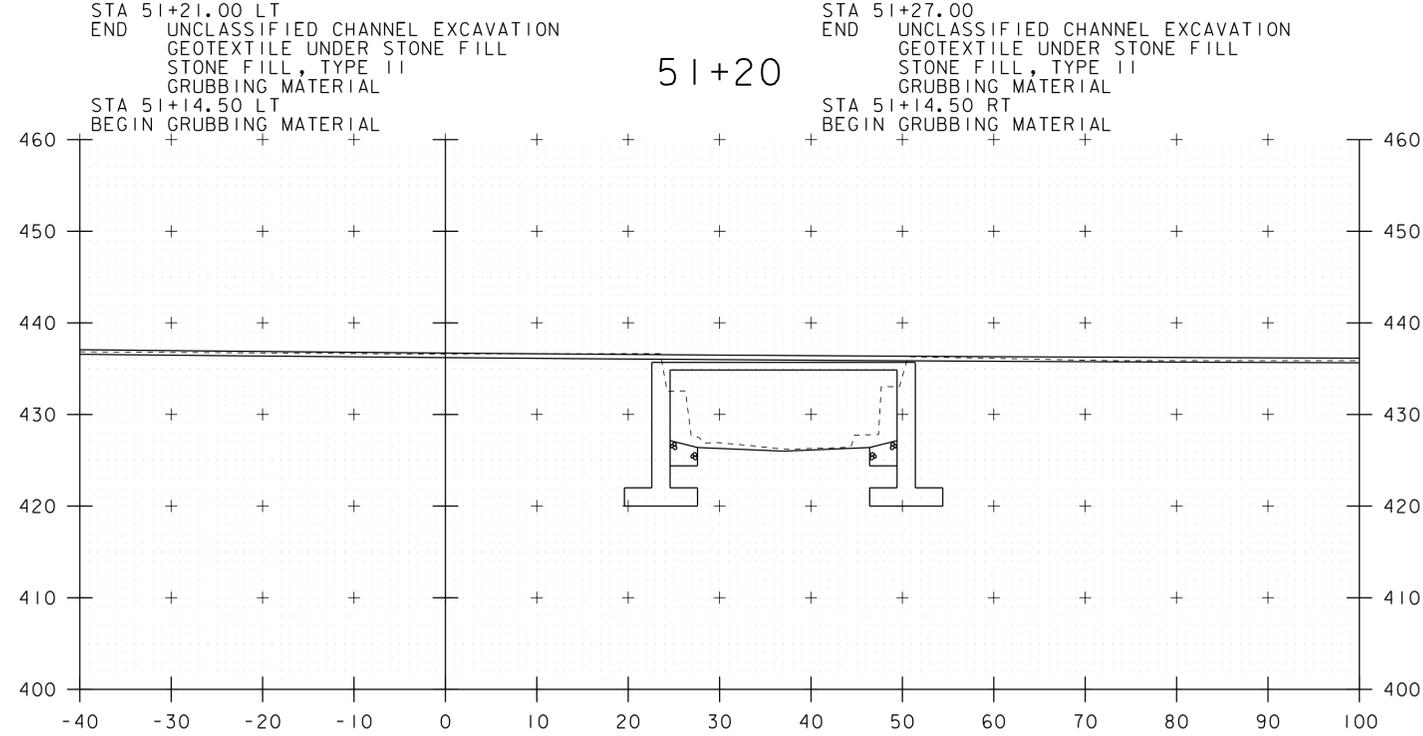
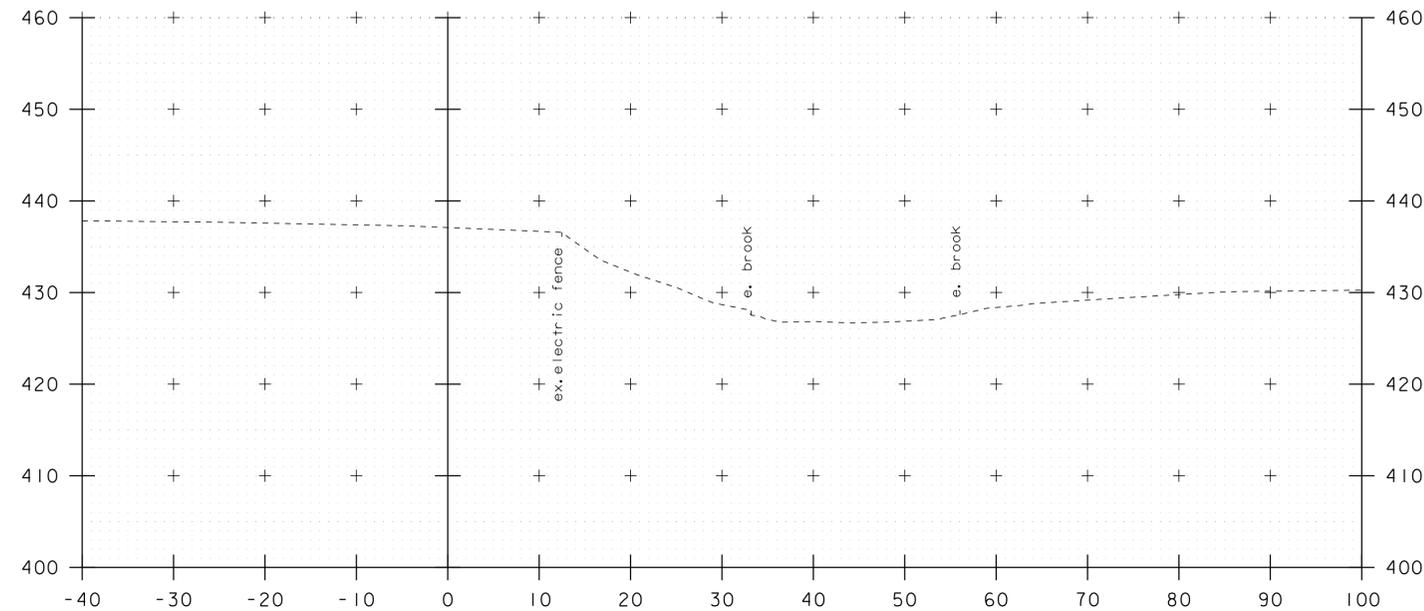
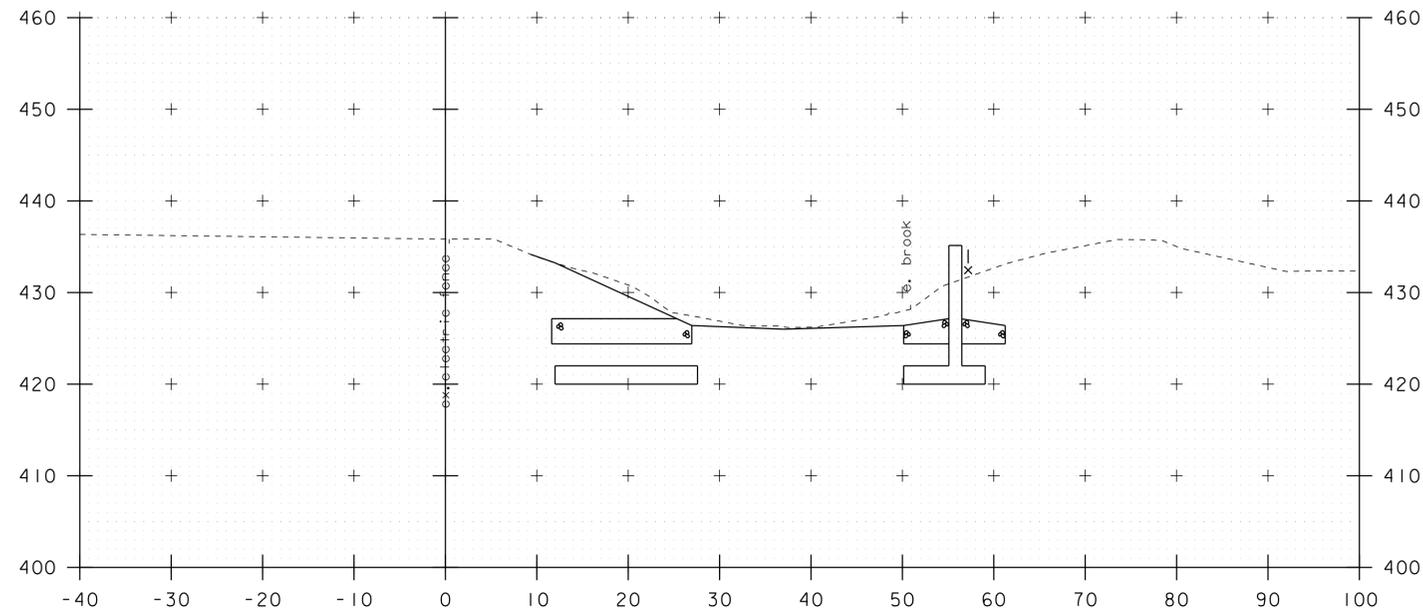
STA. 45+50 TO STA. 46+25

PROJECT NAME: RICHFORD	
PROJECT NUMBER: BRF 0302(29)	
FILE NAME: sl2j58xs.dgn	PLOT DATE: 14-MAR-2014
PROJECT LEADER: C. CARLSON	DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS	CHECKED BY: H. SALLS
MAINLINE CROSS SECTIONS 4	SHEET 22 OF 30



STA. 50+70 TO STA. 51+00

PROJECT NAME: RICHFORD	
PROJECT NUMBER: BRF 0302(29)	
FILE NAME: sl2j58xs.dgn	PLOT DATE: 14-MAR-2014
PROJECT LEADER: C. CARLSON	DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS	CHECKED BY: H. SALLS
CHANNEL CROSS SECTIONS I	SHEET 23 OF 30



51+20

51+40

51+10

51+30

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

FILE NAME: sl2j58xs.dgn  
PROJECT LEADER: C. CARLSON  
DESIGNED BY: H. SALLS  
CHANNEL CROSS SECTIONS 2

PLOT DATE: 14-MAR-2014  
DRAWN BY: R. PELLETT  
CHECKED BY: H. SALLS  
SHEET 24 OF 30

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 0.35 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.

#### **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**

#### **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.

SURFACE ROUGHENING OF ALL EXPOSED SLOPES, COMBINED WITH TEMPORARY MULCHING, SHALL BE UTILIZED ON A REGULAR BASIS. BIODEGRADABLE EROSION CONTROL MATTING OR AN EQUIVALENT SHALL BE USED TO STABILIZE ALL SLOPES STEEPER THAN 1:3.

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.

SEED, MULCH, FERTILIZER AND LIME SHALL BE USED TO ESTABLISH PERMANENT VEGETATION. FOR SLOPES STEEPER THAN 1:3, BIODEGRADABLE EROSION CONTROL MATTING OR AN EQUIVALENT SHALL BE USED INSTEAD OF MULCH.

#### **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**

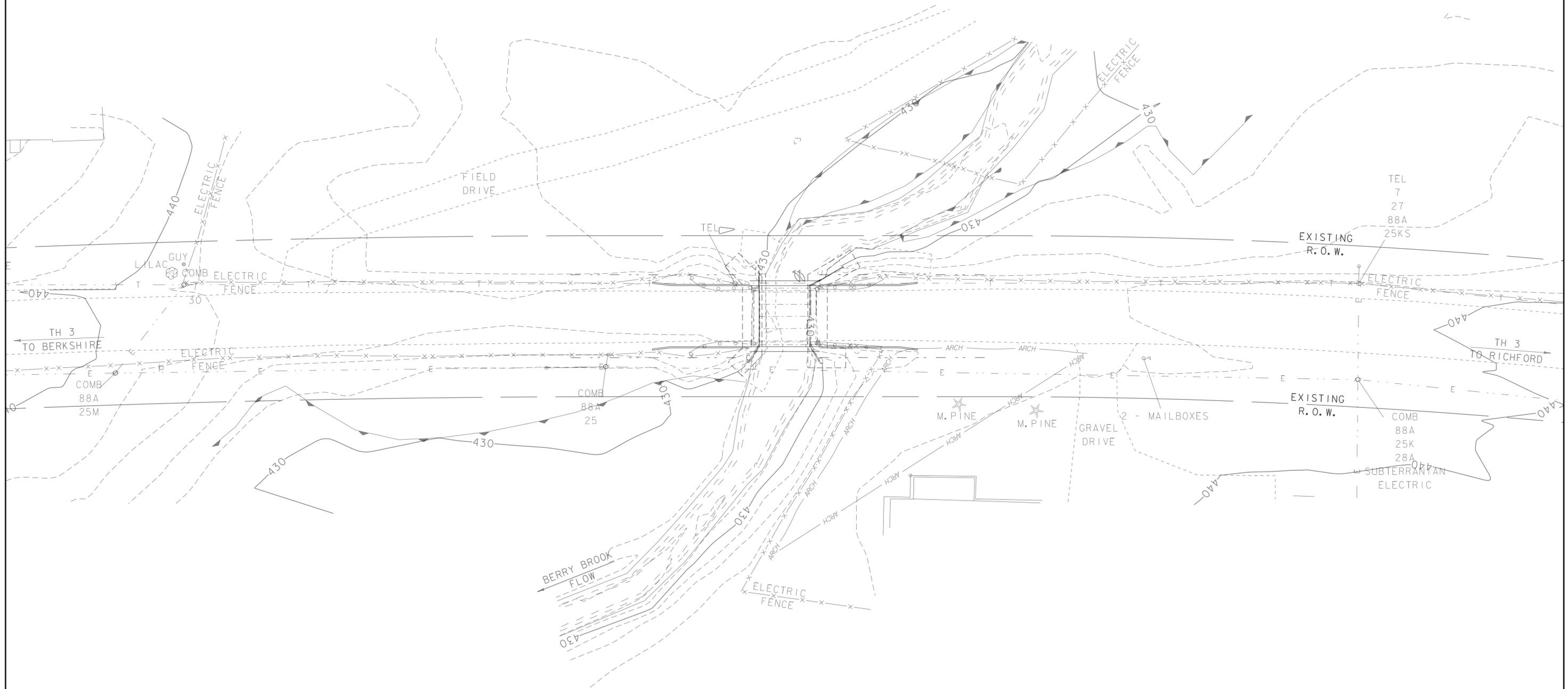
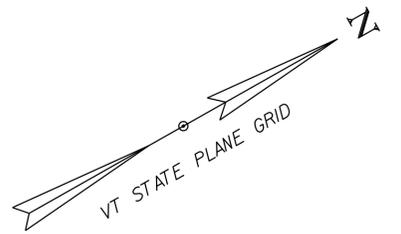
#### **1.5.2 OFF-SITE ACTIVITIES**

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)

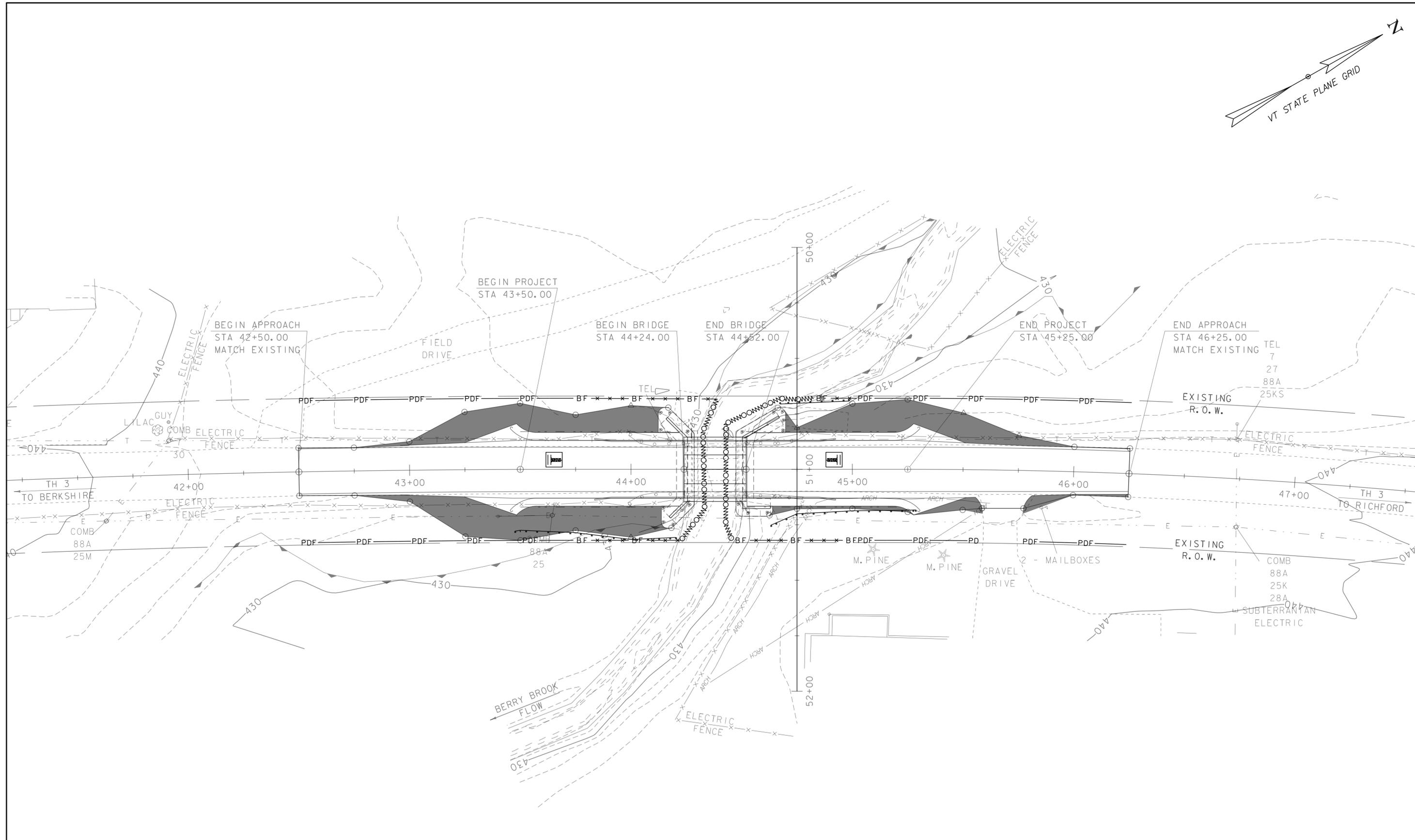
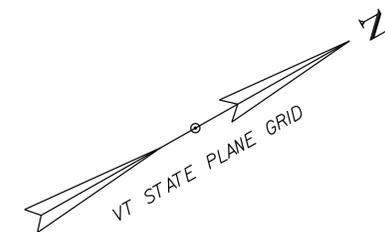
FILE NAME: s12j158epsc_narrative.dgn PLOT DATE: 14-MAR-2014  
PROJECT LEADER: C. CARLSON DRAWN BY: R. PELLETT  
DESIGNED BY: H. SALLS CHECKED BY: H. SALLS  
EPSC NARRATIVE SHEET 25 OF 30

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



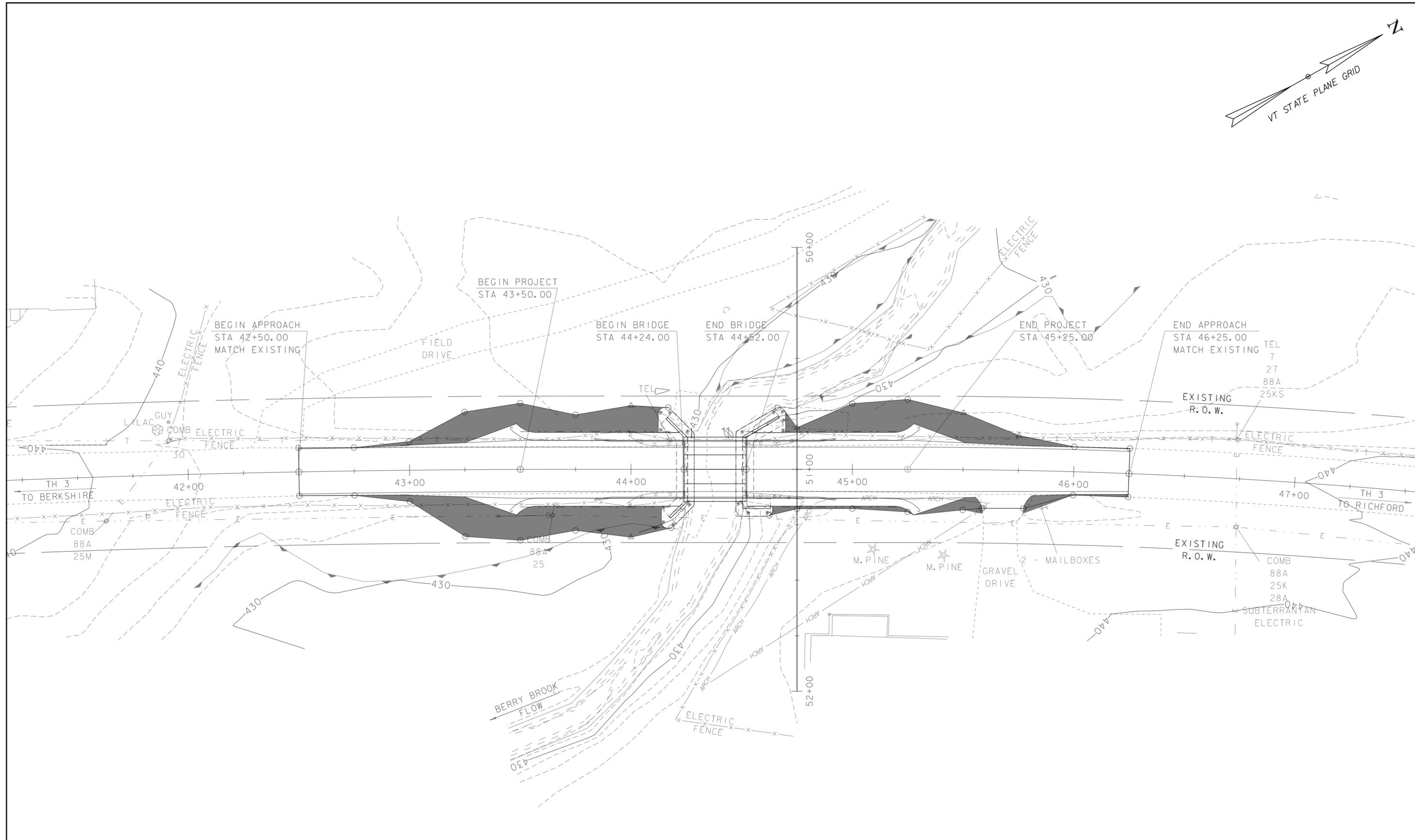
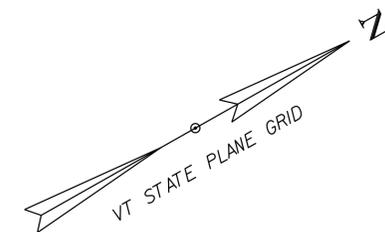
SCALE 1" = 20'-0"  
 20 0 20

PROJECT NAME:	RICHFORD	PLOT DATE:	14-MAR-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	R. PELLETT
FILE NAME:	sl2j58bdrero.dgn	CHECKED BY:	H. SALLS
PROJECT LEADER:	C. CARLSON	DESIGNED BY:	H. SALLS
DESIGNED BY:	H. SALLS	EPSC EXISTING CONDITIONS	SHEET 26 OF 30



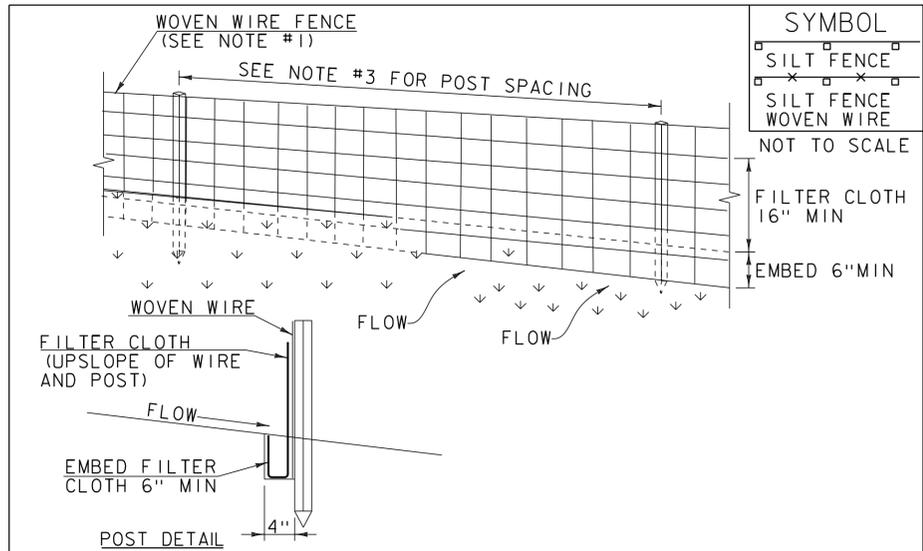
SCALE 1" = 20'-0"  
 20 0 20

PROJECT NAME: RICHFORD	
PROJECT NUMBER: BRF 0302(29)	
FILE NAME: sl2j58bdrero.dgn	PLOT DATE: 14-MAR-2014
PROJECT LEADER: C. CARLSON	DRAWN BY: R. PELLETT
DESIGNED BY: H. SALLS	CHECKED BY: H. SALLS
EPSC DURING CONSTRUCTION	SHEET 27 OF 30



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

PROJECT NAME:	RICHFORD	PLOT DATE:	14-MAR-2014
PROJECT NUMBER:	BRF 0302(29)	DRAWN BY:	R. PELLETT
FILE NAME:	sl2j58bdrero.dgn	CHECKED BY:	H. SALLS
PROJECT LEADER:	C. CARLSON	DESIGNED BY:	H. SALLS
EPSC FINAL CONDITIONS			SHEET 28 OF 30



SYMBOL	
	SILT FENCE
	SILT FENCE WOVEN WIRE

**CONSTRUCTION SPECIFICATIONS**

1. WOVEN WIRE REINFORCED FENCE IS REQUIRED WITHIN 100' UPSLOPE OF RECEIVING WATERS WHEN THE PROJECT FALLS UNDER A CONSTRUCTION STORMWATER PERMIT. WOVEN WIRE SHALL BE A MIN. 14 GAUGE WITH A 6" MAX. MESH OPENING.
2. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAF1100X, STABILINKA T140N OR APPROVED EQUIVALENT.
3. POST SPACING FOR WIRE-BACKED FENCE SHALL BE 10' MAXIMUM. FOR FILTER-CLOTH FENCE, WHEN ELONGATION IS >50%, POST SPACING SHALL NOT EXCEED 4' AND WHEN ELONGATION IS <50%, POST SPACING SHALL NOT EXCEED 6'.
4. WOVEN WIRE FENCE IS TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES. FILTER CLOTH IS TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY 6" AND FOLDED.
6. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN SEDIMENT REACHES HALF OF FABRIC HEIGHT.

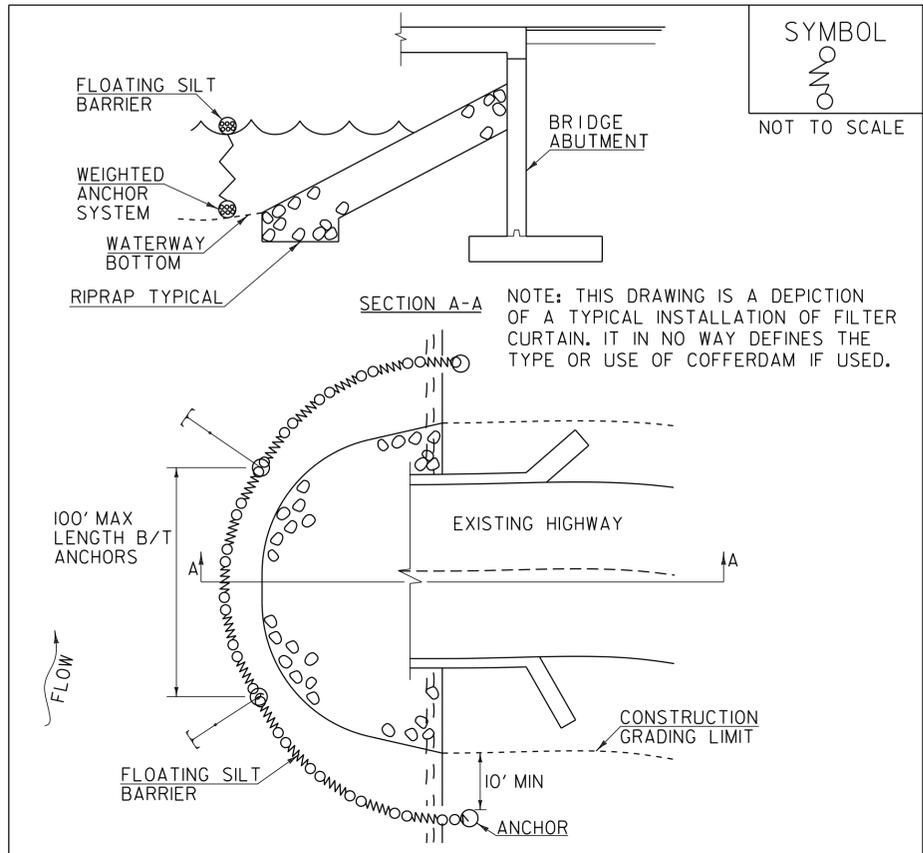
ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC  
ORIGINALLY DEVELOPED BY USDA-NRCS  
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

**SILT FENCE**

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 649 AND AS SHOWN IN THE PLANS FOR GEOTEXTILE FOR SILT FENCE (PAY ITEM 649.51) OR GEOTEXTILE FOR SILT FENCE, WOVEN WIRE REINFORCED (PAY ITEM 649.515).

REVISIONS		
MARCH 21, 2008	WHF	
DECEMBER 11, 2008	WHF	
JANUARY 13, 2009	WHF	



SYMBOL	
	FILTER CURTAIN

**CONSTRUCTION SPECIFICATIONS**

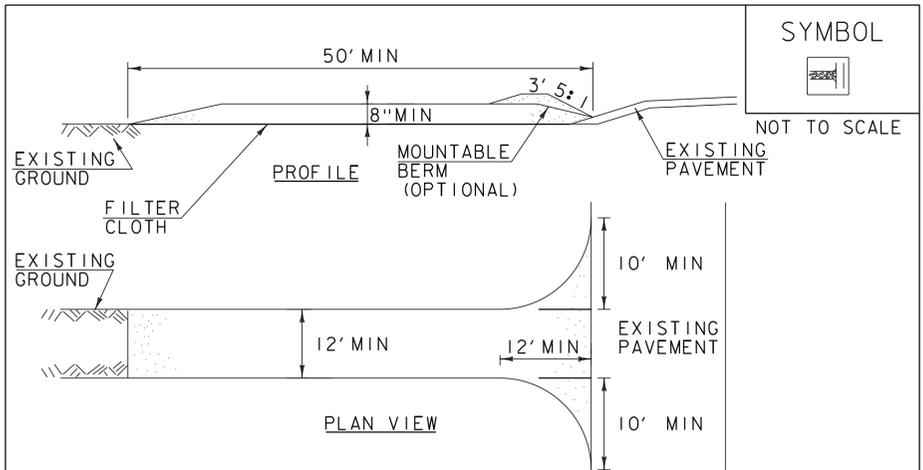
1. FILTER CURTAIN SHALL NOT BE PLACED ACROSS A FLOWING WATERWAY, OR IN A WATERWAY WITH STREAM VELOCITIES GREATER THAN 1.5 FEET/SECOND.
2. MAXIMUM 100' LENGTH BETWEEN ANCHORS.
3. LAST SECTION SHALL TERMINATE A MINIMUM OF 10' BEYOND LIMIT OF DISTURBANCE.
4. THE WEIGHTED ANCHOR SYSTEM SHALL BE A TYPE WHICH ALLOWS THE CURTAIN TO CONFORM TO THE BOTTOM OF THE WATERWAY.
5. THE CURTAIN SHALL BE REMOVED BY SLOWLY PULLING TOWARD THE SHORE MINIMIZING THE ESCAPE OF SEDIMENTS INTO WATERWAY.

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

**FILTER CURTAIN**

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 649 FOR GEOTEXTILE FOR FILTER CURTAIN (PAY ITEM 649.61).

REVISIONS		
APRIL 1, 2008	WHF	
JANUARY 13, 2009	WHF	
SEPTEMBER 4, 2009	WHF	



SYMBOL	
	STABILIZED CONSTRUCTION ENTRANCE

**CONSTRUCTION SPECIFICATIONS**

1. STONE SIZE- USE 1-4" STONE, RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH- NOT LESS THAN 50' (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30' MINIMUM LENGTH APPLIES).
3. THICKNESS- NOT LESS THAN 8".
4. WIDTH- 12' MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. 24' IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE MUST BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.
6. SURFACE WATER- ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED ACCORDING TO PERMIT REQUIREMENTS.

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

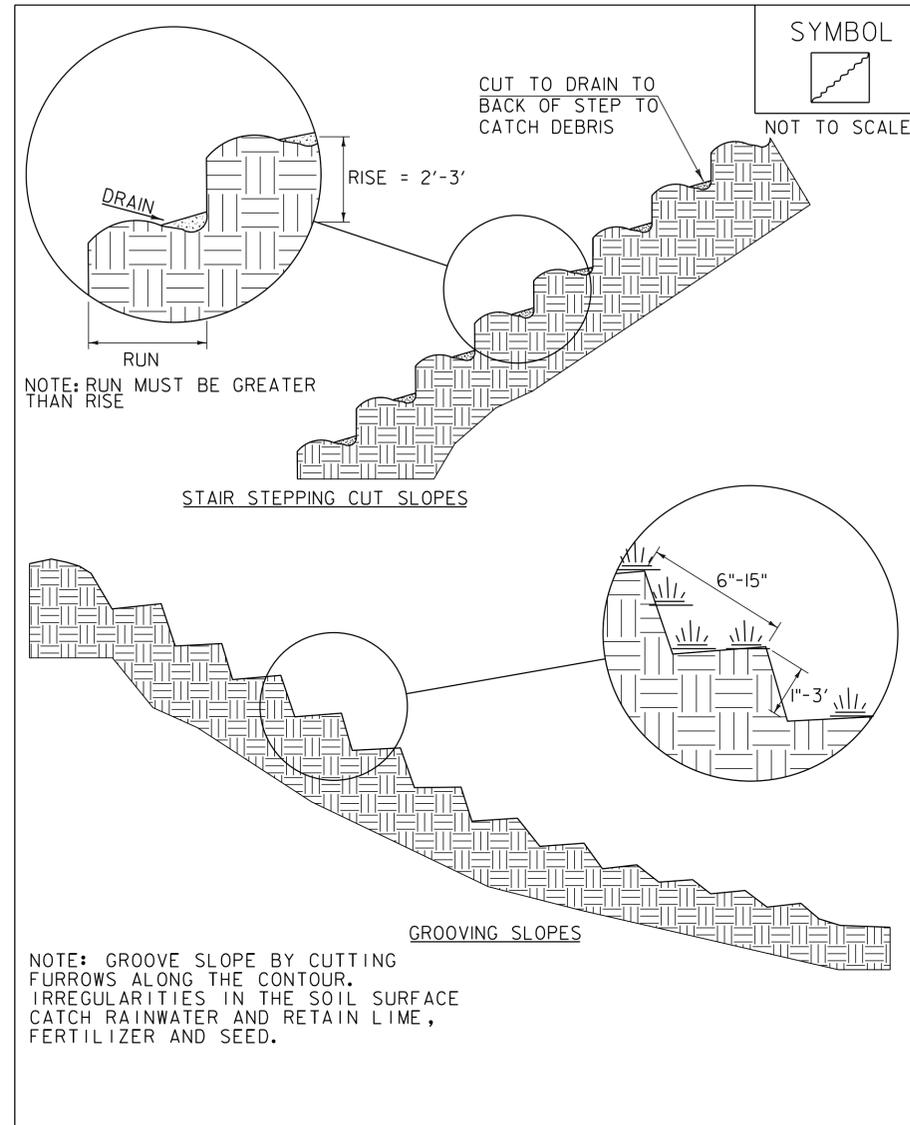
**STABILIZED CONSTRUCTION ENTRANCE**

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 FOR VEHICLE TRACKING PAD (PAY ITEM 653.35) OR AS SPECIFIED IN THE CONTRACT.

REVISIONS		
MARCH 24, 2008	WHF	
JANUARY 13, 2009	WHF	

PROJECT NAME:	RICHFORD
PROJECT NUMBER:	BRF 0302(29)
FILE NAME:	sl2j58erode+.dgn
PROJECT LEADER:	C. CARLSON
DESIGNED BY:	H. SALLS
EPSC DETAILS:	1
PLOT DATE:	14-MAR-2014
DRAWN BY:	R. PELLETT
CHECKED BY:	H. SALLS
SHEET	29 OF 30



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: 14-MAR-2014  
 DRAWN BY: R. PELLETT  
 CHECKED BY: H. SALLS  
 SHEET 30 OF 30